PAPE–DAWSON

WOLF RANCH PARKWAY / MEMORIAL DRIVE

EDWARDS AQUIFER PROTECTION PROGRAM ROADWAY APPLICATION (51423-00)



PAPE-DAWSON

September 2, 2025

Ms. Lori Wilson
Texas Commission on Environmental Quality
Region 11
12100 Park 35 Circle, Bldg. A
Austin, Texas 78753

Re: Wolf Ranch Parkway / Memorial Drive
Water Pollution Abatement Plan

Dear Mr. Sadlier:

Please find attached one (1) electronic, one (1) original, and one (1) copy of the Wolf Ranch Parkway / Memorial Drive Water Pollution Abatement Plan (WPAP). This Water Pollution Abatement Plan has been prepared in accordance with the Texas Administrative Code (30 TAC 213), and current policies for development over the Edwards Aquifer Recharge Zone.

This Water Pollution Abatement Plan applies to an approximate 34.97-acre site as identified by the project limits. Please review the plan information for the items it is intended to address. If acceptable, please provide a written approval of the plan in order that construction may begin at the earliest opportunity.

Appropriate review fee ($6,500) and fee application are included. If you have any questions or require additional information, please do not hesitate to contact me at your earliest convenience.

Sincerely,
Pape-Dawson Engineers, Inc.
Texas Board of Professional Engineers, Firm Registration # 470

Steven Crauford, P.E.
Vice President

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Texas Commission on Environmental Quality

Edwards Aquifer Application Cover Page

Our Review of Your Application

The Edwards Aquifer Program staff conducts an administrative and technical review of all applications. The turnaround time for administrative review can be up to 30 days as outlined in 30 TAC 213.4(e). Generally administrative completeness is determined during the intake meeting or within a few days of receipt. The turnaround time for technical review of an administratively complete Edwards Aquifer application is 90 days as outlined in 30 TAC 213.4(e). Please know that the review and approval time is directly impacted by the quality and completeness of the initial application that is received. In order to conduct a timely review, it is imperative that the information provided in an Edwards Aquifer application include final plans, be accurate, complete, and in compliance with 30 TAC 213.

Administrative Review

1. Edwards Aquifer applications must be deemed administratively complete before a technical review can begin. To be considered administratively complete, the application must contain completed forms and attachments, provide the requested information, and meet all the site plan requirements. The submitted application and plan sheets should be final plans. Please submit one full-size set of plan sheets with the original application, and half-size sets with the additional copies.

   To ensure that all applicable documents are included in the application, the program has developed tools to guide you and web pages to provide all forms, checklists, and guidance. Please visit the below website for assistance: http://www.tceq.texas.gov/field/eapp.

2. This Edwards Aquifer Application Cover Page form (certified by the applicant or agent) must be included in the application and brought to the administrative review meeting.

3. Administrative reviews are scheduled with program staff who will conduct the review. Applicants or their authorized agent should call the appropriate regional office, according to the county in which the project is located, to schedule a review. The average meeting time is one hour.

4. In the meeting, the application is examined for administrative completeness. Deficiencies will be noted by staff and emailed or faxed to the applicant and authorized agent at the end of the meeting, or shortly after. Administrative deficiencies will cause the application to be deemed incomplete and returned.

   An appointment should be made to resubmit the application. The application is re-examined to ensure all deficiencies are resolved. The application will only be deemed administratively complete when all administrative deficiencies are addressed.

5. If an application is received by mail, courier service, or otherwise submitted without a review meeting, the administrative review will be conducted within 30 days. The applicant and agent will be contacted with the results of the administrative review. If the application is found to be administratively incomplete, it can be retrieved from the regional office or returned by regular mail. If returned by mail, the regional office may require arrangements for return shipping.

6. If the geologic assessment was completed before October 1, 2004 and the site contains "possibly sensitive" features, the assessment must be updated in accordance with the *Instructions to Geologists* (TCEQ-0585 Instructions).

Technical Review

1. When an application is deemed administratively complete, the technical review period begins. The regional office will distribute copies of the application to the identified affected city, county, and groundwater conservation district whose jurisdiction includes the subject site. These entities and the public have 30 days to provide comments on the application to the regional office. All comments received are reviewed by TCEQ.

2. A site assessment is usually conducted as part of the technical review, to evaluate the geologic assessment and observe existing site conditions. The site must be accessible to our staff. The site boundaries should be

clearly marked, features identified in the geologic assessment should be flagged, roadways marked and the alignment of the Sewage Collection System and manholes should be staked at the time the application is submitted. If the site is not marked the application may be returned.

3. We evaluate the application for technical completeness and contact the applicant and agent via Notice of Deficiency (NOD) to request additional information and identify technical deficiencies. There are two deficiency response periods available to the applicant. There are 14 days to resolve deficiencies noted in the first NOD. If a second NOD is issued, there is an additional 14 days to resolve deficiencies. If the response to the second notice is not received, is incomplete or inadequate, or provides new information that is incomplete or inadequate, the application must be withdrawn or will be denied. Please note that because the technical review is underway, whether the application is withdrawn or denied **the application fee will be forfeited**.
4. The program has 90 calendar days to complete the technical review of the application. If the application is technically adequate, such that it complies with the Edwards Aquifer rules, and is protective of the Edwards Aquifer during and after construction, an approval letter will be issued. Construction or other regulated activity may not begin until an approval is issued.

Mid-Review Modifications

It is important to have final site plans prior to beginning the permitting process with TCEQ to avoid delays.

Occasionally, circumstances arise where you may have significant design and/or site plan changes after your Edwards Aquifer application has been deemed administratively complete by TCEQ. This is considered a "Mid-Review Modification". Mid-Review Modifications may require redistribution of an application that includes the proposed modifications for public comment.

If you are proposing a Mid-Review Modification, two options are available:

- If the technical review has begun your application can be denied/withdrawn, your fees will be forfeited, and the plan will have to be resubmitted.
- TCEQ can continue the technical review of the application as it was submitted, and a modification application can be submitted at a later time.

If the application is denied/withdrawn, the resubmitted application will be subject to the administrative and technical review processes and will be treated as a new application. The application will be redistributed to the affected jurisdictions.

Please contact the regional office if you have questions. If your project is located in Williamson, Travis, or Hays County, contact TCEQ's Austin Regional Office at 512-339-2929. If your project is in Comal, Bexar, Medina, Uvalde, or Kinney County, contact TCEQ's San Antonio Regional Office at 210-490-3096

Please fill out all required fields below and submit with your application.

1. Regulated Entity Name: Wolf Ranch Parkway / Memorial Drive						**2. Regulated Entity No.: N/A**			
3. Customer Name: City of Georgetown						**4. Customer No.:**			
5. Project Type: **(Please circle/check one)**	New		Modification			Extension		Exception	
6. Plan Type: **(Please circle/check one)**	WPAP	CZP	SCS	UST	AST	EXP	EXT	Technical Clarification	Optional Enhanced Measures
7. Land Use: **(Please circle/check one)**	Residential		Non-residential			**8. Site (acres):**			34.97
9. Application Fee:			**10. Permanent BMP(s):**			10			
11. SCS (Linear Ft.):	N/A		**12. AST/UST (No. Tanks):**			N/A			
13. County:	Williamson		**14. Watershed:**			San Gabriel River			

Application Distribution

Instructions: Use the table below to determine the number of applications required. One original and one copy of the application, plus additional copies (as needed) for each affected incorporated city, county, and groundwater conservation district are required. Linear projects or large projects, which cross into multiple jurisdictions, can require additional copies. Refer to the "Texas Groundwater Conservation Districts within the EAPP Boundaries" map found at:

http://www.tceq.texas.gov/assets/public/compliance/field_ops/eapp/EAPP%20GWCD%20map.pdf

For more detailed boundaries, please contact the conservation district directly.

Austin Region			
County:	**Hays**	**Travis**	**Williamson**
Original (1 req.)	___	___	_X_
Region (1 req.)	___	___	_X_
County(ies)	___	___	_X_
Groundwater Conservation District(s)	___Edwards Aquifer Authority ___Barton Springs/ Edwards Aquifer ___Hays Trinity ___Plum Creek	___Barton Springs/ Edwards Aquifer	NA
City(ies) Jurisdiction	___Austin ___Buda ___Dripping Springs ___Kyle ___Mountain City ___San Marcos ___Wimberley ___Woodcreek	___Austin ___Bee Cave ___Pflugerville ___Rollingwood ___Round Rock ___Sunset Valley ___West Lake Hills	___Austin ___Cedar Park ___Florence _X_Georgetown ___Jerrell ___Leander ___Liberty Hill ___Pflugerville ___Round Rock

San Antonio Region					
County:	**Bexar**	**Comal**	**Kinney**	**Medina**	**Uvalde**
Original (1 req.)	___	___	___	___	___
Region (1 req.)	___	___	___	___	___
County(ies)	___	___	___	___	___
Groundwater Conservation District(s)	___ Edwards Aquifer Authority ___Trinity-Glen Rose	___Edwards Aquifer Authority	___Kinney	___EAA ___Medina	___EAA ___Uvalde
City(ies) Jurisdiction	___Castle Hills ___Fair Oaks Ranch ___Helotes ___Hill Country Village ___Hollywood Park ___San Antonio (SAWS) ___Shavano Park	___Bulverde ___Fair Oaks Ranch ___Garden Ridge ___New Braunfels ___Schertz	NA	___San Antonio ETJ (SAWS)	NA

I certify that to the best of my knowledge, that the application is complete and accurate. This application is hereby submitted to TCEQ for administrative review and technical review. Steven Crauford, P.E. Print Name of Customer/Authorized Agent Signature of Customer/Authorized Agent Date 9/2/25

FOR TCEQ INTERNAL USE ONLY				
Date(s)Reviewed:		Date Administratively Complete:		
Received From:		Correct Number of Copies:		
Received By:		Distribution Date:		
EAPP File Number:		Complex:		
Admin. Review(s) (No.):		No. AR Rounds:		
Delinquent Fees (Y/N):		Review Time Spent:		
Lat./Long. Verified:		SOS Customer Verification:		
Agent Authorization Complete/Notarized (Y/N):		Fee Check:	Payable to TCEQ (Y/N):	
Core Data Form Complete (Y/N):			Signed (Y/N):	
Core Data Form Incomplete Nos.:			Less than 90 days old (Y/N):	

LEGAL BOUNDARY

Legal Boundary Description

The plan Includes Wolf Ranch Parkway, beginning at the intersection of Wolf Ranch Parkway and University Drive (State Highway 29) and terminating at the intersection of Wolf Ranch Parkway and Rivery Boulevard. This plan also includes Memorial Drive beginning at the intersection of Memorial Drive and River Chase Boulevard and terminating approximately 2,700 linear feet to the east.

GENERAL INFORMATION

General Information Form

Texas Commission on Environmental Quality

For Regulated Activities on the Edwards Aquifer Recharge and Transition Zones and Relating to 30 TAC §213.4(b) & §213.5(b)(2)(A), (B) Effective June 1, 1999

To ensure that the application is administratively complete, confirm that all fields in the form are complete, verify that all requested information is provided, consistently reference the same site and contact person in all forms in the application, and ensure forms are signed by the appropriate party.

Note: Including all the information requested in the form and attachments contributes to more streamlined technical reviews.

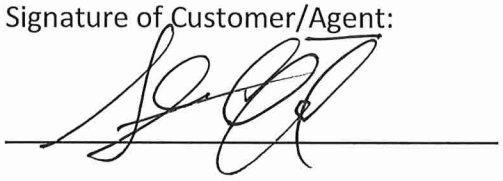
Signature

To the best of my knowledge, the responses to this form accurately reflect all information requested concerning the proposed regulated activities and methods to protect the Edwards Aquifer. This **General Information Form** is hereby submitted for TCEQ review. The application was prepared by:

Print Name of Customer/Agent: Steven Crauford, P.E.

Date: 9/2/25

Signature of Customer/Agent:



Project Information

1. Regulated Entity Name: Wolf Ranch Parkway/Memorial Drive
2. County: Williamson
3. Stream Basin: San Gabriel River
4. Groundwater Conservation District (If applicable): N/A
5. Edwards Aquifer Zone:

   ☒ Recharge Zone
   ☐ Transition Zone

6. Plan Type:

   ☒ WPAP
   ☐ SCS
   ☐ Modification
   ☐ AST
   ☐ UST
   ☐ Exception Request

7. Customer (Applicant):

   Contact Person: Hunter Anderson
   Entity: City of Georgetown
   Mailing Address: 809 Martin Luther King Jr St
   City, State: Georgetown, TX Zip: 78626
   Telephone: (512) 930-6527 FAX: N/A
   Email Address: Hunter.Anderson@georgetown.org

8. Agent/Representative (If any):

   Contact Person: Steven Crauford, P.E.
   Entity: Pape-Dawson Engineers, Inc.
   Mailing Address: 10801 N MoPac Expy., Bldg. 3 Suite 200
   City, State: Austin, TX Zip: 78759
   Telephone: (512) 454-8711 FAX: N/A
   Email Address: SCrauford@pape-dawson.com

9. Project Location:

   ☒ The project site is located inside the city limits of Georgetown.
   ☐ The project site is located outside the city limits but inside the ETJ (extra-territorial jurisdiction) of _____.
   ☐ The project site is not located within any city's limits or ETJ.

10. ☒ The location of the project site is described below. The description provides sufficient detail and clarity so that the TCEQ's Regional staff can easily locate the project and site boundaries for a field investigation.

    From TCEQ's Regional Office, proceed north on IH-35 for approximately 17.3 miles. Take Exit 261, and head right on the ramp for TX-29 toward Burnet. In approximately 0.7 miles, turn left onto TX-29 / W University Ave toward Burnet and proceed for 0.7 miles. Turn right onto Wolf Ranch Pkwy. The project site is location at the intersection between Wolf Ranch Parkway and Memorial Drive.

11. ☒ **Attachment A – Road Map**. A road map showing directions to and the location of the project site is attached. The project location and site boundaries are clearly shown on the map.

12. ☒ **Attachment B - USGS / Edwards Recharge Zone Map**. A copy of the official 7 ½ minute USGS Quadrangle Map (Scale: 1" = 2000') of the Edwards Recharge Zone is attached. The map(s) clearly show:

    ☒ Project site boundaries.
    ☒ USGS Quadrangle Name(s).
    ☒ Boundaries of the Recharge Zone (and Transition Zone, if applicable).
    ☒ Drainage path from the project site to the boundary of the Recharge Zone.

13. ☒ **The TCEQ must be able to inspect the project site or the application will be returned**. Sufficient survey staking is provided on the project to allow TCEQ regional staff to locate

the boundaries and alignment of the regulated activities and the geologic or manmade features noted in the Geologic Assessment.

☒ Survey staking will be completed by this date: At TCEQ Request

14. ☒ **Attachment C – Project Description**. Attached at the end of this form is a detailed narrative description of the proposed project. The project description is consistent throughout the application and contains, at a minimum, the following details:

☒ Area of the site
☒ Offsite areas
☒ Impervious cover
☒ Permanent BMP(s)
☒ Proposed site use
☒ Site history
☒ Previous development
☒ Area(s) to be demolished

15. Existing project site conditions are noted below:

☐ Existing commercial site
☐ Existing industrial site
☐ Existing residential site
☒ Existing paved and/or unpaved roads
☐ Undeveloped (Cleared)
☐ Undeveloped (Undisturbed/Uncleared)
☐ Other: _____

Prohibited Activities

16. ☒ I am aware that the following activities are prohibited on the Recharge Zone and are not proposed for this project:

(1) Waste disposal wells regulated under 30 TAC Chapter 331 of this title (relating to Underground Injection Control);

(2) New feedlot/concentrated animal feeding operations, as defined in 30 TAC §213.3;

(3) Land disposal of Class I wastes, as defined in 30 TAC §335.1;

(4) The use of sewage holding tanks as parts of organized collection systems; and

(5) New municipal solid waste landfill facilities required to meet and comply with Type I standards which are defined in §330.41(b), (c), and (d) of this title (relating to Types of Municipal Solid Waste Facilities).

(6) New municipal and industrial wastewater discharges into or adjacent to water in the state that would create additional pollutant loading.

17. ☒ I am aware that the following activities are prohibited on the Transition Zone and are not proposed for this project:

(1) Waste disposal wells regulated under 30 TAC Chapter 331 (relating to Underground Injection Control);

(2) Land disposal of Class I wastes, as defined in 30 TAC §335.1; and

(3) New municipal solid waste landfill facilities required to meet and comply with Type I standards which are defined in §330.41 (b), (c), and (d) of this title.

Administrative Information

18. The fee for the plan(s) is based on:

☒ For a Water Pollution Abatement Plan or Modification, the total acreage of the site where regulated activities will occur.
☐ For an Organized Sewage Collection System Plan or Modification, the total linear footage of all collection system lines.
☐ For a UST Facility Plan or Modification or an AST Facility Plan or Modification, the total number of tanks or piping systems.
☐ A request for an exception to any substantive portion of the regulations related to the protection of water quality.
☐ A request for an extension to a previously approved plan.

19. ☒ Application fees are due and payable at the time the application is filed. If the correct fee is not submitted, the TCEQ is not required to consider the application until the correct fee is submitted. Both the fee and the Edwards Aquifer Fee Form have been sent to the Commission's:

☐ TCEQ cashier
☒ Austin Regional Office (for projects in Hays, Travis, and Williamson Counties)
☐ San Antonio Regional Office (for projects in Bexar, Comal, Kinney, Medina, and Uvalde Counties)

20. ☒ Submit one (1) original and one (1) copy of the application, plus additional copies as needed for each affected incorporated city, groundwater conservation district, and county in which the project will be located. The TCEQ will distribute the additional copies to these jurisdictions. The copies must be submitted to the appropriate regional office.

21. ☒ No person shall commence any regulated activity until the Edwards Aquifer Protection Plan(s) for the activity has been filed with and approved by the Executive Director.

EDWARDS AQUIFER PROTECTION PROGRAM ROADWAY APPLICATION

Edwards Aquifer Protection Program Roadway Application

Texas Commission on Environmental Quality

This application is intended only for projects which a major roadway is designed for construction, such as State highways, County roads, and City thoroughfares.

Designed for Regulated Activities on the Contributing Zone to the Edwards Aquifer in relation to 30 TAC §213.24, Regulated Activities on the Edwards Aquifer Recharge Zone, in relation to 30 TAC §213.5(b), Effective June 1, 1999.

To ensure that the application is administratively complete, confirm that all fields in the form are complete, verify that all requested information is provided, consistently reference the same site and contact person in all forms in the application, and ensure forms are signed by the appropriate party.

Note: Including all the information requested in the form and attachments contributes to more streamlined technical reviews.

Signature

To the best of my knowledge, the responses to this form accurately reflect all information requested concerning the proposed regulated activities and methods to protect the Edwards Aquifer.

The application was prepared by:

Print Name of Customer/Agent: Steven Crauford, P.E.

Date: 9/24/25

Signature of Customer/Agent:



Project Information

1. Regulated Entity (Project) Name: Wolf Ranch Parkway / Memorial Drive
2. County: Williamson
3. Stream Basin(s): 10
4. Groundwater Conservation District (if applicable): _____
5. Customer (Applicant):

   Contact Person: Hunter Anderson
   Entity: City of Georgetown
   Mailing Address: 300 Industrial Avenue, PO Box 409
   City, State: TX Zip: 78626
   Telephone: (512)-930-6527
   Email Address: Hunter.Anderson@georgetown.org

6. Agent (Representative):

Contact Person: Steven Crauford, P.E.
Entity: Pape-Dawson Engineers
Mailing Address: 10801 N Mopac Expy.
City, State: Austin, TX Zip: 78759
Telephone: (512)-454-8711
Email Address: AConner@pape-dawson.com

7. Landowner of R.O.W. (Right of Way)
Person or entity responsible for maintenance of water quality Best Management Practices (BMPs), if not applicant.

Contact Person: _____
Entity: _____
Mailing Address: _____
City, State: _____ Zip: _____
Telephone: _____
Email Address: _____

8. ☒ **The TCEQ must be able to inspect the project site or the application will be returned.** Sufficient survey marking is provided on the project to allow TCEQ regional staff to locate the boundaries and alignment of any regulated activities and the geologic or manmade features noted in the Geologic Assessment.

☒ Survey marking will be completed by this date: At TCEQ Request

9. ☒ **Attachment A - Road Map.** A road map showing directions to and the location of the project site is attached. The map clearly shows the boundary of the project site.

10. ☒ **Attachment B - USGS Quadrangle.** A copy of the official 7 ½ minute USGS Quadrangle Map (Scale: 1" = 2000') is attached. The map(s) clearly show:

☒ Project site boundaries
☒ USGS Quadrangle Name(s)
☐ All drainage paths from site to surface waters

11. ☒ **This project extends into (Check all that apply):**

☒ Recharge Zone (RZ)
☐ Contributing Zone (CZ)
☐ Transition Zone (TZ)
☐ Contributing Zone within Transition Zone (CZ/TZ)
☐ Zone not regulated by EAPP

12. ☒ **Attachment C - Project Description**. A detailed narrative description of the proposed project is attached. The project description is consistent throughout the application and contains, at a minimum, the following details:

- ☒ Complete site area [Acres]
- ☒ Offsite upgradient stormwater areas to be captured
- ☒ Impervious area [Acres]
- ☒ Permanent BMP(s)
- ☒ Proposed site use
- ☒ Existing roadway (paved and/or unpaved)
- ☒ Structures to be demolished [Include demo phase]
- ☒ Major interim phases

13. Existing project site conditions are noted below:

- ☒ Existing paved and/or unpaved roads
- ☒ Undeveloped (Cleared)
- ☐ Undeveloped (Undisturbed/Not cleared)
- ☐ Existing commercial site
- ☐ Existing industrial site
- ☐ Existing residential site
- ☐ Other: _____

14. ☒ **Attachment D - Factors Affecting Surface Water Quality**. A detailed description of all factors that could affect surface water quality is attached.

15. ☒ Only inert materials as defined by 30 TAC §330.3 will be used as fill material.

16. Type of pavement or road surface to be used:

- ☒ Concrete
- ☒ Asphaltic concrete pavement
- ☐ Permeable Friction Course (PFC)
- ☐ Other: _____

17. Right of Way (R.O.W.) and Pavement Area:

R.O.W. for project: 25.91 (ac.)
Length: 7977 ft.
Width: varies from 50 ft. to 200 ft.
Impervious cover (IC): 19.14 (ac.)
Total of Pavement area 19.14 (ac.) ÷ R.O.W. area 25.91 (ac.) x 100 = 73.87% IC.

- ☒ CAD program was used to determine areas.
- ☒ Number of travel lanes: proposed: 3, existing: 2
- ☒ Typical widths of lanes: 16.5 (ft.)
- ☒ Are intersections also being improved? (Y/N) _____

Site Plan Requirements

Items 18 - 28 must be included on the Site Plan.

18. ☒ The Site Plan must have a minimum scale of 1" = 400'.
    Site Plan Scale: 1" = 100'

19. 100-year floodplain boundaries:

    ☐ Some part(s) of the project site is located within the 100-year floodplain. The floodplain is shown and labeled. The 100-year floodplain boundaries are based on the following specific (including date of material) source(s):_____.

    ☒ No part of the project site is located within the 100-year floodplain.

20. ☒ A layout of the development with existing and finished contours at appropriate, but not greater than ten-foot contour intervals is shown. Sensitive features, lots, wells, buildings, roads, culverts, etc. are shown on the site plan.

21. ☒ A figure (map) indicating all paths of drainage from the site to surface waters.

    N/A Name all stream crossings: _____
    ☒ Drainage patterns and approximate slopes.
    ☒ There will be no discharge to surface waters.

22. ☒ Distinguish between areas of soil disturbance and areas which will not be disturbed.

23. ☒ Show locations of major structural and nonstructural controls. These are the temporary and permanent best management practices. Include the following:

    ☒ Show design and location of any hazardous materials traps.
    ☒ Show design at outfalls of major control structures and conveyances.
    ☒ A description of the BMPs and measures that prevent pollutants from entering surface streams.

24. Show locations of staging areas or project specific locations (PSL). Are they:

    ☒ Onsite, within project R.O.W.
    ☐ Offsite.
    ☐ Not yet determined. (Requires future authorization)

25. ☒ Show locations where soil stabilization practices are expected to occur.

26. N/A Show surface waters (including wetlands).

27. Temporary aboveground storage tank facilities:

    ☐ Temporary aboveground storage tank facilities will be located on this site. Show on site plan.
    ☒ Temporary aboveground storage tank facilities will not be located on this site.

28. ☒ Plan(s) also include:

    ☒ Sidewalks
    ☒ Related turn lanes
    ☒ Demolition plans
    ☐ Other improved areas: _____
    ☒ Shared-use paths
    ☐ Off-site improvements and staging areas
    ☒ Utility relocations

Permanent Best Management Practices (BMPs)

Description of practices and measures that will be used after construction is completed.

29. ☒ Permanent BMPs and measures have been designed, and will be constructed, operated, and maintained to ensure that 80% of the incremental increase in the annual mass loading of total suspended solids (TSS) from the site caused by the regulated activity is removed. These quantities have been calculated in accordance with technical guidance accepted by the executive director.

    ☒ The TCEQ Technical Guidance Manual (TGM) was used to design permanent BMPs and measures for this site.

    ☐ A technical guidance other than the TCEQ TGM was used to design permanent BMPs and measures for this site. The complete citation for the technical guidance that was used: _____

30. ☒ **Attachment E - BMPs for Upgradient (Offsite) Stormwater.**

    ☐ A description of the BMPs and measures that will be used to prevent pollution of surface water, groundwater, or stormwater that originates upgradient from the site and flows across the site is attached.

    ☒ No surface water, groundwater or stormwater originates upgradient from the site and flows across the site, and an explanation is attached.

    ☐ Permanent BMPs or measures are not required to prevent pollution of surface water, groundwater, or stormwater that originates upgradient from the site and flows across the site, and an explanation is attached.

31. ☒ **Attachment F - BMPs for On-site Stormwater.**

    ☒ A description of the BMPs and measures that will be used to prevent pollution of surface water or groundwater that originates on-site or flows off the site, including pollution caused by contaminated stormwater runoff from the site is attached.

    ☐ Permanent BMPs or measures are not required to prevent pollution of surface water or groundwater that originates on-site or flows off the site, including pollution caused by contaminated stormwater runoff, and an explanation is attached.

32. ☒ **Attachment G - Construction Plans.** Construction plans and design calculations for the proposed permanent BMPs and measures have been prepared by or under the direct supervision of a Texas Licensed Professional Engineer, and are signed, sealed, and dated. Construction plans for the proposed permanent BMPs and measures are attached and include all proposed structural plans and specifications, and appropriate details.

    ☒ Major bridge cross-sections, and roadway plan and profiles

    ☒ BMP plans and details

    ☒ Design calculations

    ☒ Erosion control

    ☒ TCEQ Construction Notes

    ☒ SW3P

    ☐ EPIC, as necessary

33. ☒ **Attachment H - Inspection, Maintenance, Repair and Retrofit Plan**. A site and BMP specific plan for the inspection, maintenance, repair, and, if necessary, retrofit of the permanent BMPs and measures is attached. The plan fulfills all the following:

    ☒ Prepared and certified by the engineer designing the permanent BMPs and measures.
    ☒ Signed by the owner or responsible party.
    ☒ Outlines specific procedures for documenting inspections, maintenance, repairs, and, if necessary, retrofit.
    ☒ Contains a discussion of recordkeeping procedures.

34. ☐ **Attachment I - Pilot-Scale Field Testing Plan.** Pilot studies for BMPs that are not recognized by the Executive Director require prior approval from the TCEQ. A plan for pilot-scale field testing is attached.

    ☒ N/A

35. ☒ **Attachment J - Measures for Minimizing Surface Stream Contamination.** A description of the measures that will be used to avoid or minimize surface stream contamination and changes in the way in which water enters a stream as a result of the construction and development is attached. The measures address increased stream flashing, the creation of stronger flows, and in-stream effects caused by the regulated activity which increase erosion or may result in water quality degradation.

    ☒ N/A Include permanent spill measures used to contain hydrocarbons or hazardous substances by way of traps, or response contingencies.

36. The applicant is responsible for maintaining the permanent BMPs after construction until such time as the maintenance obligation is either assumed in writing by another entity.

    If the applicant intends to transfer responsibility, check the box below.

    ☐ Yes

    A copy of the transfer of responsibility must be filed with the executive director at the appropriate regional office within 30 days.

Stormwater to be generated by the Proposed Project

Description of practices and measures that will be used during construction.

37. ☒ The site description, controls, maintenance, and inspection requirements for the Storm Water Pollution Prevention Plan (SWPPP or SW3P) developed under the Texas Pollutant Discharge Elimination System (TPDES) general permits for stormwater discharges have been submitted to fulfill paragraphs 30 TAC §213.24(1-5) & §213.5(b) of the technical report.

    ☒ The Temporary Stormwater Section (TCEQ-0602) is included with the application.
    ☐ The SWPPP (SW3P) will serve as the Temporary Stormwater Section (TCEQ-0602).

38. ☒ **Attachment K - Volume and Character of Stormwater**. A detailed description of the volume (quantity) and character (quality) of the stormwater runoff expected to occur from the proposed project is attached. The estimates of stormwater runoff quality and quantity are based on area and type of impervious cover.

    ☒ Include the pre-construction runoff coefficient.
    ☒ Include the post-construction runoff coefficient.

Administrative Information

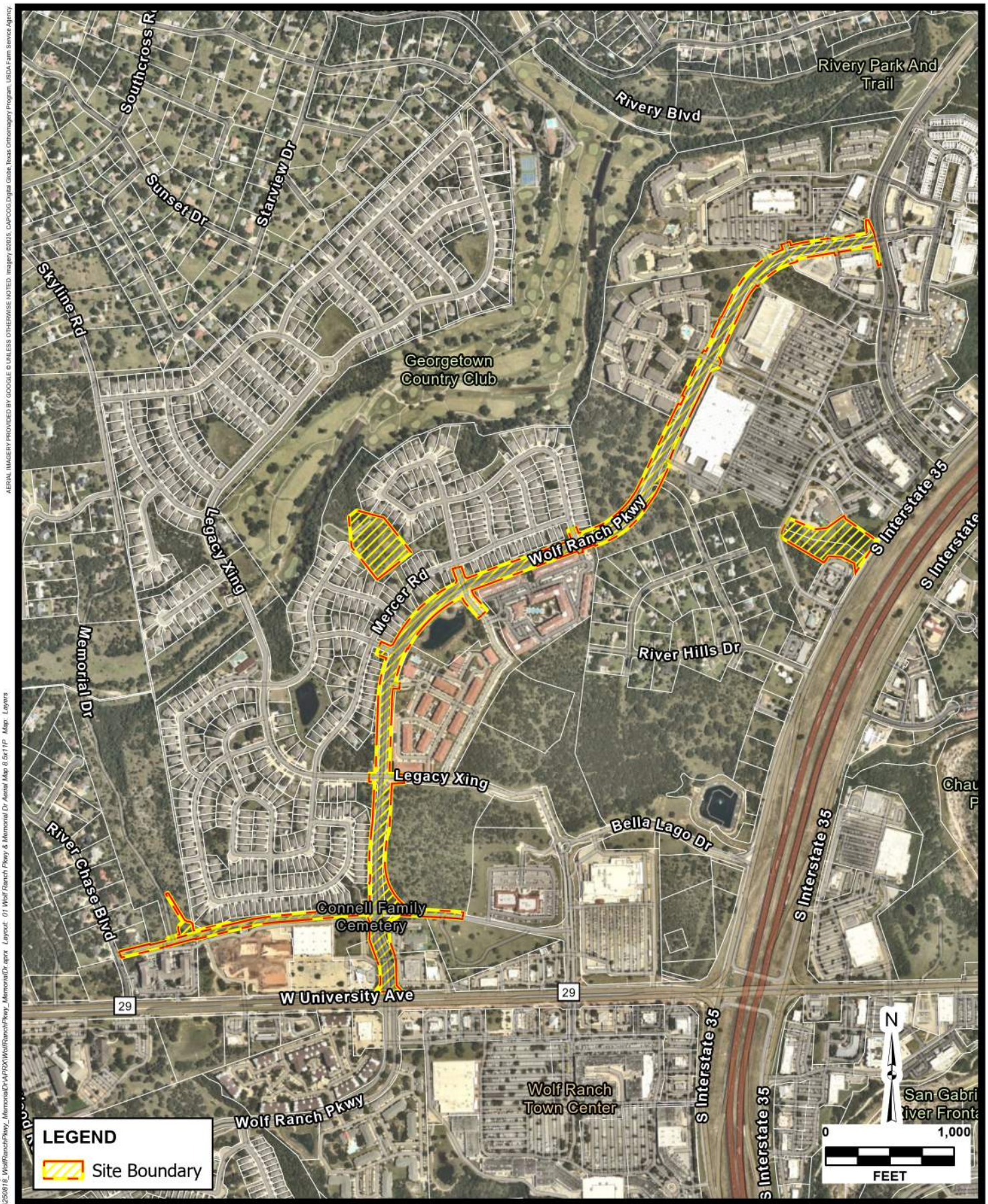
39. ☐ Submit one (1) original and one (1) copy of the application, plus one electronic copy as needed, for each affected incorporated city, groundwater conservation district, and county in which the project will be located. The TCEQ is required to distribute the additional copies to these jurisdictions.

40. The fee for the plan(s) is based on:

    ☐ The total R.O.W. (as in Item 17).

    ☐ TxDOT roadway project.

ATTACHMENT A



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Date: Aug 18, 2025 10:21 AM User: ntaylor
File: O:\Users\NTaylor\Exhibits\AKing\250818_WolfRanchPkwy_Memorial\DYAPROX\WolfRanchPkwy_MemorialDr.aprx Layout: 01 Wolf Ranch Pkwy & Memorial Dr Aerial Map 8.5x11P Map: Layers

JOB NO.	51423-00
DATE	Aug 2025
DESIGNER	AK
CHECKED	AK
DRAWN	NT
SHEET	ATTACHMENT A

WOLF RANCH PKWY & MEMORIAL DR

CITY OF GEORGETOWN, TEXAS

AERIAL MAP

PAPE-DAWSON

10801 N MOPAC EXPY, BLDG 3, STE 200 | AUSTIN, TX 78759 | 512.454.8711
TEXAS ENGINEERING FIRM #470 | TEXAS SURVEYING FIRM #10028800

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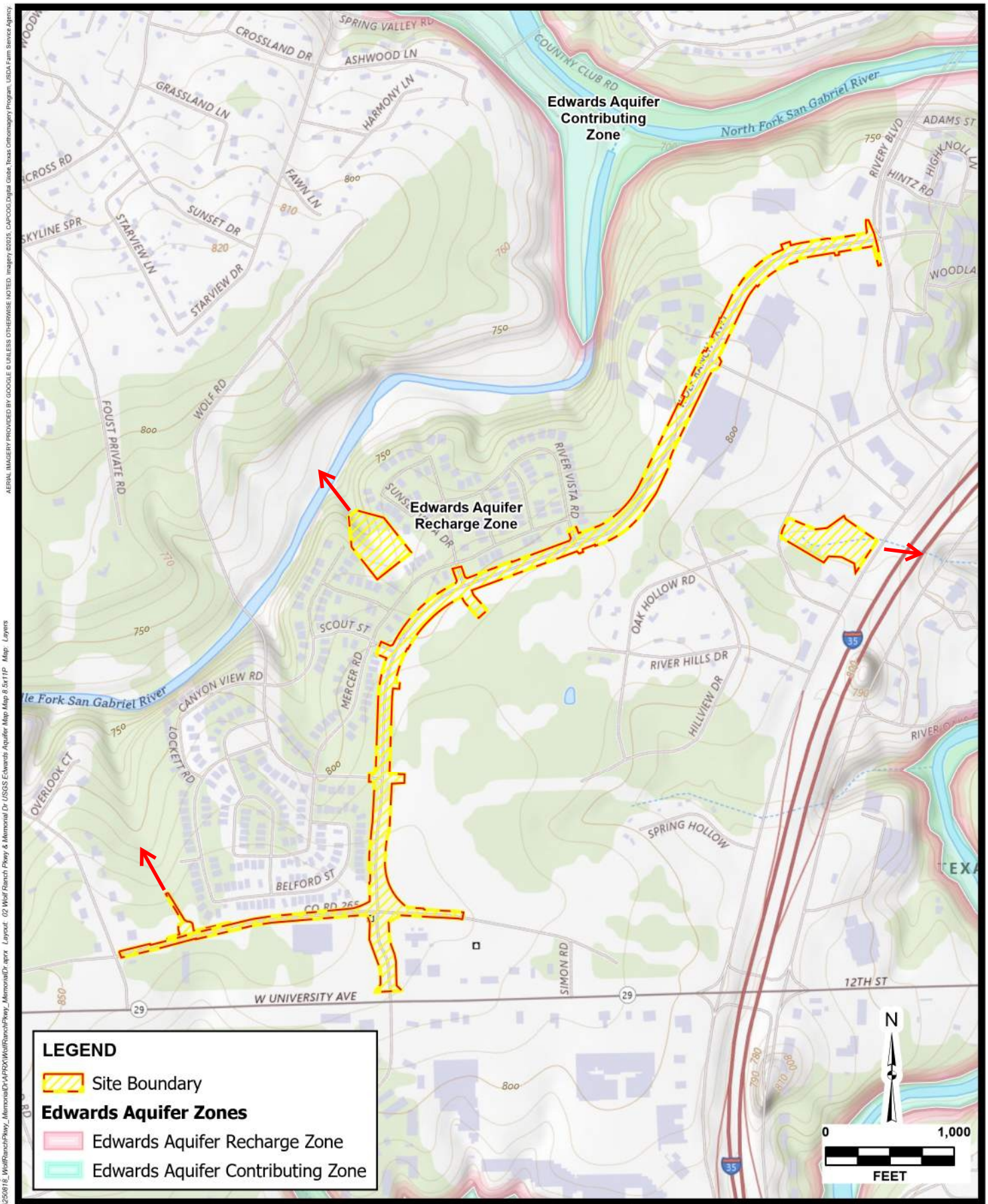
ATTACHMENT B



JOB NO. 51423-00
DATE Aug 2025
DESIGNER AK
CHECKED AK DRAWN NT
SHEET ATTACHMENT B

WOLF RANCH PKWY & MEMORIAL DR

CITY OF GEORGETOWN, TEXAS
USGS - EDWARDS AQUIFER MAP
USGS 7.5' QUAD

PAPE-DAWSON
10801 N MOPAC EXPY, BLDG 3, STE 200 | AUSTIN, TX 78759 | 512.454.8711
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Date: Aug 18, 2025 10:39 AM User: ntaylor
File: O:\Users\NTaylor\Exhibits\AKing\250818_WolfRanchPkwy_Memorial\DYAPROX\WolfRanchPkwy_MemorialDr.aprx Layout: 02 Wolf Ranch Pkwy & Memorial Dr USGS Edwards Aquifer Map 8.5x11P Map: Layers

THIS DOCUMENT HAS BEEN PRODUCED FROM MATERIAL THAT WAS STORED AND/OR TRANSMITTED ELECTRONICALLY AND MAY HAVE BEEN INADVERTENTLY ALTERED. RELY ONLY ON FINAL HARDCOPY MATERIALS BEARING THE CONSULTANT'S ORIGINAL SIGNATURE AND SEAL.

ATTACHMENT C

PROJECT DESCRIPTION

The project consists of improvements of Wolf Ranch Parkway, starting from the intersection of Wolf Ranch Parkway and University Drive (State Highway 29) and extending along Wolf Ranch Parkway approximately 7,300 linear feet to the north. The project also includes the improvements of Memorial Drive, starting from the intersection with River Chase Boulevard and extending 2,700 linear feet to the east. The entire site is located within the city limits of Georgetown in Williamson County, Texas. The project limits are located over the Edwards Aquifer Recharge Zone as shown on Attachment B. No wastewater improvements are proposed; therefore, a Sewage Collection System (SCS) Application is not required.

The Wolf Ranch Parkway and Memorial Drive expansions are a proposed roadway project and the project area includes 34.97 acres. This application only takes credit for existing impervious cover prior to December 27, 1996 per TAC 30, Chapter 213.1. The Geologic Assessment included with this Water Pollution Abatement Plan (WPAP) states that there are no naturally occurring geologic features within Wolf Ranch Parkway and Memorial Drive. There are no existing water wells within the Project Boundary submitted with this application.

Due to the City of Georgetown Salamander Ordinance, TSS removal of 85% is required on this project in excess of the 80% TSS removal required by the TCEQ. Therefore, permanent BMPs and associated sizing calculations have been adjusted to remove the required 85% TSS required by the City of Georgetown Salamander Ordinance.

Construction activities proposed with this application include demolition of existing roadways, clearing, grading, excavation, installation of utilities and drainage improvements, streets, sidewalks, and one batch detention pond. The major interim phases of construction are outlined on sheets 36 & 37 of the Construction Documents. Water quality adjustments to one existing batch detention basin are proposed (Wolf Ranch Section 2, Pond 1, approved EAPP ID No. 11000647). Detention adjustments are proposed to two existing wet basins (Rivery Pond A & B, approved EAPP ID No. 11-02041701). No water quality adjustments are proposed in these wet basins. This project will introduce approximately 7.50 acres of new impervious cover within the development including roads, sidewalks, and associated appurtenances.

The Memorial Drive drainage basin is approximately 3 acres. Within this basin, 1.31 acres are single family lots from the Wolf Ranch Section 1A subdivision. The 0.68 acres of impervious cover generated from these lots will be treated by the existing VFS-5 previously approved in EAPP ID No. 11-15032001. No changes to this PBMP are proposed. One (1) batch detention pond is proposed within the basin to treat the total 0.83 acres of impervious cover generated from new pavement and sidewalk.

The Wolf Ranch Section 1A wet pond basin, previously approved EAPP ID No. 11-15032001, treats approximately 34.12 acres of impervious cover in the ultimate condition. This basin takes credit for the existing 0.55 acre homestead previously on site. No changes are proposed to this PBMP.

The Wolf Ranch Town Center – wet pond A basin, previously approved EAPP ID No. 03082601, treats approximately 44.00 acres of impervious cover in the ultimate condition. This basin does not take credit for any existing impervious acreage. No changes are proposed to this PBMP.

The Wolf Ranch Town Center – wet pond B basin, previously approved EAPP ID No. 03082601, treats approximately 47.00 acres of impervious cover in the ultimate condition. This basin does not take credit for any existing impervious acreage. No changes are proposed to this PBMP.

The Wolf Lakes Section 1, Phase 1 & Section 2 – Pond 1 basin, previously approved EAPP ID No. 11003027, treats approximately 98.87 acres of impervious cover in the ultimate condition. This basin does not take credit for any existing impervious acreage. This basin overtreats for 0.31 acres of pavement at the intersection of Wolf Ranch Parkway and Legacy Crossing. No changes are proposed to this PBMP.

The Wolf Lakes Village Section 1, Phase 2 - Pond 1 basin, previously approved EAPP ID No. 11002713, treats approximately 25.64 acres of impervious cover in the ultimate condition. This basin does not take credit for any existing impervious acreage. No changes are proposed to this PBMP.

The Wolf Ranch Section 2 – Pond 1 basin, previously approved EAPP ID No. 11000647, now treats 27.83 acres of impervious cover in the ultimate condition. This basin takes credit for one (1.00) acre of impervious cover generated by existing Memorial Drive and the homestead previously on site. Two StormTroopers (SWAQ-110 models), are proposed in this basin. They have been sized to treat 0.79 and 0.84 acres of impervious cover from Wolf Ranch Parkway. Within this basin, 0.49 acres are single family lots from the Wolf Ranch Section 1A subdivision. The 0.29 acres of impervious cover generated from these lots will

be treated by the existing VFS-5 previously approved in EAPP ID No. 11-15032001. No changes to this VFS are proposed. This pond provides 2.72 acres of overtreatment as shown in the approved EAPP ID No. 11000647. This plan includes the expansion of the existing batch detention pond. The water quality volume is increased from 153,625 ft^3 to 226,575 ft^3 to treat the increase in impervious cover in the basin.

The Bluebonnet Plaza batch detention pond basin, previously approved EAPP ID No. 11001264, treats 13.35 of impervious cover in the ultimate condition. This basin does not take credit for any existing impervious acreage. No changes are proposed to this PMBP.

The Rivery Pond A basin, previously approved Edwards Aquifer Protection Program (EAPP) ID No. 11-02041701, treats approximately 30.96 acres of impervious cover. Two StormTroopers are proposed in this basin (one SWAQ-40, one SWAQ-25). The StormTroopers are sized to treat 0.39 acres and 0.22 acres of impervious cover respectively. This impervious cover is the additional impervious cover constructed with the expansion of Wolf Ranch Parkway. This plan increases the detention volume of the existing water quality pond A. This increased volume is for detention purposes only. No adjustments to the water quality volume or components are included in this plan.

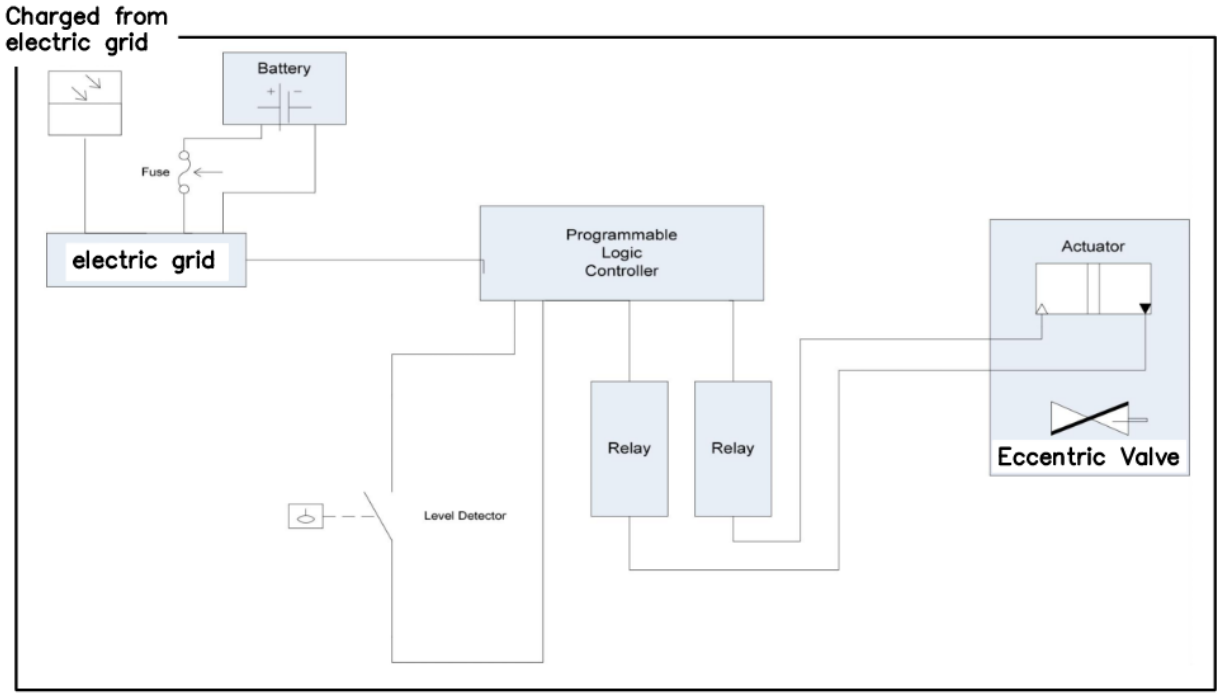
The existing Rivery Pond B treats approximately 50.27 acres of impervious cover as shown in the previously approved Edwards Aquifer Protection Program (EAPP) ID No. 11-02041701. Two StormTroopers (both SWAQ-40 models), are proposed in this basin. They treat a combined 0.88 acres (0.44 acres each) of impervious cover. This impervious cover is the additional impervious cover introduced by the project which is not treated by existing pond B. This plan increases the detention volume of the existing water quality pond B. This increased volume is for detention purposes only. No adjustments to the water quality volume or components are included in this plan.

One (1) batch detention pond, two (2) existing water quality ponds, six (6) StormTroopers, and one (1) existing vegetative filter strip are proposed as the Permanent Best Management Practices (PBMPs) for this site. All PBMPs have been designed in accordance with the TCEQ's Technical Guidance Manual (TGM) RG-348 (2005) to remove 85% of the increase in Total Suspended Solids (TSS) from the site. Additional calculations for 80% TSS removal are included in the Temporary Stormwater section under Attachment H.

The proposed Water Quality Pond is a batch detention pond with earthen side slopes. A maintenance access ramp with 4:1 slope is provided. The following is a summary of the batch detention pond controller components:

Batch Detention Pond Controller Information		
Component	**Description**	**Voltage**
Power System	Charged from electric grid 12 VDC Battery (Model MK Powered 8Gu1) (Or approved equal).	
Logic Controller	IDEC FL1C-H12RCE (Or approved equal)	12
Parts Enclosure	Southwest Photovoltaic Model BBG-1 (15.75" wide x 9.75" deep x 11.75" tall) (Or approved equal)	
Nature of Event Sensing	Anchor Scientific Float Switch (Or approved equal)	
Valve Type	2" Eccentric Plug Valve with over torque sensors and mechanical hand crank for physical override if necessary. Able to withstand 100 psi minimum. (Or approved equal)	
Actuator	EPI-6 12 VDC. Able to withstand 100 psi minimum. (Or approved equal)	12
Power Consumption (actuator, controller, relay, PLC)	242.58 W, 46.5 W-hours	

The following is a circuit diagram of the controllers:



The logic controllers will provide a test sequence. The systems will be solar powered and will be equipped with a backup battery. The systems will be equipped with an on/off/reset switch. The eccentric plug valve will be equipped with a manual hand crank for physical override if necessary, in the event of a spill or for maintenance purposes. The systems will be equipped with a clearly visible external indicator to indicate if a cycle is in progress without having to open the parts enclosure.

The logic controller cycle overviews are as follows:

Case 1: A single rain event fills the batch detention basin. The basin holds the diverted storm water for the detention time (12 hours) and the releases the water. Once the batch detention basin is empty, a delay of 2 hours is started to allow the basin to completely drain, and then a close signal is sent to the actuator to close the valve.

Case 2: A single rain event occurs but does not completely fill the batch detention basin. The basin holds the water for the detention period (12 hours), and then releases it. Once the batch detention basin is empty, a delay of 2 hours is started to allow the basin to completely drain, and then a close signal is sent to the actuator to close the valve.

Case 3: A single rain event fills the batch detention basin under the trip point of the level sensor. The level sensor does not trip. The captured water is held until it infiltrates / evaporates or is joined by storm water from a subsequent storm.

Case 4: Begins the same as Case 1. During the drawdown period, one or more additional rain events occur causing additional water to enter the batch detention basin. The valve remains open and the additional water volume is drained. Once the batch detention basin is empty, a delay of 2 hours is started to allow the basin to completely drain, and then a close signal is sent to the actuator to close the valve.

Case 5: Begins the same as Case 2. During the drawdown period, one or more additional rain events can occur causing additional water to enter the basin. The valve remains open and the additional water volume is drained. Once the batch detention basin is empty, a delay of 2 hours is started to allow the basin to completely drain, and then a close signal is sent to the actuator to close the valve.

Safety Precautions:

The system will be equipped with an alarm system that is clearly visible to indicate a system malfunction. A sign shall be posted with phone numbers of the owner and appropriate TCEQ regional office.

ATTACHMENT D

FACTORS AFFECTING WATER QUALITY

Potential sources of pollution that may reasonably be expected to affect the quality of storm water discharges from the site during construction include:

- Soil erosion due to the clearing of the site;
- Oil, grease, fuel and hydraulic fluid contamination from construction equipment and vehicle drippings;
- Hydrocarbons from asphalt paving operations;
- Miscellaneous trash and litter from construction workers and material wrappings;
- Concrete truck washout.
- Potential overflow/spills from portable toilets

Potential sources of pollution that may reasonably be expected to affect the quality of storm water discharges from the site after development include:

- Oil, grease, fuel and hydraulic fluid contamination from vehicle drippings;
- Dirt and dust which may fall off vehicles; and
- Miscellaneous trash and litter.

ATTACHMENT E

BMPs FOR UPGRADIENT STORMWATER

There are no offsite areas up gradient from the site that will flow onto the project area.

ATTACHMENT F

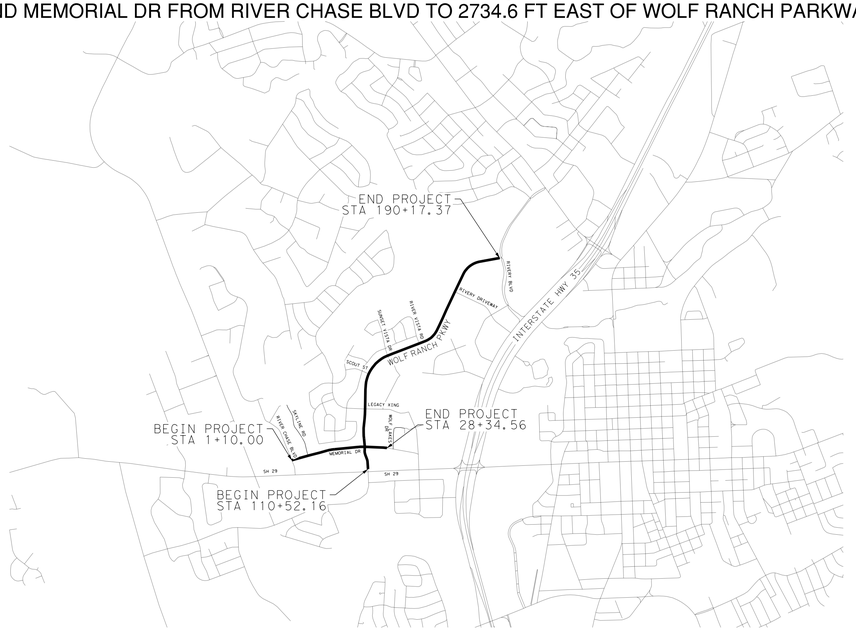
BMPs FOR ONSITE STORMWATER

One (1) batch detention pond, two (2) existing water quality ponds, six (6) StormTroopers, and one (1) existing vegetative filter strip are proposed as the Permanent Best Management Practices (PBMPs) for this site. All PBMPs have been designed in accordance with the TCEQ's Technical Guidance Manual (TGM) RG-348 (2005) to remove 80% of the increase in Total Suspended Solids (TSS) from the site.

ATTACHMENT G

City of Georgetown, Texas
WOLF RANCH PKWY/ MEMORIAL DR

LIMITS: FROM WOLF RANCH PARKWAY FROM SH 29 TO RIVERY BLVD
LENGTH: 1.5 MILES = 7970 FT
AND MEMORIAL DR FROM RIVER CHASE BLVD TO 2734.6 FT EAST OF WOLF RANCH PARKWAY



LOCATION MAP

NOT-TO-SCALE

GEORGETOWN
TEXAS
more than welcome

100% PLANS

PAPE-DAWSON ENGINEERS

AUSTIN I SAN ANTONIO I HOUSTON I FORT WORTH I DALLAS
10801 N MOPAC EXPY, BLDG 3, STE 200 I AUSTIN, TX 78759 I 512.454.8711
TBPE FIRM REGISTRATION #470 I TBPLS FIRM REGISTRATION #10028801

REGISTERED ACCESSIBILITY
SPECIALIST INSPECTION REQUIRED
TDLR NO. TABS2025016832

MAYOR
JOSH SCHROEDER

CITY COUNCIL MEMBERS
AMANDA PARR, DISTRICT 1
SHAWN HOOD, DISTRICT 2
BEN BUTLER, DISTRICT 3
RON GARLAND, DISTRICT 4
KEVIN PITTS, DISTRICT 5
JAKE FRENCH, DISTRICT 6
BEN STEWART, DISTRICT 7

CITY MANAGER
DAVID MORGAN

PUBLIC WORKS DEPARTMENT DIRECTOR
DATE:_____
SIGNATURE:_____

PROJECT MANAGER
DATE:_____
SIGNATURE:_____

SYSTEMS ENGINEERING DIRECTOR
DATE:_____
SIGNATURE:_____

STATE OF TEXAS
BRIAN A. ALLEN
123374
LICENSED
PROFESSIONAL ENGINEER

BRIAN A. ALLEN, P.E. 9/16/2025
DATE

Date: 9/16/2025
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436-439 [B] ED(8-11)-25
440 [B] LUM-A-12
441 [B] TS-BP-20
442 [B] HSWM-14 (AUS)
443 [B] MAD-14 (AUS)
444 [B] RPDD-RADD-20
445 [B] MA-C-12
446 [B] MA-DPD-20
447 [B] ILSN-25
448 [B] MA-C(ILSN)-12
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NO.	REVISION	DATE

GEORGETOWN TEXAS *more than welcome*

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TEXAS ENGINEERING FIRM #470 | TEXAS SURVEYING FIRM #10023800

[A] STATE OF TEXAS — STEVEN S. CRAUFORD — 92677 — LICENSED PROFESSIONAL ENGINEER
STEVEN S. CRAUFORD, P.E. — 9/16/2025 DATE

THE STANDARD SHEETS SPECIFICALLY IDENTIFIED ABOVE HAVE BEEN SELECTED BY ME OR UNDER MY RESPONSIBLE SUPERVISION AS BEING APPLICABLE TO THIS PROJECT.

[B] STATE OF TEXAS — JUSTIN W. CLARK — 118715 — LICENSED PROFESSIONAL ENGINEER
JUSTIN W. CLARK, P.E. — 9/16/2025 DATE

THE STANDARD SHEETS SPECIFICALLY IDENTIFIED ABOVE HAVE BEEN SELECTED BY ME OR UNDER MY RESPONSIBLE SUPERVISION AS BEING APPLICABLE TO THIS PROJECT.

[C] STATE OF TEXAS — BRIAN A. ALLEN — 123374 — LICENSED PROFESSIONAL ENGINEER
BRIAN A. ALLEN, P.E. — 9/16/2025 DATE

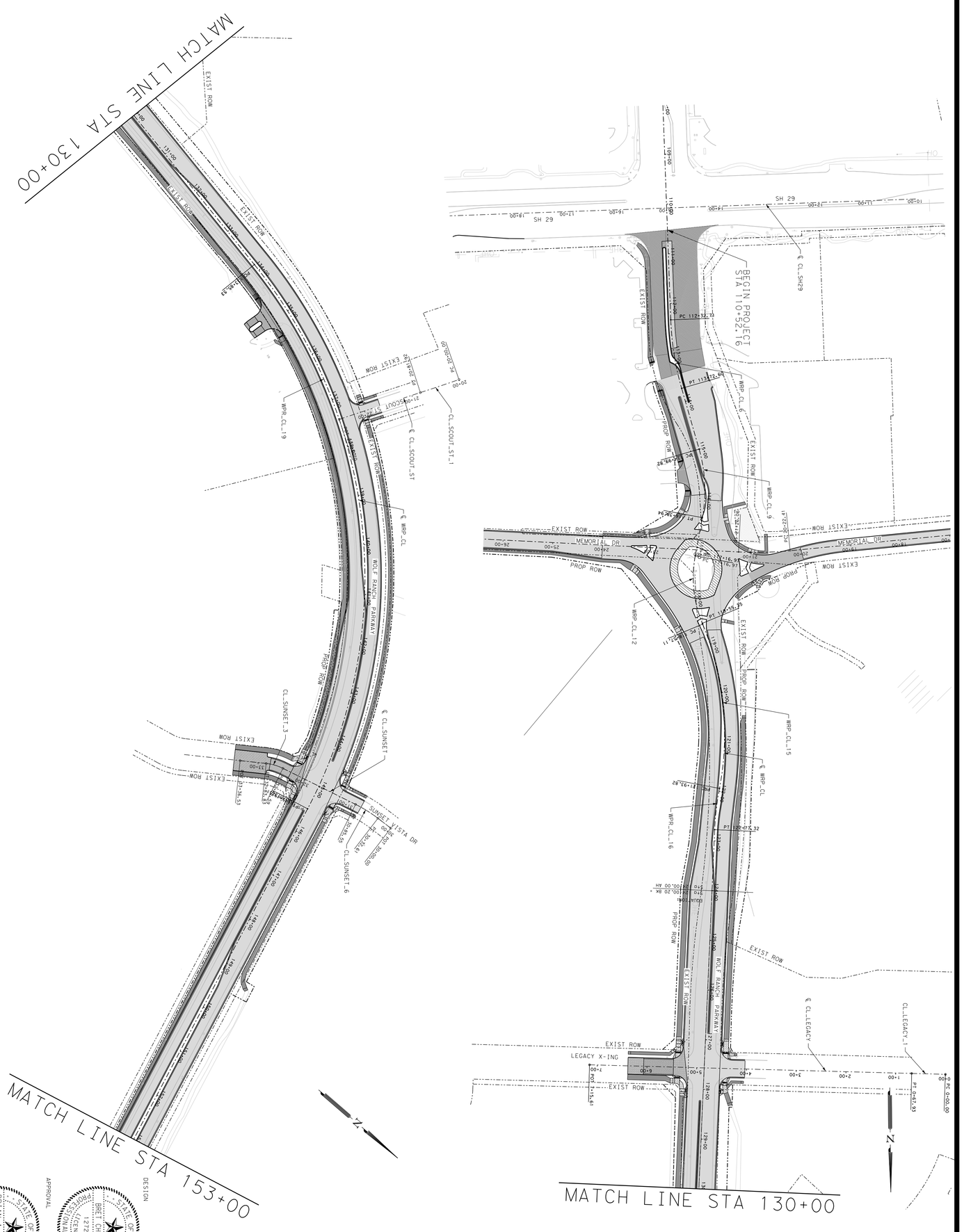
THE STANDARD SHEETS SPECIFICALLY IDENTIFIED ABOVE HAVE BEEN SELECTED BY ME OR UNDER MY RESPONSIBLE SUPERVISION AS BEING APPLICABLE TO THIS PROJECT.

WOLF RANCH PKWY / MEMORIAL DR

INDEX OF SHEETS

CITY JOB No.
JOB NO. 51423-04
DATE 9/16/2025
DESIGNER
CHECKED DRAWN

SHEET NO. 2



LEGEND

- PROPOSED ASPHALT PAVEMENT
- PROPOSED CRCP
- PROPOSED MILL AND OVERLAY
- PROPOSED CONCRETE DRIVEWAY
- PROPOSED ASPHALT DRIVEWAY
- PROPOSED BRICK DRIVEWAY
- PROPOSED CONCRETE SIDEWALK
- PROPOSED CONCRETE RAMP
- PROP R.O.W.
- EXIST R.O.W.
- UTILITY EASEMENT R.O.W.

NOTES

1. SEE "HORIZONTAL ALIGNMENT DATA" SHEETS FOR ADDITIONAL INFORMATION REGARDING HORIZONTAL ALIGNMENTS.

APPROVAL

BRIAN A. ALLEN, P.E. — 9/16/2025 DATE

DESIGN

BRET CHAPMAN, P.E. — 9/16/2025 DATE

CITY JOB No. _____
JOB NO. 914830-04
DATE 9/16/2025
DESIGNED _____
CHECKED DRAWN _____
SHEET NO. 3 SHEET 1 OF 3

WOLF RANCH PKWY / MEMORIAL DR

PROJECT LAYOUT

PAPE-DAWSON ENGINEERS
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GEORGETOWN TEXAS
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NO.	REVISION	DATE

LEGEND

- PROPOSED ASPHALT PAVEMENT
- PROPOSED CRCP
- PROPOSED MILL AND OVERLAY
- PROPOSED CONCRETE DRIVEWAY
- PROPOSED ASPHALT DRIVEWAY
- PROPOSED BRICK DRIVEWAY
- PROPOSED CONCRETE SIDEWALK
- PROPOSED CONCRETE RAMP
- PROP R.O.W
- EXIST R.O.W
- UTILITY EASEMENT R.O.W

NOTES

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0 50 100 150
SCALE: 1"= 100'

DESIGN

STATE OF TEXAS
BRET CHAPMAN
127293
LICENSED
PROFESSIONAL ENGINEER

BRET CHAPMAN, P.E. — 9/16/2025 DATE

APPROVAL

STATE OF TEXAS
BRIAN A. ALLEN
123374
LICENSED
PROFESSIONAL ENGINEER

BRIAN A. ALLEN, P.E. — 9/16/2025 DATE

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WOLF RANCH PKWY / MEMORIAL DR
PROJECT LAYOUT

CITY JOB No.
JOB NO. 51423-04
DATE 9/16/2025
DESIGNER
CHECKED DRAWN

SHEET 2 OF 3
SHEET NO. 4

LEGEND

- PROPOSED ASPHALT PAVEMENT
- PROPOSED CRCP
- PROPOSED MILL AND OVERLAY
- PROPOSED CONCRETE DRIVEWAY
- PROPOSED ASPHALT DRIVEWAY
- PROPOSED BRICK DRIVEWAY
- PROPOSED CONCRETE SIDEWALK
- PROPOSED CONCRETE RAMP
- PROP R.O.W
- EXIST R.O.W
- UTILITY EASEMENT R.O.W

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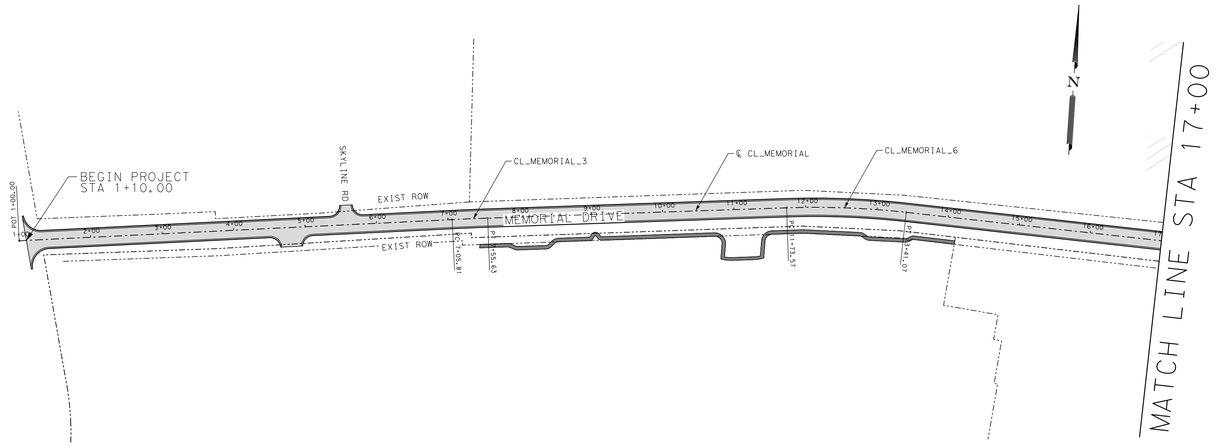
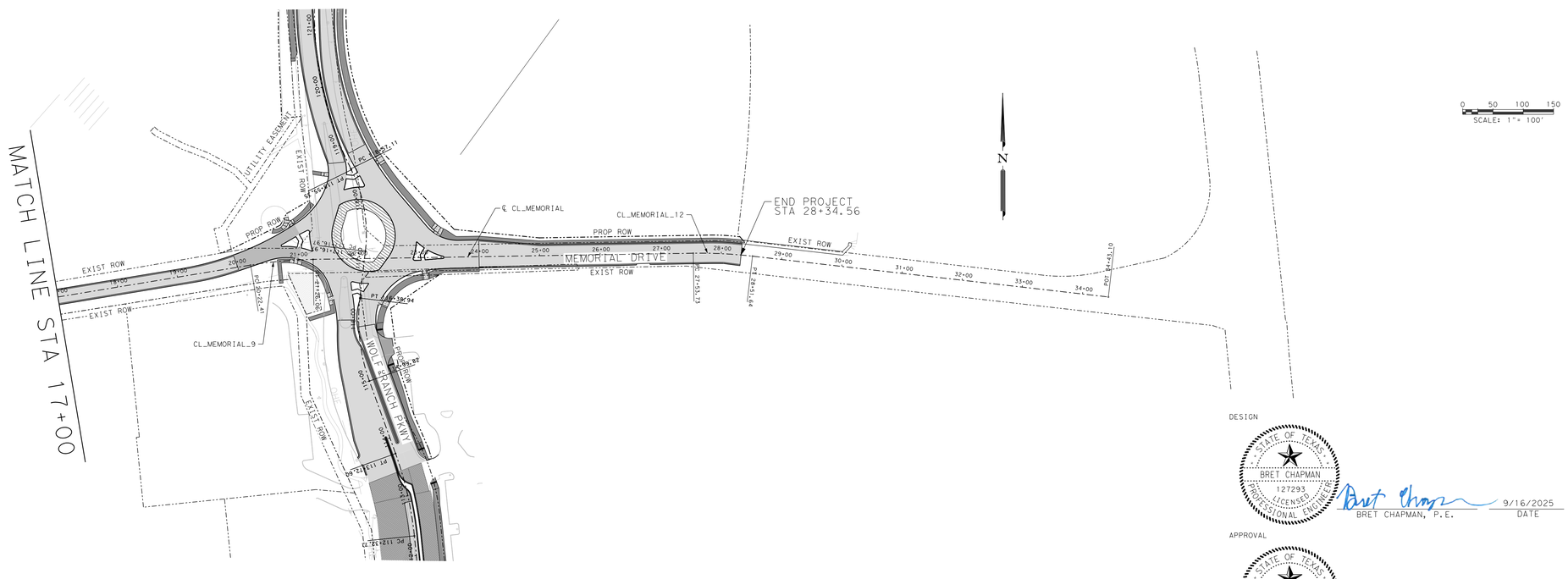
1. SEE "HORIZONTAL ALIGNMENT DATA" SHEETS FOR ADDITIONAL INFORMATION REGARDING HORIZONTAL ALIGNMENTS.





0 50 100 150
SCALE: 1"= 100'

DESIGN

STATE OF TEXAS
BRET CHAPMAN
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BRIAN A. ALLEN
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PROJECT LAYOUT

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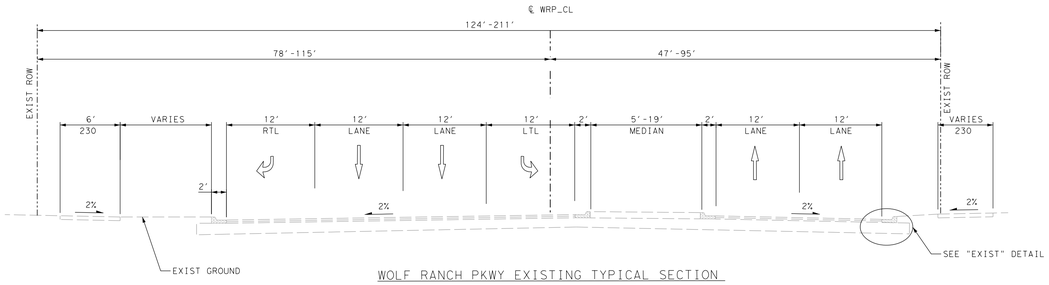
JOB NO. 51423-04
DATE 9/16/2025
DESIGNER
CHECKED DRAWN

SHEET 3 OF 3

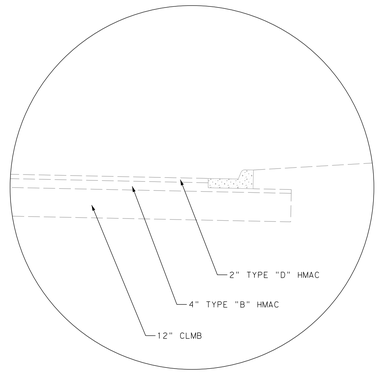
SHEET NO. 5



WOLF RANCH PKWY EXISTING TYPICAL SECTION

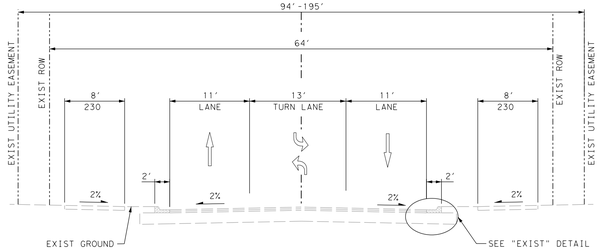
N.T.S.

BEGIN PROJECT TO STA 112+90



"EXIST" DETAIL

N.T.S.



WOLF RANCH PKWY EXISTING TYPICAL SECTION

N.T.S.

STA 112+90 TO END PROJECT

DESIGN

STATE OF TEXAS
BRET CHAPMAN
127293
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PROFESSIONAL ENGINEER

BRET CHAPMAN, P.E. 9/16/2025 DATE

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STATE OF TEXAS
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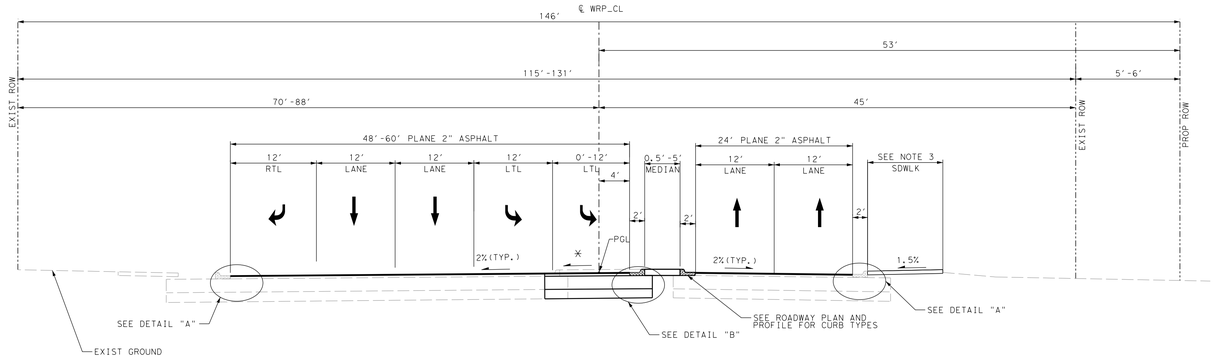
WOLF RANCH PKWY / MEMORIAL DR
EXISTING TYPICAL SECTIONS

CITY JOB No.
JOB NO. 51423-04
DATE 9/16/2025
DESIGNER
CHECKED DRAWN

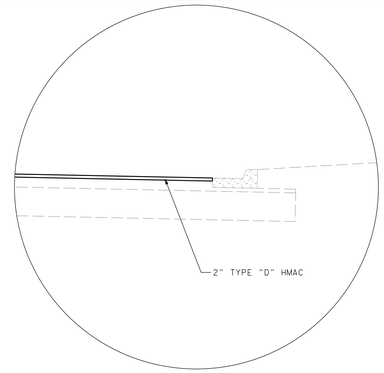
SHEET 1 OF 1
SHEET NO. 6



WOLF RANCH PKWY PROPOSED TYPICAL SECTION

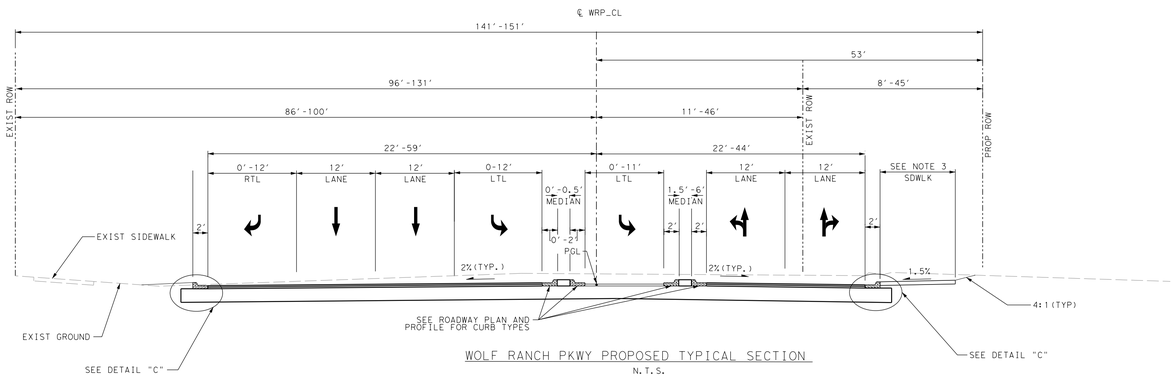
N.T.S.

BEGIN PROJECT TO STA 113+42



DETAIL "A"

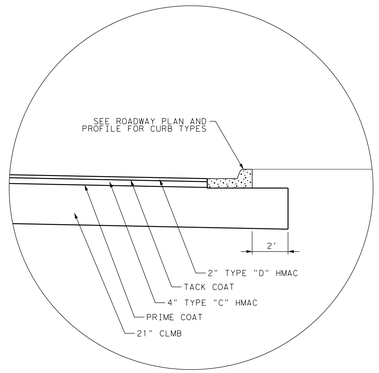
N.T.S.



WOLF RANCH PKWY PROPOSED TYPICAL SECTION

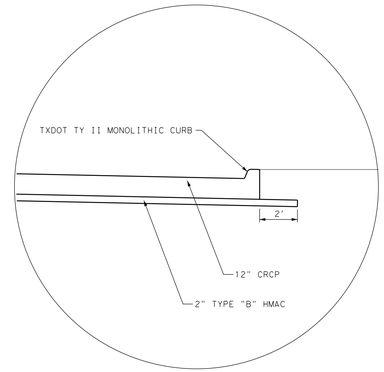
N.T.S.

STA 113+42 TO STA 115+91 (NORTHBOUND)
STA 116+03 (SOUTHBOUND)



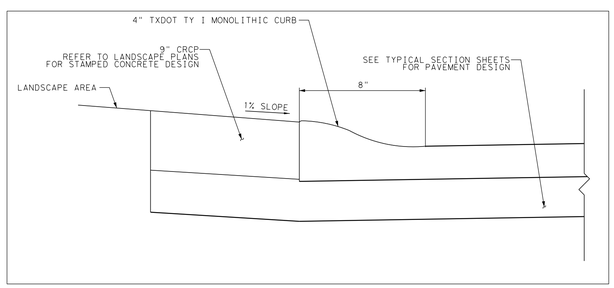
DETAIL "C"

N.T.S.



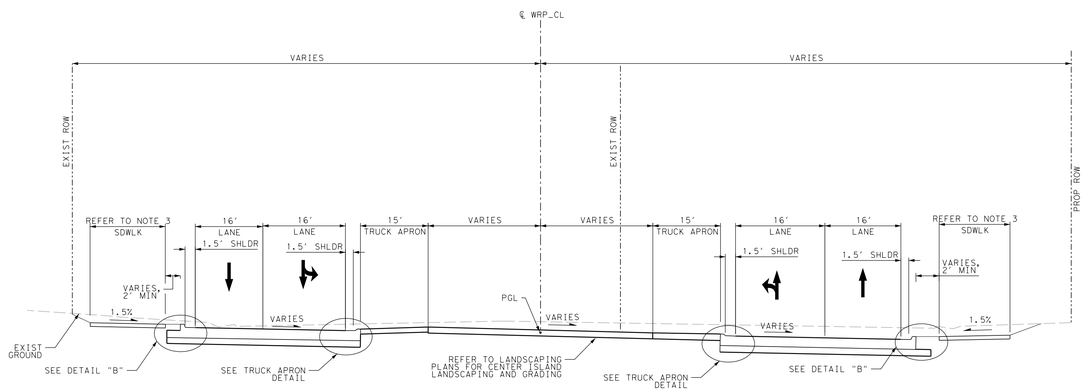
DETAIL "B"

N.T.S.



TRUCK APRON DETAIL

NOT TO SCALE



WOLF RANCH PKWY ROUNDABOUT PROPOSED TYPICAL SECTION

N.T.S.

STA 115+91 (NORTHBOUND) TO STA 118+82 (NORTHBOUND)
STA 116+03 (SOUTHBOUND) TO STA 118+72 (SOUTHBOUND)

NOTES

1. THE PGL IS PROJECTED 2% UP FROM THE EDGE OF PAVEMENT. THE AXIS OF ROTATION FOR ALL PAVEMENT IS LOCATED AT THE PGL; UNLESS OTHERWISE NOTED SEE PLAN AND PROFILE SHEETS FOR ALL SUPER ELEVATION RATES AND TRANSITIONS.
2. ALL SAW CUTS TO BE FULL DEPTH.
3. TYPICAL SIDEWALK WIDTH IS 10' AND BUFFER SPACES VARY THROUGHOUT THE PROJECT. FOR SIDEWALK WIDTH AND SPACING AT CERTAIN LOCATIONS REFER TO THE PLAN AND PROFILE SHEETS AND THE ROUNDABOUT DETAIL.
4. REFER TO PLAN AND PROFILE SHEETS FOR TEMPORARY CONSTRUCTION EASEMENT LINES.
5. FOR MEDIAN DETAILS REFER TO MEDIAN DETAILS WITHIN THE LANDSCAPE PLANS.
6. REFER TO PLAN AND PROFILE SHEETS FOR CONCRETE CURB TYPE AND LIMITS ALONG SIDEWALKS.

DESIGN

STATE OF TEXAS
BRET CHAPMAN
127293
LICENSED PROFESSIONAL ENGINEER

BRET CHAPMAN, P.E. — 9/16/2025 DATE

APPROVAL

STATE OF TEXAS
BRIAN A. ALLEN
123374
LICENSED PROFESSIONAL ENGINEER

BRIAN A. ALLEN, P.E. — 9/16/2025 DATE

NO.	REVISION	DATE

GEORGETOWN TEXAS *more than welcome*

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TEXAS ENGINEERING FIRM #470 I TEXAS SURVEYING FIRM #10028800

WOLF RANCH PKWY / MEMORIAL DR

PROPOSED TYPICAL SECTIONS

CITY JOB No.
JOB NO. 51423-04
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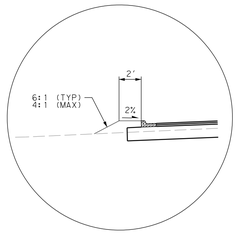
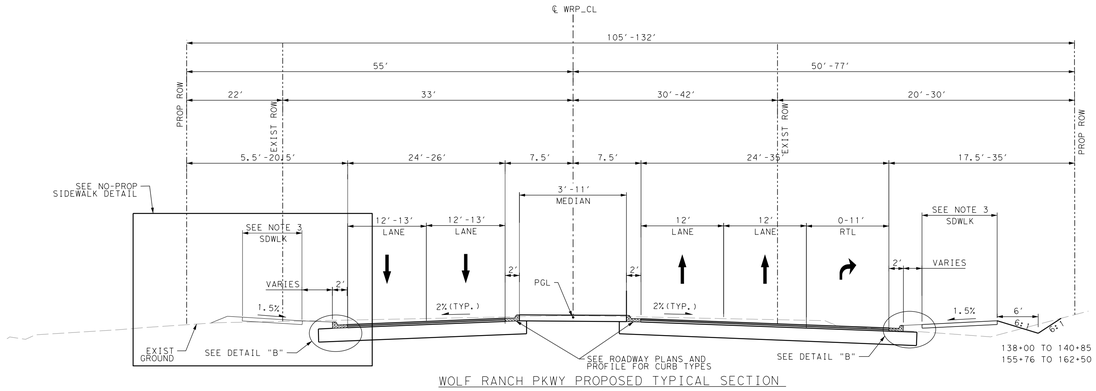
SHEET 1 OF 7

SHEET NO. 7



NO-PROP SIDEWALK DETAIL

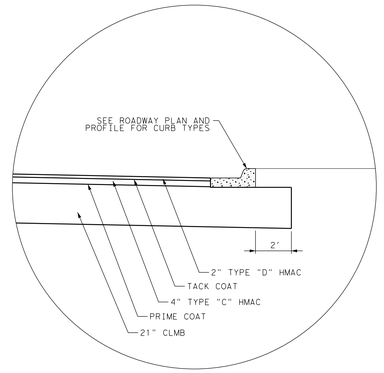
STA 128•31 TO STA 137•09
STA 149•33 TO STA 153•97



WOLF RANCH PKWY PROPOSED TYPICAL SECTION

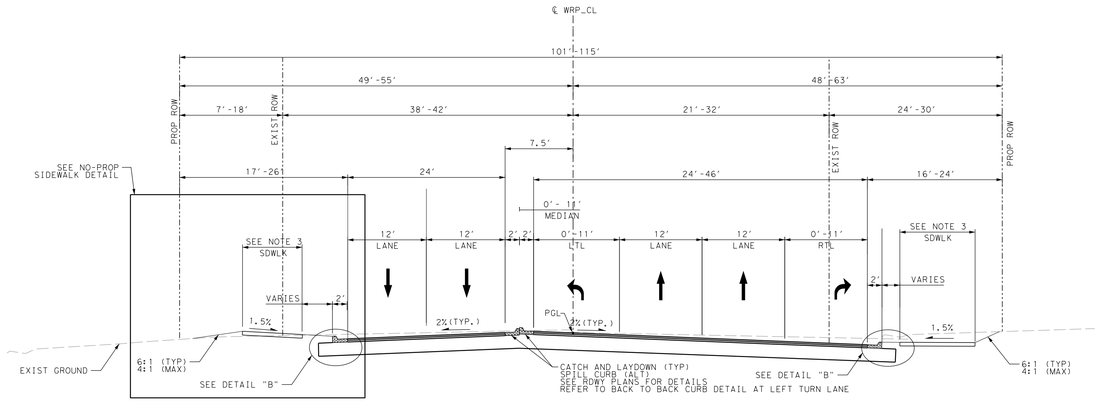
N.T.S.

STA 118•82 (NORTHBOUND) TO STA 123•02
STA 118•72 (SOUTHBOUND) TO STA 123•02
STA 132•13 TO STA 140•40
STA 149•51 TO STA 163•74
STA 177•44 TO STA 179•62
STA 183•89 TO STA 185•57



DETAIL "B"

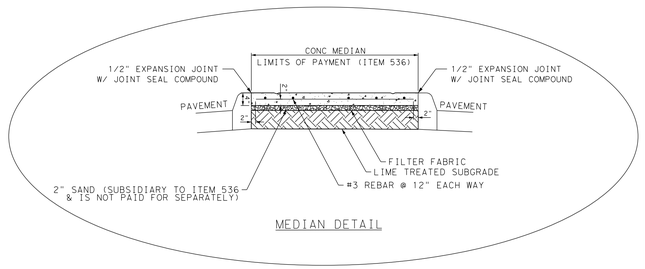
N.T.S.



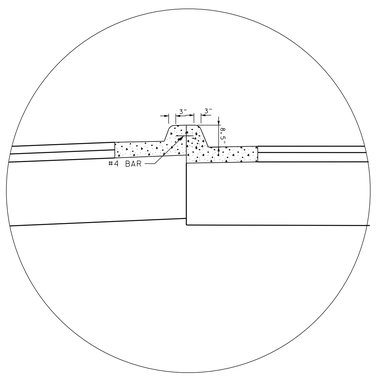
WOLF RANCH PKWY PROPOSED TYPICAL SECTION

N.T.S.

STA 123•02 TO STA 127•57
STA 140•40 TO STA 144•99
STA 168•02 TO STA 172•71
STA 181•16 TO STA 183•91
STA 185•57 TO END PROJECT

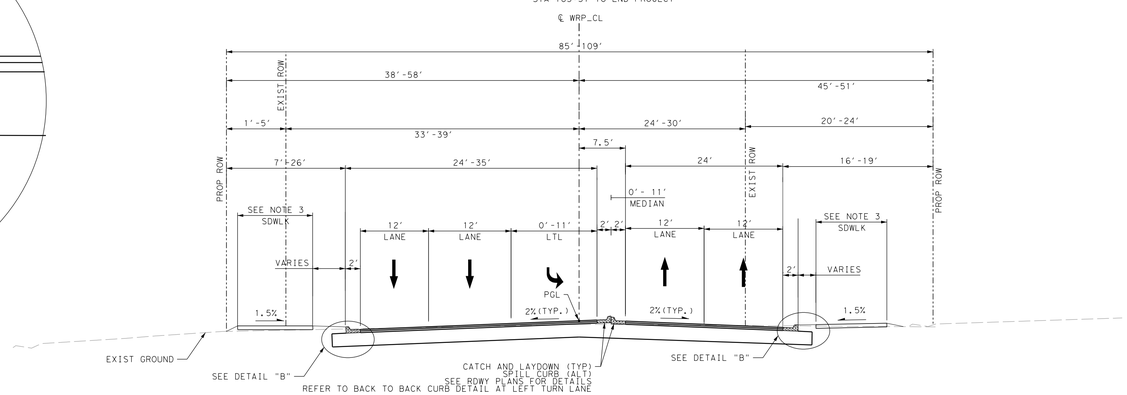


MEDIAN DETAIL



BACK TO BACK CURB DETAIL AT LEFT TURN LANES

ADDITIONAL CONCETE AND REBAR IS SUBSIDIARY TO ITEM C4-1 CONCRETE CURB AND GUTTER



WOLF RANCH PKWY PROPOSED TYPICAL SECTION

N.T.S.

STA 127•57 TO STA 132•13
STA 144•99 TO STA 149•51
STA 163•74 TO STA 168•02
STA 172•71 TO STA 177•44

NOTES

1. THE PGL IS PROJECTED 2% UP FROM THE EDGE OF PAVEMENT. THE AXIS OF ROTATION FOR ALL PAVEMENT IS LOCATED AT THE PGL; UNLESS OTHERWISE NOTED SEE PLAN AND PROFILE SHEETS FOR ALL SUPER ELEVATION RATES AND TRANSITIONS.
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DESIGN

STATE OF TEXAS
BRET CHAPMAN
127293
LICENSED PROFESSIONAL ENGINEER

BRET CHAPMAN, P.E. — 9/16/2025 DATE

APPROVAL

STATE OF TEXAS
BRIAN A. ALLEN
123374
LICENSED PROFESSIONAL ENGINEER

BRIAN A. ALLEN, P.E. — 9/16/2025 DATE

NO.	REVISION	DATE

GEORGETOWN TEXAS
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PAPE-DAWSON ENGINEERS
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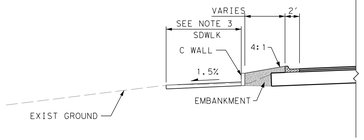
WOLF RANCH PKWY / MEMORIAL DR

PROPOSED TYPICAL SECTIONS

CITY JOB No.
JOB NO. 51423-04
DATE 9/16/2025
DESIGNER
CHECKED DRAWN

SHEET NO. 8

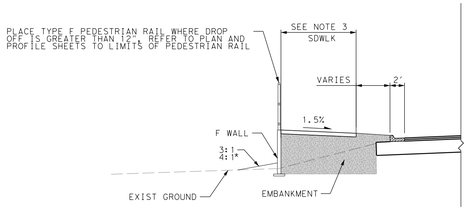


SOUTHBOUND CUT WALL DETAIL

N.T.S.

TY C1 STA 139+00 TO STA 141+00
STA 142+00 TO STA 144+40

TY C2 STA 141+00 TO STA 142+00



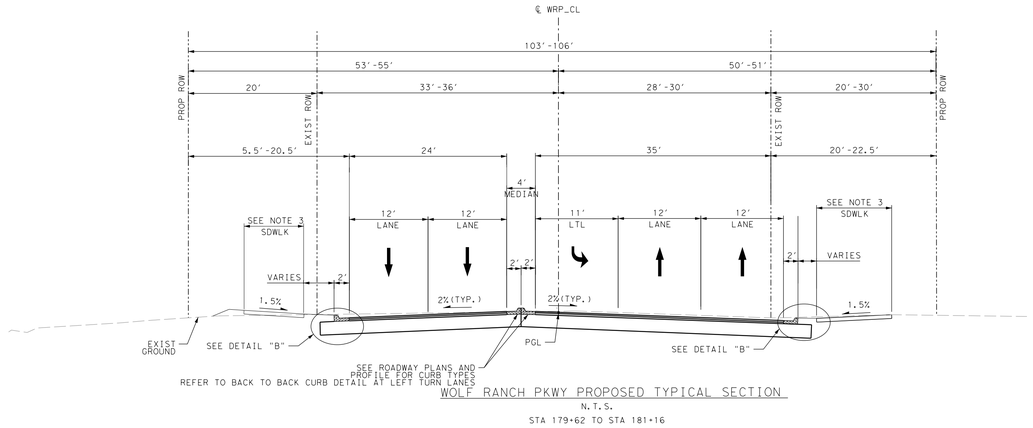
SOUTHBOUND FILL WALL DETAIL

N.T.S.

TY F1 STA 148+50 TO STA 149+10
STA 155+60 TO STA 157+00
STA 169+30 TO STA 169+50

TY F2 STA 157+00 TO STA 158+50
STA 166+80 TO STA 168+50
STA 169+10 TO STA 169+30

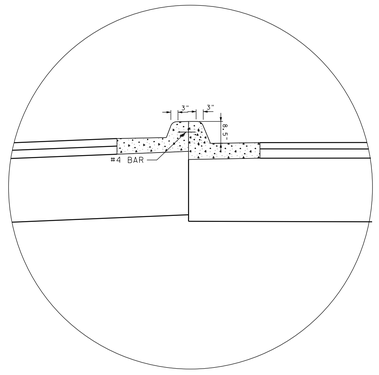
TY F3 STA 158+50 TO STA 163+25
STA 164+50 TO STA 165+25
STA 166+50 TO STA 166+80
STA 168+50 TO STA 169+10
STA 163+25 TO STA 164+50 *
STA 165+25 TO STA 166+50 *



WOLF RANCH PKWY PROPOSED TYPICAL SECTION

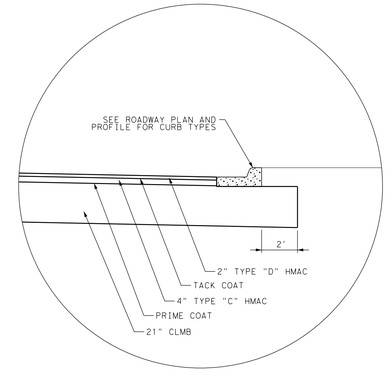
N.T.S.

STA 179+62 TO STA 181+16



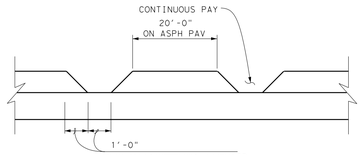
BACK TO BACK CURB DETAIL AT LEFT TURN LANES

ADDITIONAL CONCRETE AND REBAR IS SUBSIDIARY TO ITEM C4-1 CONCRETE CURB AND GUTTER



DETAIL "B"

N.T.S.



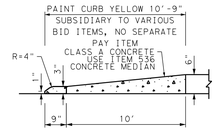
ELEVATION - SLOTTED CURB

ITEM TX529-7026 CONC CURB (DOWEL)(SLOTTED) - ON ASPH.

SLOTTED CURB DETAIL

N.T.S.

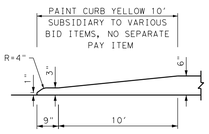
STA 141+40 TO STA 144+40
STA 181+79 TO STA 182+83



MEDIAN NOSE TRANSITION

N.T.S

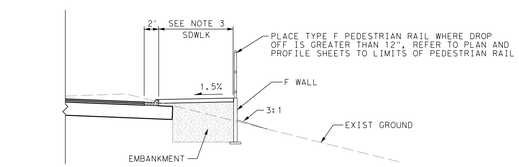
NOTE: SEE ITEM 5D5-10 YELLOW SOLID THERMOPLASTIC FOR MATERIAL TYPE AND SEALER INFORMATION.



CURB TRANSITION

N.T.S

NOTE: SEE ITEM 5D5-10 YELLOW SOLID THERMOPLASTIC FOR MATERIAL TYPE AND SEALER INFORMATION.



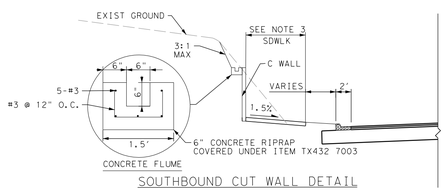
NORTHBOUND FILL WALL DETAIL

N.T.S.

TY F1 STA 168+50 TO STA 169+20

TY F2 STA 145+60 TO STA 148+50
STA 169+20 TO STA 169+70
STA 170+80 TO STA 171+96

TY F3 STA 145+50 TO STA 145+60
STA 169+70 TO STA 170+80

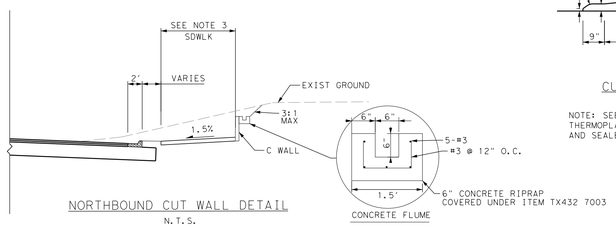


SOUTHBOUND CUT WALL DETAIL

N.T.S.

TY C1 STA 169+50 TO STA 170+30
STA 173+20 TO STA 174+30
STA 177+00 TO STA 178+25
STA 179+00 TO STA 179+90
STA 180+30 TO STA 181+00

TY C2 STA 170+30 TO STA 172+00



NORTHBOUND CUT WALL DETAIL

N.T.S.

TY C1 STA 132+00 TO STA 133+50
STA 145+50 TO STA 148+60
STA 149+50 TO STA 154+00
STA 180+40 TO STA 181+25
STA 184+00 TO STA 186+50

TY C2 STA 148+60 TO STA 149+50

NOTES

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DESIGN

STATE OF TEXAS
BRET CHAPMAN
127293
LICENSED
PROFESSIONAL ENGINEER

BRET CHAPMAN, P.E. — 9/16/2025 DATE

APPROVAL

STATE OF TEXAS
BRIAN A. ALLEN
123374
LICENSED
PROFESSIONAL ENGINEER

BRIAN A. ALLEN, P.E. — 9/16/2025 DATE

NO.	REVISION	DATE

GEORGETOWN TEXAS
more than welcome

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10801 N MOPAC EXPY, BLDG 3, STE 200 I AUSTIN, TX 78759 I 512.454.8711
TEXAS ENGINEERING FIRM #470 I TEXAS SURVEYING FIRM #10028800

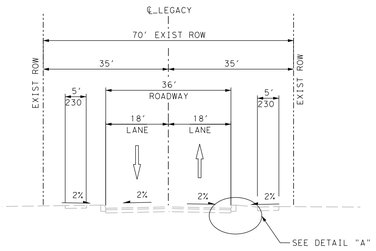
WOLF RANCH PKWY / MEMORIAL DR

PROPOSED TYPICAL SECTIONS

CITY JOB No.
JOB NO. 51423-04
DATE 9/16/2025
DESIGNER
CHECKED DRAWN

SHEET 3 OF 7

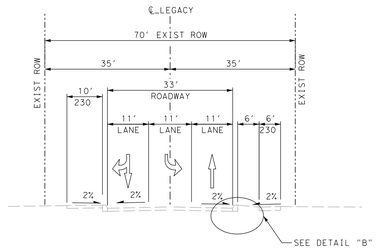
SHEET NO. 9



LEGACY CROSSING EXISTING TYPICAL SECTION

N.T.S.

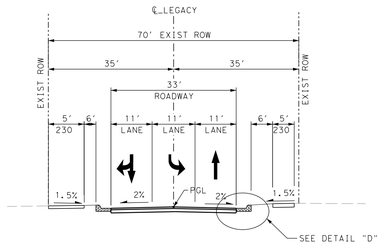
BEGIN PROJECT TO STA 4+85



LEGACY CROSSING EXISTING TYPICAL SECTION

N.T.S.

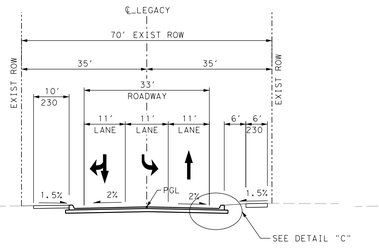
STA 4+85 TO END PROJECT



LEGACY CROSSING PROPOSED TYPICAL SECTION

N.T.S.

BEGIN PROJECT TO STA 4+53

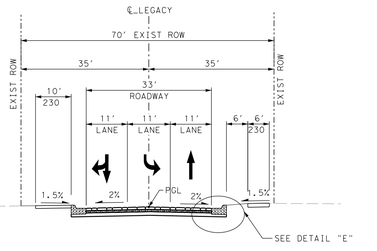


LEGACY CROSSING PROPOSED TYPICAL SECTION

N.T.S.

STA 5+22 TO STA 5+47

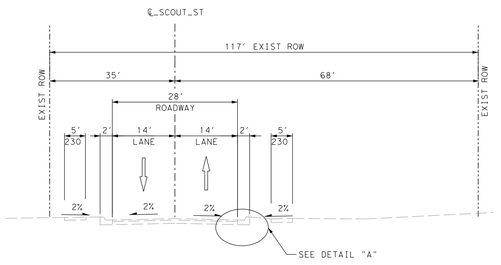
STA 6+07 TO END PROJECT



LEGACY CROSSING PROPOSED TYPICAL SECTION

N.T.S.

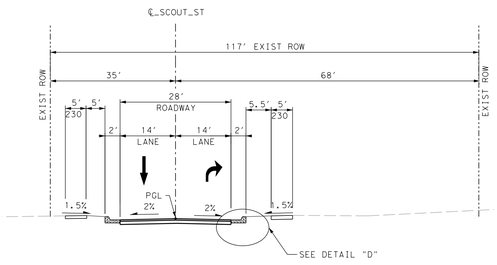
STA 5+47 TO STA 6+07



SCOUT STREET EXISTING TYPICAL SECTION

N.T.S.

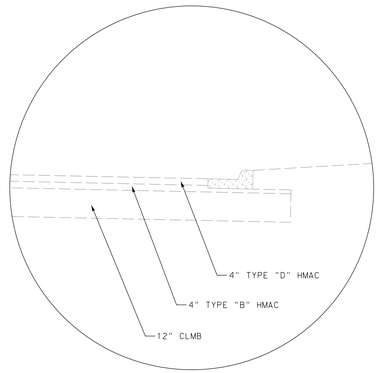
BEGIN PROJECT TO STA 22+22



SCOUT STREET PROPOSED TYPICAL SECTION

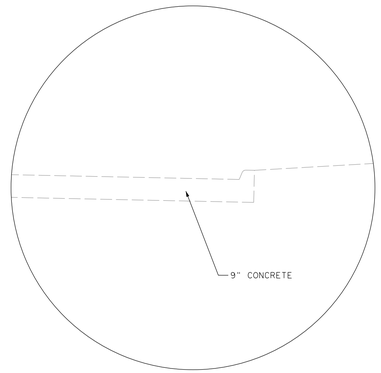
N.T.S.

BEGIN PROJECT TO STA 22+22



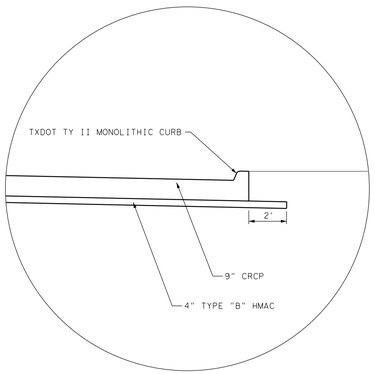
DETAIL "A"

N.T.S.



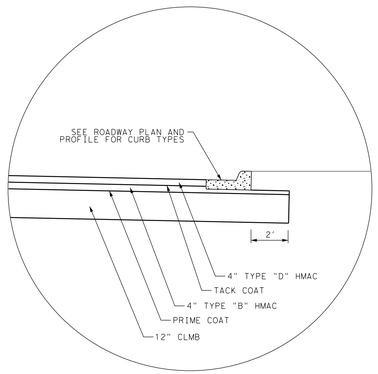
DETAIL "B"

N.T.S.



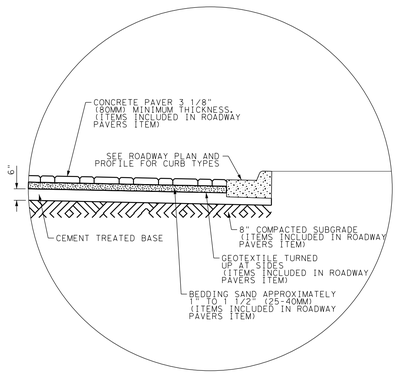
DETAIL "C"

N.T.S.



DETAIL "D"

N.T.S.



DETAIL "E"

N.T.S.

CONCRETE PAVER

NOTES

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DESIGN

STATE OF TEXAS
BRET CHAPMAN
127293
LICENSED
PROFESSIONAL ENGINEER

BRET CHAPMAN, P.E. — 9/16/2025 DATE

APPROVAL

STATE OF TEXAS
BRIAN A. ALLEN
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PROFESSIONAL ENGINEER

BRIAN A. ALLEN, P.E. — 9/16/2025 DATE

NO.	REVISION	DATE

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TEXAS ENGINEERING FIRM #470 | TEXAS SURVEYING FIRM #10028800

WOLF RANCH PKWY / MEMORIAL DR

PROPOSED TYPICAL SECTIONS

CITY JOB No.

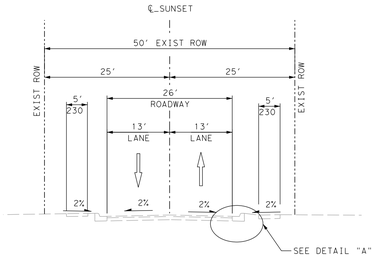
JOB NO. 51423-04

DATE 9/16/2025

DESIGNER

CHECKED DRAWN

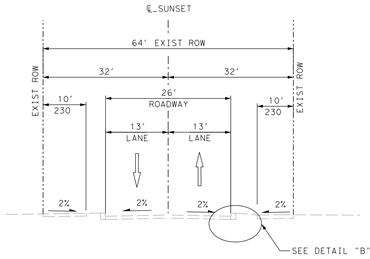
SHEET NO. 10



SUNSET VISTA DRIVE EXISTING TYPICAL SECTION

N.T.S.

BEGIN PROJECT TO STA 31+37

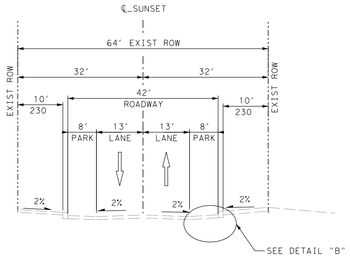


SUNSET VISTA DRIVE EXISTING TYPICAL SECTION

N.T.S.

STA 32+05 TO STA 32+30

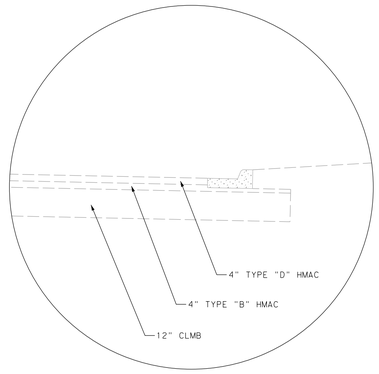
STA 32+76 TO STA 32+81



SUNSET VISTA DRIVE EXISTING TYPICAL SECTION

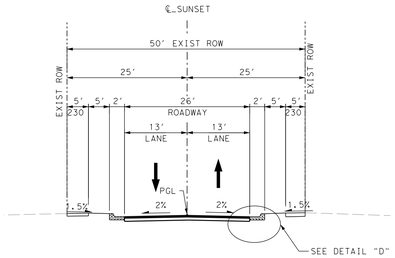
N.T.S.

STA 32+81 TO STA END PROJECT



DETAIL "A"

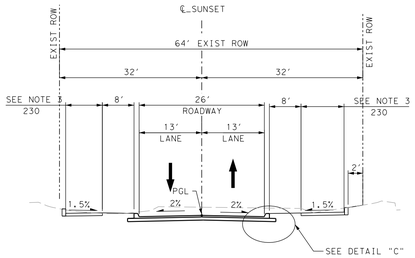
N.T.S.



SUNSET VISTA DRIVE PROPOSED TYPICAL SECTION

N.T.S.

BEGIN PROJECT TO STA 31+37

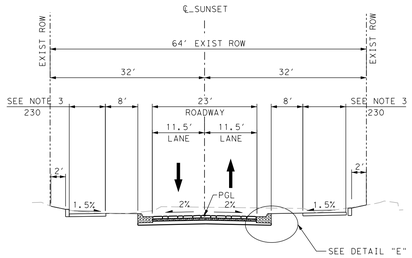


SUNSET VISTA DRIVE PROPOSED TYPICAL SECTION

N.T.S.

STA 32+05 TO STA 32+30

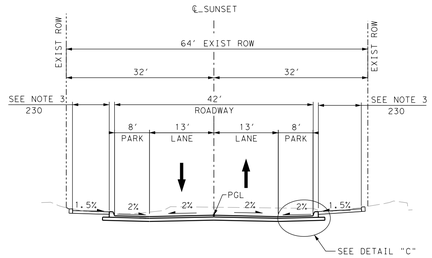
STA 32+76 TO STA 32+81



SUNSET VISTA DRIVE PROPOSED TYPICAL SECTION

N.T.S.

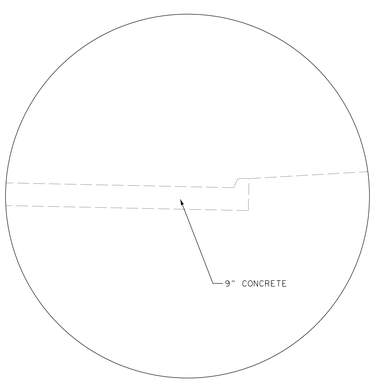
STA 32+30 TO STA 32+76



SUNSET VISTA DRIVE PROPOSED TYPICAL SECTION

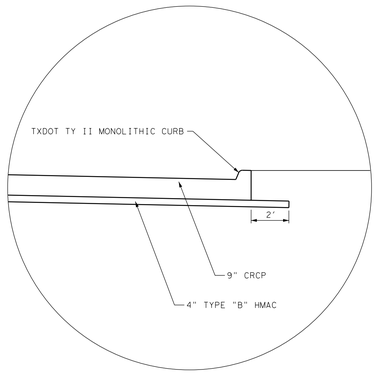
N.T.S.

STA 32+81 TO END PROJECT



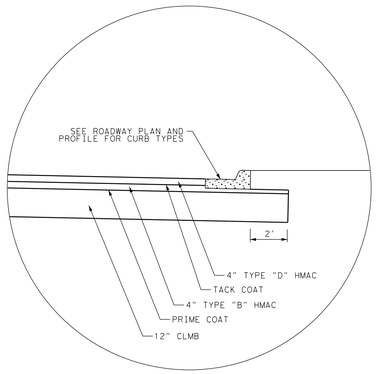
DETAIL "B"

N.T.S.



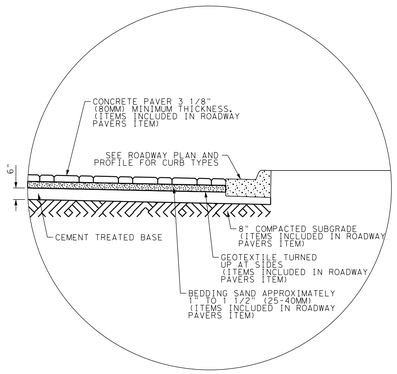
DETAIL "C"

N.T.S.



DETAIL "D"

N.T.S.



DETAIL "E"

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WOLF RANCH PKWY / MEMORIAL DR

PROPOSED TYPICAL SECTIONS

CITY JOB No.

JOB NO. 51423-04

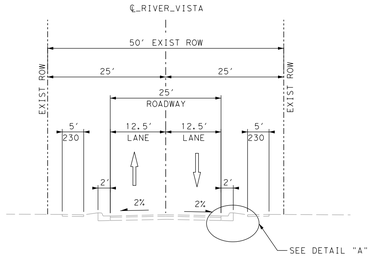
DATE 9/17/2025

DESIGNER

CHECKED DRAWN

SHEET 5 OF 7

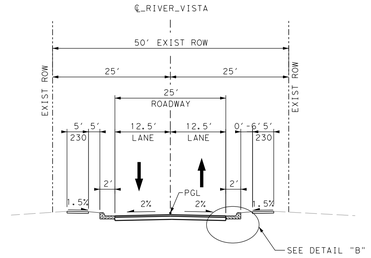
SHEET NO. 11



RIVER VISTA DRIVE EXISTING TYPICAL SECTION

N.T.S.

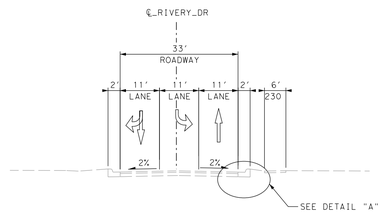
BEGIN PROJECT TO STA 41+34



RIVER VISTA DRIVE PROPOSED TYPICAL SECTION

N.T.S.

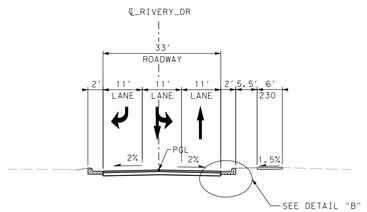
BEGIN PROJECT TO STA 41+34



RIVERY DRIVEWAY EXISTING TYPICAL SECTION

N.T.S.

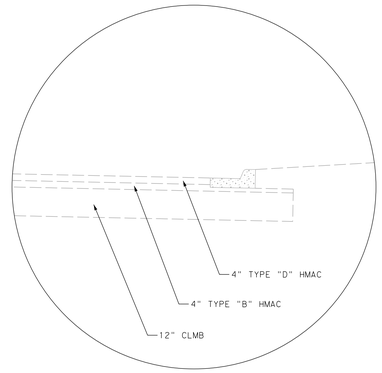
STA 52+16 TO END PROJECT



RIVERY DRIVEWAY PROPOSED TYPICAL SECTION

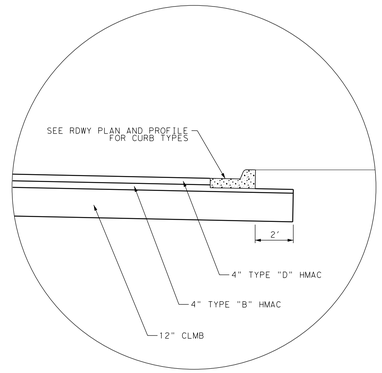
N.T.S.

STA 52+16 TO END PROJECT



DETAIL "A"

N.T.S.



DETAIL "B"

N.T.S.

NOTES

1. THE PGL IS PROJECTED 2% UP FROM THE EDGE OF PAVEMENT. THE AXIS OF ROTATION FOR ALL PAVEMENT IS LOCATED AT THE PGL; UNLESS OTHERWISE NOTED SEE PLAN AND PROFILE SHEETS FOR ALL SUPER ELEVATION RATES AND TRANSITIONS.
2. ALL SAW CUTS TO BE FULL DEPTH.
3. TYPICAL SIDEWALK WIDTH IS 10' AND BUFFER SPACES VARY THROUGHOUT THE PROJECT. FOR SIDEWALK WIDTH AND SPACING AT CERTAIN LOCATIONS REFER TO THE PLAN AND PROFILE SHEETS AND THE ROUNDABOUT DETAIL.
4. REFER TO PLAN AND PROFILE SHEETS FOR TEMPORARY CONSTRUCTION EASEMENT LINES.
5. FOR MEDIAN DETAILS REFER TO MEDIAN DETAILS WITHIN THE LANDSCAPE PLANS.
6. REFER TO PLAN AND PROFILE SHEETS FOR CONCRETE CURB TYPE AND LIMITS ALONG SIDEWALKS.

DESIGN

STATE OF TEXAS
BRET CHAPMAN
127293
LICENSED
PROFESSIONAL ENGINEER

BRET CHAPMAN, P.E. — 9/16/2025 DATE

APPROVAL

STATE OF TEXAS
BRIAN A. ALLEN
123374
LICENSED
PROFESSIONAL ENGINEER

BRIAN A. ALLEN, P.E. — 9/16/2025 DATE

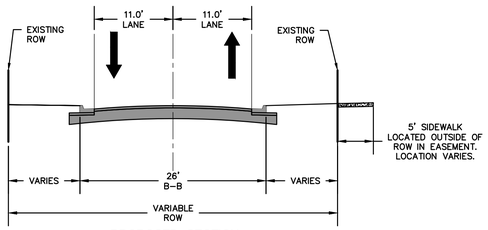
NO.	REVISION	DATE

GEORGETOWN TEXAS
more than welcome

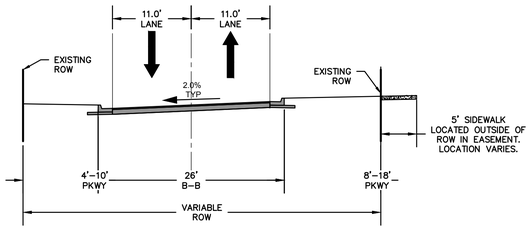
PAPE-DAWSON ENGINEERS
AUSTIN | SAN ANTONIO | HOUSTON | FORT WORTH | DALLAS
10801 N MOPAC EXPY, BLDG 3, STE 200 | AUSTIN, TX 78759 | 512.454.8711
TEXAS ENGINEERING FIRM #470 | TEXAS SURVEYING FIRM #10028800

WOLF RANCH PKWY / MEMORIAL DR
PROPOSED TYPICAL SECTIONS

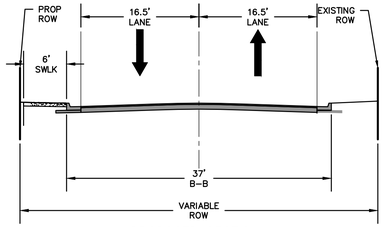
CITY JOB No.
JOB NO. 51423-04
DATE 9/16/2025
DESIGNER
CHECKED DRAWN



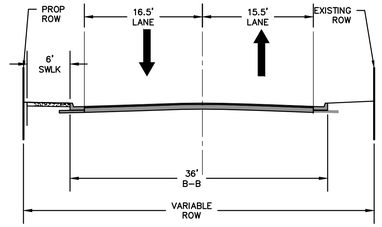
PROPOSED SECTION
MEMORIAL DRIVE
LANE WIDTH 11' MIN
(STA: 1+81.66 TO STA: 5+82.00)
(STA: 7+50.00 TO STA: 17+86.03)
SCALE: 1" = 10'



PROPOSED SECTION
MEMORIAL DRIVE
LANE WIDTH 11'
USUAL 16.5' MAX
(STA: 5+82.00 TO STA: 7+50.00)
SCALE : 1" = 10'



PROPOSED SECTION
MEMORIAL DRIVE
LANE WIDTH 16.5' USUAL
11' MIN
(STA: 25+00.00 TO STA: 26+56.49)
SCALE: 1" = 10'



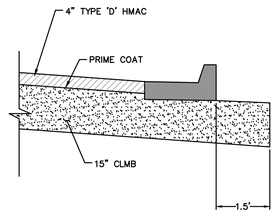
PROPOSED SECTION
MEMORIAL DRIVE
LANE WIDTH 16'
(STA: 26+56.49 TO STA: 28+34.56)
SCALE: 1" = 10'

RECOMMENDATIONS - PAVEMENT THICKNESS SECTIONS

Street Classification	Subgrade Material	Hot Mix Asphaltic Concrete, in	Crushed Limestone Base, in	Low Plasticity Sub-Base, in
Major Collector	Subgrade PI greater than 20 – Option 1	4.0	23	-
	Subgrade PI greater than 20 – Option 2	4.0	15	18**
	Subgrade PI less than 20	4.0	15	-
Minor Arterial	Subgrade PI greater than 20 – Option 1	4.0	30	-
	Subgrade PI greater than 20 – Option 2	4.0	20	18**
	Subgrade PI less than 20	4.0	20	-
Major Arterial	Subgrade PI greater than 20 – Option 1	5.0	30	-
	Subgrade PI greater than 20 – Option 2	5.0	20	18**
	Subgrade PI less than 20	5.0	20	-

NOTE:

FOR ADDITIONAL IN FORMATION ON PAVEMENT DESIGN, REFER TO GEOTECHNICAL INVESTIGATION PROVIDED BY MLA LABS, INC. DATED JULY 2024.



PAVEMENT SECTION DETAIL
SCALE: 1" =2'

STATE OF TEXAS
STEVEN S. CRAUFORD
92677
LICENSED PROFESSIONAL ENGINEER

09/12/2025

NO. REVISION | DATE

GEORGETOWN TEXAS
more than welcome

PAPE-DAWSON ENGINEERS
AUSTIN I SAN ANTONIO I HOUSTON I FORT WORTH I DALLAS
10801 N MOPAC EXPY, BLDG 3, STE 200 I AUSTIN, TX 78759 I 512.454.8711
TBPE FIRM REGISTRATION #470 I TBPLS FIRM REGISTRATION #10028801

CITY OF GEORGETOWN, TEXAS
WOLF RANCH PKWY / MEMORIAL DR

STREET TYPICAL SECTIONS

CITY JOB No.
JOB NO. 51423-00
DATE 9/12/2025
DESIGNER WT
CHECKED SC DRAWN WT

SHEET 13

Date: Sep 12, 2025, 9:56am User ID: cschatz
File: I:\Projects\514\23\00\301 Construction Documents\Civil\CS51423-00.dwg

THIS DOCUMENT HAS BEEN PRODUCED FROM MATERIAL THAT WAS STORED AND/OR TRANSMITTED ELECTRONICALLY AND MAY HAVE BEEN INADVERTENTLY ALTERED. RELY ONLY ON FINAL HARDCOPY MATERIALS BEARING THE CONSULTANT'S ORIGINAL SIGNATURE AND SEAL.

SHT NO	ITEM / TCP	TX247-7139 FL BS (CMP IN PLACE) (TY A GR 5) (IN VEH) CY	TX341-7026 D-GR HMA TY-C PG70-22 (LEVEL-UP) TON	TX403-7001 TEMPORARY SPL SHORING SF	TX502-7001 BARRICADES, SIGNS AND TRAFFIC MO	TX503-7002 PORTABLE CHANGEABLE MESSAGE SIGN EA	TX505-7001 TMA (STATIONARY) DAY	TX505-7003 TMA (MOBILE OPERATION) DAY
55	TCP PHASE I BEGIN TO 113+00				56	4	1600	75
56	TCP PHASE I 113+00 TO 118+00		2.0					
57	TCP PHASE I 118+00 TO 126+00		2.0	490				
58	TCP PHASE I 126+00 TO 134+00		109.0	1417				
59	TCP PHASE I 134+00 TO 142+00	27.0						
60	TCP PHASE I 142+00 TO 150+00		23.0	794				
61	TCP PHASE I 150+00 TO 158+00			596				
62	TCP PHASE I 158+00 TO 162+00							
63	TCP PHASE I MEMORIAL DR BEGIN TO 8+00							
64	TCP PHASE I MEMORIAL DR 8+00 TO 16+00							
65	TCP PHASE I MEMORIAL DR 16+00 TO 20+00							
66	TCP PHASE I MEMORIAL DR 24+00 TO END		3.0					
68	TCP PHASE I STEP I LEGACY XING BEGIN TO A-A							
69	TCP PHASE I STEP I LEGACY XING A-A TO END							
70	TCP PHASE I STEP IB LEGACY XING BEGIN TO A-A							
71	TCP PHASE I STEP IB LEGACY XING A-A TO END							
72	TCP PHASE I STEP II LEGACY XING BEGIN TO A-A		48.0					
73	TCP PHASE I STEP II LEGACY XING A-A TO END							
74	TCP PHASE I STEP IIB LEGACY XING BEGIN TO A-A							
75	TCP PHASE I STEP IIB LEGACY XING A-A TO END							
76	TCP PHASE II BEGIN TO 113+00							
77	TCP PHASE II 113+00 TO 118+00		2.0					
78	TCP PHASE II 118+00 TO 126+00		2.0					
79	TCP PHASE II 126+00 TO 134+00							
80	TCP PHASE II 134+00 TO 142+00							
81	TCP PHASE II 142+00 TO 150+00							
82	TCP PHASE II 150+00 TO 158+00			1342				
83	TCP PHASE II 158+00 TO 166+00			598				
84	TCP PHASE II 166+00 TO 174+00	2.0	1.0	1650				
85	TCP PHASE II 174+00 TO 182+00	6.0		490				
86	TCP PHASE II 182+00 TO 189+00	8.0						
87	TCP PHASE II RIVERY BLVD BEGIN TO END			40				
88	TCP PHASE II MEMORIAL DR BEGIN TO 8+00							
89	TCP PHASE II MEMORIAL DR 8+00 TO 16+00							
90	TCP PHASE II MEMORIAL DR 16+00 TO 20+00		1.0					
91	TCP PHASE II MEMORIAL DR 24+00 TO END							
92	TCP PHASE II STEP I RIVERY DRWY BEGIN TO F-F							
93	TCP PHASE II STEP I RIVERY DRWY F-F TO END							
94	TCP PHASE II STEP I LEGACY XING BEGIN TO A-A							
95	TCP PHASE II STEP I LEGACY XING A-A TO END							
96	TCP PHASE II STEP IB MEMORIAL DR BEGIN TO 8+00							
97	TCP PHASE II STEP IB MEMORIAL DR 8+00 TO 16+00							
98	TCP PHASE II STEP IB MEMORIAL DR 16+00 TO 20+00							
99	TCP PHASE II STEP IB MEMORIAL DR 20+00 TO 24+00							
101	TCP PHASE II STEP IB LEGACY XING BEGIN TO A-A							
102	TCP PHASE II STEP IB LEGACY XING A-A TO END							
103	TCP PHASE II STEP II LEGACY XING BEGIN TO A-A							
104	TCP PHASE II STEP II LEGACY XING A-A TO END							
105	TCP PHASE II STEP IIB LEGACY XING BEGIN TO A-A							
106	TCP PHASE II STEP IIB LEGACY XING A-A TO END							
107	TCP PHASE III STEP I SH 29 16+00 TO END							
108	TCP PHASE III STEP I BEGIN TO 113+00							
109	TCP PHASE III STEP I 113+00 TO 118+00							
110	TCP PHASE III STEP I 118+00 TO 126+00							
111	TCP PHASE III STEP I 126+00 TO 134+00							
112	TCP PHASE III STEP I 134+00 TO 142+00							
113	TCP PHASE III STEP I 142+00 TO 150+00							
114	TCP PHASE III STEP I 150+00 TO 158+00							
115	TCP PHASE III STEP I 158+00 TO 166+00							
116	TCP PHASE III STEP I 166+00 TO 174+00							
117	TCP PHASE III STEP I 174+00 TO 182+00							
118	TCP PHASE III STEP I 182+00 TO 189+50							
119	TCP PHASE III STEP I RIVERY BLVD BEGIN TO 19+00							
120	TCP PHASE III STEP I RIVERY BLVD 19+00 TO END							
121	TCP PHASE III STEP I RIVERY DRWY BEGIN TO END							

SHT NO	ITEM / TCP	TX508-7001 CONTRUCTING DETOURS SY	TX512-7009 PORT CTB (FUR & INST) (LOW PROF) (TY 1) LF	TX512-7010 PORT CTB (FUR & INST) (LOW PROF) (TY 2) LF	TX512-7033 PORT CTB (MOVE) (LOW PROF) (TY 1) LF	TX512-7034 PORT CTB (MOVE) (LOW PROF) (TY 2) LF	TX512-7057 PORT CTB (REMOVE) (LOW PROF) (TY 1) LF	TX512-7058 PORT CTB (REMOVE) (LOW PROF) (TY 2) LF
55	TCP PHASE I BEGIN TO 113+00							
56	TCP PHASE I 113+00 TO 118+00	231						
57	TCP PHASE I 118+00 TO 126+00	70	620	20				
58	TCP PHASE I 126+00 TO 134+00	358	640	60				
59	TCP PHASE I 134+00 TO 142+00		620	20				
60	TCP PHASE I 142+00 TO 150+00	103	640	40				
61	TCP PHASE I 150+00 TO 158+00	473	280	20				
62	TCP PHASE I 158+00 TO 162+00							
63	TCP PHASE I MEMORIAL DR BEGIN TO 8+00	662						
64	TCP PHASE I MEMORIAL DR 8+00 TO 16+00	915						
65	TCP PHASE I MEMORIAL DR 16+00 TO 20+00	230						
66	TCP PHASE I MEMORIAL DR 24+00 TO END	50						
68	TCP PHASE I STEP I LEGACY XING BEGIN TO A-A							
69	TCP PHASE I STEP I LEGACY XING A-A TO END							
70	TCP PHASE I STEP IB LEGACY XING BEGIN TO A-A							
71	TCP PHASE I STEP IB LEGACY XING A-A TO END							
72	TCP PHASE I STEP II LEGACY XING BEGIN TO A-A							
73	TCP PHASE I STEP II LEGACY XING A-A TO END							
74	TCP PHASE I STEP IIB LEGACY XING BEGIN TO A-A							
75	TCP PHASE I STEP IIB LEGACY XING A-A TO END							
76	TCP PHASE II BEGIN TO 113+00							
77	TCP PHASE II 113+00 TO 118+00	31	60	20				
78	TCP PHASE II 118+00 TO 126+00	33	40		620	20		
79	TCP PHASE II 126+00 TO 134+00				640	40		
80	TCP PHASE II 134+00 TO 142+00		60		620	40		
81	TCP PHASE II 142+00 TO 150+00		60		640	40		
82	TCP PHASE II 150+00 TO 158+00	737	120	20	280	20		
83	TCP PHASE II 158+00 TO 166+00	116	800					
84	TCP PHASE II 166+00 TO 174+00	68	660	40				
85	TCP PHASE II 174+00 TO 182+00	221	600	60				
86	TCP PHASE II 182+00 TO 189+00	127	400	80				
87	TCP PHASE II RIVERY BLVD BEGIN TO END	19	20	60				
88	TCP PHASE II MEMORIAL DR BEGIN TO 8+00							
89	TCP PHASE II MEMORIAL DR 8+00 TO 16+00		40	20				
90	TCP PHASE II MEMORIAL DR 16+00 TO 20+00	14	400					
91	TCP PHASE II MEMORIAL DR 24+00 TO END							
92	TCP PHASE II STEP I RIVERY DRWY BEGIN TO F-F	14	220	100				
93	TCP PHASE II STEP I RIVERY DRWY F-F TO END		240	20				
94	TCP PHASE II STEP I LEGACY XING BEGIN TO A-A							
95	TCP PHASE II STEP I LEGACY XING A-A TO END							
96	TCP PHASE II STEP IB MEMORIAL DR BEGIN TO 8+00							
97	TCP PHASE II STEP IB MEMORIAL DR 8+00 TO 16+00						40	20
98	TCP PHASE II STEP IB MEMORIAL DR 16+00 TO 20+00						400	
99	TCP PHASE II STEP IB MEMORIAL DR 20+00 TO 24+00						60	20
101	TCP PHASE II STEP IB LEGACY XING BEGIN TO A-A							
102	TCP PHASE II STEP IB LEGACY XING A-A TO END							
103	TCP PHASE II STEP II LEGACY XING BEGIN TO A-A							
104	TCP PHASE II STEP II LEGACY XING A-A TO END							
105	TCP PHASE II STEP IIB LEGACY XING BEGIN TO A-A							
106	TCP PHASE II STEP IIB LEGACY XING A-A TO END							
107	TCP PHASE III STEP I SH 29 16+00 TO END							
108	TCP PHASE III STEP I BEGIN TO 113+00							
109	TCP PHASE III STEP I 113+00 TO 118+00						380	20
110	TCP PHASE III STEP I 118+00 TO 126+00						640	40
111	TCP PHASE III STEP I 126+00 TO 134+00						680	40
112	TCP PHASE III STEP I 134+00 TO 142+00						700	40
113	TCP PHASE III STEP I 142+00 TO 150+00						680	20
114	TCP PHASE III STEP I 150+00 TO 158+00	267				20	720	
115	TCP PHASE III STEP I 158+00 TO 166+00	127			80			
116	TCP PHASE III STEP I 166+00 TO 174+00	72			640	40	20	
117	TCP PHASE III STEP I 174+00 TO 182+00	153			420	40	180	20
118	TCP PHASE III STEP I 182+00 TO 189+50	93			240	40	160	40
119	TCP PHASE III STEP I RIVERY BLVD BEGIN TO 19+00	3			40	20	40	40
120	TCP PHASE III STEP I RIVERY BLVD 19+00 TO END							
121	TCP PHASE III STEP I RIVERY DRWY BEGIN TO END						460	120

SHT NO	ITEM / TCP	TX662-7008 WK ZN PAV MRK NON-REMOV (W)6" (SLD) LF	TX662-7009 WK ZN PAV MRK NON-REMOV (W)8" (BRK) LF	TX662-7010 WK ZN PAV MRK NON-REMOV (W)8" (DOT) LF	TX662-7012 WK ZN PAV MRK NON-REMOV (W)8" (SLD) LF	TX662-7017 WK ZN PAV MRK NON-REMOV (W)24" (SLD) LF	TX662-7018 WK ZN PAV MRK NON-REMOV (W) (ARROW) EA	TX662-7030 WK ZN PAV MRK NON-REMOV (W) (WORD) EA
55	TCP PHASE I BEGIN TO 113+00	402						
56	TCP PHASE I 113+00 TO 118+00	1321		240		22		
57	TCP PHASE I 118+00 TO 126+00	1606						
58	TCP PHASE I 126+00 TO 134+00	1470				22		
59	TCP PHASE I 134+00 TO 142+00	1618						
60	TCP PHASE I 142+00 TO 150+00	1628						
61	TCP PHASE I 150+00 TO 158+00	1404						
62	TCP PHASE I 158+00 TO 162+00							
63	TCP PHASE I MEMORIAL DR BEGIN TO 8+00	697						
64	TCP PHASE I MEMORIAL DR 8+00 TO 16+00	800						
65	TCP PHASE I MEMORIAL DR 16+00 TO 20+00	129						
66	TCP PHASE I MEMORIAL DR 24+00 TO END							
68	TCP PHASE I STEP I LEGACY XING BEGIN TO A-A	247				14		
69	TCP PHASE I STEP I LEGACY XING A-A TO END							
70	TCP PHASE I STEP IB LEGACY XING BEGIN TO A-A	587						
71	TCP PHASE I STEP IB LEGACY XING A-A TO END	4						
72	TCP PHASE I STEP II LEGACY XING BEGIN TO A-A	961				14		
73	TCP PHASE I STEP II LEGACY XING A-A TO END	138						
74	TCP PHASE I STEP IIB LEGACY XING BEGIN TO A-A	159						
75	TCP PHASE I STEP IIB LEGACY XING A-A TO END							
76	TCP PHASE II BEGIN TO 113+00							
77	TCP PHASE II 113+00 TO 118+00	539				26		
78	TCP PHASE II 118+00 TO 126+00	810						
79	TCP PHASE II 126+00 TO 134+00	790				33		
80	TCP PHASE II 134+00 TO 142+00	1150				15		
81	TCP PHASE II 142+00 TO 150+00	1123				27		
82	TCP PHASE II 150+00 TO 158+00	1381				28		
83	TCP PHASE II 158+00 TO 166+00	1609						
84	TCP PHASE II 166+00 TO 174+00	1593				55		
85	TCP PHASE II 174+00 TO 182+00	1870						
86	TCP PHASE II 182+00 TO 189+00	1946						
87	TCP PHASE II RIVERY BLVD BEGIN TO END	172		54		11		
88	TCP PHASE II MEMORIAL DR BEGIN TO 8+00	657						
89	TCP PHASE II MEMORIAL DR 8+00 TO 16+00	800						
90	TCP PHASE II MEMORIAL DR 16+00 TO 20+00	400						
91	TCP PHASE II MEMORIAL DR 24+00 TO END							
92	TCP PHASE II STEP I RIVERY DRWY BEGIN TO F-F	529						
93	TCP PHASE II STEP I RIVERY DRWY F-F TO END	263						
94	TCP PHASE II STEP I LEGACY XING BEGIN TO A-A	1527				13		
95	TCP PHASE II STEP I LEGACY XING A-A TO END	142						
96	TCP PHASE II STEP IB MEMORIAL DR BEGIN TO 8+0	702						
97	TCP PHASE II STEP IB MEMORIAL DR 8+00 TO 16+0	800						
98	TCP PHASE II STEP IB MEMORIAL DR 16+00 TO 20+0	401						
99	TCP PHASE II STEP IB MEMORIAL DR 20+00 TO 24+0	274				21		
101	TCP PHASE II STEP IB LEGACY XING BEGIN TO A-A	326				25		
102	TCP PHASE II STEP IB LEGACY XING A-A TO END							
103	TCP PHASE II STEP II LEGACY XING BEGIN TO A-A	1380				25		
104	TCP PHASE II STEP II LEGACY XING A-A TO END	138						
105	TCP PHASE II STEP IIB LEGACY XING BEGIN TO A-	78				14		
106	TCP PHASE II STEP IIB LEGACY XING A-A TO END							
107	TCP PHASE III STEP I SH 29 16+00 TO END							
108	TCP PHASE III STEP I BEGIN TO 113+00	880			217	61	2	2
109	TCP PHASE III STEP I 113+00 TO 118+00	390		80	108		6	2
110	TCP PHASE III STEP I 118+00 TO 126+00	70	230	18	404		2	2
111	TCP PHASE III STEP I 126+00 TO 134+00	150	310		597		8	4
112	TCP PHASE III STEP I 134+00 TO 142+00	966	80			14		
113	TCP PHASE III STEP I 142+00 TO 150+00	806				29		
114	TCP PHASE III STEP I 150+00 TO 158+00	868				24		
115	TCP PHASE III STEP I 158+00 TO 166+00	700						
116	TCP PHASE III STEP I 166+00 TO 174+00	995				22		
117	TCP PHASE III STEP I 174+00 TO 182+00	1004						
118	TCP PHASE III STEP I 182+00 TO 189+50	1075				24		
119	TCP PHASE III STEP I RIVERY BLVD BEGIN TO 19+0	98			104	21	1	
120	TCP PHASE III STEP I RIVERY BLVD 19+00 TO END							1
121	TCP PHASE III STEP I RIVERY DRWY BEGIN TO EN	205				35		

SHT NO	ITEM / TCP	TX662-7031 WK ZN PAV MRK NON-REMOV (W)18" (YLD) EA	TX662-7038 WK ZN PAV MRK NON-REMOV (Y)6" (SLD) LF	TX662-7040 WK ZN PAV MRK NON-REMOV (Y)12" (SLD) LF	TX662-7051 WK PAV MRK REMOV (REFL) TY II-A-A EA	TX662-7053 WK ZN PAV MRK REMOV (REFL) TY II-C-R EA	TX662-7068 WK ZN PAV MRK REMOV (W)6" (SLD) LF	TX662-7070 WK ZN PAV MRK REMOV (W)8" (DOT) LF
55	TCP PHASE I BEGIN TO 113+00		253					
56	TCP PHASE I 113+00 TO 118+00		1070		24			
57	TCP PHASE I 118+00 TO 126+00		1606		40			
58	TCP PHASE I 126+00 TO 134+00		1450		36			
59	TCP PHASE I 134+00 TO 142+00		1618		40			
60	TCP PHASE I 142+00 TO 150+00		1460		36			
61	TCP PHASE I 150+00 TO 158+00		2086		50			
62	TCP PHASE I 158+00 TO 162+00		586		14			
63	TCP PHASE I MEMORIAL DR BEGIN TO 8+00							
64	TCP PHASE I MEMORIAL DR 8+00 TO 16+00							
65	TCP PHASE I MEMORIAL DR 16+00 TO 20+00							
66	TCP PHASE I MEMORIAL DR 24+00 TO END							
68	TCP PHASE I STEP I LEGACY XING BEGIN TO A-A						728	
69	TCP PHASE I STEP I LEGACY XING A-A TO END						138	
70	TCP PHASE I STEP IB LEGACY XING BEGIN TO A-A						784	
71	TCP PHASE I STEP IB LEGACY XING A-A TO END						138	
72	TCP PHASE I STEP II LEGACY XING BEGIN TO A-A						557	
73	TCP PHASE I STEP II LEGACY XING A-A TO END						144	
74	TCP PHASE I STEP IIB LEGACY XING BEGIN TO A-A						544	
75	TCP PHASE I STEP IIB LEGACY XING A-A TO END						144	
76	TCP PHASE II BEGIN TO 113+00						145	
77	TCP PHASE II 113+00 TO 118+00		1750		48			
78	TCP PHASE II 118+00 TO 126+00		1614		40			
79	TCP PHASE II 126+00 TO 134+00		1345		34			
80	TCP PHASE II 134+00 TO 142+00		1586		40			
81	TCP PHASE II 142+00 TO 150+00		1575		40			
82	TCP PHASE II 150+00 TO 158+00		1626		42			
83	TCP PHASE II 158+00 TO 166+00		1610		40			
84	TCP PHASE II 166+00 TO 174+00		1400		36			
85	TCP PHASE II 174+00 TO 182+00		1590		40			
86	TCP PHASE II 182+00 TO 189+00		1555		36			
87	TCP PHASE II RIVERY BLVD BEGIN TO END		160		4			193
88	TCP PHASE II MEMORIAL DR BEGIN TO 8+00							
89	TCP PHASE II MEMORIAL DR 8+00 TO 16+00							
90	TCP PHASE II MEMORIAL DR 16+00 TO 20+00							
91	TCP PHASE II MEMORIAL DR 24+00 TO END		866		22			
92	TCP PHASE II STEP I RIVERY DRWY BEGIN TO F-F						580	
93	TCP PHASE II STEP I RIVERY DRWY F-F TO END						263	
94	TCP PHASE II STEP I LEGACY XING BEGIN TO A-A						737	
95	TCP PHASE II STEP I LEGACY XING A-A TO END						138	
96	TCP PHASE II STEP IB MEMORIAL DR BEGIN TO 8+00							
97	TCP PHASE II STEP IB MEMORIAL DR 8+00 TO 16+00							
98	TCP PHASE II STEP IB MEMORIAL DR 16+00 TO 20+00							
99	TCP PHASE II STEP IB MEMORIAL DR 20+00 TO 24+00							
101	TCP PHASE II STEP IB LEGACY XING BEGIN TO A-A						738	
102	TCP PHASE II STEP IB LEGACY XING A-A TO END						138	
103	TCP PHASE II STEP II LEGACY XING BEGIN TO A-A						580	
104	TCP PHASE II STEP II LEGACY XING A-A TO END						144	
105	TCP PHASE II STEP IIB LEGACY XING BEGIN TO A-A						580	
106	TCP PHASE II STEP IIB LEGACY XING A-A TO END						144	
107	TCP PHASE III STEP I SH 29 16+00 TO END						320	
108	TCP PHASE III STEP I BEGIN TO 113+00					11		
109	TCP PHASE III STEP I 113+00 TO 118+00	28	726		100	5		
110	TCP PHASE III STEP I 118+00 TO 126+00	9	658			43		
111	TCP PHASE III STEP I 126+00 TO 134+00			12	14	61		
112	TCP PHASE III STEP I 134+00 TO 142+00		1772		44	8		
113	TCP PHASE III STEP I 142+00 TO 150+00		1410		46			
114	TCP PHASE III STEP I 150+00 TO 158+00		1588		42			
115	TCP PHASE III STEP I 158+00 TO 166+00		1388		36			
116	TCP PHASE III STEP I 166+00 TO 174+00		1346		34			
117	TCP PHASE III STEP I 174+00 TO 182+00		1624		42			
118	TCP PHASE III STEP I 182+00 TO 189+50		1594		38			
119	TCP PHASE III STEP I RIVERY BLVD BEGIN TO 19+00		80		2	1	760	
120	TCP PHASE III STEP I RIVERY BLVD 19+00 TO END						605	
121	TCP PHASE III STEP I RIVERY DRWY BEGIN TO END						348	

NO.	REVISION	DATE

GEORGETOWN TEXAS *more than welcome*

PAPE-DAWSON ENGINEERS
AUSTIN I SAN ANTONIO I HOUSTON I FORT WORTH I DALLAS
10801 N MOPAC EXPY, BLDG 3, STE 200 I AUSTIN, TX 78759 I 512.454.8711
TEXAS ENGINEERING FIRM #470 I TEXAS SURVEYING FIRM #10028800

WOLF RANCH PKWY / MEMORIAL DR
SUMMARY OF TCP QUANTITIES

CITY JOB No.
JOB NO. 51423-04
DATE 9/11/2025
DESIGNER
CHECKED DRAWN

SHEET NO. 14

SHT NO	ITEM: TCP	TX662-7077: WK ZN PAV MRK REMOV (W)24" (SLD)	TX662-7082: WK ZN PAV MRK REMOV (W) (ARROW)	TX662-7100: WK ZN PAV MRK REMOV (Y)6" (SLD)	TX677-7001: ELIM EXT PM & MRKS (4")	TX677-7002: ELIM EXT PM & MRKS (6")	TX677-7008: ELIM EXT PM & MRKS (24")	TX677-7009: ELIM EXT PM & MRKS (ARROW)
		LF	EA	LF	LF	LF	LF	EA
55	TCP PHASE I BEGIN TO 113+00				30			
56	TCP PHASE I 113+00 TO 118+00				683	58		
57	TCP PHASE I 118+00 TO 126+00				1608	145		
58	TCP PHASE I 126+00 TO 134+00				1525	153	71	
59	TCP PHASE I 134+00 TO 142+00				2733			
60	TCP PHASE I 142+00 TO 150+00				1810			
61	TCP PHASE I 150+00 TO 158+00				2361			
62	TCP PHASE I 158+00 TO 162+00				541			
63	TCP PHASE I MEMORIAL DR BEGIN TO 8+00							
64	TCP PHASE I MEMORIAL DR 8+00 TO 16+00							
65	TCP PHASE I MEMORIAL DR 16+00 TO 20+00							
66	TCP PHASE I MEMORIAL DR 24+00 TO END							
68	TCP PHASE I STEP I LEGACY XING BEGIN TO A-A				348		151	2
69	TCP PHASE I STEP I LEGACY XING A-A TO END							
70	TCP PHASE I STEP IB LEGACY XING BEGIN TO A-A							
71	TCP PHASE I STEP IB LEGACY XING A-A TO END							
72	TCP PHASE I STEP II LEGACY XING BEGIN TO A-A							
73	TCP PHASE I STEP II LEGACY XING A-A TO END							
74	TCP PHASE I STEP IIB LEGACY XING BEGIN TO A-A							
75	TCP PHASE I STEP IIB LEGACY XING A-A TO END							
76	TCP PHASE II BEGIN TO 113+00			203	20	150		
77	TCP PHASE II 113+00 TO 118+00				10	41	8	
78	TCP PHASE II 118+00 TO 126+00							
79	TCP PHASE II 126+00 TO 134+00							
80	TCP PHASE II 134+00 TO 142+00							
81	TCP PHASE II 142+00 TO 150+00							
82	TCP PHASE II 150+00 TO 158+00				711			
83	TCP PHASE II 158+00 TO 166+00				2452			
84	TCP PHASE II 166+00 TO 174+00				2480	287	106	3
85	TCP PHASE II 174+00 TO 182+00				2463	73		
86	TCP PHASE II 182+00 TO 189+00				1985			
87	TCP PHASE II RIVERY BLVD BEGIN TO END	463			282	369	27	4
88	TCP PHASE II MEMORIAL DR BEGIN TO 8+00							
89	TCP PHASE II MEMORIAL DR 8+00 TO 16+00							
90	TCP PHASE II MEMORIAL DR 16+00 TO 20+00							
91	TCP PHASE II MEMORIAL DR 24+00 TO END							
92	TCP PHASE II STEP I RIVERY DRWY BEGIN TO F-F				24	62		
93	TCP PHASE II STEP I RIVERY DRWY F-F TO END							
94	TCP PHASE II STEP I LEGACY XING BEGIN TO A-A							
95	TCP PHASE II STEP I LEGACY XING A-A TO END							
96	TCP PHASE II STEP IB MEMORIAL DR BEGIN TO 8+00							
97	TCP PHASE II STEP IB MEMORIAL DR 8+00 TO 16+00							
98	TCP PHASE II STEP IB MEMORIAL DR 16+00 TO 20+00							
99	TCP PHASE II STEP IB MEMORIAL DR 20+00 TO 24+00							
101	TCP PHASE II STEP IB LEGACY XING BEGIN TO A-A							
102	TCP PHASE II STEP IB LEGACY XING A-A TO END							
103	TCP PHASE II STEP II LEGACY XING BEGIN TO A-A							
104	TCP PHASE II STEP II LEGACY XING A-A TO END							
105	TCP PHASE II STEP IIB LEGACY XING BEGIN TO A-A							
106	TCP PHASE II STEP IIB LEGACY XING A-A TO END							
107	TCP PHASE III STEP I SH 29 16+00 TO END							
108	TCP PHASE III STEP I BEGIN TO 113+00							
109	TCP PHASE III STEP I 113+00 TO 118+00							
110	TCP PHASE III STEP I 118+00 TO 126+00							
111	TCP PHASE III STEP I 126+00 TO 134+00							
112	TCP PHASE III STEP I 134+00 TO 142+00							
113	TCP PHASE III STEP I 142+00 TO 150+00							
114	TCP PHASE III STEP I 150+00 TO 158+00							
115	TCP PHASE III STEP I 158+00 TO 166+00							
116	TCP PHASE III STEP I 166+00 TO 174+00							
117	TCP PHASE III STEP I 174+00 TO 182+00							
118	TCP PHASE III STEP I 182+00 TO 189+50							
119	TCP PHASE III STEP I RIVERY BLVD BEGIN TO 19+00				320		54	
120	TCP PHASE III STEP I RIVERY BLVD 19+00 TO END				90			
121	TCP PHASE III STEP I RIVERY DRWY BEGIN TO END							

SHT NO	ITEM: TCP	TX677-7015: ELIM EXT PM & MRKS (WORD)
		EA
55	TCP PHASE I BEGIN TO 113+00	
56	TCP PHASE I 113+00 TO 118+00	
57	TCP PHASE I 118+00 TO 126+00	
58	TCP PHASE I 126+00 TO 134+00	
59	TCP PHASE I 134+00 TO 142+00	
60	TCP PHASE I 142+00 TO 150+00	
61	TCP PHASE I 150+00 TO 158+00	
62	TCP PHASE I 158+00 TO 162+00	
63	TCP PHASE I MEMORIAL DR BEGIN TO 8+00	
64	TCP PHASE I MEMORIAL DR 8+00 TO 16+00	
65	TCP PHASE I MEMORIAL DR 16+00 TO 20+00	
66	TCP PHASE I MEMORIAL DR 24+00 TO END	
68	TCP PHASE I STEP I LEGACY XING BEGIN TO A-A	1
69	TCP PHASE I STEP I LEGACY XING A-A TO END	
70	TCP PHASE I STEP IB LEGACY XING BEGIN TO A-A	
71	TCP PHASE I STEP IB LEGACY XING A-A TO END	
72	TCP PHASE I STEP II LEGACY XING BEGIN TO A-A	
73	TCP PHASE I STEP II LEGACY XING A-A TO END	
74	TCP PHASE I STEP IIB LEGACY XING BEGIN TO A-A	
75	TCP PHASE I STEP IIB LEGACY XING A-A TO END	
76	TCP PHASE II BEGIN TO 113+00	
77	TCP PHASE II 113+00 TO 118+00	
78	TCP PHASE II 118+00 TO 126+00	
79	TCP PHASE II 126+00 TO 134+00	
80	TCP PHASE II 134+00 TO 142+00	
81	TCP PHASE II 142+00 TO 150+00	
82	TCP PHASE II 150+00 TO 158+00	
83	TCP PHASE II 158+00 TO 166+00	
84	TCP PHASE II 166+00 TO 174+00	2
85	TCP PHASE II 174+00 TO 182+00	
86	TCP PHASE II 182+00 TO 189+00	
87	TCP PHASE II RIVERY BLVD BEGIN TO END	2
88	TCP PHASE II MEMORIAL DR BEGIN TO 8+00	
89	TCP PHASE II MEMORIAL DR 8+00 TO 16+00	
90	TCP PHASE II MEMORIAL DR 16+00 TO 20+00	
91	TCP PHASE II MEMORIAL DR 24+00 TO END	
92	TCP PHASE II STEP I RIVERY DRWY BEGIN TO F-F	1
93	TCP PHASE II STEP I RIVERY DRWY F-F TO END	
94	TCP PHASE II STEP I LEGACY XING BEGIN TO A-A	
95	TCP PHASE II STEP I LEGACY XING A-A TO END	
96	TCP PHASE II STEP IB MEMORIAL DR BEGIN TO 8+00	
97	TCP PHASE II STEP IB MEMORIAL DR 8+00 TO 16+00	
98	TCP PHASE II STEP IB MEMORIAL DR 16+00 TO 20+00	
99	TCP PHASE II STEP IB MEMORIAL DR 20+00 TO 24+00	
101	TCP PHASE II STEP IB LEGACY XING BEGIN TO A-A	
102	TCP PHASE II STEP IB LEGACY XING A-A TO END	
103	TCP PHASE II STEP II LEGACY XING BEGIN TO A-A	
104	TCP PHASE II STEP II LEGACY XING A-A TO END	
105	TCP PHASE II STEP IIB LEGACY XING BEGIN TO A-A	
106	TCP PHASE II STEP IIB LEGACY XING A-A TO END	
107	TCP PHASE III STEP I SH 29 16+00 TO END	
108	TCP PHASE III STEP I BEGIN TO 113+00	
109	TCP PHASE III STEP I 113+00 TO 118+00	
110	TCP PHASE III STEP I 118+00 TO 126+00	
111	TCP PHASE III STEP I 126+00 TO 134+00	
112	TCP PHASE III STEP I 134+00 TO 142+00	
113	TCP PHASE III STEP I 142+00 TO 150+00	
114	TCP PHASE III STEP I 150+00 TO 158+00	
115	TCP PHASE III STEP I 158+00 TO 166+00	
116	TCP PHASE III STEP I 166+00 TO 174+00	
117	TCP PHASE III STEP I 174+00 TO 182+00	
118	TCP PHASE III STEP I 182+00 TO 189+50	
119	TCP PHASE III STEP I RIVERY BLVD BEGIN TO 19+00	
120	TCP PHASE III STEP I RIVERY BLVD 19+00 TO END	
121	TCP PHASE III STEP I RIVERY DRWY BEGIN TO END	

SHT NO	ITEM: TCP	TX677-7015: ELIM EXT PM & MRKS (WORD)
		EA
122	TCP PHASE III STEP IB RIVERY DRWY BEGIN TO END	
123	TCP PHASE III STEP IC RIVERY DRWY BEGIN TO END	
124	TCP PHASE III STEP ID RIVERY DRWY BEGIN TO END	
125	TCP PHASE III STEP II BEGIN TO 113+00	
126	TCP PHASE III STEP II 113+00 TO 122+00	
127	TCP PHASE III STEP II 122+00 TO 130+00	
128	TCP PHASE III STEP II 130+00 TO 138+00	
129	TCP PHASE III STEP II 138+00 TO 146+00	
130	TCP PHASE III STEP II 146+00 TO 154+00	
131	TCP PHASE III STEP II 154+00 TO 162+00	
132	TCP PHASE III STEP II 162+00 TO 170+00	
133	TCP PHASE III STEP II 170+00 TO 178+00	
134	TCP PHASE III STEP II 178+00 TO 186+00	
135	TCP PHASE III STEP II 186+00 TO END	
136	TCP PHASE III STEP II RIVERY BLVD 19+00 TO END	
136A	TCP PHASE II STEP O-A	
136B	TCP PHASE II STEP O-A	
136D	TCP PHASE II STEP O-B	
	TOTALS	6

SHT NO	ITEM: TCP	TX247-7139: FL BS (CMP IN PLACE) (TY A GR 5) (IN VEH)	TX341-7026: D-GR HMA TY-C PG70-22 (LEVEL-UP)	TX403-7001: TEMPORARY SPL SHORING	TX502-7001: BARRICADES, SIGNS AND TRAFFIC	TX503-7002: PORTABLE CHANGEABLE MESSAGE SIGN	TX505-7001: TMA (STATIONARY)	TX505-7003: TMA (MOBILE OPERATION)
		CY	TON	SF	MO	EA	DAY	DAY
122	TCP PHASE III STEP IB RIVERY DRWY BEGIN TO END							
123	TCP PHASE III STEP IC RIVERY DRWY BEGIN TO END							
124	TCP PHASE III STEP ID RIVERY DRWY BEGIN TO END							
125	TCP PHASE III STEP II BEGIN TO 113+00							
126	TCP PHASE III STEP II 113+00 TO 122+00							
127	TCP PHASE III STEP II 122+00 TO 130+00							
128	TCP PHASE III STEP II 130+00 TO 138+00							
129	TCP PHASE III STEP II 138+00 TO 146+00							
130	TCP PHASE III STEP II 146+00 TO 154+00							
131	TCP PHASE III STEP II 154+00 TO 162+00							
132	TCP PHASE III STEP II 162+00 TO 170+00							
133	TCP PHASE III STEP II 170+00 TO 178+00							
134	TCP PHASE III STEP II 178+00 TO 186+00							
135	TCP PHASE III STEP II 186+00 TO END							
136	TCP PHASE III STEP II RIVERY BLVD 19+00 TO END							
136A	TCP PHASE II STEP O-A							
136B	TCP PHASE II STEP O-A							
136D	TCP PHASE II STEP O-B							
	TOTALS	43.0	193.0	7417	56	4	1600	75

SHT NO	ITEM: TCP	TX508-7001: CONTRUCTING DETOURS	TX512-7009: PORT CTB (FUR & INST) (LOW PROF) (TY 1)	TX512-7010: PORT CTB (FUR & INST) (LOW PROF) (TY 2)	TX512-7033: PORT CTB (MOVE) (LOW PROF) (TY 1)	TX512-7034: PORT CTB (MOVE) (LOW PROF) (TY 2)	TX512-7057: PORT CTB (REMOVE) (LOW PROF) (TY 1)	TX512-7058: PORT CTB (REMOVE) (LOW PROF) (TY 2)
		SY	LF	LF	LF	LF	LF	LF
122	TCP PHASE III STEP IB RIVERY DRWY BEGIN TO END							
123	TCP PHASE III STEP IC RIVERY DRWY BEGIN TO END							
124	TCP PHASE III STEP ID RIVERY DRWY BEGIN TO END							
125	TCP PHASE III STEP II BEGIN TO 113+00							
126	TCP PHASE III STEP II 113+00 TO 122+00							
127	TCP PHASE III STEP II 122+00 TO 130+00							
128	TCP PHASE III STEP II 130+00 TO 138+00							
129	TCP PHASE III STEP II 138+00 TO 146+00							
130	TCP PHASE III STEP II 146+00 TO 154+00							
131	TCP PHASE III STEP II 154+00 TO 162+00							
132	TCP PHASE III STEP II 162+00 TO 170+00						480	20
133	TCP PHASE III STEP II 170+00 TO 178+00						500	60
134	TCP PHASE III STEP II 178+00 TO 186+00						220	40
135	TCP PHASE III STEP II 186+00 TO END						220	40
136	TCP PHASE III STEP II RIVERY BLVD 19+00 TO END							
136A	TCP PHASE II STEP O-A		60	20				
136B	TCP PHASE II STEP O-A							
136D	TCP PHASE II STEP O-B							
	TOTALS	5187	6580	600	4220	320	6580	600

SHT NO	ITEM: TCP	TX662-7008: WK ZN PAV MRK NON-REMOV (W)6" (SLD)	TX662-7009: WK ZN PAV MRK NON-REMOV (W)8" (BRK)	TX662-7010: WK ZN PAV MRK NON-REMOV (W)8" (DOT)	TX662-7012: WK ZN PAV MRK NON-REMOV (W)8" (SLD)	TX662-7017: WK ZN PAV MRK NON-REMOV (W)24" (SLD)	TX662-7018: WK ZN PAV MRK NON-REMOV (W) (ARROW)	TX662-7030: WK ZN PAV MRK NON-REMOV (W) (WORD)
		LF	LF	LF	LF	LF	EA	EA
122	TCP PHASE III STEP IB RIVERY DRWY BEGIN TO EN	49						
123	TCP PHASE III STEP IC RIVERY DRWY BEGIN TO EN	428				47		
124	TCP PHASE III STEP ID RIVERY DRWY BEGIN TO EN	323						
125	TCP PHASE III STEP II BEGIN TO 113+00	232	80	18	374		3	3
126	TCP PHASE III STEP II 113+00 TO 122+00		100	48	482		8	3
127	TCP PHASE III STEP II 122+00 TO 130+00				478		4	4
128	TCP PHASE III STEP II 130+00 TO 138+00				113		1	1
129	TCP PHASE III STEP II 138+00 TO 146+00	270			575	75	5	4
130	TCP PHASE III STEP II 146+00 TO 154+00				251		1	2
131	TCP PHASE III STEP II 154+00 TO 162+00	144			51	12	1	1
132	TCP PHASE III STEP II 162+00 TO 170+00	122			619	24	4	5
133	TCP PHASE III STEP II 170+00 TO 178+00	428			792	106	7	4
134	TCP PHASE III STEP II 178+00 TO 186+00	164			148	45	1	1
135	TCP PHASE III STEP II 186+00 TO END	1215			316	26		
136	TCP PHASE III STEP II RIVERY BLVD 19+00 TO END							
136A	TCP PHASE II STEP O-A							
136B	TCP PHASE II STEP O-A							
136D	TCP PHASE II STEP O-B							
	TOTALS	46153	800	458	5629	930	54	39

SHT NO	ITEM: TCP	TX662-7031: WK ZN PAV MRK NON-REMOV (W)18" (YLD)	TX662-7038: WK ZN PAV MRK NON-REMOV (Y)6" (SLD)	TX662-7040: WK ZN PAV MRK NON-REMOV (Y)12" (SLD)	TX662-7051: WK ZN PAV MRK REMOV (REFL) TY II-A-A	TX662-7053: WK ZN PAV MRK REMOV (REFL) TY II-C-R	TX662-7068: WK ZN PAV MRK REMOV (W)6" (SLD)	TX662-7070: WK ZN PAV MRK REMOV (W)8" (DOT)
		EA	LF	LF	EA	EA	LF	LF
122	TCP PHASE III STEP IB RIVERY DRWY BEGIN TO END						335	
123	TCP PHASE III STEP IC RIVERY DRWY BEGIN TO END						566	
124	TCP PHASE III STEP ID RIVERY DRWY BEGIN TO EN	8					540	
125	TCP PHASE III STEP II BEGIN TO 113+00		72	10		26		
126	TCP PHASE III STEP II 113+00 TO 122+00	18	751	16	4	12		
127	TCP PHASE III STEP II 122+00 TO 130+00		1353			24		
128	TCP PHASE III STEP II 130+00 TO 138+00		1601			5		
129	TCP PHASE III STEP II 138+00 TO 146+00		1386			29		
130	TCP PHASE III STEP II 146+00 TO 154+00		1600			13		
131	TCP PHASE III STEP II 154+00 TO 162+00		1600			3		
132	TCP PHASE III STEP II 162+00 TO 170+00		1407			31		
133	TCP PHASE III STEP II 170+00 TO 178+00		1342		4	40		
134	TCP PHASE III STEP II 178+00 TO 186+00		1376			7		
135	TCP PHASE III STEP II 186+00 TO END		766			16	760	
136	TCP PHASE III STEP II RIVERY BLVD 19+00 TO END						605	
136A	TCP PHASE II STEP O-A							81
136B	TCP PHASE II STEP O-A							81
136D	TCP PHASE II STEP O-B							355
	TOTALS	63	52246	38	1068	335	12203	355

SHT NO	ITEM: TCP	TX662-7077: WK ZN PAV MRK REMOV (W)24" (SLD)	TX662-7082: WK ZN PAV MRK REMOV (W) (ARROW)	TX662-7100: WK ZN PAV MRK REMOV (Y)6" (SLD)	TX677-7001: ELIM EXT PM & MRKS (4")	TX677-7002: ELIM EXT PM & MRKS (6")	TX677-7008: ELIM EXT PM & MRKS (24")	TX677-7009: ELIM EXT PM & MRKS (ARROW)
		LF	EA	LF	LF	LF	LF	EA
122	TCP PHASE III STEP IB RIVERY DRWY BEGIN TO END							
123	TCP PHASE III STEP IC RIVERY DRWY BEGIN TO END							
124	TCP PHASE III STEP ID RIVERY DRWY BEGIN TO END							
125	TCP PHASE III STEP II BEGIN TO 113+00							
126	TCP PHASE III STEP II 113+00 TO 122+00							
127	TCP PHASE III STEP II 122+00 TO 130+00							
128	TCP PHASE III STEP II 130+00 TO 138+00							
129	TCP PHASE III STEP II 138+00 TO 146+00							
130	TCP PHASE III STEP II 146+00 TO 154+00							
131	TCP PHASE III STEP II 154+00 TO 162+00							
132	TCP PHASE III STEP II 162+00 TO 170+00							
133	TCP PHASE III STEP II 170+00 TO 178+00							
134	TCP PHASE III STEP II 178+00 TO 186+00							
135	TCP PHASE III STEP II 186+00 TO END							
136	TCP PHASE III STEP II RIVERY BLVD 19+00 TO END							
136A	TCP PHASE II STEP O-A							
136B	TCP PHASE II STEP O-A		1					
136D	TCP PHASE II STEP O-B		1					
	TOTALS	463	2	203	22476	1338	417	9

NO.	REVISION	DATE

GEORGETOWN TEXAS *more than welcome*

PAPE-DAWSON ENGINEERS
AUSTIN I SAN ANTONIO I HOUSTON I FORT WORTH I DALLAS
10801 N MOPAC EXPY, BLDG 3, STE 200 I AUSTIN, TX 78759 I 512.454.8711
TEXAS ENGINEERING FIRM #470 I TEXAS SURVEYING FIRM #10028800

WOLF RANCH PKWY / MEMORIAL DR
SUMMARY OF TCP QUANTITIES

CITY JOB No.
JOB NO. 51423-04
DATE 9/11/2025
DESIGNER
CHECKED DRAWN

	ITEM	TX104 7001	TX104 7010	TX104 7011	TX104 7013	TX104 7017	TX105 7006	TX105 7016
	REMOVAL	REMOV CONC (PAV)	REMOV CONC (PAVERS)	REMOV CONC (DRIVEWAYS)	REMOV CONC (SIDEWALK, RAMP OR SUP)	REMOV CONC (CURB & GUTTER)	RMV (6"-10") TRT/UNTRT BASE & ASPH PAV	RMV (16"-20") TRT/UNTRT BASE & ASPH PAV
SHT NO		SY	SY	SY	SY	LF	SY	SY
174	BEGIN TO 116+00		190	157	329	977		2536
175	118+00 TO 121+00				60	892		1468
176	121+00 TO 129+00	231	287		1017	1814		3917
177	129+00 TO 137+00		59	261	522	1711		4033
178	137+00 TO 145+50	200	82		1477	1697		4383
179	145+50 TO 154+00				871	1700		3880
180	154+00 TO 162+00			80	300	1606	156	3918
181	162+00 TO 170+00			253	168	1613		3628
182	170+00 TO 178+00			440	625	1504		3851
183	178+00 TO 186+00			975	480	1254		3772
184	186+00 TO END			230	533	784	76	2225
185	SUNSET VISTA BEGIN TO END			68	35		48	1415
186	MEMORIAL DR BEGIN TO 8+00						85	1628
187	MEMORIAL DR 8+00 TO 16+00	183			238	492		2322
188	MEMORIAL DR 16+00 TO 23+00				64			1448
189	MEMORIAL DR 23+00 TO END	325			215	206		75
190	RIVERY DRIVEWAY BEGIN TO END							506
	TOTALS	939	618	2464	6934	16250	365	45005

	ITEM	TX496 7002	TX496 7003	TX496 7007	TX542 7001	TX542 7003	TX552 7011	TX560 7012
	REMOVAL	REMOV STR (INLET)	REMOV STR (MANHOLE)	REMOV STR (PIPE)	REMOVE METAL BEAM GUARD FENCE	REMOVE DOWNSTREAM ANCHOR	WIRE FENCE (REMOVE)	RELOCATE EXISTING MAILBOX
SHT NO		EA	EA	LF	LF	EA	LF	EA
174	BEGIN TO 116+00	1						
175	118+00 TO 121+00	1					300	
176	121+00 TO 129+00	7		785			486	
177	129+00 TO 137+00	6		976				
178	137+00 TO 145+50	9		985	270	2		
179	145+50 TO 154+00	6		1051				
180	154+00 TO 162+00	2		293			574	
181	162+00 TO 170+00	2	1	846			614	
182	170+00 TO 178+00	2	1	380			172	
183	178+00 TO 186+00	4	2	905			28	1
184	186+00 TO END	2	2	580				
185	SUNSET VISTA BEGIN TO END						86	
186	MEMORIAL DR BEGIN TO 8+00						400	
187	MEMORIAL DR 8+00 TO 16+00						493	2
188	MEMORIAL DR 16+00 TO 23+00						535	
189	MEMORIAL DR 23+00 TO END							
190	RIVERY DRIVEWAY BEGIN TO END			910				
	TOTALS	42	6	7711	270	2	3688	3

	ITEM	TX644 7065	TX644 7073	TX680 7004	TX690 7001	TX690 7166
	REMOVAL	RELOCATE SM RD SN SUP&AM TY 10BWG	REMOVE SM RD SN SUP&AM	REMOVING TRAFFIC SIGNALS	REMOVAL OF CONDUIT	REMOVE ROADWAY ILLUM ASSEMBLY (LED)
SHT NO		EA	EA	EA	LF	EA
174	BEGIN TO 116+00	2	4			
175	118+00 TO 121+00		7			1
176	121+00 TO 129+00		5	1	424	2
177	129+00 TO 137+00		4		422	4
178	137+00 TO 145+50		2		287	3
179	145+50 TO 154+00		2		186	4
180	154+00 TO 162+00		4		164	3
181	162+00 TO 170+00		5			3
182	170+00 TO 178+00		6	1	573	3
183	178+00 TO 186+00		5		775	4
184	186+00 TO END		2		475	1
185	SUNSET VISTA BEGIN TO END		1			1
186	MEMORIAL DR BEGIN TO 8+00					
187	MEMORIAL DR 8+00 TO 16+00		9		25	
188	MEMORIAL DR 16+00 TO 23+00					
189	MEMORIAL DR 23+00 TO END					
190	RIVERY DRIVEWAY BEGIN TO END					
	TOTALS	2	56	2	3331	29

NO.	REVISION	DATE

GEORGETOWN TEXAS *more than welcome*

PAPE-DAWSON ENGINEERS
AUSTIN I SAN ANTONIO I HOUSTON I FORT WORTH I DALLAS
10801 N MOPAC EXPY, BLDG 3, STE 200 I AUSTIN, TX 78759 I 512.454.8711
TEXAS ENGINEERING FIRM #470 I TEXAS SURVEYING FIRM #10028800

WOLF RANCH PKWY / MEMORIAL DR

SUMMARY OF REMOVAL QUANTITIES

CITY JOB No. _____
JOB NO. 51423-04
DATE 9/11/2025
DESIGNER _____
CHECKED ___ DRAWN ___

SHEET NO. 16

	ITEM	C4-1	C4-3	C5-1	C5-2	C5-3	C5-4	SD1-1
	ROADWAY PLAN AND PROFILE	CONCRETE CURB AND GUTTER	RIBBON CURB	6" CONCRETE DRIVEWAY	6" CONCRETE SIDEWALK	ASPHALT DRIVEWAY	12" CONCRETE SIDEWALK	2" TYPE "D" HMAC (SURF) WITH TACK COAT
SHT NO		LF	LF	SY	SY	SY	SY	SY
192	BEGIN TO 113+00	430			258			2530
193	113+00 TO 113+70, 120+00 TO 121+00	589			199			1205
194	121+00 TO 125+00	1601			891			2485
195	125+00 TO 129+00	1175			532			2994
196	129+00 TO 133+00	1602			450			2455
197	133+00 TO 137+00	1513		173	348			2134
198	137+00 TO 141+00	1525			428		308	2150
199	141+00 TO 145+50	1420			363		328	3389
200	145+50 TO 150+00	1788			304		340	2837
201	150+00 TO 154+00	1600			268			2134
202	154+00 TO 158+00	1558		80	620	125	93	2134
203	158+00 TO 162+00	1602			556		365	2245
204	162+00 TO 166+00	1275		211	375		445	2752
205	166+00 TO 170+00	1602			360		452	2703
206	170+00 TO 174+00	1110		270	373		185	3011
207	174+00 TO 178+00	1535		104	1005			2494
208	178+00 TO 182+00	1430		325	722			2385
209	182+00 TO 186+00	1210		461	683			2425
210	186+00 TO END	1735		204	530	40		2957
211	LEGACY X-ING	200			207			
212	SCOUT ST	117			34			
213	SUNSET VISTA DR	235			279			
214	RIVER VISTA	175			80			
215	RIVERY DRIVEWAY	115			25			
216	MEMORIAL DR BEGIN TO 5+50	820	80	72				1080
217	MEMORIAL DR 5+50 TO 10+00	890		50	150			1116
218	MEMORIAL DR 10+00 TO 14+50	875		15	259			1116
219	MEMORIAL DR 14+50 RO 19+00	930		190				1116
220	MEMORIAL DR 23+50 TO END	850		26	335			1674
221	ROUNDABOUT DETAIL	1515		80	914			
	TOTALS	33022	80	2261	11548	165	2516	53521

	ITEM	SD1-2	SD1-4	SD1-5	SD1-6	SD4-1	SD4-2	SD4-3
	ROADWAY PLAN AND PROFILE	4" TYPE "C" HMAC WITH PRIME AND TACK	4" TYPE "D" HMAC (SURF) WITH TACK COAT	4" TYPE "B" HMAC WITH PRIME AND TACK	2" TYPE "B" HMAC WITH PRIME COAT	21" TXDOT ITEM 247 (TYPE A, GRADE 5)	12" TXDOT ITEM 247 (TYPE A, GRADE 5)	ROADWAY PAVERS
SHT NO		SY	SY	SY	SY	SY	SY	SY
192	BEGIN TO 113+00	290				420		
193	113+00 TO 113+70, 120+00 TO 121+00	845				1035		
194	121+00 TO 125+00	2485				3142		
195	125+00 TO 129+00	2994				3470		
196	129+00 TO 133+00	2455				3063		
197	133+00 TO 137+00	2134				2845		56
198	137+00 TO 141+00	2150				2860		
199	141+00 TO 145+50	3389				3951		
200	145+50 TO 150+00	2837				3493		
201	150+00 TO 154+00	2134				2843		
202	154+00 TO 158+00	2134				2844		
203	158+00 TO 162+00	2245				2957		
204	162+00 TO 166+00	2752				3264		
205	166+00 TO 170+00	2703				3059		
206	170+00 TO 174+00	3011				3476		
207	174+00 TO 178+00	2494				3090		
208	178+00 TO 182+00	2385				3025		
209	182+00 TO 186+00	2425				3007		
210	186+00 TO END	2957				3563		
211	LEGACY X-ING		217	460			290	205
212	SCOUT ST		185	185			260	
213	SUNSET VISTA DR		215	720			300	120
214	RIVER VISTA		233	233			322	
215	RIVERY DRIVEWAY		257	257			335	
216	MEMORIAL DR BEGIN TO 5+50	1080				1425		
217	MEMORIAL DR 5+50 TO 10+00	1116				1458		
218	MEMORIAL DR 10+00 TO 14+50	1116				1458		
219	MEMORIAL DR 14+50 RO 19+00	1116				1458		
220	MEMORIAL DR 23+50 TO END	1674				2015		
221	ROUNDABOUT DETAIL				4650	3785		
	TOTALS	50921	1107	1855	4650	67006	1507	381

	ITEM	TX275 7001	TX275 7003	TX354 7051	TX360 7003	TX360 7006	TX432 7003	TX450 7063
	ROADWAY PLAN AND PROFILE	CEMENT	CEMENT TRT (EXIST MATL) (8")	PLANE ASPH CONC PAV(2")	CONC PVMT (CRCP) (9")	CONC PVMT (CRCP) (12")	RIPRAP (CONC)(6 IN)	RAIL (HANDRAIL)(TY F)
SHT NO		TON	SY	SY	SY	SY	CY	LF
192	BEGIN TO 113+00			2240				
193	113+00 TO 113+70, 120+00 TO 121+00			385				
194	121+00 TO 125+00							
195	125+00 TO 129+00							
196	129+00 TO 133+00						113.7	
197	133+00 TO 137+00	1.3	74				98.8	
198	137+00 TO 141+00						99.5	
199	141+00 TO 145+50						17.0	
200	145+50 TO 150+00						21.0	297
201	150+00 TO 154+00						98.8	
202	154+00 TO 158+00							94
203	158+00 TO 162+00							48
204	162+00 TO 166+00							400
205	166+00 TO 170+00						125.1	481
206	170+00 TO 174+00						15.0	206
207	174+00 TO 178+00						115.5	
208	178+00 TO 182+00						110.4	
209	182+00 TO 186+00						112.3	
210	186+00 TO END						136.9	
211	LEGACY X-ING	4.3	260		250			
212	SCOUT ST							
213	SUNSET VISTA DR	2.4	180		440			
214	RIVER VISTA							
215	RIVERY DRIVEWAY							
216	MEMORIAL DR BEGIN TO 5+50							
217	MEMORIAL DR 5+50 TO 10+00							
218	MEMORIAL DR 10+00 TO 14+50							
219	MEMORIAL DR 14+50 RO 19+00							
220	MEMORIAL DR 23+50 TO END							
221	ROUNDABOUT DETAIL				511	3635		
	TOTALS	8.0	514	2625	1201	3635	1064.0	1526

NO.	REVISION	DATE

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AUSTIN I SAN ANTONIO I HOUSTON I FORT WORTH I DALLAS

10801 N MOPAC EXPY, BLDG 3, STE 200 I AUSTIN, TX 78759 I 512.454.8711

TEXAS ENGINEERING FIRM #470 I TEXAS SURVEYING FIRM #10028800

WOLF RANCH PKWY / MEMORIAL DR

SUMMARY OF ROADWAY QUANTITIES

CITY JOB No.

JOB NO. 51423-04

DATE 9/11/2025

DESIGNER

CHECKED DRAWN

SHEET NO. 17

SHT NO	ITEM / ROADWAY PLAN AND PROFILE	TX529 7006 CONC CURB (MONO) (TY I) LF	TX529 7007 CONC CURB (MONO) (TY II) LF	TX529 7015 CONC CURB (TY F2) LF	TX529 7016 CONC CURB (TY C1) LF	TX529 7017 CONC CURB (TY F1) LF	TX529 7022 CONC CURB (TY F3) LF	TX529 7023 CONC CURB (TY C2) LF
192	BEGIN TO 113+00							
193	113+00 TO 113+70, 120+00 TO 121+00							
194	121+00 TO 125+00							
195	125+00 TO 129+00							
196	129+00 TO 133+00				100			
197	133+00 TO 137+00		88		144			
198	137+00 TO 141+00				210			
199	141+00 TO 145+50				251			107
200	145+50 TO 150+00			297	357	62		90
201	150+00 TO 154+00				401			
202	154+00 TO 158+00		73	94	8	132		
203	158+00 TO 162+00			48			332	
204	162+00 TO 166+00		96		126		400	
205	166+00 TO 170+00			241	50	90	170	
206	170+00 TO 174+00		97	126	144		80	170
207	174+00 TO 178+00		71		131			
208	178+00 TO 182+00		154		181			
209	182+00 TO 186+00		190		199			
210	186+00 TO END		156		57			
211	LEGACY X-ING		150					
212	SCOUT ST							
213	SUNSET VISTA DR		230		237			
214	RIVER VISTA							
215	RIVERY DRIVEWAY							
216	MEMORIAL DR BEGIN TO 5+50							
217	MEMORIAL DR 5+50 TO 10+00							
218	MEMORIAL DR 10+00 TO 14+50							
219	MEMORIAL DR 14+50 RO 19+00							
220	MEMORIAL DR 23+50 TO END							
221	ROUNDABOUT DETAIL	360	1635		45			
	TOTALS	360	2940	806	2641	284	982	367

SHT NO	ITEM / ROADWAY PLAN AND PROFILE	TX552 7003 WIRE FENCE (TY C) LF
192	BEGIN TO 113+00	
193	113+00 TO 113+70, 120+00 TO 121+00	
194	121+00 TO 125+00	400
195	125+00 TO 129+00	90
196	129+00 TO 133+00	
197	133+00 TO 137+00	
198	137+00 TO 141+00	
199	141+00 TO 145+50	
200	145+50 TO 150+00	
201	150+00 TO 154+00	
202	154+00 TO 158+00	166
203	158+00 TO 162+00	375
204	162+00 TO 166+00	353
205	166+00 TO 170+00	
206	170+00 TO 174+00	
207	174+00 TO 178+00	
208	178+00 TO 182+00	
209	182+00 TO 186+00	
210	186+00 TO END	
211	LEGACY X-ING	
212	SCOUT ST	
213	SUNSET VISTA DR	
214	RIVER VISTA	
215	RIVERY DRIVEWAY	
216	MEMORIAL DR BEGIN TO 5+50	
217	MEMORIAL DR 5+50 TO 10+00	
218	MEMORIAL DR 10+00 TO 14+50	
219	MEMORIAL DR 14+50 RO 19+00	
220	MEMORIAL DR 23+50 TO END	400
221	ROUNDABOUT DETAIL	420
	TOTALS	2204

SHT NO	ITEM / ROADWAY PLAN AND PROFILE	TX529 7026 CONC CURB (DOWEL)(SLOTTED) LF	TX531 7015 CURB RAMPS (TY 1) SY	TX531 7016 CURB RAMPS (TY 2) SY	TX531 7017 CURB RAMPS (TY 3) SY	TX531 7020 CURB RAMPS (TY 7) SY	TX531 7023 CURB RAMPS (TY 21) SY	TX536 7002 CONC MEDIAN SY
192	BEGIN TO 113+00							7
193	113+00 TO 113+70, 120+00 TO 121+00							
194	121+00 TO 125+00							
195	125+00 TO 129+00		40		170	45		
196	129+00 TO 133+00							
197	133+00 TO 137+00							
198	137+00 TO 141+00					40		
199	141+00 TO 145+50	300	15		115	80		
200	145+50 TO 150+00	50			10			
201	150+00 TO 154+00							
202	154+00 TO 158+00					100		
203	158+00 TO 162+00							
204	162+00 TO 166+00							17
205	166+00 TO 170+00							
206	170+00 TO 174+00		17		95	65		
207	174+00 TO 178+00							
208	178+00 TO 182+00	32						1
209	182+00 TO 186+00	82						18
210	186+00 TO END			20		30	20	30
211	LEGACY X-ING							
212	SCOUT ST							
213	SUNSET VISTA DR							
214	RIVER VISTA							
215	RIVERY DRIVEWAY							
216	MEMORIAL DR BEGIN TO 5+50							
217	MEMORIAL DR 5+50 TO 10+00							
218	MEMORIAL DR 10+00 TO 14+50							
219	MEMORIAL DR 14+50 RO 19+00					40		
220	MEMORIAL DR 23+50 TO END							
221	ROUNDABOUT DETAIL		13	38	120		65	
	TOTALS	464	85	58	510	400	85	73

NO.	REVISION	DATE

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10801 N MOPAC EXPY, BLDG 3, STE 200 | AUSTIN, TX 78759 | 512.454.8711
TEXAS ENGINEERING FIRM #470 | TEXAS SURVEYING FIRM #10028800

WOLF RANCH PKWY / MEMORIAL DR
SUMMARY OF ROADWAY QUANTITIES

CITY JOB No.
JOB NO. 51423-04
DATE 9/11/2025
DESIGNER
CHECKED DRAWN

SUMMARY OF EARTHWORK (WOLF RANCH PKWY)		
	SD2-1	SD3-1
STATION	UNCLASSIFIED ROADWAY EXCAVATION	PLACE AND COMPACT (DENSITY CONTROL) EMBANKMENT FOR ROADWAY
	CY	CY
110+50.00	0	0
111+00.00	15	1
111+50.00	28	2
112+00.00	20	6
112+50.00	18	6
113+00.00	19	4
113+50.00	17	4
114+00.00	47	1
114+50.00	87	3
115+00.00	101	5
115+50.00	81	2
116+00.00	74	1
116+50.00	79	16
117+00.00	209	48
117+50.00	333	48
118+00.00	279	17
118+50.00	211	3
119+00.00	154	1
119+50.00	111	0
120+00.00	236	0
120+50.00	347	2
121+00.00	314	6
121+50.00	307	7
122+00.00	303	9
122+50.00	313	10
123+00.00	327	10
123+50.00	364	10
124+00.00	437	5
124+50.00	473	0
125+00.00	495	0
125+50.00	533	0
126+00.00	555	0
126+50.00	564	0
127+00.00	587	0
127+50.00	926	0
128+00.00	844	0
128+50.00	458	0
129+00.00	457	0
129+50.00	437	0
130+00.00	419	1
130+50.00	405	1
131+00.00	383	3
131+50.00	349	4
132+00.00	302	8
132+50.00	272	19
133+00.00	268	24
133+50.00	260	25
134+00.00	253	28
134+50.00	236	31
135+00.00	252	28
135+50.00	253	25
136+00.00	231	24
136+50.00	242	24
137+00.00	254	22
137+50.00	352	13
138+00.00	367	8
138+50.00	269	16
139+00.00	236	26
139+50.00	208	60
140+00.00	178	108
140+50.00	152	126
141+00.00	137	106
141+50.00	135	94
142+00.00	146	94
142+50.00	180	74
143+00.00	236	55
143+50.00	294	47
144+00.00	330	39
144+50.00	381	31
145+00.00	811	15
145+50.00	784	19
146+00.00	335	34
146+50.00	317	27
147+00.00	333	23
147+50.00	353	20
148+00.00	382	14
148+50.00	418	8
149+00.00	457	5
149+50.00	474	2
150+00.00	452	4
150+50.00	426	4
151+00.00	410	3
151+50.00	389	8
152+00.00	369	24
152+50.00	357	25
153+00.00	351	10
153+50.00	357	4
154+00.00	394	0
154+50.00	608	0
155+00.00	594	0

SUMMARY OF EARTHWORK (WOLF RANCH PKWY)		
	SD2-1	SD3-1
STATION	UNCLASSIFIED ROADWAY EXCAVATION	PLACE AND COMPACT (DENSITY CONTROL) EMBANKMENT FOR ROADWAY
	CY	CY
155+50.00	381	1
156+00.00	366	5
156+50.00	374	6
157+00.00	384	13
157+50.00	393	24
158+00.00	406	31
158+50.00	394	47
159+00.00	349	67
159+50.00	323	73
160+00.00	319	77
160+50.00	312	79
161+00.00	319	70
161+50.00	331	69
162+00.00	317	89
162+50.00	298	108
163+00.00	311	119
163+50.00	350	137
164+00.00	379	146
164+50.00	381	125
165+00.00	328	108
165+50.00	270	121
166+00.00	279	128
166+50.00	299	119
167+00.00	331	71
167+50.00	371	26
168+00.00	393	23
168+50.00	416	15
169+00.00	426	13
169+50.00	435	14
170+00.00	471	16
170+50.00	505	26
171+00.00	530	18
171+50.00	544	4
172+00.00	491	14
172+50.00	519	13
173+00.00	575	0
173+50.00	501	0
174+00.00	455	0
174+50.00	436	0
175+00.00	395	1
175+50.00	358	2
176+00.00	360	1
176+50.00	351	1
177+00.00	315	3
177+50.00	286	9
178+00.00	266	15
178+50.00	264	14
179+00.00	270	12
179+50.00	286	9
180+00.00	326	6
180+50.00	369	4
181+00.00	359	6
181+50.00	324	17
182+00.00	354	12
182+50.00	364	26
183+00.00	316	33
183+50.00	383	7
184+00.00	381	18
184+50.00	304	36
185+00.00	316	35
185+50.00	314	22
186+00.00	324	9
186+50.00	340	4
187+00.00	338	1
187+50.00	319	3
188+00.00	305	4
188+50.00	320	4
189+00.00	337	3
189+50.00	356	1
190+00.00	425	10
190+50.00	238	10
TOTALS	54333	3989

SUMMARY OF EARTHWORK (MEMORIAL DR)		
	SD2-1	SD3-1
STATION	UNCLASSIFIED ROADWAY EXCAVATION	PLACE AND COMPACT (DENSITY CONTROL) EMBANKMENT FOR ROADWAY
	CY	CY
1+00.00	162	2
1+50.00	162	0
2+00.00	162	0
2+50.00	162	0
3+00.00	162	0
3+50.00	162	0
4+00.00	162	0
4+50.00	162	0
5+00.00	162	0
5+50.00	206	1
6+00.00	206	0
6+50.00	206	0
7+00.00	206	0
7+50.00	206	0
8+00.00	206	0
8+50.00	206	0
9+00.00	206	0
9+50.00	206	0
10+00.00	168	1
10+50.00	168	0
11+00.00	168	0
11+50.00	168	0
12+00.00	168	0
12+50.00	168	0
13+00.00	168	0
13+50.00	168	0
14+00.00	168	0
14+50.00	151	1
15+00.00	151	0
15+50.00	151	0
16+00.00	151	0
16+50.00	151	0
17+00.00	151	0
17+50.00	151	0
18+00.00	151	0
18+50.00	151	0
24+00.00	183	1
24+50.00	183	1
25+00.00	183	1
25+50.00	183	1
26+00.00	183	1
26+50.00	183	1
27+00.00	183	1
27+50.00	183	1
28+00.00	183	1
TOTALS	7830	14

SUMMARY OF EARTHWORK (SUNSET VISTA DR)		
	SD2-1	SD3-1
STATION	UNCLASSIFIED ROADWAY EXCAVATION	PLACE AND COMPACT (DENSITY CONTROL) EMBANKMENT FOR ROADWAY
	CY	CY
30+73.49	0	0
30+75.00	5	0
31+00.00	65	7
31+25.00	48	27
31+50.00	79	65
31+75.00	135	43
32+00.00	194	0
32+25.00	180	0
32+50.00	140	0
32+75.00	152	0
33+00.00	161	0
33+25.00	157	0
33+48.66	121	0
TOTAL	1437	143

SUMMARY OF EARTHWORK (LEGACY XING)		
	SD2-1	SD3-1
STATION	UNCLASSIFIED ROADWAY EXCAVATION	PLACE AND COMPACT (DENSITY CONTROL) EMBANKMENT FOR ROADWAY
	CY	CY
4+00.00	50	0
4+25.00	161	0
4+50.00	256	0
4+75.00	284	0
5+00.00	283	0
5+25.00	225	0
5+50.00	146	0
5+75.00	114	0
6+00.00	90	1
6+25.00	40	1
6+50.00	0	0
TOTAL	1650	2

SUMMARY OF EARTHWORK (RIVER VISTA DR)		
	SD2-1	SD3-1
STATION	UNCLASSIFIED ROADWAY EXCAVATION	PLACE AND COMPACT (DENSITY CONTROL) EMBANKMENT FOR ROADWAY
	CY	CY
40+61.67	0	0
40+75.00	26	0
41+00.00	73	0
41+25.00	130	0
41+50.00	232	0
41+75.00	278	0
42+00.00	267	1
42+25.00	154	1
42+50.00	33	1
42+59.12	6	0
TOTAL	1198	3

SUMMARY OF EARTHWORK (RIVERY DRWY)		
	SD2-1	SD3-1
STATION	UNCLASSIFIED ROADWAY EXCAVATION	PLACE AND COMPACT (DENSITY CONTROL) EMBANKMENT FOR ROADWAY
	CY	CY
51+08.52	0	0
51+25.00	72	0
51+50.00	209	0
51+75.00	238	0
52+00.00	213	0
52+25.00	189	0
52+50.00	127	0
52+68.66	34	0
TOTAL	1082	0

NO.	REVISION	DATE

PAPE-DAWSON ENGINEERS
AUSTIN I SAN ANTONIO I HOUSTON I FORT WORTH I DALLAS
10801 N MOPAC EXPY, BLDG 3, STE 200 I AUSTIN, TX 78759 I 512.454.8711
TEXAS ENGINEERING FIRM #470 I TEXAS SURVEYING FIRM #10028800

GEORGETOWN TEXAS
more than welcome

WOLF RANCH PKWY / MEMORIAL DR

SUMMARY OF EARTHWORK QUANTITIES

CITY JOB No.
JOB NO. 51423-04
DATE 9/11/2025
DESIGNER
CHECKED DRAWN

SHEET NO. 19

SHT NO	ITEM: DRAINAGE PLAN AND PROFILE	C2-01: 4' X 4' JUNCTION BOX	C2-02: 5' X 5' JUNCTION BOX	C2-03: 6' X 6' JUNCTION BOX	C2-04: 9' X 4' JUNCTION BOX	C2-05: 10' X 10' JUNCTION BOX	C2-06: 5' CURB INLET	C2-07: 10' CURB INLET
		EA	EA	EA	EA	EA	EA	EA
258	SD-M1 & SD-M2 - STA 1+00 - END	1						3
260	SD-B2 STA 1+00 - 10+00				1	1		2
261	SD-B2 STA 10+00 - 20+00							4
262	SD-B2 STA 20+00 - 30+00							4
263	SD-B2 STA 30+00 - END	1						3
264	SD-B3 STA 1+00 - END	1						2
265	SD-B4 STA 1+00 - END							2
266	SD-B5 STA 1+00 - END		1					7
269	SD-L - STORM LATERALS						2	
270	SD-S - STORM LATERALS							2
271	SD-C1 STA 1+00 - 10+00		1	3				
272	SD-C1 STA 10+00 - 20+00			1				2
273	SD-C1 STA 20+00 - END		1					2
275	SD-D1 STA 1+00 - 10+00		2	2				3
276	SD-D1 STA 10+00 - END							2
277	SD-D2 STA 1+00 - END							
460	POND 1 RETROFIT PLAN							
462	POND 1 DETAILS (2 OF 2)							
463	BATCH DETENTION POND 2 PLAN							
	TOTALS	3	5	6	1	1	2	38

SHT NO	ITEM: DRAINAGE PLAN AND PROFILE	PD1-10: 6' POND MAINTENANCE RAMP & PAD	PD1-3: 12" CLAY LINER EXCAVATION	PD1-4: 12" CLAY LINER	PD1-5: 12" TOP SOIL EXCAVATION	PD1-6: 12" TOP SOIL	PD1-7: EMBANKMENT OF POND SPOILS	PD1-8: REVEGETATION
		LS	CY	CY	CY	CY	CY	SY
258	SD-M1 & SD-M2 - STA 1+00 - END							
260	SD-B2 STA 1+00 - 10+00							
261	SD-B2 STA 10+00 - 20+00							
262	SD-B2 STA 20+00 - 30+00							
263	SD-B2 STA 30+00 - END							
264	SD-B3 STA 1+00 - END							
265	SD-B4 STA 1+00 - END							
266	SD-B5 STA 1+00 - END							
269	SD-L - STORM LATERALS							
270	SD-S - STORM LATERALS							
271	SD-C1 STA 1+00 - 10+00							
272	SD-C1 STA 10+00 - 20+00							
273	SD-C1 STA 20+00 - END							
275	SD-D1 STA 1+00 - 10+00							
276	SD-D1 STA 10+00 - END							
277	SD-D2 STA 1+00 - END							
460	POND 1 RETROFIT PLAN		1004.0	1004.0	978.0	978.0	11256.0	2933
462	POND 1 DETAILS (2 OF 2)							
463	BATCH DETENTION POND 2 PLAN	1.0	187.0	187.0	187.0	187.0	983.0	846
	TOTALS	1.0	1191.0	1191.0	1165.0	1165.0	12239.0	3779

SHT NO	ITEM: DRAINAGE PLAN AND PROFILE	C2-08: 20' CURB INLET	C2-09: 3' X 3' AREA INLET	C2-10: 5' X 5' AREA INLET	C2-11: 24" SLOPED HEADWALL	C2-12: CONCRETE COLLAR	C2-13: FLOWABLE FILL	C8-01: 18" CLASS III RCP
		EA	EA	EA	EA	EA	CY	LF
258	SD-M1 & SD-M2 - STA 1+00 - END	1			1			408
260	SD-B2 STA 1+00 - 10+00					2		39
261	SD-B2 STA 10+00 - 20+00							139
262	SD-B2 STA 20+00 - 30+00							114
263	SD-B2 STA 30+00 - END							463
264	SD-B3 STA 1+00 - END							351
265	SD-B4 STA 1+00 - END							476
266	SD-B5 STA 1+00 - END							721
269	SD-L - STORM LATERALS							
270	SD-S - STORM LATERALS							
271	SD-C1 STA 1+00 - 10+00							38
272	SD-C1 STA 10+00 - 20+00	2						167
273	SD-C1 STA 20+00 - END		1	1			3.0	672
275	SD-D1 STA 1+00 - 10+00	2						228
276	SD-D1 STA 10+00 - END							447
277	SD-D2 STA 1+00 - END	2						195
460	POND 1 RETROFIT PLAN							
462	POND 1 DETAILS (2 OF 2)							
463	BATCH DETENTION POND 2 PLAN							
	TOTALS	7	1	1	1	2	3.0	4458

SHT NO	ITEM: DRAINAGE PLAN AND PROFILE	PD1-9: BATCH DETENTION COMPONENTS	PD2-2: DEMO EXISTING GUNNITE RETAINING WALL & HANDRAIL	PD2-3: INSTALL 5' AMERISTAR MONTAGE ORNAMENTAL IRON FENCING	PD2-4: REMOVE AMERISTAR MONTAGE ORNAMENTAL IRON FENCING	PD2-9: GUNNITE VERTICAL CUT FACE	PD3-01: SWAQ 70 STORMTROOPER	PD3-02: SWAQ 110 STORMTROOPER
		LS	LS	LF	LF	FF	EA	EA
258	SD-M1 & SD-M2 - STA 1+00 - END							
260	SD-B2 STA 1+00 - 10+00							
261	SD-B2 STA 10+00 - 20+00							
262	SD-B2 STA 20+00 - 30+00							
263	SD-B2 STA 30+00 - END							
264	SD-B3 STA 1+00 - END						1	
265	SD-B4 STA 1+00 - END							1
266	SD-B5 STA 1+00 - END							
269	SD-L - STORM LATERALS							
270	SD-S - STORM LATERALS							
271	SD-C1 STA 1+00 - 10+00							
272	SD-C1 STA 10+00 - 20+00							
273	SD-C1 STA 20+00 - END						1	1
275	SD-D1 STA 1+00 - 10+00							
276	SD-D1 STA 10+00 - END							1
277	SD-D2 STA 1+00 - END							1
460	POND 1 RETROFIT PLAN		1.0	370	95			
462	POND 1 DETAILS (2 OF 2)					4000		
463	BATCH DETENTION POND 2 PLAN	1.0						
	TOTALS	1.0	1.0	370	95	4000	2	4

SHT NO	ITEM: DRAINAGE PLAN AND PROFILE	C8-02: 21" CLASS III RCP	C8-03: 24" CLASS III RCP	C8-04: 30" CLASS III RCP	C8-05: 36" CLASS III RCP	C8-06: 42" CLASS III RCP	C1P11-01: TRENCH SAFETY	G6-02: ROCK BERM - 101 LF, 1.5' HEIGHT
		LF	LF	LF	LF	LF	LF	LF
258	SD-M1 & SD-M2 - STA 1+00 - END		193				601	
260	SD-B2 STA 1+00 - 10+00				548	76	663	
261	SD-B2 STA 10+00 - 20+00				890		1029	
262	SD-B2 STA 20+00 - 30+00		821		151		1086	
263	SD-B2 STA 30+00 - END		63				525	
264	SD-B3 STA 1+00 - END		72				422	
265	SD-B4 STA 1+00 - END						476	
266	SD-B5 STA 1+00 - END				466		1187	
269	SD-L - STORM LATERALS							
270	SD-S - STORM LATERALS							
271	SD-C1 STA 1+00 - 10+00	19	21		428	468	975	
272	SD-C1 STA 10+00 - 20+00		20		243	745	1175	
273	SD-C1 STA 20+00 - END		149				821	
275	SD-D1 STA 1+00 - 10+00			730	68	132	1159	
276	SD-D1 STA 10+00 - END						447	
277	SD-D2 STA 1+00 - END		137				333	
460	POND 1 RETROFIT PLAN							101
462	POND 1 DETAILS (2 OF 2)							
463	BATCH DETENTION POND 2 PLAN							
	TOTALS	19	1475	730	2794	1422	10898	101

SHT NO	ITEM: DRAINAGE PLAN AND PROFILE	SD2-01: TOTAL EXCAVATION	SD6-01: 4' MANHOLE	SD6-02: 5' MANHOLE	SD6-03: 6' MANHOLE	SD6-07: THE RIVERY-PHASE ONE WATER QUALITY POND "A" IMPROVEMENTS	SD6-08: THE RIVERY-PHASE ONE WATER QUALITY POND "B" IMPROVEMENTS
		CY	EA	EA	EA	LS	LS
258	SD-M1 & SD-M2 - STA 1+00 - END						
260	SD-B2 STA 1+00 - 10+00				1		
261	SD-B2 STA 10+00 - 20+00				1		
262	SD-B2 STA 20+00 - 30+00			1	2		
263	SD-B2 STA 30+00 - END						
264	SD-B3 STA 1+00 - END						
265	SD-B4 STA 1+00 - END						
266	SD-B5 STA 1+00 - END						
269	SD-L - STORM LATERALS						
270	SD-S - STORM LATERALS						
271	SD-C1 STA 1+00 - 10+00						
272	SD-C1 STA 10+00 - 20+00		1	1			
273	SD-C1 STA 20+00 - END		2				
275	SD-D1 STA 1+00 - 10+00				2		
276	SD-D1 STA 10+00 - END						
277	SD-D2 STA 1+00 - END			2			
463	POND 1 RETROFIT PLAN	10252.0					
465	POND 1 DETAILS (2 OF 2)						
466	BATCH DETENTION POND 2 PLAN	609.0	1	1			
471	WATER QUALITY POND "A" PLAN VIEW LAYOUT					1.0	
474	RIVERY POND "B" SPILLWAY DETAIL						1.0
	TOTALS	10861.0	4	5	6	1.0	1.0

NO.	REVISION	DATE

GEORGETOWN TEXAS *more than welcome*

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10801 N MOPAC EXPY, BLDG 3, STE 200 I AUSTIN, TX 78759 I 512.454.8711
TEXAS ENGINEERING FIRM #470 I TEXAS SURVEYING FIRM #10028800

WOLF RANCH PKWY / MEMORIAL DR
SUMMARY OF DRAINAGE QUANTITIES

CITY JOB No.
JOB NO. 51423-04
DATE 9/12/2025
DESIGNER
CHECKED DRAWN

	ITEM	G6-1	G6-2	G6-3	TX506-7042	TX506-7046
	SW3P	SILT FENCE	ROCK BERM	CONSTRUCTION EXIT	BIODEG EROSN CONT LOGS (INSTL) (6")	BIODEG EROSN CONT LOGS (REMOVE)
SHT NO		LF	LF	EA	LF	LF
294	PHASE I BEGIN TO 118+00	272		1	80	
295	PHASE I 118+00 TO 126+00	28			120	
296	PHASE I 126+00 TO 134+00			2	180	
297	PHASE I 134+00 TO 142+00				180	
298	PHASE I 142+00 TO 150+00			2	220	
299	PHASE I 150+00 TO 158+00			1	100	
300	PHASE I 158+00 TO 162+00				40	
301	PHASE I MEMORIAL DR 19+00 TO 21+00	174				
303	PHASE II BEGIN TO 118+00			1		
304	PHASE II 118+00 TO 126+00	704			80	
305	PHASE II 126+00 TO 134+00	724		1	100	
306	PHASE II 134+00 TO 142+00	845		2	160	
307	PHASE II 142+00 TO 150+00	880		2	80	
308	PHASE II 150+00 TO 158+00	794		1	60	
309	PHASE II 158+00 TO 166+00	773			80	
310	PHASE II 166+00 TO 174+00	752		1	40	
311	PHASE II 174+00 TO 182+00	739			40	
312	PHASE II 182+00 TO 190+15	723		1	40	
313	PHASE II RIVERY BLVD				40	
314	PHASE III STEP I RIVERY DR BEGIN TO FF	73			20	
316	PHASE III STEP I BEGIN TO 118+00	163			40	
317	PHASE III STEP I 118+00 TO 126+00				40	
323	PHASE III STEP I 166+00 TO 174+00	125		1	40	
324	PHASE III STEP I 174+00 TO 182+00	645			70	
325	PHASE III STEP I 182+00 TO 190+15.24			1	20	
326	PHASE III STEP I RIVERY DR BEGIN TO END				40	
327	PHASE III STEP II BEGIN TO 118+00			1	80	
329	PHASE III STEP II 126+00 TO 134+00					120
330	PHASE III STEP II 134+00 TO 142+00					260
331	PHASE III STEP II 142+00 TO 150+00					260
332	PHASE III STEP II 150+00 TO 158+00					300
333	PHASE III STEP II 158+00 TO 166+00					220
334	PHASE III STEP II 166+00 TO 174+00					200
335	PHASE III STEP II 174+00 TO 182+00					240
336	PHASE III STEP II 182+00 TO 190+15.24					120
337	PHASE III STEP II RIVERY DR BEGIN TO END					100
338	MEMORIAL DR SW3P					80
339	SW3P LAYOUT PHASE III STEP II					90
340	SW3P LAYOUT MEMORIAL DRIVE	4758	22	4		
	TOTALS	13172	22	22	1990	1990

NO.	REVISION	DATE

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10801 N MOPAC EXPY, BLDG 3, STE 200 I AUSTIN, TX 78759 I 512.454.8711
TEXAS ENGINEERING FIRM #470 I TEXAS SURVEYING FIRM #10028800

WOLF RANCH PKWY / MEMORIAL DR

SUMMARY OF SW3P QUANTITIES

CITY JOB No.
JOB NO. 51423-04
DATE 9/11/2025
DESIGNER
CHECKED DRAWN

SHEET NO. 21

	ITEM	SD5-1	SD5-10	SD5-2	SD5-3	SD5-4	SD5-5	SD5-6
	SPM	8" WHITE DOT THERMOPLASTIC STRIPING	12" YELLOW SOLID THERMOPLASTIC	8" WHITE SOLID THERMOPLASTIC STRIPING	24" WHITE SOLID THERMOPLASTIC	THERMO PLASTIC STRIPING (ARROW)	THERMO PLASTIC STRIPING (WORD)	4" WHITE BROKEN THERMOPLASTIC
SHT NO		LF	LF	LF	LF	EA	EA	LF
348	BEGIN TO 116+00	78	25	1179	210	10	10	230
349	116+00 TO 121+00	120		950	216	17		100
350	121+00 TO 129+00		12	686	300	5	5	350
351	129+00 TO 137+00			215		1	1	400
352	137+00 TO 145+50		6	535	276	4	4	380
353	145+50 TO 154+00		6	300	35	2	2	440
354	154+00 TO 162+00			51		1	1	400
355	162+00 TO 170+00			622	24	4	5	400
356	170+00 TO 178+00		12	725	300	5	4	360
357	178+00 TO 186+00		12	195	45	4	2	400
358	186+00 TO END	21	6	1110	442	5	4	50
359	MEMORIAL DR BEGIN TO 10+00				14			
360	MEMORIAL DR 10+00 TO 20+00							
361	MEMORIAL DR 24+00 TO END							
362	LEGACY X-ING AND SCOUT ST			101	189	4		
363	SUNSET VISTA DR AND RIVER VISTA				202			
364	RIVERY DRIVEWAY			93	243	2		
	TOTALS	219	79	6762	2496	64	38	3510

	ITEM	SD5-7	SD5-8	SD5-9	TX666 7084	TX666 7087	TX666 7199	TX666 7200
	SPM	4" YELLOW SOLID THERMOPLASTIC	12" WHITE SOLID THERMOPLASTIC	SMALL ROAD SIGN	REFL PAV MRK TY I (W)(SYMBOL)(1	REF PAV MRK TY I(W)18"(YLD TRI)(100MIL)	RE PM TY II (W) (SYMBOL)	RE PM TY II (W) 18" (YLD TRI)
SHT NO		LF	LF	EA	EA	EA	EA	EA
348	BEGIN TO 116+00	202	37	10	1		1	
349	116+00 TO 121+00	465		28		63		63
350	121+00 TO 129+00	134		3				
351	129+00 TO 137+00			2				
352	137+00 TO 145+50	60		4				
353	145+50 TO 154+00	28		1				
354	154+00 TO 162+00			4				
355	162+00 TO 170+00			5				
356	170+00 TO 178+00	130		5				
357	178+00 TO 186+00	184		5				
358	186+00 TO END	60	70	2				
359	MEMORIAL DR BEGIN TO 10+00	1758		2				
360	MEMORIAL DR 10+00 TO 20+00	2000		1				
361	MEMORIAL DR 24+00 TO END	864		1				
362	LEGACY X-ING AND SCOUT ST	252		2				
363	SUNSET VISTA DR AND RIVER VISTA	370		3				
364	RIVERY DRIVEWAY	44						
	TOTALS	6551	107	78	1	63	1	63

	ITEM	TX672 7004	TX672 7006
	SPM	REFL PAV MRKR TY II-A-A	REFL PAV MRKR TY II-C-R
SHT NO		EA	EA
348	BEGIN TO 116+00	4	62
349	116+00 TO 121+00	10	10
350	121+00 TO 129+00	4	68
351	129+00 TO 137+00		40
352	137+00 TO 145+50	2	64
353	145+50 TO 154+00	2	60
354	154+00 TO 162+00		40
355	162+00 TO 170+00		72
356	170+00 TO 178+00	4	70
357	178+00 TO 186+00	10	40
358	186+00 TO END	4	50
359	MEMORIAL DR BEGIN TO 10+00	24	
360	MEMORIAL DR 10+00 TO 20+00	50	
361	MEMORIAL DR 24+00 TO END	44	
362	LEGACY X-ING AND SCOUT ST	14	5
363	SUNSET VISTA DR AND RIVER VISTA	22	
364	RIVERY DRIVEWAY	4	2
	TOTALS	198	583

NO.	REVISION	DATE

GEORGETOWN TEXAS
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10801 N MOPAC EXPY, BLDG 3, STE 200 I AUSTIN, TX 78759 I 512.454.8711
TEXAS ENGINEERING FIRM #470 I TEXAS SURVEYING FIRM #10028800

WOLF RANCH PKWY / MEMORIAL DR

SUMMARY OF TRAFFIC QUANTITIES

CITY JOB No. _____
JOB NO. 51423-04
DATE 9/11/2025
DESIGNER _____
CHECKED DRAWN

SHEET NO. 22

	ITEM	* GEO-117.1	* GEO-117.2	*** GEO-206	** GEO-236	****TX0690 7069	****TX0690 7262	** TX618 7030
	ILLUMINATION	35' STREETLIGHT POLE AND MAST ARM GALVANIZED (SINGLE ARM)	35' STREETLIGHT POLE AND MAST ARM GALVANIZED (DUAL ARM)	GEORGETOWN JUNCTION BOX COVER AND EXTENSION	CONCRETE FOUNDATION STREETLIGHT POLE	INSTALL LUMINAIRE MAST ARMS	INSTALL LUMINAIRE 250 W EQ (LED)	CONDT (PVC) (SCH 40) (2")
SHT NO		EA	EA	EA	LF	EA	EA	LF
373	MEMORIAL DR BEGIN TO 10+00	5		2	30			892
374	MEMORIAL DR 10+00 TO 20+00	5		1	30			1184
375	MEMORIAL DR 24+00 TO END	3			18			469
376	BEGIN TO 116+00	4		5	24	1	1	610
377	116+00 TO 121+00	6		7	36			863
378	121+00 TO 129+00	5		2	30	1	1	990
379	129+00 TO 137+00	3	2	3	30	1	1	1159
380	137+00 TO 145+50	1	2	5	18	1	1	766
381	145+50 TO 154+00	4	2	4	36			1264
382	154+00 TO 162+00		3		18			719
383	162+00 TO 170+00	3	2	5	30	1	1	1258
384	170+00 TO 178+00	5		8	30	1	1	1101
385	178+00 TO 186+00	3	2	9	30	1	1	1020
386	186+00 TO END	4		4	24			533
	TOTALS	51	13	55	384	7	7	12825

*CONTRACTOR SHALL PURCHASE AND INSTALL LIGHT POLES APPROVED BY THE CITY OF GEORGETOWN AND THEIR STANDARD DETAIL/MATERIAL LISTS.
**BID ITEM TO INCLUDE COST FOR ANY ADDITIONAL LABOR, MATERIAL, OR TIME SHOULD CONTRACTOR ENCOUNTER ROCK OR OTHER MEDIUM WHEN DRILLING, BORING, OR TRENCHING
*** FOR CONTRACTOR INFORMATION AND BIDDING PURPOSES. CONTRACTOR TO FURNISH AND INSTALL GROUND BOXES AS SHOWN IN THE CITY OF GEORGETOWN STANDARDS.
**** ALL UTILITY POLE MOUNTED LUMINAIRES TO BE INSTALLED BY UTILITY COMPANY. FOR CONTRACTOR INFORMATION ONLY.

	ITEM	** TX618 7055	TX620 7007	TX620 7008	TX628 7047
	ILLUMINATION	CONDT (PVC) (SCH 80) (2") (BORE)	ELEC CONDR (NO.8) BARE	ELEC CONDR (NO.8) INSULATED	ELC SRV TY A 240/480 060(NS)SS(E)PS(U)
SHT NO		LF	LF	LF	EA
373	MEMORIAL DR BEGIN TO 10+00	70	1221	2441	
374	MEMORIAL DR 10+00 TO 20+00		1465	2930	1
375	MEMORIAL DR 24+00 TO END		679	1357	
376	BEGIN TO 116+00	117	963	1925	1
377	116+00 TO 121+00	288	1428	2857	1
378	121+00 TO 129+00	192	1464	2927	
379	129+00 TO 137+00	92	1540	3079	
380	137+00 TO 145+50	261	1294	2588	
381	145+50 TO 154+00	110	1675	3350	
382	154+00 TO 162+00		954	1909	
383	162+00 TO 170+00	155	1717	3433	1
384	170+00 TO 178+00	394	1803	3607	
385	178+00 TO 186+00	397	1717	3435	1
386	186+00 TO END	210	976	1952	
	TOTALS	2285	18895	37790	5

NO. | REVISION | DATE

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TEXAS ENGINEERING FIRM #470 I TEXAS SURVEYING FIRM #10028800

WOLF RANCH PKWY / MEMORIAL DR
SUMMARY OF ILLUMINATION QUANTITIES

CITY JOB No.
JOB NO. 51423-04
DATE 9/11/2025
DESIGNER
CHECKED DRAWN

SHEET NO. 23

ITEM	0416-7042 #	0416-7043 #	0416-7044 #	0618-7054 #	0618-7055 #	0618-7060 #	0618-7061 #	0618-7064 #
INTERSECTION	DRILL SHAFT (TRF SIG POLE) (24 IN)	DRILL SHAFT (TRF SIG POLE) (30 IN)	DRILL SHAFT (TRF SIG POLE) (36 IN)	CONDT (PVC) (SCH 80) (2")	CONDT (PVC) (SCH 80) (2") (BORE)	CONDT (PVC) (SCH 80) (3")	CONDT (PVC) (SCH 80) (3") (BORE)	CONDT (PVC) (SCH 80) (4")
	LF	LF	LF	LF	LF	LF	LF	LF
WOLF RANCH PKWY AT MEMORIAL DR RRFB LAYOUT	72***							
WOLF RANCH PKWY AT LEGACY CROSSING PROPOSED SIGNAL LAYOUT	36*	22	26	365	420	265	840	
WOLF RANCH PKWY AT SUNSET VISTA DR PROPOSED SIGNAL LAYOUT	36*	22	26	315	450	275	895	20
WOLF RANCH PKWY AT RIVERY DWY PROPOSED SIGNAL LAYOUT	42*	11	39	250	415	185	825	
WOLF RANCH PKWY AT RIVERY BLVD PROPOSED SIGNAL LAYOUT	6*	11		50	325	100	650	
TOTALS	192	66	91	980	1610	825	3210	20

ITEM	0620-7007	0620-7008	0620-7009	0620-7010	0624-7008	0628-7168	0636-7001	0680-7002
INTERSECTION	ELEC CONDR (NO.8) BARE	ELEC CONDR (NO.8) INSULATED	ELEC CONDR (NO.6) BARE	ELEC CONDR (NO.6) INSULATED	GROUND BOX TY D (16292?)W/APRON	ELC SRV TY D 120/240 070(NS)AL(E)PS(U)	ALUMINUM SIGNS (TY A)	INSTALL HWY TRF SIG (ISOLATED)
	LF	LF	LF	LF	EA	EA	SF	EA
WOLF RANCH PKWY AT MEMORIAL DR RRFB LAYOUT							99	
WOLF RANCH PKWY AT LEGACY CROSSING PROPOSED SIGNAL LAYOUT	2920	1510	35	70	4	1	42	1
WOLF RANCH PKWY AT SUNSET VISTA DR PROPOSED SIGNAL LAYOUT	2885	1325	25	45	4	1	33	1
WOLF RANCH PKWY AT RIVERY DWY PROPOSED SIGNAL LAYOUT	2620	1345	50	100	4	1	44	1
WOLF RANCH PKWY AT RIVERY BLVD PROPOSED SIGNAL LAYOUT	400				2		26	
TOTALS	8825	4180	110	215	14	3	244	3

ITEM	0680-7011	0680-XXX1 **	0680-XXX2 *#	0681-7001	0682-7001	0682-7002	0682-7003	0682-7004
INTERSECTION	INSTALL HWY TRF SIG (UPGRADE)	WIND DAMPER	THRUGREEN COMMUNICATION SYSTEM	TEMP TRAF SIGNALS	VEH SIG SEC (12")LED(GRN)	VEH SIG SEC (12")LED(GRN ARW)	VEH SIG SEC (12")LED(YEL)	VEH SIG SEC (12")LED(YEL ARW)
	EA	EA	EA	EA	EA	EA	EA	EA
WOLF RANCH PKWY AT MEMORIAL DR RRFB LAYOUT								
WOLF RANCH PKWY AT LEGACY CROSSING PROPOSED SIGNAL LAYOUT		2	1	1	8	4	8	8
WOLF RANCH PKWY AT SUNSET VISTA DR PROPOSED SIGNAL LAYOUT		2	1		9	2	9	3
WOLF RANCH PKWY AT RIVERY DWY PROPOSED SIGNAL LAYOUT		3	1	1	8	2	8	4
WOLF RANCH PKWY AT RIVERY BLVD PROPOSED SIGNAL LAYOUT	1		1	1	2	3	3	1
TOTALS	1	7	4	3	27	11	28	16

ITEM	0682-7005	0682-7006	0682-7018	0682-7042	0682-7043	0684-7028	0684-7030	0684-7031
INTERSECTION	VEH SIG SEC (12")LED(RED)	VEH SIG SEC (12")LED(RED ARW)	PED SIG SEC (LED) (COUNTDOWN)	BACKPLATE W/REF BRDR(3 SEC) (VENT)ALUM	BACKPLATE W/REF BRDR(4 SEC) (VENT)ALUM	TRF SIG CBL (TY A)(14 AWG)(2 CONDR)	TRF SIG CBL (TY A)(14 AWG)(4 CONDR)	TRF SIG CBL (TY A)(14 AWG)(5 CONDR)
	EA	EA	EA	EA	EA	LF	LF	LF
WOLF RANCH PKWY AT MEMORIAL DR RRFB LAYOUT								
WOLF RANCH PKWY AT LEGACY CROSSING PROPOSED SIGNAL LAYOUT	8	4	8	8	4	1195	915	1240
WOLF RANCH PKWY AT SUNSET VISTA DR PROPOSED SIGNAL LAYOUT	9	2	8	10	1	1205	815	1250
WOLF RANCH PKWY AT RIVERY DWY PROPOSED SIGNAL LAYOUT	8	2	8	8	2	1130	855	1175
WOLF RANCH PKWY AT RIVERY BLVD PROPOSED SIGNAL LAYOUT	3	1	3	2	2	815	815	840
TOTALS	28	9	27	28	9	4345	3400	4505

ITEM	0684-7033	0686-7027	0686-7029	0686-7031	0686-7043	0686-7047	0686-7051	0687-7001
INTERSECTION	TRF SIG CBL (TY A)(14 AWG)(7 CONDR)	INS TRF SIG PL AM(S)1 ARM(24')LUM	INS TRF SIG PL AM (S)1 ARM(28')	INS TRF SIG PL AM(S)1 ARM(28')LUM	INS TRF SIG PL AM(S)1 ARM(40')LUM	INS TRF SIG PL AM(S)1 ARM(44')LUM	INS TRF SIG PL AM(S)1 ARM(48')LUM	PED POLE ASSEMBLY
	LF	EA	EA	EA	EA	EA	EA	EA
WOLF RANCH PKWY AT MEMORIAL DR RRFB LAYOUT								
WOLF RANCH PKWY AT LEGACY CROSSING PROPOSED SIGNAL LAYOUT	1895			2	1	1		8
WOLF RANCH PKWY AT SUNSET VISTA DR PROPOSED SIGNAL LAYOUT	1790	2			1	1		8
WOLF RANCH PKWY AT RIVERY DWY PROPOSED SIGNAL LAYOUT	1455			1	1	1	1	8
WOLF RANCH PKWY AT RIVERY BLVD PROPOSED SIGNAL LAYOUT	795		1					2
TOTALS	5935	2	1	3	3	3	1	26

ITEM	0688-7001	0688-7003	6001-7003	6001-7005	6007-7001	6008-7001 ##	6008-7003 ###	6008-7009
INTERSECTION	PED DETECT PUSH BUTTON (APS)	PED DETECTOR CONTROLLER UNIT	ILSN (8S)	ILSN (10S)	BBU SYSTEM (EXTERNAL BATTERY CABINET)	RVDS (PRESENCE DETECTION ONLY)	RVDS (PRESENCE AND ADVANCE DETECTION)	RADAR PRESENCE DETECTOR COMM CABLE
	EA	EA	EA	EA	EA	EA	EA	LF
WOLF RANCH PKWY AT MEMORIAL DR RRFB LAYOUT								
WOLF RANCH PKWY AT LEGACY CROSSING PROPOSED SIGNAL LAYOUT	8	1	2	2	1	2	2	830
WOLF RANCH PKWY AT SUNSET VISTA DR PROPOSED SIGNAL LAYOUT	8	1		4	1	2	2	835
WOLF RANCH PKWY AT RIVERY DWY PROPOSED SIGNAL LAYOUT	8	1	2	2	1	2	2	790
WOLF RANCH PKWY AT RIVERY BLVD PROPOSED SIGNAL LAYOUT	2	1	2	2	1	1	3	765
TOTALS	26	4	6	10	4	7	9	3220

ITEM	6108-7002	9606-7001
INTERSECTION	RRFB (ONE-WAY WIRELESS)	LAW ENFORCEMENT PERSONNEL
	EA	HR
WOLF RANCH PKWY AT MEMORIAL DR RRFB LAYOUT	12	4.0
WOLF RANCH PKWY AT LEGACY CROSSING PROPOSED SIGNAL LAYOUT		4.0
WOLF RANCH PKWY AT SUNSET VISTA DR PROPOSED SIGNAL LAYOUT		4.0
WOLF RANCH PKWY AT RIVERY DWY PROPOSED SIGNAL LAYOUT		4.0
WOLF RANCH PKWY AT RIVERY BLVD PROPOSED SIGNAL LAYOUT		4.0
TOTALS	12	20.0

\# BID ITEM TO INCLUDE COST FOR ANY ADDITIONAL LABOR, MATERIAL, OR TIME SHOULD CONTRACTOR ENCOUNTER ROCK OR OTHER MEDIUM WHEN DRILLING, BORING, OR TRENCHING
* ITEM SUBSIDIERY TO 687 AND SHOWN FOR CONTRACTOR PURPOSES ONLY
** ITEM SUBSIDIERY TO 686 AND SHOWN FOR CONTRACTOR PURPOSES ONLY
*** ITEM SUBSIDIERY TO 6073 AND SHOWN FOR CONTRACTOR PURPOSES ONLY
*# ITEM SUBSIDIERY TO 680 AND SHOWN FOR CONTRACTOR PURPOSES ONLY
USED FOR ITERIS WDR CAMERA
###USED FOR ITERIS VANTAGE VECTOR WITH NEXT UNIT

NO.	REVISION	DATE

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TEXAS ENGINEERING FIRM #470 | TEXAS SURVEYING FIRM #10028800

WOLF RANCH PKWY / MEMORIAL DR
SUMMARY OF TRAFFIC SIGNALS QUANTITIES

CITY JOB No.
JOB NO. 51423-04
DATE 9/11/2025
DESIGNER
CHECKED DRAWN

SHEET NO. 24

	ITEM	W3-1	W3-2	W3-3	W3-4	W3-5	W3-6	W3-7	W3-8	W3-9	W3-10
	WATERLINE	12" WATERLINE	FIRE HYDRANT	12" GATE VALVE	16" GATE VALVE	RMV 12" WATERLINE	RMV 16" WATERLINE	INSTALL CUT IN TEE AND CONNECT TO EXISTING WATERLINE	16" WATERLINE	6" FORCEMAIN	8" WATERLINE
SHT NO		LF	QTY	QTY	QTY	LF	LF	QTY	LF	LF	LF
280	BEGIN TO 129+00	1310	3	2	3	1013	0	2	0		0
281	129+00 TO 147+00	247	1	2		214	0	1	0		0
282	147+00 TO 165+00	777	4	1		773	0	8		20	0
283	165+00 TO 183+00	40	5		4	40	80	15	80	0	0
284	183+00 TO END		2		3	0	60	9	60		20
285	MEMORIAL DR BEGIN TO 19+00	47	1	1	3	555	0	9	555	0	
286	MEMORIAL DR 19+00 TO END		1	2	1	23	0	3	23		1
TOTALS		2421	17	8	14	2618	140	47	718	20	21

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WOLF RANCH PKWY / MEMORIAL DR

SUMMARY OF WATERLINE QUANTITIES

CITY JOB No.
JOB NO. 51423-04
DATE 9/12/2025
DESIGNER
CHECKED DRAWN

SHEET NO. 25

ROUNDABOUT			
ITEM NO.	ITEM DESCRIPTION	UNIT	QUANTITY
LA-13	INTEGRALLY COLORED STAMPED CONCRETE (6" DEPTH)	SF	9495
LA-14	SOUTHERN LIVE OAK - QUERCUS VEIGINIANA (45 GAL.)	EA	1
LA-15	CRAPE MYRTLE - LAGERSTROEMIA INDICA 'TUSCARORA' (30 GAL.)	EA	3
LA-16	WHALE'S TONGUE AGAVE - AGAVE OVATIFOLIA (30 GAL.)	EA	3
LA-17	PARRY'S AGAVE - AGAVE PARRYI (15 GAL.)	EA	11
LA-18	RED YUCCA - HESPERALOE PARVIFLORA (5 GAL.)	EA	8
LA-19	EUROPEAN GREY SEDGE - CAREX DIVULSA (1 GAL.)	EA	161
LA-20	MEADOW SEDGE - CAREX PERDENTATA (1 GAL.)	EA	208
LA-21	LITTLE BLUESTEM GRASS - SCHIZACHYRIUM SCOPARIUM (1 GAL.)	EA	7
LA-22	GULF COAST MUHLY - MUHLENBERGIA CAPILLARIS - (3 GAL.)	EA	6
LA-23	PINE MUHLY - MUHLENBERGIA DUBIA (5 GAL.)	EA	6
LA-24	TEXAS BEAR GRASS - NOLINA TEXANA (3 GAL.)	EA	8
LA-25	WALL GERMANDER - TEUCRIUM CHAMAEDRYS (1 GAL.)	EA	166
LA-26	SANTA RITA PRICKLYPEAR - OPUNTIA SANTA-RITA (5 GAL.)	EA	5
LA-27	TWISTLEAF YUCCA - YUCCA RUPICOLA (5 GAL.)	EA	12
LA-28	BLUE GRAMA GRASS - BOUTELOUA GRACILIS (1 GAL.)	EA	6
LA-29	WOOLY STEMODIA - STEMODIA TOMENTOSA (1 GAL.)	EA	255
LA-30	BOULDERS	EA	35
LA-31	LANDSCAPE BED MIX	CY	222
LA-32	NATIVE HARDWOOD MULCH	CY	111
LA-33	HYDROSEED MIX	SF	26960
LA-34	TREE STAKES	EA	9
LA-35	IRRIGATION INCLUDING TEMPORARY	LS	1

SHEET NO.	6" CONCRETE MEDIAN WITH ITEM 247 FLEX BASE	UNDYED MULCH	LANDSCAPE BED MIX	LACEY OAK TREE	DESERT WILLOW TREE	YAUPON HOLLY TREE	PRAIRIE SUMAC TREE	TEXAS MOUNTAIN LAUREL TREE	TREE STAKES	LOAM AND HYDROSEEDING INCLUDING WATER AND FERTILIZER	LIMESTONE COLUMN (TO MATCH EXISTING)	AMERISTAR ECHELON II "CLASSIC" STYLE FENCE
	LA-01	LA-02	LA-03	LA-04	LA-05	LA-06	LA-07	LA-08	LA-09	LA-10	LA-11	LA-12
	SY	CY	CY	EA	EA	EA	EA	EA	2 PER TREE	SY	EA	LF
491	183.06	1.25	5.61	0	0	0	6	0	12	692	0	0
492	329.84	4.54	20.43	0	0	3	7	0	20	3398	0	0
493	606.61	13.94	62.72	7	8	5	0	0	40	1307	0	0
494	275.47	2.74	10.93	0	0	3	3	0	12	2543	0	0
495	1116.87	25.63	113.94	7	7	11	0	11	72	3187	0	0
496	255.14	4.64	20.89	0	0	0	4	3	14	1918	3	282
497	121.39	1.67	7.50	0	0	0	0	4	8	1064	3	96
498	247.23	3.24	20.89	0	0	1	0	4	10	1131	0	0
499	181.17	2.65	11.94	0	0	4	0	0	8	850	0	0
TOTALS	3316.78	60.30	274.85	14	15	27	20	22	196	16090	6	378

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WOLF RANCH PKWY / MEMORIAL DR
SUMMARY OF LANDSCAPE QUANTITIES

CITY JOB No.
JOB NO. 51423-04
DATE 9/11/2025
DESIGNER
CHECKED DRAWN

SHEET NO. 26

A. TEXAS COMMISSION ON ENVIRONMENTAL QUALITY WATER POLLUTION ABATEMENT PLAN GENERAL CONSTRUCTION NOTES

1. Written construction notification must be given to the aPropriate TCEQ regional office no later than 48 hours prior to commencement of the regulated activity. information must include the date on which the regulated activity will commence, the name of the aProved plan for the regulated activity and the name of the prime contractor and the name and telephone number of the contact person.
2. All contractors conducting regulated activities associated with this project must be provided with complete copies of the aProved water pollution abatement plan and the TCEQ letter indicating the specific conditions of its aProval. During the course of these regulated activities, the contractors are required to keep on-site copies of the aProved plan and aProval letter.
3. If any sensitive feature is discovered during construction, all regulated activities near the sensitive feature must be suspended immediately. The aPropriate TCEQ regional office must be immediately notified of any sensitive features encountered during construction. The regulated activities near the sensitive feature may not proceed until the TCEQ has reviewed and aProved the methods proposed to protect the sensitive features and the Edwards Aquifer from any potentially adverse impacts to water quality.
4. No temporary aboveground hydrocarbon and hazardous substance storage tank system shall be installed within 150 feet of a domestic, industrial, irrigation, or public water suPly well, or other sensitive feature.
5. All temporary erosion and sedimentation (E&S) control measures must be properly selected, installed, and maintained in accordance with the manufacturers specifications and good engineering practices. Controls specified in the temporary storm water section of the aProved Edwards Aquifer protection plan are required during construction. If inspection indicates a control has been used inaProprately, or incorrectly, the aPlicant must replace or modify the control for site situations. The controls must remain in place until disturbed areas are revegetated and the areas have become permanently stabilized.
6. If sediment escapes the construction site, off-site accumulations of sediment must be removed at a frequency sufficient to minimize offsite impacts to water quality (e.g., fugitive sediment in street being washed into surface streams or sensitive features by the next rain).
7. Sediment must be removed from sediment traps or sedimentation ponds not later than when design capacity has been reduced by 50%. A permanent stake must be provided that can indicate when the sediment occupies 50% of the basin volume.
8. Litter, construction debris, and construction chemicals exposed to stormwater shall be prevented from becoming a pollutant source for stormwater discharges (e.g., screening outfalls, picked up daily).
9. All spoils (excavated material) generated from the project site must be stored on-site where E&S controls. For storage or disposal of spoils at another site on the Edwards Aquifer recharge zone, the owner of the site must receive aProval of a water pollution abatement plan for the placement of fill material or mass grading prior to the placement of spoils at the other site.
10. Stabilization measures shall be initiated as soon as practicable in portions of the site where construction activities have temporarily or permanently ceased, but in no case more than fourteen (14) days after the construction activity in that portion of the site has temporarily or permanently ceased. Where the initiation of stabilization measures by the 14th day after construction activity temporary or permanently cease is precluded by weather conditions, stabilization measures shall be initiated as soon as practicable. Where construction activity on a portion of the sight is temporarily ceased, and earth disturbing activities will be resumed within 21 days, temporary stabilization measures do not have to be initiated on that portion of site. In areas experiencing droughts where the initiation ceased is precluded by seasonal arid conditions, stabilization measures shall be initiated as soon as practicable.
11. The following records shall be maintained and made available to the TCEQ upon request: the dates when major grading activities occur; the date when construction activities temporarily or permanently cease on a portion of the site; and the dates when stabilization measures are initiated.
12. The holder of any aProved Edwards Aquifer protection plan must notify the aPropriate regional office in writing and obtain aProval from the executive director prior to initiating any of the following:

    A. Any physical or operational modification of any water pollution abatement structure(s), including but not limited to ponds, dams, berms, sewage treatment plants, and diversionary structures;

    B. Any change in the nature or character of the regulated activity from that which was originally aProved or a change which significantly impacts the ability of the plan to prevent pollution of the Edwards Aquifer;

    C. Any development of land previously identified as undeveloped in the original water pollution abatement plan.

Austin Regional Office 2800 S. IH 35, Ste 100 Austin, Texas 78704-5700 Phone (512) 339-2929 Fax (512) 339-3795	San Antonio Regional Office 140 Heimer, Suite 360 San Antonio, Texas 78232-5042 Phone (210) 490-3096 Fax (210) 545-4329

13. These general construction notes must be included on the construction plans provided to the contractor and all subcontractors.
14. Contractor shall be solely responsible for the following:
    A. Preparation of N.O.I. for the project.
    B. Obtaining aProval of N.O.I. from the TCEQ.
    C. Implementation of the aProved plan.
    D. Contractor shall have sole responsibility of the storm water pollution prevention plan and may implement or change the plan in accordance with the aProved N.O.I.
    E. Maintaining all reporting and documentation as required by the TCEQ, EPA and aProved N.O.I.
    F. Preparation and acceptance of N.O.T. from TCEQ

B. GENERAL NOTES

1. All barricades, signs and traffic control for this project shall conform to the latest edition of the Texas Manual on Uniform Traffic Control Devices.
2. The bidders for this project shall familiarize themselves with all requirements of working in State and City of Georgetown rights-of-way and easements. The bidders shall familiarize themselves with all insurance requirements for said work and shall include in their bids, insurance costs and insurance premiums that provide for the State of Texas, the City of Georgetown and the engineer as additional insured under the contractor's policies.
3. Blasting is not permitted on this project.
4. All construction operations shall be accomplished in accordance with aPlicable regulations of the U.S. Occupational Safety and Health Administration. Copies of the OSHA standards may be purchased from the U.S. government printing office: information and related reference materials may be obtained from OSHA; 903 San Jacinto, Austin, Texas.
5. These plans prepared by Kasberg, Patrick & Associates, LP, do not extend to or include designs or systems pertaining to the safety of the contractor or its employees, agents or representatives in the performance of the work. the seal of Kasberg, Patrick & Associates, LP registered professional engineer(s) hereon does not extend to any such safety systems that may now or hereafter be incorporated in the work. The contractor shall prepare or obtain the aPropriate safety systems, including the plans and specifications.
6. Contractor shall comply with all aPlicable local, state and federal requirements regarding excess and waste material, including methods of handling and disposal.
7. Contractor shall maintain access to public and private facilities during construction. Construction activities to be coordinated with the City of Georgetown Community Owned Utilities.
8. Contractor shall notify the City of Georgetown (512 -930-3555) a minimum of 3 working days, (Monday-Friday) in advance of construction startup, followed by written confirmation. Contractor shall also give a minimum of 3 working days, (Monday-Friday), notice to all authorized inspectors, superintendents or persons in charge of private and public utilities affected by his operations prior to commencement of work.
9. Location of existing utilities shown on the plans was compiled from record information. No warranty is implied as to the actual location of existing utilities. Contractor shall field verify locations of existing utilities prior to the commencement of construction. Contractor should call the City of Georgetown at (512) 930-3555. If there are any conflicts between proposed and existing utilities, or if the existing utilities are in any way different from what is shown on the plans, then it shall be the contractor's responsibility to notify the City of Georgetown or other affected utility before proceeding with any construction. The contractor shall be responsible for resolving all conflicts at his expense. The City of Georgetown will consider any conflicts at said locations on a case by case basis in order to determine if the contractor should be reimbursed for his expense in solving said conflict.
10. Contractor shall make all due precautions to protect existing facilities from damage. Any damage to existing facilities incurred as a result of these construction operations shall be repaired immediately by the contractor to at least the pre-existing condition at no additional cost to the City of Georgetown.
11. Contractor shall coordinate interruptions of all utilities and services with all aPlicable utility company or companies. All work to be in accordance with the requirements of the aPlicable utility company or agency involved.
12. When unlocated or incorrectly located underground piping or a break in a line or other utilities and services are encountered during site work operations, the contractor shall notify the aPlicable utility company immediately to obtain procedure directions. Contractor shall cooperate with the aPlicable utility company in maintaining active services in operation.
13. Contractor shall locate material storage areas away from storm water conveyance systems. Contractor shall provide protected storage areas for chemicals, paints, solvents, fertilizers and other potentially toxic materials off site.
14. No open burning is allowed within the Georgetown city limits. Burning is allowed in Williamson County by air curtain destructors method and prior written aProval from aPlicable government agencies at the contractor's expense. The contractor shall haul cleared vegetation to an acceptable off-site location with written aProval by the owner's representative. Prior to construction the contractor shall designate to the City of Georgetown's representative which method will be used for disposal of cleared vegetation.
15. Fuel storage is not allowed on this project.
16. Contractor shall advise Owner immediately, verbally and in writing, of any fuel or toxic material spills onto the project construction area and the actions to be taken to remedy the problem.
17. Contractor shall dispose of his fuels, materials and contaminated excavations in a legally aProved manner.
18. Contractor shall comply with all aPlicable environmental laws.
19. Contractor shall provide and maintain sanitary facilities on this project for employees.
20. Existing paving, buildings and other items shown on the plans is not specifically related to the work of the contractor and is for information only.
21. Any water hauled to the site during the installation shall be paid for by the contractor.
22. TxDOT requires 48-hour notification prior to any proposed work in State right of way.
23. Contractor shall make an examination of the project site and completely familiarize himself with the nature and extent of the work to be accomplished. No extra compensation will be allowed for any work made necessary by unusual conditions or obstacles encountered during the progress of the work, which conditions or obstacles are readily aParent upon a visit to the site. If there are any questions in this regard or if there are any discrepancies between the plans and actual site conditions, the contractor shall notify the engineer prior to the submission of bids.
24. The project area and surrounding areas that are utilized by the contractor shall be kept in a neat and orderly manner. Project clean up shall be done on a daily basis. Areas that have been chosen by the contractor for storing of material and equipment shall be out of public access and not create hazardous conditions for the public. These areas shall be kept in a neat and orderly manner and cleaned on a daily basis.
25. The contractor shall keep "Record Drawings" drawings of the construction on a set of drawings reserved for "Record Drawings" drawings. The "Record Drawings" plans shall be submitted to the engineer at the completion of the project.
26. Contractor shall fill out and distribute notice to residents to all affected residents at least 48 hours prior to beginning work.
27. Advisory speed limit signs shall be placed as directed by the City of Georgetown. Location and speed will be determined by the City of Georgetown.
28. The areas of the public roadways which have been disturbed by construction activity shall be inspected on a daily basis with logs kept by the contractor. Any areas that present an unsafe or unlevel riding surface for the public shall be remediated immediately to the satisfaction of the City of Georgetown. Logs shall be available for City inspection at all times.
29. All areas within the project that have been disturbed by construction shall be swept daily. Dust control on the project is of the utmost importance. Watering of the project areas shall be done routinely as needed for controlling dust and/or as directed by the City of Georgetown.
30. The contractor shall notify the City of Georgetown two weeks prior to any required utility shuts off. A meeting will be held between the City of Georgetown, the contractor and the engineer to discuss the shutoff and a test of the shut off operation shall be performed prior to the construction activity.
31. The contractor shall not use any facilities of a private property owner without a written agreement that is furnished to the City of Georgetown. These facilities shall include but not be limited to private properties for storage, water, trash receptacles, etc. All City ordinances shall be followed.
32. The contractor shall not place spoils in the yards of residence or private business without a written agreement that is furnished to the City of Georgetown.
33. During the pre-construction conference the project team will establish a single point of contact for the contractor, the City of Georgetown and the engineer.
34. Projects which are calendar day projects shall be void of rain days as credit to construction time, the City of Georgetown will not accept rain days unless a month within the project time has had rain days in excess of the average rain days for that month. Days of drying for the project will not be considered.
35. Contractor shall restore the affected area to the satisfaction of the property owner and shall provide written confirmation from the property owner before the City of Georgetown will accept the project or release any retainer.

Month	Years of Study	Rain Days
January	52 years	7 days
February	52 years	7 days
March	52 years	7 days
April	52 years	7 days
May	52 years	8 days
June	52 years	6 days
July	52 years	6 days
August	52 years	5 days
September	52 years	7 days
October	52 years	7 days
November	52 years	7 days
December	52 years	7 days

C. CONSTRUCTION LAYOUT/PROJECT COORDINATION

1. The City of Georgetown will provide the daily on-site construction representation for this project.
2. Pre-construction conference
    A. Prior to beginning work on the project and soon after the award of the contract, a conference will be held among the representatives of the City of Georgetown, the engineer, the contractor, subcontractor and any affected or aPlicable utilities that will be involved in the work. At that time the contractor shall submit charts or briefs, outlining the manner of execution of the work that is intended in order to complete the specified work within the allotted time. This conference will more completely establish the sequence of work to be followed and establish the estimated progress schedule for completion of the various tasks. When aPlicable, the Pre-construction conference will be held only after installation of the erosion and sedimentation controls. This conference may take place on-site to demonstrate competence with the erosion and sedimentation control plan and water pollution abatement plan.
    B. In addition, at this conference, the contractor shall be responsible for furnishing the engineer with all of the following, as specified herein or as directed by the engineer:
        i. Samples of all materials to be used on the project with idenification as to product name; name, location, phone number (including area code) and mailing address of product source and manufacturer, if different from source; content of product; amount of each ingredient in the product, and manufacturer's directions as to use and aPlication of the product, if aPlicable.
        ii. Manufacturer's literature of all materials and equipment installed on the project.
3. Protection of vehicular and pedestrian traffic is of the utmost importance for the project. The traffic control and sequence of construction plan shall address all anticipated situations in this regard with sufficient detail. The contractor's plan will be reviewed by the City of Georgetown.
4. The plans for this project show proposed elevations, slopes and dimensions that are intended for actual placement, however, there may be some instances where existing conditions make it impracticable to achieve the ideal. In those instances, the City of Georgetown will assist the contractor in making proper field changes to better account for field conditions.
5. The Contractor will be responsible for all surveying and construction layout for the project.
6. Contractor shall locate, protect and maintain benchmarks, monuments and control points. Re-establishment of disturbed or destroyed items shall be accomplished by a Texas Registered Professional Land Surveyor at no cost to the owner.
7. Prior to proceeding with construction on this project the contractor shall submit a project schedule in Microsoft project, both hard copy and digital copy.
8. Contractor shall acknowledge and sign a partner agreement between the City of Georgetown and contractor.
9. Contractor shall submit all video for the project on DVD.
10. Contractor shall field verify the location and depth of all existing utilities prior to excavation and contruction by pot holing.

NO.	REVISION	DATE

GEORGETOWN TEXAS *more than welcome*

PAPE-DAWSON ENGINEERS
AUSTIN | SAN ANTONIO | HOUSTON | FORT WORTH | DALLAS
10801 N MOPAC EXPY, BLDG 3, STE 200 | AUSTIN, TX 78759 | 512.454.8711
TEXAS ENGINEERING FIRM #470 | TEXAS SURVEYING FIRM #10023800

WOLF RANCH PKWY / MEMORIAL DR

GENERAL NOTES

CITY JOB No.
JOB NO. 51423-04
DATE 9/16/2025
DESIGNER
CHECKED DRAWN

D. SITE GRADING NOTES

1. Contractor shall control dust caused by the work and comply with pollution control regulations of governing authorities.
2. Contractor shall remove built up material on adjacent public roadways resulting from his work. Cleaning shall be at least once a day.
3. Contractor shall protect stockpiled materials such that storm water will not adversely affect erosion control, sidewalks, traffic, private property or drainage way.
4. Required fill embankment shall be placed and compacted per technical specifications in maximum six (6) inch loose lifts and compacted as stated in the specifications.
5. Contractor shall not stockpile material within the 100 year flood plain.
6. Contractor shall strip 6-inches of topsoil from all areas subject to grade modifications and remove any area of weak soil. This shall not be paid directly. Contractor may stockpile this material for finish grading.
7. Contractor shall place topsoil and re-establish vegitation in all areas disturbed by construction equipment and storage areas. This cost will be paid for by the contractor and will not be any part of the bid items.
8. In the event the ideal is not achieved between the cross-sections and the grading layout the cross sections shall take precedence over the grading layout.

E. PAVING AND CONCRETE NOTES

1. Any existing pavement, curbs, and/or sidewalk damaged or removed by the contractor that are not a part of this contract are shall be repaired by the contractor to at least the preexisting condition at his expense before acceptance of the work.
2. Contractor shall provide the City of Georgetown Community Owned Utilities engineer with a barricade and signing plan which will include how traffic will be handled during construction. The barricades, signs and lights shall conform to the latest edition of the Texas Manual on Uniform Traffic Control Devices.
3. Natural subgrade - loose, disturbed or undisturbed natural subgrade beneath pavement shall be scarified and rolled. Subgrade compactions shall not exceed 100%. Proof-rolling and preparation of subgrade shall include, but not be limited to, the use of pneumatic roller, tamping roller, motor grader and water truck with accompanying aPurtenances.
4. Connections between new and existing asphalt streets shall be made by removing existing street from the end of existing pavement until full depth base and HMAC are encountered and HMAC appears to be in sound condition. provide expansion joints and dowels where connecting existing curb to new construction.
5. Contractor shall not place asphalt products on ground within 48 hours of forecasted rain.
6. Streets should be cut to subgrade prior to utility construction.
7. Select material for subbase - subbase material should consist of clayey sand to clayey gravel material (sc to gc) or better, and have a CBR of at least 10. Proposed material should be tested to confirm its CBR characteristics. The following specifications are suggested to obtain such a cbr:

Plasticity Index	No more than 20%
Percent (-) 200 mesh sieve	No more than 45%

   Other materials may be capable of achieving the desired CBR characteristics. Subgrade material shall be compacted in six (6) inch lifts.
8. Fill material other than subbase - fill material beneath the pavement should consist of select, engineered material at least equal to the strength characteristics of the natural materials with a plasticity of less than 15%. The fill should be compacted in lifts not exceeding six (6) inches and eachlift should be tested for compliance with these specifications.
9. Fills with significant clay content are not recommended for use due to their potential for contributing to shrink/swell activity. Still, if clay fills are used, they should be lean (with a liquid limit of less than 50). Such fills should be placed at moisture contents greater than optimum, and should not be over compacted.
10. Concrete for all valley gutters, radius units, driveways, box culverts, aprons, headwalls, and wing walls shall be a minimum 28-day compressive strength of 3000 p.s.i., a minimum 7-day flexural strength of 510 p.s.i., a maximum water to cement ratio of 6.0 gallons per sack and be a minimum six (6) sacks per cubic yard of concrete shall be required. All other concrete shall be as specified on the plans and/or specifications.
11. Type 2 membrane curing compound (white pigmented) shall be used for this project.
12. All concrete shall be cured in accordance with the requirements of TxDOT item 526 "membrane curing".
13. Concrete rip rap shall be 4-inches in thickness with 6" x 6" x #6 welded cure fabric mesh flat panels. Finished concrete shall receive a broom finish and be sprayed with Type 2 membrane curing compound. Rip rap shall be placed with a 24-inch depth by 6-inch wide toe ditch at the bottom of slope edge and with an 18-inch depth by 6-inch wide toe ditch at the top of slope edge and side edges, unless otherwise noted on the plans.
14. All expansion joint material for driveway and sidewalk installations shall be Grade 1 Redwood (1/2" x 3 1/2" dimension).
15. All reinforcing steel for concrete shall conform with TxDot item 440, "Reinforcing Steel".
16. Pre-cast inlets, junction boxes, manholes and box culverts are allowed on this project, however, all suPlier submittals shall be required and the owner reserves the right to change elevations and slopes of, to and from each proposed structure at any time.
17. Within City of Georgetown rights-of-way, residential driveways shall have a 10% maximum grade. Non residential driveways shall have a 3% maximum grade for the first thirty (30) feet off the edge of pavement. ADA compliance required for all driveways with sidewalks or in anticipation of future sidewalks.
18. Within seven days of placing the curb and gutter, ribbon curb, or final course of HMAC if the road section does not have curb, the contractor shall back fill the slopes with topsoil, seed and water to sustain growth. watering shall occur daily by use of equipment that has spraying capabilities. Curbs shall be backfilled before any base covers are placed with in the roadway.
19. Once subgrade elevations have been achieved, subgrade shall be proof rolled in accordance with TxDOT item 216. Weak areas that are detected shall be removed and replaced with soils exhibiting similar classification, moisture content, and density as the adjacent in-site soils.
20. Onsite and imported fill shall be compacted to 98% of TEX-113-E or TEX-114-E maximum dry density. All fat clays (CH) (PI >25) soils shall be moisture conditioned to between optimum and +4% of optimum moisture content. All lower PI (PI >25) soils shall be moisture conditioned to -3% to +3% of optimum moisture content.

F. TESTING AND SUBMITTALS

1. Contractor shall be responsible for providing material samples as well as any manufacturers literature of materials used on this project as required by the engineer. Any costs associated with any sampling and testing shall be the responsibility of the contractor. These costs shall be considered as incidental and the contractor will not be entitled to any additional compensation.
2. Contractor shall be responsible for and pay for all charges of testing laboratories for services in connection with initial tests made on all imported materials to the project sites including but not limited to embedment materials, fill material, backfill material, select material, crushed limestone base, subbase, concrete, steel, wood forms, liquid asphalt, aggregate, water, cement, curing compound, guard rails, etc.

   The tests for which the contractor will typically be responsible are the Atterberg limits, sieve analysis, plasticity indices, mix design, California bearing ratios, moisture density curves and all tests required by the specifications that prove the material brought to the project sites meets or exceeds the specifications and contract documents. The owner, the City of Georgetown, will pay all the charges of testing laboratories for services in connection with in-place field densities, concrete cylinders testing, HMAC density tests and any in-place test required for quality assurance. Retesting after failure of in place tests shall be at the expense of the contractor.
3. Contractor shall coordinate all materials testing, including soil density tests and related soils analysis. Tests shall be accomplished by an independent laboratory under contract with the City of Georgetown, at the frequency, time and location as specified in the technical specifications. A copy of the test results shall be forwarded to the City of Georgetown's representative, the City of Georgetown utilities and the contractor. Tests which show unsatisfactory results shall be repeated at the expense of the contractor subsequent to the contractor's remedial activities.
4. Trench excavation and shoring safety plan system as required by the laws of the State of Texas and as outlined in the technical specifications shall be required as a minimum trench safety measure and shall be submitted to the City of Georgetown for acceptance prior to the beginning of construction. Implementation of the submitted trench safety plan shall be the sole responsibility of the contractor.

NO.	REVISION	DATE

GEORGETOWN TEXAS *more than welcome*

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WOLF RANCH PKWY / MEMORIAL DR

GENERAL NOTES

CITY JOB No.
JOB NO. 51423-04
DATE 9/16/2025
DESIGNER
CHECKED DRAWN

SHEET NO. 28

Texas Commission on Environmental Quality Organized Sewage Collection System General Construction Notes

1. This Organized Sewage Collection System (SCS) must be constructed in accordance with 30 Texas Administrative Code (TAC) §213.5(c), the Texas Commission on Environmental Quality's (TCEQ) Edwards Aquifer Rules and any local government standard specifications.

2. All contractors conducting regulated activities associated with this proposed regulated project must be provided with copies of the SCS plan and the TCEQ letter indicating the specific conditions of its approval. During the course of these regulated activities, the contractors must be required to keep on-site copies of the plan and the approval letter.

3. A written notice of construction must be submitted to the presiding TCEQ regional office at least 48 hours prior to the start of any regulated activities. This notice must include:
   - the name of the approved project;
   - the activity start date; and
   - the contact information of the prime contractor.

4. Any modification to the activities described in the referenced SCS application following the date of approval may require the submittal of an SCS application to modify this approval, including the payment of appropriate fees and all information necessary for its review and approval.

5. Prior to beginning any construction activity, all temporary erosion and sedimentation (E&S) control measures must be properly installed and maintained in accordance with the manufacturers specifications. These controls must remain in place until the disturbed areas have been permanently stabilized.

6. If any sensitive features are discovered during the wastewater line trenching activities, all regulated activities near the sensitive feature must be suspended immediately. The applicant must immediately notify the appropriate regional office of the TCEQ of the feature discovered. A geologist's assessment of the location and extent of the feature discovered must be reported to that regional office in writing and the applicant must submit a plan for ensuring the structural integrity of the sewer line or for modifying the proposed collection system alignment around the feature. The regulated activities near the sensitive feature may not proceed until the executive director has reviewed and approved the methods proposed to protect the sensitive feature and the Edwards Aquifer from any potentially adverse impacts to water quality while maintaining the structural integrity of the line.

7. Sewer lines located within or crossing the 5-year floodplain of a drainage way will be protected from inundation and stream velocities which could cause erosion and scouring of backfill. The trench must be capped with concrete to prevent scouring of backfill, or the sewer lines must be encased in concrete. All concrete shall have a minimum thickness of 6 inches.

8. Blasting procedures for protection of existing sewer lines and other utilities will be in accordance with the National Fire Protection Association criteria. Sand is not allowed as bedding or backfill in trenches that have been blasted. If any existing sewer lines are damaged, the lines must be repaired and retested.

9. All manholes constructed or rehabilitated on this project must have watertight size on size resilient connectors allowing for differential settlement. If manholes are constructed within the 100-year floodplain, the cover must have a gasket and be bolted to the ring. Where gasketed manhole covers are required for more than three manholes in sequence or for more than 1500 feet, alternate means of venting will be provided. Bricks are not an acceptable construction material for any portion of the manhole.

   The diameter of the manholes must be a minimum of four feet and the manhole for entry must have a minimum clear opening diameter of 30 inches. These dimensions and other details showing compliance with the commission's rules concerning manholes and sewer line/manhole inverts described in 30 TAC §217.55 are included on Plan Sheet of .

   It is suggested that entrance into manholes in excess of four feet deep be accomplished by means of a portable ladder. The inclusion of steps in a manhole is prohibited.

10. Where water lines and new sewer line are installed with a separation distance closer than nine feet (i.e., water lines crossing wastewater lines, water lines paralleling wastewater lines, or water lines next to manholes) the installation must meet the requirements of 30 TAC §217.53(d) (Pipe Design) and 30 TAC §290.44(e) (Water Distribution).

11. Where sewers lines deviate from straight alignment and uniform grade all curvature of sewer pipe must be achieved by the following procedure which is recommended by the pipe manufacturer: _____.

    If pipe flexure is proposed, the following method of preventing deflection of the joint must be used: _____:

    Specific care must be taken to ensure that the joint is placed in the center of the trench and properly bedded in accordance with 30 TAC §217.54.

12. New sewage collection system lines must be constructed with stub outs for the connection of anticipated extensions. The location of such stub outs must be marked on the ground such that their location can be easily determined at the time of connection of the extensions. Such stub outs must be manufactured wyes or tees that are compatible in size and material with both the sewer line and the extension. At the time of original construction, new stub-outs must be constructed sufficiently to extend beyond the end of the street pavement. All stub-outs must be sealed with a manufactured cap to prevent leakage. Extensions that were not anticipated at the time of original construction or that are to be connected to an existing sewer line not furnished with stub outs must be connected using a manufactured saddle and in accordance with accepted plumbing techniques.

    If no stub-out is present an alternate method of joining laterals is shown in the detail on Plan Sheet___of ___. (For potential future laterals).

    The private service lateral stub-outs must be installed as shown on the plan and profile sheets on Plan Sheet ___of ___and marked after backfilling as shown in the detail on Plan Sheet___of ___.

13. Trenching, bedding and backfill must conform with 30 TAC §217.54. The bedding and backfill for flexible pipe must comply with the standards of ASTM D-2321, Classes IA, IB, II or III. Rigid pipe bedding must comply with the requirements of ASTM C 12 (ANSI A 106.2) classes A, B or C.

14. Sewer lines must be tested from manhole to manhole. When a new sewer line is connected to an existing stub or clean-out, it must be tested from existing manhole to new manhole. If a stub or clean-out is used at the end of the proposed sewer line, no private service attachments may be connected between the last manhole and the cleanout unless it can be certified as conforming with the provisions of 30 TAC §213.5(c)(3)(E).

15. All sewer lines must be tested in accordance with 30 TAC §217.57. The engineer must retain copies of all test results which must be made available to the executive director upon request. The engineer must certify in writing that all wastewater lines have passed all required testing to the appropriate regional office within 30 days of test completion and prior to use of the new collection system. Testing method will be:

    (a) For a collection system pipe that will transport wastewater by gravity flow, the design must specify an infiltration and exfiltration test or a low-pressure air test. A test must conform to the following requirements:

    (1) Low Pressure Air Test.

    (A) A low pressure air test must follow the procedures described in American Society For Testing And Materials (ASTM) C-828, ASTM C- 924, or ASTM F-1417 or other procedure approved by the executive director, except as to testing times as required in Table C.3 in subparagraph (C) of this paragraph or Equation C.3 in subparagraph (B) (ii) of this paragraph.

    (B) For sections of collection system pipe less than 36 inch average inside diameter, the following procedure must apply, unless a pipe is to be tested as required by paragraph (2) of this subsection.

    (i) A pipe must be pressurized to 3.5 pounds per square inch (psi) greater than the pressure exerted by groundwater above the pipe.

    (ii) Once the pressure is stabilized, the minimum time allowable for the pressure to drop from 3.5 psi gauge to 2.5 psi gauge is computed from the following equation:

Equation C.3 $$T = \frac{0.085 \times D \times K}{Q}$$

Where:

T = time for pressure to drop 1.0 pound per square inch gauge in seconds
K = 0.000419 X D X L, but not less than 1.0
D = average inside pipe diameter in inches
L = length of line of same size being tested, in feet
Q = rate of loss, 0.0015 cubic feet per minute per square foot internal surface

(C) Since a K value of less than 1.0 may not be used, the minimum testing time for each pipe diameter is shown in the following Table C.3:

Pipe Diameter (inches)	Minimum Time (seconds)	Maximum Length for Minimum Time (feet)	Time for Longer Length (seconds/foot)
6	340	398	0.855
8	454	298	1.520
10	567	239	2.374
12	680	199	3.419
15	850	159	5.342
18	1020	133	7.693
21	1190	114	10.471
24	1360	100	13.676
27	1530	88	17.309
30	1700	80	21.369
33	1870	72	25.856

(D) An owner may stop a test if no pressure loss has occurred during the first 25% of the calculated testing time.

(E) If any pressure loss or leakage has occurred during the first 25% of a testing period, then the test must continue for the entire test duration as outlined above or until failure.

(F) Wastewater collection system pipes with a 27 inch or larger average inside diameter may be air tested at each joint instead of following the procedure outlined in this section.

(G) A testing procedure for pipe with an inside diameter greater than 33 inches must be approved by the executive director.

(2) Infiltration/Exfiltration Test.

(A) The total exfiltration, as determined by a hydrostatic head test, must not exceed 50 gallons per inch of diameter per mile of pipe per 24 hours at a minimum test head of 2.0 feet above the crown of a pipe at an upstream manhole.

(B) An owner shall use an infiltration test in lieu of an exfiltration test when pipes are installed below the groundwater level.

(C) The total exfiltration, as determined by a hydrostatic head test, must not exceed 50 gallons per inch diameter per mile of pipe per 24 hours at a minimum test head of two feet above the crown of a pipe at an upstream manhole, or at least two feet above existing groundwater level, whichever is greater.

(D) For construction within a 25-year flood plain, the infiltration or exfiltration must not exceed 10 gallons per inch diameter per mile of pipe per 24 hours at the same minimum test head as in subparagraph (C) of this paragraph.

(E) If the quantity of infiltration or exfiltration exceeds the maximum quantity specified, an owner shall undertake remedial action in order to reduce the infiltration or exfiltration to an amount within the limits specified. An owner shall retest a pipe following a remediation action.

(b) If a gravity collection pipe is composed of flexible pipe, deflection testing is also required. The following procedures must be followed:

(1) For a collection pipe with inside diameter less than 27 inches, deflection measurement requires a rigid mandrel.

(A) Mandrel Sizing.

(i) A rigid mandrel must have an outside diameter (OD) not less than 95% of the base inside diameter (ID) or average ID of a pipe, as specified in the appropriate standard by the ASTMs, American Water Works Association, UNI-BELL, or American National Standards Institute, or any related appendix.

(ii) If a mandrel sizing diameter is not specified in the appropriate standard, the mandrel must have an OD equal to 95% of the ID of a pipe. In this case, the ID of the pipe, for the purpose of determining the OD of the mandrel, must equal be the average outside diameter minus two minimum wall thicknesses for OD controlled pipe and the average inside diameter for ID controlled pipe.

(iii) All dimensions must meet the appropriate standard.

(B) Mandrel Design.

(i) A rigid mandrel must be constructed of a metal or a rigid plastic material that can withstand 200 psi without being deformed.

(ii) A mandrel must have nine or more odd number of runners or legs.

(iii) A barrel section length must equal at least 75% of the inside diameter of a pipe.

(iv) Each size mandrel must use a separate proving ring.

(C) Method Options.

(i) An adjustable or flexible mandrel is prohibited.

(ii) A test may not use television inspection as a substitute for a deflection test.

(iii) If requested, the executive director may approve the use of a deflectometer or a mandrel with removable legs or runners on a case-by-case basis.

(2) For a gravity collection system pipe with an inside diameter 27 inches and greater, other test methods may be used to determine vertical deflection.

(3) A deflection test method must be accurate to within plus or minus 0.2% deflection.

(4) An owner shall not conduct a deflection test until at least 30 days after the final backfill.

(5) Gravity collection system pipe deflection must not exceed five percent (5%).

(6) If a pipe section fails a deflection test, an owner shall correct the problem and conduct a second test after the final backfill has been in place at least 30 days.

16. All manholes must be tested to meet or exceed the requirements of 30 TAC §217.58.

(a) All manholes must pass a leakage test.

(b) An owner shall test each manhole (after assembly and backfilling) for leakage, separate and independent of the collection system pipes, by hydrostatic exfiltration testing, vacuum testing, or other method approved by the executive director.

(1) Hydrostatic Testing.

(A) The maximum leakage for hydrostatic testing or any alternative test methods is 0.025 gallons per foot diameter per foot of manhole depth per hour.

(B) To perform a hydrostatic exfiltration test, an owner shall seal all wastewater pipes coming into a manhole with an internal pipe plug, fill the manhole with water, and maintain the test for at least one hour.

(C) A test for concrete manholes may use a 24-hour wetting period before testing to allow saturation of the concrete.

(2) Vacuum Testing.

(A) To perform a vacuum test, an owner shall plug all lift holes and exterior joints with a non-shrink grout and plug all pipes entering a manhole.

(B) No grout must be placed in horizontal joints before testing.

(C) Stub-outs, manhole boots, and pipe plugs must be secured to prevent movement while a vacuum is drawn.

(D) An owner shall use a minimum 60 inch/lb torque wrench to tighten the external clamps that secure a test cover to the top of a manhole.

(E) A test head must be placed at the inside of the top of a cone section, and the seal inflated in accordance with the manufacturer's recommendations.

(F) There must be a vacuum of 10 inches of mercury inside a manhole to perform a valid test.

(G) A test does not begin until after the vacuum pump is off.

(H) A manhole passes the test if after 2.0 minutes and with all valves closed, the vacuum is at least 9.0 inches of mercury.

17. All private service laterals must be inspected and certified in accordance with 30 TAC §213.5(c)(3)(I). After installation of and, prior to covering and connecting a private service lateral to an existing organized sewage collection system, a Texas Licensed Professional Engineer, Texas Registered Sanitarian, or appropriate city inspector must visually inspect the private service lateral and the connection to the sewage collection system, and certify that it is constructed in conformity with the applicable provisions of this section. The owner of the collection system must maintain such certifications for five years and forward copies to the appropriate regional office upon request. Connections may only be made to an approved sewage collection system.

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Austin, Texas 78753-1808
Phone (512) 339-2929
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San Antonio Regional Office
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San Antonio, Texas 78233-4480
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Fax (210) 545-4329

THESE GENERAL CONSTRUCTION NOTES MUST BE INCLUDED ON THE CONSTRUCTION PLANS PROVIDED TO THE CONTRACTOR AND ALL SUBCONTRACTORS.

TCEQ-0596 (Rev. July 15, 2015)

NO.	REVISION	DATE

GEORGETOWN TEXAS *more than welcome*

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WOLF RANCH PKWY / MEMORIAL DR

GENERAL NOTES

CITY JOB No.
JOB NO. 51423-04
DATE 9/16/2025
DESIGNER
CHECKED DRAWN

SHEET NO. 29

GENERAL NOTES:

1. These construction plans were prepared, sealed, signed and dated by a Texas licensed professional engineer. Therefore, based on the engineer's concurrence of compliance, the construction plans for construction of the proposed project are hereby approved subject to the standard construction specifications and details manual and all other applicable city, state and federal requirements and codes.
2. The project is subject to all City standard specifications and details in effect at the time of submittal of the project to the city.
3. The site construction plans shall meet all requirements of the approved site plan.
4. Hot mix asphaitic concrete pavement shall be type D unless otherwise specified and shall be a minimum of 2 inches thick on public streets and roadways.
5. All sidewalks ramps are to be installed with the public infrastructure.
6. A maintenance bond is required to be submitted to the City prior to the acceptance of the public improvements. This bond shall be established for 1 year in the amount of 25% of the cost of the public improvements and shall follow the City format.
7. Record drawings of the public improvements shall be submitted to the City by the design engineer prior to the acceptance of the project. These drawings shall be on pdf (300 dpi).

ADDITIONAL GENERAL CONSTRUCTION NOTES:

1. Contractor shall call for all utility locates prior to any construction.
2. Contractor shall provide the City of Georgetown with copies of all test results prior to acceptance of this project.
3. The contractor shall keep the site clean and maintained at all times, to the satisfaction of the City. The project will not be accepted until the site has been cleaned and re-vegetated to the satisfaction of the city.
4. Contractor will be responsible for keeping roads and drives adjacent to and near the site free from soil, sediment and debris. Contractor will be responsible for dust control from the site.
5. All work on these plans shall be performed. Pay for work shown on the plans which are not identified in the contract, shall be considered incidental to the items specifically identified for payment.
6. The contractor shall provide a competent and qualified superintendent to supervise all work. The superintendent shall be present during all construction activities.
7. Adequate drainage conditions shall be maintained at all times. Any tree removed or damaged by the project, which is not specifically identified to be removed by the plans, will be replaced. No separate pay will be provided.
8. All construction and construction related activities shall be performed Monday thru Friday from 7:00 A.M. to 6:00 P.M. However, construction activities within five hundred feet (500') of a dwelling shall be performed between the hours of 9:00 A.M. and 4:00 P.M. Nighttime work will not be allowed unless approved by the city and the engineer (with uniformed off duty law enforcement officers).
9. All sidewalks shall comply with the Americans with Disabilities Act and the State Architectural Barriers Act.
10. Traffic control signs and pavement markings in accordance with the Texas Manual on Uniform Traffic Control Devices to be installed.
11. Contractor to notify the City and Engineer 48 hours in advance of any upcoming lane closures.
12. No fencing, wall or machinery is allowed to be placed so that it obstructs the sight lines of drivers from an intersecting public roadway or from an intersecting private driveway.
13. Maintain positive drainage for permanent and temporary work for the duration of the project. Be responsible for any items associated with the temporary or interim drainage and all related maintenance. This work is subsidiary.
14. Suspend all activities near any significant recharge features, such as sinkholes, caves, or any other subterranean openings that are discovered during construction or core sampling. Do not proceed until designated geologist or TCEQ representative is present to evaluate and approve remedial action.
15. Keep on site a universal spill kit adequate for the body of water and the work being performed. Debris is not allowed to fall into the Ordinary High-Water Level (OHWL). Debris that falls into the OHWL must be removed at the end of each workday. Debris that falls into the floodway must be removed at the end of each work week or prior to a rain event.
16. Water all areas of project to be seeded or sodded.
17. Vegetative watering rates and quantities are based on 1/4 inch of watering per week over a 3-month watering cycle. The actual rates used and paid for will be directed and will be based on prevailing weather conditions to maintain the seedbed.
18. Maintain drainage at curb inlets until the final roadway surface is placed.
19. For inlets not placed in roadway, construct cast-in-place reinforced concrete apron as shown in the standards. This work is subsidiary.
20. The truck mounted attenuator or trailer attenuator used for installation/removal of traffic control for a work area will be subsidiary to the barricades and traffic control work.
21. Contractor to coordinate with the City of Georgetown to maintain access for all trash pick ups and mail services at all times,
22. The price for item GUSL-30-SLI is for full compensation for furnishing, installing, and testing luminaires; luminaire arms, brackets, poles, anchor bolt assemblies, templates, internal conductors, and connections; conducting system performance testing; and materials, equipment, labor, tools, and incidentals.
23. All 55W LED lamps for the proposed roadway illumination will be furnished and installed by Oncor electric.

Item	Description	**Rate
168	Vegetative Watering	0.03 MG/SY
**204	Sprinkling (Dust)	30 GAL/CY
	(Item 132)	30 GAL/CY
	(Item 247)	30 GAL/CY
**210	Rolling (Flat Wheel)	
	(Item 247)	1 HR/200 TON
	(Item 316)	1 HR/6000 SY
**210	Rolling (Tamping and Heavy Tamping)	1 HR/200 CY
**210	Rolling (LT Pneumatic Tire)	
	(Item 132)	1 HR/500 CY
	(Item 247)	1 HR/200 TON
	(Item 316 - Seal Coat)	1 HR/6000 SY
	(Item 316 - Two Course)	1 HR/3000 SY
247	Flexible Base (CMP IN PLC)	132 LB/CF
310	Prime Coat	0.20 GAL/SY
341, 344	Dense-Graded Hot-Mix Asphalt and Superpave	110 LB/SY/IN
	Tack Coat	0.08 GAL/SY

** For Informational Purposes Only

STREET LIGHT GENERAL NOTES:

1. All PVC conduit to be schedule 40. Contractor shall install a pull string in each conduit.
2. Al l conduits placed in an open trench shall be placed a min. of 18" Deep. (Unless specified otherwise on plans).
3. All existing utility locations and type shown on plans may vary in the field. Contractor shall verify all utility types and locations in the field with the appropriate agency prior to construction.
4. The contractor shall pothole all illumination pole locations and stage electrical service locations in the field and obtain approval from engineer or onsite representative prior to drilling any foundations.
5. All construction within the Right of Way will require compliance to the Texas Manual on Uniform Traffic Control Devices.
6. All Disturbed ROW must be re-vegetated with SOD and maintained until vegetation is re-established.
7. All lane closures must be coordinated with Municipality inspectors.

GENERAL

References to manufacturer's trade name or catalog numbers are for the purpose of identification only. Similar materials from other manufacturers are permitted if they are of equal quality, comply with the specifications for this project, and are approved.

If work is performed at Contractor's option, when inclement weather is impending, and the work is damaged by subsequent precipitation, the Contractor is responsible for all costs associated with replacing the work, if required.

The roadbed will be free of organic material prior to placing any section of the pavement structure.

Equip all construction equipment used in roadway work with highly visible omnidirectional flashing warning lights.

Provide a smooth, clean sawcut along the existing asphalt or concrete pavement structure, as directed. Consider subsidiary to the pertinent Items.

Construct all manholes/valves to final pavement elevations prior to the placement of final surface. If the manholes/valves are going to be exposed to traffic, place temporary asphalt around the manhole/valve to provide a 50:1 taper. The asphalt taper is subsidiary to the ACP work.

Keep the roadway free of debris and sediment caused by construction activities. Dispose of all material in accordance with federal, state, and local regulations. This work is subsidiary.

Damage to existing pipes and SET's due to Contractor operations will be repaired at Contractor's expense.

All locations used for storing construction equipment, materials, and stockpiles of any type, within the right of way, will be as directed. Use of right of way for these purposes will be restricted to those locations where driver sight distance to businesses and side street intersections is not obstructed and at other locations where an unsightly appearance will not exist. The Contractor will not have exclusive use of right of way but will cooperate in the use of the right of way with the city/county and various public utility companies as required.

ITEM 105 - REMOVING TREATED AND UNTREATED BASE AND ASPHALT PAVEMENT
Existing typical is based on information available. This typical may not account for all maintenance work such as overlays or pavement repairs. A change in material type or thickness does not warrant additional payment. Payment is full compensation for removing all material to the depth specified.

ITEM 247 - FLEXIBLE BASE
The layer thickness will be 4 in. to 6 in. unless shown on the plans. Placing in a single layer is allowed when total thickness of base is 8 in. or less. When placed in multiple layers, compact the bottom and middle layers to at least 95% and 98% of the maximum dry density, respectively. When placed in a single layer or the final layer, compact to at least 100%.

Correction of subgrade soft spots is subsidiary.

Complete per plans the subgrade, ditches, slopes, and drainage structures prior to the placement of base.

Do not use a vibratory roller to compact base placed directly on top of a drainage structure.

Grade 4 will have the same material requirements as Grade 5 except minimum compressive strength at lateral pressure 3 psi will be 70 psi and at lateral pressure 15 psi will be 150 psi.
Grade 4 does not have a minimum compressive strength at lateral pressure 0 psi.

ITEMS 260 THRU 276 - SUBGRADE TREATMENTS AND BASE
Use ordinary compaction for subgrade treatment.

Provide soil and base samples 5 business days prior to perform treatment work to allow time to test soil and confirm treatment rate.

ITEM 275 - CEMENT TREATMENT (ROAD-MIXED)
Unless shown on the plans, apply 3.0 pounds per square yard.

Unless shown on the plans flexible base will be as follows: Type A Grade 4 or 5, microcracked, and 7-day unconfined compressive strength of 150 psi.

ITEMS 341 THRU 348 - HOT-MIX ASPHALT PAVEMENT
Core holes may be filled with an Asphaltic patching material meeting the requirements of DMS-9203 or with SCM meeting requirements of DMS-9202.

Remove and dispose of off the ROW the audible/profile markings, reflectorized markings, and raised markers.

Install transverse butt joints with 50 ft. H: 1 in. V transition from the new ACP to the existing surface. Install a butt joint with 24 in. H: 1 in. V transition from the new ACP to a driveway, pullout or intersection. Saw cut the existing pavement at the butt joints. This work is subsidiary.

Use a device to create a maximum 3H:1V notched wedge joint on all longitudinal joints of 2 in. or greater. This work is subsidiary.
Prior to milling, core the existing pavement to verify thickness. This work is subsidiary.

Ensure placement sequence to avoid excess distance of longitudinal joint lap back not to exceed one day's production rates.

Submit any proposed adjustments or changes to a JMF before production of the new JMF.
Tack every layer. Do not dilute tack coat. Apply it evenly through a distributor spray bar.

Provide a minimum transition of 10-ft for intersections, 10-ft for commercial driveways, and 6-ft for residential driveways unless otherwise shown on the plans.

Irregularities will require the replacement of a full lane width using an asphalt paver. Replace the entire sublot if the irregularities are greater than 40% of the sublot area.

Lime or an approved anti-stripping agent must be used when crushed gravel is utilized to meet a SAC "A" requirement.

When using RAP or RAS, include the management methods of processing, stockpiling, and testing the material in the QCP submitted for the project. If RAP and RAS are used in the same mix, the QCP must document that both of these materials have dedicated feeder bins for each recycled material. Blending of RAP and RAS in one feeder bin or in a stockpile is not permitted.

Asphalt content and binder properties of RAP and RAS stockpiles must be documented when recycled asphalt content greater than 20% is utilized.

No RAS is allowed in surface courses.

Department approved warm-mix additives is required for all surface mix application when RAP is used. Dosage rates will be approved during JMF approval.

The Hamburg Wheel Test will have a minimum rut depth of 3mm except for SMA with HPG or PG 76.

ITEMS 341 - DENSE-GRADED HOT-MIX ASPHALT
Design all Type D mixtures as a surface mix, maximum 15% RAP, and without RAS.

For all mix types, contractor may not use a substitute PG binder for 76-22. When using substitute binders, mold specimens for mix design and production at the temperature required for the substitute binder used to produce the HMA.

The Hamburg Wheel minimum number of passes for PG 64 or lower is reduced to 7,000. The Engineer may accept Hamburg Wheel test results for production and placement if no more than 1 of the 5 most recent tests is below the specified number of passes and the failing test is no more than 2,000 passes below the specified number of passes.

ITEM 354 - PLANING AND TEXTURING PAVEMENT
Contractor retains ownership of salvaged materials.

Unless shown on the plans, mill and resurface the work area during each shift on roadways with ADT greater than 20,000 or if milling will expose the flex base or subgrade per the typical section. Unless shown on the plans, mill and resurface a work area within 5 days for roadways with ADT 20,000 or less.

Taper permanent transverse faces 50 ft. per 1 in.
Taper temporary transverse faces 25 ft. per 1 in.
Taper permanent longitudinal faces 6 ft. per 1 in.
HMA may be used as temporary tapers. Provide minimum 1 in. butt joints at bridge ends and paving ends. This work is subsidiary.
Milled surfaces directly covered by a mat thickness of 1 in. or less shall produce a milled texture with a ridge to valley depth (RVD) no greater than 0.25 in. (6.5 mm).

ITEM 416 - DRILLED SHAFT FOUNDATIONS
Stake all Foundations, for approval, before beginning drilling operations.

Calculate the vertical signal head clearance before placing any signal pole foundation. For mast-arm signal and strain pole anchor bolts, set two in tension and two in compression.

Obtain approval of placement prior to placing concrete. Remove spoils from a flood plain at the end of each workday.

ITEM 450 - RAILING
Use the elliptical tube option for rails T401, T402, and C402.

ITEM 496 - REMOVING STRUCTURES
Submit a demolition plan to the Engineer. Have the plan signed and sealed by a licensed professional engineer when the structure will continue to accommodate traffic after removal has begun and the removal impacts any part of the structure below the deck or riding surface. If applicable, the plan must detail requirements for meeting the U.S. Army Corps of Engineers' Section 404 Permit. The demolition plan must detail handling of roadway and waterway traffic. Waterway traffic must be maintained at all times unless a closure is approved by the Engineer.

No debris is allowed to fall into a body of water. Debris that falls into the water must be removed at the end of each workday. Debris that falls into the floodway must be removed at the end of each work week or prior to a rain event.

No debris is allowed to fall directly onto existing pavement. Existing pavement must be protected from damage by debris with a minimum of 1 ft. sand cushion. Submit an alternate roadway protection or cushion material to Engineer for approval. If existing pavement is PFC, use a vacuum truck to remove embedded sand after removal of sand cushion and debris. This work is subsidiary.

ITEM 502 - BARRICADES, SIGNS, AND TRAFFIC HANDLING
Table 5 (Special Events)

Event	City	Dates
Wine and Music Festival	Georgetown	Last Saturday of September

All the large and special events listed in the above tables occur annually. Coordinate with the Department and review the city/event website to plan around the future events.

To account for directional traffic volumes, begin and end times of closures may be shifted equally by the Engineer. The closure duration will remain. Added compensation is not allowed.

One-way traffic control, including work performed under Item 510, must be set up to provide a maximum of 20 minutes of delay to the traveling public.

Submit an emailed request for a lane closure (LCN) to TxDOT. The email will be submitted in the format provided. Receive concurrence prior to implementation. Submit a cancellation of lane closures a minimum of 18 hours prior to implementation. Blanket requests for extended periods are not allowed. Max duration of a request is 2 weeks prior to requiring resubmittal.

Provide 2-hour notice prior to implementation and immediately upon removal of the closure.

For roadways listed in Table 1: Submit the request 96 hours prior to implementation.

For roadways not listed in Table 1: Submit the request a minimum of 48 hours prior to the closure and by the following deadline immediately prior to the closure: 11A on Tuesday or 11A on Friday.

For all roadways: Submit request for traffic detours and full roadway closures 168 hours prior to implementation. Submit request for nighttime work 96 hours to implementation date.

Cancellations of accepted closures (not applicable to full closures or detours) due to weather will not require resubmission in accordance with the above restrictions if the work is completed during the next allowable closure time.
Closures that conflict with adjacent contractor will be prioritized according to critical path work per latest schedule. Conflicting critical path or non-critical work will be approved for first LCN submitted. Denial of a closure due to prioritization or other reasons will not be reason for time suspension, delay, overhead, etc.

Meet with the Engineer prior to lane closures to ensure that sufficient equipment, materials, devices, and workers will be used. Take immediate action to modify current and future traffic control, if at any time the queue becomes greater than 20 minutes.

Consider inclement weather prior to implementing the lane closures. Do not set up traffic control when the pavement is wet.

NO.	REVISION	DATE

PAPE-DAWSON ENGINEERS
AUSTIN I SAN ANTONIO I HOUSTON I FORT WORTH I DALLAS
10801 N MOPAC EXPY, BLDG 3, STE 200 I AUSTIN, TX 78759 I 512.454.8711
TEXAS ENGINEERING FIRM #470 I TEXAS SURVEYING FIRM #10028800

WOLF RANCH PKWY / MEMORIAL DR

GENERAL NOTES

CITY JOB No.
JOB NO. 51423-04
DATE 9/16/2025
DESIGNER
CHECKED DRAWN

SHEET NO. 30

Date: 9/16/2025
Plotted:

THIS DOCUMENT HAS BEEN PRODUCED FROM MATERIAL THAT WAS STORED AND/OR TRANSMITTED ELECTRONICALLY AND MAY HAVE BEEN INADVERTENTLY ALTERED. RELY ONLY ON FINAL HARDCOPY MATERIALS BEARING THE CONSULTANT'S ORIGINAL SIGNATURE AND SEAL.

ITEM 502 - BARRICADES, SIGNS AND TRAFFIC HANDLING (CONT'D)

Cover, relocate, or remove existing small, large, and overhead signs that conflict with traffic control. Cover large and overhead signs to remain using latest standard TS-CD. This work is subsidiary.

Install all permanent signs, delineation, and object markers required for the operation of the roadway before opening to traffic. Use of temporary mounts is allowed or may be required until the permanent mounts are installed or not impacted by construction. Maintain the temporary mounts. This work is subsidiary.

Place a 28-inch cone, meeting requirements of BC (10) and Ty III barricades, on top of foundations that have protruding studs. This work is subsidiary.

Vertical panels used on roadways with speed limit 55 mph or greater must be round in shape or have a self-righting mechanism. The "flat" or "oblong" shaped vertical panels are not allowed.

A series of sequential flashing warning lights, per BC(7), must be installed in a merging taper for long term stationary TCP. This includes all TCP setups, such as those shown on the plans or TCP setups per the standards.

Edge condition treatment types must be in accordance with the TxDOT standard. Installation and removal of a safety slope is subsidiary.

To determine a speed limit or an advisory speed limit, submit a request to TxDOT 60 business days prior to manufacture of the sign.

For non-site-specific signal projects, 2 months of barricades will be paid per work order location.

The Contractor Force Account "Safety Contingency" that has been established for this project is intended to be utilized for work zone enhancements, to improve the effectiveness of the Traffic Control Plan, that could not be foreseen in the project planning and design stage. These enhancements will be mutually agreed upon by the Engineer and the Contractor's Responsible Person based on weekly or more frequent traffic management reviews on the project. The Engineer may choose to use existing bid items if it does not slow the implementation of enhancement.

Business access signs will be paid using safety contingency. Install as directed by the Engineer. Company logos will not be permitted on the signs. Maintenance of the signs will be subsidiary to Item 502.

ITEM 503 - PORTABLE CHANGEABLE MESSAGE SIGN

Place PCMS 10 calendar days prior to begin work stating "Road Work Begin Soon, Contact 832-7000 For Info".

Place PCMS at time of LCN request. Place the PCMS at the expected end of queue caused by the closure. When the closure is active, revise the message to reflect the actual condition during the closure, such as "RIGHT LN CLOSED XXX FT".

ITEM 505 - TRUCK MOUNTED ATTENUATOR AND TRAILER ATTENUATOR

The TMA/TA used for installation/removal of traffic control for a work area will be subsidiary to the TMA/TA used to perform the work.

The contractor will be responsible for determining if one or more operations will be ongoing at the same time to determine the total number of TMA/TA required for the work. TMA/TAs paid by the day is full compensation for all worksite locations during an entire day.

TMA/TAs used to protect damaged attenuators will be paid by the day using the force account item for the repair.

ITEM 506 - TEMPORARY EROSION, SEDIMENTATION, AND ENV CONTROLS

If SW3P plan sheets are not provided, place the control measures as directed.

Install, maintain, remove control measures in areas of the right of way utilized by the Contractor that are outside the limits of disturbance required for construction. Permanently stabilize the area. This work is subsidiary.

Erosion control measures must be initiated immediately in areas where construction activities have ceased and will not resume for a period exceeding 14 calendar days. Vertical track all exposed soil, stockpiles, and slopes. Re-track after each rain event or every 14 days, whichever occurs first. Sheep foot roller is allowed for vertical tracking. This work is subsidiary.

ITEM 506 - TEMPORARY EROSION, SEDIMENTATION, AND ENV CONTROL (CONT'D)

For routine or anticipated dewatering, notify the engineer 72 hours before beginning dewatering. Notify the Engineer within 1 hour of beginning emergency or recent rainfall dewatering. Water located within the ROW that will leave the ROW must appear free of pollutants such as suspended sediment, oil sheen, floating solids, etc. Dirty water must pass thru adequate BMPs prior to leaving the ROW to prevent discharge of dirty water. Bypass pumping of water found in a navigable waterway that enters from outside the ROW and is discharged downstream of the ROW will not require the use of BMPs. Dewatering BMPs will be paid for in conformance with the applicable bid items. However, if the necessary BMP item is not included in the Contract, payment for the BMP will be in accordance with Article 9.7., "Payment for Extra Work and Force Account Method." The act of dewatering and the equipment used to dewater will not be paid for directly but will be subsidiary to pertinent bid items.

Unless a specific pay item is provided in the plans, the installation of the 6:1 or flatter for RFD side slopes in the safety zone will be subsidiary to pertinent bid items.

Cover small waste containers (100 gallons or less) at all times. This work is subsidiary. Large waste containers (more than 100 gallons) must have a secondary discharge containment system around the container using erosion control logs. Installation of the log for each container location will be paid using existing bid items. Repair, remove, or replace of the log will not be paid. Revisions, repairs, remove or replace of the log during exchange of empty/full containers at the same location will not be paid.

Portable restrooms must be located more than 50 ft. from a waterway. Tie or stake down portable restrooms to prevent tipping due to vandalism or weather. This work is subsidiary.

Provide a designated location for disposal when excess and waste, including waste generated from cleaning of all equipment used for mixing, hauling, and transfer concrete is disposed in the ROW or PSL. Manufactured disposal containers must be metal or a plastic material with minimum 10 mil thickness. Paper, earthen berms, or pits must be lined with minimum 10 mil thickness polyethylene sheeting. Disposal locations must be located a minimum of 50 ft. from a waterway, tree, or sensitive feature. The disposal location must have a minimum height of 6 in. Maintain a minimum 4 in. of freeboard at all times. Disposal locations are not required for cleaning of small hand tools. Hardened concrete waste may be used as embankment if placed in accordance with Item 132.

Dust Control

Stockpiles that will be inactive for greater than 14 days must be treated to contain dust by covering with chemical dust suppressant, soil blanket, vertical tracking, or method other than sprinkling with water. Stockpiles that are actively being used must be treated to contain dust by vertical tracking or a method determined by the Contractor. This work is subsidiary.

Provide designated construction traffic routes when feasible. Construction site traffic must be directed to use designated routes.

ITEM 512 - PORTABLE TRAFFIC BARRIER

Designated source barrier stockpile locations: SH 45 just west of US 183 South, SH 130 @ Harold Green, or SH 130 @ Greg Manor Rd. Upon completion of the project, designated source PTB deemed unsalvageable by the Engineer will become the property of the contractor and paid for removal using Item 104. Connection hardware is NOT available for designated source, furnish and retain all hardware to install the PTB.

If bid item allows concrete or steel, the steel barrier must provide a maximum deflection of 2 ft. 3 in. Pinning and other work to obtain the required deflection is subsidiary.

Any increase in temporary barrier quantities that occur due to Contractor changes in the sequence of work or the traffic control plan will not be paid.

ITEMS 528, 529, 530, 531, & 536 - MISCELLANEOUS CONSTRUCTION

Reinforcement will be in accordance with Section 432.3.1 unless shown on the plans. Fiber reinforcement is not allowed. GFRP is allowed reinforcement for all applications. Class A and B Concrete are allowed to use Coarse Aggregate Grades 1-8.

ITEM 528, 529, 530, 531, & 536 - MISCELLANEOUS CONSTRUCTION (CONT'D)

Unless shown on the plans, all concrete will be 5 in. thick and have 2 in. sand, base, or RAP bedding. Furnish base meeting the requirement for any type or grade in accordance with Item 247. Compressive strengths for flexible base are waived. RAP must be 100% passing a 1 in. sieve. Bedding and flexible base must be placed using ordinary compaction.

Expansion joints will be placed every 40 ft. Expansion joints must be 1 in. wide asphalt board and flush with the surface. The bottom of the asphalt board will be at half the depth of the concrete. The reinforcement will be continuous thru the expansion joint.

Sidewalk cross slope must not exceed 1.5%.

If roots are encountered verify with the Engineer before accommodating or removing 2 in. diameter or larger roots. Root removal must be in accordance with Section 752.4.2. Roots may remain in the bedding or base. For improvements within 6 in. of a root, the concrete thickness may be reduced by 1 in. and the bedding increased by 1 in. to minimize impacts to the roots. Adjust bedding and surface profile to provide a 1 in. bedding cushion around the roots. The surface profile may be adjusted to the extent allowed by ADA. This work is subsidiary.

ITEMS 540, 542, & 544 - METAL BEAM GUARD FENCE AND GUARDRAIL END TREATMENTS

Furnish round timber posts for guard fence. Steel posts for low fill culvert applications is subsidiary including use of low fill culvert application due to other concrete structures such as inlets. Long span application at inlets may be used as an alternate to low fill culvert. Unless otherwise specified on the plans, use of low fill culvert or long span at inlets will be subsidiary to pertinent items. Stake the locations for approval before installation. Adjust the limits of the fence to meet field conditions. Install delineators before opening the road to traffic.

Retain all materials. Existing materials that are structurally sound and dent free may be reused. All reused material will be from this project and in compliance with current standards. Structurally sound rust spots with the largest dimension of 4 in. may be cleaned and repaired in accordance with Section 540.3.5. Punch or field drill holes in the metal rail element to accommodate post spacing. Additional holes for splice or connections are not allowed. Space the field holes in accordance with the latest standard but no closer than the minimum spacing shown on the current standard.

Remove, replace, and install mow strip block out material. Construct new block outs and backfill unused block outs with class B concrete. This work is subsidiary.

Repair of mow strip damage, not caused by contractor negligence, and installation of new mow strip will be paid with appropriate bid items. Backfill and shoulder up of area around fence and mow strip will be paid using embankment item.

ITEM 560 - MAILBOX ASSEMBLIES

All wedge anchor sockets must be set in a concrete foundation per Type 4 support/foundation detail on MB standards.

ITEM 610 - ROADWAY ILLUMINATION ASSEMBLIES

Upon removal, contact signal shop to stockpile a maximum of 10 assemblies that meet the current TxDOT standards at the Austin District Headquarters located at 7901 North IH 35, 78753. If signal shop declines receipt of these assemblies, Contractor will be responsible for disposal.

Illumination assemblies used for roadways listed in Table Dark Sky must have a color temperature less than 3000k.

Table Dark Sky

Roadway	Limits
US 290	SH 71 to RR 479 near Harper, Texas
US 281	SH 46 to RM 1431
US 87	All
SH 16	All
SH 71	RM 2244 to US 87
SH 29	RM 1431 to RR 1221 near Menard, Texas
RR 2147	All
RM 1431	US 281 to SH 29
RM 12	RM 32 to RM 3238
RM 2325	RM 12 to RM 165
Gillespie County	All Roads
Blanco County	All Roads
Mason County	All Roads

ITEM 610- ROADWAY ILLUMINATION ASSEMBLIES (CONT'D)

For each assembly, paint the service, circuit, run and assembly number/letter using 3 in. tall characters and black paint. The marking shall be stacked vertically with the service on top and the assembly number/letter on the bottom. Paint 6 ft. above the roadway surface on the hand access door side of the pole or adjacent to the assembly if mounted to a structure. This work is subsidiary.

For both transformer and shoe-base type illumination poles, provide double-pole breakaway fuse holder.

Provide 10-amp time delay fuses.

Maintain all new and existing illumination for the duration of the contract. All existing illumination will remain operational until replaced by new illumination or required to be removed due to construction. Maintenance of existing illumination will be as directed by the Engineer and paid per Section 7.2.3 Safety Contingency in accordance with Article 9.7., "Payment for Extra Work and Force Account Method."

ITEM 618 - CONDUIT

Shift the locations of conduit and ground boxes to accommodate field conditions. Install conduit not exceeding 2 feet in any direction from a straight line. Install conduit at a minimum depth of 2 ft. below finished grade. Installation of the conduit by jacking or boring method will be at a depth of at least 1 ft. below bottom of subgrade.

Install a high tension, non-metallic pull rope in all empty conduit runs. This work is subsidiary. Use a coring device, not a hammer drill, when drilling holes through concrete structures.

Structurally mounted junction boxes will be as shown on the plans. When used for traffic signal installations, these boxes will be 12" x 12" x 8". This work is subsidiary.

For underground conduit, smooth wall schedule 40 equivalent HDPE can be substituted for schedule 40 PVC. Minimum distance between HDPE joints will be 200 ft. HDPE must transition to RMC/PVC per ED (11)-14.

For SCH 80 bore conduits, a schedule 40 equivalent HDPE carrier pipe of adequate size to carry the proposed conduits can be used as substitute.

When using existing conduit, ensure that all conduits have bushings and cleaned of dirt, mud, grease, and other debris. Re-strap existing or relocated conduit per the latest specification. This work is subsidiary.

Abandoned underground conduit must have all conductors removed. This work is subsidiary.

Stakes or other physical method shall be installed to hold down conduit prior to placement of concrete/flow fill encasement.

For conduit mounted to bridges in hangers, fiberglass can be substituted for RMC. Furnish and install per 2014 Special Specification 6390 or the 2024 specification when available.

ITEM 620 - ELECTRICAL CONDUCTORS

Provide 10-amp time delay fuses.

For Flashing Beacons (Item 685) and Pedestal Poles (Item 687), provide single-pole breakaway disconnects.

Install a minimum size 8 AWG equipment grounding conductor (EGC) in all conduits including loop detectors and traffic signal cables. Payment and the size of the EGC will be in accordance with standard ED (3)-14 note 12.

Permanently mark "Illumination" on the luminaire conductors installed inside a traffic signal pole. Make the marks easily visible from the hand hole.

ITEM 624 - GROUND BOXES

Aggregate for fill under the box will be crushed, have a maximum size of 2 in., minimum size of $\frac{5}{8}$ in., and requirements per Item 302 are waived.

ITEM 628 - ELECTRICAL SERVICES

Contact the utility company upon execution of contract and prior to the pre-construction meeting to make arrangements for all work and materials provided by the utility company. Contact AUS_Auditors@txdot.gov for account approval and information. Accounts shall be placed in the name of TxDOT.

ITEM 644 - SMALL ROADSIDE SIGN ASSEMBLIES

Triangular slip base must be the clamp style to secure the post to the slip base. Set screw style slip base will not be allowed.

ITEM 662 - WORK ZONE PAVEMENT MARKINGS

Notify the Engineer at least 24 hours in advance of work for this item.

Broken line markings must use solid line markings in lane shifts.

Maintain removable and short-term markings daily. Remove within 48 hours after permanent striping has been completed.

Item 668 is not allowed for use as Item 662.

Roadways with existing profile pavement markings or rumble strips must supplement work zone solid lines with traffic buttons spaced at 12 in. Traffic buttons used to supplement the work zone markings will be paid by the each in addition to the work zone item.

ITEM 666 - RETROREFLECTORIZED PAVEMENT MARKINGS

Notify the Engineer at least 24 hr. before beginning work.

All projects, including resurfacing, must increase center-to-center width for center line markings to 18 in. unless the plans or existing is greater than 18 in.

Place longitudinal markings nightly for IH 35 main lanes or roadways with AADT greater than 100,000. Use of temporary flexible reflective roadway marker tabs is subsidiary and at the Contractor's option. Replace missing or damaged tabs nightly. If using tabs, place longitudinal markings weekly by 5 AM Friday for all weekday work and by 5 AM Monday for all weekend work. Failure to maintain tabs or place longitudinal markings by deadline will require nightly placement of longitudinal markings.

Place longitudinal markings no later than 7 calendar days after placement of the surface for roadways with AADT greater than 20,000.

When the raised portion of a profile marking is placed as a separate operation from the pavement marking, the raised portion must be placed first then covered with TY 1.

When using black shadow to cover existing stripe apply a non-retroreflective angular abrasive bead drop. The marking color shall be adjusted to resemble the pavement color. If Item 677 is not used prior to placement of black shadow, scrape the top of the marking with a blade or large piece of equipment unless surface is a seal coat. The scraping of the marking is subsidiary.

ITEM 672 - RAISED PAVEMENT MARKERS

Place Type I-C and II-C-R markers at 40 ft. spacing for all lane lines.

ITEM 677 - ELIMINATING EXISTING PAVEMENT MARKINGS AND MARKERS

Dispose of removed materials and debris at locations off the right of way.

Elimination using a pavement marking will not be allowed in lieu of methods listed in specification.

Remove pavement markings on concrete surfaces by a blasting method. Flail milling will be allowed when total quantity of removal on concrete surfaces is less than 1000 ft.

Strip seal is only method allowed on seal coat surface unless project includes placement of a new surface. If total quantity of removal on a seal coat surface is less than 2000 ft., elimination using a pavement marking is allowed if a test section is approved by the Engineer. Test section shall demonstrate the thermo marking color matches the existing pavement color.

Remove pavement markings outside the limits of the new surface by a blasting method.

Use a TRAIL or a non-retroreflective paint to cover stripe remnants that remain after elimination.

The test requirements for these materials are waived. The paint color shall be adjusted to resemble the existing pavement color. Installation and maintenance is subsidiary.

NO.	REVISION	DATE

PAPE-DAWSON ENGINEERS
AUSTIN I SAN ANTONIO I HOUSTON I FORT WORTH I DALLAS
10801 N MOPAC EXPY, BLDG 3, STE 200 I AUSTIN, TX 78759 I 512.454.8711
TEXAS ENGINEERING FIRM #470 I TEXAS SURVEYING FIRM #10028800

WOLF RANCH PKWY / MEMORIAL DR

GENERAL NOTES

CITY JOB No.
JOB NO. 51423-04
DATE 9/16/2025
DESIGNER
CHECKED DRAWN

SHEET NO. 31

Date: 9/16/2025
File:

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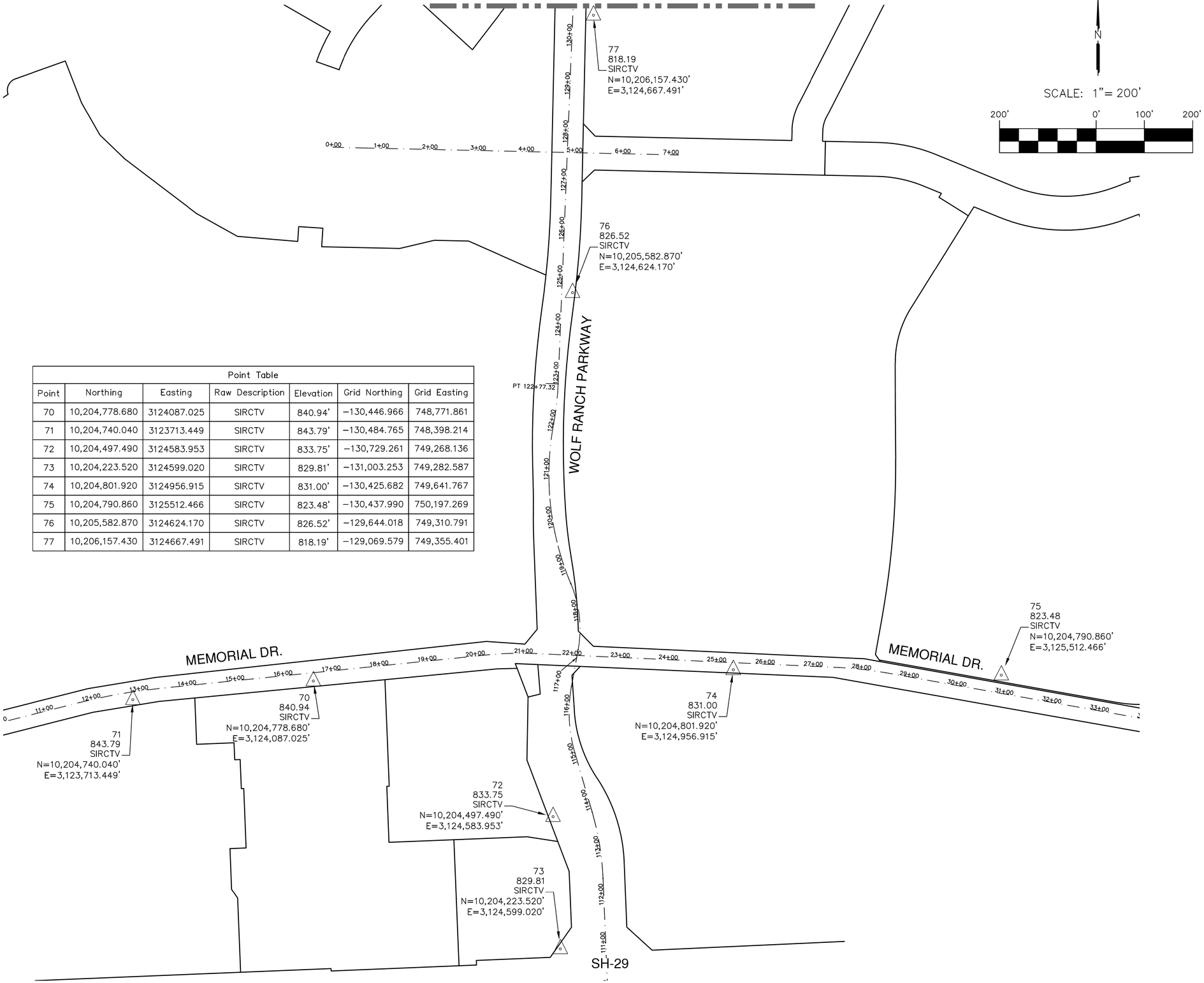

Point Table						
Point	Northing	Easting	Raw Description	Elevation	Grid Northing	Grid Easting
70	10,204,778.680	3124087.025	SIRCTV	840.94'	−130,446.966	748,771.861
71	10,204,740.040	3123713.449	SIRCTV	843.79'	−130,484.765	748,398.214
72	10,204,497.490	3124583.953	SIRCTV	833.75'	−130,729.261	749,268.136
73	10,204,223.520	3124599.020	SIRCTV	829.81'	−131,003.253	749,282.587
74	10,204,801.920	3124956.915	SIRCTV	831.00'	−130,425.682	749,641.767
75	10,204,790.860	3125512.466	SIRCTV	823.48'	−130,437.990	750,197.269
76	10,205,582.870	3124624.170	SIRCTV	826.52'	−129,644.018	749,310.791
77	10,206,157.430	3124667.491	SIRCTV	818.19'	−129,069.579	749,355.401

NOTES:

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2. ELEVATIONS SHOWN ARE BASED ON NAVD88 (GEOID 18), AND ESTABLISHED BY RTK OBSERVATIONS AND A CLOSED DOUBLE RUN DIGITAL LEVEL LOOP.

3. SURVEY WAS COMPLETED IN THE FIELD ON **9/12/2024.**

LEGEND

	CONTROL POINT
CR	COUNTY ROAD
N:	NORTHING
E:	EASTING
ELEV:	ELEVATION
TRAV	TRAVERSE

SURVEYOR'S CERTIFICATION:

THE CONTROL POINTS SHOWN HEREIN WERE DETERMINED BY A SURVEY MADE ON THE GROUND UNDER MY SUPERVISION.

SURVEYOR
RPLS 5768

STATE OF TEXAS
REGISTERED
ALAN J HORTON
5768
PROFESSIONAL
LAND SURVEYOR

09/09/2025

NO.	REVISION	DATE

GEORGETOWN TEXAS
more than welcome

PAPE-DAWSON ENGINEERS
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TBPE FIRM REGISTRATION #470 | TBPLS FIRM REGISTRATION #10028801

WOLF RANCH PKWY / MEMORIAL DR
CITY OF GEORGETOWN, TEXAS

SURVEY CONTROL SHEETS

CITY JOB No.
JOB NO. 51423-04
DATE 10/24/2024
DESIGNER
CHECKED DRAWN
SHEET 1 OF 3
SHEET 33

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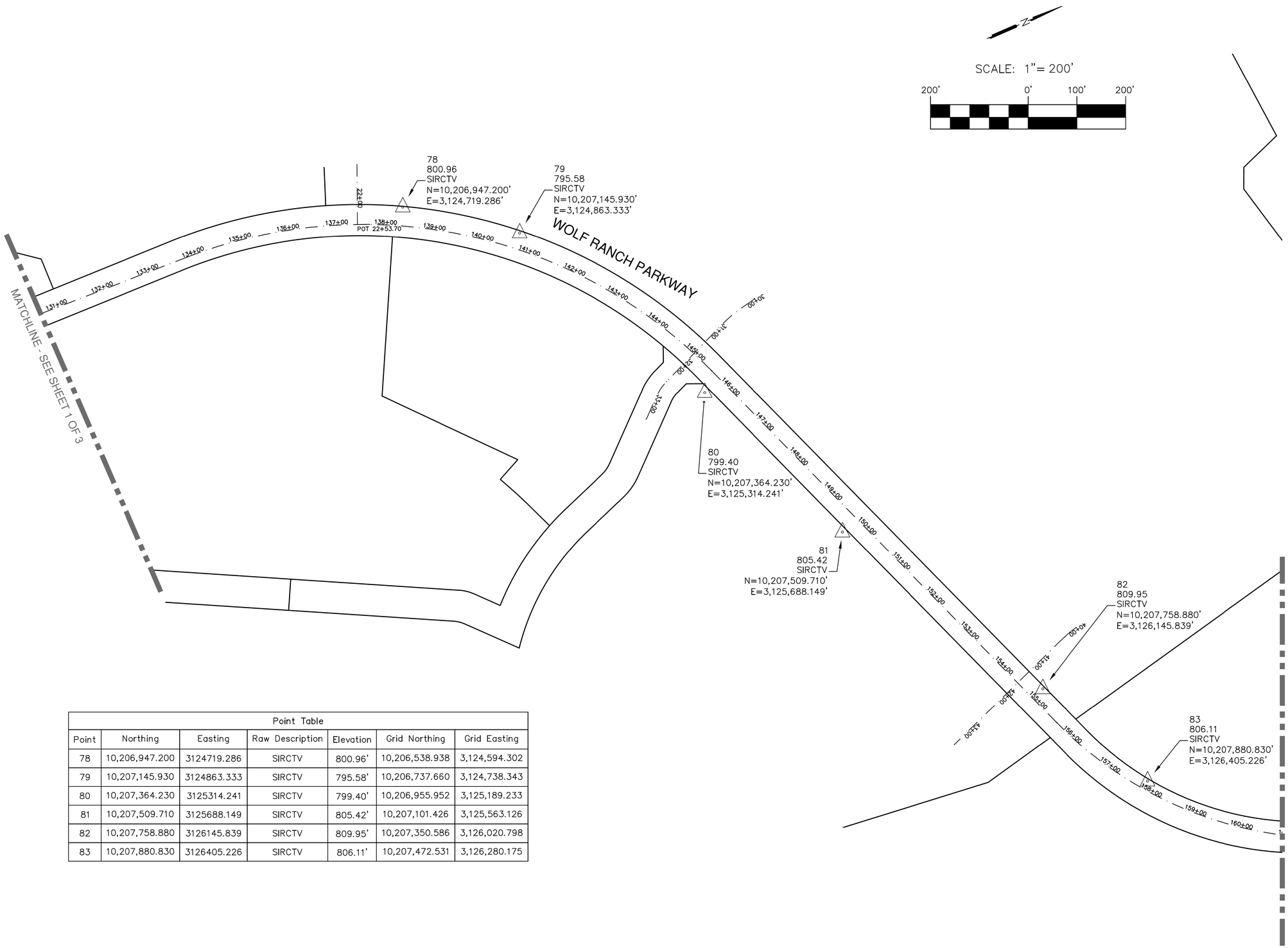

Point Table						
Point	Northing	Easting	Raw Description	Elevation	Grid Northing	Grid Easting
78	10,206,947.200	3124719.286	SIRCTV	800.96'	10,206,538.938	3,124,594.302
79	10,207,145.930	3124863.333	SIRCTV	795.58'	10,206,737.660	3,124,738.343
80	10,207,364.230	3125314.241	SIRCTV	799.40'	10,206,955.952	3,125,189.233
81	10,207,509.710	3125688.149	SIRCTV	805.42'	10,207,101.426	3,125,563.126
82	10,207,758.880	3126145.839	SIRCTV	809.95'	10,207,350.586	3,126,020.798
83	10,207,880.830	3126405.226	SIRCTV	806.11'	10,207,472.531	3,126,280.175

NOTES:

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SURVEYOR
RPLS 5768

STATE OF TEXAS REGISTERED ALAN J HORTON 5768 PROFESSIONAL LAND SURVEYOR

09/09/2025

NO.	REVISION	DATE

GEORGETOWN TEXAS more than welcome

PAPE-DAWSON ENGINEERS

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WOLF RANCH PKWY / MEMORIAL DR
CITY OF GEORGETOWN, TEXAS

SURVEY CONTROL SHEETS

CITY JOB No.
JOB NO. 51423-04
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SHEET 2 OF 3

SHEET 34

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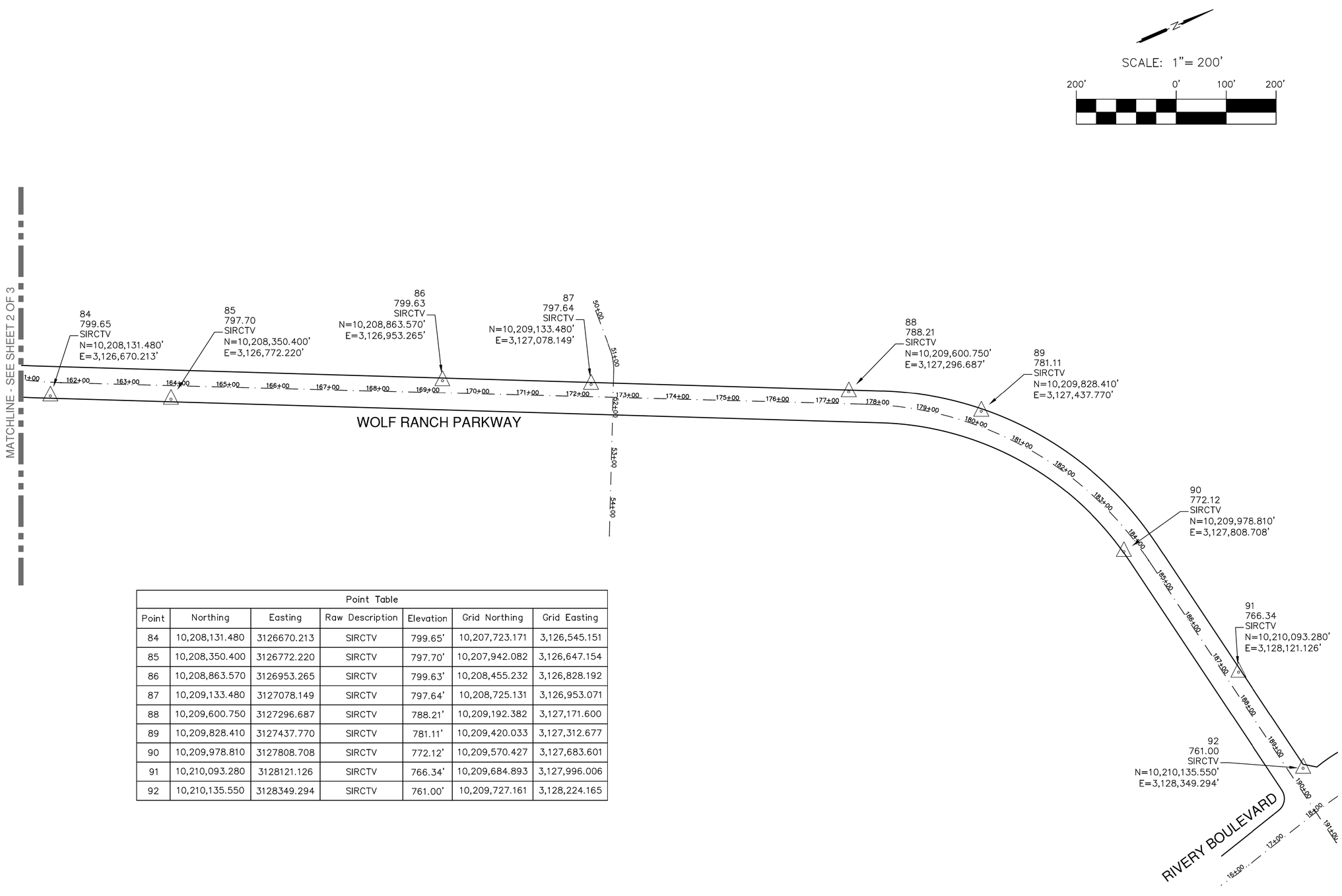

Point Table						
Point	Northing	Easting	Raw Description	Elevation	Grid Northing	Grid Easting
84	10,208,131.480	3126670.213	SIRCTV	799.65'	10,207,723.171	3,126,545.151
85	10,208,350.400	3126772.220	SIRCTV	797.70'	10,207,942.082	3,126,647.154
86	10,208,863.570	3126953.265	SIRCTV	799.63'	10,208,455.232	3,126,828.192
87	10,209,133.480	3127078.149	SIRCTV	797.64'	10,208,725.131	3,126,953.071
88	10,209,600.750	3127296.687	SIRCTV	788.21'	10,209,192.382	3,127,171.600
89	10,209,828.410	3127437.770	SIRCTV	781.11'	10,209,420.033	3,127,312.677
90	10,209,978.810	3127808.708	SIRCTV	772.12'	10,209,570.427	3,127,683.601
91	10,210,093.280	3128121.126	SIRCTV	766.34'	10,209,684.893	3,127,996.006
92	10,210,135.550	3128349.294	SIRCTV	761.00'	10,209,727.161	3,128,224.165

SCALE: 1"= 200'

200' 0' 100' 200'

NOTES:

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CITY OF GEORGETOWN, TEXAS

SURVEY CONTROL SHEETS

CITY JOB No.
JOB NO. 51423-04
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CHECKED DRAWN
SHEET 3 OF 3
SHEET 35

THIS DOCUMENT HAS BEEN PRODUCED FROM MATERIAL THAT WAS STORED AND/OR TRANSMITTED ELECTRONICALLY AND MAY HAVE BEEN INADVERTENTLY ALTERED. RELY ONLY ON FINAL HARDCOPY MATERIALS BEARING THE CONSULTANT'S ORIGINAL SIGNATURE AND SEAL.

GENERAL

1. CONTRACTOR IS TO NOT BEGIN ANY WORK IN PARCELS 4 AND 5 UNTIL THE CITY HAS CONFIRMED A ROW AGREEMENT HAS BEEN REACHED.
2. CONTRACTOR SHALL BE RESPONSIBLE TO MAINTAIN TRAFFIC CONTROL AS SET FORTH IN THE TEXAS MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES (TMUTCD) FOR STREETS AND HIGHWAYS.
3. THE CONTRACTOR SHALL COVER UP EXISTING OR PROPOSED SIGNS CONFLICTING WITH CONSTRUCTION SIGNS, AT ALL TIMES DURING CONSTRUCTION.
4. LANES MAY BE CLOSED TO TRAFFIC DURING 9AM-4PM. LANE CLOSURES OUTSIDE OF THIS TIME WINDOW REQUIRE SEPARATE APPROVAL.
5. PEDESTRIAN ROUTES SHOWN IN THE PLANS ARE SUGGESTIONS, IT IS THE CONTRACTOR'S RESPONSIBILITY TO HAVE ADA COMPLIANT ACCESSIBLE PEDESTRIAN ROUTES SHALL BE MAINTAINED AT ALL TIMES DURING CONSTRUCTION AND DO SO WHILE CONSIDERING PEDESTRIAN SAFETY. CONSTRUCTION FENCE BEING USED SHALL NOT NEGATIVELY IMPACT SIGHT DISTANCE FOR THE VEHICLES IN THE CORRIDOR. WHEN PEDESTRIANS ARE SHIFTED ONTO THE EXISTING ROADWAY PAVEMENT IN INTERIM STAGES, A POSITIVE BARRIER SHALL BE PLACED BETWEEN THE ACCESSIBLE PATH AND THE LIVE TRAFFIC AT ALL TIMES REGARDLESS OF HORIZONTAL OFFSET.
6. THE CONTRACTOR SHALL COORDINATE WITH OWNERS OR RELATED ENTITIES REGARDING LANE CLOSURES ON ANY PRIVATE RIGHT OF WAY OR STREET. CONTRACTOR TO FOLLOW TMUTCD GUIDELINES FOR LANE CLOSURES.
7. THE CONTRACTOR SHALL CHECK UTILITY ELEVATIONS BEFORE BEGINNING ANY SORT OF GRADING\EXCAVATION WORK TO ENSURE THERE ARE NO CONFLICTS.
8. CONTRACTOR TO ENSURE CITY OF ROUND ROCK WATERLINE IS NOT DAMAGED IN ANY WAY DURING CONSTRUCTION.
9. THE CONTRACTOR SHALL COORDINATE WITH ANY SCHOOL, FIRE STATIONS, POLICE DEPARTMENTS AND PUBLIC TRANSPORTATION ROUTES THAT MAY BE AFFECTED DURING CONSTRUCTION.
10. THE CONTRACTOR SHALL CONTACT THE CITY ENVIRONMENTAL WASTE SERVICES AND COORDINATE THE WORK AS TO NOT INTERRUPT TRASH PICK UP SCHEDULE.
11. ITEMS LISTED AS "CHANNELIZING DEVICES" MAY BE BARRELS, VERTICAL PANELS OR CONES. IT IS UP TO THE CONTRACTOR'S DISCRETION.
12. THE SEQUENCE OF WORK IS NOT TO BE CONSIDERED RESTRICTIVE. THE CONTRACTOR WITH WRITTEN APPROVAL OF THE ENGINEER MAY ALTER THE SEQUENCE OF CONSTRUCTION PROVIDED THE TRAFFIC IS MAINTAINED AND THE CRITERIA ESTABLISHED HEREIN IS FOLLOWED.
13. AT THE END OF EACH DAY, THE CONTRACTOR SHALL NOT LEAVE EQUIPMENT IN A POSITION THAT WILL ENDANGER THE TRAVELING PUBLIC.
14. IT IS THE CONTRACTOR RESPONSIBILITY TO MAINTAIN POSITIVE DRAINAGE THROUGHOUT THE CONSTRUCTION PROCESS FOR ALL PHASES AND INTERIM PHASES.
15. ACCESS TO PROPERTIES MUST BE MAINTAINED AT ALL TIMES, IF THERE IS A NEED TO RESTRICT ACCESS TO A PROPERTY OWNER. IT IS THE CONTRACTOR'S RESPONSIBILITY TO COORDINATE THIS AT MINIMUM 7 DAYS IN ADVANCE.
16. A MINIMUM 3:1 (H: V) TEMPORARY SAFETY SLOPE OF STABLE NON-ERODIBLE MATERIAL WILL BE REQUIRED TO PROTECT ALL DROP OFFS GREATER THAN 2" AT ALL TIMES DURING NON-WORKING HOURS. THE COST FOR THIS IS INCLUDED IN ITEM 502.
17. ANY MONUMENT SIGNS IN CONFLICT WITH PROPOSED OR TEMPORARY CONSTRUCTION THROUGHOUT THIS PROJECT ARE TO BE RETURNED TO THE OWNER.
18. ANY LOCATION WHERE 1 LANE 2 WAY TRAFFIC CONTROL WILL BE REQUIRED. THE CONTRACTOR IS TO UTILIZE THE APPROPRIATE TCP STANDARD ACCORDING TO THE DURATION REQUIRED AS SHOWN ON TXDOT'S TCP WORK SHEET (TCPWS-16).
19. CONTRACTOR SHALL NOT SET UP WORK ZONES TO PROHIBIT ANY UTILITIES FROM COMPLETING RELOCATION CONSTRUCTION.

PHASE I STEP 0

PURPOSE: MOBILIZE, PREPARE ROW, CONSTRUCTION PROPOSED WATERLINES AND FORCE MAINS, CONSTRUCTION DETENTION POND IMPROVEMENTS, CONSTRUCTION TEMPORARY PAVEMENT ON WOLF RANCH STA 115+89-116+73, TEMPORARY TRAFFIC SIGNAL ADJUSTMENTS.

1. INSTALL ADVANCE WARNING SIGNS ACCORDING TO THE ADVANCE WARNING SIGNS SHEET, THE TXDOT BC STANDARDS AND PLAN SHEETS.
2. INSTALL ALL SW3P MEASURES AND TREE PROTECTION PRIOR TO THE START OF CONSTRUCTION ACTIVITIES. THE SW3P MEASURES ARE TO BE LEFT IN PLACE UNTIL DISTURBED AREAS ARE NOT LONGER THREATENING TO THE DOWN STREAM ELEMENTS. REFER TO THE EROSION CONTROL SHEETS FOR MORE DETAILS.
3. UTILITY CONTRACTOR IS TO CONSTRUCT WATERLINE AND FORCE MAINS. THIS IS TO BE COMPLETED BEFORE DOING ANY OF THE ROADWAY CONSTRUCTION.
4. CONSTRUCT TEMPORARY MEDIAN PAVEMENT FROM STA 115+89 TO STA 116+73, UTILIZING TXDOT TCP STANDARD TCP (2-1)-18. THIS IS TO BE COMPLETED FIRST IN ORDER TO SHIFT TRAFFIC OVER.
5. DURING THIS TIME ALL OF THE NON JOINT UTILITIES ARE ALSO TO BE CONSTRUCTED. THE CONTRACTOR IS TO NOT OVERLAP WITH THEM UNTIL THEY'RE CLEARED. REFER TO TCP PLAN SHEETS FOR WHAT IS IDENTIFIED AS STEP 0.
6. USE WZ(BTS-1)-13 TO SHIFT TEMPORARY TRAFFIC SIGNAL HEADS TO INTERIM LOCATIONS AS SHOWN IN THE PLANS AND THEN USE TXDOT TCP STANDARDS TCP(3-1)-13, TCP(3-2)-13 AND TCP(3-3)-14 TO INSTALL TRAFFIC CONTROL DEVICES INCLUDING CHANNELIZING DEVICES, WORK ZONE PAVEMENT MARKINGS AND CONSTRUCTION SIGNAGE ALONG WOLF RANCH PARKWAY IN ACCORDANCE TO TXDOT TCP STANDARDS TCP(2-1)-18, TCP(2-3)-23, TCP(2-4)-18 AND TCP(2-5)-18. REFER TO THE PLANS FOR THE GENERAL LOCATION OF CONSTRUCTION PAVEMENT MARKINGS, SUGGESTED TEMPORARY PEDESTRIAN PATHS, LOW PROFILE BARRIERS AND CONSTRUCTION SIGNAGE. THE CONTRACTOR IS TO ELIMINATE ANY EXISTING PAVEMENT MARKINGS CONFLICTING WITH CONSTRUCTION MARKINGS AND REMOVE AND\OR COVER ANY SIGNS CONFLICTING WITH CONSTRUCTION SIGNS.
7. FULLY CLOSE MEMORIAL DR TO THE EAST OF THE ROUNDABOUT. RESTRICT TRAFFIC ON THE WEST SIDE OF THE ROUNDABOUT, ONLY ALLOWING FOR EASTBOUND ONLY OPERATION:
   a. UTILIZE THE MEMORIAL DRIVE DETOUR LAYOUT.
   b. CONSTRUCT THE TEMPORARY PAVEMENT ON MEMORIAL DR FOR FUTURE PHASES. TRAFFIC IS TO UTILIZE DETOURS SHOWN IN THE DETOUR LAYOUTS WITHIN THIS AREA.
   c. DO NOT CONSTRUCT THE PROPOSED ILLUMINATION POLES OR CONDUITS ON THE SOUTHERN SIDE THIS PHASE. THIS WILL BE CONSTRUCTED IN THE FUTURE.
   d. THE EASTERN SIDE OF MEMORIAL WILL OVERLAP WITH SOME NON JOINT UTILITIES. THE PLANS SHEETS SHOW THE AREA THAT IS CONSIDERED STEP 0 AND STEP 1.
8. SHIFT TRAFFIC TO THE WEST AND CONSTRUCT THE FUTURE NORTHBOUND LANES OF WOLF RANCH PARKWAY (OMIT THE TOP 2 INCHES OF PROPOSED ASPHALT, THIS WILL BE CONSTRUCTED IN THE FINAL STEPS OF THIS PROJECT), CONSTRUCT MEDIAN CURB WHERE POSSIBLE. THE PLAN SHEETS SHOW WHERE CURB IS TO BE CONSTRUCTED. WHERE THERE IS TEMPORARY ASPHALT INSTEAD OF CURB. THE INTENT IS TO PROVIDE ACCESS FOR A FUTURE PHASE AND TO REPRESENT A SMOOTH DRIVING LANE IN A FUTURE PHASE.
   a. CONSTRUCT AREAS SOUTH OF THE ROUNDABOUT AND AS TO NOT OVERLAP WITH NON JOINT BID UTILITIES. REFER TO THE CONSTRUCTION MANAGEMENT PLAN.
   b. CONSTRUCT ILLUMINATION POLES AND CONDUITS AS POSSIBLE DURING THIS PHASE.
   c. CONSTRUCT ANY IRRIGATION AND LANDSCAPE ITEMS AS POSSIBLE DURING THIS PHASE.

PHASE I STEP I

PURPOSE: CONSTRUCT FUTURE NORTH BOUND LANES FROM BEGINNING OF PROJECT TO STA 152+00. CONSTRUCT REMAINING UTILITIES AS SHOWN ON THE CONSTRUCTION MANAGEMENT PLAN. CONSTRUCT TEMPORARY PAVEMENT AS NEEDED FOR FUTURE PHASES. CONSTRUCT LEGACY CROSSING AND CONSTRUCT SUNSET VISTA. THIS STEP WILL BEGIN AFTER ALL UTILITIES HAVE BEEN CLEARED.

1. INSTALL ADVANCE WARNING SIGNS ACCORDING TO THE ADVANCE WARNING SIGNS SHEET, THE TXDOT BC STANDARDS AND PLAN SHEETS.
2. INSTALL ALL SW3P MEASURES AND TREE PROTECTION PRIOR TO THE START OF CONSTRUCTION ACTIVITIES. THE SW3P MEASURES ARE TO BE LEFT IN PLACE UNTIL DISTURBED AREAS ARE NOT LONGER THREATENING TO THE DOWN STREAM ELEMENTS. REFER TO THE EROSION CONTROL SHEETS FOR MORE DETAILS.
3. UTILITY CONTRACTOR IS TO CONSTRUCT WATERLINE AND FORCE MAINS. THIS IS TO BE COMPLETED BEFORE DOING ANY OF THE ROADWAY CONSTRUCTION.
4. CONSTRUCT TEMPORARY MEDIAN PAVEMENT FROM STA 115+89 TO STA 116+73, UTILIZING TXDOT TCP STANDARD TCP (2-1)-18. THIS IS TO BE COMPLETED FIRST IN ORDER TO SHIFT TRAFFIC OVER.
5. USE WZ(BTS-1)-13 TO SHIFT TEMPORARY TRAFFIC SIGNAL HEADS TO INTERIM LOCATIONS AS SHOWN IN THE PLANS AND THEN USE TXDOT TCP STANDARDS TCP(3-1)-13, TCP(3-2)-13 AND TCP(3-3)-14 TO INSTALL TRAFFIC CONTROL DEVICES INCLUDING CHANNELIZING DEVICES, WORK ZONE PAVEMENT MARKINGS AND CONSTRUCTION SIGNAGE ALONG WOLF RANCH PARKWAY IN ACCORDANCE TO TXDOT TCP STANDARDS TCP(2-1)-18, TCP(2-3)-23, TCP(2-4)-18 AND TCP(2-5)-18. REFER TO THE PLANS FOR THE GENERAL LOCATION OF CONSTRUCTION PAVEMENT MARKINGS, SUGGESTED TEMPORARY PEDESTRIAN PATHS, LOW PROFILE BARRIERS AND CONSTRUCTION SIGNAGE. THE CONTRACTOR IS TO ELIMINATE ANY EXISTING PAVEMENT MARKINGS CONFLICTING WITH CONSTRUCTION MARKINGS AND REMOVE AND\OR COVER ANY SIGNS CONFLICTING WITH CONSTRUCTION SIGNS.
6. CONSTRUCT REMAINING MEMORIAL SECTION ONCE DRY UTILITIES HAVE BEEN CLEARED.:
7. SHIFT TRAFFIC TO THE WEST AND CONSTRUCT THE FUTURE NORTHBOUND LANES OF WOLF RANCH PARKWAY (OMIT THE TOP 2 INCHES OF PROPOSED ASPHALT, THIS WILL BE CONSTRUCTED IN THE FINAL STEPS OF THIS PROJECT), CONSTRUCT MEDIAN CURB WHERE POSSIBLE. THE PLAN SHEETS SHOW WHERE CURB IS TO BE CONSTRUCTED. WHERE THERE IS TEMPORARY ASPHALT INSTEAD OF CURB. THE INTENT IS TO PROVIDE ACCESS FOR A FUTURE PHASE AND TO REPRESENT A SMOOTH DRIVING LANE IN A FUTURE PHASE. INCLUDING TEMPORARY PAVEMENT ON THE NORTH SIDE OF THE PROJECT. CONSTRUCT VERTICAL FLEX BASE AND\OR TEMPORARY ASPHALT FOR VERTICAL TRANSITION ON DRIVEWAYS AND CROSS STREETS FOR INTERIM CONDITIONS. CONSTRUCT SIDEWALKS, SIDEWALK WALLS, PEDESTRIAN HANDRAILS AND TEMPORARY SPECIAL SHORING. THIS CONSTRUCTION INCLUDES:
   - CONSTRUCT THE PROPOSED TRUNKLINE SHOWN IN THE PLANS. UTILIZE 1 LANE 2 WAY TRAFFIC CONTROL DURING NON-PEAK HOURS IN AREAS WHERE TRUNKLINE CONSTRUCTION EXTENDS OUTSIDE OF THE CONSTRUCTION ZONE. USE A STEEL PLATE TO COVER THE OPEN TRENCHES. TRUNKLINES AND INLETS ARE TO BE CONSTRUCTED IN A WAY TO ALLOW FOR TEMPORARY PEDESTRIAN ROUTES TO EXIST AT ALL TIMES.
   - INSTALL PROPOSED TRAFFIC SIGNAL POLES AND HEADS AT LEGACY CROSSING AND SUNSET VISTA, ENSURE THIS IS COMPLETED AFTER DRY AND WET UTILITIES HAVE FINISHED RELOCATING.
   - CONSTRUCT ILLUMINATION POLES AND CONDUITS AS POSSIBLE DURING THIS PHASE.
   - CONSTRUCT ANY IRRIGATION AND LANDSCAPE ITEMS AS POSSIBLE DURING THIS PHASE.
8. SUNSET VISTA CONSTRUCTION SHOULD BE ONE OF THE LATER STEPS OF THIS PHASE. CONTRACTOR USE CONSTRUCTION PAVEMENT MARKINGS ON EXISTING PAVEMENT FOR THE EARLIER STEPS OF THIS PHASE IN THE LAYOUT SHOWN IN THE PLANS. ONCE MAJORITY OF ROADWAY PAVEMENT HAS BEEN CONSTRUCTED FOR PHASE I, CLOSE DOWN SUNSET VISTA TO CONSTRUCT THE PROPOSED PAVEMENT SECTION AS WELL AS THE TEMPORARY ASPHALT VERTICAL TRANSITION. THE MAX DURATION OF THIS IS TO BE CLOSED IS 4 WEEKS AND IT SHOULD NOT BE CLOSED AT THE SAME TIME AS LEGACY CROSSING IS BEING CONSTRUCTED. ONCE PROPOSED PAVEMENT AND ASPHALT VERTICAL TRANSITIONS ARE COMPLETED ADD CONSTRUCTION PAVEMENT MARKINGS AND STOP SIGN TO ALLOW FOR THE INTERIM CONDITION. CONTRACTOR IS TO UTILIZE THE SUNSET VISTA DETOUR LAYOUT.
9. THE LAST STEP OF PHASE I STEP I WILL BE TO SHIFT LEGACY CROSSING TRAFFIC AND RESTRICT WESTBOUND TRAFFIC AS SHOWN IN THE PLANS. CONSTRUCT THE FUTURE EASTBOUND LANES. THIS SHALL BE DOWN AS A DURATION OF NO LONGER THAN 5 WEEKS. CONTRACTOR IS TO UTILIZE THE LEGACY CROSSING DETOUR LAYOUT. THE CONTRACTOR IS RESPONSIBLE FOR REPLACING ANY EXISTING PAVEMENT MARKINGS REMOVED DURING THIS STEP. THE COST OF THIS IS INCLUDED IN TX502 7001
10. THE CONTRACTOR IS TO UTILIZE TEMPORARY PEDESTRIAN PATHS TO SAFELY MAINTAIN PEDESTRIAN ACCESS THROUGHOUT CONSTRUCTION. WHAT IS SHOWN IN THE PLANS ARE SUGGESTIONS, THE CONTRACTOR IS TO DETERMINE THE PATHS WITH THE APPROVAL OF THE ENGINEER. TEMPORARY CONSTRUCTION FENCE AND TEMPORARY ADA RAMPS SHOWN IN THE PLANS HAVE COSTS INCLUDED IN ITEM 502.
11. AT DRIVEWAYS AND INTERSECTION AREAS THE CONTRACTOR IS TO UTILIZE FLEX BASE (DRIVEWAY) OR TEMPORARY LEVEL UP ASPHALT (CROSS STREET) FOR VERTICAL TRANSITIONS TO ENSURE A SMOOTH TRANSITION FROM PROPOSED PAVEMENT TO THE EXISTING OR VICE VERSA. THERE ARE SOME SITUATIONS WHERE THE VERTICAL ASPHALT TRANSITION WILL BE REQUIRED TO EXTEND INTO THE NEXT PHASE'S TRAVEL WAY. WHEN THIS IS NECESSARY THERE ARE SUPER ELEVATION TRANSITION LABELS SHOWN ON THE PLAN SHEETS. THE MAX CROSS SLOPE IN THESE SITUATIONS WILL BE 5%.
12. CURBS ARE TO BE CONSTRUCTED IN ALL AREA EXCEPT WHERE TEMPORARY PAVEMENT CONSTRUCTION IS BEING SHOWN IN THE MEDIANS. THIS WILL BE PAVEMENT FOR BARRIER PLACEMENT OR TRAFFIC IN A FUTURE PHASE.
13. IT IS THE CONTRACTOR'S RESPONSIBILITY TO MAINTAIN ACCESS TO ALL CROSS STREETS ACCORDING TO THE PLANS. DRIVEWAYS SHALL BE CONSTRUCTED IN HALVES AND IF THE CONTRACTOR NEEDS TO CLOSE DOWN THE ENTIRE DRIVEWAY FOR ANY AMOUNT OF TIME. THEY MUST COORDINATE WITH THE PROPERTY OWN AT A MINIMUM OF 7 DAYS IN ADVANCE.

PHASE I STEP IB

PURPOSE: CONSTRUCT REMAINING SECTION OF FUTURE EAST BOUND LANES FOR LEGACY CROSSING.

1. INSTALL NECESSARY SIGNAGE AND PAVEMENT MARKINGS FOR THE UPDATED LAYOUT. INSTALL THE RIGHT TURN BYPASS LANE AS SHOWN IN THE PLANS TO CONSTRUCT THE REMAINING SECTION OF THE FUTURE EAST BOUND LANES. THIS DURATION SHOULD BE NO LONGER THAN 2 WEEKS. CONTRACTOR IS TO UTILIZE THE LEGACY CROSSING DETOUR LAYOUT. THE CONTRACTOR IS RESPONSIBLE FOR REPLACING ANY EXISTING PAVEMENT MARKINGS REMOVED DURING THIS STEP. THE COST OF THIS IS INCLUDED IN TX502 7001

PHASE I STEP II

PURPOSE: CONSTRUCT FUTURE WEST BOUND LANES FOR LEGACY CROSSING.

1. INSTALL NECESSARY SIGNAGE AND PAVEMENT MARKINGS FOR THE UPDATED LAYOUT.
2. SHIFT TRAFFIC AND CONSTRUCT THE FUTURE WEST BOUND LANES ACCORDING TO THE PLANS. THIS SEGMENT'S DURATION SHOULD BE NO LONGER THAN 5 WEEKS. CONTRACTOR IS TO UTILIZE THE LEGACY CROSSING DETOUR LAYOUT. THE CONTRACTOR IS RESPONSIBLE FOR REPLACING ANY EXISTING PAVEMENT MARKINGS REMOVED DURING THIS STEP. THE COST OF THIS IS INCLUDED IN TX502 7001

PHASE I STEP IIB

PURPOSE: CONSTRUCT REMAINING SECTION OF FUTURE WEST BOUND LANES FOR LEGACY CROSSING.

1. INSTALL NECESSARY SIGNAGE AND PAVEMENT MARKINGS FOR THE UPDATED LAYOUT. CONSTRUCT THE REMAINING SECTION OF THE FUTURE WEST BOUND LANES. THIS DURATION SHOULD BE NO LONGER THAN 2 WEEKS.
2. ONCE PHASE I CONSTRUCTION OF LEGACY CROSSING IS COMPLETED. OPEN UP BOTH DIRECTIONS FOR THE INTERIM CONDITION. TRAFFIC TO UTILIZE THE TEMPORARY PAVEMENT TRANSITIONS UNTIL THE WEST SIDE IS CONSTRUCTED.
3. CONTRACTOR IS TO UTILIZE THE LEGACY CROSSING DETOUR LAYOUT.
4. THE CONTRACTOR IS RESPONSIBLE FOR REPLACING ANY EXISTING PAVEMENT MARKINGS REMOVED DURING THIS STEP. THE COST OF THIS IS INCLUDED IN TX502 7001

DESIGN

STATE OF TEXAS — BRET CHAPMAN — 127293 — LICENSED PROFESSIONAL ENGINEER

BRET CHAPMAN, P.E. — 9/16/2025 DATE

APPROVAL

STATE OF TEXAS — BRIAN A. ALLEN — 123374 — LICENSED PROFESSIONAL ENGINEER

BRIAN A. ALLEN, P.E. — 9/16/2025 DATE

NO.	REVISION	DATE

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GEORGETOWN TEXAS more than welcome

CITY OF GEORGETOWN, TEXAS
WOLF RANCH PKWY / MEMORIAL DR

TCP NARRATIVE

CITY JOB No.
JOB NO. 51423-04
DATE 9/16/2025
DESIGNER
CHECKED DRAWN

SHEET 1 OF 2

SHEET NO. 36

Date: 9/16/2025
File:

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PHASE II STEP 0 A AND B

PURPOSE: CONSTRUCT DOWN STREAM TRUNK LINE OF WOLF RANCH STORM SEWER SYSTEM THAT IS UNDER RIVERY BLVD. THIS IS INTENDED TO BE OVERNIGHT OPERATIONS (8PM-6AM) AND BE COMPLETED PRIOR TO DRAINAGE INSTALLATION IN THE NEXT STEP.

1. INSTALL ADVANCE WARNING SIGNS ACCORDING TO THE ADVANCE WARNING SIGNS SHEET, THE TXDOT BC STANDARDS AND PLAN SHEETS. TURN EXISTING TRAFFIC SIGNALS TO FLASHING RED FOR THIS CONSTRUCTION.
2. INSTALL ALL SW3P MEASURES AND TREE PROTECTION PRIOR TO THE START OF CONSTRUCTION ACTIVITIES. THE SW3P MEASURES ARE TO BE LEFT IN PLACE UNTIL DISTURBED AREAS ARE NOT LONGER THREATENING TO THE DOWN STREAM ELEMENTS. REFER TO THE EROSION CONTROL SHEETS FOR MORE DETAILS.
3. USE TXDOT TCP STANDARDS TCP(3-1)-13, TCP(3-2)-13 AND TCP(3-3)-14 TO INSTALL TRAFFIC CONTROL DEVICES INCLUDING CHANNELIZING DEVICES, WORK ZONE PAVEMENT MARKINGS AND CONSTRUCTION SIGNAGE ALONG WOLF RANCH PARKWAY IN ACCORDANCE TO TXDOT TCP STANDARDS TCP(2-1)-18, TCP(2-3)-23 AND TCP(2-4)-18. REFER TO THE PLANS FOR THE GENERAL LOCATION OF CHANNELIZING DEVICES, SUGGESTED TEMPORARY PEDESTRIAN PATHS AND CONSTRUCTION SIGNAGE. THE CONTRACTOR IS TO ELIMINATE ANY EXISTING PAVEMENT MARKINGS CONFLICTING WITH CONSTRUCTION MARKINGS AND REMOVE AND\OR COVER ANY SIGNS CONFLICTING WITH CONSTRUCTION SIGNS. THE CONTRACTOR IS RESPONSIBLE FOR REPLACING ANY EXISTING MARKINGS THAT HAVE BEEN REMOVED ON RIVERY BLVD. THE COST OF THIS IS INCLUDED IN TX502 7001
4. CONSTRUCT PROPOSED TRUNKLINES AND MANHOLES ACCORDING TO THE PLANS. THE INTENT IS FOR THIS TO BE OVERNIGHT CONSTRUCTION. IF THIS CAN NOT BE COMPLETED OVERNIGHT THEN DURING THE DAYTIME THE CONTRACTOR IS TO RETURN RIVERY BLVD TO NORMAL OPERATION WITH LANES AND SIGNALS. USE STEEL PLATES TO COVER OPEN TRENCHES.

PHASE II STEP I

PURPOSE: CONSTRUCT FUTURE SOUTH BOUND LANES FROM BEGINNING OF PROJECT TO THE END OF PROJECTS. UTILITY CONSTRUCTION SHOULD BE COMPLETED BY THE TIME THIS PHASE BEGINS. CONSTRUCT LEGACY CROSSING, SCOUT ST, SUNSET VISTA AND RIVER VISTA.

1. INSTALL ADVANCE WARNING SIGNS ACCORDING TO THE ADVANCE WARNING SIGNS SHEET, THE TXDOT BC STANDARDS AND PLAN SHEETS.
2. INSTALL ALL SW3P MEASURES AND TREE PROTECTION PRIOR TO THE START OF CONSTRUCTION ACTIVITIES. THE SW3P MEASURES ARE TO BE LEFT IN PLACE UNTIL DISTURBED AREAS ARE NOT LONGER THREATENING TO THE DOWN STREAM ELEMENTS. REFER TO THE EROSION CONTROL SHEETS FOR MORE DETAILS.
3. USE WZ(BTS-1)-13 TO SHIFT TEMPORARY TRAFFIC SINGAL HEADS TO INTERIM LOCATIONS AS SHOWN IN THE PLANS AND THEN USE TXDOT TCP STANDARDS TCP(3-1)-13, TCP(3-2)-13 AND TCP(3-3)-14 TO INSTALL TRAFFIC CONTROL DEVICES INCLUDING CHANNELIZING DEVICES, WORK ZONE PAVEMENT MARKINGS AND CONSTRUCTION SIGNAGE ALONG WOLF RANCH PARKWAY IN ACCORDANCE TO TXDOT TCP STANDARDS TCP(2-1)-18, TCP(2-3)-23, TCP(2-4)-18 AND TCP(2-5)-18. REFER TO THE PLANS FOR THE GENERAL LOCATION OF CONSTRUCTION PAVEMENT MARKINGS, SUGGESTED TEMPORARY PEDESTRIAN PATHS, LOW PROFILE BARRIERS AND CONSTRUCTION SIGNAGE. THE CONTRACTOR IS TO ELIMINATE ANY EXISTING PAVEMENT MARKINGS CONFLICTING WITH CONSTRUCTION MARKINGS AND REMOVE AND\OR COVER ANY SIGNS CONFLICTING WITH CONSTRUCTION SIGNS.
4. EASTERN SECTION OF MEMORIAL IS TO REMAIN CLOSED DURING THIS PHASE. ON THE WEST SIDE SHIFT TRAFFIC TO THE TEMPORARY PAVEMENT CONSTRUCTED IN THE PREVIOUS PHASE, THIS WILL STILL ALLOW ONLY EASTBOUND OPERATION.
   - DURING THIS PHASE TRUCKS ARE TO BE RESTRICTED FROM WOLF RANCH PKWY AND MEMORIAL DR WHERE THEY WOULD HAVE TO ENTER THE ROUNDABOUT. THE TRUCK DETOUR LAYOUT SHEET PROVIDES NECESSARY SIGNS TO NAVIGATE THE AREA. NO TRUCK SIGNS SHALL BE PLACE AT THE FIRST INTERSECTION OF THE BEGINNING OF THE DETOURS TO DISCOURAGE TRUCKS FROM ENTERING THE CORRIDOR.
   - CONSTRUCT FUTURE WEST BOUND LANES ACCORDING TO THE PLANS. CONSTRUCT PROPOSED TRUNKLINES AND TIE INTO THE WOLF RANCH DRAINAGE SYSTEM
5. SHIFT TRAFFIC TO THE EAST UTILIZING PAVEMENT CONSTRUCTED IN A PREVIOUS PHASE TO CONSTRUCT THE WESTERN SIDE OF THE ROADWAY (OMIT THE TOP 2" OF PROPOSED ASPHALT, THIS WILL BE CONSTRUCTED IN THE FINAL STEPS OF THIS PROJECT). CONSTRUCT MEDIAN CURB WHERE POSSIBLE TO COMPLETE MEDIANS THAT WERE PARTIALLY CONSTRUCTED IN A PREVIOUS PHASE. THE PLAN SHEETS SHOW WHERE CURB IS TO BE CONSTRUCTED. WHERE THERE IS TEMPORARY ASPHALT INSTEAD OF CURB. THE INTENT IS TO PROVIDE ACCESS FOR A FUTURE PHASE AND TO REPRESENT A SMOOTH DRIVING LANE IN A FUTURE PHASE. CONSTRUCT ANY VERTICAL FLEX BASE AND\OR TEMPORARY ASPHALT FOR VERTICAL TRANSITIONS ON DRIVEWAY AND CROSS STREETS FOR INTERIM CONDITIONS. CONSTRUCT SIDEWALK, SIDEWALK WALLS, PEDESTRIAN HANDRAILS AND TEMPORARY SPECIAL SHORING. THIS CONSTRUCTION INCLUDES:
   - CONSTRUCT THE PROPOSED TRUNKLINES SHOWN IN THE PLANS, UTILIZE 1 LANE 2 WAY TRAFFIC CONTROL DURING NON-PEAK HOURS IN AREAS WHERE THE TRUNKLINE CONSTRUCTION EXTENDS OUTSIDE OF THE CONSTRUCTION ZONE. USE A STEEL PLATE TO COVER THE OPEN TRENCHES. TRUNKLINES AND INLETS ARE TO BE CONSTRUCTED IN A WAY TO ALLOW FOR TEMPORARY PEDESTRIAN ROUTES TO EXIST AT ALL TIMES.
   - ANY REMAINING WATERLINE AND FORCE MAINES ARE TO BE CONSTRUCTED WITH THE ROADWAY, THE CONSTRUCTION MANAGEMENT PLAN DISCUSSES THE TIMELINE THEIR CONSTRUCTION VS DRY UTILITIES.
   - INSTALL PROPOSED TRAFFIC SIGNAL POLES AT LEGACY CROSSING, SUNSET VISTA AND RIVERY DRIVEWAY. MODIFY THE SIGNALS AT RIVERY BLVD AS SHOWN IN THE PLANS. ENSURE THIS IS COMPLETED AFTER DRY AND WET UTILITIES HAVE FINISHED RELOCATING.
   - CONSTRUCT ILLUMINATION POLES AND CONDUITS AS POSSIBLE DURING THIS PHASE.
   - CONSTRUCT ANY IRRIGATION AND LANDSCAPE ITEMS AS POSSIBLE DURING THIS PHASE.
6. CONSTRUCTION OF SUNSET VISTA, SCOUT ST AND RIVER VISTA SHOULD BE CONSIDERED ONE OF THE LATER STEPS IN THIS PHASE. THE CONTRACTOR IS TO UTILIZE CONSTRUCTION PAVEMENT MARKINGS ON EXISTING PAVEMENT FOR THE EARLIER STEPS AS SHOWN IN THE PLAN SHEETS. ONCE MAJORITY OF ROADWAY PAVEMENT HAS BEEN CONSTRUCTED. CLOSE DOWN SUNSET VISTA, SCOUT ST AND RIVER VISTA AND CONSTRUCT THE PROPOSED PAVEMENT AS SHOWN IN THE PLANS. NONE OF THESE INTERSECTION SHALL BE CLOSED DOWN AT THE SAME TIME AS EACH OTHER AND ALSO LEGACY CROSSING. THE MAX DURATION OF THIS IS TO BE 2 WEEKS PER STREET. ONCE CONSTRUCTION FOR THE INTERSECTIONS IS COMPLETE, THE CONTRACTOR IS TO UTILIZE CONSTRUCTION PAVEMENT MARKINGS ON THE NEW PAVEMENT AND STOP SIGNS TO ALLOW FOR THE INTERIM CONDITION. THE CONTRACTOR IS TO UTILIZE SUNSET VISTA, SCOUT ST AND RIVER VISTA DETOUR LAYOUTS DURING THESE CLOSURES.
7. ON RIVERY DRIVEWAY SHIFT TRAFFIC ACCORDING TO THE PLANS AND CONSTRUCT THE DOWN STREAM TRUNKLINE IMPROVEMENTS. CONTRACTOR TO UTILIZE THE RIVERY DRIVEWAY DETOUR LAYOUT DURING THIS CONSTRUCTION. THE CONTRACTOR IS RESPONSIBLE FOR REPLACING ANY EXISTING PAVEMENT MARKINGS REMOVED DURING THIS STEP. THE COST OF THIS IS INCLUDED IN TX502 7001
8. THE LAST STEP OF PHASE IS TO CONSTRUCT THE FUTURE EAST BOUND LANES OF LEGACY CROSSING IN ORDER TO REDUCE THE AMOUNT OF TIME THAT WEST BOUND TRAVEL IS RESTRICTED. THIS SHALL STEP SHALL BE A DURATION OF NO LONGER THAN 5 WEEKS. REFER TO PHASE II STEP I LEGACY CROSSING PLAN SHEETS. THE CONTRACTOR IS TO UTILIZE THE LEGACY CROSSING DETOUR LAYOUT. THE CONTRACTOR IS RESPONSIBLE FOR REPLACING ANY EXISTING PAVEMENT MARKINGS REMOVED DURING THIS STEP. THE COST OF THIS IS INCLUDED IN TX502 7001
9. THE CONTRACTOR IS TO UTILIZE TEMPORARY PEDESTRIAN PATHS TO SAFELY MAINTAIN PEDESTRIAN ACCESS THROUGHOUT CONSTRUCTION. WHAT IS SHOWN IN THE PLANS ARE SUGGESTIONS, THE CONTRACTOR IS TO DETERMINE THE PATHS WITH THE APPROVAL OF THE ENGINEER. TEMPORARY CONSTRUCTION FENCE AND TEMPORARY ADA RAMPS SHOWN IN THE PLANS HAVE COSTS INCLUDED IN ITEM 502.
10. AT DRIVEWAYS AND INTERSECTION AREAS THE CONTRACTOR IS TO UTILIZE FLEX BASE (DRIVEWAY) OR TEMPORARY LEVEL UP ASPHALT (CROSS STREET) FOR VERTICAL TRANSITIONS TO ENSURE A SMOOTH TRANSITION FROM PROPOSED PAVEMENT TO THE EXISTING OR VICE VERSA. THERE ARE SOME SITUATIONS WHERE THE VERTICAL ASPHALT TRANSITION WILL BE REQUIRED TO EXTEND INTO THE CURRENT PHASE'S TRAVEL WAY. WHEN THIS IS NECESSARY THERE ARE SUPER ELEVATION TRANSITION LABELS SHOWN ON THE PLAN SHEETS. THE MAC CROSS SLOPE IN THESE SITUATIONS WILL BE 5%.
11. IT IS THE CONTRACTOR'S RESPONSIBILITY TO MAINTAIN ACCESS TO ALL CROSS STREETS ACCORDING TO THE PLANS. DRIVEWAYS SHALL BE CONSTRUCTED IN HALVES AND IF THE CONTRACTOR NEEDS TO CLOSE DOWN THE ENTIRE DRIVEWAY FOR ANY AMOUNT OF TIME. THEY MUST COORDINATE WITH THE PROPERTY OWNER AT A MINIMUM OF 7 DAYS IN ADVANCE.

PHASE II STEP IB

PURPOSE: CONSTRUCT REMAINING SECTION OF MEMORIAL DR ON THE WEST OF THE ROUNDABOUT, INCLUDING MEMORIAL DRIVE AND ROUNDABOUT ILLUMINATION. CONSTRUCT REMAINING SECTION OF LEGACY CROSSING.

1. INSTALL NECESSARY SIGNAGE AND PAVEMENT MARKINGS FOR THE UPDATED LAYOUT. CONSTRUCT THE REMAINING SECTION OF THE FUTURE EAST BOUND LANES OF MEMORIAL DR.
2. INSTALL NECESSARY SIGNAGE AND PAVEMENT MARKINGS FOR THE UPDATED LAYOUT. CONSTRUCT THE REMAINING SECTION OF THE FUTURE EAST BOUND LANES OF LEGACY CROSSING. IN BETWEEN STEP 1B AND STEP II THE VERTICAL PAVEMENT TRANSITION IS THE BE REMOVED. THIS SHALL BE DONE USING 1 LANE 2 WAY TRAFFIC CONTROL DURING NONO PEAK HOURS. THIS DURATION SHOULD BE NO LONGER THAN 1 WEEK.
3. CONTRACTOR TO UTILIZE THE MEMORIAL DR DETOUR LAYOUT.
4. THE CONTRACTOR IS RESPONSIBLE FOR REPLACING ANY EXISTING PAVEMENT MARKINGS REMOVED DURING THIS STEP. THE COST OF THIS IS INCLUDED IN TX502 7001

PHASE II STEP II

PURPOSE: CONSTRUCT FUTURE WEST BOUND LANES FOR LEGACY CROSSING.

1. INSTALL NECESSARY SIGNAGE AND PAVEMENT MARKINGS FOR THE UPDATED LAYOUT.
2. SHIFT TRAFFIC AND CONSTRUCT THE FUTURE WEST BOUND LANES ACCORDING TO THE PLANS. THIS SEGMENT'S DURATION SHOULD BE NO LONGER THAN 4 WEEKS.
3. CONTRACTOR TO UTILIZE THE LEGACY CROSSING DETOUR LAYOUT SHEET.
4. THE CONTRACTOR IS RESPONSIBLE FOR REPLACING ANY EXISTING PAVEMENT MARKINGS REMOVED DURING THIS STEP. THE COST OF THIS IS INCLUDED IN TX502 7001

PHASE II STEP IIB

PURPOSE: CONSTRUCT REMAINING SECTION OF FUTURE WEST BOUND LANES FOR LEGACY CROSSING.

1. INSTALL NECESSARY SIGNAGE AND PAVEMENT MARKINGS FOR THE UPDATED LAYOUT. CONSTRUCT THE REMAINING SECTION OF THE FUTURE WEST BOUND LANES. THIS DURATION SHOULD BE NO LONGER THAN 1 WEEK.
2. ONCE PHASE I CONSTRUCTION OF LEGACY CROSSING IS COMPLETED. UTILIZE CONSTRUCTION PAVEMENT MARKINGS TO REOPEN BOTH DIRECTIONS FOR THE INTERIM CONDITION.
3. CONTRACTOR TO UTILIZE THE LEGACY CROSSING DETOUR LAYOUT.
4. THE CONTRACTOR IS RESPONSIBLE FOR REPLACING ANY EXISTING PAVEMENT MARKINGS REMOVED DURING THIS STEP. THE COST OF THIS IS INCLUDED IN TX502 7001

PHASE III STEP I

PURPOSE: MILL WOLF RANCH SOUTH OF THE ROUNDABOUT. CONSTRUCT ADDITIONAL DUAL LEFT TURN LANE, REMAINING MEDIAN ITEMS FROM SH 29 TO STA 120+50. AROUND STA 138+00 TRAFFIC WILL SHIFT TO THE FUTURE SOUTH BOUND LANES TO CONSTRUCTED THE REMAINING SECTION OF WOLF RANCH.

1. INSTALL ADVANCE WARNING SIGNS ACCORDING TO THE ADVANCE WARNING SIGNS SHEET, THE TXDOT BC STANDARDS AND PLAN SHEETS.
2. INSTALL ALL SW3P MEASURES AND TREE PROTECTION PRIOR TO THE START OF CONSTRUCTION ACTIVITIES. THE SW3P MEASURES ARE TO BE LEFT IN PLACE UNTIL DISTURBED AREAS ARE NOT LONGER THREATENING TO THE DOWN STREAM ELEMENTS. REFER TO THE EROSION CONTROL SHEETS FOR MORE DETAILS.
3. USE WZ(BTS-1)-13 TO SHIFT TEMPORARY TRAFFIC SIGNAL HEADS TO INTERIM LOCATIONS AS SHOWN IN THE PLANS AND THEN USE TXDOT TCP STANDARDS TCP(3-1)-13, TCP(3-2)-13 AND TCP(3-3)-14 TO INSTALL TRAFFIC CONTROL DEVICES INCLUDING CHANNELIZING DEVICES, WORK ZONE PAVEMENT MARKINGS AND CONSTRUCTION SIGNAGE ALONG WOLF RANCH PARKWAY USING TXDOT TCP STANDARDS TCP(2-1)-18, TCP(2-3)-23, TCP(2-4)-18 AND TCP(2-5)-18. REFER TO THE PLANS FOR THE GENERAL LOCATION OF CONSTRUCTION PAVEMENT MARKINGS. THE CONTRACTOR IS TO ELIMINATE ANY EXISTING PAVEMENT MARKINGS CONFLICTING WITH CONSTRUCTION MARKINGS AND REMOVE AND\OR COVER ANY SIGNS CONFLICTING WITH CONSTRUCTION SIGNS.
4. SHIFT TRAFFIC ONTO PROPOSED PAVEMENT UTILIZING CONSTRUCTION PAVEMENT MARKINGS. CONSTRUCT THE FULL DEPTH PAVEMENT (OMITTING THE TOP 2" OF ASPHALT), ADDITIONALLY:
   - THE CONTRACTOR IS TO UTILIZE TXDOT TCP STANDARD TCP(2-2)-18 TO PERFORM THE MILLING OPERATIONS. DO NOT COMPLETE THE OVERLAY AS THAT WILL BE COMPLETED IN A FUTURE STEP.
   - CONSTRUCT REMAINING MEDIANS AND ILLUMINATION ITEMS FROM SH 29 TO STA 120+50
   - CONSTRUCT NORTHERN END OF THE REMAINING FUTURE NORTH BOUND LANES. CONSTRUCT CURBS AND FINISH THE MEDIANS EXCEPT WHERE TEMPORARY ASPHALT IS SHOWN IN THE MEDIAN AREA.
   - CONSTRUCT REMAINING TRUNKLINES AS SHOWN IN THE PLANS. UTILIZE 1 LANE 2 WAY TRAFFIC CONTROL DURING NON-PEAK HOURS IN AREAS WHERE THE TRUNKLINE CONSTRUCTION EXTENDS OUTSIDE OF THE CONSTRUCTION ZONE.
   - ANY REMAINING WATERLINE AND FORCE MAINS ARE TO BE CONSTRUCTED WITH THE ROADWAY CONSTRUCTION.
   - INSTALL PROPOSED TRAFFIC SIGNAL POLES AT RIVERY DRIVEWAY AND MODIFY ANY REMAINING SIGNAL REQUIREMENTS AT RIVERY BLVD, ACCORDING TO THE PLANS. THIS SHOULD BE THE FINAL SIGNAL POLES TO BE CONSTRUCTED.
   - CONSTRUCT ILLUMINATION POLES AND CONDUITS AS POSSIBLE DURING THIS PHASE
   - CONSTRUCT ANY IRRIGATION AND LANDSCAPE ITEMS AS POSSIBLE DURING THIS PHASE.
5. THE LAST STEP OF THIS STAGE IS TO SHIFT RIVERY DRIVEWAY TRAFFIC TO AND RESTRICT EASTBOUND TRAVEL. REFER TO DETOUR LAYOUTS PROVIDED FOR EAST BOUND TRAVEL IN THE INTERIM STAGE. CONSTRUCT THE FUTURE EAST BOUND LANES ACCORDING TO THE PLANS. THE DURATION OF THIS CONSTRUCTION SHOULD BE NO LONGER THAN 4 WEEKS. CONTRACTOR TO UTILIZE THE RIVERY DRIVEWAY DETOUR LAYOUT. THE CONTRACTOR IS RESPONSIBLE FOR REPLACING ANY EXISTING PAVEMENT MARKINGS REMOVED DURING THIS STEP. THE COST OF THIS IS INCLUDED IN TX502 7001

PHASE III STEP IB

PURPOSE: CONSTRUCT REMAINING SECTION OF FUTURE EAST BOUND LANES ON RIVERY DRIVEWAY.

1. INSTALL NECESSARY SIGNAGE AND PAVEMENT MARKINGS FOR THE UPDATED LAYOUT. CONSTRUCT THE REMAINING SECTION OF THE FUTURE EAST BOUND LANES OF MEMORIAL DR. THIS DURATION SHOULD BE NO LONGER THAN 1 WEEK.
2. THE CONTRACTOR IS TO UTILIZE THE RIVERY DRIVEWAY DETOUR LAYOUT SHEET.
3. THE CONTRACTOR IS RESPONSIBLE FOR REPLACING ANY EXISTING PAVEMENT MARKINGS REMOVED DURING THIS STEP. THE COST OF THIS IS INCLUDED IN TX502 7001

PHASE III STEP IC

PURPOSE: CONSTRUCT REMAINING SECTION OF FUTURE WEST BOUND LANES ON RIVERY DRIVEWAY.

1. INSTALL NECESSARY SIGNAGE AND PAVEMENT MARKINGS FOR THE UPDATED LAYOUT. CONSTRUCT THE REMAINING SECTION OF THE FUTURE WEST BOUND LANES OF MEMORIAL DR. THIS DURATION SHOULD BE NO LONGER THAN 2 WEEKS.
2. THE CONTRACTOR IS TO UTILIZE THE RIVERY DRIVEWAY DETOUR LAYOUT SHEET.
3. THE CONTRACTOR IS RESPONSIBLE FOR REPLACING ANY EXISTING PAVEMENT MARKINGS REMOVED DURING THIS STEP. THE COST OF THIS IS INCLUDED IN TX502 7001

PHASE III STEP ID

PURPOSE: CONSTRUCT REMAINING SECTION OF FUTURE WEST BOUND LANES ON RIVERY DRIVEWAY.

1. INSTALL NECESSARY SIGNAGE AND PAVEMENT MARKINGS FOR THE UPDATED LAYOUT. CONSTRUCT THE REMAINING SECTION OF THE FUTURE WEST BOUND LANES OF MEMORIAL DR. THIS DURATION SHOULD BE NO LONGER THAN 2 WEEKS.
2. THE CONTRACTOR IS TO UTILIZE THE RIVERY DRIVEWAY DETOUR LAYOUT SHEET.
3. THE CONTRACTOR IS RESPONSIBLE FOR REPLACING ANY EXISTING PAVEMENT MARKINGS REMOVED DURING THIS STEP. THE COST OF THIS IS INCLUDED IN TX502 7001

PHASE III STEP II

PURPOSE: CONSTRUCT ANY REMAINING MEDIAN CURB ALONG THE ENTIRE CORRIDOR. COMPLETE ANY REMAINING LANDSCAPE ITEMS, AND ILLUMINATION ITEMS. CONSTRUCT FINAL PIECE AT RIVERY BLVD AND WOLF RANCH PKWY. CONSTRUCT TOP 2" ASPHALT LAYER ON THE ENTIRE PROJECT.

1. INSTALL ADVANCE WARNING SIGNS ACCORDING TO THE ADVANCE WARNING SIGNS SHEET, THE TXDOT BC STANDARDS AND PLAN SHEETS.
2. INSTALL ALL SW3P MEASURES AND TREE PROTECTION PRIOR TO THE START OF CONSTRUCTION ACTIVITIES. THE SW3P MEASURES ARE TO BE LEFT IN PLACE UNTIL DISTURBED AREAS ARE NOT LONGER THREATENING TO THE DOWN STREAM ELEMENTS. REFER TO THE EROSION CONTROL SHEETS FOR MORE DETAILS.
3. USE WZ(BTS-1)-13 TO SHIFT ANY TEMPORARY TRAFFIC SIGNAL HEADS TO INTERIM LOCATION OR USE THE SAME STANDARD TO REMOVAL ANY TEMPORARY TRAFFIC SIGNAL HEADS, POLES OR EQUIPMENT NO LONGER IN USE. USE TXDOT TCP STANDARDS TCP(3-1)-13, TCP(3-2)-13 AND TCP(3-3)-14 TO INSTALL TRAFFIC CONTROL DEVICES INCLUDING CHANNELIZING DEVICES, WORK ZONE PAVEMENT MARKINGS AND CONSTRUCTION SIGNAGE ALONG WOLF RANCH PARKWAY USING TXDOT TCP STANDARDS TCP(2-1)-18, TCP(2-3)-23, TCP(2-4)-18 AND TCP(2-5)-18. REFER TO THE PLANS FOR THE GENERAL LOCATION OF CONSTRUCTION PAVEMENT MARKINGS. THE CONTRACTOR IS TO ELIMINATE ANY EXISTING PAVEMENT MARKINGS CONFLICTING WITH CONSTRUCTION MARKINGS AND REMOVE AND\OR COVER ANY SIGNS CONFLICTING WITH CONSTRUCTION SIGNS.
4. MEMORIAL DRIVE IS OPEN SIMILAR TO THE PREVIOUS PHASE, REFER TO PLAN SHEETS
5. FOR RIVERY BLVD RESTRICT BOUND TRAFFIC TURNING LEFT AND GOING STRAIGHT THROUGH THE INTERSECTION. CONTRACTOR IS TO UTILIZE THE RIVERY DRIVEWAY DETOUR LAYOUT DURING THIS CONSTRUCTION.
6. FOR WOLF RANCH PARKWAY THIS WILL BE TO CONSTRUCT ANY REMAINING ITEMS THAT IS NOT THE TOP 2" LAYER OF ASPHALT. CONSTRUCT ANY REMAINING CURBS, MEDIANS, LANDSCAPING, IRRIGATION, ILLUMINATION, ANY REMAINING TRAFFIC SIGNAL ITEMS.
7. ONCE EVERYTHING ELSE IN COMPLETE, USE THE TXDOT STANDARDS PROVIDED TO CONSTRUCT THE FINAL 2" ASPHALT LAYER (CONTRACTOR TO DETERMINE THE BEST PRACTICE FOR THIS ITEM) TO PROVIDE A FINAL FRESH CLEAN SURFACE.
8. ONCE ROADWAY WORK IS COMPLETE, UTILIZE TXDOT TCP STANDARDS TCP(3-1)-13, TCP(3-2)-13 AND TCP(3-3)-14 TO INSTALL PERMANENT PAVEMENT MARKINGS, RPMS AND ANY REMAINING PERMANENT SIGNAGE.
9. ONCE IT IS DETERMINED THAT THERE WILL BE NO MORE DISTURBED AREAS, THE CONTRACTOR IS THE REMOVE THE SW3P ITEMS WHEN DEEMED SAFE BY THE ENGINEER AND PERFORM FINAL CLEAN UP.

DESIGN

STATE OF TEXAS — BRET CHAPMAN — 127293 — LICENSED PROFESSIONAL ENGINEER

BRET CHAPMAN, P.E. — 9/16/2025 DATE

APPROVAL

STATE OF TEXAS — BRIAN A. ALLEN — 123374 — LICENSED PROFESSIONAL ENGINEER

BRIAN A. ALLEN, P.E. — 9/16/2025 DATE

NO.	REVISION	DATE

GEORGETOWN TEXAS *more than welcome*

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CITY OF GEORGETOWN, TEXAS
WOLF RANCH PKWY / MEMORIAL DR

TCP NARRATIVE

CITY JOB No.
JOB NO. 51423-04
DATE 9/16/2025
DESIGNER
CHECKED DRAWN

SHEET 2 OF 2
SHEET NO. 37

Date: 9/16/2025
File:

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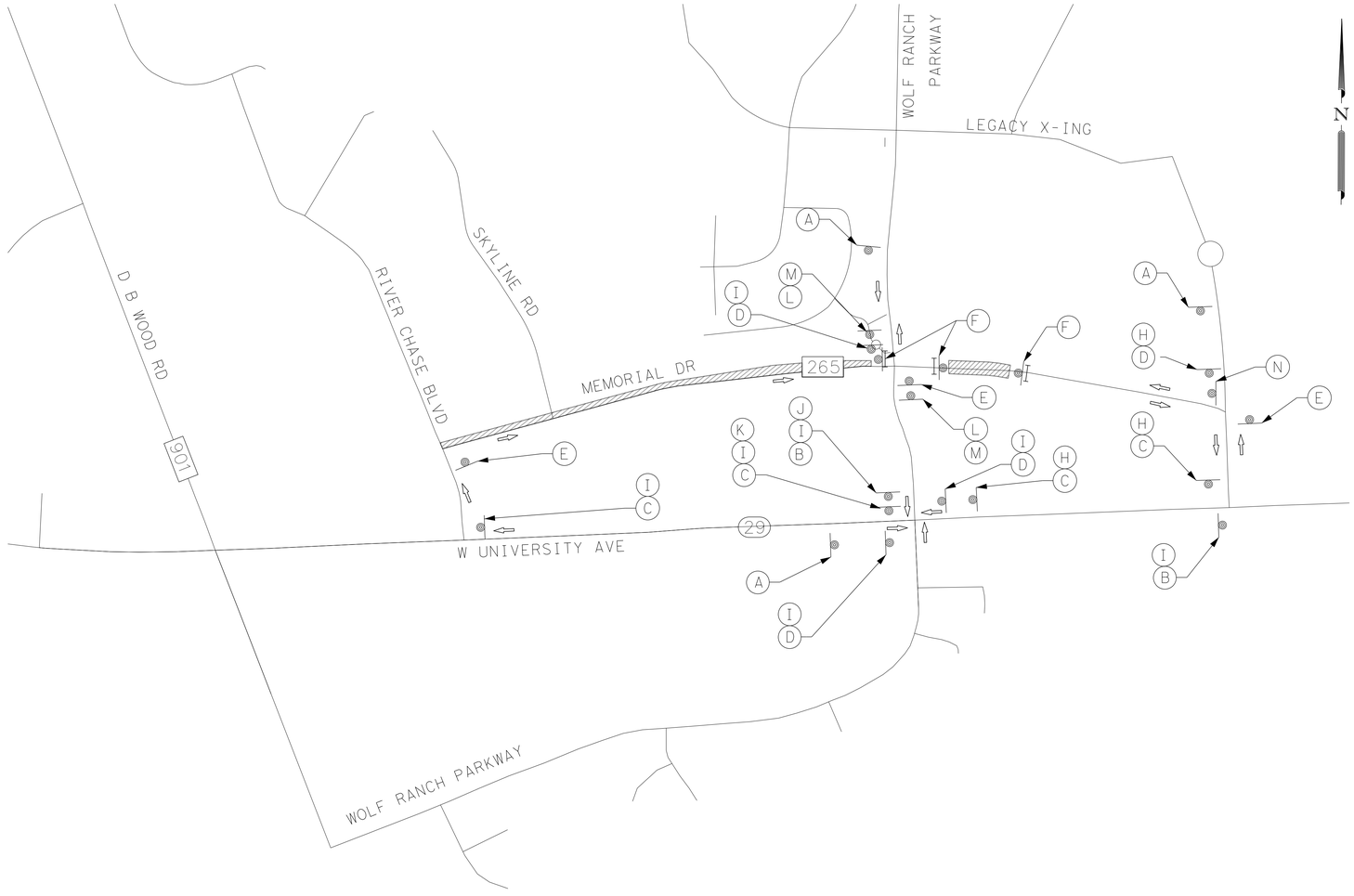

LEGEND

- CONSTRUCTION WORK ZONE
- TYPE III BARRICADE
- SIGN
- TRAFFIC FLOW ARROWS

NOTES:

1. REFER TO CONDUIT SUMMARY AND ILLUMINATION ASSEMBLIES LOCATIONS ON ILLUMINATION LEGEND
2. REFER TO STANDARD RID(2)-17 FOR DRILL SHAFT FOUNDATION CONSTRUCTION. USE 8FT. DEPTH AND 30 IN DIAMETER
3. FIXTURES ARE TO COMPLY WITH OUTDOOR LIGHTING CRITERIA SPECIFIED IN THE CODE OF ORDINANCES FROM CITY OF GEORGETOWN, TX
4. ALL CALCULATIONS ASSUME DIRECT ILLUMINATION FROM LUMINARES (NO INTERREFLECTED LIGHT)
5. FOR LIGHTS BEHIND OR NEAR RESIDENTIAL HOUSING USE HSS (HOUSE SIDE SHIELD)
6. CONTRACTOR SHALL INSTALL NEW CONDUIT TO INTERCEPT EXISTING. PULL EXISTING WIRING THROUGH NEW CONDUIT TO RELOCATED LIGHT POLE. ALL WORK AND MATERIALS REQUIRED ARE SUBSIDIARY TO LIGHT POLE RELOCATION BID ITEM.

NOT TO SCALE

NOTES:

1. FOR ADDITIONAL DETAILS SEE TxDOT BC, TCP STANDARD SHEETS.
2. EXISTING PAVEMENT MARKING CONFLICTING WITH WORK ZONE PAVEMENT MARKINGS SHALL BE REMOVED.
3. CONTRACTOR TO MAINTAIN ACCESS TO DRIVEWAYS AT ALL TIMES THROUGHOUT CONSTRUCTION.
4. REFER TO ADVANCE WARNING SIGN LAYOUT SHEET FOR ADDITIONAL ADVANCE WARNING SIGNS.
5. REFER TO TCP PLAN SHEETS FOR SPECIFIC LAYOUT OF CONSTRUCTION\LANE LINES AT A CERTAIN STEP.

DESIGN

STATE OF TEXAS — BRET CHAPMAN — 127293 — LICENSED — PROFESSIONAL ENGINEER

BRET CHAPMAN, P.E. — 9/16/2025 DATE

APPROVAL

STATE OF TEXAS — BRIAN A. ALLEN — 123374 — LICENSED — PROFESSIONAL ENGINEER

BRIAN A. ALLEN, P.E. — 9/16/2025 DATE

NO.	REVISION	DATE

GEORGETOWN TEXAS *more than welcome*

PAPE-DAWSON ENGINEERS
AUSTIN | SAN ANTONIO | HOUSTON | FORT WORTH | DALLAS
10801 N MOPAC EXPY, BLDG 3, STE 200 | AUSTIN, TX 78759 | 512.454.8711
TEXAS ENGINEERING FIRM #470 | TEXAS SURVEYING FIRM #10028800

WOLF RANCH PKWY / MEMORIAL DR
DETOUR LAYOUT
MEMORIAL DR

CITY JOB No.
JOB NO. 51423-04
DATE 9/16/2025
DESIGNER
CHECKED DRAWN
SHEET 1 OF 1
SHEET NO. 38

DETOUR AHEAD	DETOUR	DETOUR	DETOUR	END DETOUR	ROAD CLOSED	ROAD CLOSED AHEAD
(A) CW20-2D 36"X36"	(B) M4-9L 30"X24"	(C) M4-9R 36"X24"	(D) M4-9S 36"X24"	(E) M4-8A 24"X18"	(F) R11-2 48"X30"	(G) CW20-3D 36"X36"
WOLF RANCH PARKWAY	MEMORIAL DR	EAST	WEST		ROAD CLOSED TO THRU TRAFFIC	NO TRUCKS
(H) D1-1 VARIABLE X 18"	(I) D1-1 VARIABLE X 18"	(J) M3-2 24"X12"	(K) M3-4 24"X12"	(L) R3-1 24"X24"	(M) R3-2 24"X24"	(N) R11-4 60"X30" / (O) R11-4 60"X30"

Date: 9/16/2025
File:

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Ⓐ
CW20-2D
36"X36"



Ⓑ
M4-9L
36"X24"



Ⓒ
M4-9R
36"X24"



Ⓓ
M4-9S
36"X24"



Ⓔ
M4-8A
24"X18"



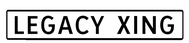
Ⓕ
R11-2
48"X30"



Ⓖ
CW20-3D
36"X36"



Ⓗ
D1-1
VARIABLE X 18"



Ⓘ
R3-1
VARIABLE X 18"



Ⓙ
R3-1
24"X24"



Ⓚ
R3-2
24"X24"



Ⓛ
R11-4
60"X30"

NOT TO SCALE

NOTES:

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4. REFER TO ADVANCE WARNING SIGN LAYOUT SHEET FOR ADDITIONAL ADVANCE WARNING SIGNS.
5. REFER TO TCP PLAN SHEETS FOR SPECIFIC LAYOUT OF CONSTRUCTION\LANE LINES AT A CERTAIN STEP.

DESIGN

STATE OF TEXAS
BRET CHAPMAN
127293
LICENSED
PROFESSIONAL ENGINEER

BRET CHAPMAN, P.E. — 9/16/2025 DATE

APPROVAL

STATE OF TEXAS
BRIAN A. ALLEN
123374
LICENSED
PROFESSIONAL ENGINEER

BRIAN A. ALLEN, P.E. — 9/16/2025 DATE

NO.	REVISION	DATE

GEORGETOWN TEXAS
more than welcome

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10801 N MOPAC EXPY, BLDG 3, STE 200 | AUSTIN, TX 78759 | 512.454.8711
TEXAS ENGINEERING FIRM #470 | TEXAS SURVEYING FIRM #10028800

WOLF RANCH PKWY / MEMORIAL DR
INTERSECTION DETOUR LAYOUT
LEGACY XING PHASE I & II

CITY JOB No.
JOB NO. 51423-04
DATE 9/16/2025
DESIGNER
CHECKED DRAWN

SHEET 1 OF 8

SHEET NO. 39

Date: 9/16/2025
File:

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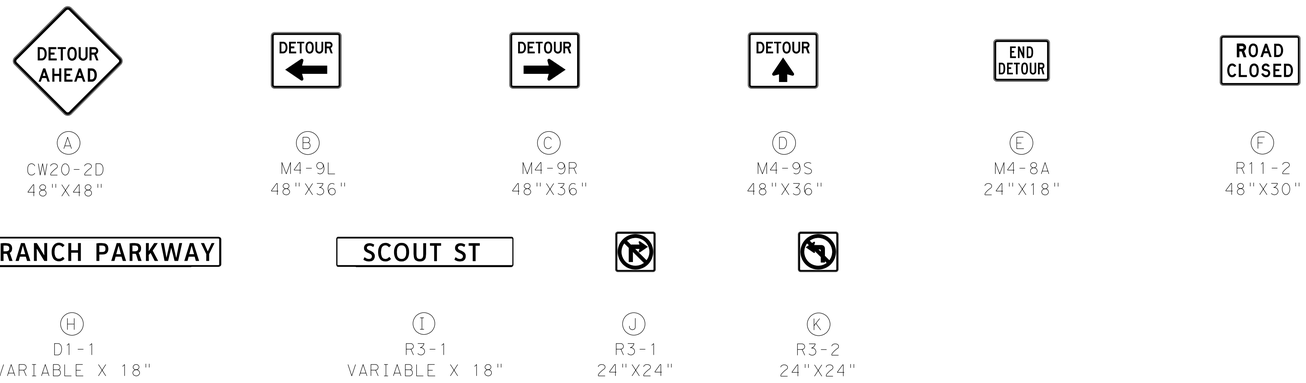

A	B	C	D	E	F
CW20-2D 48"X48"	M4-9L 48"X36"	M4-9R 48"X36"	M4-9S 48"X36"	M4-8A 24"X18"	R11-2 48"X30"

H	I	J	K
D1-1 VARIABLE X 18"	R3-1 VARIABLE X 18"	R3-1 24"X24"	R3-2 24"X24"

NOT TO SCALE

NOTES:

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4. REFER TO ADVANCE WARNING SIGN LAYOUT SHEET FOR ADDITIONAL ADVANCE WARNING SIGNS.

DESIGN

STATE OF TEXAS · BRET CHAPMAN · 127293 · LICENSED · PROFESSIONAL ENGINEER

BRET CHAPMAN, P.E. — 9/16/2025 DATE

APPROVAL

STATE OF TEXAS · BRIAN A. ALLEN · 123374 · LICENSED · PROFESSIONAL ENGINEER

BRIAN A. ALLEN, P.E. — 9/16/2025 DATE

NO.	REVISION	DATE

PAPE-DAWSON ENGINEERS

AUSTIN | SAN ANTONIO | HOUSTON | FORT WORTH | DALLAS

10801 N MOPAC EXPY, BLDG 3, STE 200 | AUSTIN, TX 78759 | 512.454.8711

TEXAS ENGINEERING FIRM #470 | TEXAS SURVEYING FIRM #10028800

GEORGETOWN TEXAS *more than welcome*

WOLF RANCH PKWY / MEMORIAL DR INTERSECTION DETOUR LAYOUT SCOUT ST PHASE II

CITY JOB No.

JOB NO. 51423-04

DATE 9/16/2025

DESIGNER

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SHEET 2 OF 8

SHEET NO. 40

Date: 9/16/2025
File:

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NOT TO SCALE

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3. CONTRACTOR TO MAINTAIN ACCESS TO DRIVEWAYS AT ALL TIMES THROUGHOUT CONSTRUCTION.
4. REFER TO ADVANCE WARNING SIGN LAYOUT SHEET FOR ADDITIONAL ADVANCE WARNING SIGNS.



(A) CW20-2D 48"X48"



(B) M4-9L 48"X36"



(C) M4-9R 48"X36"



(D) M4-9S 48"X36"



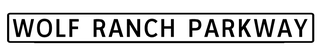
(E) M4-8A 24"X18"



(F) R11-2 48"X30"



(G) CW20-3D 48"X48"



(H) D1-1 VARIABLE X 18"



(I) R3-1 VARIABLE X 18"



(J) R3-1 24"X24"



(K) R3-2 24"X24"



(L) R11-4 60"X30"

DESIGN

STATE OF TEXAS · BRET CHAPMAN · 127293 · LICENSED · PROFESSIONAL ENGINEER

BRET CHAPMAN, P.E. — 9/16/2025 DATE

APPROVAL

STATE OF TEXAS · BRIAN A. ALLEN · 123374 · LICENSED · PROFESSIONAL ENGINEER

BRIAN A. ALLEN, P.E. — 9/16/2025 DATE

NO.	REVISION	DATE

GEORGETOWN TEXAS *more than welcome*

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10801 N MOPAC EXPY, BLDG 3, STE 200 | AUSTIN, TX 78759 | 512.454.8711
TEXAS ENGINEERING FIRM #470 | TEXAS SURVEYING FIRM #10028800

WOLF RANCH PKWY / MEMORIAL DR INTERSECTION DETOUR LAYOUT SUNSET VISTA DR PHASE I

CITY JOB No.
JOB NO. 51423-04
DATE 9/16/2025
DESIGNER
CHECKED DRAWN

SHEET 3 OF 8

SHEET NO. 41

Date: 9/16/2025
File:

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Ⓐ
CW20-2D
48"X48"



Ⓑ
M4-9L
48"X36"



Ⓒ
M4-9R
48"X36"



Ⓓ
M4-9S
48"X36"



Ⓔ
M4-8A
24"X18"



Ⓕ
R11-2
48"X30"



Ⓖ
CW20-3D
48"X48"



Ⓗ
D1-1
VARIABLE X 18"



Ⓘ
R3-1
VARIABLE X 18"



Ⓙ
R3-1
24"X24"



Ⓚ
R3-2
24"X24"



Ⓛ
R11-4
60"X30"

NOT TO SCALE

NOTES:

1. FOR ADDITIONAL DETAILS SEE TxDOT BC, TCP STANDARD SHEETS.
2. EXISTING PAVEMENT MARKING CONFLICTING WITH WORK ZONE PAVEMENT MARKINGS SHALL BE REMOVED.
3. CONTRACTOR TO MAINTAIN ACCESS TO DRIVEWAYS AT ALL TIMES THROUGHOUT CONSTRUCTION.
4. REFER TO ADVANCE WARNING SIGN LAYOUT SHEET FOR ADDITIONAL ADVANCE WARNING SIGNS.

DESIGN

STATE OF TEXAS · BRET CHAPMAN · 127293 · LICENSED · PROFESSIONAL ENGINEER

BRET CHAPMAN, P.E. — 9/16/2025 DATE

APPROVAL

STATE OF TEXAS · BRIAN A. ALLEN · 123374 · LICENSED · PROFESSIONAL ENGINEER

BRIAN A. ALLEN, P.E. — 9/16/2025 DATE

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GEORGETOWN TEXAS *more than welcome*

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TEXAS ENGINEERING FIRM #470 | TEXAS SURVEYING FIRM #10028800

WOLF RANCH PKWY / MEMORIAL DR INTERSECTION DETOUR LAYOUT SUNSET VISTA DR PHASE II

CITY JOB No.
JOB NO. 51423-04
DATE 9/16/2025
DESIGNER
CHECKED DRAWN

SHEET 4 OF 8

SHEET NO. 42

Date: 9/16/2025
File:

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Ⓐ
CW20-2D
36"X36"



Ⓑ
M4-9L
30"X24"



Ⓒ
M4-9R
30"X24"



Ⓓ
M4-9S
30"X24"



Ⓔ
M4-8A
24"X18"



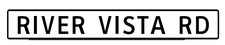
Ⓕ
R11-2
48"X30"



Ⓖ
CW20-3D
36"X36"



Ⓗ
D1-1
VARIABLE X 18"



Ⓘ
D1-1
VARIABLE X 18"



Ⓙ
R3-1
24"X24"



Ⓚ
R3-2
24"X24"

NOT TO SCALE

NOTES:

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4. REFER TO ADVANCE WARNING SIGN LAYOUT SHEET FOR ADDITIONAL ADVANCE WARNING SIGNS.

DESIGN

STATE OF TEXAS
BRET CHAPMAN
127293
LICENSED
PROFESSIONAL ENGINEER

BRET CHAPMAN, P.E. — 9/16/2025 DATE

APPROVAL

STATE OF TEXAS
BRIAN A. ALLEN
123374
LICENSED
PROFESSIONAL ENGINEER

BRIAN A. ALLEN, P.E. — 9/16/2025 DATE

NO.	REVISION	DATE

GEORGETOWN TEXAS
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PAPE-DAWSON ENGINEERS
AUSTIN I SAN ANTONIO I HOUSTON I FORT WORTH I DALLAS
10801 N MOPAC EXPY, BLDG 3, STE 200 I AUSTIN, TX 78759 I 512.454.8711
TEXAS ENGINEERING FIRM #470 I TEXAS SURVEYING FIRM #10028800

WOLF RANCH PKWY / MEMORIAL DR INTERSECTION DETOUR LAYOUT RIVER VISTA RD PHASE II

CITY JOB No.
JOB NO. 51423-04
DATE 9/16/2025
DESIGNER
CHECKED DRAWN

SHEET 5 OF 8
SHEET NO. 43

Date: 9/16/2025
File:

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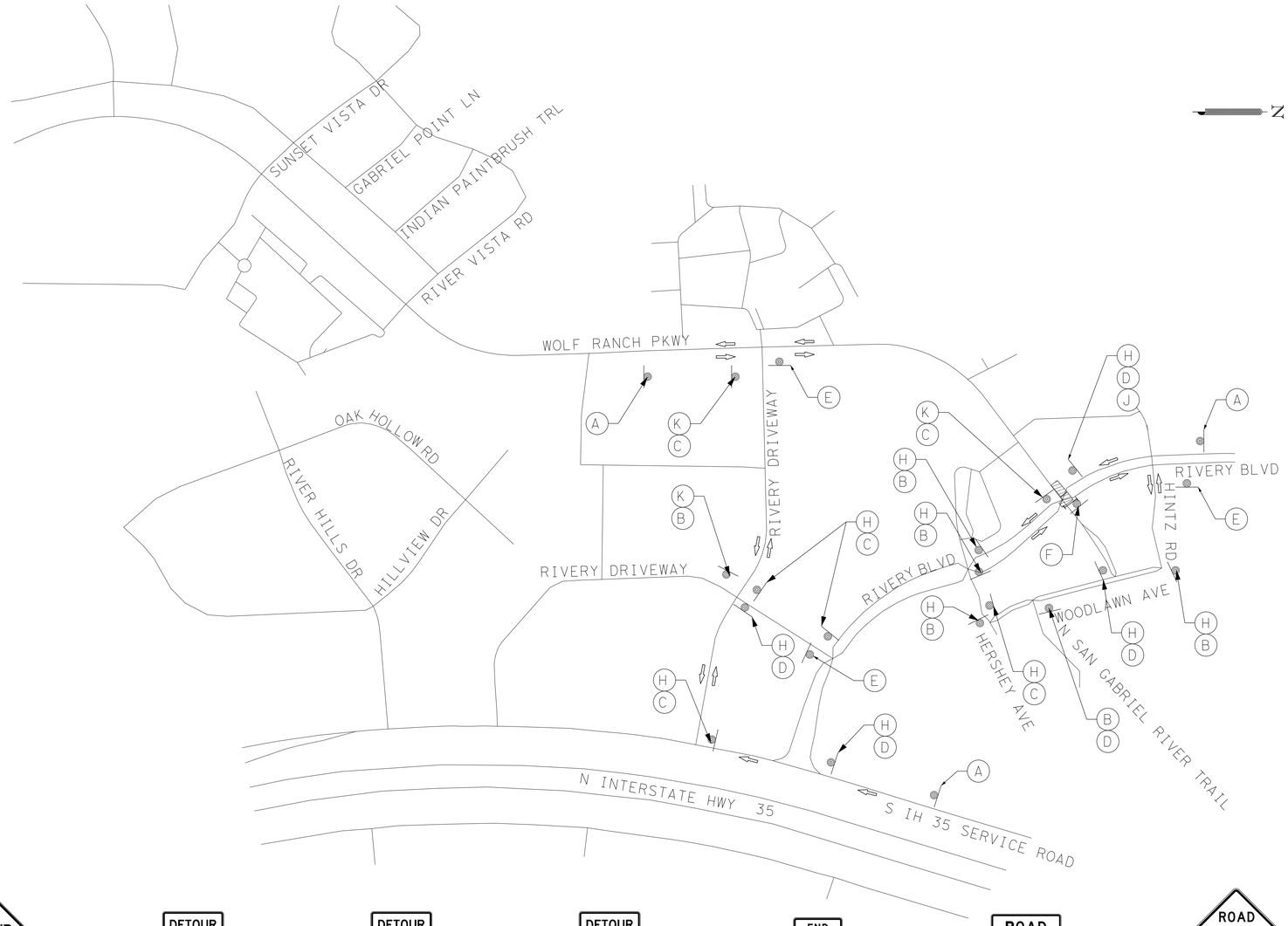

LEGEND

- CONSTRUCTION WORK ZONE
- TYPE III BARRICADE
- SIGN
- TRAFFIC FLOW ARROWS

N

NO.	REVISION	DATE

PAPE-DAWSON ENGINEERS
AUSTIN I SAN ANTONIO I HOUSTON I FORT WORTH I DALLAS
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TEXAS ENGINEERING FIRM #470 I TEXAS SURVEYING FIRM #10028800

GEORGETOWN TEXAS *more than welcome*

WOLF RANCH PKWY / MEMORIAL DR INTERSECTION DETOUR LAYOUT RIVERY BLVD PHASE II STEP 0-A,0-B

NOT TO SCALE

NOTES:

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2. EXISTING PAVEMENT MARKING CONFLICTING WITH WORK ZONE PAVEMENT MARKINGS SHALL BE REMOVED.
3. CONTRACTOR TO MAINTAIN ACCESS TO DRIVEWAYS AT ALL TIMES THROUGHOUT CONSTRUCTION.
4. REFER TO ADVANCE WARNING SIGN LAYOUT SHEET FOR ADDITIONAL ADVANCE WARNING SIGNS.



(A) CW20-2D 36"X36"



(B) M4-9L 30"X24"



(C) M4-9R 30"X24"



(D) M4-9S 30"X24"



(E) M4-8A 24"X18"



(F) R11-2 48"X30"



(G) CW20-3D 36"X36"



(H) D1-1 VARIABLE X 18"



(I) R3-2 24"X24"



(J) R3-1 24"X24"



(K) D1-1 VARIABLE X 18"

DESIGN

STATE OF TEXAS — BRET CHAPMAN — 127293 — LICENSED PROFESSIONAL ENGINEER

BRET CHAPMAN, P.E. — 9/16/2025 DATE

APPROVAL

STATE OF TEXAS — BRIAN A. ALLEN — 123374 — LICENSED PROFESSIONAL ENGINEER

BRIAN A. ALLEN, P.E. — 9/16/2025 DATE

CITY JOB No.
JOB NO. 51423-04
DATE 9/16/2025
DESIGNER
CHECKED DRAWN
SHEET 6 OF 8
SHEET NO. 43A

Date: 9/16/2025
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DETOUR AHEAD	DETOUR	DETOUR	DETOUR	END DETOUR	ROAD CLOSED	ROAD CLOSED AHEAD
(A) CW20-2D 36"X36"	(B) M4-9L 30"X24"	(C) M4-9R 30"X24"	(D) M4-9S 30"X24"	(E) M4-8A 24"X18"	(F) R11-2 48"X30"	(G) CW20-3D 36"X36"

WOLF RANCH PARKWAY	RIVERY DRIVEWAY			ROAD CLOSED TO THRU TRAFFIC
(H) D1-1 VARIABLE X 18"	(I) D1-1 VARIABLE X 18"	(J) R3-1 24"X24"	(K) R3-2 24"X24"	(L) R11-4 60"X30"

DESIGN

STATE OF TEXAS — BRET CHAPMAN — 127293 — LICENSED PROFESSIONAL ENGINEER

BRET CHAPMAN, P.E. — 9/16/2025 DATE

APPROVAL

STATE OF TEXAS — BRIAN A. ALLEN — 123374 — LICENSED PROFESSIONAL ENGINEER

BRIAN A. ALLEN, P.E. — 9/16/2025 DATE

NO.	REVISION	DATE

GEORGETOWN TEXAS *more than welcome*

PAPE-DAWSON ENGINEERS
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10801 N MOPAC EXPY, BLDG 3, STE 200 | AUSTIN, TX 78759 | 512.454.8711
TEXAS ENGINEERING FIRM #470 | TEXAS SURVEYING FIRM #10028800

WOLF RANCH PKWY / MEMORIAL DR INTERSECTION DETOUR LAYOUT RIVERY DRIVEWAY PHASE III

CITY JOB No.
JOB NO. 51423-04
DATE 9/16/2025
DESIGNER
CHECKED DRAWN

SHEET 7 OF 8

SHEET NO. 44

Date: 9/16/2025
File:

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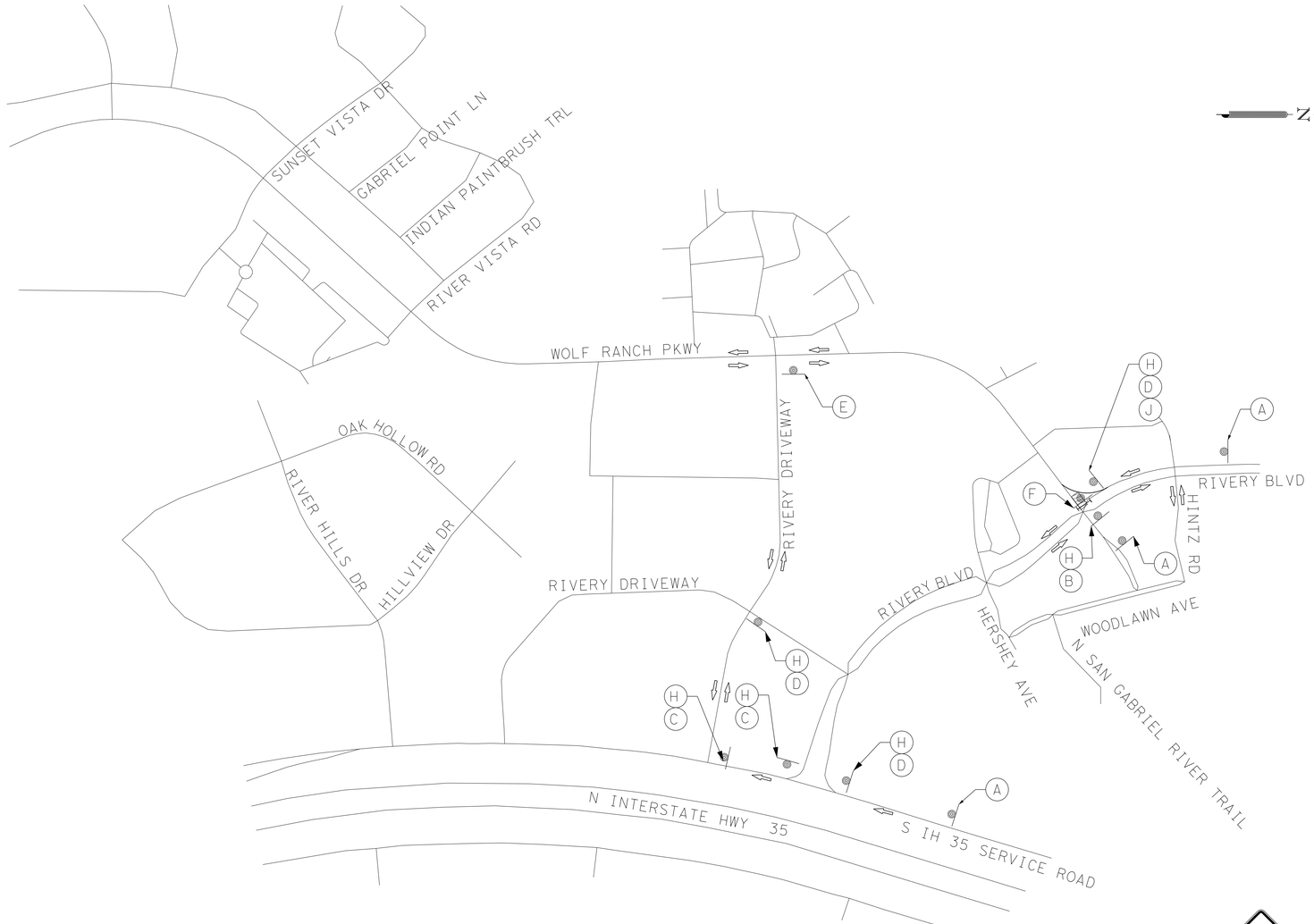

LEGEND

- CONSTRUCTION WORK ZONE
- TYPE III BARRICADE
- SIGN
- TRAFFIC FLOW ARROWS

N

NO.	REVISION	DATE

PAPE-DAWSON ENGINEERS

AUSTIN I SAN ANTONIO I HOUSTON I FORT WORTH I DALLAS

10801 N MOPAC EXPY, BLDG 3, STE 200 I AUSTIN, TX 78759 I 512.454.8711

TEXAS ENGINEERING FIRM #470 I TEXAS SURVEYING FIRM #10028800

GEORGETOWN TEXAS *more than welcome*

WOLF RANCH PKWY / MEMORIAL DR
INTERSECTION DETOUR LAYOUT
RIVERY BLVD PHASE III STEP II



(A)	(B)	(C)	(D)	(E)	(F)	(G)
CW20-2D 36"X36"	M4-9L 30"X24"	M4-9R 30"X24"	M4-9S 30"X24"	M4-8A 24"X18"	R11-2 48"X30"	CW20-3D 36"X36"





(H)	(I)	(J)
D1-1 VARIABLE X 18"	R3-2 24"X24"	R3-1 24"X24"

NOT TO SCALE

NOTES:

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DESIGN

STATE OF TEXAS — BRET CHAPMAN — 127293 — LICENSED PROFESSIONAL ENGINEER

BRET CHAPMAN, P.E. — 9/16/2025 DATE

APPROVAL

STATE OF TEXAS — BRIAN A. ALLEN — 123374 — LICENSED PROFESSIONAL ENGINEER

BRIAN A. ALLEN, P.E. — 9/16/2025 DATE

CITY JOB No.
JOB NO. 51423-04
DATE 9/16/2025
DESIGNER
CHECKED DRAWN

SHEET 8 OF 8

SHEET NO. 45

Date: 9/16/2025
File:

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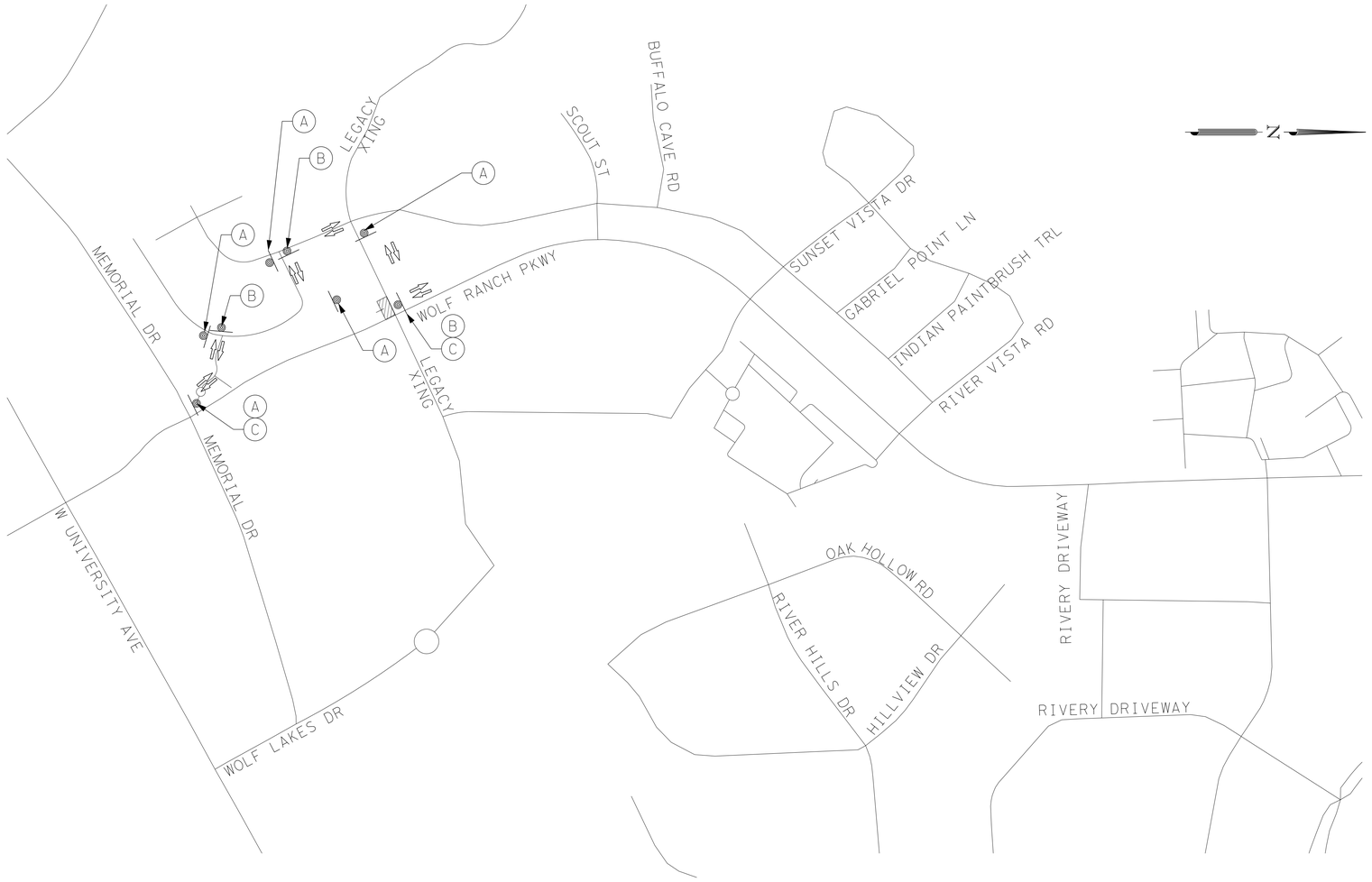

NOT TO SCALE

NOTES:

1. FOR ADDITIONAL DETAILS SEE TxDOT BC, TCP STANDARD SHEETS.
2. EXISTING PAVEMENT MARKING CONFLICTING WITH WORK ZONE PAVEMENT MARKINGS SHALL BE REMOVED.
3. CONTRACTOR TO MAINTAIN ACCESS TO DRIVEWAYS AT ALL TIMES THROUGHOUT CONSTRUCTION.
4. REFER TO ADVANCE WARNING SIGN LAYOUT SHEET FOR ADDITIONAL ADVANCE WARNING SIGNS.



(A)
M4-9bL
30"X24"



(B)
M4-9bR
30"X24"



(C)
R9-9
24" X 12"

DESIGN

STATE OF TEXAS
BRET CHAPMAN
127293
LICENSED
PROFESSIONAL ENGINEER

BRET CHAPMAN, P.E. — 9/16/2025 DATE

APPROVAL

STATE OF TEXAS
BRIAN A. ALLEN
123374
LICENSED
PROFESSIONAL ENGINEER

BRIAN A. ALLEN, P.E. — 9/16/2025 DATE

NO.	REVISION	DATE

PAPE-DAWSON ENGINEERS

AUSTIN | SAN ANTONIO | HOUSTON | FORT WORTH | DALLAS
10801 N MOPAC EXPY, BLDG 3, STE 200 | AUSTIN, TX 78759 | 512.454.8711
TEXAS ENGINEERING FIRM #470 | TEXAS SURVEYING FIRM #10028800

GEORGETOWN TEXAS
more than welcome

WOLF RANCH PKWY / MEMORIAL DR
PEDESTRIAN DETOUR LAYOUT
LEGACY XING PHASE II STEP I

CITY JOB No.
JOB NO. 51423-04
DATE 9/16/2025
DESIGNER
CHECKED DRAWN

SHEET 1 OF 1

SHEET NO. 46

Date: 9/16/2025
File:

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DETOUR	DETOUR	SIDEWALK CLOSED
(A)	(B)	(C)
M4-9bL	M4-9bR	R9-9
30"X24"	30"X24"	24" X 12"

NOT TO SCALE

NOTES:

1. FOR ADDITIONAL DETAILS SEE TxDOT BC, TCP STANDARD SHEETS.
2. EXISTING PAVEMENT MARKING CONFLICTING WITH WORK ZONE PAVEMENT MARKINGS SHALL BE REMOVED.
3. CONTRACTOR TO MAINTAIN ACCESS TO DRIVEWAYS AT ALL TIMES THROUGHOUT CONSTRUCTION.
4. REFER TO ADVANCE WARNING SIGN LAYOUT SHEET FOR ADDITIONAL ADVANCE WARNING SIGNS.

DESIGN

STATE OF TEXAS · BRET CHAPMAN · 127293 · LICENSED · PROFESSIONAL ENGINEER

BRET CHAPMAN, P.E. — 9/16/2025 DATE

APPROVAL

STATE OF TEXAS · BRIAN A. ALLEN · 123374 · LICENSED · PROFESSIONAL ENGINEER

BRIAN A. ALLEN, P.E. — 9/16/2025 DATE

NO.	REVISION	DATE

GEORGETOWN TEXAS *more than welcome*

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10801 N MOPAC EXPY, BLDG 3, STE 200 I AUSTIN, TX 78759 I 512.454.8711
TEXAS ENGINEERING FIRM #470 I TEXAS SURVEYING FIRM #10028800

WOLF RANCH PKWY / MEMORIAL DR
PEDESTRIAN DETOUR LAYOUT
LEGACY XING PHASE II STEP II

CITY JOB No.
JOB NO. 51423-04
DATE 9/16/2025
DESIGNER
CHECKED DRAWN

SHEET 1 OF 1

SHEET NO. 47

Date: 9/16/2025
File:

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LEGEND

- CONSTRUCTION WORK ZONE
- TYPE III BARRICADE
- SIGN
- TRAFFIC FLOW ARROWS

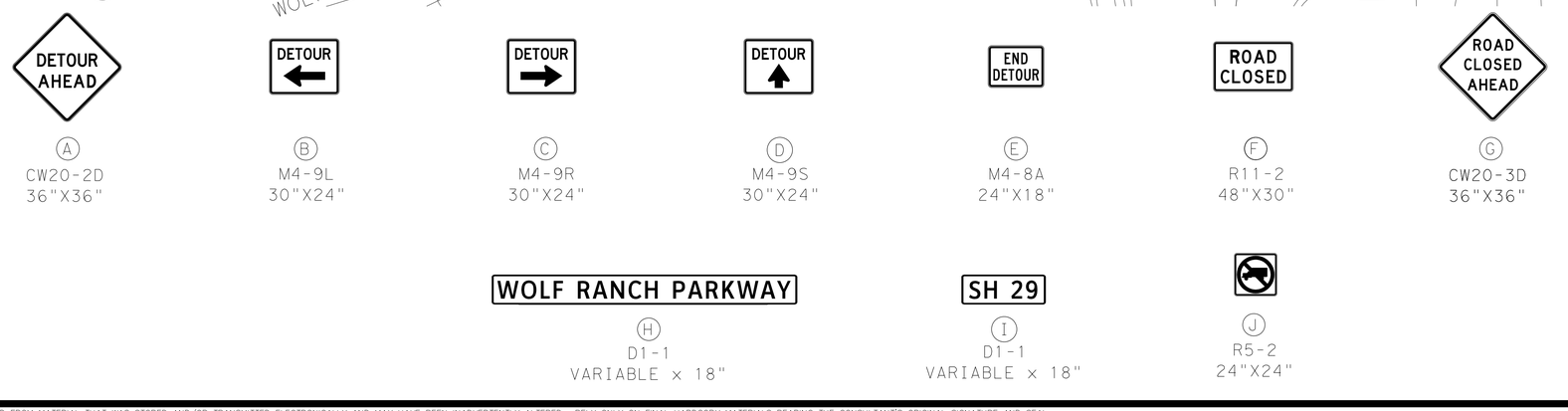
N

NO.	REVISION	DATE

GEORGETOWN TEXAS *more than welcome*

PAPE-DAWSON ENGINEERS
AUSTIN I SAN ANTONIO I HOUSTON I FORT WORTH I DALLAS
10801 N MOPAC EXPY, BLDG 3, STE 200 I AUSTIN, TX 78759 I 512.454.8711
TEXAS ENGINEERING FIRM #470 I TEXAS SURVEYING FIRM #10028800

WOLF RANCH PKWY / MEMORIAL DR
TRUCK DETOUR LAYOUT PHASE II



A	B	C	D	E	F	G	H	I	J
CW20-2D 36"X36"	M4-9L 30"X24"	M4-9R 30"X24"	M4-9S 30"X24"	M4-8A 24"X18"	R11-2 48"X30"	CW20-3D 36"X36"	D1-1 VARIABLE x 18"	D1-1 VARIABLE x 18"	R5-2 24"X24"

NOT TO SCALE

NOTES:

1. FOR ADDITIONAL DETAILS SEE TxDOT BC, TCP STANDARD SHEETS.

NOTES:

2. EXISTING PAVEMENT MARKING CONFLICTING WITH WORK ZONE PAVEMENT MARKINGS SHALL BE REMOVED.
3. CONTRACTOR TO MAINTAIN ACCESS TO DRIVEWAYS AT ALL TIMES THROUGHOUT CONSTRUCTION.
4. REFER TO ADVANCE WARNING SIGN LAYOUT SHEET FOR ADDITIONAL ADVANCE WARNING SIGNS.

DESIGN

STATE OF TEXAS — BRET CHAPMAN — 127293 — LICENSED PROFESSIONAL ENGINEER

BRET CHAPMAN, P.E. — 9/16/2025 DATE

APPROVAL

STATE OF TEXAS — BRIAN A. ALLEN — 123374 — LICENSED PROFESSIONAL ENGINEER

BRIAN A. ALLEN, P.E. — 9/16/2025 DATE

CITY JOB No.
JOB NO. 51423-04
DATE 9/16/2025
DESIGNER
CHECKED DRAWN

SHEET 1 OF 1

SHEET NO. 48

Date: 9/16/2025
File:

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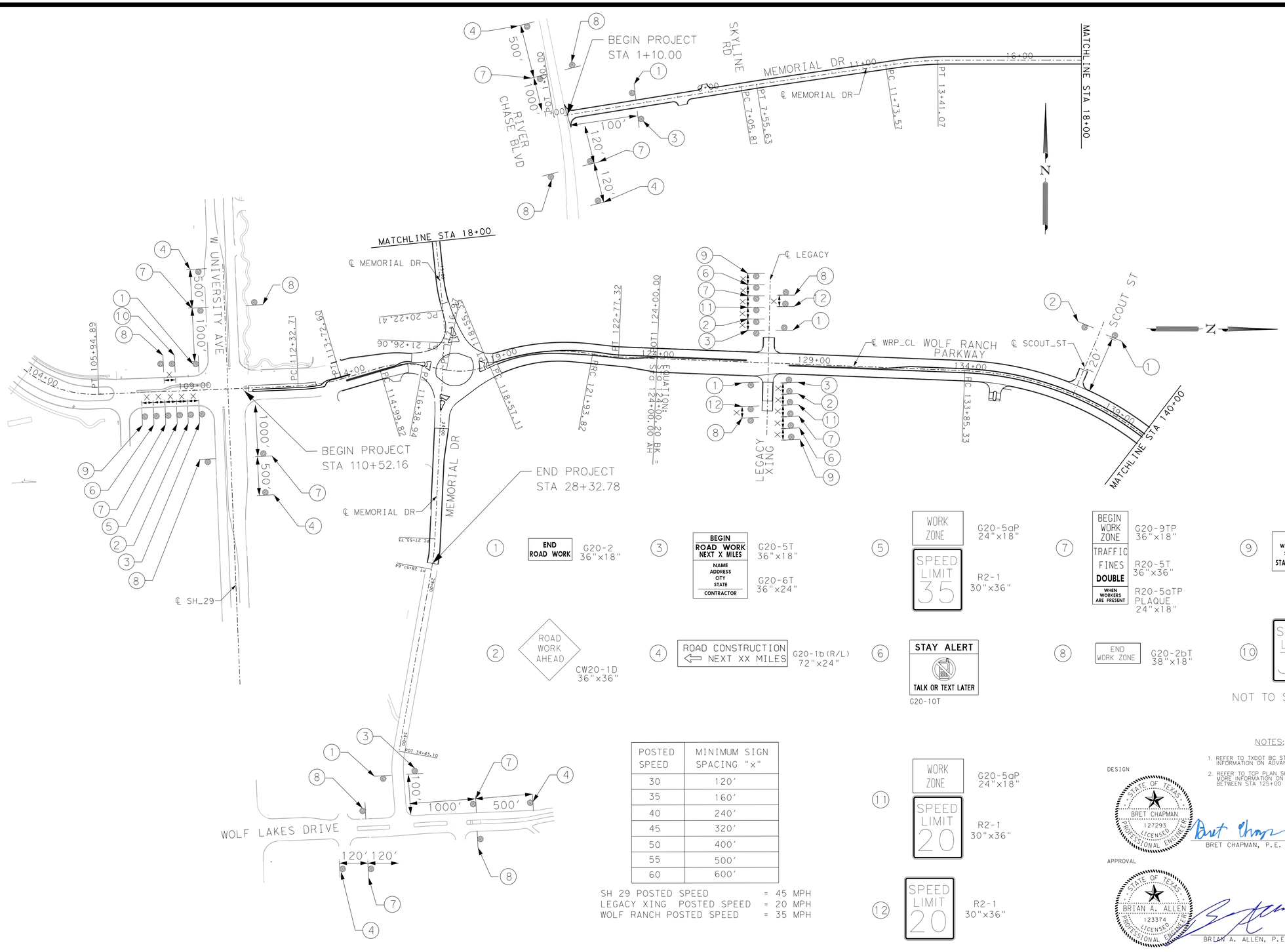

1	END ROAD WORK	G20-2 36"x18"	3	BEGIN ROAD WORK NEXT X MILES / NAME ADDRESS CITY STATE CONTRACTOR	G20-5T 36"x18" G20-6T 36"x24"	5	WORK ZONE / SPEED LIMIT 35	G20-5aP 24"x18" R2-1 30"x36"	7	BEGIN WORK ZONE / TRAFFIC FINES DOUBLE / WHEN WORKERS ARE PRESENT	G20-9TP 36"x18" R20-5T 36"x36" R20-5aTP PLAQUE 24"x18"	9	OBEY WARNING SIGNS STATE LAW	R20-3T 48"x42"
2	ROAD WORK AHEAD	CW20-1D 36"x36"	4	ROAD CONSTRUCTION ⇦ NEXT XX MILES	G20-1b(R/L) 72"x24"	6	STAY ALERT / TALK OR TEXT LATER	G20-10T	8	END WORK ZONE	G20-2bT 38"x18"	10	SPEED LIMIT 35	R2-1 30"x36"
						11	WORK ZONE / SPEED LIMIT 20	G20-5aP 24"x18" R2-1 30"x36"						
						12	SPEED LIMIT 20	R2-1 30"x36"						

NOT TO SCALE

POSTED SPEED	MINIMUM SIGN SPACING "x"
30	120'
35	160'
40	240'
45	320'
50	400'
55	500'
60	600'

SH 29 POSTED SPEED = 45 MPH
LEGACY XING POSTED SPEED = 20 MPH
WOLF RANCH POSTED SPEED = 35 MPH

NOTES:

1. REFER TO TXDOT BC STANDARDS FOR MORE INFORMATION ON ADVANCE WARNING SIGNS
2. REFER TO TCP PLAN SHEETS FOR MORE INFORMATION ON ADVANCE WARNING SIGNS BETWEEN STA 125+00 TO STA 185+00

DESIGN

STATE OF TEXAS · BRET CHAPMAN · 127293 · LICENSED · PROFESSIONAL ENGINEER

BRET CHAPMAN, P.E. — 9/16/2025 DATE

APPROVAL

STATE OF TEXAS · BRIAN A. ALLEN · 123374 · LICENSED · PROFESSIONAL ENGINEER

BRIAN A. ALLEN, P.E. — 9/16/2025 DATE

NO.	REVISION	DATE

GEORGETOWN TEXAS *more than welcome*

PAPE-DAWSON ENGINEERS
AUSTIN | SAN ANTONIO | HOUSTON | FORT WORTH | DALLAS
10801 N MOPAC EXPY, BLDG 3, STE 200 | AUSTIN, TX 78759 | 512.454.8711
TBPE FIRM REGISTRATION #470 | TBPLS FIRM REGISTRATION #100288001

WOLF RANCH PKWY / MEMORIAL DR
ADVANCED WARNING SIGNS

CITY JOB No.
JOB NO. 51423-04
DATE 9/16/2025
DESIGNER
CHECKED DRAWN

SHEET 1 OF 2
SHEET NO. 49

Date: 9/16/2025
File:

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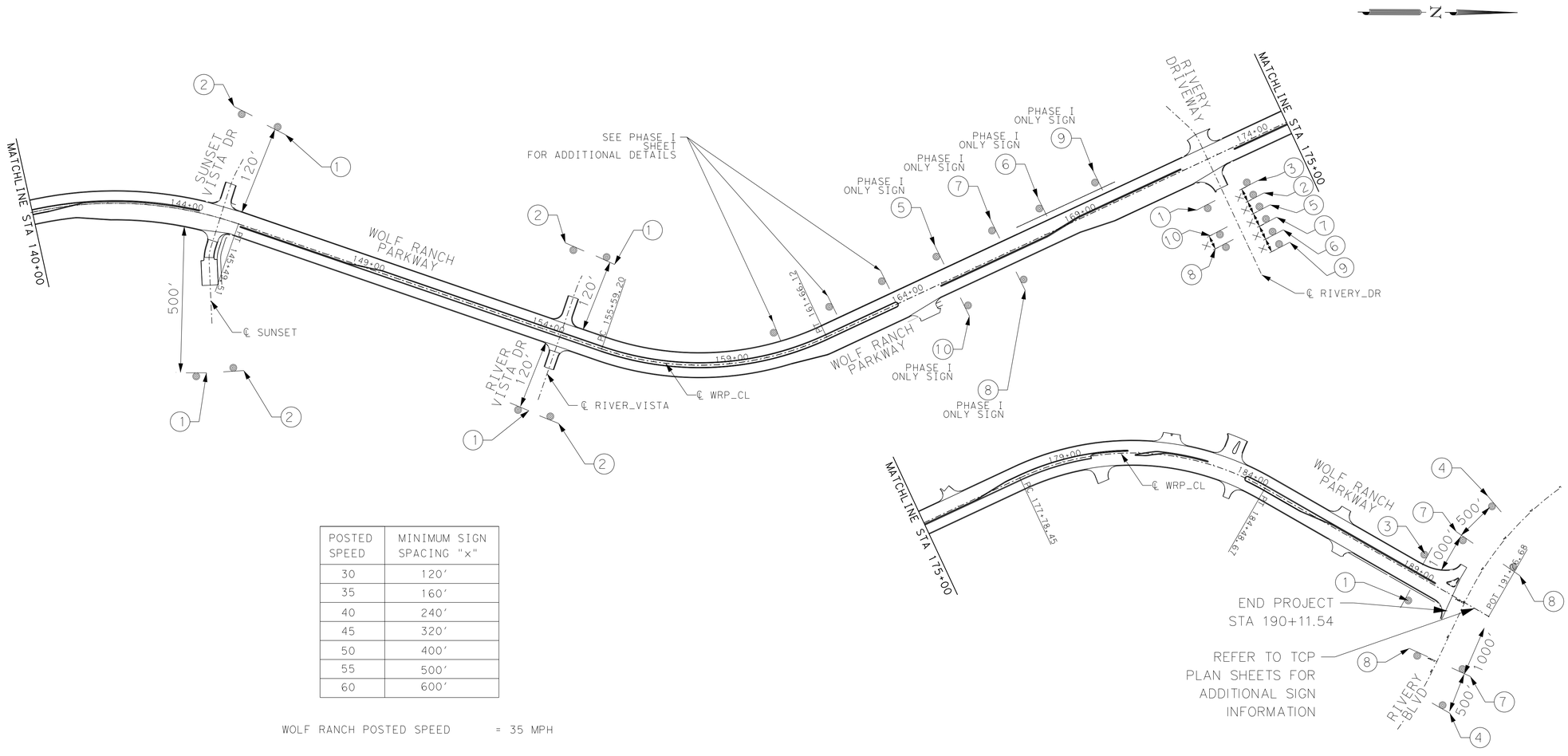

POSTED SPEED	MINIMUM SIGN SPACING "x"
30	120'
35	160'
40	240'
45	320'
50	400'
55	500'
60	600'

WOLF RANCH POSTED SPEED = 35 MPH

NOT TO SCALE

NOTES:

1. REFER TO TXDOT BC STANDARDS AND TXDOT TCP STANDARDS FOR MORE INFORMATION ON ADVANCE WARNING SIGNS
2. REFER TO TCP PLAN SHEETS FOR MORE INFORMATION ON ADVANCE WARNING SIGNS FOR INDIVIDUAL PHASES

1. END ROAD WORK — G20-2 36"x18"
2. ROAD WORK AHEAD — CW20-1D 36"x36"
3. BEGIN ROAD WORK NEXT X MILES / NAME ADDRESS CITY STATE CONTRACTOR — G20-5T 36"x18", G20-6T 36"x24"
4. ROAD CONSTRUCTION ⇦ NEXT XX MILES — G20-1b(R/L) 72"x24"
5. WORK ZONE / SPEED LIMIT 35 — G20-5aP 24"x18", R2-1 30"x36"
6. STAY ALERT / TALK OR TEXT LATER — G20-10T
7. BEGIN WORK ZONE / TRAFFIC FINES DOUBLE / WHEN WORKERS ARE PRESENT — G20-9TP 36"x18", R20-5T 36"x36", R20-5aTP PLAQUE 24"x18"
8. END WORK ZONE — G20-2bT 38"x18"
9. OBEY WARNING SIGNS STATE LAW — R20-3T 48"x42"
10. SPEED LIMIT 35 — R2-1 30"x36"

DESIGN

STATE OF TEXAS — BRET CHAPMAN — 127293 — LICENSED PROFESSIONAL ENGINEER

BRET CHAPMAN, P.E. — 9/16/2025 DATE

APPROVAL

STATE OF TEXAS — BRIAN A. ALLEN — 123374 — LICENSED PROFESSIONAL ENGINEER

BRIAN A. ALLEN, P.E. — 9/16/2025 DATE

NO.	REVISION	DATE

GEORGETOWN TEXAS *more than welcome*

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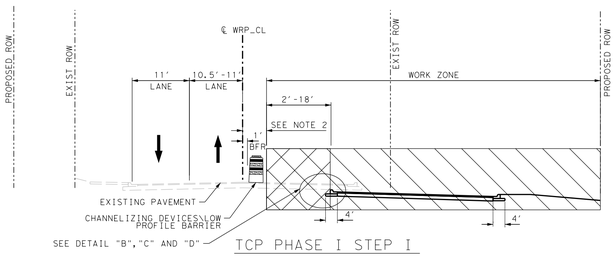
TBPE FIRM REGISTRATION #470 / TBPLS FIRM REGISTRATION #10028801

WOLF RANCH PKWY / MEMORIAL DR
ADVANCED WARNING SIGNS

CITY JOB No.
JOB NO. 51423-04
DATE 9/16/2025
DESIGNER
CHECKED DRAWN

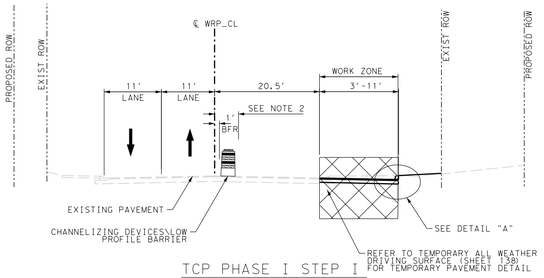
SHEET 2 OF 2
SHEET NO. 50



TCP PHASE I STEP I

N.T.S.

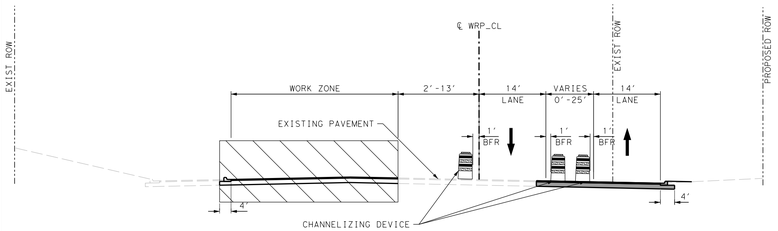
STA 113+45 TO STA 152+50
STA 115+89 TO STA 116+73*
STA 119+45 TO STA 120+70*
STA 134+30 TO STA 135+52*
STA 137+00 TO STA 138+00*
*TEMPORARY PAVEMENT LIMITS



TCP PHASE I STEP I

N.T.S.

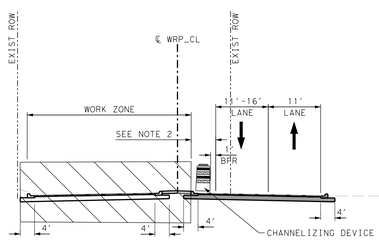
STA 152+50 TO STA 156+00



TCP PHASE II STEP I

N.T.S.

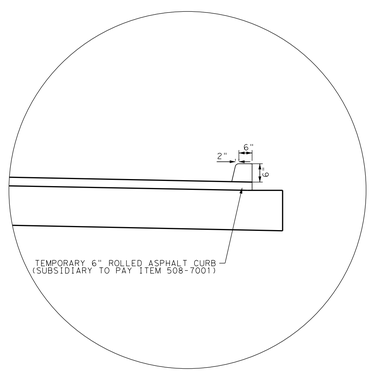
STA 113+45 TO STA 116+65



TCP PHASE II STEP I

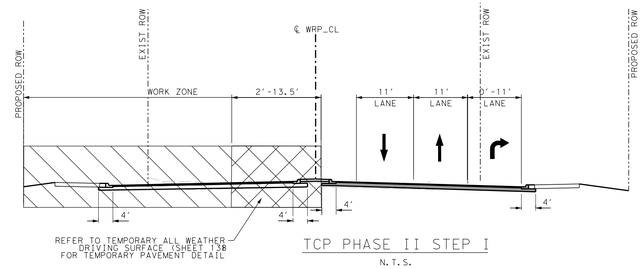
N.T.S.

STA 116+65 TO STA 119+45



DETAIL "A"

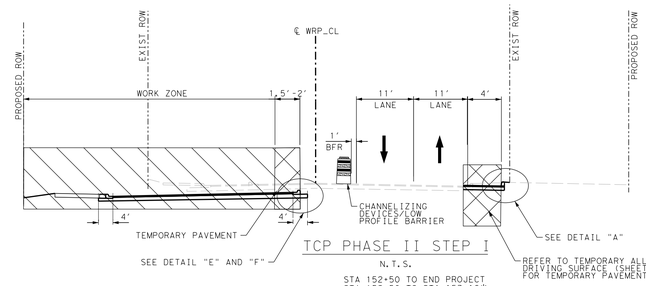
N.T.S.



TCP PHASE II STEP I

N.T.S.

STA 119+45 TO STA 152+50
STA 124+00 TO STA 127+18**
STA 137+10 TO STA 141+20*
STA 142+10 TO STA 144+47**
*TEMPORARY PAVEMENT LIMITS
**RIGHT TURN LANE LIMITS

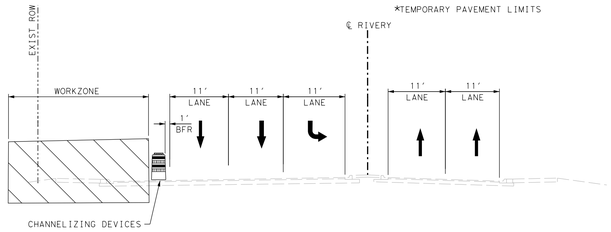


TCP PHASE II STEP I

N.T.S.

STA 152+50 TO END PROJECT
STA 152+50 TO STA 153+16*
STA 155+73 TO STA 163+72*
STA 168+82 TO STA 171+97*
STA 177+25 TO STA 180+74*
STA 182+10 TO STA 182+85*
STA 183+92 TO STA 189+63*
STA 178+49 TO STA 184+42*

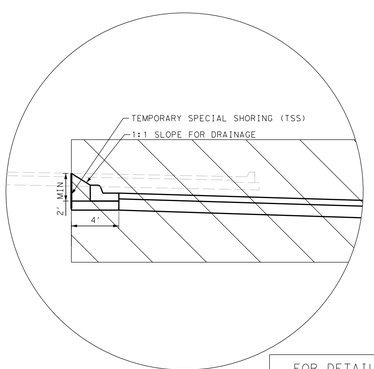
*TEMPORARY PAVEMENT LIMITS



TCP RIVERY BLVD TYPICAL PHASE II STEP I

N.T.S.

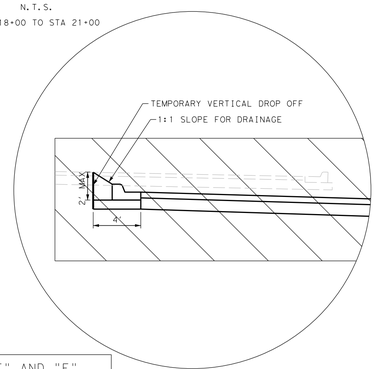
STA 18+00 TO STA 21+00



DETAIL "B"

N.T.S.

STA 123+90 TO STA 131+30 PHASE-I
STA 146+90 TO STA 152+55 PHASE-I

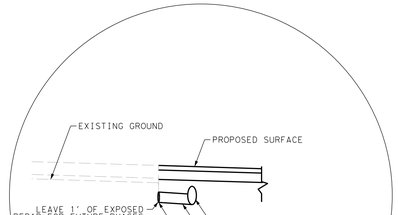


DETAIL "C"

N.T.S.

STA 113+45 TO STA 123+90
STA 131+30 TO STA 134+30
STA 135+50 TO STA 146+90

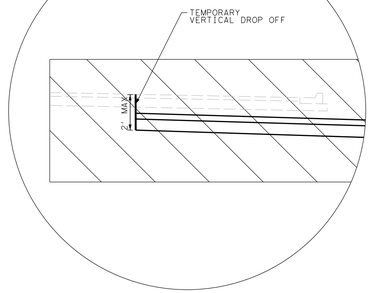
FOR DETAILS "E" AND "F"
SEE NEXT SHEET



DETAIL FOR UPSTREAM TRUNKLINE

N.T.S.

NOTES:
1. FOR UPSTREAM LATERALS AT CONSTRUCTION JOINT LINE, PLACE FLOWABLE FILL ON OPENING TO PREVENT EROSION OF EXISTING SOIL.
2. FLOWABLE FILL COST IS INCLUDED IN OTHER ITEMS OF WORK



DETAIL "D"

N.T.S.

STA 119+45 TO STA 120+70 PHASE-I
STA 134+30 TO STA 135+50 PHASE-I

LEGEND

- WORKZONE
- MILL AND OVERLAY
- TEMPORARY PAVEMENT
- PAVEMENT CONSTRUCTED IN PREVIOUS STAGE
- CHANNELIZING DEVICES

NOTES:

1. CONTRACTOR TO PROVIDE A 3:1 MAX SLOPE OF NON ERODIBLE MATERIAL AT ALL DROPS GREATER THAN 2" DURING NON WORKING PERIODS THROUGH THE ENTIRE CONSTRUCTION DURATION.
2. REFER TO TCP PLAN SHEETS FOR BUFFERS AT SPECIFIC LOCATIONS AND LOW PROFILE BARRIER LIMITS.
3. IF A PROPOSED CURB HAS BEEN CONSTRUCTED IN THE CENTER, A CHANNELIZING DEVICE IS NOT NECESSARY.

DESIGN

STATE OF TEXAS — BRET CHAPMAN — 127293 — LICENSED PROFESSIONAL ENGINEER

BRET CHAPMAN, P.E. — 9/16/2025 DATE

APPROVAL

STATE OF TEXAS — BRIAN A. ALLEN — 123374 — LICENSED PROFESSIONAL ENGINEER

BRIAN A. ALLEN, P.E. — 9/16/2025 DATE

NO.	REVISION	DATE

GEORGETOWN TEXAS *more than welcome*

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TEXAS ENGINEERING FIRM #470 | TEXAS SURVEYING FIRM #10028800

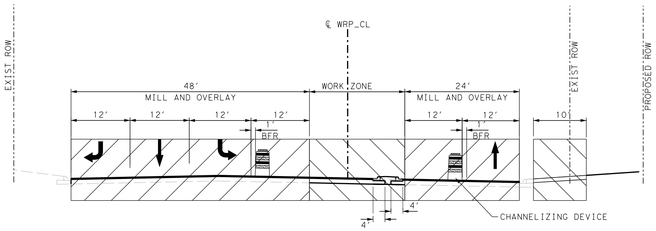
WOLF RANCH PKWY / MEMORIAL DR

TCP TYPICALS

CITY JOB No.
JOB NO. 51423-04
DATE 9/16/2025
DESIGNER
CHECKED DRAWN

SHEET 1 OF 5

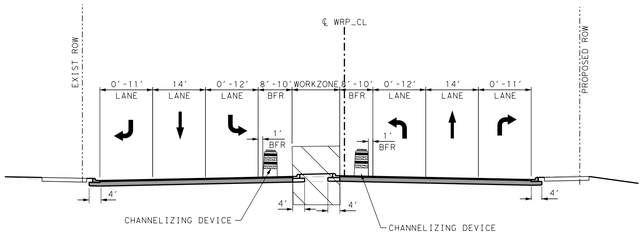
SHEET NO. 51



TCP PHASE III STEP I

N.T.S.

BEGIN TO STA 113+45



TCP PHASE III STEP II

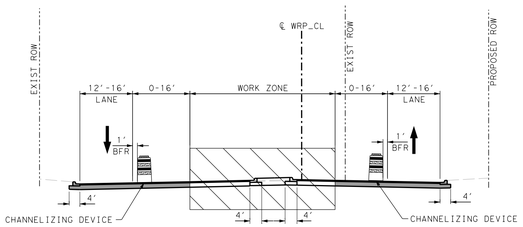
N.T.S.

BEGIN PROJECT TO END PROJECT

NOTE: REFER TO TCP PLAN SHEETS FOR LEFT AND RIGHT TURN LANE LIMITS

LEGEND

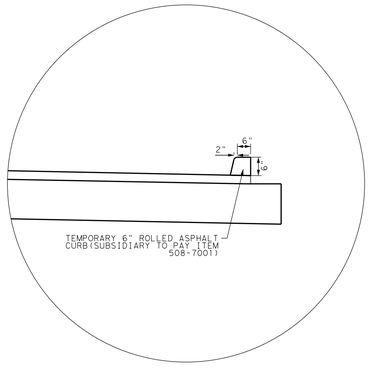
- WORKZONE
- MILL AND OVERLAY
- TEMPORARY PAVEMENT
- PAVEMENT CONSTRUCTED IN PREVIOUS STAGE
- CHANNELIZING DEVICES



TCP PHASE III STEP I

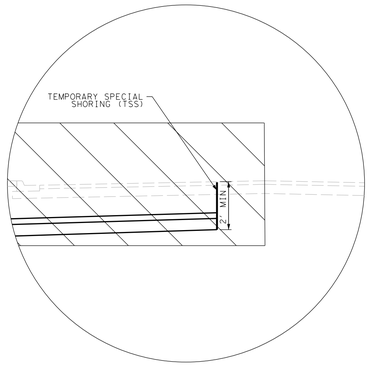
N.T.S.

STA 113+45 TO STA 120+47



DETAIL "A"

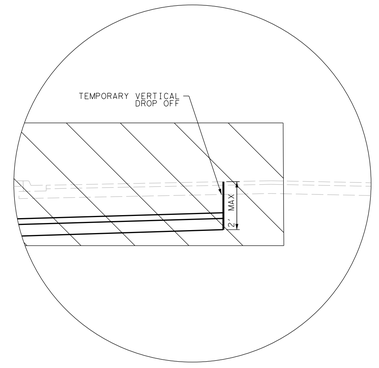
N.T.S.



DETAIL "E"

N.T.S.

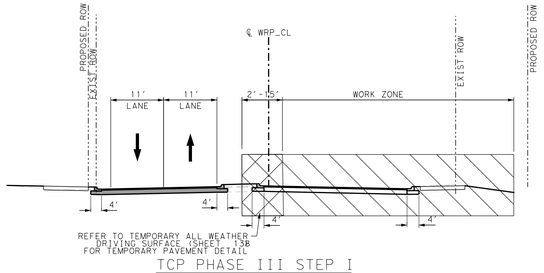
STA 152+50 TO STA 160+60 PHASE-II
STA 166+58 TO STA 176+20 PHASE-II



DETAIL "F"

N.T.S.

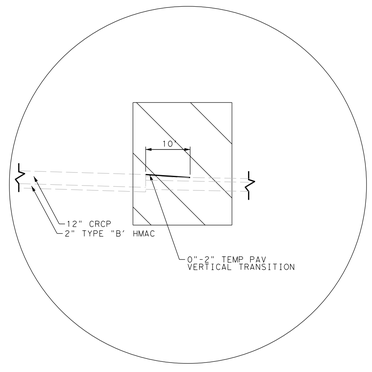
STA 160+60 TO STA 166+58 PHASE-II
STA 166+58 TO STA 189+70 PHASE-II



TCP PHASE III STEP I

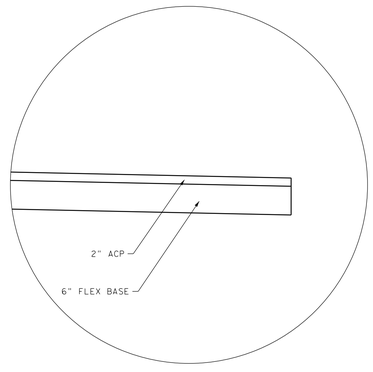
N.T.S.

STA 152+50 TO STA END PROJECT
STA 152+50 TO STA 163+73*
STA 177+25 TO STA 180+73*
STA 154+00 TO STA 155+00*
STA 179+30 TO STA 180+74*
*TEMPORARY PAVEMENT LIMITS



DETAIL "G"

N.T.S.



TEMPORARY PAVEMENT DETAIL

N.T.S.

NOTES:

1. CONTRACTOR TO PROVIDE A 3:1 MAX SLOPE OF NON ERODIBLE MATERIAL AT ALL DROPS GREATER THAN 2" DURING NON WORKING PERIODS THROUGH THE ENTIRE CONSTRUCTION DURATION.
2. REFER TO TCP PLAN SHEETS FOR BUFFERS AT SPECIFIC LOCATIONS AND LOW PROFILE BARRIER LIMITS.
3. IF A PROPOSED CURB HAS BEEN CONSTRUCTED IN THE CENTER, A CHANNELIZING DEVICE IS NOT NECESSARY.

DESIGN

STATE OF TEXAS
BRET CHAPMAN
127293
LICENSED
PROFESSIONAL ENGINEER

BRET CHAPMAN, P.E. — 9/16/2025 DATE

APPROVAL

STATE OF TEXAS
BRIAN A. ALLEN
123374
LICENSED
PROFESSIONAL ENGINEER

BRIAN A. ALLEN, P.E. — 9/16/2025 DATE

NO.	REVISION	DATE

GEORGETOWN TEXAS *more than welcome*

PAPE-DAWSON ENGINEERS
AUSTIN I SAN ANTONIO I HOUSTON I FORT WORTH I DALLAS
10801 N MOPAC EXPY, BLDG 3, STE 200 I AUSTIN, TX 78759 I 512.454.8711
TEXAS ENGINEERING FIRM #470 I TEXAS SURVEYING FIRM #10028800

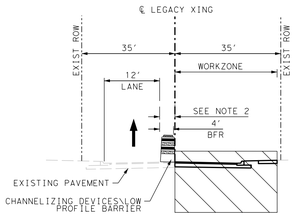
WOLF RANCH PKWY / MEMORIAL DR

TCP TYPICALS

CITY JOB No.
JOB NO. 51423-04
DATE 9/16/2025
DESIGNER
CHECKED DRAWN

LEGEND

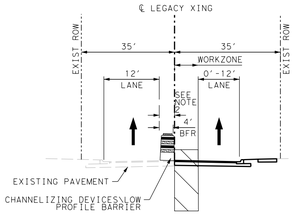
- WORKZONE
- MILL AND OVERLAY
- TEMPORARY PAVEMENT
- PAVEMENT CONSTRUCTED IN PREVIOUS STAGE
- CHANNELIZING DEVICES



TCP LEGACY XING PHASE I STEP I

N.T.S.

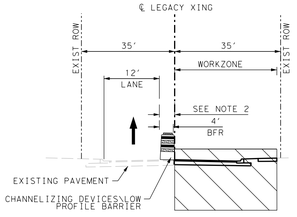
STA 4+86.76 TO STA 6+38.57
STA 4+86.76 TO STA 5+08.36 *
*TEMPORARY PAVEMENT LIMITS



TCP LEGACY XING PHASE I STEP IB

N.T.S.

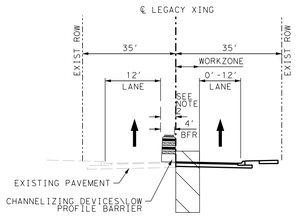
STA 4+86.76 TO STA 5+08.36



TCP LEGACY XING PHASE II STEP I

N.T.S.

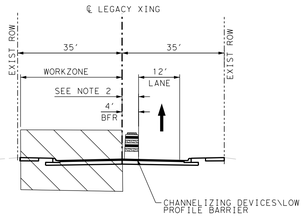
STA 4+03.22 TO STA 4+88.88



TCP LEGACY XING PHASE II STEP IB

N.T.S.

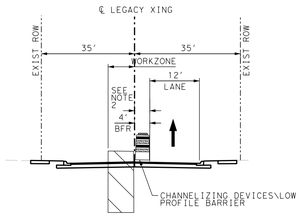
STA 4+61.54 TO STA 4+88.88



TCP LEGACY XING PHASE I STEP II

N.T.S.

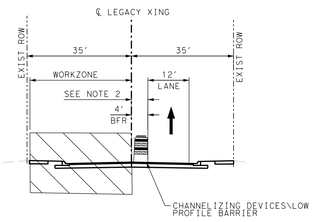
STA 4+86.92 TO STA 6+39.57
STA 4+86.92 TO STA 5+08.36 *
*TEMPORARY PAVEMENT LIMITS



TCP LEGACY XING PHASE I STEP IIB

N.T.S.

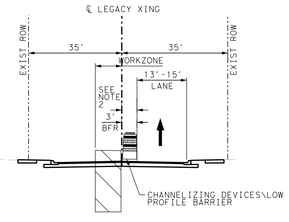
STA 4+86.97 TO STA 5+08.36



TCP LEGACY XING PHASE II STEP II

N.T.S.

STA 4+03.22 TO STA 4+89.51



TCP LEGACY XING PHASE II STEP IIB

N.T.S.

STA 4+71.83 TO STA 4+89.51

NOTES:

1. CONTRACTOR TO PROVIDE A 3:1 MAX SLOPE OF NON ERODIBLE MATERIAL AT ALL DROPS GREATER THAN 2" DURING NON WORKING PERIODS THROUGH THE ENTIRE CONSTRUCTION DURATION.
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BRET CHAPMAN, P.E. — 9/16/2025 DATE

APPROVAL

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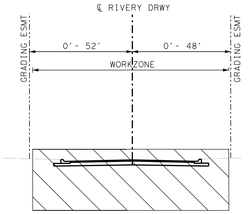
TEXAS ENGINEERING FIRM #470 | TEXAS SURVEYING FIRM #10028800

WOLF RANCH PKWY / MEMORIAL DR

TCP TYPICALS

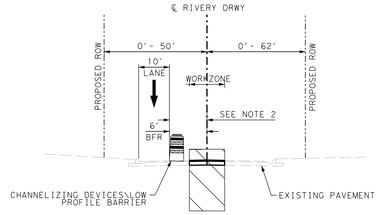
CITY JOB No.
JOB NO. 51423-04
DATE 9/16/2025
DESIGNER
CHECKED DRAWN



TCP RIVERY DRWY PHASE II STEP I

N.T.S.

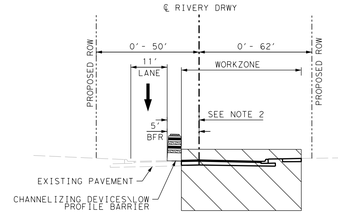
STA 51+07.95 TO STA 51+74.20
STA 51+72.20 TO STA 51+74.20*
*TEMPORARY PAVEMENT LIMITS



TCP RIVERY DRWY PHASE II STEP I

N.T.S.

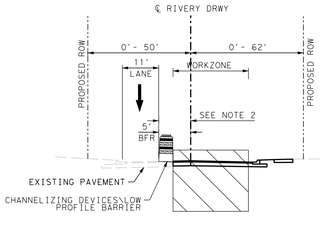
STA 51+74.20 TO STA 60+66.89
STA 51+74.20 TO STA 52+63.33*
*TEMPORARY PAVEMENT LIMITS



TCP RIVERY DRWY PHASE III STEP I

N.T.S.

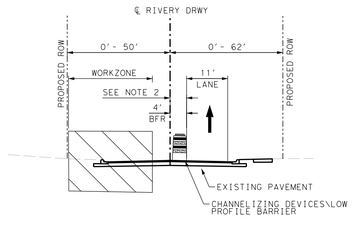
STA 52+11.13 TO STA 52+67.19



TCP LEGACY XING PHASE III STEP IB

N.T.S.

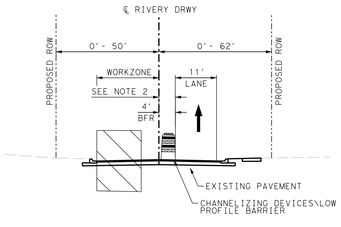
STA 51+74.32 TO STA 52+11.13



TCP RIVERY DRWY PHASE III STEP IC

N.T.S.

STA 51+74.32 TO STA 52+63.33
STA 51+74.32 TO STA 51+95.20*
*MILL PAVEMENT



TCP RIVERY DRWY PHASE III STEP ID

N.T.S.

STA 51+74.32 TO STA 51+95.20

LEGEND

- WORKZONE
- MILL AND OVERLAY
- TEMPORARY PAVEMENT
- PAVEMENT CONSTRUCTED IN PREVIOUS STAGE
- CHANNELIZING DEVICES

NOTES:

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STATE OF TEXAS
BRET CHAPMAN
127293
LICENSED
PROFESSIONAL ENGINEER

BRET CHAPMAN, P.E. — 9/16/2025 DATE

APPROVAL

STATE OF TEXAS
BRIAN A. ALLEN
123374
LICENSED
PROFESSIONAL ENGINEER

BRIAN A. ALLEN, P.E. — 9/16/2025 DATE

NO.	REVISION	DATE

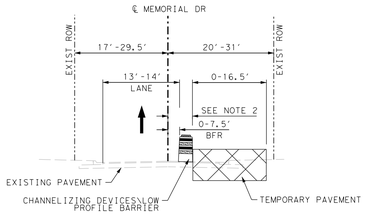
GEORGETOWN TEXAS
more than welcome

PAPE-DAWSON ENGINEERS
AUSTIN I SAN ANTONIO I HOUSTON I FORT WORTH I DALLAS
10801 N MOPAC EXPY, BLDG 3, STE 200 I AUSTIN, TX 78759 I 512.454.8711
TEXAS ENGINEERING FIRM #470 I TEXAS SURVEYING FIRM #10028800

WOLF RANCH PKWY / MEMORIAL DR

TCP TYPICALS

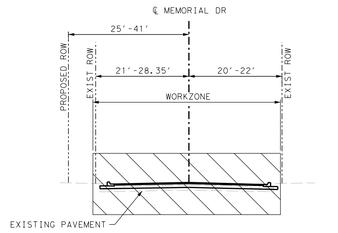
CITY JOB No.
JOB NO. 51423-04
DATE 9/16/2025
DESIGNER
CHECKED DRAWN



TCP MEMORIAL PHASE I STEP I

N.T.S.

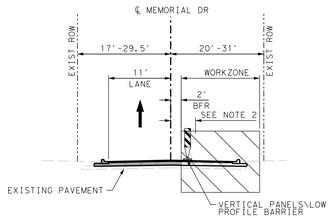
STA 1+00 TO STA 20+00



TCP MEMORIAL PHASE I STEP I

N.T.S.

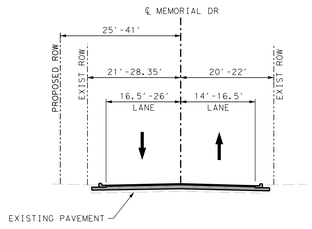
STA 24+00 TO STA 28+34.56



TCP MEMORIAL PHASE II STEP IB

N.T.S.

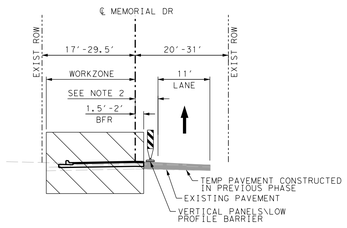
STA 1+00 TO STA 20+00



TCP MEMORIAL PHASE II STEP IB

N.T.S.

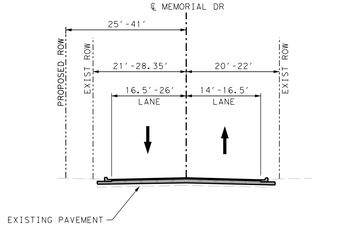
STA 24+00 TO STA 28+34.56



TCP MEMORIAL PHASE II STEP I

N.T.S.

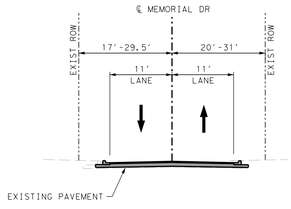
STA 1+00 TO STA 20+00



TCP MEMORIAL PHASE II STEP I

N.T.S.

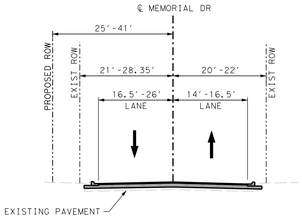
STA 24+00 TO STA 28+34.56



TCP MEMORIAL PHASE III STEP II

N.T.S.

STA 1+00 TO STA 20+00



TCP MEMORIAL PHASE III STEP II

N.T.S.

STA 24+00 TO STA 28+34.56

LEGEND

- WORKZONE
- MILL AND OVERLAY
- TEMPORARY PAVEMENT
- PAVEMENT CONSTRUCTED IN PREVIOUS STAGE
- CHANNELIZING DEVICES

NOTES:

1. CONTRACTOR TO PROVIDE A 3:1 MAX SLOPE OF NON ERODIBLE MATERIAL AT ALL DROPS GREATER THAN 2" DURING NON WORKING PERIODS THROUGH THE ENTIRE CONSTRUCTION DURATION.
2. REFER TO TCP PLAN SHEETS FOR BUFFERS AT SPECIFIC LOCATIONS AND LOW PROFILE BARRIER LIMITS.
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STATE OF TEXAS
BRET CHAPMAN
127293
LICENSED
PROFESSIONAL ENGINEER

BRET CHAPMAN, P.E. — 9/16/2025 DATE

APPROVAL

STATE OF TEXAS
BRIAN A. ALLEN
123374
LICENSED
PROFESSIONAL ENGINEER

BRIAN A. ALLEN, P.E. — 9/16/2025 DATE

NO.	REVISION	DATE

GEORGETOWN TEXAS *more than welcome*

PAPE-DAWSON ENGINEERS
AUSTIN I SAN ANTONIO I HOUSTON I FORT WORTH I DALLAS
10801 N MOPAC EXPY, BLDG 3, STE 200 I AUSTIN, TX 78759 I 512.454.8711
TEXAS ENGINEERING FIRM #470 I TEXAS SURVEYING FIRM #10028800

WOLF RANCH PKWY / MEMORIAL DR

TCP TYPICALS

CITY JOB No.

JOB NO. 51423-04

DATE 9/16/2025

DESIGNER

CHECKED DRAWN

SHEET NO. 54A

LEGEND

- PHASE I WORKZONE
- TEMPORARY PAVEMENT
- EXISTING ROW
- PROPOSED ROW
- EXISTING EASEMENT
- FENCE
- CHANNELIZING DEVICES
- TYPE III BARRICADE
- SIGN
- TRAFFIC FLOW ARROWS

(A) WK ZN PAV MRK NON-REMOVE (Y)6" (SLD)
(B) WK ZN PAV MRK NON-REMOVE (W)6" (SLD)
(C) WK ZN PAV MRK NON-REMOVE (W)24" (SLD)
(D) WK ZN PAV MRK NON-REMOVE (W)8" (DOT)
(E) WK ZN PAV MRK REMOVE (W)6" (SLD)
(F) WK ZN PAV MRK REMOVE (Y)6" (SLD)

SCALE: 1"= 20'
0' 20' 40' 60'

NOTES:

1. FOR ADDITIONAL DETAILS SEE TxDOT TCP STANDARD SHEETS.
2. EXISTING FEATURES ARE SHOWN SCREENED BACK.
3. EXISTING PAVEMENT MARKING CONFLICTING WITH WORK ZONE PAVEMENT MARKINGS SHALL BE REMOVED.
4. CONTRACTOR TO MAINTAIN ACCESS TO DRIVEWAYS AT ALL TIMES THROUGHOUT CONSTRUCTION.
5. REFER TO DETOUR LAYOUTS FOR MEMORIAL DR ACCESS DURING CLOSURES.
6. REFER TO ADVANCE WARNING SIGN LAYOUT SHEET FOR ADDITIONAL ADVANCE WARNING SIGNS
7. ALL SIGN LOCATIONS ARE APPROXIMATE, CONTRACTOR TO VERIFY EXACT LOCATIONS IN THE FIELD
8. TEMPORARY ACCESSIBLE PEDESTRIAN ROUTES PROVIDED ARE SUGGESTIONS FOR THE CONTRACTOR. ACTUAL TEMPORARY PEDESTRIAN ROUTES ARE TO BE DETERMINED IN THE FIELD BY THE CONTRACTOR WITH PEDESTRIAN SAFETY IN MIND AND APPROVED BY THE ENGINEER. ANY VERTICAL DIFFERENCES GREATER THAN 1" SHALL REQUIRE A TEMPORARY ASPHALT RAMP WITH A MAX GRADE OF 5%. THIS ITEM IS SUBSIDIARY TO OTHER ITEMS OF WORK.

DESIGN

STATE OF TEXAS — BRET CHAPMAN — 127293 — LICENSED PROFESSIONAL ENGINEER

BRET CHAPMAN, P.E. — 9/16/2025 DATE

APPROVAL

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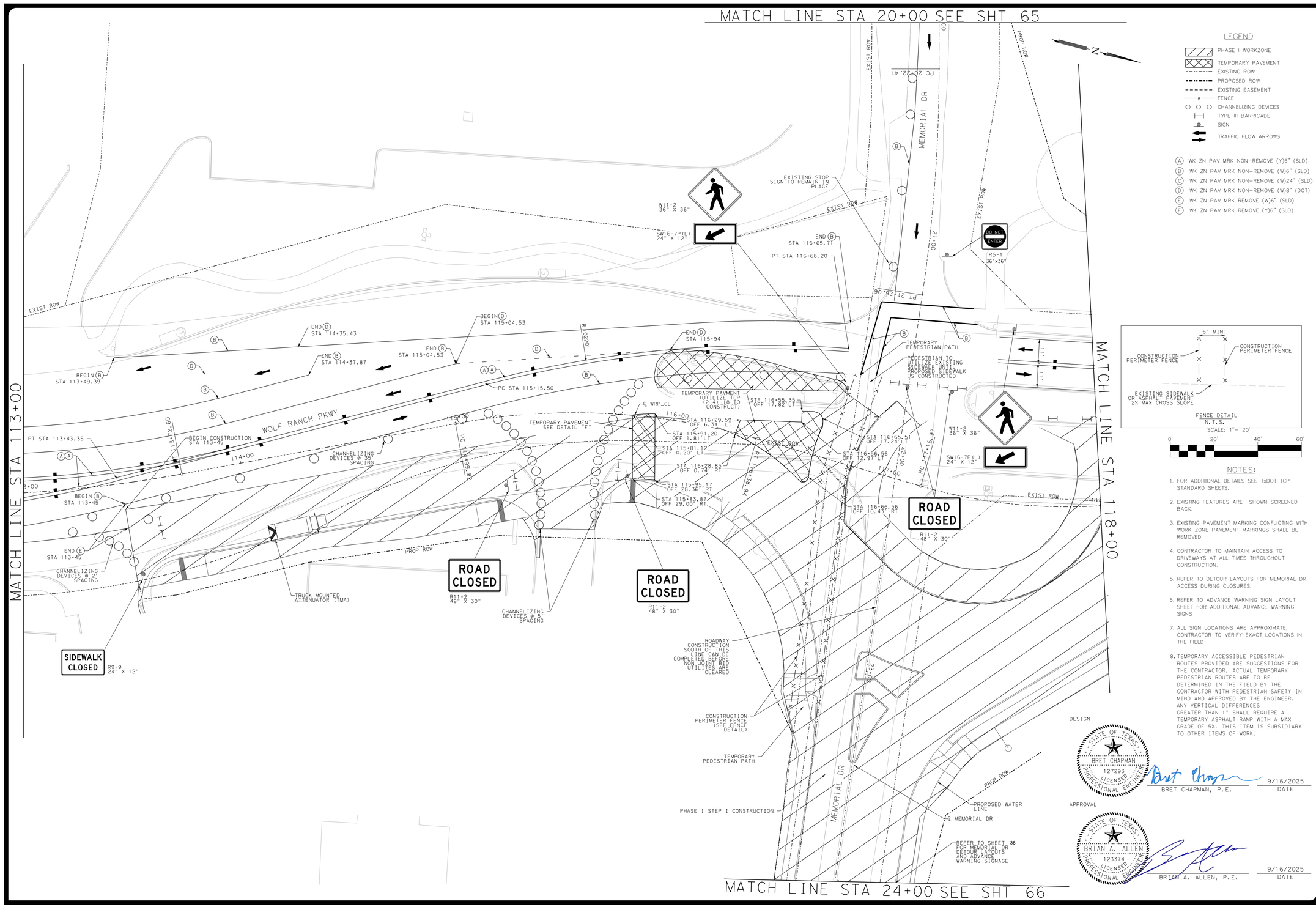
TCP PHASE I STEP I

CITY JOB No.
JOB NO. 51423-04
DATE 9/16/2025
DESIGNER
CHECKED DRAWN

SHEET 1 OF 21

SHEET NO. 55



LEGEND

- PHASE I WORKZONE
- TEMPORARY PAVEMENT
- EXISTING ROW
- PROPOSED ROW
- EXISTING EASEMENT
- FENCE
- CHANNELIZING DEVICES
- TYPE III BARRICADE
- SIGN
- TRAFFIC FLOW ARROWS

(A) WK ZN PAV MRK NON-REMOVE (Y)6" (SLD)
(B) WK ZN PAV MRK NON-REMOVE (W)6" (SLD)
(C) WK ZN PAV MRK NON-REMOVE (W)24" (SLD)
(D) WK ZN PAV MRK NON-REMOVE (W)8" (DOT)
(E) WK ZN PAV MRK REMOVE (W)6" (SLD)
(F) WK ZN PAV MRK REMOVE (Y)6" (SLD)

NOTES:

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3. EXISTING PAVEMENT MARKING CONFLICTING WITH WORK ZONE PAVEMENT MARKINGS SHALL BE REMOVED.
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AUSTIN I SAN ANTONIO I HOUSTON I FORT WORTH I DALLAS
10801 N MOPAC EXPY, BLDG 3, STE 200 I AUSTIN, TX 78759 I 512.454.8711
TEXAS ENGINEERING FIRM #470 I TEXAS SURVEYING FIRM #10028800

WOLF RANCH PKWY / MEMORIAL DR

TCP PHASE I STEP I

CITY JOB No.
JOB NO. 51423-04
DATE 9/16/2025
DESIGNER
CHECKED DRAWN

SHEET 2 OF 21

SHEET NO. 56

LEGEND

- PHASE I WORKZONE
- TEMPORARY PAVEMENT
- EXISTING ROW
- PROPOSED ROW
- EXISTING EASEMENT
- FENCE
- CHANNELIZING DEVICES
- TYPE III BARRICADE
- SIGN
- TRAFFIC FLOW ARROWS

(A) WK ZN PAV MRK NON-REMOVE (Y)6" (SLD)
(B) WK ZN PAV MRK NON-REMOVE (W)6" (SLD)
(C) WK ZN PAV MRK NON-REMOVE (W)24" (SLD)
(D) WK ZN PAV MRK NON-REMOVE (W)8" (DOT)
(E) WK ZN PAV MRK REMOVE (W)6" (SLD)
(F) WK ZN PAV MRK REMOVE (Y)6" (SLD)

SCALE: 1"= 20'

0' 20' 40' 60'

NOTES:

1. FOR ADDITIONAL DETAILS SEE TxDOT TCP STANDARD SHEETS.
2. EXISTING FEATURES ARE SHOWN SCREENED BACK.
3. EXISTING PAVEMENT MARKING CONFLICTING WITH WORK ZONE PAVEMENT MARKINGS SHALL BE REMOVED.
4. CONTRACTOR TO MAINTAIN ACCESS TO DRIVEWAYS AT ALL TIMES THROUGHOUT CONSTRUCTION.
5. REFER TO DETOUR LAYOUTS FOR MEMORIAL DR ACCESS DURING CLOSURES.
6. REFER TO ADVANCE WARNING SIGN LAYOUT SHEET FOR ADDITIONAL ADVANCE WARNING SIGNS
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DESIGN

STATE OF TEXAS
BRET CHAPMAN
127293
LICENSED
PROFESSIONAL ENGINEER

BRET CHAPMAN, P.E. — 9/16/2025 DATE

APPROVAL

STATE OF TEXAS
BRIAN A. ALLEN
123374
LICENSED
PROFESSIONAL ENGINEER

BRIAN A. ALLEN, P.E. — 9/16/2025 DATE

NO.	REVISION	DATE

GEORGETOWN TEXAS
more than welcome

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TCP PHASE I STEP I

CITY JOB No.
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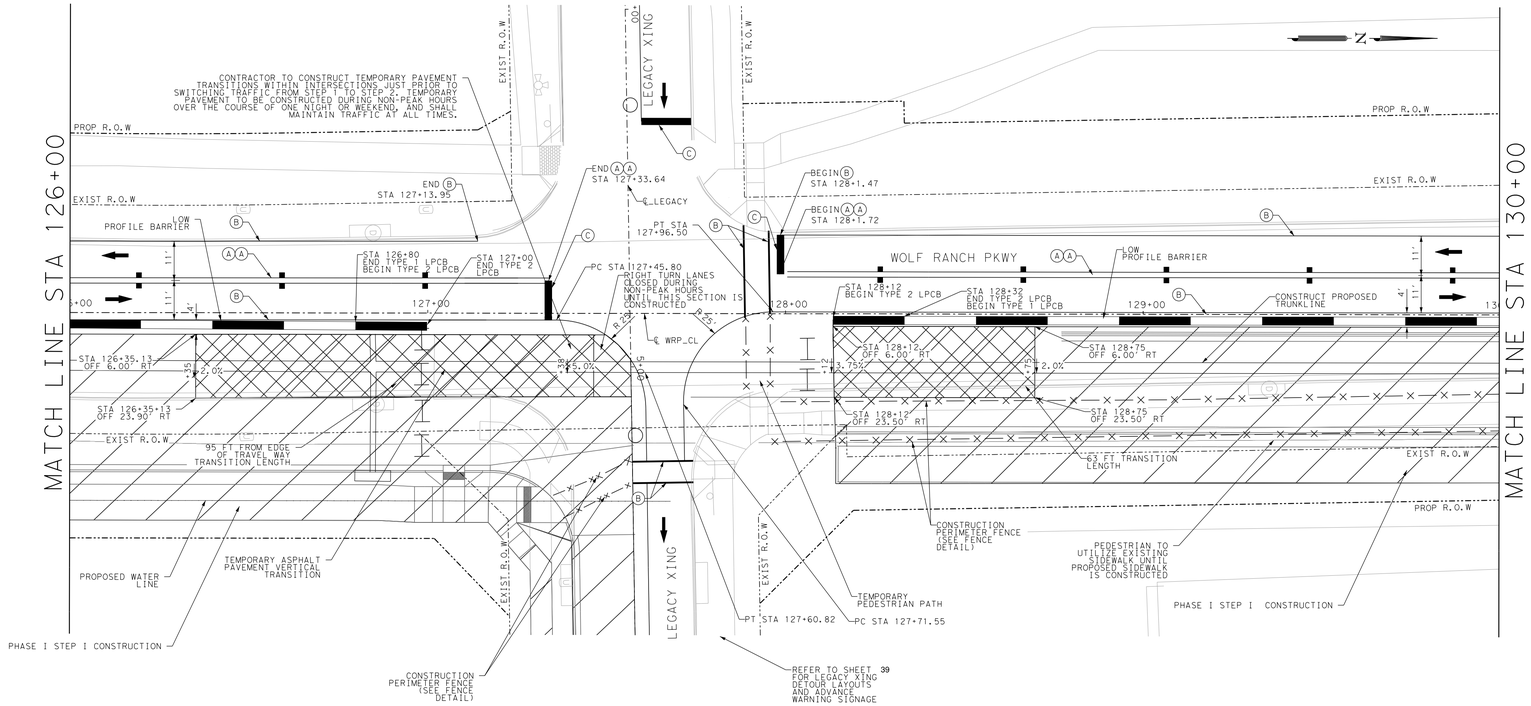
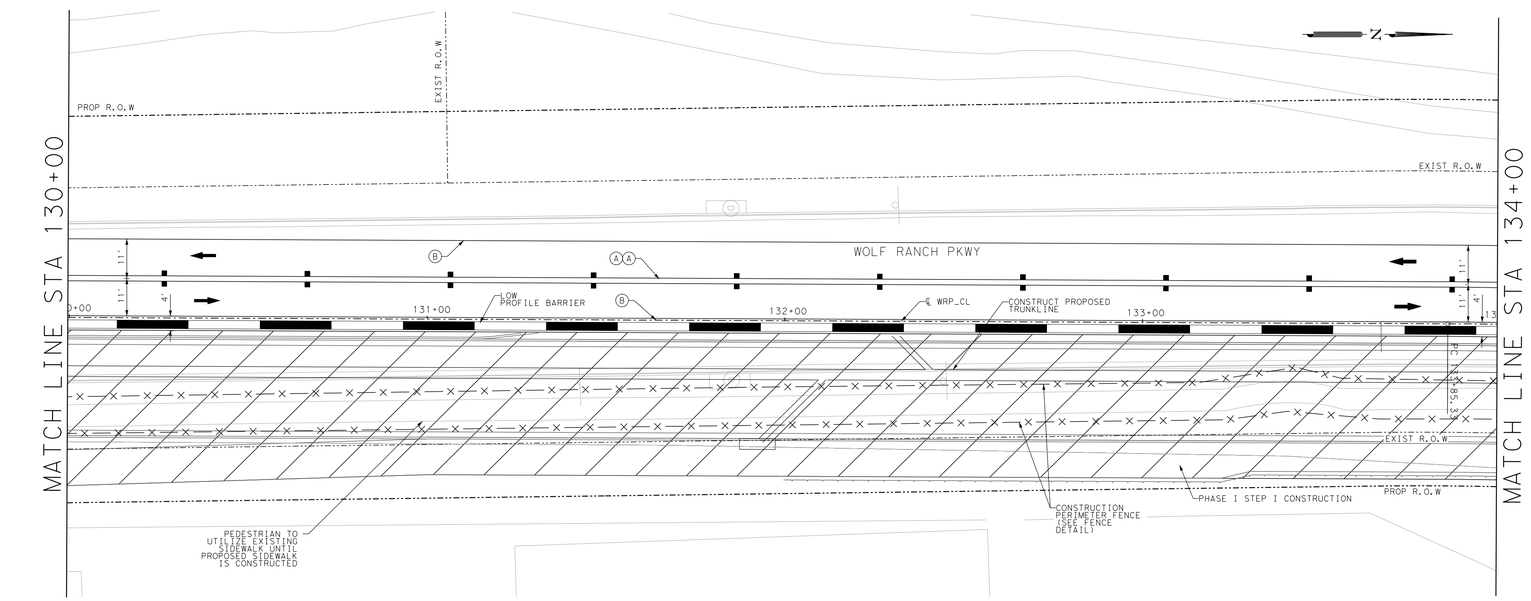
SHEET 3 OF 21

SHEET NO. 57





LEGEND

- PHASE I WORKZONE
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- PROPOSED ROW
- EXISTING EASEMENT
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- CHANNELIZING DEVICES
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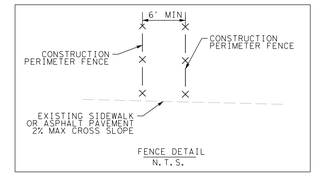
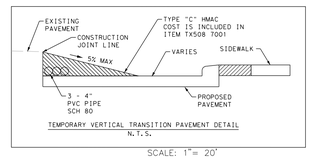


FENCE DETAIL
N.T.S.



TEMPORARY VERTICAL TRANSITION PAVEMENT DETAIL
N.T.S.

SCALE: 1"= 20'

0' 20' 40' 60'

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STATE OF TEXAS — BRET CHAPMAN — 127293 — LICENSED PROFESSIONAL ENGINEER

BRET CHAPMAN, P.E. — 9/16/2025 DATE

APPROVAL

STATE OF TEXAS — BRIAN A. ALLEN — 123374 — LICENSED PROFESSIONAL ENGINEER

BRIAN A. ALLEN, P.E. — 9/16/2025 DATE

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GEORGETOWN TEXAS more than welcome

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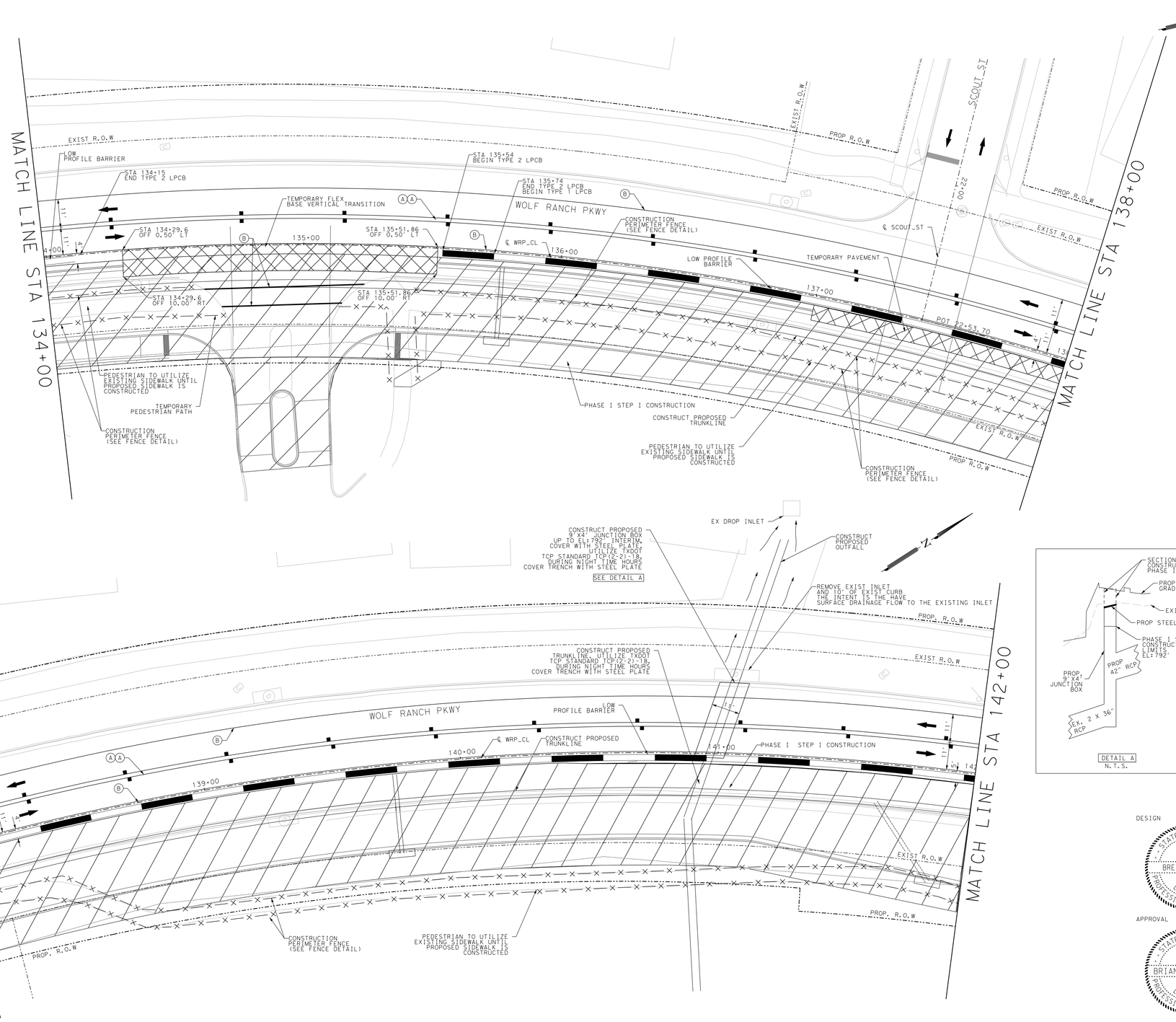

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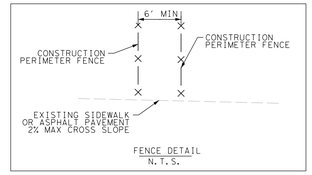
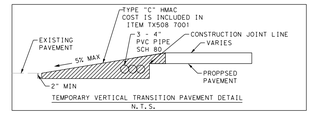


FENCE DETAIL
N.T.S.



TEMPORARY VERTICAL TRANSITION PAVEMENT DETAIL
N.T.S.

SCALE: 1"= 20'

0' 20' 40' 60'

DETAIL A
N.T.S.

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STATE OF TEXAS — BRET CHAPMAN — 127293 — LICENSED PROFESSIONAL ENGINEER

BRET CHAPMAN, P.E. — 9/16/2025 DATE

APPROVAL

STATE OF TEXAS — BRIAN A. ALLEN — 123374 — LICENSED PROFESSIONAL ENGINEER

BRIAN A. ALLEN, P.E. — 9/16/2025 DATE

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GEORGETOWN TEXAS *more than welcome*

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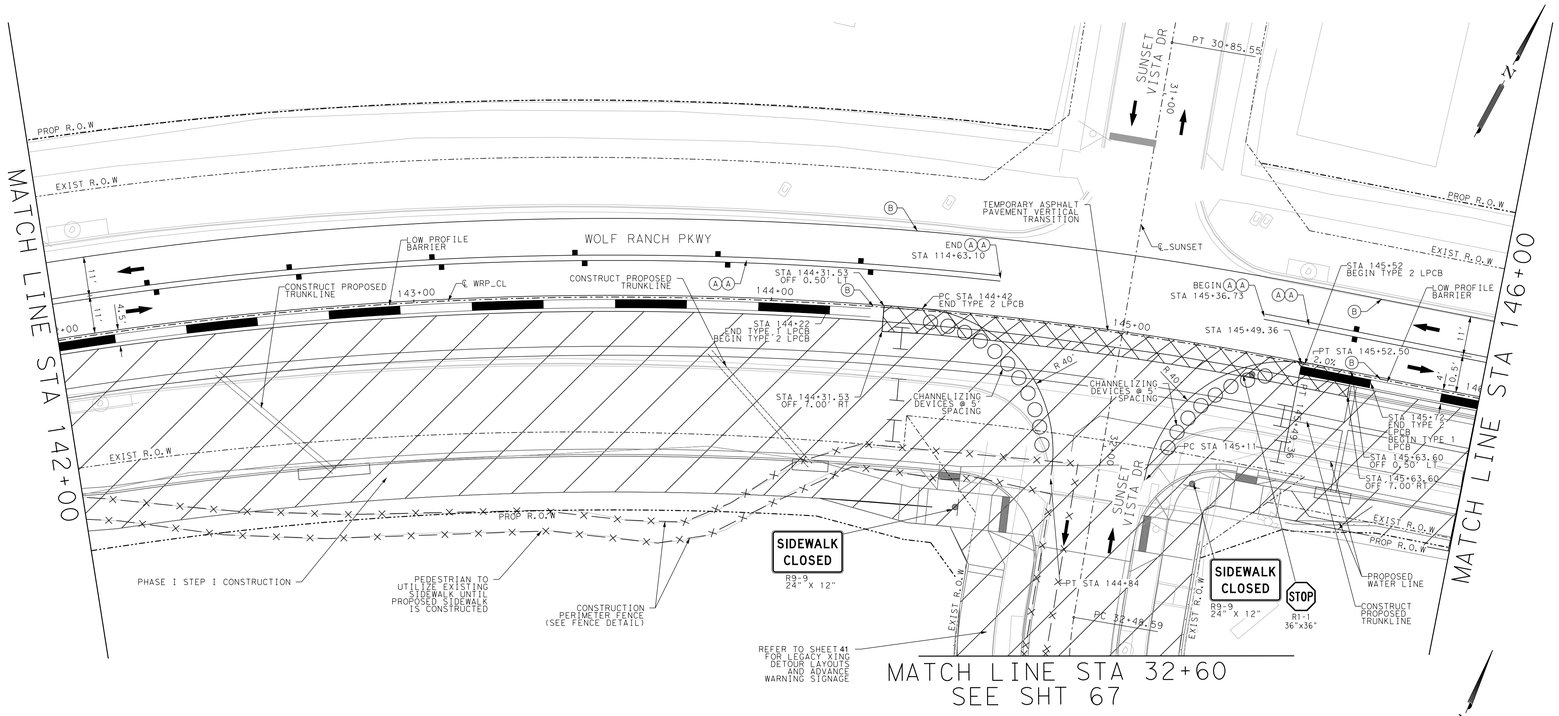
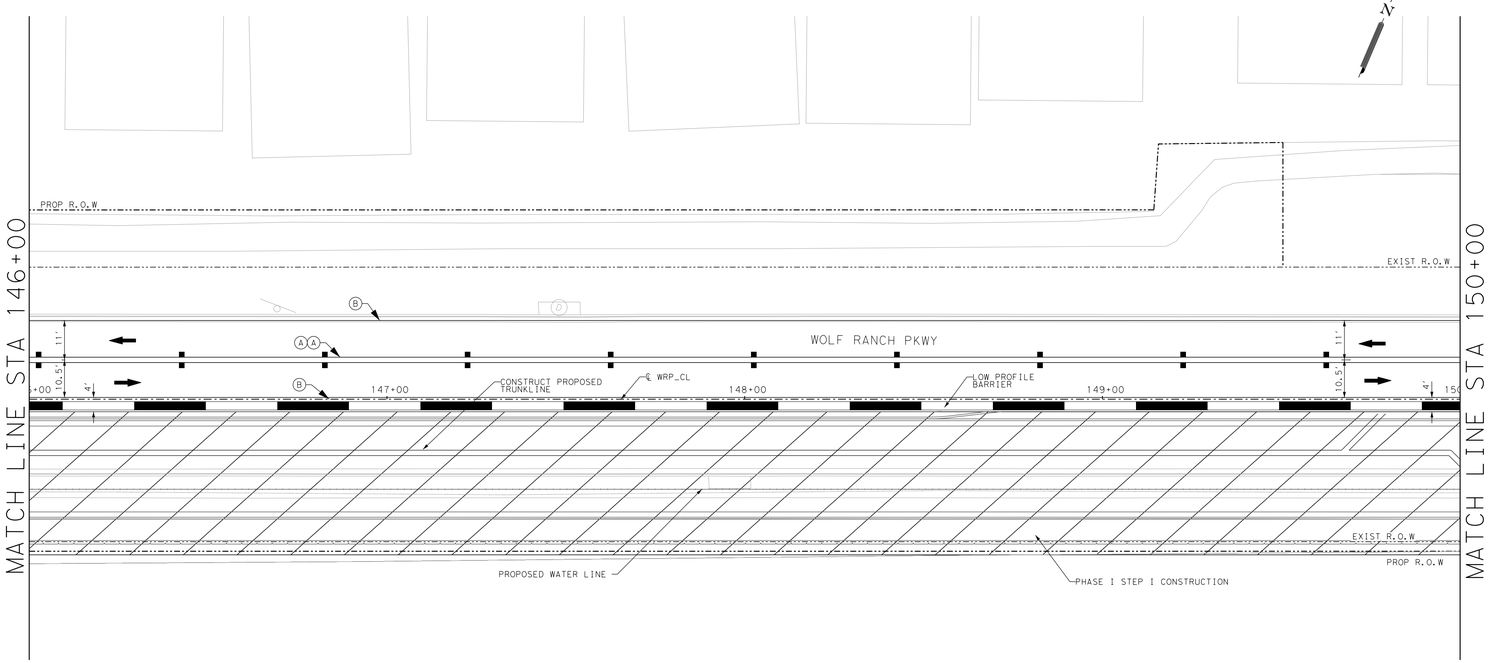
WOLF RANCH PKWY / MEMORIAL DR
TCP PHASE I STEP I

CITY JOB No.
JOB NO. 51423-04
DATE 9/16/2025
DESIGNER
CHECKED DRAWN

SHEET 5 OF 21

SHEET NO. 59





LEGEND

- PHASE I WORKZONE
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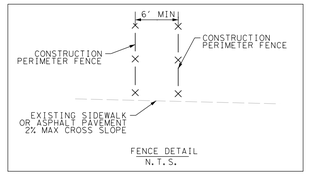
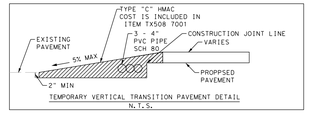


FENCE DETAIL
N.T.S.



TEMPORARY VERTICAL TRANSITION PAVEMENT DETAIL
N.T.S.

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STATE OF TEXAS · BRET CHAPMAN · 127293 · LICENSED · PROFESSIONAL ENGINEER

BRET CHAPMAN, P.E. — 9/16/2025 DATE

APPROVAL

STATE OF TEXAS · BRIAN A. ALLEN · 123374 · LICENSED · PROFESSIONAL ENGINEER

BRIAN A. ALLEN, P.E. — 9/16/2025 DATE

NO.	REVISION	DATE

GEORGETOWN TEXAS *more than welcome*

PAPE-DAWSON ENGINEERS
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WOLF RANCH PKWY / MEMORIAL DR
TCP PHASE I STEP I

CITY JOB No.
JOB NO. 51423-04
DATE 9/16/2025
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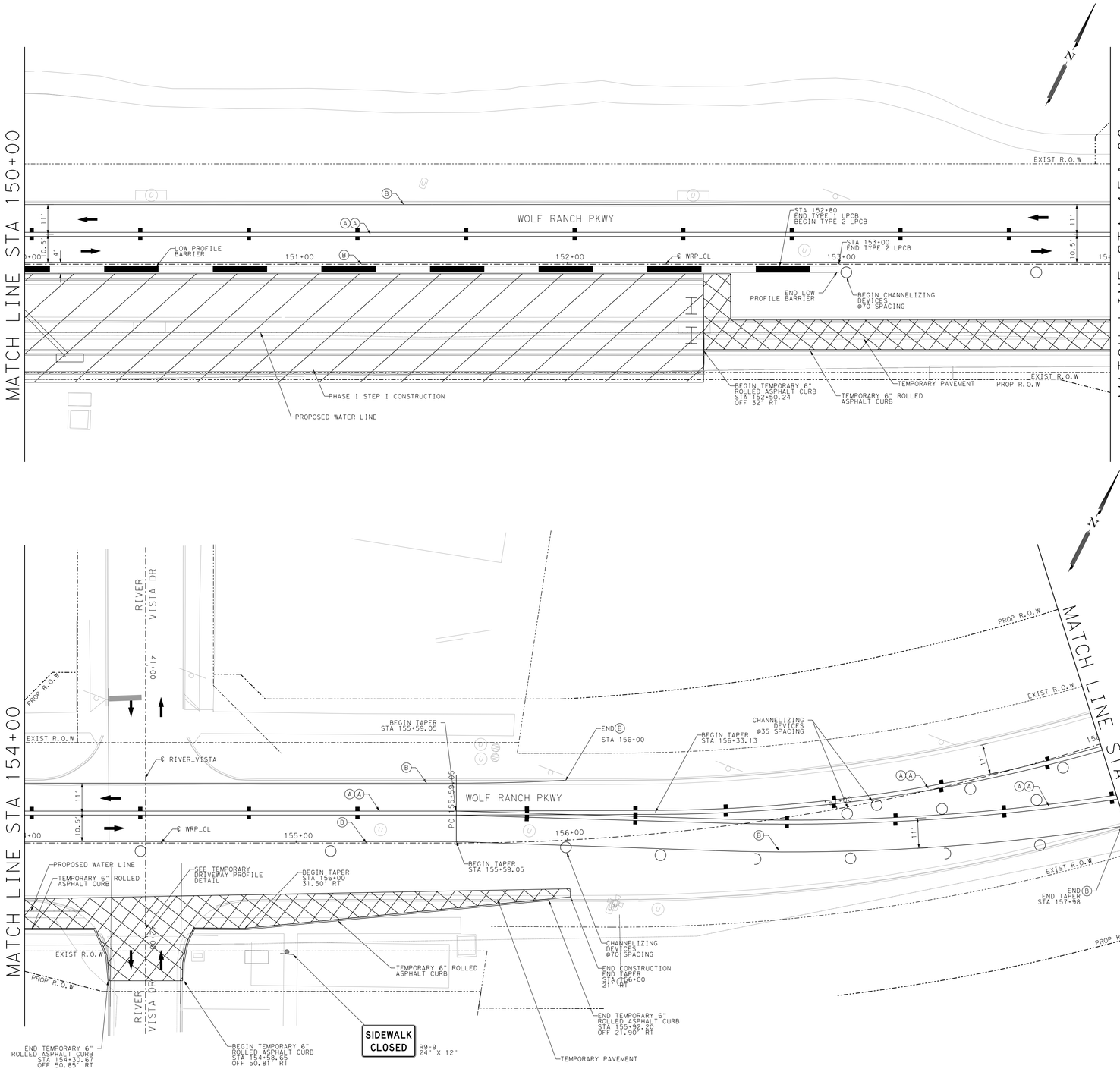
SHEET 6 OF 21

SHEET NO. 60



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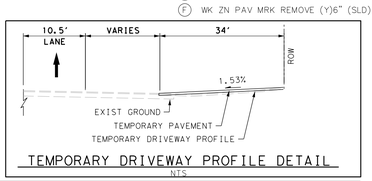
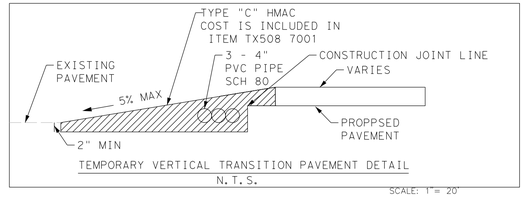


TEMPORARY DRIVEWAY PROFILE DETAIL
NTS



TEMPORARY VERTICAL TRANSITION PAVEMENT DETAIL
N.T.S.

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GEORGETOWN TEXAS more than welcome

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TCP PHASE I STEP I

CITY JOB No.
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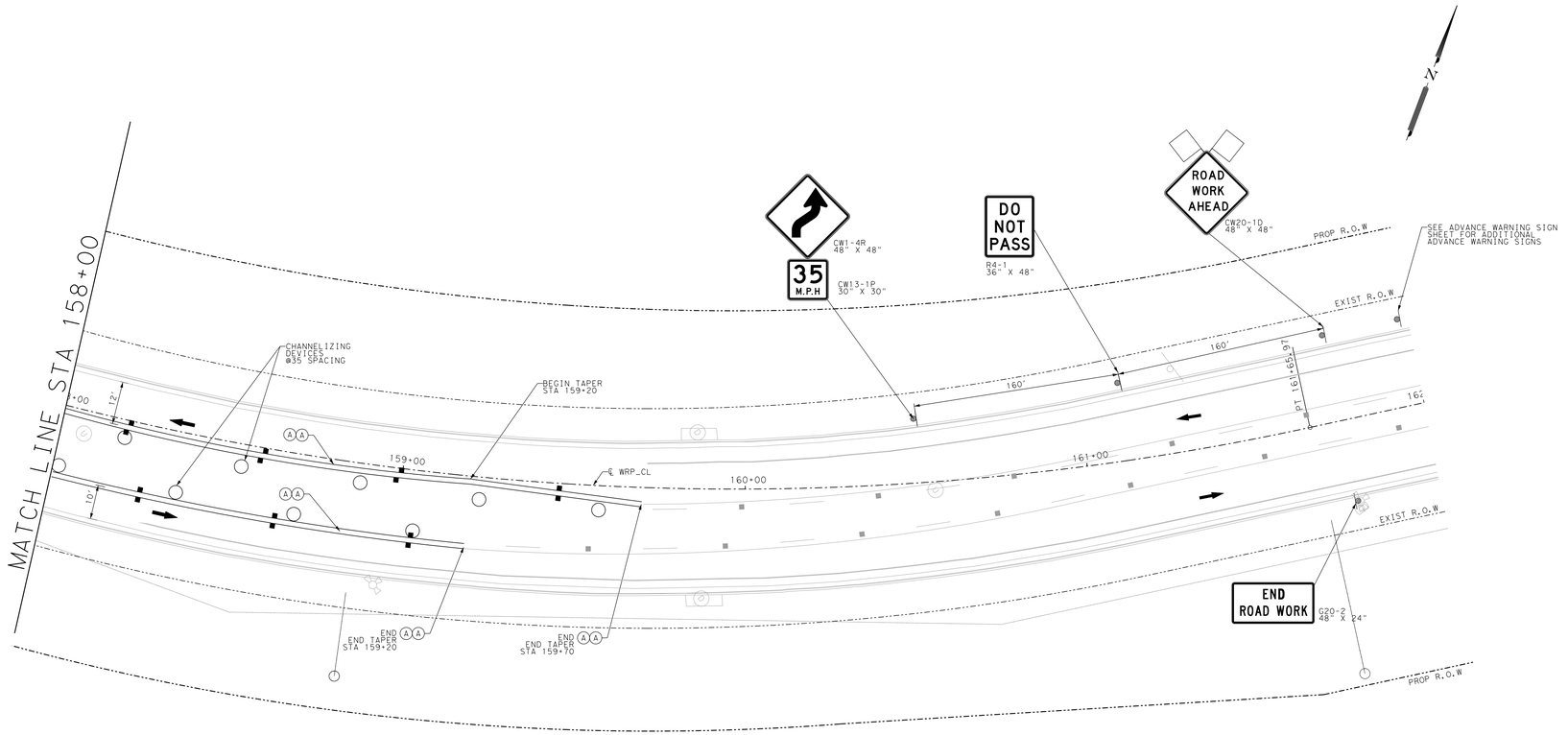
SHEET 7 OF 21

SHEET NO. 61



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TCP PHASE I STEP I

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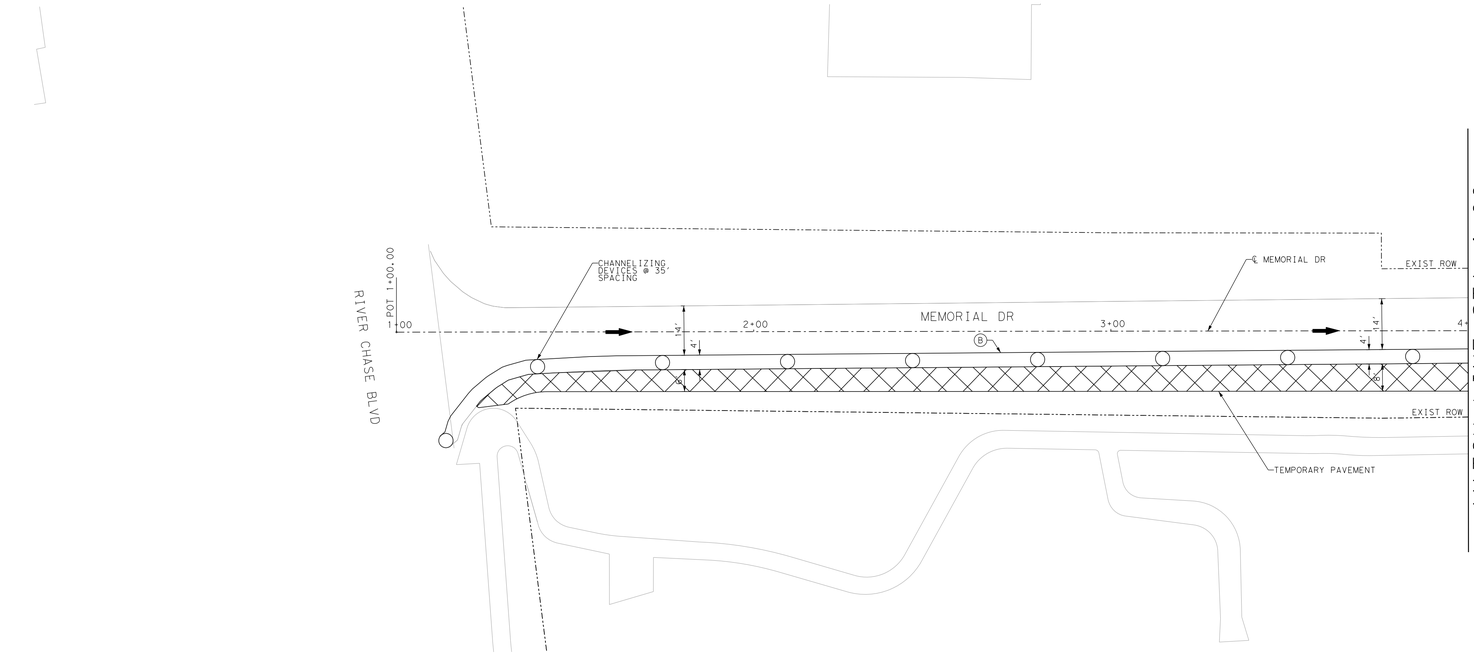
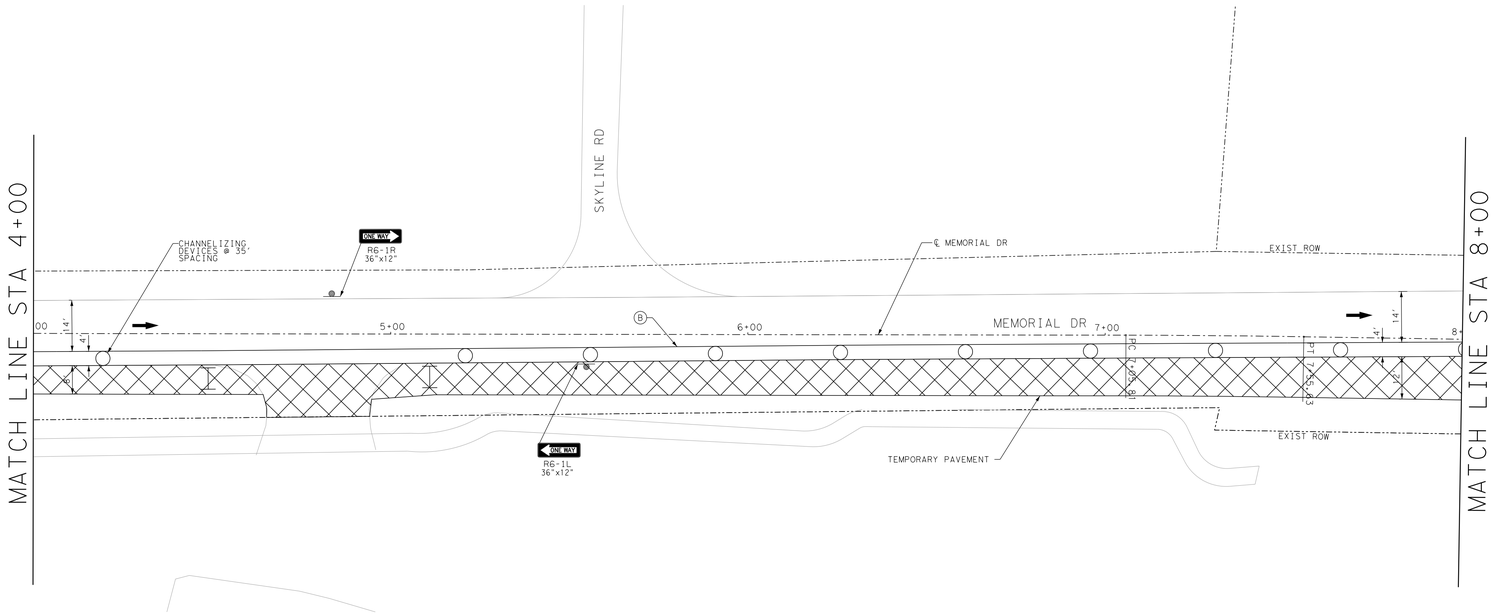
SHEET 8 OF 21

SHEET NO. 62





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(F) WK ZN PAV MRK REMOVE (Y)6" (SLD)

SCALE: 1"= 20'
0' 20' 40' 60'

NOTES:

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DESIGN

STATE OF TEXAS
BRET CHAPMAN
127293
LICENSED
PROFESSIONAL ENGINEER

BRET CHAPMAN, P.E. — 9/16/2025 DATE

APPROVAL

STATE OF TEXAS
BRIAN A. ALLEN
123374
LICENSED
PROFESSIONAL ENGINEER

BRIAN A. ALLEN, P.E. — 9/16/2025 DATE

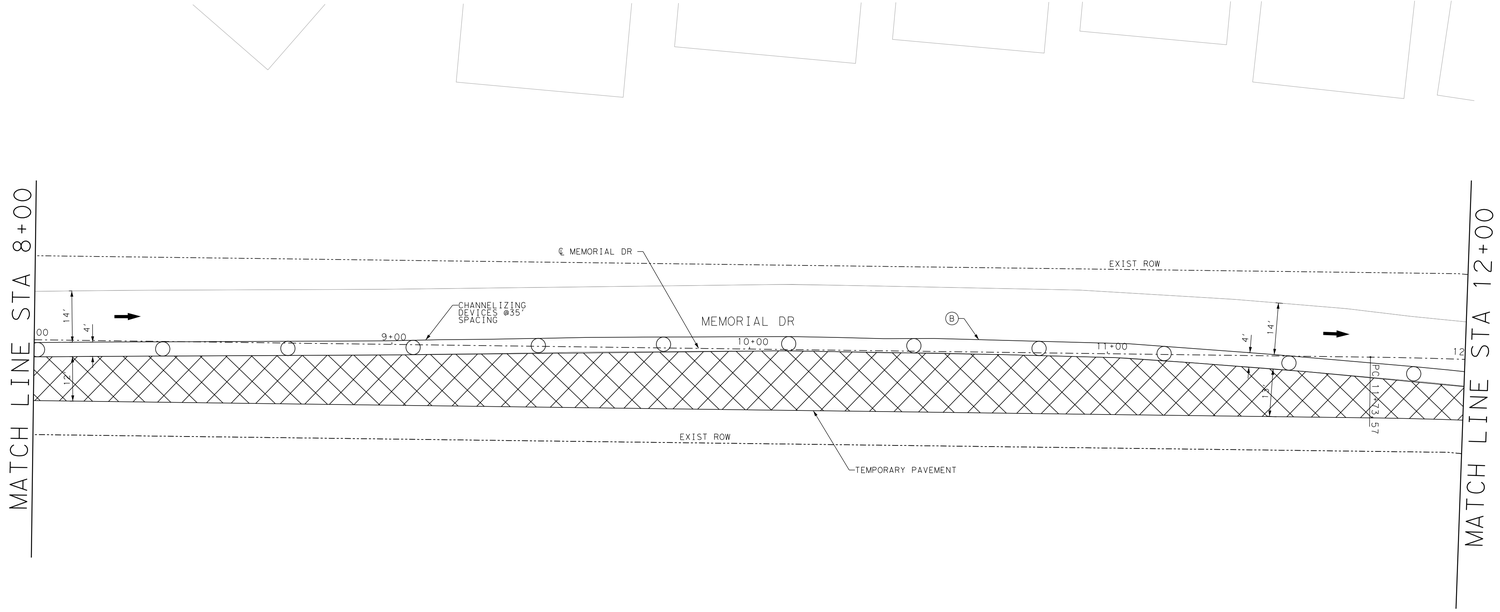
NO.	REVISION	DATE

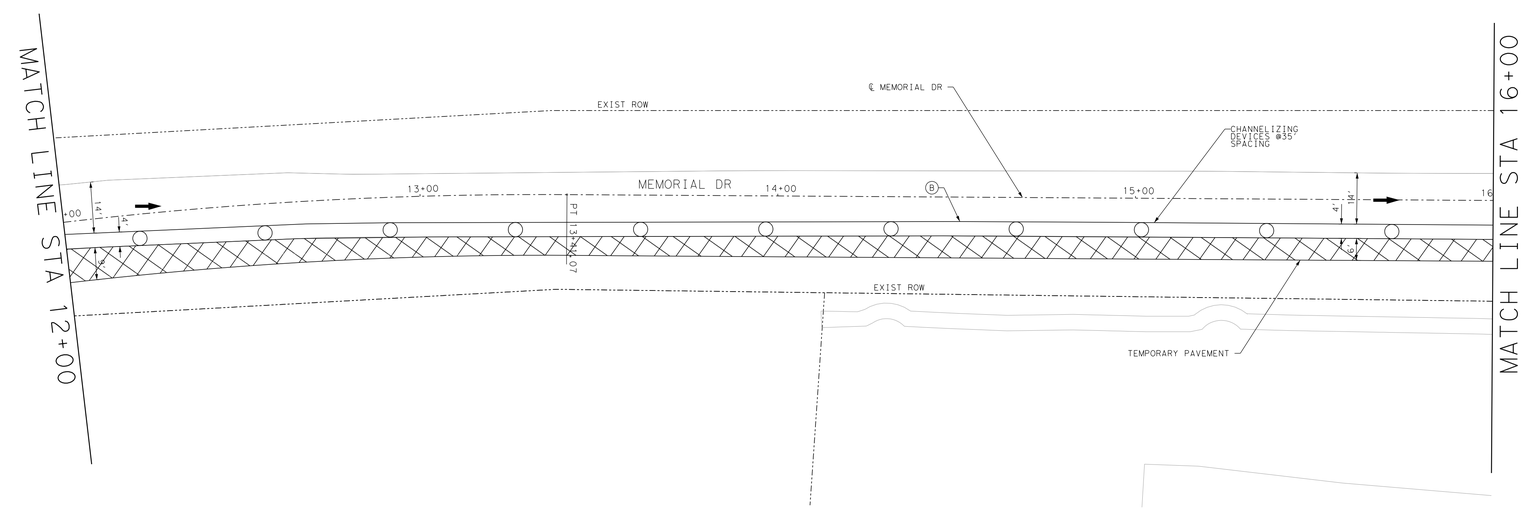
GEORGETOWN TEXAS
more than welcome

PAPE-DAWSON ENGINEERS
AUSTIN I SAN ANTONIO I HOUSTON I FORT WORTH I DALLAS
10801 N MOPAC EXPY, BLDG 3, STE 200 I AUSTIN, TX 78759 I 512.454.8711
TEXAS ENGINEERING FIRM #470 I TEXAS SURVEYING FIRM #10028800

WOLF RANCH PKWY / MEMORIAL DR
TCP PHASE I STEP I

CITY JOB No.
JOB NO. 51423-04
DATE 9/16/2025
DESIGNER
CHECKED DRAWN





LEGEND

- PHASE I WORKZONE
- TEMPORARY PAVEMENT
- EXISTING ROW
- PROPOSED ROW
- EXISTING EASEMENT
- FENCE
- CHANNELIZING DEVICES
- TYPE III BARRICADE
- SIGN
- TRAFFIC FLOW ARROWS

Ⓐ WK ZN PAV MRK NON-REMOVE (Y)6" (SLD)
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TEXAS ENGINEERING FIRM #470 | TEXAS SURVEYING FIRM #10028800

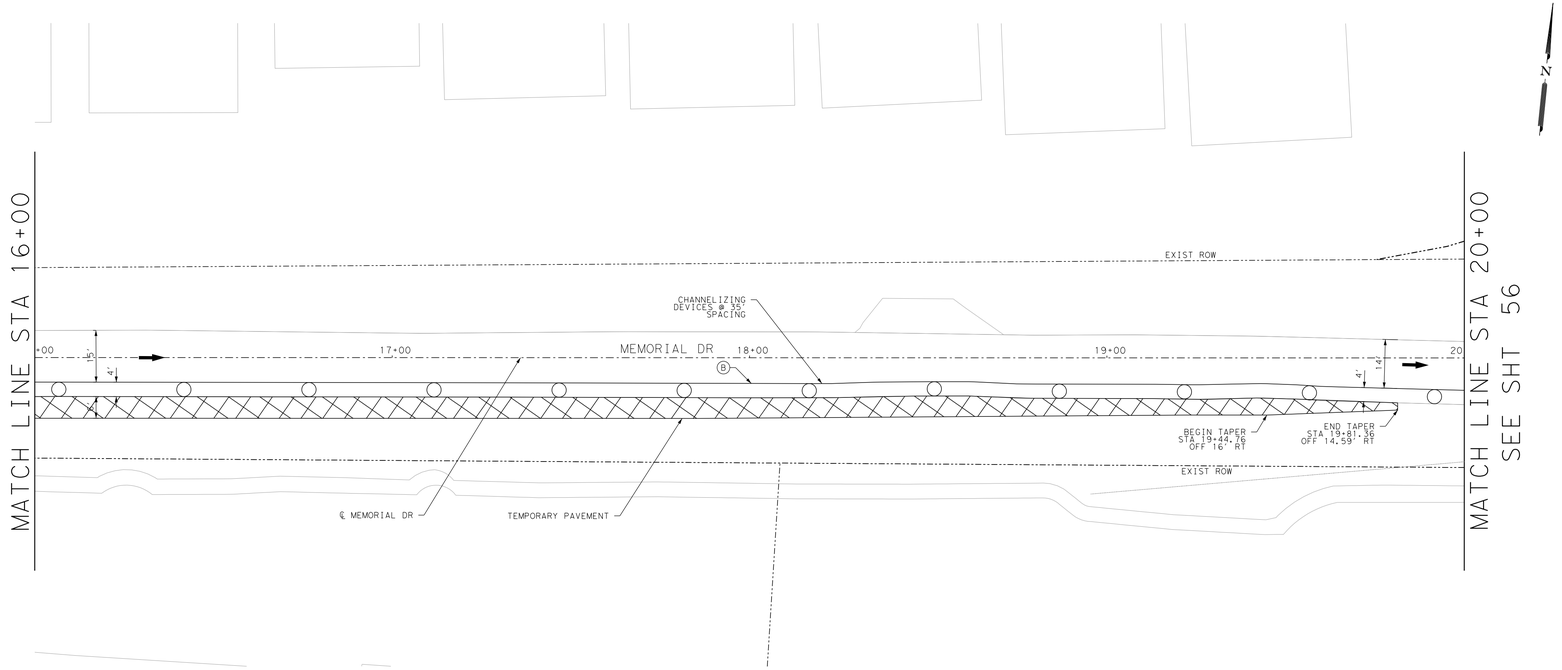
WOLF RANCH PKWY / MEMORIAL DR

TCP PHASE I STEP I

CITY JOB No.
JOB NO. 51423-04
DATE 9/16/2025
DESIGNER
CHECKED DRAWN

SHEET 10 OF 21

SHEET NO. 64



LEGEND

- PHASE I WORKZONE
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- PROPOSED ROW
- EXISTING EASEMENT
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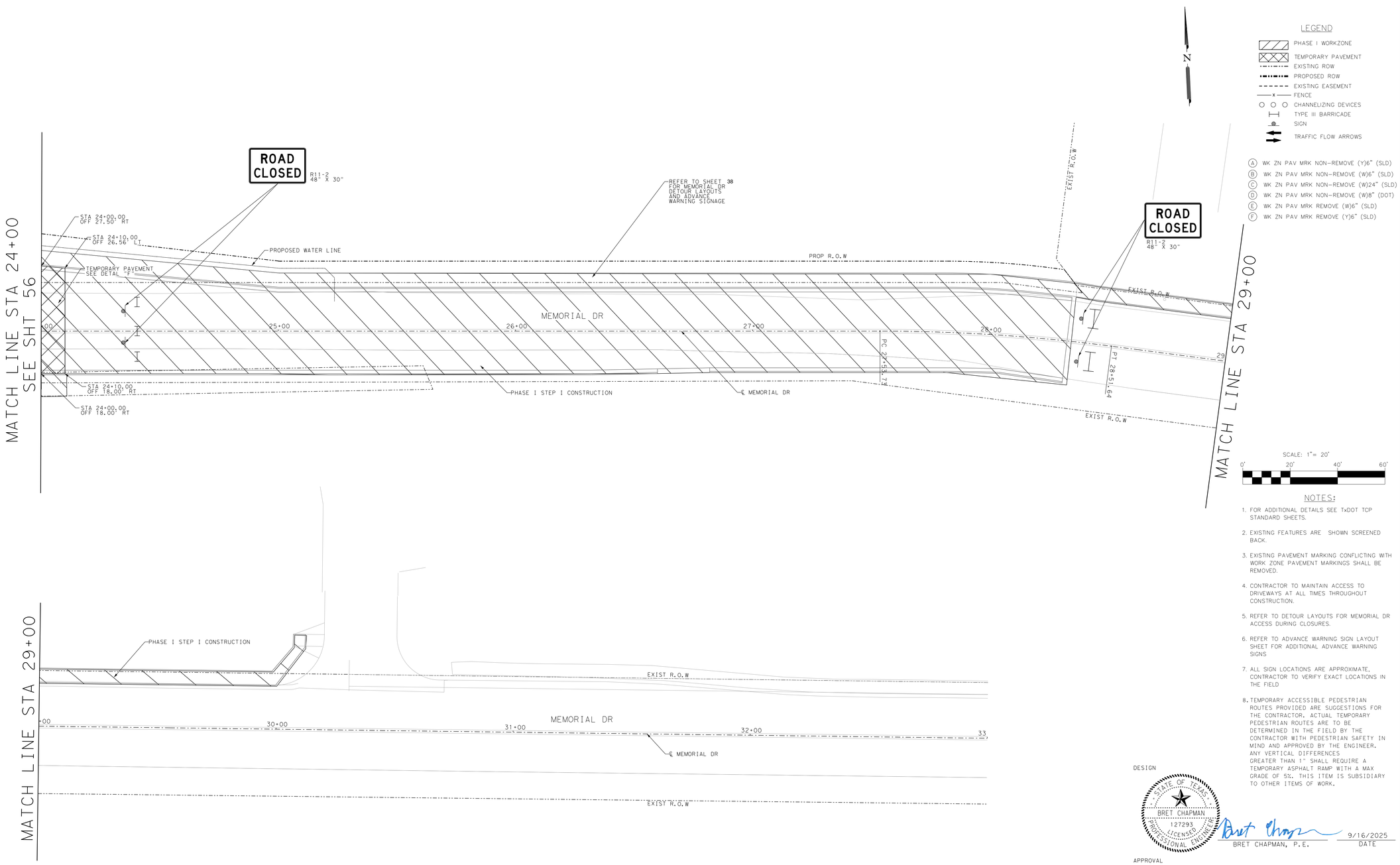
WOLF RANCH PKWY / MEMORIAL DR

TCP PHASE I STEP I

CITY JOB No.
JOB NO. 51423-04
DATE 9/16/2025
DESIGNER
CHECKED DRAWN

SHEET 11 OF 21

SHEET NO. 65



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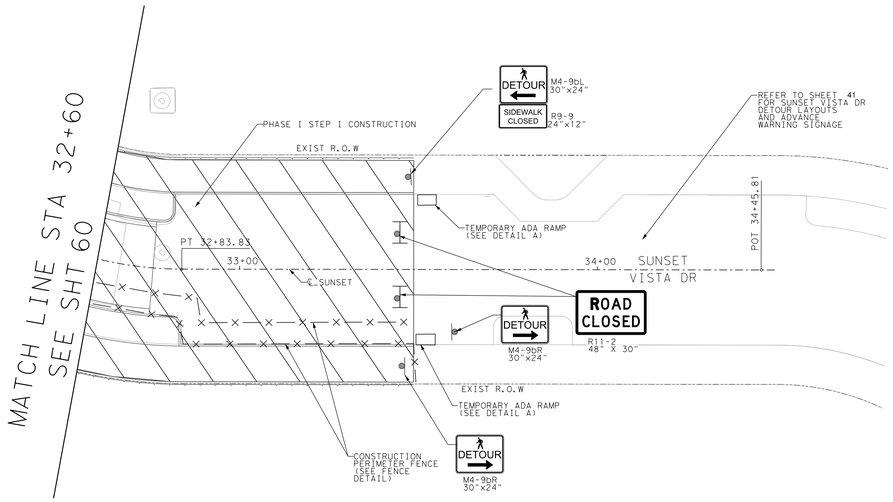
TCP PHASE I STEP I

CITY JOB No.
JOB NO. 51423-04
DATE 9/16/2025
DESIGNER
CHECKED DRAWN

SHEET 12 OF 21
SHEET NO. 66



LEGEND

- PHASE I WORKZONE
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- FENCE
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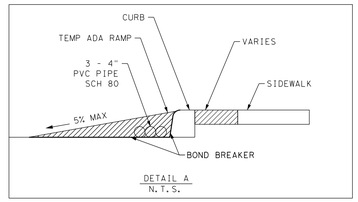
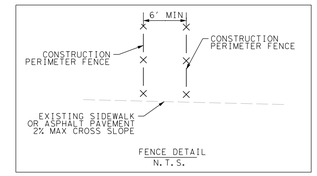


DETAIL A
N.T.S.



FENCE DETAIL
N.T.S.

SCALE: 1"= 20'

0' 20' 40' 60'

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BRET CHAPMAN, P.E. — 9/16/2025 DATE

APPROVAL

STATE OF TEXAS
BRIAN A. ALLEN
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GEORGETOWN TEXAS
more than welcome

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AUSTIN I SAN ANTONIO I HOUSTON I FORT WORTH I DALLAS
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TEXAS ENGINEERING FIRM #470 I TEXAS SURVEYING FIRM #10028800

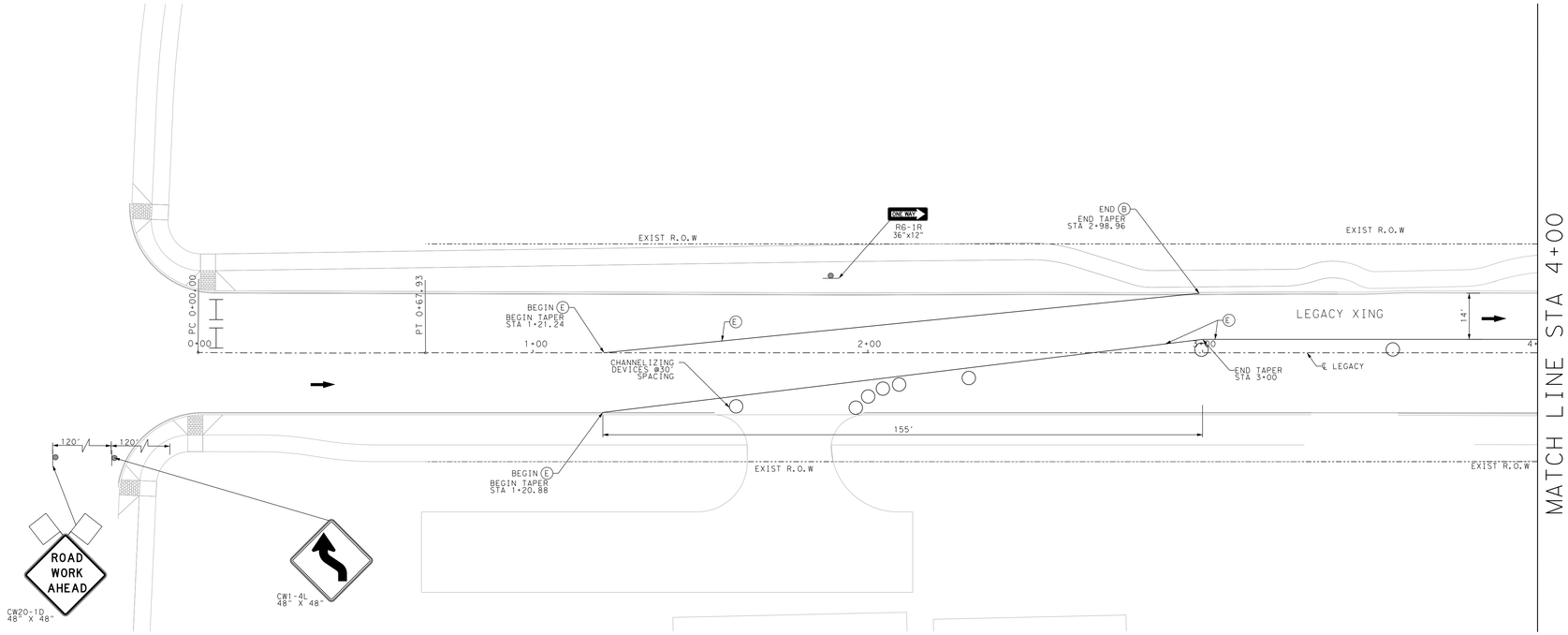
WOLF RANCH PKWY / MEMORIAL DR

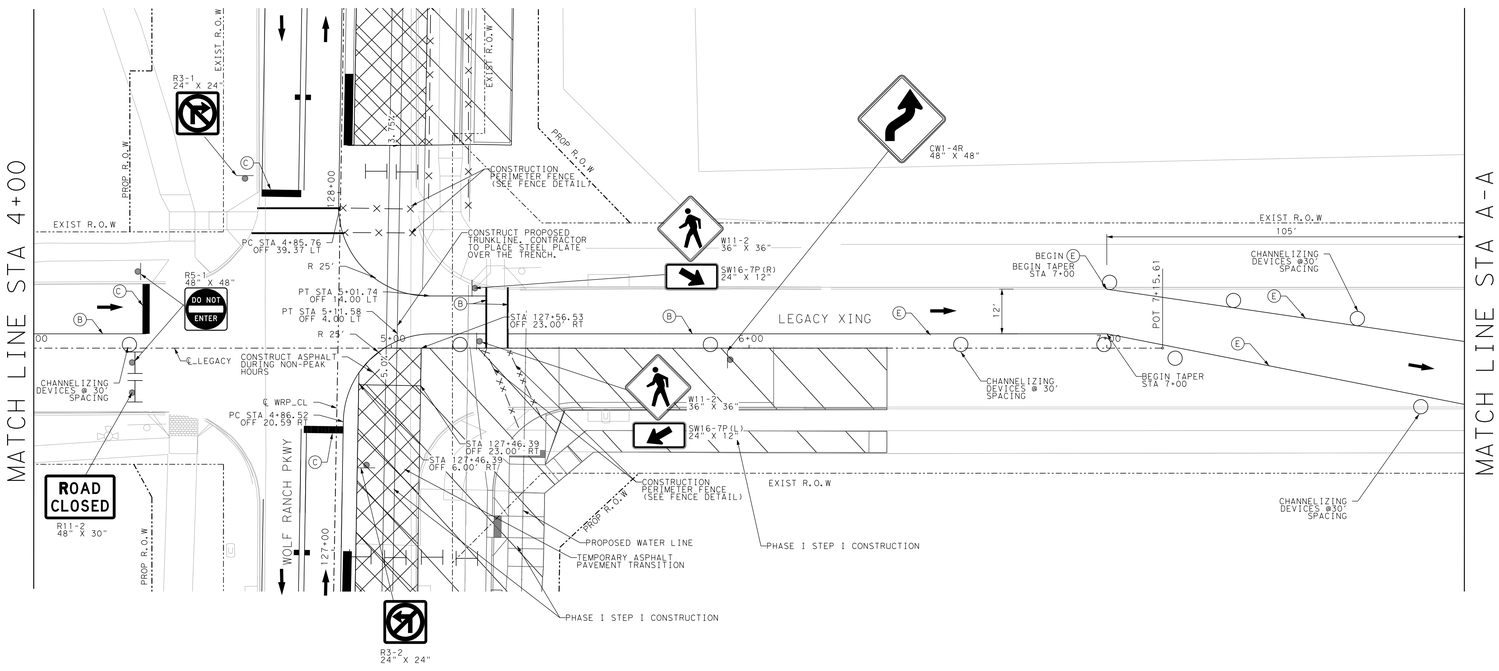
TCP PHASE I STEP I

CITY JOB No.
JOB NO. 51423-04
DATE 9/16/2025
DESIGNER
CHECKED DRAWN

SHEET 13 OF 21

SHEET NO. 67





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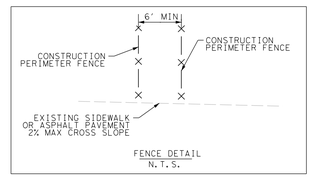
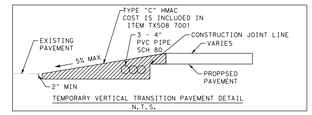


FENCE DETAIL
N.T.S.



TEMPORARY VERTICAL TRANSITION PAVEMENT DETAIL
N.T.S.

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TCP PHASE I STEP I

CITY JOB No.
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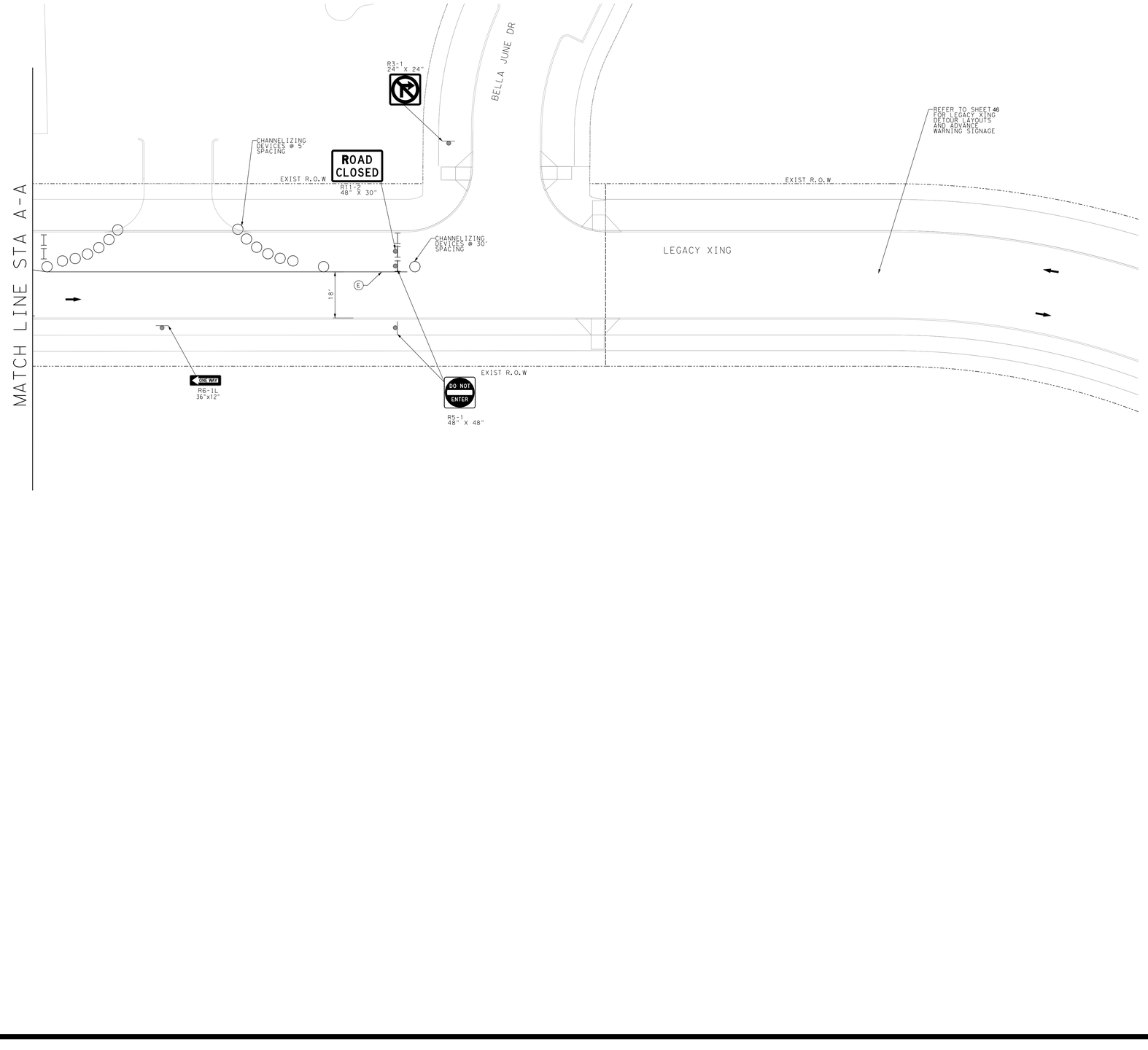
SHEET 14 OF 21
SHEET NO. 68



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TCP PHASE I STEP I

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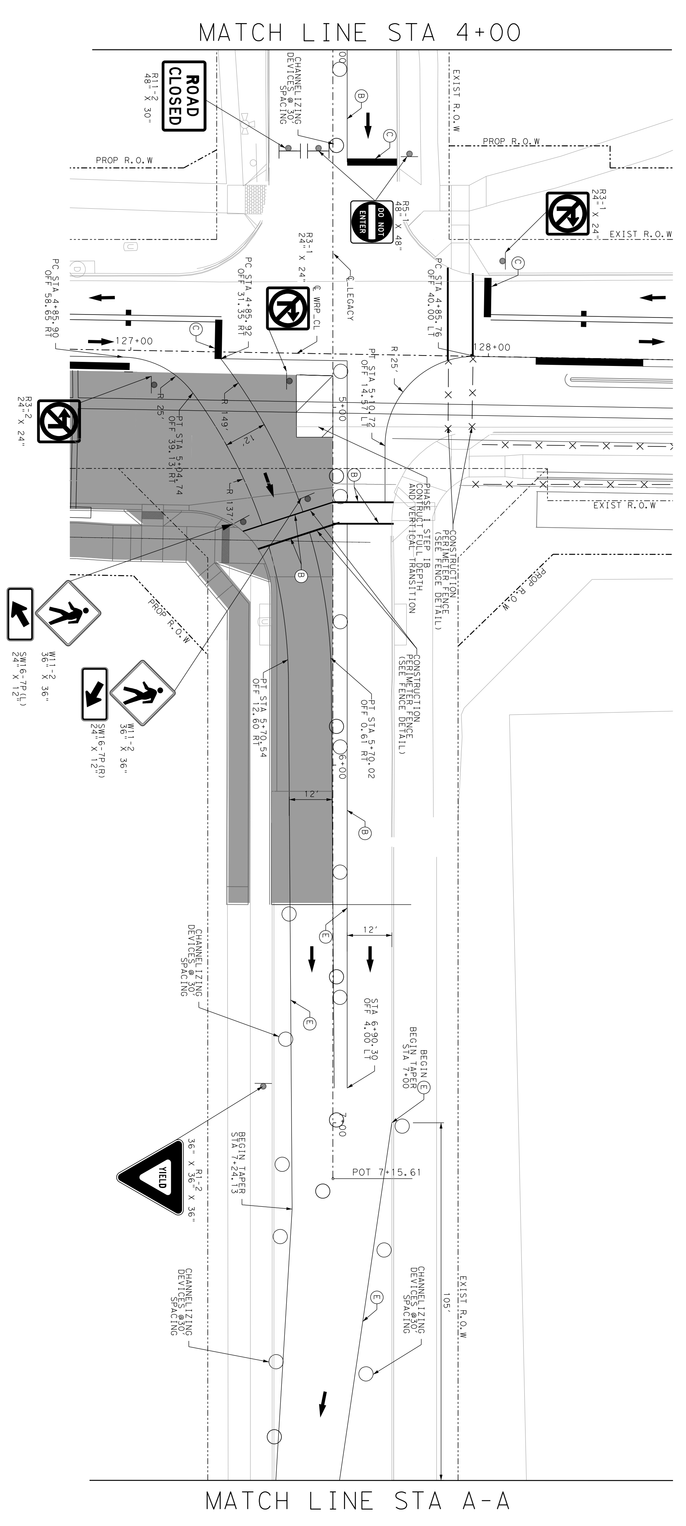

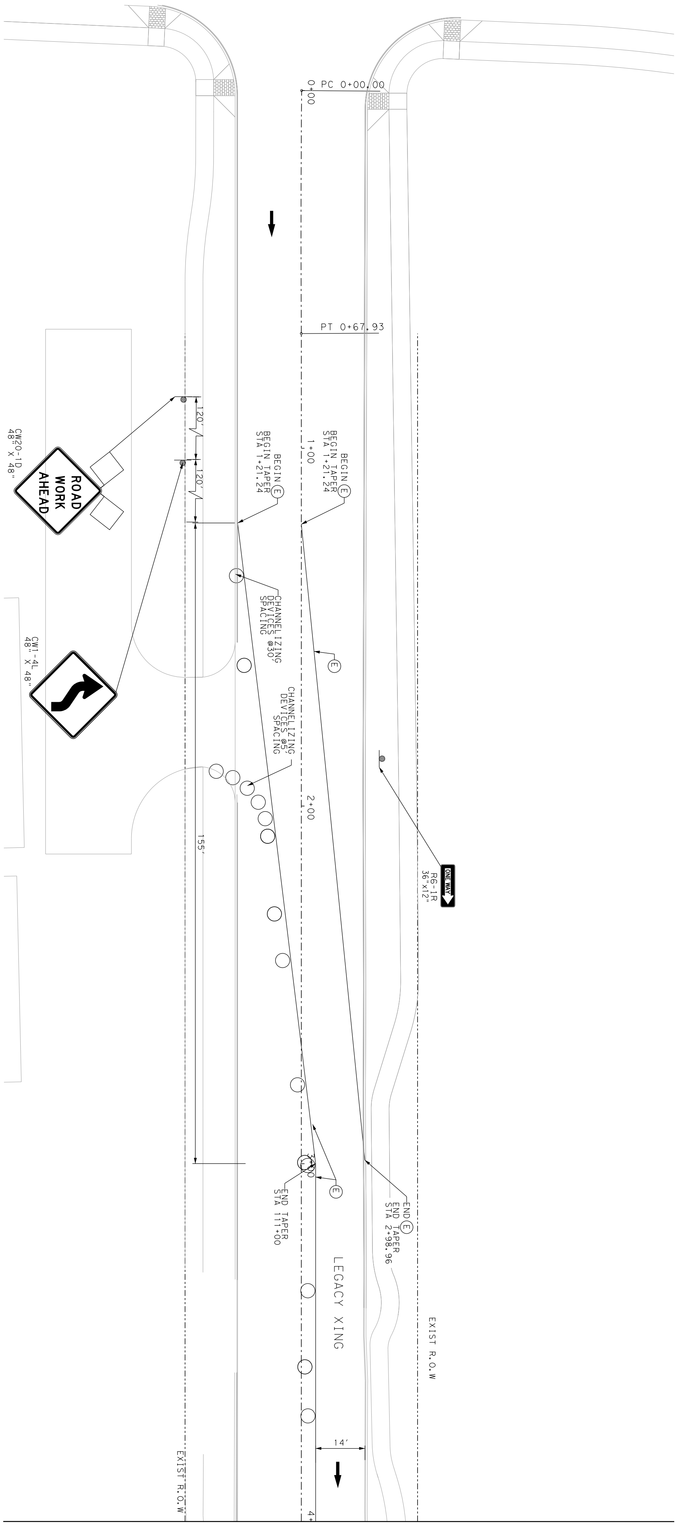

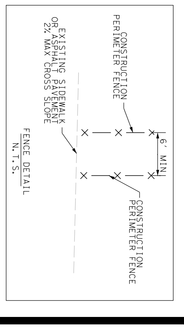

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8. TEMPORARY ACCESSIBLE PEDESTRIAN ROUTES PROVIDED ARE SUGGESTIONS FOR THE PURPOSE OF THIS PLAN. TEMPORARY PEDESTRIAN ROUTES ARE TO BE DETERMINED IN THE FIELD BY THE CONTRACTOR WITH PEDESTRIAN SAFETY IN MIND. ALL ROUTES SHALL BE APPROVED BY THE ENGINEER. ANY VERTICAL DIFFERENCES GREATER THAN 1" SHALL REQUIRE A TEMPORARY ASPHALT RAMP WITH A MAX SLOPE OF 8.3%. THIS IS SUBSIDIARY TO OTHER ITEMS OF WORK.

LEGEND

- PHASE I WORKZONE
- TEMPORARY PAVEMENT
- EXISTING ROW
- PROPOSED ROW
- EXISTING EASEMENT
- FENCE
- CHANNELIZING DEVICES
- TYPE III BARRICADE
- SIGN
- TRAFFIC FLOW ARROWS

- (A) WK ZN PAV MRK NON-REMOVE (YHF" (SLD)
- (B) WK ZN PAV MRK NON-REMOVE (WHF" (SLD)
- (C) WK ZN PAV MRK NON-REMOVE (WP4" (SLD)
- (D) WK ZN PAV MRK NON-REMOVE (WP8" (DOT)
- (E) WK ZN PAV MRK REMOVE (W)6" (SLD)
- (F) WK ZN PAV MRK REMOVE (Y)6" (SLD)

DESIGN APPROVAL

BRETT A. ALLEN, P.E. — 9/16/2025 DATE

BRET CHAPMAN, P.E. — 9/16/2025 DATE

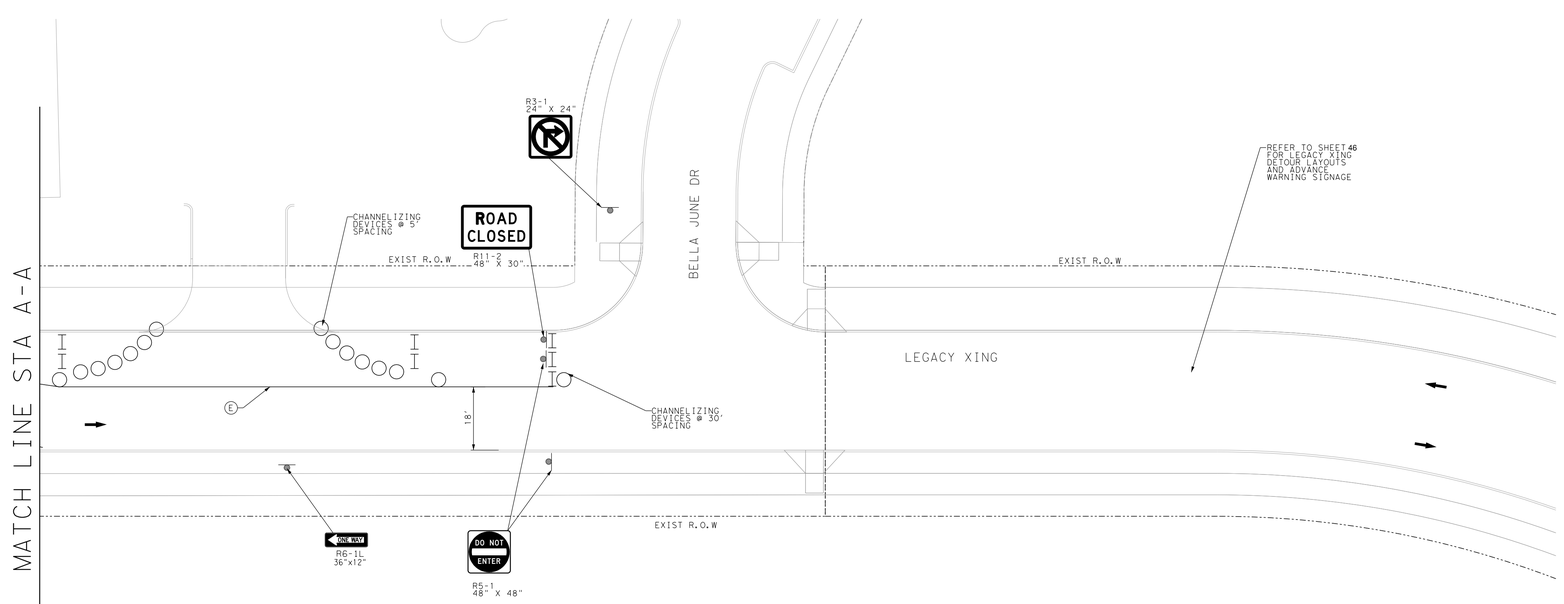
CITY JOB No. ____
JOB NO. 51435-04
DATE 9/16/2025
DESIGNED ____
CHECKED DRAWN ____
SHEET NO. 70
SHEET 16 OF 21

WOLF RANCH PKWY / MEMORIAL DR
TCP PHASE I STEP IB

PAPE-DAWSON ENGINEERS
AUSTIN I SAN ANTONIO I HOUSTON I FORT WORTH I DALLAS
10801 N MOPAC EXPY, BLDG 3, STE 200 I AUSTIN, TX 78759 I 512.454.8711
TEXAS ENGINEERING FIRM #470 I TEXAS SURVEYING FIRM #10028800

GEORGETOWN TEXAS
more than welcome

NO.	REVISION	DATE



LEGEND

- PHASE I WORKZONE
- TEMPORARY PAVEMENT
- EXISTING ROW
- PROPOSED ROW
- EXISTING EASEMENT
- FENCE
- CHANNELIZING DEVICES
- TYPE III BARRICADE
- SIGN
- TRAFFIC FLOW ARROWS

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(C) WK ZN PAV MRK NON-REMOVE (W)24" (SLD)
(D) WK ZN PAV MRK NON-REMOVE (W)8" (DOT)
(E) WK ZN PAV MRK REMOVE (W)6" (SLD)
(F) WK ZN PAV MRK REMOVE (Y)6" (SLD)

SCALE: 1"= 20'

0' 20' 40' 60'

NOTES:

1. FOR ADDITIONAL DETAILS SEE TxDOT TCP STANDARD SHEETS.
2. EXISTING FEATURES ARE SHOWN SCREENED BACK.
3. EXISTING PAVEMENT MARKING CONFLICTING WITH WORK ZONE PAVEMENT MARKINGS SHALL BE REMOVED.
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DESIGN

STATE OF TEXAS
BRET CHAPMAN
127293
LICENSED
PROFESSIONAL ENGINEER

BRET CHAPMAN, P.E. — 9/16/2025 DATE

APPROVAL

STATE OF TEXAS
BRIAN A. ALLEN
123374
LICENSED
PROFESSIONAL ENGINEER

BRIAN A. ALLEN, P.E. — 9/16/2025 DATE

NO.	REVISION	DATE

GEORGETOWN TEXAS
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PAPE-DAWSON ENGINEERS
AUSTIN I SAN ANTONIO I HOUSTON I FORT WORTH I DALLAS
10801 N MOPAC EXPY, BLDG 3, STE 200 I AUSTIN, TX 78759 I 512.454.8711
TEXAS ENGINEERING FIRM #470 I TEXAS SURVEYING FIRM #10028800

WOLF RANCH PKWY / MEMORIAL DR

TCP PHASE I STEP IB

CITY JOB No.
JOB NO. 51423-04
DATE 9/16/2025
DESIGNER
CHECKED DRAWN

LEGEND

- PHASE I WORKZONE
- TEMPORARY PAVEMENT
- EXISTING ROW
- PROPOSED ROW
- EXISTING EASEMENT
- FENCE
- CHANNELIZING DEVICES
- TYPE III BARRICADE
- SIGN
- TRAFFIC FLOW ARROWS

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FENCE DETAIL
N.T.S.

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0' 20' 40' 60'

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STATE OF TEXAS · BRET CHAPMAN · 127293 · LICENSED · PROFESSIONAL ENGINEER

BRET CHAPMAN, P.E. — 9/16/2025 DATE

APPROVAL

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BRIAN A. ALLEN, P.E. — 9/16/2025 DATE

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GEORGETOWN TEXAS *more than welcome*

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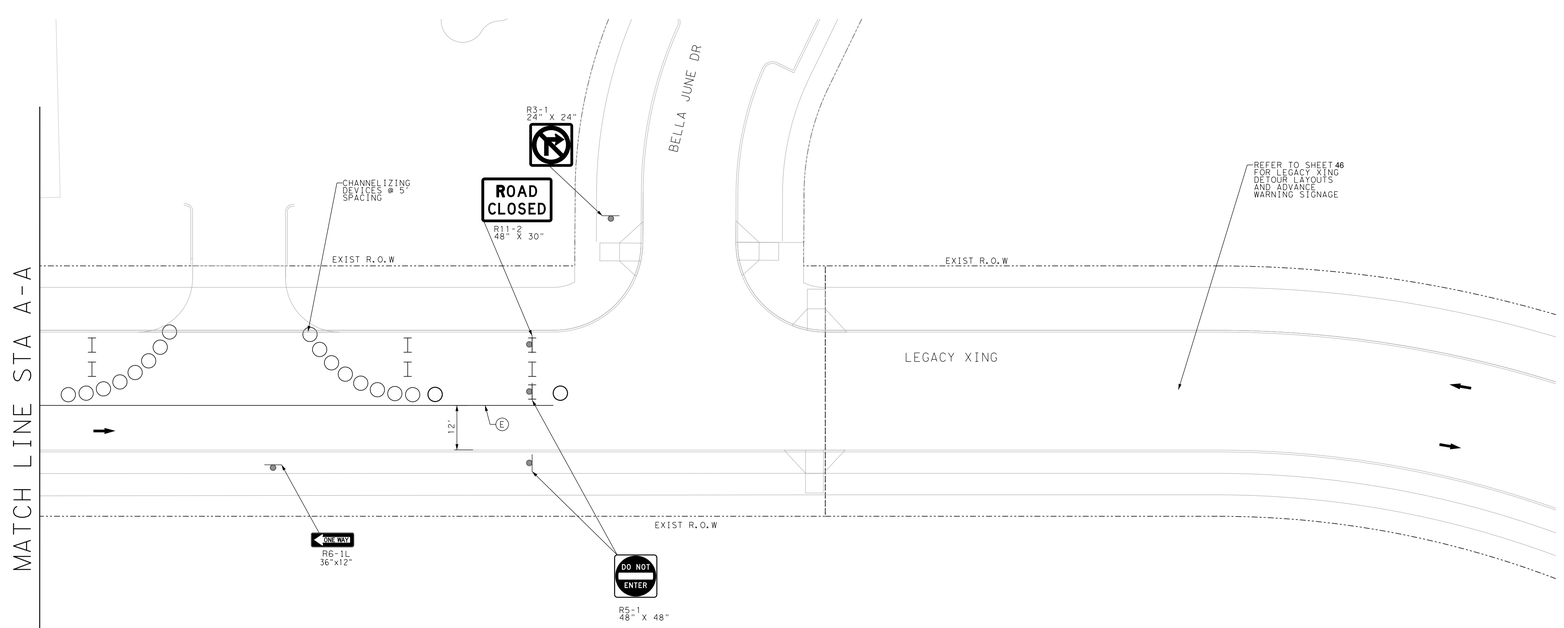
10801 N MOPAC EXPY, BLDG 3, STE 200 I AUSTIN, TX 78759 I 512.454.8711
TEXAS ENGINEERING FIRM #470 I TEXAS SURVEYING FIRM #10028800

WOLF RANCH PKWY / MEMORIAL DR
TCP PHASE I STEP II

CITY JOB No.
JOB NO. 51423-04
DATE 9/16/2025
DESIGNER
CHECKED DRAWN





LEGEND

- PHASE I WORKZONE
- TEMPORARY PAVEMENT
- EXISTING ROW
- PROPOSED ROW
- EXISTING EASEMENT
- FENCE
- CHANNELIZING DEVICES
- TYPE III BARRICADE
- SIGN
- TRAFFIC FLOW ARROWS

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(D) WK ZN PAV MRK NON-REMOVE (W)8" (DOT)
(E) WK ZN PAV MRK REMOVE (W)6" (SLD)
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SCALE: 1"= 20'

0' 20' 40' 60'

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STATE OF TEXAS
BRET CHAPMAN
127293
LICENSED
PROFESSIONAL ENGINEER

BRET CHAPMAN, P.E. — 9/16/2025 DATE

APPROVAL

STATE OF TEXAS
BRIAN A. ALLEN
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LICENSED
PROFESSIONAL ENGINEER

BRIAN A. ALLEN, P.E. — 9/16/2025 DATE

NO.	REVISION	DATE

GEORGETOWN TEXAS *more than welcome*

PAPE-DAWSON ENGINEERS
AUSTIN I SAN ANTONIO I HOUSTON I FORT WORTH I DALLAS
10801 N MOPAC EXPY, BLDG 3, STE 200 I AUSTIN, TX 78759 I 512.454.8711
TEXAS ENGINEERING FIRM #470 I TEXAS SURVEYING FIRM #10028800

WOLF RANCH PKWY / MEMORIAL DR

TCP PHASE I STEP II

CITY JOB No.
JOB NO. 51423-04
DATE 9/16/2025
DESIGNER
CHECKED DRAWN

LEGEND

- PHASE I WORKZONE
- TEMPORARY PAVEMENT
- EXISTING ROW
- PROPOSED ROW
- EXISTING EASEMENT
- FENCE
- CHANNELIZING DEVICES
- TYPE III BARRICADE
- SIGN
- TRAFFIC FLOW ARROWS

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FENCE DETAIL
N.T.S.

SCALE: 1"= 20'
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DESIGN

STATE OF TEXAS — BRET CHAPMAN — 127293 — LICENSED PROFESSIONAL ENGINEER

BRET CHAPMAN, P.E. — 9/16/2025 DATE

APPROVAL

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BRIAN A. ALLEN, P.E. — 9/16/2025 DATE

NO.	REVISION	DATE

GEORGETOWN TEXAS *more than welcome*

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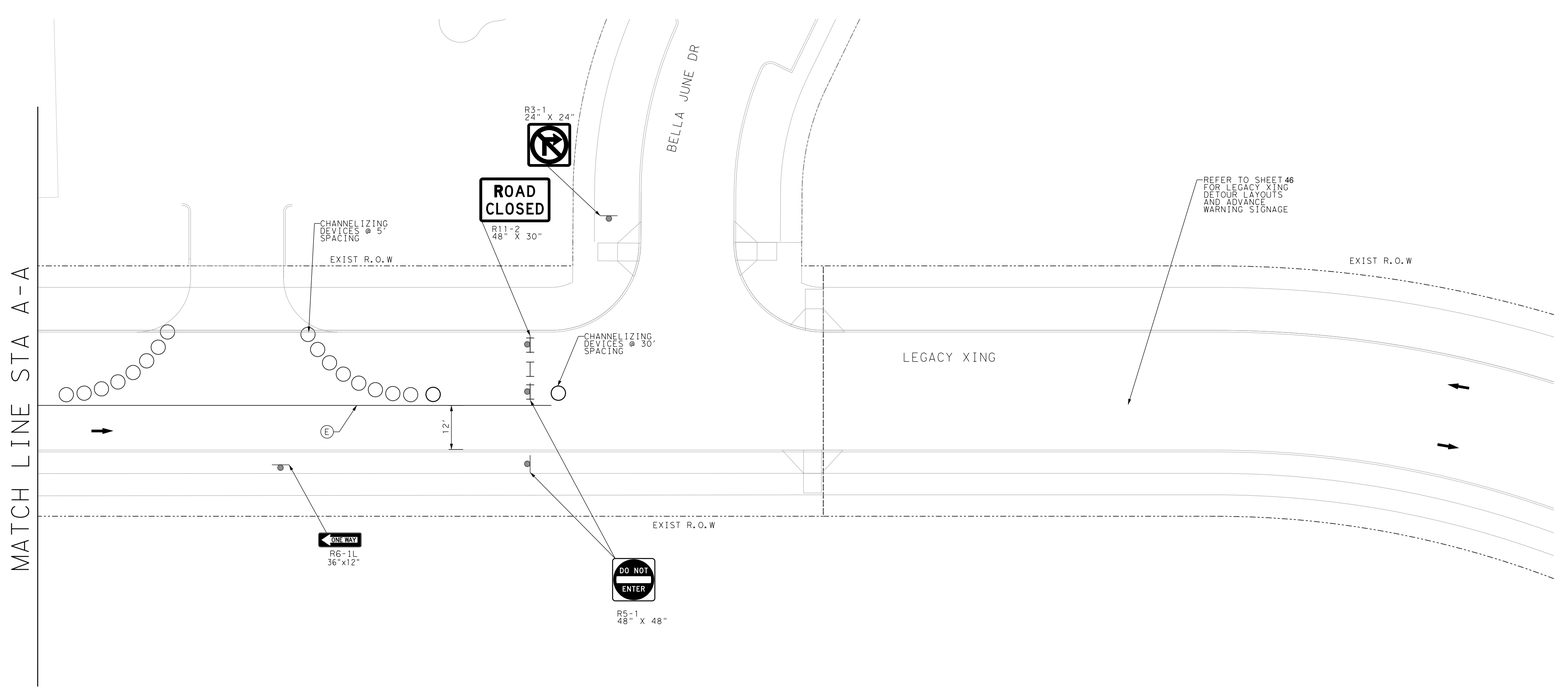
AUSTIN I SAN ANTONIO I HOUSTON I FORT WORTH I DALLAS
10801 N MOPAC EXPY, BLDG 3, STE 200 I AUSTIN, TX 78759 I 512.454.8711
TEXAS ENGINEERING FIRM #470 I TEXAS SURVEYING FIRM #10028800

WOLF RANCH PKWY / MEMORIAL DR
TCP PHASE I STEP IIB

CITY JOB No.
JOB NO. 51423-04
DATE 9/16/2025
DESIGNER
CHECKED DRAWN



LEGEND

- PHASE I WORKZONE
- TEMPORARY PAVEMENT
- EXISTING ROW
- PROPOSED ROW
- EXISTING EASEMENT
- x FENCE
- CHANNELIZING DEVICES
- TYPE III BARRICADE
- SIGN
- TRAFFIC FLOW ARROWS

(A) WK ZN PAV MRK NON-REMOVE (Y)6" (SLD)
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NOTES:

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DESIGN

STATE OF TEXAS
BRET CHAPMAN
127293
LICENSED
PROFESSIONAL ENGINEER

BRET CHAPMAN, P.E. — 9/16/2025 DATE

APPROVAL

STATE OF TEXAS
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PROFESSIONAL ENGINEER

BRIAN A. ALLEN, P.E. — 9/16/2025 DATE

NO.	REVISION	DATE

GEORGETOWN TEXAS *more than welcome*

PAPE-DAWSON ENGINEERS
AUSTIN I SAN ANTONIO I HOUSTON I FORT WORTH I DALLAS
10801 N MOPAC EXPY, BLDG 3, STE 200 I AUSTIN, TX 78759 I 512.454.8711
TEXAS ENGINEERING FIRM #470 I TEXAS SURVEYING FIRM #10028800

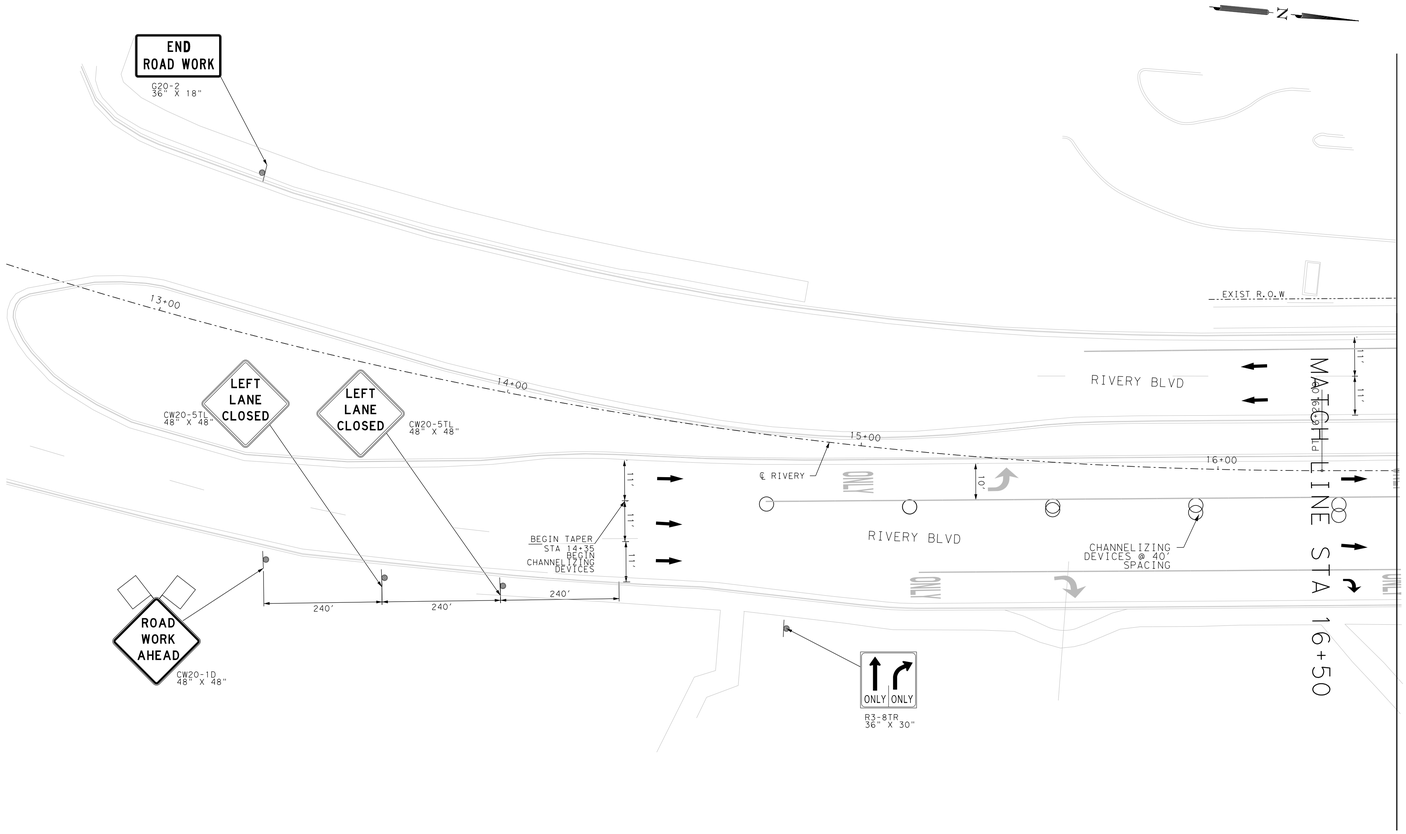
WOLF RANCH PKWY / MEMORIAL DR

TCP PHASE I STEP IIB

CITY JOB No.
JOB NO. 51423-04
DATE 9/16/2025
DESIGNER
CHECKED DRAWN

SHEET 21 OF 21

SHEET NO. 75



LEGEND

- PHASE II WORKZONE
- TEMPORARY PAVEMENT
- PAVEMENT CONSTRUCTED IN A PREVIOUS PHASE
- EXISTING ROW
- PROPOSED ROW
- EXISTING EASEMENT
- FENCE
- CHANNELIZING DEVICES
- TYPE III BARRICADE
- SIGN
- TRAFFIC FLOW ARROWS

(A) WK ZN PAV MRK NON-REMOVE (Y)6" (SLD)
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(D) WK ZN PAV MRK NON-REMOVE (W)8" (SLD)
(E) WK ZN PAV MRK NON-REMOVE (W)8" (DOT)
(F) WK ZN PAV MRK REMOVE (W)6" (SLD)
(G) WK ZN PAV MRK REMOVE (W)8" (DOT)
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SCALE: 1"= 20'

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STATE OF TEXAS
BRET CHAPMAN
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PROFESSIONAL ENGINEER

BRET CHAPMAN, P.E. — 9/16/2025 DATE

APPROVAL

STATE OF TEXAS
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GEORGETOWN TEXAS
more than welcome

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10801 N MOPAC EXPY, BLDG 3, STE 200 I AUSTIN, TX 78759 I 512.454.8711
TEXAS ENGINEERING FIRM #470 I TEXAS SURVEYING FIRM #10028800

WOLF RANCH PKWY / MEMORIAL DR
TCP PHASE II STEP 0-A

CITY JOB No.
JOB NO. 51423-04
DATE 9/16/2025
DESIGNER
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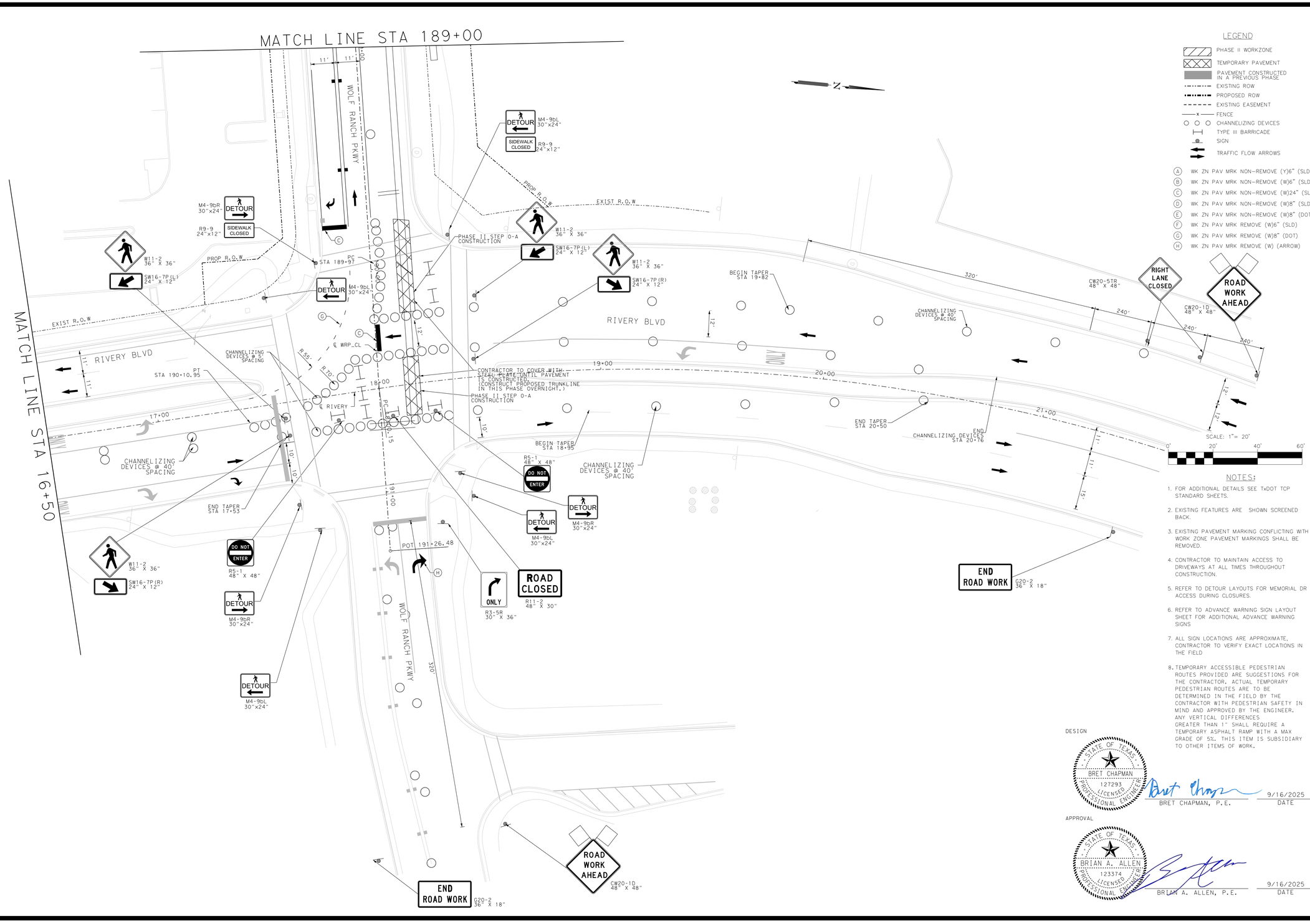

LEGEND

- PHASE II WORKZONE
- TEMPORARY PAVEMENT
- PAVEMENT CONSTRUCTED IN A PREVIOUS PHASE
- EXISTING ROW
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DESIGN

STATE OF TEXAS — BRET CHAPMAN — 127293 — LICENSED PROFESSIONAL ENGINEER

BRET CHAPMAN, P.E. — 9/16/2025 DATE

APPROVAL

STATE OF TEXAS — BRIAN A. ALLEN — 123374 — LICENSED PROFESSIONAL ENGINEER

BRIAN A. ALLEN, P.E. — 9/16/2025 DATE

NO.	REVISION	DATE

GEORGETOWN TEXAS *more than welcome*

PAPE-DAWSON ENGINEERS
AUSTIN I SAN ANTONIO I HOUSTON I FORT WORTH I DALLAS
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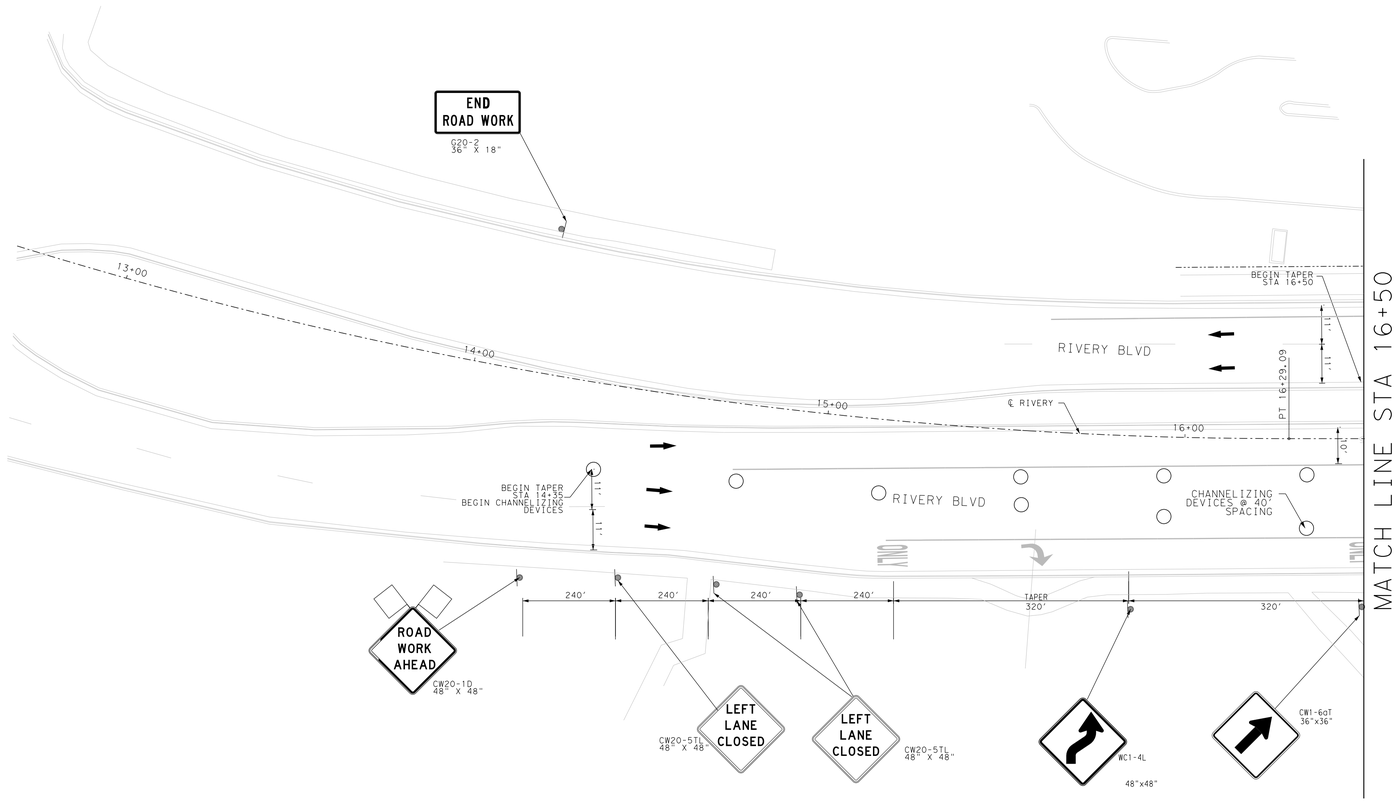
TEXAS ENGINEERING FIRM #470 I TEXAS SURVEYING FIRM #10028800

WOLF RANCH PKWY / MEMORIAL DR
TCP PHASE II STEP 0-A

CITY JOB No.
JOB NO. 51423-04
DATE 9/16/2025
DESIGNER
CHECKED DRAWN

SHEET 2 OF 35

SHEET NO. 75B



LEGEND

- PHASE II WORKZONE
- TEMPORARY PAVEMENT
- PAVEMENT CONSTRUCTED IN A PREVIOUS PHASE
- EXISTING ROW
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DESIGN

STATE OF TEXAS
BRET CHAPMAN
127293
LICENSED
PROFESSIONAL ENGINEER

BRET CHAPMAN, P.E. — 9/16/2025 DATE

APPROVAL

STATE OF TEXAS
BRIAN A. ALLEN
123374
LICENSED
PROFESSIONAL ENGINEER

BRIAN A. ALLEN, P.E. — 9/16/2025 DATE

NO.	REVISION	DATE

GEORGETOWN TEXAS
more than welcome

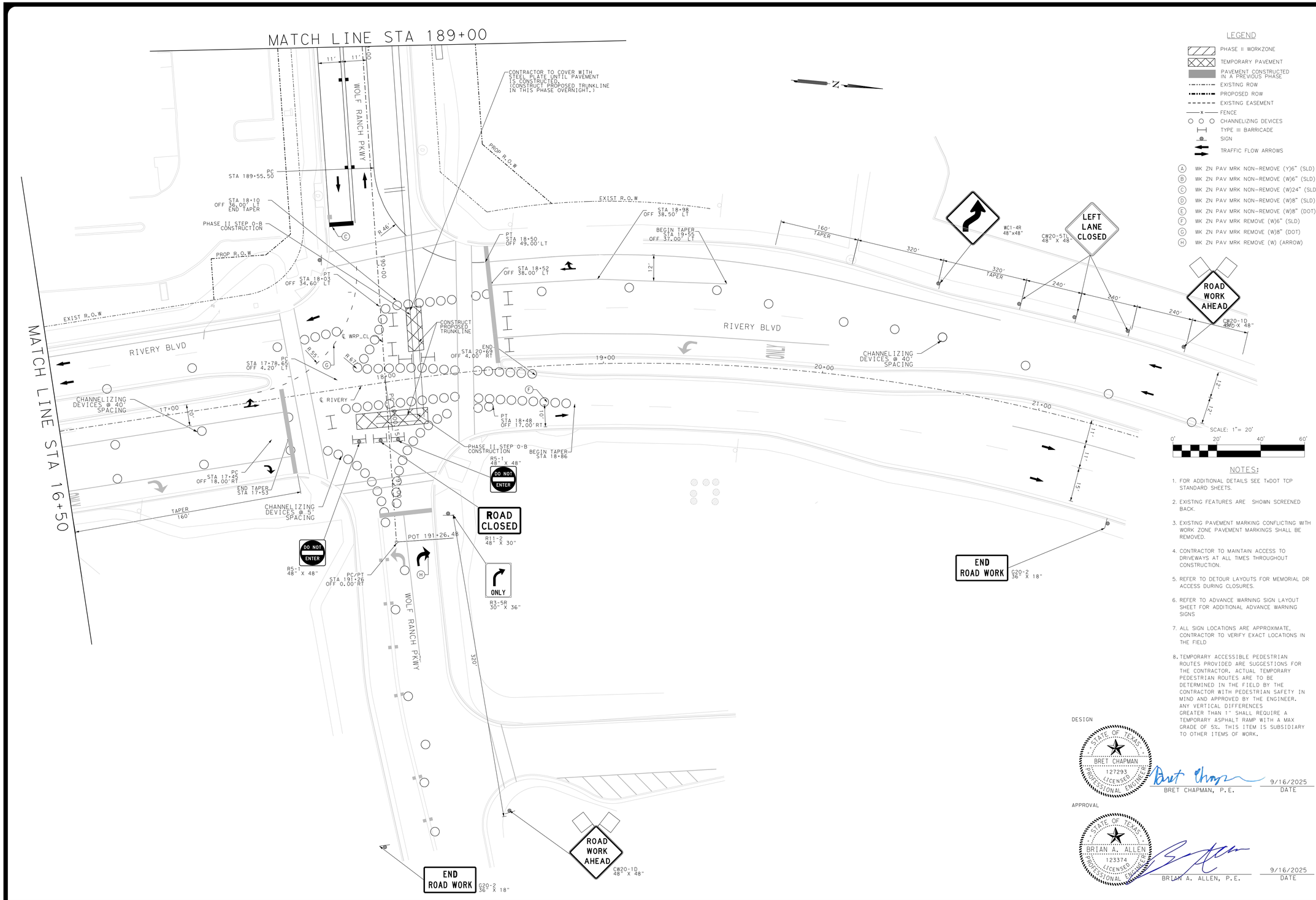
PAPE-DAWSON ENGINEERS
AUSTIN I SAN ANTONIO I HOUSTON I FORT WORTH I DALLAS
10801 N MOPAC EXPY, BLDG 3, STE 200 I AUSTIN, TX 78759 I 512.454.8711
TEXAS ENGINEERING FIRM #470 I TEXAS SURVEYING FIRM #10028800

WOLF RANCH PKWY / MEMORIAL DR

TCP PHASE II STEP 0-B

CITY JOB No.
JOB NO. 51423-04
DATE 9/16/2025
DESIGNER
CHECKED DRAWN

SHEET NO. 75C



LEGEND

- PHASE II WORKZONE
- TEMPORARY PAVEMENT
- PAVEMENT CONSTRUCTED IN A PREVIOUS PHASE
- EXISTING ROW
- PROPOSED ROW
- EXISTING EASEMENT
- FENCE
- CHANNELIZING DEVICES
- TYPE III BARRICADE
- SIGN
- TRAFFIC FLOW ARROWS

- (A) WK ZN PAV MRK NON-REMOVE (Y)6" (SLD)
- (B) WK ZN PAV MRK NON-REMOVE (W)6" (SLD)
- (C) WK ZN PAV MRK NON-REMOVE (W)24" (SLD)
- (D) WK ZN PAV MRK NON-REMOVE (W)8" (SLD)
- (E) WK ZN PAV MRK NON-REMOVE (W)8" (DOT)
- (F) WK ZN PAV MRK REMOVE (W)6" (SLD)
- (G) WK ZN PAV MRK REMOVE (W)8" (DOT)
- (H) WK ZN PAV MRK REMOVE (W) (ARROW)

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STATE OF TEXAS — BRET CHAPMAN — 127293 — LICENSED PROFESSIONAL ENGINEER

BRET CHAPMAN, P.E. — 9/16/2025 DATE

APPROVAL

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BRIAN A. ALLEN, P.E. — 9/16/2025 DATE

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GEORGETOWN TEXAS *more than welcome*

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TEXAS ENGINEERING FIRM #470 I TEXAS SURVEYING FIRM #10028800

WOLF RANCH PKWY / MEMORIAL DR
TCP PHASE II STEP 0-B

CITY JOB No.
JOB NO. 51423-04
DATE 9/16/2025
DESIGNER
CHECKED DRAWN

SHEET 4 OF 35

SHEET NO. 75D

LEGEND

- PHASE II WORKZONE
- TEMPORARY PAVEMENT
- PAVEMENT CONSTRUCTED IN A PREVIOUS PHASE
- EXISTING ROW
- PROPOSED ROW
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SCALE: 1"= 20'

0' 20' 40' 60'

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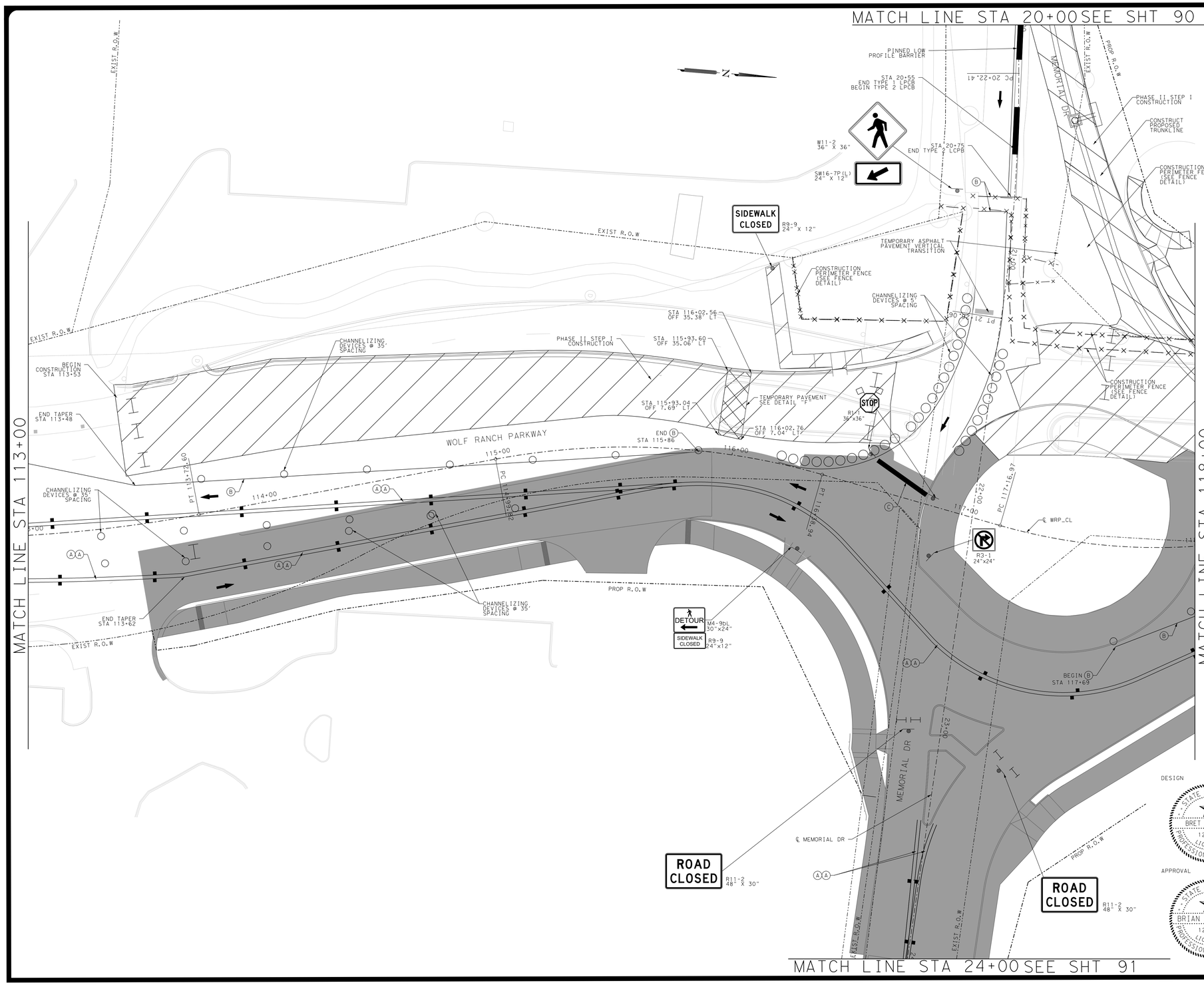
TEXAS ENGINEERING FIRM #470 I TEXAS SURVEYING FIRM #10028800

WOLF RANCH PKWY / MEMORIAL DR
TCP PHASE II STEP I

CITY JOB No.
JOB NO. 51423-04
DATE 9/16/2025
DESIGNER
CHECKED DRAWN

SHEET 5 OF 35

SHEET NO. 76



LEGEND

- PHASE II WORKZONE
- TEMPORARY PAVEMENT
- PAVEMENT CONSTRUCTED IN A PREVIOUS PHASE
- EXISTING ROW
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LICENSED PROFESSIONAL ENGINEER

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GEORGETOWN TEXAS
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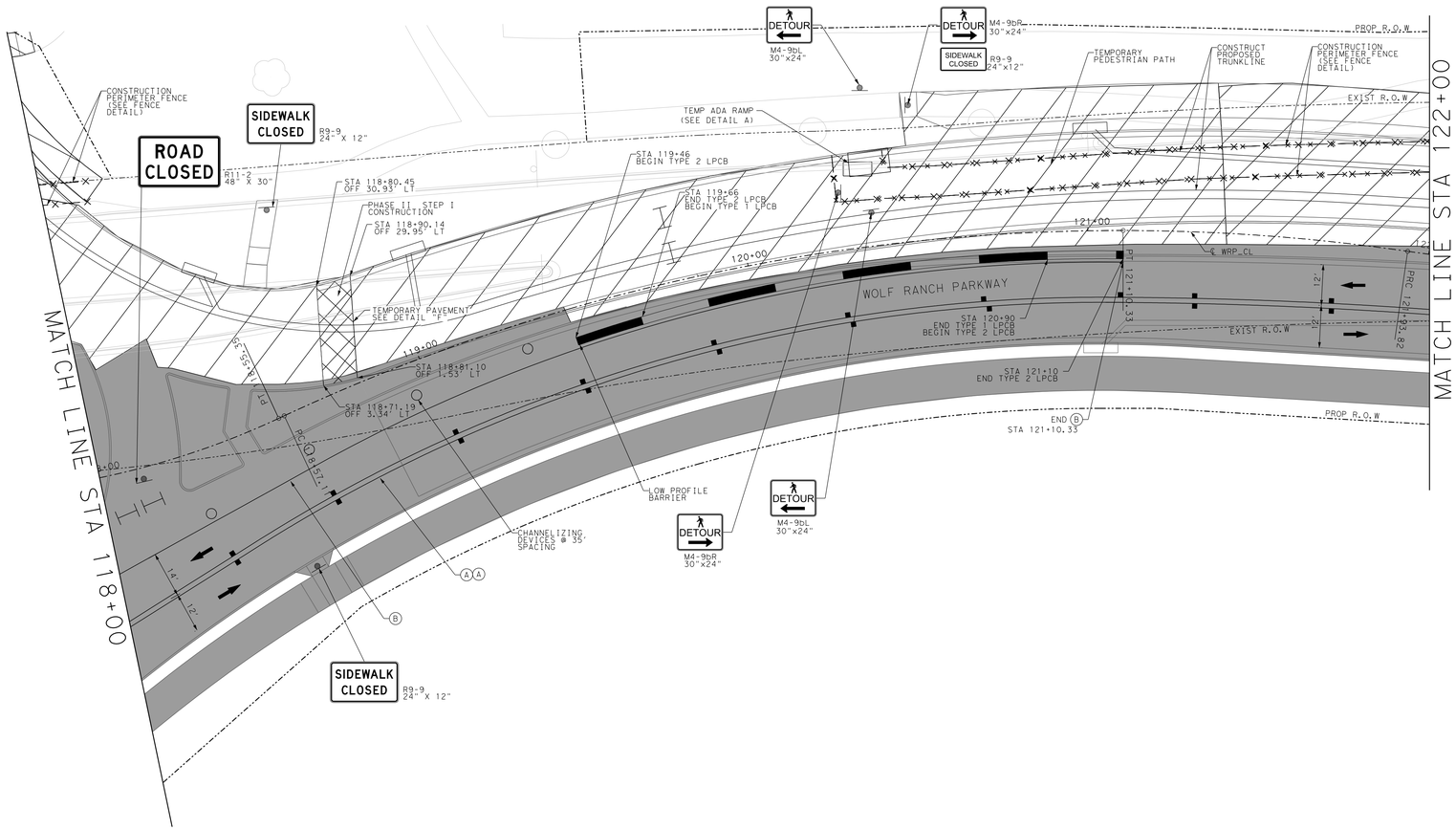
10801 N MOPAC EXPY, BLDG 3, STE 200 I AUSTIN, TX 78759 I 512.454.8711
TEXAS ENGINEERING FIRM #470 I TEXAS SURVEYING FIRM #10028800

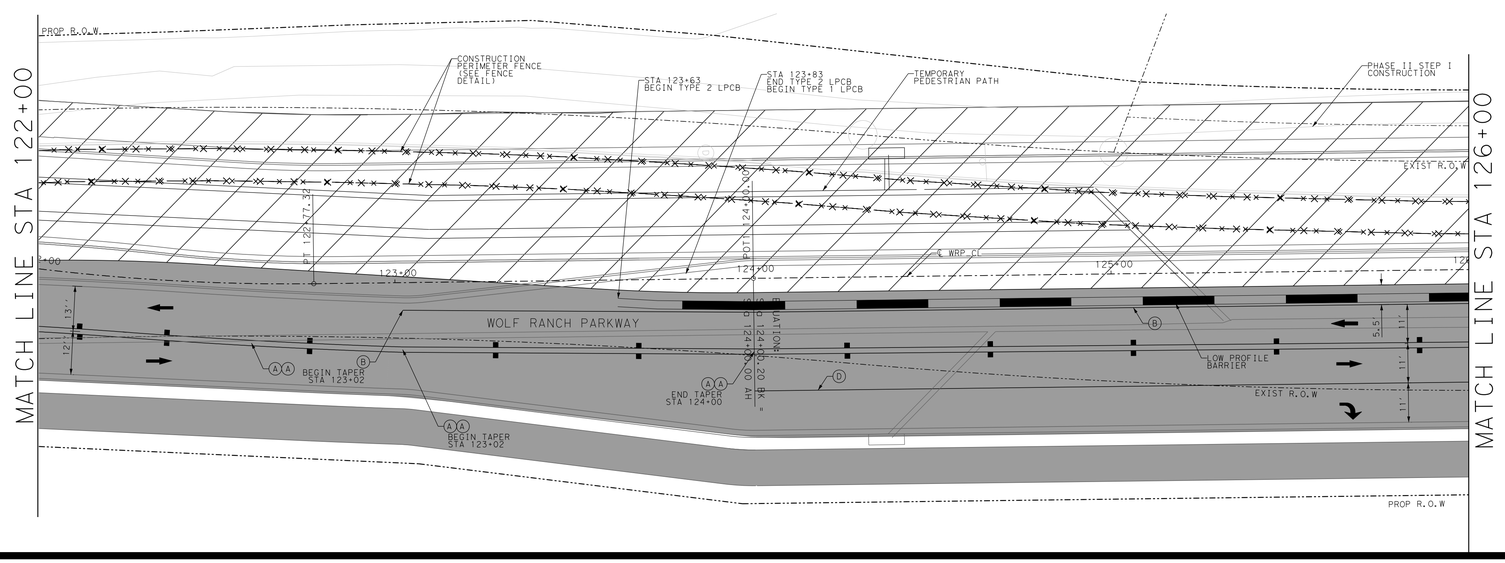
WOLF RANCH PKWY / MEMORIAL DR
TCP PHASE II STEP I

CITY JOB No.
JOB NO. 51423-04
DATE 9/16/2025
DESIGNER
CHECKED DRAWN

SHEET 6 OF 35

SHEET NO. 77





LEGEND

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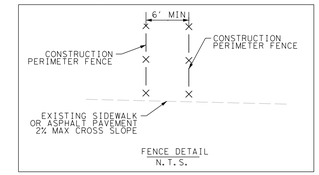
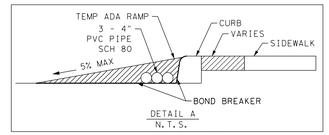


FENCE DETAIL
N.T.S.



DETAIL A
N.T.S.

SCALE: 1"= 20'

0' 20' 40' 60'

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STATE OF TEXAS
BRET CHAPMAN
127293
LICENSED
PROFESSIONAL ENGINEER

BRET CHAPMAN, P.E. — 9/16/2025 DATE

APPROVAL

STATE OF TEXAS
BRIAN A. ALLEN
123374
LICENSED
PROFESSIONAL ENGINEER

BRIAN A. ALLEN, P.E. — 9/16/2025 DATE

NO.	REVISION	DATE

GEORGETOWN TEXAS
more than welcome

PAPE-DAWSON ENGINEERS
AUSTIN I SAN ANTONIO I HOUSTON I FORT WORTH I DALLAS
10801 N MOPAC EXPY, BLDG 3, STE 200 I AUSTIN, TX 78759 I 512.454.8711
TEXAS ENGINEERING FIRM #470 I TEXAS SURVEYING FIRM #10028800

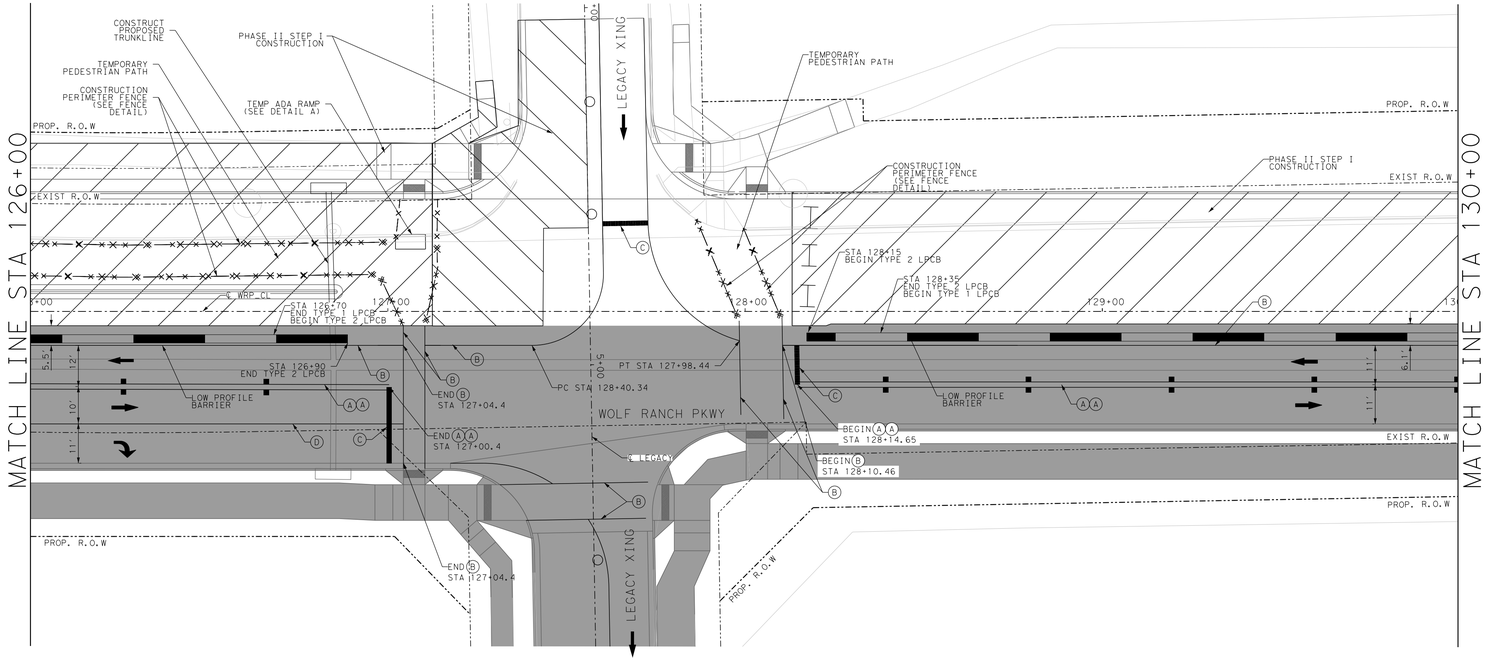
WOLF RANCH PKWY / MEMORIAL DR

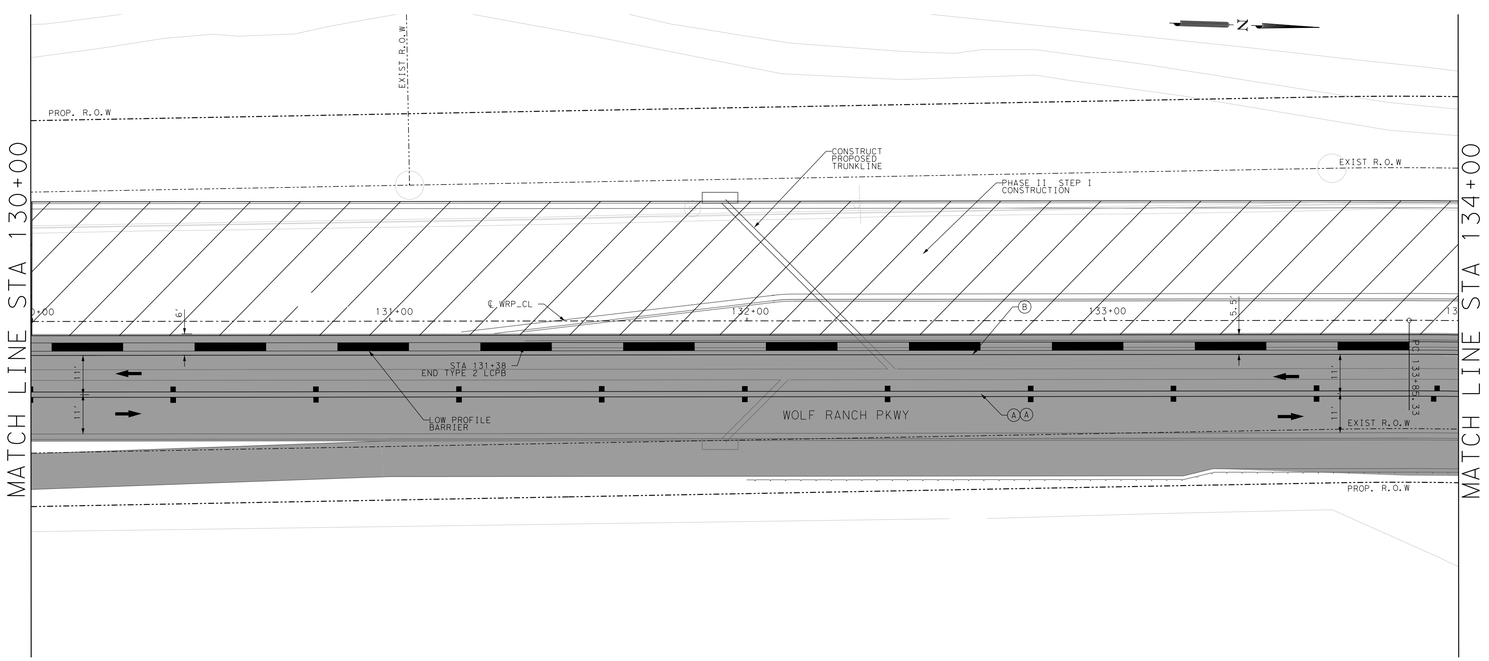
TCP PHASE II STEP I

CITY JOB No.
JOB NO. 51423-04
DATE 9/16/2025
DESIGNER
CHECKED DRAWN

SHEET 7 OF 35

SHEET NO. 78





LEGEND

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- TEMPORARY PAVEMENT
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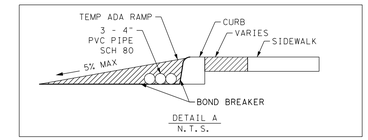
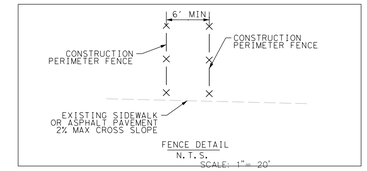


DETAIL A
N. T. S.



FENCE DETAIL
N. T. S.
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0' 20' 40' 60'

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STATE OF TEXAS · BRET CHAPMAN · 127293 · LICENSED PROFESSIONAL ENGINEER

BRET CHAPMAN, P.E. — 9/16/2025 DATE

APPROVAL

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GEORGETOWN TEXAS more than welcome

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TCP PHASE II STEP I

CITY JOB No.
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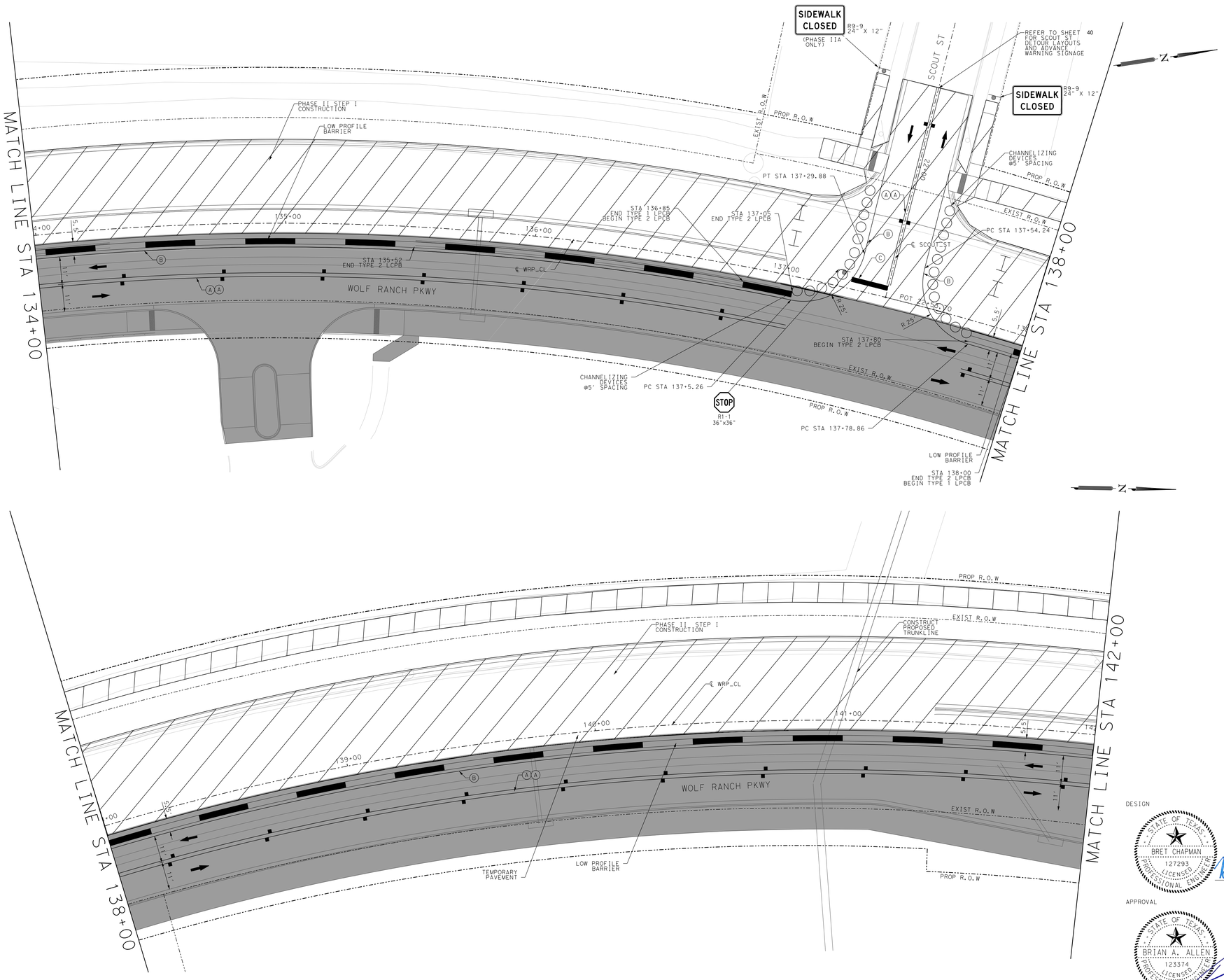

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TCP PHASE II STEP I

CITY JOB No.
JOB NO. 51423-04
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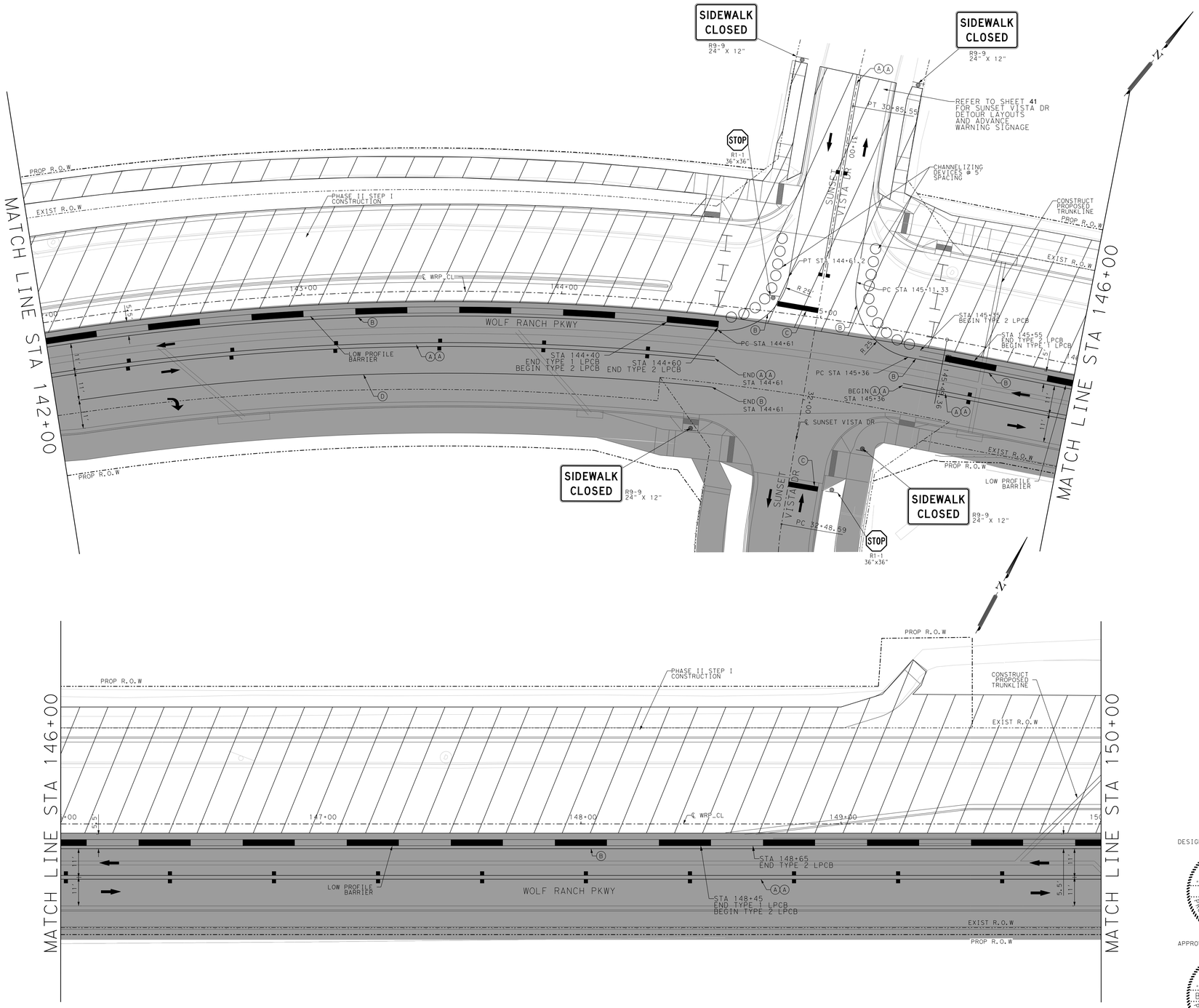
SHEET 9 OF 35

SHEET NO. 80



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DESIGN

STATE OF TEXAS
BRET CHAPMAN
127293
LICENSED
PROFESSIONAL ENGINEER

BRET CHAPMAN, P.E. — 9/16/2025 DATE

APPROVAL

STATE OF TEXAS
BRIAN A. ALLEN
123374
LICENSED
PROFESSIONAL ENGINEER

BRIAN A. ALLEN, P.E. — 9/16/2025 DATE

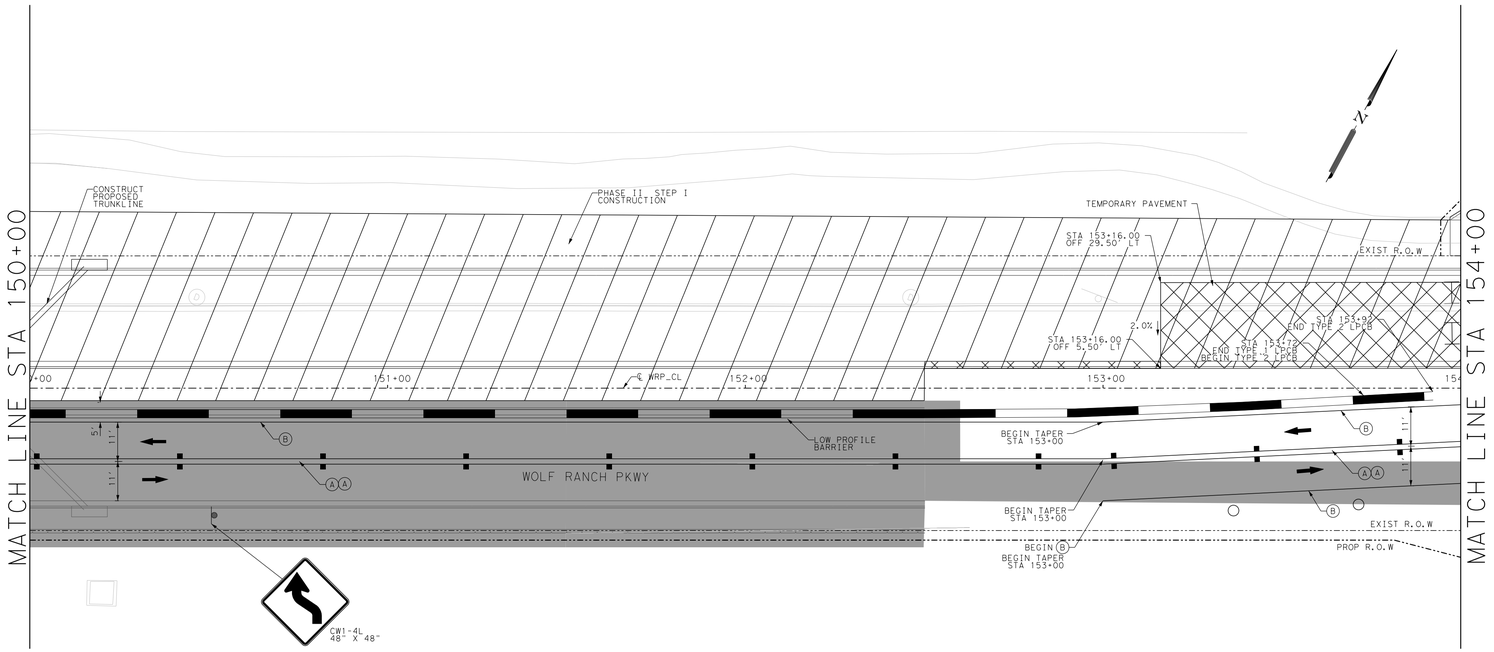
NO.	REVISION	DATE

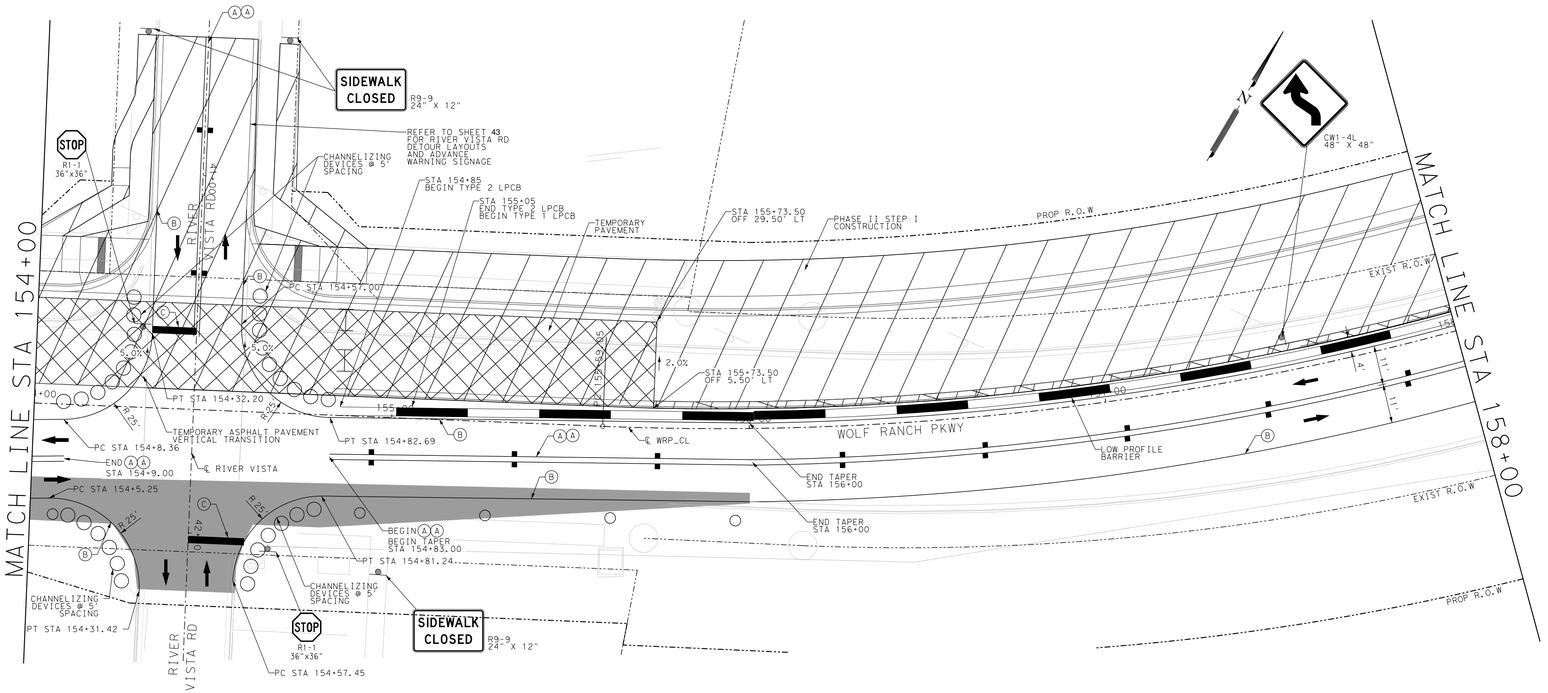
GEORGETOWN TEXAS more than welcome

PAPE-DAWSON ENGINEERS
AUSTIN I SAN ANTONIO I HOUSTON I FORT WORTH I DALLAS
10801 N MOPAC EXPY, BLDG 3, STE 200 I AUSTIN, TX 78759 I 512.454.8711
TEXAS ENGINEERING FIRM #470 I TEXAS SURVEYING FIRM #10028800

WOLF RANCH PKWY / MEMORIAL DR
TCP PHASE II STEP I

CITY JOB No.
JOB NO. 51423-04
DATE 9/16/2025
DESIGNER
CHECKED DRAWN





LEGEND

- PHASE II WORKZONE
- TEMPORARY PAVEMENT
- PAVEMENT CONSTRUCTED IN A PREVIOUS PHASE
- EXISTING ROW
- PROPOSED ROW
- EXISTING EASEMENT
- x FENCE
- CHANNELIZING DEVICES
- TYPE III BARRICADE
- SIGN
- TRAFFIC FLOW ARROWS
- (A) WK ZN PAV MRK NON-REMOVE (Y)6" (SLD)
- (B) WK ZN PAV MRK NON-REMOVE (W)6" (SLD)
- (C) WK ZN PAV MRK NON-REMOVE (W)24" (SLD)
- (D) WK ZN PAV MRK NON-REMOVE (W)8" (SLD)
- (E) WK ZN PAV MRK NON-REMOVE (W)8" (DOT)
- (F) WK ZN PAV MRK REMOVE (W)6" (SLD)
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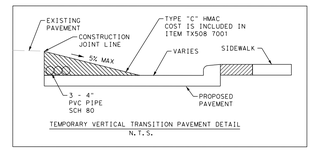

TEMPORARY VERTICAL TRANSITION PAVEMENT DETAIL
N.T.S.

SCALE: 1"= 20'

0' 20' 40' 60'

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BRET CHAPMAN, P.E. — 9/16/2025 DATE

APPROVAL

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GEORGETOWN TEXAS *more than welcome*

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WOLF RANCH PKWY / MEMORIAL DR
TCP PHASE II STEP I

CITY JOB No.
JOB NO. 51423-04
DATE 9/16/2025
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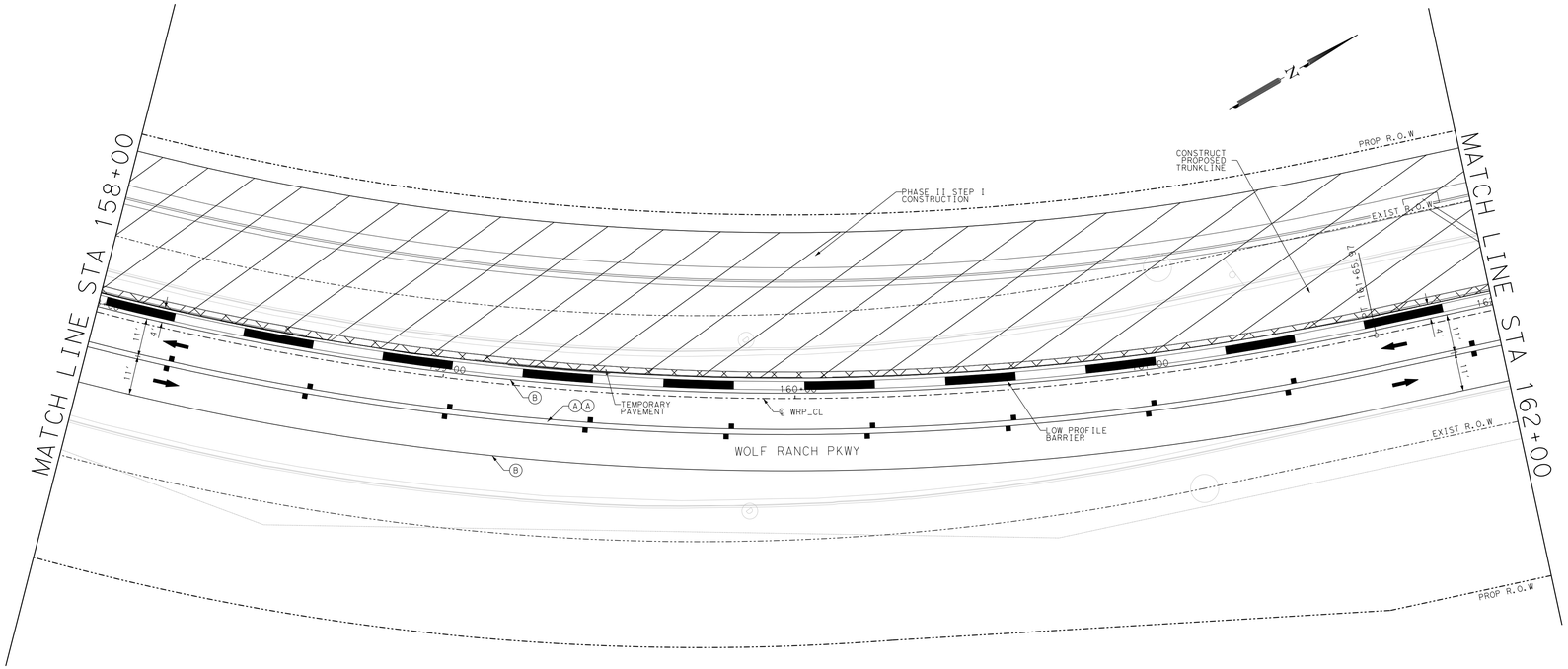
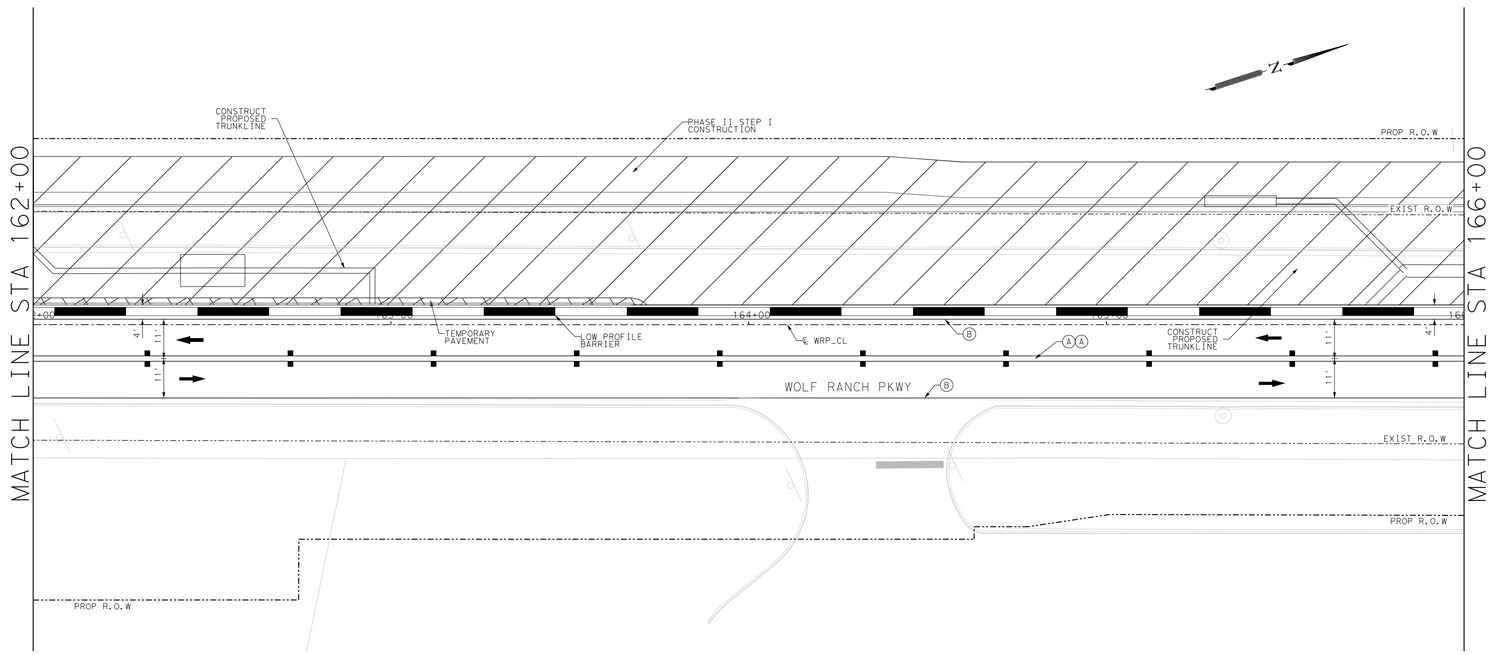
CHECKED DRAWN

SHEET 11 OF 35

SHEET NO. 82





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- SIGN
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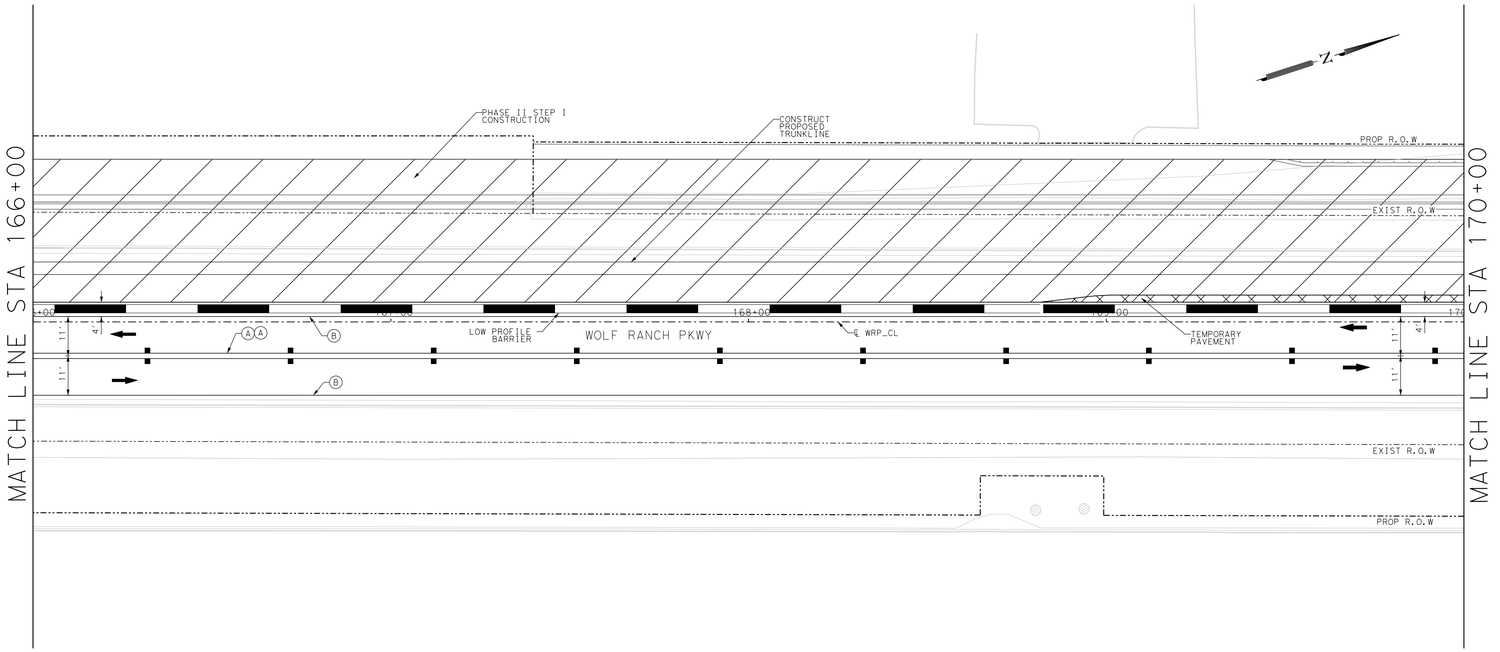
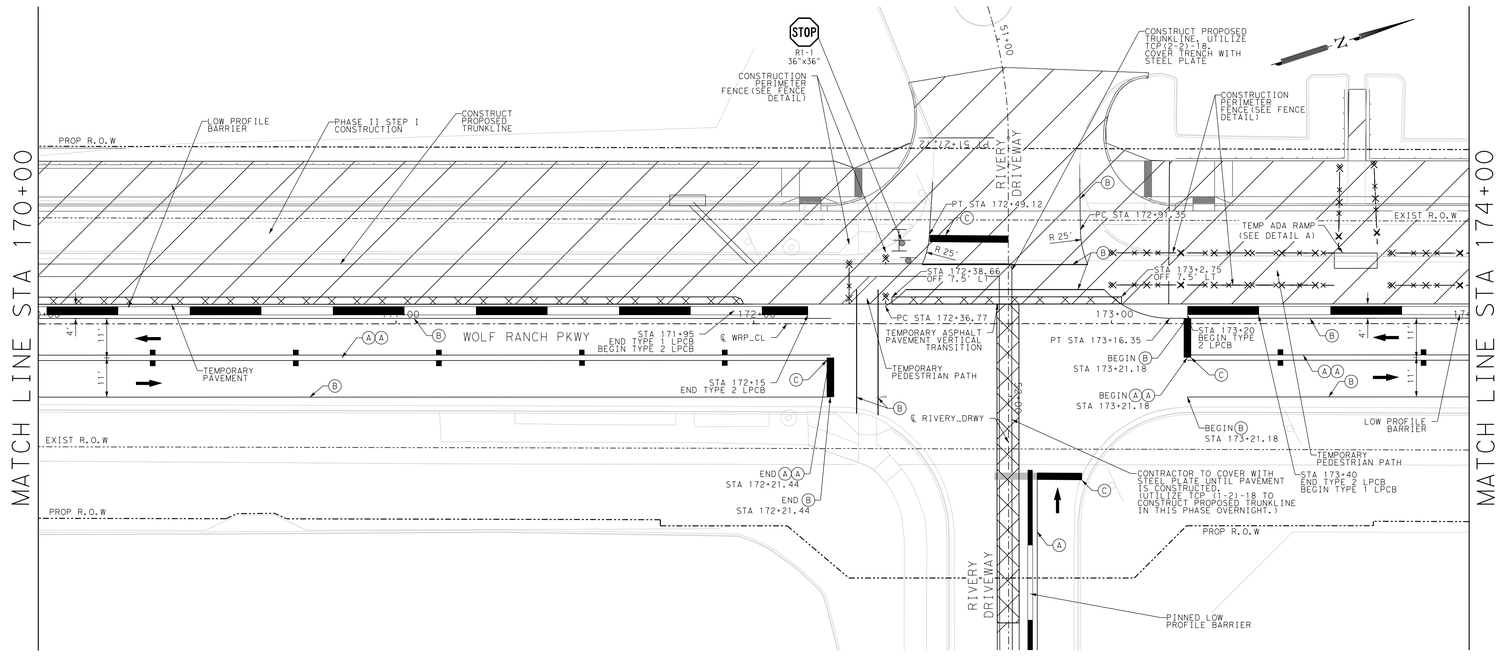
TCP PHASE II STEP I

CITY JOB No.
JOB NO. 51423-04
DATE 9/16/2025
DESIGNER
CHECKED DRAWN

SHEET 12 OF 35
SHEET NO. 83





LEGEND

- PHASE II WORKZONE
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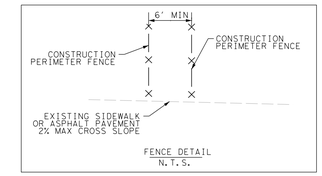
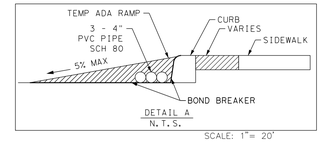


FENCE DETAIL
N.T.S.



DETAIL A
N.T.S.

SCALE: 1"= 20'

0' 20' 40' 60'

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STATE OF TEXAS — BRET CHAPMAN — 127293 — LICENSED PROFESSIONAL ENGINEER

BRET CHAPMAN, P.E. — 9/16/2025 DATE

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GEORGETOWN TEXAS *more than welcome*

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WOLF RANCH PKWY / MEMORIAL DR
TCP PHASE II STEP I

CITY JOB No.
JOB NO. 51423-04
DATE 9/16/2025
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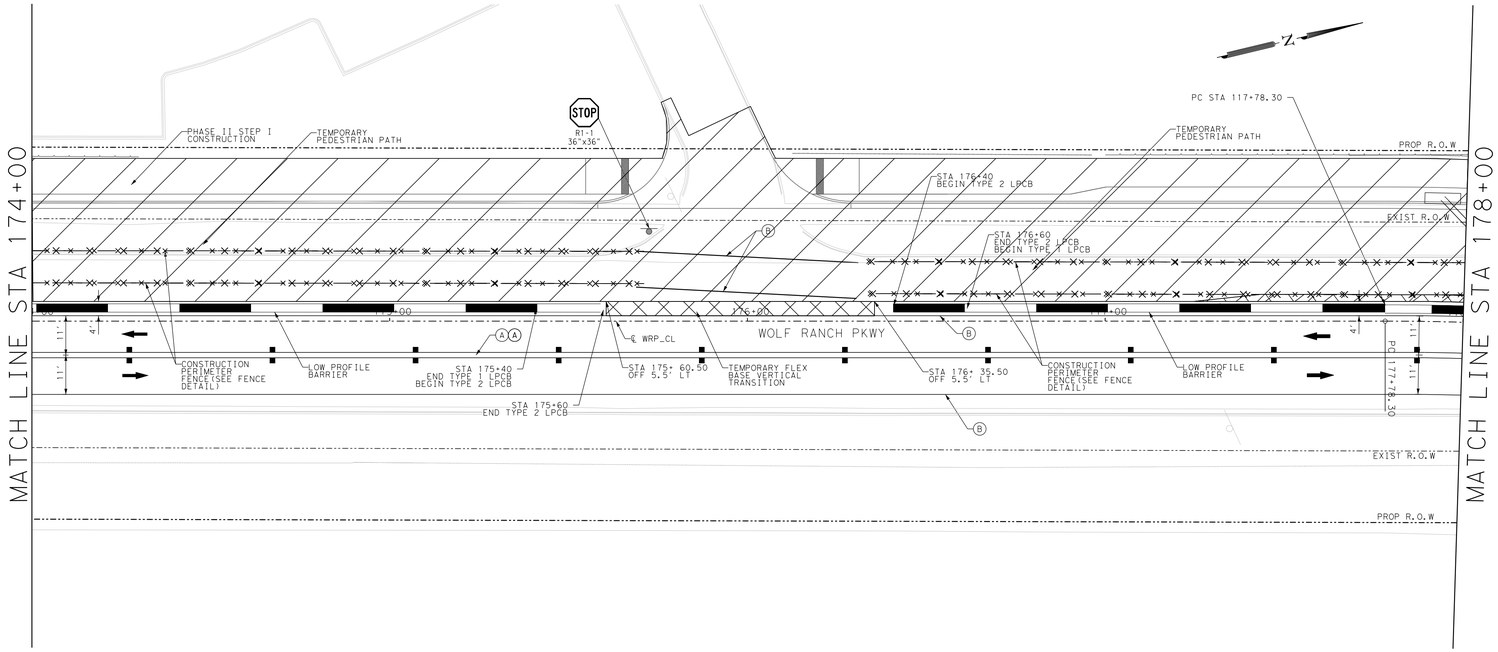
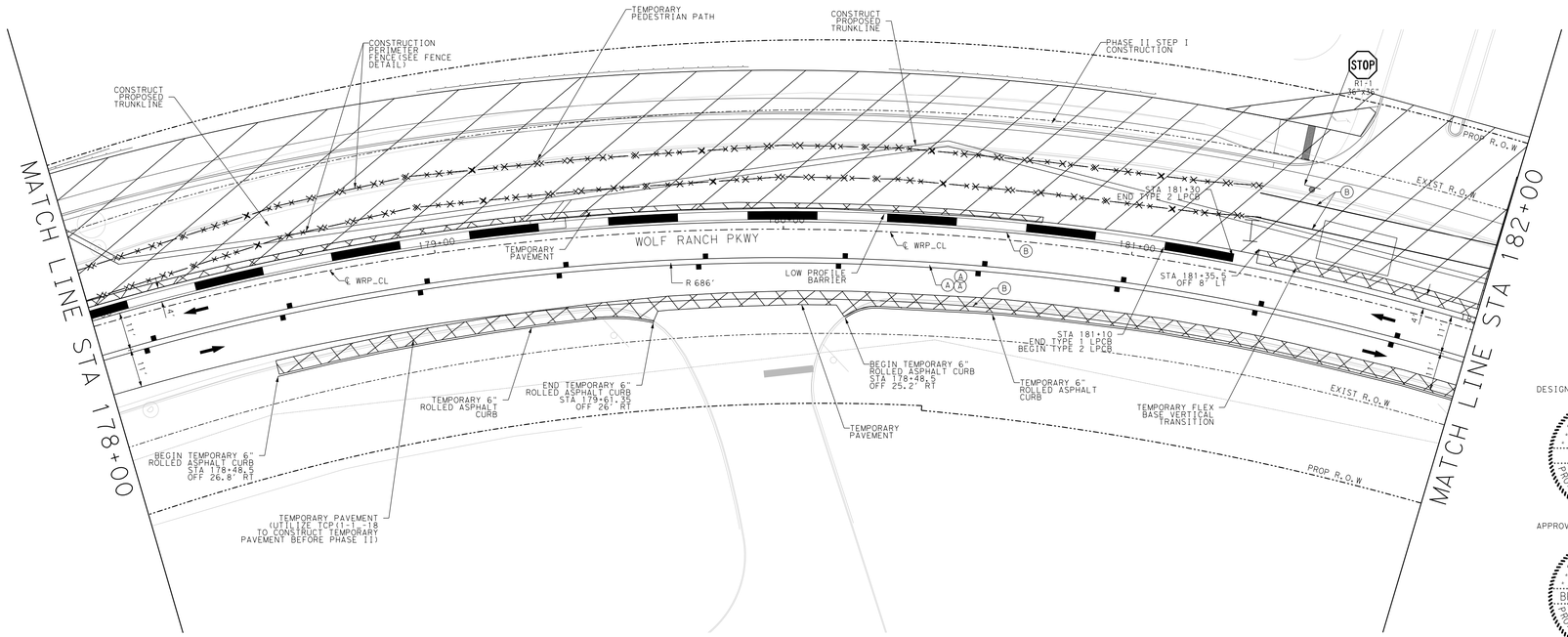
CHECKED DRAWN

SHEET 13 OF 35

SHEET NO. 84





LEGEND

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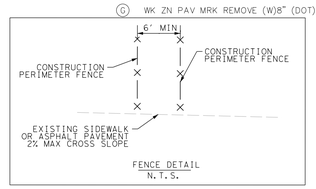
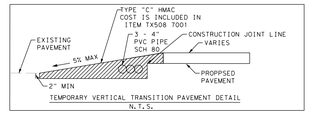


FENCE DETAIL
N.T.S.



TEMPORARY VERTICAL TRANSITION PAVEMENT DETAIL
N.T.S.

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BRET CHAPMAN, P.E. — 9/16/2025 DATE

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TEXAS ENGINEERING FIRM #470 | TEXAS SURVEYING FIRM #10028800

WOLF RANCH PKWY / MEMORIAL DR
TCP PHASE II STEP I

CITY JOB No.
JOB NO. 51423-04
DATE 9/16/2025
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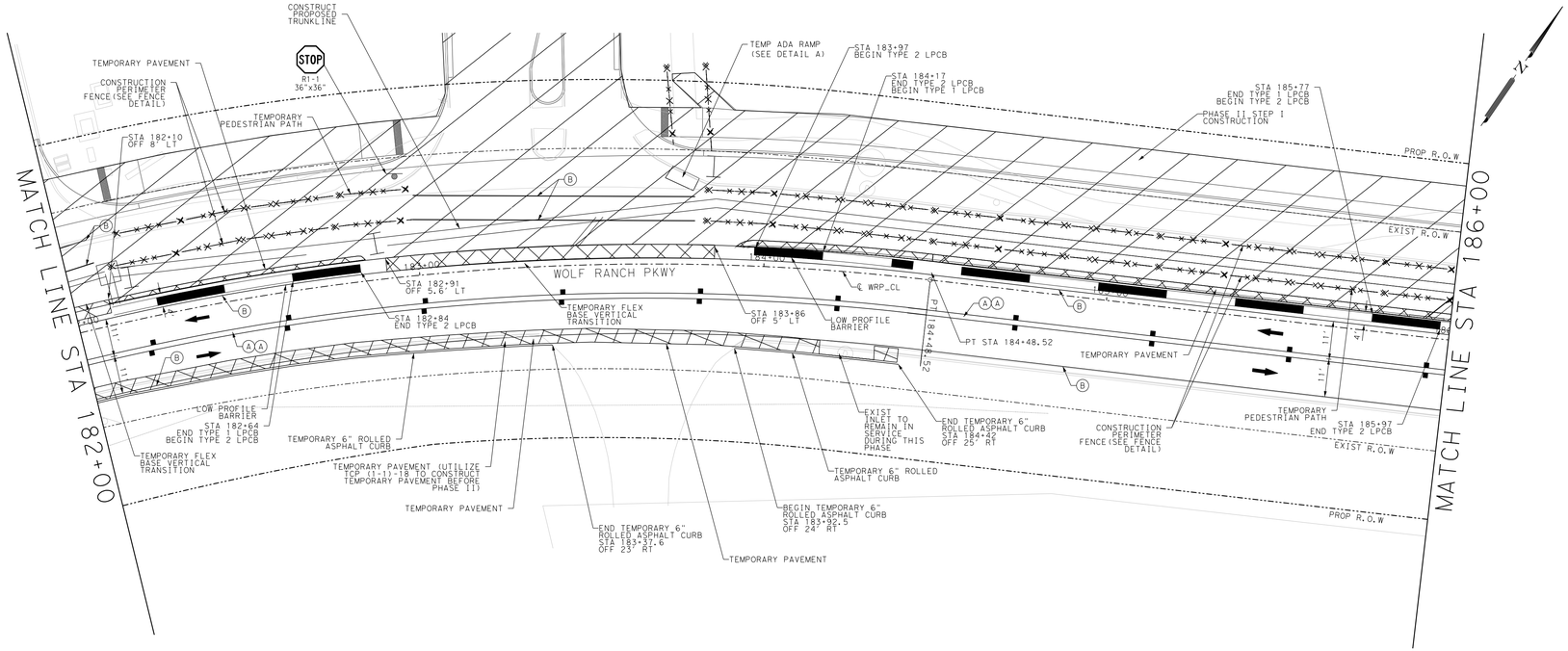
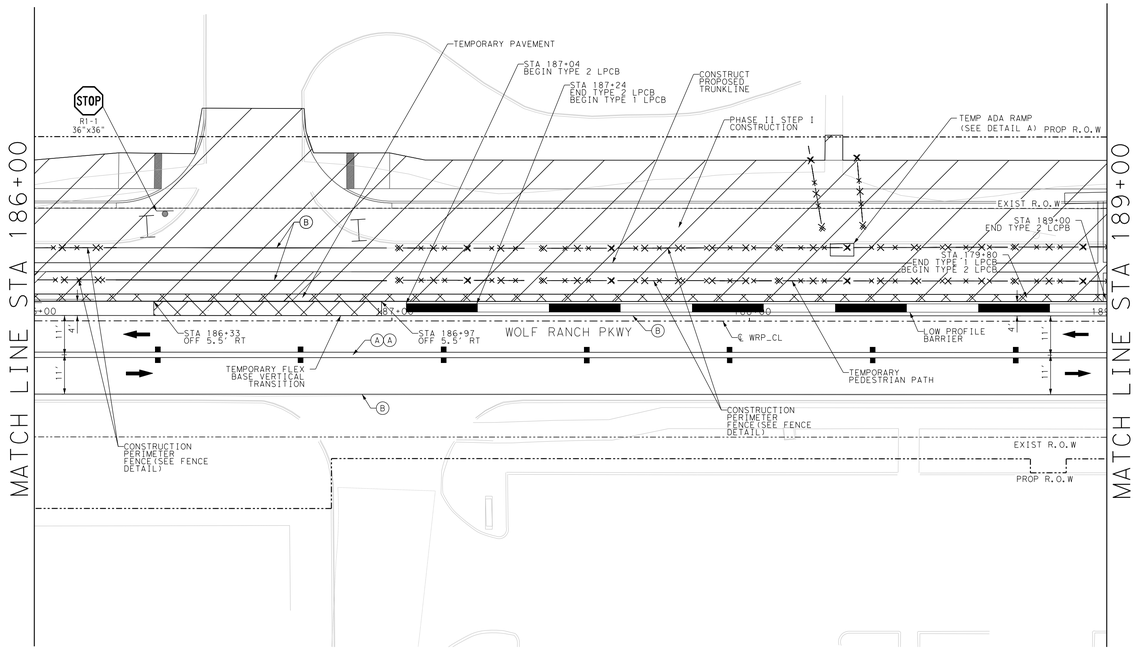
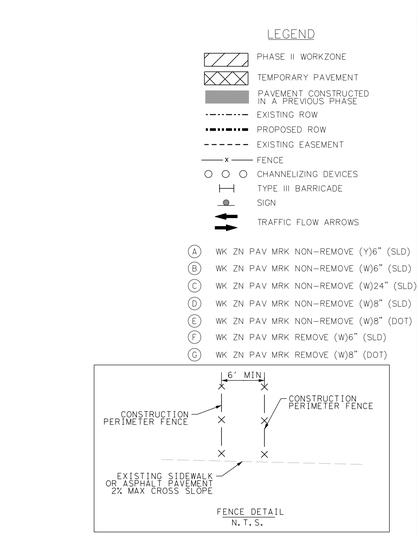
CHECKED DRAWN

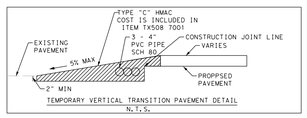
SHEET 14 OF 35

SHEET NO. 85









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TCP PHASE II STEP I

CITY JOB No.
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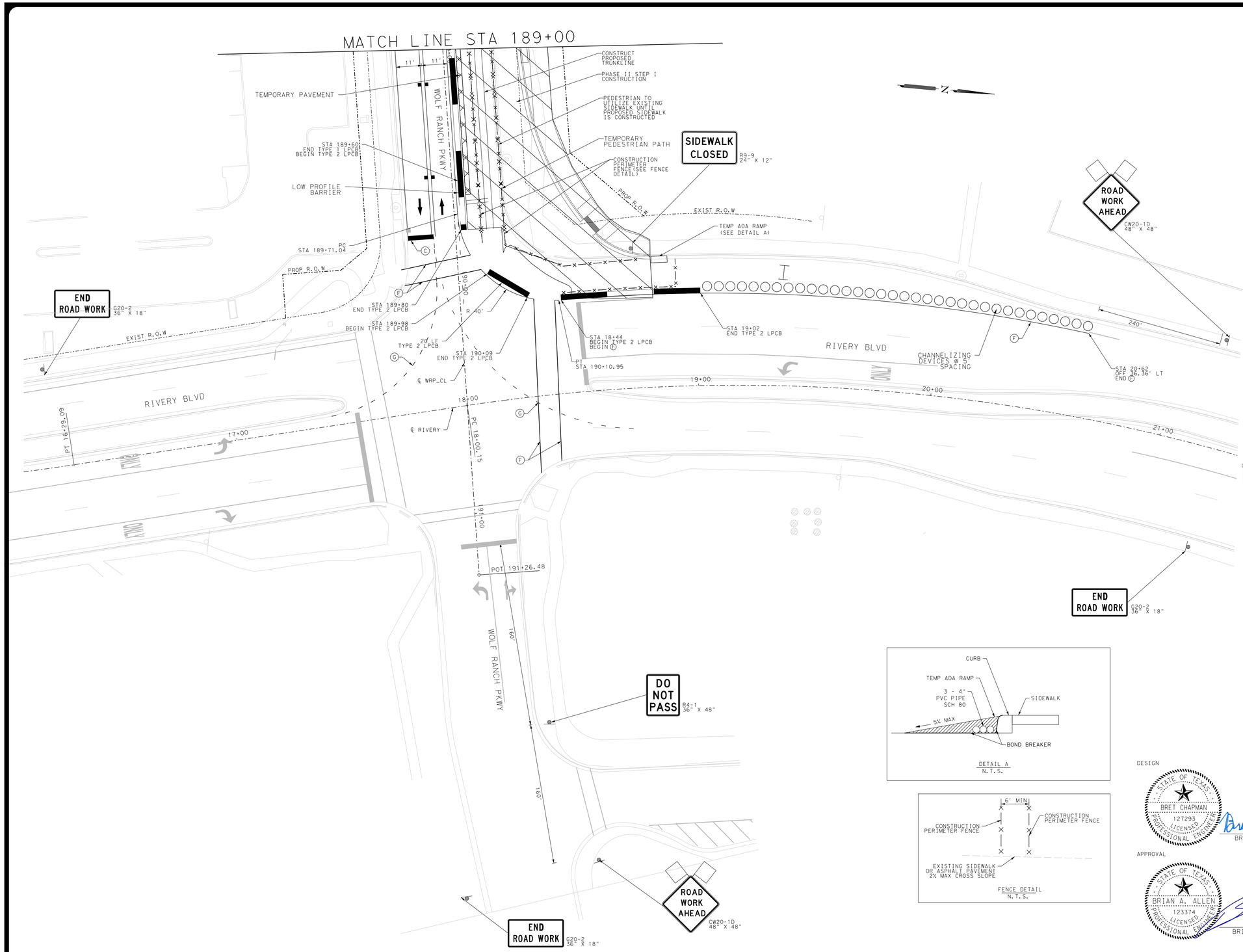
SHEET 15 OF 35

SHEET NO. 86



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STATE OF TEXAS · BRET CHAPMAN · 127293 · LICENSED · PROFESSIONAL ENGINEER

BRET CHAPMAN, P.E. — 9/16/2025 DATE

APPROVAL

STATE OF TEXAS · BRIAN A. ALLEN · 123374 · LICENSED · PROFESSIONAL ENGINEER

BRIAN A. ALLEN, P.E. — 9/16/2025 DATE

NO.	REVISION	DATE

GEORGETOWN TEXAS *more than welcome*

PAPE-DAWSON ENGINEERS
AUSTIN I SAN ANTONIO I HOUSTON I FORT WORTH I DALLAS
10801 N MOPAC EXPY, BLDG 3, STE 200 I AUSTIN, TX 78759 I 512.454.8711
TEXAS ENGINEERING FIRM #470 I TEXAS SURVEYING FIRM #10028800

WOLF RANCH PKWY / MEMORIAL DR
TCP PHASE II STEP I

CITY JOB No.
JOB NO. 51423-04
DATE 9/16/2025
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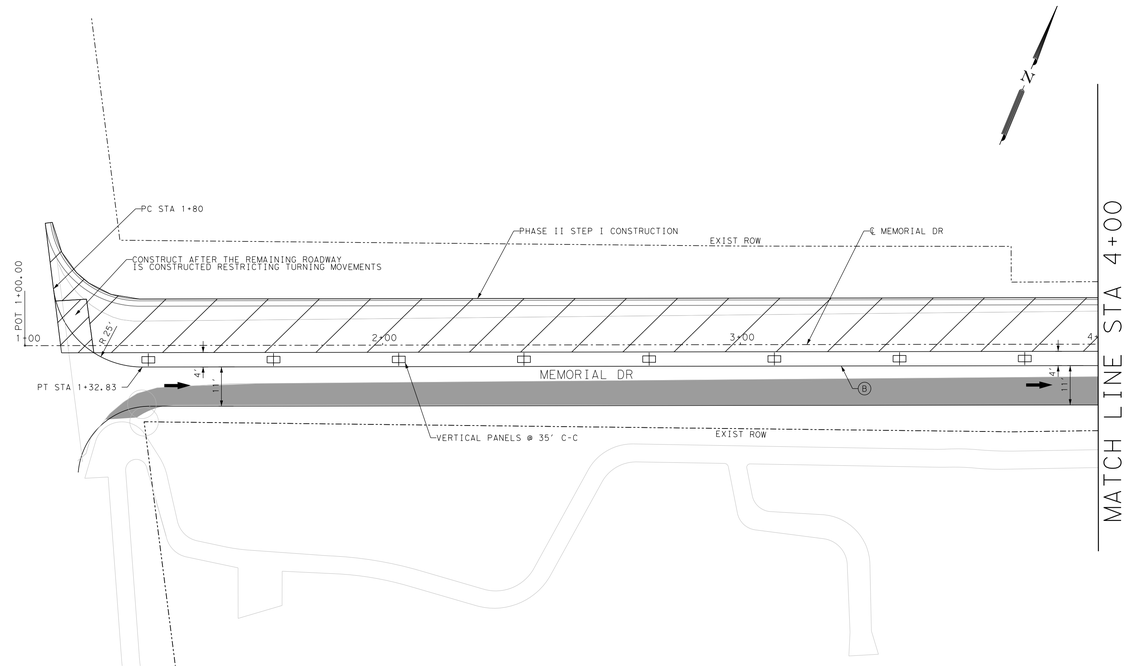
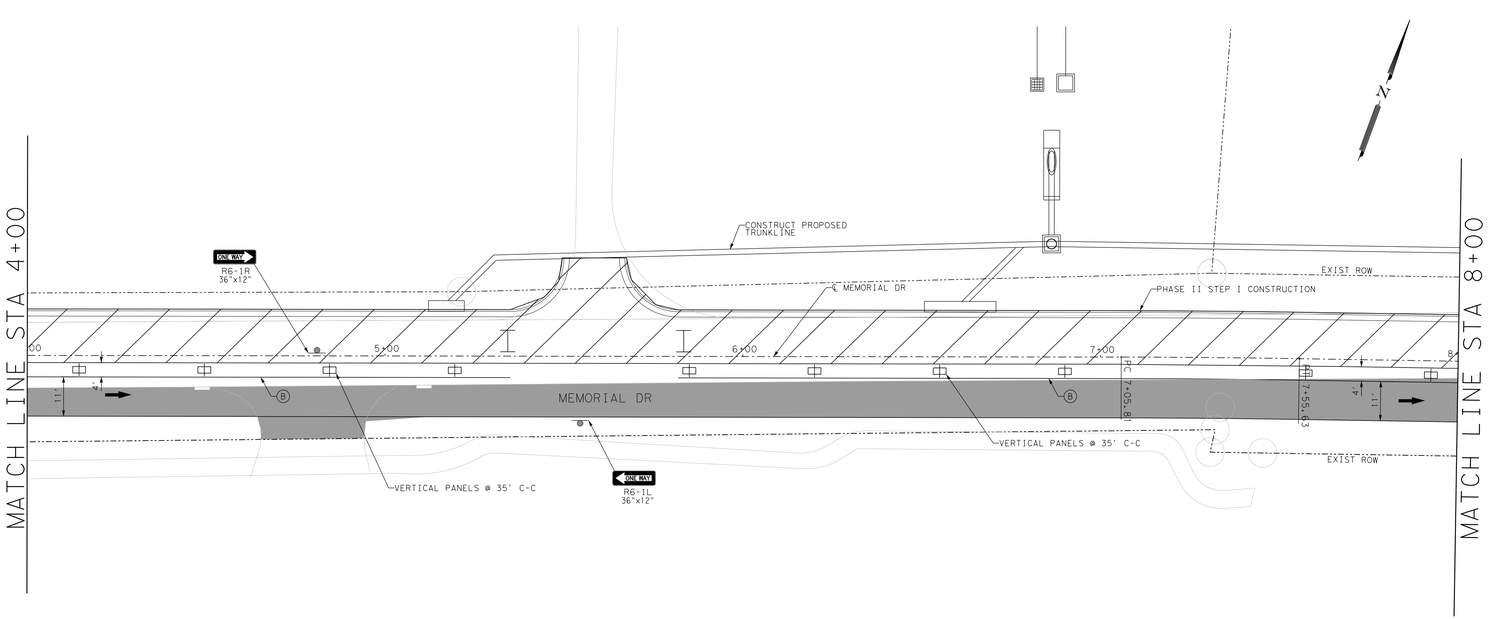
CHECKED DRAWN





LEGEND

- PHASE II WORKZONE
- TEMPORARY PAVEMENT
- PAVEMENT CONSTRUCTED IN A PREVIOUS PHASE
- EXISTING ROW
- PROPOSED ROW
- EXISTING EASEMENT
- FENCE
- CHANNELIZING DEVICES
- TYPE III BARRICADE
- SIGN
- TRAFFIC FLOW ARROWS

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SCALE: 1"= 20'
0' 20' 40' 60'

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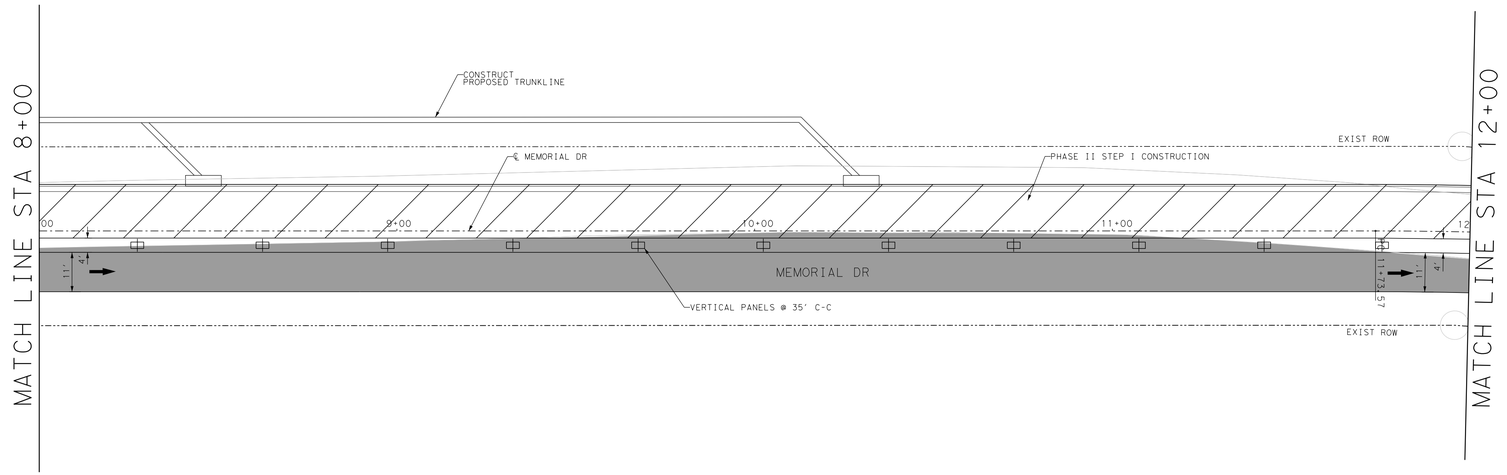
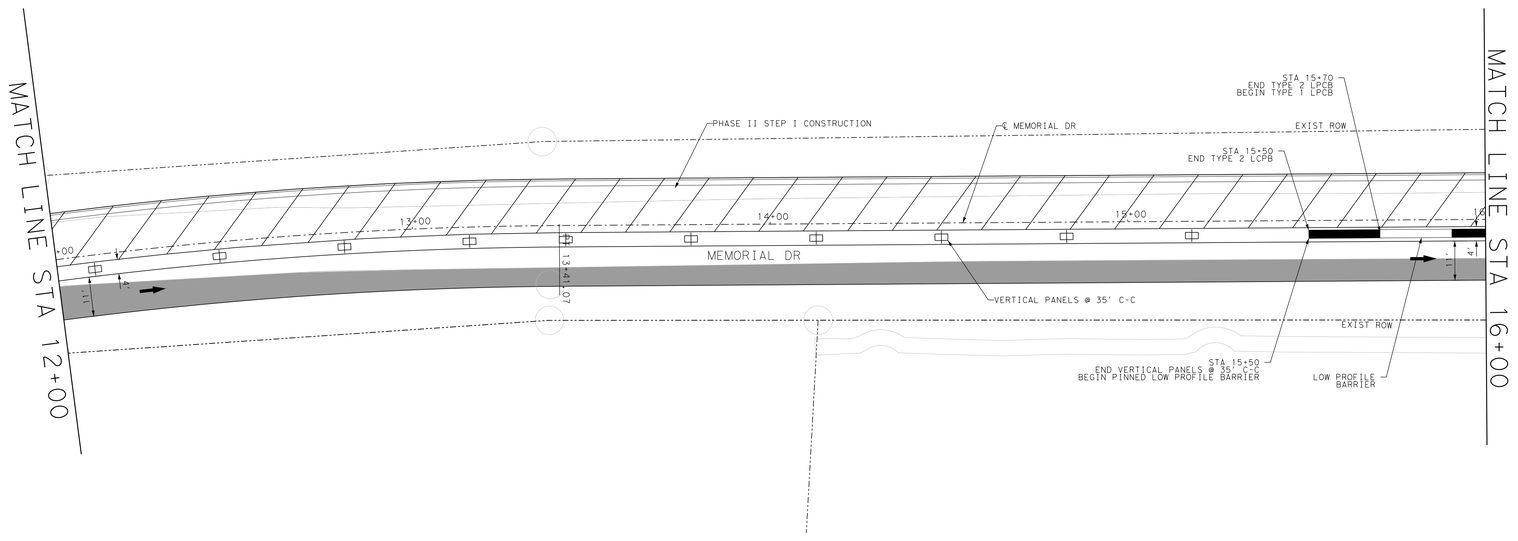
SHEET 17 OF 35
SHEET NO. 88





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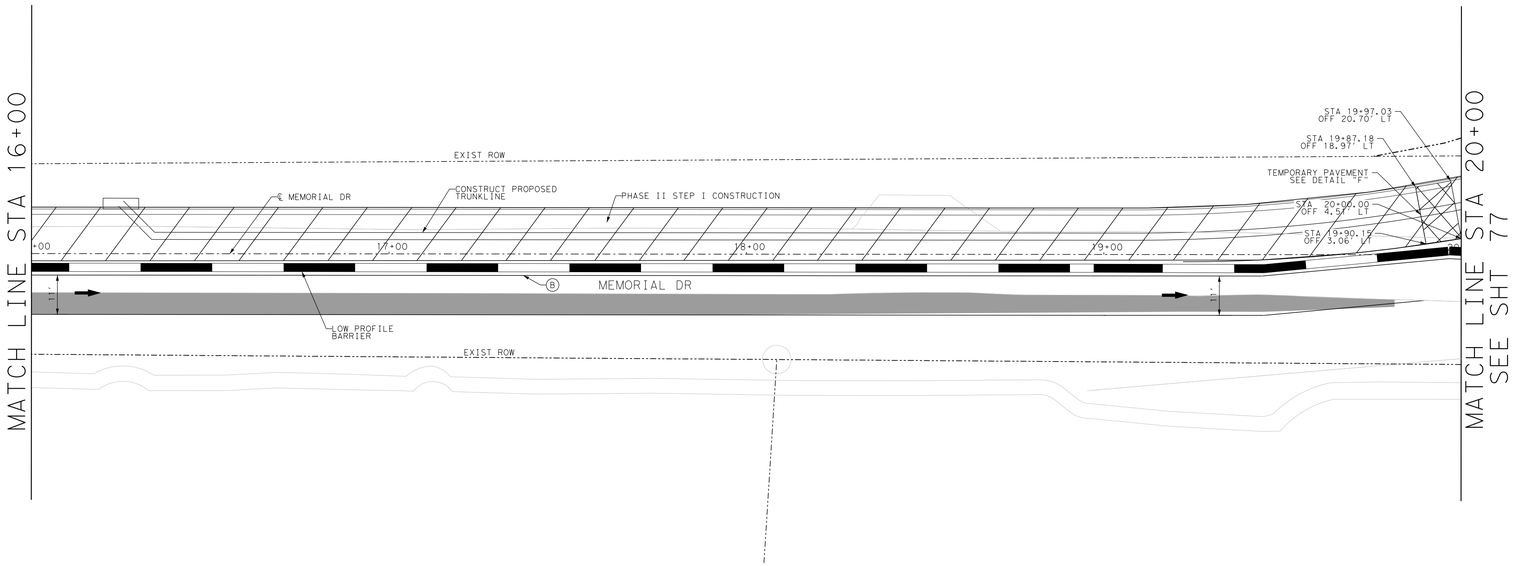
SHEET 18 OF 35

SHEET NO. 89





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TCP PHASE II STEP I

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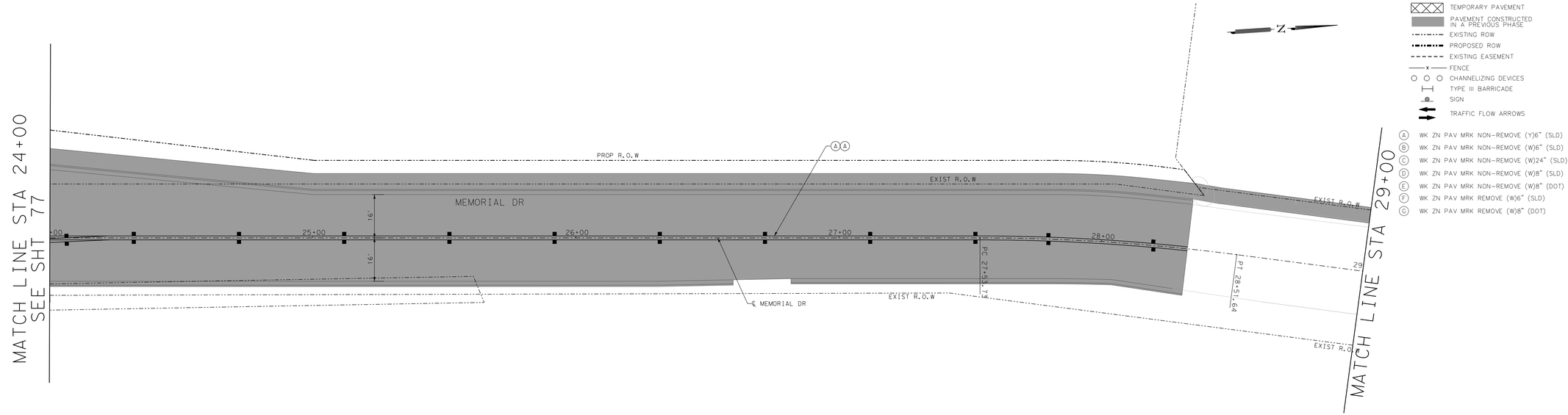
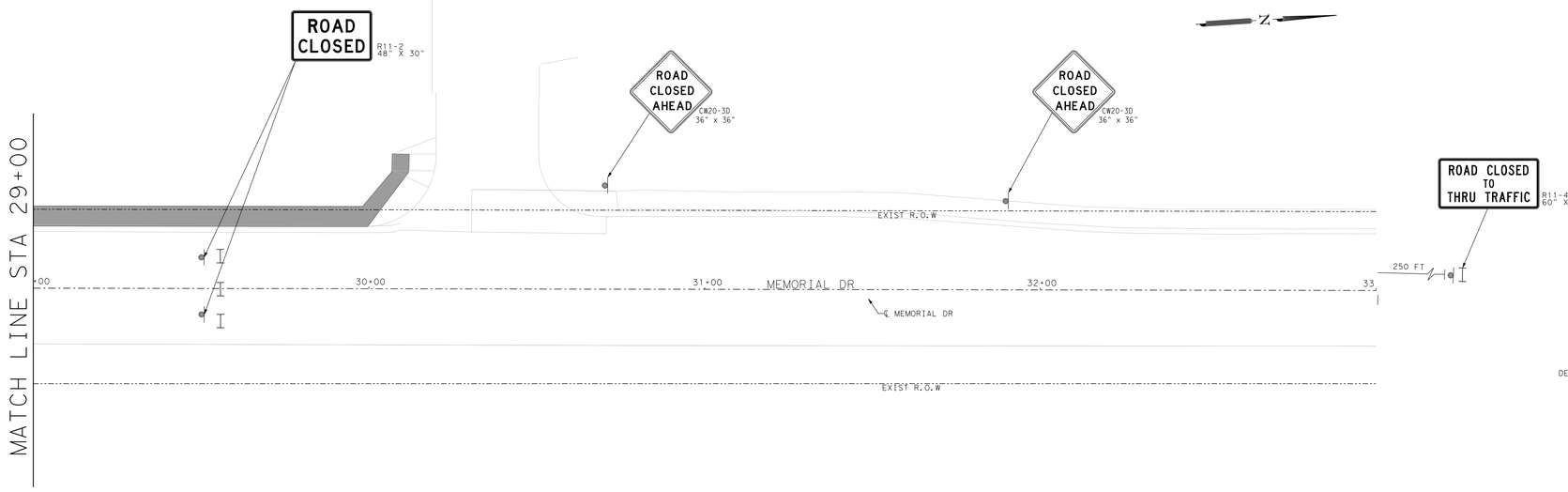
SHEET 19 OF 35

SHEET NO. 90





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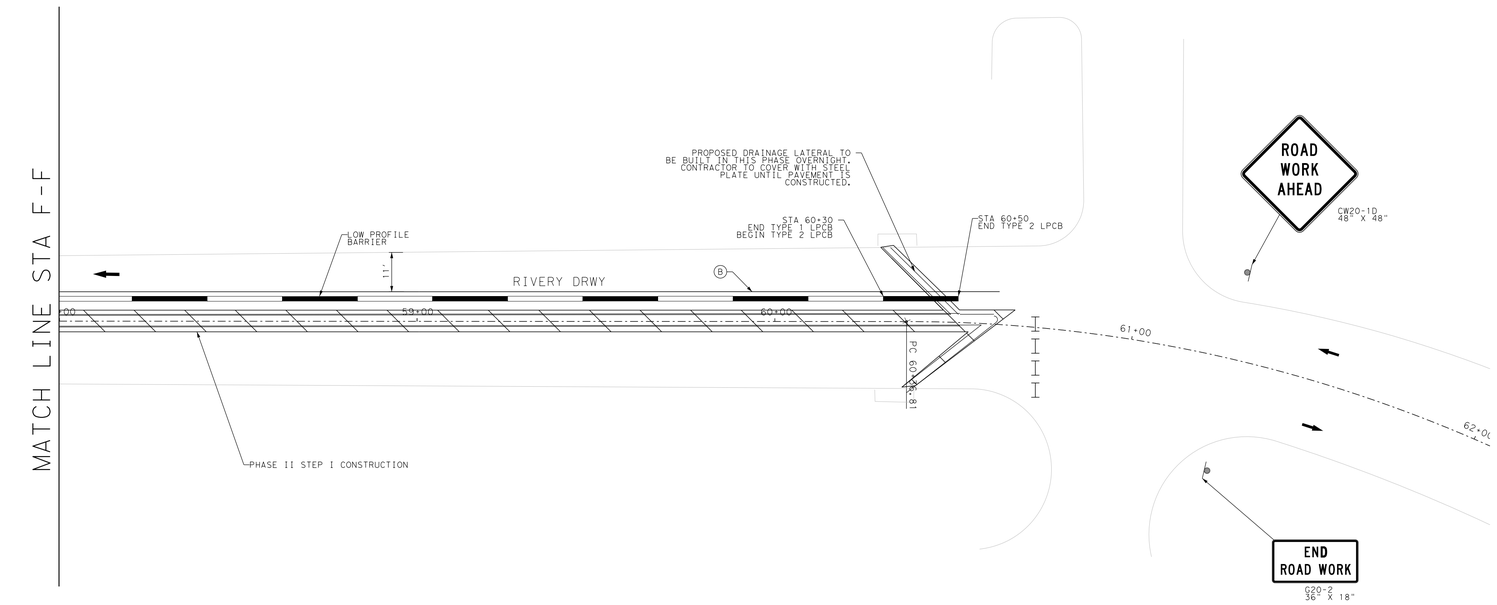

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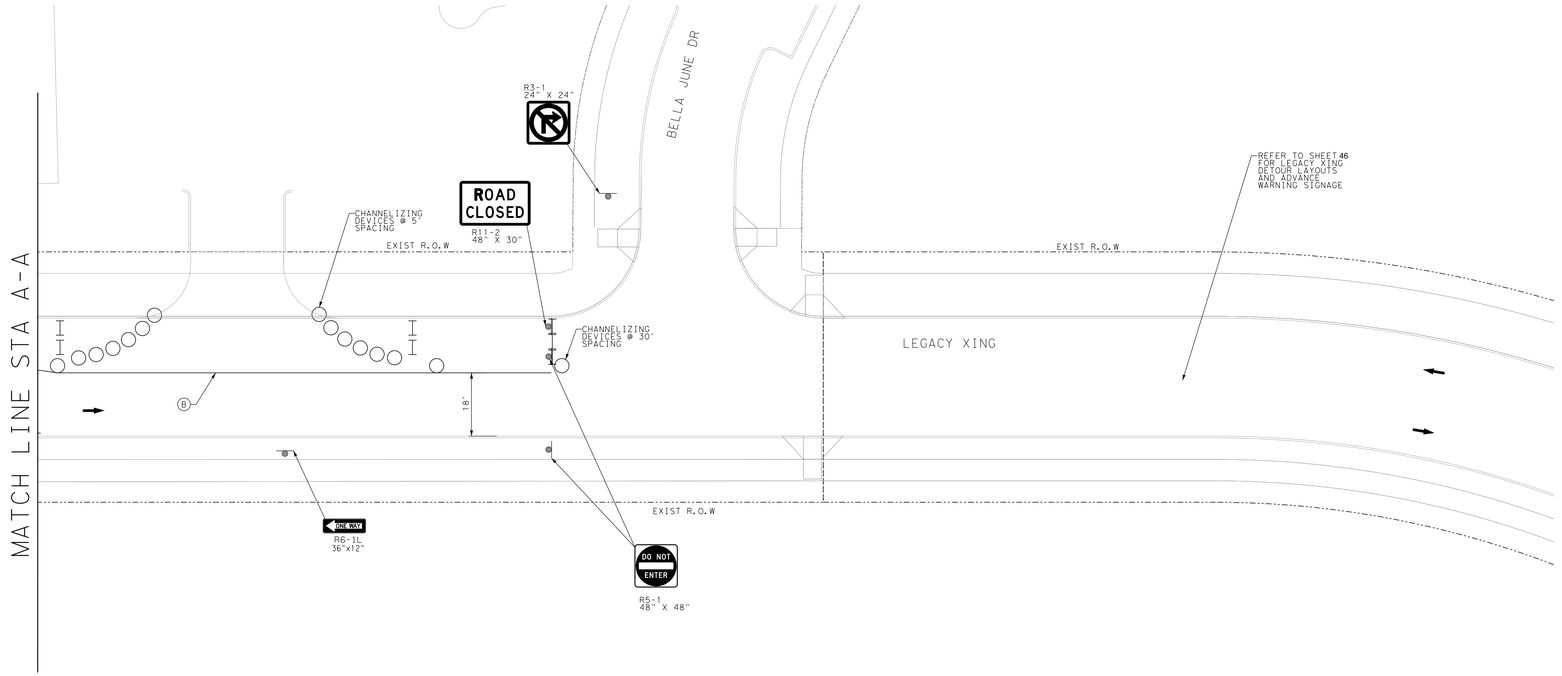



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- EXISTING ROW
- PROPOSED ROW
- EXISTING EASEMENT
- FENCE
- CHANNELIZING DEVICES
- TYPE III BARRICADE
- SIGN
- TRAFFIC FLOW ARROWS

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SCALE: 1"= 20'

0' 20' 40' 60'

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DESIGN

STATE OF TEXAS
BRET CHAPMAN
127293
LICENSED
PROFESSIONAL ENGINEER

BRET CHAPMAN, P.E. — 9/16/2025 DATE

APPROVAL

STATE OF TEXAS
BRIAN A. ALLEN
123374
LICENSED
PROFESSIONAL ENGINEER

BRIAN A. ALLEN, P.E. — 9/16/2025 DATE

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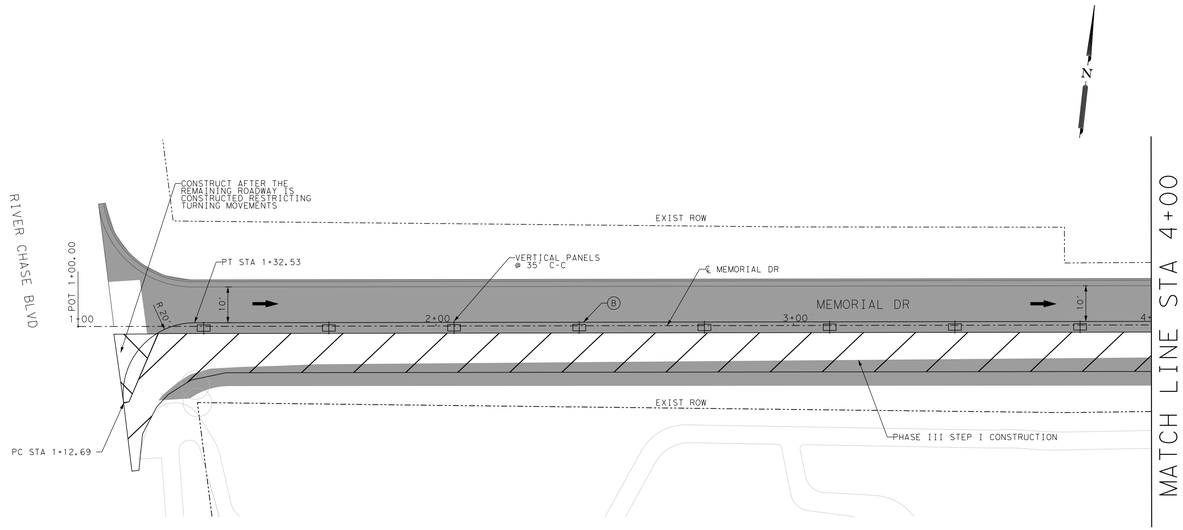
GEORGETOWN TEXAS *more than welcome*

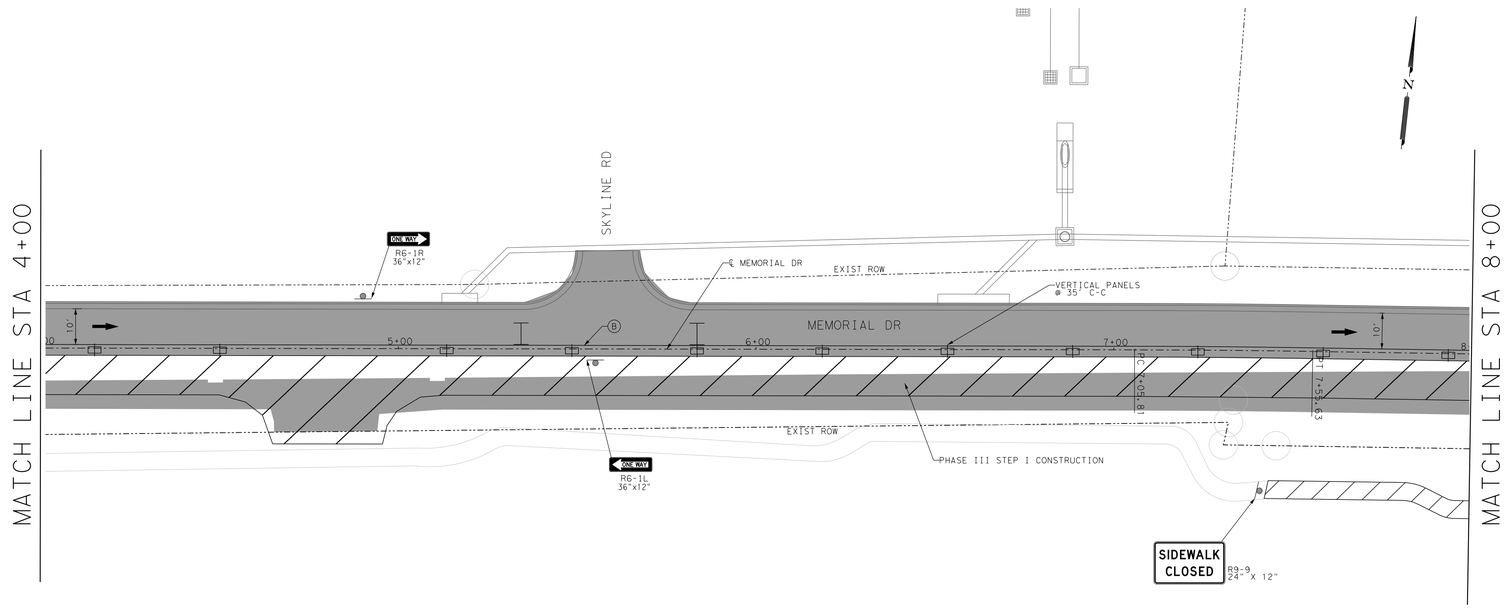
PAPE-DAWSON ENGINEERS
AUSTIN | SAN ANTONIO | HOUSTON | FORT WORTH | DALLAS
10801 N MOPAC EXPY, BLDG 3, STE 200 | AUSTIN, TX 78759 | 512.454.8711
TEXAS ENGINEERING FIRM #470 | TEXAS SURVEYING FIRM #10028800

WOLF RANCH PKWY / MEMORIAL DR

TCP PHASE II STEP I

CITY JOB No.
JOB NO. 51423-04
DATE 9/16/2025
DESIGNER
CHECKED DRAWN





LEGEND

- PHASE II WORKZONE
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TCP PHASE II STEP IB

CITY JOB No.
JOB NO. 51423-04
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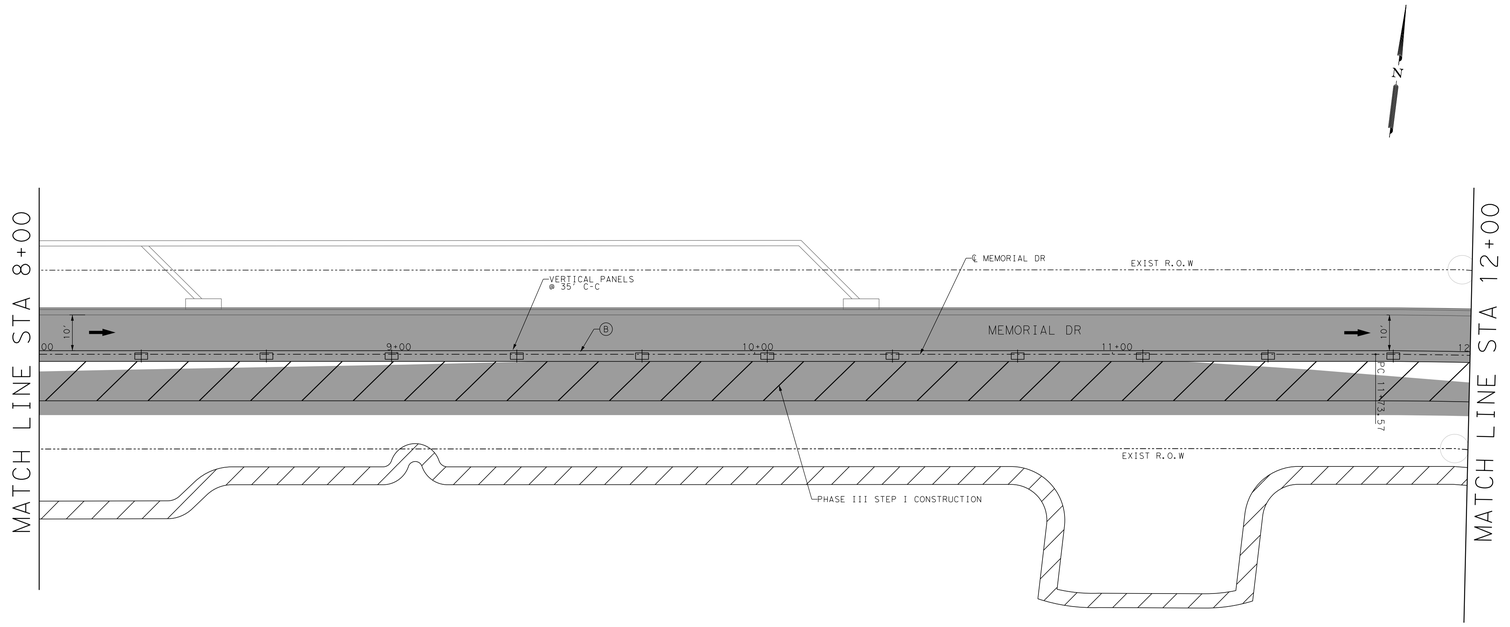
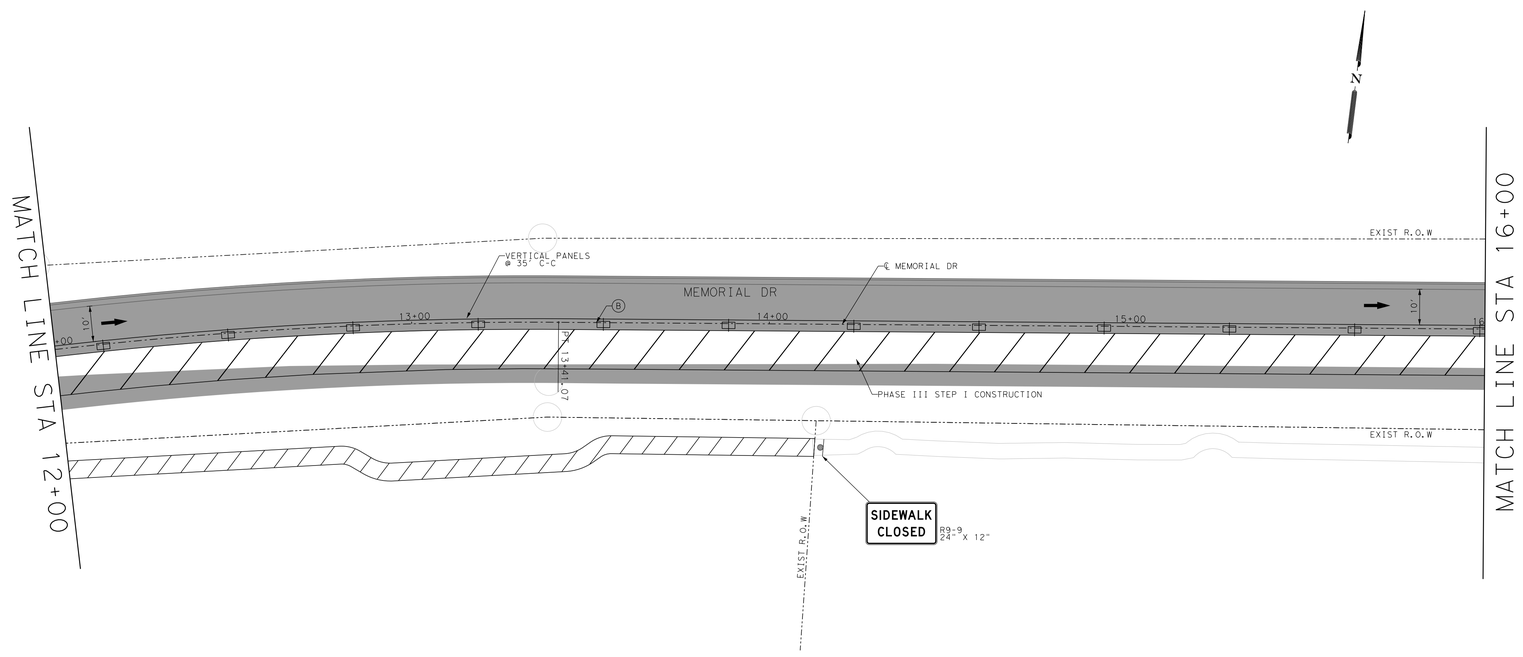
SHEET 25 OF 35

SHEET NO. 96





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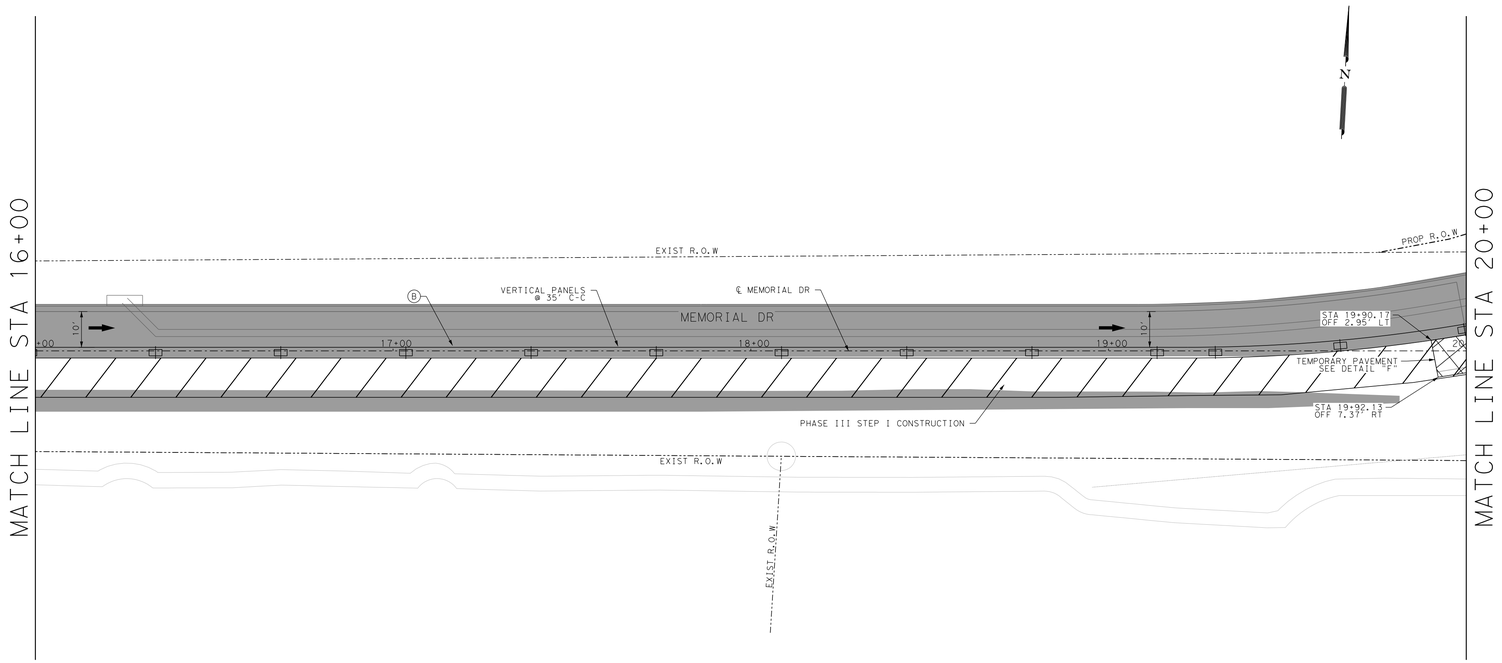

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BRET CHAPMAN, P.E. — 9/16/2025 DATE

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GEORGETOWN TEXAS
more than welcome

PAPE-DAWSON ENGINEERS
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TEXAS ENGINEERING FIRM #470 I TEXAS SURVEYING FIRM #10028800

WOLF RANCH PKWY / MEMORIAL DR
TCP PHASE II STEP IB

CITY JOB No.
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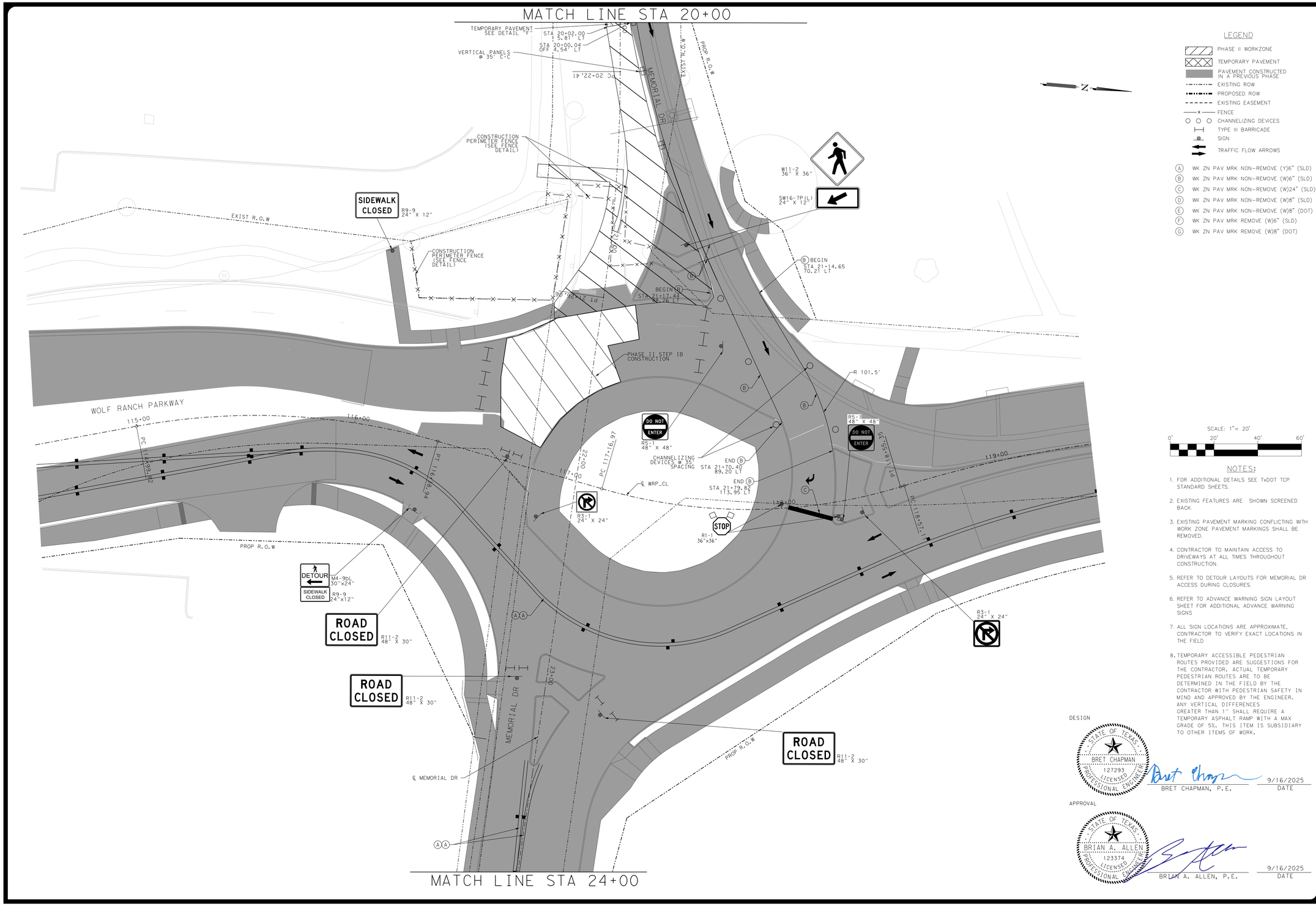

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- TEMPORARY PAVEMENT
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STATE OF TEXAS — BRET CHAPMAN — 127293 — LICENSED — PROFESSIONAL ENGINEER

BRET CHAPMAN, P.E. — 9/16/2025 DATE

APPROVAL

STATE OF TEXAS — BRIAN A. ALLEN — 123374 — LICENSED — PROFESSIONAL ENGINEER

BRIAN A. ALLEN, P.E. — 9/16/2025 DATE

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GEORGETOWN TEXAS *more than welcome*

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AUSTIN I SAN ANTONIO I HOUSTON I FORT WORTH I DALLAS
10801 N MOPAC EXPY, BLDG 3, STE 200 I AUSTIN, TX 78759 I 512.454.8711
TEXAS ENGINEERING FIRM #470 I TEXAS SURVEYING FIRM #10028800

WOLF RANCH PKWY / MEMORIAL DR
TCP PHASE II STEP IB

CITY JOB No.
JOB NO. 51423-04
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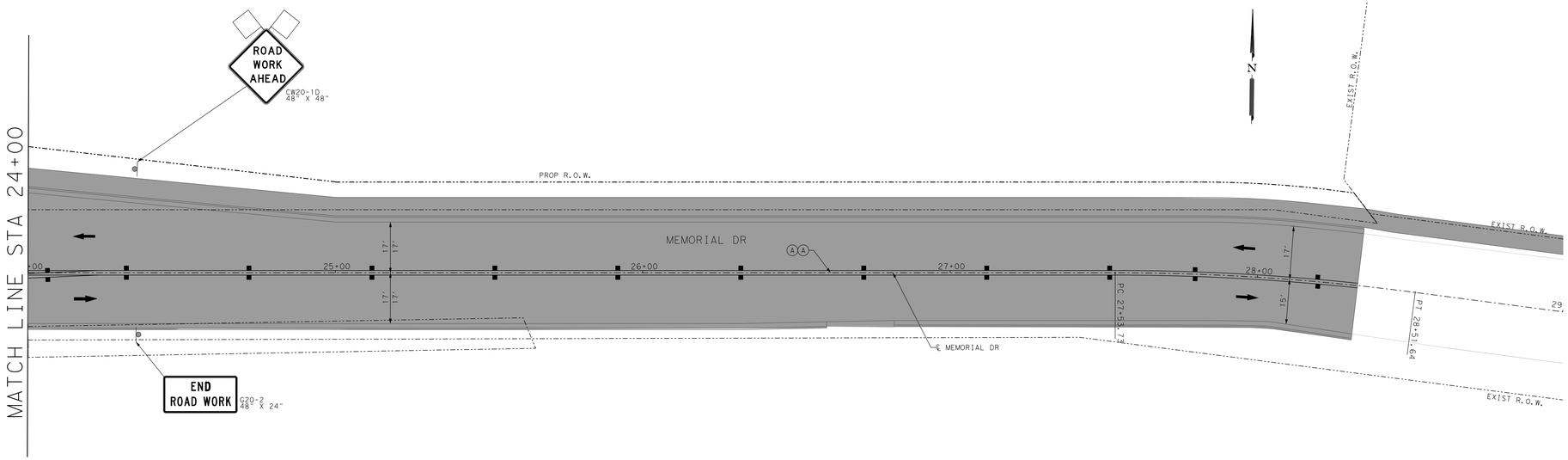
SHEET 28 OF 35

SHEET NO. 99



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WOLF RANCH PKWY / MEMORIAL DR
TCP PHASE II STEP IB

CITY JOB No.
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DETAIL A
N.T.S.

FENCE DETAIL
N.T.S.

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TCP PHASE II STEP IB

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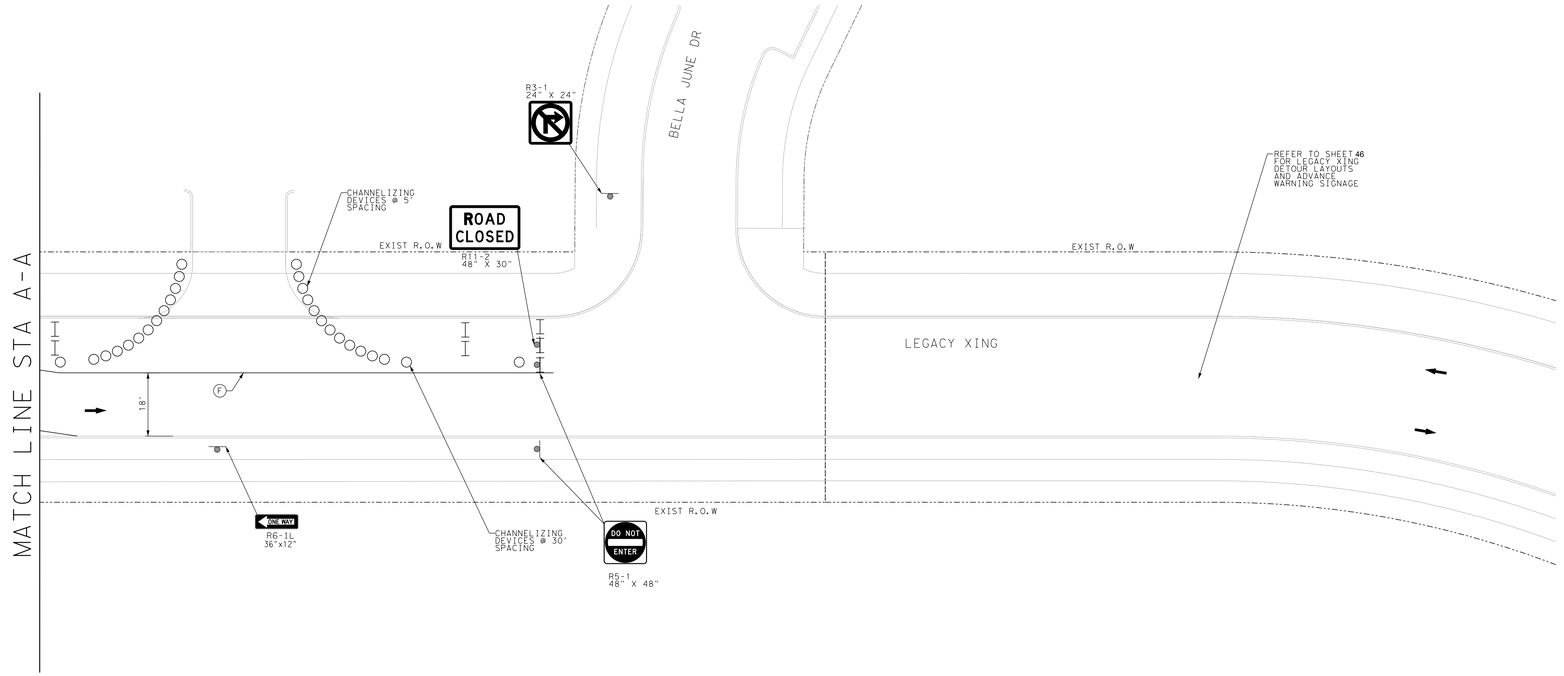
SHEET 30 OF 35

SHEET NO. 101



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STATE OF TEXAS
BRET CHAPMAN
127293
LICENSED
PROFESSIONAL ENGINEER

BRET CHAPMAN, P.E. — 9/16/2025 DATE

APPROVAL

STATE OF TEXAS
BRIAN A. ALLEN
123374
LICENSED
PROFESSIONAL ENGINEER

BRIAN A. ALLEN, P.E. — 9/16/2025 DATE

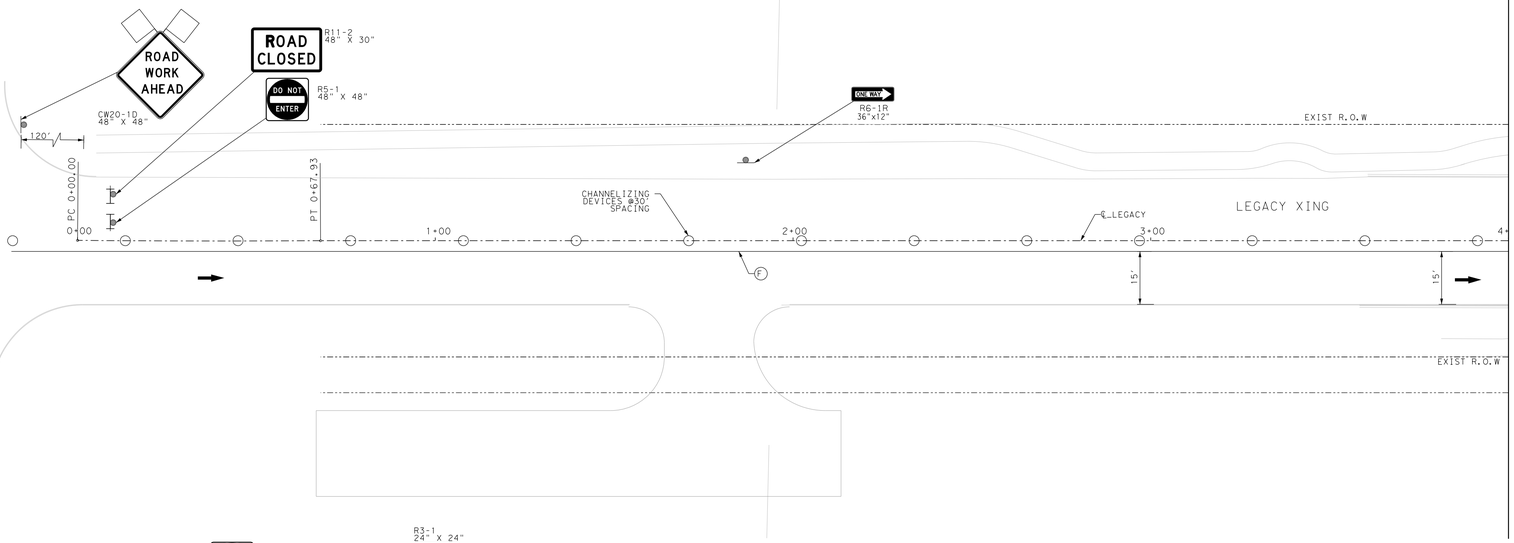
NO.	REVISION	DATE

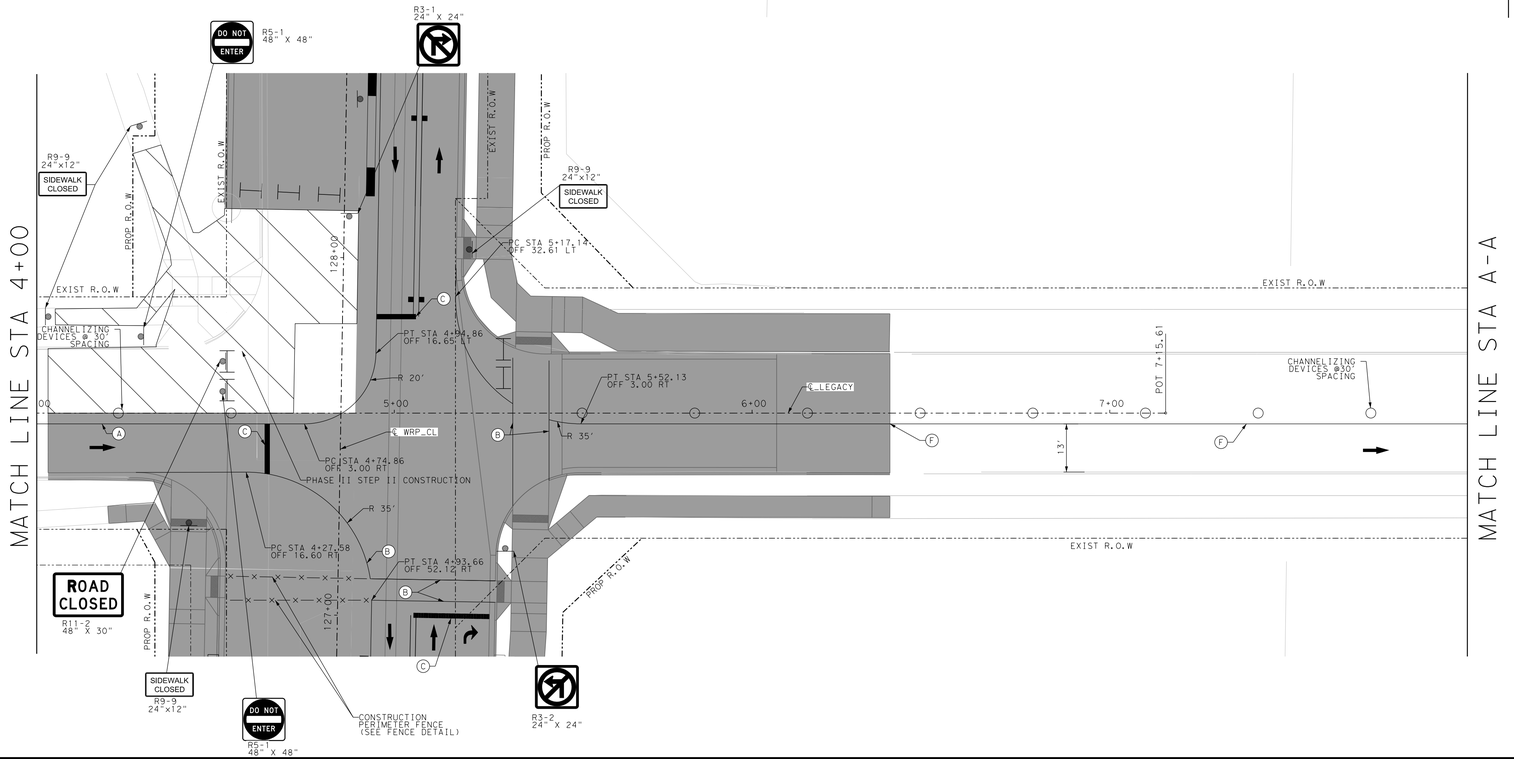
GEORGETOWN TEXAS *more than welcome*

PAPE-DAWSON ENGINEERS
AUSTIN | SAN ANTONIO | HOUSTON | FORT WORTH | DALLAS
10801 N MOPAC EXPY, BLDG 3, STE 200 | AUSTIN, TX 78759 | 512.454.8711
TEXAS ENGINEERING FIRM #470 | TEXAS SURVEYING FIRM #10028800

WOLF RANCH PKWY / MEMORIAL DR
TCP PHASE II STEP IB

CITY JOB No.
JOB NO. 51423-04
DATE 9/16/2025
DESIGNER
CHECKED DRAWN

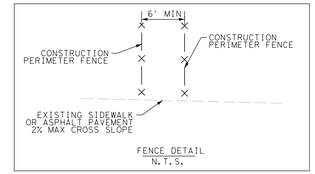




LEGEND

- PHASE II WORKZONE
- TEMPORARY PAVEMENT
- PAVEMENT CONSTRUCTED IN A PREVIOUS PHASE
- EXISTING ROW
- PROPOSED ROW
- EXISTING EASEMENT
- FENCE
- CHANNELIZING DEVICES
- TYPE III BARRICADE
- SIGN
- TRAFFIC FLOW ARROWS

(A) WK ZN PAV MRK NON-REMOVE (Y)6" (SLD)
(B) WK ZN PAV MRK NON-REMOVE (W)6" (SLD)
(C) WK ZN PAV MRK NON-REMOVE (W)24" (SLD)
(D) WK ZN PAV MRK NON-REMOVE (W)8" (SLD)
(E) WK ZN PAV MRK NON-REMOVE (W)8" (DOT)
(F) WK ZN PAV MRK REMOVE (W)6" (SLD)
(G) WK ZN PAV MRK REMOVE (W)8" (DOT)



FENCE DETAIL
N.T.S.

SCALE: 1"= 20'
0' 20' 40' 60'

NOTES:

1. FOR ADDITIONAL DETAILS SEE TxDOT TCP STANDARD SHEETS.
2. EXISTING FEATURES ARE SHOWN SCREENED BACK.
3. EXISTING PAVEMENT MARKING CONFLICTING WITH WORK ZONE PAVEMENT MARKINGS SHALL BE REMOVED.
4. CONTRACTOR TO MAINTAIN ACCESS TO DRIVEWAYS AT ALL TIMES THROUGHOUT CONSTRUCTION.
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STATE OF TEXAS · BRET CHAPMAN · 127293 · LICENSED PROFESSIONAL ENGINEER

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APPROVAL

STATE OF TEXAS · BRIAN A. ALLEN · 123374 · LICENSED PROFESSIONAL ENGINEER

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GEORGETOWN TEXAS *more than welcome*

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TEXAS ENGINEERING FIRM #470 I TEXAS SURVEYING FIRM #10028800

WOLF RANCH PKWY / MEMORIAL DR
TCP PHASE II STEP II

CITY JOB No.
JOB NO. 51423-04
DATE 9/16/2025
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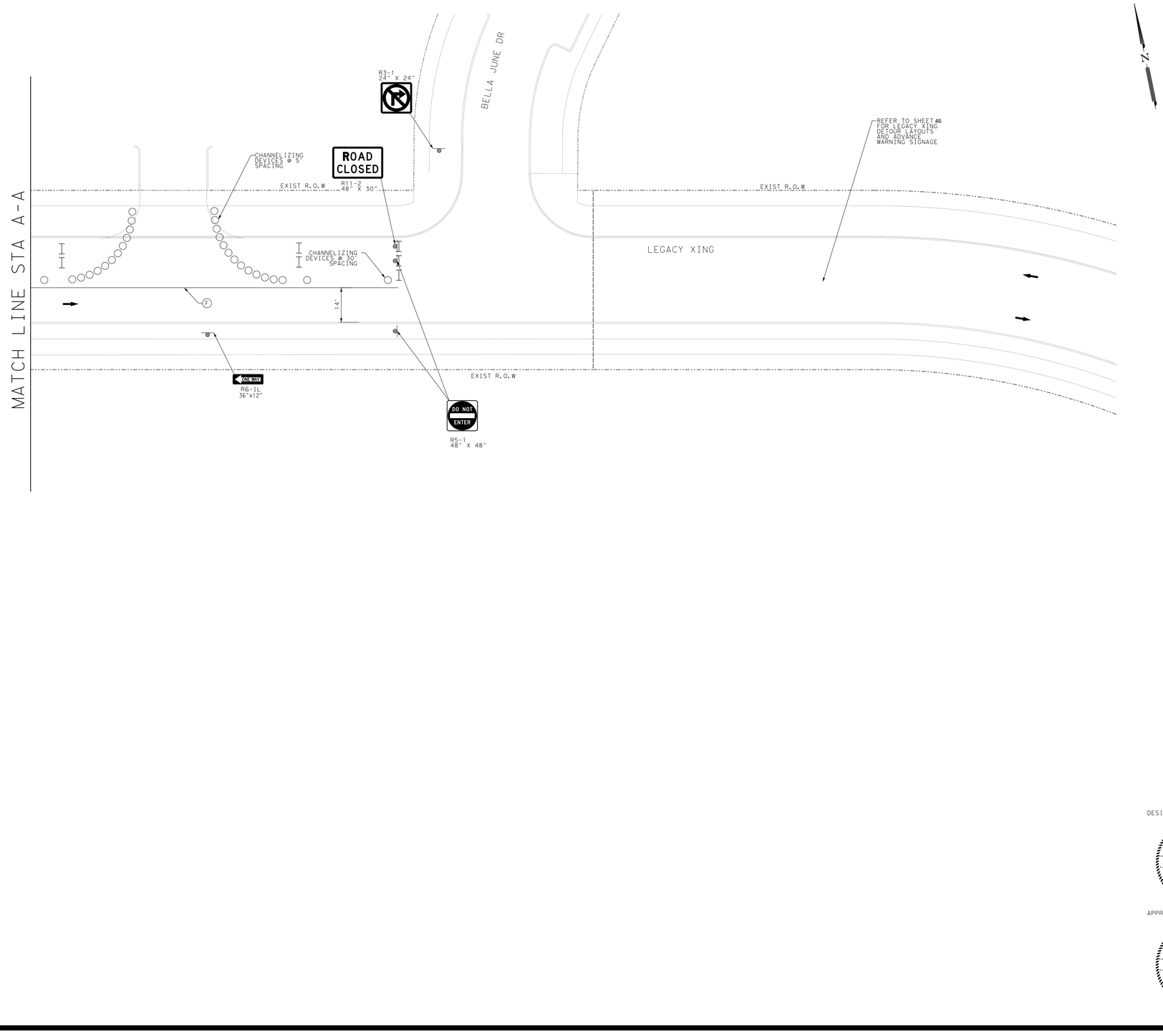
CHECKED DRAWN



LEGEND

- PHASE II WORKZONE
- TEMPORARY PAVEMENT
- PAVEMENT CONSTRUCTED IN A PREVIOUS PHASE
- EXISTING ROW
- PROPOSED ROW
- EXISTING EASEMENT
- FENCE
- CHANNELIZING DEVICES
- TYPE III BARRICADE
- SIGN
- TRAFFIC FLOW ARROWS

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(D) WK ZN PAV MRK NON-REMOVE (W)8" (SLD)
(E) WK ZN PAV MRK NON-REMOVE (W)8" (DOT)
(F) WK ZN PAV MRK REMOVE (W)6" (SLD)
(G) WK ZN PAV MRK REMOVE (W)8" (DOT)

SCALE: 1"= 20'
0' 20' 40' 60'

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WOLF RANCH PKWY / MEMORIAL DR

TCP PHASE II STEP II

CITY JOB No.
JOB NO. 51423-04
DATE 9/16/2025
DESIGNER
CHECKED DRAWN

LEGEND

- PHASE II WORKZONE
- TEMPORARY PAVEMENT
- PAVEMENT CONSTRUCTED IN A PREVIOUS PHASE
- EXISTING ROW
- PROPOSED ROW
- EXISTING EASEMENT
- FENCE
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- TYPE III BARRICADE
- SIGN
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(D) WK ZN PAV MRK NON-REMOVE (W)8" (SLD)
(E) WK ZN PAV MRK NON-REMOVE (W)8" (DOT)
(F) WK ZN PAV MRK REMOVE (W)6" (SLD)
(G) WK ZN PAV MRK REMOVE (W)8" (DOT)

FENCE DETAIL
N.T.S.

SCALE: 1"= 20'
0' 20' 40' 60'

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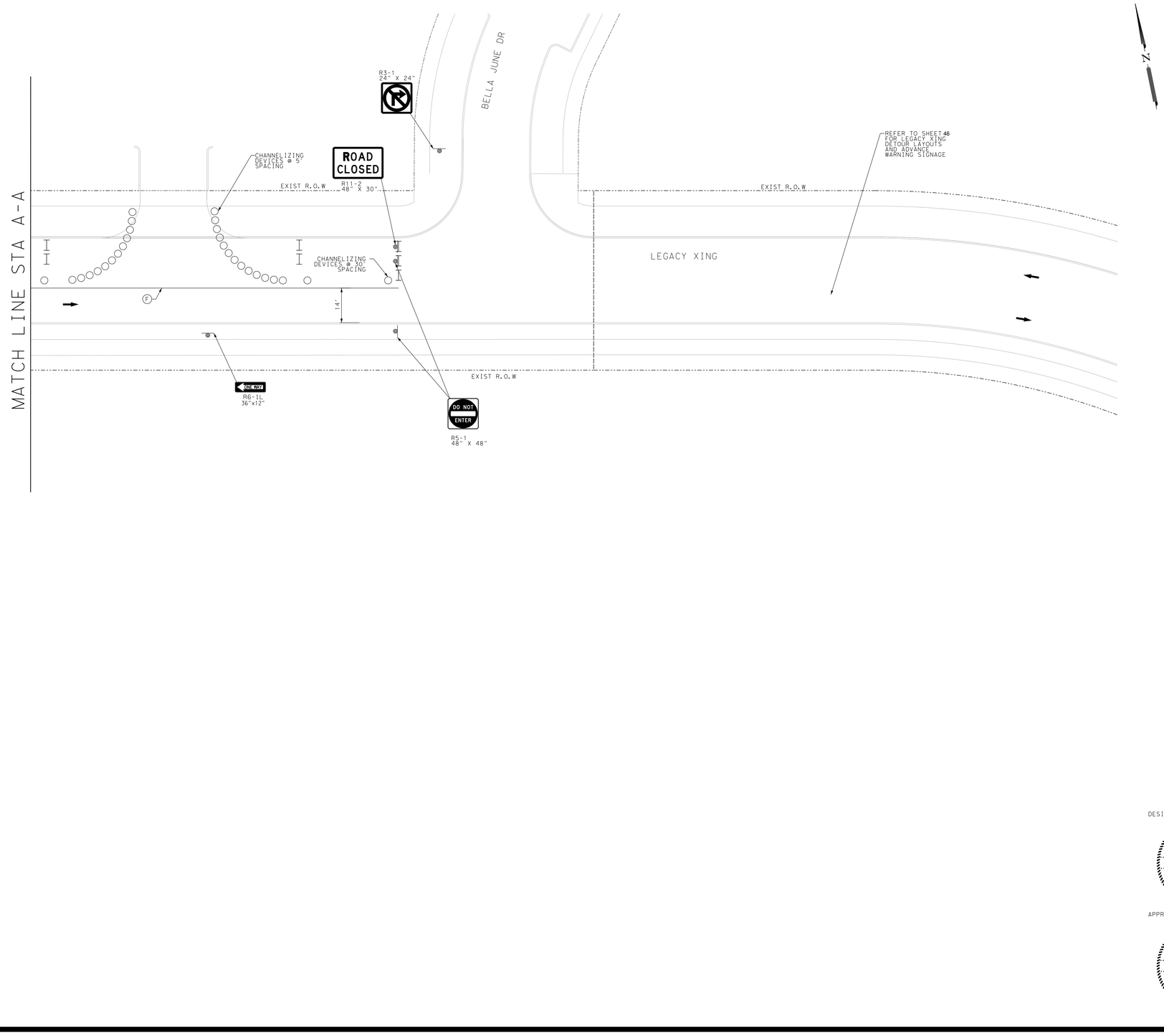
TEXAS ENGINEERING FIRM #470 I TEXAS SURVEYING FIRM #10028800

WOLF RANCH PKWY / MEMORIAL DR

TCP PHASE II STEP IIB

CITY JOB No.
JOB NO. 51423-04
DATE 9/16/2025
DESIGNER
CHECKED DRAWN



LEGEND

- PHASE II WORKZONE
- TEMPORARY PAVEMENT
- PAVEMENT CONSTRUCTED IN A PREVIOUS PHASE
- EXISTING ROW
- PROPOSED ROW
- EXISTING EASEMENT
- FENCE
- CHANNELIZING DEVICES
- TYPE III BARRICADE
- SIGN
- TRAFFIC FLOW ARROWS

(A) WK ZN PAV MRK NON-REMOVE (Y)6" (SLD)
(B) WK ZN PAV MRK NON-REMOVE (W)6" (SLD)
(C) WK ZN PAV MRK NON-REMOVE (W)24" (SLD)
(D) WK ZN PAV MRK NON-REMOVE (W)8" (SLD)
(E) WK ZN PAV MRK NON-REMOVE (W)8" (DOT)
(F) WK ZN PAV MRK REMOVE (W)6" (SLD)
(G) WK ZN PAV MRK REMOVE (W)8" (DOT)

SCALE: 1"= 20'

0' 20' 40' 60'

NOTES:

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GEORGETOWN TEXAS *more than welcome*

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AUSTIN I SAN ANTONIO I HOUSTON I FORT WORTH I DALLAS
10801 N MOPAC EXPY, BLDG 3, STE 200 I AUSTIN, TX 78759 I 512.454.8711
TEXAS ENGINEERING FIRM #470 I TEXAS SURVEYING FIRM #10028800

WOLF RANCH PKWY / MEMORIAL DR

TCP PHASE II STEP IIB

CITY JOB No.
JOB NO. 51423-04
DATE 9/16/2025
DESIGNER
CHECKED DRAWN

SHEET 35 OF 35

SHEET NO. 106

N

LEGEND

- PHASE III STEP I MILL PAVEMENT
- PHASE III STEP I WORKZONE
- PAVEMENT CONSTRUCTED IN A PREVIOUS PHASE
- EXISTING ROW
- PROPOSED ROW
- EXISTING EASEMENT
- FENCE
- CHANNELING DEVICES
- VERTICAL PANELS
- SIGN
- TRAFFIC FLOW ARROWS

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(D) WK ZN PAV MRK NON-REMOVE (W)8" (SLD)
(E) WK ZN PAV MRK NON-REMOVE (W)8" (BRK)
(F) WK ZN PAV MRK NON-REMOVE (W)8" (DOT)
(G) WK ZN PAV MRK NON-REMOVE REFL TY II-C-R
(H) WK ZN PAV MRK NON-REMOVE (W) (ARROW)
(I) WK ZN PAV MRK NON-REMOVE (W) (WORD)
(J) WK ZN PAV MRK NON-REMOVE (Y) 12" (SLD)
(K) WK ZN PAV MRK NON-REMOVE (W) (YLD TRI)
(L) WK ZN PAV MRK REMOVE (W)6" (SLD)
(M) WK ZN PAV MRK REMOVE (W)8" (DOT)
(N) WK ZN PAV MRK REMOVE (W)24" (SLD)

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0' 20' 40' 60'

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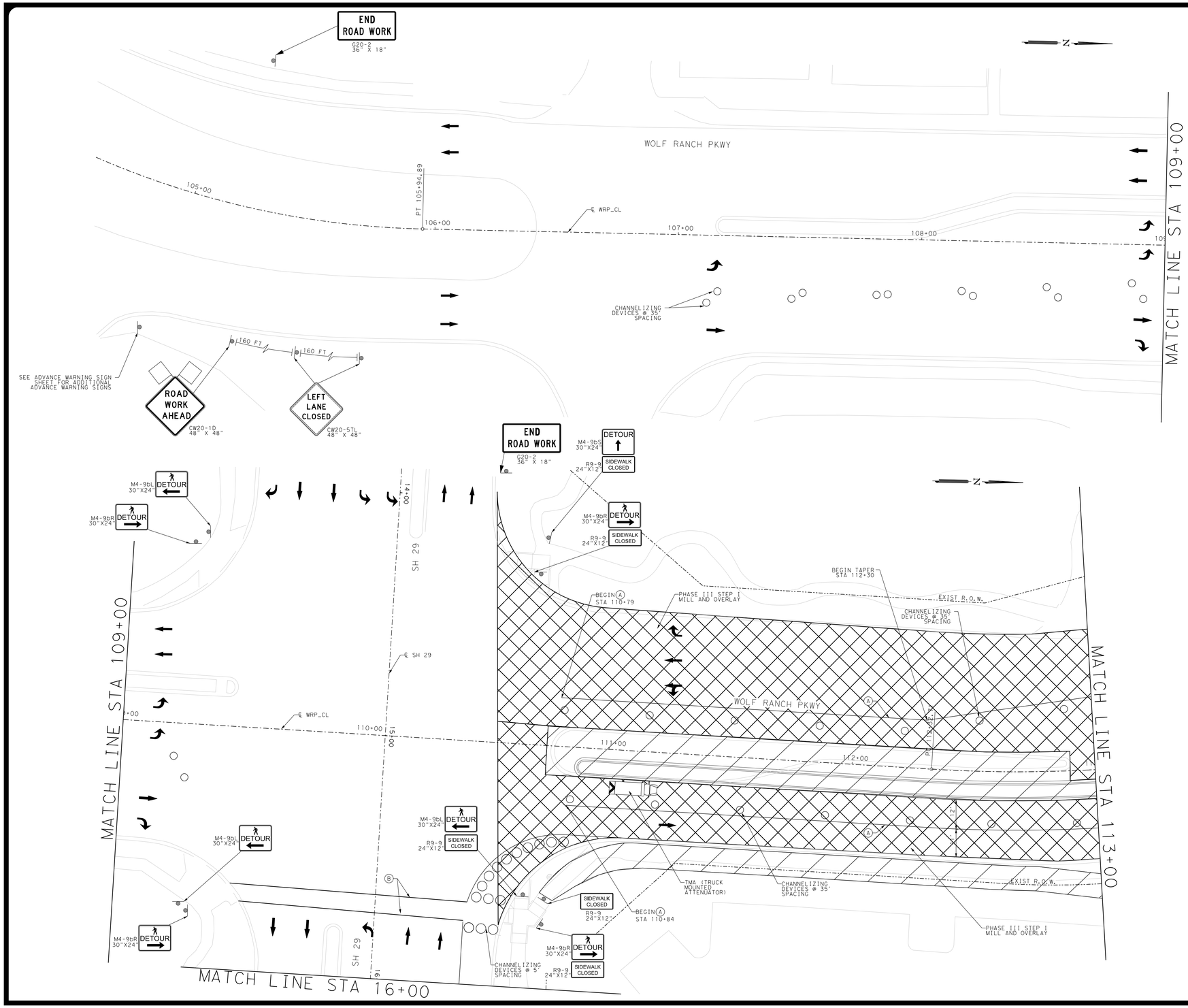
WOLF RANCH PKWY / MEMORIAL DR

TCP PHASE III STEP I

CITY JOB No.
JOB NO. 51423-04
DATE 9/16/2025
DESIGNER
CHECKED DRAWN

SHEET 1 OF 18

SHEET NO. 107



LEGEND

- PHASE III STEP I MILL PAVEMENT
- PHASE III STEP I WORKZONE
- PAVEMENT CONSTRUCTED IN A PREVIOUS PHASE
- EXISTING ROW
- PROPOSED ROW
- EXISTING EASEMENT
- FENCE
- CHANNELING DEVICES
- VERTICAL PANELS
- SIGN
- TRAFFIC FLOW ARROWS

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- Ⓑ WK ZN PAV MRK NON-REMOVE (W)6" (SLD)
- Ⓒ WK ZN PAV MRK NON-REMOVE (W)24" (SLD)
- Ⓓ WK ZN PAV MRK NON-REMOVE (W)8" (SLD)
- Ⓔ WK ZN PAV MRK NON-REMOVE (W)8" (BRK)
- Ⓕ WK ZN PAV MRK NON-REMOVE (W)8" (DOT)
- Ⓖ WK ZN PAV MRK NON-REMOVE REFL TY II-C-R
- Ⓗ WK ZN PAV MRK NON-REMOVE (W) (ARROW)
- Ⓘ WK ZN PAV MRK NON-REMOVE (W) (WORD)
- Ⓙ WK ZN PAV MRK NON-REMOVE (Y) 12" (SLD)
- Ⓚ WK ZN PAV MRK NON-REMOVE (W) (YLD TRI)
- Ⓛ WK ZN PAV MRK REMOVE (W)6" (SLD)
- Ⓜ WK ZN PAV MRK REMOVE (W)8" (DOT)
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WOLF RANCH PKWY / MEMORIAL DR
TCP PHASE III STEP I

CITY JOB No.
JOB NO. 51423-04
DATE 9/16/2025
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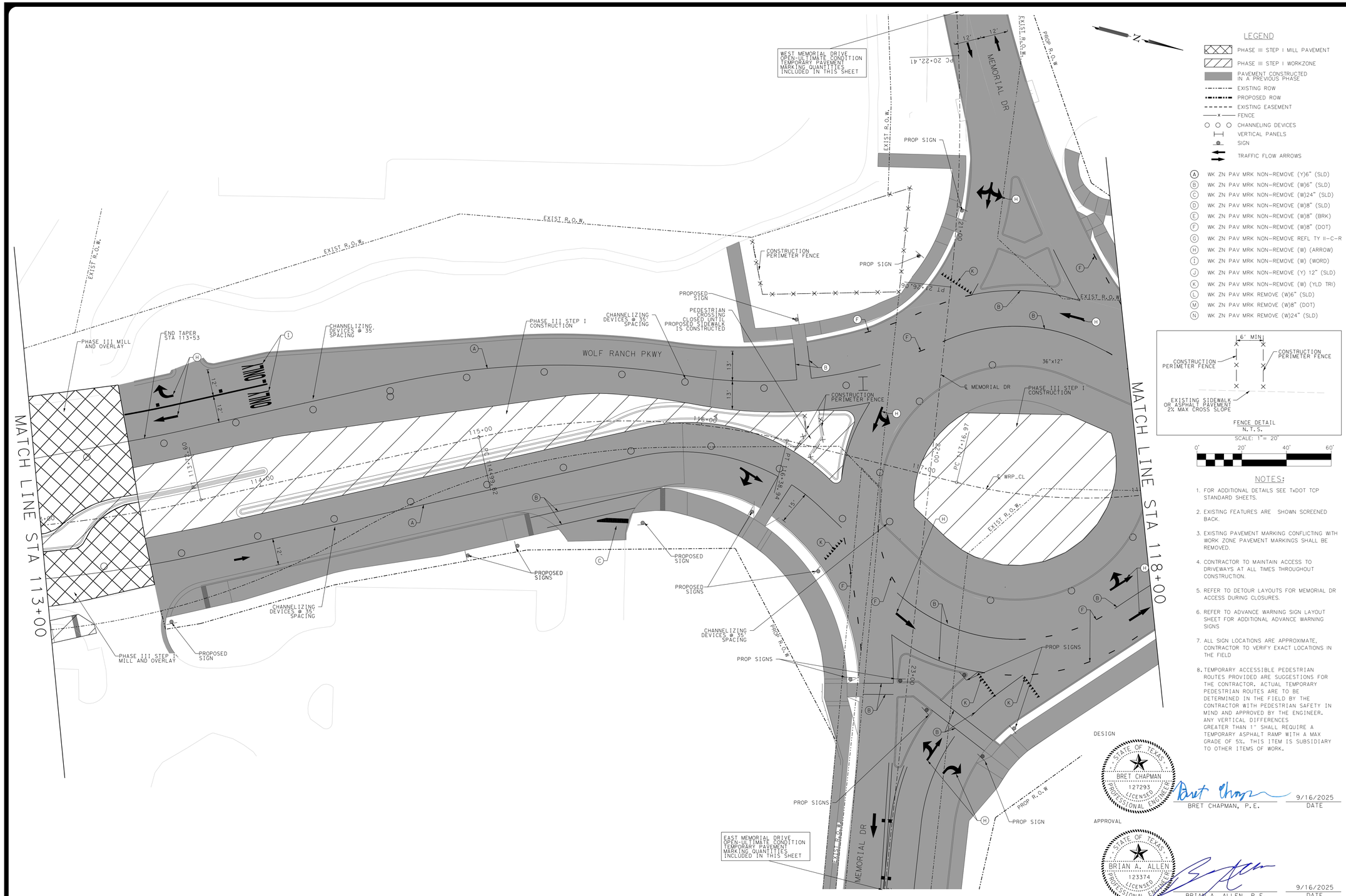
SHEET 2 OF 18

SHEET NO. 108



LEGEND

- PHASE III STEP I MILL PAVEMENT
- PHASE III STEP I WORKZONE
- PAVEMENT CONSTRUCTED IN A PREVIOUS PHASE
- EXISTING ROW
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FENCE DETAIL
N.T.S.

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BRET CHAPMAN
127293
LICENSED
PROFESSIONAL ENGINEER

BRET CHAPMAN, P.E. — 9/16/2025 DATE

APPROVAL

STATE OF TEXAS
BRIAN A. ALLEN
123374
LICENSED
PROFESSIONAL ENGINEER

BRIAN A. ALLEN, P.E. — 9/16/2025 DATE

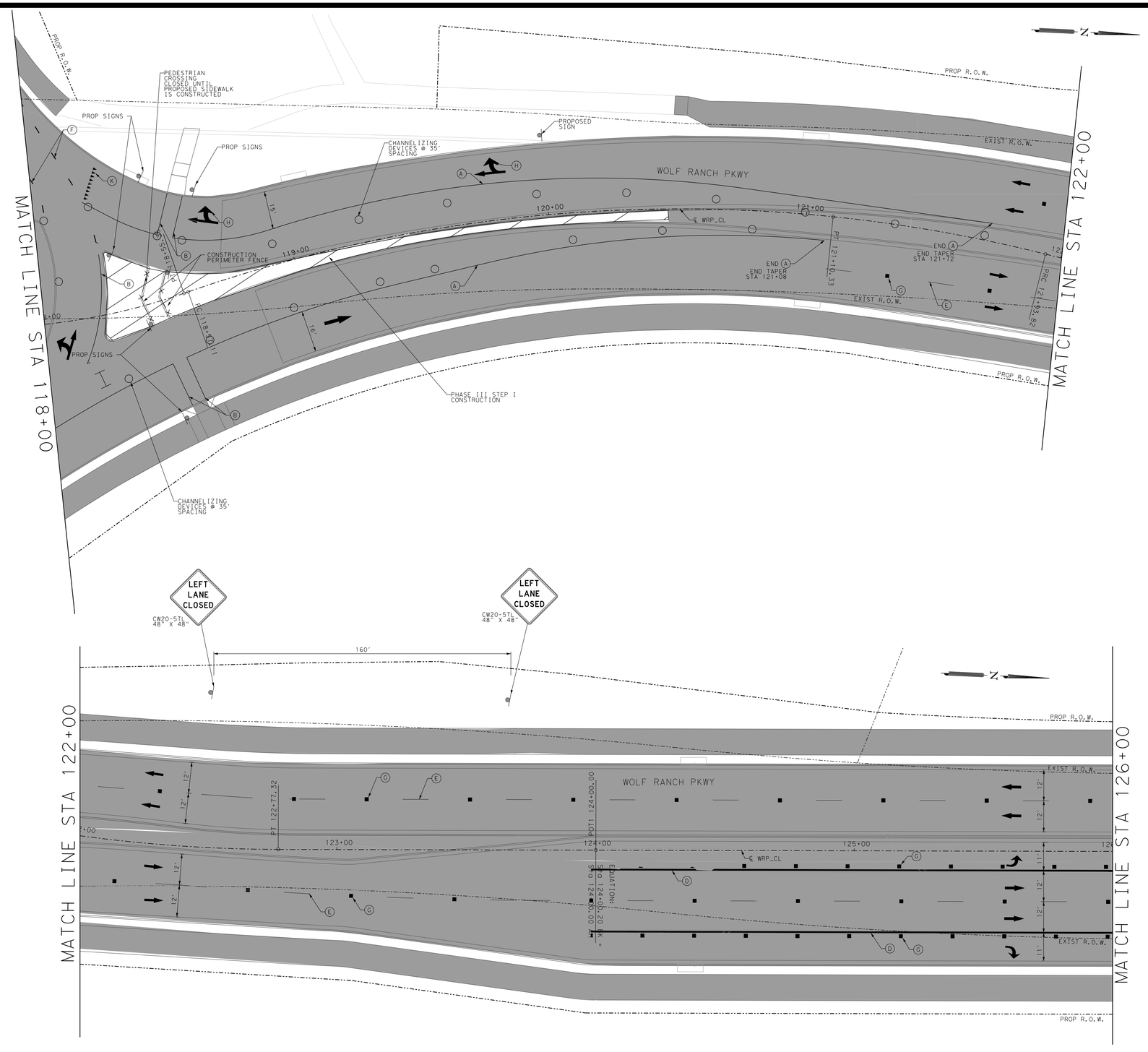
NO.	REVISION	DATE

GEORGETOWN TEXAS
more than welcome

PAPE-DAWSON ENGINEERS
AUSTIN I SAN ANTONIO I HOUSTON I FORT WORTH I DALLAS
10801 N MOPAC EXPY, BLDG 3, STE 200 I AUSTIN, TX 78759 I 512.454.8711
TEXAS ENGINEERING FIRM #470 I TEXAS SURVEYING FIRM #10028800

WOLF RANCH PKWY / MEMORIAL DR
TCP PHASE III STEP I

CITY JOB No.
JOB NO. 51423-04
DATE 9/16/2025
DESIGNER
CHECKED DRAWN
SHEET 3 OF 18
SHEET NO. 109



LEGEND

- PHASE III STEP I MILL PAVEMENT
- PHASE III STEP I WORKZONE
- PAVEMENT CONSTRUCTED IN A PREVIOUS PHASE
- EXISTING ROW
- PROPOSED ROW
- EXISTING EASEMENT
- FENCE
- CHANNELING DEVICES
- VERTICAL PANELS
- SIGN
- TRAFFIC FLOW ARROWS

- (A) WK ZN PAV MRK NON-REMOVE (Y)6" (SLD)
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- (K) WK ZN PAV MRK NON-REMOVE (W) (YLD TRI)
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SCALE: 1"= 20'

0' 20' 40' 60'

NOTES:

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2. EXISTING FEATURES ARE SHOWN SCREENED BACK.
3. EXISTING PAVEMENT MARKING CONFLICTING WITH WORK ZONE PAVEMENT MARKINGS SHALL BE REMOVED.
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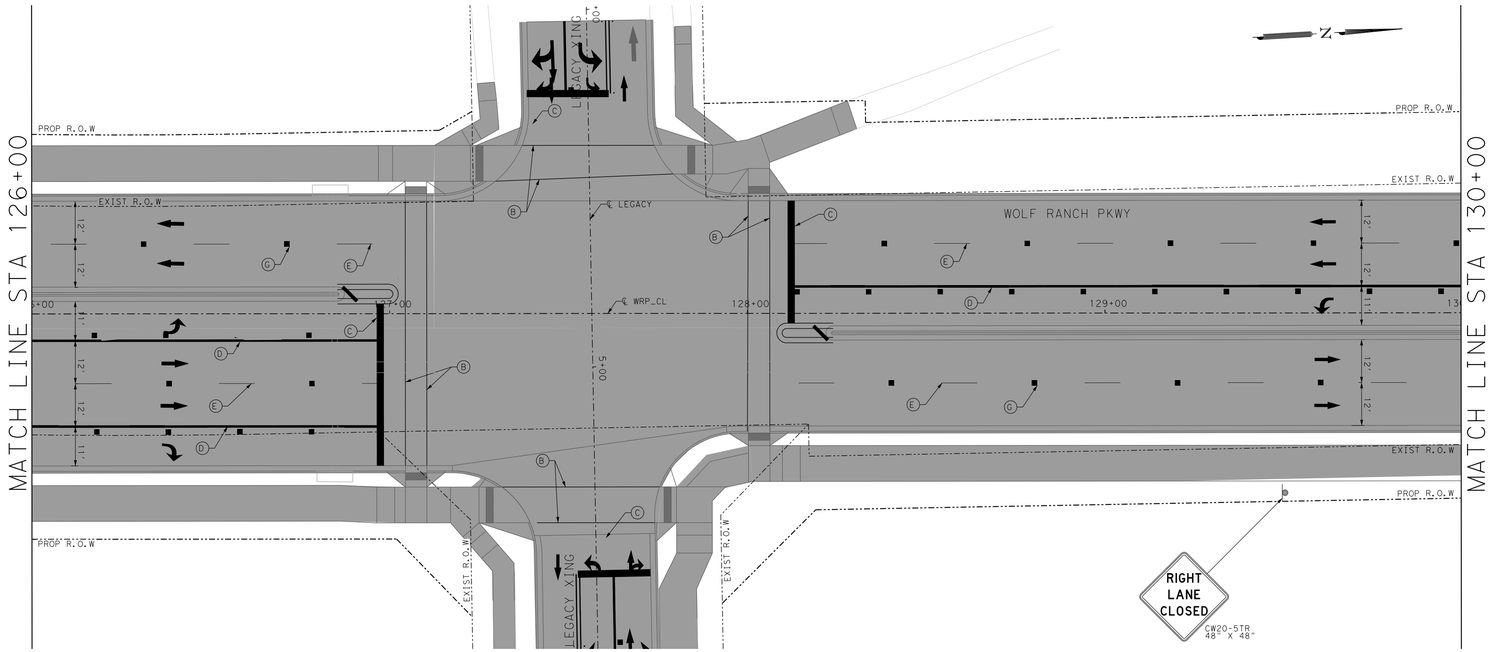

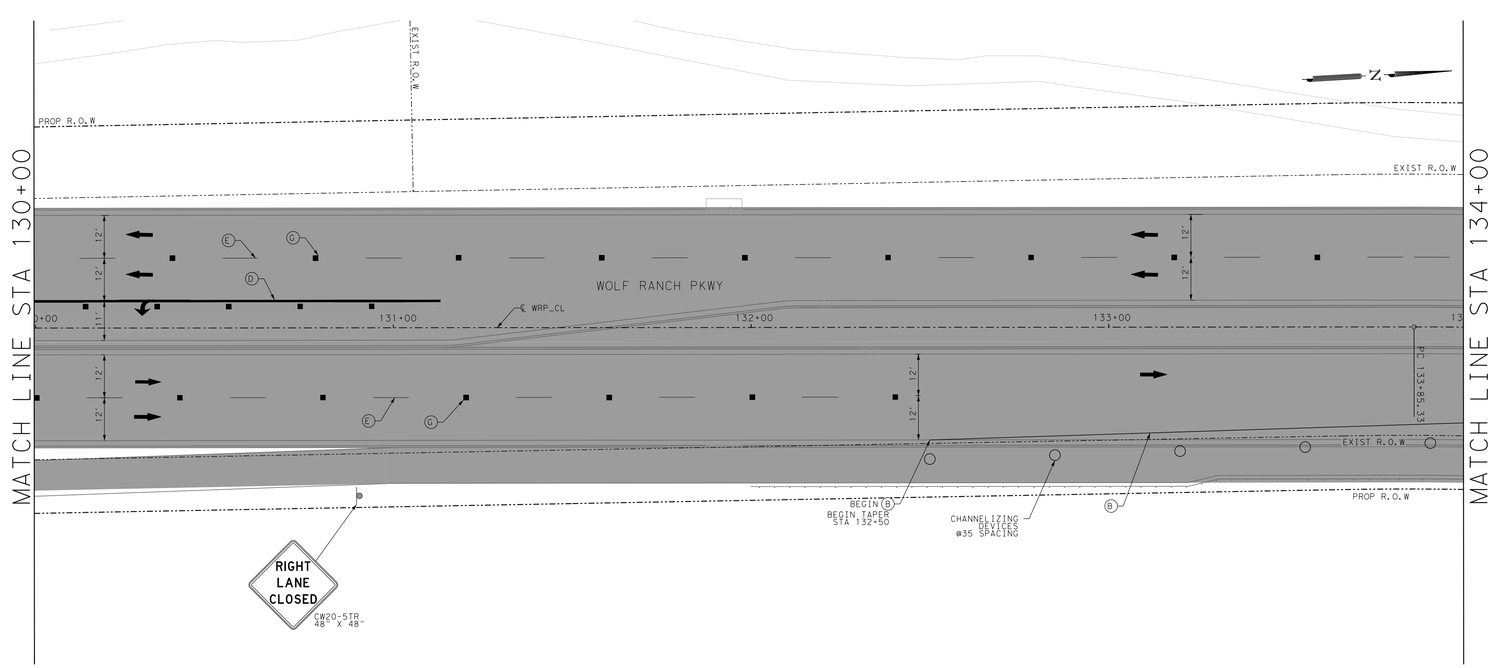

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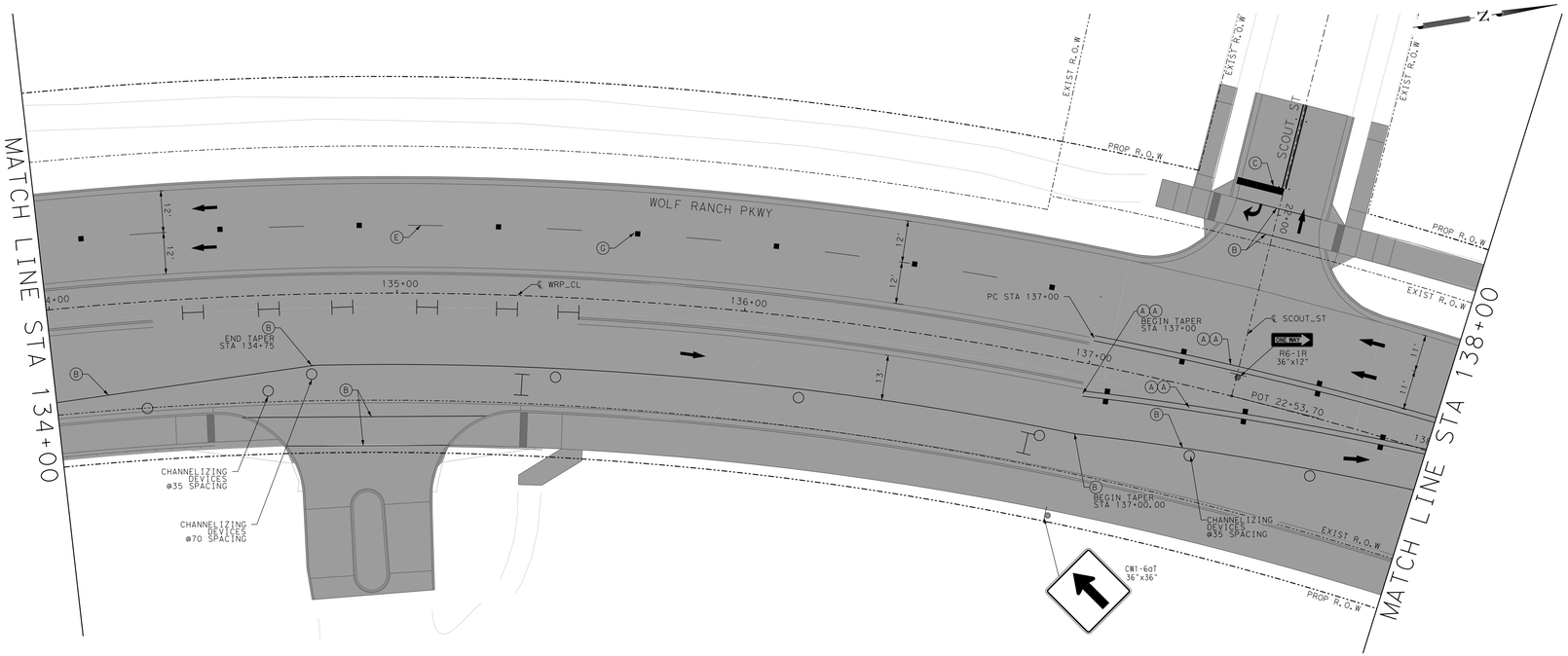
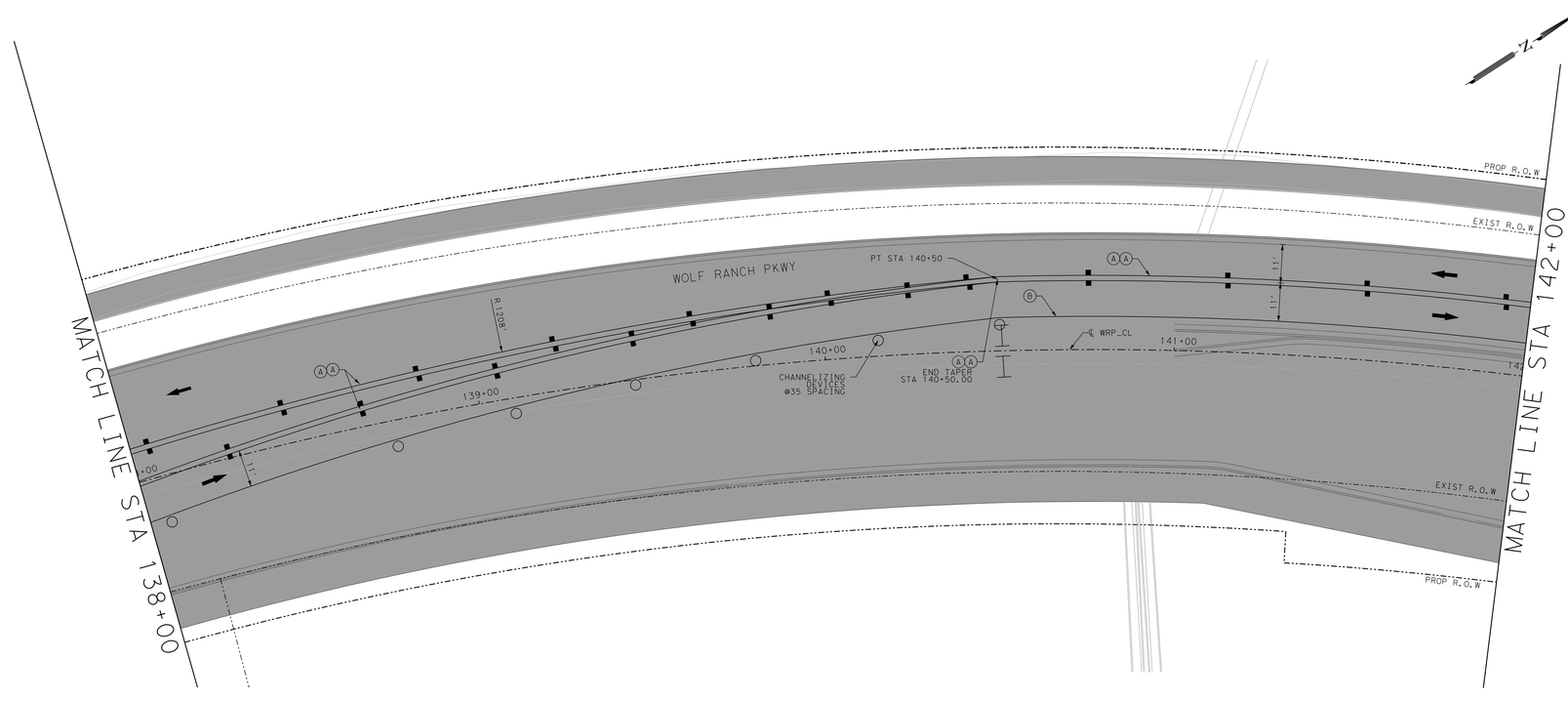
SHEET 5 OF 18

SHEET NO. 111





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TCP PHASE III STEP I

CITY JOB No.
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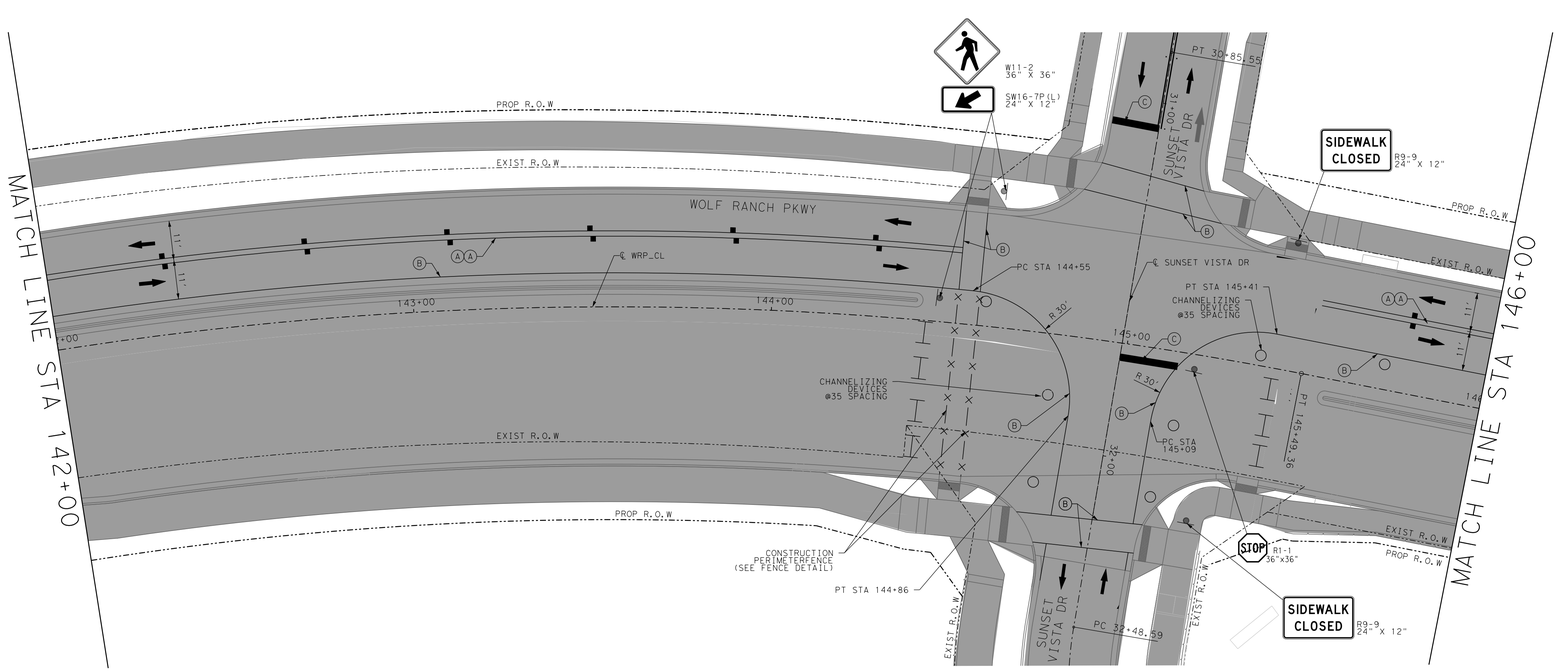
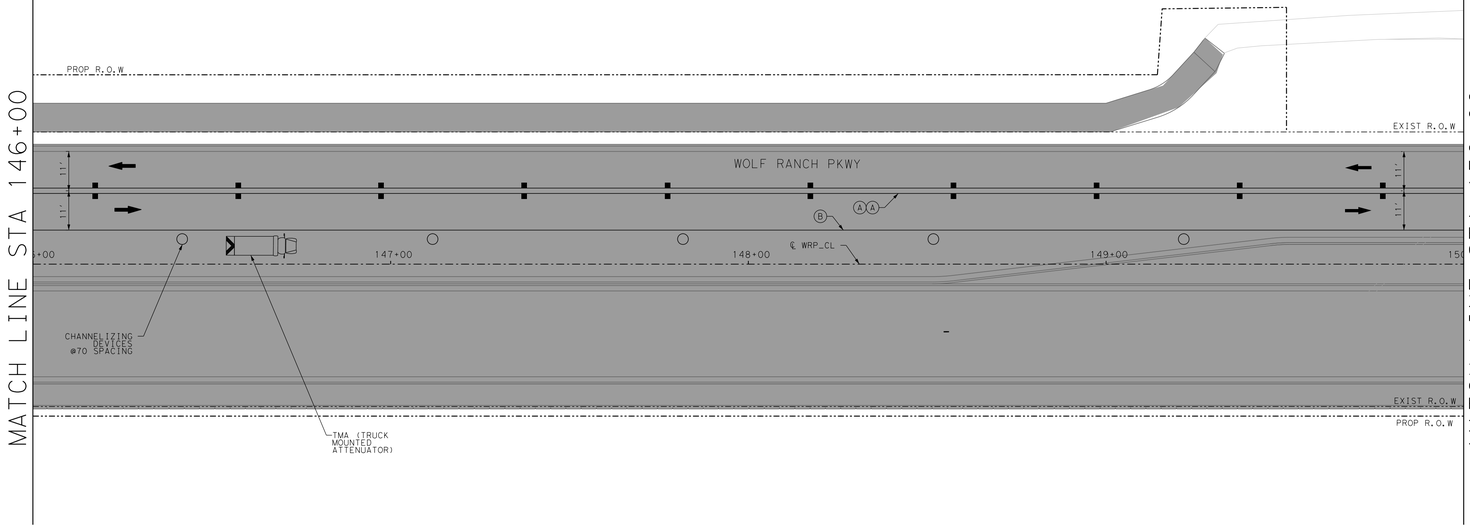
SHEET 6 OF 18

SHEET NO. 112





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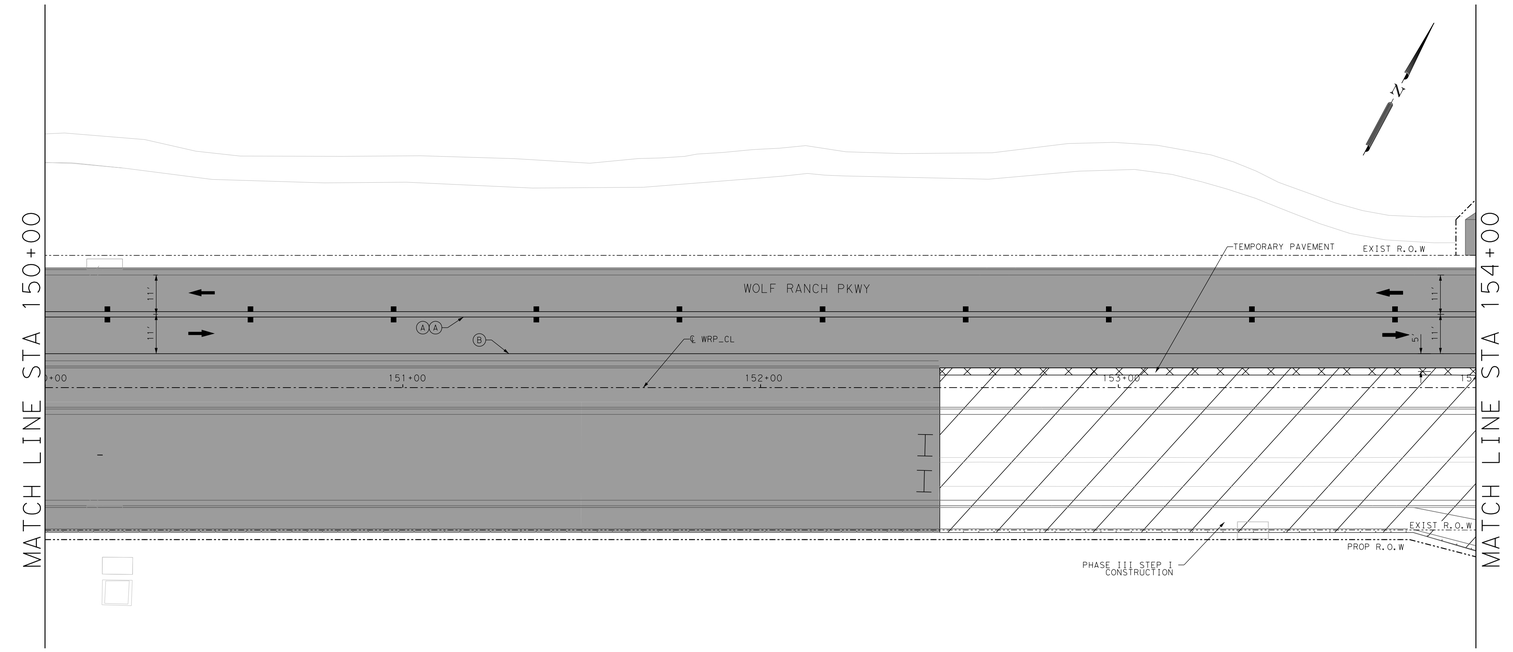

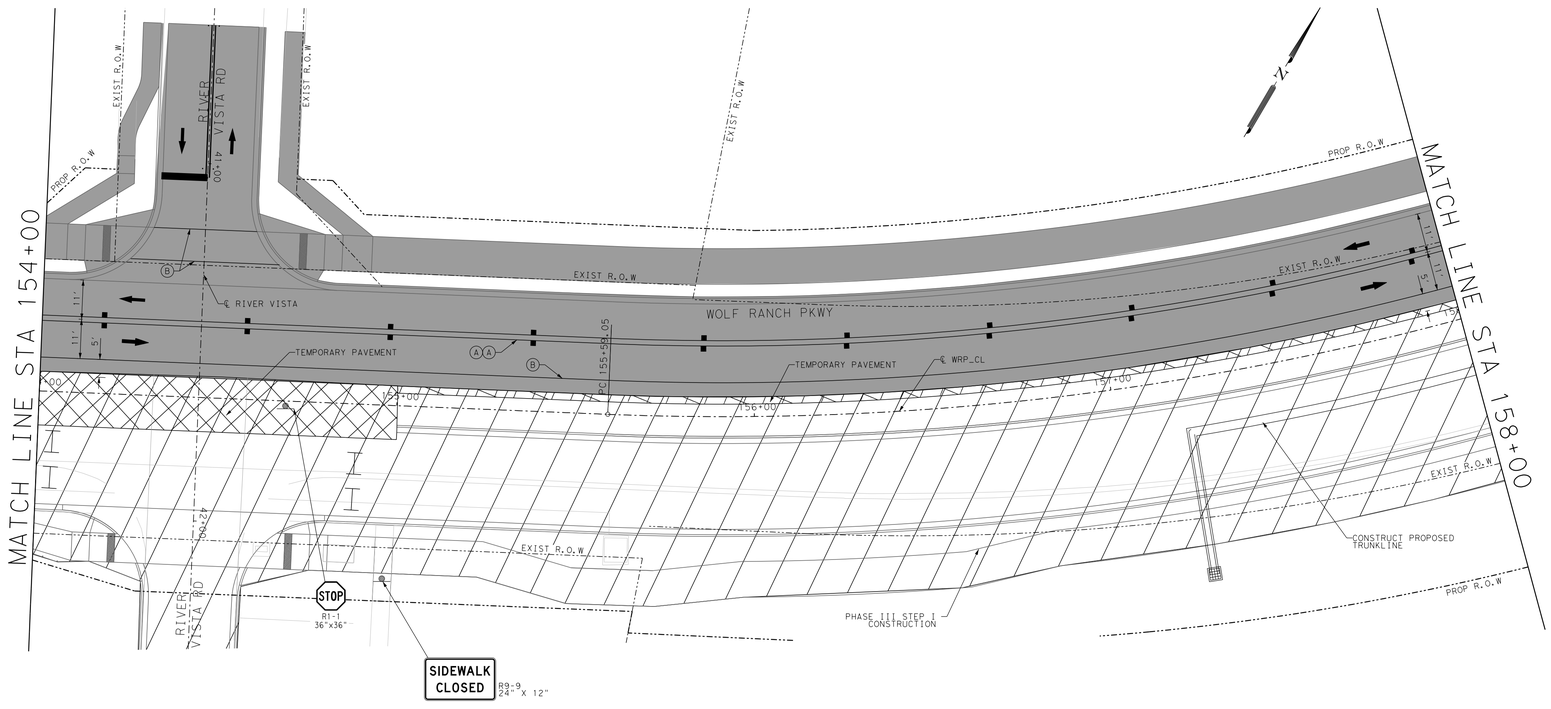

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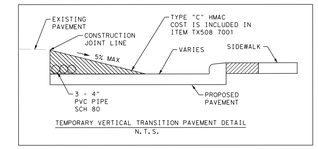

TEMPORARY VERTICAL TRANSITION PAVEMENT DETAIL
N.T.S.

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SHEET 8 OF 18

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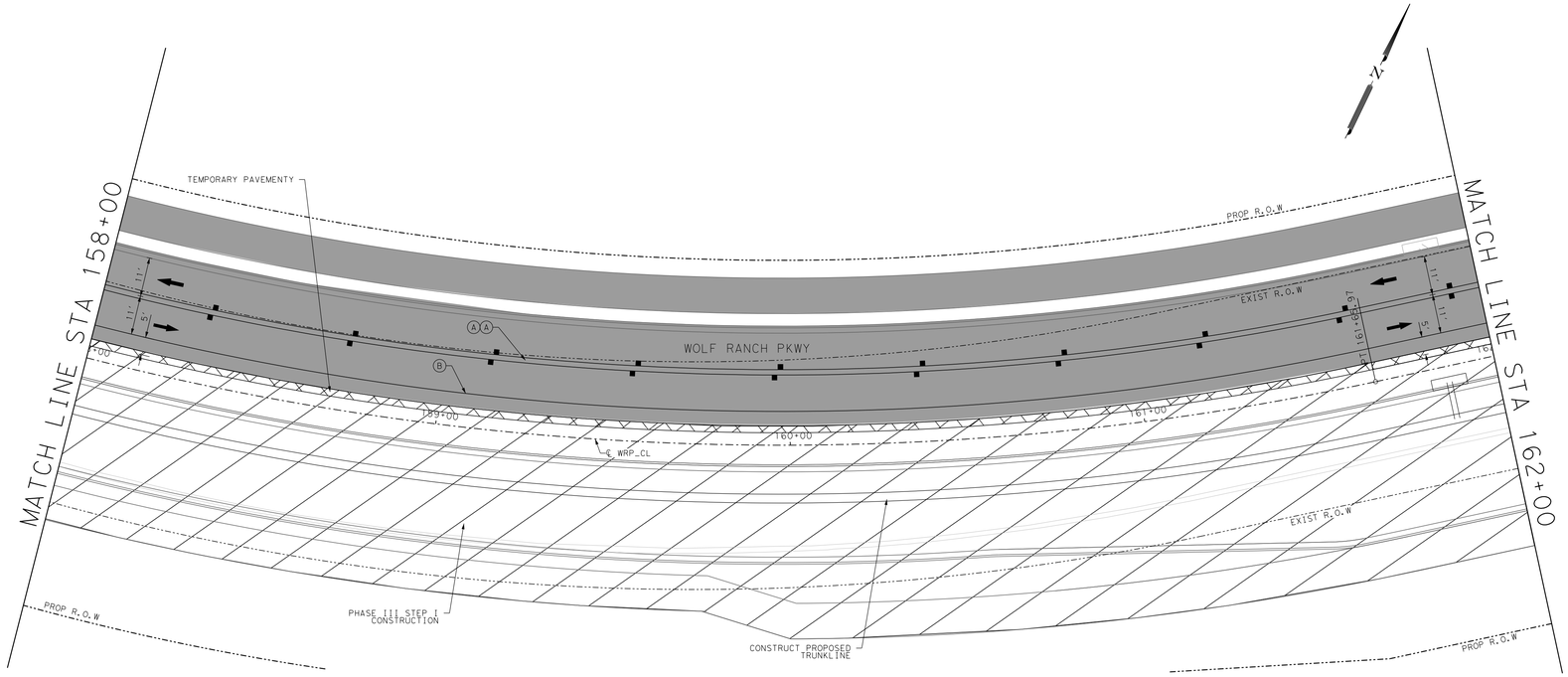

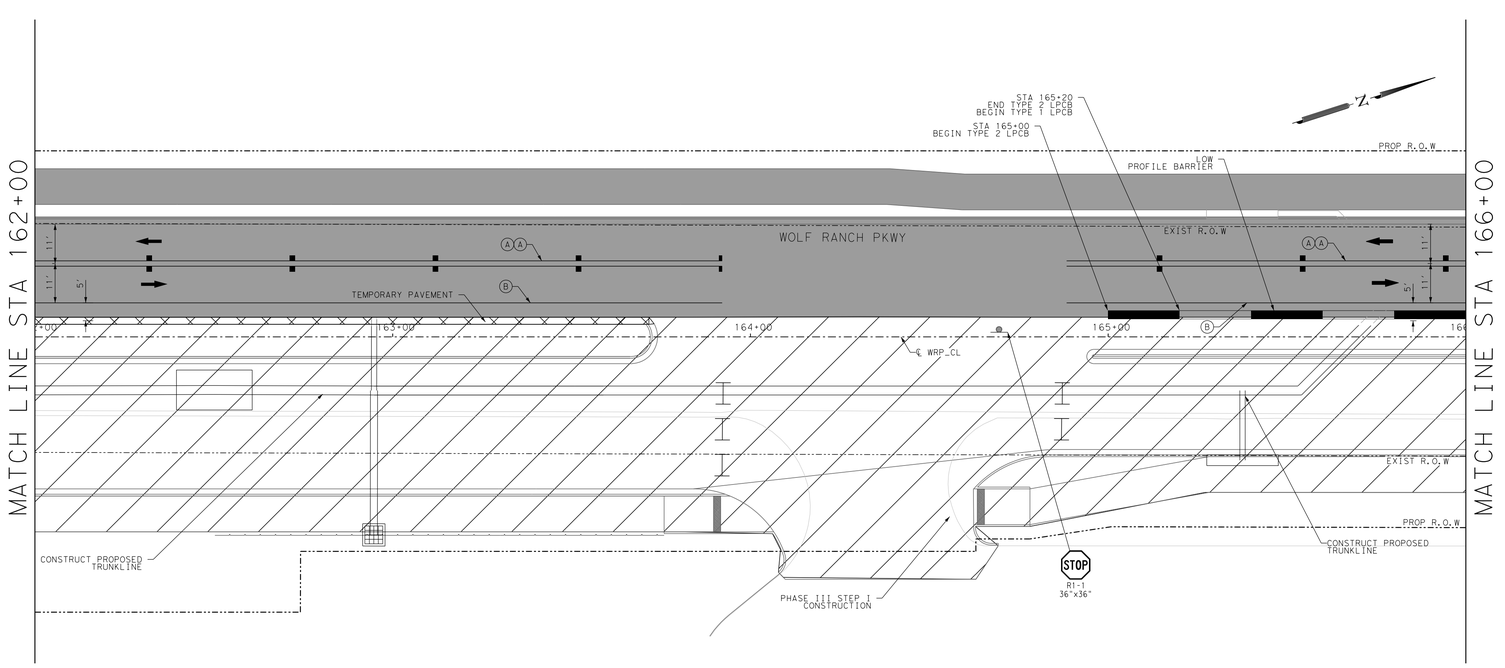

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DESIGN

STATE OF TEXAS · BRET CHAPMAN · 127293 · LICENSED PROFESSIONAL ENGINEER

BRET CHAPMAN, P.E. — 9/16/2025 DATE

APPROVAL

STATE OF TEXAS · BRIAN A. ALLEN · 123374 · LICENSED PROFESSIONAL ENGINEER

BRIAN A. ALLEN, P.E. — 9/16/2025 DATE

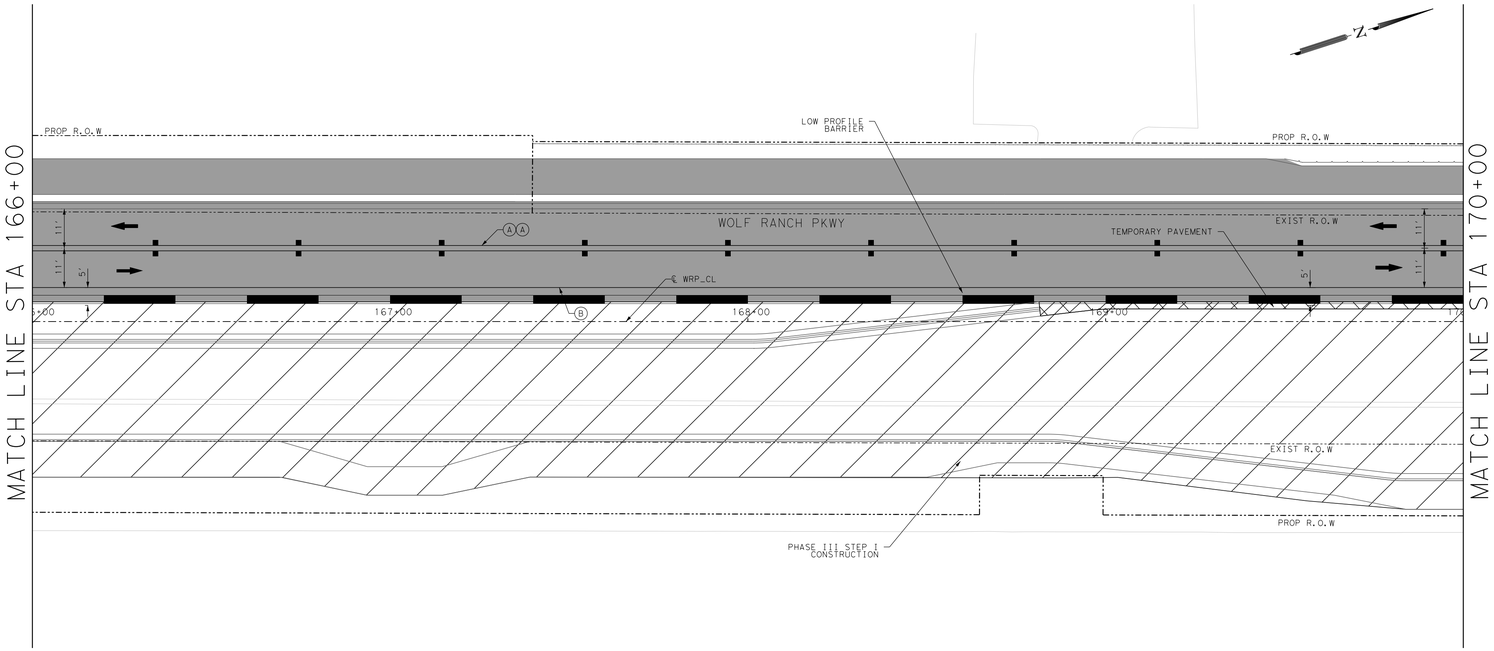
NO.	REVISION	DATE

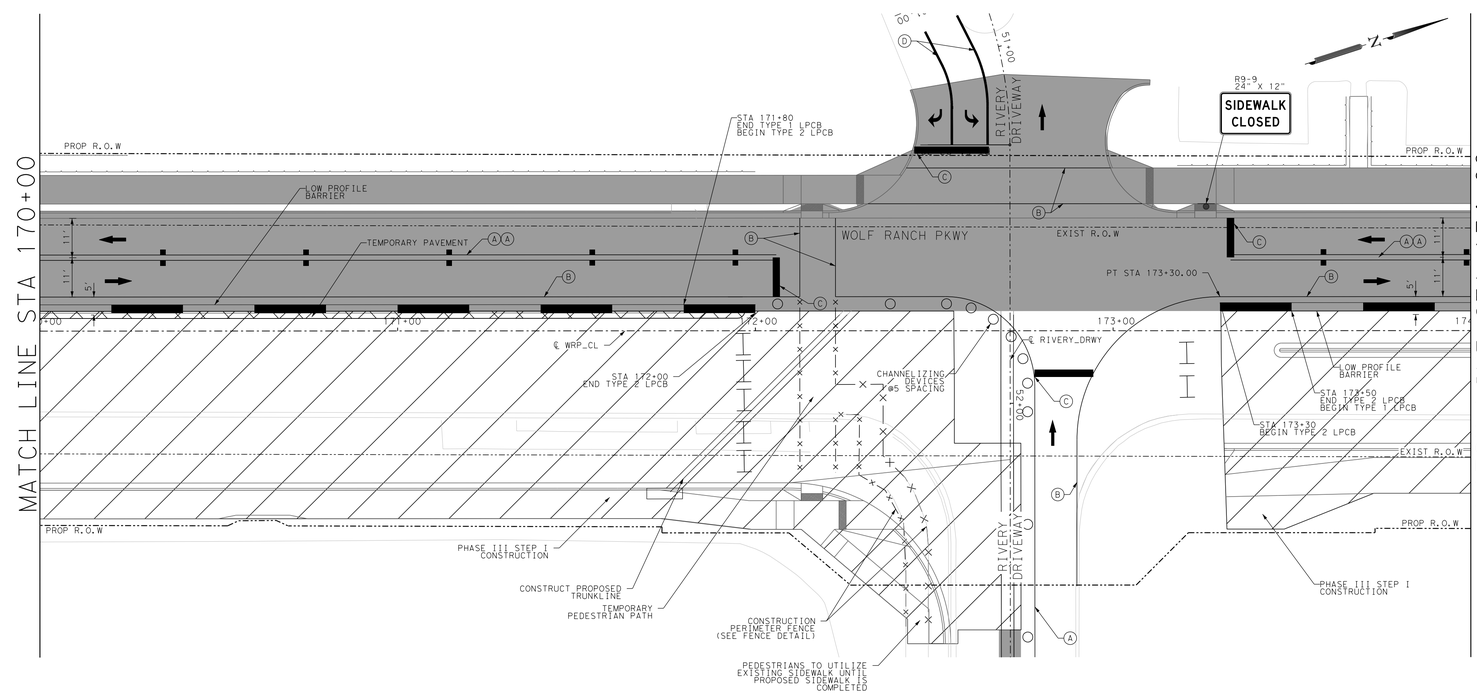
GEORGETOWN TEXAS *more than welcome*

PAPE-DAWSON ENGINEERS
AUSTIN | SAN ANTONIO | HOUSTON | FORT WORTH | DALLAS
10801 N MOPAC EXPY, BLDG 3, STE 200 | AUSTIN, TX 78759 | 512.454.8711
TEXAS ENGINEERING FIRM #470 | TEXAS SURVEYING FIRM #10028800

WOLF RANCH PKWY / MEMORIAL DR
TCP PHASE III STEP I

CITY JOB No.
JOB NO. 51423-04
DATE 9/16/2025
DESIGNER
CHECKED DRAWN





LEGEND

- PHASE III STEP I MILL PAVEMENT
- PHASE III STEP I WORKZONE
- PAVEMENT CONSTRUCTED IN A PREVIOUS PHASE
- EXISTING ROW
- PROPOSED ROW
- EXISTING EASEMENT
- FENCE
- CHANNELING DEVICES
- VERTICAL PANELS
- SIGN
- TRAFFIC FLOW ARROWS

(A) WK ZN PAV MRK NON-REMOVE (Y)6" (SLD)
(B) WK ZN PAV MRK NON-REMOVE (W)6" (SLD)
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(D) WK ZN PAV MRK NON-REMOVE (W)8" (SLD)
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(F) WK ZN PAV MRK NON-REMOVE (W)8" (DOT)
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SCALE: 1"= 20'
0' 20' 40' 60'

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TCP PHASE III STEP I

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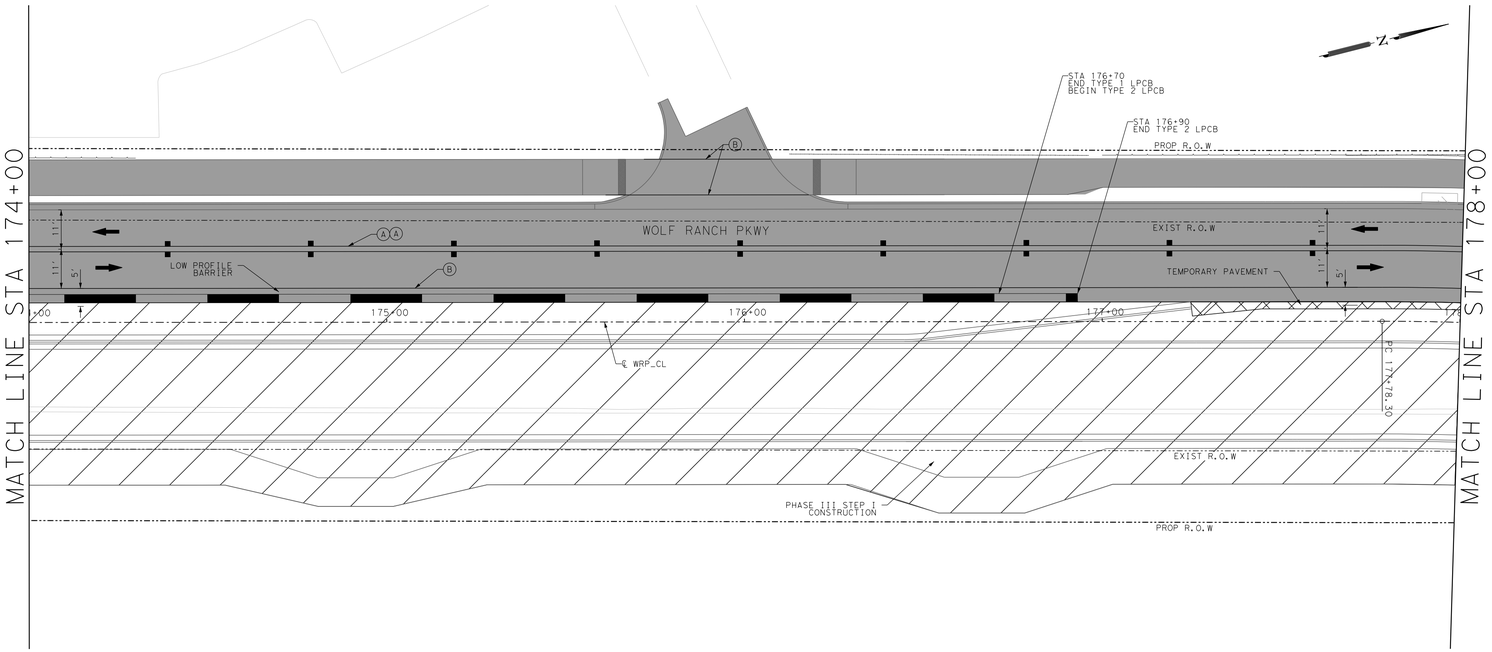

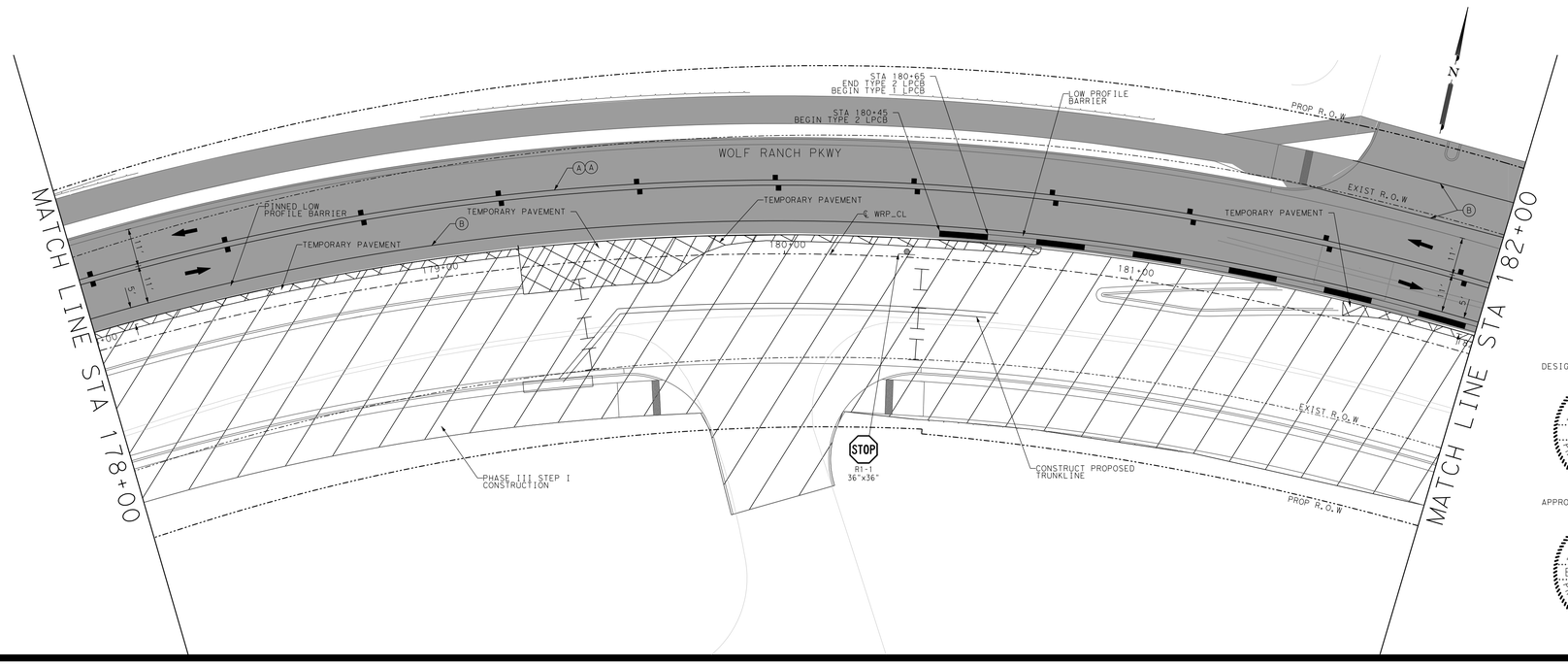

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TCP PHASE III STEP I

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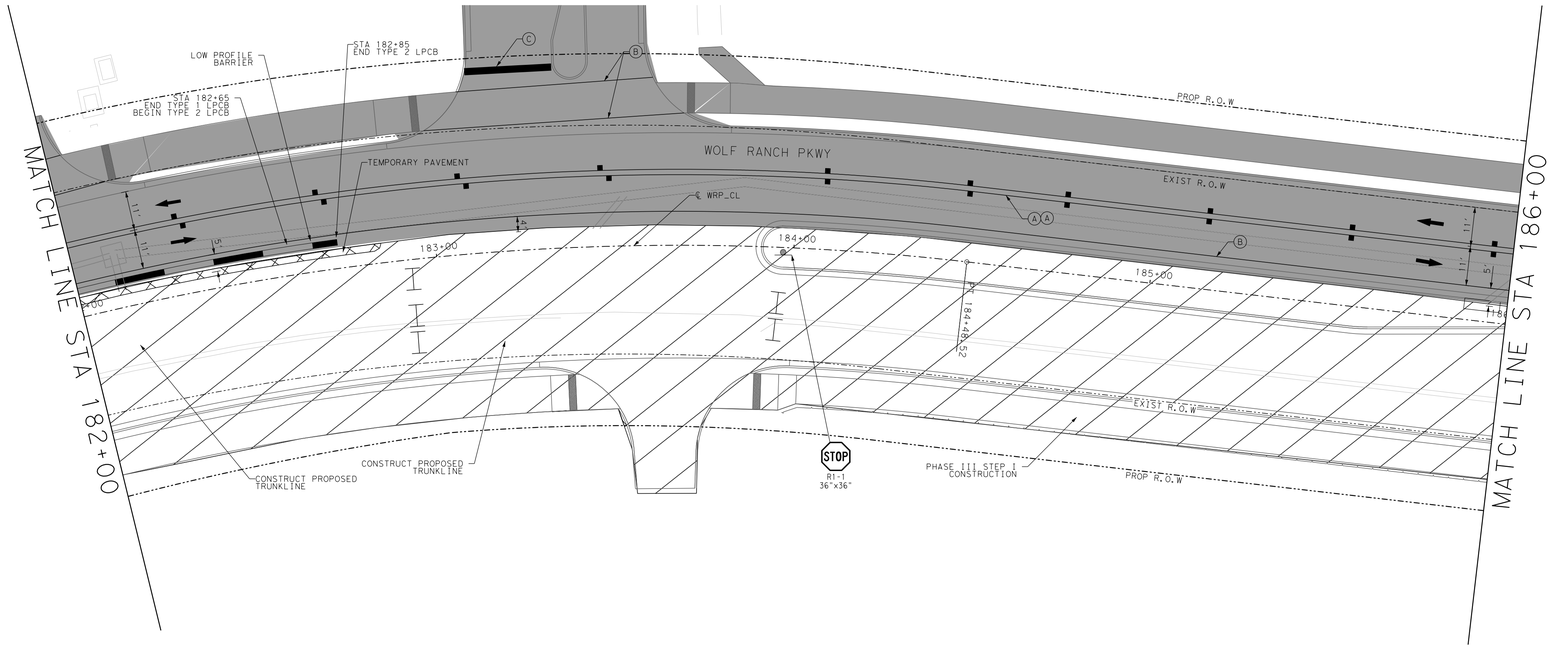
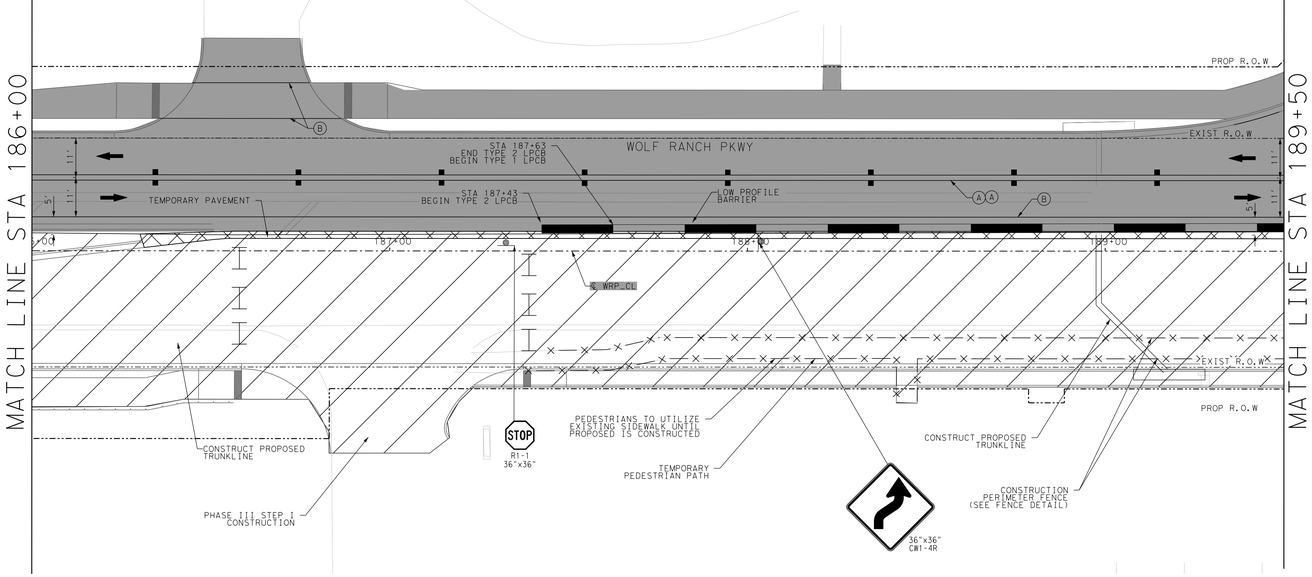
SHEET 11 OF 18

SHEET NO. 117





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TCP PHASE III STEP I

CITY JOB No.
JOB NO. 51423-04
DATE 9/16/2025
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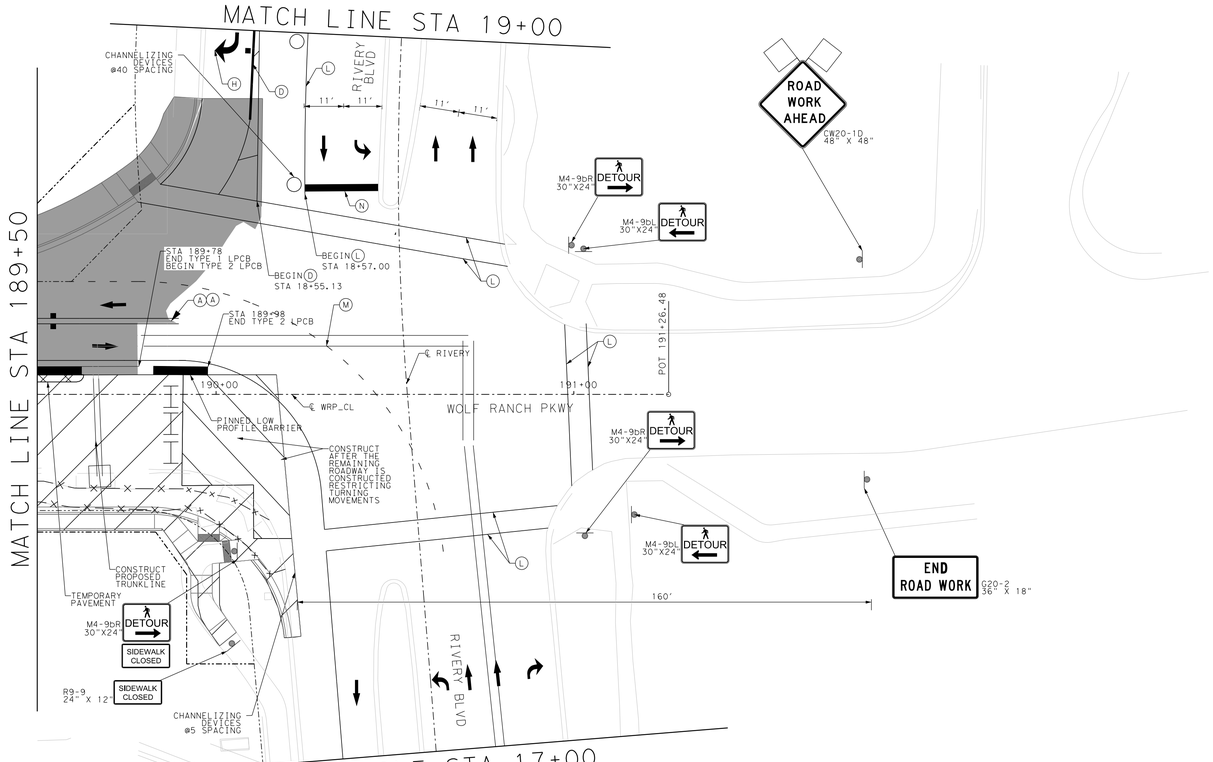
SHEET 12 OF 18

SHEET NO. 118



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SHEET 13 OF 18

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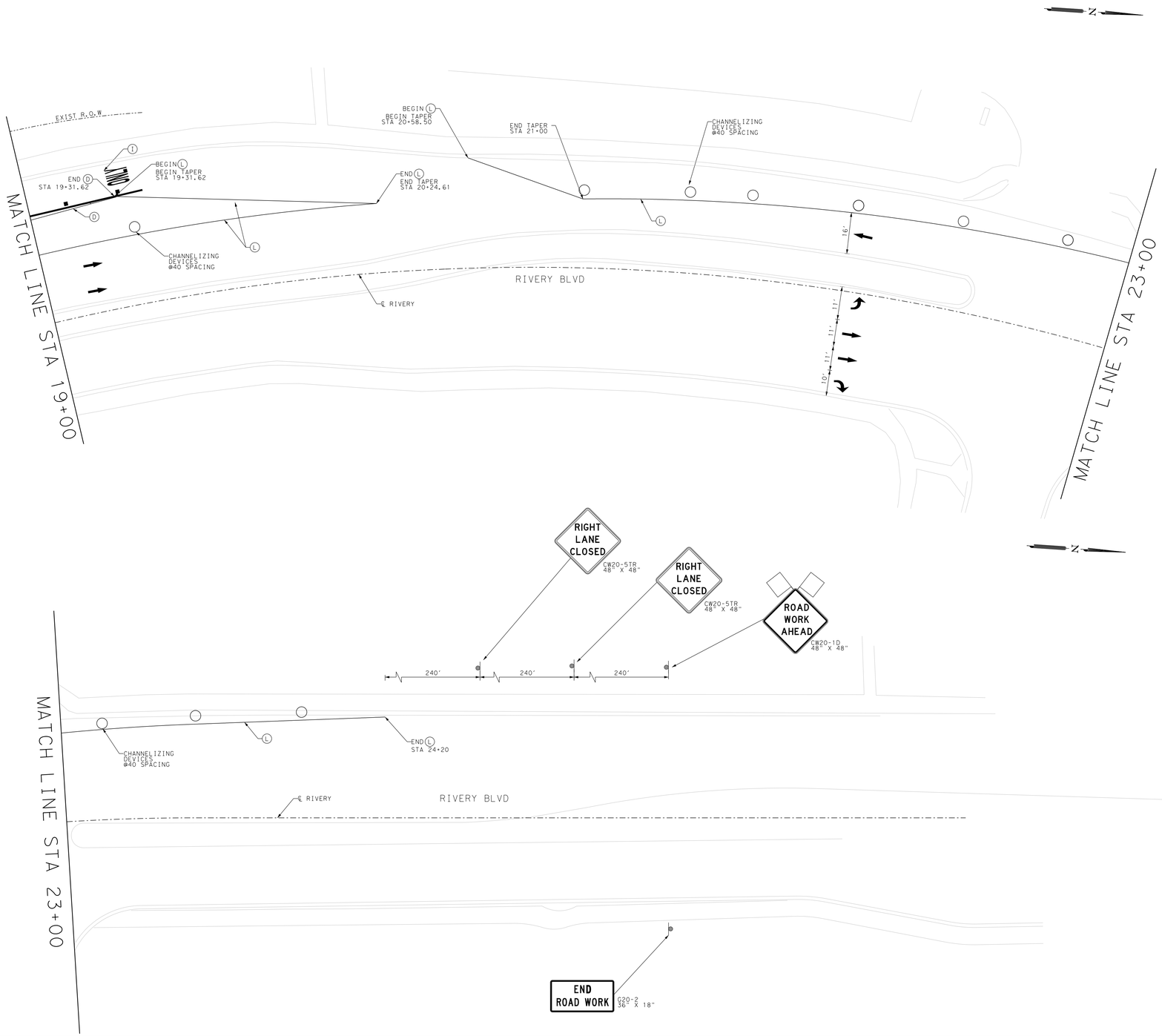

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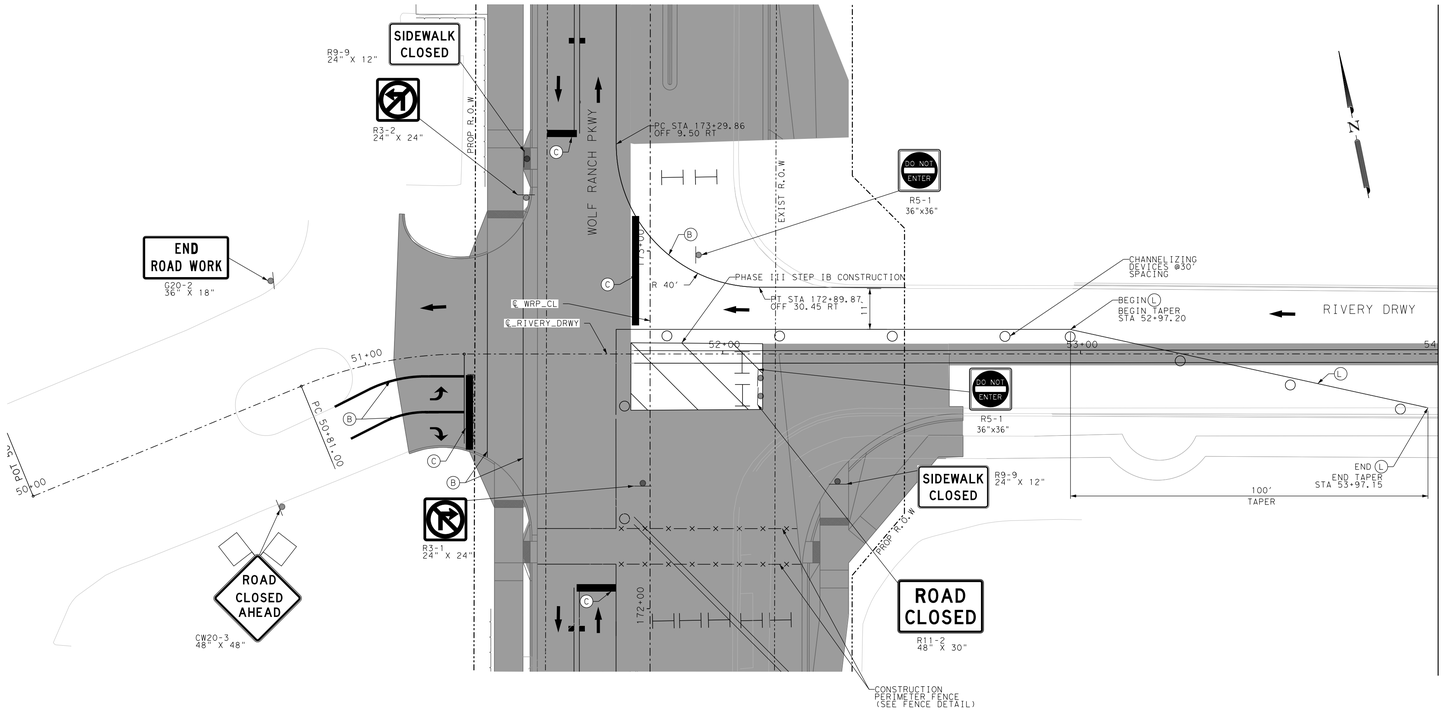

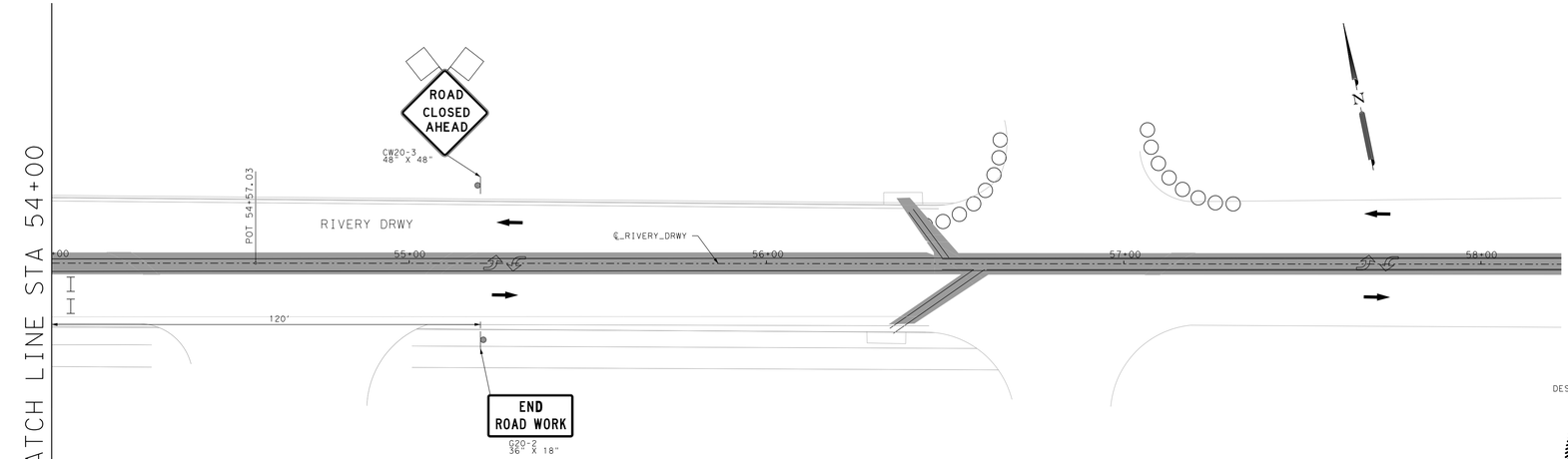

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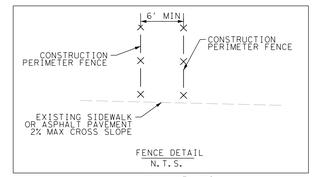
(A) WK ZN PAV MRK NON-REMOVE (Y)6" (SLD)
(B) WK ZN PAV MRK NON-REMOVE (W)6" (SLD)
(C) WK ZN PAV MRK NON-REMOVE (W)24" (SLD)
(D) WK ZN PAV MRK NON-REMOVE (W)8" (SLD)
(E) WK ZN PAV MRK NON-REMOVE (W)8" (BRK)
(F) WK ZN PAV MRK NON-REMOVE (W)8" (DOT)
(G) WK ZN PAV MRK NON-REMOVE REFL TY II-C-R
(H) WK ZN PAV MRK NON-REMOVE (W) (ARROW)
(I) WK ZN PAV MRK NON-REMOVE (W) (WORD)
(J) WK ZN PAV MRK NON-REMOVE (Y) 12" (SLD)
(K) WK ZN PAV MRK NON-REMOVE (W) (YLD TRI)
(L) WK ZN PAV MRK REMOVE (W)6" (SLD)
(M) WK ZN PAV MRK REMOVE (W)8" (DOT)
(N) WK ZN PAV MRK REMOVE (W)24" (SLD)



FENCE DETAIL
N.T.S.

SCALE: 1"= 20'

0' 20' 40' 60'

NOTES:

1. FOR ADDITIONAL DETAILS SEE TxDOT TCP STANDARD SHEETS.
2. EXISTING FEATURES ARE SHOWN SCREENED BACK.
3. EXISTING PAVEMENT MARKING CONFLICTING WITH WORK ZONE PAVEMENT MARKINGS SHALL BE REMOVED.
4. CONTRACTOR TO MAINTAIN ACCESS TO DRIVEWAYS AT ALL TIMES THROUGHOUT CONSTRUCTION.
5. REFER TO DETOUR LAYOUTS FOR MEMORIAL DR ACCESS DURING CLOSURES.
6. REFER TO ADVANCE WARNING SIGN LAYOUT SHEET FOR ADDITIONAL ADVANCE WARNING SIGNS
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DESIGN

STATE OF TEXAS
BRET CHAPMAN
127293
LICENSED
PROFESSIONAL ENGINEER

BRET CHAPMAN, P.E. — 9/16/2025 DATE

APPROVAL

STATE OF TEXAS
BRIAN A. ALLEN
123374
LICENSED
PROFESSIONAL ENGINEER

BRIAN A. ALLEN, P.E. — 9/16/2025 DATE

NO.	REVISION	DATE

GEORGETOWN TEXAS
more than welcome

PAPE-DAWSON ENGINEERS
AUSTIN I SAN ANTONIO I HOUSTON I FORT WORTH I DALLAS
10801 N MOPAC EXPY, BLDG 3, STE 200 I AUSTIN, TX 78759 I 512.454.8711
TEXAS ENGINEERING FIRM #470 I TEXAS SURVEYING FIRM #10028800

WOLF RANCH PKWY / MEMORIAL DR
TCP PHASE III STEP IB

CITY JOB No.
JOB NO. 51423-04
DATE 9/16/2025
DESIGNER
CHECKED DRAWN

SHEET 16 OF 18
SHEET NO. 122

LEGEND

- PHASE III STEP I MILL PAVEMENT
- PHASE III STEP I WORKZONE
- PAVEMENT CONSTRUCTED IN A PREVIOUS PHASE
- EXISTING ROW
- PROPOSED ROW
- EXISTING EASEMENT
- FENCE
- CHANNELING DEVICES
- VERTICAL PANELS
- SIGN
- TRAFFIC FLOW ARROWS

- (A) WK ZN PAV MRK NON-REMOVE (Y)6" (SLD)
- (B) WK ZN PAV MRK NON-REMOVE (W)6" (SLD)
- (C) WK ZN PAV MRK NON-REMOVE (W)24" (SLD)
- (D) WK ZN PAV MRK NON-REMOVE (W)8" (SLD)
- (E) WK ZN PAV MRK NON-REMOVE (W)8" (BRK)
- (F) WK ZN PAV MRK NON-REMOVE (W)8" (DOT)
- (G) WK ZN PAV MRK NON-REMOVE REFL TY II-C-R
- (H) WK ZN PAV MRK NON-REMOVE (W) (ARROW)
- (I) WK ZN PAV MRK NON-REMOVE (W) (WORD)
- (J) WK ZN PAV MRK NON-REMOVE (Y) 12" (SLD)
- (K) WK ZN PAV MRK NON-REMOVE (W) (YLD TRI)
- (L) WK ZN PAV MRK REMOVE (W)6" (SLD)
- (M) WK ZN PAV MRK REMOVE (W)8" (DOT)
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FENCE DETAIL
N.T.S.
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0' 20' 40' 60'

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TEXAS ENGINEERING FIRM #470 I TEXAS SURVEYING FIRM #10028800

WOLF RANCH PKWY / MEMORIAL DR
TCP PHASE III STEP IC

CITY JOB No.
JOB NO. 51423-04
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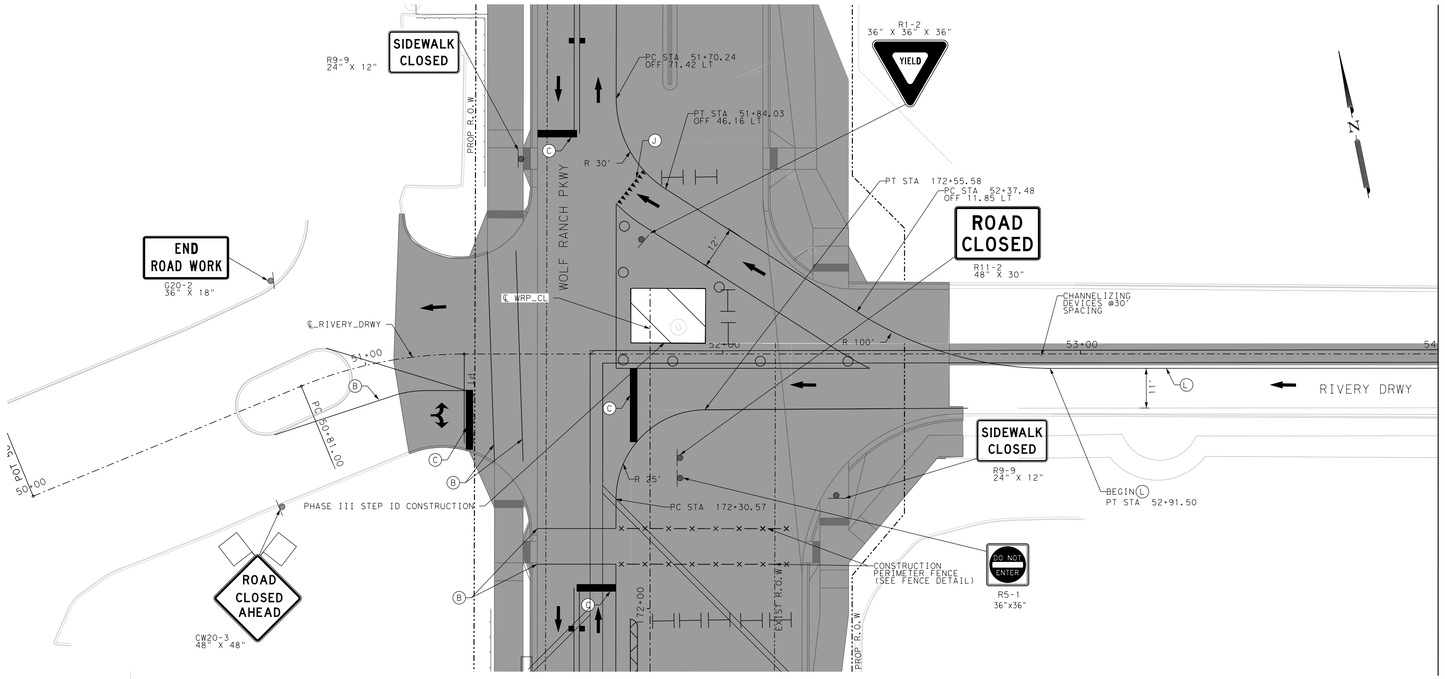

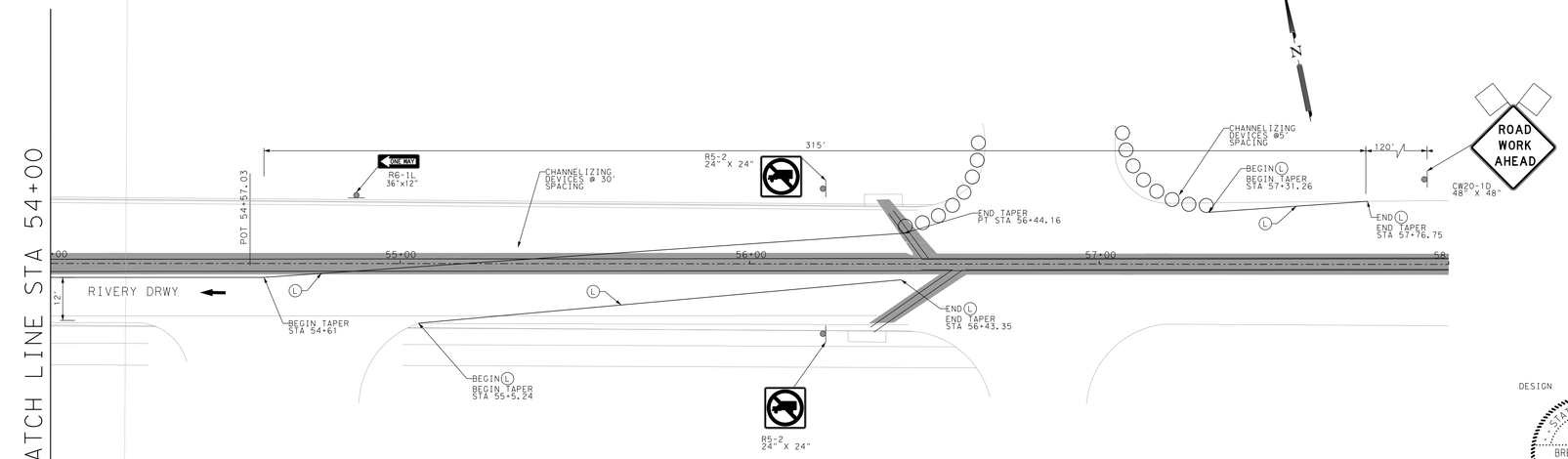

LEGEND

- PHASE III STEP I MILL PAVEMENT
- PHASE III STEP I WORKZONE
- PAVEMENT CONSTRUCTED IN A PREVIOUS PHASE
- EXISTING ROW
- PROPOSED ROW
- EXISTING EASEMENT
- FENCE
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- SIGN
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- (H) WK ZN PAV MRK NON-REMOVE (W) (ARROW)
- (I) WK ZN PAV MRK NON-REMOVE (W) (WORD)
- (J) WK ZN PAV MRK NON-REMOVE (Y) 12" (SLD)
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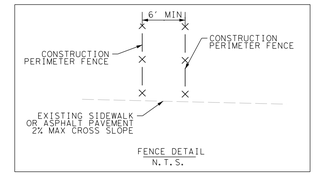

SCALE: 1"= 20'

0' 20' 40' 60'

NOTES:

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BRET CHAPMAN
127293
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PROFESSIONAL ENGINEER

BRET CHAPMAN, P.E. — 9/16/2025 DATE

APPROVAL

STATE OF TEXAS
BRIAN A. ALLEN
123374
LICENSED
PROFESSIONAL ENGINEER

BRIAN A. ALLEN, P.E. — 9/16/2025 DATE

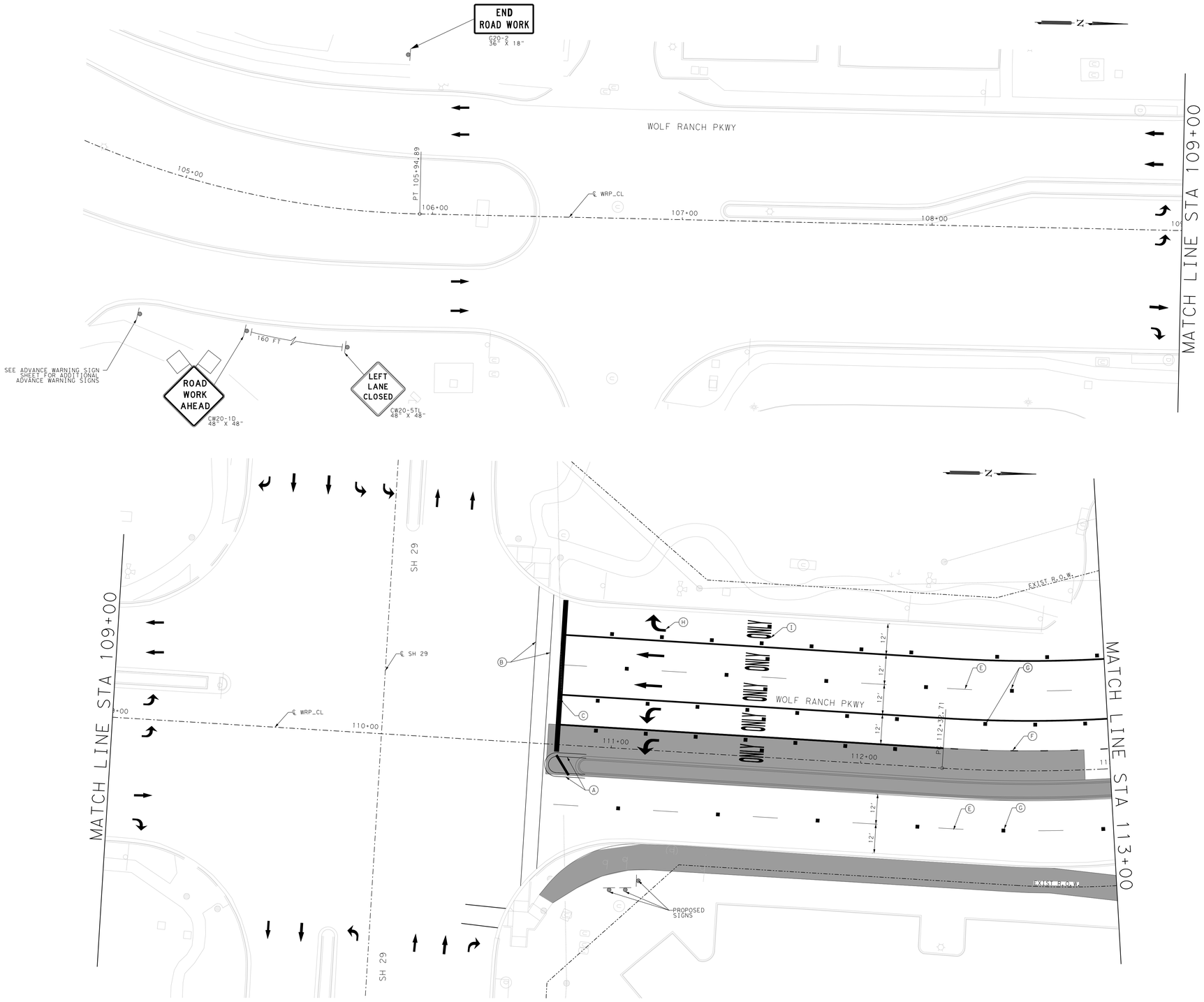
NO.	REVISION	DATE

GEORGETOWN TEXAS
more than welcome

PAPE-DAWSON ENGINEERS
AUSTIN | SAN ANTONIO | HOUSTON | FORT WORTH | DALLAS
10801 N MOPAC EXPY, BLDG 3, STE 200 | AUSTIN, TX 78759 | 512.454.8711
TEXAS ENGINEERING FIRM #470 | TEXAS SURVEYING FIRM #10028800

WOLF RANCH PKWY / MEMORIAL DR
TCP PHASE III STEP ID

CITY JOB No.
JOB NO. 51423-04
DATE 9/16/2025
DESIGNER
CHECKED DRAWN



LEGEND

- PHASE III STEP II WORKZONE
- PAVEMENT CONSTRUCTED IN A PREVIOUS PHASE
- EXISTING ROW
- PROPOSED ROW
- EXISTING EASEMENT
- CHANNELING DEVICES
- VERTICAL PANELS
- SIGN
- TRAFFIC FLOW ARROWS

(A) WK ZN PAV MRK NON-REMOVE (Y)6" (SLD)
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(J) WK ZN PAV MRK NON-REMOVE (W) (YLD TRI)
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APPROVAL

STATE OF TEXAS
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GEORGETOWN TEXAS
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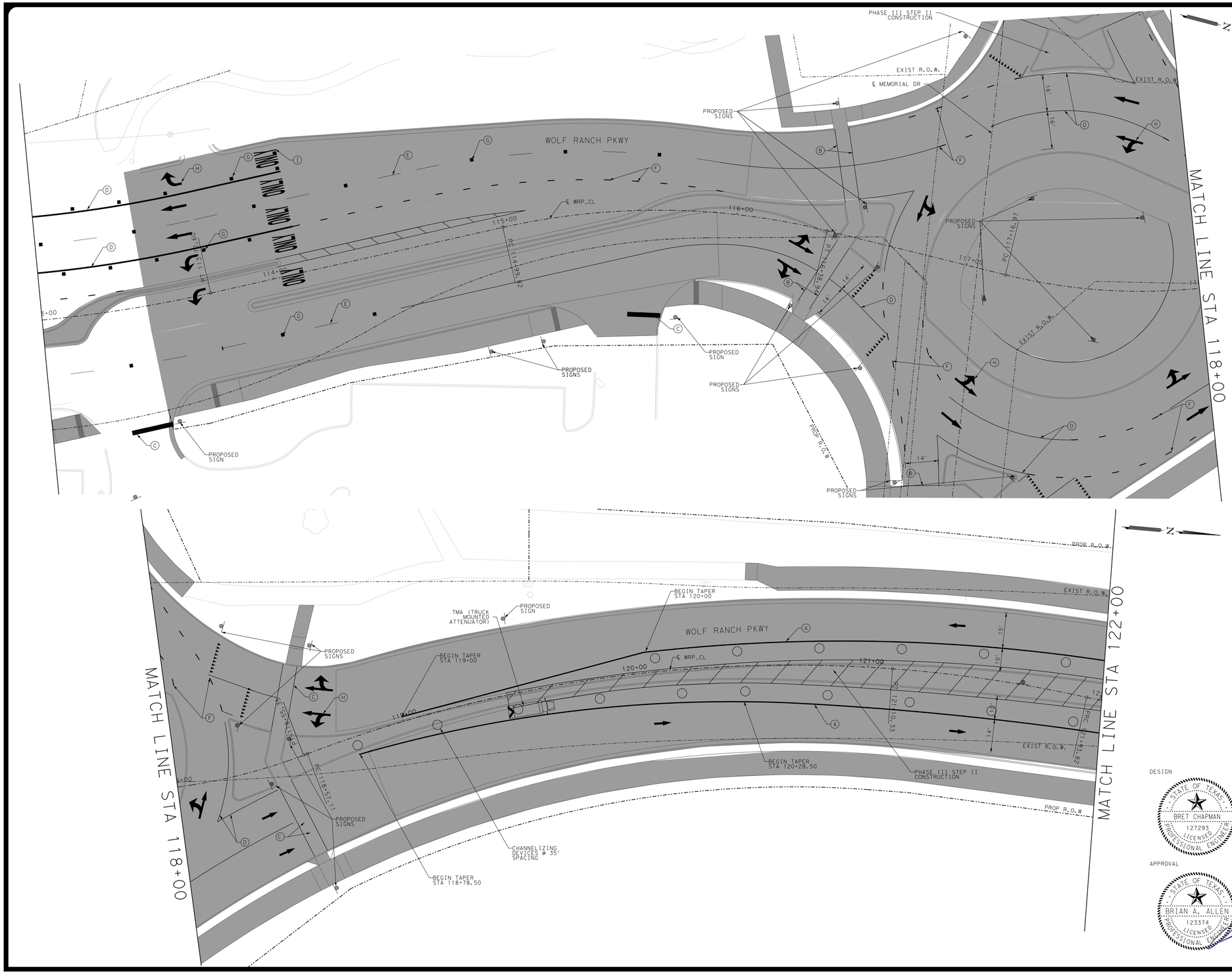
TEXAS ENGINEERING FIRM #470 | TEXAS SURVEYING FIRM #10028800

WOLF RANCH PKWY / MEMORIAL DR
TCP PHASE III STEP II

CITY JOB No.
JOB NO. 51423-04
DATE 9/16/2025
DESIGNER
CHECKED DRAWN

SHEET 1 OF 12

SHEET NO. 125



LEGEND

- PHASE III STEP II WORKZONE
- PAVEMENT CONSTRUCTED IN A PREVIOUS PHASE
- EXISTING ROW
- PROPOSED ROW
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STATE OF TEXAS — BRET CHAPMAN — 127293 — LICENSED PROFESSIONAL ENGINEER

BRET CHAPMAN, P.E. — 9/16/2025 DATE

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BRIAN A. ALLEN, P.E. — 9/16/2025 DATE

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WOLF RANCH PKWY / MEMORIAL DR
TCP PHASE III STEP II

CITY JOB No.
JOB NO. 51423-04
DATE 9/16/2025
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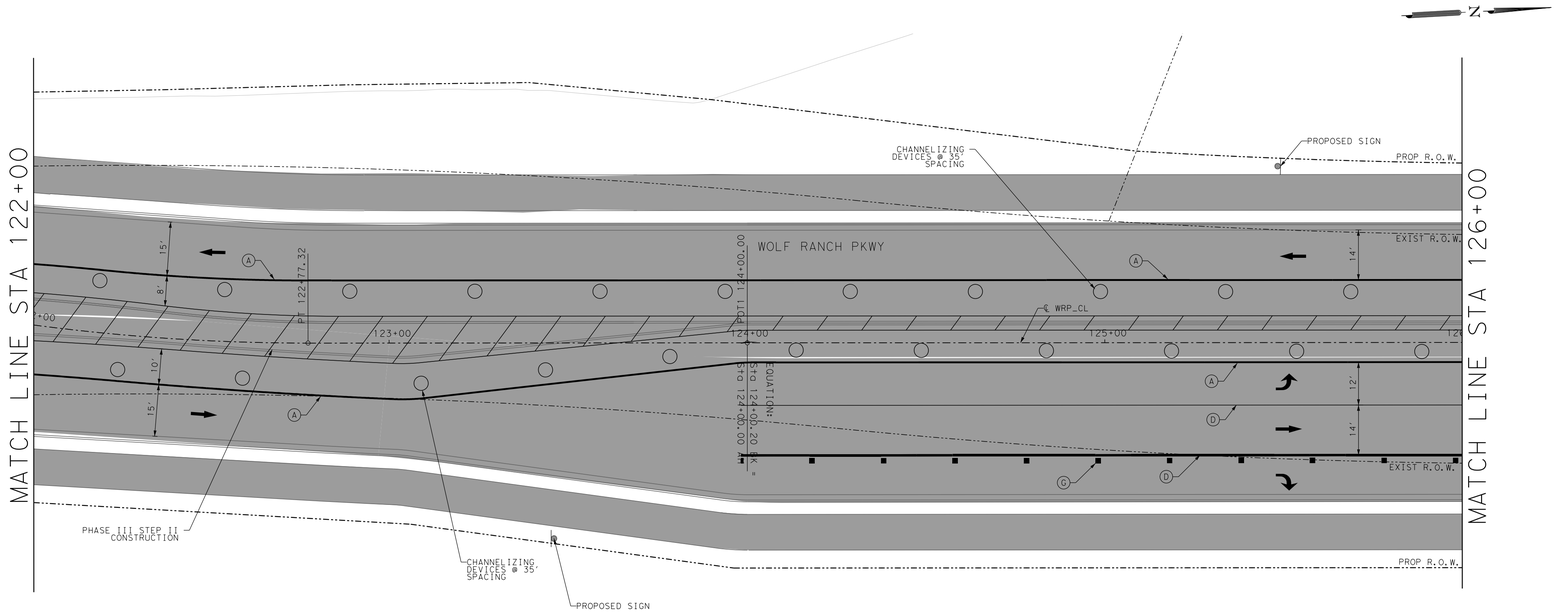
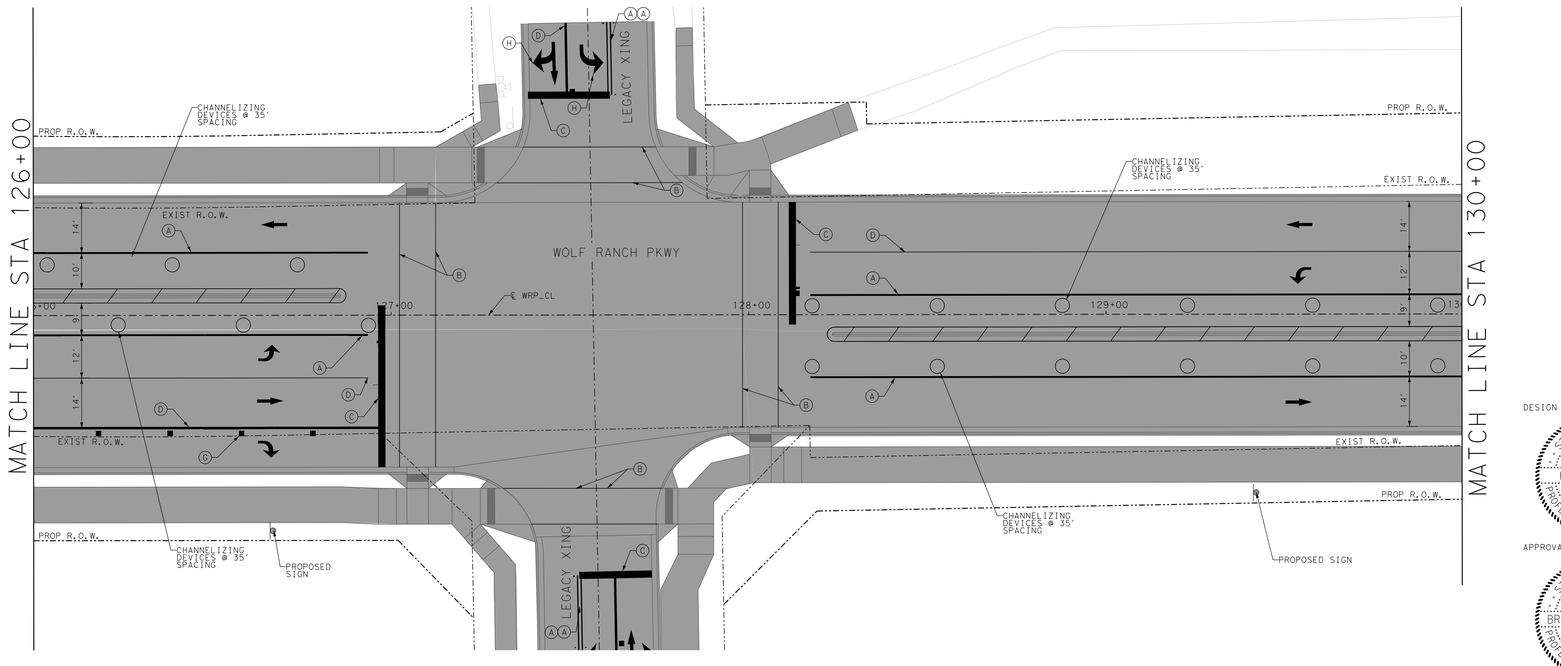
SHEET 2 OF 12

SHEET NO. 126





LEGEND

- PHASE III STEP II WORKZONE
- PAVEMENT CONSTRUCTED IN A PREVIOUS PHASE
- EXISTING ROW
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BRET CHAPMAN, P.E. — 9/16/2025 DATE

APPROVAL

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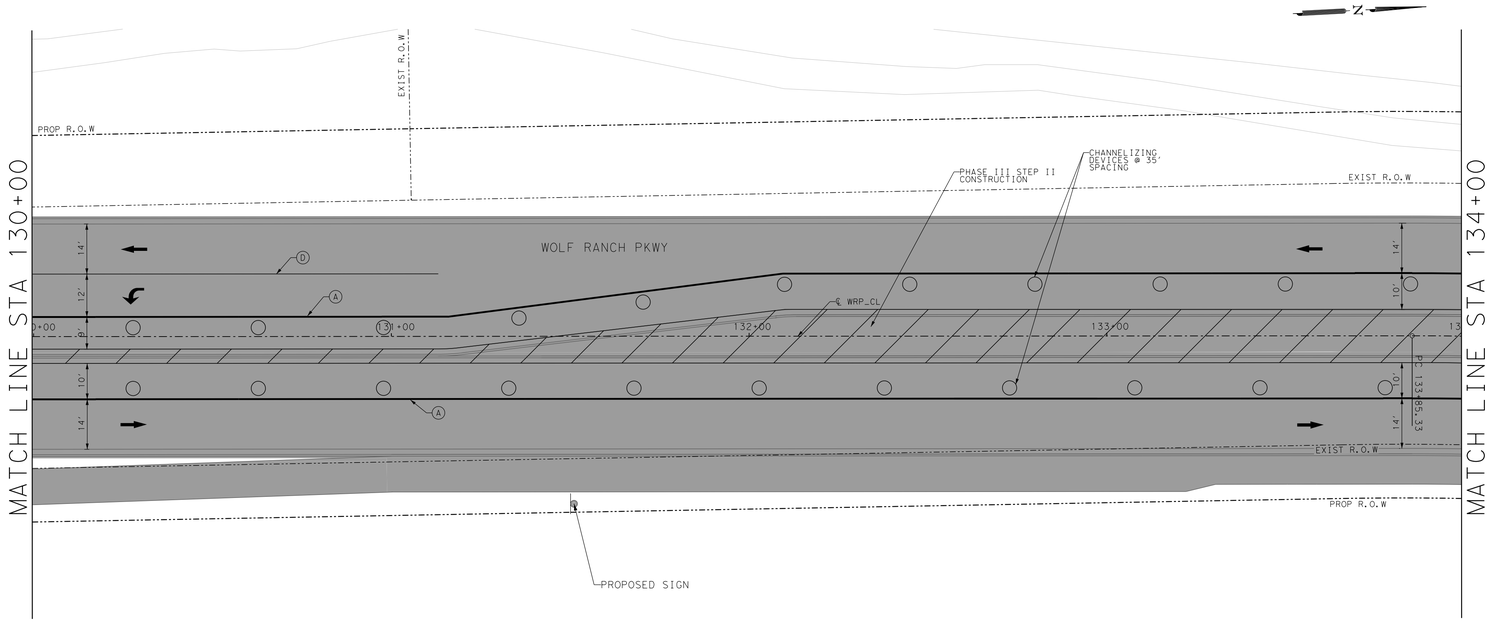
WOLF RANCH PKWY / MEMORIAL DR

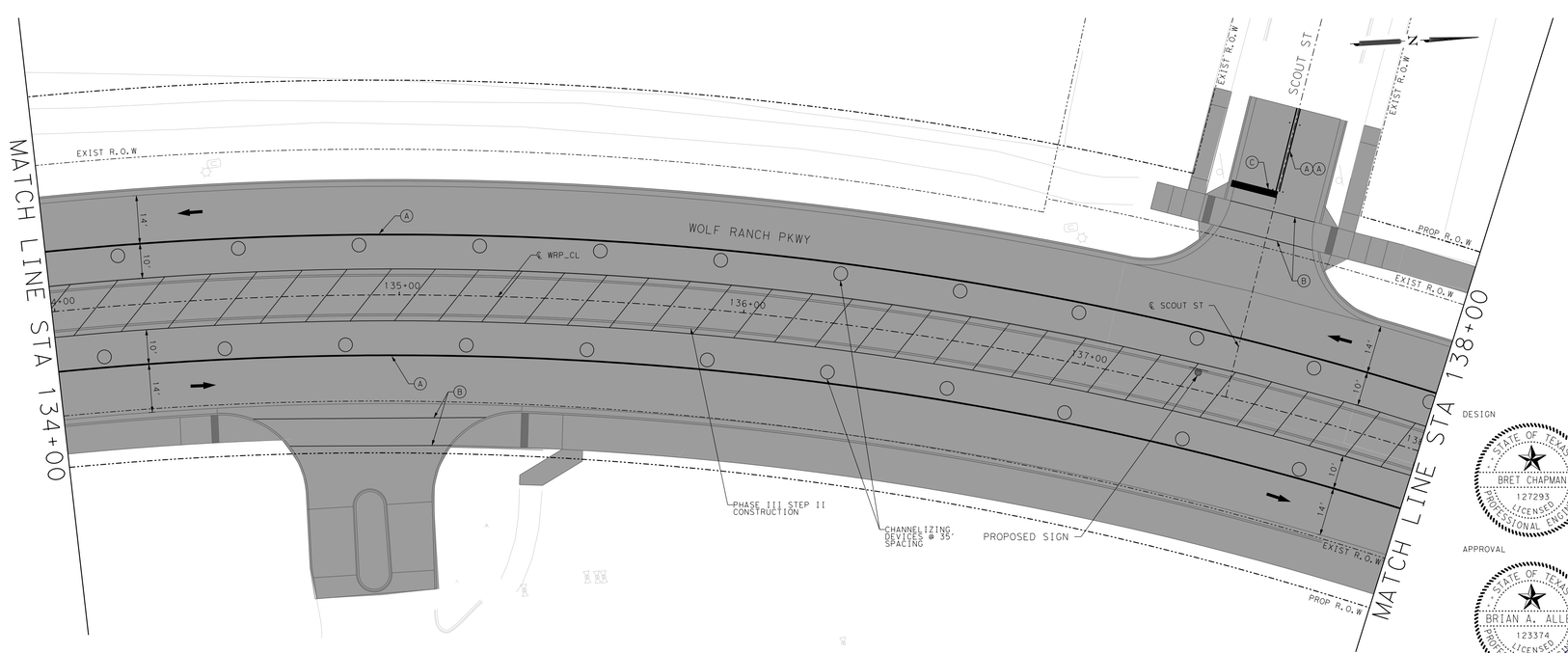
TCP PHASE III STEP II

CITY JOB No.
JOB NO. 51423-04
DATE 9/16/2025
DESIGNER
CHECKED DRAWN

SHEET 3 OF 12

SHEET NO. 127





LEGEND

- PHASE III STEP II WORKZONE
- PAVEMENT CONSTRUCTED IN A PREVIOUS PHASE
- EXISTING ROW
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STATE OF TEXAS · BRET CHAPMAN · 127293 · LICENSED · PROFESSIONAL ENGINEER

BRET CHAPMAN, P.E. — 9/16/2025 DATE

APPROVAL

STATE OF TEXAS · BRIAN A. ALLEN · 123374 · LICENSED · PROFESSIONAL ENGINEER

BRIAN A. ALLEN, P.E. — 9/16/2025 DATE

NO.	REVISION	DATE

GEORGETOWN TEXAS *more than welcome*

PAPE-DAWSON ENGINEERS
AUSTIN I SAN ANTONIO I HOUSTON I FORT WORTH I DALLAS
10801 N MOPAC EXPY, BLDG 3, STE 200 I AUSTIN, TX 78759 I 512.454.8711
TEXAS ENGINEERING FIRM #470 I TEXAS SURVEYING FIRM #10028800

WOLF RANCH PKWY / MEMORIAL DR
TCP PHASE III STEP II

CITY JOB No.
JOB NO. 51423-04
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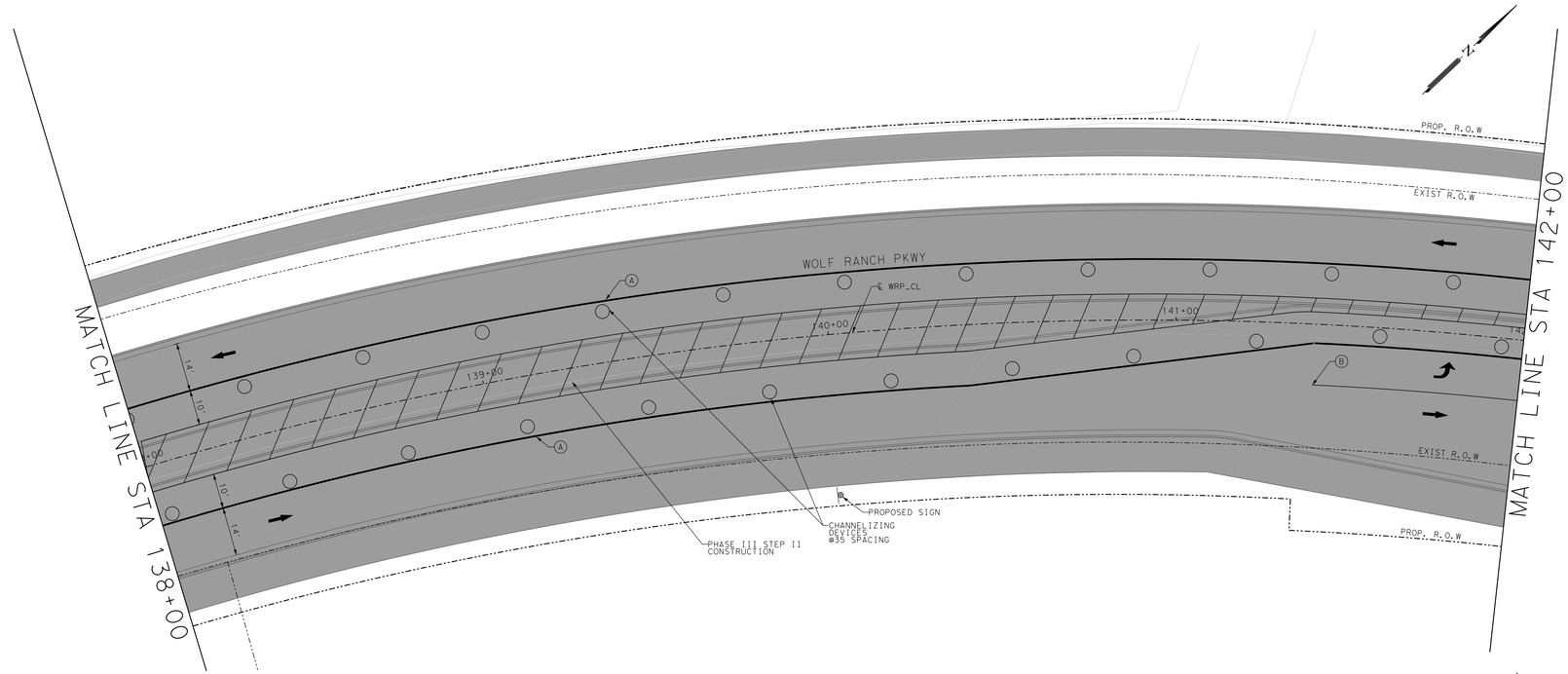

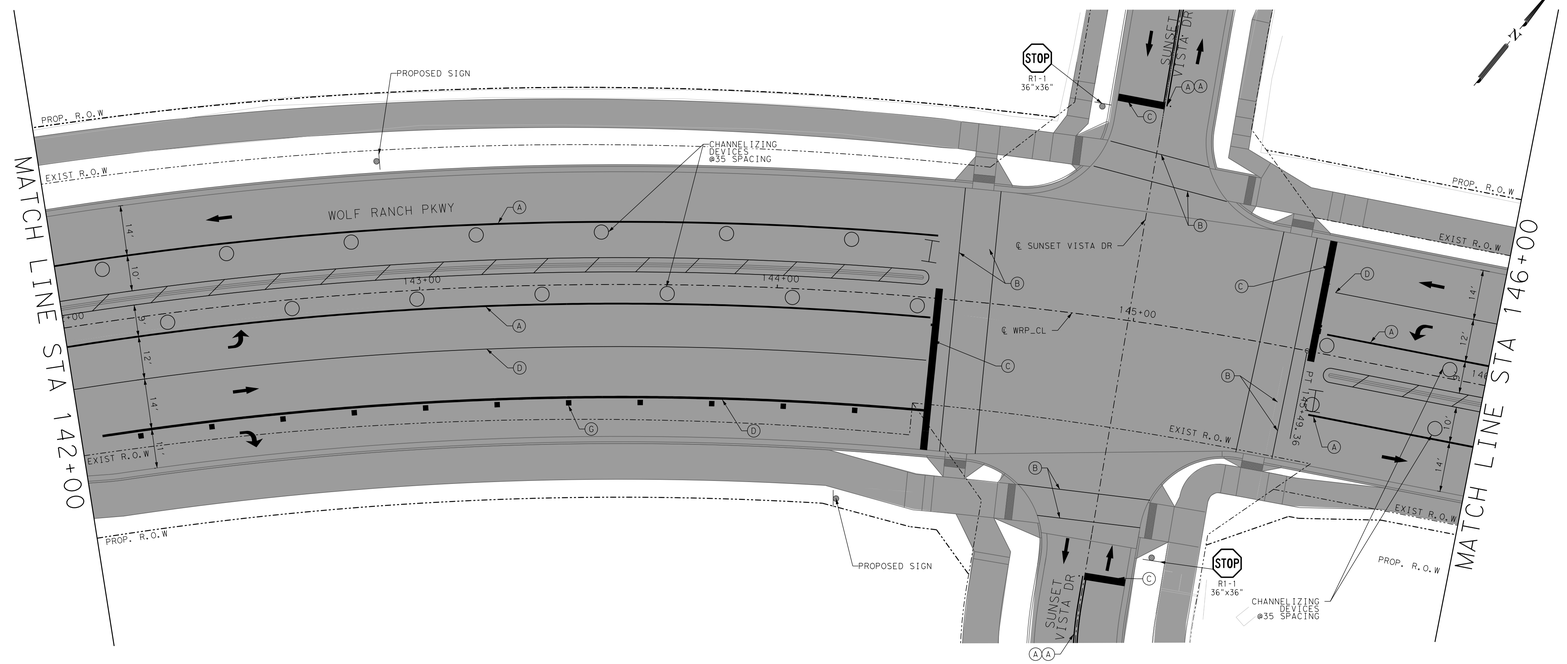

LEGEND

- PHASE III STEP II WORKZONE
- PAVEMENT CONSTRUCTED IN A PREVIOUS PHASE
- EXISTING ROW
- PROPOSED ROW
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- CHANNELING DEVICES
- VERTICAL PANELS
- SIGN
- TRAFFIC FLOW ARROWS

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(G) WK ZN PAV MRK NON-REMOVE REFL TY II-C-R
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SCALE: 1"= 20'
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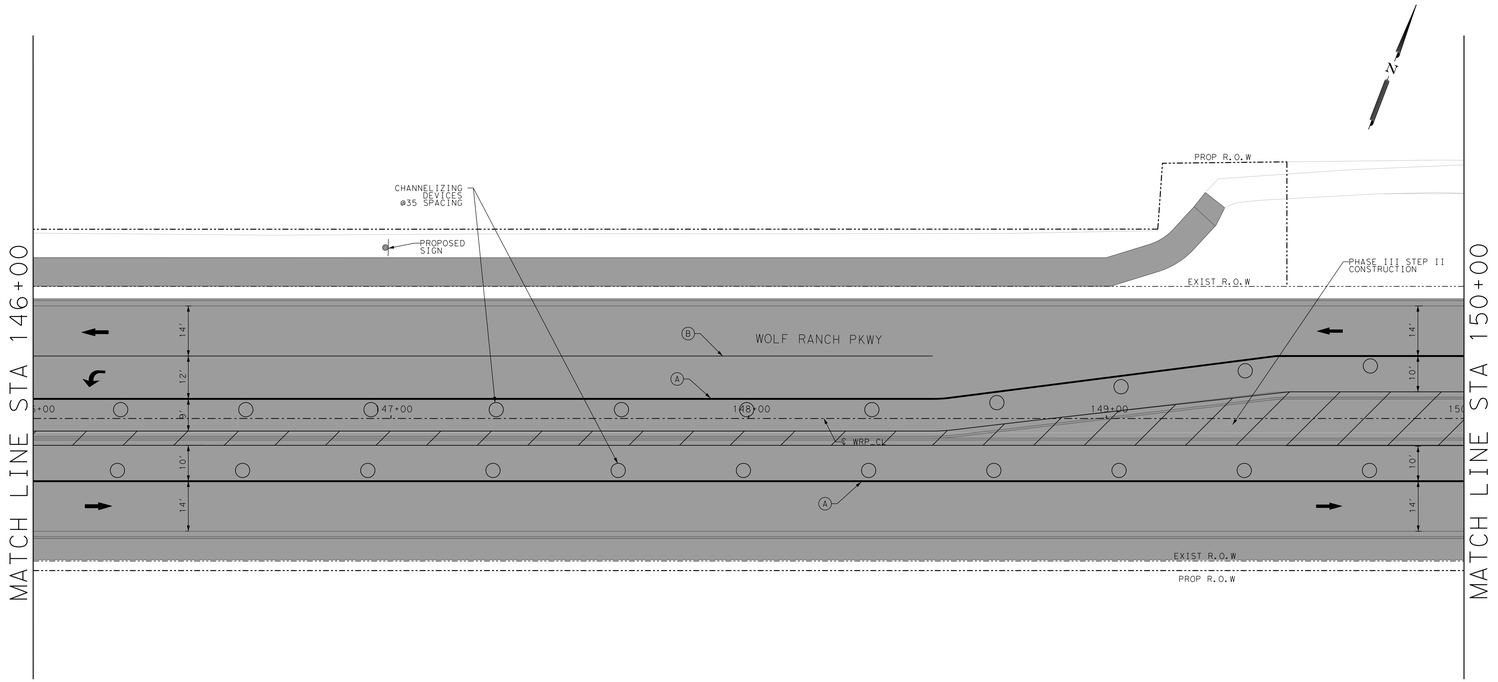
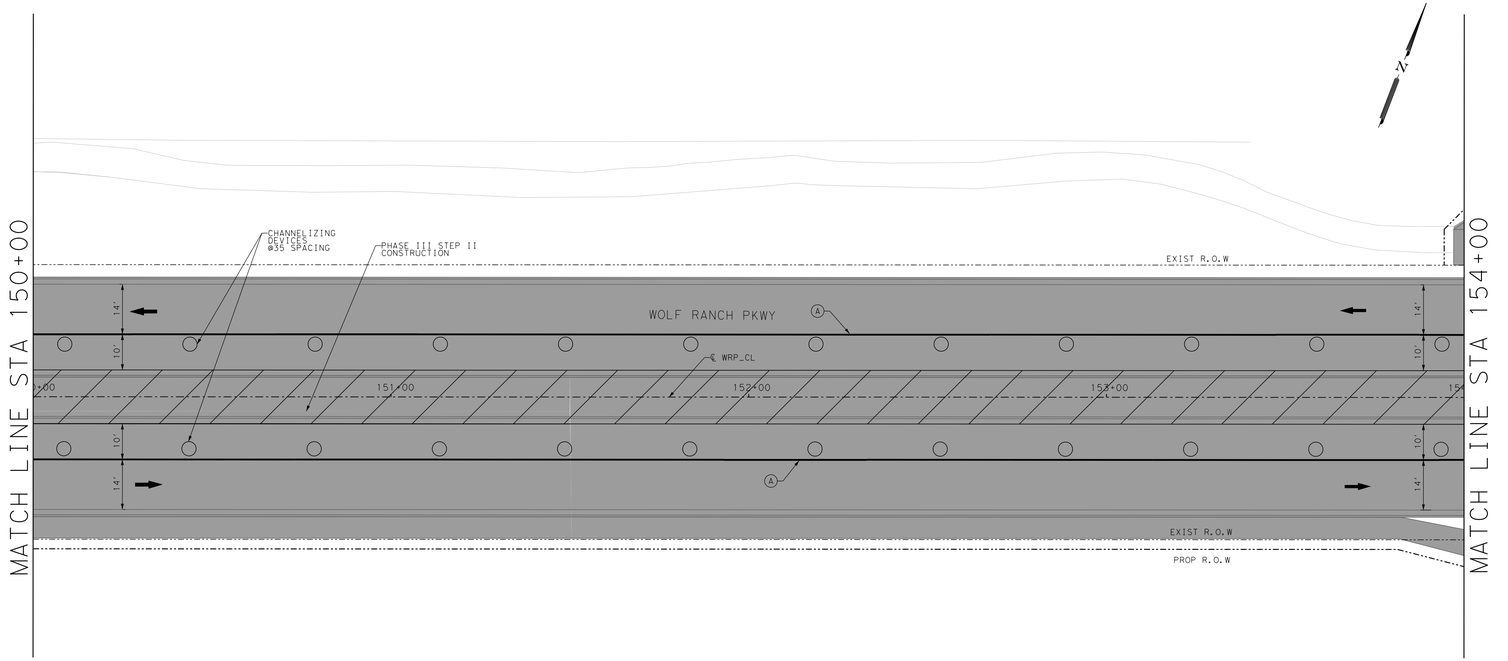
SHEET 5 OF 12
SHEET NO. 129





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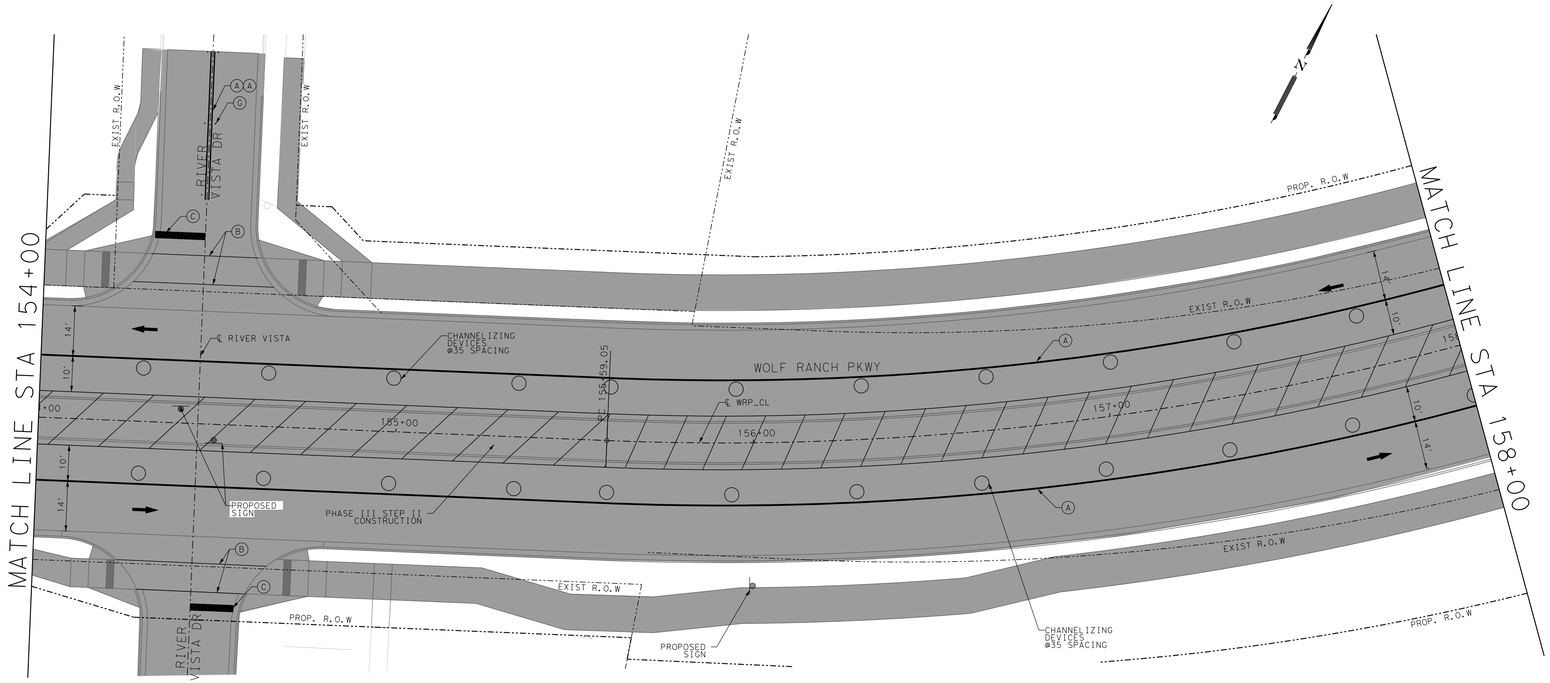

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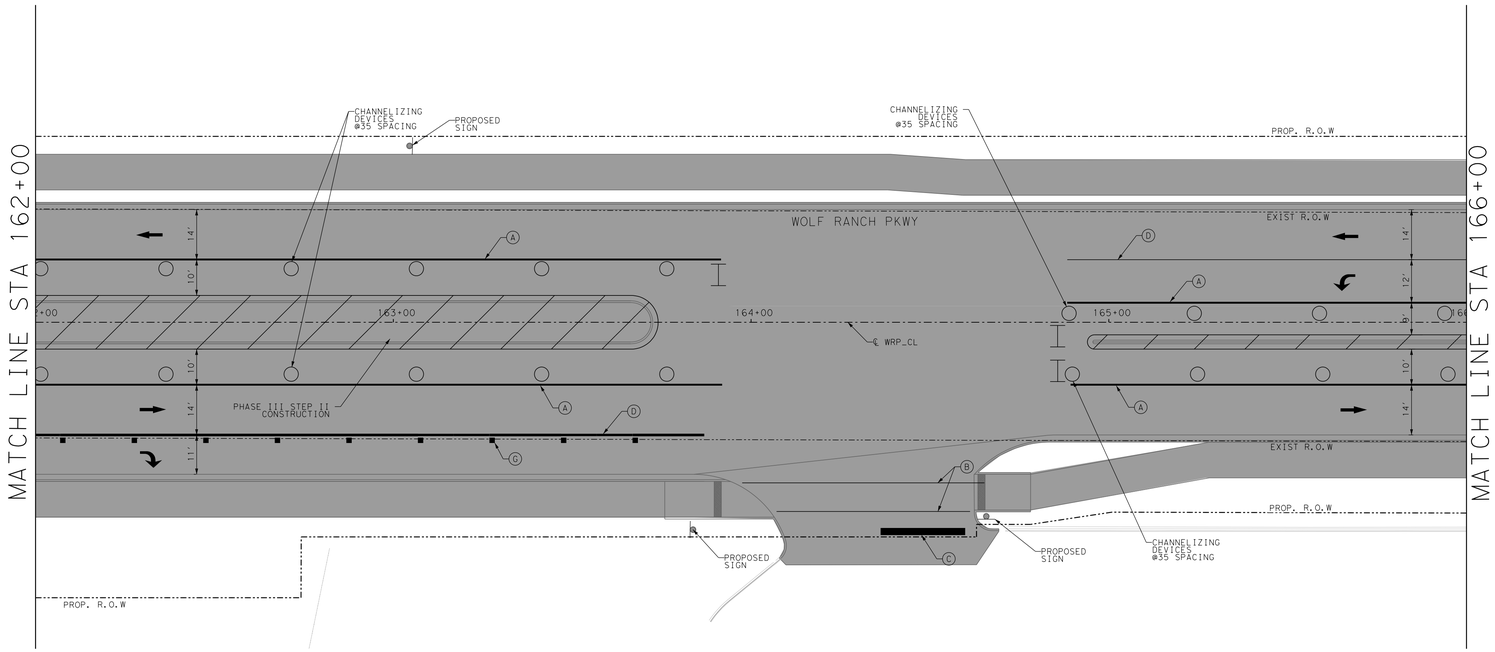

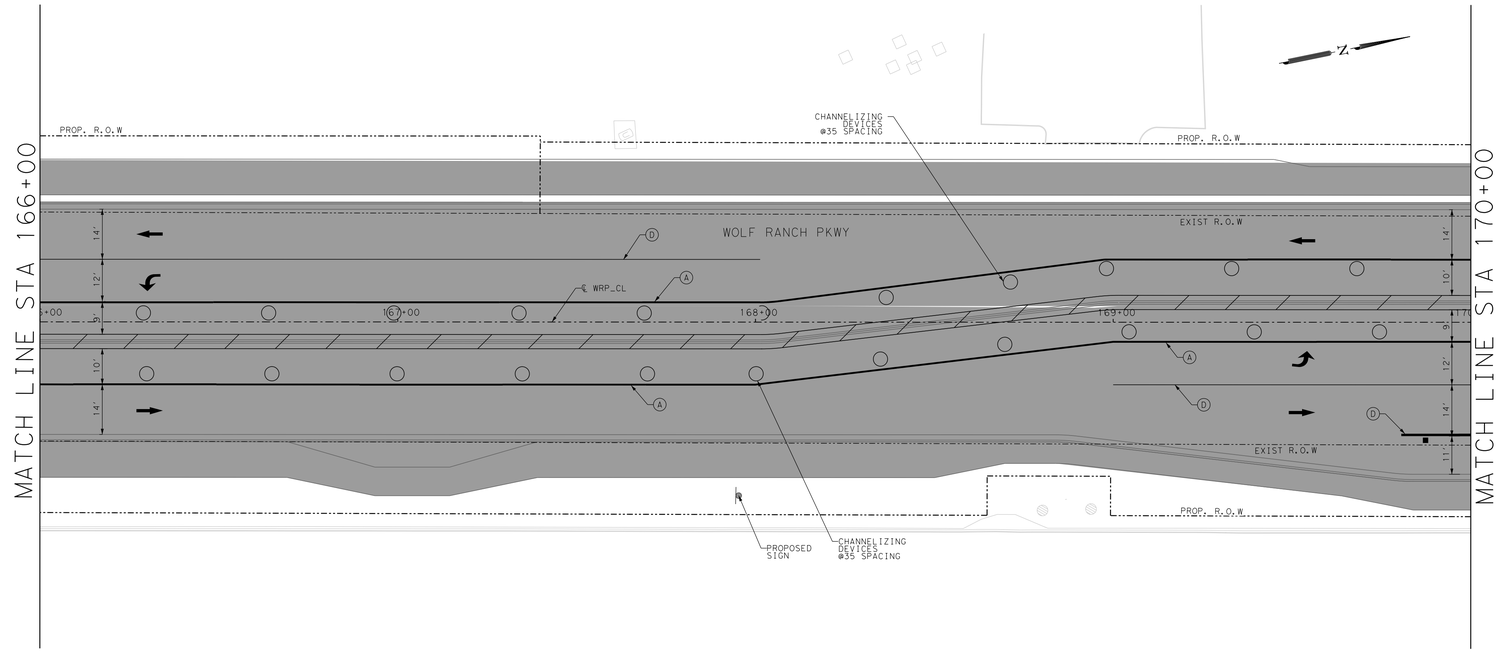

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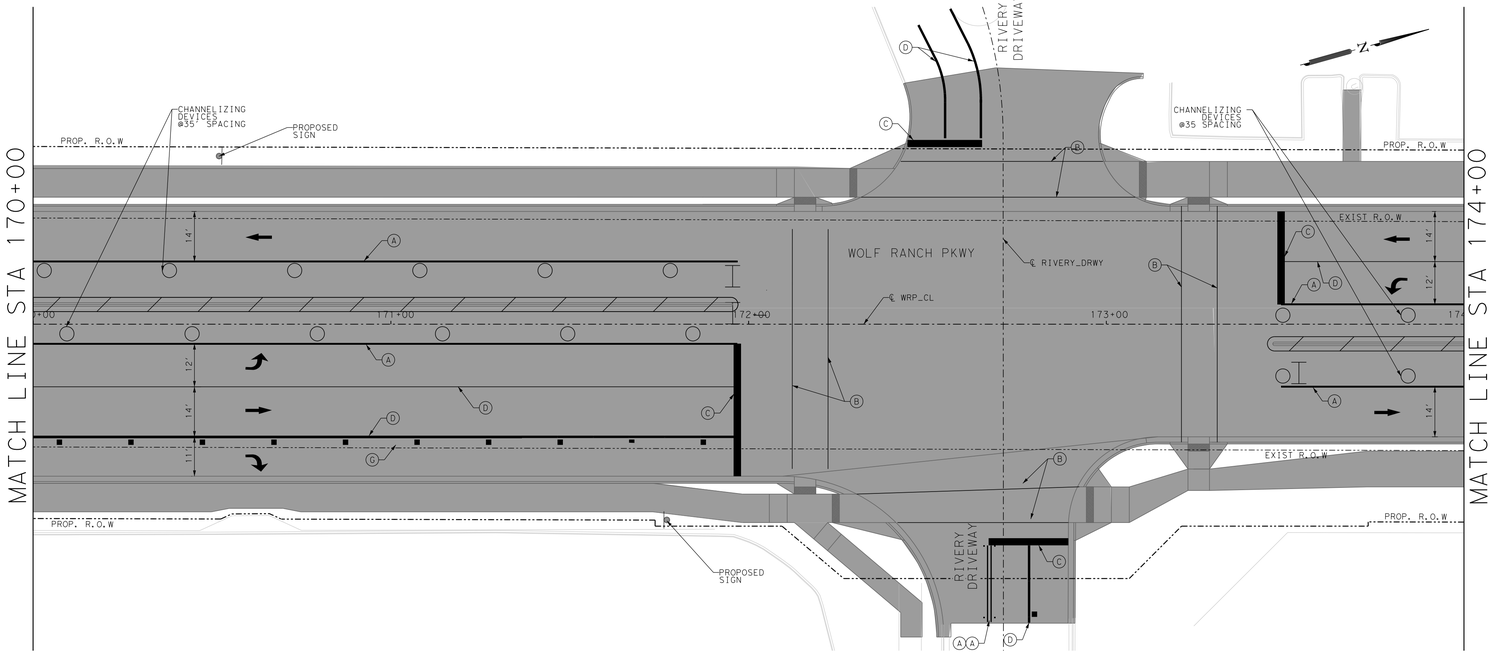

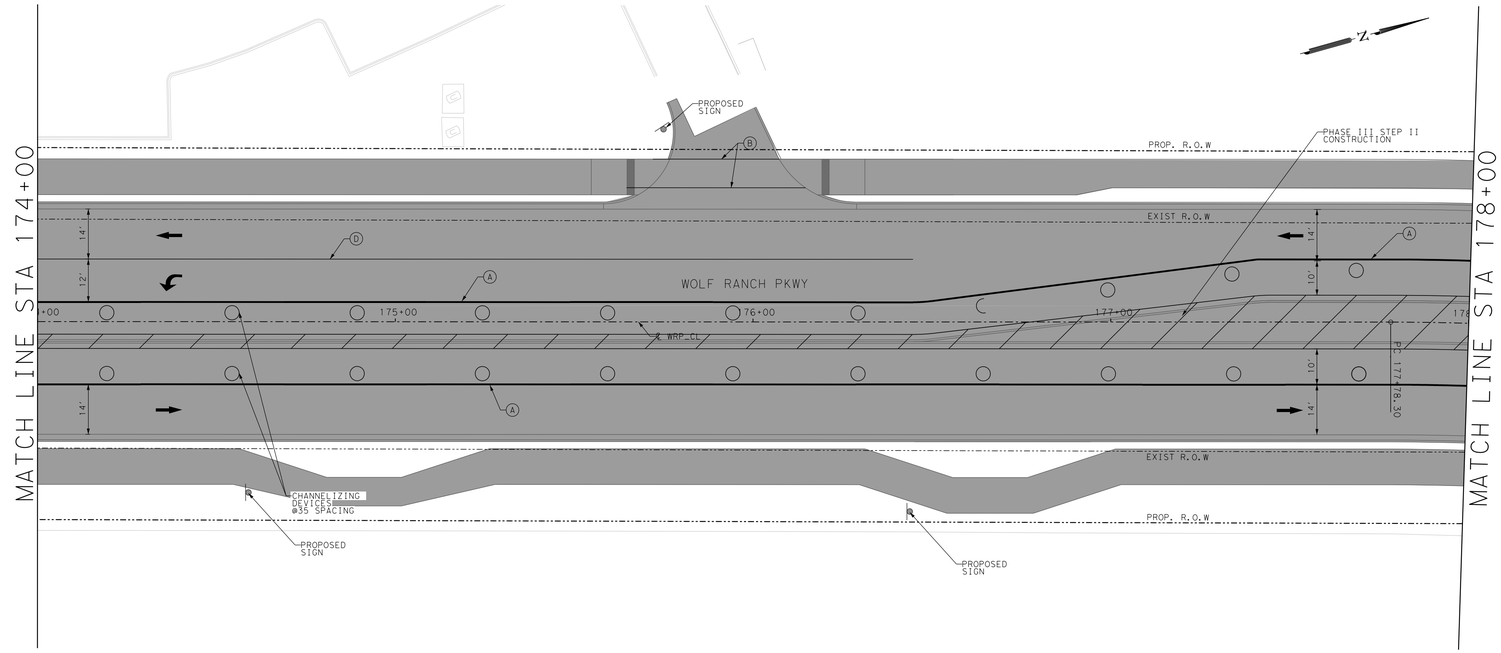

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SHEET 9 OF 12

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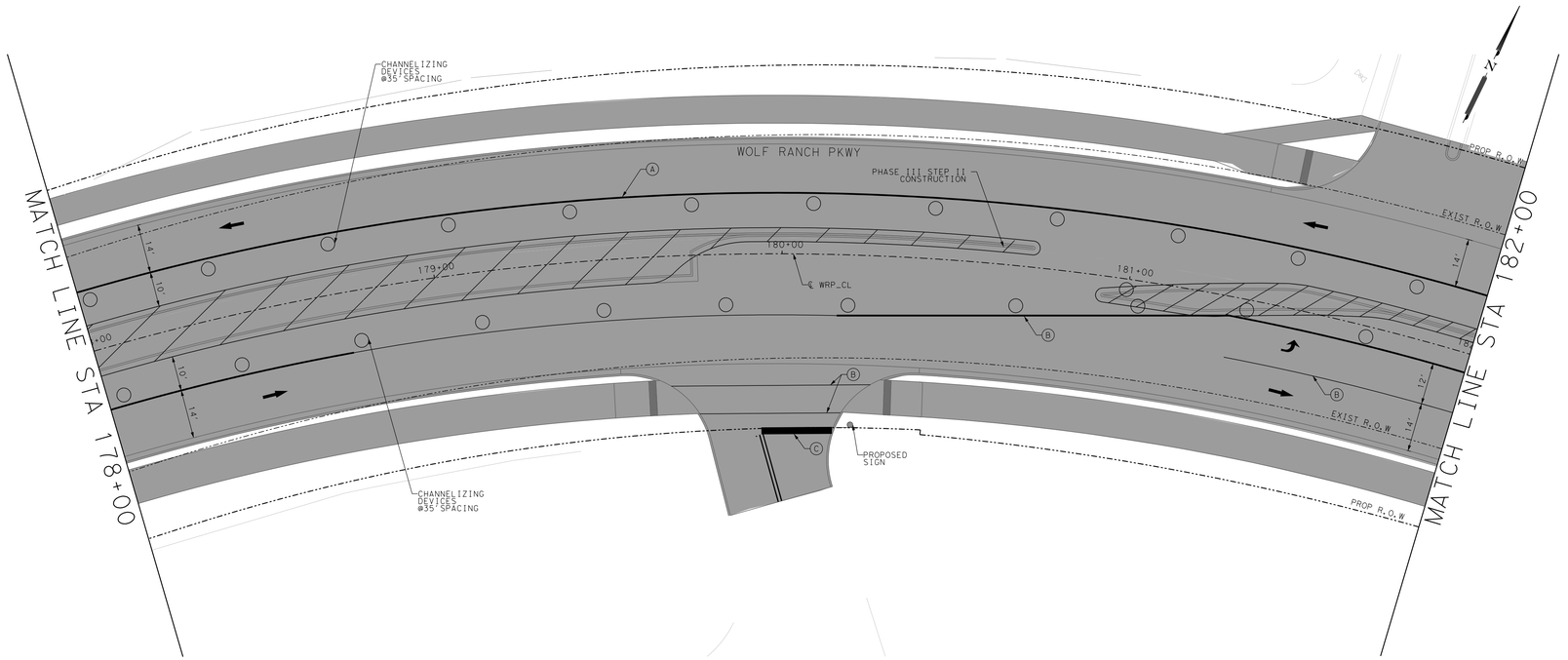

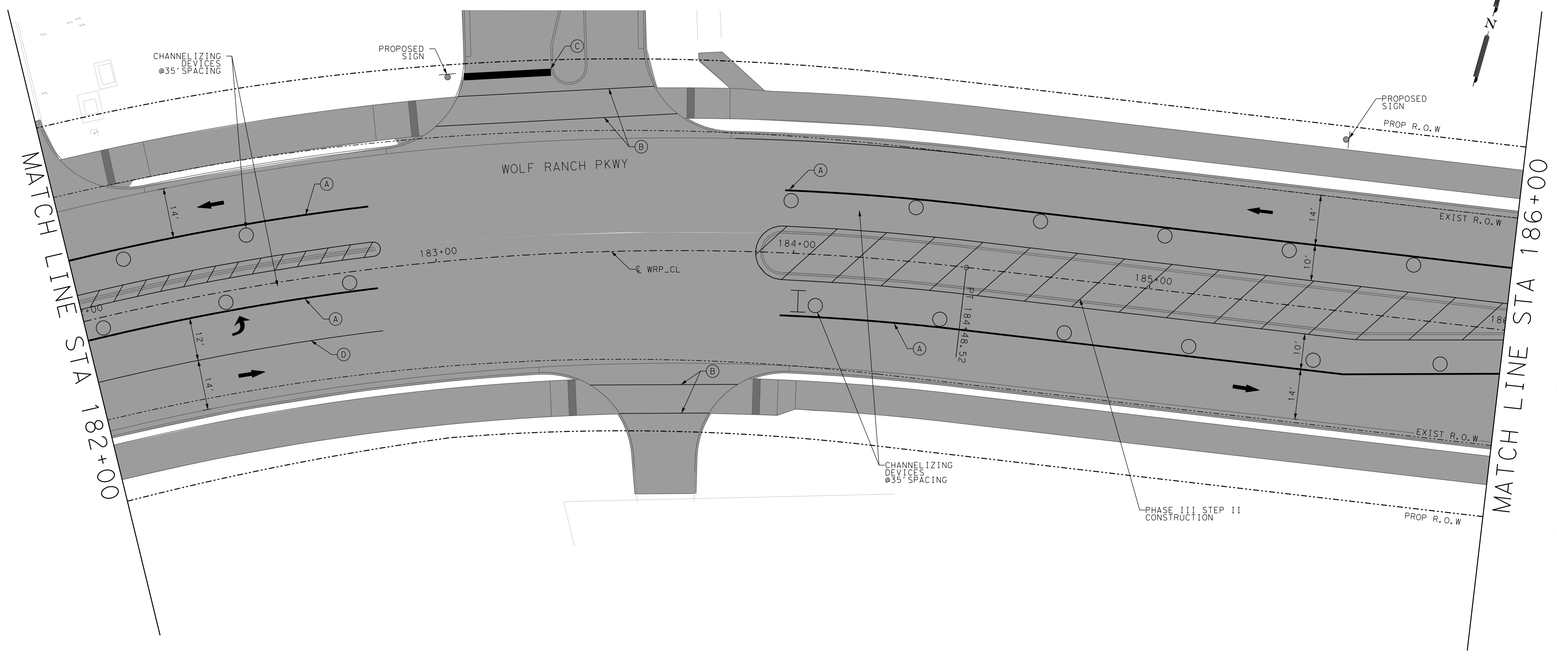

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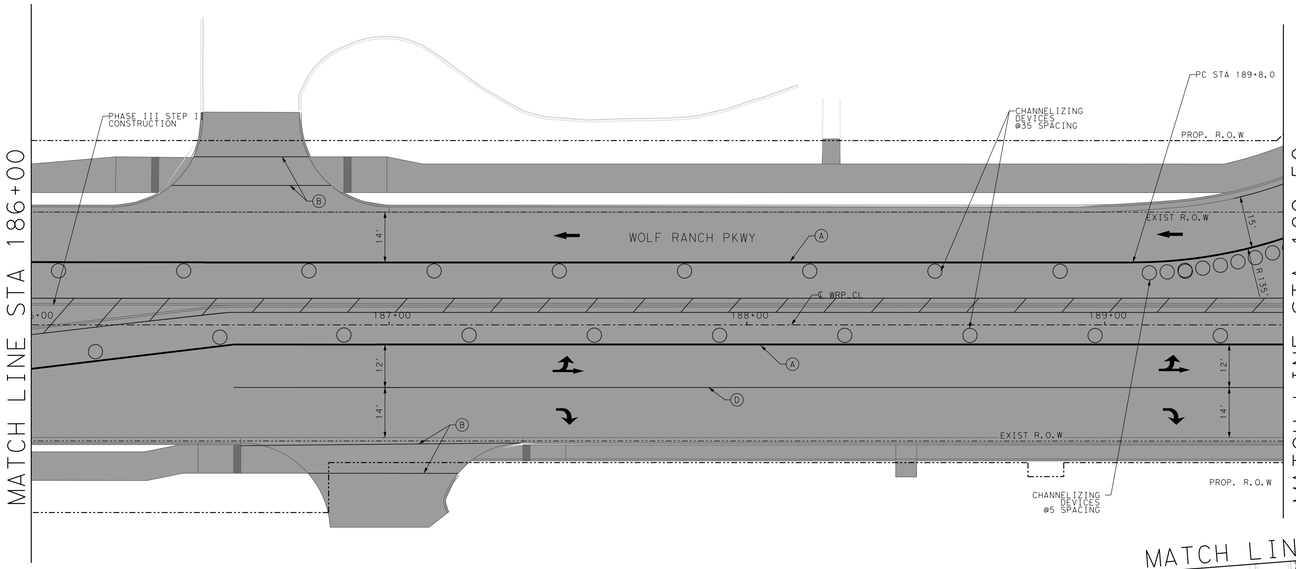
SHEET 10 OF 12

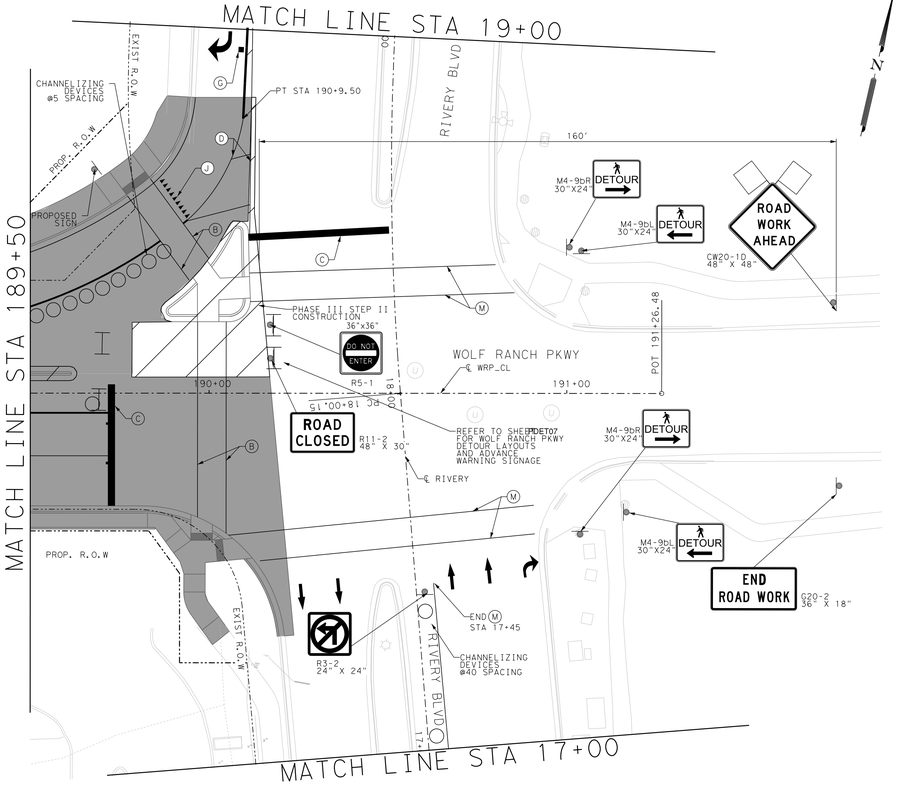
SHEET NO. 134



LEGEND

- PHASE III STEP II WORKZONE
- PAVEMENT CONSTRUCTED IN A PREVIOUS PHASE
- EXISTING ROW
- PROPOSED ROW
- EXISTING EASEMENT
- CHANNELING DEVICES
- VERTICAL PANELS
- SIGN
- TRAFFIC FLOW ARROWS

(A) WK ZN PAV MRK NON-REMOVE (Y)6" (SLD)
(B) WK ZN PAV MRK NON-REMOVE (W)6" (SLD)
(C) WK ZN PAV MRK NON-REMOVE (W)24" (SLD)
(D) WK ZN PAV MRK NON-REMOVE (W)8" (SLD)
(E) WK ZN PAV MRK NON-REMOVE (W)8" (BRK)
(F) WK ZN PAV MRK NON-REMOVE (W)8" (DOT)
(G) WK ZN PAV MRK NON-REMOVE REFL TY II-C-R
(H) WK ZN PAV MRK NON-REMOVE (W) (ARROW)
(I) WK ZN PAV MRK NON-REMOVE (W) (WORD)
(J) WK ZN PAV MRK NON-REMOVE (W) (YLD TRI)
(M) WK ZN PAV MRK NON-REMOVE (W)6" (SLD)



SCALE: 1"= 20'

0' 20' 40' 60'

NOTES:

1. FOR ADDITIONAL DETAILS SEE TxDOT TCP STANDARD SHEETS.
2. EXISTING FEATURES ARE SHOWN SCREENED BACK.
3. EXISTING PAVEMENT MARKING CONFLICTING WITH WORK ZONE PAVEMENT MARKINGS SHALL BE REMOVED.
4. CONTRACTOR TO MAINTAIN ACCESS TO DRIVEWAYS AT ALL TIMES THROUGHOUT CONSTRUCTION.
5. REFER TO DETOUR LAYOUTS FOR MEMORIAL DR ACCESS DURING CLOSURES.
6. REFER TO ADVANCE WARNING SIGN LAYOUT SHEET FOR ADDITIONAL ADVANCE WARNING SIGNS
7. ALL SIGN LOCATIONS ARE APPROXIMATE, CONTRACTOR TO VERIFY EXACT LOCATIONS IN THE FIELD
8. TEMPORARY ACCESSIBLE PEDESTRIAN ROUTES PROVIDED ARE SUGGESTIONS FOR THE CONTRACTOR. ACTUAL TEMPORARY PEDESTRIAN ROUTES ARE TO BE DETERMINED IN THE FIELD BY THE CONTRACTOR WITH PEDESTRIAN SAFETY IN MIND AND APPROVED BY THE ENGINEER. ANY VERTICAL DIFFERENCES GREATER THAN 1" SHALL REQUIRE A TEMPORARY ASPHALT RAMP WITH A MAX GRADE OF 5%. THIS ITEM IS SUBSIDIARY TO OTHER ITEMS OF WORK.

DESIGN

STATE OF TEXAS · BRET CHAPMAN · 127293 · LICENSED · PROFESSIONAL ENGINEER

BRET CHAPMAN, P.E. — 9/16/2025 DATE

APPROVAL

STATE OF TEXAS · BRIAN A. ALLEN · 123374 · LICENSED · PROFESSIONAL ENGINEER

BRIAN A. ALLEN, P.E. — 9/16/2025 DATE

NO.	REVISION	DATE

GEORGETOWN TEXAS *more than welcome*

PAPE-DAWSON ENGINEERS

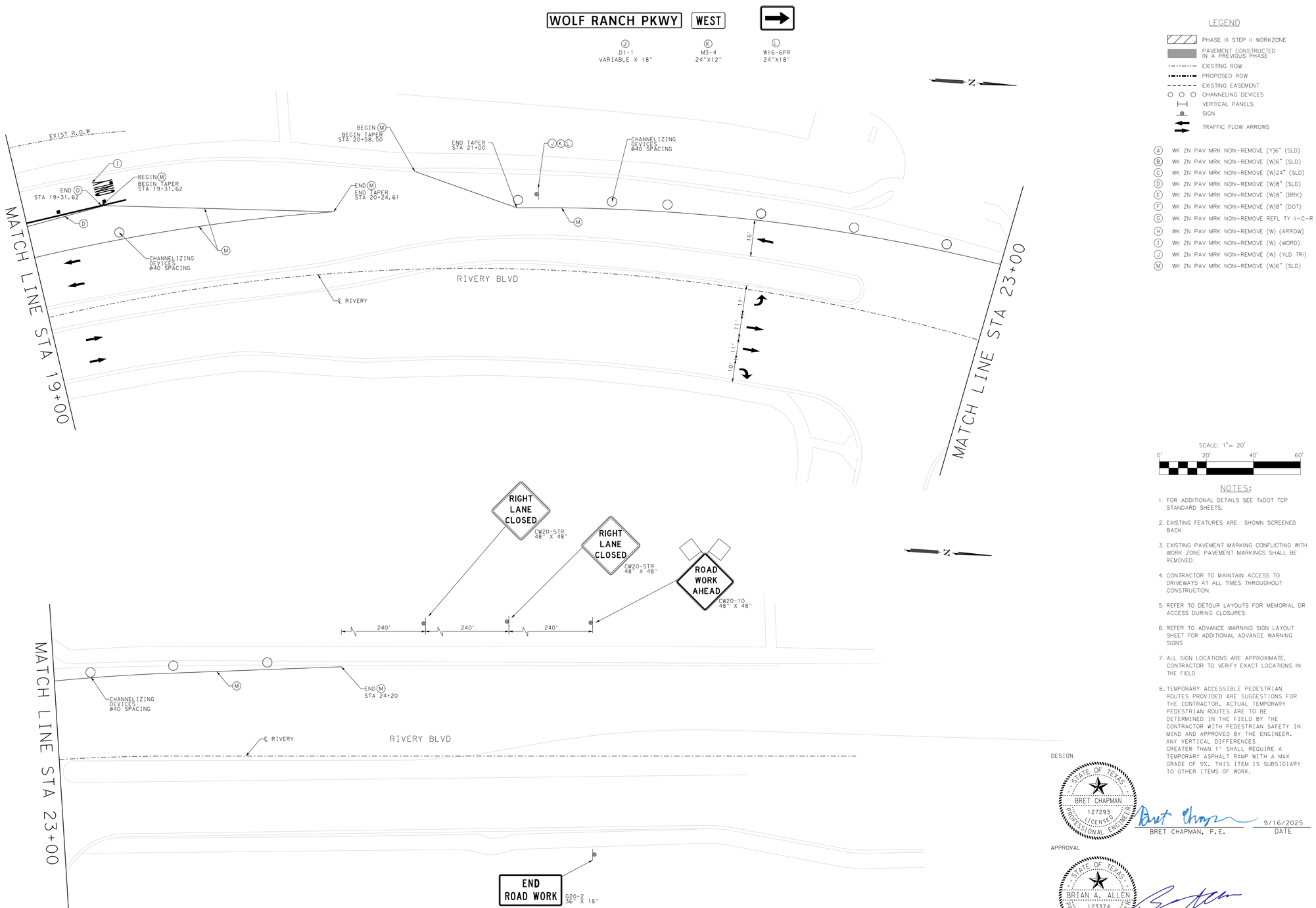
AUSTIN I SAN ANTONIO I HOUSTON I FORT WORTH I DALLAS
10801 N MOPAC EXPY, BLDG 3, STE 200 I AUSTIN, TX 78759 I 512.454.8711
TEXAS ENGINEERING FIRM #470 I TEXAS SURVEYING FIRM #10028800

WOLF RANCH PKWY / MEMORIAL DR
TCP PHASE III STEP II

CITY JOB No.
JOB NO. 51423-04
DATE 9/16/2025
DESIGNER
CHECKED DRAWN

SHEET 11 OF 12

SHEET NO. 135



LEGEND

- PHASE III STEP II WORKZONE
- PAVEMENT CONSTRUCTED IN A PREVIOUS PHASE
- EXISTING ROW
- PROPOSED ROW
- EXISTING EASEMENT
- CHANNELING DEVICES
- VERTICAL PANELS
- SIGN
- TRAFFIC FLOW ARROWS

(A) WK ZN PAV MRK NON-REMOVE (Y)6" (SLD)
(B) WK ZN PAV MRK NON-REMOVE (W)6" (SLD)
(C) WK ZN PAV MRK NON-REMOVE (W)24" (SLD)
(D) WK ZN PAV MRK NON-REMOVE (W)8" (SLD)
(E) WK ZN PAV MRK NON-REMOVE (W)8" (BRK)
(F) WK ZN PAV MRK NON-REMOVE (W)8" (DOT)
(G) WK ZN PAV MRK NON-REMOVE REFL TY II-C-R
(H) WK ZN PAV MRK NON-REMOVE (W) (ARROW)
(I) WK ZN PAV MRK NON-REMOVE (W) (WORD)
(J) WK ZN PAV MRK NON-REMOVE (W) (YLD TRI)
(M) WK ZN PAV MRK NON-REMOVE (W)6" (SLD)

SCALE: 1"= 20'
0' 20' 40' 60'

NOTES:

1. FOR ADDITIONAL DETAILS SEE TxDOT TCP STANDARD SHEETS.
2. EXISTING FEATURES ARE SHOWN SCREENED BACK.
3. EXISTING PAVEMENT MARKING CONFLICTING WITH WORK ZONE PAVEMENT MARKINGS SHALL BE REMOVED.
4. CONTRACTOR TO MAINTAIN ACCESS TO DRIVEWAYS AT ALL TIMES THROUGHOUT CONSTRUCTION.
5. REFER TO DETOUR LAYOUTS FOR MEMORIAL DR ACCESS DURING CLOSURES.
6. REFER TO ADVANCE WARNING SIGN LAYOUT SHEET FOR ADDITIONAL ADVANCE WARNING SIGNS
7. ALL SIGN LOCATIONS ARE APPROXIMATE. CONTRACTOR TO VERIFY EXACT LOCATIONS IN THE FIELD
8. TEMPORARY ACCESSIBLE PEDESTRIAN ROUTES PROVIDED ARE SUGGESTIONS FOR THE CONTRACTOR. ACTUAL TEMPORARY PEDESTRIAN ROUTES ARE TO BE DETERMINED IN THE FIELD BY THE CONTRACTOR WITH PEDESTRIAN SAFETY IN MIND AND APPROVED BY THE ENGINEER. ANY VERTICAL DIFFERENCES GREATER THAN 1" SHALL REQUIRE A TEMPORARY ASPHALT RAMP WITH A MAX GRADE OF 5%. THIS ITEM IS SUBSIDIARY TO OTHER ITEMS OF WORK.

DESIGN

STATE OF TEXAS
BRET CHAPMAN
127293
LICENSED
PROFESSIONAL ENGINEER

BRET CHAPMAN, P.E. — 9/16/2025 DATE

APPROVAL

STATE OF TEXAS
BRIAN A. ALLEN
123374
LICENSED
PROFESSIONAL ENGINEER

BRIAN A. ALLEN, P.E. — 9/16/2025 DATE

NO.	REVISION	DATE

GEORGETOWN TEXAS
more than welcome

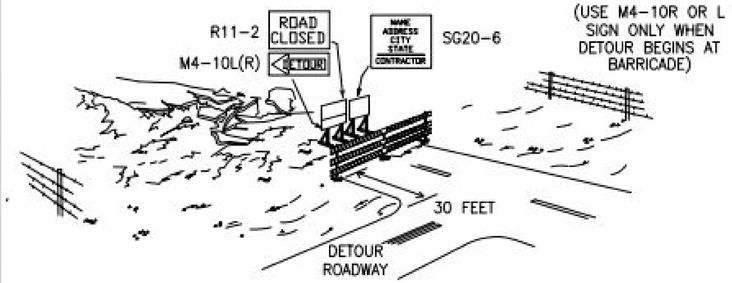
PAPE-DAWSON ENGINEERS
AUSTIN | SAN ANTONIO | HOUSTON | FORT WORTH | DALLAS
10801 N MOPAC EXPY, BLDG 3, STE 200 | AUSTIN, TX 78759 | 512.454.8711
TEXAS ENGINEERING FIRM #470 | TEXAS SURVEYING FIRM #10028800

WOLF RANCH PKWY / MEMORIAL DR
TCP PHASE III STEP II

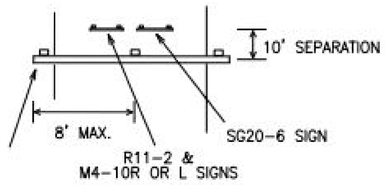
CITY JOB No.
JOB NO. 51423-04
DATE 9/16/2025
DESIGNER
CHECKED DRAWN

SHEET 12 OF 12
SHEET NO. 136

EACH ROADWAY OF DIVIDED HIGHWAY
SHALL BE BARRICADED, IN THE SAME MANNER.



PERSPECTIVE VIEW

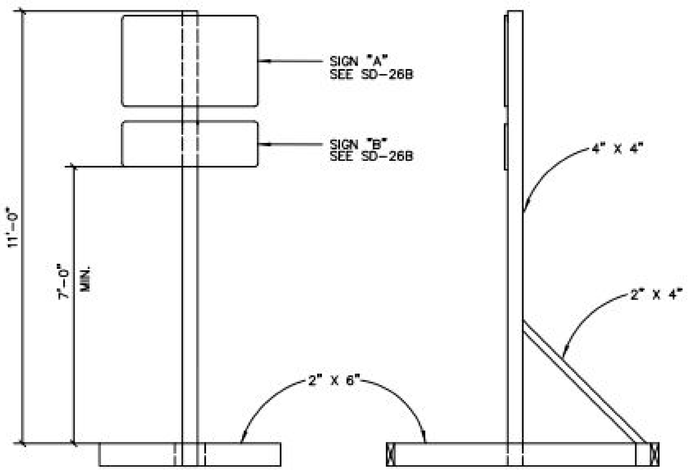


PLAN VIEW

1). R11-2 AND M4-10 SIGNS SHOULD BE MOUNTED ON INDEPENDENT SUPPORTS AT 7' MOUNTING HEIGHT IN CENTER OF ROADWAY.
2). ADVANCE SIGNING, INCLYDE CONSTRUCTION WARNING, SIGNS AND DETOUR SIGNING SHALL BE AS SPECIFIED ELSEWHERE IN THE PLANS.
3). THE THREE RAILS ON TYPE III BARRICADES SHALL BE REFLECTIVE ORANGE AND REFLECTIVE WHITE STRIPES ON ONE SIDE FACING ONE-WAY TRAFFIC AND BOTH SIDES FOR TWO-WAY TRAFFIC.
4). BARRICADE STRIPING SHOULD SLANT DOWNWARD IN THE DIRECTON OF DETOUR.
5). ALL SIGNS TO BE IN CONFORMANCE WITH THE CURRENT EDITION OF THE TEXAS MANUAL OF UNIFORM TRAFFIC CONTROL DEVICES (TMUTCD).

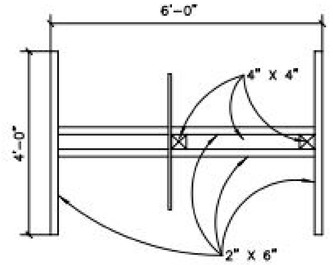
The Architect/Engineer assumes responsibility for appropriate use of this standard.

	CITY OF GEORGETOWN CONSTRUCTION STANDARDS AND DETAILS	REVISION NOTE: ADOPTED 6/21/2006
	TYPE III CONSTRUCTION BARRICADE	DRAWING NAME: SD22
		SCALE: NTS; DATE: 1/2003
		DESIGNED BY: MRS; APPROVED BY: TRB



FRONT VIEW

SIDE VIEW



TOP VIEW

NOTES:
1. ALL MATERIALS SHALL BE FURNISHED BY THE CONTRACTOR WITH THE EXCEPTION OF THE CITY OF GEORGETOWN G.U.S. LOGO WHICH WILL BE FURNISHED BY THE CITY.
2. ALL SIGNS TO BE IN CONFORMANCE WITH THE CURRENT EDITION OF THE TEXAS MANUAL OF UNIFORM TRAFFIC CONTROL DEVICES (TMUTCD).

The Architect/Engineer assumes responsibility for appropriate use of this standard.

	CITY OF GEORGETOWN CONSTRUCTION STANDARDS AND DETAILS	REVISION NOTE: ADOPTED 6/21/2006
	PROJECT SIGN TYPE II	DRAWING NAME: SD26
		SCALE: NTS; DATE: 1/2003
		DESIGNED BY: MRS; APPROVED BY: TRB

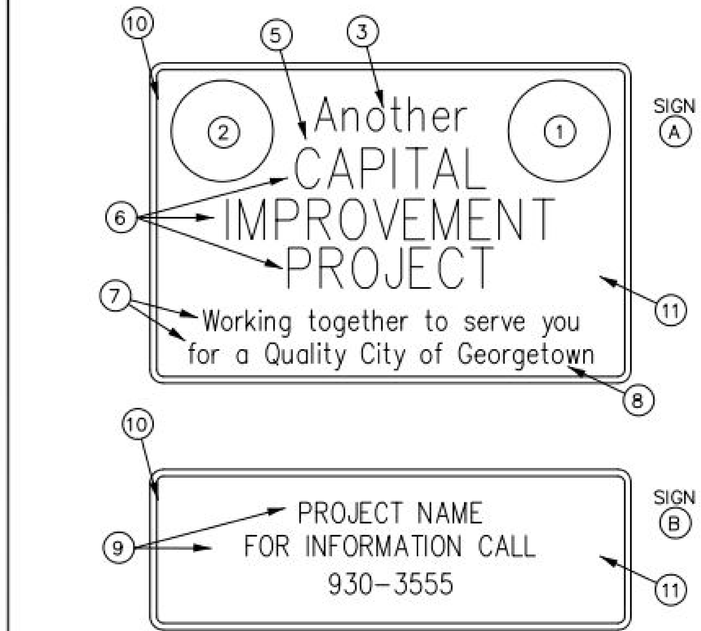
NO.	REVISION	DATE

PAPE-DAWSON ENGINEERS
AUSTIN | SAN ANTONIO | HOUSTON | FORT WORTH | DALLAS
10801 N MOPAC EXPY, BLDG 3, STE 200 | AUSTIN, TX 78759 | 512.454.8711
TEXAS ENGINEERING FIRM #470 | TEXAS SURVEYING FIRM #10023800

GEORGETOWN TEXAS
more than welcome

WOLF RANCH PKWY / MEMORIAL DR
TCP STANDARDS (GEORGETOWN)

CITY JOB No.
JOB NO. 51423-04
DATE 9/11/2025
DESIGNER
CHECKED DRAWN



NOTES:

1. CITY SEAL (FURNISHED BY THE CITY)
2. G.U.S. LOGO (FURNISHED BY THE CITY)
3. (1 3/4") BLUE LETTERS
4. (2 1/2") BLUE LETTERS
5. (1 1/4") SPACE
6. (3") BLUE LETTERS
7. (2") RED UPPER, (1 1/2") RED LOWER CASE LETTERS
8. (2") BLUE UPPER, (1 1/2") BLUE LOWER CASE LETTERS (City of Georgetown)
9. (10") LETTERS
10. (1 3/8") BLUE BORDER
11. REFLECTIVE SILVER SHEETING .080 ALUMINUM 2290, TRANSPARENT RED PAINT 712, BLUE PAINT 710, 3M CO. OR APPROVED EQUIVALENT.
12. REFER TO SHEET SD-26A

The Architect/Engineer assumes responsibility for appropriate use of this standard.

REVISION NOTE: ADOPTED 6/21/2006

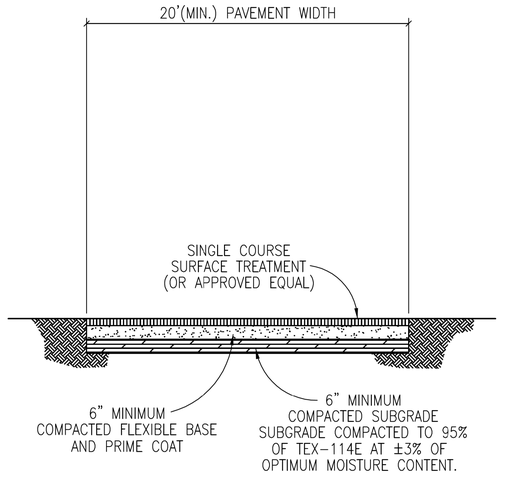
GEORGETOWN TEXAS Georgetown Utility Systems Your Community Owned Utility

CITY OF GEORGETOWN
CONSTRUCTION STANDARDS AND DETAILS

STANDARD STREET SIGN DETAIL II

DRAWING NAME: SD27

SCALE:	DATE:
NTS	1/2003
DRAWN BY:	APPROVED BY:
MRS	TRB



NOTES:

1. EVERY BUILDING CONSTRUCTED SHALL BE ACCESSIBLE TO EMERGENCY APPARATUS BY WAY OF TEMPORARY ALL WEATHER DRIVING SURFACES.
2. A TEMPORARY ALL WEATHER DRIVING SURFACE SHALL EXTEND TO WITHIN 150' OF ALL EXTERIOR PORTIONS OF BUILDINGS
3. TEMPORARY ALL WEATHER DRIVING SURFACES SHALL BE CONSTRUCTED AS SHOWN ON CONSTRUCTION PLANS AND IN ACCORDANCE WITH ITEM 316 SURFACE TREATMENTS OF THE TXDOT STANDARD SPECIFICATIONS FOR CONSTRUCTION OF HIGHWAYS, STREETS AND BRIDGES.
4. TEMPORARY ALL WEATHER DRIVING SURFACES SHALL BE CAPABLE OF SUPPORTING A DESIGN WHEEL LOAD OF 16,000 LB. (H-20 LOADING) IN ORDER TO SUPPORT A GROSS VEHICLE WEIGHT OF 80,000 LB. IF SUBGRADE CONDITIONS CHANGE OR ARE VERY UNSTABLE, AN ADDITIONAL GEOTECHNICAL AND/OR ENGINEERING DESIGN MAY REQUIRE A GREATER CROSS SECTION.
5. CONTRACTOR OR DEVELOPER SHALL MAINTAIN TEMPORARY ALL WEATHER DRIVING SURFACE THROUGHOUT CONSTRUCTION.
6. APPLICABLE SIGNAGE SHALL BE INSTALLED BY THE CONTRACTOR TO DISALLOW PARKING (NO PARKING – FIRE LANE).
7. TEMPORARY ALL WEATHER DRIVING SURFACES SHALL BE INSTALLED PRIOR TO THE ERECTION OF ANY STRUCTURAL FRAMING ABOVE THE FOUNDATION SLAB. CONTACT FIRE SERVICES FOR THE COORDINATION OF TEMPORARY ALL WEATHER DRIVING SURFACES FOR CONSTRUCTION.

The Architect/Engineer assumes responsibility for appropriate use of this standard.

REVISION NOTE: ADOPTED 6/21/2006

GEORGETOWN TEXAS Georgetown Utility Systems Your Community Owned Utility

CITY OF GEORGETOWN
CONSTRUCTION STANDARDS AND DETAILS

TEMPORARY ALL WEATHER DRIVING SURFACE

DRAWING NAME: SD43

SCALE:	DATE:
NTS	1/2003
DRAWN BY:	APPROVED BY:
MRS	TRB

NO.	REVISION	DATE

GEORGETOWN TEXAS *more than welcome*

PAPE-DAWSON ENGINEERS
AUSTIN I SAN ANTONIO I HOUSTON I FORT WORTH I DALLAS
10801 N MOPAC EXPY, BLDG 3, STE 200 I AUSTIN, TX 78759 I 512.454.8711
TEXAS ENGINEERING FIRM #470 I TEXAS SURVEYING FIRM #10023800

WOLF RANCH PKWY / MEMORIAL DR

TCP STANDARDS (GEORGETOWN)

CITY JOB No.
JOB NO. 51423-04
DATE 9/11/2025
DESIGNER
CHECKED DRAWN

Logo Usage Guidelines

The following guidelines illustrate the proper use of the Georgetown logo. These rules apply to all versions of the Georgetown logo, icon, and any department logos that utilize the logo elements.

GEORGETOWN TEXAS
more than welcome

Primary Logo (with Tagline)
The lockup of the logo with the tagline underneath is the preferred logo, and should be used in most circumstances.

Typefaces

Files have been provided in a variety of formats that allow use of the Georgetown logo without purchasing typefaces. The logo itself is considered a piece of artwork and should not be changed. However, if additional customizations are made to the logo, such as creating department logos, it will be necessary to purchase the appropriate license for the typeface.

PT Serif
Bold
Headline/Subhead Font

1 2 3 4 5 6 7 8 9 0
A B C D E F G H I J K L M N O P Q R S T U V W X Y Z
a b c d e f g h i j k l m n o p q r s t u v w x y z

Montserrat
Regular
Body Copy Font

1 2 3 4 5 6 7 8 9 0
A B C D E F G H I J K L M N O P Q R S T U V W X Y Z
a b c d e f g h i j k l m n o p q r s t u v w x y z

Color Palette

The color palette provides a guide for keeping a consistent color scheme within the brand. Consult the color palettes shown below and work closely with professional printing services to ensure proper colors are used.

Black (80%)
C0 M0 Y0 K80
R88 B89 G91
HEX: #58595B

Pantone 1788 C
C0 M93 Y82 K0
R238 B39 G55
HEX: #EE2737

The Architect/Engineer assumes responsibility for appropriate use of this standard.

REVISED ON: 06/2006

GEORGETOWN TEXAS more than welcome	CITY OF GEORGETOWN CONSTRUCTION STANDARDS AND DETAILS CAPITAL IMPROVEMENT PROJECT SIGN SIGN STANDARDS	DRAWING NAME: SD26 1 OF 7 SCALE: NTS · DATE: 1/2003 DRAWN BY: MRS · APPROVED BY: TRB



NOTES:
1. PRIMARY LOGO WITH TAGLINE
2. MONTSERRAT (REGULAR) 80% GREY
3. MONTSERRAT (REGULAR) 80% GREY
4. PT SERIF (ITALIC) WHITE
5. PT SERIF (REGULAR) WHITE
6. PT SERIF (REGULAR) 80% GREY
7. MONTSERRAT (REGULAR) 80% GREY
   a. PT SERIF (ITALIC) 80% GREY
8. MONTSERRAT (REGULAR) 80% GREY

The Architect/Engineer assumes responsibility for appropriate use of this standard.

REVISED ON: 06/2006

GEORGETOWN TEXAS more than welcome	CITY OF GEORGETOWN CONSTRUCTION STANDARDS AND DETAILS CAPITAL IMPROVEMENT PROJECT SIGN 4'x4' SIGN	DRAWING NAME: SD26 2 OF 7 SCALE: NTS · DATE: 1/2003 DRAWN BY: MRS · APPROVED BY: TRB

NO. | REVISION | DATE

GEORGETOWN TEXAS more than welcome

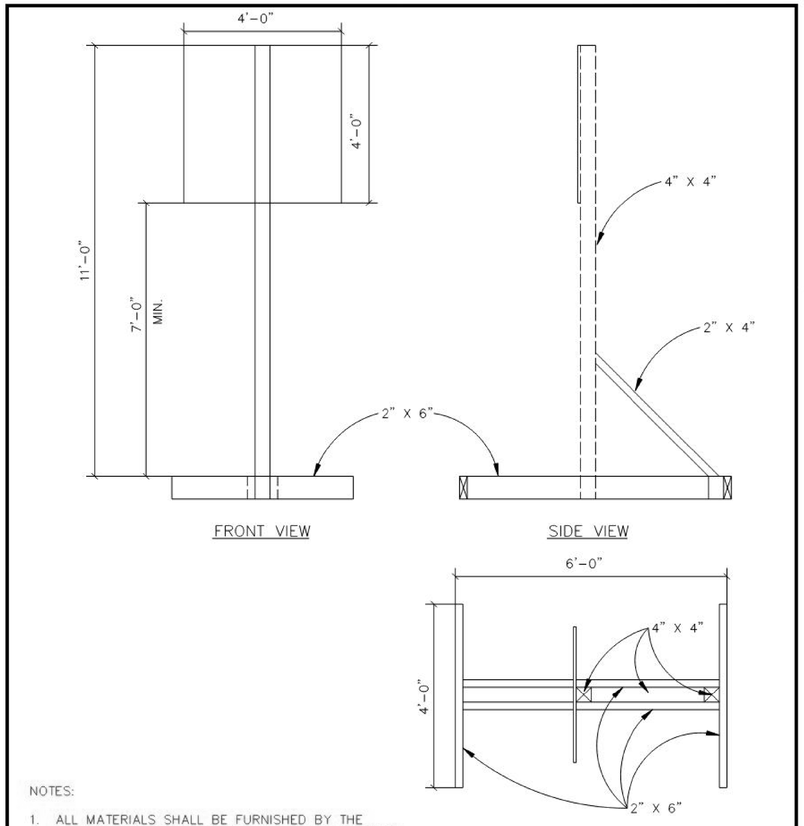
PAPE-DAWSON ENGINEERS
AUSTIN I SAN ANTONIO I HOUSTON I FORT WORTH I DALLAS
10801 N MOPAC EXPY, BLDG 3, STE 200 I AUSTIN, TX 78759 I 512.454.8711
TEXAS ENGINEERING FIRM #470 I TEXAS SURVEYING FIRM #10023800

WOLF RANCH PKWY / MEMORIAL DR

TCP STANDARDS (GEORGETOWN)

CITY JOB No.
JOB NO. 51423-04
DATE 9/11/2025
DESIGNER
CHECKED DRAWN

SHEET NO. 139



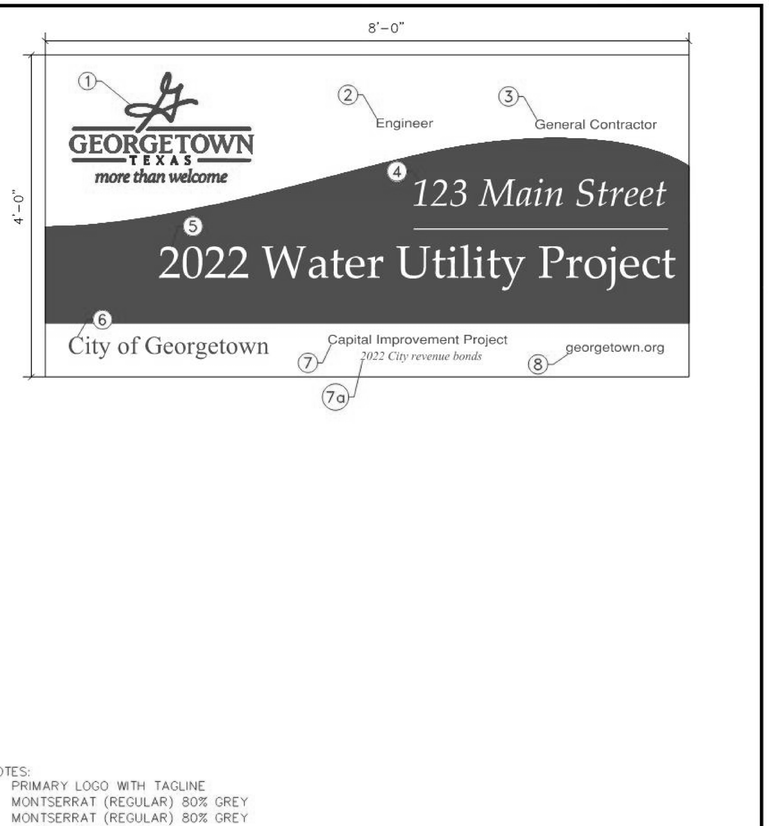
NOTES:

1. ALL MATERIALS SHALL BE FURNISHED BY THE CONTRACTOR WITH THE EXCEPTION OF THE CITY OF GEORGETOWN G.U.S. LOGO WHICH WILL BE FURNISHED BY THE CITY.
2. ALL SIGNS TO BE IN CONFORMANCE WITH THE CURRENT EDITION OF THE TEXAS MANUAL OF UNIFORM TRAFFIC CONTROL DEVICES (TMUTCD).

The Architect/Engineer assumes responsibility for appropriate use of this standard.

REVISED ON: 06/2006

GEORGETOWN TEXAS more than welcome	CITY OF GEORGETOWN CONSTRUCTION STANDARDS AND DETAILS CAPITAL IMPROVEMENT PROJECT SIGN 4'x4' SIGN BASE	DRAWING NAME: SD26 3 OF 7 SCALE: NTS · DATE: 1/2003 DRAWN BY: MRS · APPROVED BY: TRB



NOTES:

1. PRIMARY LOGO WITH TAGLINE
2. MONTSERRAT (REGULAR) 80% GREY
3. MONTSERRAT (REGULAR) 80% GREY
4. PT SERIF (ITALIC) WHITE
5. PT SERIF (REGULAR) WHITE
6. PT SERIF (REGULAR) 80% GREY
7. MONTSERRAT (REGULAR) 80% GREY
   a. PT SERIF (ITALIC) 80% GREY
8. MONTSERRAT (REGULAR) 80% GREY

The Architect/Engineer assumes responsibility for appropriate use of this standard.

REVISED ON: 06/2006

GEORGETOWN TEXAS more than welcome	CITY OF GEORGETOWN CONSTRUCTION STANDARDS AND DETAILS CAPITAL IMPROVEMENT PROJECT SIGN 4'x8' SIGN	DRAWING NAME: SD26 4 OF 7 SCALE: NTS · DATE: 1/2003 DRAWN BY: MRS · APPROVED BY: TRB

NO.	REVISION	DATE

GEORGETOWN TEXAS more than welcome

PAPE-DAWSON ENGINEERS
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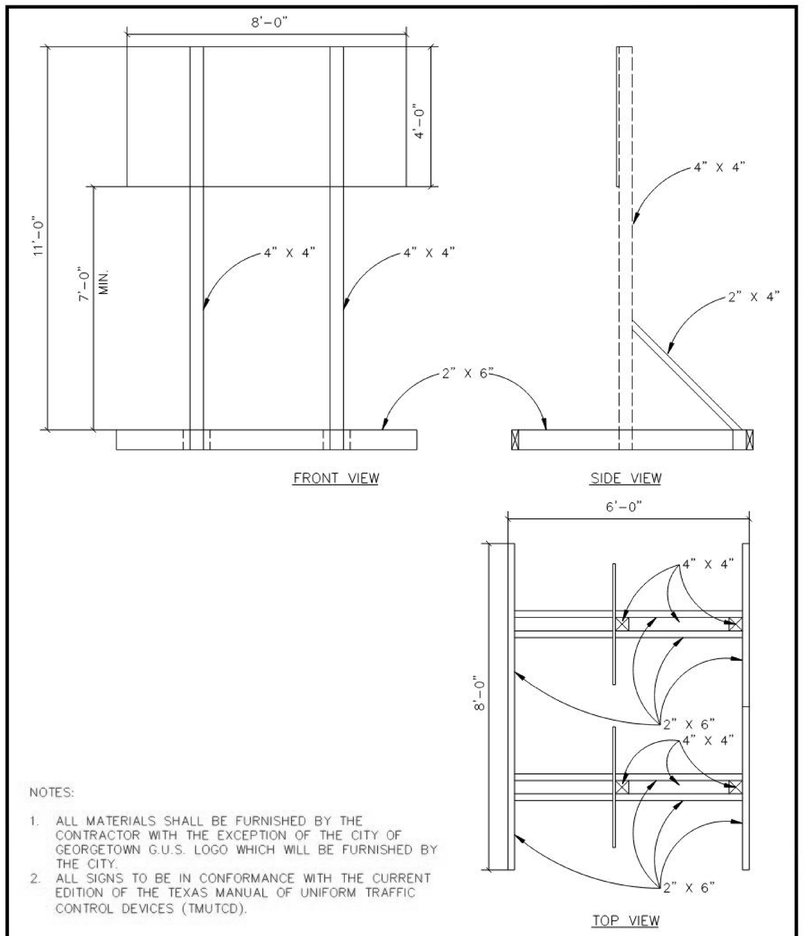
TEXAS ENGINEERING FIRM #470 | TEXAS SURVEYING FIRM #10028800

WOLF RANCH PKWY / MEMORIAL DR

TCP STANDARDS (GEORGETOWN)

CITY JOB No.
JOB NO. 51423-04
DATE 9/11/2025
DESIGNER
CHECKED DRAWN



NOTES:

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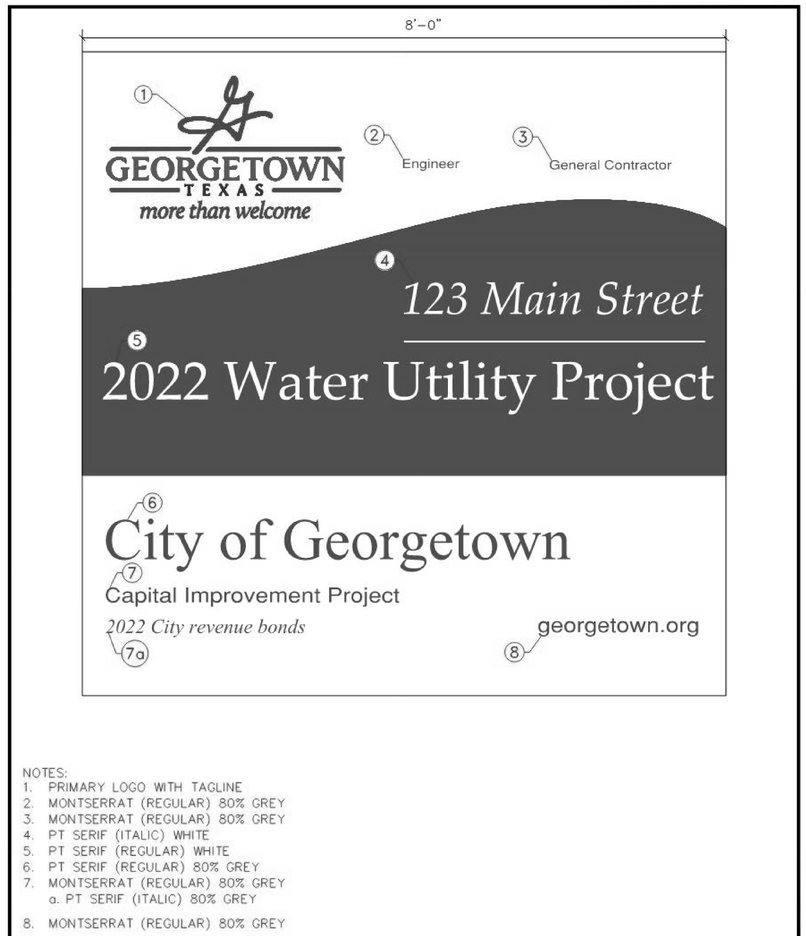
The Architect/Engineer assumes responsibility for appropriate use of this standard.

REVISED ON: 06/2006

GEORGETOWN TEXAS more than welcome	CITY OF GEORGETOWN CONSTRUCTION STANDARDS AND DETAILS CAPITAL IMPROVEMENT PROJECT SIGN 4'x8' SIGN BASE	DRAWING NAME: SD26 5 OF 7 SCALE: NTS · DATE: 1/2003 DRAWN BY: MRS · APPROVED BY: TRB



NOTES:
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3. MONTSERRAT (REGULAR) 80% GREY
4. PT SERIF (ITALIC) WHITE
5. PT SERIF (REGULAR) WHITE
6. PT SERIF (REGULAR) 80% GREY
7. MONTSERRAT (REGULAR) 80% GREY
   a. PT SERIF (ITALIC) 80% GREY
8. MONTSERRAT (REGULAR) 80% GREY

The Architect/Engineer assumes responsibility for appropriate use of this standard.

REVISED ON: 06/2006

GEORGETOWN TEXAS more than welcome	CITY OF GEORGETOWN CONSTRUCTION STANDARDS AND DETAILS CAPITAL IMPROVEMENT PROJECT SIGN 8'x8' SIGN	DRAWING NAME: SD26 6 OF 7 SCALE: NTS · DATE: 1/2003 DRAWN BY: MRS · APPROVED BY: TRB

NO.	REVISION	DATE

GEORGETOWN TEXAS more than welcome

PAPE-DAWSON ENGINEERS
AUSTIN I SAN ANTONIO I HOUSTON I FORT WORTH I DALLAS
10801 N MOPAC EXPY, BLDG 3, STE 200 I AUSTIN, TX 78759 I 512.454.8711
TEXAS ENGINEERING FIRM #470 I TEXAS SURVEYING FIRM #10023800

WOLF RANCH PKWY / MEMORIAL DR

TCP STANDARDS (GEORGETOWN)

CITY JOB No.
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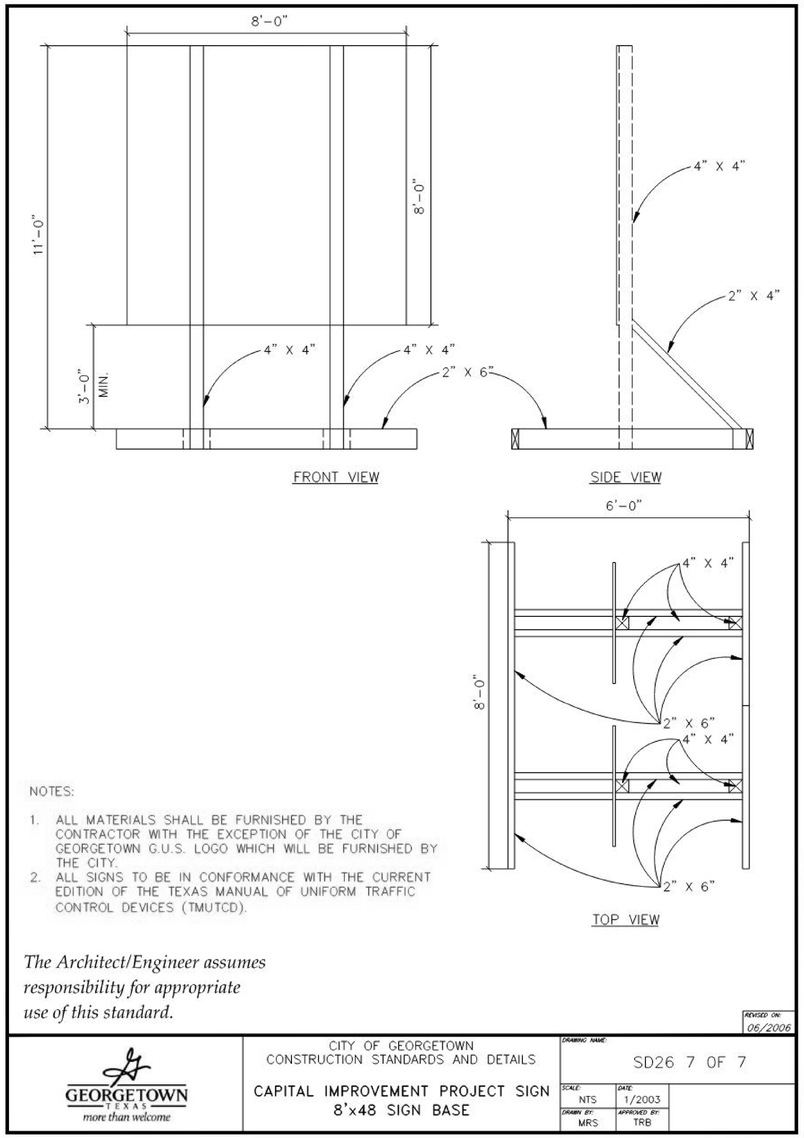
DATE 9/11/2025
DESIGNER
CHECKED DRAWN



NOTES:

1. ALL MATERIALS SHALL BE FURNISHED BY THE CONTRACTOR WITH THE EXCEPTION OF THE CITY OF GEORGETOWN G.U.S. LOGO WHICH WILL BE FURNISHED BY THE CITY.
2. ALL SIGNS TO BE IN CONFORMANCE WITH THE CURRENT EDITION OF THE TEXAS MANUAL OF UNIFORM TRAFFIC CONTROL DEVICES (TMUTCD).

The Architect/Engineer assumes responsibility for appropriate use of this standard.

REVISED ON: 06/2006

GEORGETOWN TEXAS *more than welcome*

CITY OF GEORGETOWN
CONSTRUCTION STANDARDS AND DETAILS

CAPITAL IMPROVEMENT PROJECT SIGN
8'x48 SIGN BASE

DRAWING NAME: SD26 7 OF 7

SCALE: NTS | DATE: 1/2003

DRAWN BY: MRS | APPROVED BY: TRB

NO.	REVISION	DATE

GEORGETOWN TEXAS *more than welcome*

PAPE-DAWSON ENGINEERS

AUSTIN I SAN ANTONIO I HOUSTON I FORT WORTH I DALLAS
10801 N MOPAC EXPY, BLDG 3, STE 200 I AUSTIN, TX 78759 I 512.454.8711
TEXAS ENGINEERING FIRM #470 I TEXAS SURVEYING FIRM #10028800

WOLF RANCH PKWY / MEMORIAL DR

TCP STANDARDS (GEORGETOWN)

CITY JOB No.
JOB NO. 51423-04
DATE 9/11/2025
DESIGNER
CHECKED DRAWN

SHEET NO. 142

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BARRICADE AND CONSTRUCTION (BC) STANDARD SHEETS GENERAL NOTES:

1. The Barricade and Construction Standard Sheets (BC sheets) are intended to show typical examples for placement of temporary traffic control devices, construction pavement markings, and typical work zone signs. The information contained in these sheets meet or exceed the requirements shown in the "Texas Manual on Uniform Traffic Control Devices" (TMUTCD).

2. The development and design of the Traffic Control Plan (TCP)is the responsibility of the Engineer.

3. The Contractor may propose changes to the TCP that are signed and sealed by a licensed professional engineer for approval. The Engineer may develop, sign and seal Contractor proposed changes.

4. The Contractor is responsible for installing and maintaining the traffic control devices as shown in the plans. The Contractor may not move or change the approximate location of any device without the approval of the Engineer.

5. Geometric design of lane shifts and detours should, when possible, meet the applicable design criteria contained in manuals such as the American Association of State Highway and Transportation Officials (AASHTO), "A Policy on Geometric Design of Highways and Streets," the TxDOT "Roadway Design Manual" or engineering judgment.

6. When projects abut, the Engineer(s) may omit the END ROAD WORK, TRAFFIC FINES DOUBLE, and other advance warning signs if the signing would be redundant and the work areas appear continuous to the motorists. If the adjacent project is completed first, the Contractor shall erect the necessary warning signs as shown on these sheets, the TCP sheets or as directed by the Engineer. The BEGIN ROAD WORK NEXT X MILES sign shall be revised to show appropriate work zone distance.

7. The Engineer may require duplicate warning signs on the median side of divided highways where median width will permit and traffic volumes justify the signing.

8. All signs shall be constructed in accordance with the details found in the "Standard Highway Sign Designs for Texas," latest edition. Sign details not shown in this manual shall be shown in the plans or the Engineer shall provide a detail to the Contractor before the sign is manufactured.

9. The temporary traffic control devices shown in the illustrations of the BC sheets are examples. As necessary, the Engineer will determine the most appropriate traffic control devices to be used.

10. Where highway construction or maintenance work is being undertaken, other than mobile operations as defined by the Texas Manual on Uniform Traffic Control Devices, CSJ limit signs are required. CSJ limit signs are shown on BC(2). The OBEY WARNING SIGNS STATE LAW sign, STAY ALERT TALK OR TEXT LATER and the WORK ZONE TRAFFIC FINES DOUBLE sign with plaque shall be erected in advance of the CSJ limits. The BEGIN ROAD WORK NEXT X MILES, CONTRACTOR and END ROAD WORK signs shall be erected at or near the CSJ limits. For mobile operations, CSJ limit signs are not required.

11. Traffic control devices should be in place only while work is actually in progress or a definite need exists.

12. The Engineer has the final decision on the location of all traffic control devices.

13. Inactive equipment and work vehicles, including workers' private vehicles must be parked away from travel lanes. They should be as close to the right-of-way line as possible, or located behind a barrier or guardrail, or as approved by the Engineer.

WORKER SAFETY NOTES:

1. Workers on foot who are exposed to traffic or to construction equipment within the right-of-way shall wear high-visibility safety apparel meeting the requirements of ISEA "American National Standard for High-Visibility Apparel," or equivalent revisions, and labeled as ANSI 107-2004 standard performance for Class 2 or 3 risk exposure. Class 3 garments should be considered for high traffic volume work areas or night time work.

2. Except in emergency situations, flagger stations shall be illuminated when flagging is used at night.

COMPLIANT WORKZONE TRAFFIC CONTROL DEVICES

1. Only pre-qualified products shall be used. The "Compliant Work Zone Traffic Control Devices List" (CWZTCD) describes pre-qualified products and their sources.

2. Work zone traffic control devices shall be compliant with the Manual for Assessing safety Hardware (MASH).

THE DOCUMENTS BELOW CAN BE FOUND ON-LINE AT http://www.txdot.gov
COMPLIANT WORK ZONE TRAFFIC CONTROL DEVICES LIST (CWZTCD)
DEPARTMENTAL MATERIAL SPECIFICATIONS (DMS)
MATERIAL PRODUCER LIST (MPL)
ROADWAY DESIGN MANUAL - SEE "MANUALS (ONLINE MANUALS)"
STANDARD HIGHWAY SIGN DESIGNS FOR TEXAS (SHSD)
TEXAS MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES (TMUTCD)
TRAFFIC ENGINEERING STANDARD SHEETS

Texas Department of Transportation

Traffic Safety Division Standard

BARRICADE AND CONSTRUCTION GENERAL NOTES AND REQUIREMENTS

BC(1)-21

FILE: bc-21.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT November 2002	CONT	SECT	JOB	HIGHWAY
REVISIONS	0514	23	04 Wolf Ranch Parkway	
4-03 7-13	DIST	COUNTY		SHEET NO.
9-07 8-14	AUS	Williamson		143
5-10 5-21				

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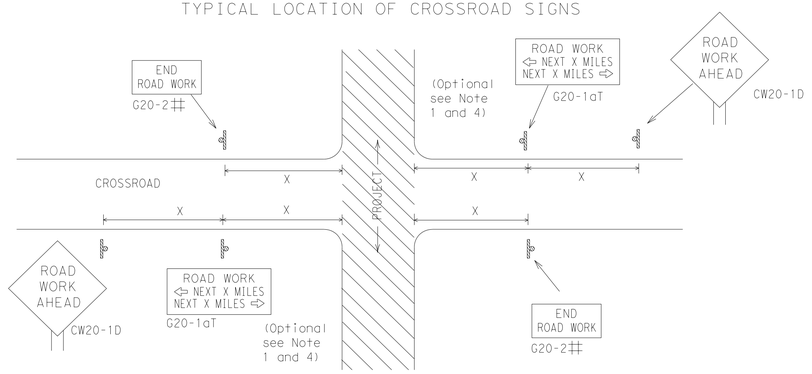
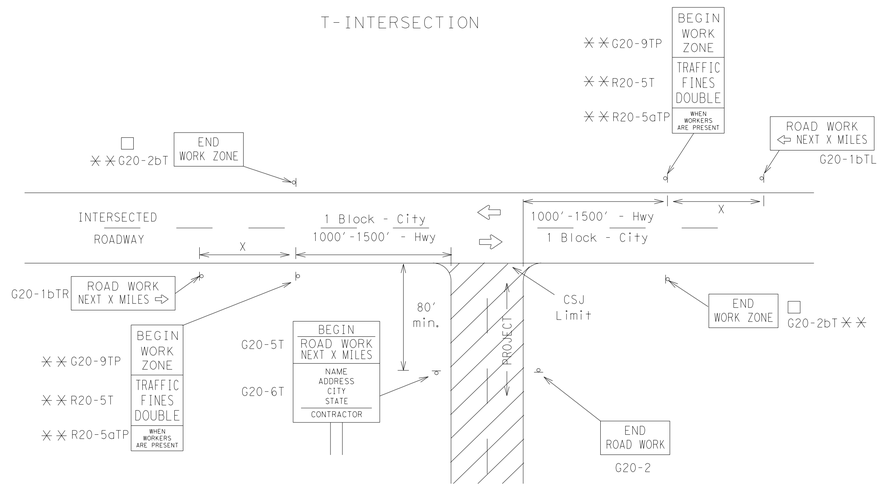
TYPICAL LOCATION OF CROSSROAD SIGNS



T-INTERSECTION



CSJ LIMITS AT T-INTERSECTION

1. The Engineer will determine the types and location of any additional traffic control devices, such as a flagger and accompanying signs, or other signs, that should be used when work is being performed at or near an intersection.

2. If construction closes the road at a T-intersection, the Contractor shall place the "CONTRACTOR NAME"(G20-6T) sign behind the Type 3 Barricades for the road closure (see BC(10) also). The "ROAD WORK NEXT X MILES" left arrow(G20-1bTL) and "ROAD WORK NEXT X MILES" right arrow (G20-1bTR)" signs shall be replaced by the detour signing called for in the plans.

TYPICAL CONSTRUCTION WARNING SIGN SIZE AND SPACING[1,5,6]

SIZE

Sign Number or Series	Conventional Road	Expressway/ Freeway
CW20[4] CW21 CW22 CW23 CW25	48" x 48"	48" x 48"
CW1, CW2, CW7, CW8, CW9, CW11, CW14	36" x 36"	48" x 48"
CW3, CW4, CW5, CW6, CW8-3, CW10, CW12	48" x 48"	48" x 48"

SPACING

Posted Speed	Sign △ Spacing "X"
MPH	Feet (Apprx.)
30	120
35	160
40	240
45	320
50	400
55	500[2]
60	600[2]
65	700[2]
70	800[2]
75	900[2]
80	1000[2]
✳	✳[3]

✳ For typical sign spacings on divided highways, expressways and freeways, see Part 6 of the "Texas Manual on Uniform Traffic Control Devices" (TMUTCD) typical application diagrams or TCP Standard Sheets.

△ Minimum distance from work area to first Advance Warning sign nearest the work area and/or distance between each additional sign.

GENERAL NOTES

1. Special or larger size signs may be used as necessary.

2. Distance between signs should be increased as required to have 1500 feet advance warning.

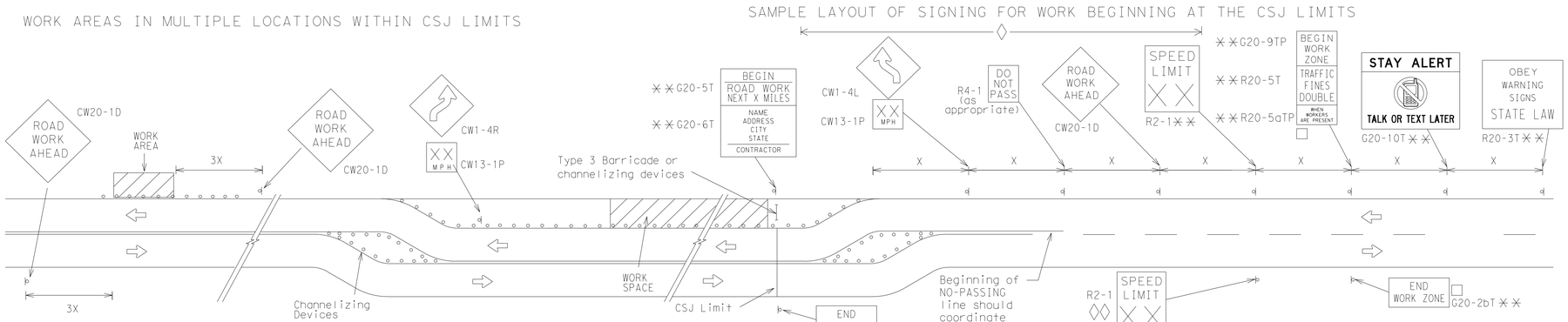
3. Distance between signs should be increased as required to have 1/2 mile or more advance warning.

4. 36" x 36" "ROAD WORK AHEAD" (CW20-1D)signs may be used on low volume crossroads at the discretion of the Engineer as per TMUTCD Part 5. See Note 2 under "Typical Location of Crossroad Signs".

5. Only diamond shaped warning sign sizes are indicated.

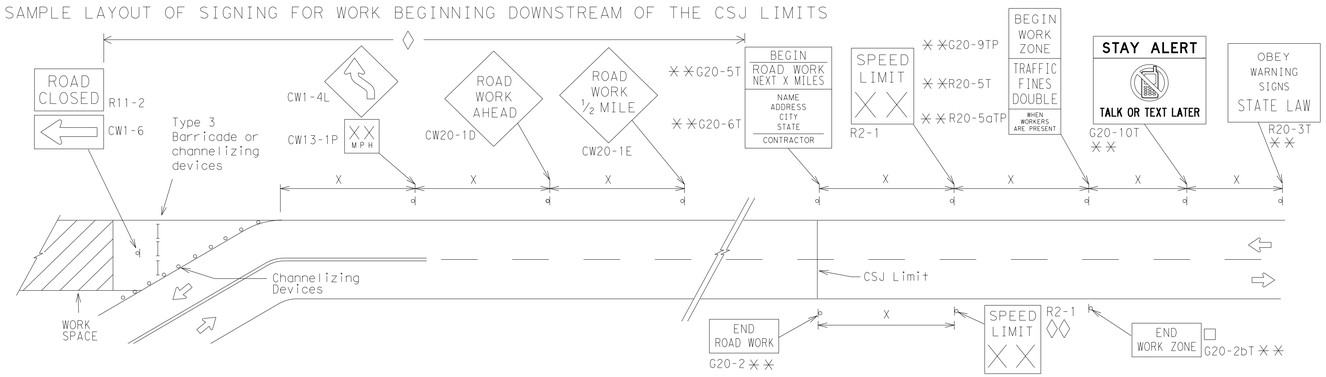
6. See sign size listing in "TMUTCD", Sign Appendix or the "Standard Highway Sign Designs for Texas" manual for complete list of available sign design sizes.

WORK AREAS IN MULTIPLE LOCATIONS WITHIN CSJ LIMITS



When extended distances occur between minimal work spaces, the Engineer/Inspector should ensure additional "ROAD WORK AHEAD"(CW20-1D)signs are placed in advance of these work areas to remind drivers they are still within the project limits. See the applicable TCP sheets for exact location and spacing of signs and channelizing devices.

SAMPLE LAYOUT OF SIGNING FOR WORK BEGINNING DOWNSTREAM OF THE CSJ LIMITS



SAMPLE LAYOUT OF SIGNING FOR WORK BEGINNING AT THE CSJ LIMITS

When extended distances occur between minimal work spaces, the Engineer/Inspector should ensure additional "ROAD WORK AHEAD"(CW20-1D)signs are placed in advance of these work areas to remind drivers they are still within the project limits. See the applicable TCP sheets for exact location and spacing of signs and channelizing devices.

NOTES

The Contractor shall determine the appropriate distance to be placed on the G20-1 series signs and "BEGIN ROAD WORK NEXT X MILES"(G20-5T)sign for each specific project. This distance shall replace the "X" and shall be rounded to the nearest whole mile with the approval of the Engineer. No decimals shall be used.

□ The "BEGIN WORK ZONE"(G20-9TP) and "END WORK ZONE" (G20-2bT) shall be used as shown on the sample layout when advance signs are required outside the CSJ Limits. They inform the motorist of entering or leaving a part of the work zone lying outside the CSJ Limits where traffic fines may double if workers are present.

✳✳ CSJ limit signing is required for highway construction and maintenance work, with the exception of mobile operations.

◊ Area for placement of "ROAD WORK AHEAD" (CW20-1D)sign and other signs or devices as called for on the Traffic Control Plan.

◊◊ Contractor will install a regulatory speed limit sign at the end of the work zone.

LEGEND	
⊢⊣	Type 3 Barricade
○ ○ ○	Channelizing Devices
▬	Sign
X	See Typical Construction Warning Sign Size and Spacing chart or the TMUTCD for sign spacing requirements.

Texas Department of Transportation

Traffic Safety Division Standard

BARRICADE AND CONSTRUCTION PROJECT LIMIT

BC(2)-21

FILE: bc-21.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT November 2002	CONT	SECT	JOB	HIGHWAY
REVISIONS	0514	23	04 Wolf Ranch Parkway	
9-07 8-14	DIST	COUNTY		SHEET NO.
7-13 5-21	AUS	Williamson		144

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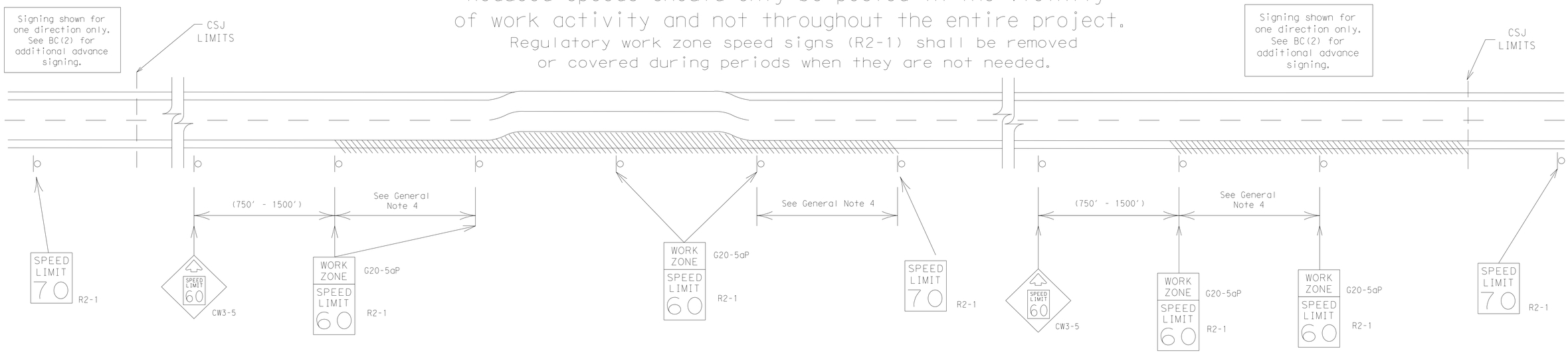
TYPICAL APPLICATION OF WORK ZONE SPEED LIMIT SIGNS

Work zone speed limits shall be regulatory, established in accordance with the "Procedures for Establishing Speed Zones," and approved by the Texas Transportation Commission, or by City Ordinance when within Incorporated City Limits.

Reduced speeds should only be posted in the vicinity of work activity and not throughout the entire project.
Regulatory work zone speed signs (R2-1) shall be removed or covered during periods when they are not needed.



GUIDANCE FOR USE:

LONG/INTERMEDIATE TERM WORK ZONE SPEED LIMITS

This type of work zone speed limit should be included on the design of the traffic control plans when restricted geometrics with a lower design speed are present in the work zone and modification of the geometrics to a higher design speed is not feasible.

Long/Intermediate Term Work Zone Speed Limit signs, when approved as described above, should be posted and visible to the motorist when work activity is present. Work activity may also be defined as a change in the roadway that requires a reduced speed for motorists to safely negotiate the work area, including:

a) rough road or damaged pavement surface
b) substantial alteration of roadway geometrics (diversions)
c) construction detours
d) grade
e) width
f) other conditions readily apparent to the driver

As long as any of these conditions exist, the work zone speed limit signs should remain in place.

SHORT TERM WORK ZONE SPEED LIMITS

This type of work zone speed limit may be included on the design of the traffic control plans when workers or equipment are not behind concrete barrier, when work activity is within 10 feet of the traveled way or actually in the traveled way.

Short Term Work Zone Speed Limit signs should be posted and visible to the motorists only when work activity is present. When work activity is not present, signs shall be removed or covered.
(See Removing or Covering on BC(4)).

GENERAL NOTES

1. Regulatory work zone speed limits should be used only for sections of construction projects where speed control is of major importance.
2. Regulatory work zone speed limit signs shall be placed on supports at a 7 foot minimum mounting height.
3. Speed zone signs are illustrated for one direction of travel and are normally posted for each direction of travel.
4. Frequency of work zone speed limit signs should be:
   40 mph and greater 0.2 to 2 miles
   35 mph and less 0.2 to 1 mile
5. Regulatory speed limit signs shall have black legend and border on a white reflective background (See "Reflective Sheeting" on BC(4)).
6. Fabrication, erection and maintenance of the"ADVANCE SPEED LIMIT"(CW3-5)sign, "WORK ZONE"(G20-5aP) plaque and the "SPEED LIMIT"(R2-1)signs shall not be paid for directly, but shall be considered subsidiary to Item 502.
7. Turning signs from view, laying signs over or down will not be allowed, unless as otherwise noted under "REMOVING OR COVERING" on BC(4).
8. Techniques that may help reduce traffic speeds include but are not limited to:
   A. Law enforcement.
   B. Flagger stationed next to sign.
   C. Portable changeable message sign (PCMS).
   D. Low-power (drone) radar transmitter.
   E. Speed monitor trailers or signs.
9. Speeds shown on details above are for illustration only. Work Zone Speed Limits should only be posted as approved for each project.
10. For more specific guidance concerning the type of work, work zone conditions and factors impacting allowable regulatory construction speed zone reduction see TxDOT form #1204 in the TxDOT e-form system.

Texas Department of Transportation | Traffic Safety Division Standard

BARRICADE AND CONSTRUCTION WORK ZONE SPEED LIMIT

BC(3)-21

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©TxDOT November 2002	CONT	SECT	JOB	HIGHWAY
REVISIONS	0514	23	04	Wolf Ranch Parkway
9-07 8-14	DIST	COUNTY		SHEET NO.
7-13 5-21	AUS	Williamson		145

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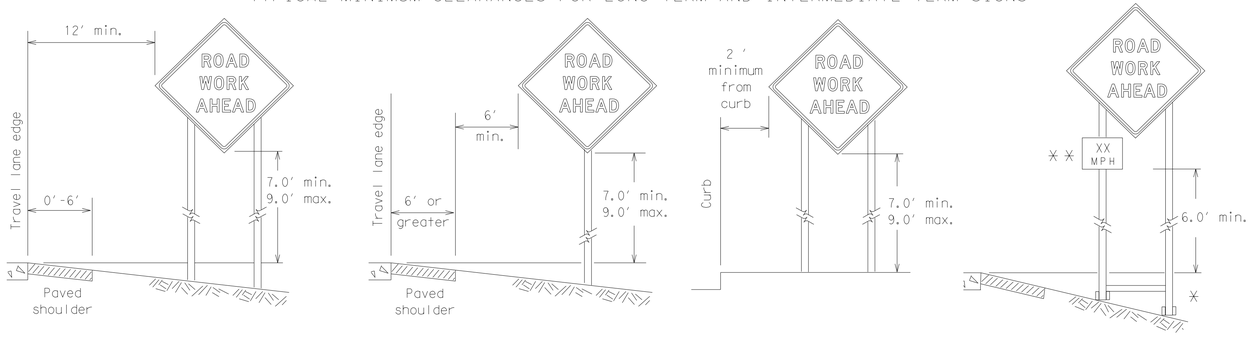
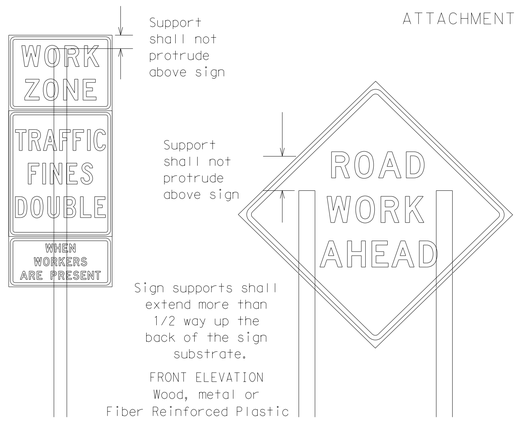
TYPICAL MINIMUM CLEARANCES FOR LONG TERM AND INTERMEDIATE TERM SIGNS



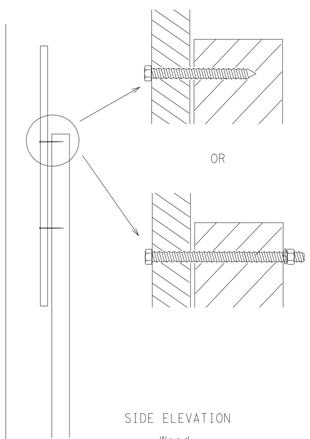
⁎ When placing skid supports on unlevel ground, the leg post lengths must be adjusted so the sign appears straight and plumb. Objects shall NOT be placed under skids as a means of leveling.

⁎⁎ When plaques are placed on dual-leg supports, they should be attached to the upright nearest the travel lane. Supplemental plaques (advisory or distance) should not cover the surface of the parent sign.

ATTACHMENT FOR SIGN SUPPORTS



FRONT ELEVATION
Wood, metal or Fiber Reinforced Plastic



SIDE ELEVATION
Wood

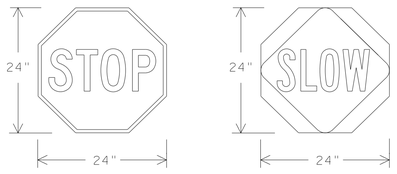
Attachment to wooden supports will be by bolts and nuts or screws. Use TxDOT's or manufacturer's recommended procedures for attaching sign substrates to other types of sign supports

Nails shall NOT be allowed. Each sign shall be attached directly to the sign support. Multiple signs shall not be joined or spliced by any means. Wood supports shall not be extended or repaired by splicing or other means.

Splicing embedded perforated square metal tubing in order to extend post height will only be allowed when the splice is made using four bolts, two above and two below the spice point. Splice must be located entirely behind the sign substrate, not near the base of the support. Splice insert lengths should be at least 5 times nominal post size, centered on the splice and of at least the same gauge material.

STOP/SLOW PADDLES

1. STOP/SLOW paddles are the primary method to control traffic by flaggers. The STOP/SLOW paddle size should be 24" x 24".
2. STOP/SLOW paddles shall be retroreflectorized when used at night.
3. STOP/SLOW paddles may be attached to a staff with a minimum length of 6′ to the bottom of the sign.
4. Any lights incorporated into the STOP or SLOW paddle faces shall only be as specifically described in Section 6E.03 Hand Signaling Devices in the TMUTCD.



Background - Red
Legend & Border - White

Background - Orange
Legend & Border - Black

SHEETING REQUIREMENTS (WHEN USED AT NIGHT)		
USAGE	COLOR	SIGN FACE MATERIAL
BACKGROUND	RED	TYPE B OR C SHEETING
BACKGROUND	ORANGE	TYPE B_{FL} OR C_{FL} SHEETING
LEGEND & BORDER	WHITE	TYPE B OR C SHEETING
LEGEND & BORDER	BLACK	ACRYLIC NON-REFLECTIVE FILM

CONTRACTOR REQUIREMENTS FOR MAINTAINING PERMANENT SIGNS WITHIN THE PROJECT LIMITS

1. Permanent signs are used to give notice of traffic laws or regulations, call attention to conditions that are potentially hazardous to traffic operations, show route designations, destinations, directions, distances, services, points of interest, and other geographical, recreational, specific service (LOGO), or cultural information. Drivers proceeding through a work zone need the same, if not better route guidance as normally installed on a roadway without construction.
2. When permanent regulatory or warning signs conflict with work zone conditions, remove or cover the permanent signs until the permanent sign message matches the roadway condition. For details for covering large guide signs see the TS-CD standard.
3. When existing permanent signs are moved and relocated due to construction purposes, they shall be visible to motorists at all times.
4. If existing signs are to be relocated on their original supports, they shall be installed on crashworthy bases as shown on the SMD Standard sheets. The signs shall meet the required mounting heights shown on the BC Sheets or the SMD Standards. This work should be paid for under the appropriate pay item for relocating existing signs.
5. If permanent signs are to be removed and relocated using temporary supports, the Contractor shall use crashworthy supports as shown on the BC standard sheets, TLRS standard sheets or the CWZTCD list. The signs shall meet the required mounting heights shown on the BC, or the SMD standard sheets during construction. This work should be paid for under the appropriate pay item for relocating existing signs.
6. Any sign or traffic control device that is struck or damaged by the Contractor or his/her construction equipment shall be replaced as soon as possible by the Contractor to ensure proper guidance for the motorists. This will be subsidiary to Item 502.

GENERAL NOTES FOR WORK ZONE SIGNS

1. Contractor shall install and maintain signs in a straight and plumb condition and/or as directed by the Engineer.
2. Wooden sign posts shall be painted white.
3. Barricades shall NOT be used as sign supports.
4. All signs shall be installed in accordance with the plans or as directed by the Engineer. Signs shall be used to regulate, warn, and guide the traveling public safely through the work zone.
5. The Contractor may furnish either the sign design shown in the plans or in the "Standard Highway Sign Designs for Texas" (SHSD). The Engineer/Inspector may require the Contractor to furnish other work zone signs that are shown in the TMUTCD but may have been omitted from the plans. Any variation in the plans shall be documented by written agreement between the Engineer and the Contractor's Responsible Person. All changes must be documented in writing before being implemented. This can include documenting the changes in the Inspector's TxDOT diary and having both the Inspector and Contractor initial and date the agreed upon changes.
6. The Contractor shall furnish sign supports listed in the "Compliant Work Zone Traffic Control Device List" (CWZTCD) for small roadside signs. Supports for temporary large roadside signs shall meet the requirements detailed on the Temporary Large Roadside Signs (TLRS) standard sheets. The Contractor shall install the sign support in accordance with the manufacturer's recommendations. If there is a question regarding installation procedures, the Contractor shall furnish the Engineer a copy of the manufacturer's installation recommendations so the Engineer can verify the correct procedures are being followed.
7. The Contractor is responsible for installing signs on approved supports and replacing signs with damaged or cracked substrates and/or damaged or marred reflective sheeting as directed by the Engineer/Inspector.
8. Identification markings may be shown only on the back of the sign substrate. The maximum height of letters and/or company logos used for identification shall be 1 inch.
9. The Contractor shall replace damaged wood posts. New or damaged wood sign posts shall not be spliced.

DURATION OF WORK (as defined by the "Texas Manual on Uniform Traffic Control Devices" Part 6)

1. The types of sign supports, sign mounting height, the size of signs, and the type of sign substrates can vary based on the type of work being performed. The Engineer is responsible for selecting the appropriate size sign for the type of work being performed. The Contractor is responsible for ensuring the sign support, sign mounting height and substrate meets manufacturer's recommendations in regard to crashworthiness and duration of work requirements.
   a. Long-term stationary - work that occupies a location more than 3 days.
   b. Intermediate-term stationary - work that occupies a location more than one daylight period up to 3 days, or nighttime work lasting more than one hour.
   c. Short-term stationary - daytime work that occupies a location for more than 1 hour in a single daylight period.
   d. Short, duration - work that occupies a location up to 1 hour.
   e. Mobile - work that moves continuously or intermittently (stopping for up to approximately 15 minutes.)

SIGN MOUNTING HEIGHT

1. The bottom of Long-term/Intermediate-term signs shall be at least 7 feet, but not more than 9 feet, above the paved surface, except as shown for supplemental plaques mounted below other signs.
2. The bottom of Short-term/Short Duration signs shall be a minimum of 1 foot above the pavement surface but no more than 2 feet above the ground.
3. Long-term/Intermediate-term Signs may be used in lieu of Short-term/Short Duration signing.
4. Short-term/Short Duration signs shall be used only during daylight and shall be removed at the end of the workday or raised to appropriate Long-term/Intermediate sign height.
5. Regulatory signs shall be mounted at least 7 feet, but not more than 9 feet, above the paved surface regardless of work duration.

SIZE OF SIGNS

1. The Contractor shall furnish the sign sizes shown on BC (2) unless otherwise shown in the plans or as directed by the Engineer.

SIGN SUBSTRATES

1. The Contractor shall ensure the sign substrate is installed in accordance with the manufacturer's recommendations for the type of sign support that is being used. The CWZTCD lists each substrate that can be used on the different types and models of sign supports.
2. "Mesh" type materials are NOT an approved sign substrate, regardless of the tightness of the weave.
3. All wooden individual sign panels fabricated from 2 or more pieces shall have one or more plywood cleat, 1/2" thick by 6" wide, fastened to the back of the sign and extending fully across the sign. The cleat shall be attached to the back of the sign using wood screws that do not penetrate the face of the sign panel. The screws shall be placed on both sides of the splice and spaced at 6" centers. The Engineer may approve other methods of splicing the sign face.

REFLECTIVE SHEETING

1. All signs shall be retroreflective and constructed of sheeting meeting the color and retro-reflectivity requirements of DMS-8300 for rigid signs or DMS-8310 for roll-up signs. The web address for DMS specifications is shown on BC(1).
2. White sheeting, meeting the requirements of DMS-8300 Type A, shall be used for signs with a white background.
3. Orange sheeting, meeting the requirements of DMS-8300 Type B_{FL} or Type C_{FL}, shall be used for rigid signs with orange backgrounds.

SIGN LETTERS

1. All sign letters and numbers shall be clear, and open rounded type uppercase alphabet letters as approved by the Federal Highway Administration (FHWA) and as published in the "Standard Highway Sign Design for Texas" manual. Signs, letters and numbers shall be of first class workmanship in accordance with Department Standards and Specifications.

REMOVING OR COVERING

1. When sign messages may be confusing or do not apply, the signs shall be removed or completely covered.
2. Long-term stationary or intermediate stationary signs installed on square metal tubing may be turned away from traffic 90 degrees when the sign message is not applicable. This technique may not be used for signs installed in the median of divided highways or near any intersections where the sign may be seen from approaching traffic.
3. Signs installed on wooden skids shall not be turned at 90 degree angles to the roadway. These signs should be removed or completely covered when not required.
4. When signs are covered, the material used shall be opaque, such as heavy mil black plastic, or other materials which will cover the entire sign face and maintain their opaque properties under automobile headlights at night, without damaging the sign sheeting.
5. Burlap shall NOT be used to cover signs.
6. Duct tape or other adhesive material shall NOT be affixed to a sign face.
7. Signs and anchor stubs shall be removed and holes backfilled upon completion of work.

SIGN SUPPORT WEIGHTS

1. Where sign supports require the use of weights to keep from turning over, the use of sandbags with dry, cohesionless sand should be used.
2. The sandbags will be tied shut to keep the sand from spilling and to maintain a constant weight.
3. Rock, concrete, iron, steel or other solid objects shall not be permitted for use as sign support weights.
4. Sandbags should weigh a minimum of 35 lbs and a maximum of 50 lbs.
5. Sandbags shall be made of a durable material that tears upon vehicular impact. Rubber (such as tire inner tubes) shall NOT be used.
6. Rubber ballasts designed for channelizing devices should not be used for ballast on portable sign supports. Sign supports designed and manufactured with rubber bases may be used when shown on the CWZTCD list.
7. Sandbags shall only be placed along or laid over the base supports of the traffic control device and shall not be suspended above ground level or hung with rope, wire, chains or other fasteners. Sandbags shall be placed along the length of the skids to weigh down the sign support.
8. Sandbags shall NOT be placed under the skid and shall not be used to level sign supports placed on slopes.

FLAGS ON SIGNS

1. Flags may be used to draw attention to warning signs. When used, the flag shall be 16 inches square or larger and shall be orange or fluorescent red-orange in color. Flags shall not be allowed to cover any portion of the sign face.

Texas Department of Transportation

Traffic Safety Division Standard

BARRICADE AND CONSTRUCTION TEMPORARY SIGN NOTES

BC(4)-21

FILE: bc-21.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT November 2002	CONT	SECT	JOB	HIGHWAY
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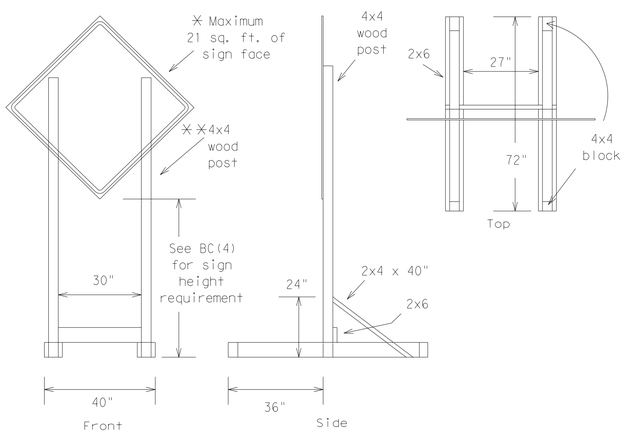
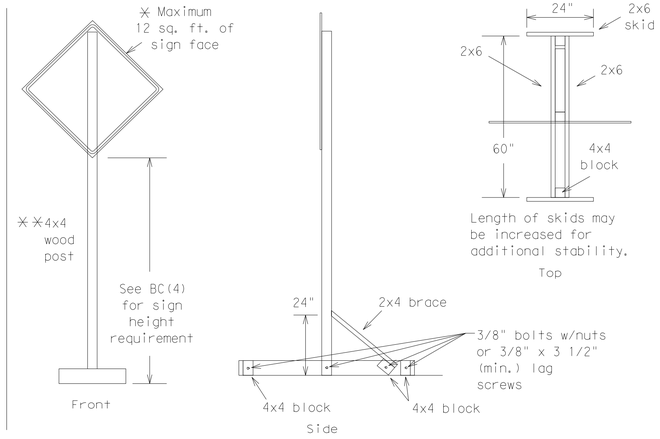
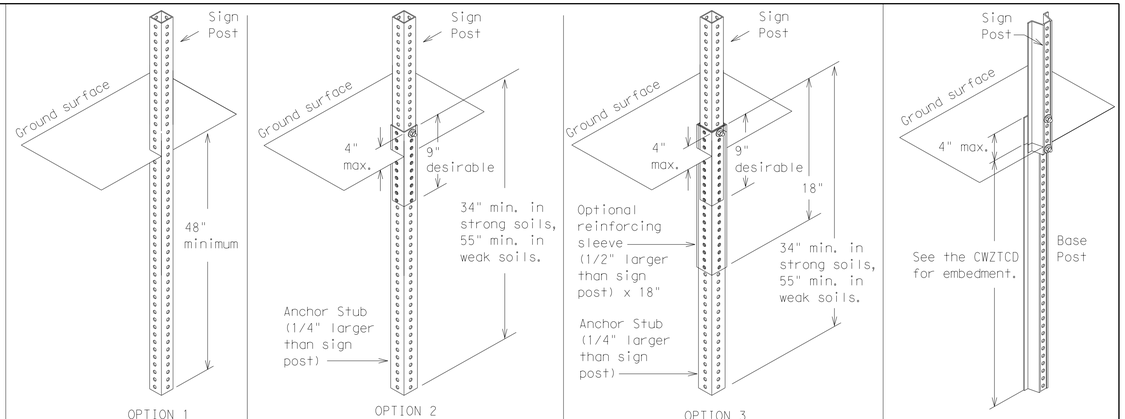




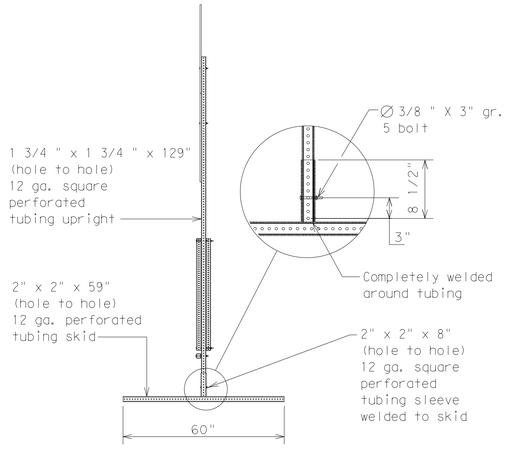
SKID MOUNTED WOOD SIGN SUPPORTS

* LONG/INTERMEDIATE TERM STATIONARY - PORTABLE SKID MOUNTED SIGN SUPPORTS



GROUND MOUNTED SIGN SUPPORTS

Refer to the CWZTCD and the manufacturer's installation procedure for each type sign support.
The maximum sign square footage shall adhere to the manufacturer's recommendation.
Two post installations can be used for larger signs.



SKID MOUNTED PERFORATED SQUARE STEEL TUBING SIGN SUPPORTS

* LONG/INTERMEDIATE TERM STATIONARY - PORTABLE SKID MOUNTED SIGN SUPPORTS

WEDGE ANCHORS

Both steel and plastic Wedge Anchor Systems as shown on the SMD Standard Sheets may be used as temporary sign supports for signs up to 10 square feet of sign face. They may be set in concrete or in sturdy soils if approved by the Engineer. (See web address for "Traffic Engineering Standard Sheets" on BC(1)).

OTHER DESIGNS

MORE DETAILS OF APPROVED LONG/INTERMEDIATE AND SHORT TERM SUPPORTS CAN BE FOUND ON THE CWZTCD LIST. SEE BC(1) FOR WEBSITE LOCATION.

GENERAL NOTES

1. Nails may be used in the assembly of wooden sign supports, but 3/8" bolts with nuts or 3/8" x 3 1/2" lag screws must be used on every joint for final connection.
2. No more than 2 sign posts shall be placed within a 7 ft. circle, except for specific materials noted on the CWZTCD List.
3. When project is completed, all sign supports and foundations shall be removed from the project site. This will be considered subsidiary to Item 502.

* See BC(4) for definition of "Work Duration."

** Wood sign posts MUST be one piece. Splicing will NOT be allowed. Posts shall be painted white.

☐ See the CWZTCD for the type of sign substrate that can be used for each approved sign support.

Texas Department of Transportation | Traffic Safety Division Standard

BARRICADE AND CONSTRUCTION TYPICAL SIGN SUPPORT

BC(5)-21

FILE: bc-21.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
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9-07 8-14	DIST	COUNTY		SHEET NO.
7-13 5-21	AUS	Williamson		147

WHEN NOT IN USE, REMOVE THE PCMS FROM THE RIGHT-OF-WAY OR PLACE THE PCMS BEHIND BARRIER OR GUARDRAIL WITH SIGN PANEL TURNED PARALLEL TO TRAFFIC

PORTABLE CHANGEABLE MESSAGE SIGNS

1. The Engineer/Inspector shall approve all messages used on portable changeable message signs (PCMS).
2. Messages on PCMS should contain no more than 8 words (about four to eight characters per word), not including simple words such as "TO," "FOR," "AT," etc.
3. Messages should consist of a single phase, or two phases that alternate. Three-phase messages are not allowed. Each phase of the message should convey a single thought, and must be understood by itself.
4. Use the word "EXIT" to refer to an exit ramp on a freeway; i.e., "EXIT CLOSED." Do not use the term "RAMP."
5. Always use the route or interstate designation (IH, US, SH, FM) along with the number when referring to a roadway.
6. When in use, the bottom of a stationary PCMS message panel should be a minimum 7 feet above the roadway, where possible.
7. The message term "WEEKEND" should be used only if the work is to start on Saturday morning and end by Sunday evening at midnight. Actual days and hours of work should be displayed on the PCMS if work is to begin on Friday evening and/or continue into Monday morning.
8. The Engineer/Inspector may select one of two options which are available for displaying a two-phase message on a PCMS. Each phase may be displayed for either four seconds each or for three seconds each.
9. Do not "flash" messages or words included in a message. The message should be steady burn or continuous while displayed.
10. Do not present redundant information on a two-phase message; i.e., keeping two lines of the message the same and changing the third line.
11. Do not use the word "Danger" in message.
12. Do not display the message "LANES SHIFT LEFT" or "LANES SHIFT RIGHT" on a PCMS. Drivers do not understand the message.
13. Do not display messages that scroll horizontally or vertically across the face of the sign.
14. The following table lists abbreviated words and two-word phrases that are acceptable for use on a PCMS. Both words in a phrase must be displayed together. Words or phrases not on this list should not be abbreviated, unless shown in the TMUTCD.
15. PCMS character height should be at least 18 inches for trailer mounted units. They should be visible from at least 1/2 (.5) mile and the text should be legible from at least 600 feet at night and 800 feet in daylight. Truck mounted units must have a character height of 10 inches and must be legible from at least 400 feet.
16. Each line of text should be centered on the message board rather than left or right justified.
17. If disabled, the PCMS should default to an illegible display that will not alarm motorists and will only be used to alert workers that the PCMS has malfunctioned. A pattern such as a series of horizontal solid bars is appropriate.

WORD OR PHRASE	ABBREVIATION
Access Road	ACCS RD
Alternate	ALT
Avenue	AVE
Best Route	BEST RTE
Boulevard	BLVD
Bridge	BRDG
Cannot	CANT
Center	CTR
Construction Ahead	CONST AHD
CROSSING	XING
Detour Route	DETOUR RTE
Do Not	DONT
East	E
Eastbound	(route) E
Emergency	EMER
Emergency Vehicle	EMER VEH
Entrance, Enter	ENT
Express Lane	EXP LN
Expressway	EXPWY
XXXX Feet	XXXX FT
Fog Ahead	FOG AHD
Freeway	FRWY, FWY
Freeway Blocked	FWY BLKD
Friday	FRI
Hazardous Driving	HAZ DRIVING
Hazardous Material	HAZMAT
High-Occupancy	HOV
Vehicle Highway	HWY
Hour(s)	HR, HRS
Information	INFO
It Is	ITS
Junction	JCT
Left	LFT
Left Lane	LFT LN
Lane Closed	LN CLOSED
Lower Level	LWR LEVEL
Maintenance	MAINT

WORD OR PHRASE	ABBREVIATION
Major	MAJ
Miles	MI
Miles Per Hour	MPH
Minor	MNR
Monday	MON
Normal	NORM
North	N
Northbound	(route) N
Parking	PKING
Road	RD
Right Lane	RT LN
Saturday	SAT
Service Road	SERV RD
Shoulder	SHLDR
Slippery	SLIP
South	S
Southbound	(route) S
Speed	SPD
Street	ST
Sunday	SUN
Telephone	PHONE
Temporary	TEMP
Thursday	THURS
To Downtown	TO DWNTN
Traffic	TRAF
Travelers	TRVLRS
Tuesday	TUES
Time Minutes	TIME MIN
Upper Level	UPR LEVEL
Vehicles (s)	VEH, VEHS
Warning	WARN
Wednesday	WED
Weight Limit	WT LIMIT
West	W
Westbound	(route) W
Wet Pavement	WET PVMT
Will Not	WONT

Roadway designation # IH-number, US-number, SH-number, FM-number

RECOMMENDED PHASES AND FORMATS FOR PCMS MESSAGES DURING ROADWORK ACTIVITIES

(The Engineer may approve other messages not specifically covered here.)

Phase 1: Condition Lists

Road/Lane/Ramp Closure List

- FREEWAY CLOSED X MILE
- FRONTAGE ROAD CLOSED
- ROAD CLOSED AT SH XXX
- SHOULDER CLOSED XXX FT
- ROAD CLSD AT FM XXXX
- RIGHT LN CLOSED XXX FT
- RIGHT X LANES CLOSED
- RIGHT X LANES OPEN
- CENTER LANE CLOSED
- DAYTIME LANE CLOSURES
- NIGHT LANE CLOSURES
- I-XX SOUTH EXIT CLOSED
- VARIOUS LANES CLOSED
- EXIT XXX CLOSED X MILE
- EXIT CLOSED
- RIGHT LN TO BE CLOSED
- MALL DRIVEWAY CLOSED
- X LANES CLOSED TUE - FRI
- XXXXXXXX BLVD CLOSED

Other Condition List

- ROADWORK XXX FT
- ROAD REPAIRS XXXX FT
- FLAGGER XXXX FT
- LANE NARROWS XXXX FT
- RIGHT LN NARROWS XXXX FT
- TWO-WAY TRAFFIC XX MILE
- MERGING TRAFFIC XXXX FT
- CONST TRAFFIC XXX FT
- LOOSE GRAVEL XXXX FT
- UNEVEN LANES XXXX FT
- DETOUR X MILE
- ROUGH ROAD XXXX FT
- ROADWORK PAST SH XXXX
- ROADWORK NEXT FRI-SUN
- BUMP XXXX FT
- US XXX EXIT X MILES
- TRAFFIC SIGNAL XXXX FT
- LANES SHIFT *

* LANES SHIFT in Phase 1 must be used with STAY IN LANE in Phase 2.

Phase 2: Possible Component Lists

Action to Take/Effect on Travel List

- MERGE RIGHT
- FORM X LINES RIGHT
- DETOUR NEXT X EXITS
- USE XXXXX RD EXIT
- USE EXIT XXX
- USE EXIT I-XX NORTH
- STAY ON US XXX SOUTH
- USE I-XX E TO I-XX N
- TRUCKS USE US XXX N
- WATCH FOR TRUCKS
- WATCH FOR TRUCKS
- EXPECT DELAYS
- EXPECT DELAYS
- PREPARE TO STOP
- REDUCE SPEED XXX FT
- END SHOULDER USE
- USE OTHER ROUTES
- WATCH FOR WORKERS
- STAY IN LANE *

Location List

- AT FM XXXX
- BEFORE RAILROAD CROSSING
- NEXT X MILES
- PAST US XXX EXIT
- XXXXXXX TO XXXXXXX
- US XXX TO FM XXXX

Warning List

- SPEED LIMIT XX MPH
- MAXIMUM SPEED XX MPH
- MINIMUM SPEED XX MPH
- ADVISORY SPEED XX MPH
- RIGHT LANE EXIT
- USE CAUTION
- DRIVE SAFELY
- DRIVE WITH CARE

** Advance Notice List

- TUE-FRI XX AM- X PM
- APR XX- XX X PM-X AM
- BEGINS MONDAY
- BEGINS MAY XX
- MAY X-X XX PM - XX AM
- NEXT FRI-SUN
- XX AM TO XX PM
- NEXT TUE AUG XX
- TONIGHT XX PM- XX AM

* LANES SHIFT in Phase 1 must be used with STAY IN LANE in Phase 2.

** See Application Guidelines Note 6.

APPLICATION GUIDELINES

1. Only 1 or 2 phases are to be used on a PCMS.
2. The 1st phase (or both) should be selected from the "Road/Lane/Ramp Closure List" and the "Other Condition List".
3. A 2nd phase can be selected from the "Action to Take/Effect on Travel, Location, General Warning, or Advance Notice Phase Lists".
4. A Location Phase is necessary only if a distance or location is not included in the first phase selected.
5. If two PCMS are used in sequence, they must be separated by a minimum of 1000 ft. Each PCMS shall be limited to two phases, and should be understandable by themselves.
6. For advance notice, when the current date is within seven days of the actual work date, calendar days should be replaced with days of the week. Advance notification should typically be for no more than one week prior to the work.

WORDING ALTERNATIVES

1. The words RIGHT, LEFT and ALL can be interchanged as appropriate.
2. Roadway designations IH, US, SH, FM and LP can be interchanged as appropriate.
3. EAST, WEST, NORTH and SOUTH (or abbreviations E, W, N and S) can be interchanged as appropriate.
4. Highway names and numbers replaced as appropriate.
5. ROAD, HIGHWAY and FREEWAY can be interchanged as needed.
6. AHEAD may be used instead of distances if necessary.
7. FT and MI, MILE and MILES interchanged as appropriate.
8. AT, BEFORE and PAST interchanged as needed.
9. Distances or AHEAD can be eliminated from the message if a location phase is used.

PCMS SIGNS WITHIN THE R.O.W. SHALL BE BEHIND GUARDRAIL OR CONCRETE BARRIER OR SHALL HAVE A MINIMUM OF FOUR (4) PLASTIC DRUMS PLACED PERPENDICULAR TO TRAFFIC ON THE UPSTREAM SIDE OF THE PCMS, WHEN EXPOSED TO ONE DIRECTION OF TRAFFIC. WHEN EXPOSED TO TWO WAY TRAFFIC, THE FOUR DRUMS SHOULD BE PLACED WITH ONE DRUM AT EACH OF THE FOUR CORNERS OF THE UNIT.

FULL MATRIX PCMS SIGNS

1. When Full Matrix PCMS signs are used, the character height and legibility/visibility requirements shall be maintained as listed in Note 15 under "PORTABLE CHANGEABLE MESSAGE SIGNS" above.
2. When symbol signs, such as the "Flagger Symbol"(CW20-7) are represented graphically on the Full Matrix PCMS sign and, with the approval of the Engineer, it shall maintain the legibility/visibility requirement listed above.
3. When symbol signs are represented graphically on the Full Matrix PCMS, they shall only supplement the use of the static sign represented, and shall not substitute for, or replace that sign.
4. A full matrix PCMS may be used to simulate a flashing arrow board provided it meets the visibility, flash rate and dimming requirements on BC(7), for the same size arrow.

Texas Department of Transportation

Traffic Safety Division Standard

BARRICADE AND CONSTRUCTION PORTABLE CHANGEABLE MESSAGE SIGN (PCMS)

BC(6)-21

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DATE: 9/11/2025 11:22:36 AM
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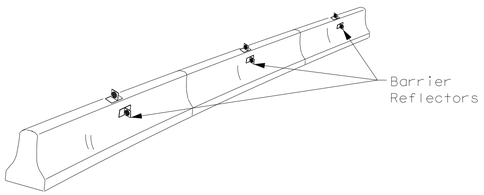
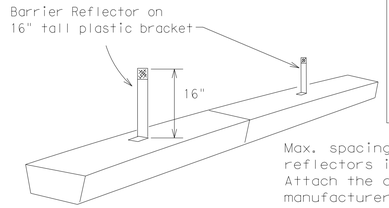
1. Barrier Reflectors shall be pre-qualified, and conform to the color and reflectivity requirements of DMS-8600. A list of prequalified Barrier Reflectors can be found at the Material Producer List web address shown on BC(1).
2. Color of Barrier Reflectors shall be as specified in the TMUTCD. The cost of the reflectors shall be considered subsidiary to Item 512.



CONCRETE TRAFFIC BARRIER (CTB)

3. Where traffic is on one side of the CTB, two (2) Barrier Reflectors shall be mounted in approximately the midsection of each section of CTB. An alternate mounting location is uniformly spaced at one end of each CTB. This will allow for attachment of a barrier grapple without damaging the reflector. The Barrier Reflector mounted on the side of the CTB shall be located directly below the reflector mounted on top of the barrier, as shown in the detail above.
4. Where CTB separates two-way traffic, three barrier reflectors shall be mounted on each section of CTB. The reflector unit on top shall have two yellow reflective faces (Bi-Directional)while the reflectors on each side of the barrier shall have one yellow reflective face, as shown in the detail above.
5. When CTB separates traffic traveling in the same direction, no barrier reflectors will be required on top of the CTB.
6. Barrier Reflector units shall be yellow or white in color to match the edgeline being supplemented.
7. Maximum spacing of Barrier Reflectors is forty (40) feet.
8. Pavement markers or temporary flexible-reflective roadway marker tabs shall NOT be used as CTB delineation.
9. Attachment of Barrier Reflectors to CTB shall be per manufacturer's recommendations.
10. Missing or damaged Barrier Reflectors shall be replaced as directed by the Engineer.
11. Single slope barriers shall be delineated as shown on the above detail.

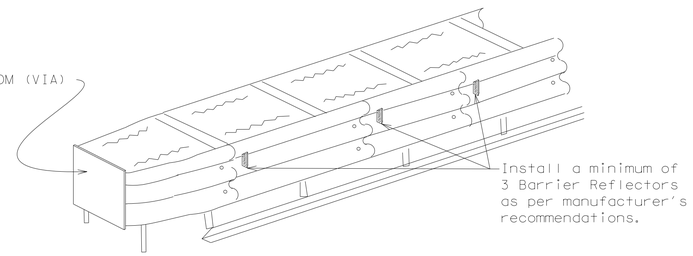


Max. spacing of barrier reflectors is 20 feet. Attach the delineators as per manufacturer's recommendations.

LOW PROFILE CONCRETE BARRIER (LPCB)

LOW PROFILE CONCRETE BARRIER (LPCB) USED IN WORK ZONES

LPCB is approved for use in work zone locations, where the posted speed is 45mph, or less. See Roadway Standard Sheet LPCB.

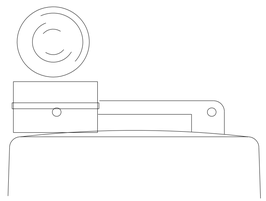


DELINEATION OF END TREATMENTS

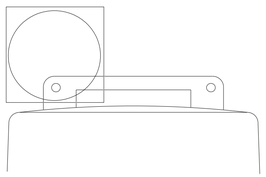
END TREATMENTS FOR CTB'S USED IN WORK ZONES

End treatments used on CTB's in work zones shall meet the apppropriate crashworthy standards as defined in the Manual for Assessing Safety Hardware (MASH). Refer to the CWZTCD List for approved end treatments and manufacturers.

BARRIER REFLECTORS FOR CONCRETE TRAFFIC BARRIER AND ATTENUATORS



Type C Warning Light or approved substitute mounted on a drum adjacent to the travel way.



Warning reflector may be round or square. Must have a yellow reflective surface area of at least 30 square inches

WARNING LIGHTS

1. Warning lights shall meet the requirements of the TMUTCD.
2. Warning lights shall NOT be installed on barricades.
3. Type A-Low Intensity Flashing Warning Lights are commonly used with drums. They are intended to warn of or mark a potentially hazardous area. Their use shall be as indicated on this sheet and/or other sheets of the plans by the designation "FL". The Type A Warning Lights shall not be used with signs manufactured with Type B_{FL} or C_{FL} Sheeting meeting the requirements of Departmental Material Specification DMS-8300.
4. Type-C and Type D 360 degree Steady Burn Lights are intended to be used in a series for delineation to supplement other traffic control devices. Their use shall be as indicated on this sheet and/or other sheets of the plans by the designation "SB".
5. The Engineer/Inspector or the plans shall specify the location and type of warning lights to be installed on the traffic control devices.
6. When required by the Engineer, the Contractor shall furnish a copy of the warning lights certification. The warning light manufacturer will certify the warning lights meet the requirements of the latest ITE Purchase Specifications for Flashing and Steady-Burn Warning Lights.
7. When used to delineate curves, Type-C and Type D Steady Burn Lights should only be placed on the outside of the curve, not the inside.
8. The location of warning lights and warning reflectors on drums shall be as shown elsewhere in the plans.

WARNING LIGHTS MOUNTED ON PLASTIC DRUMS

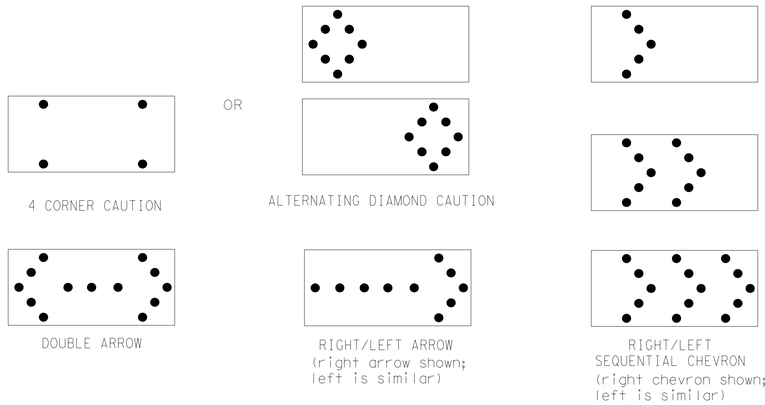
1. Type A flashing warning lights are intended to warn drivers that they are approaching or are in a potentially hazardous area.
2. Type A random flashing warning lights are not intended for delineation and shall not be used in a series.
3. A series of sequential flashing warning lights placed on channelizing devices to form a merging taper may be used for delineation. If used, the successive flashing of the sequential warning lights should occur from the beginning of the taper to the end of the merging taper in order to identify the desired vehicle path. The rate of flashing for each light shall be 65 flashes per minute, plus or minus 10 flashes.
4. Type C and D steady-burn warning lights are intended to be used in a series to delineate the edge of the travel lane on detours, on lane changes, on lane closures, and on other similar conditions.
5. Type A, Type C and Type D warning lights shall be installed at locations as detailed on other sheets in the plans.
6. Warning lights shall not be installed on a drum that has a sign, chevron or vertical panel.
7. The maximum spacing for warning lights on drums should be identical to the channelizing device spacing.

WARNING REFLECTORS MOUNTED ON PLASTIC DRUMS AS A SUBSTITUTE FOR TYPE C (STEADY BURN) WARNING LIGHTS

1. A warning reflector or approved substitute may be mounted on a plastic drum as a substitute for a Type C, steady burn warning light at the discretion of the Contractor unless otherwise noted in the plans.
2. The warning reflector shall be yellow in color and shall be manufactured using a sign substrate approved for use with plastic drums listed on the CWZTCD.
3. The warning reflector shall have a minimum retroreflective surface area (one-side) of 30 square inches.
4. Round reflectors shall be fully reflectorized, including the area where attached to the drum.
5. Square substrates must have a minimum of 30 square inches of reflectorized sheeting. They do not have to be reflectorized where it attaches to the drum.
6. The side of the warning reflector facing approaching traffic shall have sheeting meeting the color and retroreflectivity requirements for DMS 8300-Type B or Type C.
7. When used near two-way traffic, both sides of the warning reflector shall be reflectorized.
8. The warning reflector should be mounted on the side of the handle nearest approaching traffic.
9. The maximum spacing for warning reflectors should be identical to the channelizing device spacing requirements.

Arrow Boards may be located behind channelizing devices in place for a shoulder taper or merging taper, otherwise they shall be delineated with four (4) channelizing devices placed perpendicular to traffic on the upstream side of traffic.

1. The Flashing Arrow Board should be used for all lane closures on multi-lane roadways, or slow moving maintenance or construction activities on the travel lanes.
2. Flashing Arrow Boards should not be used on two-lane, two-way roadways, detours, diversions or work on shoulders unless the "CAUTION" display (see detail below) is used.
3. The Engineer/Inspector shall choose all appropriate signs, barricades and/or other traffic control devices that should be used in conjunction with the Flashing Arrow Board.
4. The Flashing Arrow Board should be able to display the following symbols:



4 CORNER CAUTION

ALTERNATING DIAMOND CAUTION

DOUBLE ARROW

RIGHT/LEFT ARROW
(right arrow shown;
left is similar)

RIGHT/LEFT
SEQUENTIAL CHEVRON
(right chevron shown;
left is similar)

5. The "CAUTION" display consists of four corner lamps flashing simultaneously, or the Alternating Diamond Caution mode as shown.
6. The straight line caution display is NOT ALLOWED.
7. The Flashing Arrow Board shall be capable of minimum 50 percent dimming from rated lamp voltage. The flashing rate of the lamps shall not be less than 25 nor more than 40 flashes per minute.
8. Minimum lamp "on time" shall be approximately 50 percent for the flashing arrow and equal intervals of 25 percent for each sequential phase of the flashing chevron.
9. The sequential arrow display is NOT ALLOWED.
10. The flashing arrow display is the TxDOT standard; however, the sequential chevron display may be used during daylight operations.
11. The Flashing Arrow Board shall be mounted on a vehicle, trailer or other suitable support.
12. A Flashing Arrow Board SHALL NOT BE USED to laterally shift traffic.
13. A full matrix PCMS may be used to simulate a Flashing Arrow Board provided it meets visibility, flash rate and dimming requirements on this sheet for the same size arrow.
14. Minimum mounting height of trailer mounted Arrow Boards should be 7 feet from roadway to bottom of panel.

REQUIREMENTS			
TYPE	MINIMUM SIZE	MINIMUM NUMBER OF PANEL LAMPS	MINIMUM VISIBILITY DISTANCE
B	30 x 60	13	3/4 mile
C	48 x 96	15	1 mile

ATTENTION

Flashing Arrow Boards shall be equipped with automatic dimming devices.

WHEN NOT IN USE, REMOVE THE ARROW BOARD FROM THE RIGHT-OF-WAY OR PLACE THE ARROW BOARD BEHIND CONCRETE TRAFFIC BARRIER OR GUARDRAIL.

FLASHING ARROW BOARDS

TRUCK-MOUNTED ATTENUATORS

1. Truck-mounted attenuators (TMA) used on TxDOT facilities must meet the requirements outlined in the Manual for Assessing Safety Hardware (MASH).
2. Refer to the CWZTCD for the requirements of Level 2 or Level 3 TMAs.
3. Refer to the CWZTCD for a list of approved TMAs.
4. TMAs are required on freeways unless otherwise noted in the plans.
5. A TMA should be used anytime that it can be positioned 30 to 100 feet in advance of the area of crew exposure without adversely affecting the work performance.
6. The only reason a TMA should not be required is when a work area is spread down the roadway and the work crew is an extended distance from the TMA.

Texas Department of Transportation

Traffic Safety Division Standard

BARRICADE AND CONSTRUCTION ARROW PANEL, REFLECTORS, WARNING LIGHTS & ATTENUATOR

BC(7)-21

FILE: bc-21.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT November 2002	CONT	SECT	JOB	HIGHWAY
REVISIONS	0514	23	04	Wolf Ranch Parkway
9-07 8-14	DIST	COUNTY		SHEET NO.
7-13 5-21	AUS	Williamson		149

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GENERAL NOTES

1. For long term stationary work zones on freeways, drums shall be used as the primary channelizing device.
2. For intermediate term stationary work zones on freeways, drums should be used as the primary channelizing device but may be replaced in tangent sections by vertical panels, or 42" two-piece cones. In tangent sections, one-piece cones may be used with the approval of the Engineer but only if personnel are present on the project at all times to maintain the cones in proper position and location.
3. For short term stationary work zones on freeways, drums are the preferred channelizing device but may be replaced in tapers, transitions and tangent sections by vertical panels, two-piece cones or one-piece cones as approved by the Engineer.
4. Drums and all related items shall comply with the requirements of the current version of the "Texas Manual on Uniform Traffic Control Devices" (TMUTCD) and the "Compliant Work Zone Traffic Control Devices List" (CWZTCD).
5. Drums, bases, and related materials shall exhibit good workmanship and shall be free from objectionable marks or defects that would adversely affect their appearance or serviceability.
6. The Contractor shall have a maximum of 24 hours to replace any plastic drums identified for replacement by the Engineer/Inspector. The replacement device must be an approved device.

GENERAL DESIGN REQUIREMENTS

Pre-qualified plastic drums shall meet the following requirements:

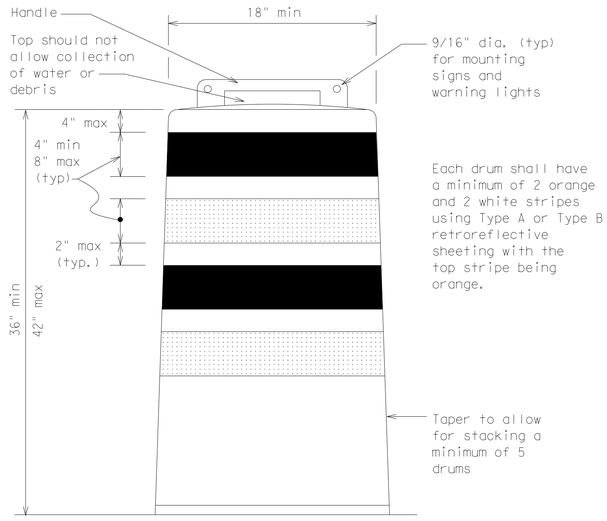
1. Plastic drums shall be a two-piece design; the "body" of the drum shall be the top portion and the "base" shall be the bottom.
2. The body and base shall lock together in such a manner that the body separates from the base when impacted by a vehicle traveling at a speed of 20 MPH or greater but prevents accidental separation due to normal handling and/or air turbulence created by passing vehicles.
3. Plastic drums shall be constructed of lightweight flexible, and deformable materials. The Contractor shall NOT use metal drums or single piece plastic drums as channelization devices or sign supports.
4. Drums shall present a profile that is a minimum of 18 inches in width at the 36 inch height when viewed from any direction. The height of drum unit (body installed on base) shall be a minimum of 36 inches and a maximum of 42 inches.
5. The top of the drum shall have a built-in handle for easy pickup and shall be designed to drain water and not collect debris. The handle shall have a minimum of two widely spaced 9/16 inch diameter holes to allow attachment of a warning light, warning reflector unit or approved compliant sign.
6. The exterior of the drum body shall have a minimum of four alternating orange and white retroreflective circumferential stripes not less than 4 inches nor greater than 8 inches in width. Any non-reflectorized space between any two adjacent stripes shall not exceed 2 inches in width.
7. Bases shall have a maximum width of 36 inches, a maximum height of 4 inches, and a minimum of two footholds of sufficient size to allow base to be held down while separating the drum body from the base.
8. Plastic drums shall be constructed of ultra-violet stabilized, orange, high-density polyethylene (HDPE) or other approved material.
9. Drum body shall have a maximum unballasted weight of 11 lbs.
10. Drum and base shall be marked with manufacturer's name and model number.

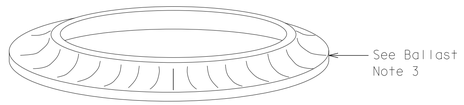
RETROREFLECTIVE SHEETING

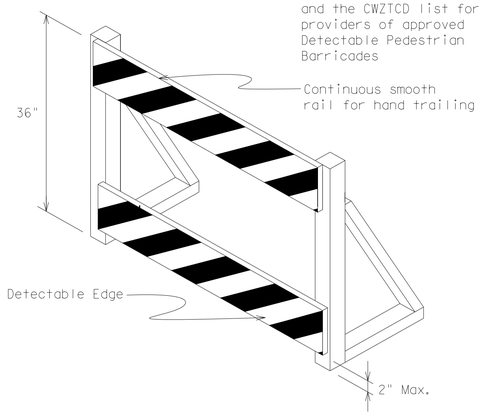
1. The stripes used on drums shall be constructed of sheeting meeting the color and retroreflectivity requirements of Departmental Materials Specification DMS-8300, "Sign Face Materials." Type A or Type B reflective sheeting shall be supplied unless otherwise specified in the plans.
2. The sheeting shall be suitable for use on and shall adhere to the drum surface such that, upon vehicular impact, the sheeting shall remain adhered in-place and exhibit no delaminating, cracking, or loss of retroreflectivity other than that loss due to abrasion of the sheeting surface.

BALLAST

1. Unballasted bases shall be large enough to hold up to 50 lbs. of sand. This base, when filled with the ballast material, should weigh between 35 lbs (minimum) and 50 lbs (maximum). The ballast may be sand in one to three sandbags separate from the base, sand in a sand-filled plastic base, or other ballasting devices as approved by the Engineer. Stacking of sandbags will be allowed, however height of sandbags above pavement surface may not exceed 12 inches.
2. Bases with built-in ballast shall weigh between 40 lbs. and 50 lbs. Built-in ballast can be constructed of an integral crumb rubber base or a solid rubber base.
3. Recycled truck tire sidewalls may be used for ballast on drums approved for this type of ballast on the CWZTCD list.
4. The ballast shall not be heavy objects, water, or any material that would become hazardous to motorists, pedestrians, or workers when the drum is struck by a vehicle.
5. When used in regions susceptible to freezing, drums shall have drainage holes in the bottoms so that water will not collect and freeze becoming a hazard when struck by a vehicle.
6. Ballast shall not be placed on top of drums.
7. Adhesives may be used to secure base of drums to pavement.

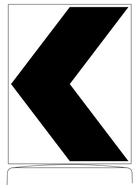




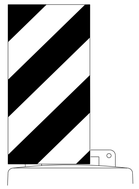


DETECTABLE PEDESTRIAN BARRICADES

1. When existing pedestrian facilities are disrupted, closed, or relocated in a TTC zone, the temporary facilities shall be detectable and include accessibility features consistent with the features present in the existing pedestrian facility. Refer to WZ(BTS-2) for Pedestrian Control requirements for Sidewalk Diversions, Sidewalk Detours and Crosswalk Closures.
2. Where pedestrians with visual disabilities normally use the closed sidewalk, a Detectable Pedestrian Barricade shall be placed across the full width of the closed sidewalk instead of a Type 3 Barricade.
3. Detectable pedestrian barricades similar to the one pictured above, longitudinal channelizing devices, some concrete barriers, and wood or chain link fencing with a continuous detectable edging can satisfactorily delineate a pedestrian path.
4. Tape, rope, or plastic chain strung between devices are not detectable, do not comply with the design standards in the "Americans with Disabilities Act Accessibility Guidelines (ADAAG)" and should not be used as a control for pedestrian movements.
5. Warning lights shall not be attached to detectable pedestrian barricades.
6. Detectable pedestrian barricades should use 8" nominal barricade rails as shown on BC(10) provided that the top rail provides a smooth continuous rail suitable for hand trailing with no splinters, burrs, or sharp edges.



18" x 24" Sign
(Maximum Sign Dimension)
Chevron CW1-8, Opposing Traffic Lane Divider, Driveway sign D70a, Keep Right R4 series or other signs as approved by Engineer



12" x 24"
Vertical Panel
mount with diagonals sloping down towards travel way

Plywood, Aluminum or Metal sign substrates shall NOT be used on plastic drums

SIGNS, CHEVRONS, AND VERTICAL PANELS MOUNTED ON PLASTIC DRUMS

1. Signs used on plastic drums shall be manufactured using substrates listed on the CWZTCD.
2. Chevrons and other work zone signs with an orange background shall be manufactured with Type B_{FL} or Type C_{FL} Orange sheeting meeting the color and retroreflectivity requirements of DMS-8300, "Sign Face Material," unless otherwise specified in the plans.
3. Vertical Panels shall be manufactured with orange and white sheeting meeting the requirements of DMS-8300 Type A or Type B. Diagonal stripes on Vertical Panels shall slope down toward the intended traveled lane.
4. Other sign messages (text or symbolic) may be used as approved by the Engineer. Sign dimensions shall not exceed 18 inches in width or 24 inches in height, except for the R9 series signs discussed in note 8 below.
5. Signs shall be installed using a 1/2 inch bolt (nominal) and nut, two washers, and one locking washer for each connection.
6. Mounting bolts and nuts shall be fully engaged and adequately torqued. Bolts should not extend more than 1/2 inch beyond nuts.
7. Chevrons may be placed on drums on the outside of curves, on merging tapers or on shifting tapers. When used in these locations, they may be placed on every drum or spaced not more than on every third drum. A minimum of three (3) should be used at each location called for in the plans.
8. R9-9, R9-10, R9-11 and R9-11a Sidewalk Closed signs which are 24 inches wide may be mounted on plastic drums, with approval of the Engineer.

Texas Department of Transportation | Traffic Safety Division Standard

BARRICADE AND CONSTRUCTION CHANNELIZING DEVICES

BC(8)-21

FILE: bc-21.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT November 2002	CONT	SECT	JOB	HIGHWAY
REVISIONS	0514	23	04 Wolf Ranch Parkway	
4-03 8-14	DIST	COUNTY		SHEET NO.
9-07 5-21	AUS	Williamson		150
7-13				

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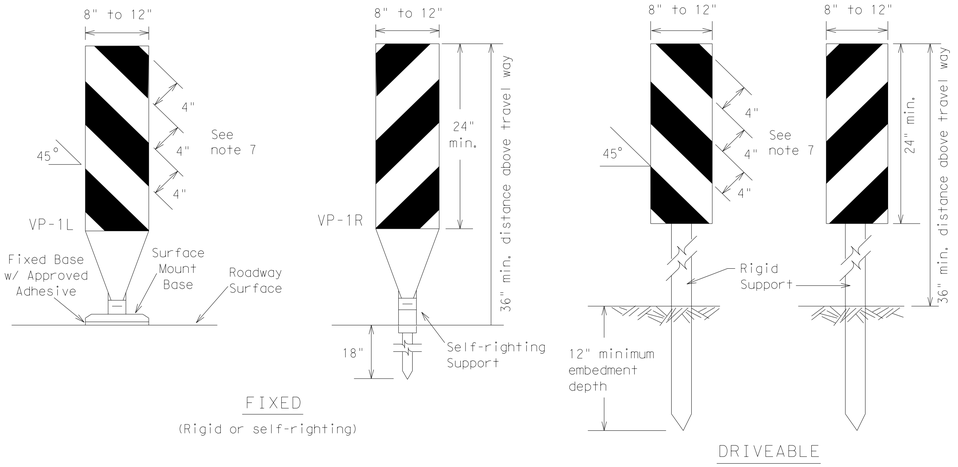
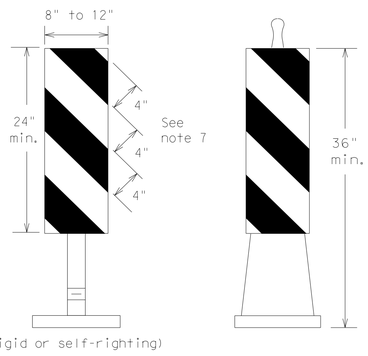


FIXED

(Rigid or self-righting)

DRIVEABLE

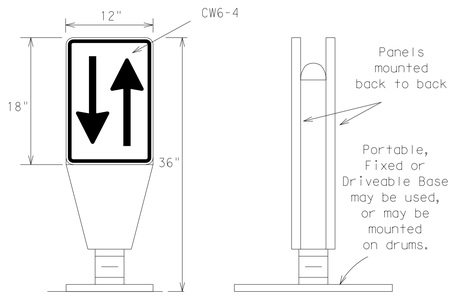


(Rigid or self-righting)

PORTABLE

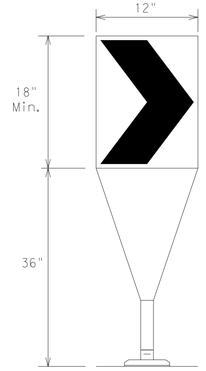
1. Vertical Panels (VP's) are normally used to channelize traffic or divide opposing lanes of traffic.
2. VP's may be used in daytime or nighttime situations. They may be used at the edge of shoulder drop-offs and other areas such as lane transitions where positive daytime and nighttime delineation is required. The Engineer/Inspector shall refer to the Roadway Design Manual for additional requirements on the use VP's for drop-offs.
3. VP's should be mounted back to back if used at the edge of cuts adjacent to two-way two lane roadways. Stripes are to be reflective orange and reflective white and should always slope downward toward the travel lane.
4. VP's used on expressways and freeways or other high speed roadways, may have more than 270 square inches of retroreflective area facing traffic.
5. Self-righting supports are available with portable base. See "Compliant Work Zone Traffic Control Devices List" (CWZTCD).
6. Sheeting for the VP's shall be retroreflective Type A or Type B conforming to Departmental Material Specification DMS-8300, unless noted otherwise.
7. Where the height of reflective material on the vertical panel is 36 inches or greater, a panel stripe of 6 inches shall be used.

VERTICAL PANELS (VPs)



1. Opposing Traffic Lane Dividers (OTLD) are delineation devices designed to convert a normal one-way roadway section to two-way operation. OTLD's are used on temporary centerlines. The upward and downward arrows on the sign's face indicate the direction of traffic on either side of the divider. The base is secured to the pavement with an adhesive or rubber weight to minimize movement caused by a vehicle impact or wind gust.
2. The OTLD may be used in combination with 42" cones or VPs.
3. Spacing between the OTLD shall not exceed 500 feet. 42" cones or VPs placed between the OTLD's should not exceed 100 foot spacing.
4. The OTLD shall be orange with a black non-reflective legend. Sheeting for the OTLD shall be retroreflective Type B_{FL} or Type C_{FL} conforming to Departmental Material Specification DMS-8300, unless noted otherwise. The legend shall meet the requirements of DMS-8300.

OPPOSING TRAFFIC LANE DIVIDERS (OTLD)



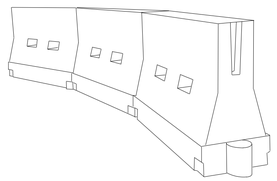
Fixed Base w/ Approved Adhesive (Driveable Base, or Flexible Support can be used)

1. The chevron shall be a vertical rectangle with a minimum size of 12 by 18 inches.
2. Chevrons are intended to give notice of a sharp change of alignment with the direction of travel and provide additional emphasis and guidance for vehicle operators with regard to changes in horizontal alignment of the roadway.
3. Chevrons, when used, shall be erected on the outside of a sharp curve or turn, or on the far side of an intersection. They shall be in line with and at right angles to approaching traffic. Spacing should be such that the motorist always has three in view, until the change in alignment eliminates its need.
4. To be effective, the chevron should be visible for at least 500 feet.
5. Chevrons shall be orange with a black nonreflective legend. Sheeting for the chevron shall be retroreflective Type B_{FL} or Type C_{FL} conforming to Departmental Material Specification DMS-8300, unless noted otherwise. The legend shall meet the requirements of DMS-8300.
6. For Long Term Stationary use on tapers or transitions on freeways and divided highways, self-righting chevrons may be used to supplement plastic drums but not to replace plastic drums.

CHEVRONS

GENERAL NOTES

1. Work Zone channelizing devices illustrated on this sheet may be installed in close proximity to traffic and are suitable for use on high or low speed roadways. The Engineer/Inspector shall ensure that spacing and placement is uniform and in accordance with the "Texas Manual on Uniform Traffic Control Devices" (TMUTCD).
2. Channelizing devices shown on this sheet may have a driveable, fixed or portable base. The requirement for self-righting channelizing devices must be specified in the General Notes or other plan sheets.
3. Channelizing devices on self-righting supports should be used in work zone areas where channelizing devices are frequently impacted by errant vehicles or vehicle related wind gusts making alignment of the channelizing devices difficult to maintain. Locations of these devices shall be detailed elsewhere in the plans. These devices shall conform to the TMUTCD and the "Compliant Work Zone Traffic Control Devices List" (CWZTCD).
4. The Contractor shall maintain devices in a clean condition and replace damaged, nonreflective, faded, or broken devices and bases as required by the Engineer/Inspector. The Contractor shall be required to maintain proper device spacing and alignment.
5. Portable bases shall be fabricated from virgin and/or recycled rubber. The portable bases shall weigh a minimum of 30 lbs.
6. Pavement surfaces shall be prepared in a manner that ensures proper bonding between the adhesives, the fixed mount bases and the pavement surface. Adhesives shall be prepared and applied according to the manufacturer's recommendations.
7. The installation and removal of channelizing devices shall not cause detrimental effects to the final pavement surfaces, including pavement surface discoloration or surface integrity. Driveable bases shall not be permitted on final pavement surfaces. The Engineer/Inspector shall approve all application and removal procedures of fixed bases.



LONGITUDINAL CHANNELIZING DEVICES (LCD)

1. LCDs are crashworthy, lightweight, deformable devices that are highly visible, have good target value and can be connected together. They are not designed to contain or redirect a vehicle on impact.
2. LCDs may be used instead of a line of cones or drums.
3. LCDs shall be placed in accordance to application and installation requirements specific to the device, and used only when shown on the CWZTCD list.
4. LCDs should not be used to provide positive protection for obstacles, pedestrians or workers.
5. LCDs shall be supplemented with retroreflective delineation as required for temporary barriers on BC(7) when placed roughly parallel to the travel lanes.
6. LCDs used as barricades placed perpendicular to traffic should have at least one row of reflective sheeting meeting the requirements for barricade rails as shown on BC(10). Place reflective sheeting near the top of the LCD along the full length of the device.

WATER BALLASTED SYSTEMS USED AS BARRIERS

1. Water ballasted systems used as barriers shall not be used solely to channelize road users, but also to protect the work space per the appropriate Manual for Assessing Safety Hardware (MASH) crashworthiness requirements based on roadway speed and barrier application.
2. Water ballasted systems used to channelize vehicular traffic shall be supplemented with retroreflective delineation or channelizing devices to improve daytime/nighttime visibility. They may also be supplemented with pavement markings.
3. Water ballasted systems used as barriers shall be placed in accordance to application and installation requirements specific to the device, and used only when shown on the CWZTCD list.
4. Water ballasted systems used as barriers should not be used for a merging taper except in low speed (less than 45 MPH) urban areas. When used on a taper in a low speed urban area, the taper shall be delineated and the taper length should be designed to optimize road user operations considering the available geometric conditions.
5. When water ballasted systems used as barriers have blunt ends exposed to traffic, they should be attenuated as per manufacturer recommendations or flared to a point outside the clear zone.

If used to channelize pedestrians, longitudinal channelizing devices or water ballasted systems must have a continuous detectable bottom for users of long canes and the top of the unit shall not be less than 32 inches in height.

HOLLOW OR WATER BALLASTED SYSTEMS USED AS LONGITUDINAL CHANNELIZING DEVICES OR BARRIERS

Posted Speed	Formula	Minimum Desirable Taper Lengths ✳✳ 10′ Offset	11′ Offset	12′ Offset	Suggested Maximum Spacing of Channelizing Devices On a Taper	On a Tangent
30	$L=\frac{WS^2}{60}$	150′	165′	180′	30′	60′
35		205′	225′	245′	35′	70′
40		265′	295′	320′	40′	80′
45	L=WS	450′	495′	540′	45′	90′
50		500′	550′	600′	50′	100′
55		550′	605′	660′	55′	110′
60		600′	660′	720′	60′	120′
65		650′	715′	780′	65′	130′
70		700′	770′	840′	70′	140′
75		750′	825′	900′	75′	150′
80		800′	880′	960′	80′	160′

✳✳Taper lengths have been rounded off.
L=Length of Taper (FT.) W=Width of Offset (FT.)
S=Posted Speed (MPH)

SUGGESTED MAXIMUM SPACING OF CHANNELIZING DEVICES AND MINIMUM DESIRABLE TAPER LENGTHS

Texas Department of Transportation

Traffic Safety Division Standard

BARRICADE AND CONSTRUCTION CHANNELIZING DEVICES

BC(9)-21

FILE: bc-21.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT November 2002	CONT	SECT	JOB	HIGHWAY
REVISIONS	0514	23	04 Wolf Ranch Parkway	
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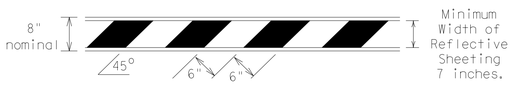
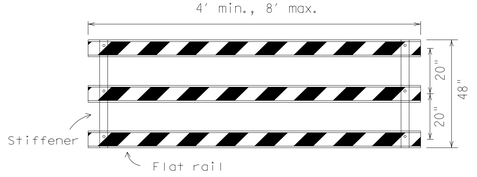
TYPE 3 BARRICADES

1. Refer to the Compliant Work Zone Traffic Control Devices List (CWZTCD) for details of the Type 3 Barricades and a list of all materials used in the construction of Type 3 Barricades.
2. Type 3 Barricades shall be used at each end of construction projects closed to all traffic.
3. Barricades extending across a roadway should have stripes that slope downward in the direction toward which traffic must turn in detouring. When both right and left turns are provided, the chevron striping may slope downward in both directions from the center of the barricade. Where no turns are provided at a closed road, striping should slope downward in both directions toward the center of roadway.
4. Striping of rails, for the right side of the roadway, should slope downward to the left. For the left side of the roadway, striping should slope downward to the right.
5. Identification markings may be shown only on the back of the barricade rails. The maximum height of letters and/or company logos used for identification shall be 1".
6. Barricades shall not be placed parallel to traffic unless an adequate clear zone is provided.
7. Warning lights shall NOT be installed on barricades.
8. Where barricades require the use of weights to keep from turning over, the use of sandbags with dry, cohesionless sand is recommended. The sandbags will be tied shut to keep the sand from spilling and to maintain a constant weight. Sand bags shall not be stacked in a manner that covers any portion of a barricade rails reflective sheeting. Rock, concrete, iron, steel or other solid objects will NOT be permitted. Sandbags should weigh a minimum of 35 lbs and a maximum of 50 lbs. Sandbags shall be made of a durable material that tears upon vehicular impact. Rubber (such as tire inner tubes) shall not be used for sandbags. Sandbags shall only be placed along or upon the base supports of the device and shall not be suspended above ground level or hung with rope, wire, chains or other fasteners.
9. Sheeting for barricades shall be retroreflective Type A or Type B conforming to Departmental Material Specification DMS-8300 unless otherwise noted.

Barricades shall NOT be used as a sign support.



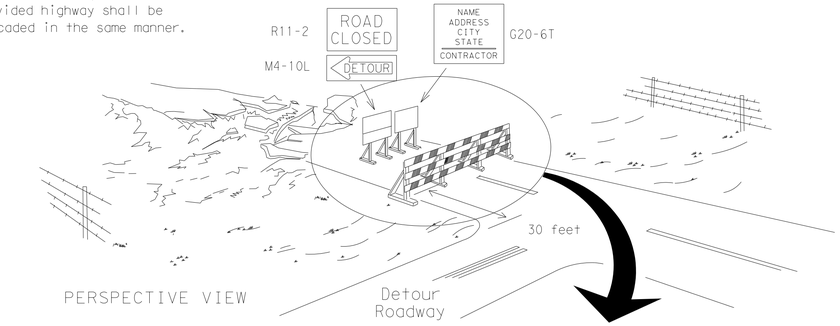
TYPICAL STRIPING DETAIL FOR BARRICADE RAIL



Stiffener may be inside or outside of support, but no more than 2 stiffeners shall be allowed on one barricade.

TYPICAL PANEL DETAIL
FOR SKID OR POST TYPE BARRICADES

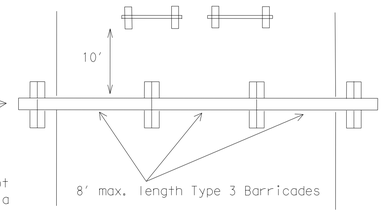
Each roadway of a divided highway shall be barricaded in the same manner.



PERSPECTIVE VIEW

The three rails on Type 3 barricades shall be reflectorized orange and reflective white stripes on one side facing one-way traffic and both sides for two-way traffic.

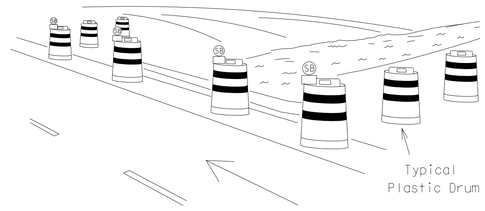
Barricade striping should slant downward in the direction of detour.



PLAN VIEW

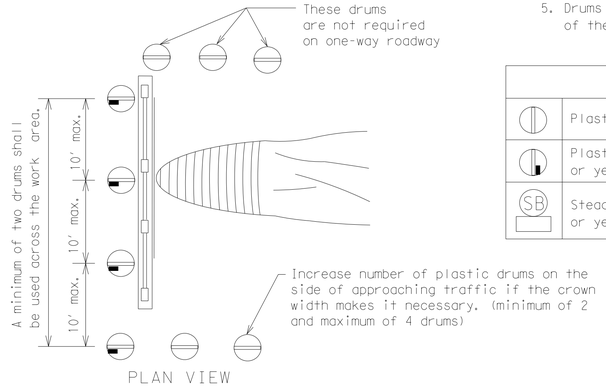
1. Signs should be mounted on independent supports at a 7 foot mounting height in center of roadway. The signs should be a minimum of 10 feet behind Type 3 Barricades.
2. Advance signing shall be as specified elsewhere in the plans.

TYPE 3 BARRICADE (POST AND SKID) TYPICAL APPLICATION



PERSPECTIVE VIEW

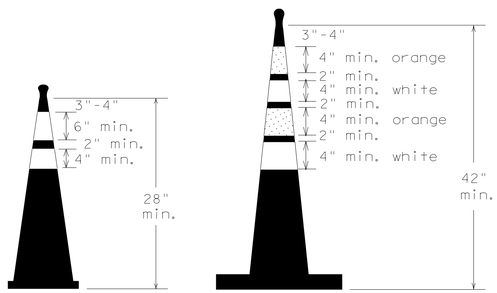
1. Where positive redirectional capability is provided, drums may be omitted.
2. Plastic construction fencing may be used with drums for safety as required in the plans.
3. Vertical Panels on flexible support may be substituted for drums when the shoulder width is less than 4 feet.
4. When the shoulder width is greater than 12 feet, steady-burn lights may be omitted if drums are used.
5. Drums must extend the length of the culvert widening.



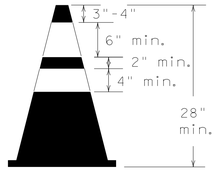
PLAN VIEW

LEGEND	
	Plastic drum
	Plastic drum with steady burn light or yellow warning reflector
SB	Steady burn warning light or yellow warning reflector

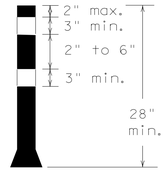
CULVERT WIDENING OR OTHER ISOLATED WORK WITHIN THE PROJECT LIMITS



Two-Piece cones



One-Piece cones

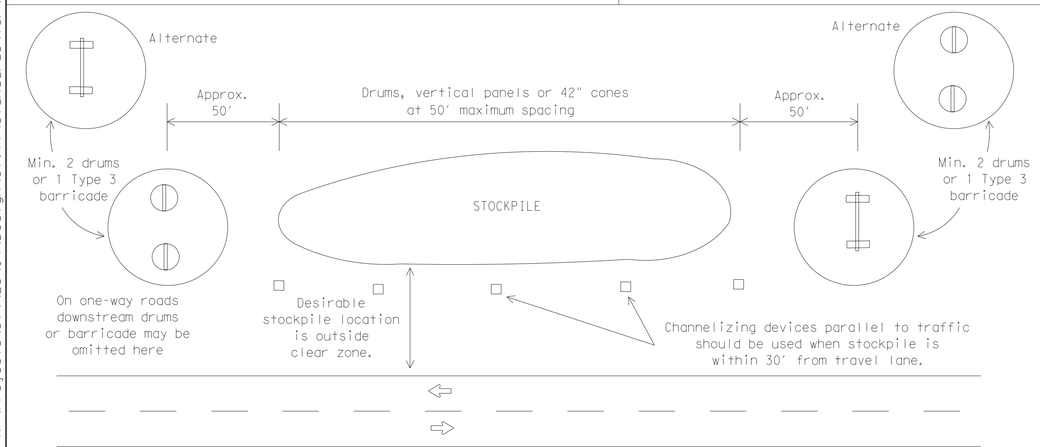


Tubular Marker

28" Cones shall have a minimum weight of 9 1/2 lbs.

42" 2-piece cones shall have a minimum weight of 30 lbs. including base.

1. Traffic cones and tubular markers shall be predominantly orange, and meet the height and weight requirements shown above.
2. One-piece cones have the body and base of the cone molded in one consolidated unit. Two-piece cones have a cone shaped body and a separate rubber base, or ballast, that is added to keep the device upright and in place.
3. Two-piece cones may have a handle or loop extending up to 8" above the minimum height shown, in order to aid in retrieving the device.
4. Cones or tubular markers shall have white or white and orange reflective bands as shown above. The reflective bands shall have a smooth, sealed outer surface and meet the requirements of Departmental Material Specification DMS-8300 Type A or Type B.
5. 28" cones and tubular markers are generally suitable for short duration and short-term stationary work as defined on BC(4). These should not be used for intermediate-term or long-term stationary work unless personnel is on-site to maintain them in their proper upright position.
6. 42" two-piece cones, vertical panels or drums are suitable for all work zone durations.
7. Cones or tubular markers used on each project should be of the same size and shape.



TRAFFIC CONTROL FOR MATERIAL STOCKPILES

Texas Department of Transportation

Traffic Safety Division Standard

BARRICADE AND CONSTRUCTION CHANNELIZING DEVICES

BC(10)-21

FILE: bc-21.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT November 2002	CONT	SECT	JOB	HIGHWAY
REVISIONS 9-07 8-14 7-13 5-21	0514	23	04 Wolf Ranch Parkway	
	DIST	COUNTY		SHEET NO.
	AUS	Williamson		152

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WORK ZONE PAVEMENT MARKINGS

GENERAL

1. The Contractor shall be responsible for maintaining work zone and existing pavement markings, in accordance with the standard specifications and special provisions, on all roadways open to traffic within the CSJ limits unless otherwise stated in the plans.
2. Color, patterns and dimensions shall be in conformance with the "Texas Manual on Uniform Traffic Control Devices" (TMUTCD).
3. Additional supplemental pavement marking details may be found in the plans or specifications.
4. Pavement markings shall be installed in accordance with the TMUTCD and as shown on the plans.
5. When short term markings are required on the plans, short term markings shall conform with the TMUTCD, the plans and details as shown on the Standard Plan Sheet WZ(STPM).
6. When standard pavement markings are not in place and the roadway is opened to traffic, DO NOT PASS signs shall be erected to mark the beginning of the sections where passing is prohibited and PASS WITH CARE signs at the beginning of sections where passing is permitted.
7. All work zone pavement markings shall be installed in accordance with Item 662, "Work Zone Pavement Markings."

RAISED PAVEMENT MARKERS

1. Raised pavement markers are to be placed according to the patterns on BC(12).
2. All raised pavement markers used for work zone markings shall meet the requirements of Item 672, "RAISED PAVEMENT MARKERS" and Departmental Material Specification DMS-4200 or DMS-4300.

PREFABRICATED PAVEMENT MARKINGS

1. Removable prefabricated pavement markings shall meet the requirements of DMS-8241.
2. Non-removable prefabricated pavement markings (foil back) shall meet the requirements of DMS-8240.

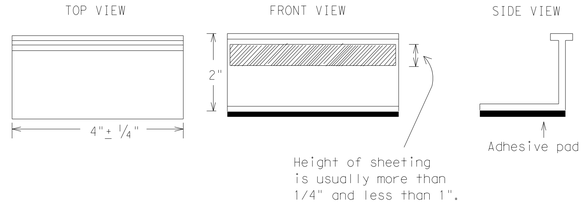
MAINTAINING WORK ZONE PAVEMENT MARKINGS

1. The Contractor will be responsible for maintaining work zone pavement markings within the work limits.
2. Work zone pavement markings shall be inspected in accordance with the frequency and reporting requirements of work zone traffic control device inspections as required by Form 599.
3. The markings should provide a visible reference for a minimum distance of 300 feet during normal daylight hours and 160 feet when illuminated by automobile low-beam headlights at night, unless sight distance is restricted by roadway geometrics.
4. Markings failing to meet this criteria within the first 30 days after placement shall be replaced at the expense of the Contractor as per Specification Item 662.

REMOVAL OF PAVEMENT MARKINGS

1. Pavement markings that are no longer applicable, could create confusion or direct a motorist toward or into the closed portion of the roadway shall be removed or obliterated before the roadway is opened to traffic.
2. The above shall not apply to detours in place for less than three days, where flaggers and/or sufficient channelizing devices are used in lieu of markings to outline the detour route.
3. Pavement markings shall be removed to the fullest extent possible, so as not to leave a discernable marking. This shall be by any method approved by TxDOT Specification Item 677 for "Eliminating Existing Pavement Markings and Markers".
4. The removal of pavement markings may require resurfacing or seal coating portions of the roadway as described in Item 677.
5. Subject to the approval of the Engineer, any method that proves to be successful on a particular type pavement may be used.
6. Blast cleaning may be used but will not be required unless specifically shown in the plans.
7. Over-painting of the markings SHALL NOT BE permitted.
8. Removal of raised pavement markers shall be as directed by the Engineer.
9. Removal of existing pavement markings and markers will be paid for directly in accordance with Item 677, "ELIMINATING EXISTING PAVEMENT MARKINGS AND MARKERS," unless otherwise stated in the plans.
10. Black-out marking tape may be used to cover conflicting existing markings for periods less than two weeks when approved by the Engineer.

Temporary Flexible-Reflective Roadway Marker Tabs



STAPLES OR NAILS SHALL NOT BE USED TO SECURE TEMPORARY FLEXIBLE-REFLECTIVE ROADWAY MARKER TABS TO THE PAVEMENT SURFACE

1. Temporary flexible-reflective roadway marker tabs used as guidemarks shall meet the requirements of DMS-8242.
2. Tabs detailed on this sheet are to be inspected and accepted by the Engineer or designated representative. Sampling and testing is not normally required, however at the option of the Engineer, either "A" or "B" below may be imposed to assure quality before placement on the roadway.
   A. Select five (5) or more tabs at random from each lot or shipment and submit to the Construction Division, Materials and Pavement Section to determine specification compliance.
   B. Select five (5) tabs and perform the following test. Affix five (5) tabs at 24 inch intervals on an asphaltic pavement in a straight line. Using a medium size passenger vehicle or pickup, run over the markers with the front and rear tires at a speed of 35 to 40 miles per hour, four (4) times in each direction. No more than one (1) out of the five (5) reflective surfaces shall be lost or displaced as a result of this test.
3. Small design variances may be noted between tab manufacturers.
4. See Standard Sheet WZ(STPM) for tab placement on new pavements. See Standard Sheet TCP(7-1) for tab placement on seal coat work.

RAISED PAVEMENT MARKERS USED AS GUIDEMARKS

1. Raised pavement markers used as guidemarks shall be from the approved product list, and meet the requirements of DMS-4200.
2. All temporary construction raised pavement markers provided on a project shall be of the same manufacturer.
3. Adhesive for guidemarks shall be bituminous material hot applied or butyl rubber pad for all surfaces, or thermoplastic for concrete surfaces.

Guidemarks shall be designated as:
YELLOW - (two amber reflective surfaces with yellow body).
WHITE - (one silver reflective surface with white body).

DEPARTMENTAL MATERIAL SPECIFICATIONS	
PAVEMENT MARKERS (REFLECTORIZED)	DMS-4200
TRAFFIC BUTTONS	DMS-4300
EPOXY AND ADHESIVES	DMS-6100
BITUMINOUS ADHESIVE FOR PAVEMENT MARKERS	DMS-6130
PERMANENT PREFABRICATED PAVEMENT MARKINGS	DMS-8240
TEMPORARY REMOVABLE, PREFABRICATED PAVEMENT MARKINGS	DMS-8241
TEMPORARY FLEXIBLE, REFLECTIVE ROADWAY MARKER TABS	DMS-8242

A list of prequalified reflective raised pavement markers, non-reflective traffic buttons, roadway marker tabs and other pavement markings can be found at the Material Producer List web address shown on BC(1).

Texas Department of Transportation

Traffic Safety Division Standard

BARRICADE AND CONSTRUCTION PAVEMENT MARKINGS

BC(11)-21

FILE: bc-21.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT February 1998	CONT	SECT	JOB	HIGHWAY
REVISIONS	0514	23	04 Wolf Ranch Parkway	
2-98 9-07 5-21	DIST	COUNTY		SHEET NO.
1-02 7-13	AUS	Williamson		153
11-02 8-14				

105

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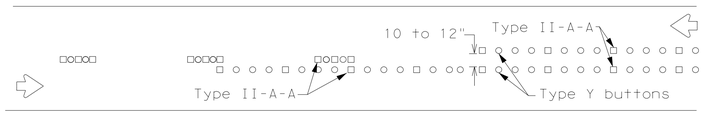
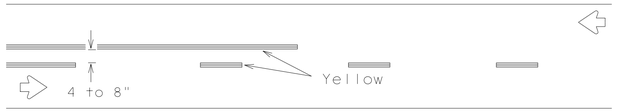
PAVEMENT MARKING PATTERNS



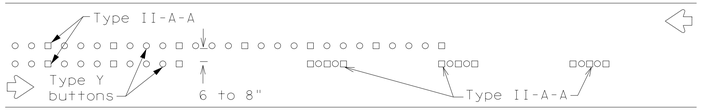
REFLECTORIZED PAVEMENT MARKINGS - PATTERN A



RAISED PAVEMENT MARKERS - PATTERN A



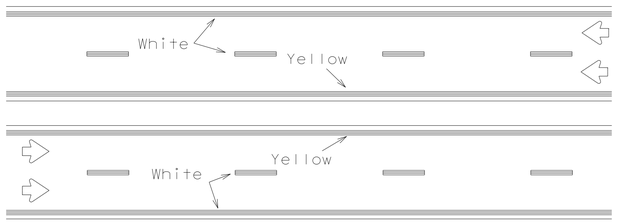
REFLECTORIZED PAVEMENT MARKINGS - PATTERN B



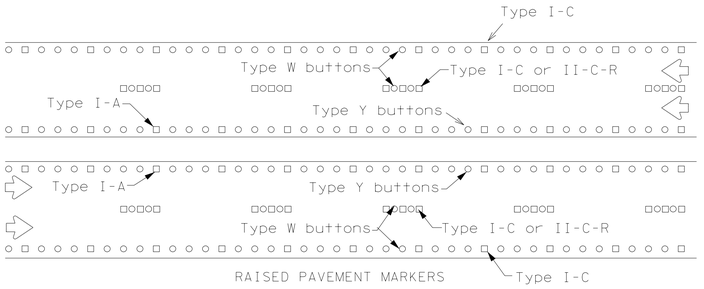
RAISED PAVEMENT MARKERS - PATTERN B

Pattern A is the TXDOT Standard, however Pattern B may be used if approved by the Engineer.
Prefabricated markings may be substituted for reflectorized pavement markings.

CENTER LINE & NO-PASSING ZONE BARRIER LINES FOR TWO-LANE, TWO-WAY HIGHWAYS



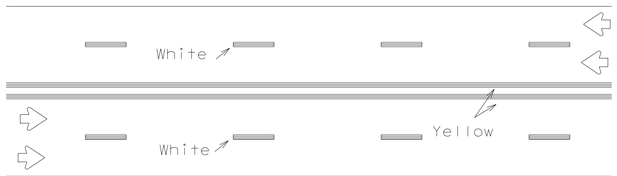
REFLECTORIZED PAVEMENT MARKINGS



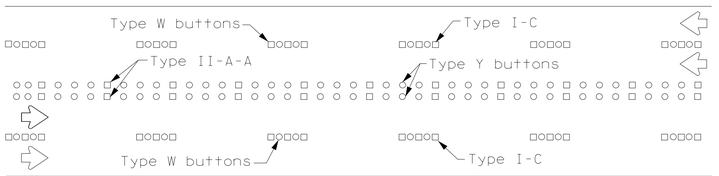
RAISED PAVEMENT MARKERS

Prefabricated markings may be substituted for reflectorized pavement markings.

EDGE & LANE LINES FOR DIVIDED HIGHWAY



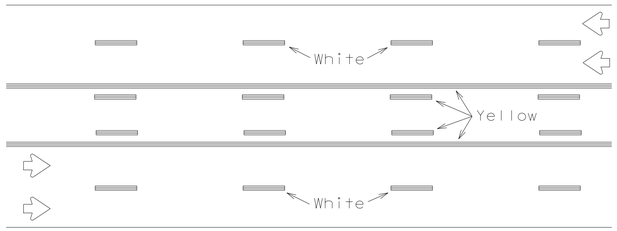
REFLECTORIZED PAVEMENT MARKINGS



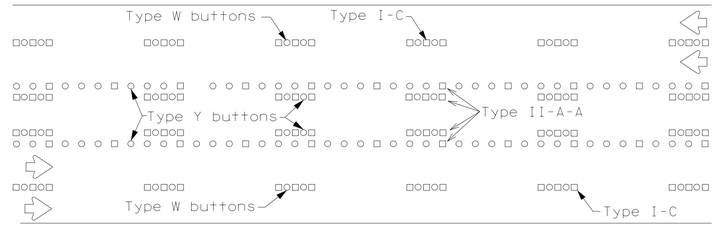
RAISED PAVEMENT MARKERS

Prefabricated markings may be substituted for reflectorized pavement markings.

LANE & CENTER LINES FOR MULTILANE UNDIVIDED HIGHWAYS



REFLECTORIZED PAVEMENT MARKINGS



RAISED PAVEMENT MARKERS

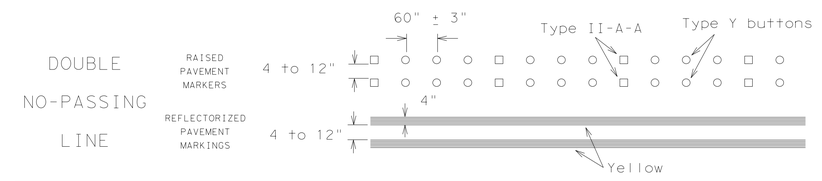
Prefabricated markings may be substituted for reflectorized pavement markings.

TWO-WAY LEFT TURN LANE

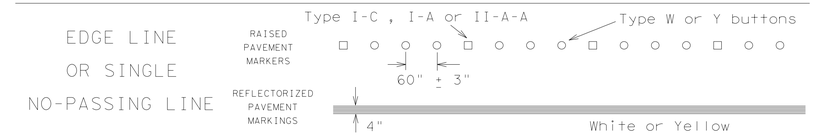
STANDARD WORK ZONE PAVEMENT MARKINGS DETAILS

SOLID LINES

DOUBLE NO-PASSING LINE

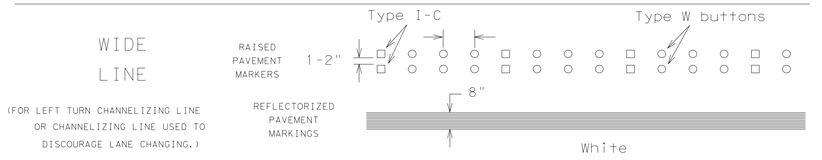


EDGE LINE OR SINGLE NO-PASSING LINE



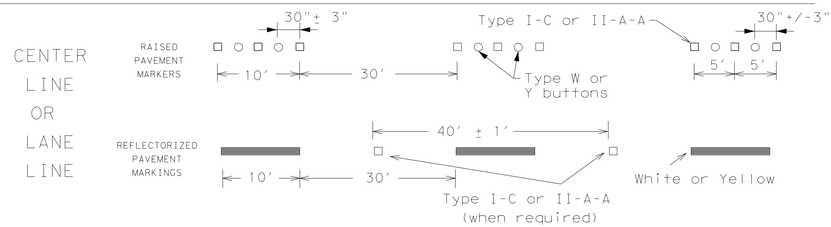
WIDE LINE

(FOR LEFT TURN CHANNELIZING LINE OR CHANNELIZING LINE USED TO DISCOURAGE LANE CHANGING.)

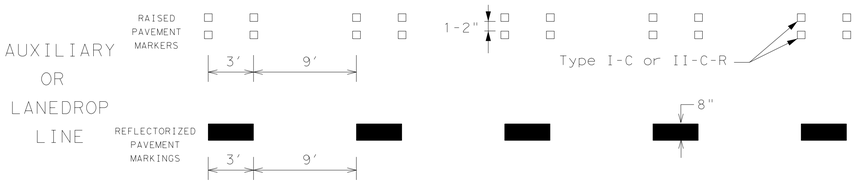


BROKEN LINES

CENTER LINE OR LANE LINE

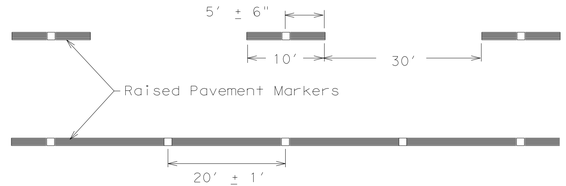


AUXILIARY OR LANEDROP LINE



REMOVABLE MARKINGS WITH RAISED PAVEMENT MARKERS

If raised pavement markers are used to supplement REMOVABLE markings, the markers shall be applied to the top of the tape at the approximate mid length of tape used for broken lines or at 20 foot spacing for solid lines. This allows an easier removal of raised pavement markers and tape.



Centerline only - not to be used on edge lines

Raised pavement markers used as standard pavement markings shall be from the approved products list and meet the requirements of Item 672 "RAISED PAVEMENT MARKERS."

Texas Department of Transportation

Traffic Safety Division Standard

BARRICADE AND CONSTRUCTION PAVEMENT MARKING PATTERNS

BC(12)-21

FILE: bc-21.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT February 1998	CONT	SECT	JOB	HIGHWAY
REVISIONS 1-97 9-07 5-21 2-98 7-13 11-02 8-14	0514	23	04 Wolf Ranch Parkway	
	DIST	COUNTY		SHEET NO.
	AUS	Williamson		154

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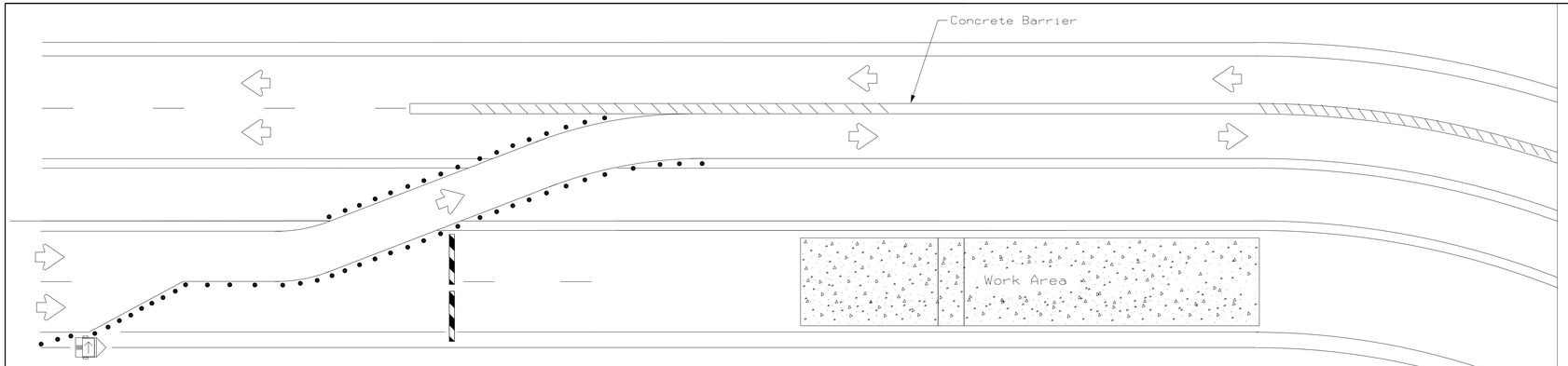


NOTES:

1. Length of Safety Glare screen will be specified elsewhere in the plans.
2. The cumulative nominal length of the modular safety glare screen units shall equal the length of the individual sections of temporary concrete traffic barrier on which they are installed so the joint between barrier sections will not be spanned by any one safety glare screen unit.
3. Screen Panel/blades will be designed such that reflective sheeting conforming with Departmental Material Specification DMS-8300, Sign Face Materials, Type B or C Yellow, minimum size of 2 inches by 12 inches can be attached to the edge of the panel/blade. The sheeting shall be attached to one glare screen panel/blade per section of concrete barrier not to exceed a spacing of 30 feet. Barrier reflectors are not necessary when panel/blades are installed with reflective sheeting as described.
4. Payment for these devices will be under statewide Special Specification "Modular Glare Screens for Headlight Barrier."
5. This detail is only intended to show types of locations where Glare Screens would be appropriate. Required signing and other devices shall be as shown elsewhere in the plans.

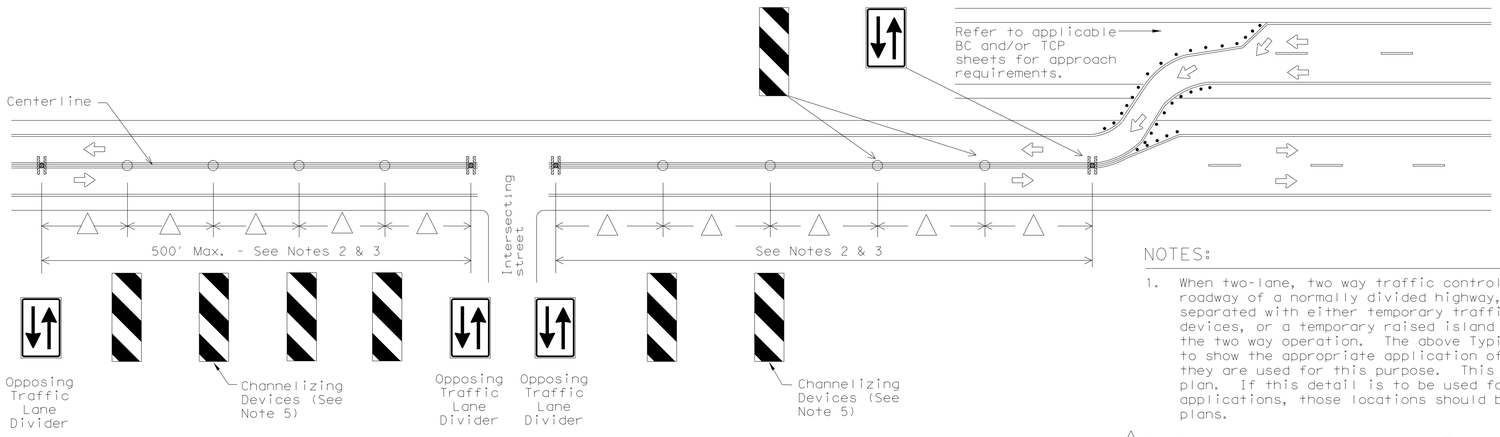
BARRIER DELINEATION WITH MODULAR GLARE SCREENS

LEGEND	
	Type 3 Barricade
• • •	Channelizing Devices
	Trailer Mounted Flashing Arrow Board
	Sign
\\\\	Safety glare screen

DEPARTMENTAL MATERIAL SPECIFICATIONS	
SIGN FACE MATERIALS	DMS-8300
DELINEATORS AND OBJECT MARKERS	DMS-8600
MODULAR GLARE SCREENS FOR HEADLIGHT BARRIER	DMS-8610

Only pre-qualified products shall be used. A copy of the Compliant Work Zone Traffic Control Devices List" CWZTCD) describes pre-qualified products and their sources and may be found at the following web address:

http://www.txdot.gov/business/resources/producer-list.html



VERTICAL PANELS & OPPOSING TRAFFIC LANE DIVIDERS (OTLD) SEPARATING TWO-WAY TRAFFIC ON NORMALLY DIVIDED HIGHWAYS

NOTES:

1. When two-lane, two way traffic control must be maintained on one roadway of a normally divided highway, opposing traffic shall be separated with either temporary traffic barriers, channelizing devices, or a temporary raised island throughout the length of the two way operation. The above Typical Application is intended to show the appropriate application of channelizing devices when they are used for this purpose. This is not a traffic control plan. If this detail is to be used for other types of roads or applications, those locations should be stated elsewhere in the plans.

△2. Space devices according to the Tangent Spacing shown on the Device Spacing table on BC(9) but not exceeding 100'.

3. Every fifth device should be an OTLD except when spaced closer to accommodate an intersection. An OTLD should be the first device on each side of intersecting streets or roads.
4. Locations where surface mount bases with adhesives or self-righting devices will be required in order to maintain them in their proper position should be noted elsewhere in the plans.
5. Channelizing devices are to be vertical panels, 42" cones or tubular markers that are at least 36" tall. Tubular markers used to separate traffic should have a rubber base weighing at least 30 pounds. Tubular markers that are 42" tall or more shall have four bands of reflective material as detailed for 42" cones on BC(10). Tubular markers less than 42" but at least 36" tall shall have three bands of 3" wide white reflective material spaced 2" apart. Reflective material shall meet DMS-8300, Type A.

Texas Department of Transportation

Traffic Operations Division Standard

TRAFFIC CONTROL PLAN TYPICAL DETAILS

WZ(TD)-17

FILE: wztd-17.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT February 1998	CONT	SECT	JOB	HIGHWAY
REVISIONS 2-17	0514	23	04 Wolf Ranch Parkway	
4-98	DIST	COUNTY		SHEET NO.
3-03	AUS	Williamson		155
7-13				

110

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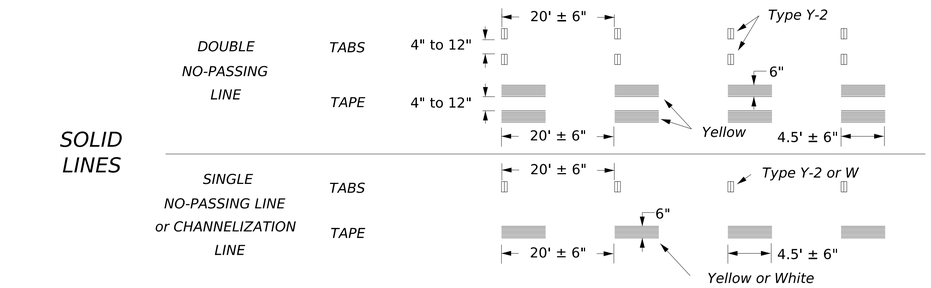
WORK ZONE SHORT TERM PAVEMENT MARKINGS DETAILS



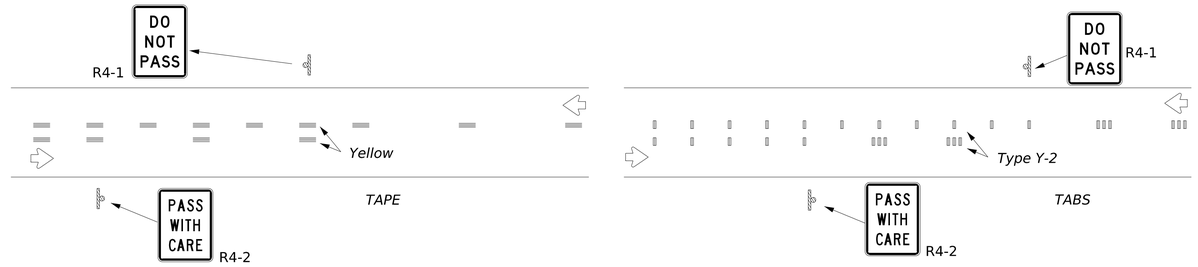
NOTES:

1. Short term pavement markings may be prefabricated markings (stick down tape) or temporary flexible reflective roadway marker tabs unless otherwise specified elsewhere in plans.
2. Short term pavement markings shall NOT be used to simulate edge lines.
3. Dimensions indicated on this sheet are typical and approximate. Variations in size and height may occur between markers or devices made by manufacturers, by as much as 1/4 inch, unless otherwise noted.
4. Temporary flexible-reflective roadway marker tabs will require normal maintenance replacement when used on roadways with an ADT per lane of up to 7500 vehicles with no more than 10% truck mix. When roadways exceed these values, additional maintenance replacement of devices should be planned.
5. No segment of roadway open to traffic shall remain without permanent pavement markings for a period greater than 14 calendar days. The Contractor will be responsible for maintaining short term pavement markings until permanent pavement markings are in place. When the Contractor is responsible for placement of permanent pavement markings, no segment of roadway shall remain without permanent pavement markings for a period greater than 14 calendar days unless weather conditions prohibit placement. Permanent pavement markings shall be placed as soon as weather permits.
6. For two lane, two-way roadways, DO NOT PASS signs shall be erected to mark the beginning of sections where passing is prohibited and PASS WITH CARE signs shall be erected to mark the beginning of sections where passing is permitted. Signs shall be in accordance with the "Texas Manual on Uniform Traffic Control Devices" (TMUTCD) and may be used to indicate the limits of no-passing zones for up to 14 calendar days. Permanent pavement markings should then be placed.
7. For low volume two lane, two-way roadways of 4000 ADT or less, no-passing lines may be omitted when approved by the Engineer. DO NOT PASS and PASS WITH CARE signs shall be erected (see note 6).
8. For exit gores where a lane is being dropped place wide gore markings or retroreflective channelizing devices to guide motorist through the exit. If channelizing devices are to be used it should be noted elsewhere in the plans. One piece cones are not allowed for this purpose.

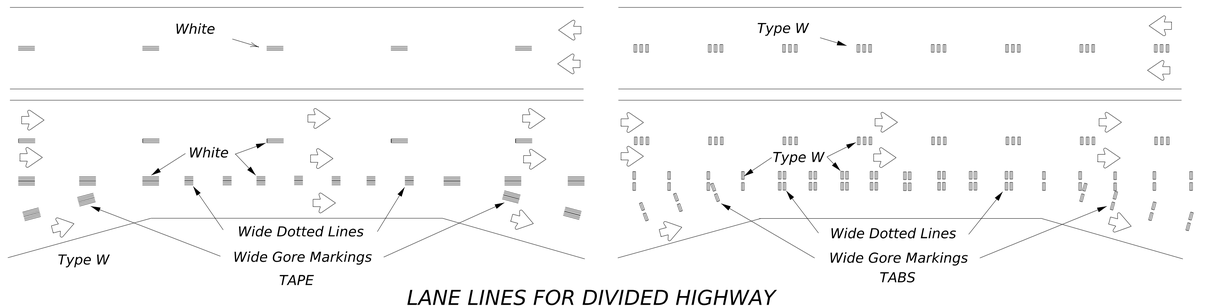
TEMPORARY FLEXIBLE, REFLECTIVE ROADWAY MARKER TABS (TABS)

1. Temporary flexible-reflective roadway marker tabs detailed on this sheet will be designated Type Y-2 (two amber reflective surfaces with yellow body); Type Y (one amber reflective surface with yellow body); and Type W (one white or silver reflective surface with white body). Additional details may be found on BC(11).
2. Tabs shall meet requirements of Departmental Material Specification DMS-8242.
3. When dry, tabs shall be visible for a minimum distance of 200 feet during normal daylight hours and when illuminated by automobile low-beam head light at night, unless sight distance is restricted by roadway geometrics.
4. No two consecutive tabs nor four tabs per 1000 feet of line shall be missing or fail to meet the visual performance requirements of Note 3.

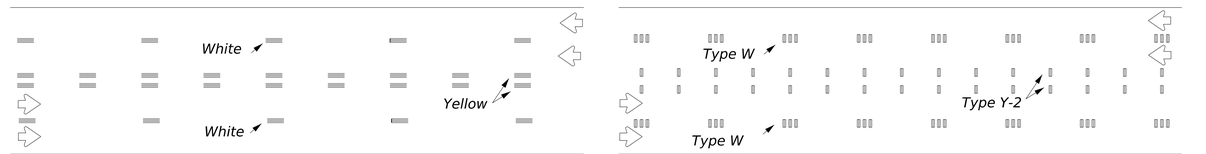
WORK ZONE SHORT TERM PAVEMENT MARKINGS PATTERNS



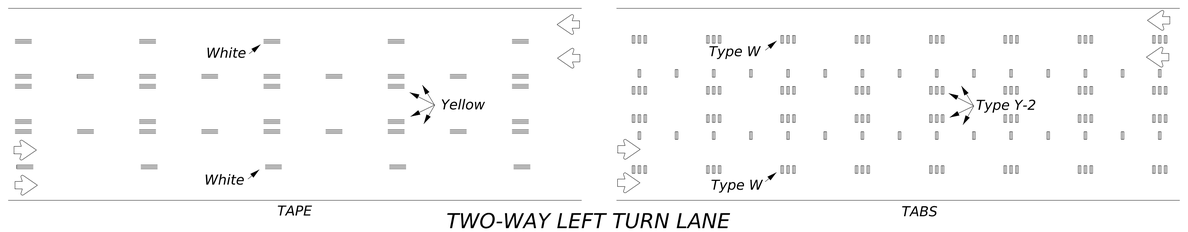
CENTER LINE & NO-PASSING ZONE BARRIER LINES FOR TWO LANE TWO-WAY HIGHWAYS



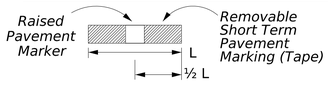
LANE LINES FOR DIVIDED HIGHWAY



LANE & CENTER LINES FOR MULTILANE UNDIVIDED HIGHWAYS



TWO-WAY LEFT TURN LANE



If raised pavement markers are used to supplement REMOVABLE short term markings, the markers shall be applied to the top of the tape at the approximate mid length of the tape. This allows an easier removal of raised markers and tape.

PREFABRICATED PAVEMENT MARKINGS

1. Temporary Removable Prefabricated Pavement Markings shall meet the requirements of DMS-8241.
2. Non-removable Prefabricated Pavement Markings shall meet the requirements of either DMS-8240 "Permanent Prefabricated Pavement Markings" or DMS-8243 "Temporary Costruction-Grade Prefabricated Pavement Markings."

RAISED PAVEMENT MARKERS

1. All raised pavement markers used for work zone markings shall meet the requirements of Item 672, "RAISED PAVEMENT MARKERS" and DMS-4200.

DEPARTMENTAL MATERIAL SPECIFICATIONS (DMS) & MATERIAL PRODUCER LISTS (MPL)

1. DMSs referenced above can be found along with embedded links to their respective MPLs at the following website:

http://www.txdot.gov/business/contractors_consultants/material_specifications/default.htm

Texas Department of Transportation

Traffic Safety Division Standard

WORK ZONE SHORT TERM PAVEMENT MARKINGS

WZ(STPM)-23

FILE: wzstpm-23.dgn	DN:	CK:	DW:	CK:
© TxDOT February 2023	CONT	SECT	JOB	HIGHWAY
REVISIONS	0514	23	04	Wolf Ranch Parkway
4-92 7-13 1-97 2-23 3-03	DIST	COUNTY		SHEET NO.
	AUS	Williamson		156

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DATE: 9/11/2025 11:22:42 AM
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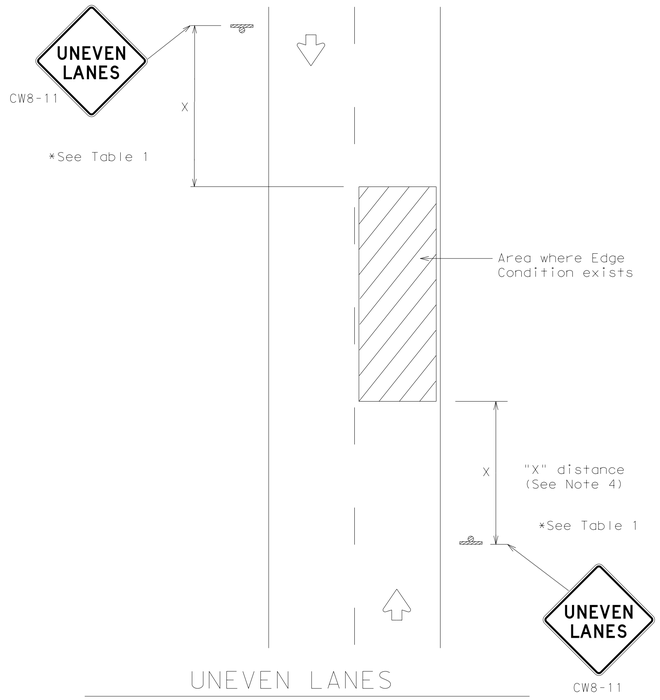
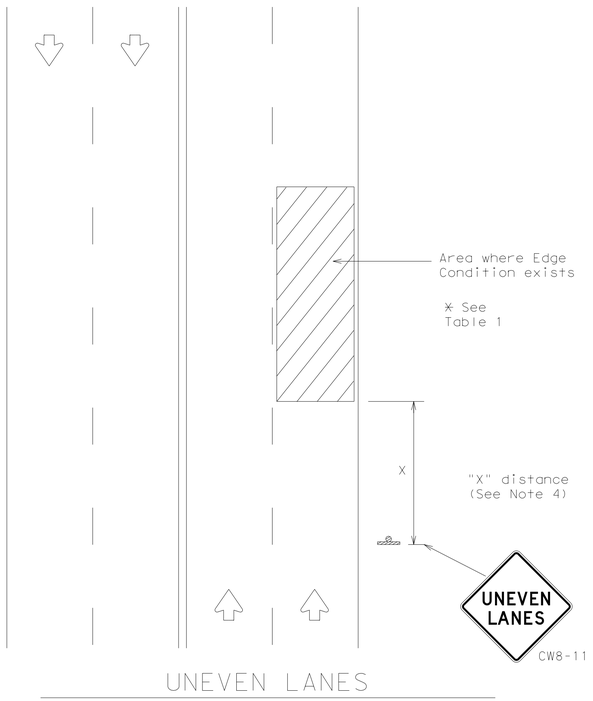
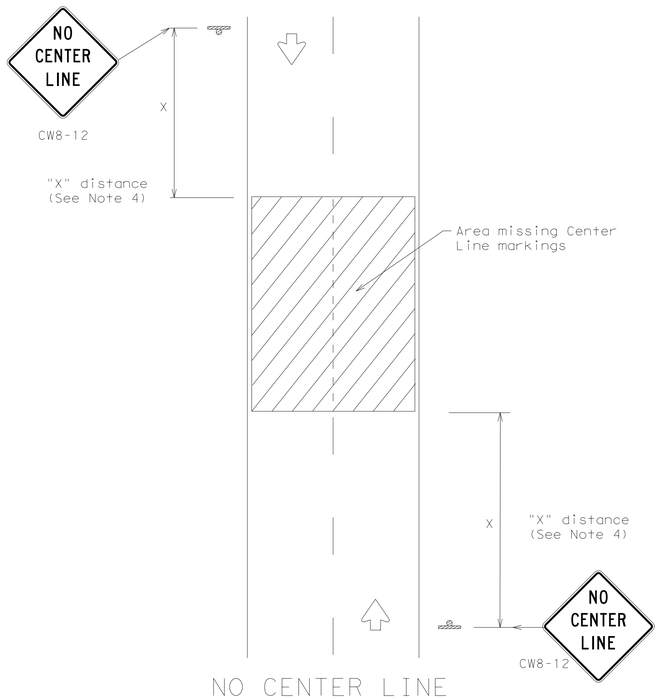


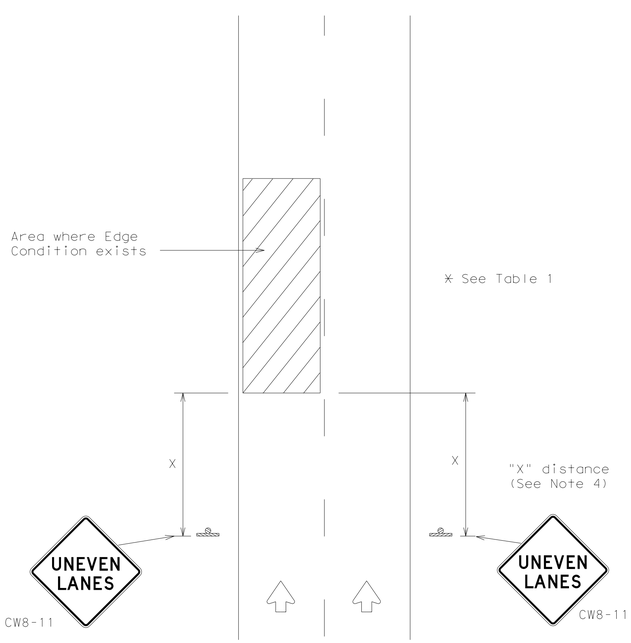
UNEVEN LANES
TWO LANE CONVENTIONAL ROAD



UNEVEN LANES
FOUR LANE CONVENTIONAL ROAD



NO CENTER LINE
TWO LANE CONVENTIONAL ROAD



UNEVEN LANES
DIVIDED ROADWAY

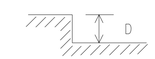
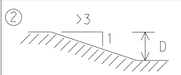
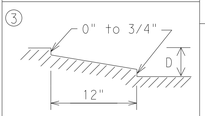
DEPARTMENTAL MATERIAL SPECIFICATIONS	
PERMANENT PREFABRICATED PAVEMENT MARKINGS	DMS-8240
TEMPORARY (REMOVABLE) PREFABRICATED PAVEMENT MARKINGS	DMS-8241
SIGN FACE MATERIALS	DMS-8300

COLOR	USAGE	SHEETING MATERIAL
ORANGE	BACKGROUND	TYPE B_{FL} OR TYPE C_{FL} SHEETING
BLACK	LEGEND & BORDERS	ACRYLIC NON-REFLECTIVE SHEETING

GENERAL NOTES

1. If spalling or holes occur, ROUGH ROAD (CW8-8) signs should be placed in advance of the condition and be repeated every two miles where the condition persists.
2. UNEVEN LANES (CW8-11) signs shall be installed in advance of the condition and repeated every mile. Signs installed along the uneven lane condition may be supplemented with the NEXT XX MILES (CW7-3aP) plaque or Advisory Speed (CW13-1P) plaque.
3. NO CENTER LINE (CW8-12) signs and temporary pavement markings as per the WZ(STPM) standard shall be installed if yellow centerlines separating two way traffic are obscured or obliterated. Repeat NO CENTER LINE signs every two miles where the center line markings are not in place. The signs and markings shall remain in place until permanent pavement markings are installed.
4. Signs shall be spaced at the distances recommended as per BC standards.
5. Additional signs may be required as directed by the Engineer. Signs shall remain in place until final surface is applied. Signs shall be considered subsidiary to Item 502 "BARRICADES, SIGNS AND TRAFFIC HANDLING."
6. Signs shall be fabricated and mounted on supports as shown on the BC standards and/or listed on the "Compliant Work Zone Traffic Control Devices" list.
7. Short term markings shall not be used to simulate edge lines.
8. All signs shall be constructed in accordance with the details found in the "Standard Highway Sign Designs for Texas," latest edition.

TABLE 1

Edge Condition	Edge Height (D)	* Warning Devices
① 	Less than or equal to: 1¼" (maximum-planing) 1½" (typical-overlay)	Sign: CW8-11
	Distance "D" may be a maximum of 1 1/4 " for planing operations and 2" for overlay operations if uneven lanes with edge condition 1 are open to traffic after work operations cease.	
② 	Less than or equal to 3"	Sign: CW8-11
③  Notched Wedge Joint	Distance "D" may be a maximum of 3" if uneven lanes with edge condition 2 or 3 are open to traffic after work operations cease. Uneven lanes should not be open to traffic when "D" is greater than 3".	

TRAFFIC CONTROL DURING PLANING, OVERLAY AND LEVELING OPERATIONS ARE SHOWN ELSEWHERE IN THE PLANS.

MINIMUM WARNING SIGN SIZE	
Conventional roads	36" x 36"
Freeways/expressways, divided roadways	48" x 48"

Texas Department of Transportation

Traffic Operations Division Standard

SIGNING FOR UNEVEN LANES

WZ(UL)-13

FILE: wzui-13.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT April 1992	CONT	SECT	JOB	HIGHWAY
REVISIONS	0514	23	04	Wolf Ranch Parkway
8-95 2-98 7-13	DIST	COUNTY		SHEET NO.
1-97 3-03	AUS	Williamson		157

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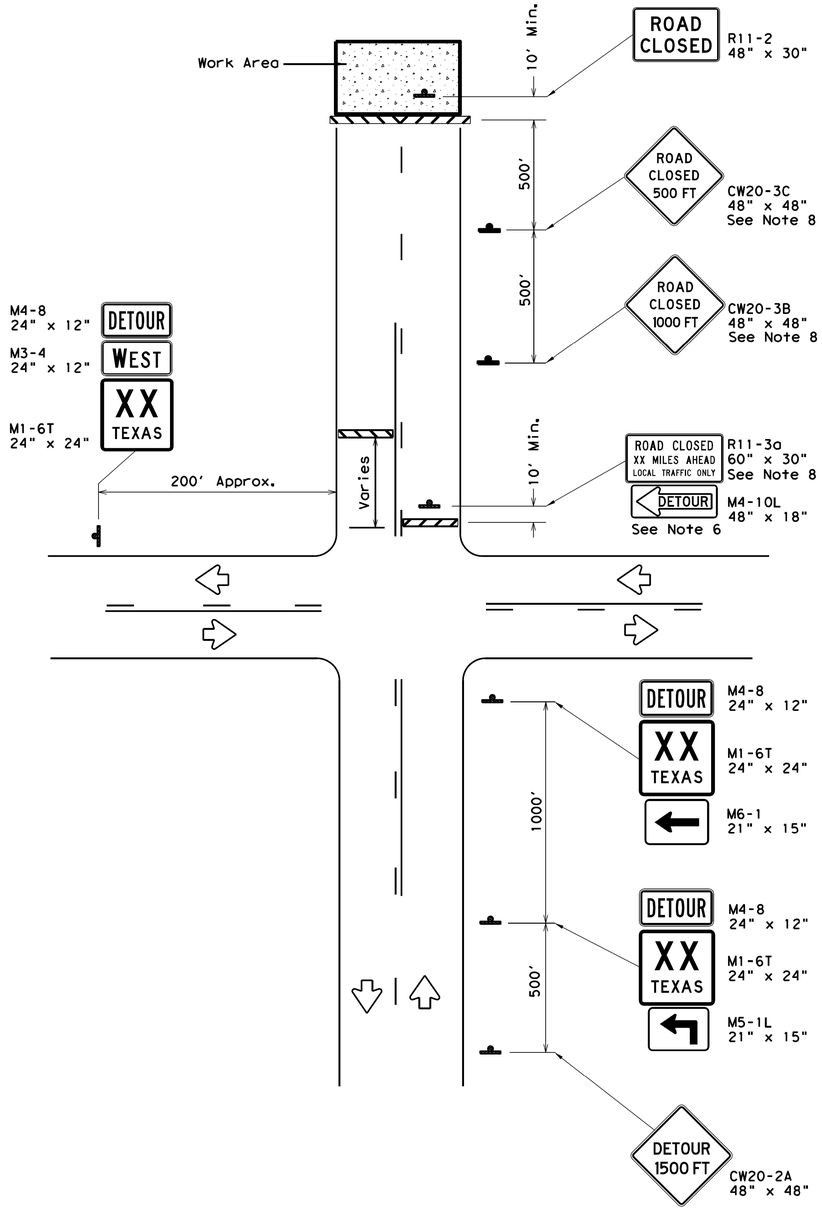
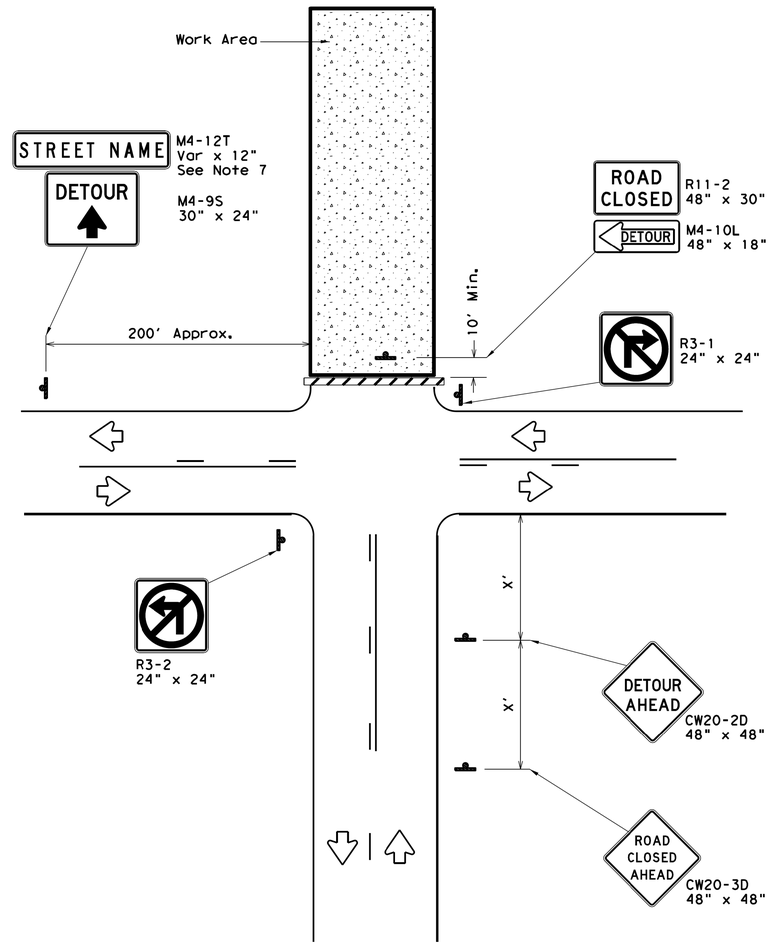


ROAD CLOSURE BEYOND THE INTERSECTION

Signing for a Numbered Route with an Off-Site Detour



ROAD CLOSURE AT THE INTERSECTION

Signing for an Un-numbered Route with an Off-Site Detour

LEGEND	
	Type 3 Barricade
	Sign

Posted Speed *	Minimum Sign Spacing "X" Distance
30	120'
35	160'
40	240'
45	320'
50	400'
55	500'
60	600'
65	700'
70	800'
75	900'

* Conventional Roads Only

GENERAL NOTES

1. This sheet is intended to provide details for temporary work zone road closures. For permanent road closure details see the D&OM standards.
2. Barricades used shall meet the requirements shown on Barricade and Construction Standard BC(10) and listed on the Compliant Work Zone Traffic Control Devices list (CWZTCD).
3. Stockpiled materials shall not be placed on the traffic side of barricades.
4. Barricades at the road closure should extend from pavement edge to pavement edge.
5. Detour signing shown is intended to illustrate the type of signing that is appropriate for numbered routes or un-numbered routes as labeled. It does not indicate the full extent of detour signing required. Detour routes should be signed as shown elsewhere in the plans.
6. If the road is open for a significant distance beyond the intersection or there are significant origin/destination points beyond the intersection, the signs and barricades at this location should be located at the edge of the traveled way.
7. The Street Name (M4-12T) sign is to be placed above the DETOUR (M4-9S) sign.
8. For urban areas where there is a shorter distance between the intersection and the actual closure location, the ROAD CLOSED XX MILES AHEAD (R11-3a) sign may be replaced with a ROAD CLOSED TO THRU TRAFFIC (R11-4) sign. If adequate space does not exist between the intersection and the closure a single ROAD CLOSED AHEAD (CW20-3D) sign spaced as per the table above may replace the ROAD CLOSED 1000 FT (CW20-3B) and ROAD CLOSED 500 FT (CW20-3C) signs.
9. Signs and barricades shown shall be subsidiary to Item 502. Locations where these details will be required shall be as shown elsewhere in the plans.

Texas Department of Transportation

Traffic Operations Division Standard

WORK ZONE ROAD CLOSURE DETAILS

WZ(RCD)-13

FILE: wzrcd-13.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
© TxDOT August 1995	CONT	SECT	JOB	HIGHWAY
REVISIONS				
1-97 4-98 7-13	DIST	COUNTY		SHEET NO.
2-98 3-03				158

DATE:
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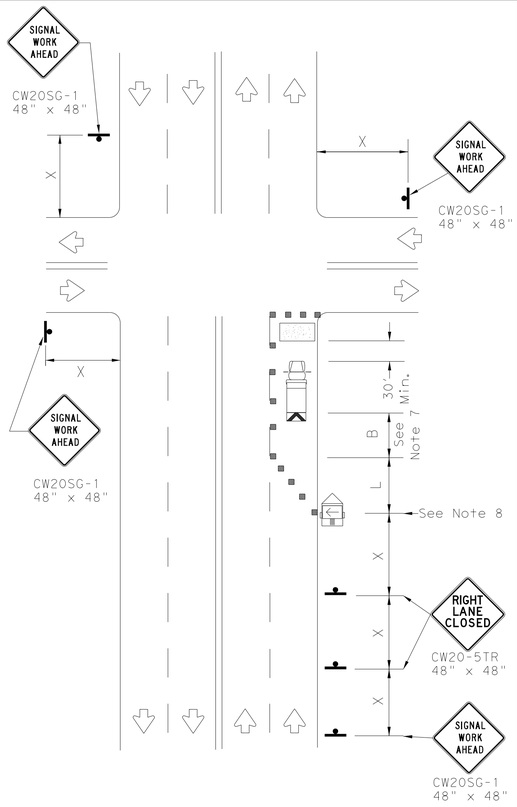
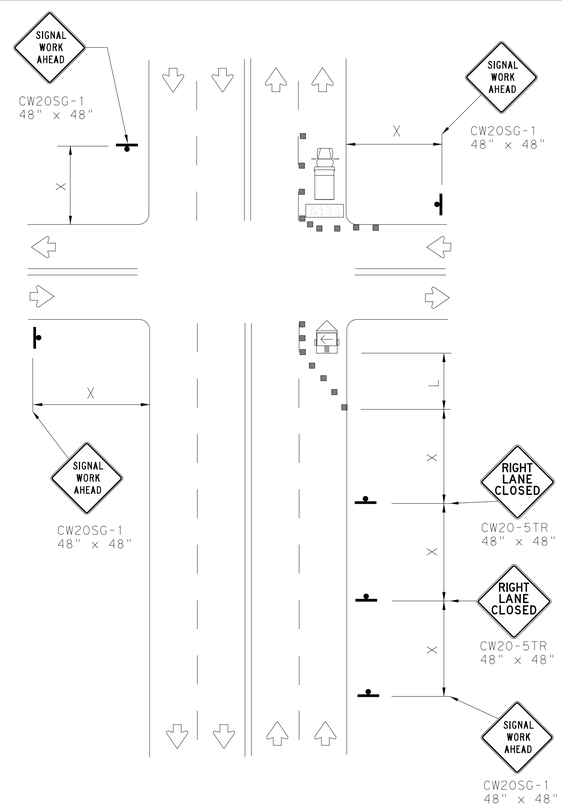


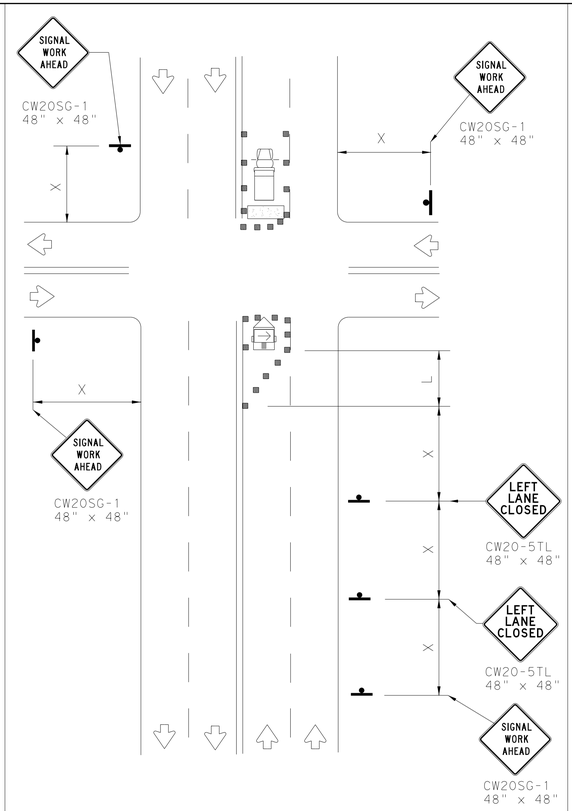
NEAR SIDE LANE CLOSURE

SHORT DURATION OR SHORT TERM STATIONARY



FAR SIDE RIGHT LANE CLOSURE

SHORT DURATION OR SHORT TERM STATIONARY



FAR SIDE LEFT LANE CLOSURE

SHORT DURATION OR SHORT TERM STATIONARY

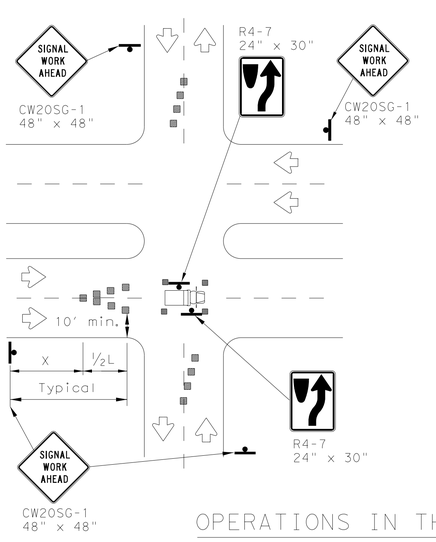
LEGEND			
	Type 3 Barricade		Channelizing Devices
	Heavy Work Vehicle		Truck Mounted Attenuator (TMA)
	Trailer Mounted Flashing Arrow Board		Portable Changeable Message Sign (PCMS)
	Sign		Traffic Flow
	Flag		Flagger

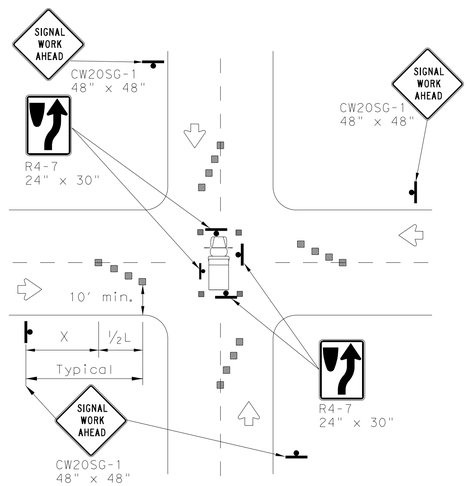
Posted Speed ✳	Formula	Minimum Desirable Taper Lengths ✳✳ 10′ Offset	11′ Offset	12′ Offset	Suggested Maximum Spacing of Channelizing Devices: On a Taper	On a Tangent	Minimum Sign Spacing "X" Distance	Suggested Longitudinal Buffer Space "B"
30	$L=\frac{WS^2}{60}$	150′	165′	180′	30′	60′	120′	90′
35		205′	225′	245′	35′	70′	160′	120′
40		265′	295′	320′	40′	80′	240′	155′
45	L=WS	450′	495′	540′	45′	90′	320′	195′
50		500′	550′	600′	50′	100′	400′	240′
55		550′	605′	660′	55′	110′	500′	295′
60		600′	660′	720′	60′	120′	600′	350′
65		650′	715′	780′	65′	130′	700′	410′
70		700′	770′	840′	70′	140′	800′	475′
75		750′	825′	900′	75′	150′	900′	540′

✳ Conventional Roads Only

✳✳ Taper lengths have been rounded off.
L=Length of Taper(FT) W=Width of Offset(FT) S=Posted Speed(MPH)

WORKERS IN BUCKET TRUCKS SHALL NOT WORK ABOVE OPEN LANES OF TRAFFIC.





OPERATIONS IN THE INTERSECTION

SHORT DURATION

GENERAL NOTES

1. The minimum size channelizing device is the 28" cone. 42" Two-piece cones, drums, vertical panels or barricades will be required when the device must be left unattended at night.
2. Obstructions or hazards at the work area shall be clearly marked and delineated at all times.
3. Flaggers and Flagger Symbol (CW20-7) signs may be required according to field conditions.
4. Vehicles parked in roadway shall be equipped with at least two high intensity rotating, flashing, oscillating or strobe type lights.
5. High level warning devices (flag trees) may be used at corners of the vehicle.
6. When work operations are performed on existing signals, the signals may be placed in flashing red mode when approved by the engineer. If existing signals do not have power, All-Way Stop (R1-1 and R1-3P) signs may be implemented when approved by the engineer.
7. For Short-Term Stationary work the buffer space "B" from the above table should be used if field conditions permit. For Short Duration (less than 1 hour) any buffer space provided will enhance the safety of the setup.
8. The arrow board at this location may be omitted for Short Duration work if the work vehicle has an arrow board in operation. As an option, the arrow board may be placed at the end of the taper in the closed lane if space is not available at the beginning of the taper.
9. Signs and devices for the NEAR SIDE LANE CLOSURE may be altered for a left lane closure by using a LEFT LANE CLOSED (CW20-5TL) and adding channelizing devices on the centerline to protect the work space from opposing traffic.

Texas Department of Transportation

Traffic Operations Division Standard

TRAFFIC SIGNAL WORK TYPICAL DETAILS

WZ(BTS-1)-13

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©TxDOT April 1992	CONT	SECT	JOB	HIGHWAY
REVISIONS	0514	23	04	Wolf Ranch Parkway
2-98 10-99 7-13	DIST	COUNTY		SHEET NO.
4-98 3-03	AUS	Williamson		159

114

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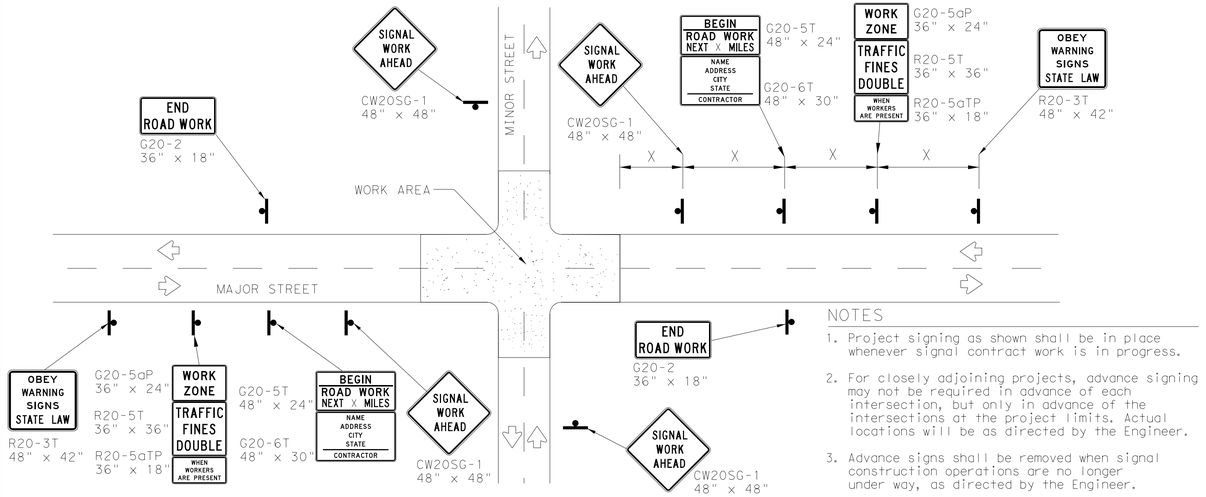


TYPICAL ADVANCE SIGNAL PROJECT SIGNING

FOR LONG TERM and INTERMEDIATE-TERM STATIONARY WORK OPERATIONS

NOTES

1. Project signing as shown shall be in place whenever signal contract work is in progress.
2. For closely adjoining projects, advance signing may not be required in advance of each intersection, but only in advance of the intersections at the project limits. Actual locations will be as directed by the Engineer.
3. Advance signs shall be removed when signal construction operations are no longer under way, as directed by the Engineer.
4. Warning sign spacing shown is typical for both directions.
5. See the Table on sheet 1 of 2 for Typical warning sign spacing.

GENERAL NOTES FOR WORK ZONE SIGNS

1. Signs shall be installed and maintained in a straight and plumb condition.
2. Wooden sign posts shall be painted white.
3. Barricades shall NOT be used as sign supports.
4. Nails shall NOT be used to attach signs to any support.
5. All signs shall be installed in accordance with the plans or as directed by the Engineer.
6. The Contractor shall furnish the sign design shown in the plans or in the "Standard Highway Sign Designs for Texas" (SHSD).
7. The Contractor shall furnish sign supports and substrates listed in the "Compliant Work Zone Traffic Control Device List" (CWZTCD), installed as per the manufacturer's recommendations.
8. Temporary signs that have damaged or cracked substrates and/or damaged or marred reflective sheeting shall be replaced as directed by the Engineer.
9. Identification markings may be shown only on the back of the sign substrate. The maximum height of letters and/or company logos used for identification shall be 1".
10. Damaged wood posts shall be replaced. Splicing wood posts will not be allowed.

DURATION OF WORK

1. Work zone durations are defined in Part 6, Section 6G.02 of the Texas Manual on Uniform Traffic Control Devices (TMUTCD).

SIGN MOUNTING HEIGHT

1. Sign height of Long-term/Intermediate-term warning signs shall be as shown on Figure 6F-1 of the TMUTCD.
2. Sign height of Short-term/Short Duration warning signs shall be as shown on Figure 6F-2 of the TMUTCD.
3. Regulatory signs shall be mounted at least 7 feet, but not more than 9 feet, above the paved surface regardless of work duration.

REMOVING OR COVERING

1. When sign messages may be confusing or do not apply, the signs shall be removed or completely covered, unless otherwise approved by the Engineer.
2. When signs are covered, the material used shall be opaque, such as heavy mil black plastic, or other materials which will cover the entire sign face and maintain their opaque properties under automobile headlights at night without damaging the sign sheeting. Burlap, or heavy materials such as plywood or aluminum shall not be used to cover signs.
3. Duct tape or other adhesive material shall NOT be affixed to a sign face.
4. Signs and anchor stubs shall be removed and holes back filled upon completion of the work.

REFLECTIVE SHEETING

1. All signs shall be retroreflective and constructed of sheeting meeting the requirements of the DMS and color usage table shown on this sheet.

SIGN SUPPORT WEIGHTS

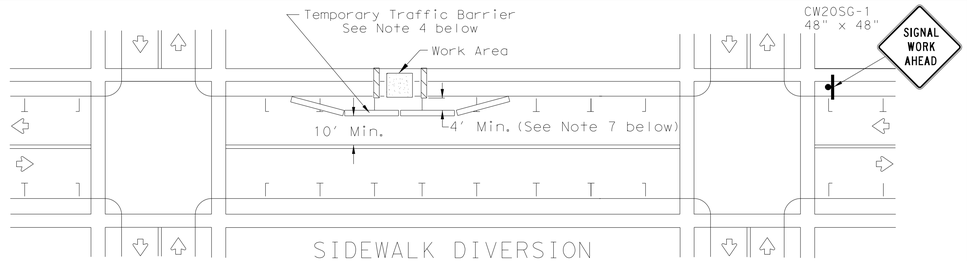
1. Weights used to keep signs from turning over should be sandbags filled with dry, cohesionless material.
2. The sandbags will be tied shut to keep the sand from spilling and to maintain a constant weight.
3. Rock, concrete, iron, steel or other solid objects will not be permitted for use as sign support weights.
4. Sandbags should weigh a minimum of 35 lbs and a maximum of 50 lbs.
5. Sandbags shall be made of a durable material that tears upon vehicular impact. Rubber, such as tire inner tubes, shall not be used.
6. Rubber ballasts designed for channelizing devices should not be used for ballast on portable sign supports. Sign supports designed and manufactured with rubber bases may be used when shown on the CWZTCD list.
7. Sandbags shall only be placed along or laid over the base supports of the traffic control device and shall not be suspended above ground level or hung with rope, wire, chains or other fastners. Sandbags shall be placed along the length of the skids to weigh down the sign support.
8. Sandbags shall NOT be placed under the skid and shall not be used to level sign supports placed on slopes.

LEGEND	
	Sign
	Channelizing Devices
	Type 3 Barricade

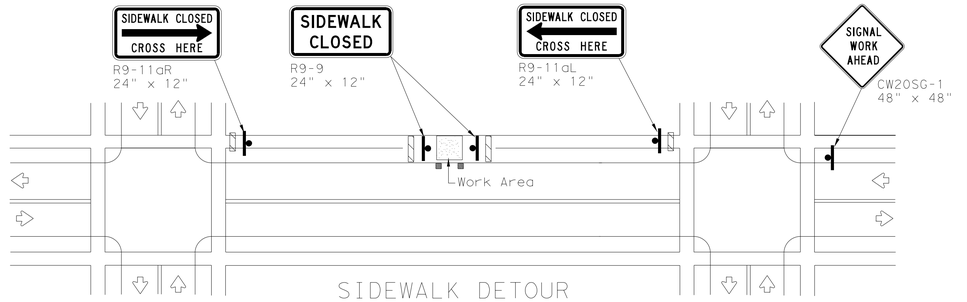
DEPARTMENTAL MATERIAL SPECIFICATIONS	
SIGN FACE MATERIALS	DMS-8300
FLEXIBLE ROLL-UP REFLECTIVE SIGNS	DMS-8310

COLOR	USAGE	SHEETING MATERIAL
ORANGE	BACKGROUND	TYPE B_{FL} OR TYPE C_{FL} SHEETING
WHITE	BACKGROUND	TYPE A SHEETING
BLACK	LEGEND & BORDERS	ACRYLIC NON-REFLECTIVE SHEETING

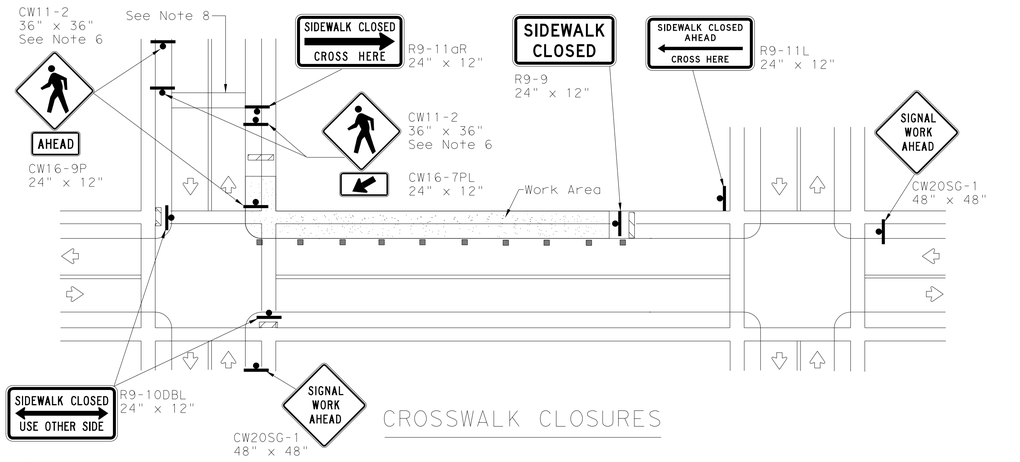
Only pre-qualified products shall be used. A copy of the "Compliant Work Zone Traffic Control Devices List" (CWZTCD) describes pre-qualified products and their sources and may be found at the following web address:
http://www.txdot.gov/txdot_library/publications/construction.htm



SIDEWALK DIVERSION



SIDEWALK DETOUR



CROSSWALK CLOSURES

PEDESTRIAN CONTROL

1. Holes, trenches or other hazards shall be adequately protected by covering, delineating or surrounding the hazard with orange plastic pedestrian fencing or longitudinal channelizing devices, or as directed by the Engineer.
2. "CROSSWALK CLOSURES" as detailed above will require the Engineer's approval prior to installation.
3. R9 series signs shown may be placed on supports detailed on the BC standards or CWZTCD list, or when fabricated from approved lightweight plastic substrates, they may be mounted on top of a plastic drum at or near the location shown.
4. For speeds less than 45 mph longitudinal channelizing devices may be used instead of traffic barriers when approved by the Engineer. Attenuation of blunt ends and installation of water filled devices shall be as per BC(9) and manufacturer's recommendations.
5. Location of devices are for general guidance. Actual device spacing and location must be field adjusted to meet actual conditions.
6. Where pedestrians with visual disabilities normally use the closed sidewalk Detectable Pedestrian Barricades should be used instead of the Type 3 Barricades shown.
7. The width of existing sidewalk should be maintained if practical.
8. Pavement markings for mid-block crosswalks shall be paid for under the appropriate bid items.
9. When crosswalks or other pedestrian facilities are closed or relocated, temporary facilities shall be detectable and shall include accessibility features consistent with the features present in the existing pedestrian facility.

Texas Department of Transportation

Traffic Operations Division Standard

TRAFFIC SIGNAL WORK BARRICADES AND SIGNS

WZ(BTS-2)-13

FILE: wzbts-13.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT April 1992	CONT	SECT	JOB	HIGHWAY
REVISIONS	0514	23	04 Wolf Ranch Parkway	
2-98 10-99 7-13	DIST	COUNTY		SHEET NO.
4-98 3-03	AUS	Williamson		160

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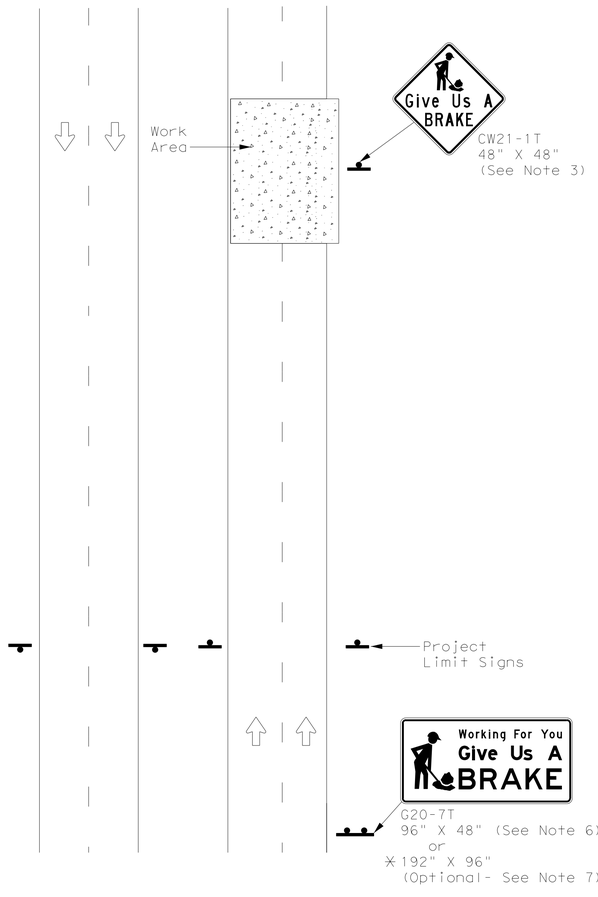
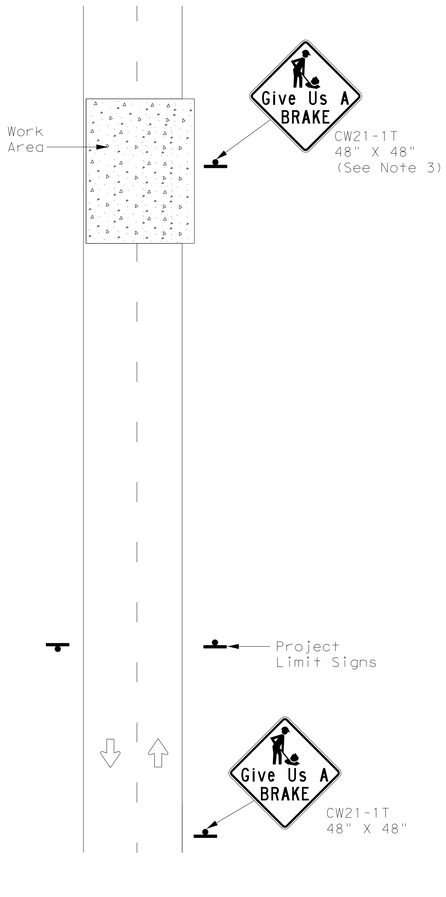


DIVIDED HIGHWAY



UNDIVIDED HIGHWAY

SIGNS ARE SHOWN FOR ONE DIRECTION OF TRAVEL

* When the optional larger WORKING FOR YOU GIVE US A BRAKE (G20-7T) 192" x 96" sign is required, the locations shall be noted elsewhere in the plans.

SUMMARY OF LARGE SIGNS

BACKGROUND COLOR	SIGN DESIGNATION	SIGN	SIGN DIMENSIONS	REFLECTIVE SHEETING	SQ FT	GALVANIZED STRUCTURAL STEEL			DRILLED SHAFT 24" DIA. (LF)
						Size	(LF) ①	(LF) ②	
Orange	G20-7T	Working For You Give Us A BRAKE	96" X 48"	Type B_{FL} or C_{FL}	32	▲	▲	▲	▲
Orange	G20-7T	Working For You Give Us A BRAKE	192" X 96"	Type B_{FL} or C_{FL}	128	W8x18	16	17	12

▲ See Note 6 Below

LEGEND	
	Sign
	Large Sign
	Traffic Flow

DEPARTMENTAL MATERIAL SPECIFICATIONS	
PLYWOOD SIGN BLANKS	DMS-7100
ALUMINUM SIGN BLANKS	DMS-7110
SIGN FACE MATERIALS	DMS-8300

COLOR	USAGE	SHEETING MATERIAL
ORANGE	BACKGROUND	TYPE B_{FL} OR TYPE C_{FL}
BLACK	LEGEND & BORDERS	NON-REFLECTIVE ACRYLIC FILM

GENERAL NOTES

1. See BC and SMD sheets for additional sign support details.
2. Sign locations shall be approved by the Engineer.
3. For projects more than two miles in length, Give Us a BRAKE signs should be repeated halfway through the project. The Give Us a Brake (CW21-1T) may be used for this purpose.
4. Work zone speed limits are sometimes used in conjunction with GIVE US A BRAKE signing. See BC(3) for location and spacing of construction speed zone signing when required.
5. Give Us a Brake (CW21-1T) signs and supports shall be considered subsidiary to Item 502, "Barricades, Signs and Traffic Handling."
6. The 96" X 48" Working For You Give Us A BRAKE (G20-7T) may use a 1/2" or 5/8" plywood substrate or 0.125" aluminum sheeting substrate and may be supported by two 4" x 6" wood posts with drilled holes for breakaway as per BC(5) and will be subsidiary to Item 502.
7. The Working For You Give Us A BRAKE (G20-7T) 192" X 96" sign shall be paid for under the following specification items:
   Item 636 - Aluminum Signs
   Item 647 - Large Roadside Sign Supports and Assemblies.
   Item 416 - Drilled Shaft Foundations
8. All signs shall be constructed in accordance with the details found in the "Standard Highway Sign Designs for Texas," latest edition. Sign details not shown in this manual shall be shown in the plans or the Engineer shall provide a detail to the Contractor before the sign is manufactured.

Texas Department of Transportation

Traffic Operations Division Standard

WORK ZONE "GIVE US A BRAKE" SIGNS

WZ(BRK)-13

FILE: wzbrk-13.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT August 1995	CONT	SECT	JOB	HIGHWAY
REVISIONS	0514	23	04	Wolf Ranch Parkway
6-96 5-98 7-13	DIST	COUNTY		SHEET NO.
8-96 3-03	AUS	Williamson		161

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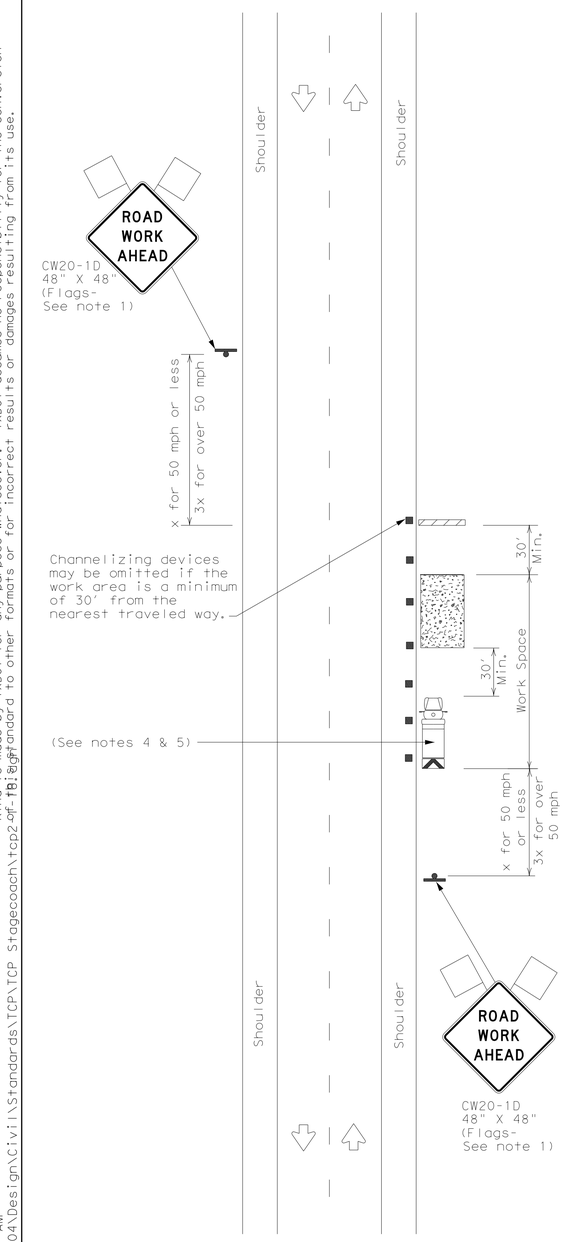
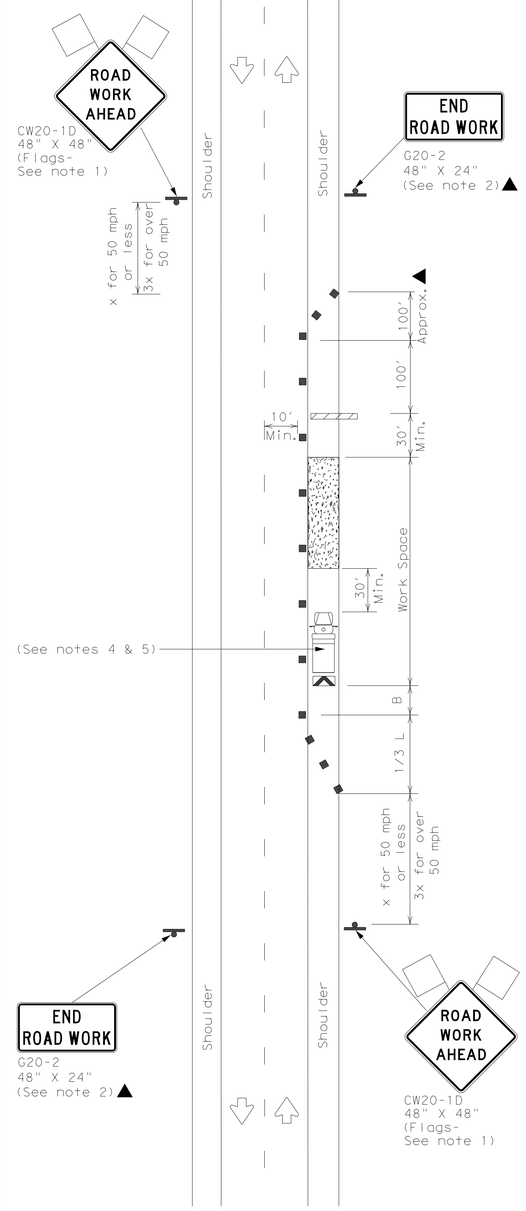


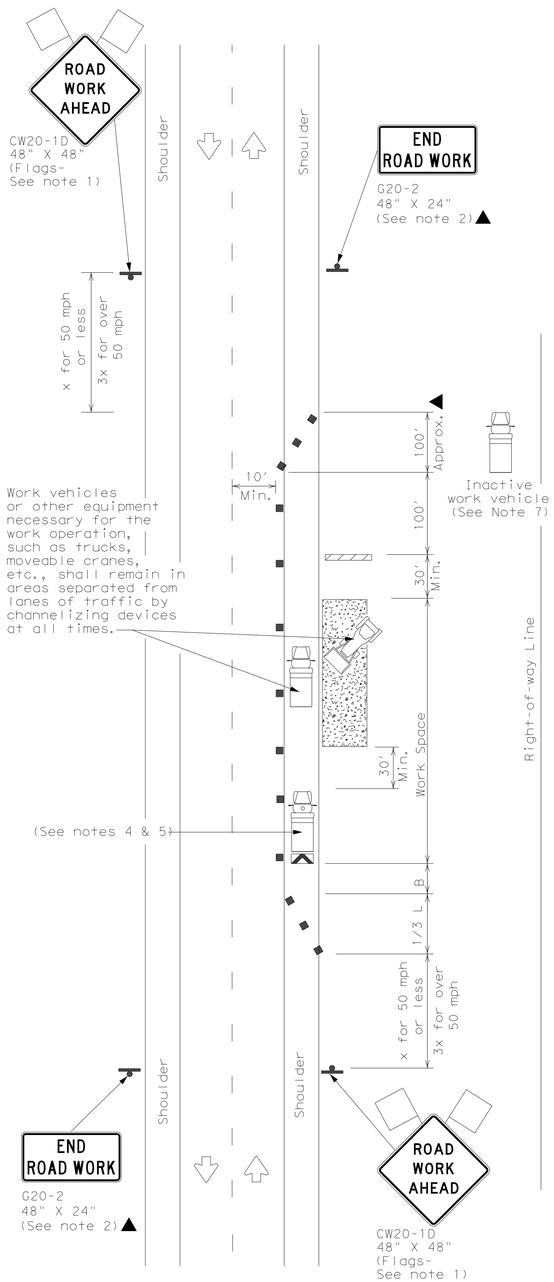
TCP (2-1a)

WORK SPACE NEAR SHOULDER
Conventional Roads



TCP (2-1b)

WORK SPACE ON SHOULDER
Conventional Roads



TCP (2-1c)

WORK VEHICLES ON SHOULDER
Conventional Roads

LEGEND			
	Type 3 Barricade		Channelizing Devices
	Heavy Work Vehicle		Truck Mounted Attenuator (TMA)
	Trailer Mounted Flashing Arrow Board	M	Portable Changeable Message Sign (PCMS)
	Sign		Traffic Flow
	Flag		Flagger

Posted Speed *	Formula	Minimum Desirable Taper Lengths ** 10' Offset	11' Offset	12' Offset	Suggested Maximum Spacing of Channelizing Devices On a Taper	On a Tangent	Minimum Sign Spacing "X" Distance	Suggested Longitudinal Buffer Space "B"
30	$L=\frac{WS^2}{60}$	150'	165'	180'	30'	60'	120'	90'
35		205'	225'	245'	35'	70'	160'	120'
40		265'	295'	320'	40'	80'	240'	155'
45	L=WS	450'	495'	540'	45'	90'	320'	195'
50		500'	550'	600'	50'	100'	400'	240'
55		550'	605'	660'	55'	110'	500'	295'
60		600'	660'	720'	60'	120'	600'	350'
65		650'	715'	780'	65'	130'	700'	410'
70		700'	770'	840'	70'	140'	800'	475'
75		750'	825'	900'	75'	150'	900'	540'

* Conventional Roads Only

** Taper lengths have been rounded off.
L=Length of Taper(FT) W=Width of Offset(FT) S=Posted Speed(MPH)

TYPICAL USAGE				
MOBILE	SHORT DURATION	SHORT TERM STATIONARY	INTERMEDIATE TERM STATIONARY	LONG TERM STATIONARY
	✓	✓	✓	✓

GENERAL NOTES

1. Flags attached to signs where shown, are REQUIRED.
2. All traffic control devices illustrated are REQUIRED, except those denoted with the triangle symbol may be omitted when stated in the plans, or for routine maintenance work, when approved by the Engineer.
3. Stockpiled material should be placed a minimum of 30 feet from nearest traveled way.
4. Shadow Vehicle with TMA and high intensity rotating, flashing, oscillating or strobe lights. A Shadow Vehicle with a TMA should be used anytime it can be positioned 30 to 100 feet in advance of the area of crew exposure without adversely affecting the performance or quality of the work. If workers are no longer present but road or work conditions require the traffic control to remain in place, Type 3 Barricades or other channelizing devices may be substituted for the Shadow Vehicle and TMA.
5. Additional Shadow Vehicles with TMAs may be positioned off the paved surface, next to those shown in order to protect a wider work space.
6. See TCP(5-1) for shoulder work on divided highways, expressways and freeways.
7. Inactive work vehicles or other equipment should be parked near the right-of-way line and not parked on the paved shoulder.
8. CW21-5 "SHOULDER WORK" signs may be used in place of CW20-1D "ROAD WORK AHEAD" signs for shoulder work on conventional roadways.

Texas Department of Transportation — Traffic Operations Division Standard

TRAFFIC CONTROL PLAN CONVENTIONAL ROAD SHOULDER WORK

TCP(2-1)-18

FILE: tcp2-1-18.dgn	DN:	CK:	DW:	CK:
© TxDOT December 1985	CONT	SECT	JOB	HIGHWAY
REVISIONS 2-94 4-98 8-95 2-12 1-97 2-18	0514	23	04 Wolf Ranch Parkway	
	DIST	COUNTY		SHEET NO.
	AUS	Williamson		162

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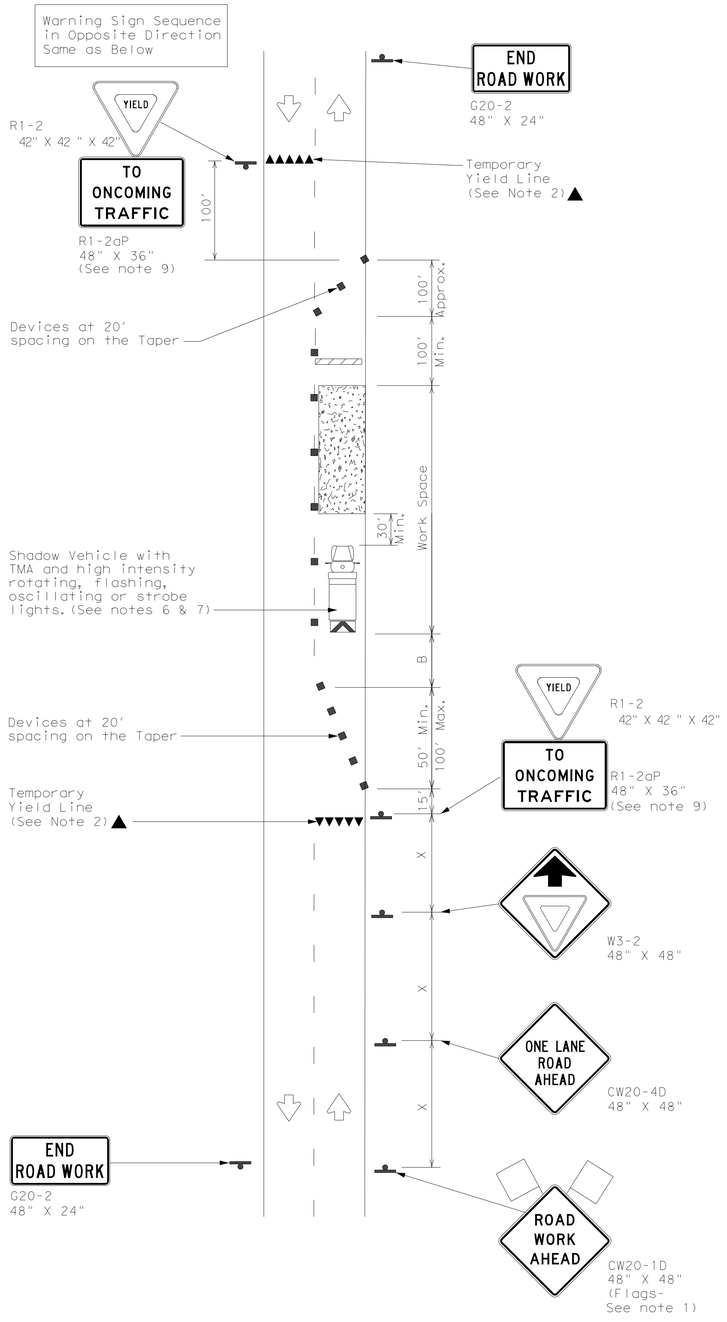
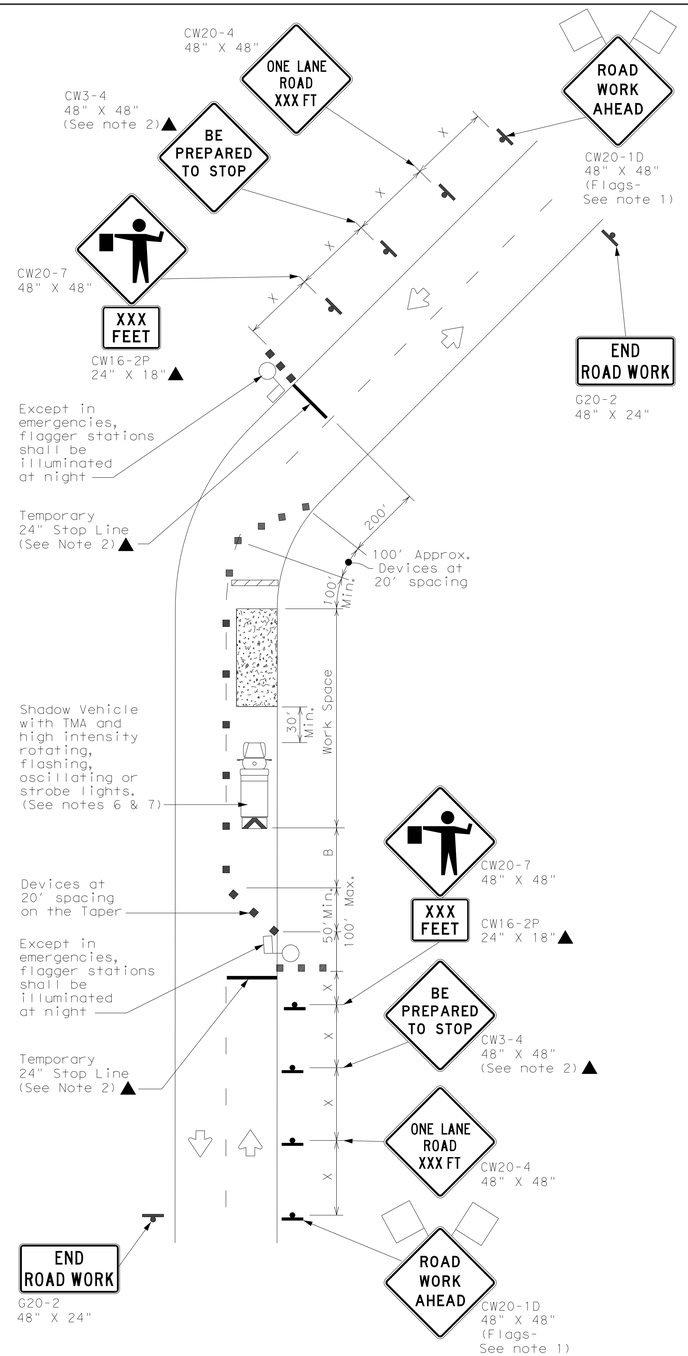


TCP (2-2a)
2-LANE ROADWAY WITHOUT PAVED SHOULDERS
ONE LANE TWO-WAY
CONTROL WITH YIELD SIGNS
(Less than 2000 ADT - See Note 9)



TCP (2-2b)
2-LANE ROADWAY WITHOUT PAVED SHOULDERS
ONE LANE TWO-WAY
CONTROL WITH FLAGGERS

LEGEND			
	Type 3 Barricade		Channelizing Devices
	Heavy Work Vehicle		Truck Mounted Attenuator (TMA)
	Trailer Mounted Flashing Arrow Board	M	Portable Changeable Message Sign (PCMS)
	Sign		Traffic Flow
	Flag		Flagger

Posted Speed *	Formula	Minimum Desirable Taper Lengths ** 10' Offset	11' Offset	12' Offset	Suggested Maximum Spacing of Channelizing Devices On a Taper	On a Tangent	Minimum Sign Spacing "X" Distance	Suggested Longitudinal Buffer Space "B"	Stopping Sight Distance
30	$L=\frac{WS^2}{60}$	150'	165'	180'	30'	60'	120'	90'	200'
35		205'	225'	245'	35'	70'	160'	120'	250'
40		265'	295'	320'	40'	80'	240'	155'	305'
45	L=WS	450'	495'	540'	45'	90'	320'	195'	360'
50		500'	550'	600'	50'	100'	400'	240'	425'
55		550'	605'	660'	55'	110'	500'	295'	495'
60		600'	660'	720'	60'	120'	600'	350'	570'
65		650'	715'	780'	65'	130'	700'	410'	645'
70		700'	770'	840'	70'	140'	800'	475'	730'
75		750'	825'	900'	75'	150'	900'	540'	820'

* Conventional Roads Only
** Taper lengths have been rounded off.
L=Length of Taper(FT) W=Width of Offset(FT) S=Posted Speed(MPH)

TYPICAL USAGE				
MOBILE	SHORT DURATION	SHORT TERM STATIONARY	INTERMEDIATE TERM STATIONARY	LONG TERM STATIONARY
	✓	✓	✓	

GENERAL NOTES

1. Flags attached to signs where shown, are REQUIRED.
2. All traffic control devices illustrated are REQUIRED, except those denoted with the triangle symbol may be omitted when stated elsewhere in the plans, or for routine maintenance work, when approved by the Engineer.
3. The CW3-4 "BE PREPARED TO STOP" sign may be installed after the CW20-4 "ONE LANE ROAD XXX FT" sign, but proper sign spacing shall be maintained.
4. Flaggers should use two-way radios or other methods of communication to control traffic.
5. Length of work space should be based on the ability of flaggers to communicate.
6. A Shadow Vehicle with a TMA should be used anytime it can be positioned 30 to 100 feet in advance of the area of crew exposure without adversely affecting the performance or quality of the work. If workers are no longer present but road or work conditions require the traffic control to remain in place, Type 3 Barricades or other channelizing devices may be substituted for the Shadow Vehicle and TMA.
7. Additional Shadow Vehicles with TMAs may be positioned off the paved surface, next to those shown in order to protect a wider work space.

TCP (2-2a)

8. The R1-2 "YIELD" sign traffic control may be used on projects with approaches that have adequate sight distance. For projects in urban areas, work space should be no longer than one half city block. In rural areas, roadways with less than 2000 ADT, work space should be no longer than 400 feet.
9. The R1-2aP "YIELD TO ONCOMING TRAFFIC" sign shall be placed on a support at a 7 foot minimum mounting height.

TCP (2-2b)

10. Channelizing devices on the center line may be omitted when a pilot car is leading traffic and approved by the Engineer.
11. If the work space is located near a horizontal or vertical curve, the buffer distances should be increased in order to maintain stopping sight distance to the flagger and a queue of stopped vehicles. (See table above).
12. Flaggers should use 24" STOP/SLOW paddles to control traffic. Flags should be limited to emergency situtations.

Texas Department of Transportation
Traffic Operations Division Standard

TRAFFIC CONTROL PLAN
ONE-LANE TWO-WAY
TRAFFIC CONTROL

TCP(2-2)-18

FILE: tcp2-2-18.dgn	DN:	CK:	DW:	CK:
©TxDOT December 1985	CONT	SECT	JOB	HIGHWAY
REVISIONS 8-95 3-03 1-97 2-12 4-98 2-18	0514	23	04	Wolf Ranch Parkway
	DIST	COUNTY		SHEET NO.
	AUS	Williamson		163

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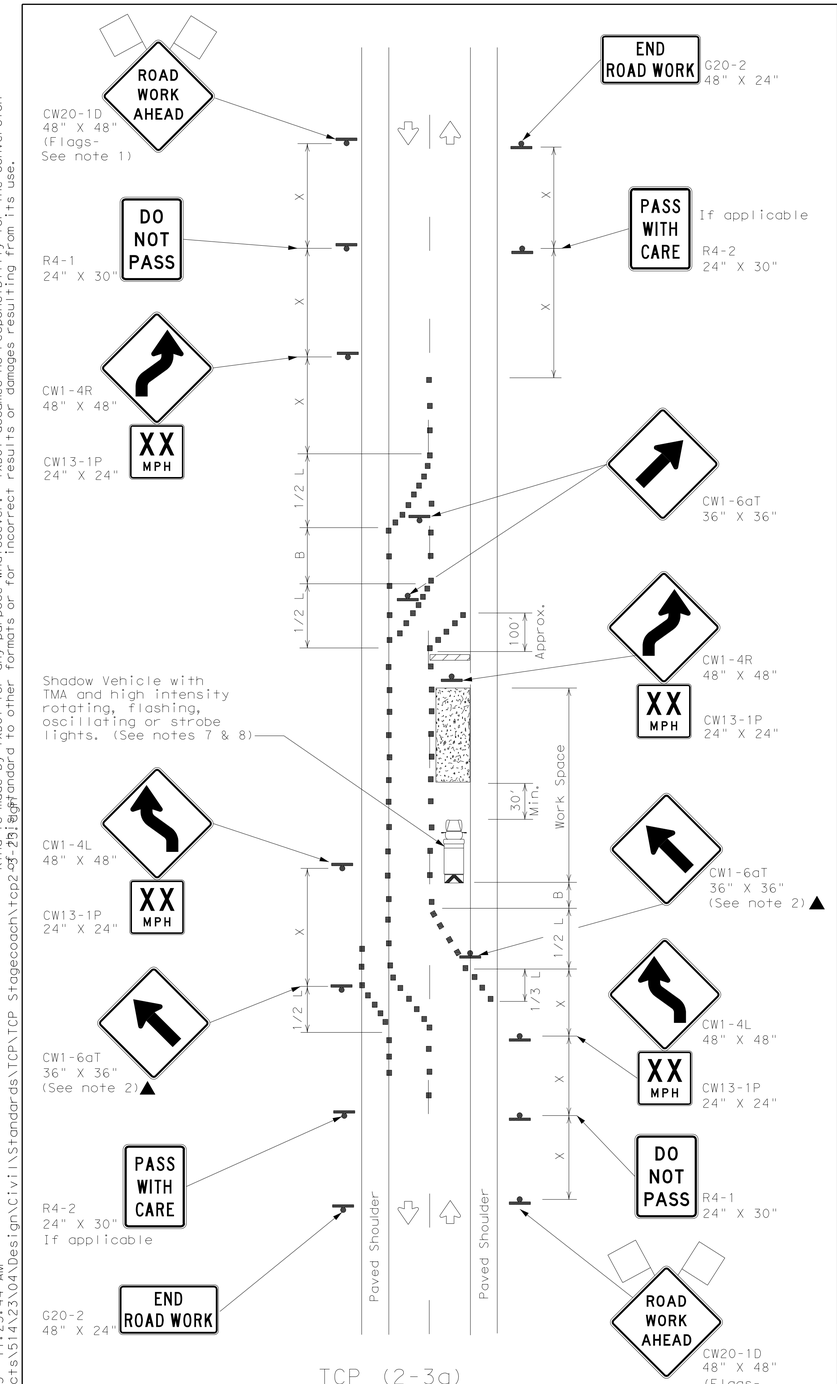
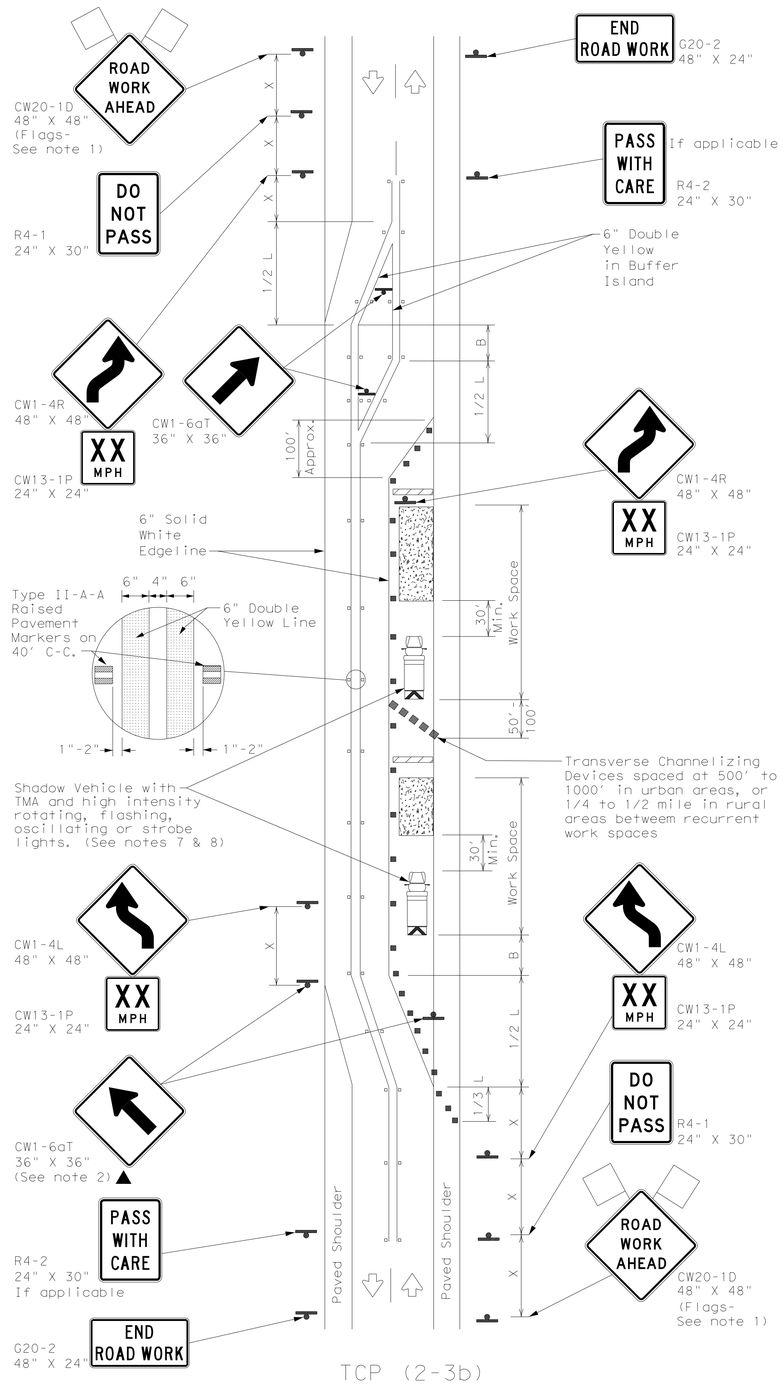


TCP (2-3a)
2-LANE ROADWAY WITH PAVED SHOULDERS
ONE LANE CLOSED
ADEQUATE FIELD OF VIEW



TCP (2-3b)
2-LANE ROADWAY WITH PAVED SHOULDERS
ONE LANE CLOSED
INADEQUATE FIELD OF VIEW

LEGEND			
	Type 3 Barricade		Channelizing Devices
	Heavy Work Vehicle		Truck Mounted Attenuator (TMA)
	Trailer Mounted Flashing Arrow Board	....	Raised Pavement Markers Ty II-AA
	Sign		Traffic Flow
	Flag		Flagger

Posted Speed ✳	Formula	Minimum Desirable Taper Lengths ✳✳ 10′ Offset	11′ Offset	12′ Offset	Suggested Maximum Spacing of Channelizing Devices On a Taper	On a Tangent	Minimum Sign Spacing "X" Distance	Suggested Longitudinal Buffer Space "B"
30	$L=\frac{WS^2}{60}$	150′	165′	180′	30′	60′	120′	90′
35		205′	225′	245′	35′	70′	160′	120′
40		265′	295′	320′	40′	80′	240′	155′
45	L=WS	450′	495′	540′	45′	90′	320′	195′
50		500′	550′	600′	50′	100′	400′	240′
55		550′	605′	660′	55′	110′	500′	295′
60		600′	660′	720′	60′	120′	600′	350′
65		650′	715′	780′	65′	130′	700′	410′
70		700′	770′	840′	70′	140′	800′	475′
75		750′	825′	900′	75′	150′	900′	540′

✳ Conventional Roads Only
✳✳ Taper lengths have been rounded off.
L=Length of Taper(FT) W=Width of Offset(FT) S=Posted Speed(MPH)

TYPICAL USAGE				
MOBILE	SHORT DURATION	SHORT TERM STATIONARY	INTERMEDIATE TERM STATIONARY	LONG TERM STATIONARY
				TCP(2-3b)ONLY
			✓	✓

GENERAL NOTES

1. Flags attached to signs where shown, are REQUIRED.
2. All traffic control devices illustrated are REQUIRED, except those denoted with the triangle symbol may be omitted when stated elsewhere in the plans, or for routine maintenance work, when approved by the Engineer.
3. When work space will be in place less than three days existing pavement markings may remain in place. Channelizing devices shall be used to separate traffic.
4. Flagger control should NOT be used unless roadway conditions or heavy traffic volume require additional emphasis to safely control traffic. Flagger should be positioned at end of traffic queue.
5. The R4-1 "DO NOT PASS," R4-2 " PASS WITH CARE" and construction regulatory speed zone signs may be installed within CW20-1D "ROAD WORK AHEAD" signs. Proper spacing of signs shall be maintained.
6. Conflicting pavement marking shall be removed for long term projects.
7. A Shadow Vehicle with a TMA should be used anytime it can be positioned 30 to 100 feet in advance of the area of crew exposure without adversely affecting the performance or quality of the work. If workers are no longer present but road or work conditions require the traffic control to remain in place, Type 3 Barricades or other channelizing devices may be substituted.
8. Additional Shadow Vehicles with TMAs may be positioned off the paved surface, next to those shown in order to protect a wider work space.

TCP (2-3a)

9. Conflicting pavement markings shall be removed for long-term projects. For shorter durations where traffic is directed over a yellow centerline, channelizing devices which separate two-way traffic should be spaced on tapers at 20′ or 15′ if posted speeds are 35 mph or slower, and for tangent sections, at 1/2(S) where S is the speed in mph. This tighter device spacing is intended for the area of the conflicting markings, not the entire work zone.

Texas Department of Transportation
Traffic Safety Division Standard

TRAFFIC CONTROL PLAN TRAFFIC SHIFTS ON TWO-LANE ROADS

TCP(2-3)-23

FILE: tcp(2-3)-23.dgn	DN:	CK:	DW:	CK:
©TxDOT April 2023	CONT	SECT	JOB	HIGHWAY
REVISIONS 12-85 4-98 2-18 8-95 3-03 4-23 1-97 2-12	0514	23	04 Wolf Ranch Parkway	
	DIST	COUNTY		SHEET NO.
	AUS	Williamson		164

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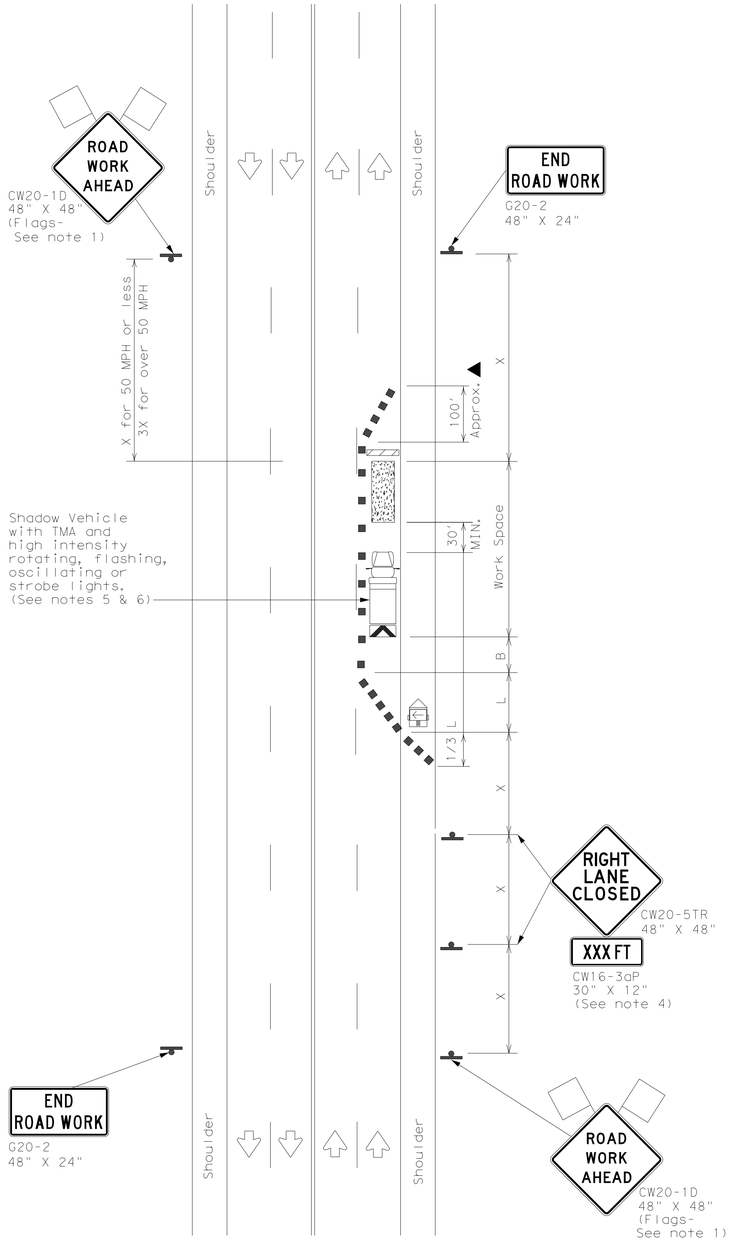
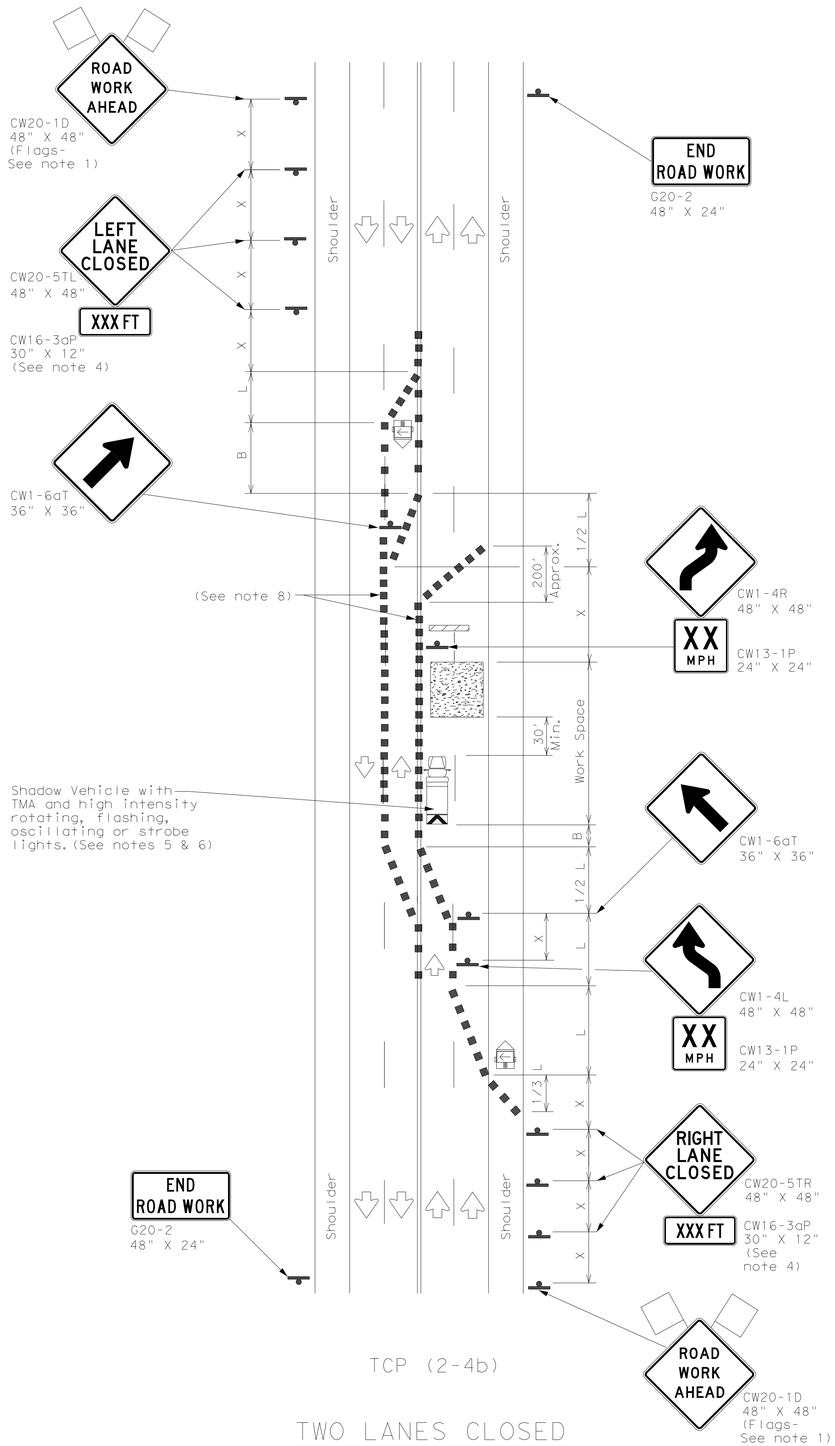


TCP (2-4a)

ONE LANE CLOSED



TCP (2-4b)

TWO LANES CLOSED

LEGEND			
	Type 3 Barricade		Channelizing Devices
	Heavy Work Vehicle		Truck Mounted Attenuator (TMA)
	Trailer Mounted Flashing Arrow Board	M	Portable Changeable Message Sign (PCMS)
	Sign		Traffic Flow
	Flag		Flagger

Posted Speed *	Formula	Minimum Desirable Taper Lengths ** 10' Offset	11' Offset	12' Offset	Suggested Maximum Spacing of Channelizing Devices: On a Taper	On a Tangent	Minimum Sign Spacing "X" Distance	Suggested Longitudinal Buffer Space "B"
30	$L = \frac{WS^2}{60}$	150'	165'	180'	30'	60'	120'	90'
35		205'	225'	245'	35'	70'	160'	120'
40		265'	295'	320'	40'	80'	240'	155'
45	L = WS	450'	495'	540'	45'	90'	320'	195'
50		500'	550'	600'	50'	100'	400'	240'
55		550'	605'	660'	55'	110'	500'	295'
60		600'	660'	720'	60'	120'	600'	350'
65		650'	715'	780'	65'	130'	700'	410'
70		700'	770'	840'	70'	140'	800'	475'
75		750'	825'	900'	75'	150'	900'	540'

* Conventional Roads Only

** Taper lengths have been rounded off.
L=Length of Taper(FT) W=Width of Offset(FT) S=Posted Speed(MPH)

TYPICAL USAGE				
MOBILE	SHORT DURATION	SHORT TERM STATIONARY	INTERMEDIATE TERM STATIONARY	LONG TERM STATIONARY
		✓	✓	

GENERAL NOTES

1. Flags attached to signs where shown, are REQUIRED.
2. All traffic control devices illustrated are REQUIRED, except those denoted with the triangle symbol may be omitted when stated elsewhere in the plans, or for routine maintenance work, when approved by the Engineer.
3. The downstream taper is optional. When used, it should be 100 feet minimum length per lane.
4. For short term applications, when post mounted signs are not used, the distance legend may be shown on the sign face rather than on a CW16-3aP supplemental plaque.
5. A Shadow Vehicle with a TMA should be used anytime it can be positioned 30 to 100 feet in advance of the area of crew exposure without adversely affecting the performance or quality of the work. If workers are no longer present but road or work conditions require the traffic control to remain in place, Type 3 Barricades or other channelizing devices may be substituted for the Shadow Vehicle and TMA.
6. Additional Shadow Vehicles with TMAs may be positioned in each closed lane, on the shoulder or off the paved surface, next to those shown in order to protect a wider work space.

TCP (2-4a)

7. If this TCP is used for a left lane closure, CW20-5TL "LEFT LANE CLOSED"signs shall be used and channelizing devices shall be placed on the centerline to protect the work space from opposing traffic with the arrow board placed in the closed lane near the end of the merging taper.

TCP (2-4b)

8. For shorter durations where traffic is directed over a yellow centerline, channelizing devices which separate two-way traffic should be spaced on tapers at 20' or 15' if posted speeds are 35 mph or slower, and for tangent sections, at 1/2(S) where S is the speed in mph. This tighter devices spacing is intended for the area of conflicting markings, not the entire work zone.

Texas Department of Transportation

Traffic Operations Division Standard

TRAFFIC CONTROL PLAN LANE CLOSURES ON MULTILANE CONVENTIONAL ROADS

TCP(2-4)-18

FILE: tcp2-4-18.dgn	DN:	CK:	DW:	CK:
©TxDOT December 1985	CONT	SECT	JOB	HIGHWAY
REVISIONS 8-95 3-03	0514	23	04	Wolf Ranch Parkway
1-97 2-12	DIST	COUNTY		SHEET NO.
4-98 2-18	AUS	Williamson		165

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DATE: 9/11/2025 11:23:47 AM
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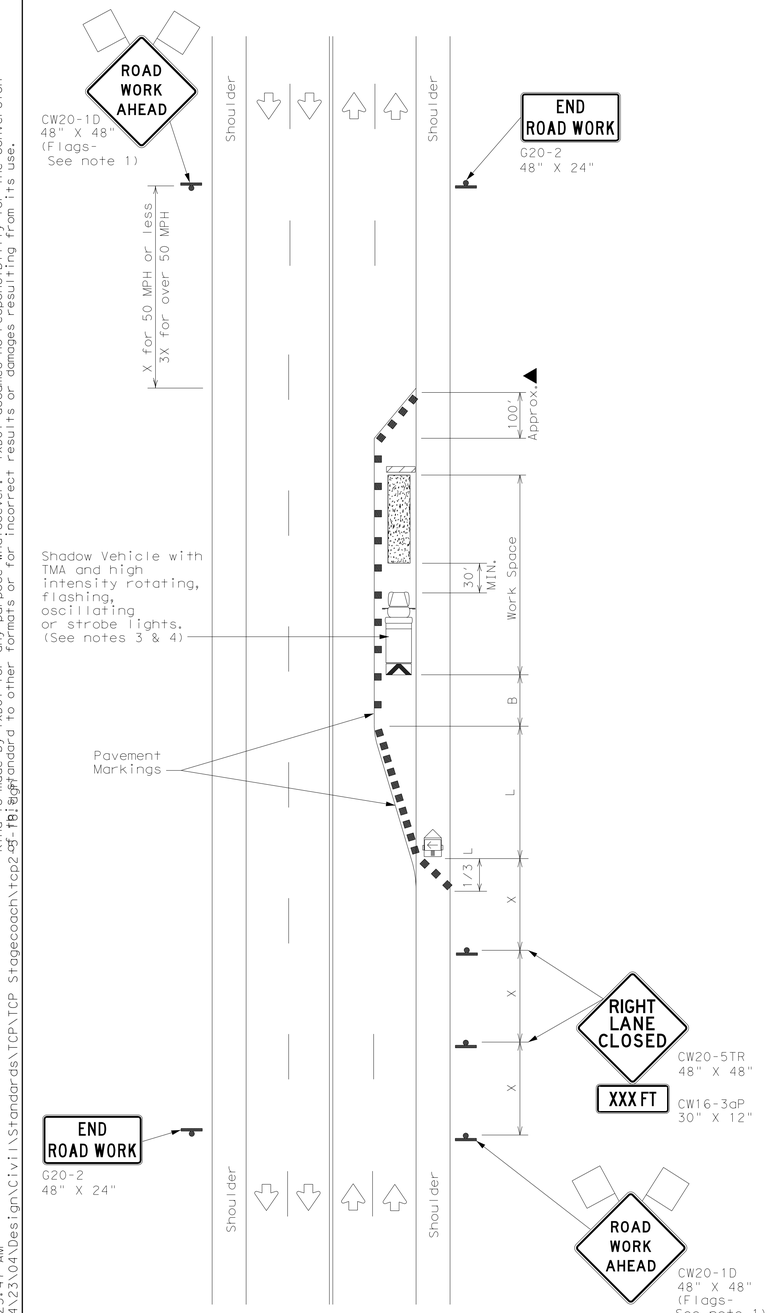
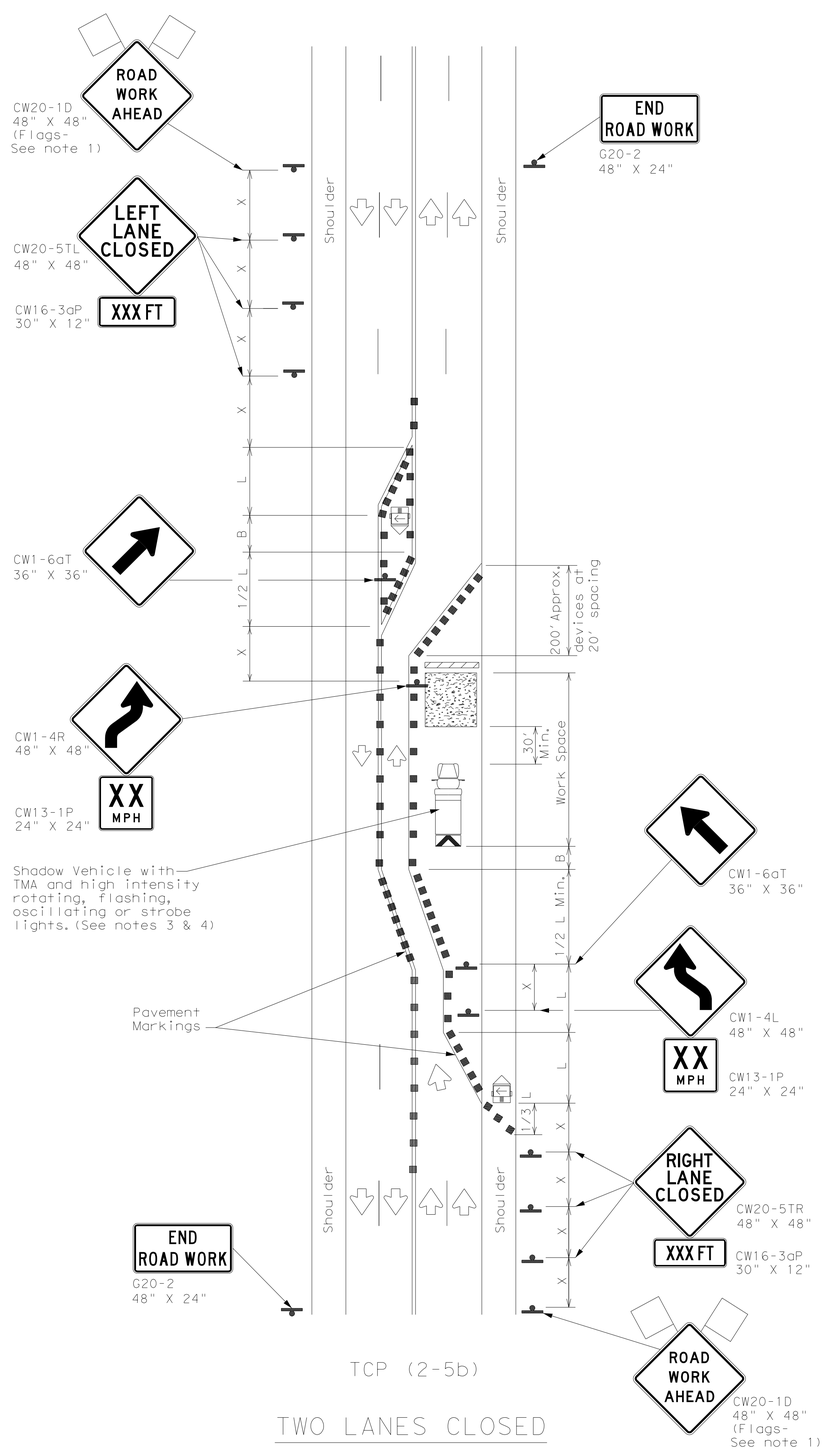


TCP (2-5a)

ONE LANE CLOSED



TCP (2-5b)

TWO LANES CLOSED

LEGEND			
	Type 3 Barricade		Channelizing Devices
	Heavy Work Vehicle		Truck Mounted Attenuator (TMA)
	Trailer Mounted Flashing Arrow Board		Portable Changeable Message Sign (PCMS)
	Sign		Traffic Flow
	Flag		Flagger

Posted Speed *	Formula	Minimum Desirable Taper Lengths ** 10' Offset	11' Offset	12' Offset	Suggested Maximum Spacing of Channelizing Devices: On a Taper	On a Tangent	Minimum Sign Spacing "X" Distance	Suggested Longitudinal Buffer Space "B"
30	$L=\frac{WS^2}{60}$	150'	165'	180'	30'	60'	120'	90'
35		205'	225'	245'	35'	70'	160'	120'
40		265'	295'	320'	40'	80'	240'	155'
45	L=WS	450'	495'	540'	45'	90'	320'	195'
50		500'	550'	600'	50'	100'	400'	240'
55		550'	605'	660'	55'	110'	500'	295'
60		600'	660'	720'	60'	120'	600'	350'
65		650'	715'	780'	65'	130'	700'	410'
70		700'	770'	840'	70'	140'	800'	475'
75		750'	825'	900'	75'	150'	900'	540'

* Conventional Roads Only

** Taper lengths have been rounded off.
L=Length of Taper(FT) W=Width of Offset(FT) S=Posted Speed(MPH)

TYPICAL USAGE				
MOBILE	SHORT DURATION	SHORT TERM STATIONARY	INTERMEDIATE TERM STATIONARY	LONG TERM STATIONARY
			✓	✓

GENERAL NOTES

1. Flags attached to signs where shown, are REQUIRED.
2. All traffic control devices illustrated are REQUIRED, except those denoted with the triangle symbol may be omitted when stated elsewhere in the plans, or for routine maintenance work, when approved by the Engineer.
3. A Shadow Vehicle with a TMA should be used anytime it can be positioned 30 to 100 feet in advance of the area of crew eposure without adversely affecting the performance or quality of the work. If workers are no longer present but road or work conditions require the traffic control to remain in place, Type 3 Barricades or other channelizing devices may be substitutued for the Shadow Vehicle and TMA.
4. Additional Shadow Vehicles with TMAs may be positioned in each closed lane, on the shoulder or off the paved surface, next to those shown in order to protect a wider work space.
5. The downstream taper is optional. When used, it should be 100 feet approximately per lane, with channelizing devices spaced at 20 feet.

TCP (2-5a)

6. If this TCP is used for a left lane closure, CW20-5TL "LEFT LANE CLOSED" signs shall be used and channelizing devices shall be placed on the centerline to protect the work space from opposing traffic, with the arrow board placed in the closed lane near the end of the merging taper.

TCP (2-5b)

7. Conflicting pavement markings shall be removed for long-term projects.

Texas Department of Transportation

Traffic Operations Division Standard

TRAFFIC CONTROL PLAN LONG TERM LANE CLOSURES MULTILANE CONVENTIONAL RDS.

TCP(2-5)-18

FILE: tcp2-5-18.dgn	DN:	CK:	DW:	CK:
©TxDOT December 1985	CONT	SECT	JOB	HIGHWAY
REVISIONS 8-95 2-12	0514	23	04 Wolf Ranch Parkway	
1-97 3-03	DIST	COUNTY		SHEET NO.
4-98 2-18	AUS	Williamson		166

165

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DATE: 9/11/2025 11:23:48 AM
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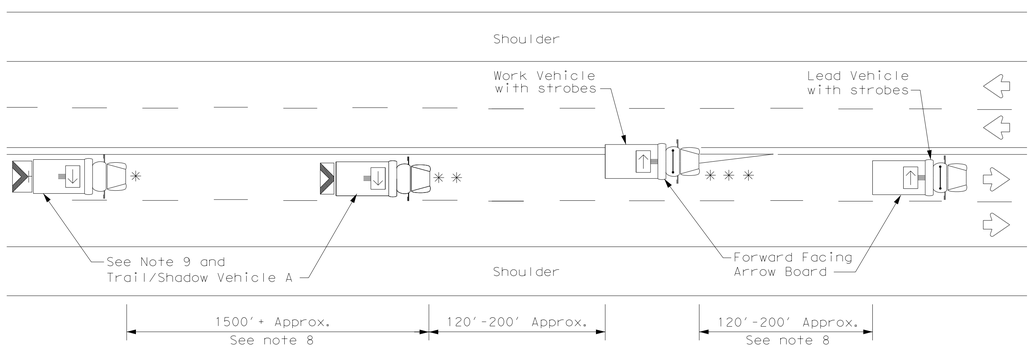
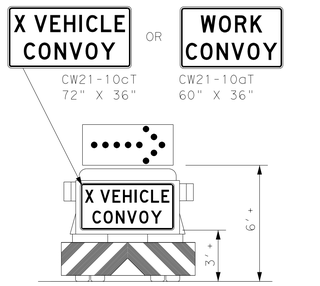


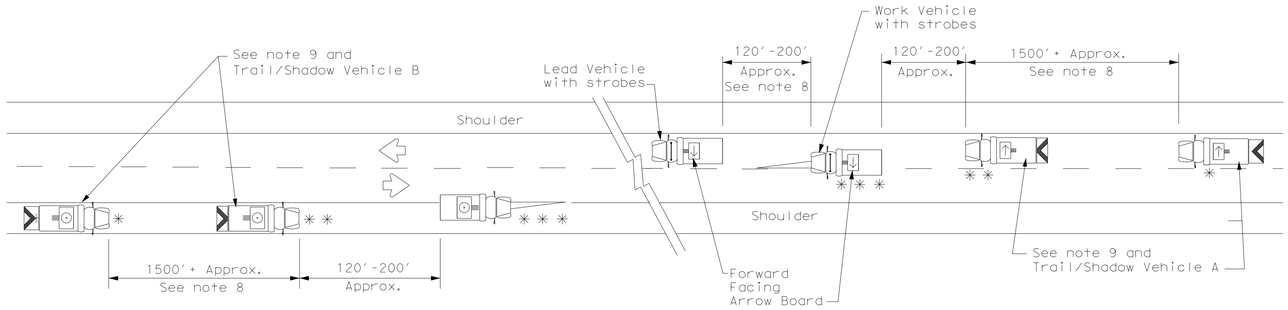
TCP (3-1a)

UNDIVIDED MULTILANE ROADWAY



TRAIL/SHADOW VEHICLE A

with RIGHT Directional display Flashing Arrow Board

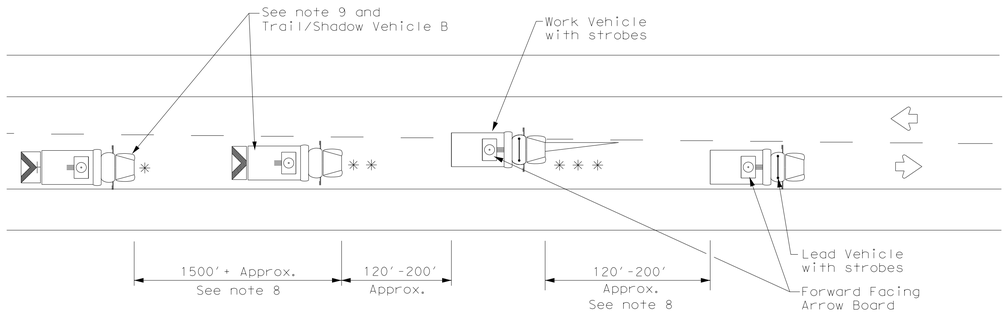


WORK ON SHOULDER

WORK ON TRAVEL LANE

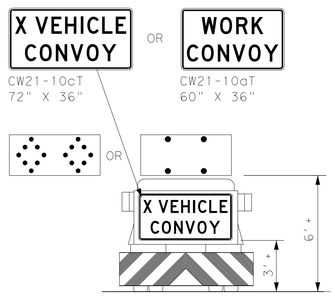
TCP (3-1b)

TWO-WAY ROADWAY WITH PAVED SHOULDERS



TCP (3-1c)

TWO-WAY ROADWAY WITHOUT PAVED SHOULDERS



TRAIL/SHADOW VEHICLE B

with Flashing Arrow Board in CAUTION display

LEGEND			
*	Trail Vehicle	ARROW BOARD DISPLAY	
* *	Shadow Vehicle		
* * *	Work Vehicle		RIGHT Directional
	Heavy Work Vehicle		LEFT Directional
	Truck Mounted Attenuator (TMA)		Double Arrow
	Traffic Flow		CAUTION (Alternating Diamond or 4 Corner Flash)

TYPICAL USAGE				
MOBILE	SHORT DURATION	SHORT TERM STATIONARY	INTERMEDIATE TERM STATIONARY	LONG TERM STATIONARY
✓				

GENERAL NOTES

1. TRAIL, SHADOW, and LEAD vehicles shall be equipped with arrow boards as illustrated. When a LEAD vehicle is not used the WORK vehicle must be equipped with an arrow board. The Engineer will determine if the LEAD VEHICLE and/or TRAIL VEHICLE are required based on prevailing roadway conditions, traffic volume, and sight distance restrictions.

2. The use of amber high intensity rotating, flashing, oscillating, or strobe lights on vehicles are required. Blue high intensity rotating, flashing, oscillating or strobe lights when mounted on the driver's side of the vehicle may be operated simultaneously with the amber beacons or strobe lights.

3. The use of truck mounted attenuators (TMA) on the SHADOW VEHICLE and TRAIL VEHICLE are required.

4. Reflective sheeting on the rear of the TMA shall meet or exceed the reflectivity and color requirements of DEPARTMENTAL MATERIAL SPECIFICATION DMS 8300, Type A.

5. Flashing arrow boards shall be Type B or Type C as per the Barricade and Construction (BC) standards. The board shall be controlled from inside the vehicle.

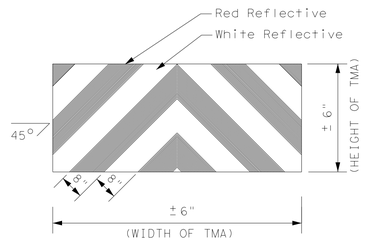
6. Each vehicle shall have two-way radio communication capability.

7. When work convoys must change lanes, the TRAIL VEHICLE should change lanes first to shadow the other convoy vehicles.

8. Vehicle spacing between the TRAIL VEHICLE and the SHADOW VEHICLE will vary depending on sight distance restrictions. Motorists approaching the work convoy should be able to see the TRAIL VEHICLE in time to slow down and/or change lanes as they approach the TRAIL VEHICLE. Vehicle spacing between the WORK VEHICLE and SHADOW VEHICLE and vehicle spacing between WORK VEHICLE and LEAD VEHICLE may vary according to terrain, work activity and other factors.

9. "X VEHICLE CONVOY" (CW21-10cT) or "WORK CONVOY" (CW21-10aT) signs shall be used on TRAIL VEHICLES and SHADOW VEHICLES as shown. As an option 48" X 48" diamond shaped "WORK CONVOY"(CW21-10T) or "X VEHICLE CONVOY" (CW21-10bT) signs may be used where adequate mounting space exists. When used, the X VEHICLE CONVOY sign shall have the number of the convoy vehicles displayed on the sign in the number designation "X" location. The "X VEHICLE CONVOY" sign shall not be used on the SHADOW VEHICLE if a TRAIL VEHICLE is used.

10. On two-lane two-way roadways, the work and protection vehicles should pull over periodically to allow motor vehicle traffic to pass. If motorists are not allowed to pass the work convoy, a "DO NOT PASS" (R4-1) sign should be placed on the back of the rearmost protection vehicle.



STRIPING FOR TMA

Texas Department of Transportation

Traffic Operations Division Standard

TRAFFIC CONTROL PLAN MOBILE OPERATIONS UNDIVIDED HIGHWAYS

TCP(3-1)-13

FILE: tcp3-1.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT December 1985	CONT	SECT	JOB	HIGHWAY
REVISIONS 2-94 4-98 8-95 7-13 1-97	0514	23	04	Wolf Ranch Parkway
	DIST	COUNTY		SHEET NO.
	AUS	Williamson		167

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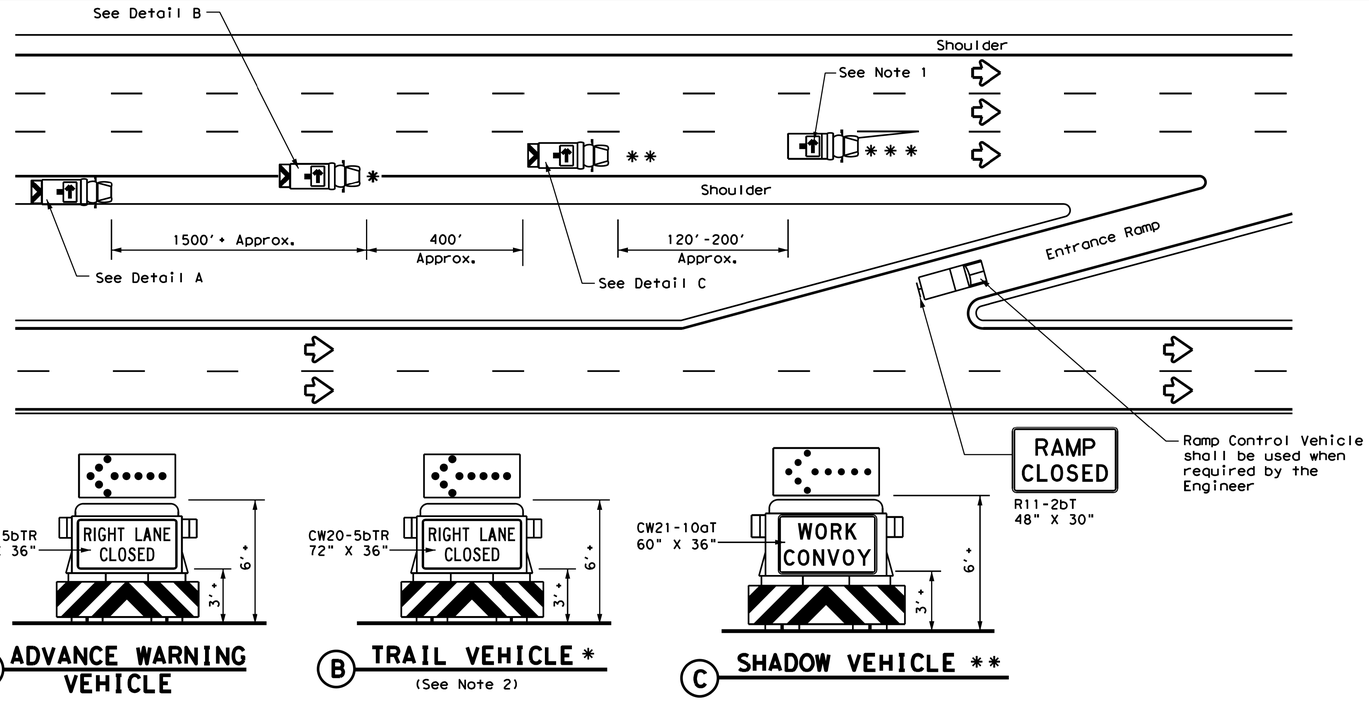
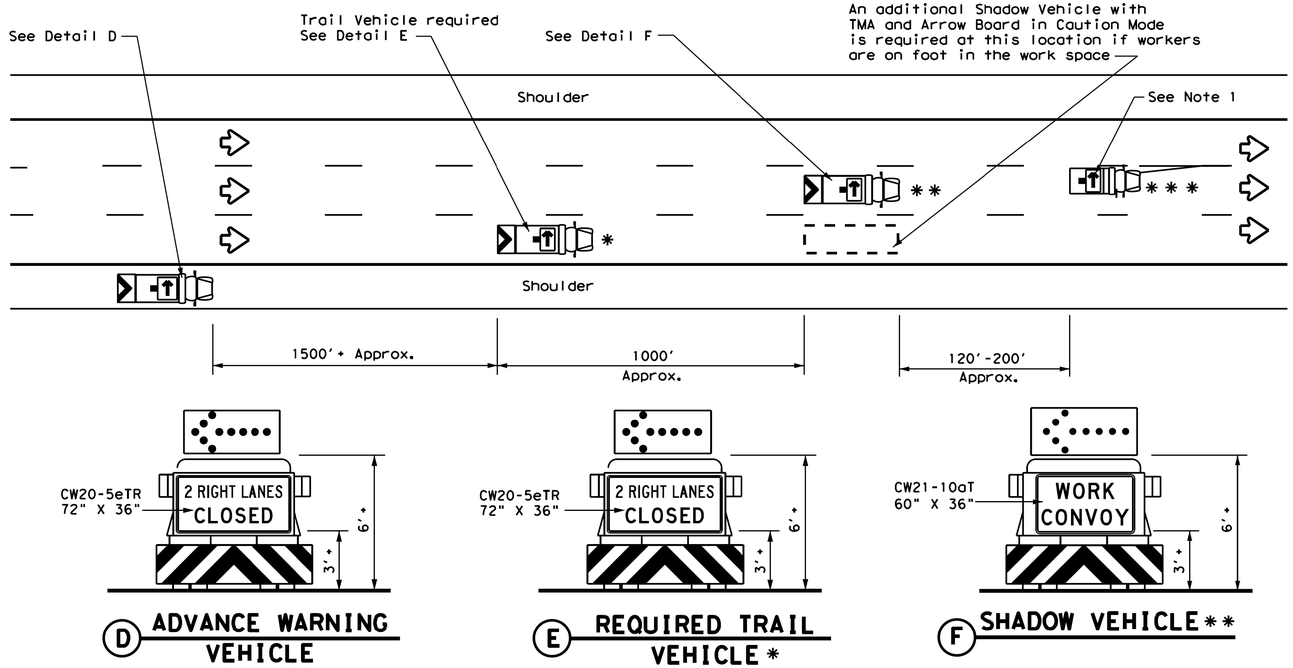


A ADVANCE WARNING VEHICLE

B TRAIL VEHICLE * (See Note 2)

C SHADOW VEHICLE **

RIGHT LANE CLOSURE ON DIVIDED HIGHWAY - TCP(3-2a)



D ADVANCE WARNING VEHICLE

E REQUIRED TRAIL VEHICLE *

F SHADOW VEHICLE **

INTERIOR LANE CLOSURE ON MULTI-LANE DIVIDED HIGHWAY - TCP(3-2b)

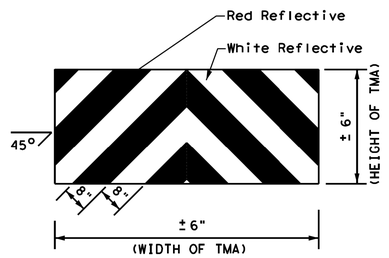
DATE:
FILE:

LEGEND			
*	Trail Vehicle	ARROW BOARD DISPLAY	
**	Shadow Vehicle		
***	Work Vehicle		RIGHT Directional
	Heavy Work Vehicle		LEFT Directional
	Truck Mounted Attenuator (TMA)		Double Arrow
	Traffic Flow		CAUTION (Alternating Diamond or 4 Corner Flash)

TYPICAL USAGE				
MOBILE	SHORT DURATION	SHORT TERM STATIONARY	INTERMEDIATE TERM STATIONARY	LONG TERM STATIONARY
✓				

GENERAL NOTES

1. ADVANCE WARNING, TRAIL and SHADOW vehicles shall be equipped with Type B or Type C flashing arrow boards as per the Barricade and Construction (BC) standards. Arrow boards on WORK vehicles will be optional based on the type of work being performed. The arrow boards shall be operated from inside the vehicle.
2. For TCP(3-2a) the Engineer will determine if the TRAIL VEHICLE is required based on prevailing roadway conditions, traffic volume, and sight distance restrictions. All other vehicles shown for both TCP(3-2a) and TCP(3-2b) are required.
3. The use of amber high intensity rotating, flashing, oscillating, or strobe lights on vehicles are required. Blue high intensity rotating, flashing, oscillating or strobe lights when mounted on the driver's side of the vehicle may be operated simultaneously with the amber beacons or strobe lights.
4. The use of truck mounted attenuators (TMA) on the ADVANCE WARNING, SHADOW, and TRAIL vehicles are required.
5. Reflective sheeting on the rear of the TMA shall meet or exceed the reflectivity and color requirements of DMS 8300, Type A.
6. Each vehicle shall have two-way radio communication capability.
7. When work convoys must change lanes, the TRAIL VEHICLE should change lanes first to shadow the other convoy vehicles.
8. Vehicle spacing between the TRAIL VEHICLE and the SHADOW VEHICLE will vary depending on sight distance restrictions. Motorists approaching the work convoy should be able to see the TRAIL VEHICLE in time to slow down and/or change lanes as they approach the TRAIL VEHICLE. Vehicle spacing between the WORK VEHICLE and SHADOW VEHICLE may vary according to terrain, work activity and other factors.
9. Standard 48" X 48" diamond shaped warning signs with the same message as those shown may be used where adequate mounting space exists.
10. The signs shown should be used on the Advance Warning Vehicle. As an option, a portable changeable message sign (PCMS) or a truck mounted changeable message sign (TMCMS) with a minimum character height of 12", and displaying the same legend may be substituted for these signs. An appropriate directional arrow display, simulating the size and legibility of the flashing arrow board, must be used in the second phase of the PCMS/TMCMS message. When this is done, the arrow board will not be required on the Advance Warning Vehicle.
11. Standard diamond shape versions of the CW20-5 series signs may be used as an option if the rectangular signs shown are not available.
12. The principles on this sheet may be used to close lanes from the left side of the roadway considering the number of lanes, shoulder width, sight distance, and ramp frequency.
13. Signs and flashing arrow board modes shall be appropriately altered when implementing left lane closures or interior closures which close the left lanes.
14. The Advance Warning Vehicle may straddle the edgeline when shoulder width makes it necessary.



STRIPING FOR TMA

Texas Department of Transportation

Traffic Operations Division Standard

TRAFFIC CONTROL PLAN MOBILE OPERATIONS DIVIDED HIGHWAYS

TCP(3-2)-13

FILE: tcp3-2.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
© TxDOT December 1985	CONT	SECT	JOB	HIGHWAY
REVISIONS 2-94 4-98 8-95 7-13 1-97	DIST	COUNTY		SHEET NO. 168

176

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DATE: 9/11/2025 11:24:52 AM
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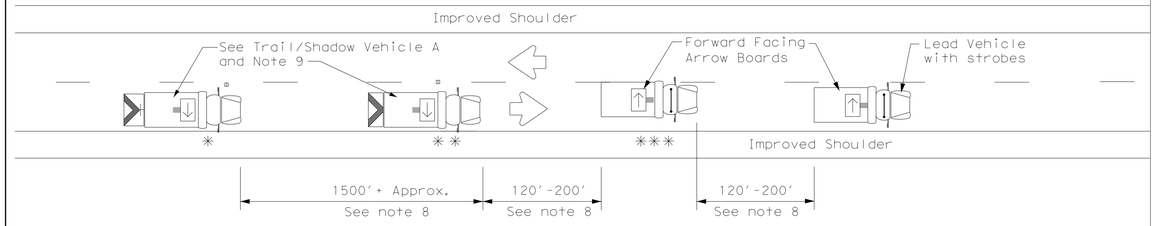
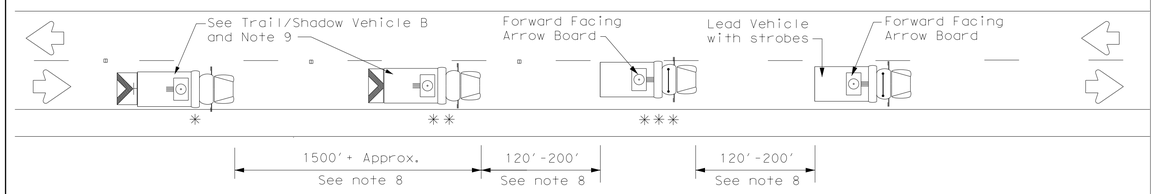


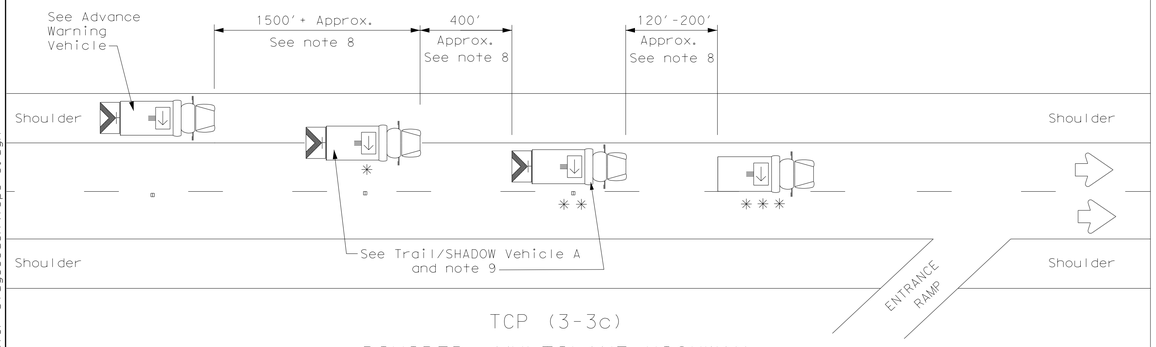
TCP (3-3a)

TWO LANE HIGHWAY WITH PAVED SHOULDERS (WORK ON TRAVEL LANE)



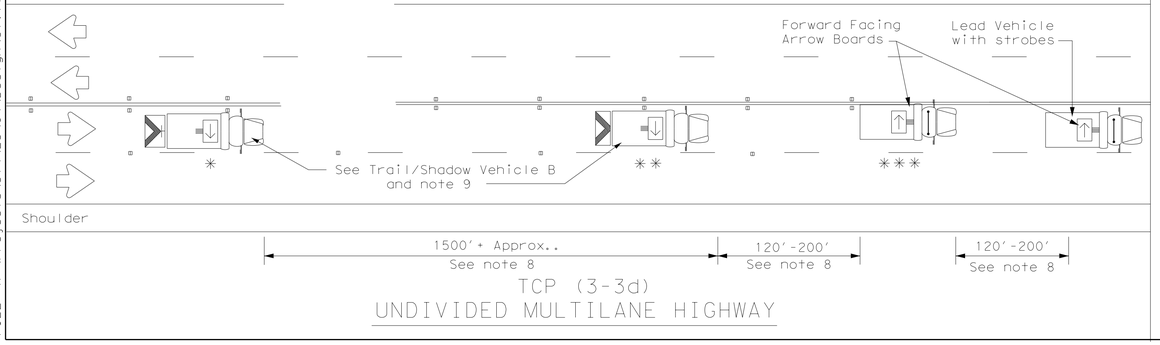
TCP (3-3b)

TWO LANE HIGHWAY WITHOUT PAVED SHOULDERS (WORK ON TRAVEL LANE)



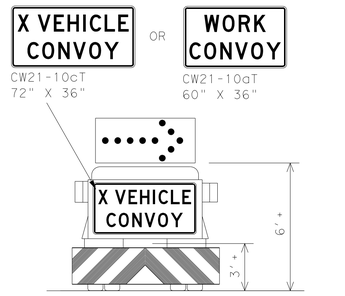
TCP (3-3c)

DIVIDED MULTILANE HIGHWAY



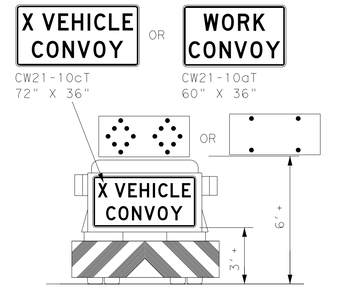
TCP (3-3d)

UNDIVIDED MULTILANE HIGHWAY



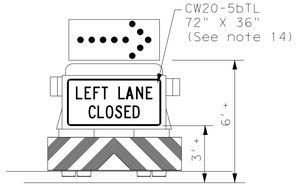
TRAIL/SHADOW VEHICLE A

with RIGHT Directional display
Flashing Arrow Board

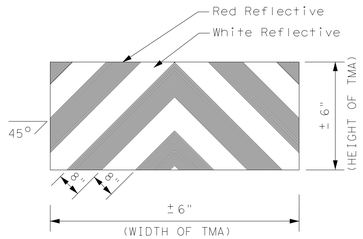


TRAIL/SHADOW VEHICLE B

with Flashing Arrow Board
in Caution Mode



ADVANCE WARNING VEHICLE



STRIPING FOR TMA

LEGEND			
*	Trail Vehicle	ARROW BOARD DISPLAY	
**	Shadow Vehicle		
***	Work Vehicle		RIGHT Directional
	Heavy Work Vehicle		LEFT Directional
	Truck Mounted Attenuator (TMA)		Double Arrow
	Traffic Flow		CAUTION (Alternating Diamond or 4 Corner Flash)

TYPICAL USAGE				
MOBILE	SHORT DURATION	SHORT TERM STATIONARY	INTERMEDIATE TERM STATIONARY	LONG TERM STATIONARY
✓				

GENERAL NOTES

1. TRAIL, SHADOW, and LEAD vehicles shall be equipped with arrow boards as illustrated. When a LEAD vehicle is not used on two way roads the WORK vehicle must have an arrow board. For divided roadways, the arrow board on the WORK vehicle is optional based on the type of work being performed. The Engineer will determine if the LEAD vehicle and/or TRAIL vehicle are required based on prevailing roadway conditions, traffic volume, and sight distance restrictions.
2. The use of amber high intensity rotating, flashing, oscillating, or strobe lights on vehicles are required. Blue high intensity rotating, flashing, oscillating, or strobe lights when mounted on the driver's side of the vehicle may be operated simultaneously with the amber beacons or strobe lights.
3. The use of truck mounted attenuators (TMA) on the SHADOW VEHICLE, ADVANCE WARNING and TRAIL VEHICLE are required.
4. Reflective sheeting on the rear of the TMA shall meet or exceed the reflectivity and color requirements of DEPARTMENTAL MATERIAL SPECIFICATION DMS 8300, Type A.
5. Flashing arrow boards shall be Type B or Type C as per the Barricade and Construction (BC) standards. The board shall be controlled from inside the vehicle.
6. Each vehicle shall have two-way radio communication capability.
7. When work convoys must change lanes, the TRAIL VEHICLE should change lanes first to shadow the other convoy vehicles.
8. Vehicle spacing between the TRAIL VEHICLE and the SHADOW VEHICLE will vary depending on sight distance restrictions. Motorists approaching the convoy should be able to see the TRAIL VEHICLE in time to slow down and/or change lanes as they approach the TRAIL VEHICLE. Vehicle spacing between the WORK VEHICLE and SHADOW VEHICLE and vehicle spacing between WORK VEHICLE and LEAD VEHICLE may vary according to terrain, work activity and other factors.
9. X VEHICLE CONVOY (CW21-10cT) or WORK CONVOY (CW21-10aT) signs shall be used on TRAIL VEHICLES and SHADOW VEHICLES as shown. As an option 48" x 48" diamond shaped WORK CONVOY (CW21-10T) or X VEHICLE CONVOY (CW21-10bT) signs may be used where adequate mounting space exists. When used, the X VEHICLE CONVOY sign shall have the number of the convoy vehicles displayed on the sign in the number designation "X" location. The X VEHICLE CONVOY sign shall not be used on the SHADOW VEHICLE if a TRAIL VEHICLE is used.
10. For divided highways with two or three lanes in one direction, the appropriate LEFT LANE CLOSED (CW20-5bTL), RIGHT LANE CLOSED (CW20-5bTR), or CENTER LANE CLOSED (CW20-5dT) sign should be used on the Advance Warning Vehicle. As an option, a portable changeable message sign (PCMS) or truck mounted changeable message sign (TMCMS) with a minimum character height of 12", and displaying the same legend may be substituted for these signs. An appropriate directional arrow display, simulating the size and legibility of the flashing arrow board may be used in the second phase of the PCMS/TMCMS message. When this is done, the arrow board will not be required on the Advance Warning Vehicle.
11. A double arrow shall not be displayed on the arrow board on the Advance Warning Vehicle.
12. For divided highways with three or four lanes in each direction, use TCP(3-2).
13. Standard diamond shape versions of the CW20-5 series signs may be used as an option if the rectangular signs shown are not available.
14. The Advance Warning Vehicle may straddle the edgeline when Shoulder width makes it necessary.
15. On two-lane two-way roadways, the work and protection vehicles should pull over periodically to allow motor vehicle traffic to pass. If motorists are not allowed to pass the work convoy, a DO NOT PASS (R4-1) sign should be placed on the back of the rearmost protection vehicle.

Texas Department of Transportation

Traffic Operations Division Standard

TRAFFIC CONTROL PLAN MOBILE OPERATIONS RAISED PAVEMENT MARKER INSTALLATION/ REMOVAL

TCP(3-3)-14

FILE: tcp3-3.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT September 1987	CONT	SECT	JOB	HIGHWAY
REVISIONS	0514	23	04	Wolf Ranch Parkway
2-94 4-98	DIST	COUNTY		SHEET NO.
8-95 7-13	AUS	Williamson		169
1-97 7-14				

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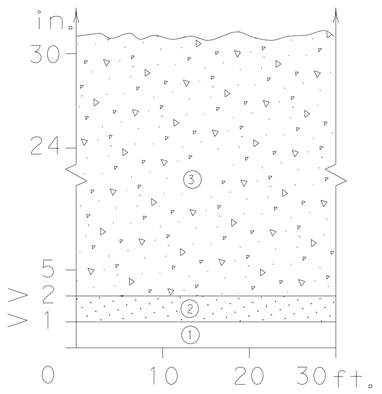
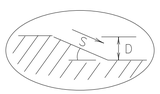
DATE: 9/11/2025 11:24:53 AM
FILE: H:\Projects\514\23\04\Design\Civil\Standards\TCP\TCP Stagecoach\edgecon.dgn

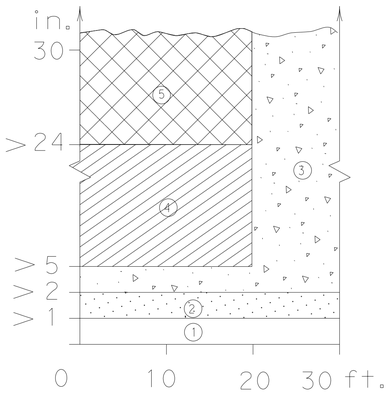
DEFINITION OF TREATMENT ZONES FOR VARIOUS EDGE CONDITIONS

Edge Height (D) in Inches versus Lateral Clearance (Y) in Feet

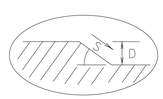


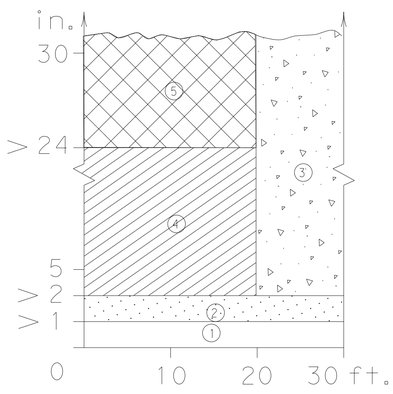
Edge Condition I
S = (3:1) (or flatter)



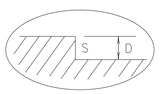


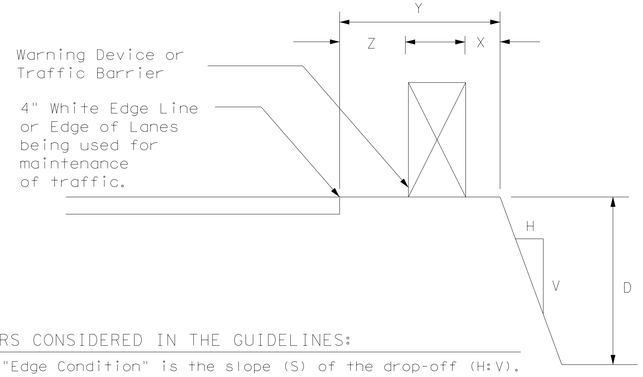
Edge Condition II
S = ((2.99):1) to (1:1)





Edge Condition III
S is steeper than (1:1)





FACTORS CONSIDERED IN THE GUIDELINES:

1. The "Edge Condition" is the slope (S) of the drop-off (H:V). The "Edge Height is the depth of the drop-off "D".

2. Distance "X" is to be the maximum practical under job conditions. Two feet minimum for high speed conditions. Distance "Y" is the lateral clearance from edge of travel lane to edge of dropoff. Distance "Z" does not have a minimum.

3. In addition to the factors considered in the guidelines, each construction zone drop-off situation should be analyzed individually, taking into account other variables, such as: traffic mix, posted speed in the construction zone, horizontal curvature, and the practicality of the treatment options.

4. The conditions for indicating the use of positive or protective barriers are given by Zone-5 and Figure-1. Traffic barriers are primarily applicable for high speed conditions. Urban areas with speeds of 30 mph or less may have a lesser need for signing, delineation, and barriers. Right-angled edges, however, with "D" greater than 2 inches and located within a lateral offset of 6 feet, may indicate a higher level of treatment.

5. If the distance "Y" must be less than 3 feet, the use of a positive barrier may not be feasible. In such a case, consider either: 1) narrowing the lanes to a desired 11 to 12 feet or 10 foot minimum (see CW20-8 sign), or 2) provide an edge slope such as Edge Condition I.

Zone	Treatment Types Guidelines:
①	No treatment
②	CW 8-11 "Uneven Lanes" signs.
③	CW 8-9a Shoulder Drop-Off" or CW 8-11 signs plus vertical panels.
④	CW8-9a or CW 8-11, signs plus drums. Where restricted space precludes the use of drums, use vertical panels. An edge slope to that of the profered Edge Condition I.
⑤	Check indications (Figure-1) for possitive barrier. Where positive barrier is not indicated, the treatment shown above for Zone-4 may be used after consideration of other applicable factors.

Edge Condition Notes:

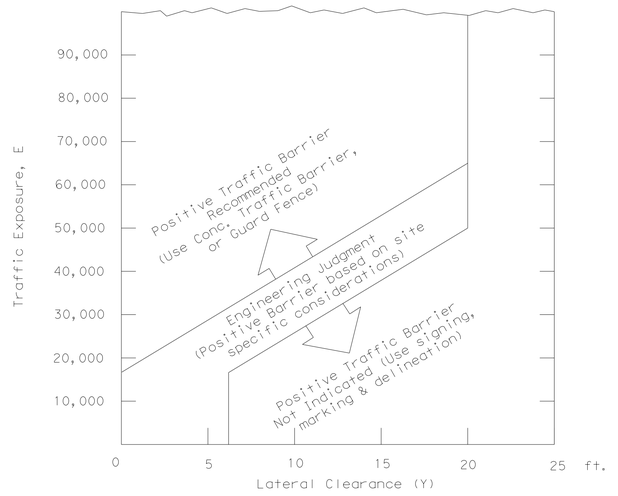
1. Edge Condition I: Most vehicles are able to traverse an edge condition with a slope rate of (3 to 1) or flatter. The slope must be constructed with a compacted material capable of supporting vehicles.

2. Edge Condition II: Most vehicles are able to traverse an edge condition with a slope between (2.99 to 1) and (1 to 1) so long as "D" does not exceed 5 inches. Under-carriage drag on most automobiles will occur when "D" exceeds 6 inches. As "D" exeeds 24 inches, the possibility for rollover is greater in most vehicles.

3. Edge Condition III: When slopes are greater than (1 to 1) and where "D" is greater than 2 inches, a more difficult control factor may exist for some vehicles, if not properly treated. For example, where "D" is greater than 2 inches and up to 24 inches different types of vehicles may experience different steering control at different edge heights. Automobiles might experience more steering control differential when "D" is greater than 2 inches and up to 5 inches. Trucks, particularly those with high loads, have more steering control differential when "D" is greater than 5 inches and up to 24 inches. When "D" exceeds 24 inches, the possibility of rollover is greater for most vehicles.

4. Milling or overlay operations that result in Edge Condition III should not be in place without appropriate warning treatments, and these conditions should not be left in place for extended periods of time.

FIGURE-1: CONDITIONS INDICATING USE OF POSITIVE BARRIER FOR ZONE 5 (▨)



1. E = ADT x T
   Where ADT is that portion of the average daily traffic volume traveling within 20 feet (generally two adjacent lanes) of the edge dropoff condition; and, T is the duration time in years of the dropoff condition.

2. Figure-1 provides a practical approach to the use of positive barriers for the protection of vehicles from pavement drop-offs. Other factors, such as the presence of heavy machinery, construction workers, or the mix and volume of traffic may make the use of positive barriers appropriate, even when the edge condition alone may not justify the use of a barrier.

3. An approved end treatment should be provided for any positive barrier end located within the clear zone.

These guidelines apply to temporary traffic control areas or work zones where continuous pavement edges or drop-offs exists parallel and adjacent to a lane used by traffic. The edge conditions may be present between shoulders and travel lanes, between adjacent or opposing travel lanes, or at intermediate points across the width of the paved surface. Due to the variability in construction operations, tolerances in the variables may be allowed by the engineer. These guidelines do not apply to short term operations. These guidelines do not constitute a rigid standard or policy; rather, they are guidance to be used in conjunction with engineering judgement. These guidelines may be updated on the Design Division's on-line manuals.

Engineer's Seal

DESIGN

STATE OF TEXAS
BRET CHAPMAN
127293
LICENSED
PROFESSIONAL ENGINEER

BRET CHAPMAN, P.E. — 9/11/2025 DATE

APPROVAL

STATE OF TEXAS
BRIAN A. ALLEN
123374
LICENSED
PROFESSIONAL ENGINEER

BRIAN A. ALLEN, P.E. — 9/11/2025 DATE

Date _____

Texas Department of Transportation

Traffic Safety Division Standard

TREATMENT FOR VARIOUS EDGE CONDITIONS

FILE: edgecon.dgn	DN:	CK:	DW:	CK:
©TxDOT August 2000	CONT	SECT	JOB	HIGHWAY
REVISIONS	0514	23	04	Wolf Ranch Parkway
03-01	DIST	COUNTY		SHEET NO.
08-01	AUS	Williamson		170
9-21				

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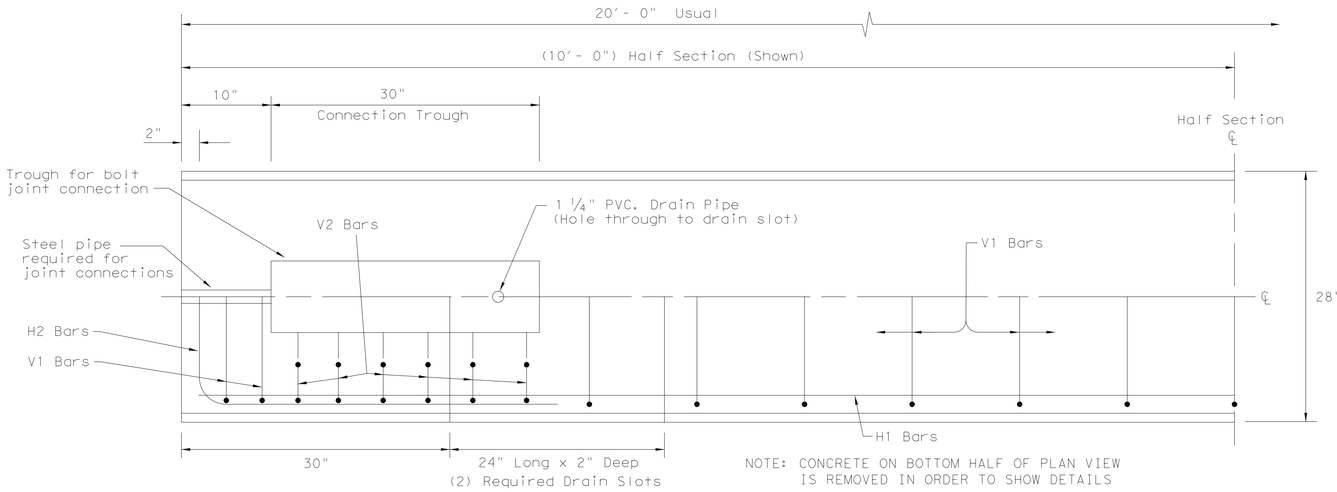
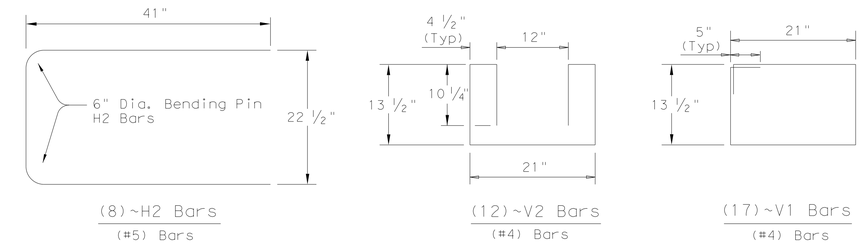


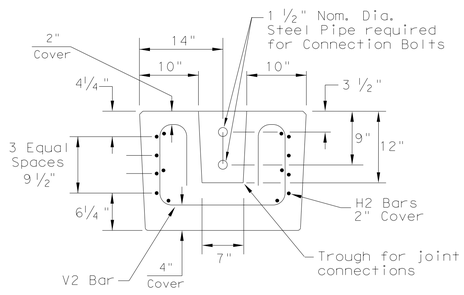
PLAN
(TYPE 1) BARRIER SEGMENT
(SYMMETRICAL ABOUT CENTER LINES)



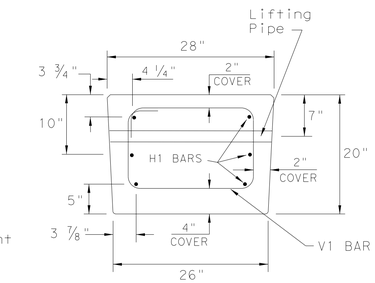
(8)~H2 Bars (#5) Bars
(12)~V2 Bars (#4) Bars
(17)~V1 Bars (#4) Bars

REINFORCING STEEL DETAILS
TYPE 1 - BARRIER SEGMENT

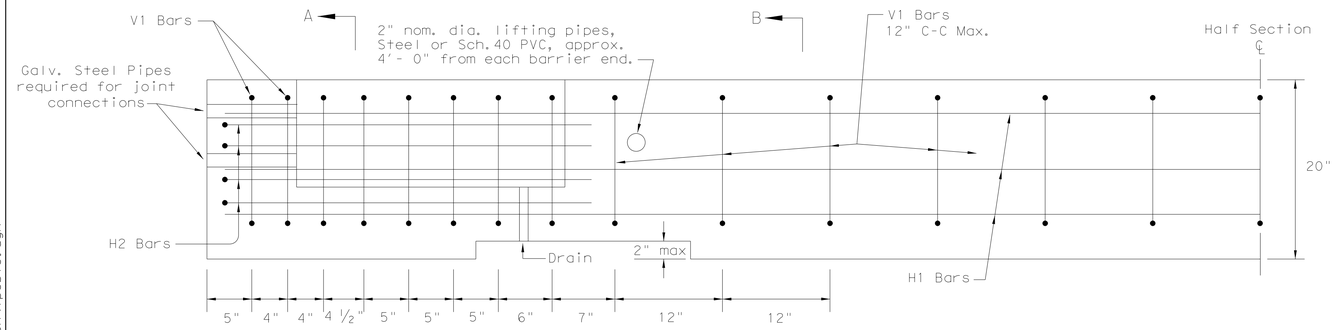
Note: Use 2" Dia. Bending Pin, unless otherwise shown



SECTION A-A



SECTION B-B



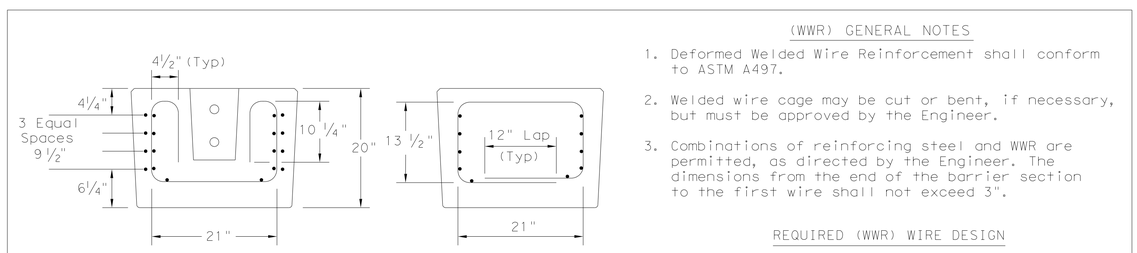
ELEVATION
(TYPE 1) BARRIER SEGMENT
(SYMMETRICAL ABOUT CENTER LINES)

GENERAL NOTES

1. Low Profile Concrete Barrier (LPCB), is approved for use in temporary work zone locations, where the posted speed is 45 mph, or less.
2. Concrete shall be Class H for precast barrier with a minimum compressive strength of 3,600 psi.
3. Where used, rebar reinforcement shall be Grade 60 and conform to ASTM A615.
4. Precast LPCB barrier length shall be 20 ft.
5. All barrier edges shall have ¾" chamfer or a tooled radius.
6. Joint connection hardware shall be in accordance with Item 449, "Anchor Bolts." and is considered subsidiary.
7. Steel pipe required for joint connection bolts shall be galvanized in accordance with Item 445, "Galvanizing."
8. Welded wire reinforcement (WWR) may be used in lieu of conventional reinforcement for Type 1 barrier, and shall meet the requirements shown.

FOR CONTRACTORS INFORMATION ONLY

(TYPE 1) APPROX. QUANTITIES	20 FT. SECTION	
CONCRETE	CY	2.6
REINFORCING STEEL	LBS	330
TOTAL BARRIER WT.	LBS	11000



SECTION A-A
SECTION B-B

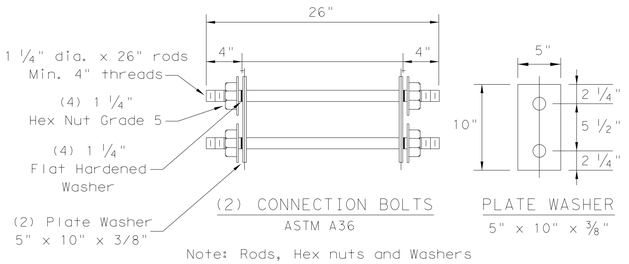
(WWR) GENERAL NOTES

1. Deformed Welded Wire Reinforcement shall conform to ASTM A497.
2. Welded wire cage may be cut or bent, if necessary, but must be approved by the Engineer.
3. Combinations of reinforcing steel and WWR are permitted, as directed by the Engineer. The dimensions from the end of the barrier section to the first wire shall not exceed 3".

REQUIRED (WWR) WIRE DESIGN

8 ~ (D31) Horizontal Wires (Equally spaced)
10 ~ (D20) Horizontal Wires (Equally spaced)
29 ~ (D20) Vertical Wires (Spaced as shown in Elevation View)

WELDED WIRE REINFORCEMENT (WWR)- OPTIONAL REINFORCING



(2) CONNECTION BOLTS
ASTM A36

Note: Rods, Hex nuts and Washers shall be Galvanized.

PLATE WASHER
5" x 10" x ⅜"

SHEET 1 OF 2

Texas Department of Transportation
Design Division Standard

LOW PROFILE CONCRETE BARRIER
PRECAST BARRIER (TYPE 1)
LPCB-13

FILE: lpcb13.dgn	DN: TxDOT	CK: AM	DW: VP	CK:
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REVISIONS	0514	23	04	Wolf Ranch Parkway
	DIST	COUNTY		SHEET NO.
	AUS	Williamson		171

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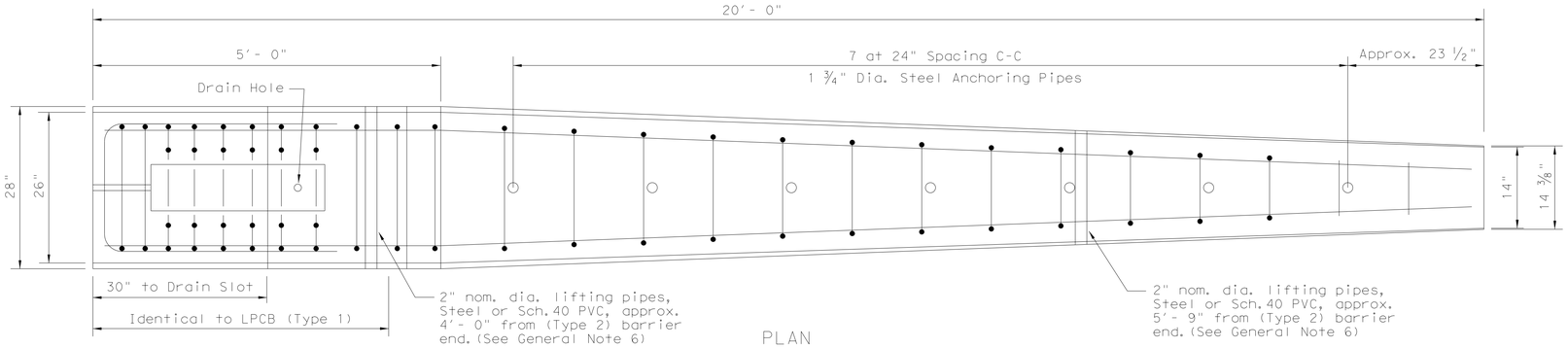
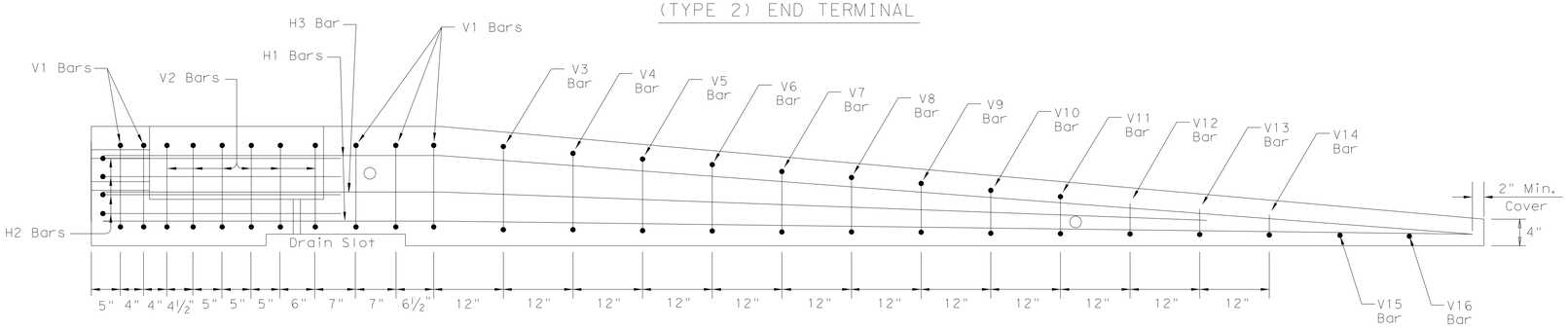
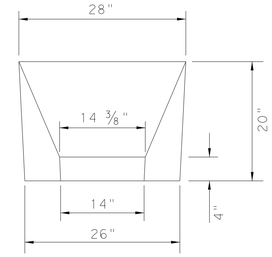


PLAN
(TYPE 2) END TERMINAL



ELEVATION
(TYPE 2) END TERMINAL

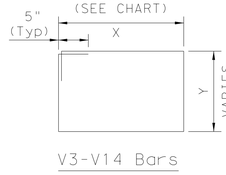
Note:
Anchoring pipes not shown in Elevation View



APPROACH VIEW

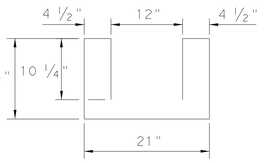
TYPE 2 - NOTES

1. Welded wire reinforcment (WWR) is "not" an option for Type 2 Barrier.
2. Type 2 Barrier shall be used as an end treatment for the Type 1 barrier segments, when applicable.
3. The end treatment can be used without the anchor pins in locations that can accommodate approximately 4 ft. of lateral displacement of the end treatment. The use of non-pinned end treatment does not affect the performance or the deflection of the Low-Profile barrier system.
4. The anchor pins are all the same length and are to be driven flush with the top of the (Type 2) barrier surface.
5. The bends in the H3 and H1 bars are slight, no formal bend is necessary.
6. The Type 2 barrier segment must be lifted from the rear first, to prevent cracking of sloped section.
7. See LPCB sheet 1 for additional information.

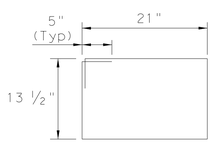


V3-V14 Bars

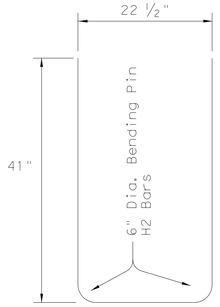
BAR(#4)	X (IN.)	Y (IN.)
V3 BAR	20 ¼	14 ½
V4 BAR	19 ½	13 ½
V5 BAR	18 ½	12 ¼
V6 BAR	17 ½	11 ¼
V7 BAR	17	10 ¼
V8 BAR	16 ¼	9
V9 BAR	15 ½	8
V10 BAR	14 ½	7
V11 BAR	13 ¾	6



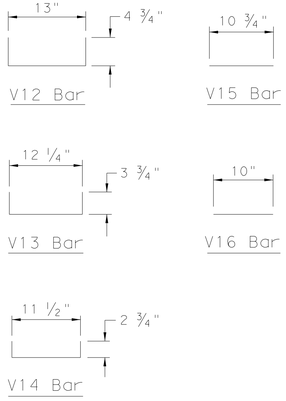
(6)~V2 Bars



(5)~V1 Bars

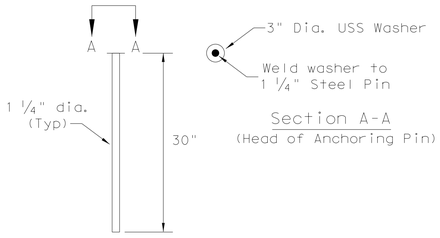


(4)~H2 Bars
(#5) Bars



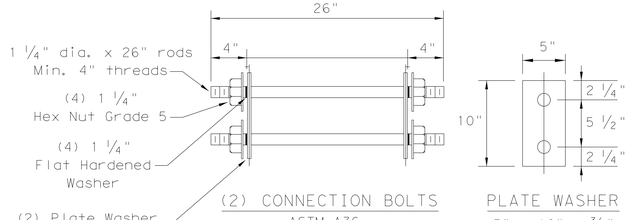
Note: All V Bars are (#4)

REINFORCING STEEL DETAILS
TYPE 2 - END TERMINAL



Section A-A
(Head of Anchoring Pin)

(7) Anchor Pins
ASTM A36 Steel
(See Note 3)

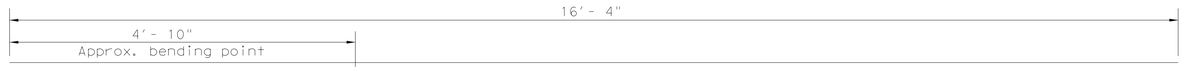


(2) CONNECTION BOLTS
ASTM A36

PLATE WASHER
5" x 10" x ⅜"

Note: Rods, Hex nuts and Washers shall be Galvanized.

Note: Use 2" Dia. Bending Pin, unless otherwise shown



(2)~H3 Bars
(#5) Bar



Note: Bends on H1 and H3 bars are slight and do not require formal bends.

(4)~H1 Bars
(#5) Bar

FOR CONTRACTORS INFORMATION ONLY

(TYPE 2) APPROX. QUANTITIES	20 FT. SECTION	
CONCRETE	CY	1.65
REINFORCING STEEL	LBS	240
TOTAL BARRIER WT.	LBS	7000

Texas Department of Transportation

Design Division Standard

LOW PROFILE CONCRETE BARRIER
PRECAST BARRIER
(TYPE 2)
LPCB-13

FILE: lpcb13.dgn	DN: TxDOT	CK: AM	DW: VP	CK:
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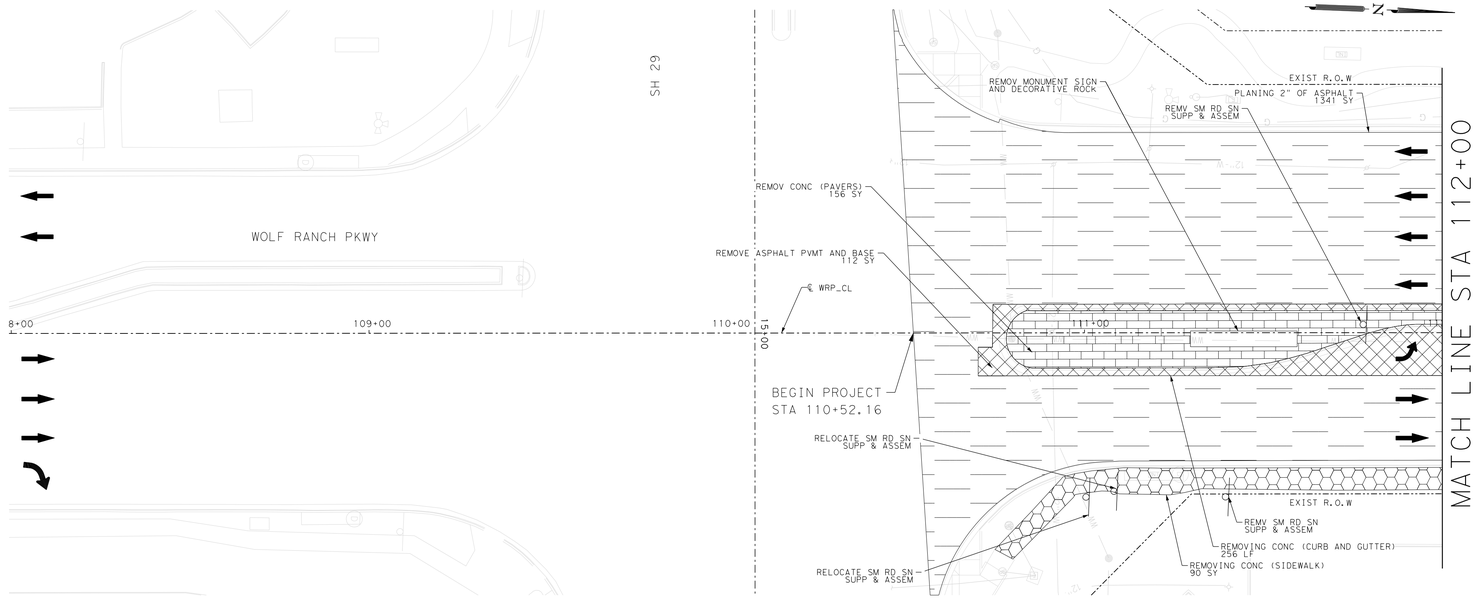
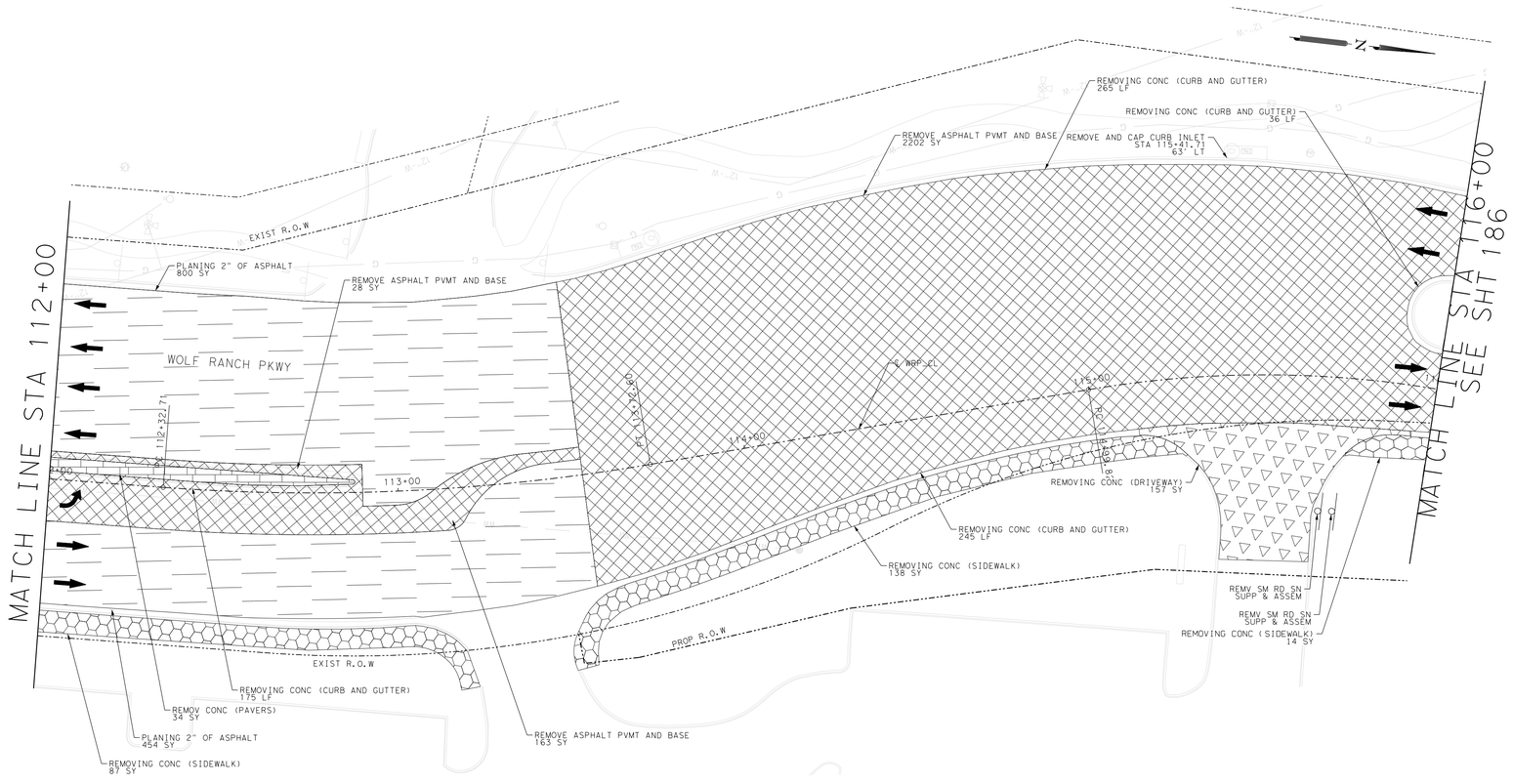
	DIST	COUNTY		SHEET NO.
	AUS	Williamson		172





LEGEND

- CONCRETE PAVEMENT REMOVAL
- CONCRETE DRIVEWAY REMOVAL
- ASPHALT PAVEMENT AND BASE REMOVAL
- ASPHALT DRIVEWAY REMOVAL
- CONCRETE REMOVAL
- PAVERS REMOVAL
- PLANING ASPHALT
- FENCE REMOVAL
- UTILITY REMOVAL
- EXIST TRAFFIC FLOW
- FOC1 — ATT
- FOC3 — MCI
- FOC4 — OPTIMUM
- FOC1 (D) — ATT
- FOC2 (D) — GEORGETOWN UTILITY SERVICES
- FOC3 (D) — MCI
- FOC4 (D) — OPTIMUM
- CTV1 — UNKNOWN
- CTV2 — OPTIMUM
- T1 — FRONTIER
- T1 (D) — FRONTIER
- TS1 (D) — FRONTIER
- TS1 (D) — TxDOT
- E1 (D) — GEORGETOWN UTILITY SERVICES
- E2 (D) — PEDERNALES ELECTRIC COOP
- E2 — PEDERNALES ELECTRIC COOP
- E1 — GEORGETOWN UTILITY SERVICES
- G1 — ATMOS
- G1 (D) — ATMOS
- W1 — GEORGETOWN UTILITY SERVICES
- W1 (D) — GEORGETOWN UTILITY SERVICES
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- OHE — EXIST. OVERHEAD ELECTRIC

SCALE: 1"= 20'

0' 20' 40' 60'

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DESIGN

STATE OF TEXAS — BRET CHAPMAN — 127293 — LICENSED PROFESSIONAL ENGINEER

BRET CHAPMAN, P.E. — 9/16/2025 DATE

APPROVAL

STATE OF TEXAS — BRIAN A. ALLEN — 123374 — LICENSED PROFESSIONAL ENGINEER

BRIAN A. ALLEN, P.E. — 9/16/2025 DATE

NO.	REVISION	DATE

GEORGETOWN TEXAS *more than welcome*

PAPE-DAWSON ENGINEERS
AUSTIN I SAN ANTONIO I HOUSTON I FORT WORTH I DALLAS
10801 N MOPAC EXPY, BLDG 3, STE 200 I AUSTIN, TX 78759 I 512.454.8711
TEXAS ENGINEERING FIRM #470 I TEXAS SURVEYING FIRM #10028800

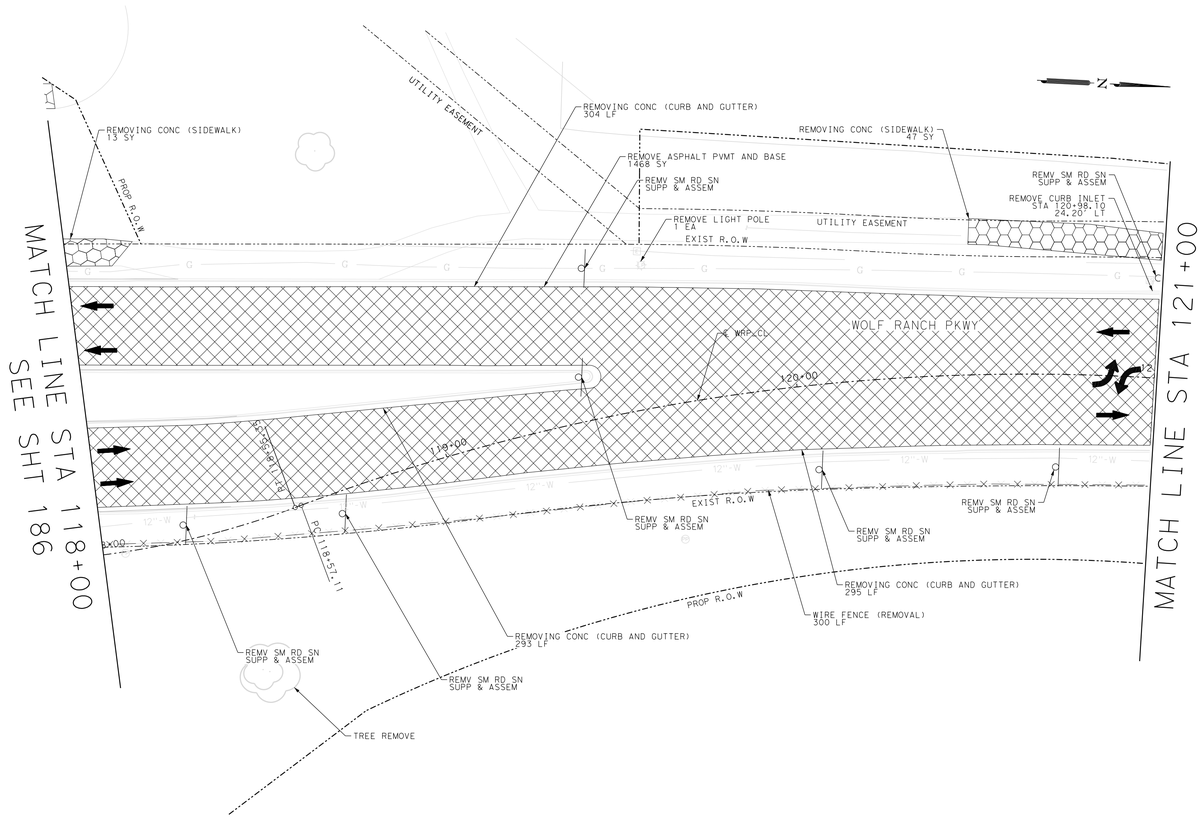
WOLF RANCH PKWY / MEMORIAL DR

REMOVAL PLAN

CITY JOB No.
JOB NO. 51423-04
DATE 9/16/2025
DESIGNER
CHECKED DRAWN

SHEET 1 OF 17

SHEET NO. 173



LEGEND

- CONCRETE PAVEMENT REMOVAL
- CONCRETE DRIVEWAY REMOVAL
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- ASPHALT DRIVEWAY REMOVAL
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BRET CHAPMAN, P.E. — 9/16/2025 DATE

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BRIAN A. ALLEN, P.E. — 9/16/2025 DATE

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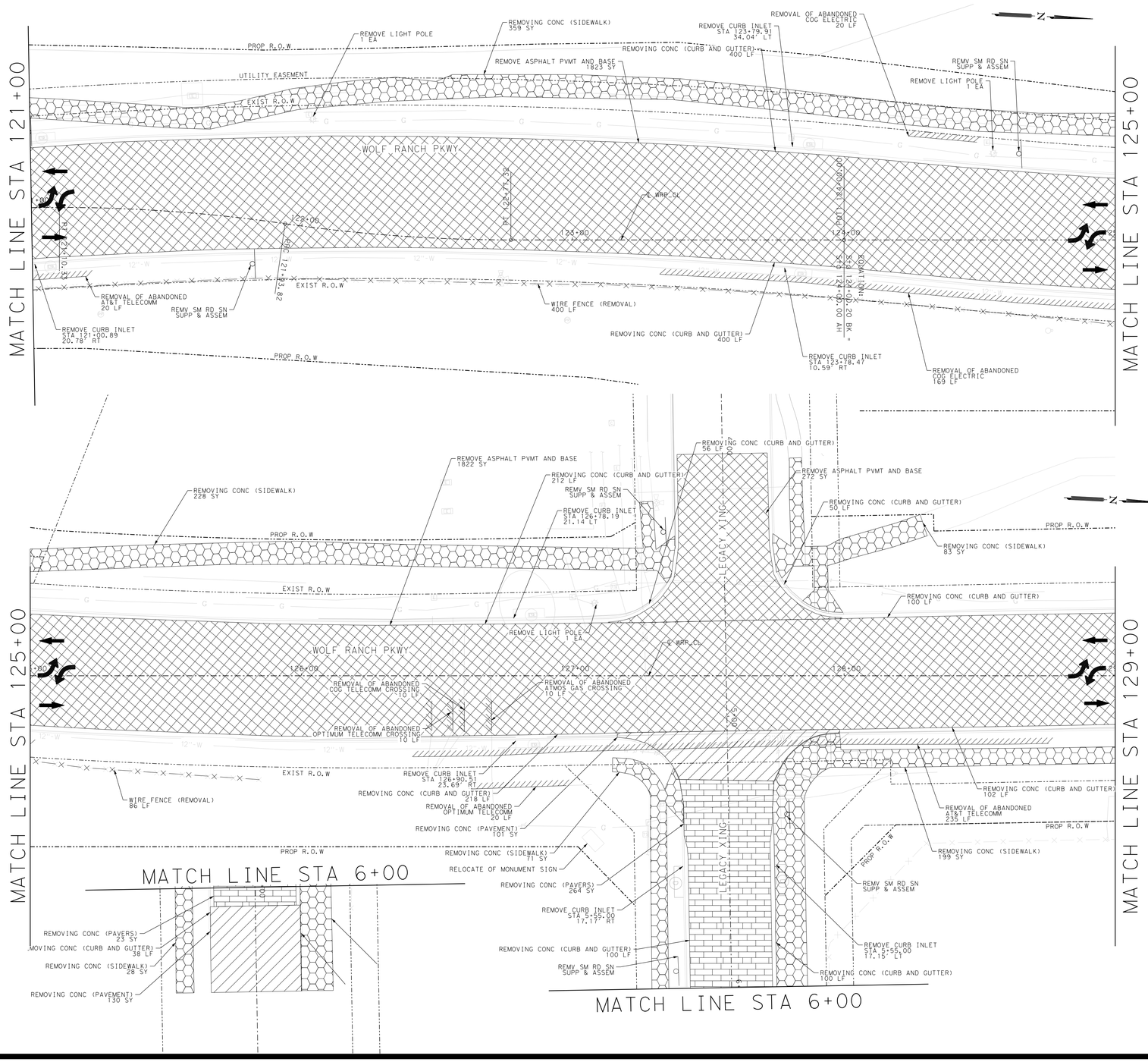

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STATE OF TEXAS — BRET CHAPMAN — 127293 — LICENSED PROFESSIONAL ENGINEER

BRET CHAPMAN, P.E. — 9/16/2025 DATE

APPROVAL

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GEORGETOWN TEXAS *more than welcome*

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REMOVAL PLAN

CITY JOB No.
JOB NO. 51423-04
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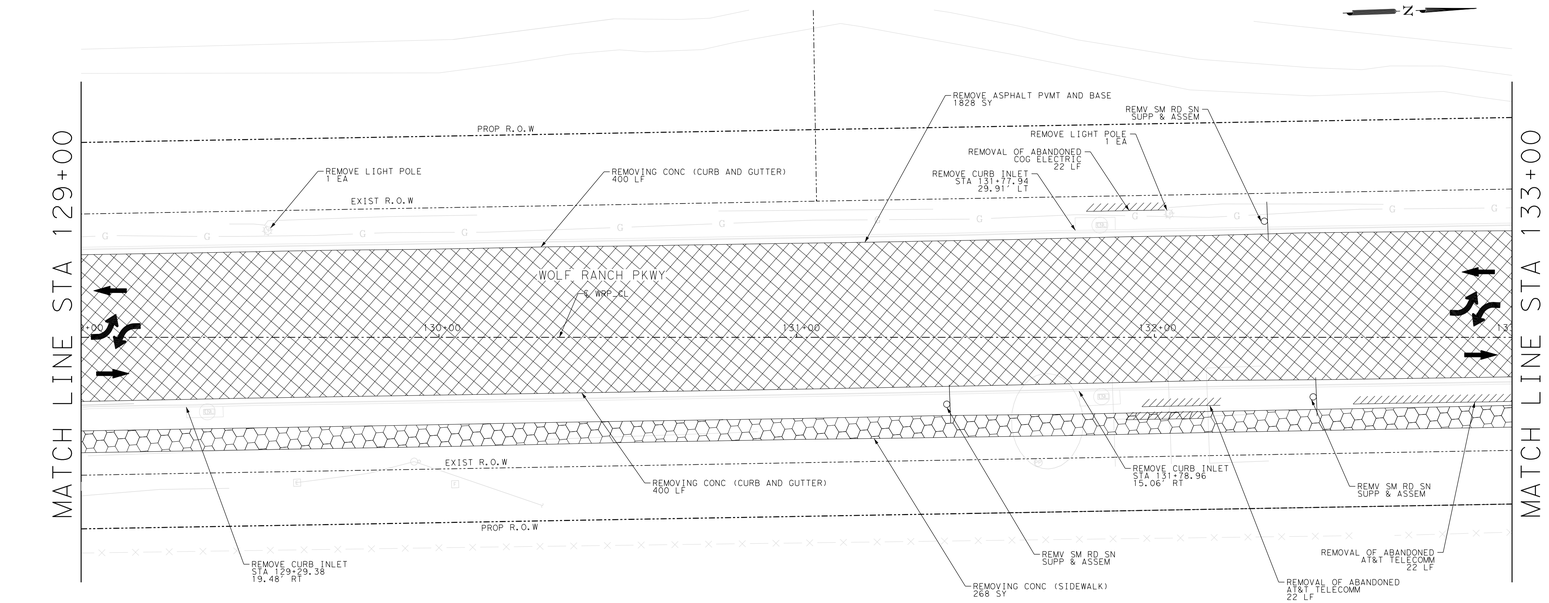
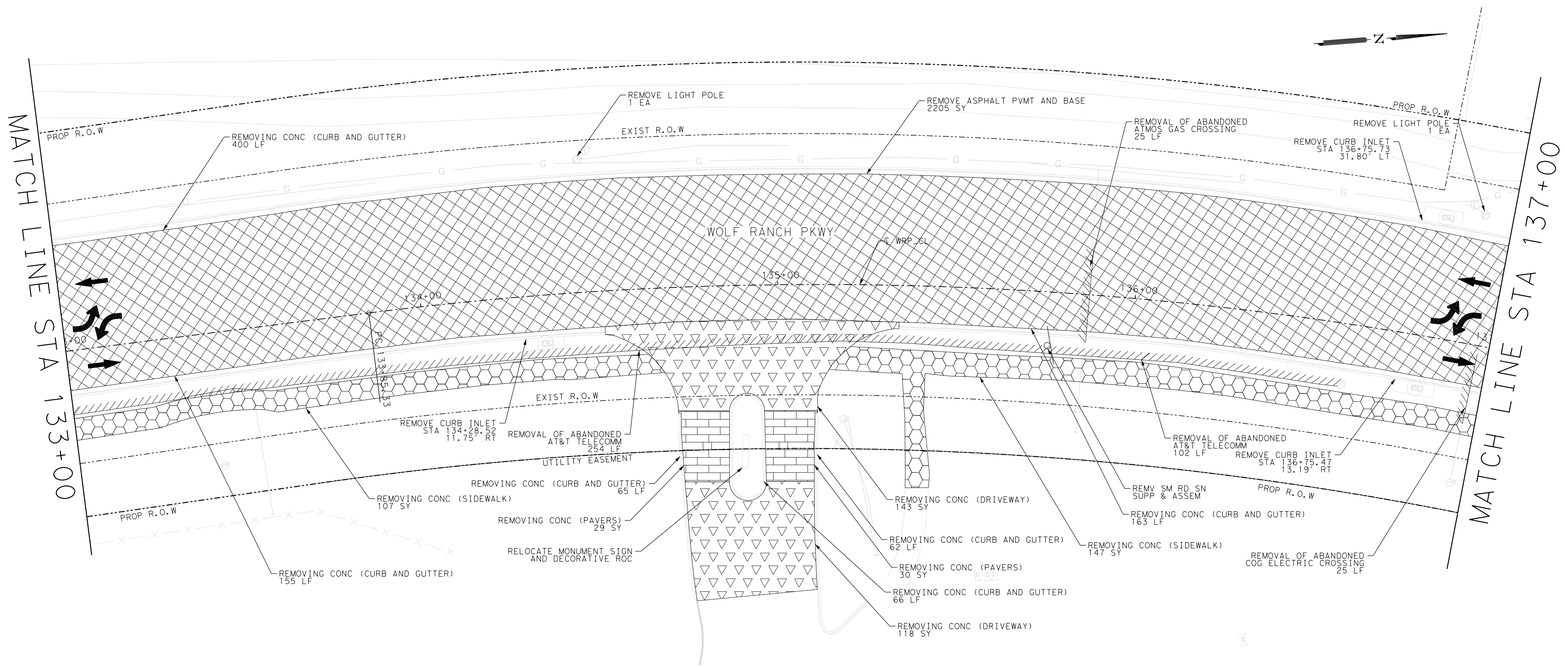
CHECKED DRAWN

SHEET 3 OF 17

SHEET NO. 175





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BRET CHAPMAN, P.E. — 9/16/2025 DATE

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REMOVAL PLAN

CITY JOB No.
JOB NO. 51423-04
DATE 9/16/2025
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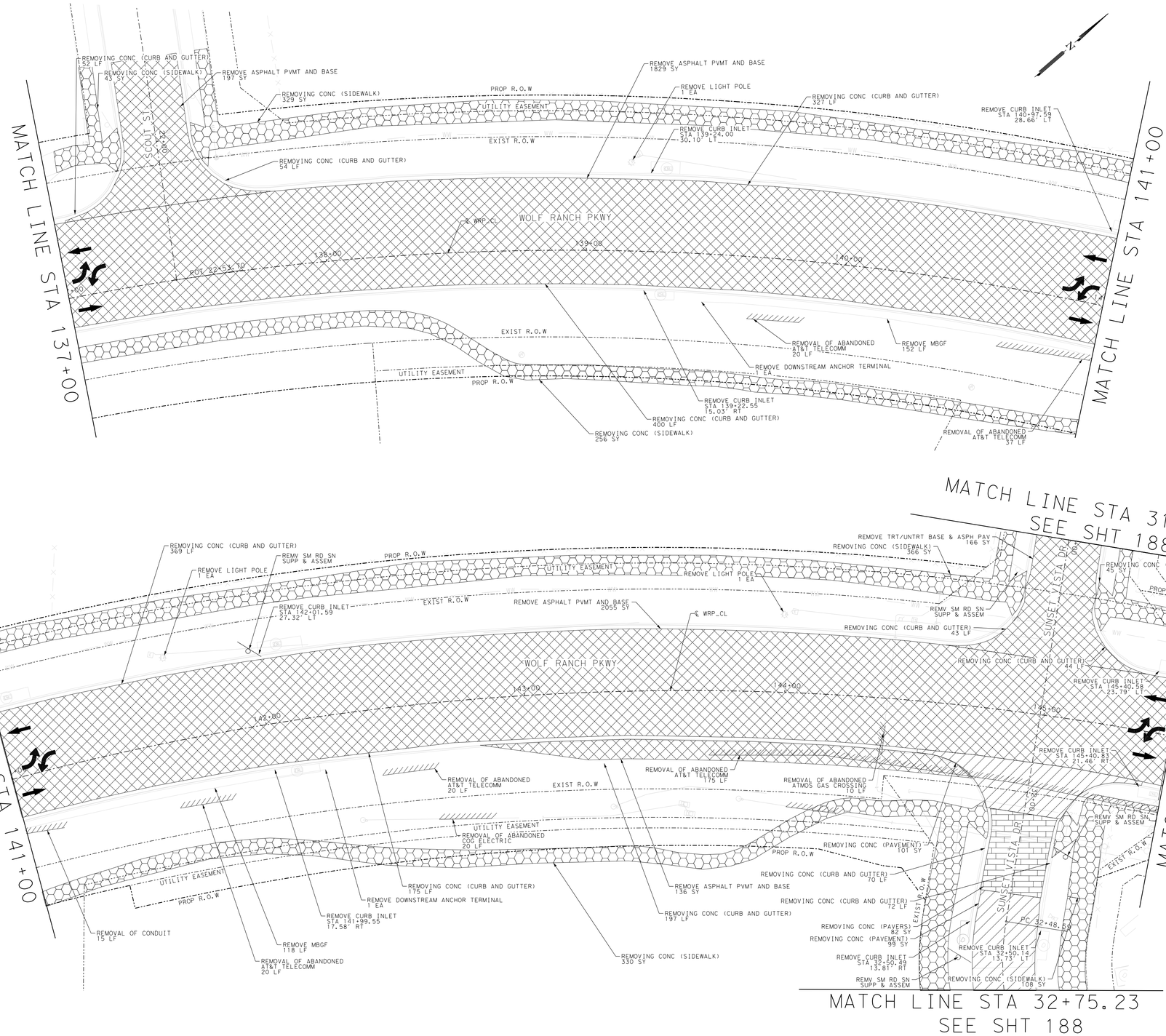
SHEET 4 OF 17

SHEET NO. 176



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REMOVAL PLAN

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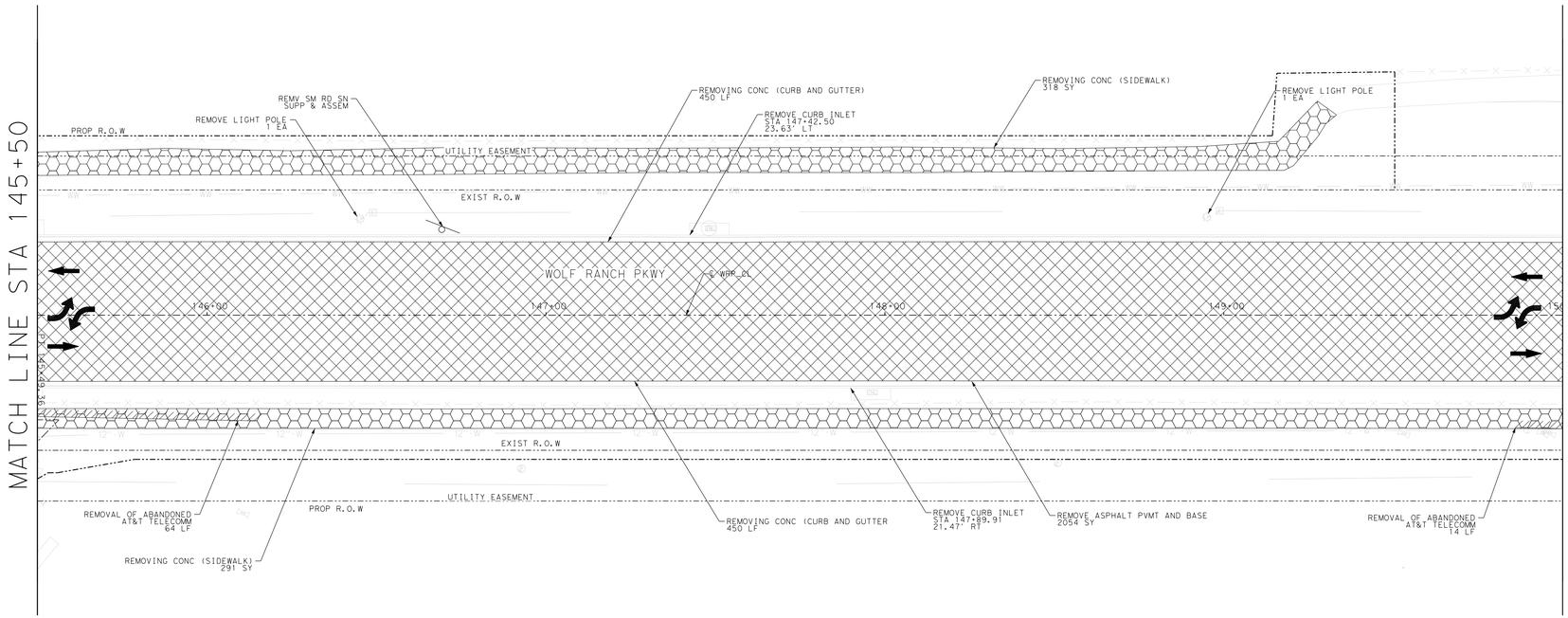
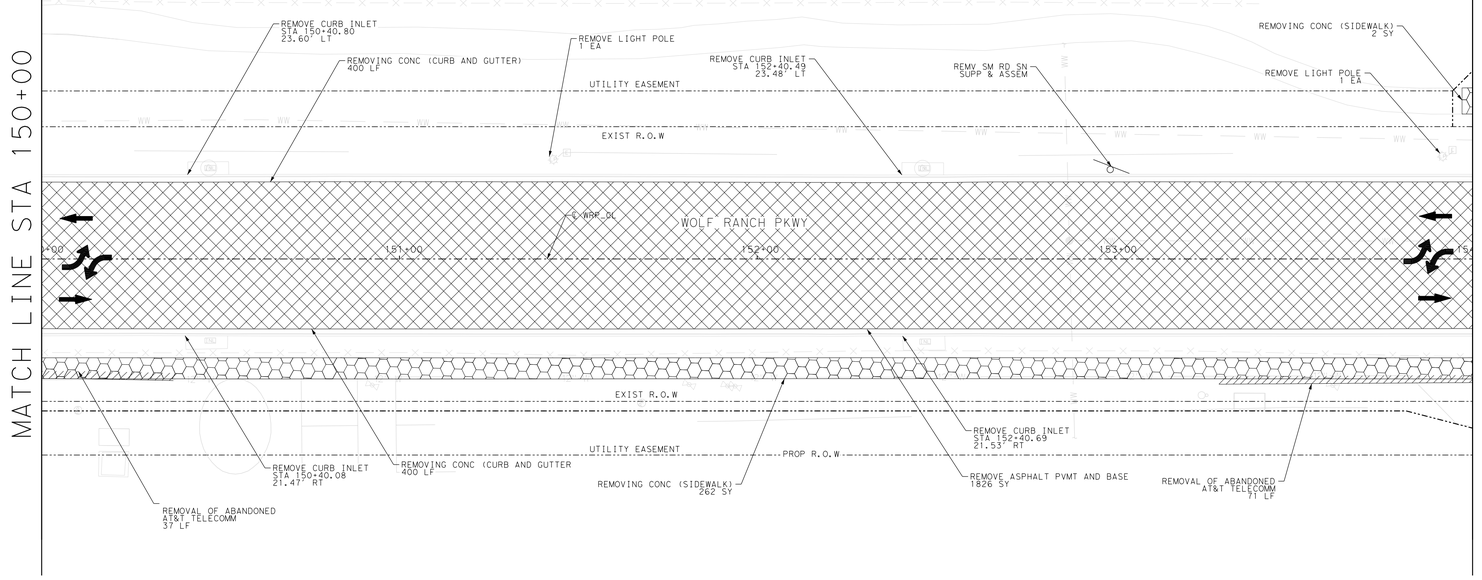
SHEET 5 OF 17

SHEET NO. 177





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SHEET 6 OF 17

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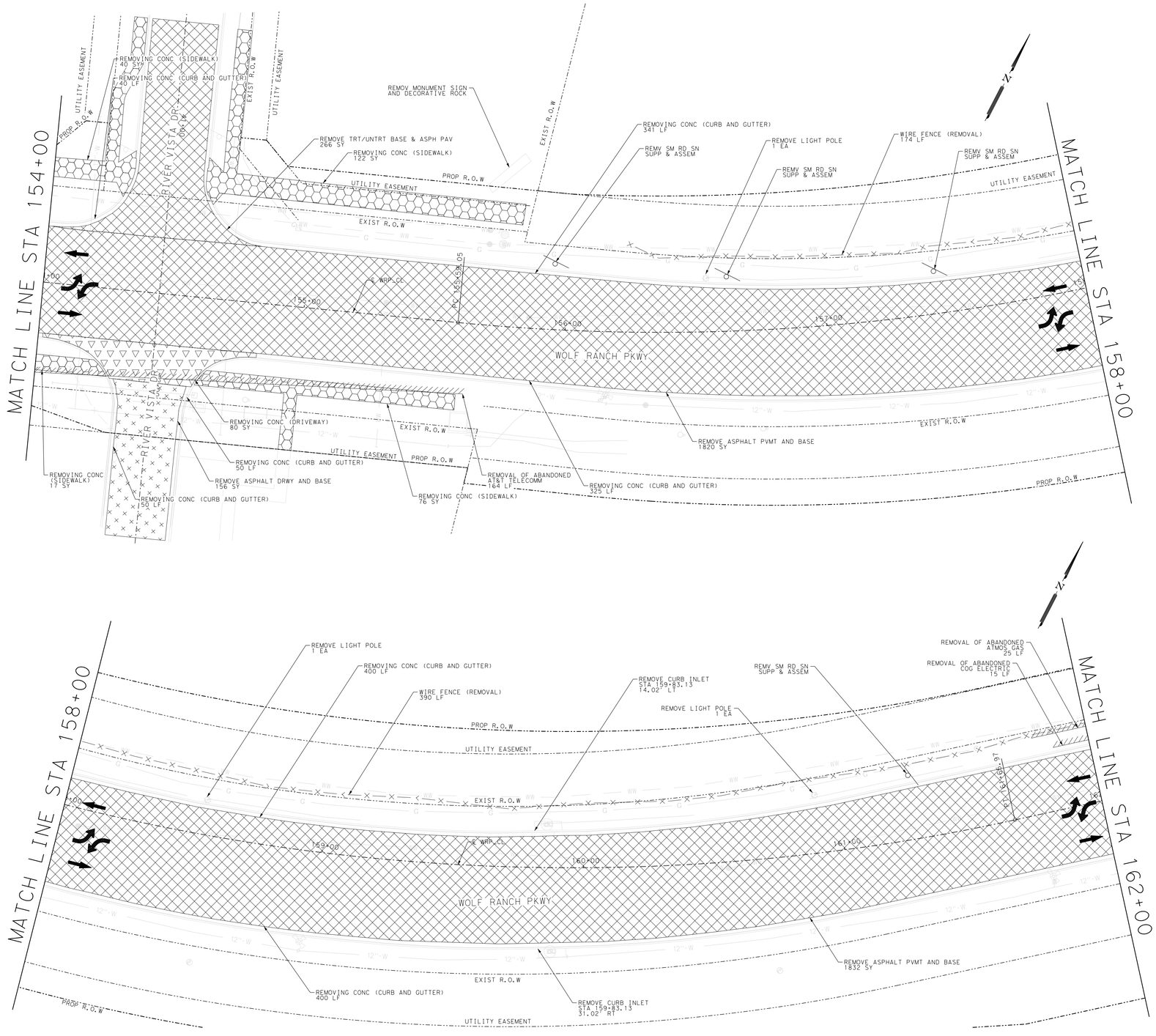

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- PAVERS REMOVAL
- PLANING ASPHALT
- FENCE REMOVAL
- UTILITY REMOVAL
- EXIST TRAFFIC FLOW
- FOC1 — ATT
- FOC3 — MCI
- FOC4 — OPTIMUM
- FOC1 (D) — ATT
- FOC2 (D) — GEORGETOWN UTILITY SERVICES
- FOC3 (D) — MCI
- FOC4 (D) — OPTIMUM
- CTV1 — UNKNOWN
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- T1 — FRONTIER
- T1 (D) — FRONTIER
- TS1 (D) — FRONTIER
- TS1 (D) — TxDOT
- E1 (D) — GEORGETOWN UTILITY SERVICES
- E2 (D) — PEDERNALES ELECTRIC COOP
- E2 — PEDERNALES ELECTRIC COOP
- E1 — GEORGETOWN UTILITY SERVICES
- G1 — ATMOS
- G1 (D) — ATMOS
- W1 — GEORGETOWN UTILITY SERVICES
- W1 (D) — GEORGETOWN UTILITY SERVICES
- W2 — CITY OF ROUND ROCK
- W2 (D) — CITY OF ROUND ROCK
- WW1 (D) — CITY OF GEORGETOWN
- OHE — EXIST. OVERHEAD ELECTRIC

SCALE: 1"= 20'

0' 20' 40' 60'

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DESIGN

STATE OF TEXAS — BRET CHAPMAN — 127293 — LICENSED PROFESSIONAL ENGINEER

BRET CHAPMAN, P.E. — 9/16/2025 DATE

APPROVAL

STATE OF TEXAS — BRIAN A. ALLEN — 123374 — LICENSED PROFESSIONAL ENGINEER

BRIAN A. ALLEN, P.E. — 9/16/2025 DATE

NO.	REVISION	DATE

GEORGETOWN TEXAS *more than welcome*

PAPE-DAWSON ENGINEERS
AUSTIN I SAN ANTONIO I HOUSTON I FORT WORTH I DALLAS
10801 N MOPAC EXPY, BLDG 3, STE 200 I AUSTIN, TX 78759 I 512.454.8711
TEXAS ENGINEERING FIRM #470 I TEXAS SURVEYING FIRM #10028800

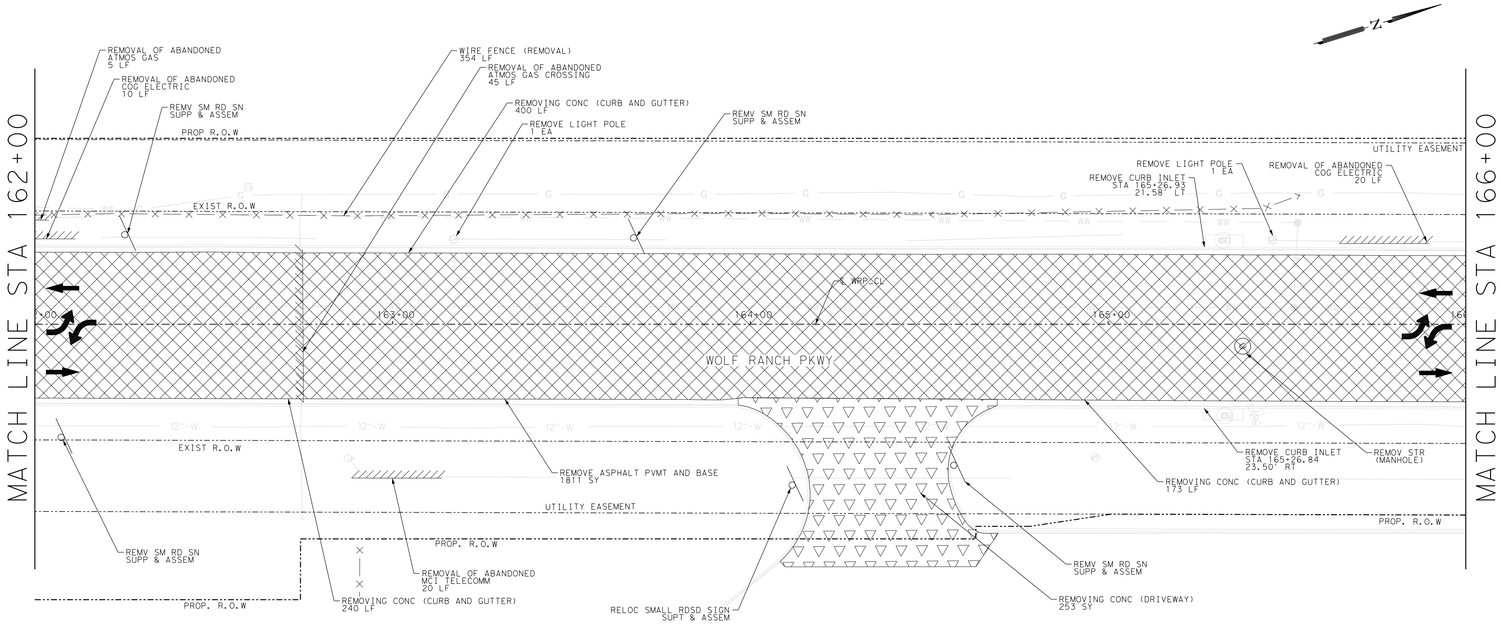
WOLF RANCH PKWY / MEMORIAL DR

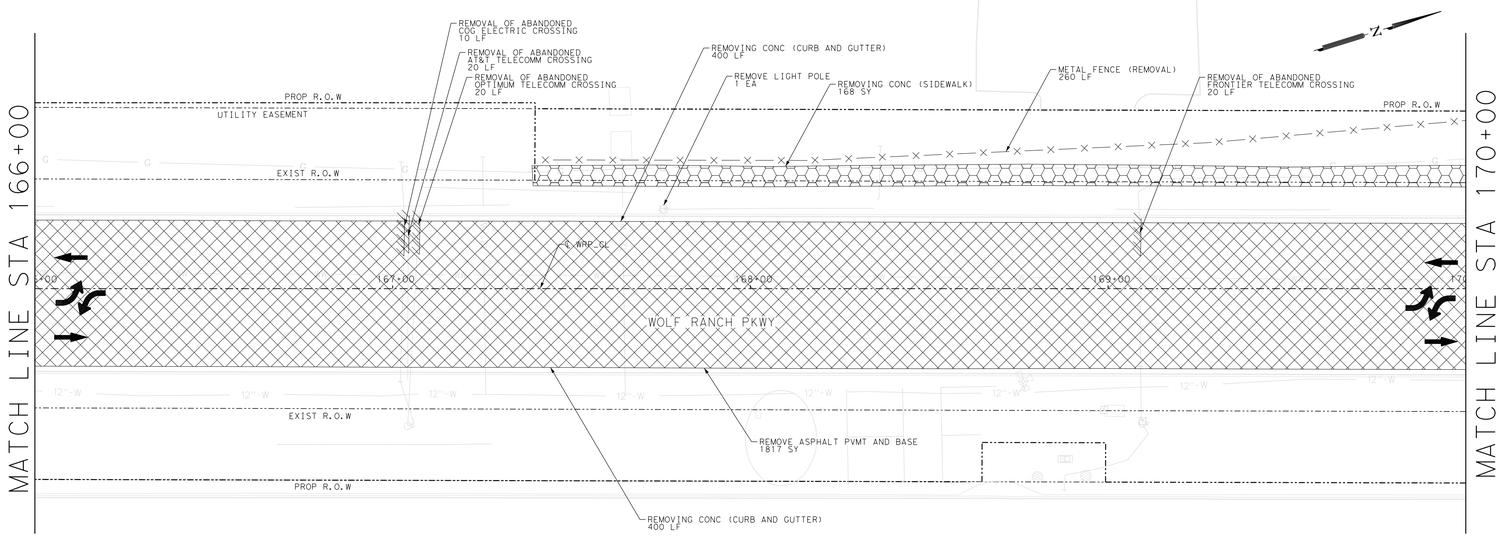
REMOVAL PLAN

CITY JOB No.
JOB NO. 51423-04
DATE 9/16/2025
DESIGNER
CHECKED DRAWN

SHEET 7 OF 17

SHEET NO. 179





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- E2 (D) — PEDERNALES ELECTRIC COOP
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BRET CHAPMAN, P.E. — 9/16/2025 DATE

APPROVAL

STATE OF TEXAS — BRIAN A. ALLEN — 123374 — LICENSED PROFESSIONAL ENGINEER

BRIAN A. ALLEN, P.E. — 9/16/2025 DATE

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WOLF RANCH PKWY / MEMORIAL DR
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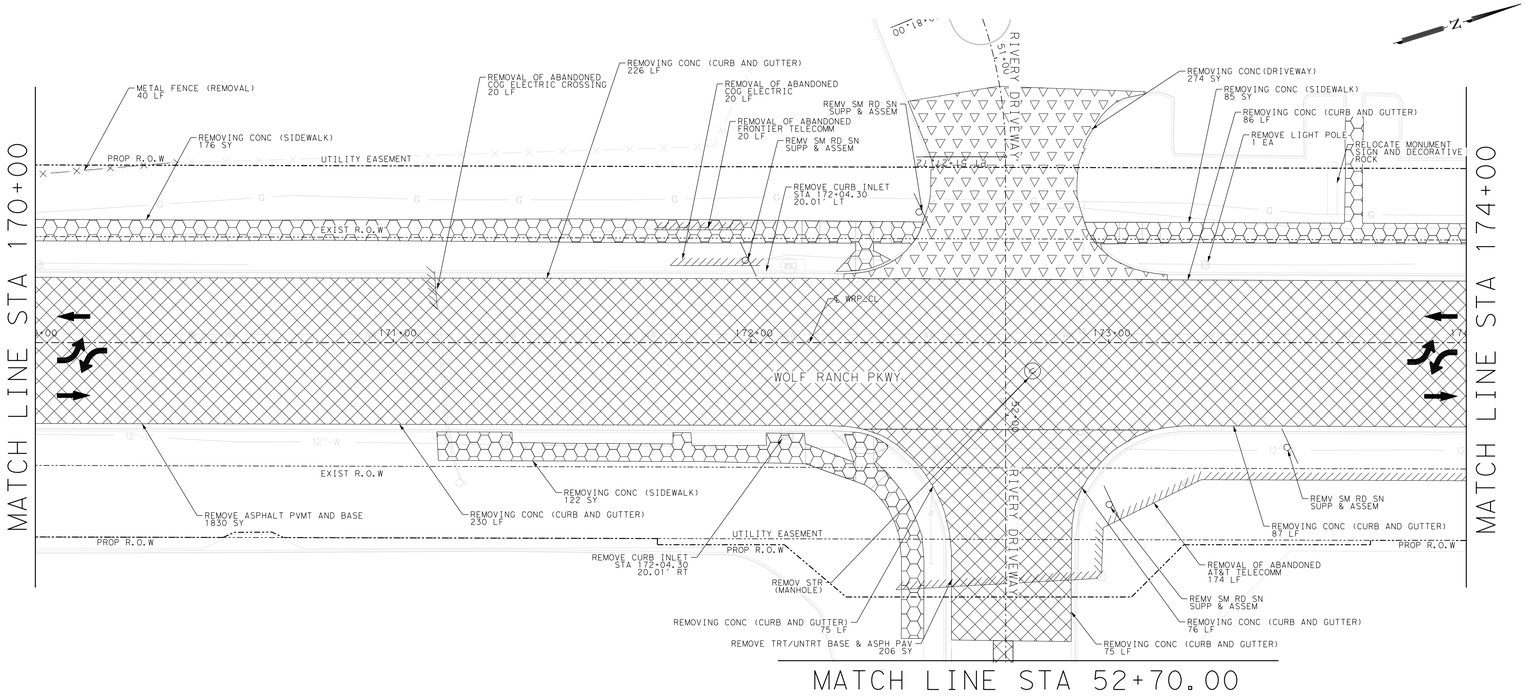

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- FOC1 — ATT
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GEORGETOWN TEXAS *more than welcome*

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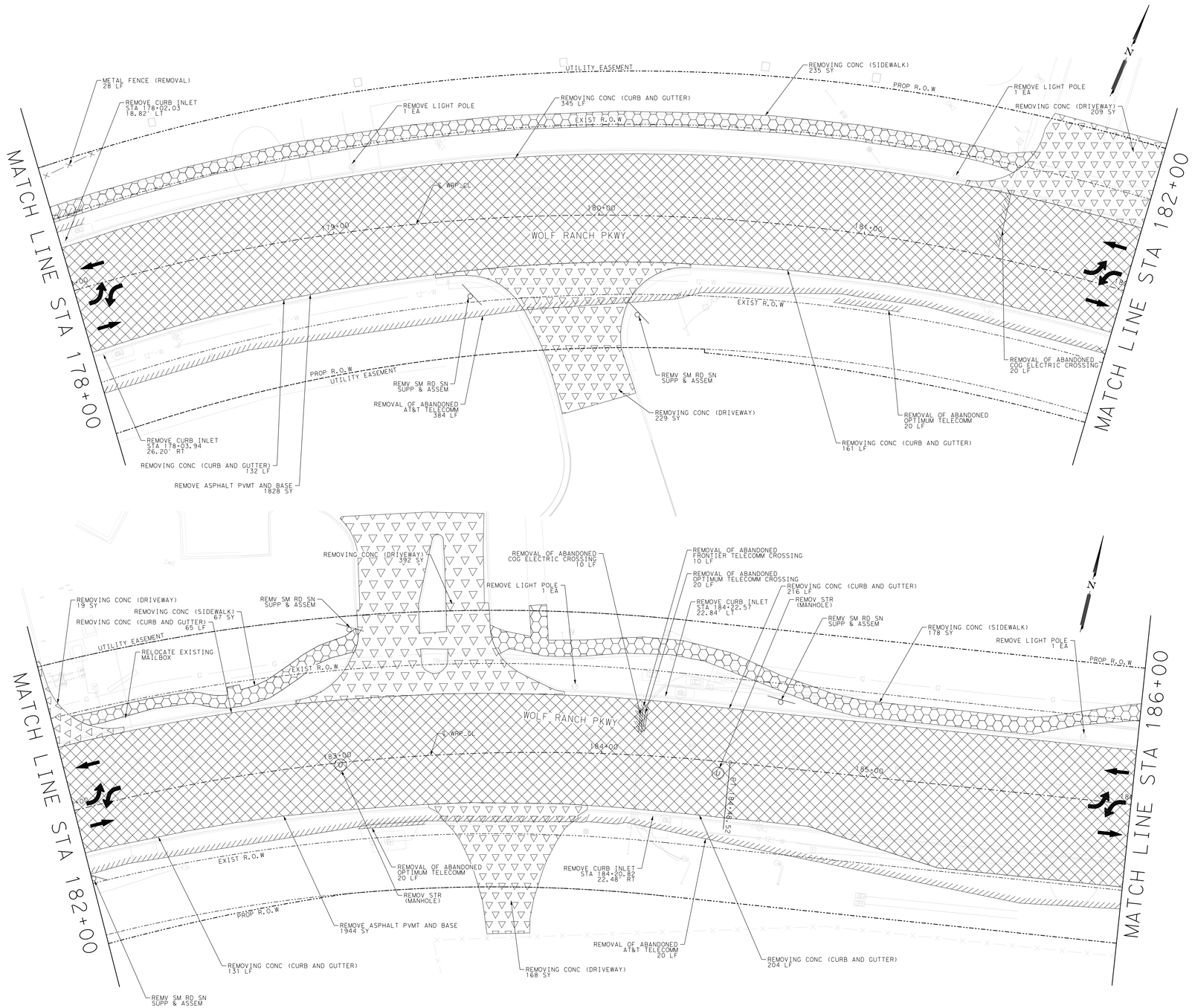

LEGEND

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BRET CHAPMAN, P.E. — 9/16/2025 DATE

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GEORGETOWN TEXAS *more than welcome*

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REMOVAL PLAN

CITY JOB No.
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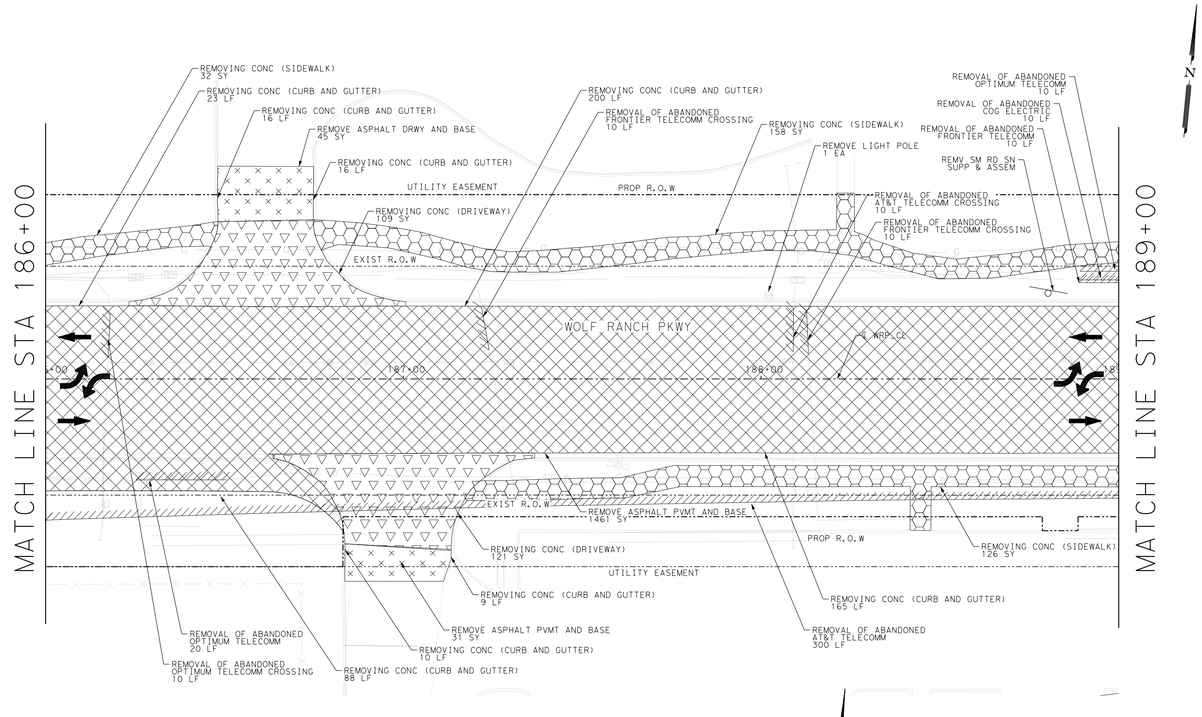
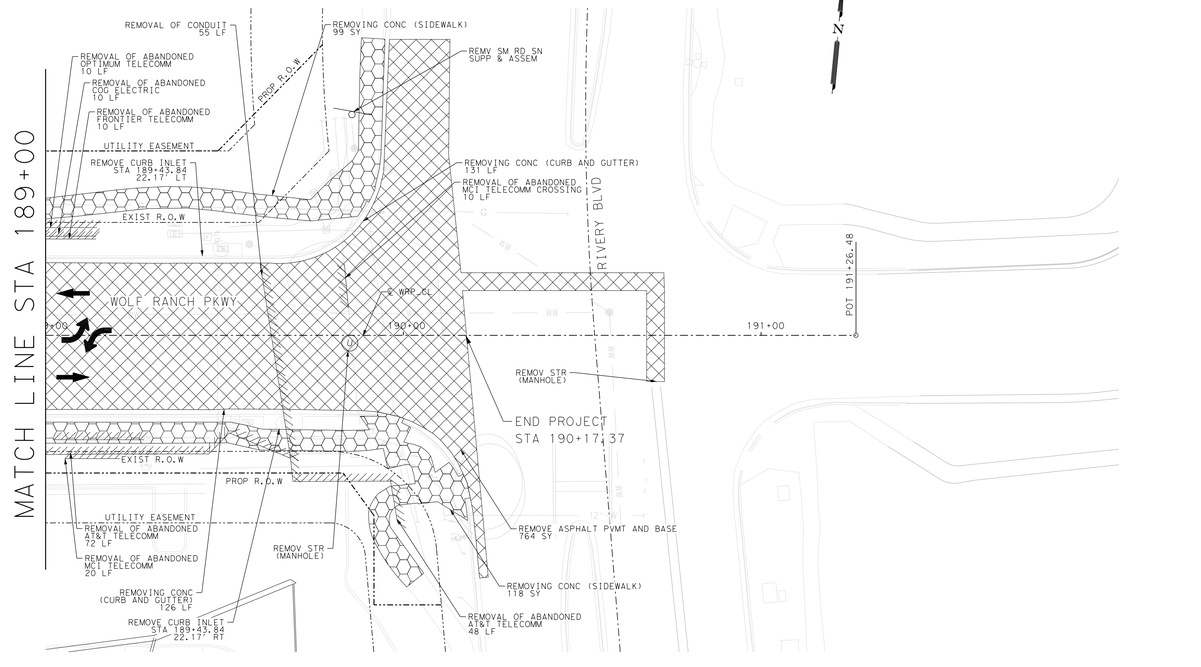
SHEET 10 OF 17

SHEET NO. 182





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SHEET 11 OF 17

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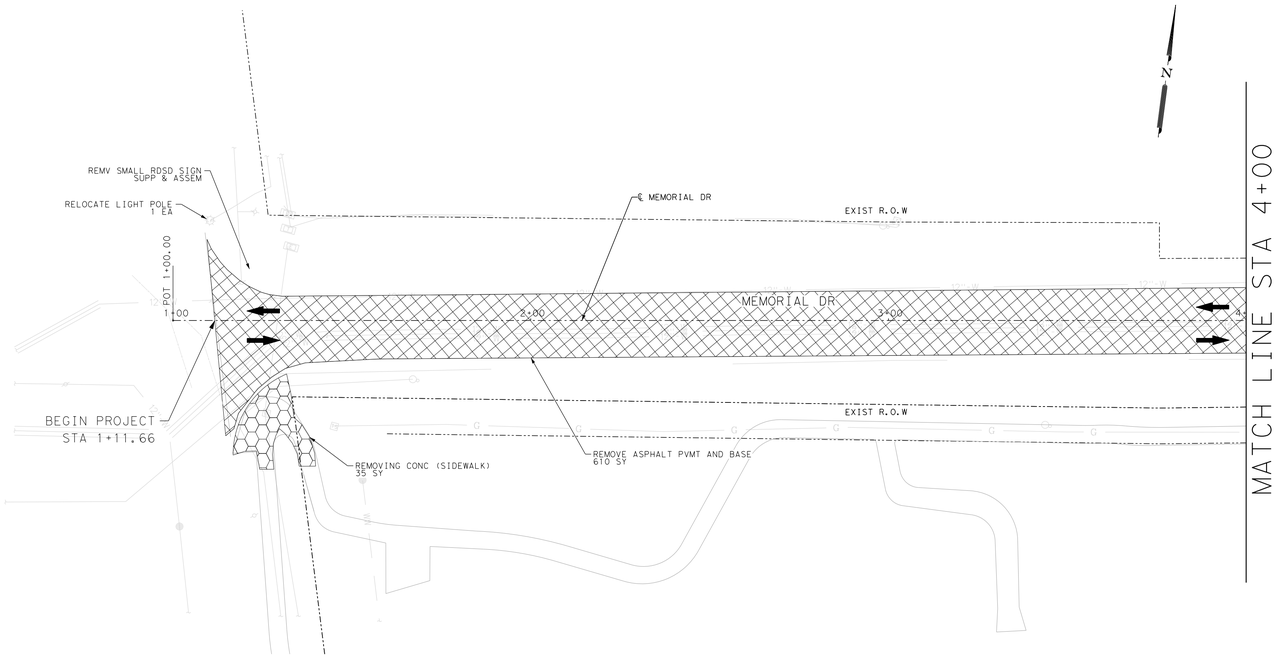

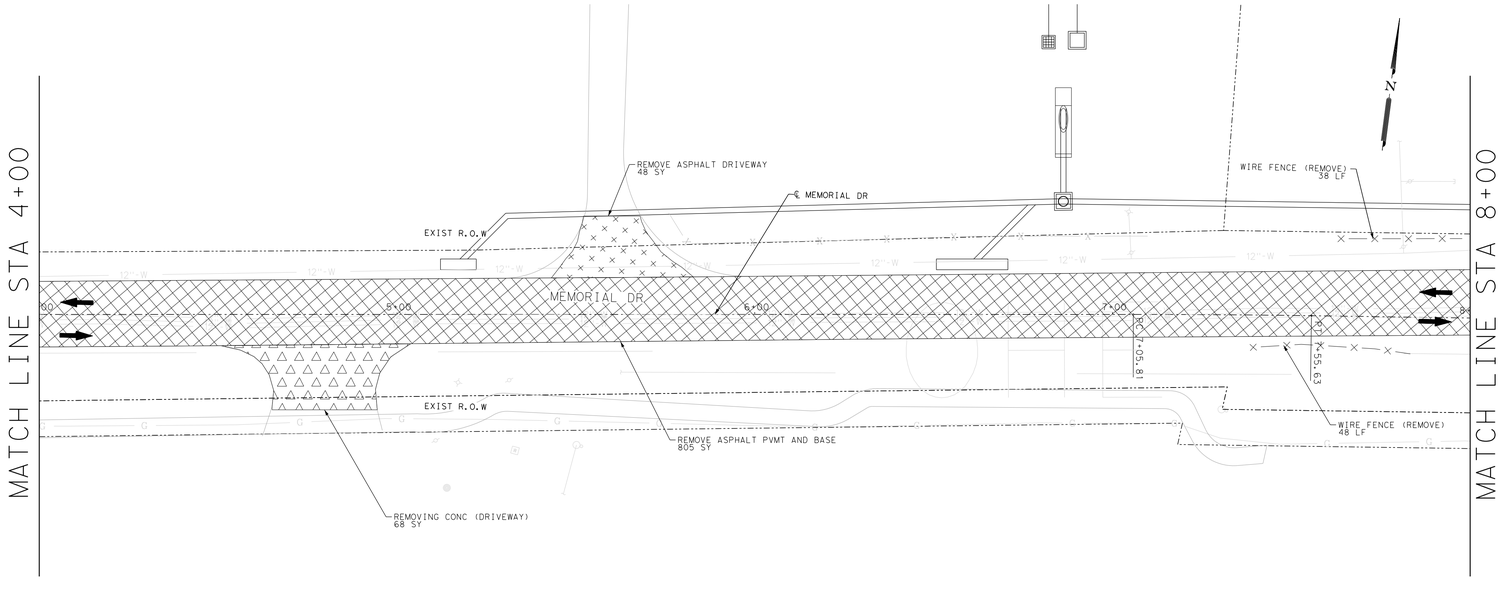

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- FENCE REMOVAL
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- OHE — EXIST. OVERHEAD ELECTRIC

SCALE: 1"= 20'

0' 20' 40' 60'

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DESIGN

STATE OF TEXAS — BRET CHAPMAN — 127293 — LICENSED — PROFESSIONAL ENGINEER

BRET CHAPMAN, P.E. — 9/16/2025 DATE

APPROVAL

STATE OF TEXAS — BRIAN A. ALLEN — 123374 — LICENSED — PROFESSIONAL ENGINEER

BRIAN A. ALLEN, P.E. — 9/16/2025 DATE

NO.	REVISION	DATE

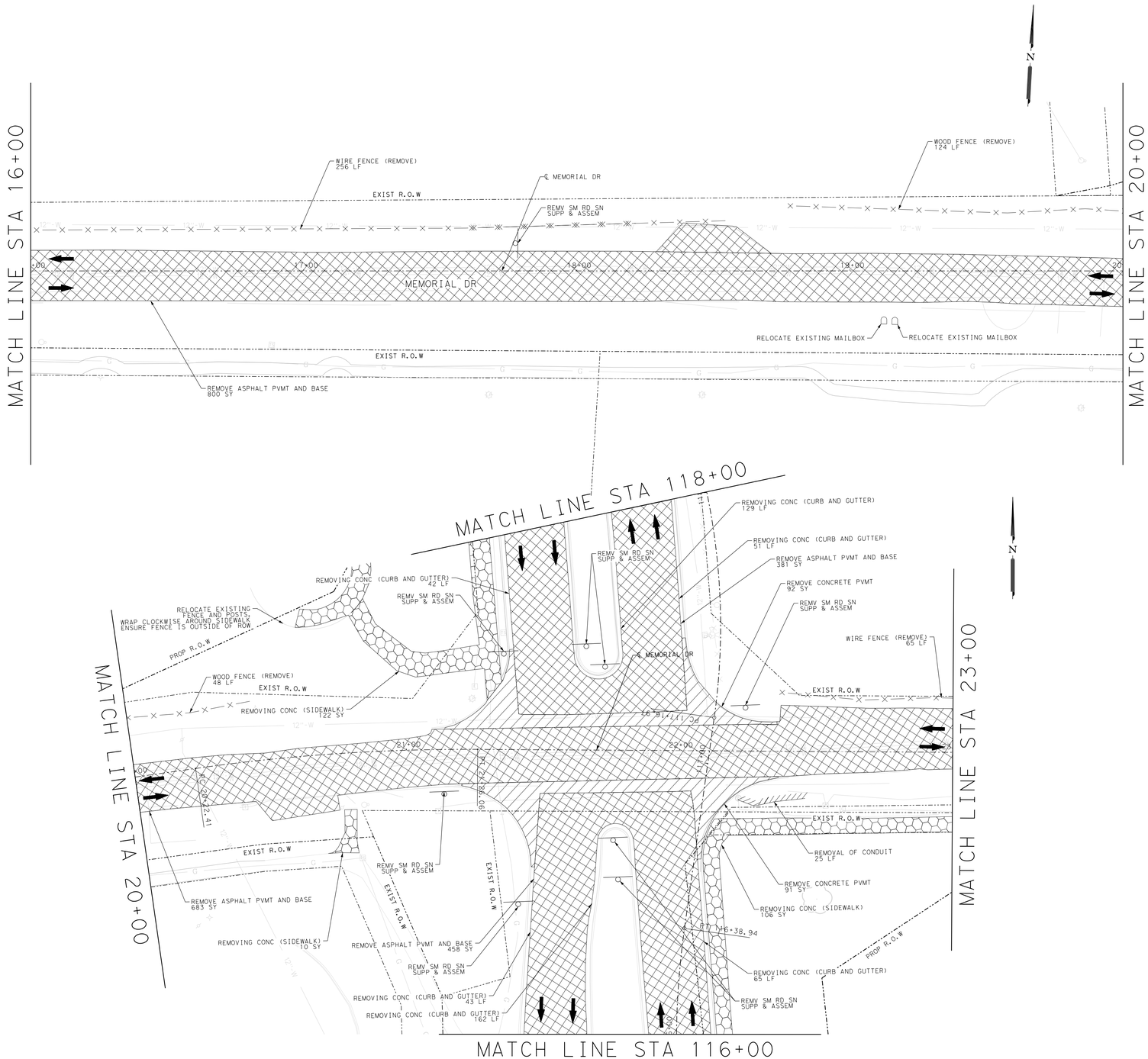
GEORGETOWN TEXAS *more than welcome*

PAPE-DAWSON ENGINEERS
AUSTIN I SAN ANTONIO I HOUSTON I FORT WORTH I DALLAS
10801 N MOPAC EXPY, BLDG 3, STE 200 I AUSTIN, TX 78759 I 512.454.8711
TEXAS ENGINEERING FIRM #470 I TEXAS SURVEYING FIRM #10028800

WOLF RANCH PKWY / MEMORIAL DR

REMOVAL PLAN

CITY JOB No.
JOB NO. 51423-04
DATE 9/16/2025
DESIGNER
CHECKED DRAWN



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STATE OF TEXAS — BRET CHAPMAN — 127293 — LICENSED PROFESSIONAL ENGINEER

BRET CHAPMAN, P.E. — 9/16/2025 DATE

APPROVAL

STATE OF TEXAS — BRIAN A. ALLEN — 123374 — LICENSED PROFESSIONAL ENGINEER

BRIAN A. ALLEN, P.E. — 9/16/2025 DATE

NO.	REVISION	DATE

GEORGETOWN TEXAS *more than welcome*

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AUSTIN I SAN ANTONIO I HOUSTON I FORT WORTH I DALLAS
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WOLF RANCH PKWY / MEMORIAL DR

REMOVAL PLAN

CITY JOB No.
JOB NO. 51423-04
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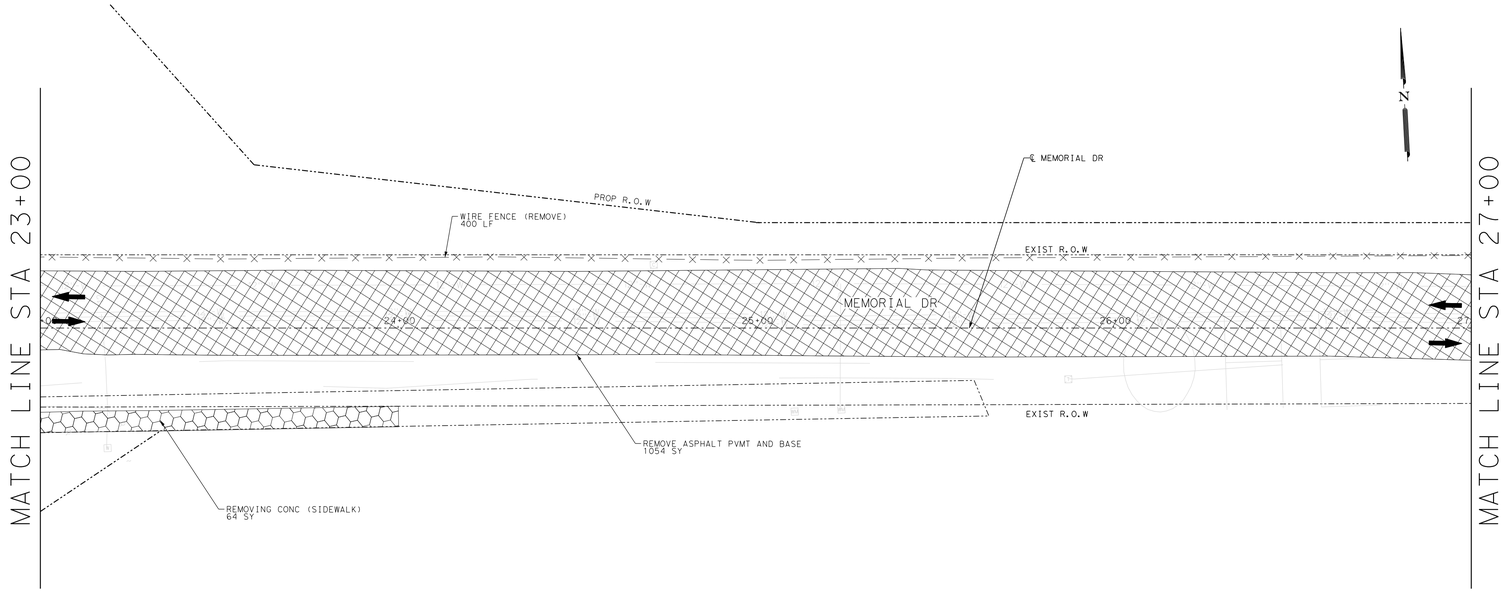
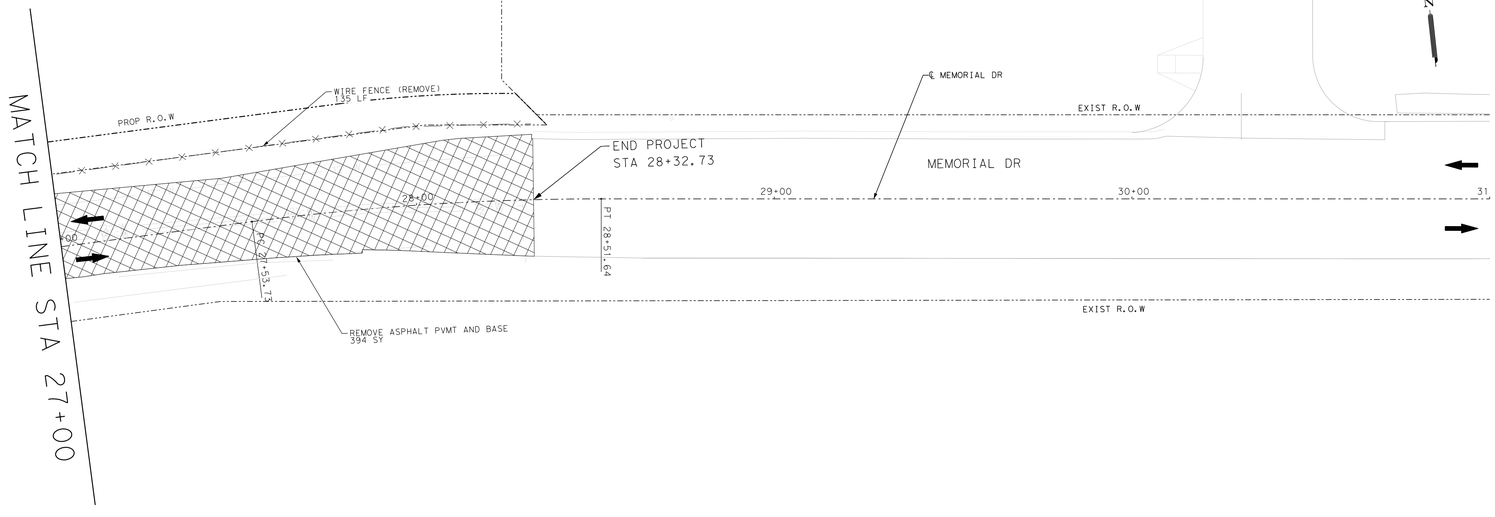
DESIGNER
CHECKED DRAWN

SHEET 14 OF 17

SHEET NO. 186





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STATE OF TEXAS — BRET CHAPMAN — 127293 — LICENSED PROFESSIONAL ENGINEER

BRET CHAPMAN, P.E. — 9/16/2025 DATE

APPROVAL

STATE OF TEXAS — BRIAN A. ALLEN — 123374 — LICENSED PROFESSIONAL ENGINEER

BRIAN A. ALLEN, P.E. — 9/16/2025 DATE

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GEORGETOWN TEXAS *more than welcome*

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WOLF RANCH PKWY / MEMORIAL DR

REMOVAL PLAN

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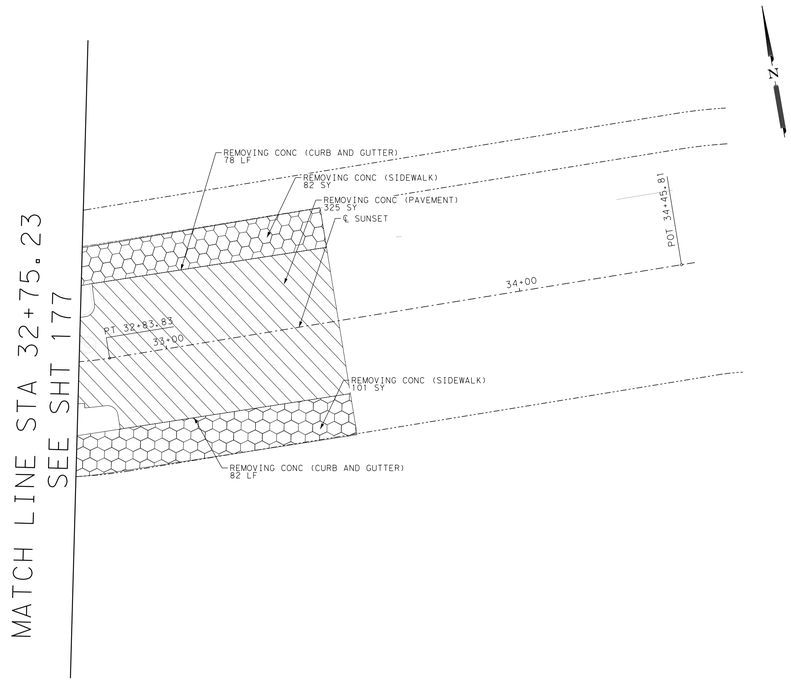

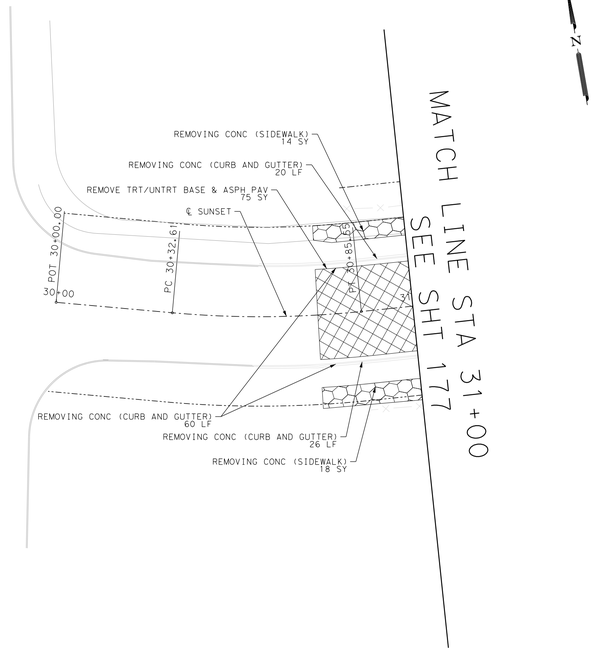

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STATE OF TEXAS — BRET CHAPMAN — 127293 — LICENSED — PROFESSIONAL ENGINEER

BRET CHAPMAN, P.E. — 9/16/2025 DATE

APPROVAL

STATE OF TEXAS — BRIAN A. ALLEN — 123374 — LICENSED — PROFESSIONAL ENGINEER

BRIAN A. ALLEN, P.E. — 9/16/2025 DATE

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GEORGETOWN TEXAS *more than welcome*

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WOLF RANCH PKWY / MEMORIAL DR

REMOVAL PLAN

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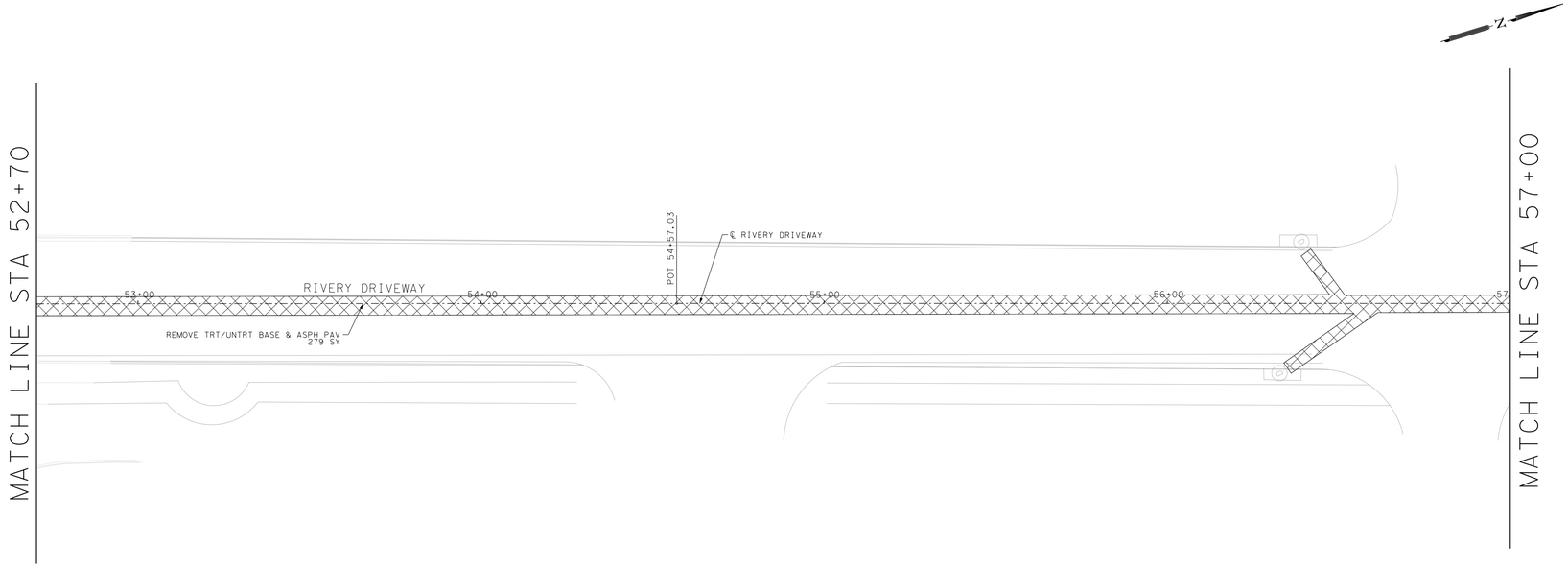

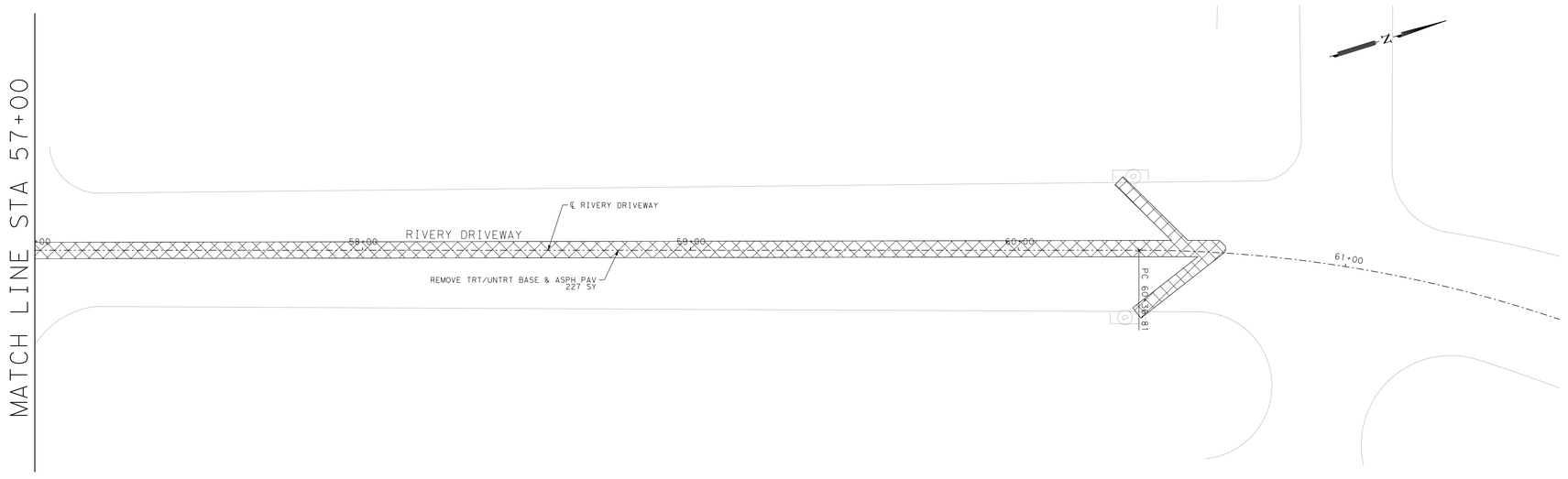

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CITY JOB No.
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SHEET 17 OF 17

SHEET NO. 189

<x* 1 Describe Chain WRP_CL

Chain WRP_CL contains:
88 CUR WRP_CL_3 CUR WRP_CL_6 CUR WRP_CL_9 CUR WRP_CL_12 CUR WRP_CL_15 CUR WRP_CL_16 STAEQU1 CUR WRP_CL_19 CUR WRP_CL_22 CUR WRP_CL_25 89

Beginning chain WRP_CL description
Feature: Geom_Centerline
****

Point 88 N 10,203,310.85 E 3,124,352.93 Sta 100+00.00

Course from 88 to PC WRP_CL_3 N 6° 43' 25" E Dist 196.85

Curve Data

Curve WRP_CL_3
P.I. Station = 104+19.57 N 10,203,509.61 E 3,124,722.43
Delta = 64° 03' 40" (LT)
Degree = 16° 05' 40"
Tangent = 222.72
Length = 398.04
Radius = 356.00
External = 63.93
Long Chord = 377.62
Mid. Ord. = 54.20
P.C. Station = 101+96.85 N 10,203,404.10 E 3,124,526.29
P.T. Station = 105+94.89 N 10,203,732.14 E 3,124,713.35
C.C. N 10,203,717.62 E 3,124,357.64
Back = N 6° 43' 25" E
Ahead = N 2° 20' 15" W
Chord Bear = N 29° 41' 35" E

Course from PT WRP_CL_3 to PC WRP_CL_6 N 2° 20' 15" W Dist 637.82

Curve Data

Curve WRP_CL_6
P.I. Station = 113+03.00 N 10,204,439.67 E 3,124,684.47
Delta = 13° 56' 23" (LT)
Degree = 9° 57' 52"
Tangent = 70.29
Length = 139.89
Radius = 575.00
External = 4.28
Long Chord = 139.55
Mid. Ord. = 4.25
P.C. Station = 112+32.71 N 10,204,369.43 E 3,124,687.33
P.T. Station = 113+72.60 N 10,204,507.14 E 3,124,664.76
C.C. N 10,204,345.98 E 3,124,112.81
Back = N 2° 20' 15" W
Ahead = N 16° 16' 38" W
Chord Bear = N 9° 18' 27" W

Course from PT WRP_CL_6 to PC WRP_CL_9 N 16° 16' 38" W Dist 127.22

Curve Data

Curve WRP_CL_9
P.I. Station = 115+70.66 N 10,204,697.26 E 3,124,609.25
Delta = 26° 34' 12" (RT)
Degree = 19° 05' 55"
Tangent = 70.83
Length = 139.12
Radius = 300.00
External = 8.25
Long Chord = 137.88
Mid. Ord. = 8.03
P.C. Station = 114+99.82 N 10,204,629.26 E 3,124,629.11
P.T. Station = 116+38.94 N 10,204,766.95 E 3,124,621.91
C.C. N 10,204,713.35 E 3,124,917.08
Back = N 16° 16' 38" W
Ahead = N 10° 17' 35" E
Chord Bear = N 2° 59' 32" W

Course from PT WRP_CL_9 to PC WRP_CL_12 N 10° 17' 35" E Dist 78.03

Curve Data

Curve WRP_CL_12
P.I. Station = 117+88.14 N 10,204,913.75 E 3,124,648.57
Delta = 33° 02' 02" (LT)
Degree = 23° 52' 24"
Tangent = 71.17
Length = 138.37
Radius = 240.00
External = 10.33
Long Chord = 136.46
Mid. Ord. = 9.90
P.C. Station = 117+16.97 N 10,204,843.73 E 3,124,635.85
P.T. Station = 118+55.35 N 10,204,979.39 E 3,124,621.06
C.C. N 10,204,886.61 E 3,124,399.71
Back = N 10° 17' 35" E
Ahead = N 22° 44' 28" W
Chord Bear = N 6° 13' 26" W

Course from PT WRP_CL_12 to PC WRP_CL_15 N 22° 44' 28" W Dist 1.76

Curve Data

Curve WRP_CL_15
P.I. Station = 120+30.36 N 10,205,140.80 E 3,124,553.40
Delta = 33° 15' 46" (RT)
Degree = 9° 52' 43"
Tangent = 173.25
Length = 336.72
Radius = 580.00
External = 25.32
Long Chord = 332.01
Mid. Ord. = 24.26
P.C. Station = 118+57.11 N 10,204,981.01 E 3,124,620.38
P.T. Station = 121+93.82 N 10,205,311.14 E 3,124,585.04
C.C. N 10,205,205.22 E 3,125,155.29
Back = N 22° 44' 28" W
Ahead = N 10° 31' 19" E
Chord Bear = N 6° 06' 34" W

Curve Data

Curve WRP_CL_16
P.I. Station = 122+35.65 N 10,205,352.25 E 3,124,592.68
Delta = 8° 14' 55" (LT)
Degree = 9° 52' 43"
Tangent = 41.82
Length = 83.50
Radius = 580.00
External = 1.51
Long Chord = 83.43
Mid. Ord. = 1.50
P.C. Station = 121+93.82 N 10,205,311.14 E 3,124,585.04
P.T. Station = 122+77.32 N 10,205,394.04 E 3,124,594.34
C.C. N 10,205,417.05 E 3,124,014.79
Back = N 10° 31' 19" E
Ahead = N 2° 16' 24" E
Chord Bear = N 6° 23' 52" E

Course from PT WRP_CL_16 to STAEQU1 N 2° 16' 24" E Dist 122.88

Equation: Sta 124+00.20 (BK) = Sta 124+00.00 (AH) End Region 1 / Begin Region 2

Point STAEQU1 N 10,205,516.82 E 3,124,599.21 Sta 124+00.00

Course from STAEQU1 to PC WRP_CL_19 N 2° 16' 24" E Dist 985.33

Curve Data

Curve WRP_CL_19
P.I. Station = 140+43.35 N 10,207,158.88 E 3,124,664.40
Delta = 66° 41' 29" (RT)
Degree = 5° 43' 46"
Tangent = 658.02
Length = 1,163.98
Radius = 1,000.00
External = 197.08
Long Chord = 1,099.38
Mid. Ord. = 164.63
P.C. Station = 133+85.33 N 10,206,501.38 E 3,124,638.30
P.T. Station = 145+49.32 N 10,207,395.07 E 3,125,278.57
C.C. N 10,206,461.71 E 3,125,637.51
Back = N 2° 16' 24" E
Ahead = N 68° 57' 53" E
Chord Bear = N 35° 37' 09" E

Course from PT WRP_CL_19 to PC WRP_CL_22 N 68° 57' 53" E Dist 1,009.69

Curve Data

Curve WRP_CL_22
P.I. Station = 158+78.33 N 10,207,872.11 E 3,126,519.01
Delta = 44° 01' 04" (LT)
Degree = 7° 15' 09"
Tangent = 319.32
Length = 606.92
Radius = 790.00
External = 62.10
Long Chord = 592.10
Mid. Ord. = 57.57
P.C. Station = 155+59.00 N 10,207,757.49 E 3,126,220.97
P.T. Station = 161+65.92 N 10,208,161.64 E 3,126,653.70
C.C. N 10,208,494.84 E 3,125,937.40
Back = N 68° 57' 53" E
Ahead = N 24° 56' 50" E
Chord Bear = N 46° 57' 21" E

Course from PT WRP_CL_22 to PC WRP_CL_25 N 24° 56' 50" E Dist 1,612.33

Curve Data

Curve WRP_CL_25
P.I. Station = 181+41.55 N 10,209,952.93 E 3,127,486.98
Delta = 54° 51' 30" (RT)
Degree = 8° 11' 06"
Tangent = 363.30
Length = 670.22
Radius = 700.00
External = 88.66
Long Chord = 644.91
Mid. Ord. = 78.69
P.C. Station = 177+78.25 N 10,209,623.53 E 3,127,333.75
P.T. Station = 184+48.47 N 10,210,017.24 E 3,127,844.54
C.C. N 10,209,328.29 E 3,127,968.44
Back = N 24° 56' 50" E
Ahead = N 79° 48' 19" E
Chord Bear = N 52° 22' 34" E

Course from PT WRP_CL_25 to 89 N 79° 48' 19" E Dist 678.01

Point 89 N 10,210,137.24 E 3,128,511.84 Sta 191+26.48

****
Ending chain WRP_CL description

<x* 2 DESCRIBE CHAIN CL_SH29

Chain CL_SH29 contains:
SH01 SH02

Beginning chain CL_SH29 description
Description:
****

Point SH01 N 10,204,124.38 E 3,124,196.92 Sta 10+00.00

Course from SH01 to SH02 N 87° 39' 45" E Dist 1,491.38

Point SH02 N 10,204,185.21 E 3,125,687.06 Sta 24+91.38

****
Ending chain CL_SH29 description

<x* 3 Describe Chain CL_MEMORIAL

Chain CL_MEMORIAL contains:
70 CUR CL_MEMORIAL_3 CUR CL_MEMORIAL_6 CUR CL_MEMORIAL_9 CUR CL_MEMORIAL_12 71

Beginning chain CL_MEMORIAL description
Feature: Geom_Centerline
****

Point 70 N 10,204,462.19 E 3,122,564.18 Sta 1+00.00

Course from 70 to PC CL_MEMORIAL_3 N 74° 59' 18" E Dist 605.81

Curve Data

Curve CL_MEMORIAL_3
P.I. Station = 7+30.72 N 10,204,625.56 E 3,123,173.37
Delta = 0° 49' 38" (RT)
Degree = 1° 39' 36"
Tangent = 24.91
Length = 49.82
Radius = 3,451.50
External = 0.09
Long Chord = 49.82
Mid. Ord. = 0.09
P.C. Station = 7+05.81 N 10,204,619.10 E 3,123,149.31
P.T. Station = 7+55.63 N 10,204,631.66 E 3,123,197.53
C.C. N 10,201,285.39 E 3,124,043.31
Back = N 74° 59' 18" E
Ahead = N 75° 48' 56" E
Chord Bear = N 75° 24' 07" E

Course from PT CL_MEMORIAL_3 to PC CL_MEMORIAL_6 N 75° 48' 56" E Dist 417.93

Curve Data

Curve CL_MEMORIAL_6
P.I. Station = 12+57.47 N 10,204,754.63 E 3,123,684.06
Delta = 8° 20' 05" (RT)
Degree = 4° 58' 33"
Tangent = 83.90
Length = 167.51
Radius = 1,151.50
External = 3.05
Long Chord = 167.36
Mid. Ord. = 3.04
P.C. Station = 11+73.57 N 10,204,734.07 E 3,123,602.72
P.T. Station = 13+41.07 N 10,204,763.19 E 3,123,767.53
C.C. N 10,203,617.68 E 3,123,884.89
Back = N 75° 48' 56" E
Ahead = N 84° 09' 01" E
Chord Bear = N 79° 58' 58" E

Course from PT CL_MEMORIAL_6 to PC CL_MEMORIAL_9 N 84° 09' 01" E Dist 681.33

Curve Data

Curve CL_MEMORIAL_9
P.I. Station = 20+74.33 N 10,204,837.92 E 3,124,496.96
Delta = 8° 29' 03" (RT)
Degree = 8° 11' 06"
Tangent = 51.92
Length = 103.65
Radius = 700.00
External = 1.92
Long Chord = 103.56
Mid. Ord. = 1.92
P.C. Station = 20+22.41 N 10,204,832.63 E 3,124,445.31
P.T. Station = 21+26.06 N 10,204,835.53 E 3,124,548.83
C.C. N 10,204,136.27 E 3,124,516.66
Back = N 84° 09' 01" E
Ahead = S 87° 21' 56" E
Chord Bear = N 88° 23' 32" E

Course from PT CL_MEMORIAL_9 to PC CL_MEMORIAL_12 S 87° 21' 56" E Dist 627.67

Curve Data

Curve CL_MEMORIAL_12
P.I. Station = 28+02.76 N 10,204,804.43 E 3,125,224.81
Delta = 7° 28' 47" (RT)
Degree = 7° 38' 22"
Tangent = 49.02
Length = 97.91
Radius = 750.00
External = 1.60
Long Chord = 97.84
Mid. Ord. = 1.60
P.C. Station = 27+53.73 N 10,204,806.68 E 3,125,175.84
P.T. Station = 28+51.64 N 10,204,795.82 E 3,125,273.07
C.C. N 10,204,057.48 E 3,125,141.37
Back = S 87° 21' 56" E
Ahead = S 79° 53' 09" E
Chord Bear = S 83° 37' 33" E

Course from PT CL_MEMORIAL_12 to 71 S 79° 53' 09" E Dist 591.46

Point 71 N 10,204,691.95 E 3,125,855.35 Sta 34+43.10

****
Ending chain CL_MEMORIAL description

DESIGN

STATE OF TEXAS · BRET CHAPMAN · 127293 · LICENSED · PROFESSIONAL ENGINEER

BRET CHAPMAN, P.E. 9/16/2025 DATE

APPROVAL

STATE OF TEXAS · BRIAN A. ALLEN · 123374 · LICENSED · PROFESSIONAL ENGINEER

BRIAN A. ALLEN, P.E. 9/16/2025 DATE

NO. | REVISION | DATE

GEORGETOWN TEXAS more than welcome

PAPE-DAWSON ENGINEERS
AUSTIN I SAN ANTONIO I HOUSTON I FORT WORTH I DALLAS
10801 N MOPAC EXPY, BLDG 3, STE 200 I AUSTIN, TX 78759 I 512.454.8711
TEXAS ENGINEERING FIRM #470 I TEXAS SURVEYING FIRM #10028800

WOLF RANCH PKWY / MEMORIAL DR
HORIZONTAL ALIGNMENT DATA

CITY JOB No.
JOB NO. 51423-04
DATE 9/16/2025
DESIGNER
CHECKED DRAWN

SHEET 1 OF 2

SHEET NO. 190

```
<*      4   Describe Chain CL_LEGACY

Chain CL_LEGACY contains:
 CUR CL_LEGACY_1 72

Beginning chain CL_LEGACY description
Feature: Geom_Secondary
==============================================================================

                                  Curve Data
                                 *----------*
Curve CL_LEGACY_1
P.I.  Station            0+33.97  N       10,205,882.93  E        3,124,162.36
Delta       =          0° 44' 50" (LT)
Degree      =          1° 06' 00"
Tangent     =               33.97
Length      =               67.93
Radius      =            5,208.83
External    =                0.11
Long Chord  =               67.93
Mid. Ord.   =                0.11
P.C.  Station            0+00.00  N       10,205,883.95  E        3,124,128.41
P.T.  Station            0+67.93  N       10,205,882.35  E        3,124,196.33
C.C.                              N       10,211,090.42  E        3,124,284.93
Back        = S  88° 16' 41" E
Ahead       = S  89° 01' 31" E
Chord Bear  = S  88° 39' 06" E

Course from PT CL_LEGACY_1 to 72 S 88° 43' 30" E Dist 647.67

Point 72              N    10,205,867.94 E     3,124,843.84 Sta       7+15.61

==============================================================================
Ending chain CL_LEGACY description
```

```
<*      5   Describe Chain CL_SCOUT_ST

Chain CL_SCOUT_ST contains:
 CUR CL_SCOUT_ST_1 98

Beginning chain CL_SCOUT_ST description
Feature: Geom_Secondary
==============================================================================

                                  Curve Data
                                 *----------*
Curve CL_SCOUT_ST_1
P.I.  Station           20+40.96  N       10,206,931.06  E        3,124,519.27
Delta       =          1° 33' 19" (RT)
Degree      =          1° 53' 54"
Tangent     =               40.96
Length      =               81.92
Radius      =            3,018.15
External    =                0.28
Long Chord  =               81.92
Mid. Ord.   =                0.28
P.C.  Station           20+00.00  N       10,206,946.27  E        3,124,481.24
P.T.  Station           20+81.92  N       10,206,914.83  E        3,124,556.88
C.C.                              N       10,204,143.73  E        3,123,360.97
Back        = S  68° 12' 43" E
Ahead       = S  66° 39' 24" E
Chord Bear  = S  67° 26' 03" E

Course from PT CL_SCOUT_ST_1 to 98 S 67° 00' 56" E Dist 171.78

Point 98              N    10,206,847.75 E     3,124,715.03 Sta      22+53.70

==============================================================================
Ending chain CL_SCOUT_ST description
```

```
<*      6   Describe Chain CL_RIVER_VISTA

Chain CL_RIVER_VISTA contains:
 CUR CL_RIVER_VIST_1 76

Beginning chain CL_RIVER_VISTA description
Feature: Geom_Secondary
==============================================================================

                                  Curve Data
                                 *----------*
Curve CL_RIVER_VIST_1
P.I.  Station           40+21.64  N       10,207,850.69  E        3,126,062.49
Delta       =          8° 15' 06" (LT)
Degree      =         19° 05' 55"
Tangent     =               21.64
Length      =               43.21
Radius      =              300.00
External    =                0.78
Long Chord  =               43.17
Mid. Ord.   =                0.78
P.C.  Station           40+00.00  N       10,207,871.80  E        3,126,057.70
P.T.  Station           40+43.21  N       10,207,830.49  E        3,126,070.25
C.C.                              N       10,207,938.10  E        3,126,350.29
Back        = S  12° 46' 08" E
Ahead       = S  21° 01' 14" E
Chord Bear  = S  16° 53' 41" E

Course from PT CL_RIVER_VIST_1 to 76 S 21° 01' 14" E Dist 303.30

Point 76              N    10,207,547.37 E     3,126,179.05 Sta      43+46.51

==============================================================================
Ending chain CL_RIVER_VISTA description
```

```
<*      7    DESCRIBE CHAIN CL_SUNSET

Chain CL_SUNSET contains:
 96 CUR CL_SUNSET_3 CUR CL_SUNSET_6 97

Beginning chain CL_SUNSET description
Feature: Geom_Secondary
==============================================================================

Point 96              N    10,207,534.47 E     3,125,178.47 Sta      30+00.00

Course from 96 to PC CL_SUNSET_3 S 11° 18' 20" E Dist 32.61

                                  Curve Data
                                 *----------*
Curve CL_SUNSET_3
P.I.  Station           30+59.16  N       10,207,476.46  E        3,125,190.07
Delta       =         11° 06' 36" (LT)
Degree      =         20° 59' 15"
Tangent     =               26.55
Length      =               52.94
Radius      =              273.00
External    =                1.29
Long Chord  =               52.85
Mid. Ord.   =                1.28
P.C.  Station           30+32.61  N       10,207,502.50  E        3,125,184.86
P.T.  Station           30+85.55  N       10,207,451.91  E        3,125,200.19
C.C.                              N       10,207,556.02  E        3,125,452.56
Back        = S  11° 18' 20" E
Ahead       = S  22° 24' 56" E
Chord Bear  = S  16° 51' 38" E

Course from PT CL_SUNSET_3 to PC CL_SUNSET_6 S 22° 24' 56" E Dist 163.04

                                  Curve Data
                                 *----------*
Curve CL_SUNSET_6
P.I.  Station           32+66.39  N       10,207,284.73  E        3,125,269.15
Delta       =         20° 11' 39" (LT)
Degree      =         57° 17' 45"
Tangent     =               17.81
Length      =               35.25
Radius      =              100.00
External    =                1.57
Long Chord  =               35.06
Mid. Ord.   =                1.55
P.C.  Station           32+48.59  N       10,207,301.20  E        3,125,262.36
P.T.  Station           32+83.83  N       10,207,271.63  E        3,125,281.21
C.C.                              N       10,207,339.33  E        3,125,354.81
Back        = S  22° 24' 56" E
Ahead       = S  42° 36' 35" E
Chord Bear  = S  32° 30' 46" E

Course from PT CL_SUNSET_6 to 97 S 42° 36' 35" E Dist 165.94

Point 97              N    10,207,149.50 E     3,125,393.55 Sta      34+49.77

==============================================================================
Ending chain CL_SUNSET description
```

```
<*      8   Describe Chain CL_RIVERY_DR

Chain CL_RIVERY_DR contains:
 SD01 CUR CL_RIVERY_DR1 CUR CL_RIVERY_DR2

Beginning chain CL_RIVERY_DR description
==============================================================================

Point SD01            N    10,209,200.39 E     3,126,946.72 Sta      50+00.00

Course from SD01 to PC CL_RIVERY_DR1 S 87° 23' 21" E Dist 81.00

                                  Curve Data
                                 *----------*
Curve CL_RIVERY_DR1
P.I.  Station           51+04.68  N       10,209,195.62  E        3,127,051.29
Delta       =         22° 19' 27" (RT)
Degree      =         47° 44' 47"
Tangent     =               23.68
Length      =               46.76
Radius      =              120.00
External    =                2.31
Long Chord  =               46.46
Mid. Ord.   =                2.27
P.C.  Station           50+81.00  N       10,209,196.70  E        3,127,027.64
P.T.  Station           51+27.76  N       10,209,185.64  E        3,127,072.76
C.C.                              N       10,209,076.82  E        3,127,022.17
Back        = S  87° 23' 21" E
Ahead       = S  65° 03' 54" E
Chord Bear  = S  76° 13' 37" E

Course from PT CL_RIVERY_DR1 to PC CL_RIVERY_DR2 S 65° 03' 54" E Dist 909.05

                                  Curve Data
                                 *----------*
Curve CL_RIVERY_DR2
P.I.  Station           61+54.52  N       10,208,752.77  E        3,128,003.81
Delta       =         32° 47' 39" (RT)
Degree      =         14° 19' 26"
Tangent     =              117.70
Length      =              228.95
Radius      =              400.00
External    =               16.96
Long Chord  =              225.83
Mid. Ord.   =               16.27
P.C.  Station           60+36.81  N       10,208,802.39  E        3,127,897.08
P.T.  Station           62+65.76  N       10,208,653.24  E        3,128,066.66
C.C.                              N       10,208,439.68  E        3,127,728.44
Back        = S  65° 03' 54" E
Ahead       = S  32° 16' 15" E
Chord Bear  = S  48° 40' 04" E

==============================================================================
Ending chain CL_RIVERY_DR description
```

```
<*      10   DESCRIBE CHAIN CL_RIVERY_BLV

Chain CL_RIVERY_BLV contains:
 CUR CL_RIVERY_BLV1 CUR CL_RIVERY_BLV2 CUR CL_RIVERY_BLV3 RIV02

Beginning chain CL_RIVERY_BLV description
==============================================================================

                                  Curve Data
                                 *----------*
Curve CL_RIVERY_BLV1
P.I.  Station           10+37.15  N       10,209,372.10  E        3,128,495.74
Delta       =          3° 32' 48" (RT)
Degree      =          4° 46' 29"
Tangent     =               37.15
Length      =               74.28
Radius      =            1,200.00
External    =                0.58
Long Chord  =               74.27
Mid. Ord.   =                0.57
P.C.  Station           10+00.00  N       10,209,335.07  E        3,128,492.78
P.T.  Station           10+74.28  N       10,209,408.89  E        3,128,500.99
C.C.                              N       10,209,239.41  E        3,129,688.96
Back        = N   4° 34' 21" E
Ahead       = N   8° 07' 09" E
Chord Bear  = N   6° 20' 45" E

Course from PT CL_RIVERY_BLV1 to PC CL_RIVERY_BLV2 N 8° 07' 09" E Dist 74.61

                                  Curve Data
                                 *----------*
Curve CL_RIVERY_BLV2
P.I.  Station           13+92.25  N       10,209,723.66  E        3,128,545.90
Delta       =         22° 55' 41" (LT)
Degree      =          4° 46' 29"
Tangent     =              243.36
Length      =              480.20
Radius      =            1,200.00
External    =               24.43
Long Chord  =              477.01
Mid. Ord.   =               23.94
P.C.  Station           11+48.89  N       10,209,482.74  E        3,128,511.53
P.T.  Station           16+29.09  N       10,209,958.94  E        3,128,483.70
C.C.                              N       10,209,652.22  E        3,127,323.56
Back        = N   8° 07' 09" E
Ahead       = N  14° 48' 32" W
Chord Bear  = N   3° 20' 41" W

Course from PT CL_RIVERY_BLV2 to PC CL_RIVERY_BLV3 N 14° 48' 32" W Dist 171.06

                                  Curve Data
                                 *----------*
Curve CL_RIVERY_BLV3
P.I.  Station           20+86.05  N       10,210,400.71  E        3,128,366.90
Delta       =         40° 15' 33" (RT)
Degree      =          7° 20' 44"
Tangent     =              285.90
Length      =              548.07
Radius      =              780.00
External    =               50.74
Long Chord  =              536.87
Mid. Ord.   =               47.64
P.C.  Station           18+00.15  N       10,210,124.31  E        3,128,439.97
P.T.  Station           23+48.22  N       10,210,658.87  E        3,128,489.76
C.C.                              N       10,210,323.68  E        3,129,194.07
Back        = N  14° 48' 32" W
Ahead       = N  25° 27' 01" E
Chord Bear  = N   5° 19' 15" E

Course from PT CL_RIVERY_BLV3 to RIV02 N 25° 27' 01" E Dist 290.63

Point RIV02           N    10,210,921.29 E     3,128,614.65 Sta      26+38.85

==============================================================================
Ending chain CL_RIVERY_BLV description
```

DESIGN

STATE OF TEXAS
BRET CHAPMAN
127293
LICENSED
PROFESSIONAL ENGINEER

BRET CHAPMAN, P.E. 9/16/2025
DESIGN DATE

APPROVAL

STATE OF TEXAS
BRIAN A. ALLEN
123374
LICENSED
PROFESSIONAL ENGINEER

BRIAN A. ALLEN, P.E. 9/16/2025
DATE

NO.	REVISION	DATE

GEORGETOWN
TEXAS
more than welcome

PAPE-DAWSON ENGINEERS
AUSTIN | SAN ANTONIO | HOUSTON | FORT WORTH | DALLAS
10801 N MOPAC EXPY, BLDG 3, STE 200 | AUSTIN, TX 78759 | 512.454.8711
TEXAS ENGINEERING FIRM #470 | TEXAS SURVEYING FIRM #10028800

WOLF RANCH PKWY / MEMORIAL DR
HORIZONTAL ALIGNMENT DATA

CITY JOB No.
JOB NO. 51423-04
DATE 9/16/2025
DESIGNER
CHECKED DRAWN

SHEET 2 OF 2

SHEET NO. 191

LEGEND

- PROPOSED ASPHALT PAVEMENT
- PROPOSED CONCRETE PAVEMENT
- PROPOSED MILL AND OVERLAY
- PROPOSED CONCRETE DRIVEWAY
- PROPOSED ASPHALT DRIVEWAY
- PROPOSED PAVERS
- PROPOSED CONCRETE SIDEWALK
- PROPOSED CURB RAMP
- PROP R.O.W
- EXIST R.O.W
- UTILITY EASEMENT R.O.W
- PGL PROFILE GRADE LINE
- PROPOSED TRAFFIC FLOW
- PROPOSED STORM DRAIN/INLET
- FOC1 EXIST/ABANDONED ATT
- FOC3 EXIST/ABANDONED MCI
- FOC4 EXIST/ABANDONED OPTIMUM
- FOC1 (D) EXIST/ABANDONED ATT
- FOC2 (D) EXIST/ABANDONED GEORGETOWN UTILITY SERVICES
- FOC3 (D) EXIST/ABANDONED MCI
- CTV1 EXIST/ABANDONED OPTIMUM
- CTV1 (D) EXIST/ABANDONED UNKNOWN
- T1 EXIST/ABANDONED OPTIMUM
- T1 (D) EXIST/ABANDONED FRONTIER
- TS1 EXIST/ABANDONED FRONTIER
- TS1 (D) EXIST/ABANDONED FRONTIER
- E1 (D) EXIST/ABANDONED TxDOT
- E2 (D) EXIST/ABANDONED GEORGETOWN UTILITY SERVICES
- E2 EXIST/ABANDONED PEDERNALES ELECTRIC COOP
- E1 EXIST/ABANDONED PEDERNALES ELECTRIC COOP
- G1 EXIST/ABANDONED GEORGETOWN UTILITY SERVICES
- G1 (D) EXIST/ABANDONED ATMOS
- W1 EXIST/ABANDONED ATMOS
- W1 (D) EXIST/ABANDONED GEORGETOWN UTILITY SERVICES
- W2 EXIST/ABANDONED GEORGETOWN UTILITY SERVICES
- WW1 (D) EXIST/ABANDONED CITY OF ROUND ROCK
- OHE EXIST/ABANDONED CITY OF GEORGETOWN
- EXIST/ABANDONED EXIST. OVERHEAD ELECTRIC
- EXIST/ABANDONED RETAINING WALL
- PR FOC PROPOSED AT&T
- G1 PROPOSED ATMOS
- PR-T1 PROPOSED FRONTIER UG
- PR-OHT1 PROPOSED FRONTIER AERIEL
- PR UGE PROPOSED COG ELECTRIC UG
- PR OHE PROPOSED COG ELECTRIC AERIEL
- W1 PROPOSED COG WATER
- PR TELECOM PROPOSED OPTIMUM
- PR UGE PROPOSED PEC ELECTRIC UG
- UTILITY REMOVAL
- R RAMP (12:1 MAX RUN, 1:48 MAX CROSS SLOPE
- L LANDING (1:48 MAX SLOPE, ALL DIRECTIONS)
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0' 20' 40' 60'

SCALE: PLAN 1"= 20'

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STATE OF TEXAS
BRET CHAPMAN
127293
LICENSED
PROFESSIONAL ENGINEER

BRET CHAPMAN, P.E. 9/16/2025 DATE

APPROVAL

STATE OF TEXAS
BRIAN A. ALLEN
123374
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GEORGETOWN TEXAS more than welcome

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10801 N MOPAC EXPY, BLDG 3, STE 200 I AUSTIN, TX 78759 I 512.454.8711
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CITY JOB No.
JOB NO. 51423-04
DATE 9/16/2025
DESIGNER
CHECKED DRAWN

SHEET 1 OF 29

SHEET NO. 192

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9/16/2025
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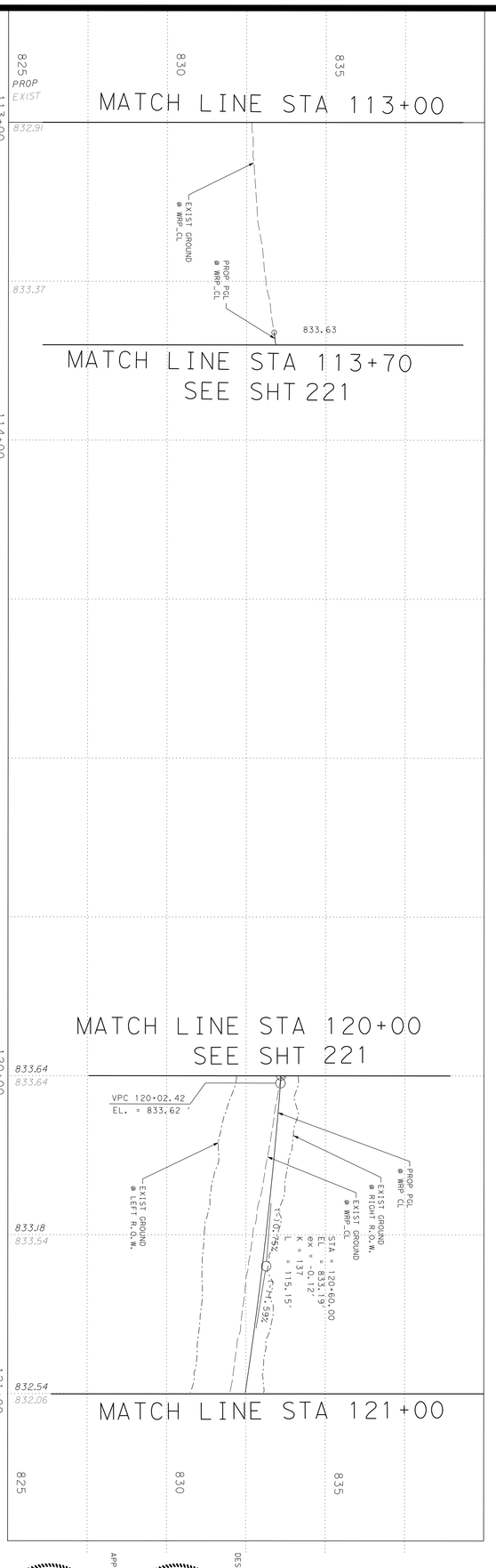

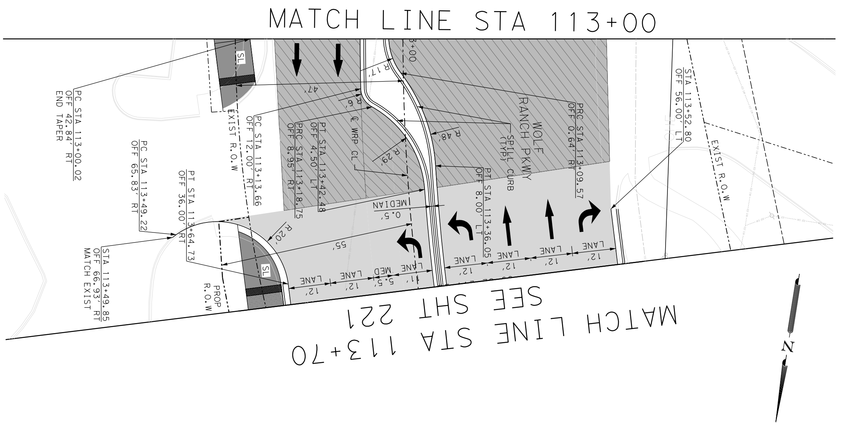

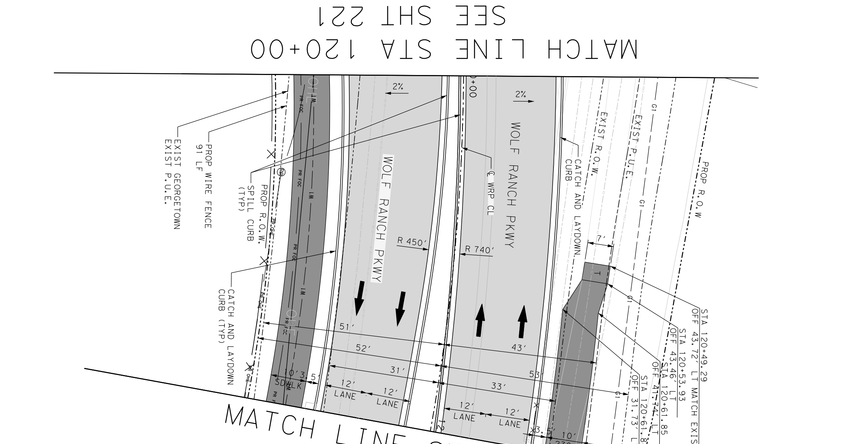



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0' 20' 40' 60'
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LEGEND

- PROPOSED ASPHALT PAVEMENT
- PROPOSED CONCRETE PAVEMENT
- PROPOSED MILL AND OVERLAY
- PROPOSED CONCRETE DRIVEWAY
- PROPOSED ASPHALT DRIVEWAY
- PROPOSED PAVERS
- PROPOSED CONCRETE SIDEWALK
- PROPOSED CURB RAMP
- PROPOSED R.O.W.
- EXIST R.O.W
- UTILITY EASEMENT R.O.W
- PROFILE GRADE LINE
- PROPOSED TRAFFIC FLOW
- PGL
- PROPOSED STORM DRAIN/INLET
- EXIST/ABANDONED STORM DRAIN/INLET
- EXIST/ABANDONED MCI
- EXIST/ABANDONED OPTIMUM
- EXIST/ABANDONED ATT
- EXIST/ABANDONED GEORGETOWN UTILITY SERVICES
- EXIST/ABANDONED UNKNOWN
- EXIST/ABANDONED FRONTIER
- EXIST/ABANDONED PEDERNALES ELECTRIC COOP
- EXIST/ABANDONED ATMOS
- EXIST/ABANDONED GEORGETOWN UTILITY SERVICES
- EXIST/ABANDONED CITY OF ROUND ROCK
- EXIST/ABANDONED CITY OF GEORGETOWN
- EXIST/ABANDONED RETAINING WALL
- EXIST/ABANDONED ELECTRIC
- PROPOSED AT&T
- PROPOSED FRONTIER UG
- PROPOSED FRONTIER AERIEL
- PROPOSED COG ELECTRIC UG
- PROPOSED COG ELECTRIC AERIEL
- PROPOSED COG WATER
- PROPOSED UTILITY REMOVAL
- PROPOSED PEC ELECTRIC UG
- PROPOSED PEC ELECTRIC AERIEL
- UTILITY REMOVAL
- LS LIGHT STANDARD (TYP)
- T TRAFFIC SIGNAL (TYP)
- R RADIUS
- L LENGTH
- 1:48 MAX SLOPE
- 1:20 MAX SLOPE

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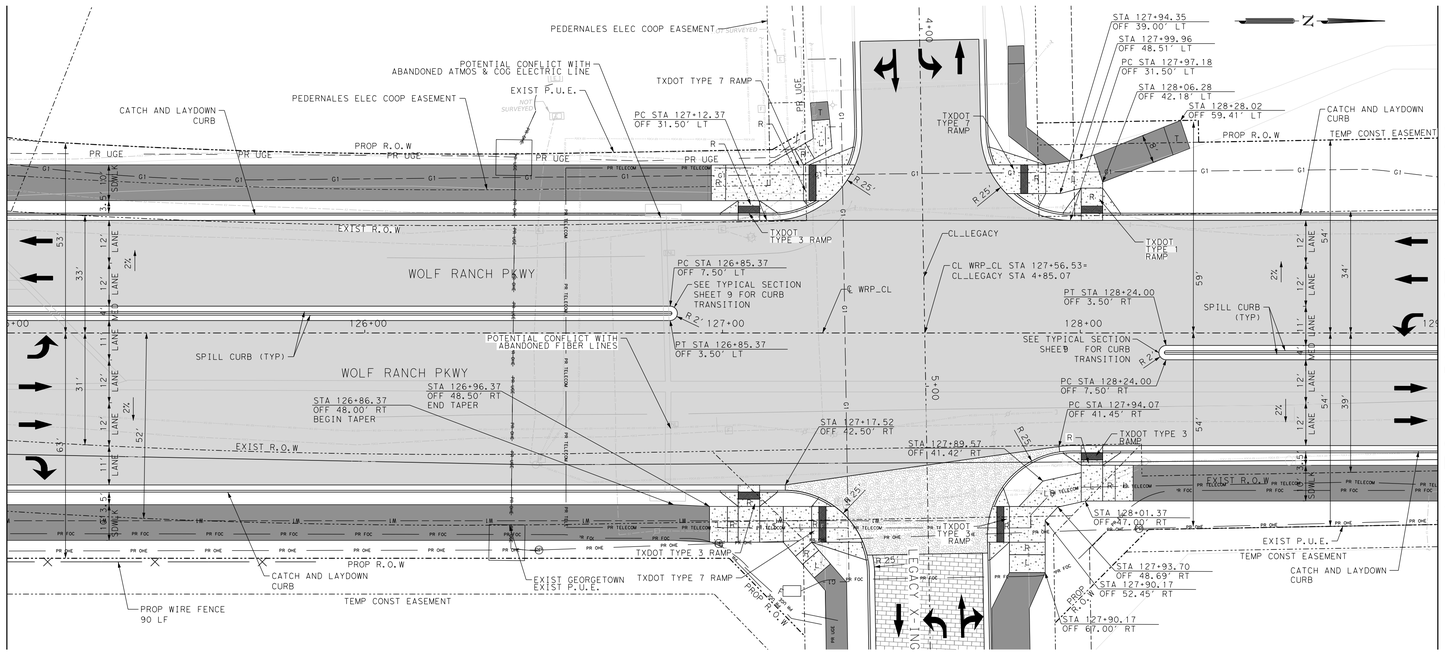

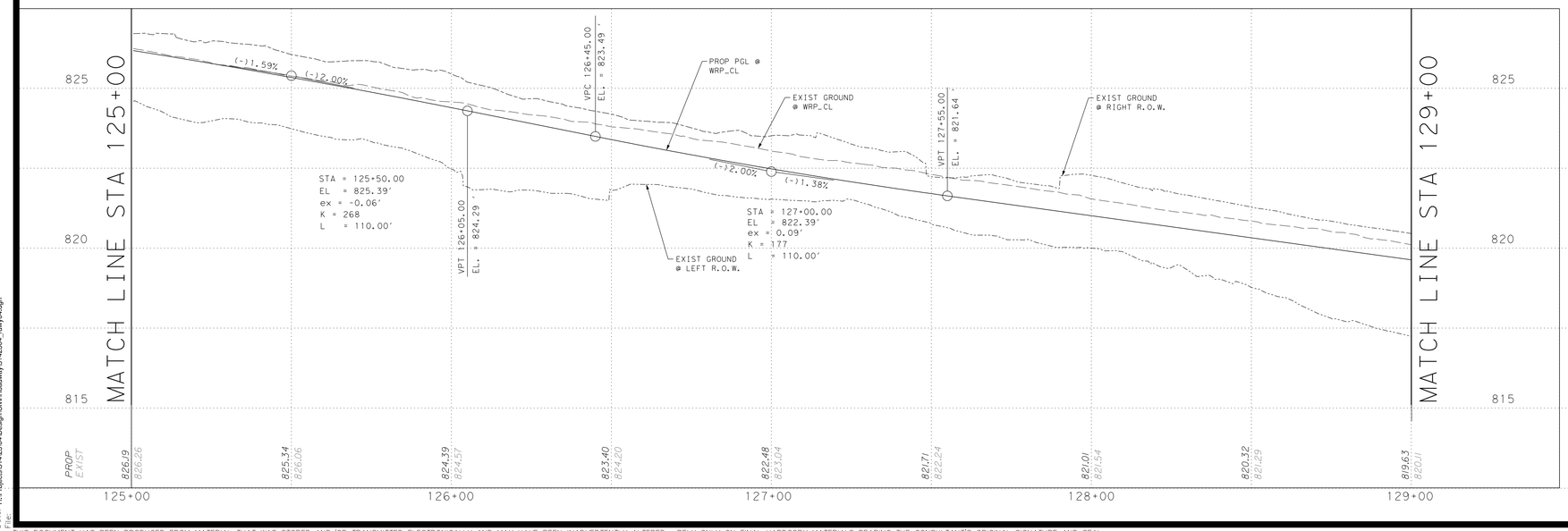

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SHEET 4 OF 29

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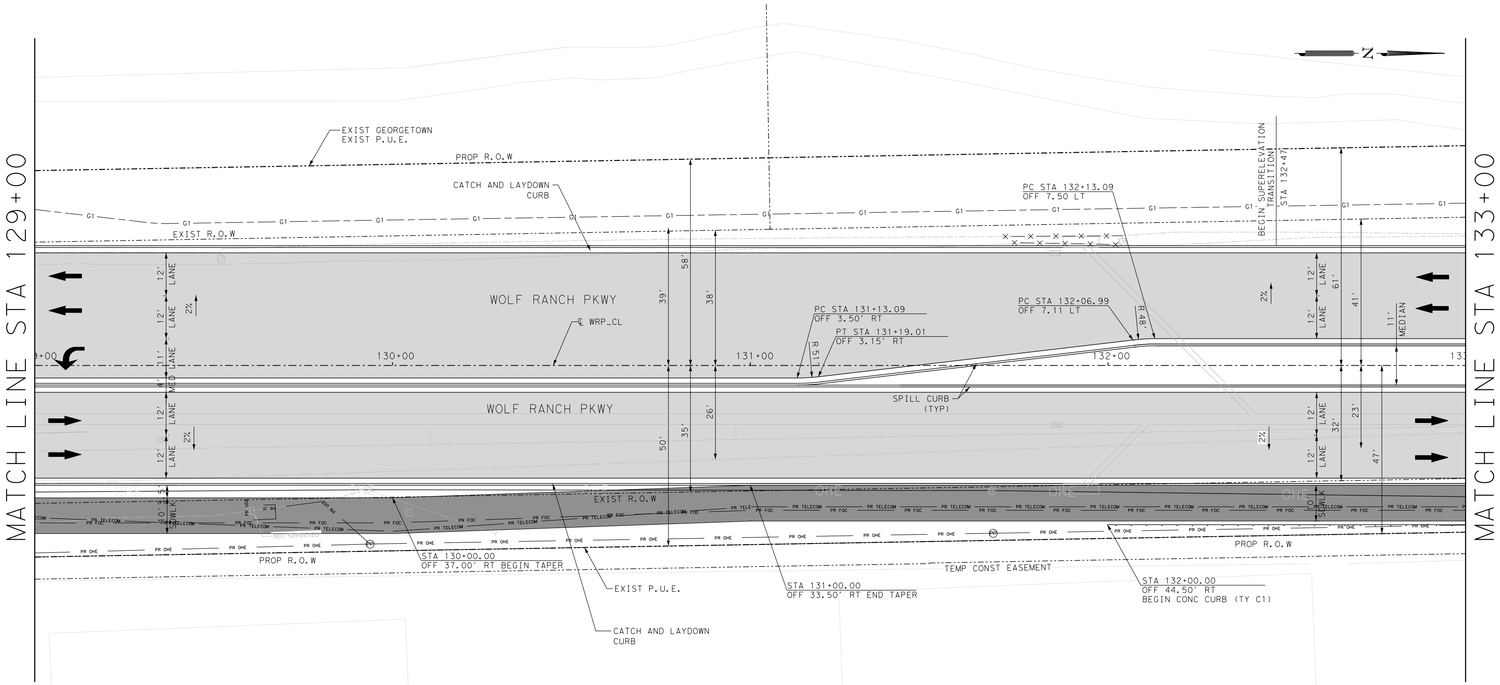

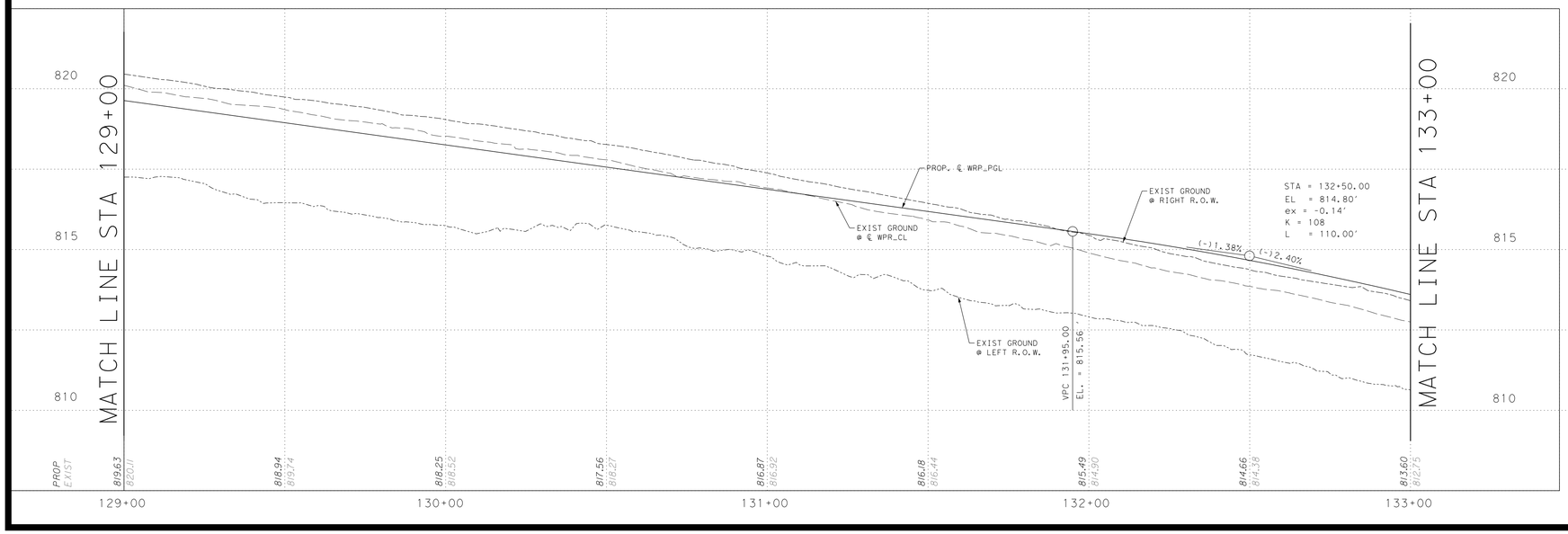

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SHEET 5 OF 29

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DESIGN

STATE OF TEXAS
BRET CHAPMAN
127293
LICENSED
PROFESSIONAL ENGINEER

BRET CHAPMAN, P.E. — 9/16/2025 DATE

APPROVAL

STATE OF TEXAS
BRIAN A. ALLEN
123374
LICENSED
PROFESSIONAL ENGINEER

BRIAN A. ALLEN, P.E. — 9/16/2025 DATE

NO.	REVISION	DATE

GEORGETOWN TEXAS *more than welcome*

PAPE-DAWSON ENGINEERS
AUSTIN I SAN ANTONIO I HOUSTON I FORT WORTH I DALLAS
10801 N MOPAC EXPY, BLDG 3, STE 200 I AUSTIN, TX 78759 I 512.454.8711
TEXAS ENGINEERING FIRM #470 I TEXAS SURVEYING FIRM #10028800

WOLF RANCH PKWY / MEMORIAL DR
ROADWAY PLAN AND PROFILE

CITY JOB No.
JOB NO. 51423-04
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DESIGNER
CHECKED DRAWN

SHEET 6 OF 29

SHEET NO. 197

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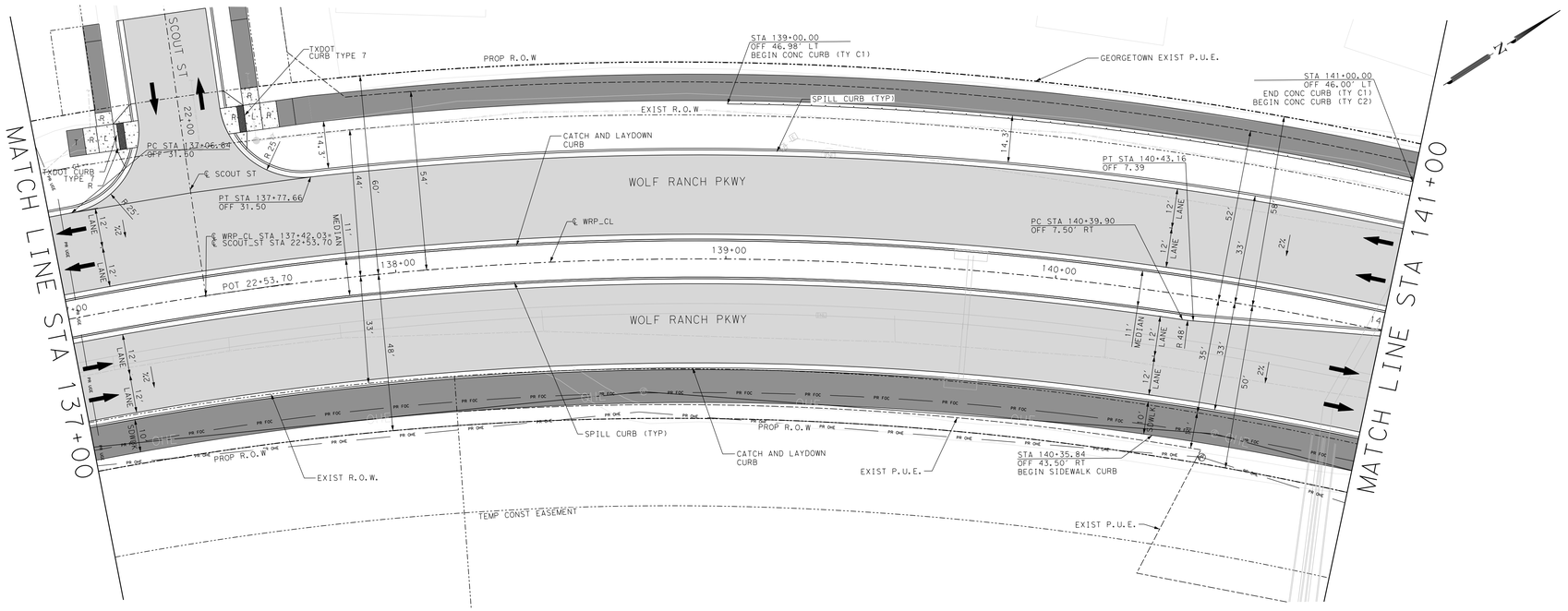

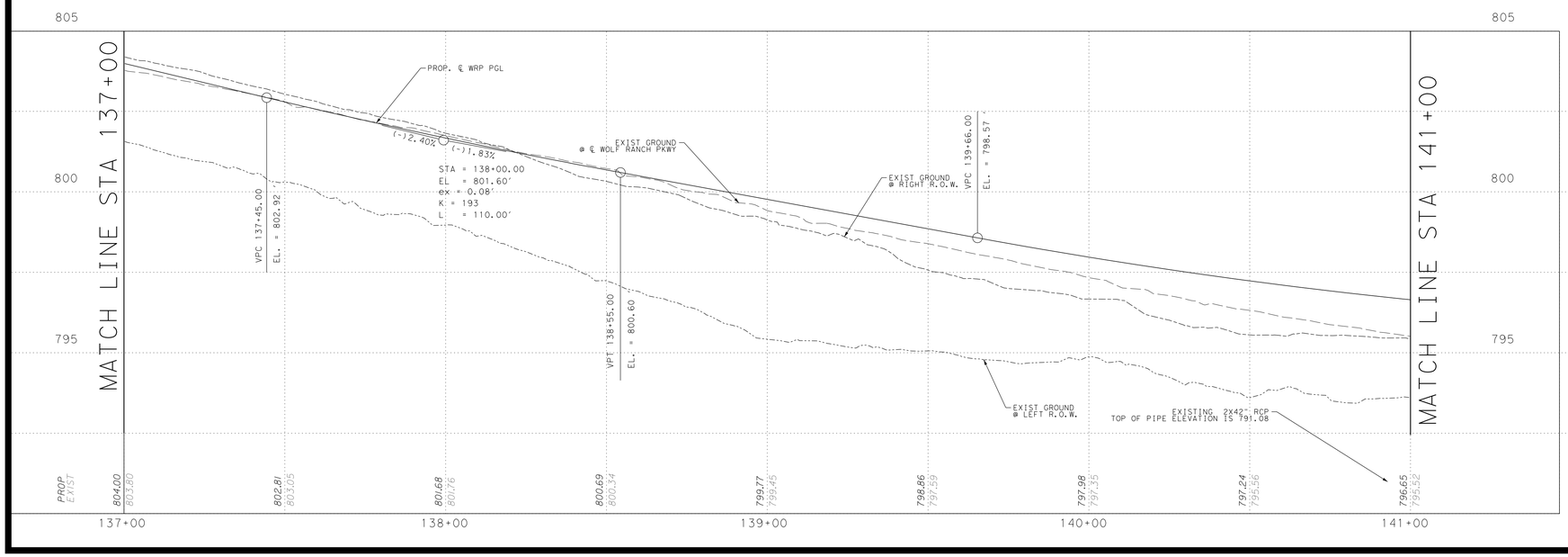

LEGEND

- PROPOSED ASPHALT PAVEMENT
- PROPOSED CONCRETE PAVEMENT
- PROPOSED MILL AND OVERLAY
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- EXIST R.O.W
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- PGL PROFILE GRADE LINE
- PROPOSED TRAFFIC FLOW
- PROPOSED STORM DRAIN/INLET
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- FOC3 EXIST/ABANDONED MCI
- FOC4 EXIST/ABANDONED OPTIMUM
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- FOC3 (D) EXIST/ABANDONED MCI
- CTV1 EXIST/ABANDONED OPTIMUM
- CTV1 (D) EXIST/ABANDONED UNKNOWN
- T2 (D) EXIST/ABANDONED OPTIMUM
- T1 EXIST/ABANDONED FRONTIER
- T1 (D) EXIST/ABANDONED FRONTIER
- TS1 (D) EXIST/ABANDONED FRONTIER
- TS1 (D) EXIST/ABANDONED TxDOT
- E1 (D) EXIST/ABANDONED GEORGETOWN UTILITY SERVICES
- E2 (D) EXIST/ABANDONED PEDERNALES ELECTRIC COOP
- E2 EXIST/ABANDONED PEDERNALES ELECTRIC COOP
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- G1 EXIST/ABANDONED ATMOS
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- W1 (D) EXIST/ABANDONED GEORGETOWN UTILITY SERVICES
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- W2 (D) EXIST/ABANDONED CITY OF ROUND ROCK
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SCALE: PLAN 1"= 20'
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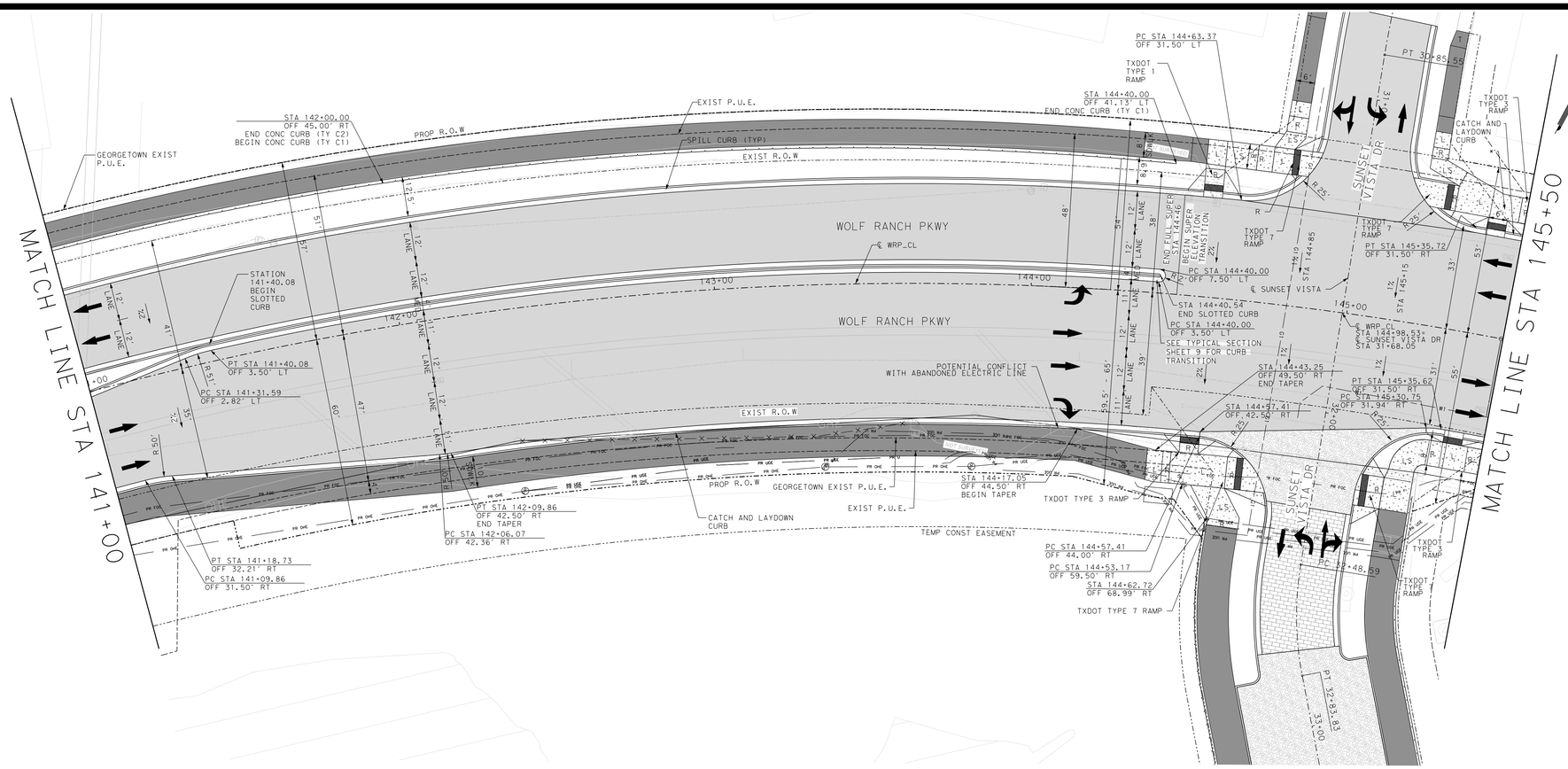

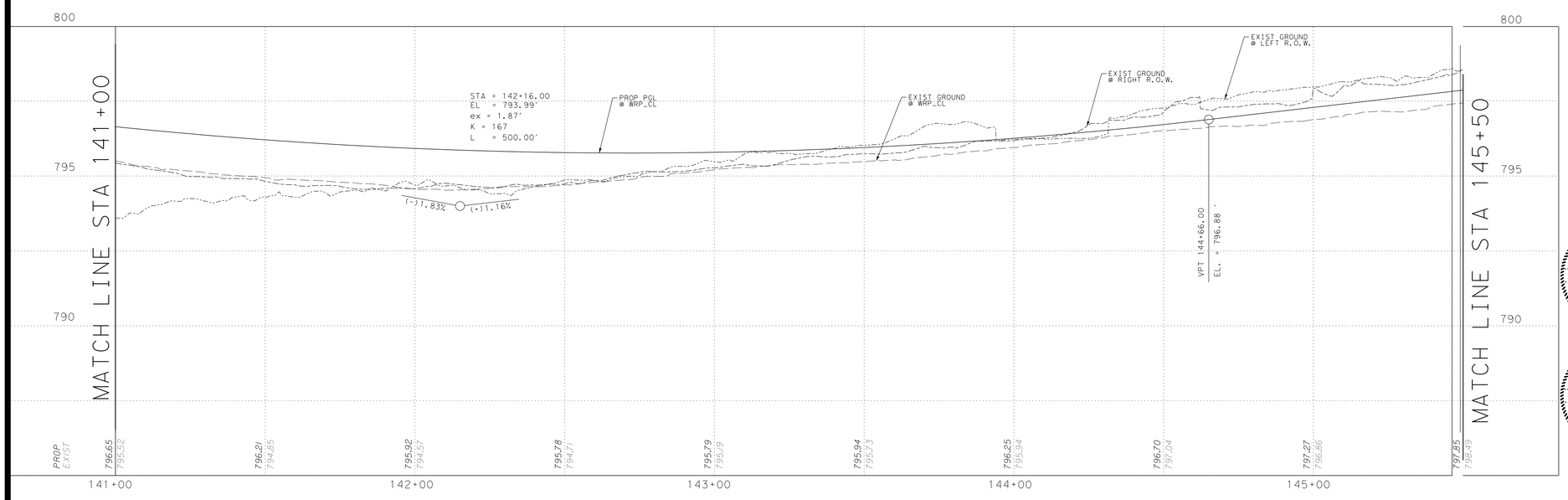

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SHEET 8 OF 29
SHEET NO. 199

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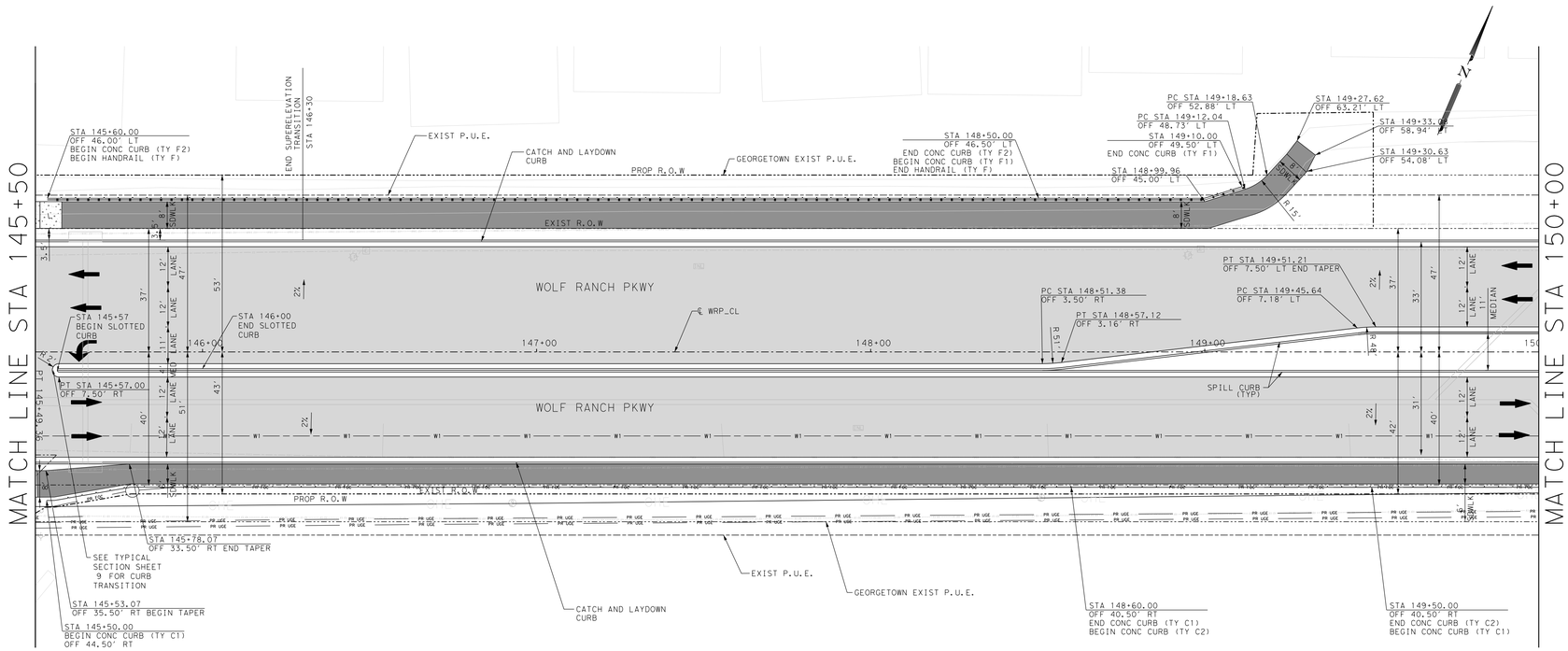

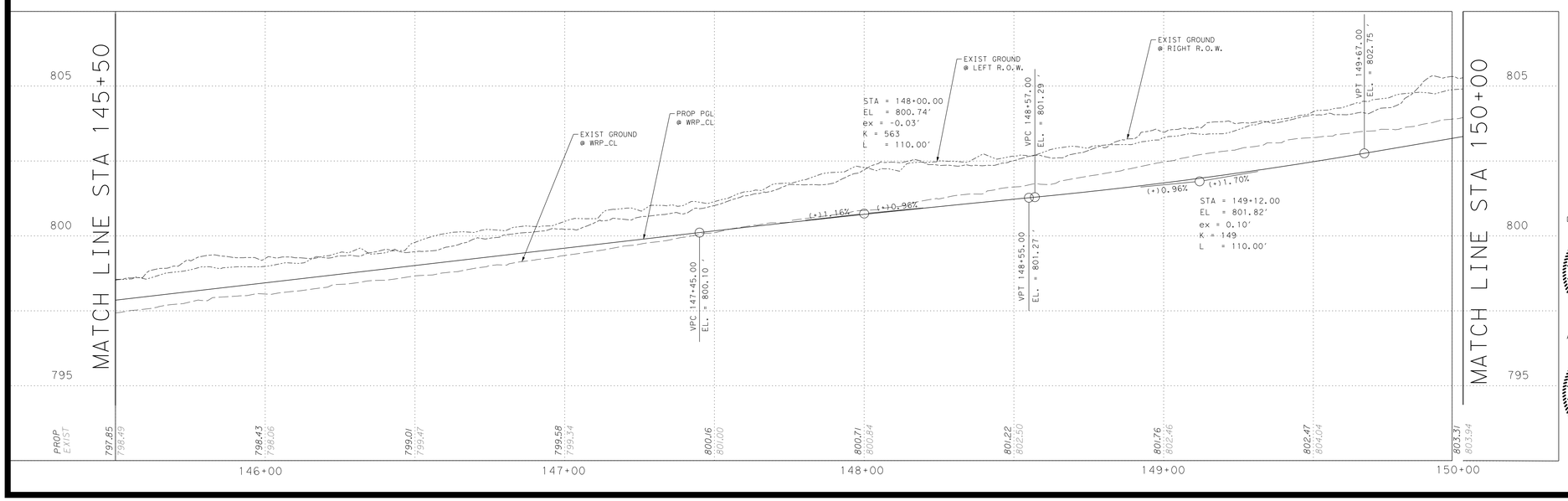

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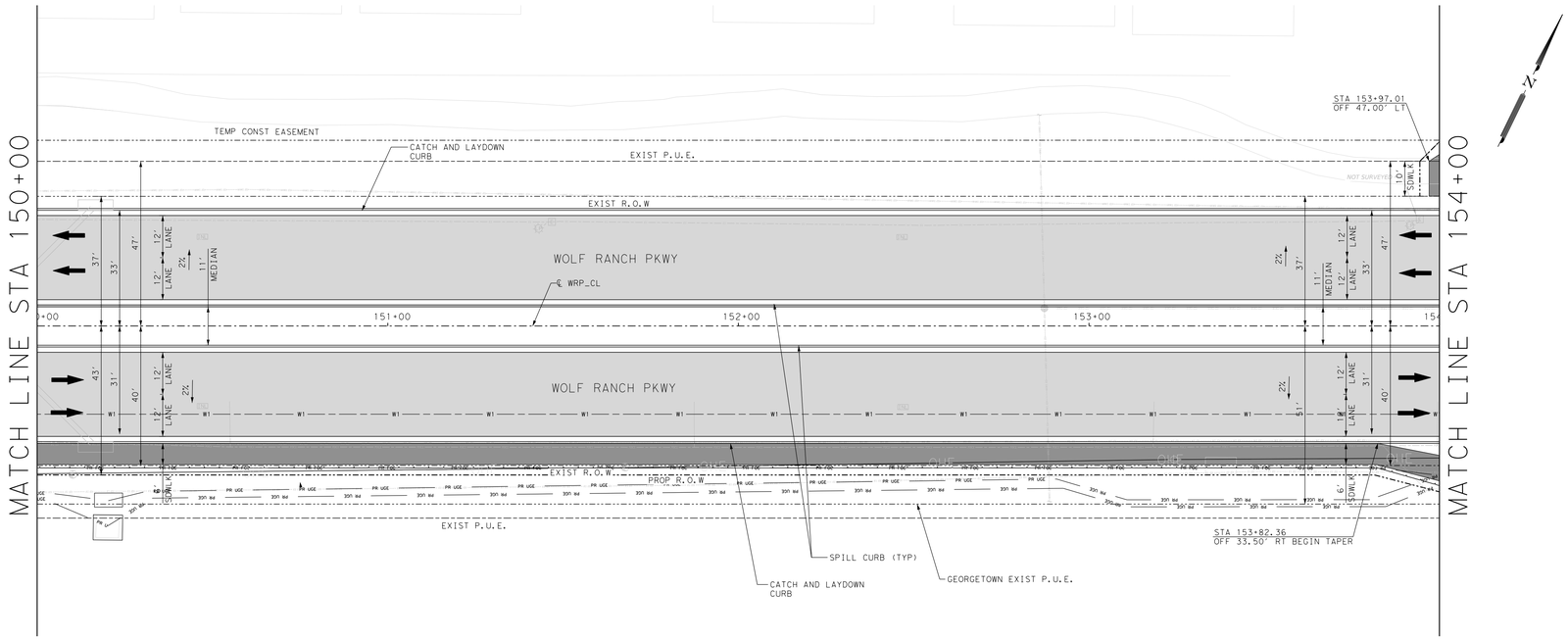

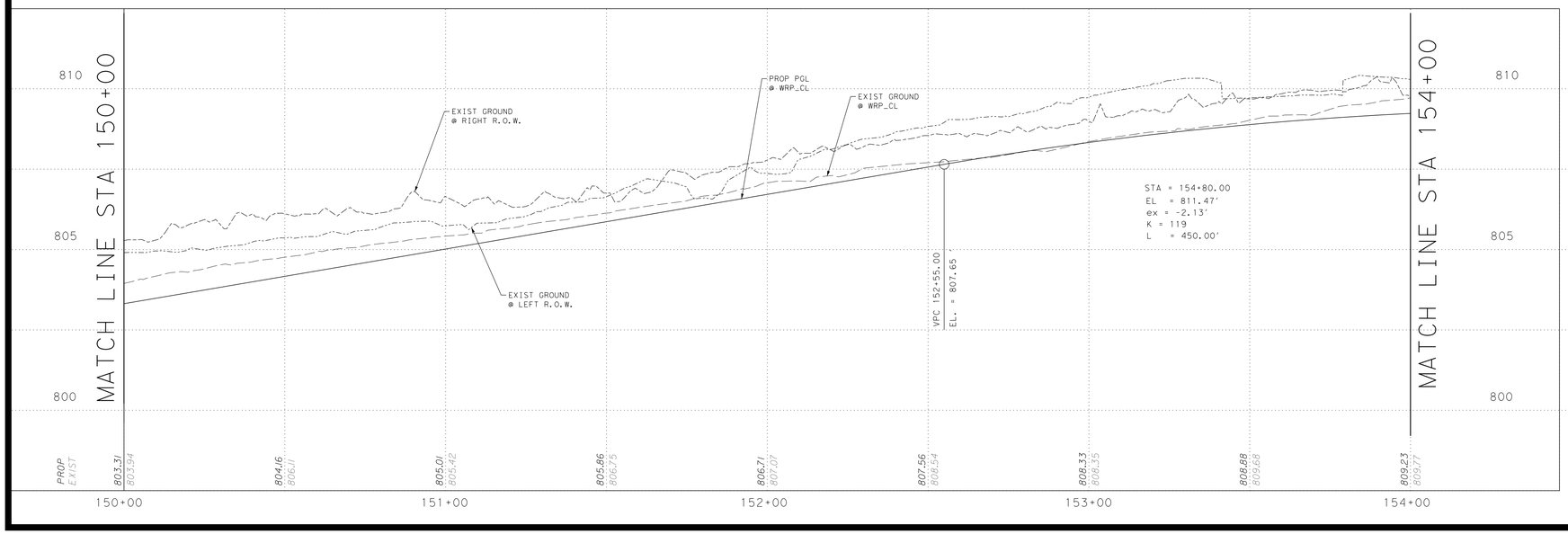

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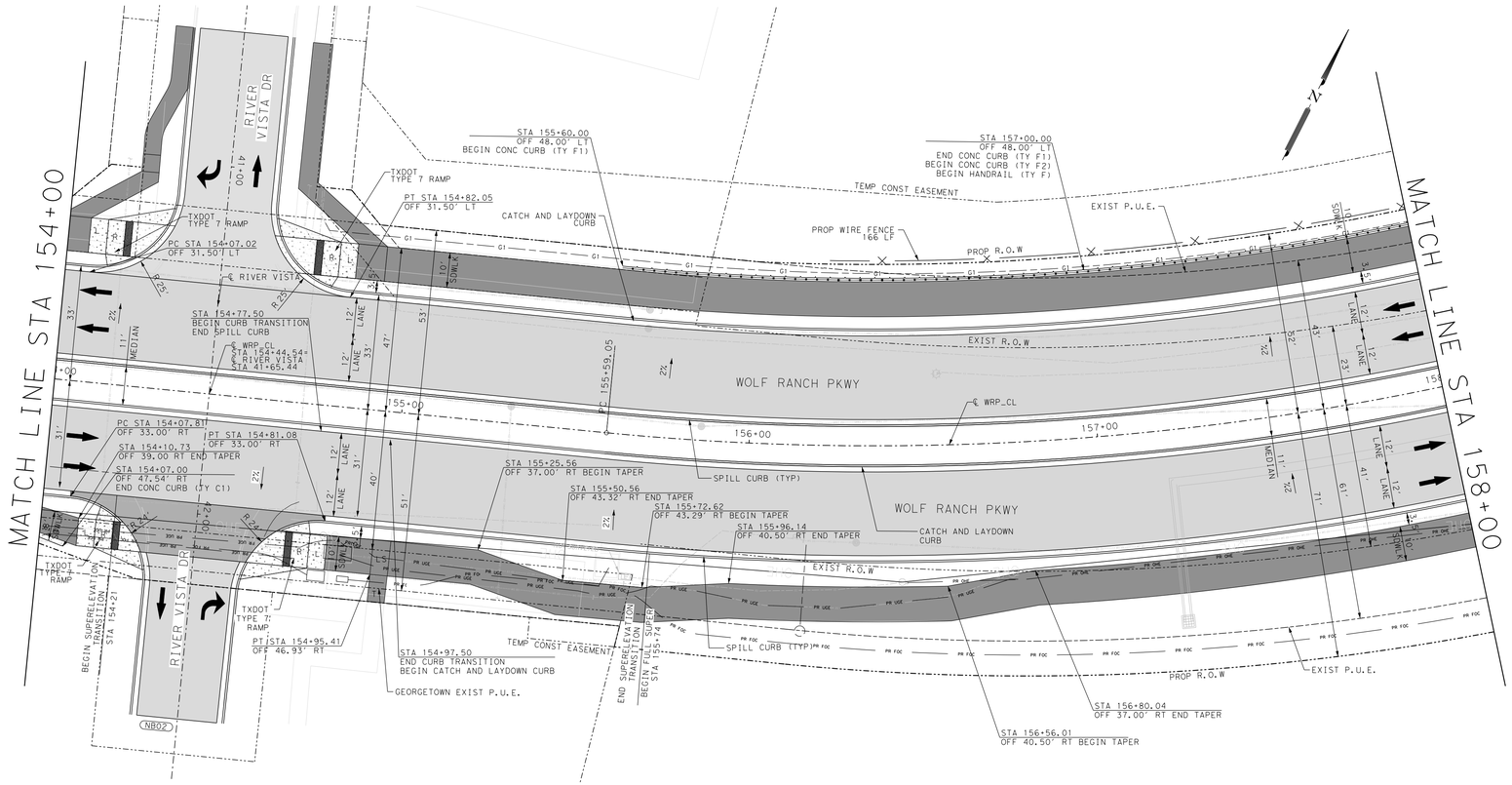

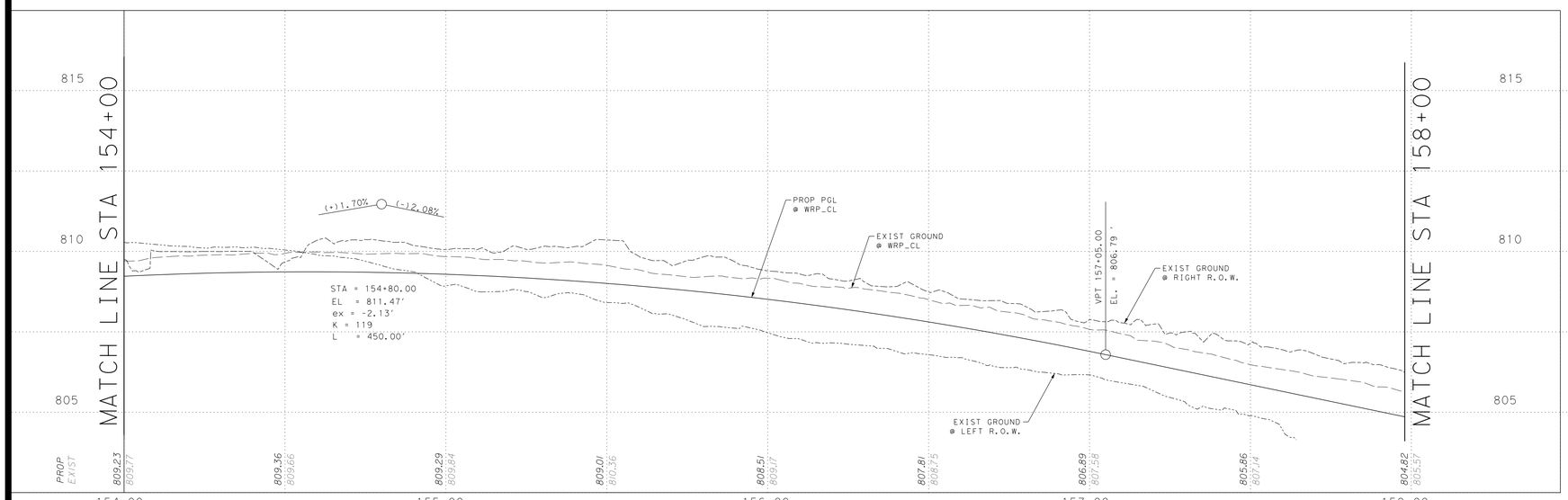

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- TS1 (D) EXIST/ABANDONED TxDOT
- E1 (D) EXIST/ABANDONED GEORGETOWN UTILITY SERVICES
- E2 (D) EXIST/ABANDONED PEDERNALES ELECTRIC COOP
- E2 EXIST/ABANDONED PEDERNALES ELECTRIC COOP
- E1 EXIST/ABANDONED GEORGETOWN UTILITY SERVICES
- G1 EXIST/ABANDONED ATMOS
- G1 (D) EXIST/ABANDONED ATMOS
- W1 EXIST/ABANDONED GEORGETOWN UTILITY SERVICES
- W1 (D) EXIST/ABANDONED GEORGETOWN UTILITY SERVICES
- W2 EXIST/ABANDONED CITY OF ROUND ROCK
- W2 (D) EXIST/ABANDONED CITY OF ROUND ROCK
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- OHE EXIST/ABANDONED EXIST. OVERHEAD ELECTRIC
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- PR FOC PROPOSED AT&T
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- W1 PROPOSED COG WATER
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- R RAMP (12:1 MAX RUN, 1:48 MAX CROSS SLOPE
- L LANDING (1:48 MAX SLOPE, ANY DIRECTION)
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- T TRANSITION

SCALE: 1"= 20'

0' 20' 40' 60'

SCALE: PLAN 1"= 20'

PROFILE 1"= 2'

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DESIGN

STATE OF TEXAS
BRET CHAPMAN
127293
LICENSED
PROFESSIONAL ENGINEER

BRET CHAPMAN, P.E. — 9/16/2025 DATE

APPROVAL

STATE OF TEXAS
BRIAN A. ALLEN
123374
LICENSED
PROFESSIONAL ENGINEER

BRIAN A. ALLEN, P.E. — 9/16/2025 DATE

NO.	REVISION	DATE

GEORGETOWN TEXAS
more than welcome

PAPE-DAWSON ENGINEERS
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10801 N MOPAC EXPY, BLDG 3, STE 200 I AUSTIN, TX 78759 I 512.454.8711
TEXAS ENGINEERING FIRM #470 I TEXAS SURVEYING FIRM #10028800

WOLF RANCH PKWY / MEMORIAL DR
ROADWAY PLAN AND PROFILE

CITY JOB No.
JOB NO. 51423-04
DATE 9/16/2025
DESIGNER
CHECKED DRAWN

SHEET 11 OF 29

SHEET NO. 202

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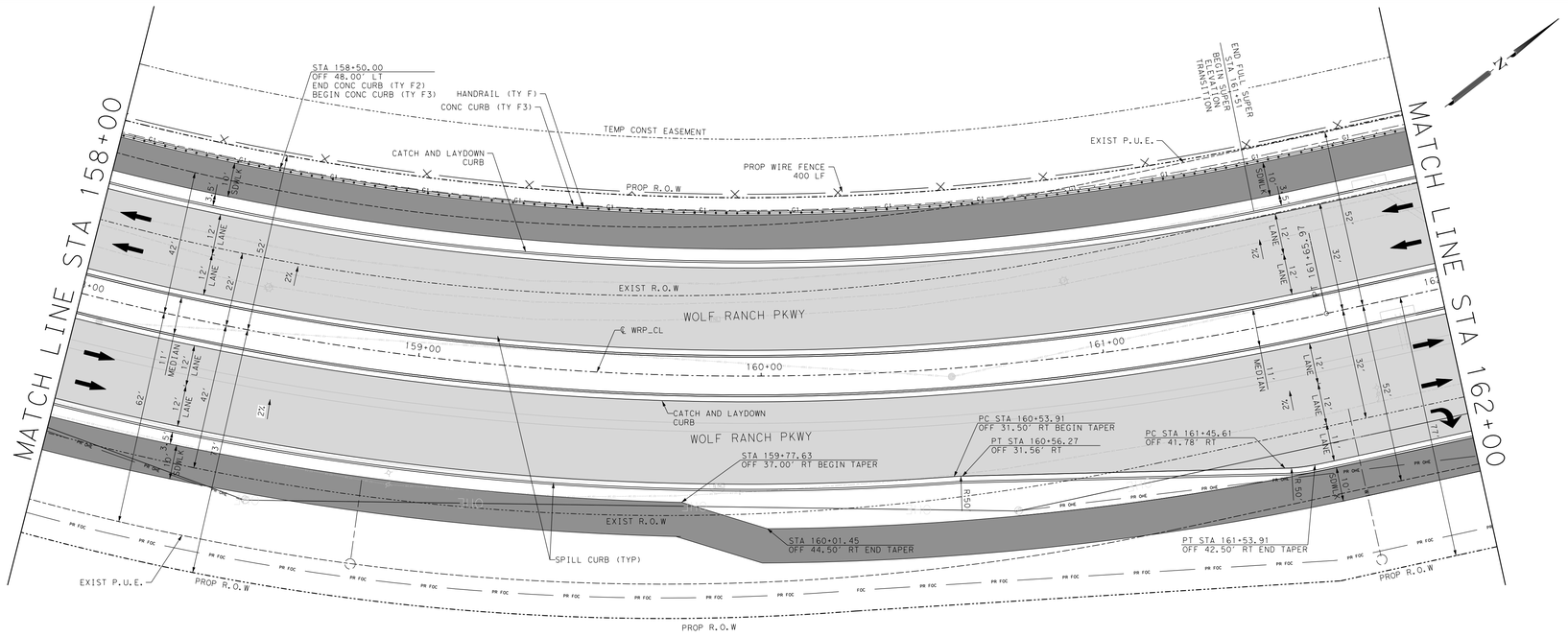

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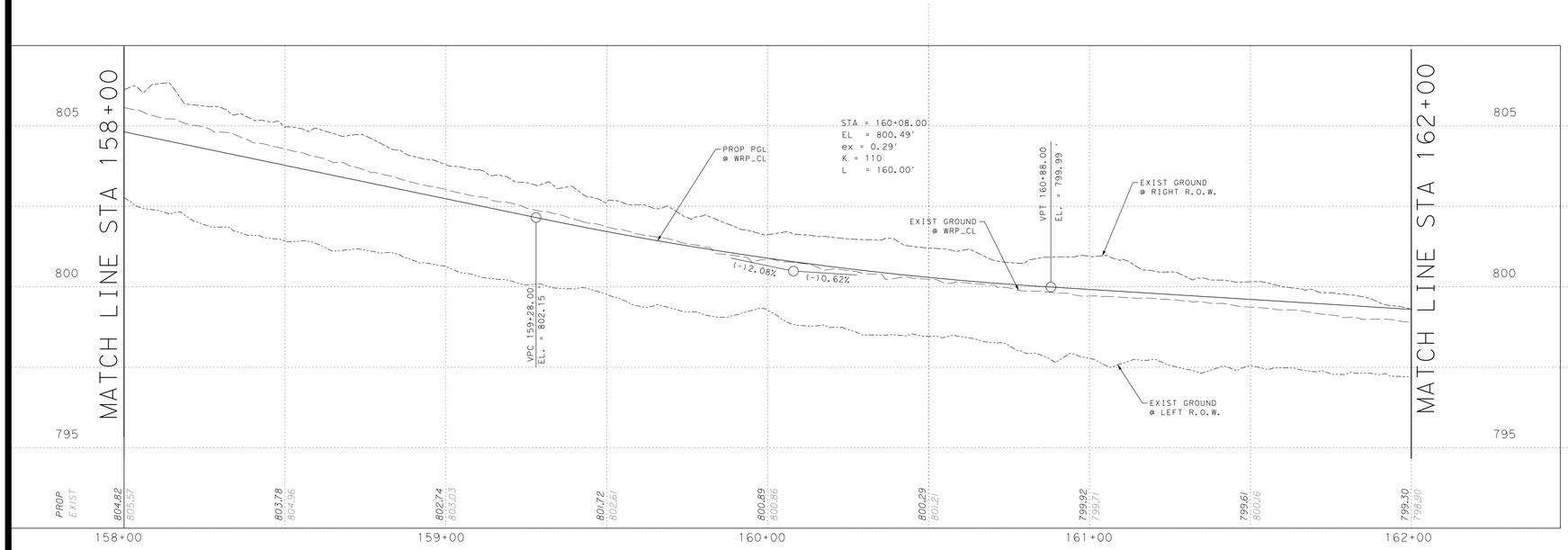

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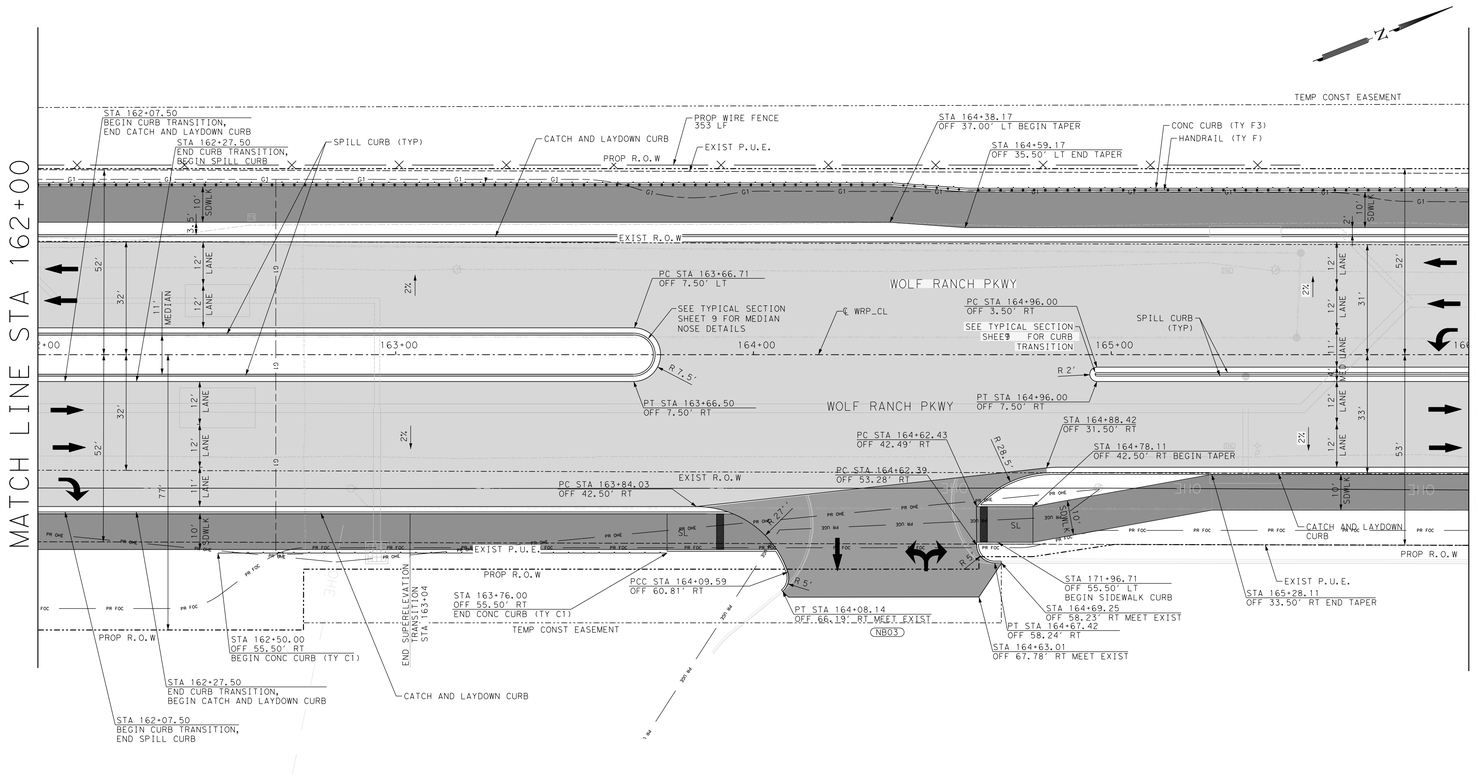

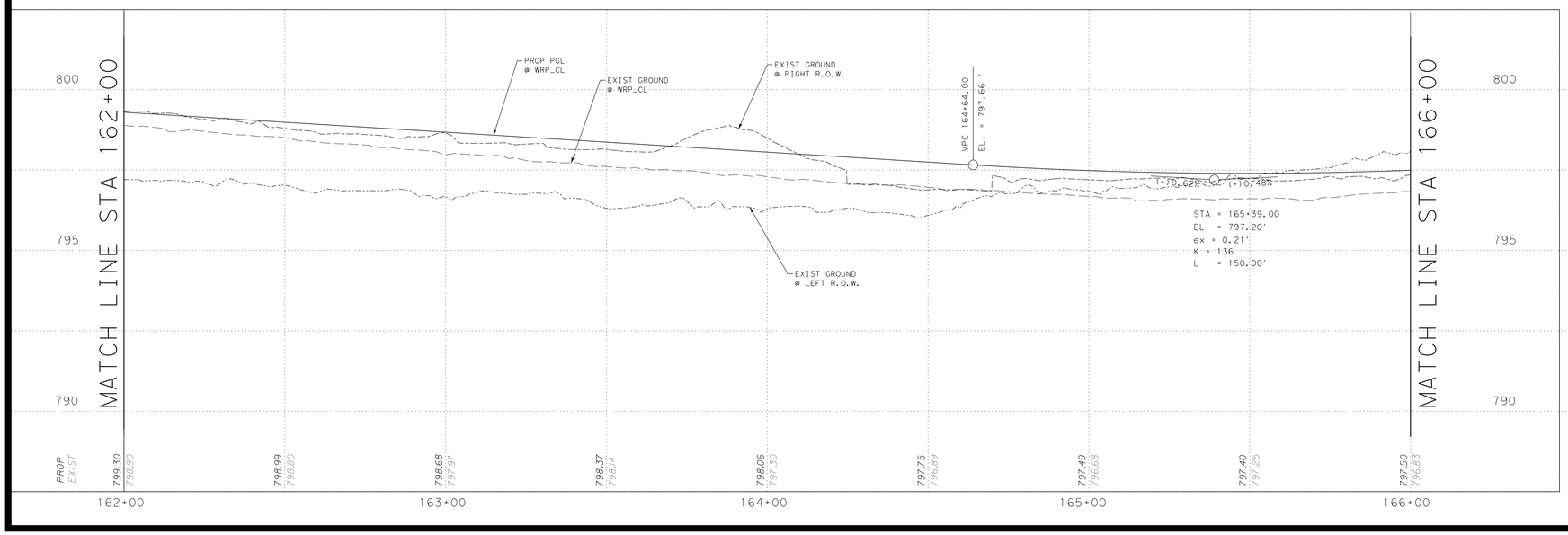

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SHEET 13 OF 29

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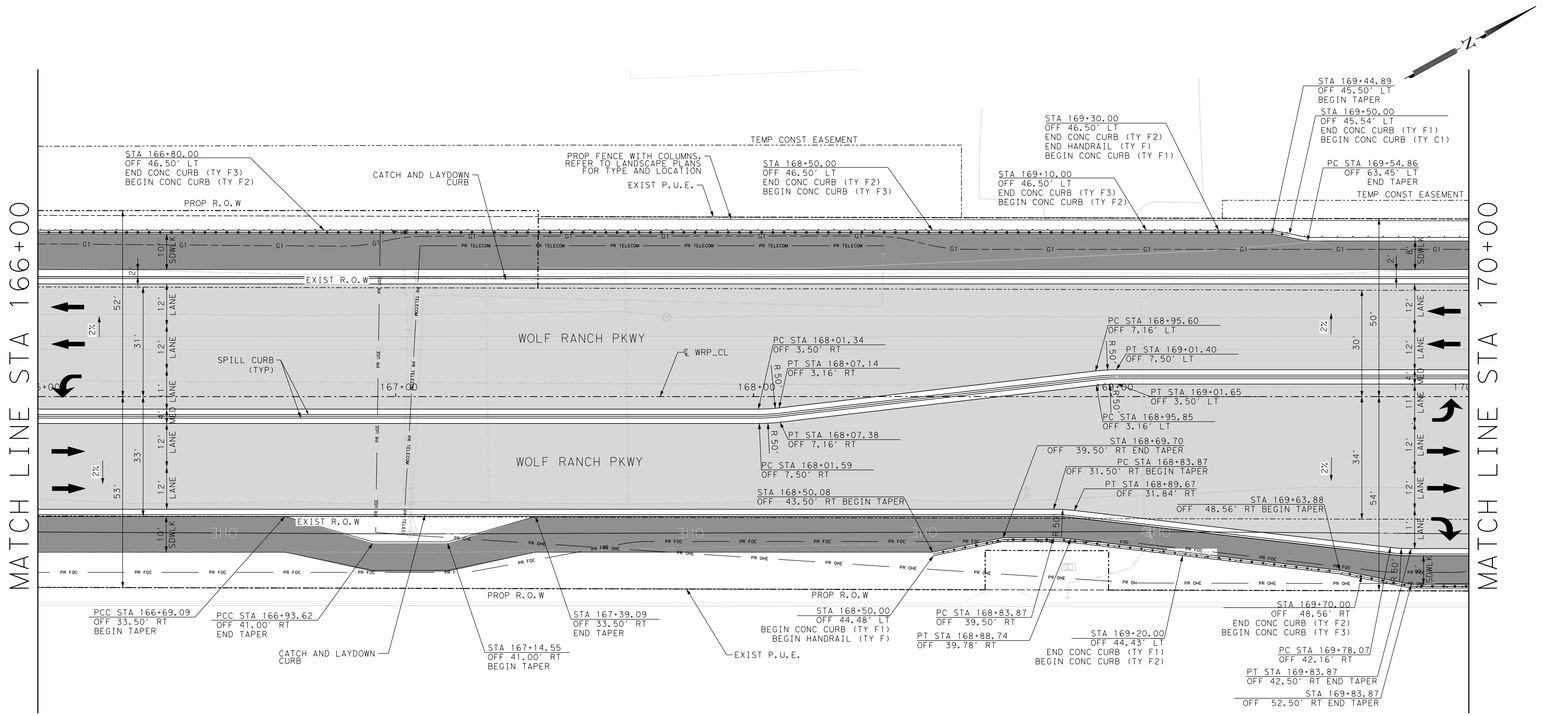

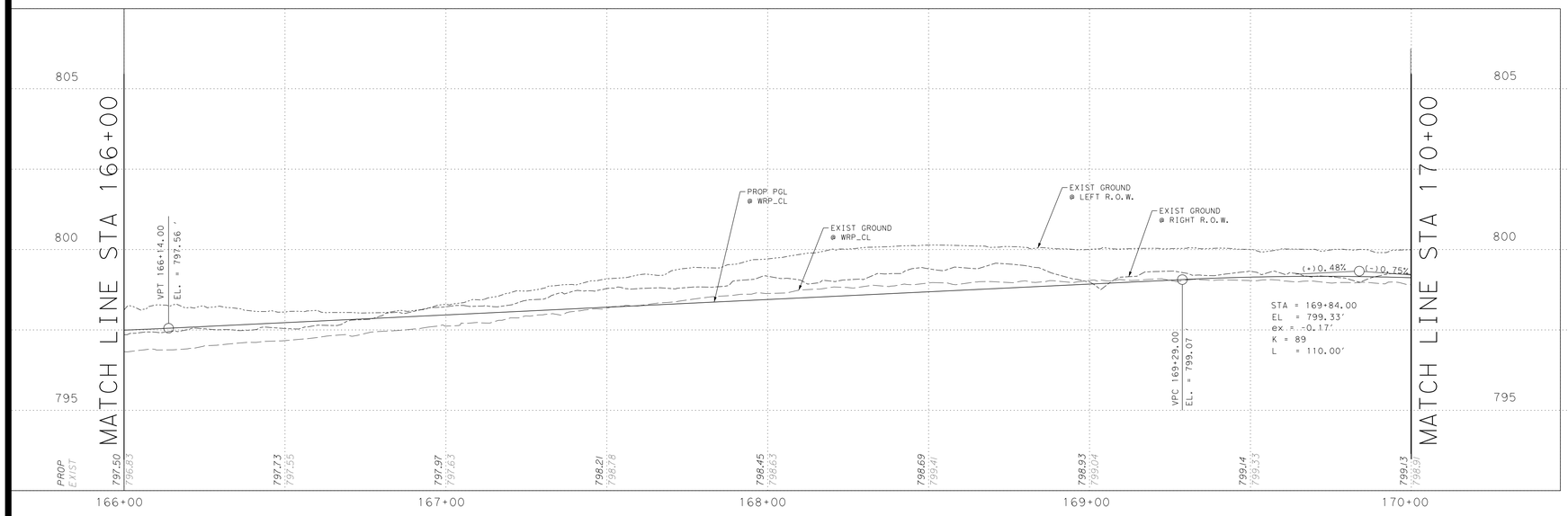

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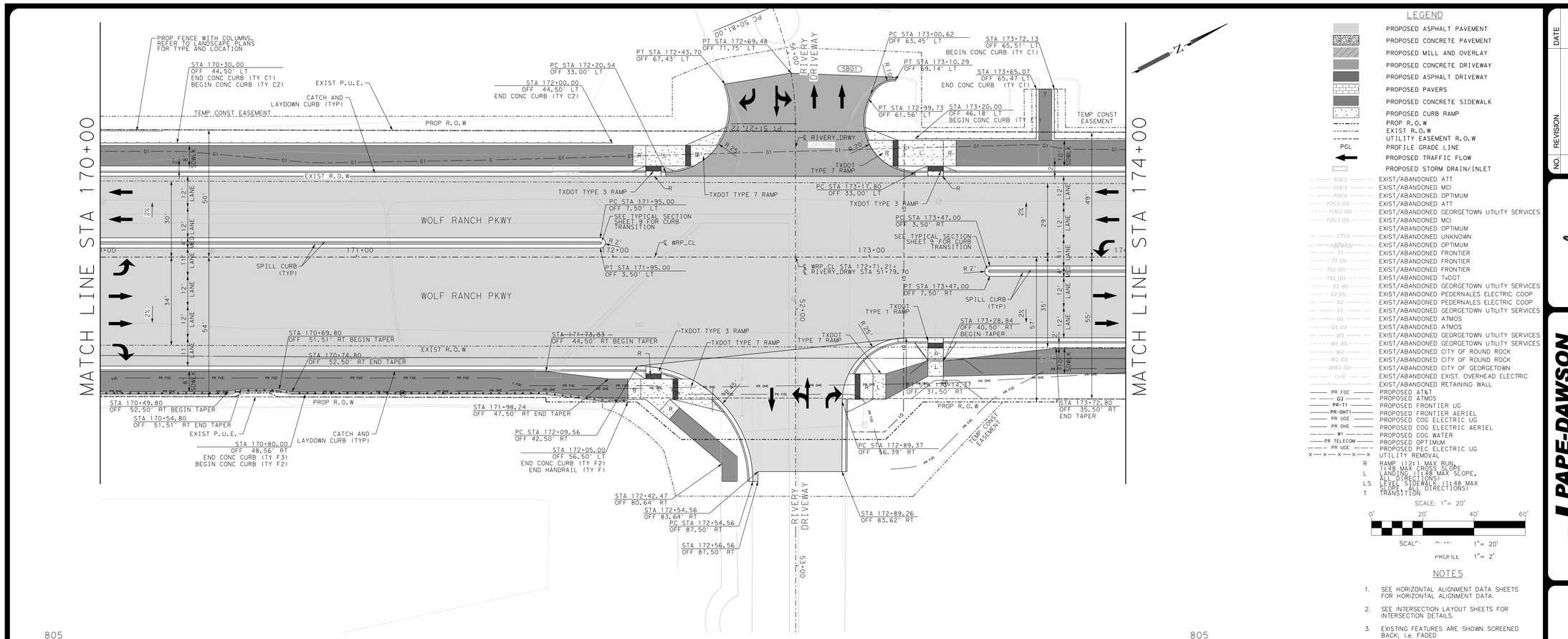

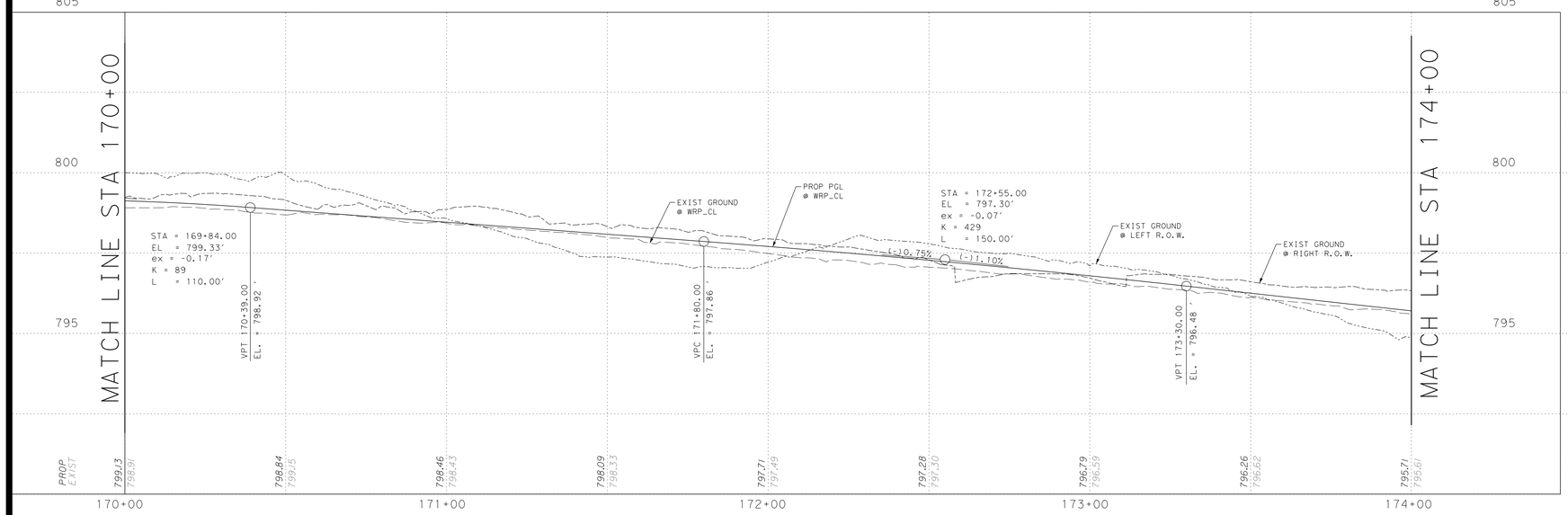

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SHEET NO. 206

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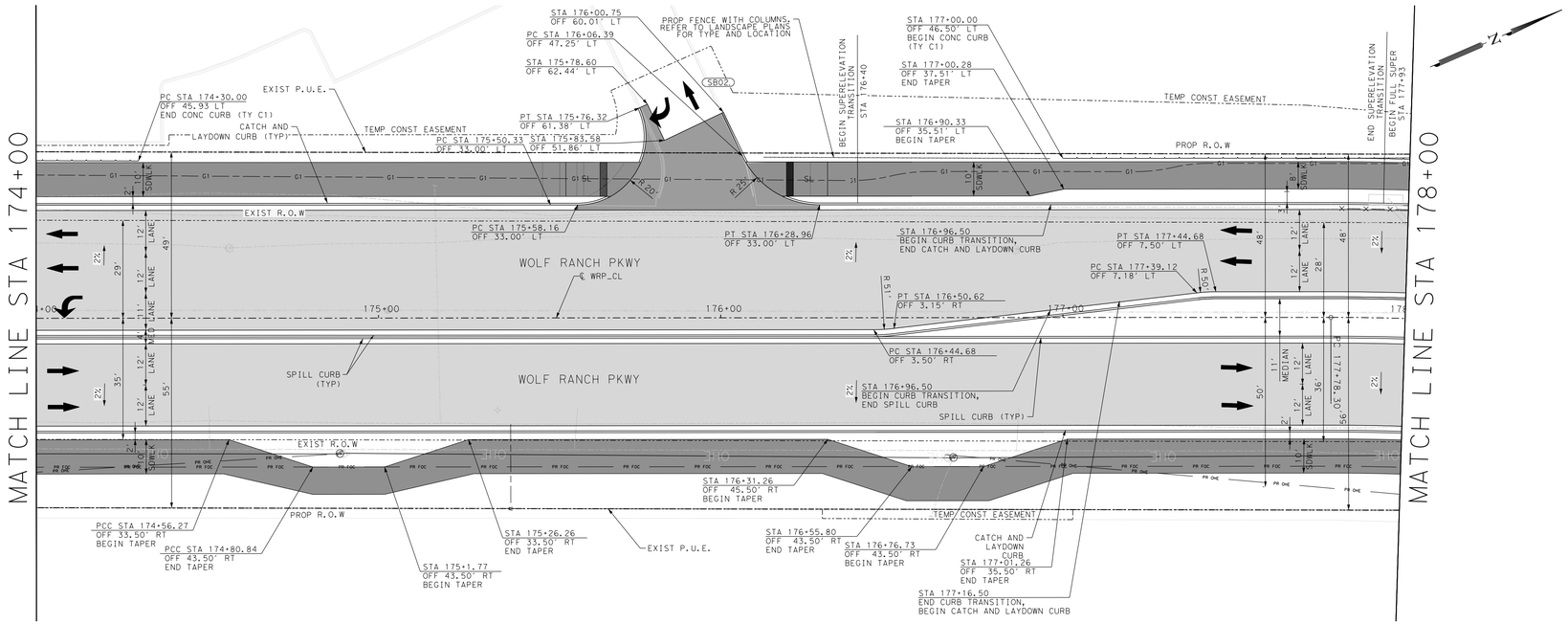

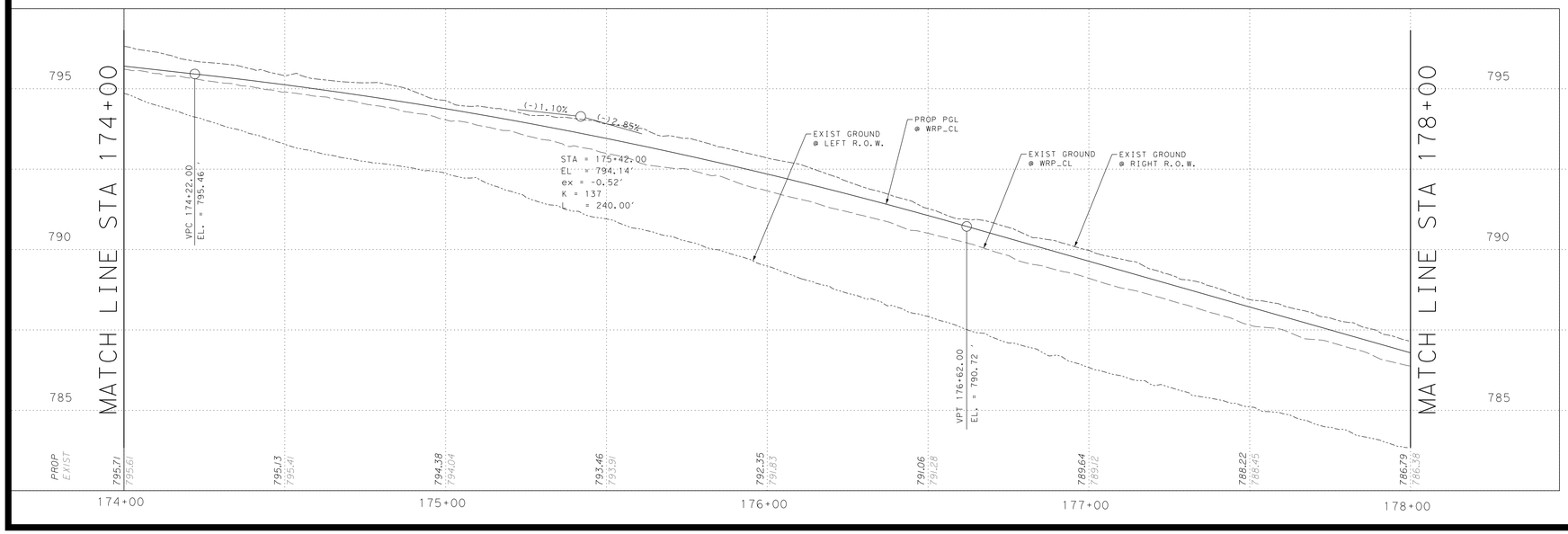

LEGEND

- PROPOSED ASPHALT PAVEMENT
- PROPOSED CONCRETE PAVEMENT
- PROPOSED MILL AND OVERLAY
- PROPOSED CONCRETE DRIVEWAY
- PROPOSED ASPHALT DRIVEWAY
- PROPOSED PAVERS
- PROPOSED CONCRETE SIDEWALK
- PROPOSED CURB RAMP
- PROP R.O.W
- EXIST R.O.W
- UTILITY EASEMENT R.O.W
- PGL PROFILE GRADE LINE
- PROPOSED TRAFFIC FLOW
- PROPOSED STORM DRAIN/INLET
- FOC1 EXIST/ABANDONED ATT
- FOC3 EXIST/ABANDONED MCI
- FOC4 EXIST/ABANDONED OPTIMUM
- FOC1 (D) EXIST/ABANDONED ATT
- FOC2 (D) EXIST/ABANDONED GEORGETOWN UTILITY SERVICES
- FOC3 (D) EXIST/ABANDONED MCI
- CTV1 EXIST/ABANDONED OPTIMUM
- CTV1 (D) EXIST/ABANDONED UNKNOWN
- FOC4 (D) EXIST/ABANDONED OPTIMUM
- T1 EXIST/ABANDONED FRONTIER
- T1 (D) EXIST/ABANDONED FRONTIER
- TS1 EXIST/ABANDONED FRONTIER
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- E1 (D) EXIST/ABANDONED GEORGETOWN UTILITY SERVICES
- E2 (D) EXIST/ABANDONED PEDERNALES ELECTRIC COOP
- E2 EXIST/ABANDONED PEDERNALES ELECTRIC COOP
- E1 EXIST/ABANDONED GEORGETOWN UTILITY SERVICES
- G1 EXIST/ABANDONED ATMOS
- G1 (D) EXIST/ABANDONED ATMOS
- W1 EXIST/ABANDONED GEORGETOWN UTILITY SERVICES
- W1 (D) EXIST/ABANDONED GEORGETOWN UTILITY SERVICES
- W2 EXIST/ABANDONED CITY OF ROUND ROCK
- W2 (D) EXIST/ABANDONED CITY OF ROUND ROCK
- WW1 (D) EXIST/ABANDONED CITY OF GEORGETOWN
- OHE EXIST/ABANDONED EXIST. OVERHEAD ELECTRIC
- EXIST/ABANDONED RETAINING WALL
- PR FOC PROPOSED AT&T
- G1 PROPOSED ATMOS
- PR-T1 PROPOSED FRONTIER UG
- PR-OHT1 PROPOSED FRONTIER AERIEL
- PR UGE PROPOSED COG ELECTRIC UG
- PR OHE PROPOSED COG ELECTRIC AERIEL
- W1 PROPOSED COG WATER
- PR TELECOM PROPOSED OPTIMUM
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- UTILITY REMOVAL
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- T TRANSITION

SCALE: 1"= 20'

0' 20' 40' 60'

SCALE 1"= 20'

PROFILE 1"= 2'

NOTES

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DESIGN

STATE OF TEXAS
BRET CHAPMAN
127293
LICENSED PROFESSIONAL ENGINEER

BRET CHAPMAN, P.E. 9/16/2025 DATE

APPROVAL

STATE OF TEXAS
BRIAN A. ALLEN
123374
LICENSED PROFESSIONAL ENGINEER

BRIAN A. ALLEN, P.E. 9/16/2025 DATE

NO.	REVISION	DATE

GEORGETOWN TEXAS *more than welcome*

PAPE-DAWSON ENGINEERS
AUSTIN | SAN ANTONIO | HOUSTON | FORT WORTH | DALLAS
10801 N MOPAC EXPY, BLDG 3, STE 200 | AUSTIN, TX 78759 | 512.454.8711
TEXAS ENGINEERING FIRM #470 | TEXAS SURVEYING FIRM #10028800

WOLF RANCH PKWY / MEMORIAL DR
ROADWAY PLAN AND PROFILE

CITY JOB No.
JOB NO. 51423-04
DATE 9/16/2025
DESIGNER
CHECKED DRAWN

SHEET 16 OF 29

SHEET NO. 207

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LEGEND

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- T1 EXIST/ABANDONED FRONTIER
- T1 (D) EXIST/ABANDONED FRONTIER
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BRET CHAPMAN, P.E. 9/16/2025 DATE

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SHEET 17 OF 29

SHEET NO. 208

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LEGEND

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- PROPOSED CONCRETE PAVEMENT
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SHEET 18 OF 29

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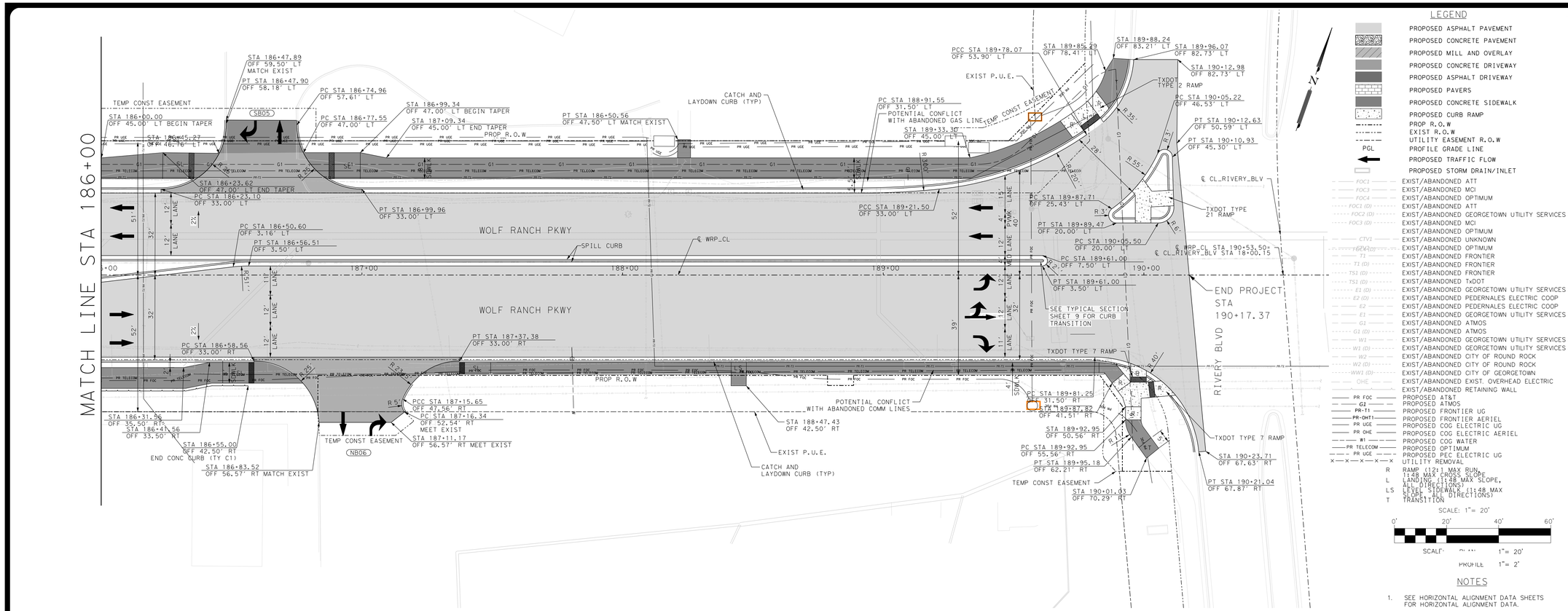

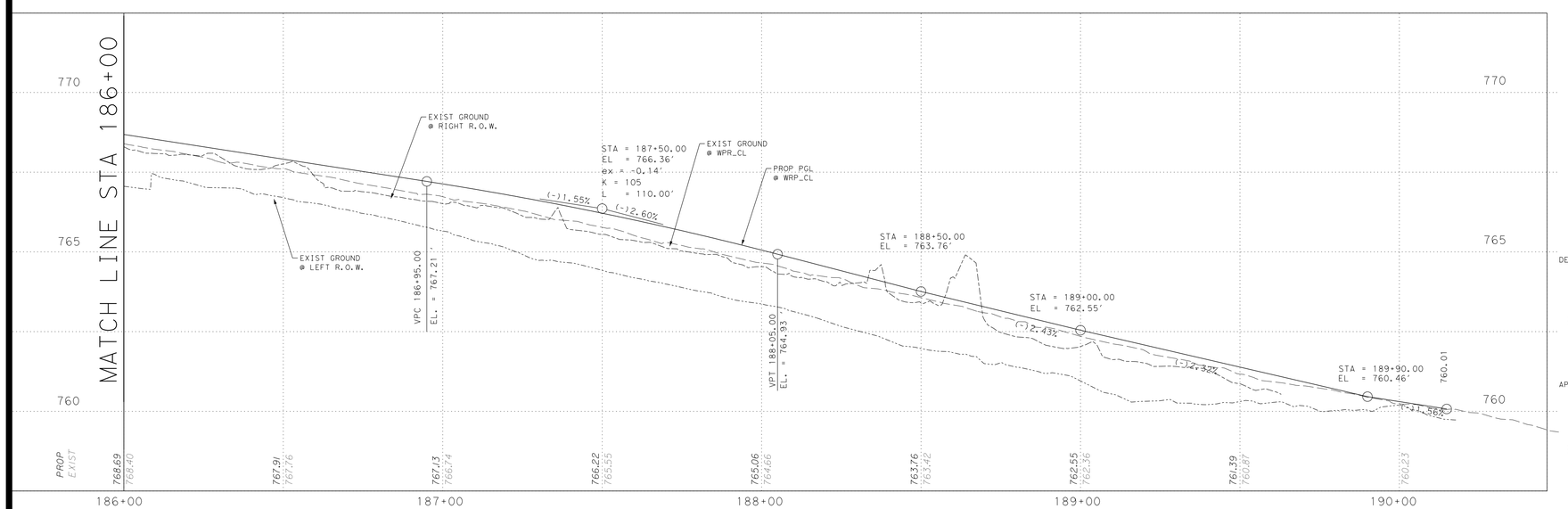

LEGEND

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- G1 (D) EXIST/ABANDONED ATMOS
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BRET CHAPMAN, P.E. — 9/16/2025 DATE

APPROVAL

STATE OF TEXAS — BRIAN A. ALLEN — 123374 — LICENSED PROFESSIONAL ENGINEER

BRIAN A. ALLEN, P.E. — 9/16/2025 DATE

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ROADWAY PLAN AND PROFILE

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SHEET 19 OF 29

SHEET NO. 210

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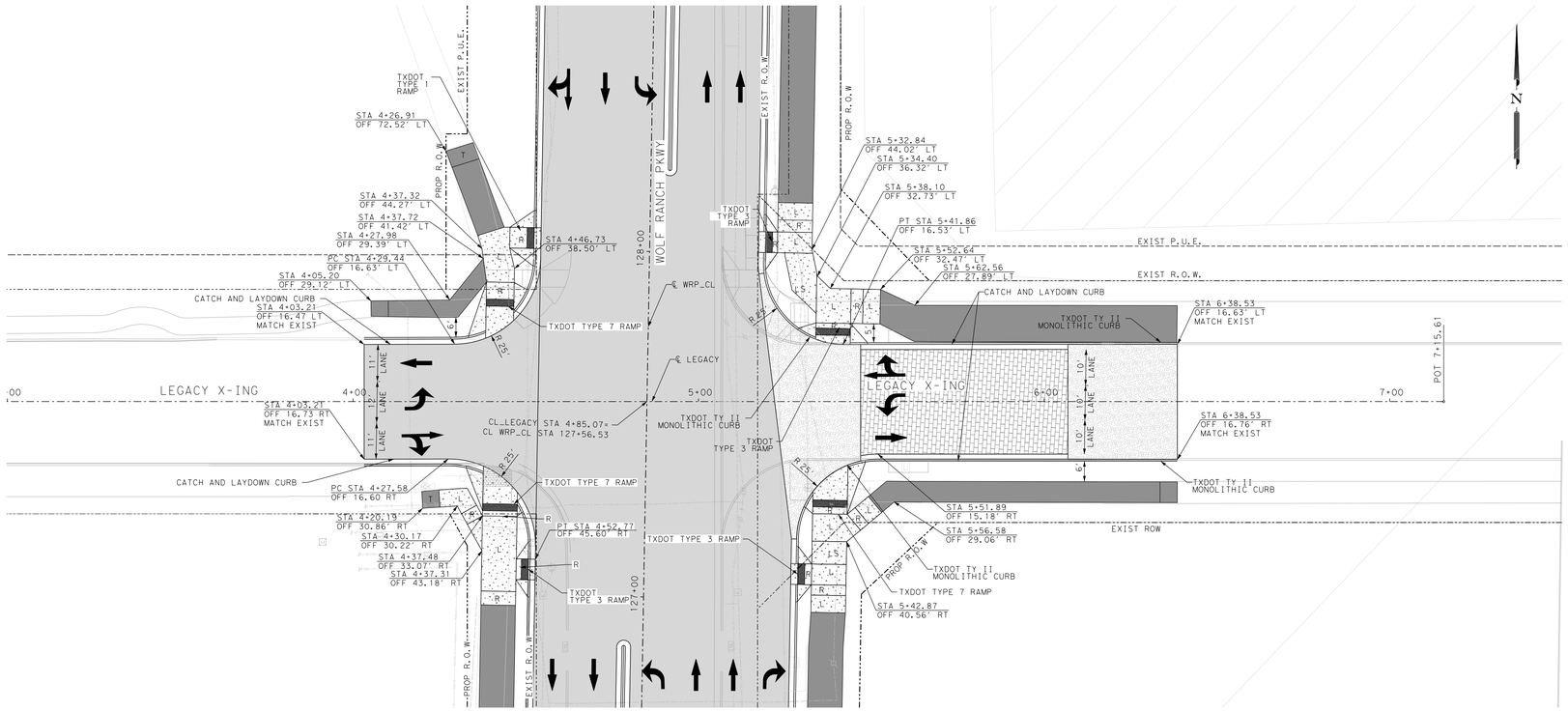

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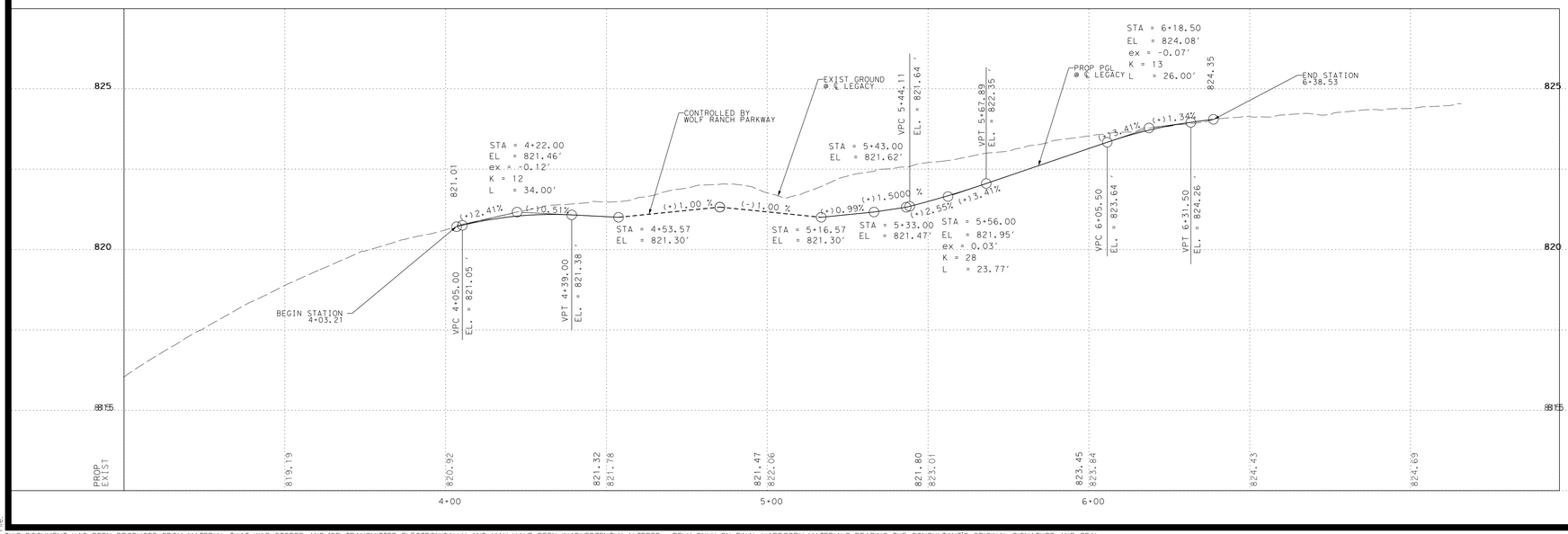

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CITY OF GEORGETOWN, TEXAS
WOLF RANCH PKWY / LEGACY X-ING

ROADWAY PLAN AND PROFILE

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SHEET NO. 211

9/16/2025
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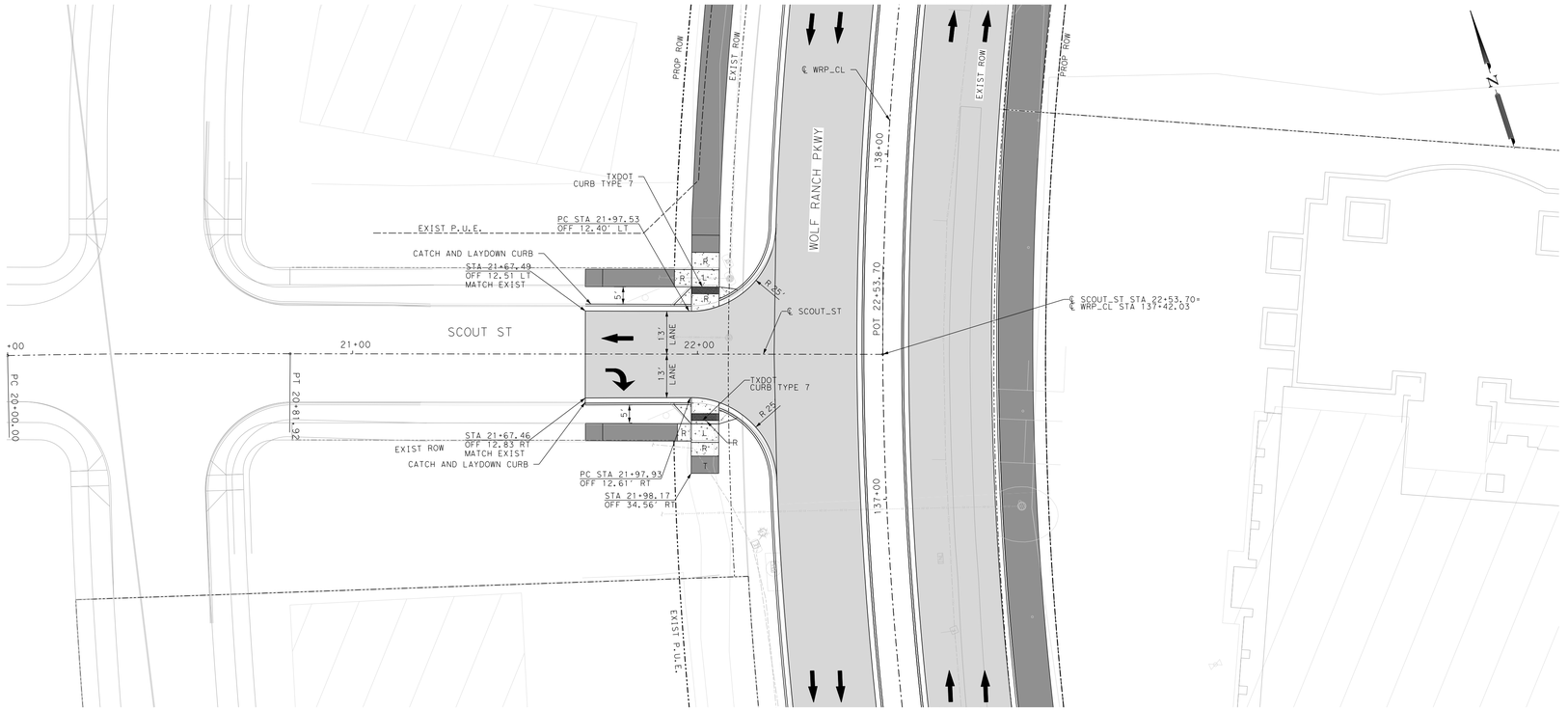

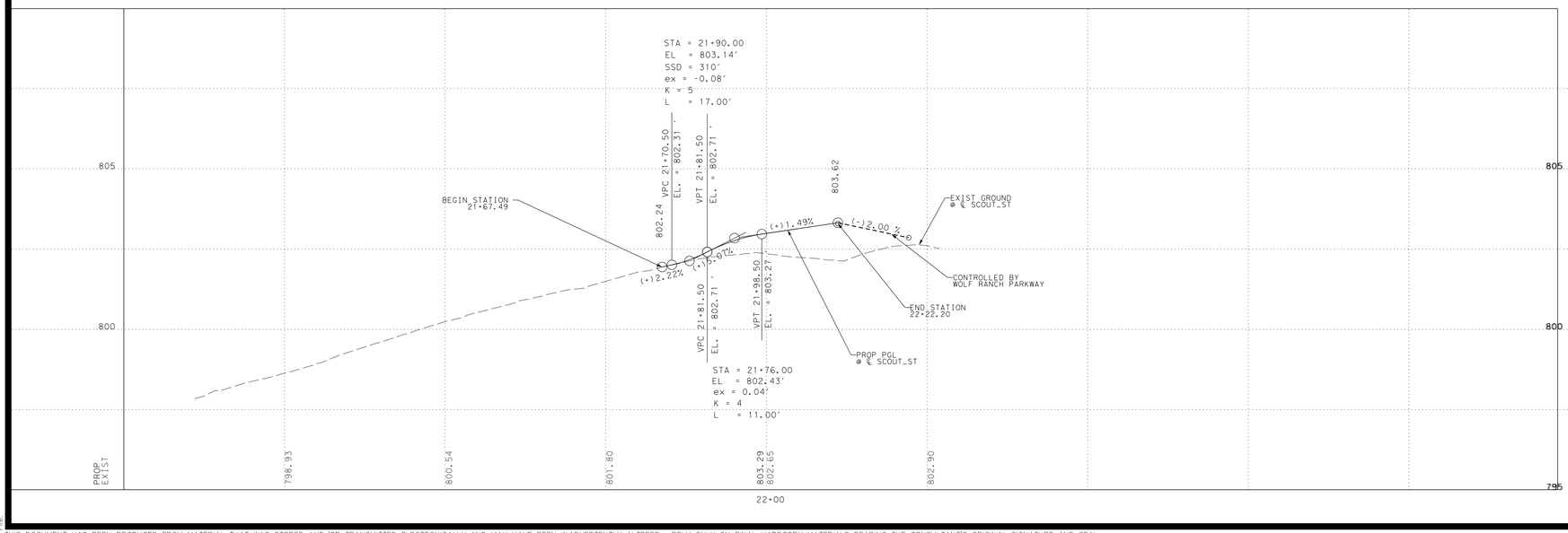

LEGEND

- PROPOSED ASPHALT PAVEMENT
- PROPOSED CONCRETE PAVEMENT
- PROPOSED MILL AND OVERLAY
- PROPOSED CONCRETE DRIVEWAY
- PROPOSED ASPHALT DRIVEWAY
- PROPOSED PAVERS
- PROPOSED CONCRETE SIDEWALK
- PROPOSED CURB RAMP
- PROP R.O.W
- EXIST R.O.W
- UTILITY EASEMENT R.O.W
- PGL PROFILE GRADE LINE
- PROPOSED TRAFFIC FLOW
- PROPOSED STORM DRAIN/INLET
- FOC1 EXIST/ABANDONED ATT
- FOC3 EXIST/ABANDONED MCI
- FOC4 EXIST/ABANDONED OPTIMUM
- FOC1 (D) EXIST/ABANDONED ATT
- FOC2 (D) EXIST/ABANDONED GEORGETOWN UTILITY SERVICES
- FOC3 (D) EXIST/ABANDONED MCI
- CTV1 EXIST/ABANDONED OPTIMUM
- CTV1 EXIST/ABANDONED UNKNOWN
- FOC4 (D) EXIST/ABANDONED OPTIMUM
- T1 EXIST/ABANDONED FRONTIER
- T1 (D) EXIST/ABANDONED FRONTIER
- TS1 (D) EXIST/ABANDONED FRONTIER
- TS1 (D) EXIST/ABANDONED TxDOT
- E1 (D) EXIST/ABANDONED GEORGETOWN UTILITY SERVICES
- E2 (D) EXIST/ABANDONED PEDERNALES ELECTRIC COOP
- E2 EXIST/ABANDONED PEDERNALES ELECTRIC COOP
- E1 EXIST/ABANDONED GEORGETOWN UTILITY SERVICES
- G1 EXIST/ABANDONED ATMOS
- G1 (D) EXIST/ABANDONED ATMOS
- W1 EXIST/ABANDONED GEORGETOWN UTILITY SERVICES
- W1 (D) EXIST/ABANDONED GEORGETOWN UTILITY SERVICES
- W2 EXIST/ABANDONED CITY OF ROUND ROCK
- W2 (D) EXIST/ABANDONED CITY OF ROUND ROCK
- WW1 (D) EXIST/ABANDONED CITY OF GEORGETOWN
- OHE EXIST/ABANDONED EXIST. OVERHEAD ELECTRIC
- EXIST/ABANDONED RETAINING WALL
- PR FOC PROPOSED AT&T
- G1 PROPOSED ATMOS
- PR-T1 PROPOSED FRONTIER UG
- PR-OHT1 PROPOSED FRONTIER AERIEL
- PR UGE PROPOSED COG ELECTRIC UG
- PR OHE PROPOSED COG ELECTRIC AERIEL
- W1 PROPOSED COG WATER
- PR TELECOM PROPOSED OPTIMUM
- PR UGE PROPOSED PEC ELECTRIC UG
- UTILITY REMOVAL
- R RAMP (12:1 MAX RUN, 1:48 MAX CROSS SLOPE
- L LANDING (1:48 MAX SLOPE, ALL DIRECTIONS)
- LS LEVEL SIDEWALK (1:48 MAX SLOPE, ALL DIRECTIONS)
- T TRANSITION

SCALE: 1"= 20'

0' 20' 40' 60'

SCALE: 1"= 20'

PROFILE 1"= 2'

NOTES

1. SEE HORIZONTAL ALIGNMENT DATA SHEETS FOR HORIZONTAL ALIGNMENT DATA.
2. SEE INTERSECTION LAYOUT SHEETS FOR INTERSECTION DETAILS.
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DESIGN

STATE OF TEXAS
BRET CHAPMAN
127293
LICENSED
PROFESSIONAL ENGINEER

BRET CHAPMAN, P.E. 9/16/2025 DATE

APPROVAL

STATE OF TEXAS
BRIAN A. ALLEN
123374
LICENSED
PROFESSIONAL ENGINEER

BRIAN A. ALLEN, P.E. 9/16/2025 DATE

NO.	REVISION	DATE

GEORGETOWN TEXAS
more than welcome

PAPE-DAWSON ENGINEERS
AUSTIN | SAN ANTONIO | HOUSTON | FORT WORTH | DALLAS
10801 N MOPAC EXPY, BLDG 3, STE 200 | AUSTIN, TX 78759 | 512.454.8711
TEXAS ENGINEERING FIRM #470 | TEXAS SURVEYING FIRM #10028800

CITY OF GEORGETOWN, TEXAS
WOLF RANCH PKWY / SCOUT ST
ROADWAY PLAN AND PROFILE

CITY JOB No.
JOB NO. 51423-04
DATE 9/16/2025
DESIGNER
CHECKED DRAWN

SHEET 21 OF 29

SHEET NO. 212

9/16/2025
Date: H:\Projects\51423\04\Design\Civil\Roadway\Sht\s Sheets\51423t04_rdwy_02_scout.dgn
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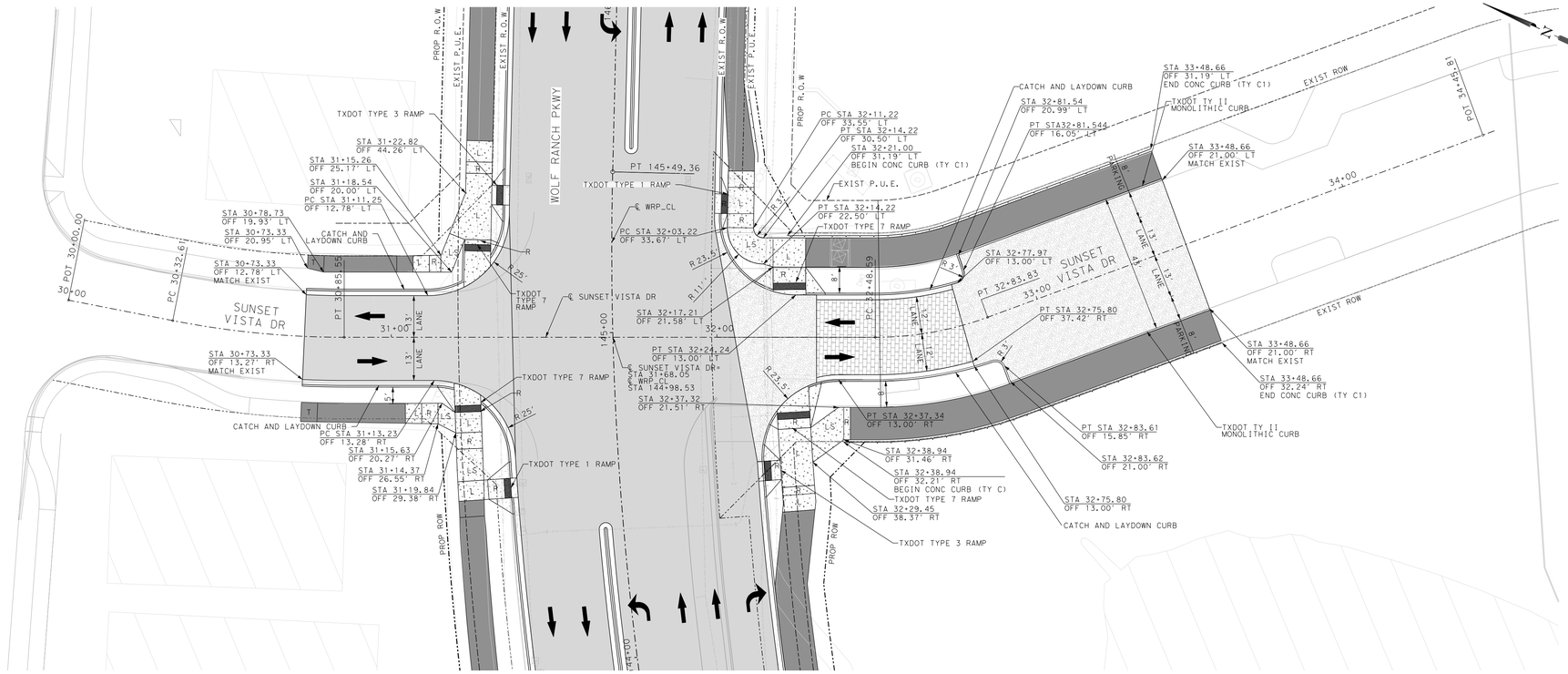

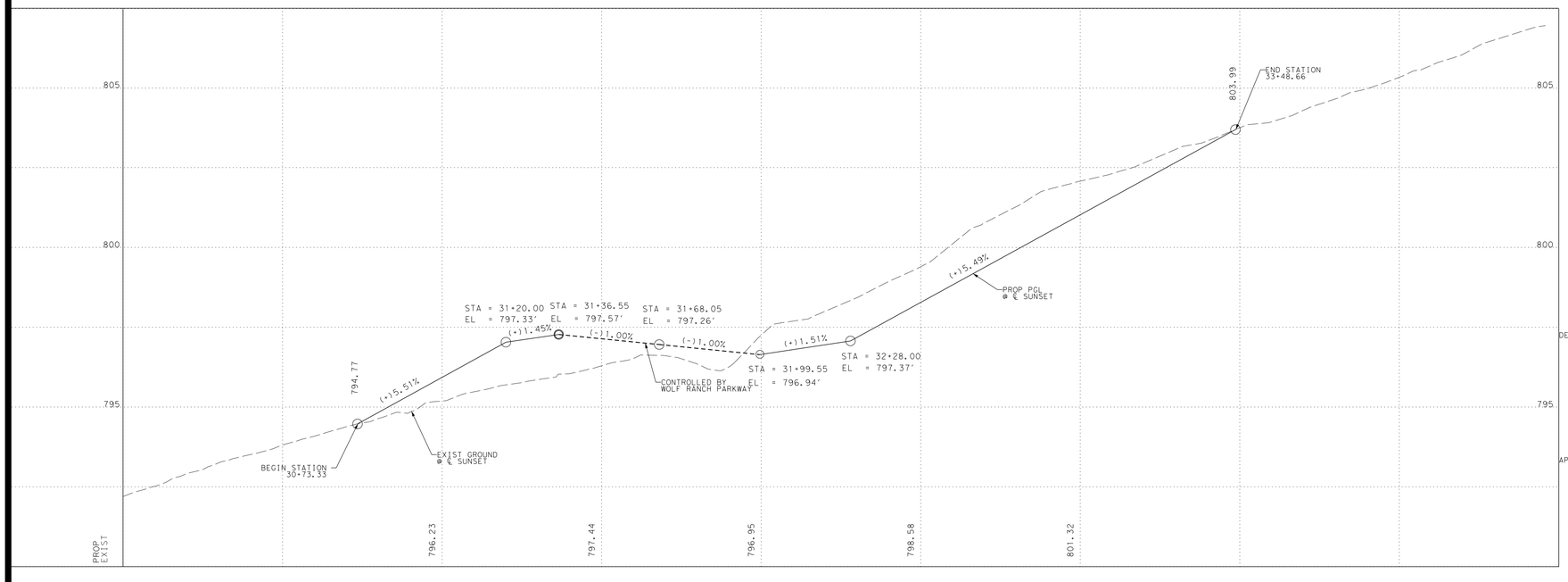

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LEGEND

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- UTILITY EASEMENT R.O.W
- PGL PROFILE GRADE LINE
- PROPOSED TRAFFIC FLOW
- PROPOSED STORM DRAIN/INLET
- FOC1 EXIST/ABANDONED ATT
- FOC3 EXIST/ABANDONED MCI
- FOC4 EXIST/ABANDONED OPTIMUM
- FOC1 (D) EXIST/ABANDONED ATT
- FOC2 (D) EXIST/ABANDONED GEORGETOWN UTILITY SERVICES
- FOC3 (D) EXIST/ABANDONED MCI
- CTV1 EXIST/ABANDONED OPTIMUM
- CTV1 (D) EXIST/ABANDONED UNKNOWN
- T2 (D) EXIST/ABANDONED OPTIMUM
- T1 EXIST/ABANDONED FRONTIER
- T1 (D) EXIST/ABANDONED FRONTIER
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DESIGN

STATE OF TEXAS
BRET CHAPMAN
127293
LICENSED
PROFESSIONAL ENGINEER

BRET CHAPMAN, P.E. 9/16/2025 DATE

APPROVAL

STATE OF TEXAS
BRIAN A. ALLEN
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LICENSED
PROFESSIONAL ENGINEER

BRIAN A. ALLEN, P.E. 9/16/2025 DATE

NO.	REVISION	DATE

GEORGETOWN TEXAS *more than welcome*

PAPE-DAWSON ENGINEERS
AUSTIN I SAN ANTONIO I HOUSTON I FORT WORTH I DALLAS
10801 N MOPAC EXPY, BLDG 3, STE 200 I AUSTIN, TX 78759 I 512.454.8711
TEXAS ENGINEERING FIRM #470 I TEXAS SURVEYING FIRM #10028800

CITY OF GEORGETOWN, TEXAS
WOLF RANCH PKWY / SUNSET VISTA DR
ROADWAY PLAN AND PROFILE

CITY JOB No.
JOB NO. 51423-04
DATE 9/16/2025
DESIGNER
CHECKED DRAWN
SHEET 22 OF 29
SHEET NO. 213

9/16/2025
Date: H:\Projects\514\23\04\Design\Civil\Roadway\Side Streets\5142304_rdwy_03_sunset.dgn
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- PGL PROFILE GRADE LINE
- PROPOSED TRAFFIC FLOW
- PROPOSED STORM DRAIN/INLET

- FOC1 — EXIST/ABANDONED ATT
- FOC3 — EXIST/ABANDONED MCI
- FOC4 — EXIST/ABANDONED OPTIMUM
- FOC1 (D) — EXIST/ABANDONED ATT
- FOC2 (D) — EXIST/ABANDONED GEORGETOWN UTILITY SERVICES
- FOC3 (D) — EXIST/ABANDONED MCI
- CTV1 — EXIST/ABANDONED OPTIMUM
- CTV4 — EXIST/ABANDONED UNKNOWN
- CTV4 (D) — EXIST/ABANDONED OPTIMUM
- T1 — EXIST/ABANDONED FRONTIER
- T1 (D) — EXIST/ABANDONED FRONTIER
- TS1 (D) — EXIST/ABANDONED FRONTIER
- TS1 (D) — EXIST/ABANDONED TxDOT
- E1 (D) — EXIST/ABANDONED GEORGETOWN UTILITY SERVICES
- E2 (D) — EXIST/ABANDONED PEDERNALES ELECTRIC COOP
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- E1 — EXIST/ABANDONED GEORGETOWN UTILITY SERVICES
- G1 — EXIST/ABANDONED ATMOS
- G1 (D) — EXIST/ABANDONED ATMOS
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- W2 (D) — EXIST/ABANDONED CITY OF ROUND ROCK
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- OHE — EXIST/ABANDONED EXIST. OVERHEAD ELECTRIC
- EXIST/ABANDONED RETAINING WALL

- PR FOC — PROPOSED AT&T
- G1 — PROPOSED ATMOS
- PR-T1 — PROPOSED FRONTIER UG
- PR-OHT1 — PROPOSED FRONTIER AERIEL
- PR UGE — PROPOSED COG ELECTRIC UG
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DESIGN

STATE OF TEXAS
BRET CHAPMAN
127293
LICENSED
PROFESSIONAL ENGINEER

BRET CHAPMAN, P.E. — 9/16/2025 DATE

APPROVAL

STATE OF TEXAS
BRIAN A. ALLEN
123374
LICENSED
PROFESSIONAL ENGINEER

BRIAN A. ALLEN, P.E. — 9/16/2025 DATE

NO.	REVISION	DATE

GEORGETOWN TEXAS
more than welcome

PAPE-DAWSON ENGINEERS
AUSTIN I SAN ANTONIO I HOUSTON I FORT WORTH I DALLAS
10801 N MOPAC EXPY, BLDG 3, STE 200 I AUSTIN, TX 78759 I 512.454.8711
TEXAS ENGINEERING FIRM #470 I TEXAS SURVEYING FIRM #10028800

CITY OF GEORGETOWN, TEXAS
WOLF RANCH PKWY / RIVER VISTA DR
ROADWAY PLAN AND PROFILE

CITY JOB No.
JOB NO. 51423-04
DATE 9/16/2025
DESIGNER
CHECKED DRAWN
SHEET 23 OF 29
SHEET NO. 214

9/16/2025
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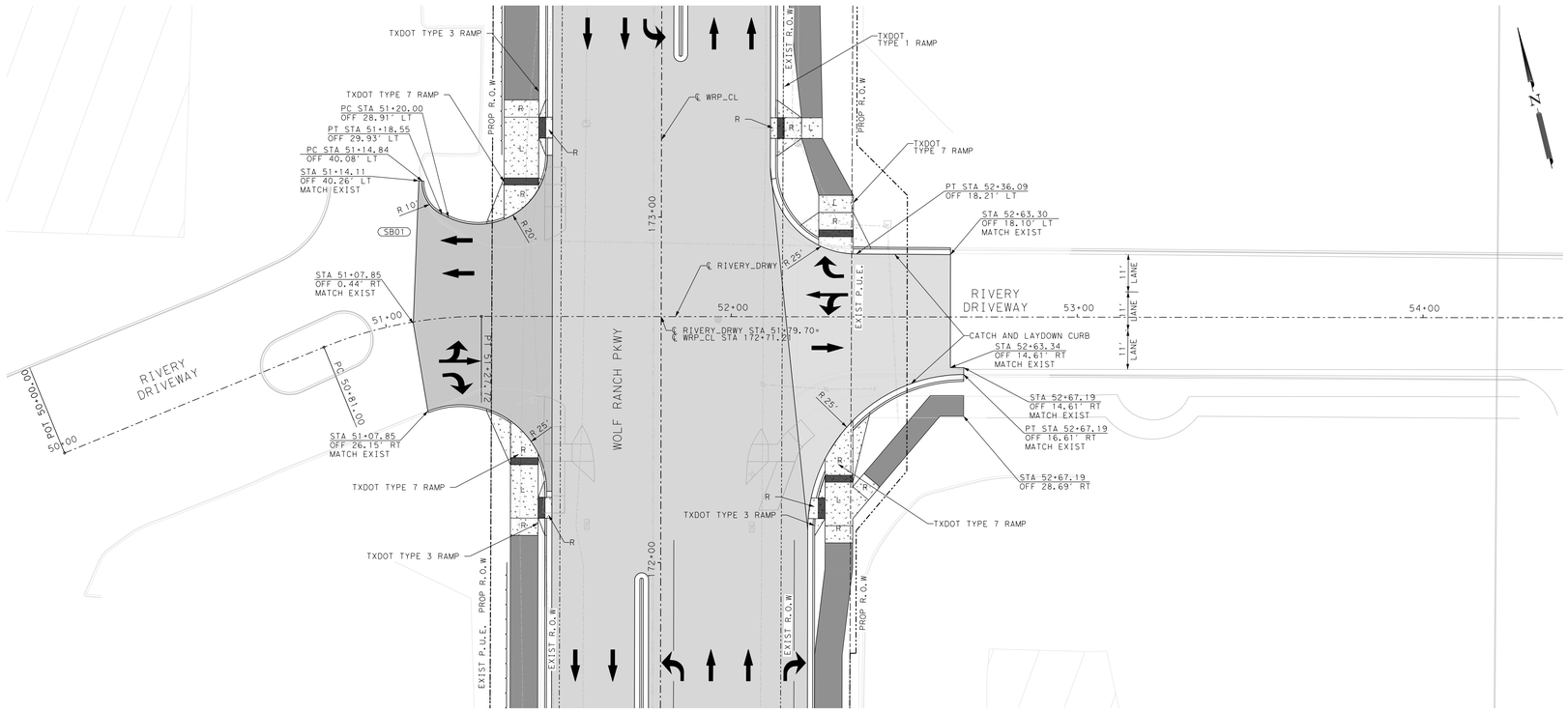

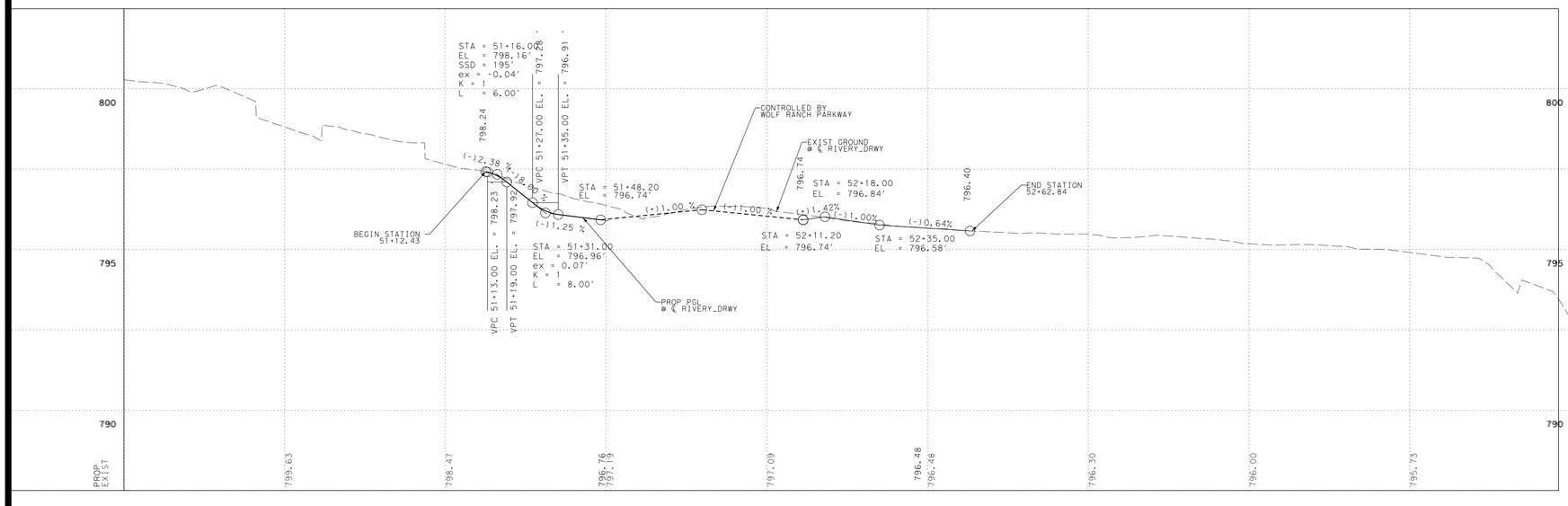

LEGEND

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BRET CHAPMAN
127293
LICENSED
PROFESSIONAL ENGINEER

BRET CHAPMAN, P.E. 9/16/2025 DATE

APPROVAL

STATE OF TEXAS
BRIAN A. ALLEN
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LICENSED
PROFESSIONAL ENGINEER

BRIAN A. ALLEN, P.E. 9/16/2025 DATE

NO.	REVISION	DATE

GEORGETOWN TEXAS
more than welcome

PAPE-DAWSON ENGINEERS
AUSTIN I SAN ANTONIO I HOUSTON I FORT WORTH I DALLAS
10801 N MOPAC EXPY, BLDG 3, STE 200 I AUSTIN, TX 78759 I 512.454.8711
TEXAS ENGINEERING FIRM #470 I TEXAS SURVEYING FIRM #10028800

CITY OF GEORGETOWN, TEXAS
WOLF RANCH PKWY / RIVERY DRWY

ROADWAY PLAN AND PROFILE

CITY JOB No.
JOB NO. 51423-04
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DESIGNER
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SHEET 24 OF 29
SHEET NO. 215

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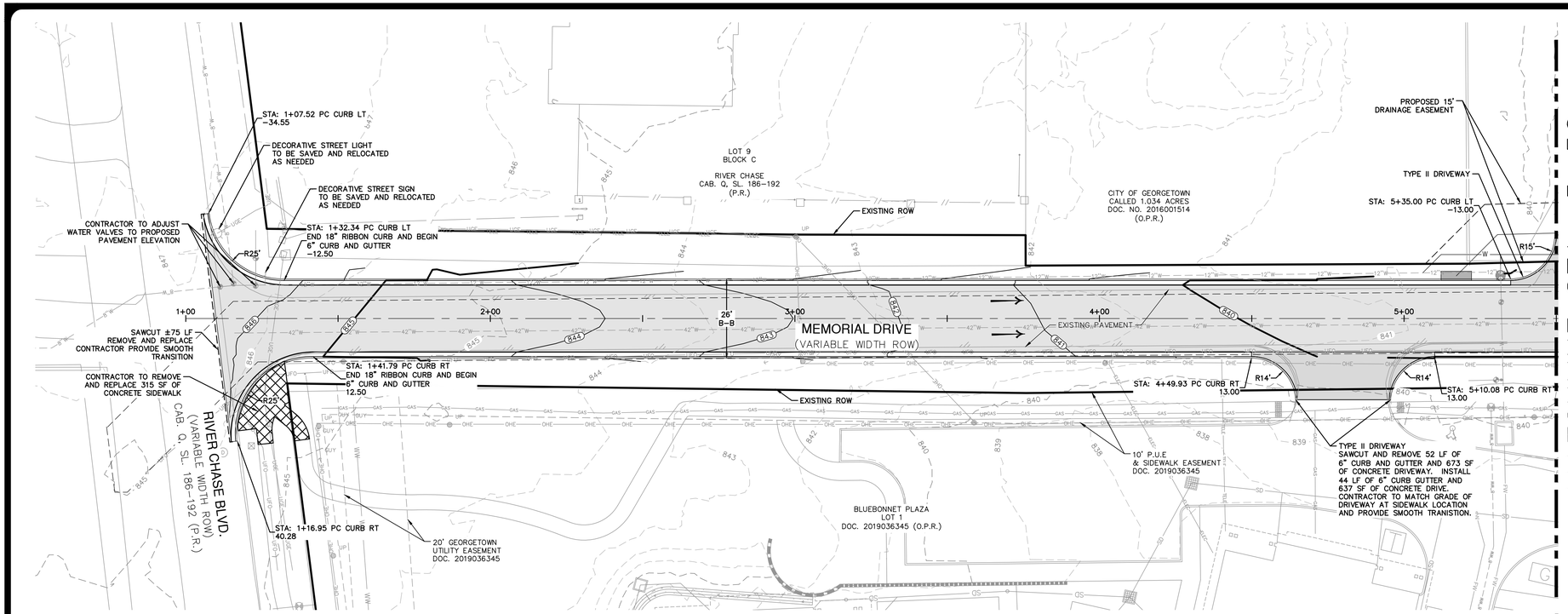

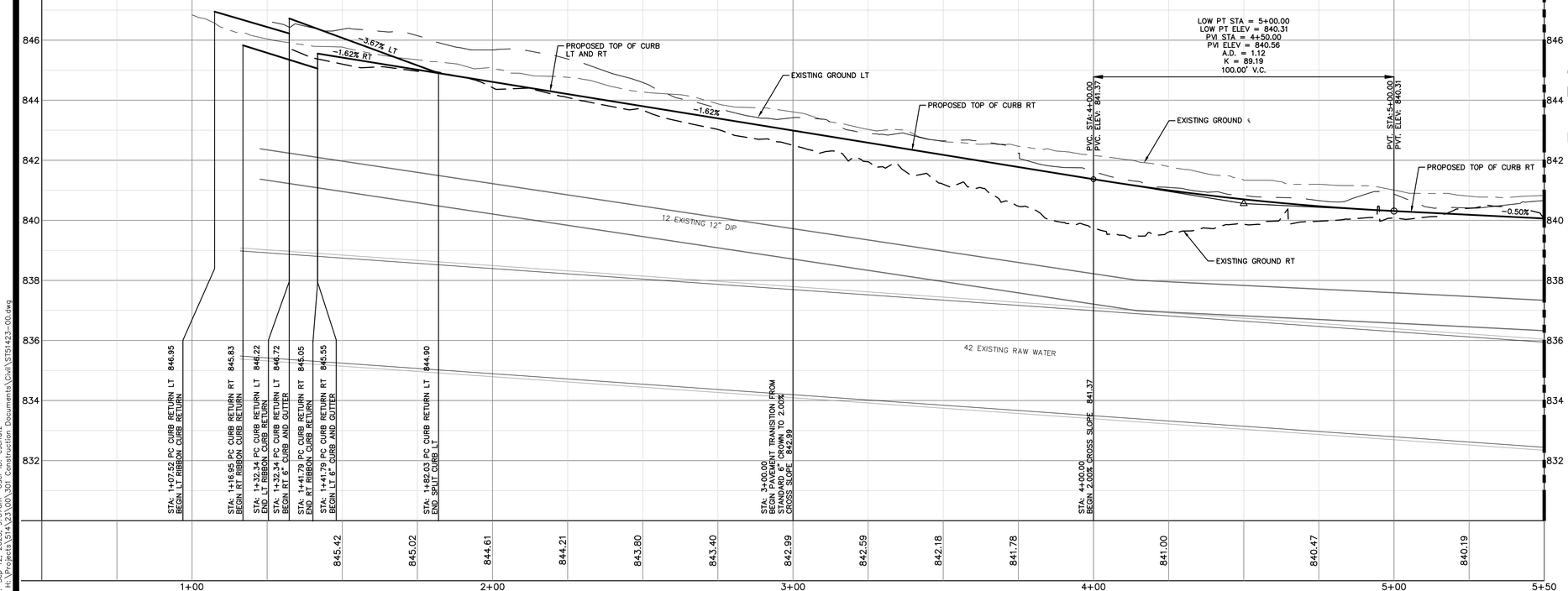

STATE OF TEXAS
STEVEN S. CRAUFORD
92677
LICENSED PROFESSIONAL ENGINEER
09/12/2025

PROFILE SCALES:
1" = 20' HORIZONTAL
1" = 2' VERTICAL

PROFILE LEGEND:
NATURAL GROUND RT ⊕ ROW
NATURAL GROUND LT ⊕ ROW
NATURAL GROUND ⊕ CENTER LINE
PROPOSED GRADELINE ⊕ TOP OF CURB (TC)

NO.	REVISION	DATE

GEORGETOWN TEXAS
more than welcome

PAPE-DAWSON ENGINEERS
AUSTIN | SAN ANTONIO | HOUSTON | FORT WORTH | DALLAS
10801 N MOPAC EXPY, BLDG 3, STE 200 | AUSTIN, TX 78759 | 512.454.8711
TBPE FIRM REGISTRATION #470 | TBPLS FIRM REGISTRATION #10028801

CITY OF GEORGETOWN, TEXAS
WOLF RANCH PKWY / MEMORIAL DR

MEMORIAL DRIVE - STA 1+00-5+50

CITY JOB No.
JOB NO. 51423-00
DATE 9/12/2025
DESIGNER WT
CHECKED SC DRAWN WT
SHEET 25 OF 29
SHEET 216

Date: Sep 12, 2025, 9:57am User ID: cschatz
File: H:\Projects\514\231\01\301 Construction Documents\Civil\ST51423-00.dwg

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MATCHLINE STA: 5+50

MATCHLINE STA: 10+00

CONTRACTOR TO MATCH EXISTING GRADE AND PROVIDE SMOOTH TRANSITION

TYPE II DRIVEWAY

STA: 5+82.00 PC CURB LT
-13.00

R15'

ALJD-GTTX, LLC
CALLED 39.17 ACRES
DOC. NO. 2006101010
(O.P.R.)

PROPOSED 15' DRAINAGE EASEMENT

EXISTING ROW

WOLF RANCH WEST,
SECTION 1A, PHASE 3
DOC. NO.2016085463 (O.P.R.)

BLOCK A

EXISTING PAVEMENT

MEMORIAL DRIVE
(VARIABLE WIDTH ROW)

26'
B-B

BLUEBONNET PLAZA
LOT 1
DOC. 2019036345 (O.P.R.)

BLUEBONNET PLAZA
LOT 2
DOC. 2019036345 (O.P.R.)

10' P.U.E
& SIDEWALK EASEMENT
DOC. 2019036345

EXISTING ROW

PROPOSED 5'
SIDEWALK

20' GEORGETOWN
UTILITY EASEMENT
DOC. 2019036345

MEMORIAL DRIVE (30 MPH)

LOW PT STA = 6+60.77
LOW PT ELEV = 839.71
PVI STA = 6+80.50
PVI ELEV = 839.41
A.D. = 1.24
K = 160.89
200.00' V.C.

PVC STA:5+80.50
PVC ELEV: 839.97

PVT STA:7+80.50
PVT ELEV: 840.15

-0.50%

0.74%

PROPOSED TOP OF CURB RT

EXISTING GROUND LT

EXISTING GROUND

EXISTING GROUND RT

12 EXISTING 12" DIP

42 EXISTING RAW WATER

839.94 | 839.82 | 839.75 | 839.71 | 839.72 | 839.76 | 839.84 | 839.96 | 840.11 | 840.30 | 840.49 | 840.67 | 840.86 | 841.04 | 841.23 | 841.42 | 841.60

6+00 7+00 8+00 9+00 10+00

SCALE: 1" = 20'

0' 20' 40' 60'

LEGEND

- PROPOSED ASPHALT PAVEMENT
- CENTER LINE
- W — WATER LINE
- WW — WASTEWATER LINE & MH
- SD — STORM DRAIN LINE & MH
- CURB INLET
- GATE VALVE
- FIRE HYDRANT
- EXISTING GATE VALVE
- EXISTING FIRE HYDRANT
- FW — EXISTING FIRE WATER LINE
- 8"W — EXISTING 8" WATER LINE
- 12"W — EXISTING 12" WATER LINE
- 42"W — EXISTING 42" WATER LINE
- WW — EXISTING WASTEWATER LINE
- SD — EXISTING STORM DRAIN LINE
- OHE — OHE — EXISTING OVERHEAD ELECTRIC LINE
- GAS — EXISTING GAS LINE
- EXISTING METAL FENCE
- EXISTING WOOD FENCE
- X — EXISTING BARBED WIRE FENCE
- DIRECTION OF FLOW
- PROPOSED CONCRETE DRIVEWAY
- PROPOSED SIDEWALK

STATE OF TEXAS
STEVEN S. CRAUFORD
92677
LICENSED
PROFESSIONAL ENGINEER

09/12/2025

PROFILE SCALES:

1" = 20' HORIZONTAL
1" = 2' VERTICAL

PROFILE LEGEND:

NATURAL GROUND RT @ ROW

NATURAL GROUND LT @ ROW

NATURAL GROUND @ CENTER LINE

PROPOSED GRADELINE @ TOP OF CURB (TC)

NO.	REVISION	DATE

GEORGETOWN
TEXAS
more than welcome

PAPE-DAWSON ENGINEERS
AUSTIN | SAN ANTONIO | HOUSTON | FORT WORTH | DALLAS
10801 N MOPAC EXPY, BLDG 3, STE 200 | AUSTIN, TX 78759 | 512.454.8711
TBPE FIRM REGISTRATION #470 | TBPLS FIRM REGISTRATION #10028801

CITY OF GEORGETOWN, TEXAS
WOLF RANCH PKWY / MEMORIAL DR

MEMORIAL DRIVE - STA 5+50-10+00

CITY JOB No.
JOB NO. 51423-00
DATE 9/12/2025
DESIGNER WT
CHECKED SC DRAWN WT

SHEET 26 OF 29

SHEET 217

Date: Sep 12, 2025, 10:58am User ID: cashatz
File: K:\Proj\51423\23\00\301 Construction Documents\Civil\ST51423-00.dwg

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MATCHLINE STA: 10+00

MATCHLINE STA: 14+50

EXISTING ROW

STA: 11+73.57 PC CURB LT
-13.00

STA: 11+73.57 ● PC

WOLF RANCH WEST,
SECTION 1A, PHASE 3
DOC. NO.20160085463 (O.P.R.)

BLOCK A

STA: 13+43.54 PC CURB LT
-12.98

STA: 13+41.07 ● PT

EXISTING PAVEMENT

26'
B-B

STA: 11+73.57 PC CURB RT
13.00

STA: 10+92.87 BEGIN DRIVEWAY CURB RT
11.00

STA: 11+19.82 END
DRIVEWAY CURB RT
11.00

MEMORIAL DRIVE
(VARIABLE WIDTH ROW)

STA: 13+41.07 PC CURB RT
13.00

CONTRACTOR TO MATCH
EXISTING GRADE AND
PROVIDE SMOOTH TRANSITION

0.057 ACRE LEASE TRACT
PRIMECO PERSONAL
COMMUNICATION, L.P.
DOC. NO. 1996044968 (O.P.R.)

BLUEBONNET PLAZA
LOT 2
DOC. 2019036345 (O.P.R.)

10' P.U.E.
& SIDEWALK EASEMENT
DOC. 2019036345

PROPOSED 5'
SIDEWALK

EXISTING ROW

MEMORIAL DRIVE (30 MPH)

HIGH PT STA = 12+53.07
HIGH PT ELEV = 843.47
PVI STA = 12+49.48
PVI ELEV = 843.64
A.D. = -1.39
K = 72.02
100.00' V.C.

PVC STA:11+99.48
PVC ELEV: 843.27

PVT STA:12+99.48
PVT ELEV: 843.32

EXISTING GROUND LT

EXISTING GROUND

EXISTING GROUND RT

PROPOSED TOP OF CURB RT

PROPOSED TOP OF CURB RT

PROPOSED TOP OF CURB
LT AND RT

0.74%

-0.57%

12 EXISTING 12" DIP

42 EXISTING RAW WATER

STA: 11+50.00
END 2.00% CROSS SLOPE AND
BEGIN TRANSITION TO STANDARD
6" CROWN, 842.90

STA: 12+50.00
BEGIN STANDARD 6" CROWN, 843.47

841.97	842.16	842.35	842.53	842.72	842.90	843.09	843.28	843.42	843.47	843.44	843.32	843.16	843.00	842.84	842.67	842.51
11+00							12+00				13+00				14+00	14+50

SCALE: 1" = 20'

0' 20' 40' 60'

LEGEND

- PROPOSED ASPHALT PAVEMENT
- CENTER LINE
- W — WATER LINE
- WW — WASTEWATER LINE & MH
- SD — STORM DRAIN LINE & MH
- CURB INLET
- GATE VALVE
- FIRE HYDRANT
- EXISTING GATE VALVE
- EXISTING FIRE HYDRANT
- FW — EXISTING FIRE WATER LINE
- 8"W — EXISTING 8" WATER LINE
- 12"W — EXISTING 12" WATER LINE
- 42"W — EXISTING 42" WATER LINE
- WW — EXISTING WASTEWATER LINE
- SD — EXISTING STORM DRAIN LINE
- OHE — OHE — EXISTING OVERHEAD ELECTRIC LINE
- GAS — GAS — EXISTING GAS LINE
- EXISTING METAL FENCE
- EXISTING WOOD FENCE
- X — EXISTING BARBED WIRE FENCE
- DIRECTION OF FLOW
- PROPOSED CONCRETE DRIVEWAY
- PROPOSED SIDEWALK

STATE OF TEXAS
STEVEN S. CRAUFORD
92677
LICENSED
PROFESSIONAL ENGINEER

09/12/2025

PROFILE SCALES:

1" = 20' HORIZONTAL
1" = 2' VERTICAL

PROFILE LEGEND:

- NATURAL GROUND RT @ ROW
- NATURAL GROUND LT @ ROW
- NATURAL GROUND @ CENTER LINE
- PROPOSED GRADELINE @ TOP OF CURB (TC)

NO.	REVISION	DATE

GEORGETOWN
TEXAS
more than welcome

PAPE-DAWSON ENGINEERS
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TBPE FIRM REGISTRATION #470 | TBPLS FIRM REGISTRATION #10028801

CITY OF GEORGETOWN, TEXAS
WOLF RANCH PKWY / MEMORIAL DR

MEMORIAL DRIVE - STA 10+00-14+50

CITY JOB No.
JOB NO. 51423-00
DATE 9/12/2025
DESIGNER WT
CHECKED SC DRAWN WT
SHEET 27 OF 29
SHEET 218

Date: Sep 12, 2025, 10:56am User ID: cschatz
File: H:\Projects\514_23\001\301 Construction Documents\Civil\ST51423-00.dwg

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MATCHLINE STA: 14+50

MATCHLINE STA: 19+00

EXISTING ROW

MEMORIAL DRIVE
(VARIABLE WIDTH ROW)

26'
B-B

15+00 16+00 17+00 18+00 19+00

BLOCK A
25

WOLF RANCH WEST,
SECTION 1A, PHASE 3
DOC. NO.2016085463 (O.P.R.)

STA: 18+80.48 PI CURB RT
13.00

STA: 18+61.44 PC CURB RT
25.15

STA: 17+98.48 PI CURB RT
13.00

STA: 18+17.00 PC CURB RT
24.10

STA: 18+17.00 PC CURB RT
33.53

STA: 17+98.30 PC CURB RT
44.62

R21'

R10'

R657'

R660'

10' P.U.E
& SIDEWALK EASEMENT
DOC. 2019036345

TYPE II DRIVEWAY
SAWCUT AND REMOVE
89 LF 6" CURB AND GUTTER.
CONTRACTOR CONNECT TO
EXISTING PAVEMENT AND PROVIDE
SMOOTH TRANSITION

STA: 18+61.44 PC CURB RT
33.58

STA: 18+79.61 PC CURB RT
45.71

BLUEBONNET PLAZA
LOT 3
DOC. 2019036345 (O.P.R.)

BLUEBONNET PLAZA
LOT 4
DOC. 2019036345 (O.P.R.)

MEMORIAL DRIVE (30 MPH)

PROPOSED TOP OF CURB
LT AND RT

EXISTING GROUND LT

EXISTING GROUND

EXISTING GROUND RT

-0.64%

12 EXISTING 12" DIP

42 EXISTING RAW WATER

STA: 19+00.00 839.45
BEGIN CONSTRUCTION
OF ROUNDABOUT
(SEE SHEET 221 OF 523 FOR GRADING)

842.19 842.03 841.87 841.71 841.55 841.39 841.22 841.06 840.90 840.74 840.58 840.42 840.26 840.10 839.94 839.78 839.61

15+00 16+00 17+00 18+00 19+00

SCALE: 1" = 20'

0' 20' 40' 60'

LEGEND

- PROPOSED ASPHALT PAVEMENT
- CENTER LINE
- W — WATER LINE
- WW — WASTEWATER LINE & MH
- SD — STORM DRAIN LINE & MH
- CURB INLET
- GATE VALVE
- FIRE HYDRANT
- EXISTING GATE VALVE
- EXISTING FIRE HYDRANT
- FW — EXISTING FIRE WATER LINE
- 8"W — EXISTING 8" WATER LINE
- 12"W — EXISTING 12" WATER LINE
- 42"W — EXISTING 42" WATER LINE
- WW — EXISTING WASTEWATER LINE
- SD — EXISTING STORM DRAIN LINE
- OHE — EXISTING OVERHEAD ELECTRIC LINE
- GAS — EXISTING GAS LINE
- EXISTING METAL FENCE
- EXISTING WOOD FENCE
- X — EXISTING BARBED WIRE FENCE
- DIRECTION OF FLOW
- PROPOSED CONCRETE DRIVEWAY
- PROPOSED SIDEWALK

PROFILE SCALES:
1" = 20' HORIZONTAL
1" = 2' VERTICAL

PROFILE LEGEND:

- NATURAL GROUND RT @ ROW
- NATURAL GROUND LT @ ROW
- NATURAL GROUND @ CENTER LINE
- PROPOSED GRADELINE @ TOP OF CURB (TC)

STATE OF TEXAS
STEVEN S. CRAUFORD
92677
LICENSED
PROFESSIONAL ENGINEER

09/12/2025

NO.	REVISION	DATE

GEORGETOWN
TEXAS
more than welcome

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TBPE FIRM REGISTRATION #470 | TBPLS FIRM REGISTRATION #10028801

CITY OF GEORGETOWN, TEXAS
WOLF RANCH PKWY / MEMORIAL DR

MEMORIAL DRIVE - STA 14+50-19+00

CITY JOB No.
JOB NO. 51423-00
DATE 9/12/2025
DESIGNER WT
CHECKED SC DRAWN WT
SHEET 28 OF 29
SHEET 219

Date: Sep 12, 2025, 9:59am User ID: cschultz
File: H:\Projects\514\23\00\301 Construction Documents\Civil\51514423-00.dwg

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MATCHLINE STA: 23+50

STA: 23+65.97 PC CURB LT
-28.00

STA: 24+00.12 PI CURB LT
-28.00
TC 832.59

STA: 25+00.02 PI CURB LT
-18.50
TC 831.89

EXISTING ROW

OWNER: WOLF LAKES, LP
REMNANT PORTION OF
A CALLED 202.149 ACRE TRACT
TRACT FIVE: PARCEL ONE
DOC. NO. 2013096286 (O.P.R.)

PROPOSED 6'
SIDEWALK

EXISTING BARBED WIRE FENCE
TO BE REMOVED AND REPLACED
AT PROPOSED RIGHT-OF-WAY

STA: 27+53.73 PC CURB LT
-18.50

STA: 27+53.73 ℄ PC

STA: 28+34.56
END CONSTRUCTION
℄ CONNECT TO EXISTING PAVEMENT

EXISTING PAVEMENT

24+00 25+00 26+00 27+00 28+00

37'
B-B

36'
B-B

MEMORIAL DRIVE
(VARIABLE WIDTH ROW)

R7' R7'

STA: 26+56.49 PC CURB RT
18.01

STA: 26+63.49 PC CURB RT
26.43

STA: 26+81.96 PC CURB RT
17.50

STA: 26+74.67 PC CURB RT
23.63

TYPE II DRIVEWAY
CONTRACTOR TO END DRIVEWAY
AND MATCH EXISTING GRADE.

EXISTING ROW

A CALLED 12 3/10 ACRE TRACT
VOL. 117, PG. 173 (D.R.)

STA: 28+02.69 PI CURB RT
16.94

LOT 3
CR 265 SUBDIVISION
CABINET EE, SLIDES 237-238 (P.R.)

STA: 24+00.00 CURB RT
18.50
TC 832.93

SCALE: 1" = 20'
0' 20' 40' 60'

LEGEND

- PROPOSED ASPHALT PAVEMENT
- CENTER LINE
- W — WATER LINE
- WW — WASTEWATER LINE & MH
- SD — STORM DRAIN LINE & MH
- CURB INLET
- GATE VALVE
- FIRE HYDRANT
- EXISTING GATE VALVE
- EXISTING FIRE HYDRANT
- FW — EXISTING FIRE WATER LINE
- 8"W — EXISTING 8" WATER LINE
- 12"W — EXISTING 12" WATER LINE
- 42"W — EXISTING 42" WATER LINE
- WW — EXISTING WASTEWATER LINE
- SD — EXISTING STORM DRAIN LINE
- OHE — OHE — EXISTING OVERHEAD ELECTRIC LINE
- GAS — EXISTING GAS LINE
- EXISTING METAL FENCE
- EXISTING WOOD FENCE
- X — EXISTING BARBED WIRE FENCE
- DIRECTION OF FLOW
- PROPOSED CONCRETE DRIVEWAY
- PROPOSED SIDEWALK

MATCHLINE STA: 23+50

SEE SHEET 221 OF 523
FOR GRADING

TRANSITION FROM ROUNDABOUT
TO TYPICAL ROADWAY SECTION
(SEE PLAN VIEW FOR TOP OF CURB ELEVATIONS)

MEMORIAL DRIVE (30 MPH)

PROPOSED TOP OF CURB

EXISTING GROUND LT

EXISTING GROUND ℄

EXISTING GROUND RT

-1.46%

-1.00%

-1.4%

12 EXISTING 12" DIP

42 EXISTING RAW WATER

STA: 24+00.00
END CONSTRUCTION
OF ROUNDABOUT
(SEE SHEET XX OF XX FOR GRADING)

PVI STA: 28+10.97
PVI ELEV: 827.34

STA: 28+34.56 827.10
END CONSTRUCTION
AND CONNECT TO EXISTING PAVEMENT

834 832 830 828 826 824 822 820 818

833.71 833.35 832.98 832.62 832.25 831.89 831.52 831.15 830.79 830.42 830.06 829.69 829.32 828.96 828.59 828.23 827.86 827.50 827.19

24+00 25+00 26+00 27+00 28+00 28+50

PROFILE SCALES:
1" = 20' HORIZONTAL
1" = 2' VERTICAL

PROFILE LEGEND:

- NATURAL GROUND RT ℄ ROW
- NATURAL GROUND LT ℄ ROW
- NATURAL GROUND ℄ CENTER LINE
- PROPOSED GRADELINE ℄ TOP OF CURB (TC)

STATE OF TEXAS
STEVEN S. CRAUFORD
92677
LICENSED
PROFESSIONAL ENGINEER

09/12/2025

NO.	REVISION	DATE

GEORGETOWN
TEXAS
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CITY OF GEORGETOWN, TEXAS
WOLF RANCH PKWY / MEMORIAL DR

MEMORIAL DRIVE 23+50-END

CITY JOB No.
JOB NO. 51423-00
DATE 9/12/2025
DESIGNER WT
CHECKED SC DRAWN WT
SHEET 29 OF 29
SHEET 220

Date: Sep 12, 2025, 10:00am User ID: cashatz
File: I:\Projects\514\23\00\301 Construction Documents\Civil\ST51423-00.dwg

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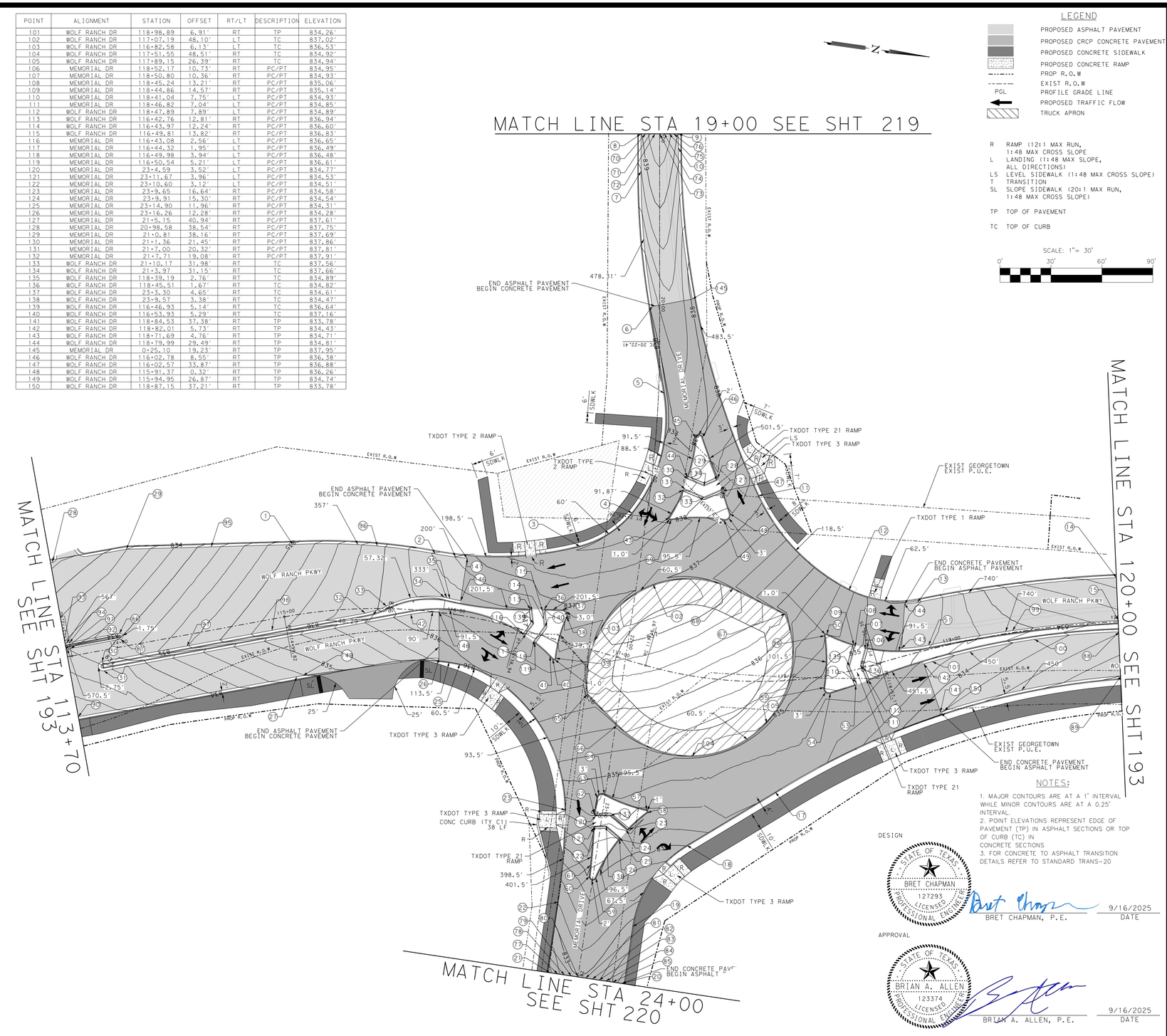
POINT	ALIGNMENT	STATION	OFFSET	RT/LT	DESCRIPTION	ELEVATION
1	WOLF RANCH DR	115+10.79	41.25'	LT	PC/PT	835.01'
2	WOLF RANCH DR	115+85.45	33.95'	LT	PC/PT	836.54'
3	WOLF RANCH DR	116+61.30	55.20'	LT	TC	837.53'
4	MEMORIAL DR	21+25.85	7.28'	RT	TC	837.67'
5	MEMORIAL DR	20+52.42	4.90'	LT	PC/PT	838.43'
6	MEMORIAL DR	20+01.70	4.34'	RT	PC/PT	838.03'
7	MEMORIAL DR	19+22.16	11.00'	RT	PC/PT	838.74'
8	MEMORIAL DR	19+00.00	11.00'	RT	TP	838.98'
9	MEMORIAL DR	1+22.40	11.00'	RT	TP	838.98'
10	MEMORIAL DR	19+08.34	11.00'	LT	PC/PT	838.85'
11	MEMORIAL DR	21+06.59	62.20'	LT	PC/PT	837.08'
12	WOLF RANCH DR	118+50.06	45.30'	LT	PC/PT	835.34'
13	WOLF RANCH DR	118+89.77	28.49'	LT	PC/PT	834.74'
14	WOLF RANCH DR	120+00.00	25.91'	LT	TP	833.12'
15	WOLF RANCH DR	120+00.00	0.72'	LT	TP	833.63'
17	WOLF RANCH DR	117+91.76	64.07'	RT	PC/PT	834.53'
18	MEMORIAL DR	23+12.75	51.08'	LT	PC/PT	834.00'
19	MEMORIAL DR	23+65.97	26.00'	LT	PC/PT	832.88'
20	MEMORIAL DR	24+00.00	26.00'	LT	TP	832.12'
21	MEMORIAL DR	24+00.00	16.50'	RT	TP	832.46'
22	MEMORIAL DR	23+58.05	16.50'	RT	PC/PT	833.27'
23	MEMORIAL DR	23+05.62	19.95'	RT	TC	834.54'
25	WOLF RANCH DR	116+08.93	26.81'	RT	PC/PT	835.93'
26	WOLF RANCH DR	115+94.95	26.87'	RT	TP	835.83'
27	WOLF RANCH DR	115+05.00	35.98'	RT	TP	834.70'
28	WOLF RANCH DR	113+70.00	56.22'	LT	PC/PT	832.69'
29	WOLF RANCH DR	114+15.55	56.00'	LT	TP	833.24'
30	WOLF RANCH DR	113+89.53	6.51'	RT	PC/PT	833.72'
31	WOLF RANCH DR	113+89.56	12.00'	RT	PC/PT	833.68'
32	WOLF RANCH DR	115+47.64	2.73'	RT	PC/PT	835.93'
33	WOLF RANCH DR	115+60.28	1.42'	LT	PC/PT	836.05'
34	WOLF RANCH DR	115+93.44	9.19'	LT	PC/PT	836.33'
35	WOLF RANCH DR	115+96.51	8.90'	LT	PC/PT	836.35'
36	WOLF RANCH DR	116+48.77	16.34'	LT	PC/PT	837.09'
37	WOLF RANCH DR	116+60.55	19.15'	LT	PC/PT	836.97'
38	WOLF RANCH DR	116+66.18	14.17'	LT	PC/PT	836.92'
39	WOLF RANCH DR	116+66.56	10.43'	RT	PC/PT	836.44'
40	WOLF RANCH DR	116+62.86	13.03'	RT	PC/PT	836.39'
41	WOLF RANCH DR	116+60.76	11.84'	RT	PC/PT	836.41'
42	WOLF RANCH DR	115+74.84	2.76'	RT	PC/PT	836.16'
43	MEMORIAL DR	21+23.69	11.92'	LT	PC/PT	837.80'
44	MEMORIAL DR	21+00.59	19.09'	LT	PC/PT	837.92'
45	MEMORIAL DR	20+77.36	21.97'	LT	PC/PT	838.06'
46	MEMORIAL DR	20+76.03	28.68'	LT	PC/PT	838.01'
47	MEMORIAL DR	21+03.91	43.20'	LT	PC/PT	837.63'
48	MEMORIAL DR	21+16.83	49.61'	LT	PC/PT	837.28'
49	MEMORIAL DR	21+22.87	45.42'	LT	PC/PT	837.23'
50	WOLF RANCH DR	118+30.57	25.31'	LT	PC/PT	835.34'
51	WOLF RANCH DR	118+87.41	2.54'	LT	PC/PT	834.53'
53	WOLF RANCH DR	118+40.46	10.40'	RT	PC/PT	835.01'
54	WOLF RANCH DR	118+25.47	12.07'	RT	PC/PT	834.81'
55	WOLF RANCH DR	118+20.72	6.19'	RT	PC/PT	835.05'
56	WOLF RANCH DR	118+26.11	23.45'	LT	PC/PT	835.41'
57	MEMORIAL DR	22+95.22	25.53'	LT	PC/PT	834.70'
58	MEMORIAL DR	22+99.57	27.06'	LT	PC/PT	834.52'
59	MEMORIAL DR	23+41.21	3.28'	LT	PC/PT	834.02'
60	MEMORIAL DR	23+40.45	3.59'	RT	PC/PT	834.02'
61	MEMORIAL DR	23+33.85	3.88'	RT	PC/PT	834.15'
62	MEMORIAL DR	23+05.01	6.19'	RT	PC/PT	834.97'
63	MEMORIAL DR	22+93.95	6.07'	RT	PC/PT	834.88'
64	MEMORIAL DR	22+89.77	0.03'	RT	PC/PT	834.82'
65	WOLF RANCH DR	116+88.68	27.09'	RT	PC/PT	936.14'
66	WOLF RANCH DR	117+10.77	39.94'	RT	PC/PT	835.76'
67	WOLF RANCH DR	118+04.83	40.25'	LT	PC/PT	835.89'
68	WOLF RANCH DR	117+66.37	55.46'	LT	PC/PT	836.51'
69	MEMORIAL DR	21+27.02	14.97'	LT	PC/PT	837.75'
70	MEMORIAL DR	19+00.00	8.25'	RT	TP	839.16'
71	MEMORIAL DR	19+00.00	5.50'	RT	TP	839.32'
72	MEMORIAL DR	19+00.00	2.75'	RT	TP	839.41'
73	MEMORIAL DR	19+00.00	0.00'	RT	TP	839.45'
74	MEMORIAL DR	19+00.00	2.75'	LT	TP	839.41'
75	MEMORIAL DR	19+00.00	5.50'	LT	TP	839.32'
76	MEMORIAL DR	19+00.00	8.25'	LT	TP	839.16'
77	MEMORIAL DR	24+00.00	12.00'	RT	TP	832.70'
78	MEMORIAL DR	24+00.00	8.00'	RT	TP	832.85'
79	MEMORIAL DR	24+00.00	4.00'	RT	TP	832.95'
80	MEMORIAL DR	24+00.00	0.00'	RT	TP	832.98'
81	MEMORIAL DR	24+00.00	4.50'	LT	TP	832.96'
82	MEMORIAL DR	24+00.00	8.50'	LT	TP	832.88'
83	MEMORIAL DR	24+00.00	12.50'	LT	TP	832.77'
84	MEMORIAL DR	24+00.00	16.50'	LT	TP	832.60'
85	MEMORIAL DR	24+00.00	20.50'	LT	TP	832.40'
86	WOLF RANCH DR	114+02.62	8.00'	LT	PC/PT	833.95'
87	WOLF RANCH DR	114+02.62	4.50'	LT	PC/PT	834.01'
88	WOLF RANCH DR	120+00.00	6.02'	RT	TP	833.52'
89	WOLF RANCH DR	120+00.00	32.03'	RT	TP	832.50'
90	WOLF RANCH DR	113+70.00	35.95'	RT	TP	833.04'
91	WOLF RANCH DR	113+69.11	4.50'	LT	PC/PT	833.72'
92	WOLF RANCH DR	113+72.63	4.50'	LT	PC/PT	833.77'
93	WOLF RANCH DR	113+69.12	8.00'	LT	PC/PT	833.51'
94	WOLF RANCH DR	113+72.63	8.00'	LT	PC/PT	833.55'
95	WOLF RANCH DR	114+64.98	48.35'	LT	TP	834.15'
96	WOLF RANCH DR	115+54.87	36.79'	LT	TP	835.92'
97	WOLF RANCH DR	114+40.37	6.50'	RT	TP	834.73'
98	WOLF RANCH DR	114+91.21	6.50'	RT	TP	835.40'
99	WOLF RANCH DR	119+37.41	1.15'	LT	TP	834.10'
100	WOLF RANCH DR	119+49.48	5.87'	RT	TP	833.91'

POINT	ALIGNMENT	STATION	OFFSET	RT/LT	DESCRIPTION	ELEVATION
101	WOLF RANCH DR	118+98.89	6.91'	RT	TP	834.26'
102	WOLF RANCH DR	117+07.19	48.10'	LT	TC	837.02'
103	WOLF RANCH DR	116+82.58	6.13'	LT	TC	836.53'
104	WOLF RANCH DR	117+51.55	48.51'	RT	TC	834.92'
105	WOLF RANCH DR	117+89.15	26.39'	RT	TC	834.94'
106	MEMORIAL DR	18+52.17	10.73'	RT	PC/PT	834.95'
107	MEMORIAL DR	18+50.80	10.36'	RT	PC/PT	834.93'
108	MEMORIAL DR	18+45.24	13.21'	RT	PC/PT	835.06'
109	MEMORIAL DR	18+44.86	14.57'	RT	PC/PT	835.14'
110	MEMORIAL DR	18+41.04	7.75'	LT	PC/PT	834.93'
111	MEMORIAL DR	18+46.82	7.04'	LT	PC/PT	834.85'
112	WOLF RANCH DR	118+47.89	7.89'	LT	PC/PT	834.89'
113	WOLF RANCH DR	116+42.76	12.81'	RT	PC/PT	836.94'
114	WOLF RANCH DR	116+43.97	12.24'	RT	PC/PT	836.60'
115	WOLF RANCH DR	116+49.81	13.82'	RT	PC/PT	836.83'
116	MEMORIAL DR	116+43.08	2.56'	LT	PC/PT	836.65'
117	MEMORIAL DR	116+44.32	1.95'	LT	PC/PT	836.49'
118	MEMORIAL DR	116+49.98	3.94'	LT	PC/PT	836.48'
119	MEMORIAL DR	116+50.54	5.21'	LT	PC/PT	836.61'
120	MEMORIAL DR	23+4.59	3.52'	LT	PC/PT	834.77'
121	MEMORIAL DR	23+11.67	3.96'	LT	PC/PT	834.53'
122	MEMORIAL DR	23+10.60	3.12'	LT	PC/PT	834.51'
123	MEMORIAL DR	23+9.65	16.64'	RT	PC/PT	834.58'
124	MEMORIAL DR	23+9.91	15.30'	RT	PC/PT	834.54'
125	MEMORIAL DR	23+14.90	11.96'	RT	PC/PT	834.31'
126	MEMORIAL DR	23+16.26	12.28'	RT	PC/PT	834.28'
127	MEMORIAL DR	21+5.15	40.94'	RT	PC/PT	837.61'
128	MEMORIAL DR	20+98.58	38.54'	RT	PC/PT	837.75'
129	MEMORIAL DR	21+0.81	38.16'	RT	PC/PT	837.69'
130	MEMORIAL DR	21+1.36	21.45'	RT	PC/PT	837.86'
131	MEMORIAL DR	21+7.00	20.32'	RT	PC/PT	837.81'
132	MEMORIAL DR	21+7.71	19.08'	RT	PC/PT	837.91'
133	WOLF RANCH DR	21+10.17	31.98'	RT	TC	837.56'
134	WOLF RANCH DR	21+3.97	31.15'	RT	TC	837.66'
135	WOLF RANCH DR	118+39.19	2.76'	RT	TC	834.89'
136	WOLF RANCH DR	118+45.51	1.67'	RT	TC	834.82'
137	WOLF RANCH DR	23+3.30	4.65'	RT	TC	834.61'
138	WOLF RANCH DR	23+9.57	3.38'	RT	TC	834.47'
139	WOLF RANCH DR	116+46.93	5.14'	RT	TC	836.64'
140	WOLF RANCH DR	116+53.93	5.29'	RT	TC	837.16'
141	WOLF RANCH DR	118+84.53	37.38'	RT	TP	833.78'
142	WOLF RANCH DR	118+82.01	5.73'	RT	TP	834.43'
143	WOLF RANCH DR	118+71.69	4.76'	RT	TP	834.71'
144	WOLF RANCH DR	118+79.99	29.49'	RT	TP	834.81'
145	MEMORIAL DR	0+25.10	19.23'	RT	TP	837.95'
146	WOLF RANCH DR	116+02.78	8.55'	RT	TP	836.38'
147	WOLF RANCH DR	116+02.57	33.87'	RT	TP	836.88'
148	WOLF RANCH DR	115+91.37	0.32'	RT	TP	836.26'
149	WOLF RANCH DR	115+94.95	26.87'	RT	TP	834.74'
150	WOLF RANCH DR	118+87.15	37.21'	RT	TP	833.78'



LEGEND

- PROPOSED ASPHALT PAVEMENT
- PROPOSED CRCP CONCRETE PAVEMENT
- PROPOSED CONCRETE SIDEWALK
- PROPOSED CONCRETE RAMP
- PROP R.O.W
- EXIST R.O.W
- PGL PROFILE GRADE LINE
- PROPOSED TRAFFIC FLOW
- TRUCK APRON

R RAMP (12:1 MAX RUN, 1:48 MAX CROSS SLOPE)
L LANDING (1:48 MAX SLOPE, ALL DIRECTIONS)
LS LEVEL SIDEWALK (1:48 MAX CROSS SLOPE)
T TRANSITION
SL SLOPE SIDEWALK (20:1 MAX RUN, 1:48 MAX CROSS SLOPE)

TP TOP OF PAVEMENT

TC TOP OF CURB

SCALE: 1"= 30'

0' 30' 60' 90'

NOTES:

1. MAJOR CONTOURS ARE AT A 1' INTERVAL WHILE MINOR CONTOURS ARE AT A 0.25' INTERVAL.
2. POINT ELEVATIONS REPRESENT EDGE OF PAVEMENT (TP) IN ASPHALT SECTIONS OR TOP OF CURB (TC) IN CONCRETE SECTIONS
3. FOR CONCRETE TO ASPHALT TRANSITION DETAILS REFER TO STANDARD TRANS-20

DESIGN

STATE OF TEXAS · BRET CHAPMAN · 127293 · LICENSED · PROFESSIONAL ENGINEER

BRET CHAPMAN, P.E. — 9/16/2025 DATE

APPROVAL

STATE OF TEXAS · BRIAN A. ALLEN · 123374 · LICENSED · PROFESSIONAL ENGINEER

BRIAN A. ALLEN, P.E. — 9/16/2025 DATE

NO.	REVISION	DATE

GEORGETOWN TEXAS *more than welcome*

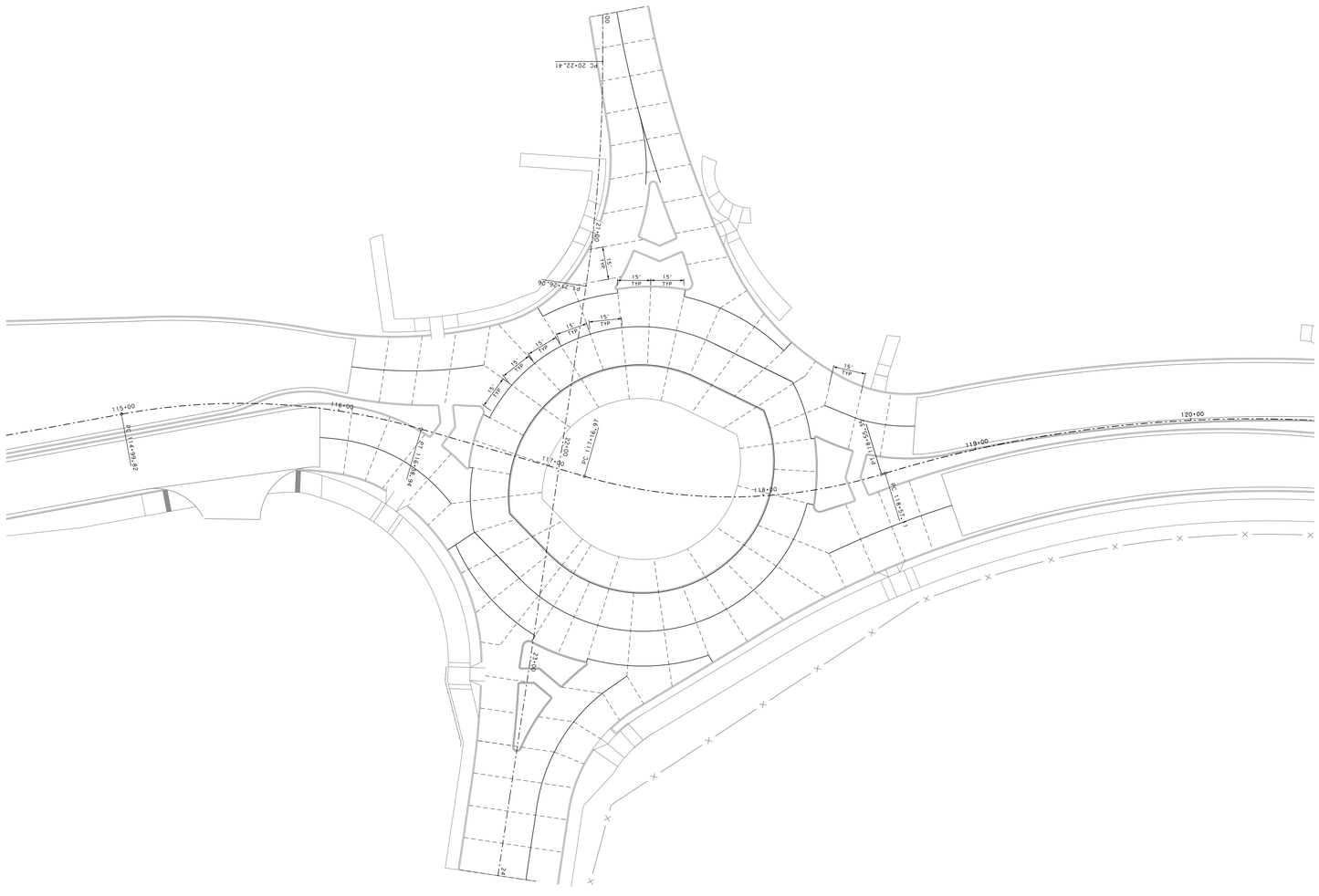
PAPE-DAWSON ENGINEERS
AUSTIN | SAN ANTONIO | HOUSTON | FORT WORTH | DALLAS
10801 N MOPAC EXPY, BLDG 3, STE 200 | AUSTIN, TX 78759 | 512.454.8711
TEXAS ENGINEERING FIRM #470 | TEXAS SURVEYING FIRM #10028800

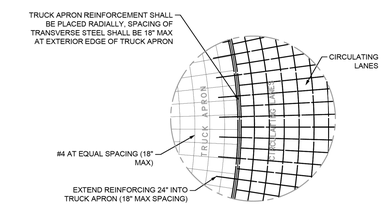
WOLF RANCH PKWY / MEMORIAL DR
ROUNDABOUT DETAIL

CITY JOB No.
JOB NO. 51423-04
DATE 9/16/2025
DESIGNER
CHECKED DRAWN

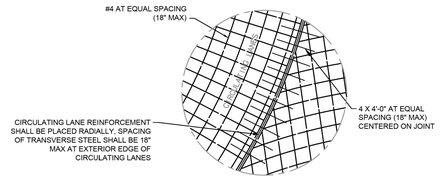
SHEET 1 OF 6

SHEET NO. 221





STEEL REINFORCEMENT DETAIL A



STEEL REINFORCEMENT DETAIL B

ROUNDABOUT STEEL REINFORCEMENT LAYOUT

NOTES:

1. PROVIDE CONTINUOUS NO. 4 REBAR 2" OFF FACE AT ALL CONSTRUCTION JOINTS, ON BOTH SIDES OF JOINT.
2. ALL REBAR 18" MAXIMUM SPACING.

SCALE: 1"= 30'

0' 30' 60' 90'

NOTES

1. ALL PAVEMENT JOINTS ARE EITHER SAWED CONTRACTION OR CONSTRUCTION JOINTS UNLESS NOTED OTHERWISE.
2. TRANSVERSE JOINT SPACING: DESIRABLE: 15', MAXIMUM: 18', MINIMUM: 4'.
3. LONGITUDINAL JOINT SPACING SHALL MATCH LANE LINES UNLESS SHOWN OTHERWISE.
4. FOR MORE DETAILED SAWCUT AND JOINT INFORMATION REFER TO STANDARD JS-14
5. ALL PAVEMENT JOINTS SHALL BE SEALED. REFER TO CONCRETE PAVING STANDARD DETAIL FOR JOINT INFORMATION.
6. REFER TO CRCP(1)-24 FOR REBAR SIZE AND SPACING OUTSIDE OF THE CIRCULATING AREA.

DESIGN

STATE OF TEXAS
BRET CHAPMAN
127293
LICENSED
PROFESSIONAL ENGINEER

BRET CHAPMAN, P.E. 9/16/2025 DATE

APPROVAL

STATE OF TEXAS
BRIAN A. ALLEN
123374
LICENSED
PROFESSIONAL ENGINEER

BRIAN A. ALLEN, P.E. 9/16/2025 DATE

NO.	REVISION	DATE

GEORGETOWN TEXAS *more than welcome*

PAPE-DAWSON ENGINEERS
AUSTIN I SAN ANTONIO I HOUSTON I FORT WORTH I DALLAS
10801 N MOPAC EXPY, BLDG 3, STE 200 I AUSTIN, TX 78759 I 512.454.8711
TEXAS ENGINEERING FIRM #470 I TEXAS SURVEYING FIRM #10028800

WOLF RANCH PKWY / MEMORIAL DR
ROUNDABOUT JOINTING LAYOUT

CITY JOB No.
JOB NO. 51423-04
DATE 9/16/2025
DESIGNER
CHECKED DRAWN

SHEET 1 OF 1

SHEET NO. 222

POINT	ALIGNMENT	STATION	OFFSET	POINT	ELEVATION
1	CL_LEGACY	4+52.66	51.60' RT	EOP	821.96
2	CL_LEGACY	4+52.77	45.60' RT	EOP	821.94
3	CL_LEGACY	4+52.83	42.03' RT	EOP	821.93
4	CL_LEGACY	4+47.60	26.29' RT	EOP	821.25
5	CL_LEGACY	4+37.73	18.64' RT	EOP	821.06
6	CL_LEGACY	4+27.58	16.60' RT	EOP	821.03
9	CL_LEGACY	4+03.22	16.67' RT	EOP	MATCH EXIST
10	CL_LEGACY	4+03.22	0.00'	---	MATCH EXIST
11	CL_LEGACY	4+03.22	16.54' LT	EOP	MATCH EXIST
14	CL_LEGACY	4+29.44	16.63' LT	EOP	821.05
15	CL_LEGACY	4+38.38	19.32' LT	EOP	821.01
16	CL_LEGACY	4+46.47	23.45' LT	EOP	820.87
17	CL_LEGACY	4+54.28	41.20' LT	EOP	820.60
18	CL_LEGACY	4+54.33	44.29' LT	EOP	820.65
19	CL_LEGACY	4+54.44	50.29' LT	EOP	820.47
20	CL_LEGACY	4+34.77	74.98' LT	---	MATCH EXIST
21	CL_LEGACY	4+26.91	72.52' LT	---	MATCH EXIST
22	CL_LEGACY	5+17.43	49.20' LT	EOP	820.45
23	CL_LEGACY	5+17.32	43.20' LT	EOP	820.61

LEGEND

- PROPOSED ASPHALT PAVEMENT
- PROPOSED CONCRETE PAVEMENT
- PROPOSED MILL AND OVERLAY
- PROPOSED CONCRETE DRIVEWAY
- PROPOSED ASPHALT DRIVEWAY
- PROPOSED PAVERS
- PROPOSED CONCRETE SIDEWALK
- PROPOSED CURB RAMP
- PROP R.O.W
- EXIST R.O.W
- UTILITY EASEMENT R.O.W
- PGL PROFILE GRADE LINE
- PROPOSED TRAFFIC FLOW
- PROPOSED STORM DRAIN/INLET

R RAMP (12:1 MAX RUN, 1:48 MAX CROSS SLOPE)
L LANDING (1:48 MAX SLOPE, ALL DIRECTIONS)
LS LEVEL SIDEWALK (1:48 MAX CROSS SLOPE)
T TRANSITION
SL SLOPE SIDEWALK (20:1 MAX RUN, 1:48 MAX CROSS SLOPE)

POINT	ALIGNMENT	STATION	OFFSET	POINT	ELEVATION
24	CL_LEGACY	5+17.28	40.46' LT	EOP	820.68
25	CL_LEGACY	5+33.89	18.07' LT	EOP	821.11
26	CL_LEGACY	5+42.48	16.53' LT	EOP	821.24
27	CL_LEGACY	5+45.86	16.54' LT	EOP	821.26
28	CL_LEGACY	5+46.88	15.07' LT	EOP	821.38
30	CL_LEGACY	5+51.89	15.18' RT	EOP	821.55
31	CL_LEGACY	5+46.88	15.68' RT	EOP	821.52
32	CL_LEGACY	5+43.25	18.31' RT	EOP	821.52
33	CL_LEGACY	5+33.12	26.02' RT	EOP	821.60
34	CL_LEGACY	5+26.88	39.74' RT	EOP	821.77
35	CL_LEGACY	5+26.75	46.89' RT	EOP	821.77
36	CL_LEGACY	5+26.65	52.88' RT	EOP	821.77
37	CL_LEGACY	6+06.88	15.22' RT	EOP	823.38
39	CL_LEGACY	6+06.88	15.10' LT	EOP	823.38
42	CL_LEGACY	6+38.53	16.62' LT	---	MATCH EXIST
43	CL_LEGACY	6+38.53	0.00'	---	MATCH EXIST
44	CL_LEGACY	6+38.53	16.77' RT	---	MATCH EXIST
45	CL_LEGACY	6+06.88	16.72' RT	TOC	823.80
46	CL_LEGACY	6+06.88	16.60' LT	TOC	823.80
47	CL_LEGACY	5+46.88	16.57' LT	TOC	821.84
48	CL_LEGACY	5+46.88	17.21' RT	TOC	822.00
49	CL_LEGACY	5+17.46	36.98' LT	EOP	820.78

NOTES

1. MAJOR CONTOURS ARE AT A 1' INTERVAL WHILE MINOR CONTOURS ARE AT A 0.25' INTERVAL.
2. POINT ELEVATIONS REPRESENT EDGE OF PAVEMENT UNLESS OTHERWISE NOTED.
3. FOR ADDITIONAL INFORMATION REFER TO TO THE APPLICABLE PLAN AND PROFILE SHEET.

SCALE: 1"= 10'
0' 10' 20' 30'

DESIGN

STATE OF TEXAS
BRET CHAPMAN
127293
LICENSED
PROFESSIONAL ENGINEER

BRET CHAPMAN, P.E. 9/16/2025 DATE

APPROVAL

STATE OF TEXAS
BRIAN A. ALLEN
123374
LICENSED
PROFESSIONAL ENGINEER

BRIAN A. ALLEN, P.E. 9/16/2025 DATE

NO.	REVISION	DATE

GEORGETOWN TEXAS
more than welcome

PAPE-DAWSON ENGINEERS
AUSTIN I SAN ANTONIO I HOUSTON I FORT WORTH I DALLAS
10801 N MOPAC EXPY, BLDG 3, STE 200 I AUSTIN, TX 78759 I 512.454.8711
TEXAS ENGINEERING FIRM #470 I TEXAS SURVEYING FIRM #10028800

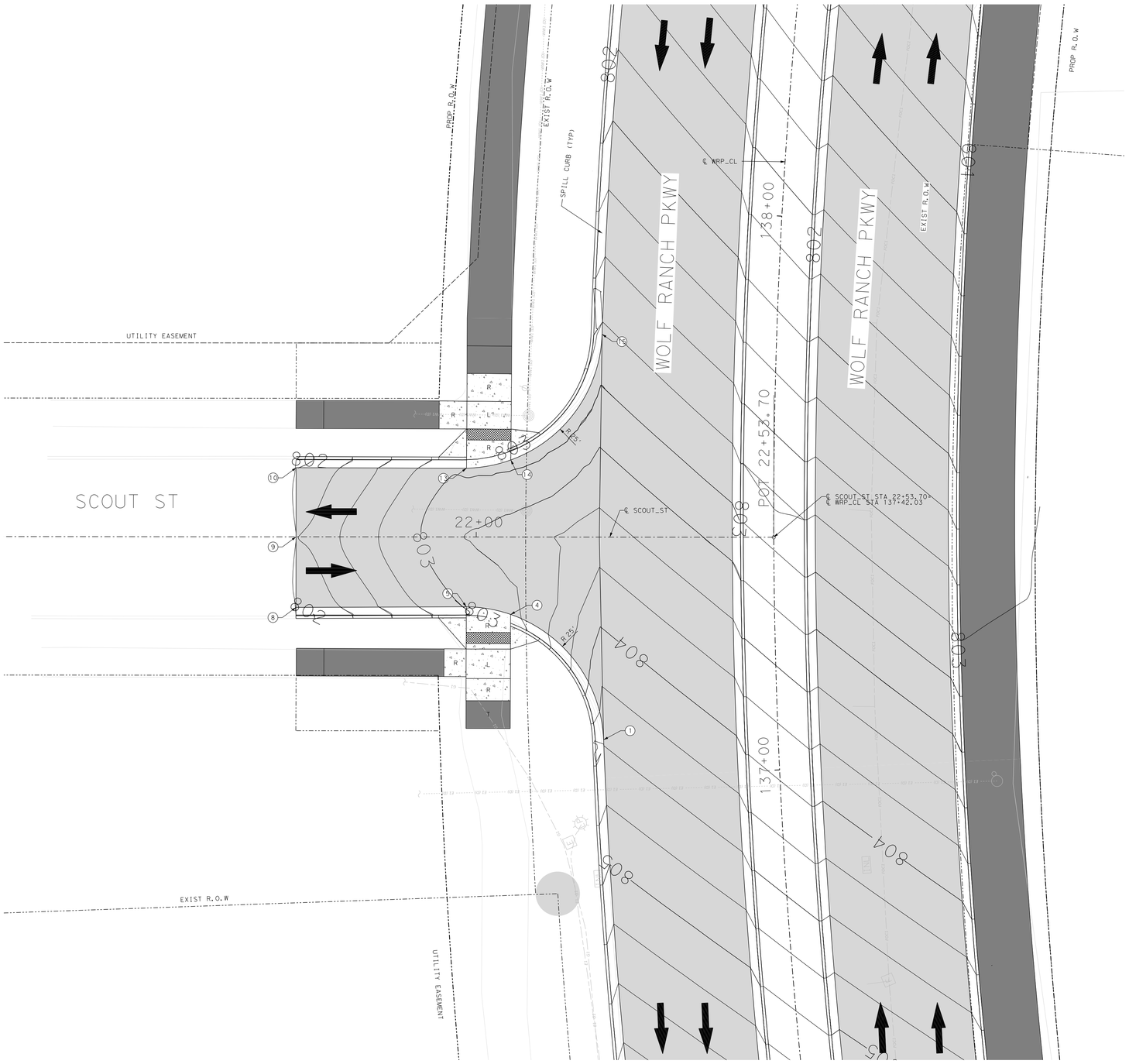
CITY OF GEORGETOWN, TEXAS
WOLF RANCH PKWY / LEGACY X-ING

INTERSECTION DETAIL

CITY JOB No.
JOB NO. 51423-04
DATE 9/16/2025
DESIGNER
CHECKED DRAWN
SHEET 1 OF 6
SHEET NO. 223

Date: 9/16/2025
File:

THIS DOCUMENT HAS BEEN PRODUCED FROM MATERIAL THAT WAS STORED AND/OR TRANSMITTED ELECTRONICALLY AND MAY HAVE BEEN INADVERTENTLY ALTERED. RELY ONLY ON FINAL HARDCOPY MATERIALS BEARING THE CONSULTANT'S ORIGINAL SIGNATURE AND SEAL.



LEGEND

- PROPOSED ASPHALT PAVEMENT
- PROPOSED CONCRETE PAVEMENT
- PROPOSED MILL AND OVERLAY
- PROPOSED CONCRETE DRIVEWAY
- PROPOSED ASPHALT DRIVEWAY
- PROPOSED PAVERS
- PROPOSED CONCRETE SIDEWALK
- PROPOSED CURB RAMP
- PROP R.O.W
- EXIST R.O.W
- UTILITY EASEMENT R.O.W
- PGL PROFILE GRADE LINE
- PROPOSED TRAFFIC FLOW
- PROPOSED STORM DRAIN/INLET

R RAMP (12:1 MAX RUN, 1:48 MAX CROSS SLOPE
L LANDING (1:48 MAX SLOPE, ALL DIRECTIONS)
LS LEVEL SIDEWALK (1:48 MAX CROSS SLOPE)
T TRANSITION
SL SLOPE SIDEWALK (20:1 MAX RUN, 1:48 MAX CROSS SLOPE)

POINT	ALIGNMENT	STATION	OFFSET	POINT	ELEVATION
1	SCOUT_ST	22+23.02	36.60' RT	EOP	804.48
4	SCOUT_ST	22+06.21	13.98' RT	EOP	803.16
5	SCOUT_ST	21+98.21	12.61' RT	EOP	803.01
8	SCOUT_ST	21+67.46	12.75' RT	EOP	MATCH EXIST
9	SCOUT_ST	21+67.48	0.00'	---	MATCH EXIST
10	SCOUT_ST	21+67.49	12.47' LT	EOP	MATCH EXIST
13	SCOUT_ST	21+98.22	12.41' LT	EOP	802.97
14	SCOUT_ST	22+06.23	13.91' LT	EOP	802.94
15	SCOUT_ST	22+22.68	36.63' LT	EOP	802.80

SCALE: 1"= 10'
0' 10' 20' 30'

NOTES

1. MAJOR CONTOURS ARE AT A 1' INTERVAL WHILE MINOR CONTOURS ARE AT A 0.25' INTERVAL.
2. POINT ELEVATIONS REPRESENT EDGE OF PAVEMENT UNLESS OTHERWISE NOTED.
3. FOR ADDITIONAL INFORMATION REFER TO TO THE APPLICABLE PLAN AND PROFILE SHEET.

DESIGN

STATE OF TEXAS
BRET CHAPMAN
127293
LICENSED
PROFESSIONAL ENGINEER

BRET CHAPMAN, P.E. 9/16/2025 DATE

APPROVAL

STATE OF TEXAS
BRIAN A. ALLEN
123374
LICENSED
PROFESSIONAL ENGINEER

BRIAN A. ALLEN, P.E. 9/16/2025 DATE

NO.	REVISION	DATE

GEORGETOWN TEXAS
more than welcome

PAPE-DAWSON ENGINEERS
AUSTIN I SAN ANTONIO I HOUSTON I FORT WORTH I DALLAS
10801 N MOPAC EXPY, BLDG 3, STE 200 I AUSTIN, TX 78759 I 512.454.8711
TEXAS ENGINEERING FIRM #470 I TEXAS SURVEYING FIRM #10028800

CITY OF GEORGETOWN, TEXAS
WOLF RANCH PKWY / SCOUT ST

INTERSECTION DETAIL

CITY JOB No.
JOB NO. 51423-04
DATE 9/16/2025
DESIGNER
CHECKED DRAWN

SHEET 2 OF 6

SHEET NO. 224

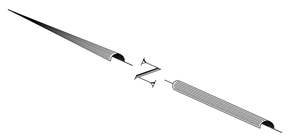
Date: 9/16/2025
File:

THIS DOCUMENT HAS BEEN PRODUCED FROM MATERIAL THAT WAS STORED AND/OR TRANSMITTED ELECTRONICALLY AND MAY HAVE BEEN INADVERTENTLY ALTERED. RELY ONLY ON FINAL HARDCOPY MATERIALS BEARING THE CONSULTANT'S ORIGINAL SIGNATURE AND SEAL.

POINT	ALIGNMENT	STATION	OFFSET	POINT	ELEVATION
1	CL_SUNSET	31+38.98	49.14' RT	EOP	797.30
2	CL_SUNSET	31+38.58	43.16' RT	EOP	797.32
3	CL_SUNSET	31+38.15	36.74' RT	EOP	797.30
4	CL_SUNSET	31+27.41	17.71' RT	EOP	796.96
5	CL_SUNSET	31+19.27	14.02' RT	EOP	796.83
6	CL_SUNSET	31+13.19	13.27' RT	EOP	796.80
9	CL_SUNSET	30+73.33	13.27' RT	EOP	MATCH EXIST
10	CL_SUNSET	30+73.33	0.00'	---	MATCH EXIST
11	CL_SUNSET	30+73.33	12.78' LT	EOP	MATCH EXIST

POINT	ALIGNMENT	STATION	OFFSET	POINT	ELEVATION
15	CL_SUNSET	31+11.25	12.78' LT	EOP	796.60
16	CL_SUNSET	31+22.28	15.34' LT	EOP	797.02
17	CL_SUNSET	31+30.42	21.73' LT	EOP	797.26
18	CL_SUNSET	31+36.25	37.52' LT	EOP	797.83
19	CL_SUNSET	31+36.29	40.57' LT	EOP	797.91
20	CL_SUNSET	31+36.38	46.57' LT	EOP	798.08
21	CL_SUNSET	31+99.35	44.05' LT	EOP	797.14
22	CL_SUNSET	31+99.26	38.05' LT	EOP	797.07
23	CL_SUNSET	31+99.25	36.76' LT	EOP	797.06
24	CL_SUNSET	31+99.65	32.03' LT	EOP	796.99
25	CL_SUNSET	32+17.28	14.06' LT	EOP	797.26
26	CL_SUNSET	32+27.29	13.00' LT	EOP	797.39

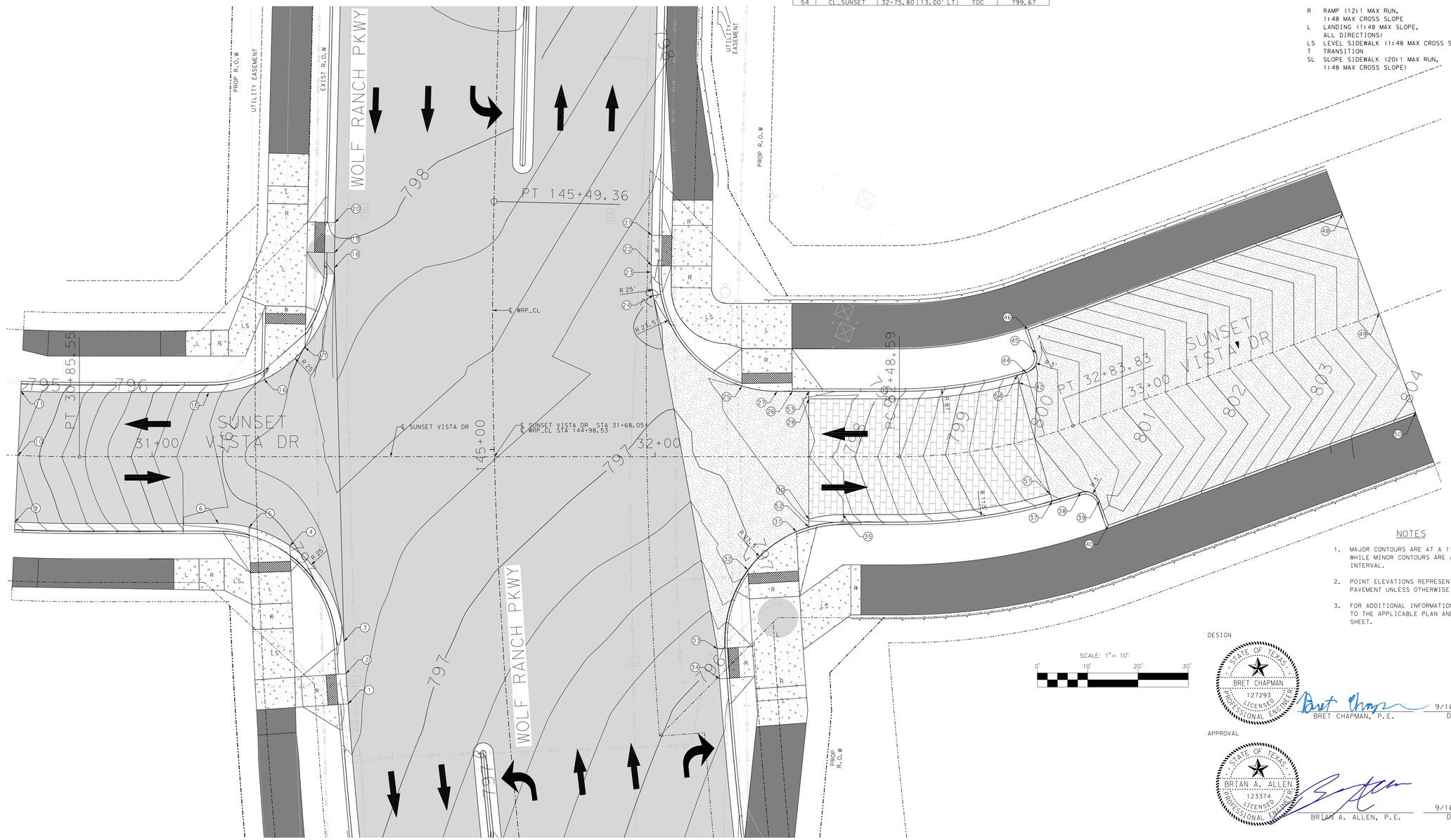
POINT	ALIGNMENT	STATION	OFFSET	POINT	ELEVATION
27	CL_SUNSET	32+24.24	13.00' LT	EOP	797.35
28	CL_SUNSET	32+30.57	11.50' LT	EOP	797.52
30	CL_SUNSET	32+30.57	12.43' RT	EOP	797.26
31	CL_SUNSET	32+28.11	14.89' RT	EOP	797.13
32	CL_SUNSET	32+18.47	22.49' RT	EOP	796.86
33	CL_SUNSET	32+12.39	38.19' RT	EOP	796.06
34	CL_SUNSET	32+12.82	44.18' RT	EOP	795.92
35	CL_SUNSET	32+37.34	11.50' RT	EOP	797.36
37	CL_SUNSET	32+75.80	13.00' RT	TOC	799.67
38	CL_SUNSET	32+81.02	13.00' RT	TOC	799.96
39	CL_SUNSET	32+83.61	15.85' RT	TOC	801.65
40	CL_SUNSET	32+83.62	21.00' RT	TOC	801.42
42	CL_SUNSET	32+75.80	11.50' LT	EOP	799.75
44	CL_SUNSET	32+77.97	13.00' LT	TOC	799.79
45	CL_SUNSET	32+81.54	16.05' LT	TOC	800.62
46	CL_SUNSET	32+81.54	20.98' LT	TOC	801.21
48	CL_SUNSET	33+48.66	21.00' LT	EOP	MATCH EXIST
49	CL_SUNSET	33+48.66	0.00'	---	MATCH EXIST
50	CL_SUNSET	33+48.66	21.00' RT	EOP	MATCH EXIST
51	CL_SUNSET	32+75.80	11.50' RT	EOP	799.75
52	CL_SUNSET	32+30.57	14.00' RT	TOC	797.17
53	CL_SUNSET	32+30.57	13.00' LT	TOC	797.43
54	CL_SUNSET	32+75.80	13.00' LT	TOC	799.67



LEGEND

- PROPOSED ASPHALT PAVEMENT
- PROPOSED CONCRETE PAVEMENT
- PROPOSED MILL AND OVERLAY
- PROPOSED CONCRETE DRIVEWAY
- PROPOSED ASPHALT DRIVEWAY
- PROPOSED PAVERS
- PROPOSED CONCRETE SIDEWALK
- PROPOSED CURB RAMP
- PROP R.O.W
- EXIST R.O.W
- UTILITY EASEMENT R.O.W
- PGL PROFILE GRADE LINE
- PROPOSED TRAFFIC FLOW
- PROPOSED STORM DRAIN/INLET

R RAMP (12:1 MAX RUN, 1:48 MAX CROSS SLOPE
L LANDING (1:48 MAX SLOPE, ALL DIRECTIONS)
LS LEVEL SIDEWALK (1:48 MAX CROSS SLOPE)
T TRANSITION
SL SLOPE SIDEWALK (20:1 MAX RUN, 1:48 MAX CROSS SLOPE)



NOTES

1. MAJOR CONTOURS ARE AT A 1' INTERVAL WHILE MINOR CONTOURS ARE AT A 0.25' INTERVAL.
2. POINT ELEVATIONS REPRESENT EDGE OF PAVEMENT UNLESS OTHERWISE NOTED.
3. FOR ADDITIONAL INFORMATION REFER TO TO THE APPLICABLE PLAN AND PROFILE SHEET.

DESIGN

STATE OF TEXAS — BRET CHAPMAN — 127293 — LICENSED PROFESSIONAL ENGINEER

BRET CHAPMAN, P.E. — 9/16/2025 DATE

APPROVAL

STATE OF TEXAS — BRIAN A. ALLEN — 123374 — LICENSED PROFESSIONAL ENGINEER

BRIAN A. ALLEN, P.E. — 9/16/2025 DATE

NO.	REVISION	DATE

GEORGETOWN TEXAS *more than welcome*

PAPE-DAWSON ENGINEERS
AUSTIN I SAN ANTONIO I HOUSTON I FORT WORTH I DALLAS
10801 N MOPAC EXPY, BLDG 3, STE 200 I AUSTIN, TX 78759 I 512.454.8711
TEXAS ENGINEERING FIRM #470 I TEXAS SURVEYING FIRM #10028800

CITY OF GEORGETOWN, TEXAS
WOLF RANCH PKWY / SUNSET VISTA DR

INTERSECTION DETAIL

CITY JOB No.
JOB NO. 51423-04
DATE 9/16/2025
DESIGNER
CHECKED DRAWN

SHEET 3 OF 6

SHEET NO. 225

Date: 9/16/2025
File:

THIS DOCUMENT HAS BEEN PRODUCED FROM MATERIAL THAT WAS STORED AND/OR TRANSMITTED ELECTRONICALLY AND MAY HAVE BEEN INADVERTENTLY ALTERED. RELY ONLY ON FINAL HARDCOPY MATERIALS BEARING THE CONSULTANT'S ORIGINAL SIGNATURE AND SEAL.

Date: 9/16/2025
File:

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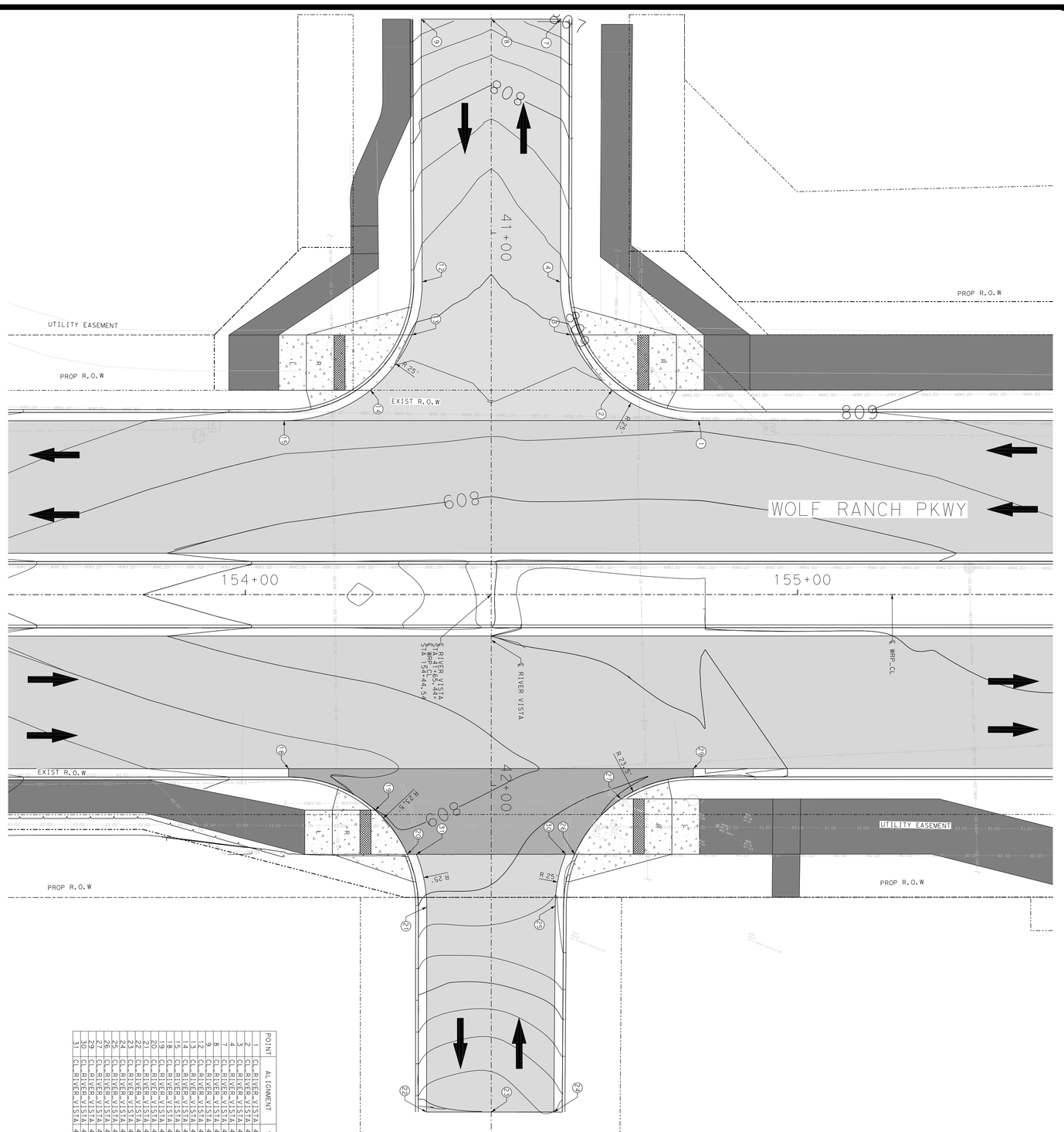

POINT	ALIGNMENT	STATION	OFFSET	POINT	ELEVATION
1	CL-RIVER VISTA	41+28.93	37.45' LT	EOP	808.74
2	CL-RIVER VISTA	41+28.93	37.45' LT	EOP	808.74
3	CL-RIVER VISTA	41+18.44	14.42' LT	EOP	808.28
4	CL-RIVER VISTA	41+18.44	14.42' LT	EOP	808.28
5	CL-RIVER VISTA	41+08.23	12.62' LT	EOP	MATCH EXIST
6	CL-RIVER VISTA	41+08.23	12.62' LT	EOP	MATCH EXIST
7	CL-RIVER VISTA	41+08.84	12.60' RT	EOP	808.16
8	CL-RIVER VISTA	41+08.84	12.60' RT	EOP	808.16
9	CL-RIVER VISTA	41+08.28	0.00'	---	MATCH EXIST
10	CL-RIVER VISTA	41+08.28	0.00'	---	MATCH EXIST
11	CL-RIVER VISTA	41+18.45	14.37' RT	EOP	808.18
12	CL-RIVER VISTA	41+18.45	14.37' RT	EOP	808.18
13	CL-RIVER VISTA	41+28.95	37.93' RT	EOP	808.42
14	CL-RIVER VISTA	41+28.95	37.93' RT	EOP	808.42
15	CL-RIVER VISTA	41+96.95	36.93' RT	EOP	808.16
16	CL-RIVER VISTA	41+96.95	36.93' RT	EOP	808.16
17	CL-RIVER VISTA	42+19.45	15.19' RT	EOP	808.09
18	CL-RIVER VISTA	42+19.45	15.19' RT	EOP	808.09
19	CL-RIVER VISTA	42+21.98	11.68' RT	EOP	809.35
20	CL-RIVER VISTA	42+21.98	11.68' RT	EOP	809.35
21	CL-RIVER VISTA	42+59.10	0.00' RT	EOP	MATCH EXIST
22	CL-RIVER VISTA	42+59.10	0.00' RT	EOP	MATCH EXIST
23	CL-RIVER VISTA	42+59.10	11.34' LT	EOP	MATCH EXIST
24	CL-RIVER VISTA	42+59.10	11.34' LT	EOP	MATCH EXIST
25	CL-RIVER VISTA	42+12.44	15.10' LT	EOP	809.44
26	CL-RIVER VISTA	42+12.44	15.10' LT	EOP	809.44
27	CL-RIVER VISTA	42+02.44	23.47' LT	EOP	809.20
28	CL-RIVER VISTA	42+02.44	23.47' LT	EOP	809.20
29	CL-RIVER VISTA	42+19.44	13.47' LT	EOP	809.42
30	CL-RIVER VISTA	42+19.44	13.47' LT	EOP	809.42
31	CL-RIVER VISTA	42+12.45	13.56' RT	EOP	809.08

NOTES

1. MAJOR CONTOURS ARE AT A 1' INTERVAL. MINOR CONTOURS ARE AT A 0.25' INTERVAL.
2. POINT ELEVATIONS REPRESENT EDGE OF PAVEMENT UNLESS OTHERWISE NOTED.
3. FOR ADDITIONAL INFORMATION REFER TO THE APPLICABLE PLAN AND PROFILE SHEET.

SCALE: 1"= 10'

0' 10' 20' 30'

LEGEND

- PROPOSED ASPHALT PAVEMENT
- PROPOSED CONCRETE PAVEMENT
- PROPOSED MILL AND OVERLAY
- PROPOSED CONCRETE DRIVEWAY
- PROPOSED ASPHALT DRIVEWAY
- PROPOSED PAVERS
- PROPOSED CONCRETE SIDEWALK
- PROP R.O.W
- PROPOSED CURB RAMP
- EXIST R.O.W
- UTILITY EASEMENT
- PROPERTY LINE
- PROPOSED STORM DRAIN/INLET
- PROPOSED TRAFFIC FLOW

R RAMP (12:1 MAX RUN, 1:48 MAX CROSS SLOPE

L LANDING (5' MIN X 5' MAX SLOPE, ALL DIRECTIONS)

LS LEVEL SIDEWALK (1:48 MAX CROSS SLOPE)

T TRANSITION SIDEWALK (20:1 MAX RUN, 1:48 MAX CROSS SLOPE)

N

DESIGN

BRIAN A. ALLEN, P.E. — 9/16/2025 DATE

APPROVAL

BRET CHAPMAN, P.E. — 9/16/2025 DATE

CITY OF GEORGETOWN, TEXAS
WOLF RANCH PKWY / RIVER VISTA DR

INTERSECTION DETAIL

PAPE-DAWSON ENGINEERS
AUSTIN | SAN ANTONIO | HOUSTON | FORT WORTH | DALLAS
10801 N MOPAC EXPY, BLDG 3, STE 200 | AUSTIN, TX 78759 | 512.454.8711
TEXAS ENGINEERING FIRM #470 | TEXAS SURVEYING FIRM #10028800

GEORGETOWN TEXAS more than welcome

NO.	REVISION	DATE

CITY JOB No. ____
JOB NO. 51423-04
DATE 9/16/2025
DESIGNED ____
DRAWN ____
CHECKED ____
SHEET NO. 226 SHEET 4 OF 6

9/16/2025
Date:
File:

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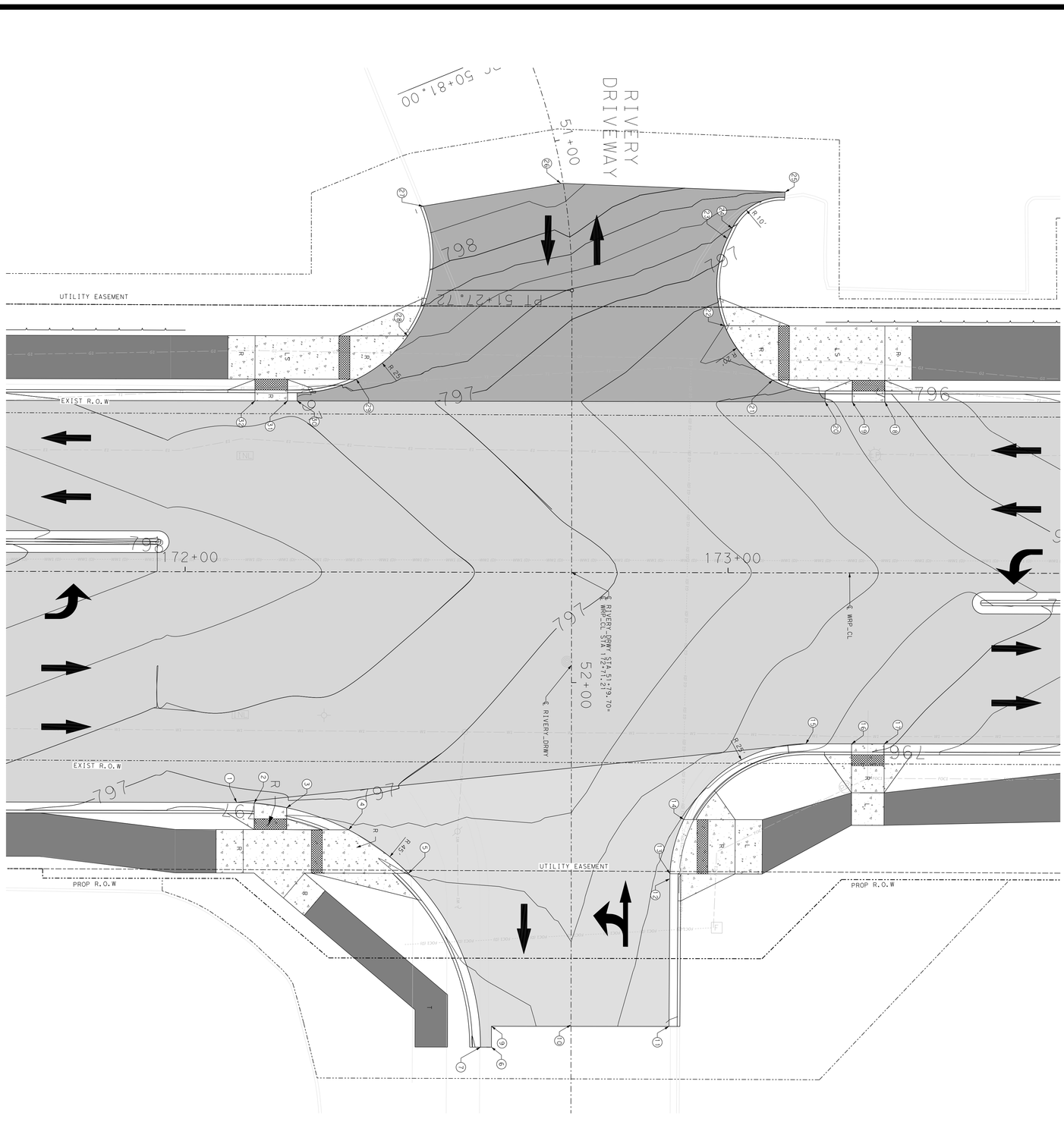


POINT	ALIGNMENT	STATION	OFFSET	POINT	ELEVATION
1	CL_RIVERY_DR	52+22.18	61.60' RT	EOP	796.95
2	CL_RIVERY_DR	52+22.19	50.58' RT	EOP	796.91
3	CL_RIVERY_DR	52+22.19	40.99' RT	EOP	796.88
4	CL_RIVERY_DR	52+22.19	30.58' RT	EOP	796.84
5	CL_RIVERY_DR	52+35.19	23.27' RT	EOP	796.51
6	CL_RIVERY_DR	52+57.19	16.61' RT	---	MATCH EXIST
7	CL_RIVERY_DR	52+57.19	16.61' RT	---	MATCH EXIST
8	CL_RIVERY_DR	52+63.34	14.61' RT	---	MATCH EXIST
9	CL_RIVERY_DR	52+63.50	18.10' LT	---	MATCH EXIST
10	CL_RIVERY_DR	52+63.50	18.10' LT	---	MATCH EXIST
11	CL_RIVERY_DR	52+26.12	18.21' LT	EOP	796.19
12	CL_RIVERY_DR	52+26.12	18.21' LT	EOP	796.19
13	CL_RIVERY_DR	52+11.21	43.21' LT	EOP	796.32
14	CL_RIVERY_DR	52+26.20	20.76' LT	EOP	796.23
15	CL_RIVERY_DR	52+11.21	43.21' LT	EOP	796.32
16	CL_RIVERY_DR	52+11.21	57.65' LT	EOP	796.04
17	CL_RIVERY_DR	51+98.21	57.65' LT	EOP	796.04
18	CL_RIVERY_DR	51+98.21	57.65' LT	EOP	796.05
19	CL_RIVERY_DR	51+98.21	146.66' LT	EOP	796.28
20	CL_RIVERY_DR	51+98.21	146.66' LT	EOP	796.28
21	CL_RIVERY_DR	51+44.21	258.19' LT	EOP	796.50
22	CL_RIVERY_DR	51+44.21	258.19' LT	EOP	796.50
23	CL_RIVERY_DR	51+20.00	328.91' LT	EOP	797.17
24	CL_RIVERY_DR	51+18.45	329.23' LT	EOP	797.17
25	CL_RIVERY_DR	51+18.45	40.23' LT	EOP	796.19
26	CL_RIVERY_DR	51+07.85	0.00'	---	MATCH EXIST
27	CL_RIVERY_DR	51+07.85	0.00'	---	MATCH EXIST
28	CL_RIVERY_DR	51+36.19	26.21' RT	EOP	796.56
29	CL_RIVERY_DR	51+36.19	26.21' RT	EOP	MATCH EXIST
30	CL_RIVERY_DR	51+45.19	39.70' RT	EOP	797.37
31	CL_RIVERY_DR	51+45.19	39.70' RT	EOP	797.37
32	CL_RIVERY_DR	51+48.19	58.37' RT	EOP	797.19

LEGEND

- PROPOSED ASPHALT PAVEMENT
- PROPOSED CONCRETE PAVEMENT
- PROPOSED MILL AND OVERLAY
- PROPOSED CONCRETE DRIVEWAY
- PROPOSED ASPHALT DRIVEWAY
- PROPOSED PAVERS
- PROPOSED CONCRETE SIDEWALK
- PROPOSED CURB RAMP
- PROP R.O.W
- EXIST R.O.W
- UTILITY EASEMENT
- PROPERTY LINE
- PCL
- PROPOSED TRAFFIC FLOW
- PROPOSED STORM DRAIN/INLET

R RAMP (12:1 MAX RUN, 1:48 MAX CROSS SLOPE.
L LANDING (4' MIN MAX SLOPE, ALL DIRECTIONS)
LS LEVEL SIDEWALK (1:48 MAX CROSS SLOPE)
T TRANSITION
SL SLOPED SIDEWALK (20:1 MAX RUN, 1:48 MAX CROSS SLOPE)

NOTES

1. MAJOR CONTOURS ARE AT A 1' INTERVAL MINOR CONTOURS ARE AT A 0.25' INTERVAL.
2. POINT ELEVATIONS REPRESENT EDGE OF PAVEMENT UNLESS OTHERWISE NOTED.
3. FOR ADDITIONAL INFORMATION REFER TO THE APPLICABLE PLAN AND PROFILE SHEET.

SCALE: 1"= 10'
0' 10' 20' 30'

DESIGN

BRIAN A. ALLEN, P.E. — 9/16/2025 DATE

APPROVAL

BRET CHAPMAN, P.E. — 9/16/2025 DATE

CITY OF GEORGETOWN, TEXAS
WOLF RANCH PKWY / RIVERY DRWY

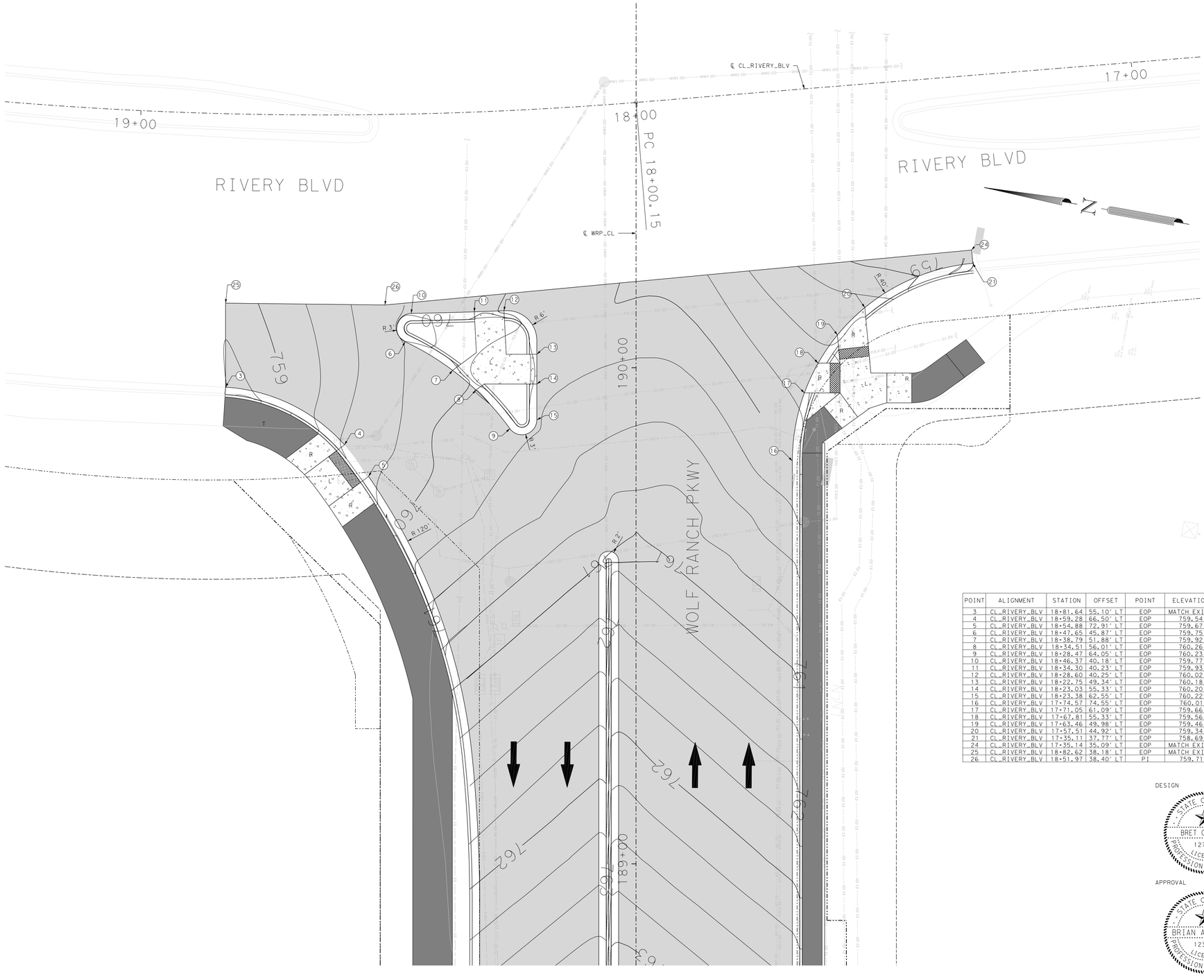
INTERSECTION DETAIL

CITY JOB No. 51423-04
JOB NO. 51423-04
DATE 9/16/2025
DESIGNED
DRAWN
CHECKED
SHEET NO. 227 SHEET 5 OF 6

PAPE-DAWSON ENGINEERS
AUSTIN | SAN ANTONIO | HOUSTON | FORT WORTH | DALLAS
10801 N MOPAC EXPY, BLDG 3, STE 200 | AUSTIN, TX 78759 | 512.454.8711
TEXAS ENGINEERING FIRM #470 | TEXAS SURVEYING FIRM #10028800

GEORGETOWN TEXAS
more than welcome

NO.	REVISION	DATE



LEGEND

- PROPOSED ASPHALT PAVEMENT
- PROPOSED CONCRETE PAVEMENT
- PROPOSED MILL AND OVERLAY
- PROPOSED CONCRETE DRIVEWAY
- PROPOSED ASPHALT DRIVEWAY
- PROPOSED PAVERS
- PROPOSED CONCRETE SIDEWALK
- PROPOSED CURB RAMP
- PROP R.O.W
- EXIST R.O.W
- UTILITY EASEMENT R.O.W
- PGL PROFILE GRADE LINE
- PROPOSED TRAFFIC FLOW
- PROPOSED STORM DRAIN/INLET

R RAMP (12:1 MAX RUN, 1:48 MAX CROSS SLOPE)
L LANDING (1:48 MAX SLOPE, ALL DIRECTIONS)
LS LEVEL SIDEWALK (1:48 MAX CROSS SLOPE)
T TRANSITION
SL SLOPE SIDEWALK (20:1 MAX RUN, 1:48 MAX CROSS SLOPE)

POINT	ALIGNMENT	STATION	OFFSET	POINT	ELEVATION
3	CL_RIVERY_BLV	18+81.64	55.10' LT	EOP	MATCH EXIST
4	CL_RIVERY_BLV	18+59.28	66.50' LT	EOP	759.54
5	CL_RIVERY_BLV	18+54.88	72.91' LT	EOP	759.67
6	CL_RIVERY_BLV	18+47.65	45.87' LT	EOP	759.75
7	CL_RIVERY_BLV	18+38.79	51.88' LT	EOP	759.92
8	CL_RIVERY_BLV	18+34.51	56.01' LT	EOP	760.26
9	CL_RIVERY_BLV	18+28.47	64.05' LT	EOP	760.23
10	CL_RIVERY_BLV	18+46.37	40.18' LT	EOP	759.77
11	CL_RIVERY_BLV	18+34.30	40.23' LT	EOP	759.93
12	CL_RIVERY_BLV	18+28.60	40.25' LT	EOP	760.02
13	CL_RIVERY_BLV	18+22.75	49.34' LT	EOP	760.18
14	CL_RIVERY_BLV	18+23.03	55.33' LT	EOP	760.20
15	CL_RIVERY_BLV	18+23.38	62.55' LT	EOP	760.22
16	CL_RIVERY_BLV	17+74.57	74.55' LT	EOP	760.01
17	CL_RIVERY_BLV	17+71.05	61.09' LT	EOP	759.66
18	CL_RIVERY_BLV	17+67.81	55.33' LT	EOP	759.56
19	CL_RIVERY_BLV	17+63.46	49.98' LT	EOP	759.46
20	CL_RIVERY_BLV	17+57.51	44.92' LT	EOP	759.34
21	CL_RIVERY_BLV	17+35.11	37.77' LT	EOP	758.69
24	CL_RIVERY_BLV	17+35.14	35.09' LT	EOP	MATCH EXIST
25	CL_RIVERY_BLV	18+82.62	38.18' LT	EOP	MATCH EXIST
26	CL_RIVERY_BLV	18+51.97	38.40' LT	PI	759.71

SCALE: 1"= 10'
0' 10' 20' 30'

NOTES

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2. POINT ELEVATIONS REPRESENT EDGE OF PAVEMENT UNLESS OTHERWISE NOTED.
3. FOR ADDITIONAL INFORMATION REFER TO TO THE APPLICABLE PLAN AND PROFILE SHEET.

DESIGN

STATE OF TEXAS
BRET CHAPMAN
127293
LICENSED
PROFESSIONAL ENGINEER

BRET CHAPMAN, P.E. 9/16/2025 DATE

APPROVAL

STATE OF TEXAS
BRIAN A. ALLEN
123374
LICENSED
PROFESSIONAL ENGINEER

BRIAN A. ALLEN, P.E. 9/16/2025 DATE

NO.	REVISION	DATE

GEORGETOWN TEXAS more than welcome

PAPE-DAWSON ENGINEERS
AUSTIN I SAN ANTONIO I HOUSTON I FORT WORTH I DALLAS
10801 N MOPAC EXPY, BLDG 3, STE 200 I AUSTIN, TX 78759 I 512.454.8711
TEXAS ENGINEERING FIRM #470 I TEXAS SURVEYING FIRM #10028800

CITY OF GEORGETOWN, TEXAS
WOLF RANCH PKWY / RIVERY BLVD

INTERSECTION DETAIL

CITY JOB No.
JOB NO. 51423-04
DATE 9/16/2025
DESIGNER
CHECKED DRAWN

SHEET 6 OF 6
SHEET NO. 228

Date: 9/16/2025
File:

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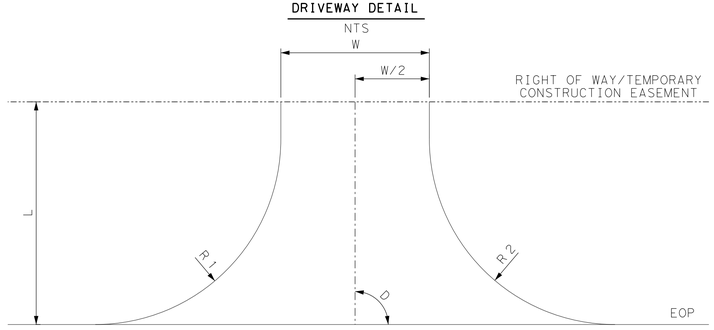
PLAN SHEET NO.	DRWY NO.	ROAD NAME	DRWY C/L STA.	OFFSET	WIDTH (W)	LENGTH (L)			PROP SLOPE (S)			RADIUS (R)		DEFLECTION ANGLE (D)
						L1	L2	L3	S1	S2	S3	R1	R2	
					FT	FT	FT	FT	%	%		FT	FT	°
197	NB01	WOLF RANCH PKWY	134+91.06	31.50'	35.50	12.30	42.94	N/A	-1.50	2.69	N/A	25.00	25.00	0.00
202	NB02	WOLF RANCH PKWY	154+44.49	31.50'	26.00		62.16		REFER TO NOTE 4			23.50	23.50	0.00
204	NB03	WOLF RANCH PKWY	164+35.69	36.97'	61.60	5.38	12.11	13.20	0.30	-1.90	-7.64	27.00	28.50	0.00
206	SB01	WOLF RANCH PKWY	172+71.15	31.50	66.60		40.00		REFER TO NOTE 4			25.00	20.00	0.00
207	SB02	WOLF RANCH PKWY	175+96.30	31.50	20.50	11.50	13.00	N/A	1.50	-0.29	N/A	20.00	25.00	3.00
208	NB04	WOLF RANCH PKWY	179+92.73	31.50'	30.00	12.15	12.38	15.64	1.50	5.00	0.79	25.00	25.00	0.00
208	SB03	WOLF RANCH PKWY	181+79.46	31.50'	44.60	13.50	10.34	N/A	-1.50	-9.50	N/A	25.00	25.00	0.00
209	SB04	WOLF RANCH PKWY	183+39.25	31.50'	50.00	13.33	46.60	N/A	1.50	-4.50	N/A	25.00	25.00	0.00
209	NB05	WOLF RANCH PKWY	183+63.67	31.50'	16.00	12.88	23.85	N/A	1.90	13.00	N/A	25.00	25.00	0.00
210	SB05	WOLF RANCH PKWY	186+62.51	31.50'	27.00	15.55	12.37	N/A	1.50	-3.70	N/A	25.00	25.00	0.00
210	NB06	WOLF RANCH PKWY	186+99.26	31.50'	32.75	15.56	9.57	N/A	1.50	6.90	N/A	25.00	23.50	0.00

NOTES:

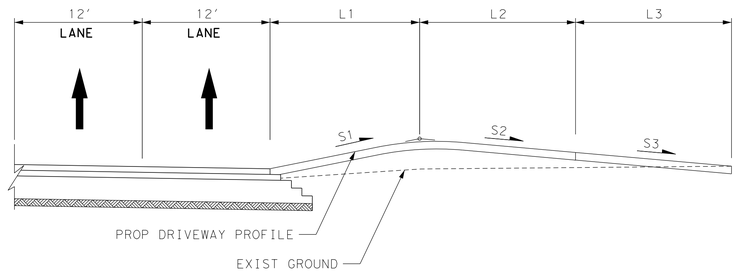
1. REFER TO PLAN AND PROFILE SHEETS FOR MATERIAL TYPE AND LIMITS.
2. REFER TO PLAN AND PROFILE SHEETS FOR MEDIAN TYPE, WIDTH AND LANE WIDTHS FOR DRIVEWAYS WITH MEDIANS.
3. DRIVEWAY WIDTH IS MEASURED FROM CURB FACE TO CURB FACE REGARDLESS OF IF IT IS CURB AND GUTTER OR MONOLITHIC.
4. REFER TO CROSS STREET PLAN AND PROFILE SHEETS FOR PROFILE INFORMATION.
5. CURB AND GUTTER, MONOLITHIC CURBS AND RAISED MEDIANS THAT FALL WITHIN A DRIVEWAY ARE SUBSIDIARY TO THE DRIVEWAY PAY ITEMS.

DRIVEWAY DETAIL

NTS



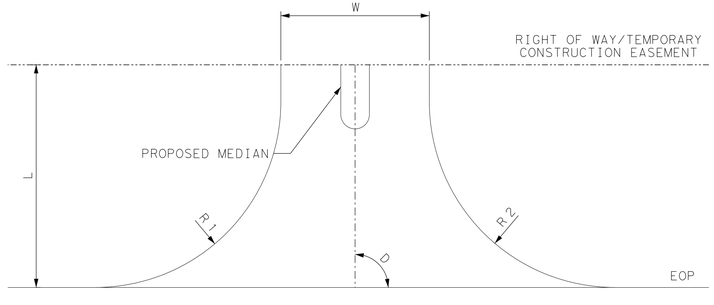
PLAN



PROFILE

DRIVEWAY W/ MEDIAN DETAIL

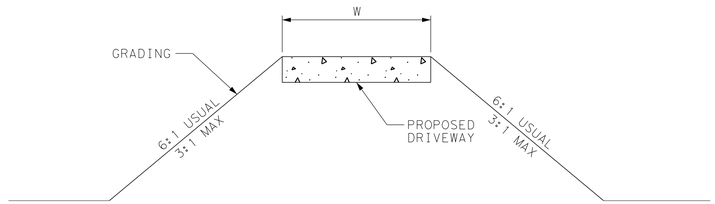
NTS

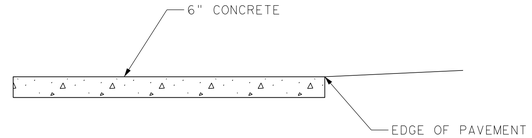


PLAN

DRIVEWAY PROFILE DETAIL

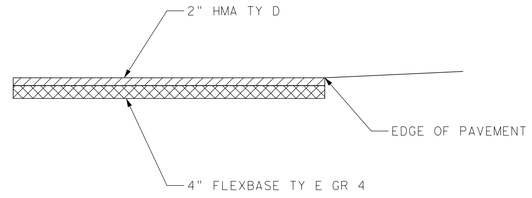
NTS





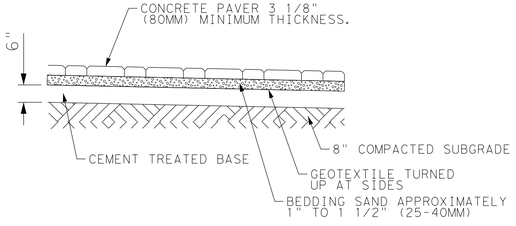
TYPICAL CONCRETE PAVEMENT SECTION

NTS



TYPICAL ASPHALT PAVEMENT SECTION

NTS



TYPICAL DRIVEWAY ROADWAY PAVERS SECTION

NTS

NOTES:
ALL ITEMS IN THE DRIVEWAY PAVERS ARE SUBSIDIARY TO THE "6" CONCRETE DRIVEWAY" PAY ITEM.

DESIGN

STATE OF TEXAS — BRET CHAPMAN — 127293 — LICENSED PROFESSIONAL ENGINEER

BRET CHAPMAN, P.E. — 9/16/2025 DATE

APPROVAL

STATE OF TEXAS — BRIAN A. ALLEN — 123374 — LICENSED PROFESSIONAL ENGINEER

BRIAN A. ALLEN, P.E. — 9/16/2025 DATE

NO.	REVISION	DATE

GEORGETOWN TEXAS *more than welcome*

PAPE-DAWSON ENGINEERS
AUSTIN | SAN ANTONIO | HOUSTON | FORT WORTH | DALLAS
10801 N MOPAC EXPY, BLDG 3, STE 200 | AUSTIN, TX 78759 | 512.454.8711
TEXAS ENGINEERING FIRM #470 | TEXAS SURVEYING FIRM #10028800

WOLF RANCH PKWY / MEMORIAL DR

DRIVEWAY DETAILS

CITY JOB No.
JOB NO. 51423-04
DATE 9/16/2025
DESIGNER
CHECKED DRAWN

SHEET 1 OF 1

SHEET NO. 229

Date: 9/16/2025

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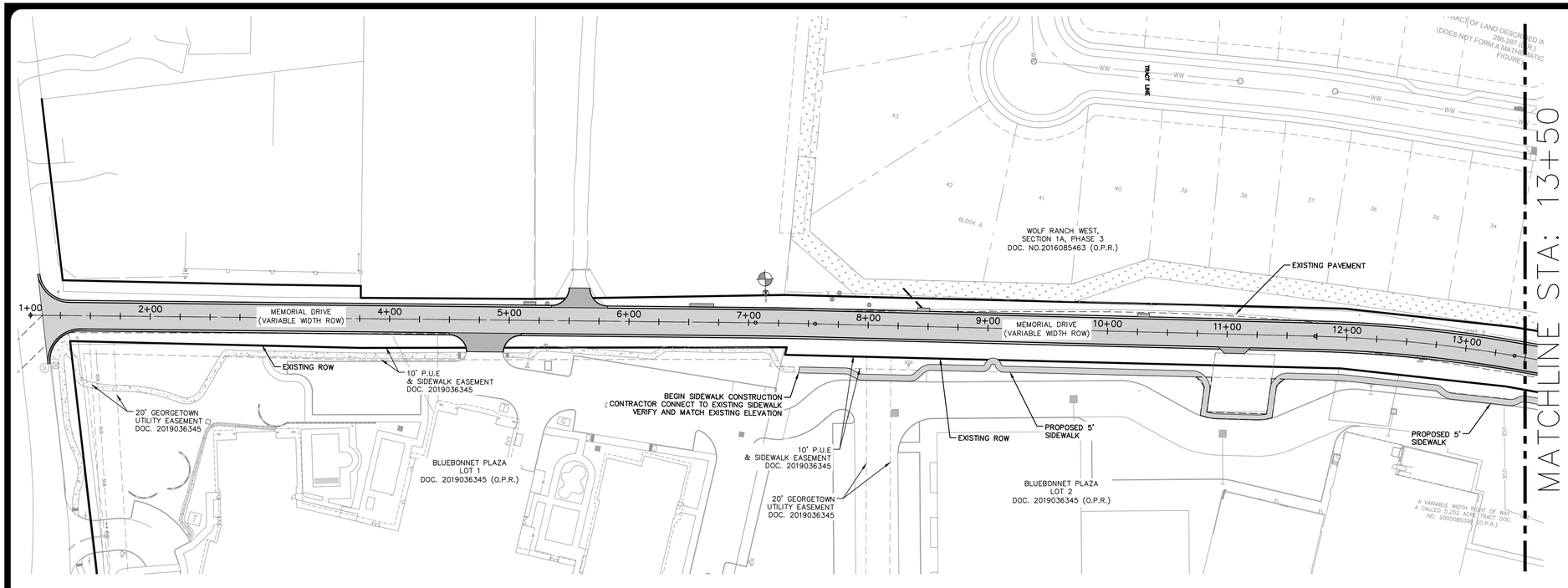

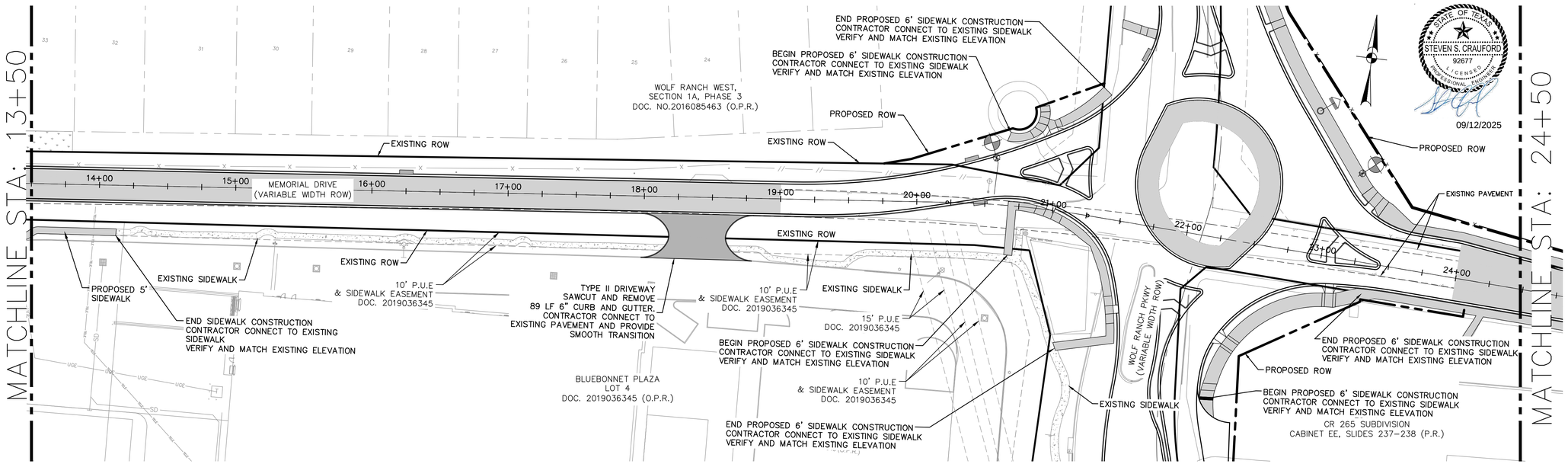

NO.	REVISION	DATE

GEORGETOWN
TEXAS
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AUSTIN | SAN ANTONIO | HOUSTON | FORT WORTH | DALLAS
10801 N MOPAC EXPY, BLDG 3, STE 200 | AUSTIN, TX 78759 | 512.454.8711
TBPE FIRM REGISTRATION #470 | TBPLS FIRM REGISTRATION #10028801

CITY OF GEORGETOWN, TEXAS
WOLF RANCH PKWY / MEMORIAL DR

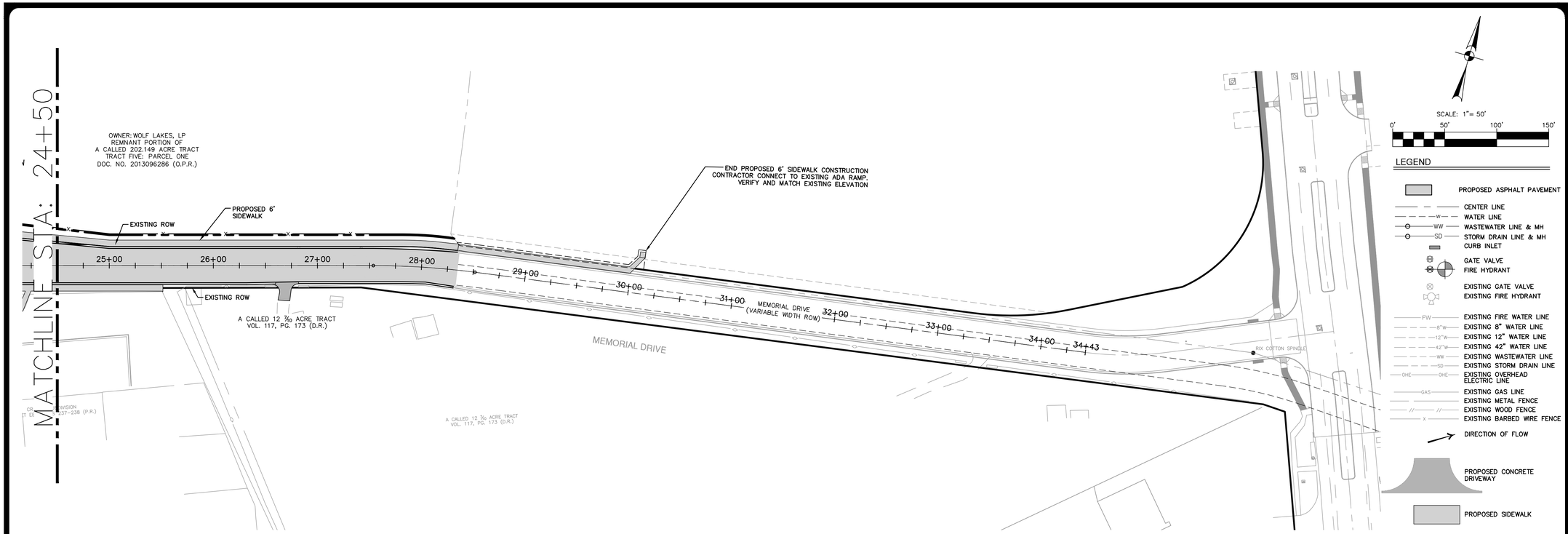
MEMORIAL DRIVE SIDEWALK PLAN 1 OF 2

CITY JOB No.
JOB NO. 51423-00
DATE 9/12/2025
DESIGNER WT
CHECKED ARC DRAWN WT

SHEET 230

Date: Sep 12, 2025, 10:01am User ID: cschultz
File: I:\Projects\514\23\001\301 Construction Documents\Civil\SW51423-00.dwg

THIS DOCUMENT HAS BEEN PRODUCED FROM MATERIAL THAT WAS STORED AND/OR TRANSMITTED ELECTRONICALLY AND MAY HAVE BEEN INADVERTENTLY ALTERED. RELY ONLY ON FINAL HARDCOPY MATERIALS BEARING THE CONSULTANT'S ORIGINAL SIGNATURE AND SEAL.



NO.	REVISION	DATE

GEORGETOWN TEXAS
more than welcome

PAPE-DAWSON ENGINEERS
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10801 N MOPAC EXPY, BLDG 3, STE 200 I AUSTIN, TX 78759 I 512.454.8711
TBPE FIRM REGISTRATION #470 I TBPLS FIRM REGISTRATION #10028801

STATE OF TEXAS
STEVEN S. CRAUFORD
92677
LICENSED PROFESSIONAL ENGINEER

09/12/2025

CITY OF GEORGETOWN, TEXAS
WOLF RANCH PKWY / MEMORIAL DR

MEMORIAL DRIVE SIDEWALK PLAN 2 OF 2

CITY JOB No.
JOB NO. 51423-00
DATE 9/12/2025
DESIGNER WT
CHECKED ARC DRAWN WT

SHEET 231

Date: Sep 12, 2025, 10:02am User ID: cshatz
File: H:\Projects\51423\03\301 Construction Documents\Civil\SW51423-00.dwg

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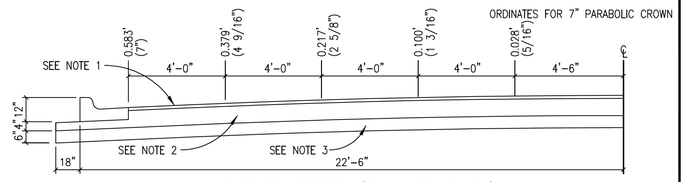
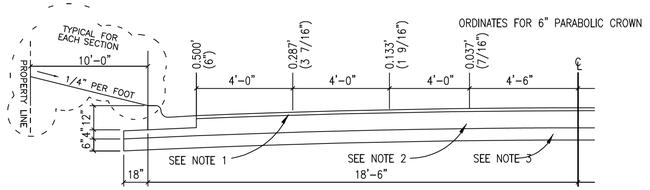
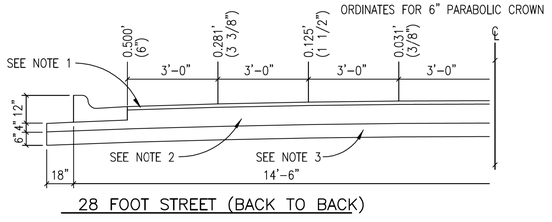


45 FOOT STREET (BACK TO BACK)



37 FOOT STREET (BACK TO BACK)



28 FOOT STREET (BACK TO BACK)

NOTES:

1. 2" HOT MIX ASPHALTIC CONCRETE.
2. 8" FLEXBASE SHALL BE PLACED IN LIFTS NOT EXCEEDING 6" COMPACTED DEPTH AND TO 100% OF MAXIMUM DENSITY AS DETERMINED BY TEX-113E AT ±3% OF OPTIMUM MOISTURE CONTENT.
3. LIME STABILIZATION MAY BE USED IF A QUALIFIED GEOTECHNICAL REPORT INDICATES THAT THE SULFATE LEVELS ARE LOW ENOUGH.

STREET AND ROADWAY DESIGN CRITERIA

STREET CLASSIFICATION	TOTAL EQUIVALENT 18K AXLE LOAD APPLICATIONS (20 YEAR FLEXIBLE DESIGN)
LOCAL	
ALLEY	20,000
RESIDENTIAL LANE	20,000
LOCAL STREET	20,000
COLLECTORS	
RESIDENTIAL	80,000
MAJOR NEIGHBOORHOOD	290,000
ARTERIALS	
MINOR ARTERIAL	1,020,000
MAJOR ARTERIAL	5,200,000

The Architect/Engineer assumes responsibility for appropriate use of this standard.

REVISION NOTE: ADOPTED 6/21/2006

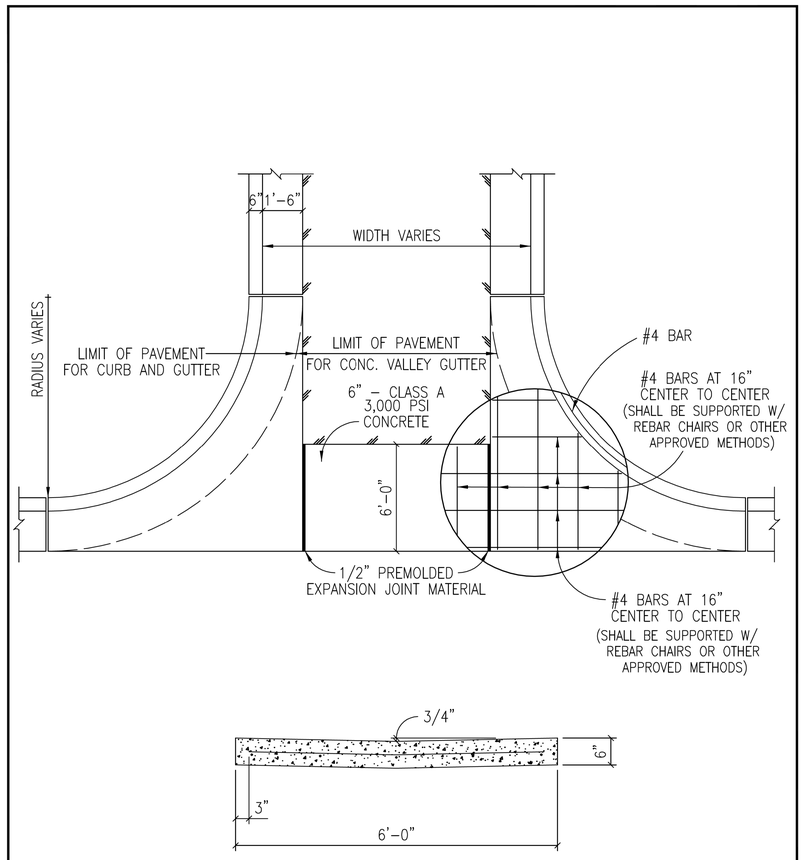
EST. 1848 GEORGETOWN TEXAS Georgetown Utility Systems Your Community Owned Utility

CITY OF GEORGETOWN
CONSTRUCTION STANDARDS AND DETAILS

TYPICAL HALF CROSS – SECTIONS FOR H.M.A.C. SURFACED STREETS

DRAWING NAME: SD01

SCALE: NTS | DATE: 1/2003 | DRAWN BY: MRS | APPROVED BY: TRB



The Architect/Engineer assumes responsibility for appropriate use of this standard.

REVISION NOTE: ADOPTED 6/21/2006

EST. 1848 GEORGETOWN TEXAS Georgetown Utility Systems Your Community Owned Utility

CITY OF GEORGETOWN
CONSTRUCTION STANDARDS AND DETAILS

CONCRETE VALLEY GUTTER DETAIL

DRAWING NAME: SD03

SCALE: NTS | DATE: 1/2003 | DRAWN BY: MRS | APPROVED BY: TRB

NO.	REVISION	DATE

GEORGETOWN TEXAS *more than welcome*

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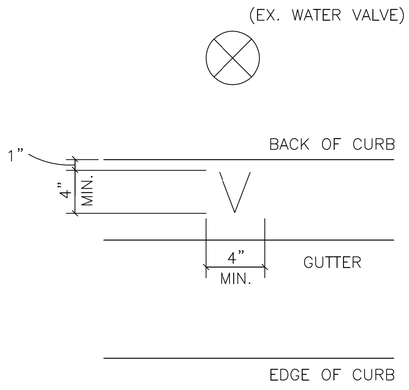
TEXAS ENGINEERING FIRM #470 I TEXAS SURVEYING FIRM #10023800

WOLF RANCH PKWY / MEMORIAL DR

ROADWAY STANDARDS

CITY JOB No.
JOB NO. 51423-04
DATE 9/11/2025
DESIGNER
CHECKED DRAWN

SHEET NO. 232



PLAN VIEW
(TYPICAL)

NOTES:

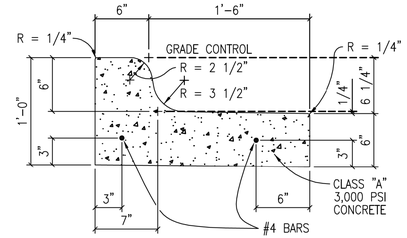
1. ALL WATER SERVICE, WASTE WATER SERVICE AND VALVE LOCATIONS SHALL BE APPROXIMATLEY MARKED AS FOLLOWS:

WATER SERVICE	"W"	TOP OF CURB
WASTE WATER SERVICE	"S"	TOP OF CURB
VALVE	"V"	TOP OF CURB

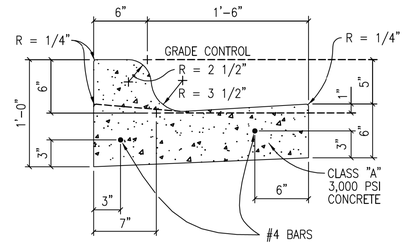
2. LETTERS SHALL HAVE A 1/2" MAX. WIDTH.

The Architect/Engineer assumes responsibility for appropriate use of this standard.

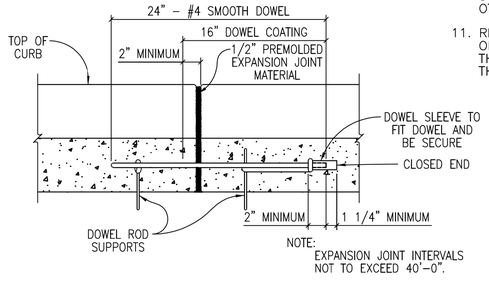
		REVISION NOTE: ADOPTED 6/21/2006
GEORGETOWN TEXAS Georgetown Utility Systems Your Community Owned Utility	CITY OF GEORGETOWN CONSTRUCTION STANDARDS AND DETAILS CURB STAMP DETAIL	DRAWING NAME: SD05
		SCALE: NTS / DATE: 1/2003
		DRAWN BY: MRS / APPROVED BY: TRB



SPILL CURB



CATCH AND LAYDOWN CURB



CURB DOWEL DETAIL

NOTES:

1. ALL WORK AND MATERIAL SHALL CONFORM TO ASTM A615, A615M, C309, AND D1752. BROOM FINISH EXPOSED SURFACE.
2. CONTRACTION JOINT SPACING 10' MAX.
3. EXPANSION JOINTS AS PER STD. ASTM D-1752.
4. 1/2" EXPANSION JOINT MATERIAL SHALL BE PROVIDED WHERE CURB IS ADJACENT TO SIDEWALK OR RIP-RAP.
5. TRANSITIONS BETWEEN CURBS OR DIFFERING CROSS SECTIONS SHALL OCCUR OVER A 20 FOOT LENGTH AS APPROVED BY THE ENGINEER OR THE CITY OF GEORGETOWN.
6. ALL CONCRETE SHALL BE CLASS A, 3000 PSI.
7. ALL SURFACES THAT ARE CHIPPED OR OTHERWISE DAMAGED DURING CONSTRUCTION SHALL BE REPAIRED.
8. THE FOLLOWING SCHEME OF REINFORCEMENT SHALL BE REQUIRED. THE MANNER OF PLACEMENT AND LOCATION SHALL BE TO THE SATISFACTION OF THE ENGINEER OR THE CITY OF GEORGETOWN.
   A. ALL CURB AND CURB AND GUTTER (REINFORCED) SHALL HAVE TWO #4 LONGITUDINAL REINFORCING BARS.
9. REINFORCING BARS SHALL BE LAPPED A MINIMUM OF 15 INCH.
10. REINFORCING BARS SHALL BE SUPPORTED WITH REBAR CHAIRS OR OTHER APPROVED METHODS.
11. REBAR SUPPORTS ARE NOT REQUIRED ON MACHINE PLACED CURB PROVIDED THAT REBAR IS PROPERLY GUIDED INTO THE CURB SECTION.

The Architect/Engineer assumes responsibility for appropriate use of this standard.

		REVISION NOTE: ADOPTED 6/21/2006
GEORGETOWN TEXAS Georgetown Utility Systems Your Community Owned Utility	CITY OF GEORGETOWN CONSTRUCTION STANDARDS AND DETAILS CURB AND GUTTER DETAILS	DRAWING NAME: SD06
		SCALE: NTS / DATE:
		DRAWN BY: MRS / APPROVED BY: TRB

NO.	REVISION	DATE

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AUSTIN I SAN ANTONIO I HOUSTON I FORT WORTH I DALLAS
10801 N MOPAC EXPY, BLDG 3, STE 200 I AUSTIN, TX 78759 I 512.454.8711
TEXAS ENGINEERING FIRM #470 I TEXAS SURVEYING FIRM #10028800

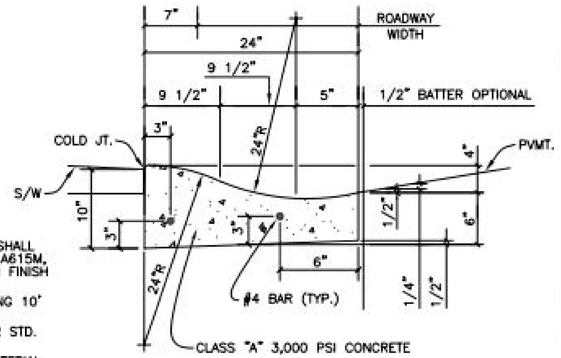
GEORGETOWN TEXAS *more than welcome*

WOLF RANCH PKWY / MEMORIAL DR

ROADWAY STANDARDS

CITY JOB No.
JOB NO. 51423-04
DATE 9/11/2025
DESIGNER
CHECKED DRAWN

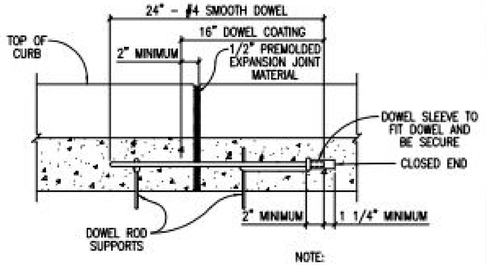
SHEET NO. 233



MOUNTABLE CURB

NOTES:

1. ALL WORK AND MATERIAL SHALL CONFORM TO ASTM A615, A615M, C309, AND D1752. BROOM FINISH EXPOSED SURFACE.
2. CONTRACTION JOINT SPACING 10' MAX.
3. EXPANSION JOINTS AS PER STD. ASTM D-1752.
4. 1/2" EXPANSION JOINT MATERIAL SHALL BE PROVIDED WHERE CURB IS ADJACENT TO SIDEWALK OR RIP-RAP.
5. TRANSITIONS BETWEEN CURBS OR DIFFERING CROSS SECTIONS SHALL OCCUR OVER A 20 FOOT LENGTH AS APPROVED BY THE ENGINEER OR TH CITY OF GEORGETOWN.
6. ALL CONCRETE SHALL BE CLASS A, 3000 PSI.
7. ALL SURFACES THAT ARE CHIPPED OR OTHERWISE DAMAGED DURING CONSTRUCTION SHALL BE REPAIRED.
8. ONE OF THE FOLLOWING SCHEMES OF REINFORCEMENT SHALL BE REQUIRED. THE MANNER OF PLACEMENT AND LOCATION SHALL BE TO THE SATISFACTION OF THE ENGINEER OR THE CITY OF GEORGETOWN.
   A. CURB AND GUTTER (REINFORCED) SHALL HAVE LONGITUDINAL REINFORCING BARS AS FOLLOWS: THREE #4,
   B. ALL TYPES OF CURB (REINFORCED) SHALL HAVE #4 BAR FOR LONGITUDINAL REINFORCEMENT.
9. REINFORCING BARS SHALL BE LAPPED A MINIMUM OF 15 INCH.
10. REINFORCING BARS SHALL BE SUPPORTED WITH REBAR CHAIRS OR OTHER APPROVED METHODS.
11. REBAR SUPPORTS ARE NOT REQUIRED ON MACHINE PLACED CURB PROVIDED THAT REBAR IS PROPERLY GUIDED INTO THE CURB SECTION.



NOTE:
EXPANSION JOINT INTERVALS NOT TO EXCEED 40'-0".

CURB DOWEL DETAIL

The Architect/Engineer assumes responsibility for appropriate use of this standard.

REVISION NOTE: ADOPTED 6/21/2006

CITY OF GEORGETOWN
CONSTRUCTION STANDARDS AND DETAILS

MOUNTABLE CURB AND GUTTER DETAILS

DRAWING NAME: SD07

SCALE: NTS | DATE: 1/2003 | DRAWN BY: MRS | APPROVED BY: TRB

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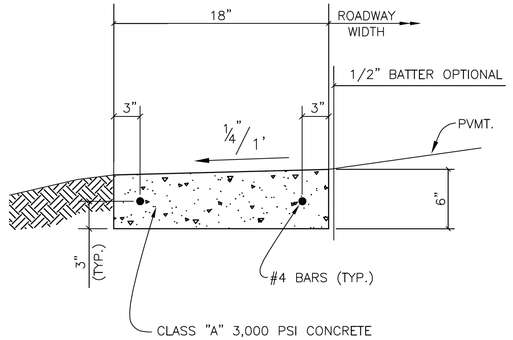
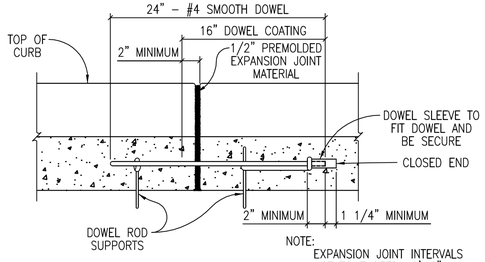
Georgetown Utility Systems
Your Community Owned Utility



RIBBON CURB

NOTES:

1. ALL WORK AND MATERIAL SHALL CONFORM TO ASTM A615, A615M, C309, AND D1752. BROOM FINISH EXPOSED SURFACE.
2. CONTRACTION JOINT SPACING 10' MAX.
3. EXPANSION JOINTS AS PER STD. ASTM D-1752.
4. 1/2" EXPANSION JOINT MATERIAL SHALL BE PROVIDED WHERE CURB IS ADJACENT TO SIDEWALK OR RIP-RAP.
5. TRANSITIONS BETWEEN CURBS OR DIFFERING CROSS SECTIONS SHALL OCCUR OVER A 20 FOOT LENGTH AS APPROVED BY THE ENGINEER OR TH CITY OF GEORGETOWN.
6. ALL CONCRETE SHALL BE CLASS A, 3000 PSI.
7. ALL SURFACES THAT ARE CHIPPED OR OTHERWISE DAMAGED DURING CONSTRUCTION SHALL BE REPAIRED.
8. ONE OF THE FOLLOWING SCHEMES OF REINFORCEMENT SHALL BE REQUIRED. THE MANNER OF PLACEMENT AND LOCATION SHALL BE TO THE SATISFACTION OF THE ENGINEER OR THE CITY OF GEORGETOWN.
   A. CURB AND GUTTER (REINFORCED) SHALL HAVE LONGITUDINAL REINFORCING BARS AS FOLLOWS: THREE #4,
   B. ALL TYPES OF CURB (REINFORCED) SHALL HAVE #4 BAR FOR LONGITUDINAL REINFORCEMENT.
9. REINFORCING BARS SHALL BE LAPPED A MINIMUM OF 15 INCH.
10. REINFORCING BARS SHALL BE SUPPORTED WITH REBAR CHAIRS OR OTHER APPROVED METHODS.
11. REBAR SUPPORTS ARE NOT REQUIRED ON MACHINE PLACED CURB PROVIDED THAT REBAR IS PROPERLY GUIDED INTO THE CURB SECTION.



NOTE:
EXPANSION JOINT INTERVALS NOT TO EXCEED 40'-0".

CURB DOWEL DETAIL

The Architect/Engineer assumes responsibility for appropriate use of this standard.

REVISION NOTE: ADOPTED 6/21/2006

CITY OF GEORGETOWN
CONSTRUCTION STANDARDS AND DETAILS

RIBBON CURB DETAILS

DRAWING NAME: SD08

SCALE: NTS | DATE: 1/2003 | DRAWN BY: MRS | APPROVED BY: TRB

GEORGETOWN TEXAS
Georgetown Utility Systems
Your Community Owned Utility

NO.	REVISION	DATE

GEORGETOWN TEXAS
more than welcome

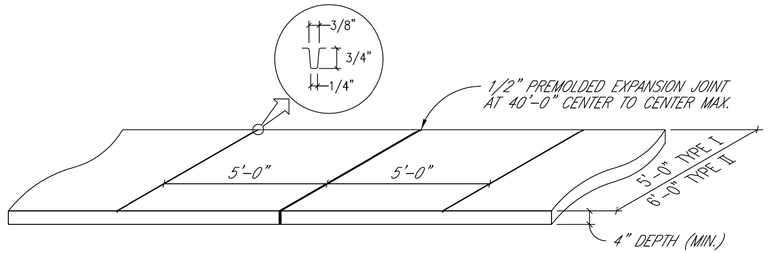
PAPE-DAWSON ENGINEERS
AUSTIN I SAN ANTONIO I HOUSTON I FORT WORTH I DALLAS
10801 N MOPAC EXPY, BLDG 3, STE 200 I AUSTIN, TX 78759 I 512.454.8711
TEXAS ENGINEERING FIRM #470 I TEXAS SURVEYING FIRM #10028800

WOLF RANCH PKWY / MEMORIAL DR

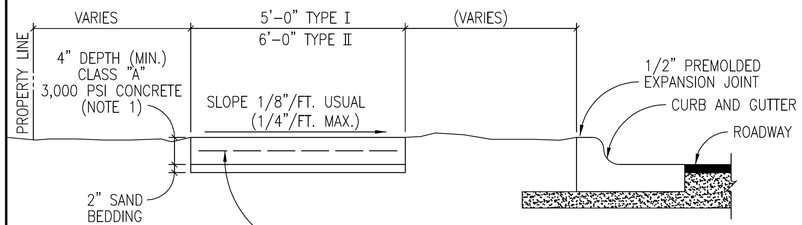
ROADWAY STANDARDS

CITY JOB No.
JOB NO. 51423-04
DATE 9/11/2025
DESIGNER
CHECKED DRAWN

SHEET NO. 234



TYPE I – AS REQUIRED FOR SINGLE FAMILY, DUPLEXES AND TOWNHOUSES.
TYPE II – AS REQUIRED FOR APARTMENTS, OFFICE AND PARKING LOTS, COMMERCIAL AND INDUSTRIAL.



NOTES:

1. FOR ROLLER STAMPED SIDEWALK: MATCH TO SPECIFICATIONS.
2. STANDARD LOCATION OF SIDEWALK IS OFF BACK OF CURB. SPECIAL DESIGNS MAY BE APPROVED BY THE CITY ENGINEER, PRIOR TO FINAL DESIGN.
3. SIDEWALK SHALL CONFORM TO CURRENT AMERICANS WITH DISABILITIES ACT STANDARDS.
4. IF REQUIRED ALL SIDEWALKS SHALL BE SUBMITTED AND APPROVED BY THE TEXAS DEPARTMENT OF LICENSING AND REGULATION BY THE ENGINEER RECORD.
5. ANY VARIANCE IN TEXTURE, GRADE OR ALIGNMENT MUST BE APPROVED BY THE TEXAS DEPARTMENT OF LICENSING AND REGULATION.

The Architect/Engineer assumes responsibility for appropriate use of this standard.

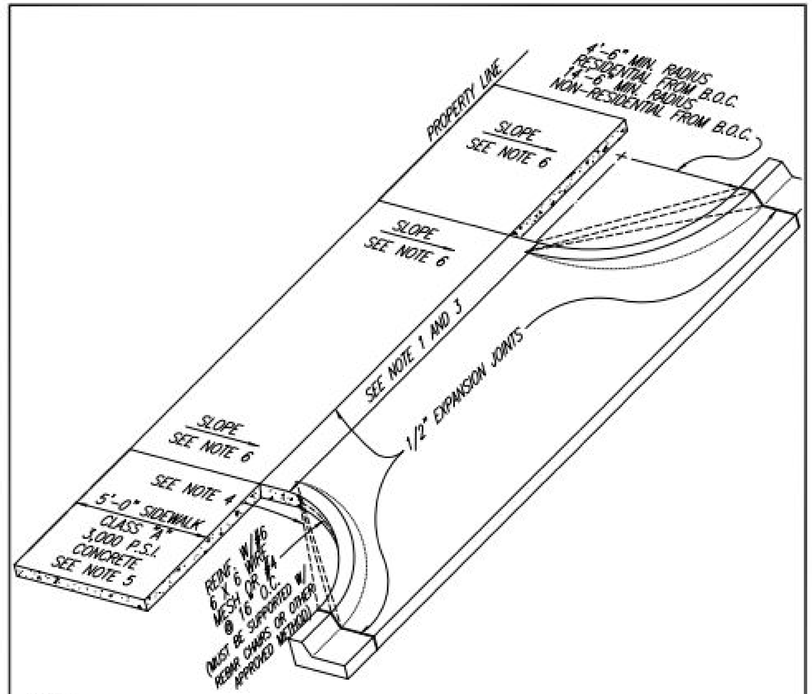
REVISION NOTE: ADOPTED 6/21/2006

GEORGETOWN TEXAS Georgetown Utility Systems Your Community Owned Utility

CITY OF GEORGETOWN
CONSTRUCTION STANDARDS AND DETAILS
SIDEWALK SECTION AND JOINT DETAIL

DRAWING NAME: SD14

SCALE:	DATE:
NTS	1/2003
DRAWN BY:	APPROVED BY:
MRS	TRB



NOTES:

1. MAXIMUM WIDTH OF APPROACH SHALL BE 24'-0" FOR RESIDENTIAL, 30'-0" FOR NON-RESIDENTIAL UNDIVIDED AND 45'-0" FOR NON-RESIDENTIAL DIVIDED.
2. DRIVEWAY PERMITS TO BE ACQUIRED FROM CITY INSPECTION OFFICE.
3. MINIMUM WIDTH OF APPROACH SHALL BE 10'-0" FOR RESIDENTIAL AND 15'-0" FOR NON-RESIDENTIAL.
4. LINEAR "RADIUS" AT CORNERS, PERMITTED FOR "SINGLE FAMILY" OR "TWO FAMILY" RESIDENTIAL DRIVEWAY APPROACH.
5. SIDEWALK LOCATION TO BE APPROVED BY CITY ENGINEER PRIOR TO FINAL DESIGN.
6. SLOPE 1/8" PER FOOT USUAL, NOT TO EXCEED 1/4" PER FOOT.
7. DRIVEWAY APPROACH THICKNESS TO BE A MIN. OF 6".

The Architect/Engineer assumes responsibility for appropriate use of this standard.

REVISION NOTE: ADOPTED 6/21/2006

GEORGETOWN TEXAS Georgetown Utility Systems Your Community Owned Utility

CITY OF GEORGETOWN
CONSTRUCTION STANDARDS AND DETAILS
CONCRETE DRIVEWAY APPROACH TYPICAL

DRAWING NAME: SD15

SCALE:	DATE:
NTS	1/2003
DRAWN BY:	APPROVED BY:
MRS	TRB

NO.	REVISION	DATE

GEORGETOWN TEXAS *more than welcome*

PAPE-DAWSON ENGINEERS
AUSTIN | SAN ANTONIO | HOUSTON | FORT WORTH | DALLAS
10801 N MOPAC EXPY, BLDG 3, STE 200 | AUSTIN, TX 78759 | 512.454.8711
TEXAS ENGINEERING FIRM #470 | TEXAS SURVEYING FIRM #10023800

WOLF RANCH PKWY / MEMORIAL DR

ROADWAY STANDARDS

CITY JOB No.
JOB NO. 51423-04
DATE 9/11/2025
DESIGNER
CHECKED DRAWN

SHEET NO. 235

The Architect/Engineer assumes responsibility for appropriate use of this standard.

NOTES:

1. COMMERCIAL SIDEWALKS WIDTHS – 6'
   RESIDENTIAL SIDEWALKS WIDTHS – 5'
2. ALL SLOPES ARE MAXIMUM ALLOWABLE. FLATTER SLOPES THAT WILL STILL DRAIN PROPERLY ARE ENCOURAGED.
3. ALL CONCRETE SURFACES SHALL RECEIVE A LIGHT BROOM FINISH UNLESS NOTED OTHERWISE IN THE PLANS.
4. FOR PURPOSES OF WARNING, THE CURB RAMPS SHALL HAVE A LIGHT REFLECTIVE VALUE AND TEXTURE THAT SIGNIFICANTLY CONTRASTS WITH THAT OF ADJOINING PEDESTRIAN ROUTES.
5. TEXTURES MAY CONSIST OF PAVERS WITH TRUNCATED DOMED SURFACES OR GROOVES. TEXTURES ARE REQUIRED TO BE DETECTABLE UNDERFOOT. SURFACES THAT WOULD ALLOW WATER TO ACCUMULATE ARE PROHIBITED.
6. COLOR CONTRAST, FOR EXAMPLE, CAN BE ACCOMPLISHED WITH COLORED CONCRETE PAVERS THAT HAVE TRUNCATED DOMES OR BY COLORED STAINED CONCRETE WITH GROOVES, EITHER OF WHICH WOULD PROVIDE A CONTRAST WITH TYPICALLY LIGHT COLORED CONCRETE.
7. ADDITIONAL INFORMATION ON CURB RAMP LOCATION, DESIGN, VISIBILITY AND TEXTURE MAY BE FOUND IN THE CURRENT EDITION OF THE TEXAS ACCESSIBILITY STANDARDS (TAS) PREPARED AND ADMINISTERED BY THE TEXAS DEPARTMENT OF LICENSING AND REGULATION (TDLR).
8. RAISED MEDIANS SEPARATE OPPOSING DIRECTIONS OF TRAFFIC AND PROVIDE A REFUGE AREA FOR PEDESTRIANS IF THEY ARE UNABLE TO CROSS THE ENTIRE ROADWAY IN THE ALLOTTED SIGNAL PHASE. TO SERVE AS A REFUGE AREA, THE MEDIAN SHOULD BE A MINIMUM OF 4 FEET WIDE. MEDIANS SHOULD BE DESIGNED TO PROVIDE ACCESSIBLE PASSAGE OVER OR THROUGH THEM.
9. ALL SIDEWALK PLANS AND DETAILS SHALL BE SUBMITTED AND APPROVED BY THE TEXAS DEPARTMENT OF LICENSING AND REGUALTION (TDLR).
10. ANY PART OF THE ACCESSIBLE ROUTE WITH A SLOPE GRATER THAN 1:20 (5%) SHALL BE CONSIDERED A RAMP. IF A RAMP HAS A RISE GREATER THAN 6 INCHES OR A HORIZONTAL PROJECTION GREATER THAN 72 INCHES, THEN IT SHALL HAVE HANDRAILS ON BOTH SIDES. THE ONLY EXCEPTION IS AT CURB RAMPS. HANDRAILS ARE NOT REQUIRED ON CURB RAMPS. CURB RAMPS SHALL BE PROVIDED WHERE EVER AN ACCESSIBLE ROUTE CROSSES (PENETRATES) A CURB. CURB RAMPS ARE GENERALLY INTERPRETED AS ONLY THE PORTION TYING DIRECTLY INTO THE ROADWAY.
11. TRAFFIC SIGNAL OR ILLUMINATION POLES, GROUND BOXES, CONTROLLER BOXES, SIGNS, DRAINAGE FACILITIES AND OTHER ITEMS SHALL BE PLACED SO NOT TO OBSTRUCT THE ACCESSIBLE ROUTE.
12. ALL SIDEWALKS WILL BE DOWELED INTO EXISTING SIDEWALKS, DRIVEWALKS, DRIVEWAYS, INLET BOXES, RETAINING WALLS, ETC.
13. ALL SIDEWALK CROSS–SLOPES SHALL NOT EXCEED 1:50, UNLESS A VARIANCE IS PROVIDED BY TDLR.

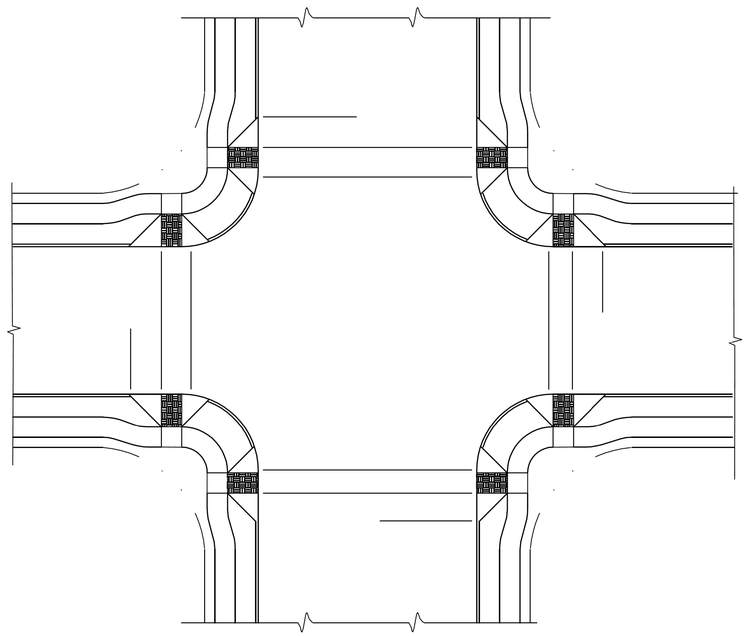
REVISION NOTE: ADOPTED 6/21/2006

EST. 1848 GEORGETOWN TEXAS Georgetown Utility Systems Your Community Owned Utility

CITY OF GEORGETOWN
CONSTRUCTION STANDARDS AND DETAILS
PEDESTRIAN RAMPS GENERAL NOTES

DRAWING NAME: SD28

SCALE:	DATE:
NTS	1/2003
DRAWN BY:	APPROVED BY:
MRS	TRB



OFFSET SIDEWALKS

NOTE: CURB RAMPS WITH RETURNED CURBS INSTEAD OF SIDE FLARES ARE PERMITTED WHERE PEDSTRIANS WOULD NOT NORMALLY WALK ACROSS THE RAMP

The Architect/Engineer assumes responsibility for appropriate use of this standard.

REVISION NOTE: ADOPTED 6/21/2006

EST. 1848 GEORGETOWN TEXAS Georgetown Utility Systems Your Community Owned Utility

CITY OF GEORGETOWN
CONSTRUCTION STANDARDS AND DETAILS
TYPICAL INTERSECTON LAYOUT

DRAWING NAME: SD29

SCALE:	DATE:
NTS	1/2003
DRAWN BY:	APPROVED BY:
MRS	TRB

NO.	REVISION	DATE

GEORGETOWN TEXAS *more than welcome*

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AUSTIN I SAN ANTONIO I HOUSTON I FORT WORTH I DALLAS
10801 N MOPAC EXPY, BLDG 3, STE 200 I AUSTIN, TX 78759 I 512.454.8711
TEXAS ENGINEERING FIRM #470 I TEXAS SURVEYING FIRM #10028800

WOLF RANCH PKWY / MEMORIAL DR

CITY JOB No.
JOB NO. 51423-04
DATE 9/11/2025
DESIGNER
CHECKED DRAWN

SHEET NO. 236

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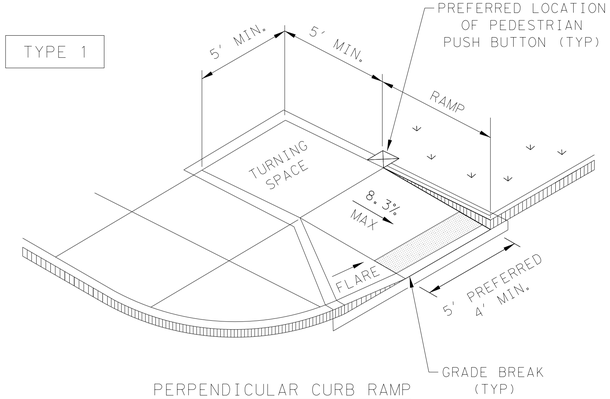
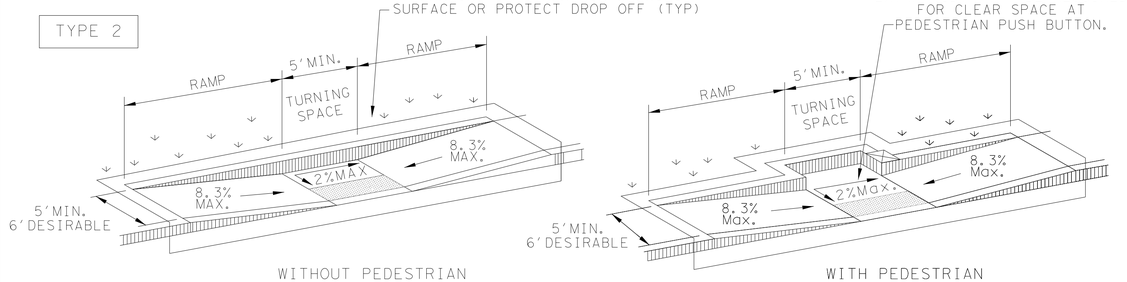
DATE:
FILE:

TYPE 1



PERPENDICULAR CURB RAMP

TYPE 2

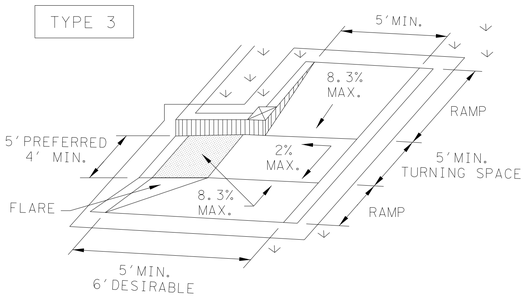


WITHOUT PEDESTRIAN PUSH BUTTON

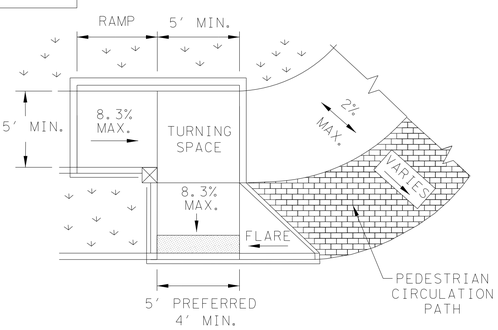
WITH PEDESTRIAN PUSH BUTTON

PARALLEL CURB RAMP

TYPE 3

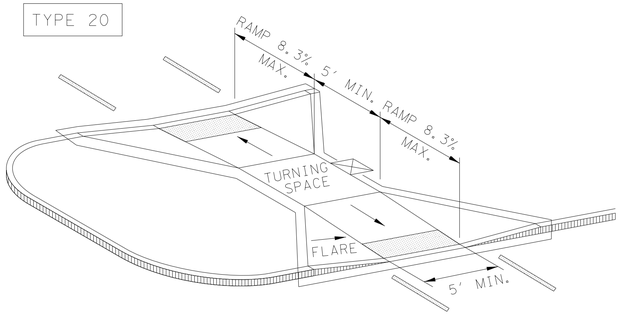


TYPE 6



COMBINATION CURB RAMPS

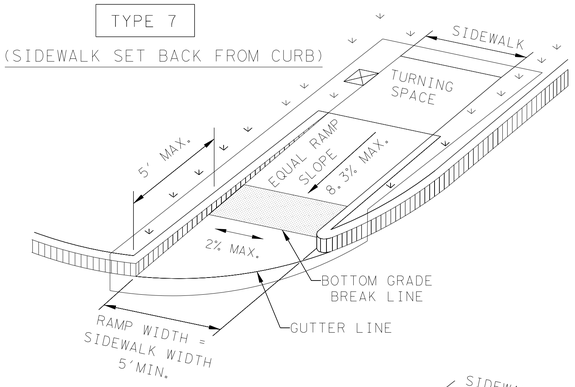
TYPE 20



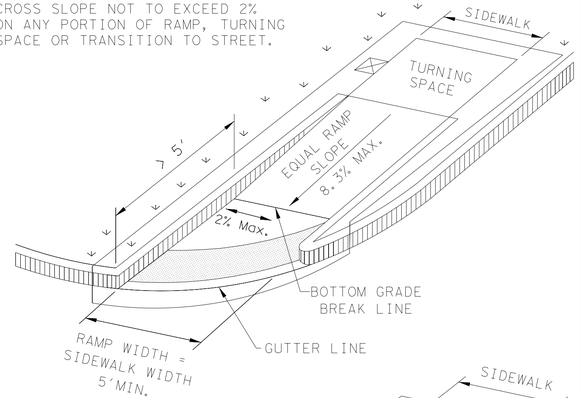
CURB RAMPS AT MEDIAN ISLANDS

TYPE 7

(SIDEWALK SET BACK FROM CURB)

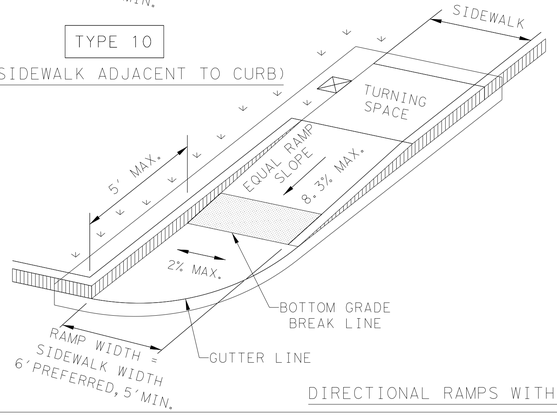


CROSS SLOPE NOT TO EXCEED 2% ON ANY PORTION OF RAMP, TURNING SPACE OR TRANSITION TO STREET.

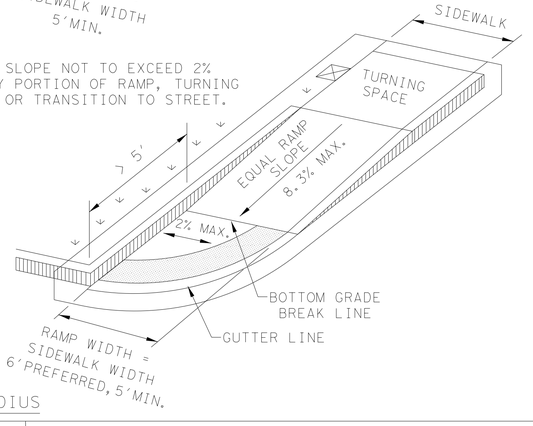


TYPE 10

(SIDEWALK ADJACENT TO CURB)

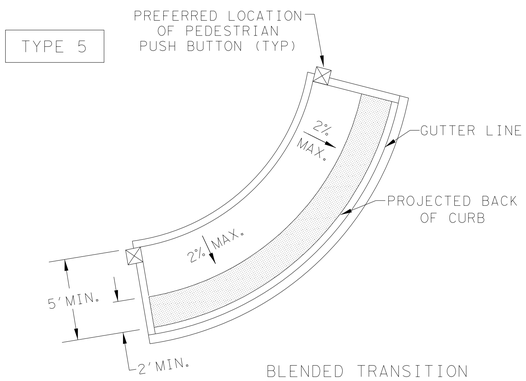


CROSS SLOPE NOT TO EXCEED 2% ON ANY PORTION OF RAMP, TURNING SPACE OR TRANSITION TO STREET.



DIRECTIONAL RAMPS WITHIN RADIUS

TYPE 5

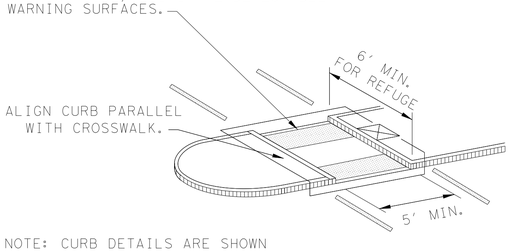


BLENDED TRANSITION

(FLUSH LANDING)

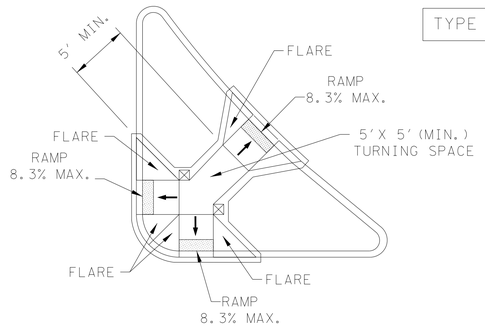
TYPE 21

INSTALL DETECTABLE WARNING SURFACE AT EACH END OF THE CUT-THROUGH RAMP WITH A MINIMUM 2' USUAL SIDEWALK SURFACE BETWEEN. IF MEDIAN IS LESS THAN 6' WIDE, ELIMINATE DETECTABLE WARNING SURFACES.



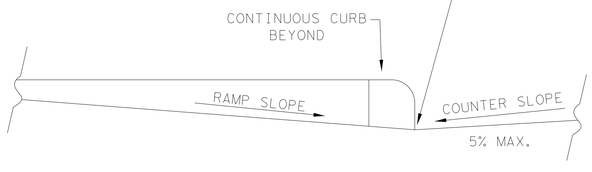
NOTE: CURB DETAILS ARE SHOWN ELSEWHERE IN THE PLANS.

TYPE 22



COMBINATION ISLAND RAMPS

BOTTOM GRADE BREAK OF CURB RAMP WILL NORMALLY BE AT GUTTER LINE. SURFACE SLOPES AT GRADE BREAKS SHALL BE FLUSH.



TYPICAL SECTION OF PERPENDICULAR CURB RAMP AT CONNECTION TO ROADWAY

NOTES / LEGEND:

SEE GENERAL NOTES ON SHEET 2 OF 4 FOR MORE INFORMATION.

DENOTES PLANTING OR NON-WALKING SURFACE NOT PART OF PEDESTRIAN CIRCULATION PATH.

DETECTABLE WARNING SURFACE

DENOTES PREFERRED LOCATION OF PEDESTRIAN PUSH BUTTON IF APPLICABLE.

GUTTER LINE

GRADE BREAK

RAMP LIMITS OF PAYMENT

Texas Department of Transportation

Design Division Standard

PEDESTRIAN FACILITIES CURB RAMPS

PED-18

FILE: ped18	DN: TxDOT		DW: VP	CK: KM	CK: PK & JG
© TxDOT: MARCH, 2002	CONT	SECT	JOB		HIGHWAY
REVISIONS					
REVISED 08,2005 REVISED 06,2012 REVISED 01,2018	DIST	COUNTY			SHEET NO.
					237

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DATE:
FILE:

GENERAL NOTES

CURB RAMPS

1. Install a curb ramp or blended transition at each pedestrian street crossing.
2. All slopes shown are maximum allowable. Cross slopes of 1.5% and lesser running should be used. Adjust curb ramp length or grade of approach sidewalks as directed.
3. Maximum allowable cross slope on sidewalk and curb ramp surfaces is 2%.
4. The minimum sidewalk width is 5′. Where the sidewalk is adjacent to the back of curb, a 6′ sidewalk width is desirable. Where a 5′ sidewalk cannot be provided due to site constraints, sidewalk width may be reduced to 4′ for short distances. 5′x 5′ passing areas at intervals not to exceed 200′ are required.
5. Turning Spaces shall be 5′x 5′ minimum. Cross slope shall be maximum 2%.
6. Clear space at the bottom of curb ramps shall be a minimum of 4′x 4′ wholly contained within the crosswalk and wholly outside the parallel vehicular travel path.
7. Provide flared sides where the pedestrian circulation path crosses the curb ramp. Flared sides shall be sloped at 10% maximum, measured parallel to the curb. Returned curbs may be used only where pedestrians would not normally walk across the ramp, either because the adjacent surface is planted, substantially obstructed, or otherwise protected.
8. Additional information on curb ramp location, design, light reflective value and texture may be found in the latest draft of the Proposed Guidelines for Pedestrian Facilities in the Public Right of Way (PROWAG) as published by the U.S. Architectural and Transportation Barriers Compliance Board (Access Board).
9. To serve as a pedestrian refuge area, the median should be a minimum of 6′ wide, measured from back of curbs. Medians should be designed to provide accessible passage over or through them.
10. Small channelization islands, which do not provide a minimum 5′x 5′ landing at the top of curb ramps, shall be cut through level with the surface of the street.
11. Crosswalk dimensions, crosswalk markings and stop bar locations shall be as shown elsewhere in the plans. At intersections where crosswalk markings are not required, curb ramps shall align with theoretical crosswalks unless otherwise directed.
12. Provide curb ramps to connect the pedestrian access route at each pedestrian street crossing. Handrails are not required on curb ramps.
13. Curb ramps and landings shall be constructed and paid for in accordance with Item 531 "Sidewalks".
14. Place concrete at a minimum depth of 5" for ramps, flares and landings, unless otherwise directed.
15. Furnish and install No. 3 reinforcing steel bars at 18" o.c. both ways, unless otherwise directed.
16. Provide a smooth transition where the curb ramps connect to the street.
17. Curbs shown on sheet 1 within the limits of payment are considered part of the curb ramp for payment, whether it is concrete curb, gutter, or combined curb and gutter.
18. Existing features that comply with applicalble standards may remain in place unless otherwise shown on the plans.

DETECTABLE WARNING MATERIAL

19. Curb ramps must contain a detectable warning surface that consists of raised truncated domes complying with PROWAG. The surface must contrast visually with adjoining surfaces, including side flares. Furnish and install an approved cast-in-place dark brown or dark red detectable warning surface material adjacent to uncolored concrete, unless specified elsewhere in the plans.
20. Detectable Warning Materials must meet TxDOT Departmental Materials Specification DMS 4350 and be listed on the Material Producer List. Install products in accordance with manufacturer's specifications.
21. Detectable warning surfaces must be firm, stable and slip resistant.
22. Detectable warning surfaces shall be a minimum of 24 inches in depth in the direction of pedestrian travel, and extend the full width of the curb ramp or landing where the pedestrian access route enters the street.
23. Detectable warning surfaces shall be located so that the edge nearest the curb line is at the back of curb and neither end of that edge is greater than 5 feet from the back of curb. Detectable warning surfaces may be curved along the corner radius.
24. Shaded areas on Sheet 1 of 4 indicate the approximate location for the detectable warning surface for each curb ramp type.

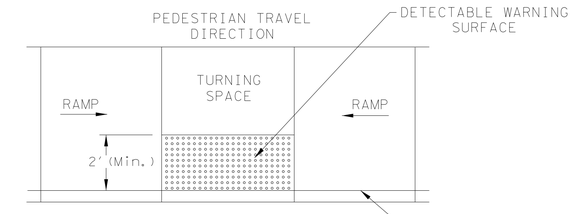
DETECTABLE WARNING PAVERS (IF USED)

25. Furnish detectable warning paver units meeting all requirements of ASTM C-936, C-33. Lay in a two by two unit basket weave pattern or as directed.
26. Lay full-size units first followed by closure units consisting of at least 25 percent (25%) of a full unit. Cut detectable warning paver units using a power saw.

SIDEWALKS

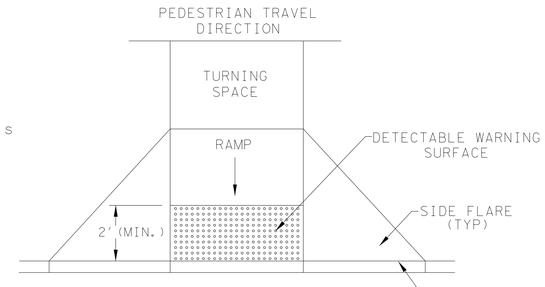
27. Provide clear ground space at operable parts, including pedestrian push buttons. Operable parts shall be placed within unobstructed reach range specified in PROWAG section R406.
28. Place traffic signal or illumination poles, ground boxes, controller boxes, signs, drainage facilities and other items so as not to obstruct the pedestrian access route or clear ground space.
29. Street grades and cross slopes shall be as shown elsewhere in the plans.
30. Changes in level greater than 1/4 inch are not permitted.
31. The least possible grade should be used to maximize accessibility. The running slope of sidewalks and crosswalks within the public right of way may follow the grade of the parallel roadway. Where a continuous grade greater than five percent (5%) must be provided, handrails may be desirable to improve accessibility. Handrails may also be needed to protect pedestrians from potentially hazardous conditions. If provided, handrails shall comply with PROWAG R409.
32. Handrail extensions shall not protrude into the usable landing area or into intersecting pedestrian routes.
33. Driveways and turnouts shall be constructed and paid for in accordance with Item "Intersections, Driveways and Turnouts". Sidewalks shall be constructed and paid for in accordance with Item, "Sidewalks".
34. Sidewalk details are shown elsewhere in the plans.

DETECTABLE WARNING SURFACE DETAILS



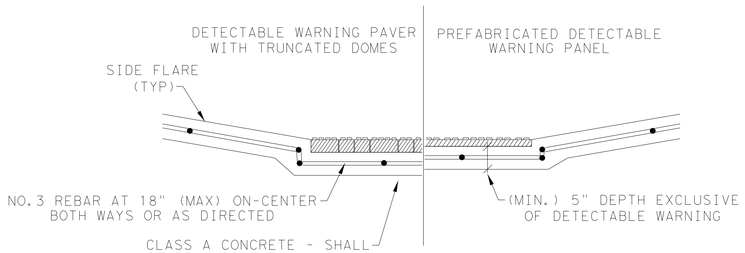
PARALLEL CURB RAMP

TYPICAL PLACEMENT OF DETECTABLE WARNING SURFACE ON LANDING AT STREET EDGE.



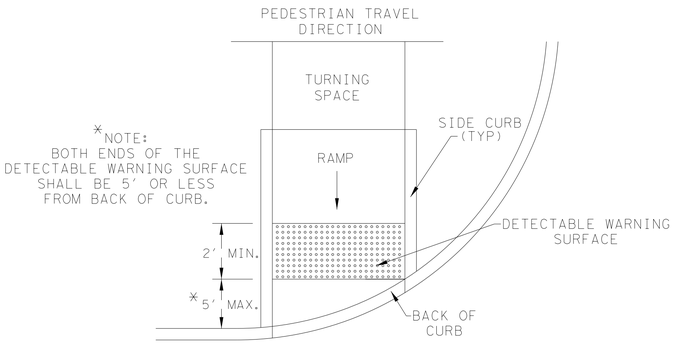
PERPENDICULAR CURB RAMP

TYPICAL PLACEMENT OF DETECTABLE WARNING SURFACE ON SLOPING RAMP RUN.



SECTION VIEW DETAIL

CURB RAMP AT DETECTIBLE WARNINGS



DIRECTIONAL CURB RAMP

TYPICAL PLACEMENT OF DETECTABLE WARNING SURFACE ON SLOPING RAMP RUN.

Texas Department of Transportation

Design Division Standard

PEDESTRIAN FACILITIES CURB RAMPS

PED-18

FILE: ped18	DN: TxDOT	DW: VP	CK: KM	CK: PK & JG
© TxDOT: MARCH, 2002	CONT	SECT	JOB	HIGHWAY
REVISIONS REVISED 08,2005 REVISED 06,2012 REVISED 01,2018	DIST	COUNTY		SHEET NO.
				238

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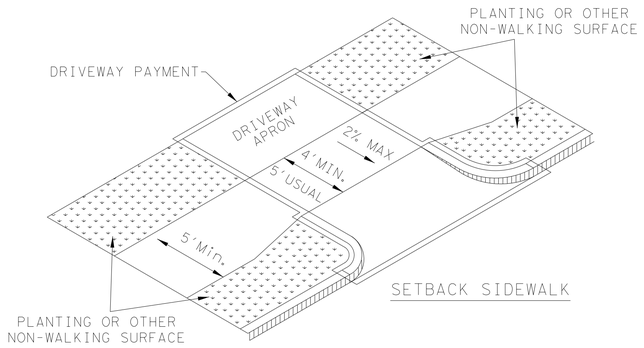
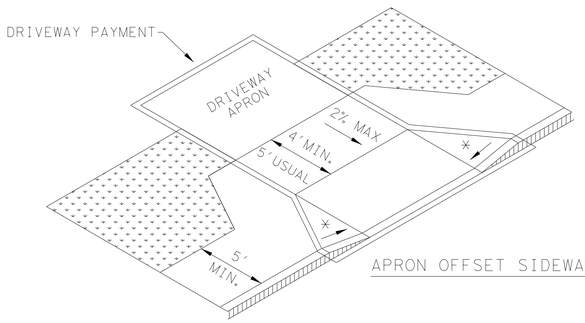
DATE:
FILE:

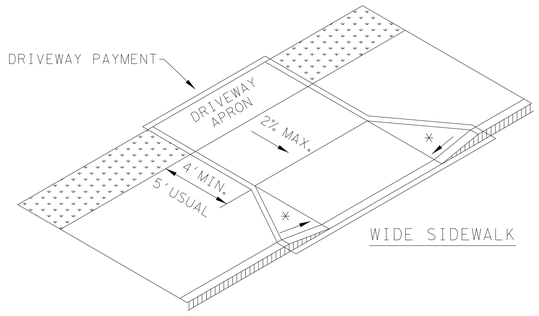
SIDEWALK TREATMENT AT DRIVEWAYS



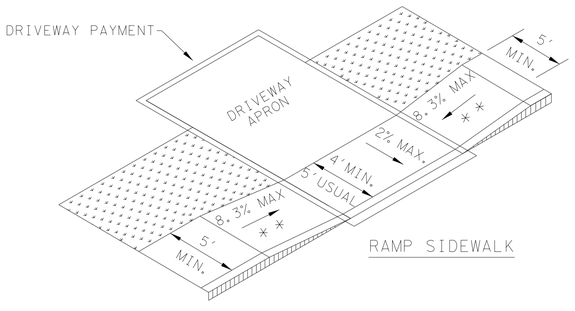
SETBACK SIDEWALK



APRON OFFSET SIDEWALK



WIDE SIDEWALK

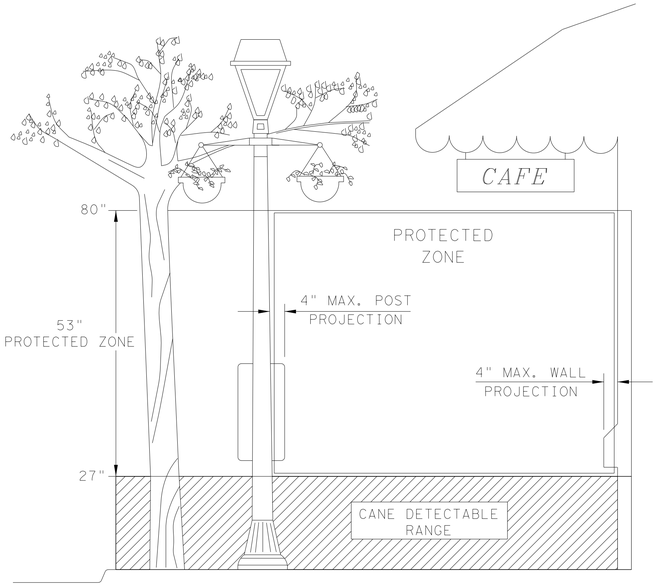


RAMP SIDEWALK

NOTES:

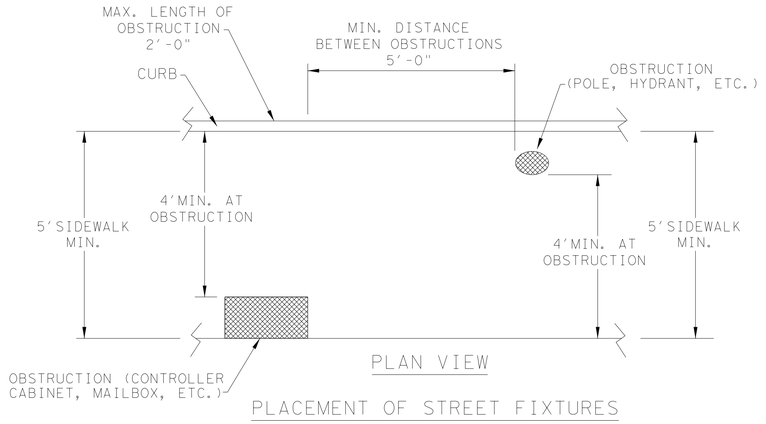
* WHERE DRIVEWAYS CROSS THE PEDESTRIAN ROUTE, SIDES SHALL BE FLARED AT 10% MAX SLOPE.

* * IF CURB HEIGHT IS GREATER THAN 6 INCHES, USE GRADE LESS THAN OR EQUAL TO 5%. HANDRAIL AND DETECTABLE WARNING ARE NOT REQUIRED.



PROTECTED ZONE

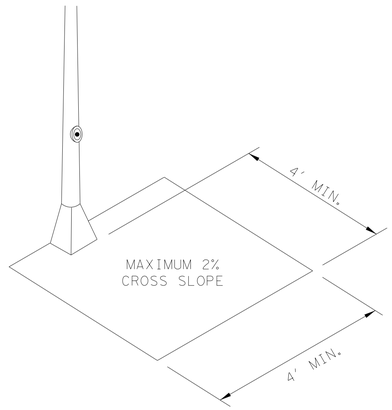
NOTE: IN PEDESTRIAN CIRCULATION AREA, MAXIMUM 4" PROJECTION FOR POST OR WALL MOUNTED OBJECTS BETWEEN 27" AND 80" ABOVE THE SURFACE.



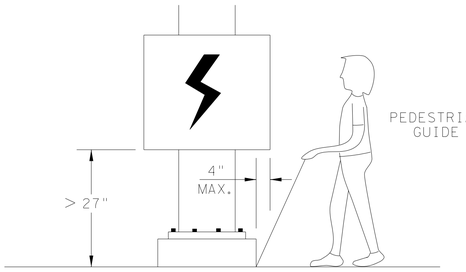
PLAN VIEW

PLACEMENT OF STREET FIXTURES

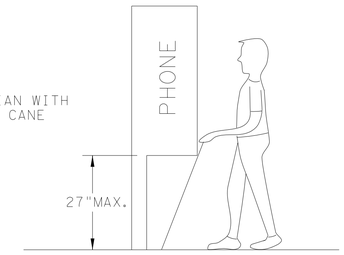
NOTE: ITEMS NOT INTENDED FOR PUBLIC USE. MINIMUM 4' X 4' CLEAR GROUND SPACE REQUIRED AT PUBLIC USE FIXTURES.



CLEAR SPACE ADJACENT TO PEDESTRIAN PUSH BUTTON



WHEN AN OBSTRUCTION OF A HEIGHT GREATER THAN 27" FROM THE SURFACE WOULD CREATE A PROTRUSION OF MORE THAN 4" INTO THE PEDESTRIAN CIRCULATION AREA, CONSTRUCT ADDITIONAL CURB OR FOUNDATION AT THE BOTTOM TO PROVIDE A MAXIMUM 4" OVERHANG.



PROTRUDING OBJECTS OF A HEIGHT ≤27" ARE DETECTABLE BY CANE AND DO NOT REQUIRE ADDITIONAL TREATMENT.

DETECTION BARRIER FOR VERTICAL CLEARANCE < 80"

Texas Department of Transportation

Design Division Standard

PEDESTRIAN FACILITIES CURB RAMPS

PED-18

FILE: ped18	DN: TxDOT		DW: VP	CK: KM	CK: PK & JG
© TxDOT: MARCH, 2002	CONT	SECT	JOB		HIGHWAY
REVISIONS					
REVISED 08,2005	DIST	COUNTY			SHEET NO.
REVISED 06,2012					239
REVISED 01,2018					

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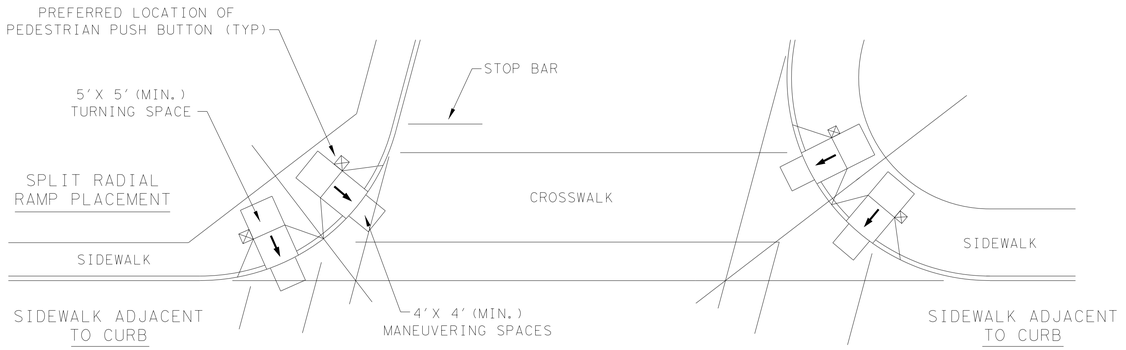
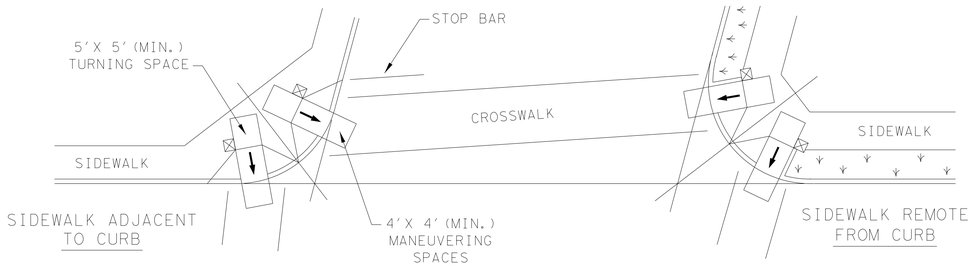
DATE:
FILE:

TYPICAL CROSSING LAYOUTS

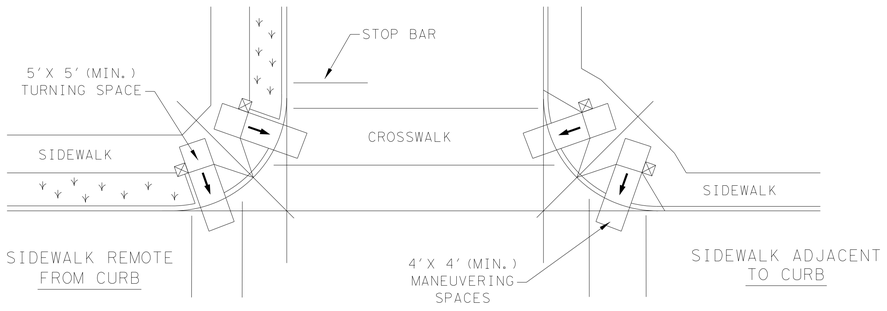
SEE SHEET 1 OF 4 FOR DETAILS AND DIMENSIONS



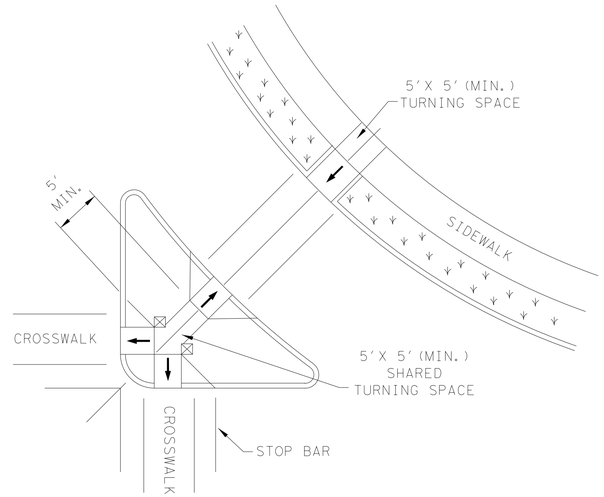
SKEWED INTERSECTION WITH "LARGE" RADIUS



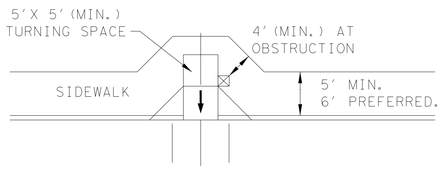
SKEWED INTERSECTION WITH "SMALL" RADIUS

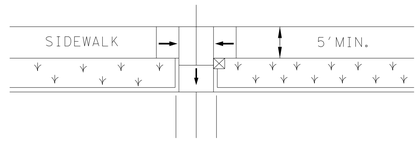


NORMAL INTERSECTION WITH "SMALL" RADIUS



AT INTERSECTION
W/FREE RIGHT TURN & ISLAND





MID-BLOCK PLACEMENT
PERPENDICULAR RAMPS

LEGEND:

SHOWS DOWNWARD SLOPE. →

DENOTES PREFERRED LOCATION OF PEDESTRIAN PUSH BUTTON (IF APPLICABLE). ☒

DENOTES PLANTING OR NON-WALKING SURFACE NOT PART OF PEDESTRIAN CIRCULATION PATH.

Texas Department of Transportation

Design Division Standard

PEDESTRIAN FACILITIES
CURB RAMPS

PED-18

FILE: ped18	DN: TxDOT	DW: VP	CK: KM	CK: PK & JG
© TxDOT: MARCH, 2002	CONT	SECT	JOB	HIGHWAY
REVISIONS				
REVISED 08,2005 REVISED 06,2012 REVISED 01,2018	DIST	COUNTY		SHEET NO.
				240

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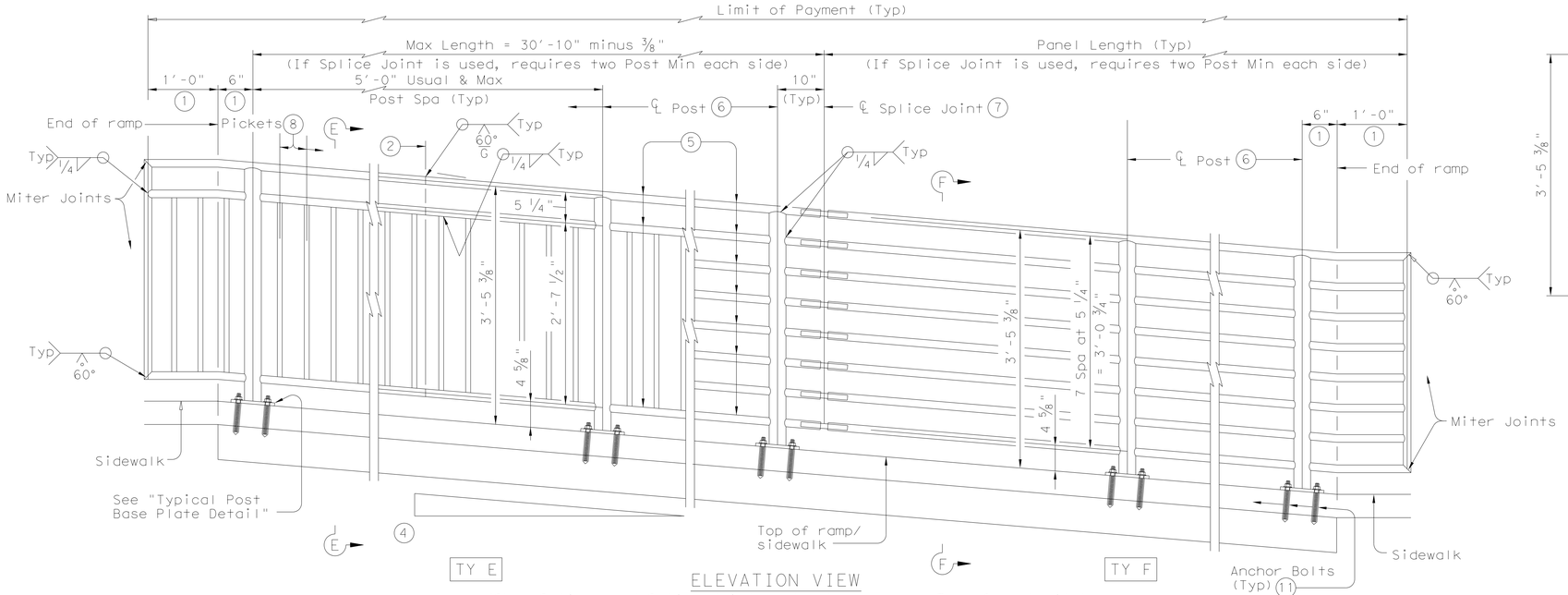
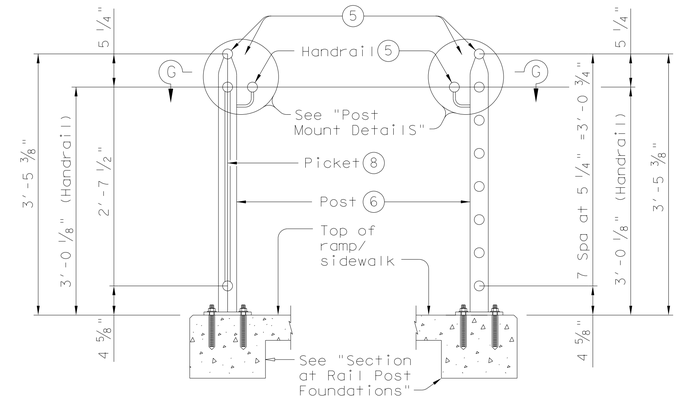


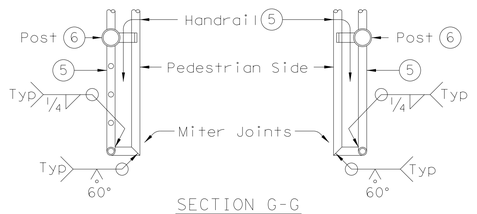
ELEVATION VIEW

(Shop Splices and Splice Joints only shown on one Type for clarity)

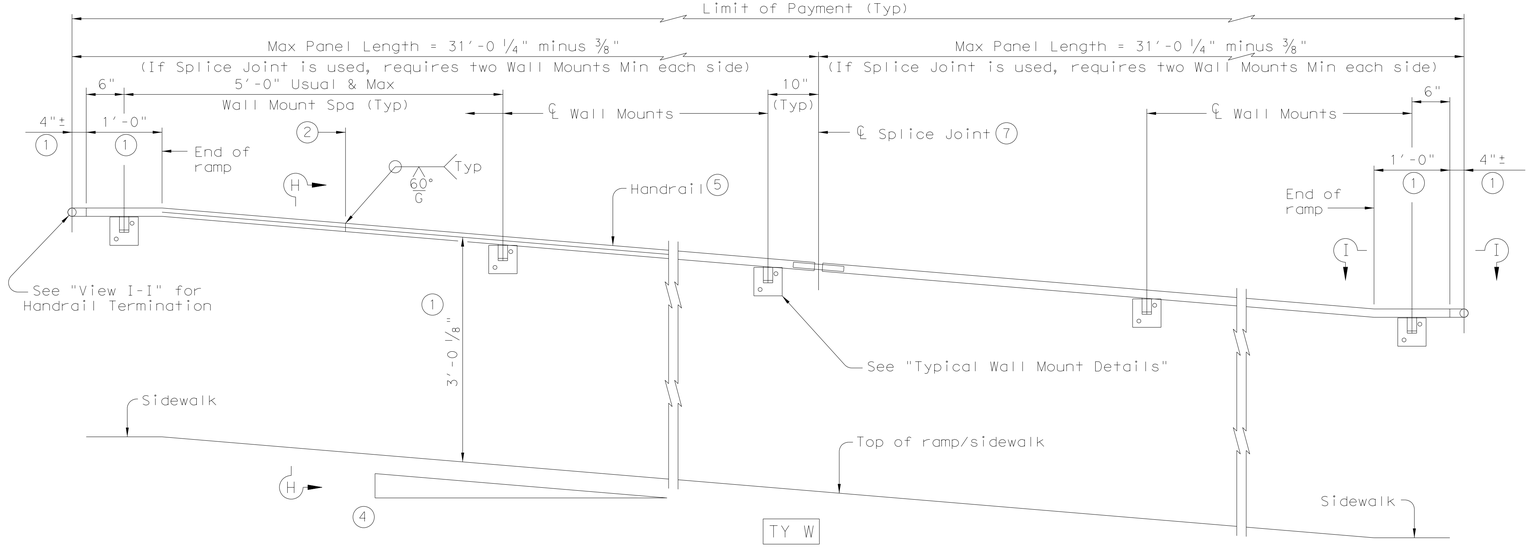


SECTION E-E
(Showing Handrail TY E)

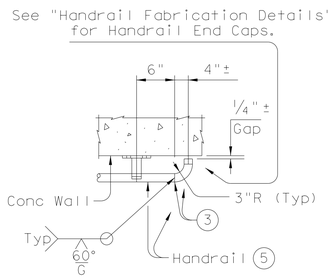
SECTION F-F
(Showing Handrail TY F)



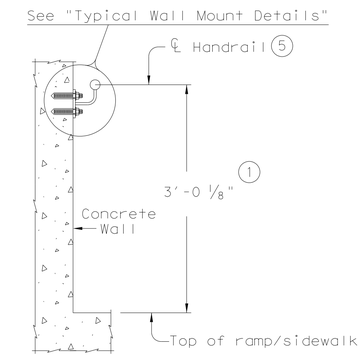
SECTION G-G
(Showing Handrail Termination)



ELEVATION VIEW



VIEW I-I
(Showing Handrail Termination)



SECTION H-H
(Showing Handrail TY W)

1. Parallel to ground.
2. One shop splice per panel is permitted with minimum 85 percent penetration. The weld may be square groove or single vee groove. Grind smooth.
3. Shop splice is permitted with minimum 85 percent penetration. The weld may be square groove or single vee groove. Grind smooth.
4. See Ramp Details located elsewhere in plans for ramp slope and dimensions. Maximum ramp slope will not exceed 8.3 percent. Level landing required for each 30" rise if grade exceeds 5 percent.
5. 1 ½" Dia. Standard Pipe (1.900" O.D., 0.145" wall thickness). Parallel to ramp / sidewalk. Provide holes as needed in 1 ½" Dia. pipe for galvanizing drainage and venting.
6. 2 ½" Dia. Standard Pipe (2.875" O.D., 0.203" wall thickness). See "Post Mount Detail" for crimping and trimming post to fit Dia. of top rail. Provide holes as needed in post for galvanizing drainage and venting. Plumb all posts.
7. See "Handrail Fabrication Details" for Splice Joints.
8. ℄ 5/8" Dia. Round Bar equal spacing at 4 ½" Max. Plumb all pickets.
11. See "General Notes" for anchor bolt information.

SHEET 2 OF 3

Texas Department of Transportation

Design Division Standard

PEDESTRIAN HANDRAIL DETAILS

PRD-13

FILE: prd13.dgn	DN: TxDOT	CK: AM	DW: JTR	CK: CGL
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REVISIONS				
REVISED MAY, 2013 (VP)	DIST	COUNTY		SHEET NO.
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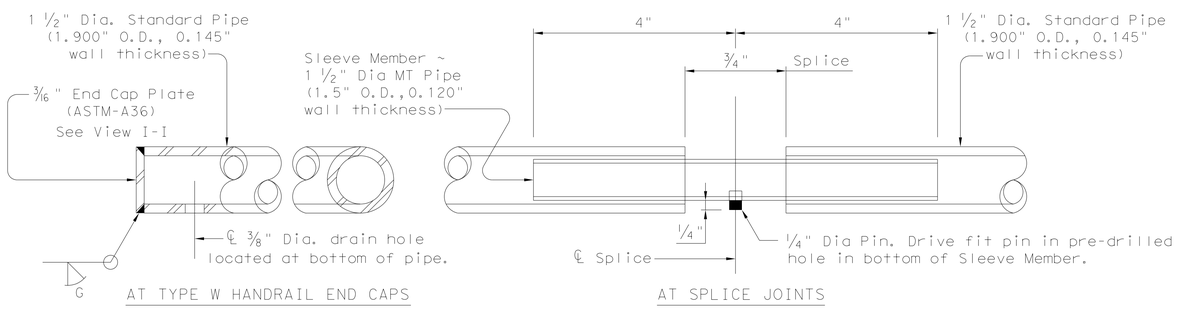
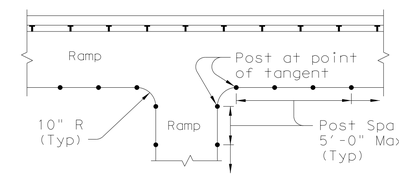


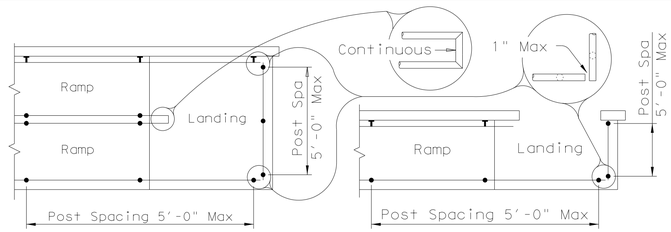
AT TYPE W HANDRAIL END CAPS

AT SPLICE JOINTS

HANDRAIL FABRICATION DETAILS



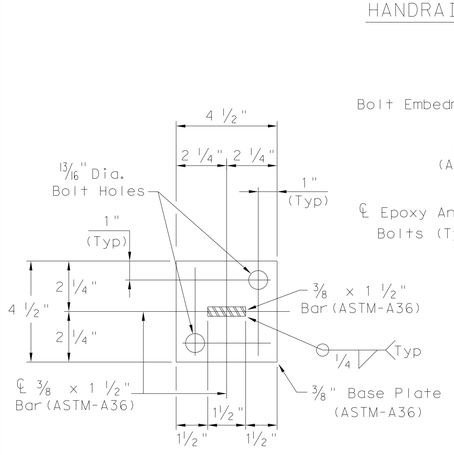
RAMP INTERSECTION



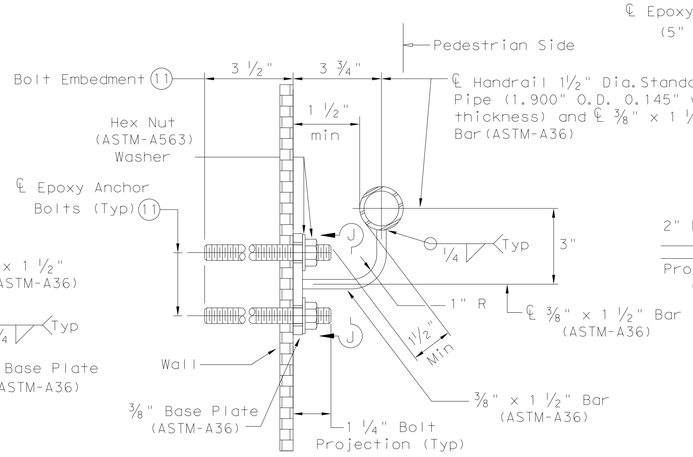
MULTI-LEVEL RAMP

SINGLE-LEVEL RAMP

PLAN SHOWING RAIL AT RAMP CONDITIONS

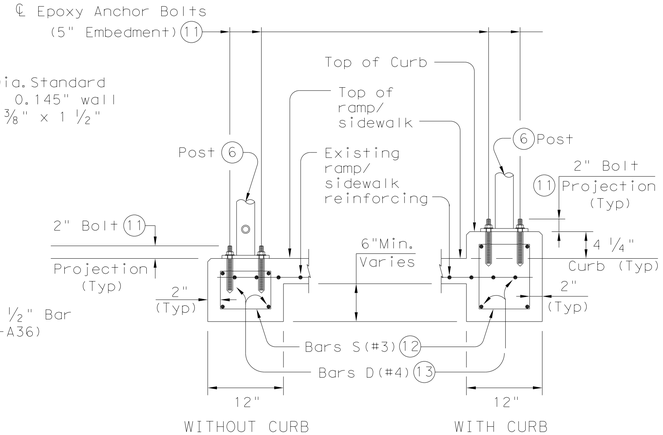


SECTION J-J
(Anchor Bolts not shown for clarity)



SECTION AT WALL MOUNT

TYPICAL WALL MOUNT DETAILS



WITHOUT CURB

WITH CURB

SECTION AT RAIL POST FOUNDATIONS

GENERAL NOTES

Designed according to ADAAG, Texas Accessibility Standards, Uniform Building Code, and AASHTO LRFD Specifications.

Handrail anchorage details shown on this standard may require modification for select structure types. See appropriate details elsewhere in plans for these modifications.

Pipe will conform to ASTM-A53 Grade B or A500 Grade B. Steel plates and steel bars will conform to ASTM-A36. Mechanical tubing (MT) will conform to ASTM A513 Grade 1015 or higher. Galvanize all steel components except reinforcing steel unless noted otherwise.

Concrete for foundations will be in accordance with Item 531 "Sidewalks". All reinforcing steel must be Grade 60. Bar laps, where required, will be as follows: Uncoated ~ #4 = 1'-5" Epoxy coated ~ #4 = 2'-1"

When the plans require painted steel, follow the requirements for painting galvanized steel in Item 446, "Cleaning and Painting Steel". Sleeve Members will receive galvanization and only get field painted after installation unless directed otherwise by Engineer.

Epoxy Anchor bolts for wall mount and post base plate will be ⅝" Dia. ASTM A36 threaded rods with one hex nut and one hardened steel washer at each bolt. ⅝" Dia. threaded rod embedment depth for wall mounts is 3 ½" and embedment depth for post base plate is 5".

Embed threaded rods into concrete with a Type III (Class C) epoxy meeting the requirements of DMS-6100, "Epoxies and Adhesives". Mix and dispense adhesive with the manufacturer's static mixing nozzle/dual cartridge system. Core drill holes (percussion drilling not permitted).

At the contractor's option the post base plate anchor bolts may be cast with the Ramp/Sidewalk (See Cast-in-Place Anchor Bolt Options).

Optional cast-in-place anchor bolts will be ⅝" Dia ASTM A307 Grade A bolts (or A36 threaded rods with one tack welded hex nut each) with one hex nut and one hardened steel washer at each bolt. Embedment depth of cast-in-place bolt will be 8" for post base plate.

Handrails and any wall or other surface adjacent to them will be free of any sharp or abrasive elements.

Submit shop drawings to the Engineer unless otherwise noted. For curved handrail applications, fabricate the handrail to the curve if radius is less than 600 ft. Shop drawings are required when rail is fabricated to the curve.

For all handrails, erection drawings will be submitted to the Engineer for approval to ensure proper installation.

Drawings will show handrail mount locations with bolts setting, spacing, ramp slope, and/or splice joint locations, and handrail lengths with identification showing where each handrail goes on the layout.

Payment for concrete sidewalks or curb ramps will be paid for in accordance with Item 531 "Sidewalks".

Payment for all items shown is to be included in unit price bid in accordance with Item 450 "Railing" of the type specified.

All exposed edges will be rounded or chamfered to approximately ⅛" by grinding.

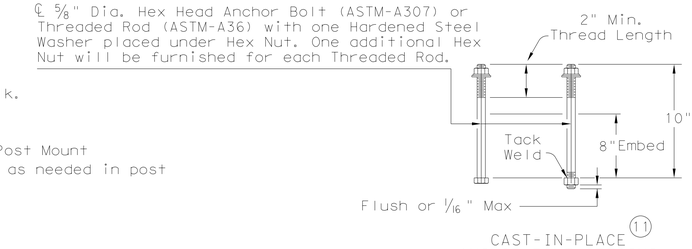
(5) 1 ½" Dia. Standard Pipe (1.900" O.D., 0.145" wall thickness). Parallel to ramp/sidewalk. Provide holes as needed in 1 ½" Dia. pipe for galvanizing drainage and venting.

(6) 2 ½" Dia. Standard Pipe (2.875" O.D., 0.203" wall thickness). Plumb all posts. See "Post Mount Detail" for crimping and trimming post to fit the diamenter of top rail. Provide holes as needed in post for galvanizing drainage and venting.

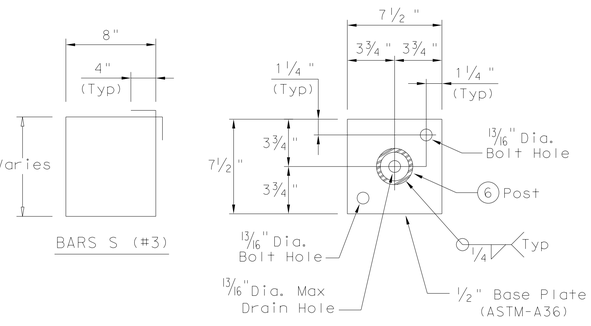
(11) See "General Notes" for anchor bolt information.

(12) Bars S(#3) spaced at 12" Max (Spaced 3" from outside edge of overall length of Ramp/Sidewalk).

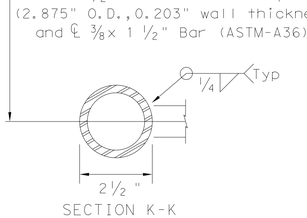
(13) Provide 1 ½" end cover to Bars D(#4) from outside edge of overall length of Ramp/Sidewalk.



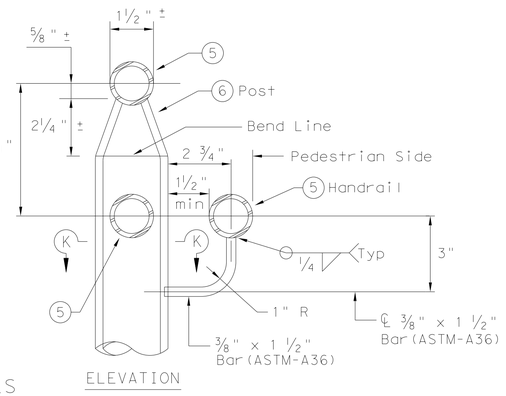
CAST-IN-PLACE ANCHOR BOLT OPTIONS
(Used for Post Base Plate only)



TYPICAL POST BASE PLATE DETAIL



SECTION K-K



ELEVATION

POST MOUNT DETAILS

SHEET 3 OF 3

Texas Department of Transportation

Design Division Standard

PEDESTRIAN HANDRAIL DETAILS

PRD-13

FILE: prd13.dgn	DN: TxDOT	CK: AM	DW: JTR	CK: CGL
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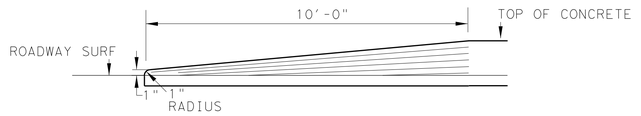
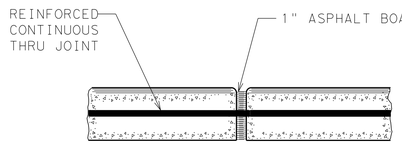
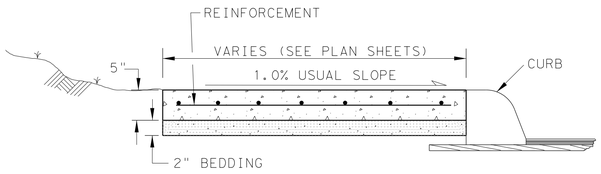
REVISIONS REVISED MAY, 2013 (VP)				
	DIST	COUNTY		SHEET NO.
				241A



TAPER FOR CURB AND MEDIAN ENDS

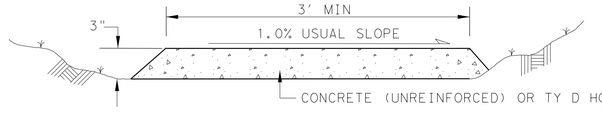


CURB, SIDEWALK, & SUP EXPANSION JOINT DETAIL



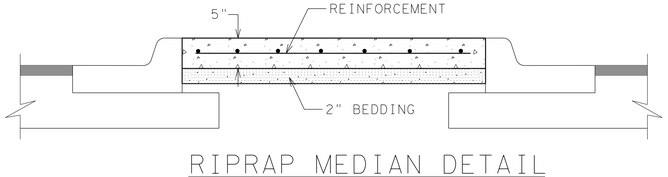
SIDEWALK & SHARED USE PATH (S.U.P.) TYP. SECT.

1. SIDEWALK OR S.U.P. EXPANSION JOINTS ARE TO BE AT A MAX. SPACING OF 40' AND COINCIDE WITH THE CURB EXPANSION JOINTS (WHEN ADJACENT TO CURB).
2. TOOLED OR SAWED CONTRACTION JOINTS ARE NOT ALLOWED



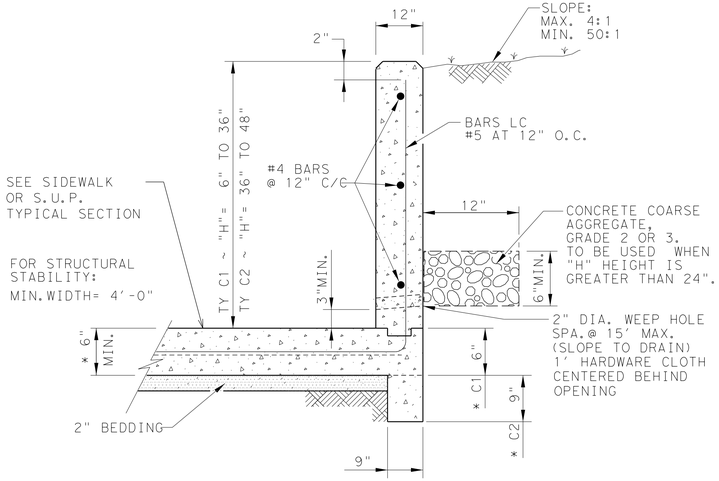
TEMPORARY SIDEWALK & SHARED USE PATH (S.U.P.)

1. EXPANSION JOINTS, BEDDING, AND TOOL JOINTS ARE NOT REQUIRED.
2. PROVIDE 5' X 5' PASSING AREA AT INTERVALS NOT TO EXCEED 200'.
3. 4' TALL ORANGE CONSTRUCTION FENCE REQUIRED IF DROP OFF GREATER THAN 6" ADJACENT TO SIDEWALK.
4. ALL MATERIAL AND TESTING REQUIREMENTS ARE WAIVED.
5. INSTALLATION, MAINTENANCE, FENCE, AND REMOVAL ARE SUBSIDIARY TO SIDEWALK ITEM.
6. EXCAVATION AND EMBANKMENT TO PROVIDE ADA COMPLIANCE WILL BE PAID USING PERTINENT BID ITEMS.
7. LOCATION AS DIRECTED BY ENGINEER.

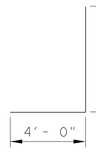


RIPRAP MEDIAN DETAIL

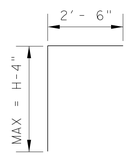
1. EXPANSION JOINTS ARE TO BE AT A MAX. SPACING OF 40' AND COINCIDE WITH THE CURB EXPANSION JOINTS (WHEN ADJACENT TO CURB)
2. EXPANSION MATERIAL BETWEEN MEDIAN AND CURB IS NOT REQUIRED.



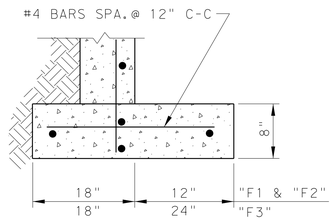
CONC CURB (TY C1) & (TY C2)



BAR LC



BAR LF



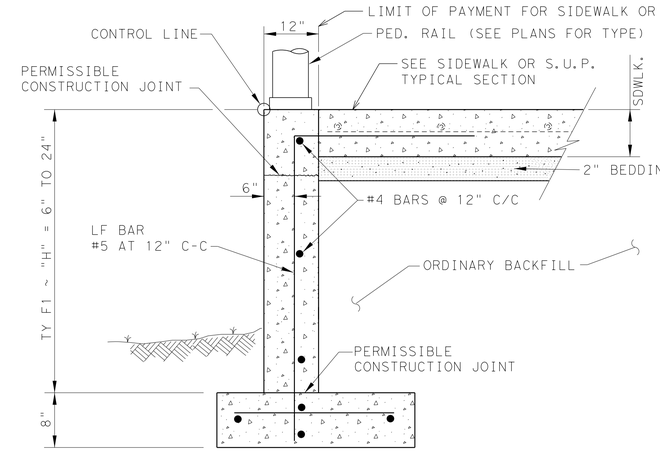
FOOTING DETAIL

SIDEWALK, SHARED USE PATH, AND MEDIAN NOTES

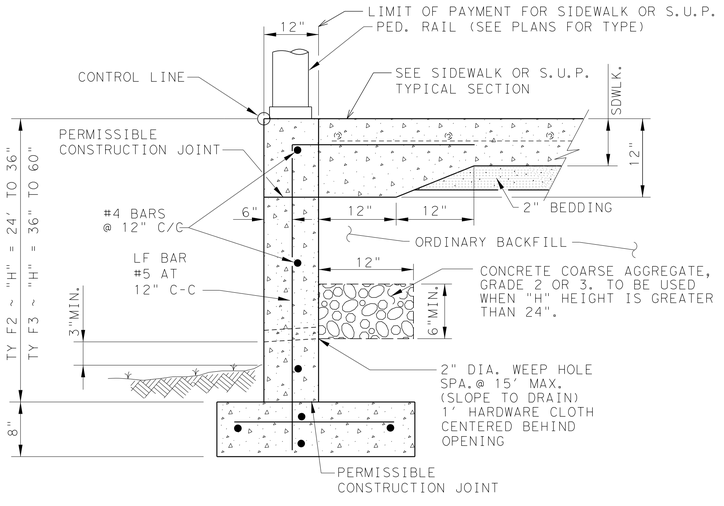
Reinforcement will be in accordance with Item 432.3.1. Fiber reinforcement is not allowed. Class A and B Concrete are allowed to use Coarse Aggregate Grades 1-8.

Bedding may be sand, base, or RAP bedding. Furnish base meeting the requirement for any type or grade in accordance with Item 247. Base compressive strengths are waived. RAP must be 100% passing a 1 in. sieve. Bedding must be placed using ordinary compaction.

If roots are encountered verify with the Engineer prior to accommodating or removing 2 in. diameter or larger roots. Root removal must be in accordance with Item 752.4.2. Roots may remain in the bedding or base. For improvements within 6 in. of a root, the concrete thickness may be reduced by 1 in. and the bedding increased by 1 in. to minimize impacts to the roots. Adjust bedding and surface profile to provide a 1 in. bedding cushion around the roots. The surface profile may be adjusted to the extent allowed by ADA. This work is subsidiary.



CONC CURB (TY F1)‡



CONC CURB (TY F2) & (TY F3)‡

CONCRETE CURB NOTES:
All Concrete, including adjacent sidewalk or S.U.P., shall be Class "C".
All Reinforcing Steel shall be Grade 60.
Minimum 4' sidewalk width for CONC CURB (TYPES C1 & C2).

‡ Until the sidewalk is complete, lateral support for the "F" curbs will be required.

ALL WORK SHOWN BEYOND TYPICAL SIDEWALK, S.U.P., AND PED RAIL IS SUBSIDIARY.

DESIGN SOIL PARAMETERS:
Soil Unit Wt. = 120 pcf
Phi = 30 Degrees
Cohesion = 50 psf
Min. PI = 15
Max. PI = 30
SURCHARGE:
TYPE F CURB q = 2' Adjacent to sidewalk
Max. slope behind TYPE C Curb = 4:1
Min. Factor of Safety against sliding is 1.5.
Designed in accordance with current AASHTO Standards and Interim Specifications.

NOT TO SCALE

Texas Department of Transportation | Austin District Standard

MISCELLANEOUS CURB, PATH, SIDEWALK, AND MEDIAN DETAILS

MCPSWMD-25 (AUS)

©TxDOT 2024

REVISIONS
04/19: APPROVED
02/23: ADDED TEMP S/W
10/24: REVISED TO 2024 SPEC

CONT	SECT	JOB	HIGHWAY
0514	23	04Wolf Ranch Parkway	
DIST	COUNTY		SHEET NO.
AUS	Williamson		242

DATE: 9/11/2025 11:29:55 AM
FILE: H:\Projects\514\23\04\Design\Civil\Standards\Roadway\mcpswmd-25.dgn

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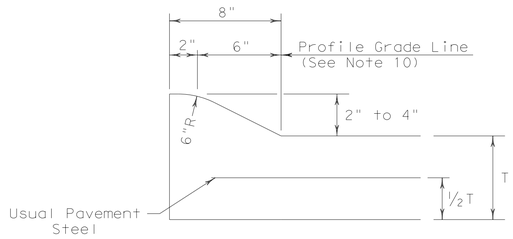
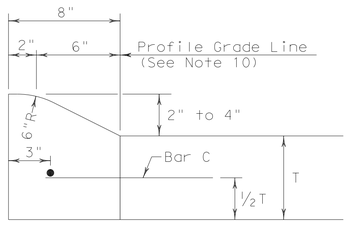


TYPE I CURB (MONOLITHIC)
2" - 4" HEIGHT



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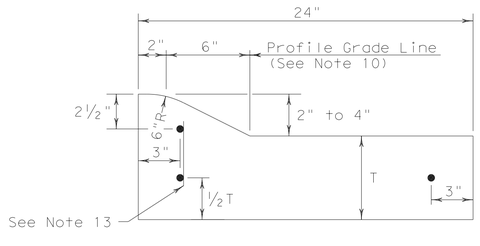
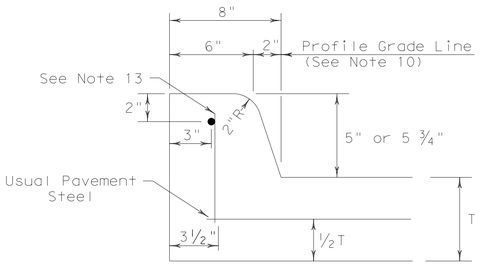
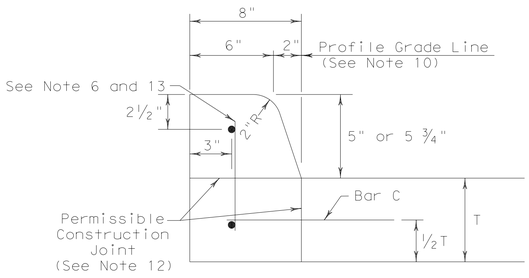


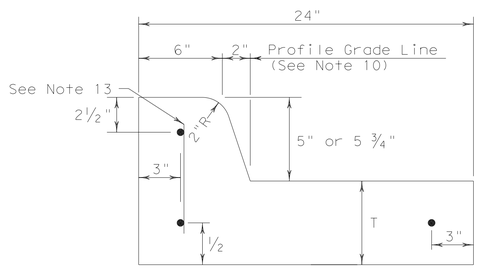
TYPE I CURB AND GUTTER
2" - 4" HEIGHT



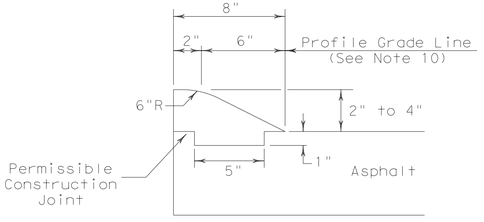
TYPE II CURB (MONOLITHIC)
5" - 5 ¾" HEIGHT



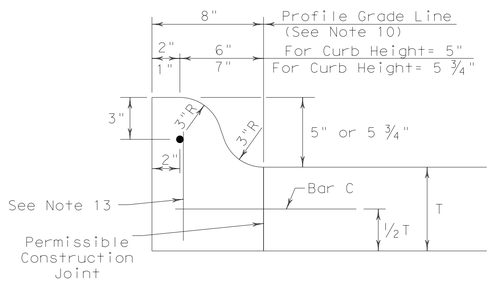
TYPE II CURB
5" - 5 ¾" HEIGHT



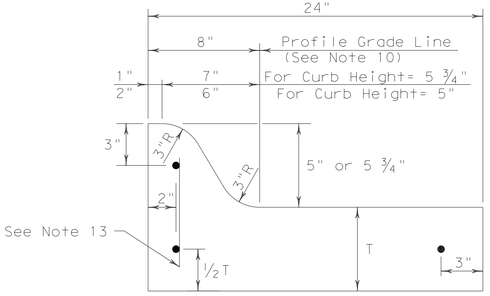
TYPE II CURB AND GUTTER
5" - 5 ¾" HEIGHT



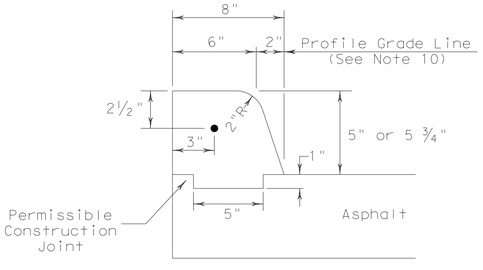
TYPE III CURB (KEYED)
2" - 4" HEIGHT



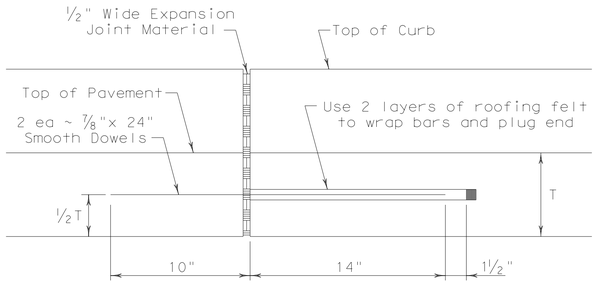
TYPE IIa CURB
5" - 5 ¾" HEIGHT



TYPE IIa CURB AND GUTTER
5" - 5 ¾" HEIGHT

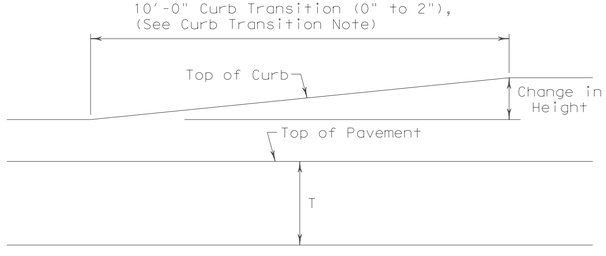


TYPE IV CURB (KEYED)
5" - 5 ¾" HEIGHT



EXPANSION JOINT DETAIL

CURB TRANSITION NOTE:
Field conditions may require a longer or shorter transition, and shall be shown elsewhere in the plans, or as directed by the Engineer.



CURB TRANSITION
Note: To be paid for as Highest Curb

GENERAL NOTES

1. All materials and construction shall be in accordance with Item 529, "Concrete Curb, Gutter, and Combined Curb and Gutter."
2. Concrete shall be Class A.
3. When reinforcing bars are used, they shall be No.4 unless otherwise shown. The use of fiber reinforced concrete in lieu of reinforcing steel is acceptable. Use fibers meeting the requirements of DMS 4550, "Fibers for Concrete," and dose fibers in accordance with Material Producers List (MPL) "Fibers for Class A and B Concrete Applications."
4. Round exposed sharp edges with a rounding tool, to a minimum radius of ¼ inch.
5. All existing curbs and driveways to be removed shall be sawed or removed at existing joints.
6. Where concrete curb is to be placed on existing concrete pavement, Bar B may be drilled and grouted in place, or may be inserted into fresh concrete.
7. Expansion and contraction joints shall be constructed to match pavement joints in all curbs and curb and gutter adjacent to jointed concrete pavement. Where placement of curb or curb and gutter is not adjacent to concrete pavement, expansion joints shall be provided at structures, curb returns at streets, and at locations directed by The Engineer.
8. Vertical and horizontal dowel bars and transverse reinforcing bars shall be placed at four feet C~C.
9. Dimension 'T' shown is the thickness of concrete pavement. When curb is installed adjacent to flexible pavement dimension 'T' is 8" maximum.
10. Usual profile grade line. Refer to typical sections and plan-profile sheets for exact locations.
11. One-half inch expansion joint material shall be provided where curb or curb and gutter is adjacent to sidewalk or riprap.
12. When horizontal permissible construction joints are used, the longitudinal pavement steel shall be placed in accordance with pavement details shown elsewhere in the plans. Reinforcing steel for curb section shall then conform to that required for concrete curb.
13. Bar B placement as needed (typically at four ft. C-C) to support curb reinforcing steel during concrete placement.



BAR B

BAR C

Texas Department of Transportation

Design Division Standard

CONCRETE CURB AND CURB AND GUTTER

CCCG-22

FILE: cccg21.dgn	DN: TXDOT	CK: AN	DW: CS	CK: KM
© TxDOT: JUNE 2022	CONT	SECT	JOB	HIGHWAY
REVISIONS				
	DIST	COUNTY		SHEET NO.
				243

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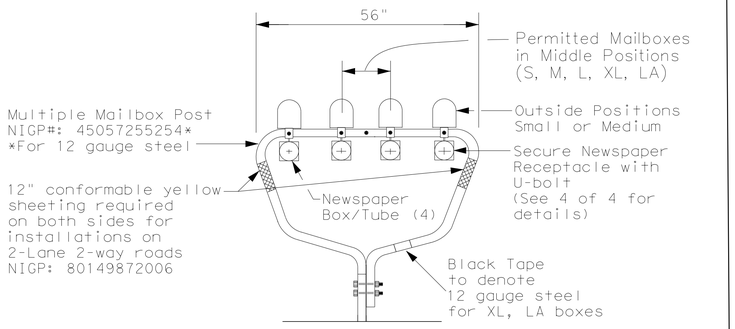
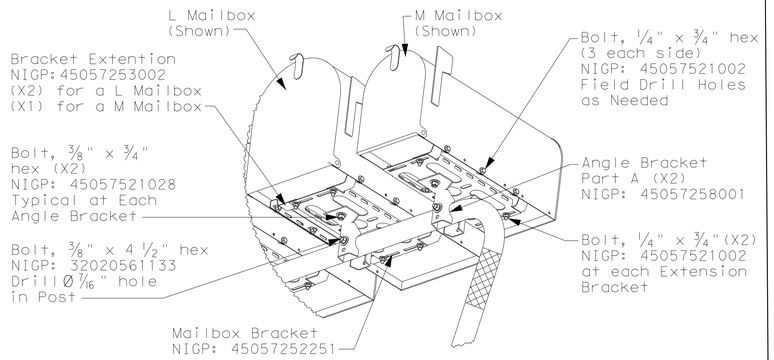
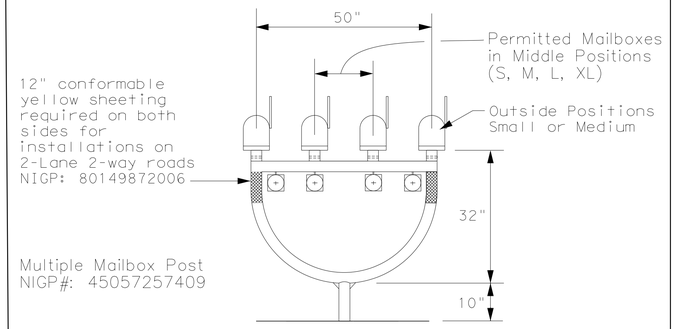
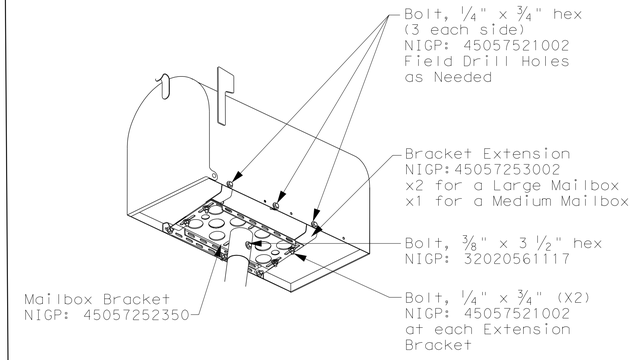
TYPE 1 - MULTIPLE





TYPE 4 - MULTIPLE





MAILBOX SIZES

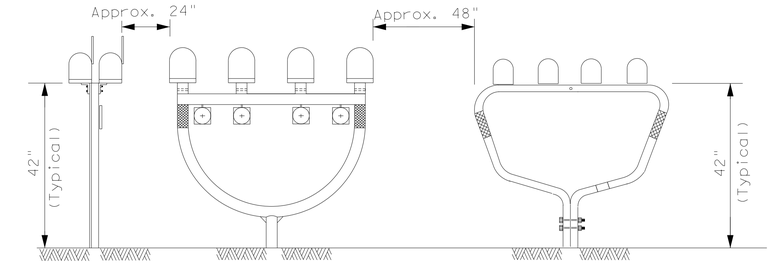
MAILBOX SIZE	TYPICAL DIMENSIONS			MAX **
	LENGTH	WIDTH	HEIGHT	WEIGHT
SMALL	19 1/2"	6"	7"	6 LBS
MEDIUM	22 1/2" *	8" *	11 1/2" *	8 LBS
LARGE	23 1/2"	11 1/2"	13 1/2"	11 LBS
EXTRA LARGE	18"	14"	12"	13 LBS
LOCKABLE	18"	11 1/2"	15"	23 LBS

* See Note 1.
** Excluding Molded Plastic on 4 X 4 Post

GENERAL NOTES:

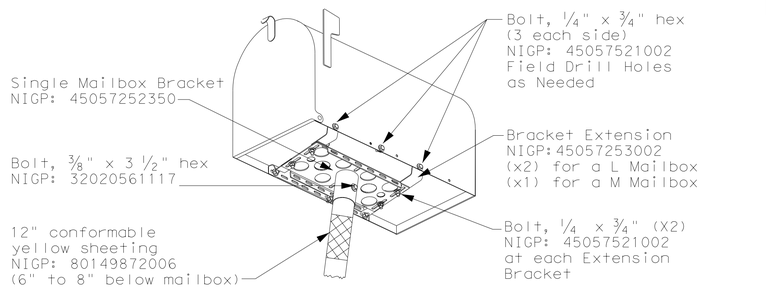
1. Dimensions shown (length, width, and height) are typical, not maximums. However, anytime a medium size mailbox is mounted on a single/double mount or on the outside position on a multi mount, the dimensions shown are maximums.
2. Mailboxes shall be made of light weight sheet metal or light weight plastic. Heavy steel, cast iron or decorative mailboxes shall not be used on the state highway system.

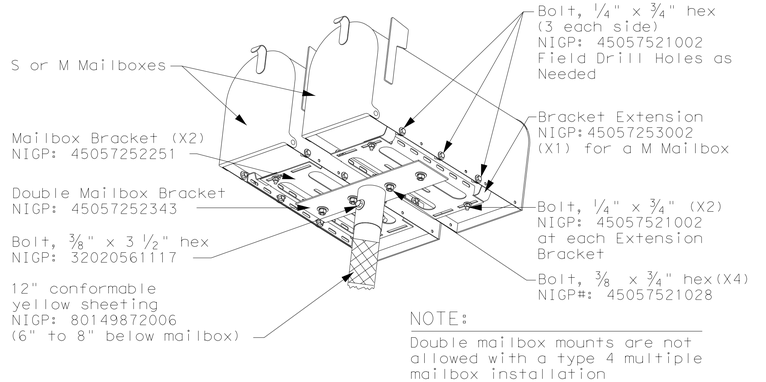
TYPICAL INSTALLATION MEASUREMENTS



NOTE:
Mailbox installations in sidewalk areas shall be in accordance with the latest TxDOT Design Standard sheets PED-Pedestrian Facilities Curb Ramps.

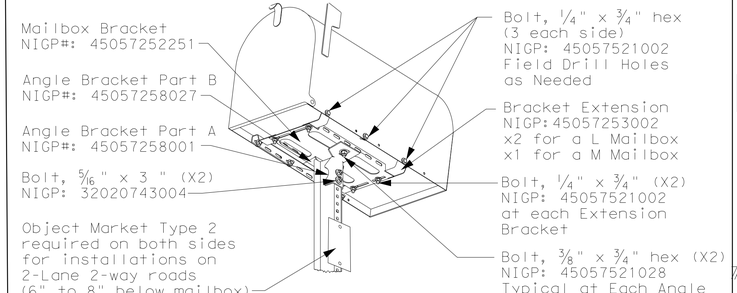
TYPE 2 and 4 - SINGLE/DOUBLE

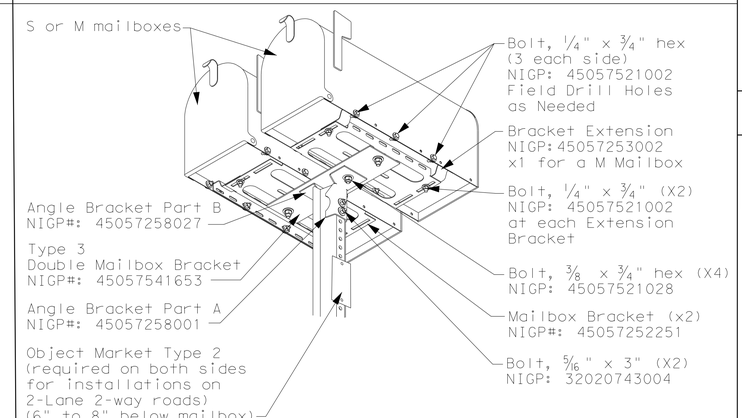




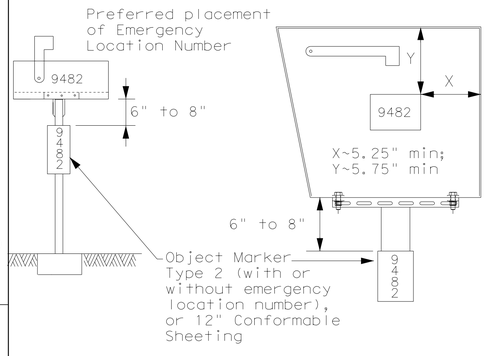
NOTE:
Double mailbox mounts are not allowed with a type 4 multiple mailbox installation

TYPE 3 - SINGLE/DOUBLE





PLACEMENT OF EMERGENCY LOCATION NUMBER

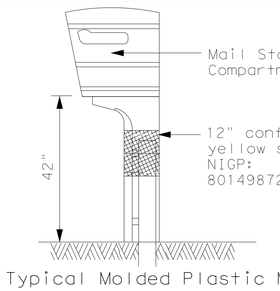


NOTES:

1. Location numbers are provided by homeowner. Minimum size 1" height.
2. Location number is typically placed on the mailbox in a contrasting color.
3. Black numbers may be placed on the Type 2 object marker if the numbers cannot be placed on the mailbox.
4. Alternatively, a green or blue plate with white numbers attached may be mounted below the object marker. Other contrasting color configuration, as approved, may be used.
5. See 3 of 4 for Foundation details.
6. See 4 of 4 for Hardware details.

SHEET 1 OF 4

TYPE 5



Typical Molded Plastic Mailbox

Texas Department of Transportation

Maintenance Division Standard

MAILBOX MOUNTING AND ASSEMBLY

MB(1)-21

FILE: MB-21.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK:
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REVISIONS 2/2005 11/2009 4/2015 6/2005 1/2011 11/2006 7/2014	DIST	COUNTY		SHEET NO. 244

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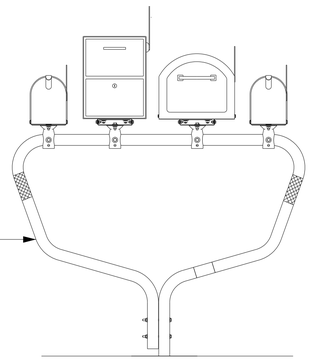
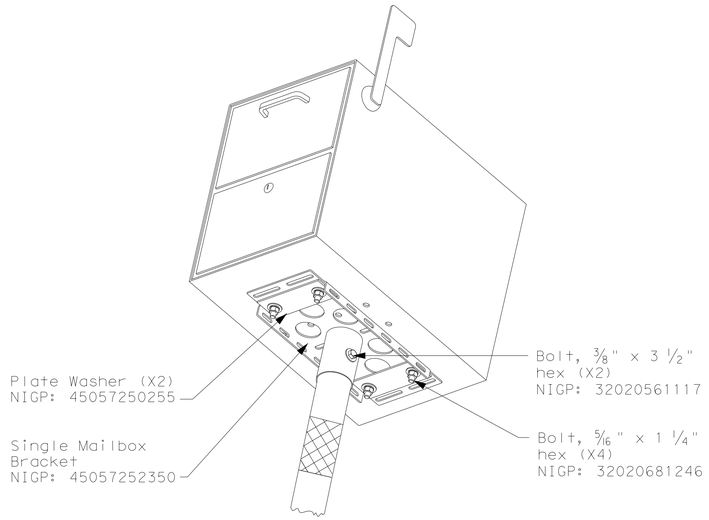
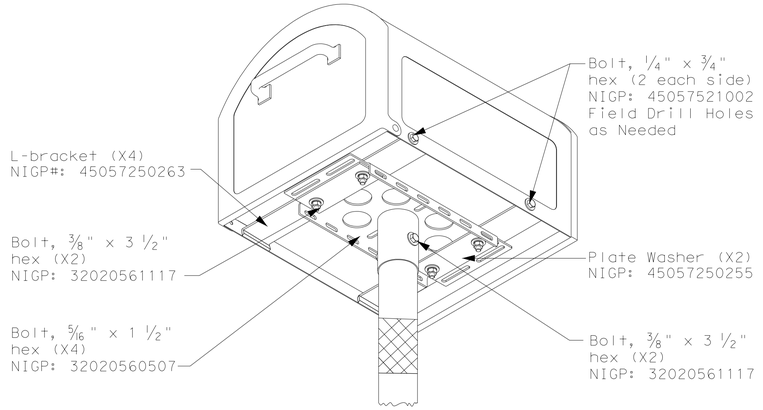
TYPE 1- MULTI LOCKABLE AND XL MAILBOX



TYPE 2/4 - SINGLE LOCKABLE MAILBOX

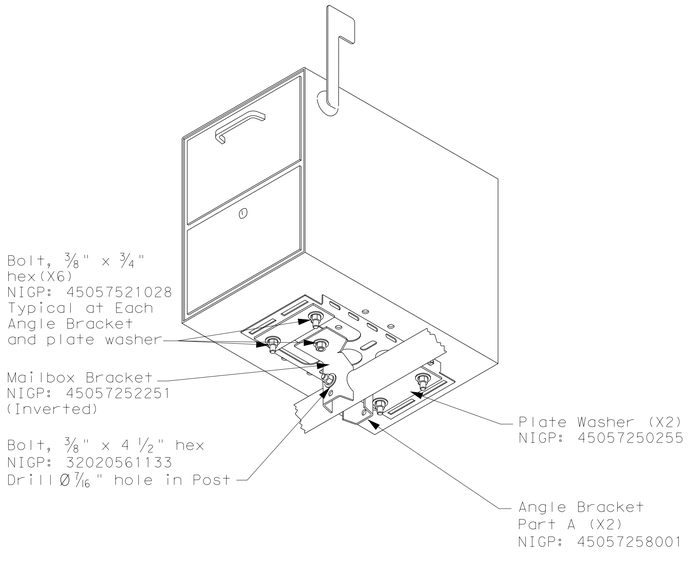


TYPE 2/4 - SINGLE XL MAILBOX

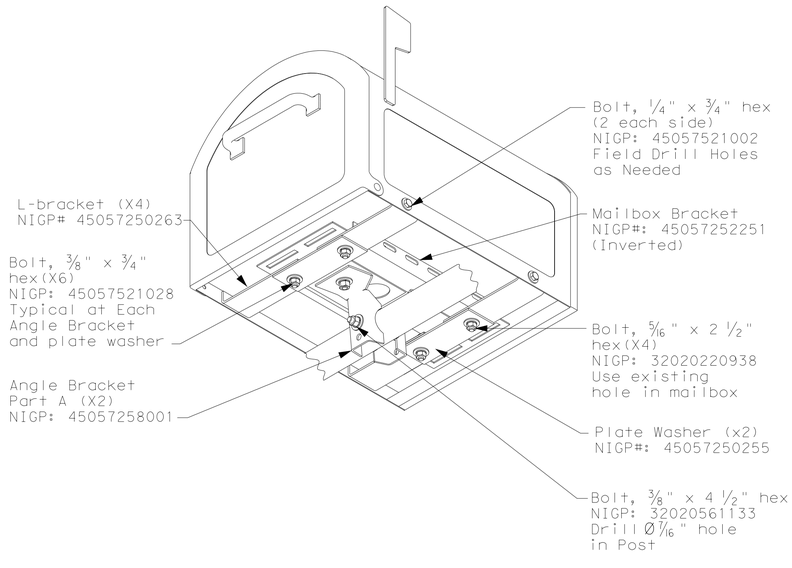


NOTE:
Follow same configuration when mounting an XL mailbox on a Type 4 multi post.

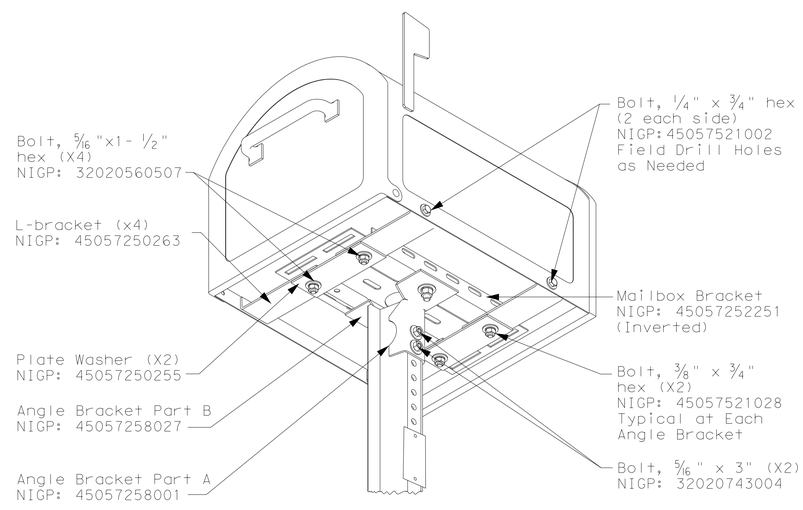
TYPE 1 MULTI – LOCKABLE ARCHITECTURAL (LA)



TYPE 1 MULTI – XL MAILBOX



TYPE 3 - XL MAILBOX MOUNTING



Texas Department of Transportation | Maintenance Division Standard

XL AND LOCKABLE ARCHITECTURAL MAILBOX ASSEMBLY

MB(2)-21

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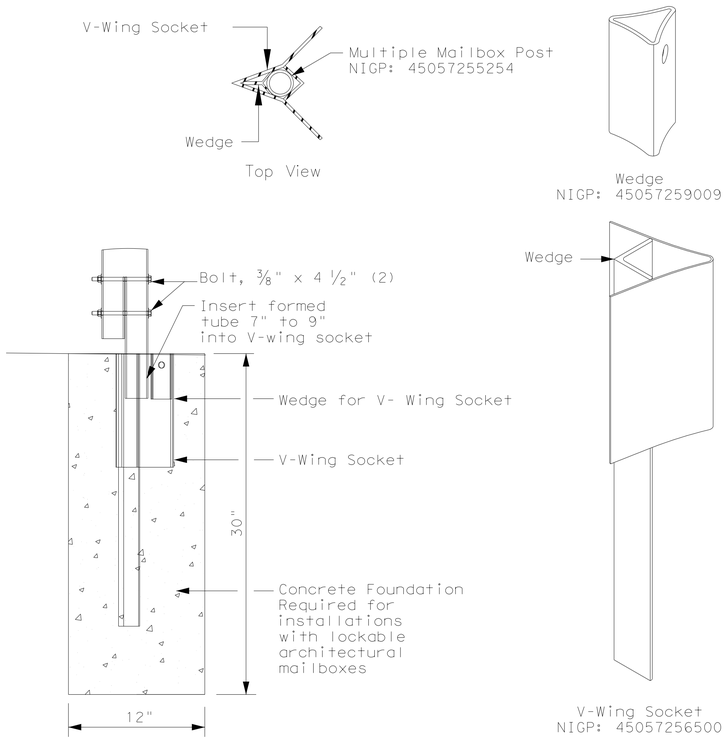
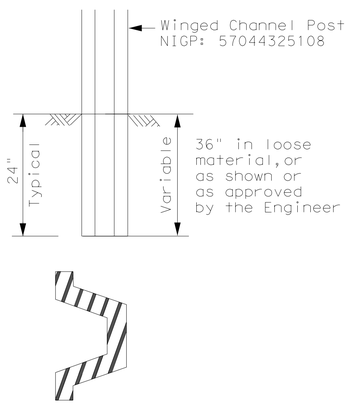
TYPE 1 - SUPPORT/FOUNDATION

Thin Wall Tube w/ V-LOC Anchorage



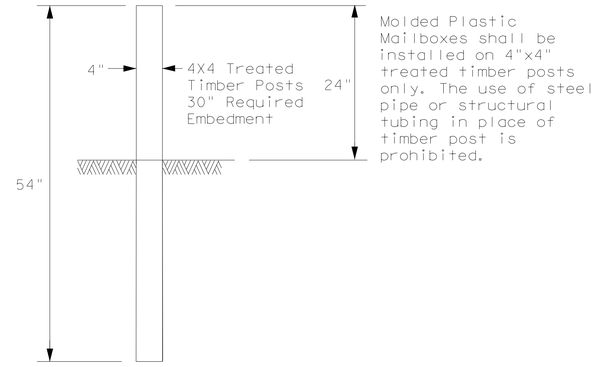
TYPE 3 - SUPPORT/FOUNDATION



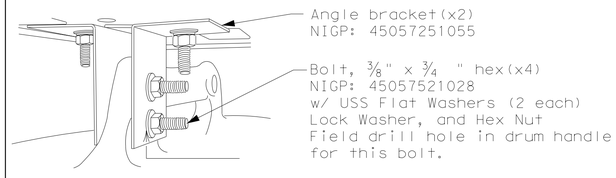
NOTES:

1. Attach Object Marker(OM) facing direction of traffic.
2. OM will also be required on opposite side if installed on a 2-Lane, 2-Way roadway.

TYPE 5 - SUPPORT/FOUNDATION



TYPE 6 - TEMPORARY MAILBOX SUPPORT



Plastic Drum NIGP: 55093383655
Rubber Collar NIGP: 55093387102

NOTES:

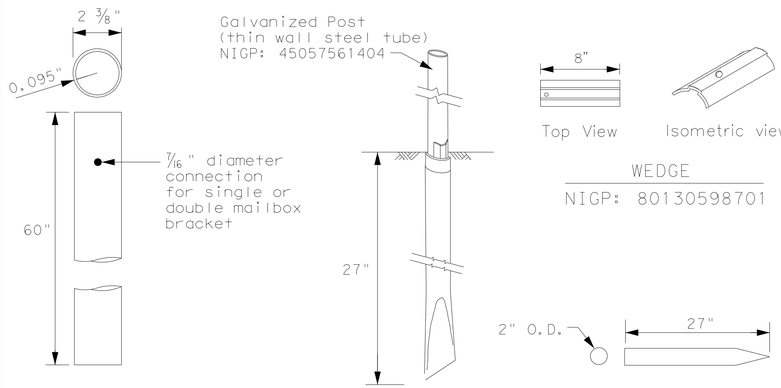
1. Place on approved plastic drum as shown in the Compliant Work Zone Traffic Control Devices (CWZTCD).
2. Existing attachment hardware shall be used unless damaged. Damaged hardware shall be replaced.

GENERAL NOTES:

1. Erect post plumb or vertical.
2. When galvanized part is required galvanize in accordance with Item 445.
3. Use a concrete footing as shown or when directed. Concrete footing will be required when soils do not hold the support/foundations in a stable condition, only on Type 1, Type 2, and Type 4

TYPE 2 - SUPPORT/FOUNDATION

Thin Wall Steel Tube w/Wedge Anchor System

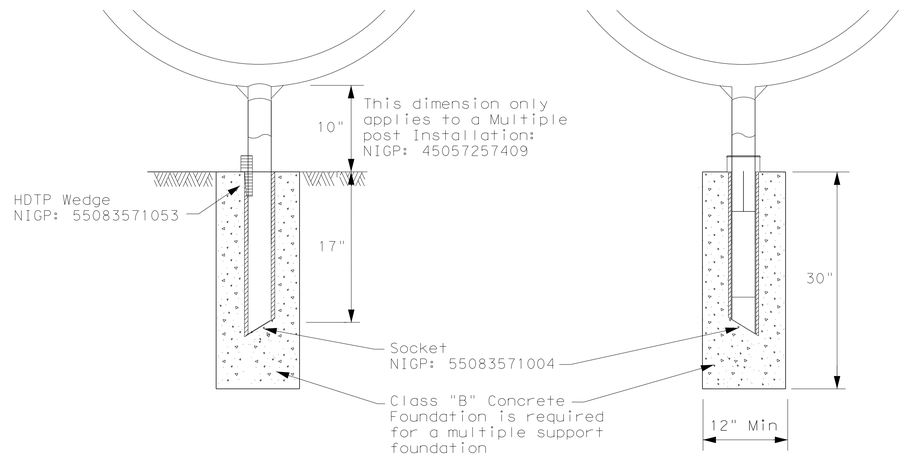


MAILBOX POST

WEDGE ANCHOR
NIGP: 80130238407

TYPE 4 - SUPPORT/FOUNDATION

Whitecoated steel post NIGP: 45057561107
Multiple post NIGP: 45057257409
Recycled Rubber post (RR) NIGP: 45057561057



SHEET 3 OF 4

Texas Department of Transportation

Maintenance Division Standard

MAILBOX SUPPORT AND FOUNDATION

MB(3)-21

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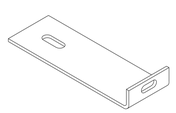
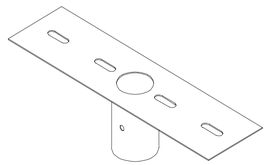
DATE:
FILE:

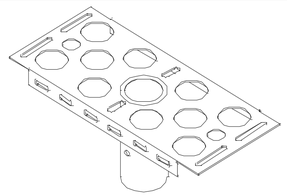
TYPE	TYPE 1	TYPE 2	TYPE 3	TYPE 4			TYPE 5	TYPE 6
Configuration	Multiple	Single or Double	Single or Double	Single	Double	Multiple	Single	Single
Mailbox Size NIGP #	Outside Position: S or M Inside Position: S, M, L, XL, or LA	Single: S, M, L, XL, or LA Double: SS, SM, MM	Single: S, M, L, or XL Double: SS, SM, MM	S, M, L, XL, or LA	SS, SM, or MM	Outside Position: S or M Inside Position: S, M, L, or XL	Molded Plastic	S, or M
Mailbox Post NIGP #	45057255254 (Galvanized Multiple)	45057561404 (Thin Walled Gavanize)	57044325108 (Wing Channel Post)	45057561107 (Thin walled white powder coated) 45057561057 (Recycled Rubber Post: S or M only)	45057561107 (Thin Walled White Powder Coated)	45057257409 (White Powder Coated Multiple)	4x4 Timber	Construction Barrel
Post and Mailbox Hardware NIGP #	45057259009 (Wedge) 45057256500 (V-Wing Socket) 45057253002 (Bracket Extension) 45057252251 (Mailbox Bracket) 45057258001 (Part A Angle Bracket x2) 45057250255 (Plate Washer for XL/LA x2) 45057250263 (L-Bracket for XL x4)	80130598701 (Wedge) 80130238407 (Wedge Anchor) 45057253002 (Bracket Extension) 45057252343 (Double MB Bracket) 45057252350 (S. Mailbox Bracket) 45057252251 (Mailbox Bracket) 45057250255 (Plate Washer for XL/LA x2) 45057250263 (L-Bracket forXL x4)	45057541653 (Type 3 Double Mailbox Bracket) 45057252251 (Mailbox Bracket) 45057253002 (Bracket Extension) 45057258001 (Part A Angle Bracket) 45057258027 (Part B Angle Bracket) 45057250255 (Plate Washer for XL x2) 45057250263 (L-Bracket for XL x4)	55083571053 (Wedge) 55083571004 (Socket) 45057252350 (Single Mailbox Bracket) 45057253002 (Bracket Extension) 45057250255 (Plate Washer for XL/LA x2) 45057250263 (L-Bracket for XL x4)	55083571053 (Wedge) 55083571004 (Socket) 45057253002 (Bracket Extension) 45057252343 (Double Mount Bracket) 45057252251 (Mailbox Bracket x2)	55083571053 (Wedge) 55083571004 (Socket) 45057253002 (Bracket Extension) 45057252350 (Single Mount Bracket) 45057250255 (Plate Washer for XL x2) 45057250263 (L-Bracket for XL x4)	None	45057251055 Angle Bracket (x2)
Foundation Used	Class B Concrete (Required for LA Mailboxes)	Class B Concrete (Required for LA Mailboxes)	None	Class B Concrete (not used with recycled rubber post, required for LA Mailboxes)	Class B Concrete (not required)	Class B Concrete	None	None



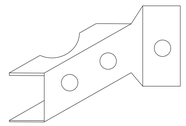
NIGP: 45057250263
L-Bracket x4 for
XL sized mailboxes



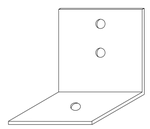
NIGP: 45057252343
Double Mailbox Bracket
For Type 2 and Type 4
double mount



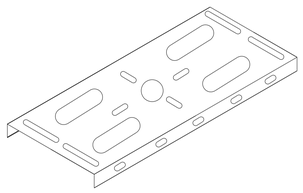
NIGP: 45057252350
Single Mailbox Bracket
For Type 2 single and for
Type 4 single and multi mount



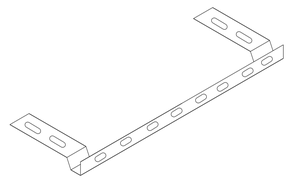
NIGP: 45057258001
Part "A" Angle Bracket
For Type 1 multi (2 per mailbox)
and Type 3 single and double



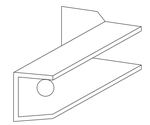
NIGP: 45057251055
Type 6 Angle Bracket
(2 per mailbox)



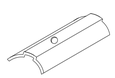
NIGP: 45057252251
Mailbox Bracket
For Type 1 multi and
any double mount (use 2)



NIGP: 45057253002
Bracket Extension
Use 1 for a medium Mailbox
Use 2 for a Large Mailbox



NIGP: 45057258027
Part "B" Angle Bracket
For Type 3 single
and double



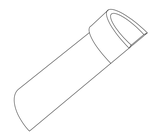
NIGP: 80130598701
Wedge for Type 2



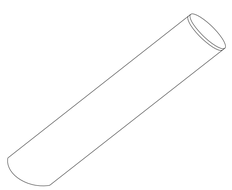
NIGP: 45057250255
Plate Washer for Architecural
and XL Mailboxes



NIGP: 45057541653
Type 3 double mailbox bracket



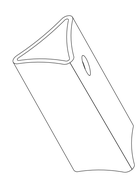
NIGP: 55083571053
Type 4 Mailbox Wedge



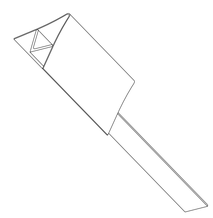
NIGP: 55083571004
Type 4 Mailbox Socket



NIGP: 80130238407
Type 2 Wedge Anchor



NIGP: 45057259009
Wedge for Type 1 V-wing Socket



NIGP: 45057256500
V-wing Socket for
Type 1 Foundation

NIGP #	OBJECT MARKERS AND CONFORMABLE SHEETING
55008311759	Type 2 OM 4"x4" (3 Needed) for Type 3 Wing Channel Post
55008312906	Type 2 OM 6"x12" (1 needed) for Type 3 Wing Channel Post
80149872006	12" Conformable Reflective Yellow Sheeting for Flexible Posts

NOTES:

1. Type 2 object marker in accordance with Traffic Engineering Standard Delineators & Object Markers.
2. A light weight receptacle for newspaper delivery can be attached to mailbox posts if the receptacle does not touch the mailbox, present a hazard to traffic or delivery of the mail, extend beyond the front of the mailbox, or display advertising, except the publication title.

BID CODES FOR CONTRACTS

MB-(X) ASSM TY (XXX) (X)

Type of Mailbox
- S = Single
- D = Double
- M = Multiple
- MP = Molded Plastic

Type of Post
- WC = Winged Channel Post
- RR = Recycled Rubber
- TWW = Thin Walled White Tubing
- TWG = Thin Walled Galvanized Tubing
- TIM = Timber

Type of Foundation
- Ty 1 = V-Loc
- Ty 2 = Wedge Anchor Steel System
- Ty 3 = Winged Channel post
- Ty 4 = Wedge Anchor Plastic System
- Ty 5 = 4 X 4 Post

Texas Department of Transportation

Maintenance Division Standard

NIGP PARTS LIST AND COMPATIBILITY

MB(4)-21

FILE: MB-21.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT March 2004	CONT	SECT	JOB	HIGHWAY
REVISIONS 2/2005 11/2009 4/2015 6/2005 1/2011 11/2006 7/2014	DIST	COUNTY		SHEET NO. 247

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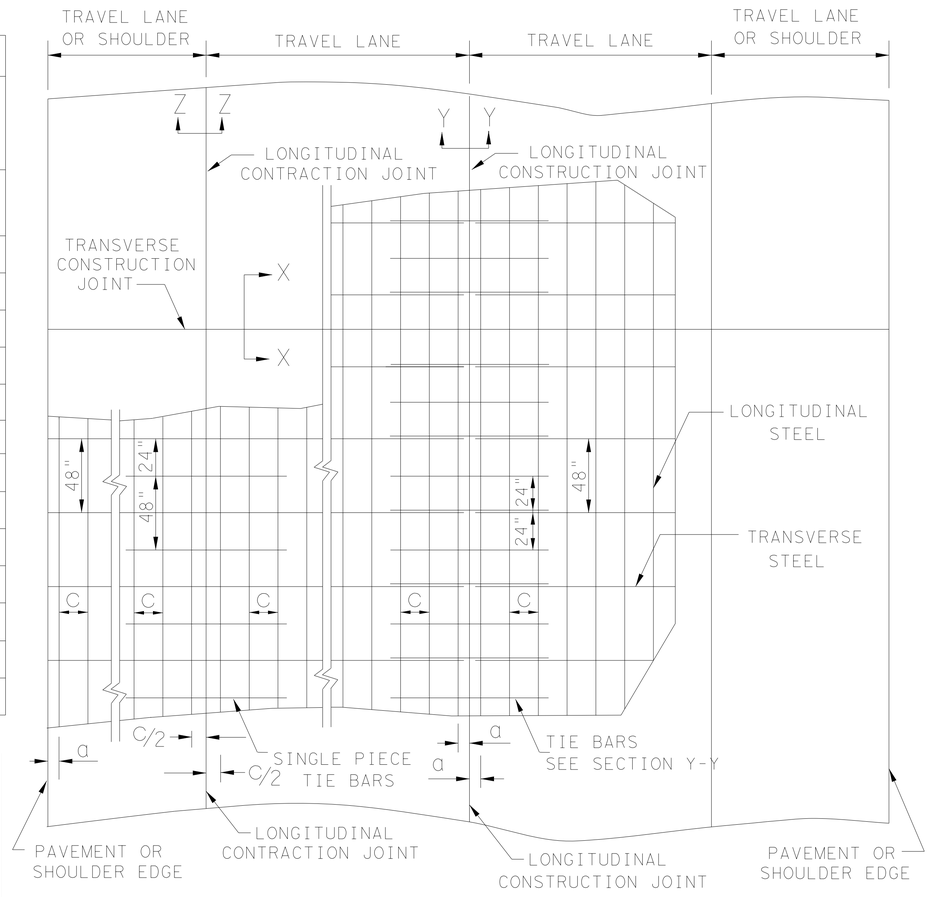
GENERAL NOTES

TABLE NO. 1 LONGITUDINAL STEEL				
SLAB THICKNESS AND BAR SIZE		LONGITUDINAL STEEL BARS	FIRST SPACING AT EDGE OR JOINT	LONG. STEEL VERTICAL POSITION FROM BOTTOM OF PAVEMENT
T (IN.)	BAR SIZE	SPACING C (IN.)	SPACING a (IN.)	T1 (IN.)
7.0	#5	6.5	3 TO 4	3.5
7.5	#5	6.0	3 TO 4	3.75
8.0	#6	9.0	3 TO 4	4.0
8.5	#6	8.5	3 TO 4	4.25
9.0	#6	8.0	3 TO 4	4.5
9.5	#6	7.5	3 TO 4	4.75
10.0	#6	7.0	3 TO 4	5.0
10.5	#6	6.75	3 TO 4	5.5
11.0	#6	6.5	3 TO 4	6.0
11.5	#6	6.25	3 TO 4	6.5
12.0	#6	6.0	3 TO 4	7.0
12.5	#6	5.75	3 TO 4	7.5
13.0	#6	5.5	3 TO 4	8.0

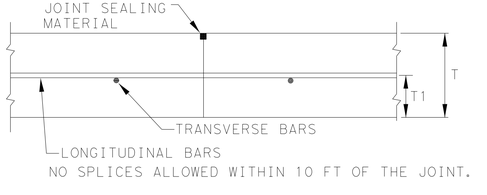
TABLE NO. 2 TRANSVERSE STEEL AND TIE BARS						
SLAB THICKNESS (IN.)	TRANSVERSE STEEL		TIE BARS AT LONGITUDINAL CONTRACTION JOINT (SECTION Z-Z)		TIE BARS AT LONGITUDINAL CONSTRUCTION JOINT (SECTION Y-Y)	
	BAR SIZE	SPACING (IN.)	BAR SIZE	SPACING (IN.)	BAR SIZE	SPACING (IN.)
7.0 - 7.5	#5*	48	#5*	48	#5*	24
8.0 - 13.0	#5*	48	#6	48	#6	24

*CONTRACTOR MAY USE #6 REINFORCING STEEL INSTEAD OF #5 REINFORCING STEEL OR COMBINATION OF EACH SIZE

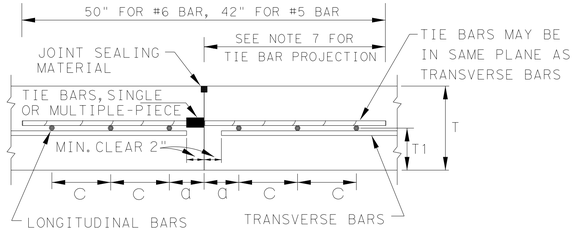


TYPICAL PAVEMENT LAYOUT

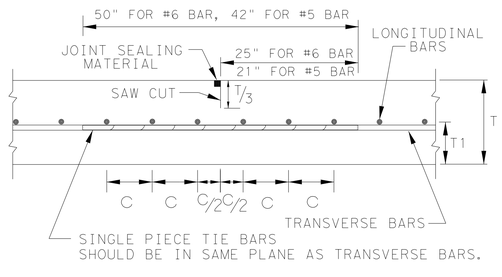
PLAN VIEW (NOT TO SCALE)



TRANSVERSE CONSTRUCTION JOINT
SECTION X - X



LONGITUDINAL CONSTRUCTION JOINT
SECTION Y - Y



LONGITUDINAL CONTRACTION JOINT
SECTION Z - Z

SHEET 1 OF 2

Texas Department of Transportation

Design Division Standard

CONTINUOUSLY REINFORCED CONCRETE PAVEMENT

ONE LAYER STEEL BAR PLACEMENT
T - 7 to 13 INCHES

CRCP(1)-24

FILE: crcp124.dgn	DN: CES	CK: KM	DW: CES	CK: AN
©TxDOT: Sept 2024	CONT	SECT	JOB	HIGHWAY
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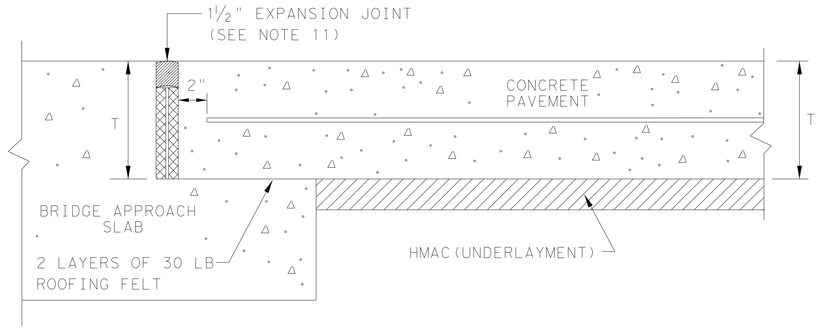
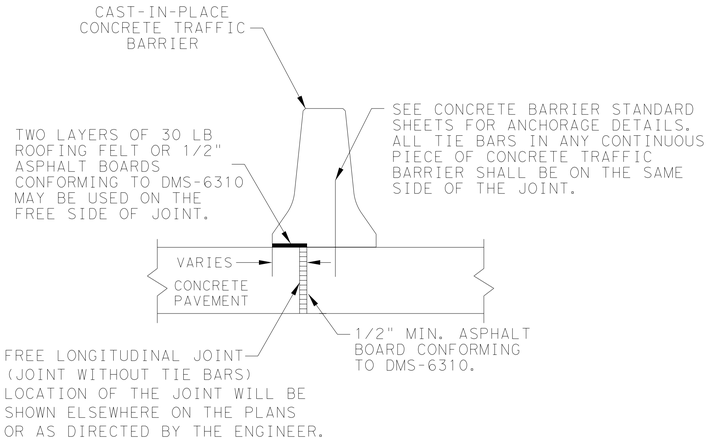
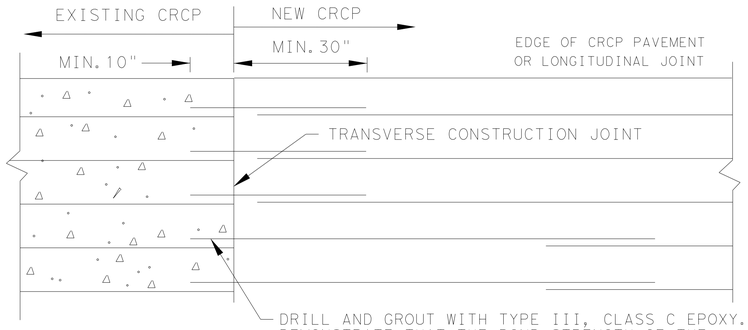


TRANSVERSE EXPANSION JOINT DETAIL
AT BRIDGE APPROACH



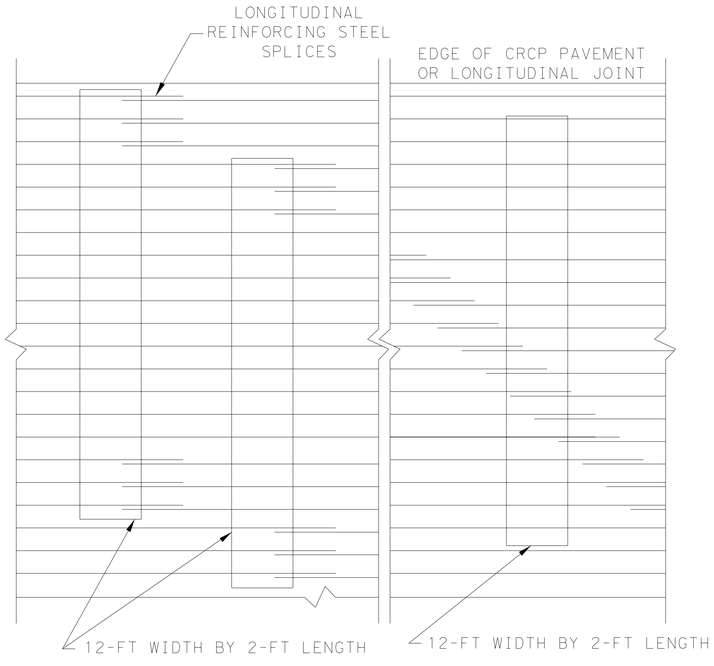
CENTERLINE FREE LONGITUDINAL JOINT DETAIL



OPTION A: DRILL AND EPOXY
PLAN VIEW (NOT TO SCALE)

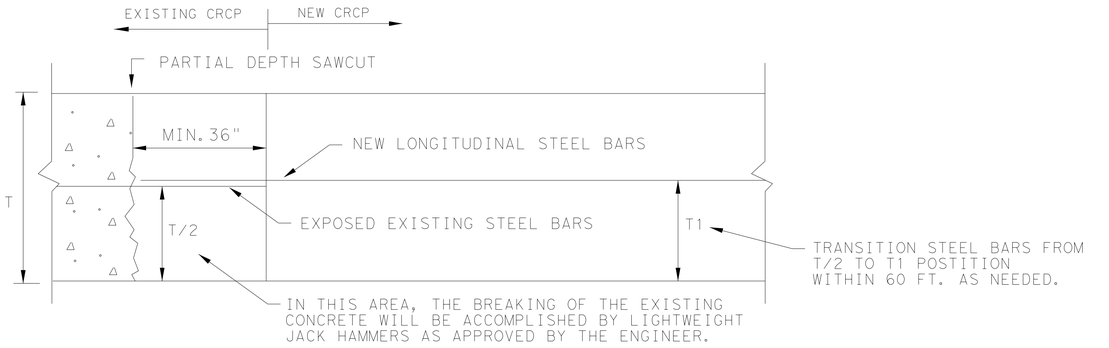
1. BEFORE CONCRETE PLACEMENT, PERFORM PULL-OUT TESTS ON EPOXY-GROUTED TIE BARS IN ACCORDANCE WITH ITEM 360.
2. SPACE TIE BARS AT 24" SPACING. USE #6 TIE BARS FOR 8" AND THICKER PAVEMENTS, USE #5 TIE BARS FOR LESS THAN 8" THICK PAVEMENTS.

LONGITUDINAL WIDENING JOINT DETAIL



STAGGER THE LAP LOCATIONS SO THAT NO MORE THAN 1/3 OF THE LONGITUDINAL STEEL IS SPLICED IN ANY GIVEN 12-FT. WIDTH AND 2-FT. LENGTH OF THE PAVEMENT. ANY OTHER LAP CONFIGURATION MEETING THIS REQUIREMENT WILL BE ALLOWED.

EXAMPLES OF LAP CONFIGURATION
PLAN VIEW (NOT TO SCALE)



OPTION B: BREAKBACK AND LAP

TRANSVERSE TIE JOINT DETAIL
NEW CRCP TO EXISTING CRCP

SHEET 2 OF 2

Texas Department of Transportation

Design Division Standard

CONTINUOUSLY REINFORCED CONCRETE PAVEMENT

ONE LAYER STEEL BAR PLACEMENT
T - 7 to 13 INCHES

CRCP(1)-24

FILE: crcp124.dgn	DN: TxDOT	CK: KM	DW: CES	CK: AN
©TxDOT: Sept 2024	CONT	SECT	JOB	HIGHWAY
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				249

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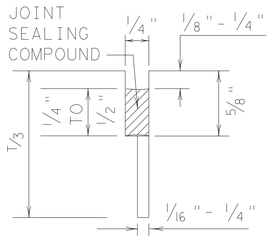
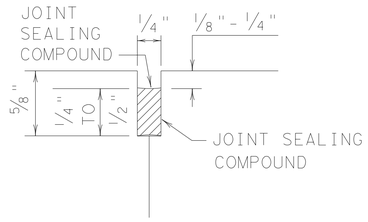
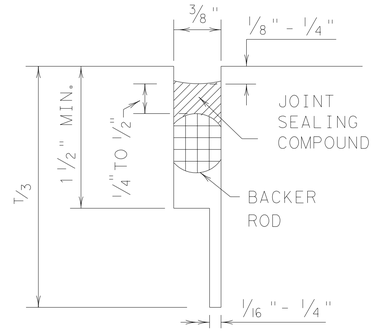
METHOD B: JOINT SEALING COMPOUND



LONGITUDINAL SAWED CONTRACTION JOINT



LONGITUDINAL OR TRANSVERSE CONSTRUCTION JOINT



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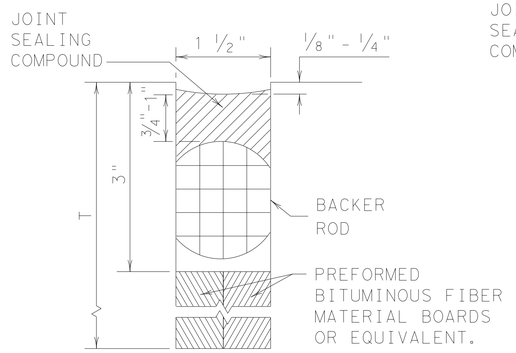
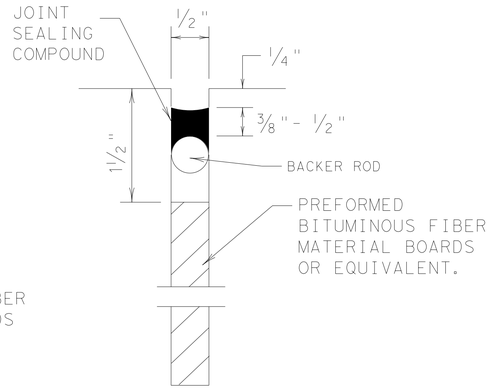
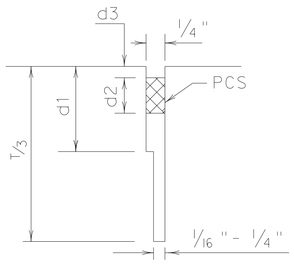


TRANSVERSE FORMED EXPANSION JOINT

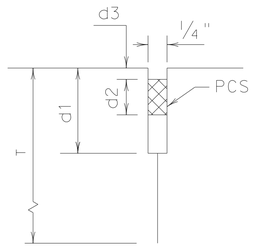


FORMED ISOLATION JOINT

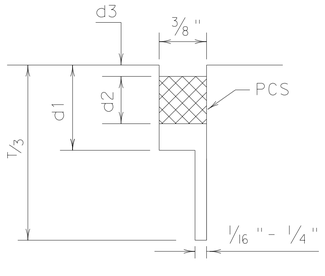
METHOD A: PREFORMED COMPRESSION SEALS (PCS)(DMS-6310 CLASS 6)



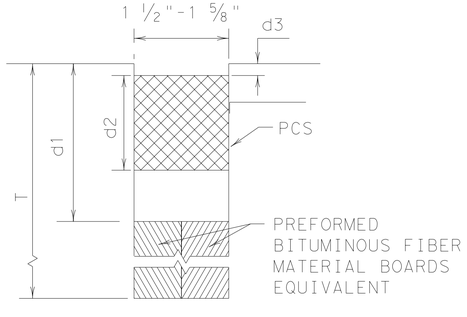
LONGITUDINAL SAWED CONTRACTION JOINT



LONGITUDINAL CONSTRUCTION JOINT



TRANSVERSE SAWED CONTRACTION JOINT



TRANSVERSE FORMED EXPANSION JOINT

GENERAL NOTES

1. UNLESS OTHERWISE SHOWN IN THE PLANS, EITHER METHOD "A" OR METHOD "B" MAY BE USED.
2. THE LOCATION OF JOINTS SHALL BE AS SHOWN ELSEWHERE IN THE PLANS.
3. THE JOINT RESERVOIR FOR SEALANT OR PCS SHALL BE SAWED UNLESS OTHERWISE SHOWN ON THE PLANS FOR THE LONGITUDINAL AND TRANSVERSE CONSTRUCTION JOINTS AND THE SAWED JOINTS.
4. DIMENSIONS d1, d2, AND d3 SHOWN IN METHOD A SHALL BE IN ACCORDANCE WITH THE PREFORMED COMPRESSION SEAL MANUFACTURER'S RECOMMENDATION.
5. REFER TO DMS-6310 "JOINT SEALANTS AND FILLERS" FOR THE CLASSIFICATIONS.
6. FOR SAWED LONGITUDINAL JOINT, LONGITUDINAL OR TRANSVERSE CONSTRUCTION JOINT, USE JOINT SEALANT CLASS 5 OR 8 UNLESS OTHERWISE SHOWN ON THE PLAN OR APPROVED.
7. FOR TRANSVERSE SAWED CONTRACTION, TRANSVERSE FORMED EXPANSION JOINT, AND ISOLATION JOINT USE JOINT SEALANT CLASS 5 OR 8 AT NEW JOINTS. USE JOINT SEALANT CLASS 4,5,7,OR 8 FOR MAINTAINING EXISTING JOINTS.
8. THE JOINTS SHALL BE CLEANED IN ACCORDANCE WITH THE ITEM 438 "CLEANING AND SEALING JOINTS" OR ITEM 713 "CLEANING AND SEALING JOINTS AND CRACKS (CONCRETE PAVEMENT)".
9. ISOLATION JOINTS ACCOMMODATE HORIZONTAL AND VERTICAL MOVEMENTS THAT OCCUR BETWEEN A PAVEMENT AND A STRUCTURE. ISOLATION JOINTS MAY BE USED FOR BRIDGE ABUTMENTS, INTERSECTIONS, CURB AND GUTTER, OLD AND NEW PAVEMENTS, OR AROUND DRAINAGE INLETS, MANHOLES, FOOTINGS AND LIGHTING STRUCTURES.

Texas Department of Transportation

Design Division Standard

CONCRETE PAVING DETAILS

JOINT SEALS

JS-14

FILE: js14.dgn	DN: TxDOT	DN: HC	DW: HC	CK: AN
©TxDOT: DECEMBER 2014	CONT	SECT	JOB	HIGHWAY
REVISIONS				
	DIST	COUNTY		SHEET NO.
				250

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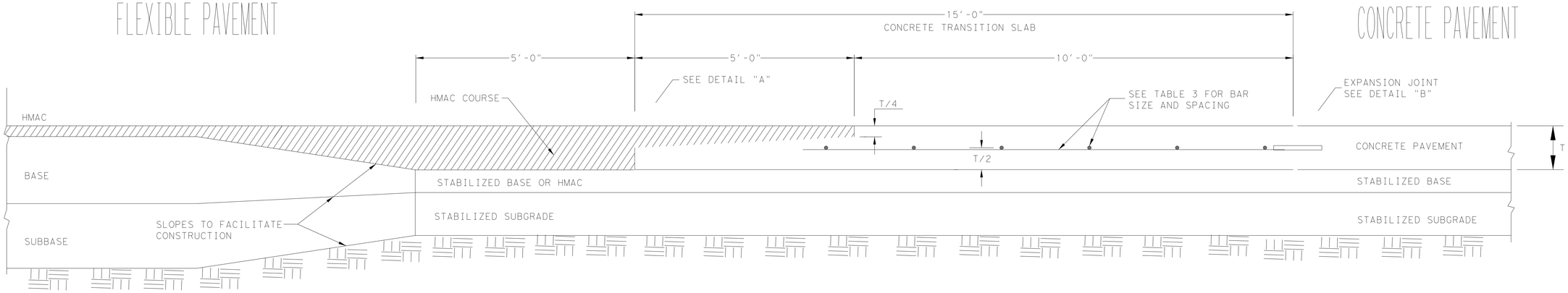
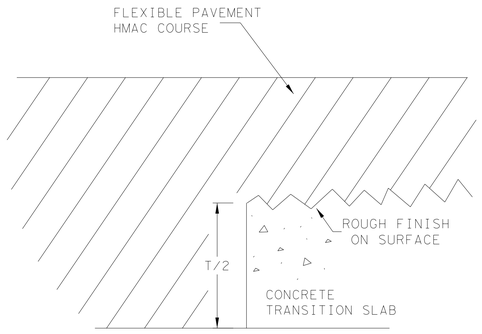
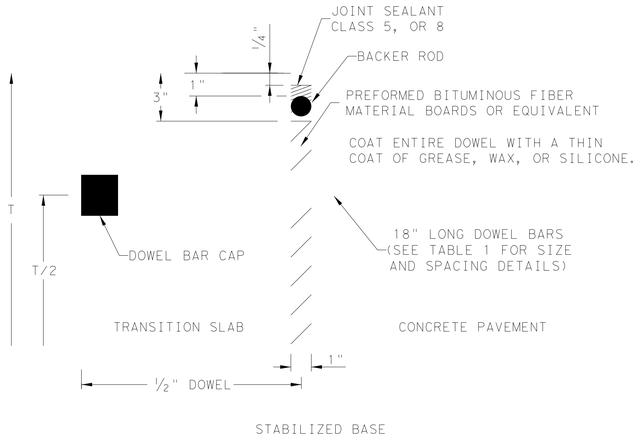


TYPICAL JUNCTION OF CONCRETE PAVEMENT WITH FLEXIBLE PAVEMENT

(NOT TO SCALE)



DETAIL "A"



DETAIL "B"

GENERAL NOTES

1. FOR FURTHER INFORMATION REGARDING THE PLACEMENT OF CONCRETE AND LOAD TRANSFER DEVICES REFER TO THE GOVERNING SPECIFICATIONS FOR "CONCRETE PAVEMENT" AND "REINFORCING STEEL."
2. DETAILS FOR PAVEMENT WIDTH AND THE CROWN CROSS-SLOPE SHALL BE SHOWN ELSEWHERE IN THE PLANS.
3. MATCH THE LONGITUDINAL JOINTS OF THE CONCRETE TRANSITION SLAB WITH ADJOINING CONCRETE PAVEMENT. PROVIDE EQUIVALENT TIEBARS OR TRANSVERSE BARS AT THESE LONGITUDINAL JOINTS, SEE TABLE NO. 2.
4. REFER TO DMS-6310, "JOINT SEALANTS AND FILLERS" FOR THE CLASSIFICATIONS.
5. TRANSITION SLABS WILL BE PAID UNDER ITEM 360, "CONCRETE PAVEMENTS."

TABLE NO.1 DOWELS (SMOOTH BARS)

SLAB THICKNESS T (IN.)	BAR DIA. AND LENGTH	SPACING (IN.)
7 TO 7.5	1" X 18"	12
8 TO 10	1 1/4" X 18"	12
10 TO 13	1 1/2" X 18"	12

TABLE NO.2 TIE BARS (DEFORMED BARS)

SLAB THICKNESS T (IN.)	BAR SIZE	SPACING (IN.)
7 TO 7.5	#5	24
8 TO 13	#6	24

TABLE NO.3 TRANSITION SLAB STEEL (DEFORMED BARS)

SLAB THICKNESS T (IN.)	BAR SIZE	SPACING (IN.) TRANSVERSE DIRECTION	SPACING (IN.) LONGITUDINAL DIRECTION
7 TO 7.5	#5	24	12
8 TO 13	#6	24	12

ADJUST SPACING OF LONGITUDINAL BARS AS NEEDED TO ACCOMDATE DOWEL BAR SPACING.

Texas Department of Transportation

Design Division Standard

CONCRETE PAVEMENT DETAILS TRANSITION SLAB

T-7 to 13 INCHES

TRANS-20

FILE: transitslab20.dgn	DN: TxDOT	DN: TxDOT	DW: AN	CK: KM
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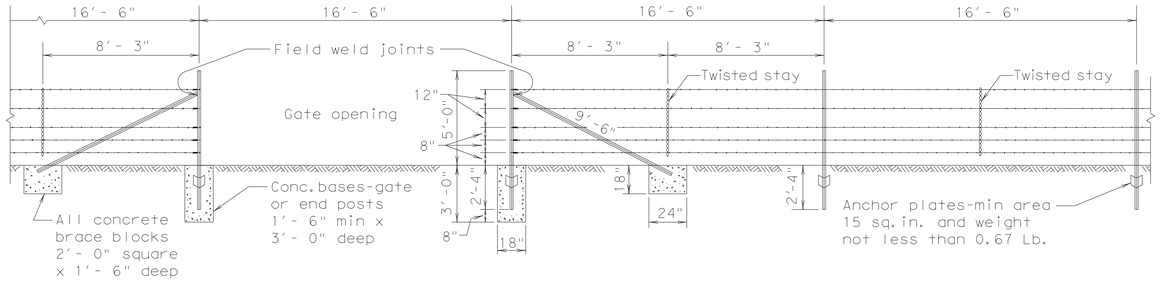
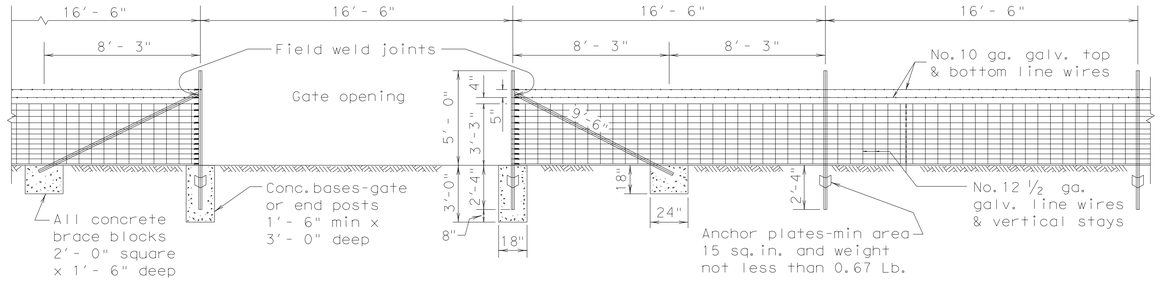


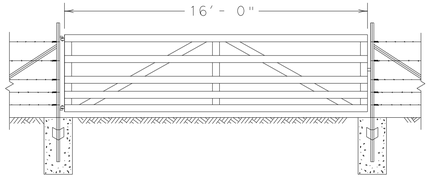
SECTION GALVANIZED BARBED WIRE FENCE WITH METAL POSTS
BRACING DETAIL USED AT ENDS AND GATES
TYPE "C" FENCE
(See General Note 8)

Note:
For Steel pipe and T-Post requirements. (See General Notes 6 & 7)

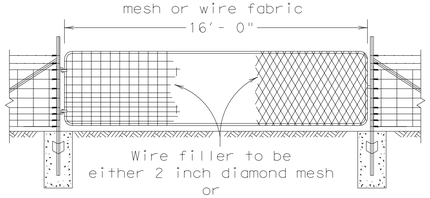


SECTION GALVANIZED WOVEN WIRE FENCE WITH METAL POSTS
BRACING DETAIL USED AT ENDS AND GATES
TYPE "D" FENCE
(See General Note 8)

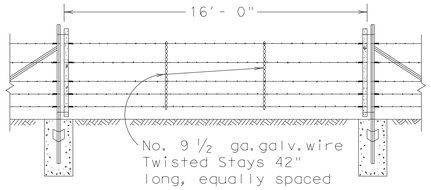
Metal gate shall consist of 5 panels not less than 4′- 4" high and shall be aluminum or galvanized metal and of good quality. Gate and hardware shall meet the approval of the engineer.



DETAIL TYPE 1 GATE



DETAIL TYPE 2 GATE

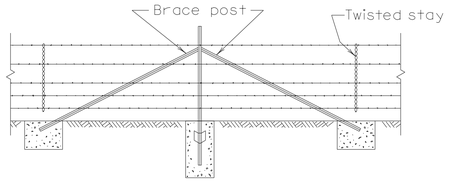


DETAIL TYPE 3 GATE

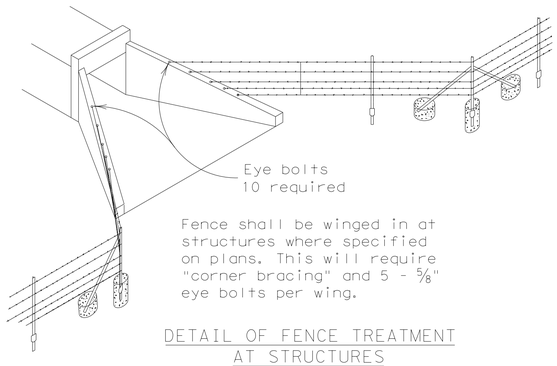
GENERAL NOTES

1. Any high point which interferes with the placing of wire mesh shall be excavated to provide a 2 inch clearance.
2. Latches for Type 1 and Type 2 gates shall be good commercial quality and design latch of the spring, fork or chain type. All latches shall be suitable to the gate and shall be approved by the Engineer.
3. Hinges for Type 2 gates shall be a commercial design approved by the Engineer suitable for post and gate.
4. Concrete shall be of the design and consistency approved by the Engineer and shall contain not less than 4 sacks of cement per cubic yard. Concrete footings are to be crowned at the top to shed water.
5. Steel anchor plates shall be of a design and thickness sufficient to prevent turning of the post in firm soil.
6. Steel pipe end posts, corner and pull posts shall be a minimum of 2" Std. pipe (2.375" O.D., 0.154" wall thickness) with a 1¼" Std. pipe brace (1.660" O.D., 0.140" wall thickness), with a 2"x2"x1/4" angle, or other as approved by the Engineer. Fasteners for securing barbed wire or woven wire fence to metal posts shall be a minimum of 11 gauge galvanized steel wire. Tubular posts shall be fitted with water malleable iron caps.
7. If Steel pipe is used for posts and braces, use standard pipe in accordance with ASTM A 53, Class B or A 501. For T-Posts use steel that meets ASTM A 702. Metal line posts shall be not less than 6′-6" in length and shall weigh not less than (1.33 lbs./lin.ft.). These Items shall be in accordance with Item 552, "Wire Fence."
8. Barbed Wire shall be in accordance with ASTM A 121, Class 1 Design designation 12-2-4-1 4R or 12-2-5-1 4R, or as approved by the Engineer.

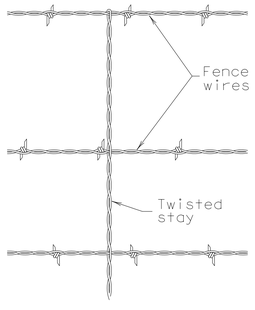
   Woven Wire Fence (Type D) shall be in accordance with ASTM A 116, Class 1 No. 12-1/2 Grade 60 (See Table 1 ASTM A 116) to the height and design shown on the plans, or as approved by the Engineer.
9. The location of gates and corner posts will be as indicated elsewhere in these plans.



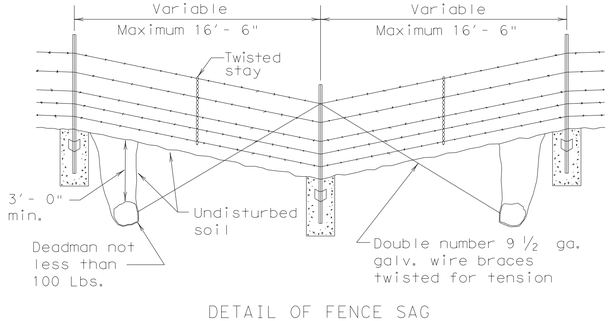
CORNER OR PULL POST ASSEMBLY



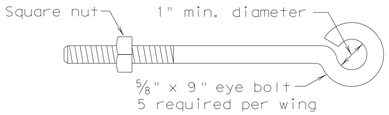
DETAIL OF FENCE TREATMENT AT STRUCTURES



DETAIL OF STAY
(Barbed Wire Fence)



DETAIL OF FENCE SAG



DETAIL OF EYE BOLT

Texas Department of Transportation

Design Division Standard

BARBED WIRE AND WOVEN WIRE FENCE (STEEL POSTS)

WF(2)-10

FILE: wf210.dgn	DN: TxDOT	CK: AM	DW: VP	CK:
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	DIST	COUNTY		SHEET NO.
				251A

MATCHLINE 1 - SEE SHEET 253

SCALE: 1"= 80'

0' 80' 160' 240'

MATCHLINE 1 - SEE THIS SHEET

MATCHLINE 2 - SEE THIS SHEET

MATCHLINE 1 - THIS SHEET

MATCHLINE 2 - THIS SHEET

WOLF RANCH PARKWAY

RIVER CHASE BLVD.

MEMORIAL DRIVE

EXISTING ROW

STATE HIGHWAY 29
(VARIABLE WIDTH ROW)

WOLF RANCH WEST, SECTION 1A, PHASE 3
DOC. NO.2016085463 (O.P.R.)

ALJD-GTTX, LLC
CALLED 39.17 ACRES
DOC. NO. 2006101010
(O.P.R.)

CITY OF GEORGETOWN
CALLED 1.034 ACRES
DOC. NO. 2016001514
(O.P.R.)

LOT 9
BLOCK C
RIVER CHASE
CAB. Q, SL. 186-192
(P.R.)

BLUEBONNET PLAZA
LOT 1
DOC. 2019036345 (O.P.R.)

BLUEBONNET PLAZA
LOT 2
DOC. 2019036345 (O.P.R.)

BLUEBONNET PLAZA
LOT 3
DOC. 2019036345 (O.P.R.)

BLUEBONNET PLAZA
LOT 4
DOC. 2019036345 (O.P.R.)

BLUEBONNET PLAZA
LOT 5
DOC. 2019036345 (O.P.R.)

0.057 ACRE LEASE TRACT
PRIMECO PERSONAL
COMMUNICATION, L.P.
DOC. NO. 1996044968
(O.P.R.)

CONNELL
CEMETERY
REMNANT
PORTION OF A
CALLED 6.82
ACRES VOL. 406,
PG. 196 (D.R.)

LOT 3
CR 265 SUBDIVISION
CABINET EE,
SLIDES 237-238 (P.R.)

OWNER:WOLF LAKES, LP
REMNANT PORTION OF
A CALLED 202.149 ACRE TRACT
TRACT FIVE: PARCEL ONE
DOC. NO. 2013096286 (O.P.R.)

A CALLED 12 ½ ACRE TRACT
VOL. 117, PG. 173 (D.R.)

PROPOSED 3' ROW DEDICATION

BLOCK A

OPEN SPACE

M1.1 M1.2 M2.1 M2.2A M2.2B M-BP

B2.1 B2.2 B2.3 B2.04 B2.05 B3.01 B4.01

A2.2 A2.3 A2.4

A11.1 A11.2

OA1.1 OA1.2 OA1.3 OA1.4 OA1.5

LEGEND

- EXISTING STORM DRAIN
- PROPOSED STORM DRAIN
- OVERALL DRAINAGE AREA BOUNDARY
- INLET DRAINAGE AREA BOUNDARY
- A1.1 DRAINAGE AREA DESIGNATION
- STORM DRAIN INLET
- SHEET FLOW
- SHALLOW CONCENTRATED FLOW
- CHANNELIZED FLOW
- FLOW DIRECTION

STATE OF TEXAS
STEVEN S. CRAUFORD
92677
LICENSED
PROFESSIONAL ENGINEER

09/12/2025

NO. REVISION DATE

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CITY OF GEORGETOWN, TEXAS
WOLF RANCH PKWY / MEMORIAL DR

OVERALL DRAINAGE AREA MAP SH 1 OF 3

CITY JOB No.
JOB NO. 51423-00
DATE 9/12/2025
DESIGNER JB
CHECKED SC DRAWN JB

SHEET 252

Date: Sep 12, 2025, 11:06am User ID: csabatr
File: H:\Projects\514\23\00\30_Construction Documents\Civil\00_DACOMBINED51423-00.dwg

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SCALE: 1"= 80'
0' 80' 160' 240'

LEGEND

- EXISTING STORM DRAIN
- OVERALL DRAINAGE AREA BOUNDARY
- INLET DRAINAGE AREA BOUNDARY
- A1.1 — DRAINAGE AREA DESIGNATION
- STORM DRAIN INLET
- SHEET FLOW
- SHALLOW CONCENTRATED FLOW
- CHANNELIZED FLOW
- FLOW DIRECTION

NO.	REVISION	DATE

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STATE OF TEXAS
STEVEN S. CRAUFORD
92677
LICENSED PROFESSIONAL ENGINEER
09/12/2025

CITY OF GEORGETOWN, TEXAS
WOLF RANCH PKWY / MEMORIAL DR
OVERALL DRAINAGE AREA MAP SH 3 OF 3

CITY JOB No.
JOB NO. 51423-00
DATE 9/12/2025
DESIGNER JB
CHECKED SC DRAWN JB

SHEET 254

Date: Sep 12, 2025, 11:10am User ID: cshott
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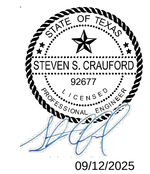
WOLF RANCH										25 year						100 year					
										Pervious		Impervious			Weighted C	Pervious		Impervious		Weighted C
D.A.	AREA	AREA	LOT AREA	OPEN SPACE	SIDEWALK	STREET	IC	IC	PC	%IC	C	PC * C	C	IC * C		C	PC * C	C	IC * C	
	(SF)	(AC)	(SF)	(SF)	(SF)	(SF)	(SF)	(AC)												
B2.04	16,557	0.38	0	6,964	7916	1676	10289	0.24	0.14	62.14%	0.39	0.06	0.97	0.23	0.75	0.46	0.07	0.97	0.23	0.78
B2.05	15,527	0.36	0	11,770	1942	1815	4934	0.11	0.24	31.78%	0.39	0.09	0.97	0.11	0.57	0.46	0.11	0.97	0.11	0.62
B2.06	17,033	0.39	0	3,969	10583	2480	13460	0.31	0.08	79.03%	0.39	0.03	0.97	0.30	0.85	0.46	0.04	0.97	0.30	0.86
B2.07	16,451	0.38	0	4,261	9212	2977	12615	0.29	0.09	76.69%	0.39	0.03	0.97	0.28	0.83	0.46	0.04	0.97	0.28	0.85
B2.08	26,812	0.62	0	3,015	19220	4577	24098	0.55	0.06	89.88%	0.39	0.02	0.97	0.54	0.91	0.46	0.03	0.97	0.54	0.92
B2.09	26,431	0.61	0	11,805	13941	685	15806	0.36	0.24	59.80%	0.39	0.10	0.97	0.35	0.74	0.46	0.11	0.97	0.35	0.76
B2.10	24,615	0.57	0	12,404	12211	13451	31	0.26	54.65%	0.39	0.10	0.97	0.30	0.71	0.46	0.12	0.97	0.30	0.74	
B2.11	17,549	0.40	0	1,421	12868	3261	16271	0.37	0.03	92.72%	0.39	0.01	0.97	0.36	0.93	0.46	0.01	0.97	0.36	0.93
B2.12	22,534	0.52	0	8,807	13523	204	14028	0.34	0.18	64.82%	0.39	0.07	0.97	0.33	0.77	0.46	0.08	0.97	0.33	0.79
B2.13	18,342	0.42	0	2,088	12294	3961	16463	0.38	0.04	89.75%	0.39	0.02	0.97	0.37	0.91	0.46	0.02	0.97	0.37	0.92
B3.01	23,361	0.54	7163	8,716	5595	1886	12651	0.29	0.25	54.15%	0.39	0.10	0.97	0.28	0.70	0.46	0.11	0.97	0.28	0.74
B3.02	24,310	0.56	2688	9,480	9336	2805	14703	0.34	0.22	60.48%	0.39	0.09	0.97	0.33	0.74	0.46	0.10	0.97	0.33	0.77
B4.01	26,557	0.61	0	12,500	14007	51	15308	0.35	0.26	57.64%	0.39	0.10	0.97	0.34	0.72	0.46	0.12	0.97	0.34	0.75
B4.02	22,516	0.52	0	7,253	11928	3336	15989	0.37	0.15	71.01%	0.39	0.06	0.97	0.36	0.80	0.46	0.07	0.97	0.36	0.82
B5.01	27,962	0.64	0	5,152	18522	4288	23325	0.54	0.11	83.42%	0.39	0.04	0.97	0.52	0.87	0.46	0.05	0.97	0.52	0.89
B5.02	15,922	0.37	0	2,218	13684	20	13926	0.32	0.05	87.47%	0.39	0.02	0.97	0.31	0.90	0.46	0.02	0.97	0.31	0.91
B5.03	22,096	0.51	0	4,688	14,297	3,112	17,877	0.41	0.10	80.91%	0.39	0.04	0.97	0.40	0.86	0.46	0.04	0.97	0.40	0.87
B5.04	24,391	0.56	0	5,260	15311	3821	19658	0.45	0.11	80.59%	0.39	0.04	0.97	0.44	0.86	0.46	0.05	0.97	0.44	0.87
B5.05	20,966	0.48	0	7,132	11701	2123	14537	0.33	0.15	69.37%	0.39	0.06	0.97	0.32	0.79	0.46	0.07	0.97	0.32	0.81
B5.06	**32,647**	**0.75**	**0**	**14,718**	**15,876**	**2,053**	**19,401**	**0.45**	**0.30**	59.43%	0.39	0.12	0.97	0.43	0.73	0.46	0.14	0.97	0.43	0.76
B5.06A	21,071	0.48	0	10,017	9795	1259	12,056	0.28	0.21	57.21%	0.39	0.08	0.97	0.27	0.72	0.46	0.10	0.97	0.27	0.75
B5.06B	11,576	0.27	0	4,701	6080	794	7345	0.17	0.10	63.45%	0.39	0.04	0.97	0.16	0.76	0.46	0.04	0.97	0.16	0.78
B5.07	38,184	0.88	0	22,406	13722	2056	18019	0.41	0.46	47.19%	0.39	0.18	0.97	0.46	0.66	0.46	0.21	0.97	0.40	0.70
C1.01	18,039	0.41	0	9,065	8,974	0	9881	0.23	0.19	54.77%	0.39	0.07	0.97	0.22	0.71	0.46	0.09	0.97	0.22	0.74
C1.02	31,354	0.72	0	3,605	21462	6286	28109	0.65	0.07	89.65%	0.39	0.03	0.97	0.63	0.91	0.46	0.03	0.97	0.63	0.92
C1.03	36,860	0.85	0	7,100	22803	6958	30471	0.70	0.15	82.67%	0.39	0.06	0.97	0.68	0.87	0.46	0.07	0.97	0.68	0.88
C1.04	80,159	1.84	0	24,404	55,955	0	58396	1.34	0.50	72.67%	0.39	0.20	0.97	1.30	0.81	0.46	0.23	0.97	1.30	0.83
C1.05	**41,529**	**0.95**	**0**	**8,223**	**25,466**	**7,840**	**34,128**	0.78	0.17	82.18%	0.39	0.07	0.97	0.76	0.87	0.46	0.08	0.97	0.76	0.88
C1.05A	13,672	0.31	0	2767	8268	2637	11,182	0.26	0.06	81.79%	0.39	0.02	0.97	0.25	0.86	0.46	0.03	0.97	0.25	0.88
C1.05B	27,857	0.64	0	5,456	17198	5203	22947	0.53	0.11	82.37%	0.39	0.04	0.97	0.51	0.87	0.46	0.05	0.97	0.51	0.88
C1.06	**59,118**	**1.36**	**0**	**23,918**	**28,385**	**6,815**	**57,592**	0.86	0.49	63.59%	0.39	0.19	0.97	0.84	0.76	0.46	0.23	0.97	0.84	0.78
C1.06A	21,209	0.49	0	9,549	9902	1758	12615	0.29	0.20	59.48%	0.39	0.08	0.97	0.28	0.73	0.46	0.09	0.97	0.28	0.76
C1.06B	37,908	0.87	0	14,368	18483	5057	24977	0.57	0.30	65.89%	0.39	0.12	0.97	0.56	0.77	0.46	0.14	0.97	0.56	0.80
C1.07	11,400	0.26	0	2,053	7229	2123	9558	0.22	0.04	83.80%	0.39	0.02	0.97	0.21	0.88	0.46	0.02	0.97	0.21	0.89
C1.08	11,589	0.27	0	1,732	8214	1642	10030	0.23	0.04	86.55%	0.39	0.01	0.97	0.22	0.89	0.46	0.02	0.97	0.22	0.90
D1.01	32,170	0.74	0	3,554	23574	5042	28972	0.67	0.07	90.06%	0.39	0.03	0.97	0.65	0.92	0.46	0.03	0.97	0.65	0.92
D1.02	5,571	0.13	0	792	3250	1529	4858	0.11	0.02	87.21%	0.39	0.01	0.97	0.11	0.90	0.46	0.01	0.97	0.11	0.90
D1.03	41,086	0.94	0	24,057	13792	3237	19435	0.45	0.50	47.30%	0.39	0.19	0.97	0.43	0.66	0.46	0.23	0.97	0.43	0.70
D1.04	14,483	0.33	0	1,868	10319	2297	12802	0.29	0.04	88.39%	0.39	0.02	0.97	0.29	0.90	0.46	0.02	0.97	0.29	0.91
D1.05	19,177	0.44	0	5,399	10974	2804	14318	0.33	0.11	74.66%	0.39	0.04	0.97	0.32	0.82	0.46	0.05	0.97	0.32	0.84
D1.06	15,109	0.34	0	1,929	10506	2575	13274	0.30	0.04	88.43%	0.39	0.02	0.97	0.30	0.90	0.46	0.02	0.97	0.30	0.91
D1.07	16,083	0.37	0	3,709	9944	2439	12753	0.29	0.08	79.29%	0.39	0.03	0.97	0.28	0.85	0.46	0.04	0.97	0.28	0.86
D2.01	44,797	1.03	0	11,538	25734	7525	34413	0.79	0.24	76.82%	0.39	0.09	0.97	0.77	0.84	0.46	0.11	0.97	0.77	0.85
D2.02	39,124	0.90	0	20,673	15462	2988	20518	0.47	0.43	52.44%	0.39	0.17	0.97	0.46	0.69	0.46	0.20	0.97	0.46	0.73
OFF.01	6,781	0.16	0	0	6781	0	6781	0.16	0.00	100.00%	0.39	0.00	0.97	0.15	0.97	0.46	0.00	0.97	0.15	0.97
OFF.02	20,416	0.47	0	0	20416	0	20416	0.47	0.00	100.00%	0.39	0.00	0.97	0.45	0.97	0.46	0.00	0.97	0.45	0.97
OFF.03	20,062	0.46	0	0	20062	0	20062	0.46	0.00	100.00%	0.39	0.00	0.97	0.45	0.97	0.46	0.00	0.97	0.45	0.97
OFF.04	20,015	0.46	0	0	20015	0	20015	0.46	0.000	100.00%	0.39	0.00	0.97	0.45	0.97	0.46	0.00	0.97	0.45	0.97
OA1.1	43,820	1.01	0	0	3508	15410	18,918	0.43	0.57	43.17%	0.39	0.22	0.97	0.42	0.64	0.46	0.26	0.97	0.42	0.68
OA1.2	24,229	0.56	0	0	1353.00	16937	18,290	0.42	0.14	75.49%	0.39	0.05	0.97	0.41	0.83	0.46	0.06	0.97	0.41	0.84
OA1.3	24,599	0.57	0	0	4711	18877	23,588	0.54	0.03	95.50%	0.39	0.01	0.97	0.53	0.94	0.46	0.01	0.97	0.53	0.95
OA1.4	26,247	0.60	0	0	831.00	16899	17,730	0.41	0.20	67.55%	0.39	0.08	0.97	0.39	0.78	0.46	0.09	0.97	0.39	0.80
OA1.5	21,261	0.49	0	0	0	12143	12,143	0.28	0.21	57.11%	0.39	0.08	0.97	0.27	0.72	0.46	0.10	0.97	0.27	0.75
MEMORIAL DRIVE																				
M1.1	38,410	0.88	20655	0	0	5875	18,268	0.42	0.46	47.56%	0.39	0.18	0.97	0.41	0.67	0.46	0.21	0.97	0.41	0.70
M1.2	29,280	0.67	16784	0	0	4779	14,849	0.34	0.33	50.72%	0.39	0.13	0.97	0.33	0.68	0.46	0.15	0.97	0.33	0.72
M2.1	**28,039**	0.64	5760	0	18	12776	16,250	0.37	0.27	57.95%	0.39	0.11	0.97	0.36	0.73	0.46	0.12	0.97	0.36	0.76
M2.2A	6,088	0.14	0	0	0	3950	3,950	0.09	0.05	64.88%	0.39	0.02	0.97	0.09	0.77	0.46	0.02	0.97	0.09	0.79
M2.2B	8,433	0.19	0	0	0	4807	4,807	0.11	0.08	57.00%	0.39	0.03	0.97	0.11	0.72	0.46	0.04	0.97	0.11	0.75
M2.2	14,521	0.33	0	0	0	8757	8,757	0.20	0.13	60.31%	0.39	0.05	0.97	0.20	0.74	0.46	0.06	0.97	0.20	0.77
M-BP	15,665	0.36	4481	0	0	170	2,859	0.07	0.29	18.25%	0.39	0.11	0.97	0.06	0.50	0.46	0.14	0.97	0.06	0.55
B2.1	44,075	1.01	29371	0	0	4863	22,486	0.52	0.50	51.02%	0.39	0.19	0.97	0.50	0.69	0.46	0.23	0.97	0.50	0.72
B2.2	31,258	0.72	12152	0	0	5556	12,847	0.29	0.42	41.10%	0.39	0.16	0.97	0.29	0.63	0.46	0.19	0.97	0.29	0.67
B2.3	23,202	0.53	0	0	688	11,286	11,974	0.27	0.26	51.61%	0.39	0.10	0.97	0.27	0.69	0.46	0.12	0.97	0.27	0.72
A11.1	54,979	1.26	0	0	7247	34410	41,657	0.96	0.31	75.77%	0.39	0.12	0.97	0.93	0.83	0.46	0.14	0.97	0.93	0.85
A11.2	43,547	1.00	0	0	2437	30984	33,421	0.77	0.23	76.75%	0.39	0.09	0.97	0.74	0.84	0.46	0.11	0.97	0.74	0.85

DRAINAGE AREA	INLET NUMBER	AREA (acres)	COMPOSITE C		A·C25	A·C100	SHEET FLOW			SHALLOW CONCENTRATED FLOW			CHANNELIZED FLOW				Cumulative	INTENSITY		DISCHARGE	
			C25	C100			Length (ft)	Manning's (n)	Slope ft/ft	Tc (min)	Length (ft)	Paved/ Unpaved	Slope ft/ft	Tc (min)	Length (ft)	Manning's (n)	Slope ft/ft	Velocity ft/s	Tc (min)	Tc (min)	I 25yr (in/hr)	I 100yr (in/hr)	Q 25 (cfs)	Q 100 (cfs)
B2.04	B2.04	0.38	0.75	0.78	0.29	0.30	100	0.3	0.012	6.5	90	U	0.028	0.6	10	0.02	0.008	2.5	0.1	7.14	9.2	11.1	2.6	3.3
B2.05	B2.05	0.36	0.57	0.62	0.20	0.22	100	0.3	0.016	5.6	70	U	0.025	0.5	40	0.02	0.008	2.5	0.3	6.37	9.4	11.4	1.9	2.5
B2.06	B2.06	0.39	0.85	0.86	0.33	0.34	0	0.3	1.000	0.0	0	U	1.000	0.0	0	0.02	0.018	3.9	0.0	5.00	9.8	11.9	3.3	4.0
B2.07	B2.07	0.38	0.83	0.85	0.32	0.32	0	0.3	1.000	0.0	0	U	1.000	0.0	0	0.02	0.018	3.9	0.0	5.00	9.8	11.9	3.1	3.8
B2.08	B2.08	0.62	0.91	0.92	0.56	0.57	0	0.3	1.000	0.0	0	U	1.000	0.0	0	0.02	0.014	3.4	0.0	5.00	9.8	11.9	5.5	6.7
B2.09	B2.09	0.61	0.74	0.76	0.45	0.46	0	0.3	1.000	0.0	0	U	1.000	0.0	0	0.02	0.014	3.4	0.0	5.00	9.8	11.9	4.4	5.5
B2.10	B2.10	0.57	0.71	0.74	0.40	0.42	0	0.3	1.000	0.0	0	U	1.000	0.0	0	0.02	0.024	4.5	0.0	5.00	9.8	11.9	3.9	5.0
B2.11	B2.11	0.40	0.93	0.93	0.37	0.38	0	0.3	1.000	0.0	0	U	1.000	0.0	0	0.02	0.024	4.5	0.0	5.00	9.8	11.9	3.7	4.5
B2.12	B2.12	0.52	0.77	0.79	0.40	0.41	0	0.3	1.000	0.0	0	U	1.000	0.0	0	0.02	0.021	4.2	0.0	5.00	9.8	11.9	3.9	4.9
B2.13	B2.13	0.42	0.91	0.92	0.38	0.39	0	0.3	1.000	0.0	0	U	1.000	0.0	0	0.02	0.021	4.2	0.0	5.00	9.8	11.9	3.8	4.6
B3.01	B3.01	0.54	0.70	0.74	0.38	0.39	0	0.3	1.000	0.0	0	U	1.000	0.0	0	0.02	0.011	3.0	0.0	5.00	9.8	11.9	3.7	4.7
B3.02	B3.02	0.56	0.74	0.77	0.41	0.43	0	0.3	1.000	0.0	0	U	1.000	0.0	0	0.02	0.016	3.6	0.0	5.00	9.8	11.9	4.1	5.1
B4.01	B4.01	0.61	0.72	0.75	0.44	0.46	0	0.3	1.000	0.0	0	U	1.000	0.0	0	0.02	0.011	3.0	0.0	5.00	9.8	11.9	4.3	5.5
B4.02	B4.02	0.52	0.80	0.82	0.41	0.42	0	0.3	1.000	0.0	0	U	1.000	0.0	0	0.02	0.016	3.6	0.0	5.00	9.8	11.9	4.1	5.0
B5.01	B5.01	0.64	0.87	0.89	0.56	0.57	0	0.3	1.000	0.0	0	U	1.000	0.0	0	0.02	0.017	3.8	0.0	5.00	9.8	11.9	5.5	6.8
B5.02	B5.02	0.37	0.90	0.91	0.33	0.33	0	0.3	1.000	0.0	0	U	1.000	0.0	0	0.02	0.017	3.8	0.0	5.00	9.8	11.9	3.2	3.9
B5.03	B5.03	0.51	0.86	0.87	0.44	0.44	0	0.3	1.000	0.0	0	U	1.000	0.0	0	0.02	0.011	3.0	0.0	5.00	9.8	11.9	4.3	5.3
B5.04	B5.04	0.56	0.86	0.87	0.48	0.49	0	0.3	1.000	0.0	0	U	1.000	0.0	0	0.02	0.011	3.0	0.0	5.00	9.8	11.9	4.7	5.8
B5.05	B5.05	0.48	0.79	0.81	0.38	0.39	0	0.3	1.000	0.0	0	U	1.000	0.0	0	0.02	0.012	3.1	0.0	5.00	9.8	11.9	3.8	4.7
B5.06	B5.06	0.75	0.73	0.76	0.55	0.57	-	-	-	-	-	-	-	-	-	-	-	-	-	5.00	9.8	11.9	5.4	6.8
B5.06A	B5.06A	0.48	0.72	0.75	0.35	0.36	-	-	-	-	-	-	-	-	-	-	-	-	-	5.00	9.8	11.9	3.4	4.3
B5.06B	B5.06B	0.27	0.76	0.78	0.20	0.21	0	0.3	1.000	0.0	0	U	1.000	0.0	0	0.02	0.018	3.9	0.0	5.00	9.8	11.9	2.0	2.5
B5.07	B5.07	0.88	0.66	0.70	0.58	0.61	0	0.3	1.000	0.0	0	U	1.000	0.0	0	0.02	0.018	3.9	0.0	5.00	9.8	11.9	5.7	7.3
C1.01	C1.01	0.41	0.71	0.74	0.29	0.31	0	0.3	1.000	0.0	0	U	1.000	0.0	0	0.02	0.018	3.9	0.0	5.00	9.8	11.9	2.9	3.6
C1.02	C1.02	0.72	0.91	0.92	0.65	0.66	0	0.3	1.000	0.0	0	U	1.000	0.0	0	0.02	0.018	3.9	0.0	5.00	9.8	11.9	6.4	7.8
C1.03	C1.03	0.85	0.87	0.88	0.74	0.75	0	0.3	1.000	0.0	0	U	1.000	0.0	0	0.02	0.018	3.9	0.0	5.00	9.8	11.9	7.2	8.9
C1.04	C1.04	1.84	0.81	0.83	1.50	1.53	0	0.3	1.000	0.0	0	U	1.000	0.0	0	0.02	0.018	3.9	0.0	5.00	9.8	11.9	14.7	18.2
C1.05	C1.05	0.95	0.77	0.80	0.88	0.83	0.84	-	-	81	-	-	-	-	7.2	8.9	-	-	-	5.00	9.8	11.9	8.1	10.0
C1.05A	C1.05A	0.31	0.86	0.88	0.27	0.28	0	0.3	1.000	0.0	0	U	1.000	0.0	0	0.02	0.006	2.3	0.0	5.00	9.8	11.9	2.7	3.3
C1.05B	C1.05B	0.64	0.87	0.88	0.55	0.56	0	0.3	1.000	0.0	0	U	1.000	0.0	0	0.02	0.005	2.0	0.0	5.00	9.8	11.9	5.5	6.7
C1.06	C1.06	1.36	0.76	0.78	1.03	1.06	-	-	-	-	-	-	-	-	-	-	-	-	-	5.00	9.8	11.9	10.1	12.6
C1.06A	C1.06A	0.49	0.73	0.76	0.36	0.37	0	0.3	1.000	0.0	0	U	1.000	0.0	0	0.02	0.006	2.3	0.0	5.00	9.8	11.9	3.5	4.4
C1.06B	C1.06B	0.87	0.77	0.80	0.67	0.69	0	0.3	1.000	0.0	0	U	1.000	0.0	0	0.02	0.005	2.1	0.0	5.00	9.8	11.9	6.6	8.2
C1.07	C1.07	0.26	0.88	0.89	0.23	0.23	0	0.3	1.000	0.0	0	U	1.000	0.0	0	0.02	0.008	2.5	0.0	5.00	9.8	11.9	2.3	2.8
C1.08	C1.08	0.27	0.89	0.90	0.24	0.24	0	0.3	1.000	0.0	0	U	1.000	0.0	0	0.02	0.008	2.5	0.0	5.00	9.8	11.9	2.3	2.8
D1.01	D1.01	0.74	0.91	0.92	0.67	0.68	0	0.3	1.000	0.0	0	U	1.000	0.0	0	0.02	0.020	4.0	0.0	5.00	9.8	11.9	6.6	8.1
D1.02	D1.02	0.13	0.90	0.90	0.11	0.12	0	0.3	1.000	0.0	0	U	1.000	0.0	0	0.02	0.029	4.9	0.0	5.00	9.8	11.9	1.1	1.4
D1.03	D1.03	0.94	0.66	0.70	0.63	0.66	0	0.3	0.003	0.0	180	U	0.058	0.8	180	0.02	0.024	4.5	0.7	5.00	9.8	11.9	6.2	7.9
D1.04	D1.04	0.33	0.90	0.91	0.30	0.30	0	0.3	1.000	0.0	0	U	1.000	0.0	0	0.02	0.017	3.8	0.0	5.00	9.8	11.9	3.0	3.6
D1.05	D1.05	0.44	0.82	0.84	0.36	0.37	0	0.3	1.000	0.0	0	U	1.000	0.0	0	0.02	0.017	3.7	0.0	5.00	9.8	11.9	3.6	4.4
D1.06	D1.06	0.34	0.90	0.91	0.31	0.31	0	0.3	1.000	0.0	0	U	1.000	0.0	0	0.02	0.020	4.1	0.0	5.00	9.8	11.9	3.1	3.7
D1.07	D1.07	0.37	0.85	0.86	0.31	0.32	0	0.3	1.000	0.0	0	U	1.000	0.0	0	0.02	0.022	4.3	0.0	5.00	9.8	11.9	3.1	3.8
D2.01	D2.01	1.03	0.84	0.85	0.86	0.88	0	0.3	1.000	0.0	0	U	1.000	0.0	0	0.02	0.021	4.2	0.0	5.00	9.8	11.9	8.5	10.4
D2.02	D2.02	0.90	0.69	0.73	0.62	0.65	0	0.3	0.001	0.0	190	U	0.054	0.8	0	0.02	0.026	4.6	0.0	5.00	9.8	11.9	6.1	7.8
OFF.01	OFF.01	0.16	0.97	0.97	0.15	0.15	0	0.3	1.000	0.0	0	U	1.000	0.0	0	0.02	0.010	2.9	0.0	5.00	9.8	11.9	1.5	1.8
OFF.02	OFF.02	0.47	0.97	0.97	0.45	0.45	0	0.3	1.000	0.0	0	U	1.000	0.0	0	0.02	0.011	3.0	0.0	5.00	9.8	11.9	4.5	5.4
OFF.03	OFF.03	0.46	0.97	0.97	0.45	0.45	0	0.3	1.000	0.0	0	U	1.000	0.0	0	0.02	0.030	5.0	0.0	5.00	9.8	11.9	4.4	5.3
OFF.04	OFF.04	0.46	0.97	0.97	0.45	0.45	0	0.3	1.000	0.0	0	U	1.000	0.0	0	0.02	0.030	5.0	0.0	5.00	9.8	11.9	4.4	5.3
OA1.1	OA1.1	1.01	0.64	0.68	0.64	0.68	90	0.3	0.035	3.4	0	U	0.027	0.0	292	0.02	0.016	3.6	1.3	5.00	9.8	11.9	6.3	8.1
OA1.2	OA1.2	0.56	0.83	0.84	0.46	0.47	93	0.3	0.046	3.1	0	U	0.010	0.0	214	0.02	0.018	3.9	0.9	5.00	9.8	11.9	4.5	5.6
OA1.3	OA1.3	0.57	0.94	0.95	0.54	0.54	0	0.3	0.0	0.0	0	U	0.031	0.0	509	0.02	0.012	3.2	2.7	5.00	9.8	11.9	5.3	6.4
OA1.4	OA1.4	0.60	0.78	0.80	0.47	0.48	80	0.3	0.022	3.9	0	U	0.116	0.0	173	0.02	0.013	3.3	0.9	5.00	9.8	11.9	4.6	5.8
OA1.5	OA1.5	0.49	0.72	0.75	0.35	0.37	48	0.3	0.073	1.

STREET FLOW AND INLET CALCULATIONS
25 YEAR STORM

						STREET CAPACITY								INLET ON GRADE CAPACITY										SUMP INLET CAPACITY							
																									CURB (with Depression)				AREA (without Depression)			
Inlet No.	Inlet Type	Drainage Area	Q 25 (cfs)	Q pass (cfs)	Q total (cfs)	Street Width F-F (ft)	Crown Type	Curb Height (ft)	Gutter Slope (%)	a (ft)	Yo (ft)	Crown Height (ft)	Ponded Width (+) (ft)	Ponded Width (ft)	Eo	S'w	Sx	Se	LT	L	E	Qi	Qpass (cfs)	Pass to Inlet #	Qtotal (cfs)	Length (ft)	d (ft)	d (ft) (d ≤ h + a)	Length (ft)	h (ft)	d (ft) (d ≤ h)	do (ft) Orifice (d ≥ 1.4h)
B2.04	G-1	0.38	2.6	0.0	2.61	25	S	0.50	0.75%	0.42	0.24	0.50	11.86	11.86	0.30	0.28	0.02	0.10	9.6	10	1.00	2.61	0.0	B2.05	-	-	-	-	-	-	-	-
B2.05	G-1	0.36	1.9	0.0	1.9	25	S	0.50	0.75%	0.42	0.21	0.50	10.57	10.57	0.34	0.28	0.02	0.11	8.0	10	1.00	1.92	0.0	0.00	-	-	-	-	-	-	-	-
B2.06	G-1	0.39	3.3	0.0	3.3	25	S	0.50	1.84%	0.42	0.22	0.50	10.90	10.90	0.33	0.28	0.02	0.11	13.3	10	0.92	3.00	0.3	B2.08	-	-	-	-	-	-	-	-
B2.07	G-1	0.38	3.1	0.7	3.8	25	S	0.50	1.84%	0.42	0.23	0.50	11.55	11.55	0.31	0.28	0.02	0.11	14.5	10	0.88	3.34	0.5	B2.09	-	-	-	-	-	-	-	-
B2.08	G-1	0.62	5.5	1.3	6.8	25	S	0.50	1.38%	0.42	0.30	0.50	4.65	15.15	0.24	0.28	0.02	0.09	19.1	10	0.74	5.02	1.8	B2.11	-	-	-	-	-	-	-	-
B2.09	G-1	0.61	4.4	0.5	4.9	25	S	0.50	1.38%	0.42	0.27	0.50	3.97	13.35	0.27	0.28	0.02	0.10	15.7	10	0.84	4.08	0.8	B2.10	-	-	-	-	-	-	-	-
B2.10	G-1	0.57	3.9	0.8	4.7	25	S	0.50	2.40%	0.42	0.24	0.50	3.45	11.90	0.30	0.28	0.02	0.10	17.4	10	0.78	3.70	1.0	B2.12	-	-	-	-	-	-	-	-
B2.11	G-1	0.40	3.7	1.8	5.5	25	S	0.50	2.40%	0.42	0.25	0.50	3.69	12.58	0.29	0.28	0.02	0.10	19.0	10	0.74	4.05	1.4	B2.13	-	-	-	-	-	-	-	-
B2.12	G-1	0.52	3.9	1.0	4.9	25	S	0.50	2.12%	0.42	0.25	0.50	3.62	12.37	0.29	0.28	0.02	0.10	17.35	10	0.79	3.87	1.0	B5.06A	-	-	-	-	-	-	-	-
B2.13	G-1	0.42	3.8	1.4	5.2	25	S	0.50	2.12%	0.42	0.25	0.50	3.71	12.63	0.29	0.28	0.02	0.10	17.92	10	0.77	4.00	1.2	B5.06A	-	-	-	-	-	-	-	-
B3.01	G-1	0.54	3.7	0.0	3.7	25	S	0.50	1.09%	0.42	0.25	0.50	3.71	12.62	0.29	0.28	0.02	0.10	12.74	10	0.94	3.48	0.2	B3.02	-	-	-	-	-	-	-	-
B3.02	G-1	0.56	4.1	0.2	4.3	25	S	0.50	1.59%	0.42	0.25	0.50	3.63	12.42	0.29	0.28	0.02	0.10	15.08	10	0.86	3.69	0.6	B2.08	-	-	-	-	-	-	-	-
B4.01	G-1	0.61	4.3	0.0	4.3	25	S	0.50	1.09%	0.42	0.27	0.50	3.98	13.39	0.27	0.28	0.02	0.10	13.95	10	0.90	3.90	0.4	B4.02	-	-	-	-	-	-	-	-
B4.02	G-1	0.52	4.1	0.4	4.5	25	S	0.50	1.59%	0.42	0.25	0.50	3.72	12.66	0.29	0.28	0.02	0.10	15.54	10	0.84	3.82	0.7	B2.07	-	-	-	-	-	-	-	-
B5.01	G-1	0.64	5.5	0.0	5.5	25	S	0.50	1.70%	0.42	0.27	0.50	4.01	13.46	0.27	0.28	0.02	0.10	17.69	10	0.78	4.29	1.2	B5.04	-	-	-	-	-	-	-	-
B5.02	G-1	0.37	3.2	0.0	3.2	25	S	0.50	1.70%	0.42	0.22	0.50	3.15	11.01	0.32	0.28	0.02	0.11	12.95	10	0.93	3.00	0.2	B5.03	-	-	-	-	-	-	-	-
B5.03	G-1	0.51	4.3	0.2	4.5	25	S	0.50	1.07%	0.42	0.27	0.50	4.06	13.62	0.27	0.28	0.02	0.09	14.22	10	0.89	4.01	0.5	B5.05	-	-	-	-	-	-	-	-
B5.04	G-1	0.56	4.7	1.2	6.0	25	S	0.50	1.07%	0.42	0.30	0.50	4.64	15.11	0.24	0.28	0.02	0.09	16.70	10	0.81	4.80	1.2	B5.05	-	-	-	-	-	-	-	-
B5.05	G-1	0.48	3.8	3.4	7.2	25	S	0.50	1.16%	0.42	0.32	0.50	4.98	15.95	0.23	0.28	0.02	0.08	18.92	10	0.74	5.31	1.9	B5.06A	-	-	-	-	-	-	-	-
B5.06	G-1	0.75	5.4	5.5	10.9	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.00	10.9	20.0	0.4	0.35	-	-	-	-
B5.06A	S-1	0.48	3.4	4.1	7.5	25	S	0.50	1.20%	0.42	0.32	0.50	5.06	16.15	0.23	0.28	0.02	0.08	19.6	10	0.72	5.44	2.1	0.00	-	-	-	-	-	-	-	-
B5.06B	S-1	0.27	2.0	1.4	3.4	25	S	0.50	1.83%	0.42	0.22	0.50	3.16	11.04	0.32	0.28	0.02	0.11	13.50	10	0.91	3.08	0.3	0.00	-	-	-	-	-	-	-	-
B5.07	S-1	0.88	5.7	0.0	5.7	25	S	0.50	1.83%	0.42	0.27	0.50	4.01	13.46	0.27	0.28	0.02	0.10	18.36	10	0.76	4.33	1.4	B5.06B	-	-	-	-	-	-	-	-
C1.01	S-1	0.41	2.9	0.0	2.9	25	S	0.50	0.0183	0.42	0.21	0.5	2.95	10.41	0.34	0.28	0.02	0.12	12.32	10	0.95	2.74	0.1	C1.04	2.9	-	-	-	9.0	0.5	0.23	0.2
C1.02	S-1	0.72	6.4	0.0	6.4	25	S	0.50	1.83%	0.42	0.28	0.50	4.24	14.07	0.26	0.28	0.02	0.09	19.7	10	0.72	4.65	1.8	C1.06A	-	-	-	-	-	-	-	-
C1.03	G-1	0.85	7.2	0.0	7.2	25	S	0.50	1.83%	0.42	0.29	0.50	4.48	14.70	0.25	0.28	0.02	0.09	21.0	10	0.69	4.97	2.3	C1.05A	-	-	-	-	-	-	-	-
C1.04	G-1	1.84	14.7	0.1	14.9	25	S	0.50	1.83%	0.42	0.39	0.50	6.51	19.26	0.19	0.28	0.02	0.07	31.88	10	0.49	7.32	7.6	0.00	14.9	-	-	-	25.0	0.5	0.34	0.3
C1.05	G-1	0.95	8.1	2.3	10.4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.00	10.4	20.0	0.3	0.34	-	-	-	-
C1.05A	G-1	0.31	2.7	2.3	4.9	25	S	0.50	0.62%	0.42	0.31	0.50	4.84	15.60	0.24	0.28	0.02	0.09	13.28	10	0.92	4.54	0.4	0.00	-	-	-	-	-	-	-	-
C1.05B	G-1	0.64	5.5	0.0	5.5	25	S	0.50	0.50%	0.42	0.34	0.50	5.36	16.84	0.22	0.28	0.02	0.08	13.45	10	0.91	4.99	0.5	0.00	-	-	-	-	-	-	-	-
C1.06	G-1	1.36	10.1	1.8	11.9	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.00	11.9	20.0	0.4	0.37	-	-	-	-
C1.06A	G-1	0.49	3.5	1.8	5.3	25	S	0.50	0.62%	0.42	0.32	0.50	5.02	16.04	0.23	0.28	0.02	0.08	13.86	10	0.90	4.78	0.5	0.0	-	-	-	-	-	-	-	-
C1.06B	G-1	0.87	6.6	0.0	6.6	25	S	0.50	0.54%	0.42	0.36	0.50	5.83	17.89	0.21	0.28	0.02	0.08	15.22	10	0.85	5.65	1.0	0.0	-	-	-	-	-	-	-	-
C1.07	G-1	0.26	2.3	0.0	2.3	25	S	0.50	0.75%	0.42	0.22	0.50	3.22	11.22	0.32	0.28	0.02	0.11	8.79	10	1.00	2.26	0.0	D1.01	-	-	-	-	-	-	-	-
C1.08	G-1	0.27	2.3	0.0	2.3	25	S	0.50	0.75%	0.42	0.23	0.50	3.27	11.37	0.31	0.28	0.02	0.11	9.0	10	1.00	2.33	0.0	D2.01	-	-	-	-	-	-	-	-
D1.01	G-1	0.74	6.6	0.0	6.6	25	S	0.50	1.96%	0.42	0.26	0.50	3.81	12.92	0.28	0.28	0.02	0.10	19.6	10	0.72	4.80	1.8	D1.02	-	-	-	-	-	-	-	-
D1.02	G-1	0.13	1.1	1.8	3.0	25	S	0.50	2.85%	0.42	0.18	0.50	2.47	8.90	0.39	0.28	0.02	0.13	13.3	10	0.92	2.72	0.2	D2.02	-	-	-	-	-	-	-	-
D1.03	G-1	0.94	6.2	0.0	6.2	25	S	0.50	2.40%	0.42	0.24	0.50	3.52	12.11	0.30	0.28	0.02	0.10	19.7	10	0.72	4.46	1.7	D1.05	-	-	-	-	-	-	-	-
D1.04	S-1	0.33	3.0	0.0	3.0	25	S	0.50	1.72%	0.42	0.20	0.50	2.74	9.77	0.36	0.28	0.02	0.12	11.9	10	0.96	2.85	0.1	D1.06	-	-	-	-	-	-	-	-
D1.05	G-1	0.44	3.6	1.7	5.3	25	S	0.50	1.68%	0.42	0.24	0.50	3.56	12.21	0.30	0.28	0.02	0.10	16.6	10	0.81	4.28	1.0	D1.07	-	-	-	-	-	-	-	-
D1.06	G-1	0.34	3.1	0.1	3.2	25	S	0.50	2.01%	0.42	0.19	0.50	2.74	9.75	0.36	0.28	0.02	0.12	12.8	20	1.00	3.17	0.0	0.0	-	-	-	-	-	-	-	-
D1.07	G-1	0.37	3.1	1.0	4.1	25	S	0.50	2.24%	0.42	0.21	0.50	2.98	10.51	0.34	0.28	0.02	0.11	15.2	20	1.00	4.09	0.0	0.0	-	-	-	-	-	-	-	-
D2.01	G-1	1.03	8.5	0.0	8.5	25	S	0.50	2.14%	0.42	0.28	0.50	4.18	13.92	0.26	0.28	0.02	0.09	23.0	20	0.97	8.24	0.2	D2.02								
D2.02	G-1	0.90	6.1	0.5	6.6	25	S	0.50	2.58%	0.42	0.24	0.50	3.57	12.24	0.29	0.28	0.02	0.10	20.7	20	1.00	6.57	0.0	D1.03	-	-	-	-	-	-	-	-
OFF.01	G-1	0.16	1.5	0.0	1.5	25	S	0.50	1.00%	0.42	0.17	0.50	2.30	8.36	0.41	0.28	0.02	0.13	7.1	10	1.00	1.49	0.0	0.0	-	-	-	-	-	-	-	-
OFF.02	G-1	0.47	4.5	0.0	4.5	25	S	0.50	1.10%	0.42	0.25	0.50	3.63	12.42	0.29	0.28	0.02	0.10	13.7	10	0.90	4.04	0.4	B2.08	-	-	-	-	-	-	-	-
OFF.03	G-1	0.46	4.4	0.0	4.4	25	S	0.50	3.00%	0.42	0.20	0.50	2.89	10.22	0.35	0.28	0.02	0.12	16.9	10	0.80	3.52	0.9	B5.05	-	-	-	-	-	-	-	-
OFF.04	G-1	0.46	4.4	0.0	4.4	25	S	0.50	3.00%	0.42	0.20	0.50	2.89	10.21	0.35	0.28	0.02	0.12	16.9	10	0.80	3.51	0.9	B5.05	-	-	-	-	-	-	-	-
OA1.1	G-1	1.01	6.3	0.0	6.3	63	S	0.50	0.90%	0.42	0.32	0.50	40.26	40.26	0.10	0.28	0.01	0.03	28.4	10	0.54	3.44	2.9	OA1.2	-	-	-	-	-	-	-	-
OA1.2	G-1	0.56	4.5	2.9	7.4	63	S	0.50	1.10%	0.42	0.33	0.50	41.16	41.16	0.09	0.28	0.01	0.03	32.5	15	0.67	4.99	2.4	OA1.4	-	-	-	-	-	-	-	-
OA1.3	G-1	0.57	5.3	0.0	5.3	27	S	0.50	2.20%	0.42	0.25	0.50	13.61	13.61	0.27	0.28	0.02	0.09	19.0	15	0.94	4.95	0.3	OA1.4	-	-	-	-	-	-	-	-
OA1.4	G-1	0.60	4.6	2.8	7.4	65	S	0.50	0.90%	0.42	0.34	0.50	44.01	44.01	0.09	0.28	0.01	0.03	31.6	15	0.69	5.07	2.3	OA1.5	-	-	-	-	-	-	-	-
OA1.5	G-1	0.49	3.5	2.3	5.8	25	S	0.50	0.90%	0.42	0.31	0.50	15.44	15.44	0.24	0.28	0.02	0.09	15.8	15	1.00	5.76	0.0		-	-	-	-	-	-	-	-
M1.1	G-1	0.88	5.2	0.0	5.2	25	S	0.50	0.74%	0.42	0.31	0.50	15.40	15.40	0.24	0.28	0.02	0.09	14.2	10	0.89	4.62	0.6	M1.2	-	-	-	-	-	-	-	-
M1.2	G-1	0.67	4.3	0.0	4.3	25	S	0.50	0.74%	0.42	0.29	0.50	14.37	14.37	0.26	0.28	0.02	0.09	12.8	10	0.94	4.05	0.3	M2.2	-	-	-	-	-	-	-	-
M2.1	G-1	0.64	4.6	0.0	4.6	25	S	0.50	1.30%	0.42	0.26	0.50	13.22	13.22	0.27	0.28	0.02	0.10	15.0	10	0.86	3.96	0.6		-	-	-	-	-	-	-	-
M2.2A	-	0.14	1.1	0.0	1.1	25	S	0.50	0.14%	0.42	0.23	0.50	11.50	11.50	0.31	0.28	0.02	0.11	3.9	10	1.00	1.05	0.0		-	-	-	-	-	-	-	-
M2.2B	-	0.19	1.4	0.0	1.4	25	S	0.50	0.14%	0.42	0.25	0.50	12.69	12.69	0.29	0.28	0.02	0.10	4.6	10	1.00	1.37	0.0		-	-	-	-	-	-	-	-
M2.2	S-1	0.33	2.4	0.0	2.4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		2.4	20.0	0.1	0.1	-	-	-	-
B2.1	G-1	1.01	5.9	0.0	5.9	25	P	0.50	0.57%	0.42	0.34	0.50	5.40	5.40	0.58	0.28	0.04	0.20	8.3	10	1.00	5.85	0.0		-	-	-	-	-	-	-	-
B2.2	G-1	0.72	4.2	0.0	4.2	25	P	0.50	0.64%	0.42	0.29	0.50	4.47	4.47	0.66	0.28	0.04	0.23	7.1	10	1.00	4.25	0.0		-	-	-	-	-	-	-	-
B2.3	G-1	0.53	3.3	0.0	3.3	25	P	0.50	1.51%	0.42	0.23	0.50	3.29	3.29	0.80	0.28	0.04	0.26	7.5	10	1.00	3.34	0.0		-	-	-	-	-	-	-	-
A11.1	G-1	1.26	9.5	0.0	9.5	36	P	0.50	1.09%	0.42	0.36	0.50	8.47	8.47	0.41	0.28	0.03	0.14	15.4	10	0.85	8.08	1.5	A2.3	-	-	-	-	-	-	-	-
A11.2	G-1	1.00	7.6	0.0	7.6	36	P	0.50	1.09%	0.42	0.33	0.50	7.53	7.53	0.45	0.28	0.03	0.15	13.4	10	0.92	6.97	0.6	A2.3	-	-	-	-	-	-	-	-



09/12/2025

NO.	REVISION	DATE

GEORGETOWN TEXAS *more than welcome*

PAPE-DAWSON ENGINEERS
AUSTIN | SAN ANTONIO | HOUSTON | FORT WORTH | DALLAS
10801 N MOPAC EXPY, BLDG 3, STE 200 | AUSTIN, TX 78759 | 512.454.8711
TBPE FIRM REGISTRATION #470 | TBPLS FIRM REGISTRATION #10028801

CITY OF GEORGETOWN, TEXAS
WOLF RANCH PKWY / MEMORIAL DR
OVERALL DRAINAGE AREA CALCULATIONS (2 OF 3)

CITY JOB No.
JOB NO. 51423-00
DATE 9/12/2025
DESIGNER JB
CHECKED SC DRAWN JB

SHEET 256

Date: Sep 12, 2025, 10:09am User ID: cschatz
File: H:\Projects\514\23\00\30 Construction Documents\Civil\00_DACOMBINED51423-00.dwg

THIS DOCUMENT HAS BEEN PRODUCED FROM MATERIAL THAT WAS STORED AND/OR TRANSMITTED ELECTRONICALLY AND MAY HAVE BEEN INADVERTENTLY ALTERED. RELY ONLY ON FINAL HARDCOPY MATERIALS BEARING THE CONSULTANT'S ORIGINAL SIGNATURE AND SEAL.

STREET FLOW AND INLET CALCULATIONS
100 YEAR STORM

					STREET CAPACITY							INLET ON GRADE CAPACITY										SUMP INLET CAPACITY							
						Street	Crown	Curb	Gutter			Crown	Ponded										CURB (with Depression)		AREA (without Depression)				
Inlet No.	Inlet Type	Drainage Area	Q 100 (cfs)	Q pass (cfs)	Q total (cfs)	Width F-F (ft)	Type	Height (ft)	Slope (%)	a (ft)	Yo (ft)	Height (ft)	Width (+) (ft)	Eo	S'w	Sx	Se	LT	L	E	Qi	Qpass (cfs)	Pass to Inlet #	Qtotal (cfs)	Length (ft)	d (ft)	d (ft) (d ≤ h + a)	Length (ft)	h (ft)	d (ft) (d ≤ h)	do (ft) Orifice (d ≥ 1.4h)
B2.04	G-1	0.38	3.3	0.0	3.3	25	S	0.50	0.75%	0.42	0.26	0.50	12.91	0.28	0.28	0.02	0.10	10.92	10	0.99	3.24	0.04	B2.05	-	-	-	-	-	-	-	-
B2.05	G-1	0.36	2.5	0.0	2.6	25	S	0.50	0.75%	0.42	0.24	0.50	11.76	0.31	0.28	0.02	0.11	9.45	10	1.00	2.56	0.00		-	-	-	-	-	-	-	-
B2.06	G-1	0.39	4.0	0.0	4.0	25	S	0.50	1.84%	0.42	0.24	0.50	11.77	0.31	0.28	0.02	0.11	14.94	10	0.86	3.46	0.55	B2.08	-	-	-	-	-	-	-	-
B2.07	G-1	0.38	3.8	1.4	5.2	25	S	0.50	1.84%	0.42	0.26	0.50	13.02	0.28	0.28	0.02	0.10	17.47	10	0.78	4.11	1.14	B2.09	-	-	-	-	-	-	-	-
B2.08	G-1	0.62	6.7	2.7	9.4	25	S	0.50	1.38%	0.42	0.34	0.50	17.12	0.22	0.28	0.02	0.08	23.05	10	0.64	6.05	3.39	B2.11	-	-	-	-	-	-	-	-
B2.09	G-1	0.61	5.5	1.1	6.7	25	S	0.50	1.38%	0.42	0.30	0.50	15.02	0.24	0.28	0.02	0.09	18.83	10	0.74	4.95	1.70	B2.10	-	-	-	-	-	-	-	-
B2.10	G-1	0.57	5.0	1.7	6.7	25	S	0.50	2.40%	0.42	0.27	0.50	13.54	0.27	0.28	0.02	0.10	21.29	10	0.68	4.54	2.13	B2.12	-	-	-	-	-	-	-	-
B2.11	G-1	0.40	4.5	3.4	7.9	25	S	0.50	2.40%	0.42	0.29	0.50	14.41	0.25	0.28	0.02	0.09	23.42	10	0.63	4.97	2.88	B2.13	-	-	-	-	-	-	-	-
B2.12	G-1	0.52	4.9	2.1	7.0	25	S	0.50	2.12%	0.42	0.28	0.50	14.12	0.26	0.28	0.02	0.09	21.28	10	0.68	4.76	2.23	B5.06A	-	-	-	-	-	-	-	-
B2.13	G-1	0.42	4.6	2.9	7.5	25	S	0.50	2.12%	0.42	0.29	0.50	14.48	0.25	0.28	0.02	0.09	22.13	10	0.66	4.94	2.53	B5.06A	-	-	-	-	-	-	-	-
B3.01	G-1	0.54	4.7	0.0	4.7	25	S	0.50	1.09%	0.42	0.28	0.50	13.78	0.26	0.28	0.02	0.09	14.59	10	0.88	4.11	0.58	B3.02	-	-	-	-	-	-	-	-
B3.02	G-1	0.56	5.1	0.6	5.7	25	S	0.50	1.59%	0.42	0.28	0.50	13.78	0.26	0.28	0.02	0.09	17.73	10	0.78	4.41	1.27	B2.08	-	-	-	-	-	-	-	-
B4.01	G-1	0.61	5.5	0.0	5.5	25	S	0.50	1.09%	0.42	0.29	0.50	14.59	0.25	0.28	0.02	0.09	15.93	10	0.83	4.54	0.92	B4.02	-	-	-	-	-	-	-	-
B4.02	G-1	0.52	5.0	0.9	6.0	25	S	0.50	1.59%	0.42	0.28	0.5	14.04	0.26	0.28	0.02	0.09	18.25	10	0.76	4.54	1.43	B2.07	-	-	-	-	-	-	-	-
B5.01	G-1	0.64	6.8	0.0	6.8	25	S	0.50	1.70%	0.42	0.29	0.50	14.52	0.25	0.28	0.02	0.09	19.89	10	0.72	4.83	1.92	B5.04	-	-	-	-	-	-	-	-
B5.02	G-1	0.37	3.9	0.0	3.9	25	S	0.50	1.70%	0.42	0.24	0.50	11.86	0.30	0.28	0.02	0.10	14.53	10	0.88	3.45	0.48	B5.03	-	-	-	-	-	-	-	-
B5.03	G-1	0.51	5.3	0.5	5.7	25	S	0.50	1.07%	0.42	0.30	0.5	14.90	0.25	0.28	0.02	0.09	16.35	10	0.82	4.69	1.05	B5.05	-	-	-	-	-	-	-	-
B5.04	G-1	0.56	5.8	1.9	7.7	25	S	0.50	1.07%	0.42	0.33	0.50	16.65	0.22	0.28	0.02	0.08	19.40	10	0.73	5.62	2.09	B5.05	-	-	-	-	-	-	-	-
B5.05	G-1	0.48	4.7	6.1	10.7	25	S	0.50	1.16%	0.42	0.37	0.50	18.55	0.20	0.28	0.02	0.08	23.86	10	0.62	6.69	4.03	B5.06A	-	-	-	-	-	-	-	-
B5.06	G-1	0.75	6.8	11.1	17.9	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		17.9	20.0	0.5	0.49	-	-	-	-
B5.06A	S-1	0.48	4.3	8.8	13.1	25	S	0.50	1.20%	0.42	0.40	0.50	19.88	0.19	0.28	0.02	0.07	26.99	10	0.57	7.41	5.70		-	-	-	-	-	-	-	-
B5.06B	S-1	0.27	2.5	2.3	4.8	25	S	0.50	1.83%	0.42	0.25	0.5	12.58	0.29	0.28	0.02	0.10	16.53	10	0.81	3.88	0.90		-	-	-	-	-	-	-	-
B5.07	S-1	0.88	7.3	0.0	7.3	25	S	0.50	1.83%	0.42	0.29	0.50	14.74	0.25	0.28	0.02	0.09	21.14	10	0.68	4.99	2.30	B5.06B	-	-	-	-	-	-	-	-
C1.01	S-1	0.41	3.6	0.0	3.6	25	S	0.50	1.83%	0.42	0.23	0.5	11.36	0.31	0.28	0.02	0.11	14.11	10	0.89	3.24	0.39	C1.04	3.6	-	-	-	9.0	0.5	0.26	0.3
C1.02	S-1	0.72	7.8	0.0	7.8	25	S	0.50	1.83%	0.42	0.30	0.50	15.15	0.24	0.28	0.02	0.09	22.04	10	0.66	5.20	2.64	C1.06A	-	-	-	-	-	-	-	-
C1.03	G-1	0.85	8.9	0.0	8.9	25	S	0.50	1.83%	0.42	0.32	0.50	15.86	0.23	0.28	0.02	0.09	23.66	10	0.63	5.57	3.30	C1.05A	-	-	-	-	-	-	-	-
C1.04	G-1	1.84	18.2	0.4	18.6	25	S	0.50	1.83%	0.42	0.42	0.5	20.94	0.18	0.28	0.02	0.07	36.23	10	0.44	8.20	10.40		18.6	-	-	-	25.0	0.5	0.39	0.4
C1.05	G-1	0.95	10.0	3.3	13.3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		13.3	20.0	0.4	0.40	-	-	-	-
C1.05A	G-1	0.31	3.3	3.3	6.6	25	S	0.50	0.62%	0.42	0.35	0.50	17.36	0.21	0.28	0.02	0.08	15.66	10	0.84	5.52	1.05		-	-	-	-	-	-	-	-
C1.05B	G-1	0.64	6.7	0.0	6.7	25	S	0.50	0.50%	0.42	0.36	0.5	18.17	0.21	0.28	0.02	0.08	15.11	10	0.86	5.74	0.95		-	-	-	-	-	-	-	-
C1.06	G-1	1.36	12.6	2.6	15.3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		15.3	20.0	0.4	0.44	-	-	-	-
C1.06A	G-1	0.49	4.4	2.6	7.1	25	S	0.50	0.62%	0.42	0.36	0.5	17.84	0.21	0.28	0.02	0.08	16.32	10	0.82	5.78	1.28		-	-	-	-	-	-	-	-
C1.06B	G-1	0.87	8.2	0.0	8.2	25	S	0.50	0.54%	0.42	0.39	0.50	19.42	0.19	0.28	0.02	0.07	17.26	10	0.79	6.50	1.73		-	-	-	-	-	-	-	-
C1.07	G-1	0.26	2.8	0.0	2.8	25	S	0.50	0.75%	0.42	0.24	0.50	12.10	0.30	0.28	0.02	0.10	9.88	10	1.00	2.76	0.00	D1.01	-	-	-	-	-	-	-	-
C1.08	G-1	0.27	2.8	0.0	2.8	25	S	0.50	0.75%	0.42	0.24	0.50	12.25	0.29	0.28	0.02	0.10	10.07	10	1.00	2.85	0.00	D2.01	-	-	-	-	-	-	-	-
D1.01	G-1	0.74	8.1	0.0	8.1	25	S	0.50	1.96%	0.42	0.30	0.50	15.12	0.24	0.28	0.02	0.09	22.74	10	0.65	5.22	2.84	D1.02	-	-	-	-	-	-	-	-
D1.02	G-1	0.13	1.4	2.8	4.2	25	S	0.50	2.85%	0.42	0.22	0.50	11.05	0.32	0.28	0.02	0.11	16.94	10	0.80	3.37	0.85	D2.02	-	-	-	-	-	-	-	-
D1.03	G-1	0.94	7.9	0.8	8.6	25	S	0.50	2.40%	0.42	0.30	0.50	14.92	0.25	0.28	0.02	0.09	24.73	10	0.61	5.23	3.39	D1.05	-	-	-	-	-	-	-	-
D1.04	S-1	0.33	3.6	0.0	3.6	25	S	0.50	1.72%	0.42	0.23	0.50	11.44	0.31	0.28	0.02	0.11	13.83	10	0.90	3.24	0.36	D1.06	-	-	-	-	-	-	-	-
D1.05	G-1	0.44	4.4	3.4	7.8	25	S	0.50	1.68%	0.42	0.31	0.50	15.36	0.24	0.28	0.02	0.09	21.54	10	0.67	5.26	2.53	D1.07	-	-	-	-	-	-	-	-
D1.06	G-1	0.34	3.7	0.4	4.1	25	S	0.50	2.01%	0.42	0.23	0.50	11.66	0.31	0.28	0.02	0.11	15.41	20	1.00	4.09	0.00		-	-	-	-	-	-	-	-
D1.07	G-1	0.37	3.8	2.5	6.3	25	S	0.50	2.24%	0.42	0.27	0.50	13.46	0.27	0.28	0.02	0.10	20.34	20	1.00	6.32	0.00		-	-	-	-	-	-	-	-
D2.01	G-1	1.03	10.4	0.0	10.4	25	S	0.50	2.14%	0.42	0.33	0.50	16.36	0.23	0.28	0.02	0.08	26.87	20	0.91	9.51	0.89	D2.02	-	-	-	-	-	-	-	-
D2.02	G-1	0.90	7.8	1.7	9.5	25	S	0.50	2.58%	0.42	0.31	0.50	15.26	0.24	0.28	0.02	0.09	26.57	20	0.92	8.73	0.77	D1.03	-	-	-	-	-	-	-	-
OFF.01	G-1	0.16	1.8	0.0	1.8	25	S	0.50	1.00%	0.42	0.20	0.50	9.76	0.36	0.28	0.02	0.12	8.19	10	1.00	1.79	0.00		-	-	-	-	-	-	-	-
OFF.02	G-1	0.47	5.4	0.0	5.4	25	S	0.50	1.10%	0.42	0.29	0.50	14.49	0.25	0.28	0.02	0.09	15.88	10	0.83	4.50	0.90	B2.08	-	-	-	-	-	-	-	-
OFF.03	G-1	0.46	5.3	0.0	5.307	25	S	0.50	3.00%	0.42	0.24	0.50	11.93	0.30	0.28	0.02	0.10	19.59	10	0.72	3.84	1.47	B5.05	-	-	-	-	-	-	-	-
OFF.04	G-1	0.46	5.3	0.0	5.295	25	S	0.50	3.00%	0.42	0.24	0.50	11.92	0.30	0.28	0.02	0.10	19.56	10	0.72	3.84	1.46	B5.05	-	-	-	-	-	-	-	-
OA1.1	G-1	1.01	8.1	0.0	8.1	63	S	0.50	0.90%	0.42	0.35	0.50	44.20	0.09	0.28	0.01	0.03	32.83	10	0.48	3.90	4.2	OA1.2	-	-	-	-	-	-	-	-
OA1.2	G-1	0.56	5.6	4.2	9.8	63	S	0.50	1.10%	0.42	0.36	0.50	45.68	0.09	0.28	0.01	0.03	38.28	15	0.59	5.80	4.0	OA1.4	-	-	-	-	-	-	-	-
OA1.3	G-1	0.57	6.4	0.0	6.4	27	S	0.50	2.20%	0.42	0.27	0.50	14.63	0.25	0.28	0.02	0.09	21.26	15	0.89	5.67	0.7	OA1.4	-	-	-	-	-	-	-	-
OA1.4	G-1	0.60	5.8	4.7	10.5	65	S	0.50	0.90%	0.42	0.39	0.50	50.15	0.08	0.28	0.01	0.03	38.77	15	0.59	6.13	4.3	OA1.5	-	-	-	-	-	-	-	-
OA1.5	G-1	0.49	4.4	4.3	8.7	25	S	0.50	0.90%	0.42	0.36	0.50	17.99	0.21	0.28	0.02	0.08	20.00	15	0.92	7.98	0.7		-	-	-	-	-	-	-	-
M1.1	G-1	0.88	6.7	0.0	6.7	25	S	0.50	0.74%	0.42	0.34	0.50	16.90	0.22	0.28	0.02	0.08	16.44	10	0.82	5.44	1.2	M1.2	-	-	-	-	-	-	-	-
M1.2	G-1	0.67	5.5	0.0	5.5	25	S	0.50	0.74%	0.42	0.31	0.50	15.72	0.23	0.28	0.02	0.09	14.70	10	0.87	4.80	0.7	M2.2	-	-	-	-	-	-	-	-
M2.1	G-1	0.64	5.8	0.0	5.8	25	S	0.50	1.30%	0.42	0.29	0.50	14.40	0.25	0.28	0.02	0.09	17.13	10	0.79	4.59	1.2	M2.2	-	-	-	-	-	-	-	-
M2.2A	-	0.14	1.3	0.0	1.3	25	S	0.50	0.14%	0.42	0.25	0.50	12.48	0.29	0.28	0.02	0.10	4.47	10	1.00	1.31	0.0		-	-	-	-	-	-	-	-
M2.2B	-	0.19	1.7	0.0	1.7	25	S	0.50	0.14%	0.42	0.28	0.50	13.83	0.26	0.28	0.02	0.09	5.24	10	1.00	1.73	0.0		-	-	-	-	-	-	-	-
M2.2	S-1	0.33	3.0	0.0	3.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		3.0	20.0	0.2	0.2	-	-	-	-
B2.1	G-1	1.01	7.5	0.0	7.5	25	P	0.50	0.57%	0.42	0.37	0.50	6.15	0.53	0.28	0.04	0.19	9.68	10	1.00	7.47	0.0	B2.2	-	-	-	-	-	-	-	-
B2.2	G-1	0.72	5.5	0.0	5.5	25	P	0.50	0.64%	0.42	0.32	0.50	5.06	0.61	0.28	0.04	0.21	8.20	10	1.00	5.47	0.0	B2.3	-	-	-	-	-	-	-	-
B2.3	G-1	0.53	4.2	0.0	4.2	25	P	0.50	1.51%	0.42	0.25	0.50	3.66	0.76	0.28	0.04	0.25	8.56	10	1.00	4.24	0.0	B3.01	-	-	-	-	-	-	-	-
A11.1	G-1	1.26	11.8	0.0	11.8	36	P	0.50	1.09%	0.42	0.39	0.50	9.55	0.37	0.28	0.03	0.13	17.70	10	0.78	9.16	2.6	A2.3	-	-	-	-	-	-	-	-
A11.2	G-1	1.00	9.4	0.0	9.4	36	P	0.50	1.09%	0.42	0.36	0.50	8.41	0.41	0.28	0.03	0.14	15.29	10	0.85	8.01	1.4	A2.3	-	-	-	-	-	-	-	-



09/12/2025

NO. | REVISION | DATE

GEORGETOWN TEXAS
more than welcome

PAPE-DAWSON ENGINEERS
AUSTIN | SAN ANTONIO | HOUSTON | FORT WORTH | DALLAS
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TBPE FIRM REGISTRATION #470 | TBPLS FIRM REGISTRATION #10028801

CITY OF GEORGETOWN, TEXAS
WOLF RANCH PKWY / MEMORIAL DR
OVERALL DRAINAGE AREA CALCULATIONS (3 OF 3)

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JOB NO. 51423-00
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File: H:\Projects\514\23\00\30 Construction Documents\Civil\00_DACOMBINED51423-00.dwg

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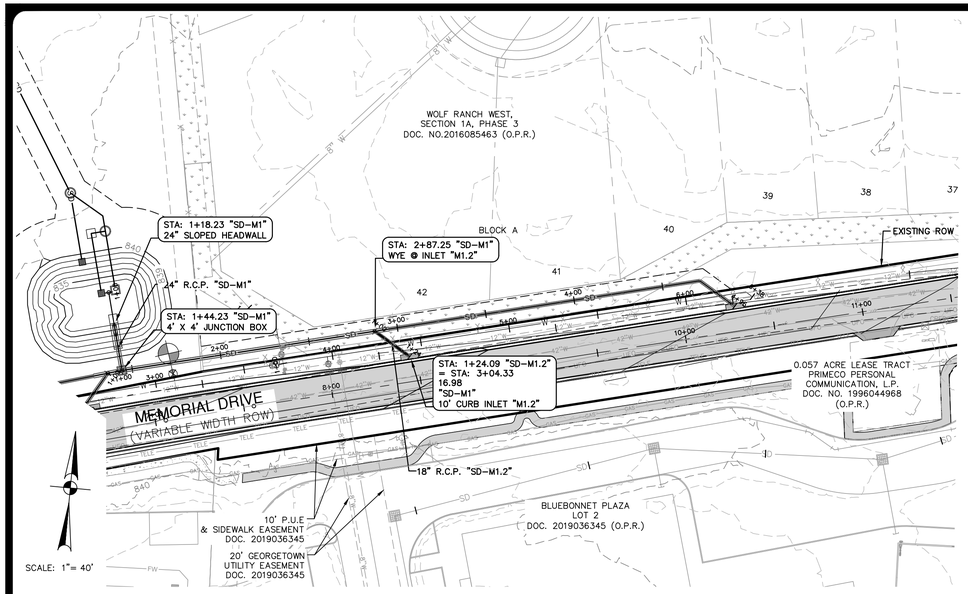
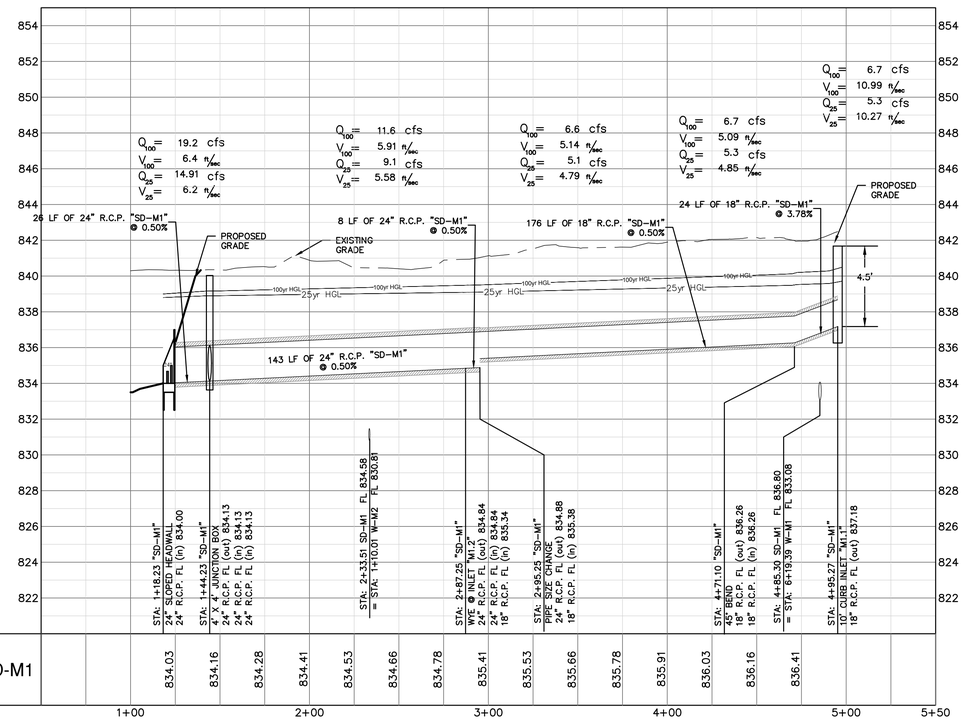
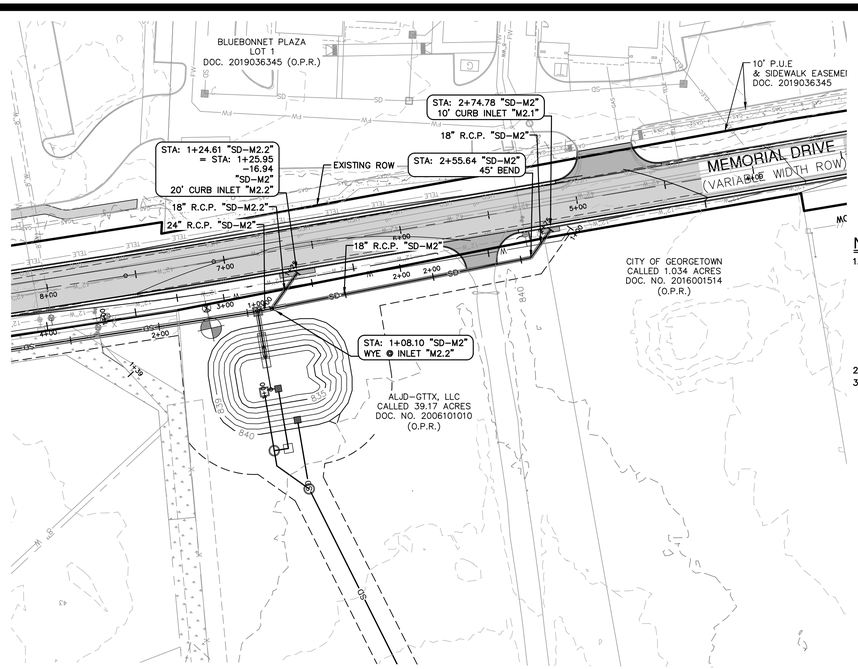
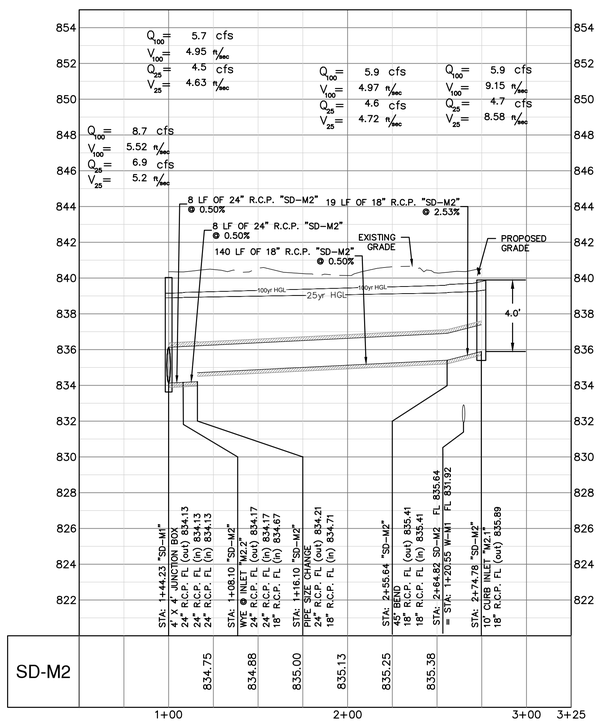


STORM DRAIN LINE M1





STORM DRAIN LINE M2



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2. ALL ROF IS CLASS III UNLESS OTHERWISE NOTED.
3. ALL FILL AREAS SHALL BE COMPACTED TO 95% PRIOR TO UTILITY INSTALLATION.

LEGEND

- W — WATER LINE
- WW — WASTEWATER LINE & MH
- SD — STORM DRAIN LINE & MH
- CURB INLET
- SINGLE WATER SERVICE
- DOUBLE WATER SERVICE
- SINGLE WW SERVICE
- DOUBLE WW SERVICE
- GATE VALVE
- FIRE HYDRANT
- EXISTING WATER LINE
- EXISTING WASTEWATER LINE
- EXISTING STORM DRAIN LINE
- 786 — EXISTING CONTOUR LINE
- 786 — PROPOSED CONTOUR LINE
- 100 YR. FLOODPLAIN
- VEGETATIVE FILTER STRIP
- PROPERTY BOUNDARY

PROFILE SCALES:

1" = 40' HORIZONTAL
1" = 4' VERTICAL

PROFILE LEGEND:

- NATURAL GROUND
- FINISHED GRADE
- SUBGRADE
- PROPOSED STORM DRAIN
- 100-YR HGL — 100yr HGL — 100yr HGL
- 25-YR HGL — 25yr HGL

STATE OF TEXAS
STEVEN S. CRAUFORD
92677
LICENSED
PROFESSIONAL ENGINEER

09/12/2025

NO.	REVISION	DATE

GEORGETOWN TEXAS
more than welcome

PAPE-DAWSON ENGINEERS
AUSTIN I SAN ANTONIO I HOUSTON I FORT WORTH I DALLAS
10801 N MOPAC EXPY, BLDG 3, STE 200 I AUSTIN, TX 78759 I 512.454.8711
TBPE FIRM REGISTRATION #470 I TBPLS FIRM REGISTRATION #10028801

CITY OF GEORGETOWN, TEXAS
WOLF RANCH PKWY / MEMORIAL DR

SD-M1 & SD-M2 - STA 1+00 - END

CITY JOB No.
JOB NO. 51423-00
DATE 9/12/2025
DESIGNER JB
CHECKED SC DRAWN JB

SHEET 258

Date: Sep 12, 2025, 10:11am User ID: cashatz
File: I:\Projects\514\23\01\301 Construction Documents\Civil\SD51423-00.dwg

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PROFILE SCALES:

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1" = 4' VERTICAL

PROFILE LEGEND:

NATURAL GROUND

FINISHED GRADE

SUBGRADE

PROPOSED STORM DRAIN

100-YR HGL — 100yr HGL — 100yr HGL

25-YR HGL — 25yr HGL —

STATE OF TEXAS
STEVEN S. CRAUFORD
92677
LICENSED
PROFESSIONAL ENGINEER

09/12/2025

NO.	REVISION	DATE

GEORGETOWN TEXAS
more than welcome

PAPE-DAWSON ENGINEERS
AUSTIN I SAN ANTONIO I HOUSTON I FORT WORTH I DALLAS
10801 N MOPAC EXPY, BLDG 3, STE 200 I AUSTIN, TX 78759 I 512.454.8711
TBPE FIRM REGISTRATION #470 I TBPLS FIRM REGISTRATION #10028801

CITY OF GEORGETOWN, TEXAS
WOLF RANCH PKWY / MEMORIAL DR

SD-M - STORM DRAIN LATERALS

CITY JOB No.
JOB NO. 51423-00
DATE 9/12/2025
DESIGNER JB
CHECKED SC DRAWN JB

SHEET 259

Date: Sep 12, 2025, 10:11am User ID: cshatz
File: H:\Projects\514\23\00\301 Construction Documents\Civil\SD51423-00.dwg

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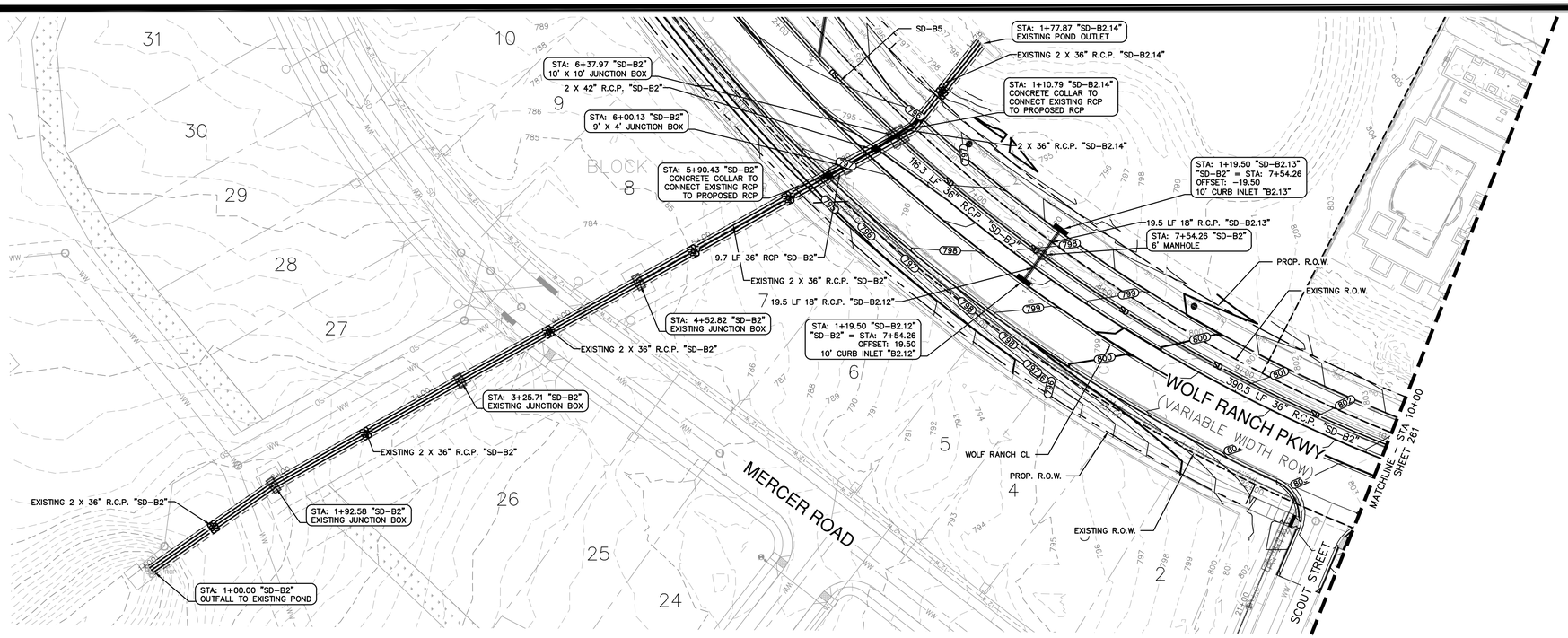

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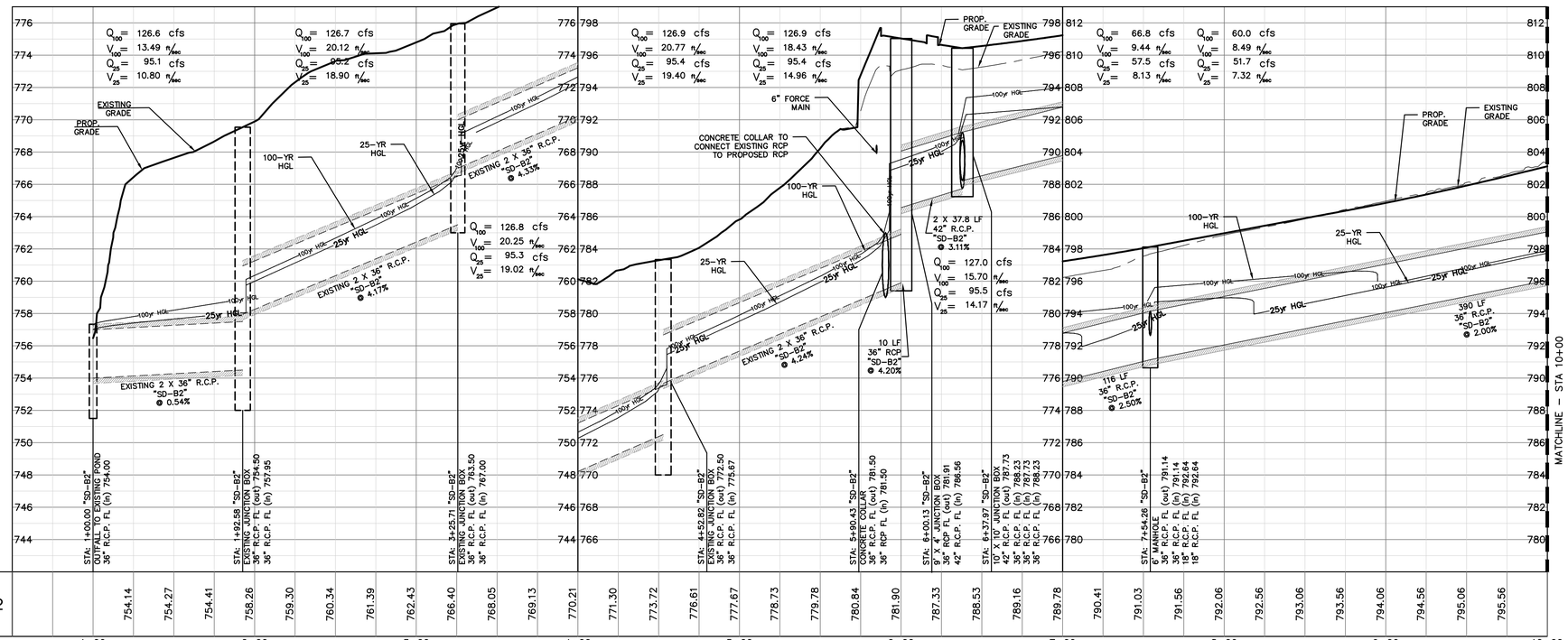
LEGEND

- CURB INLET
- W — EXISTING WATER LINE
- WW — EXISTING WASTEWATER LINE
- SD — EXISTING STORM DRAIN LINE
- UGE — EXISTING ELECTRIC LINE
- EXISTING TELECOM LINE
- GAS — EXISTING GAS LINE
- 786 — EXISTING CONTOUR LINE
- 786 — PROPOSED CONTOUR LINE
- 100 YR. FLOODPLAIN
- VEGETATIVE FILTER STRIP
- PROPERTY BOUNDARY
- PROPOSED STORM DRAIN



PROFILE SCALES:
1" = 40' HORIZONTAL
1" = 4' VERTICAL

PROFILE LEGEND:

- NATURAL GROUND
- FINISHED GRADE
- SUBGRADE
- PROPOSED STORM DRAIN
- 100-YR HGL
- 25-YR HGL

DESIGN

STATE OF TEXAS — ANTHONY DOAK — 146562 — LICENSED PROFESSIONAL ENGINEER

ANTHONY DOAK, P.E.

9/17/2025
DATE

APPROVAL

STATE OF TEXAS — BRIAN A. ALLEN — 123374 — LICENSED PROFESSIONAL ENGINEER

BRIAN A. ALLEN, P.E.

9/16/2025
DATE

NO.	REVISION	DATE

GEORGETOWN TEXAS *more than welcome*

PAPE-DAWSON ENGINEERS
AUSTIN | SAN ANTONIO | HOUSTON | FORT WORTH | DALLAS
10801 N MOPAC EXPY, BLDG 3, STE 200 | AUSTIN, TX 78759 | 512.454.8711
TBPE FIRM REGISTRATION #470 | TBPLS FIRM REGISTRATION #10028801

WOLF RANCH PKWY / MEMORIAL DR
CITY OF GEORGETOWN, TEXAS
SD-B2 - STA 1+00 - 10+00

CITY JOB No.
JOB NO. 51423-04
DATE 9/4/2025
DESIGNER BT
CHECKED AD DRAWN JC
SHEET 260

Date: Sep 04, 2025, 11:58am User ID: BTa
File: H:\Projects\51423\03\01 Construction Docs (Drainage)\Civil\SD_B_51423-04.dwg

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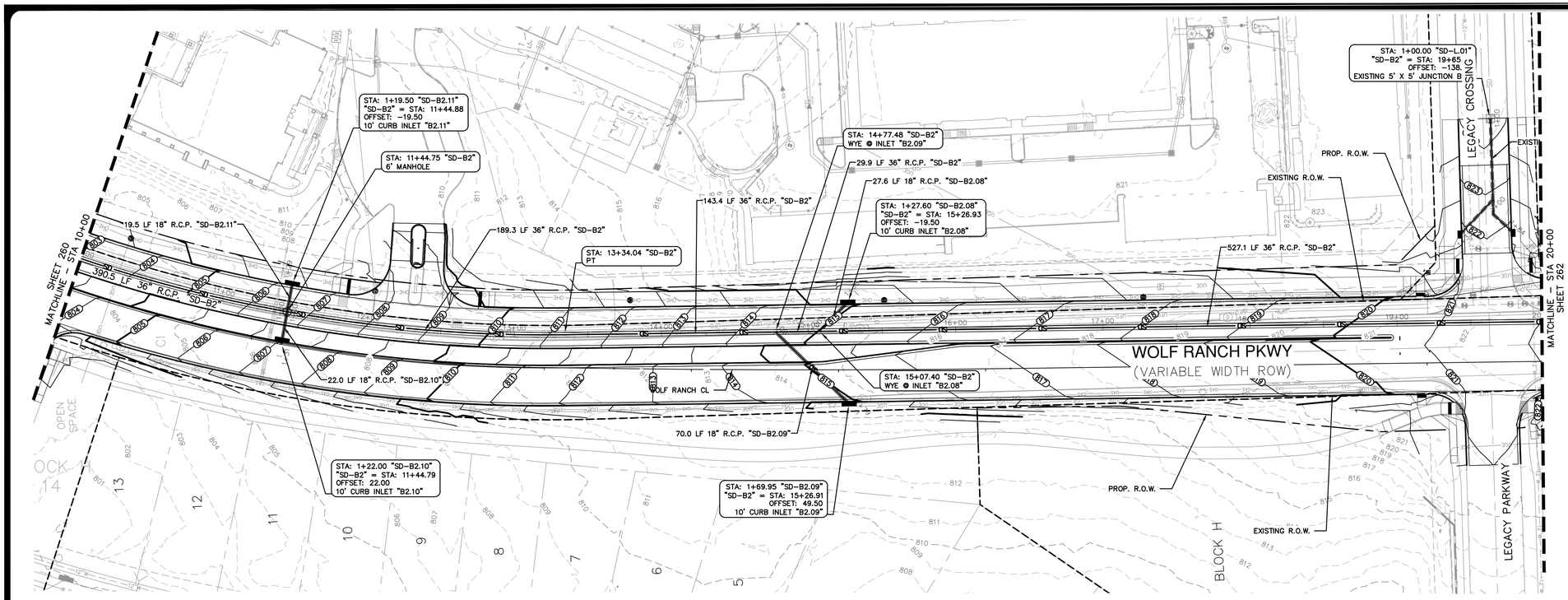

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- W — EXISTING WATER LINE
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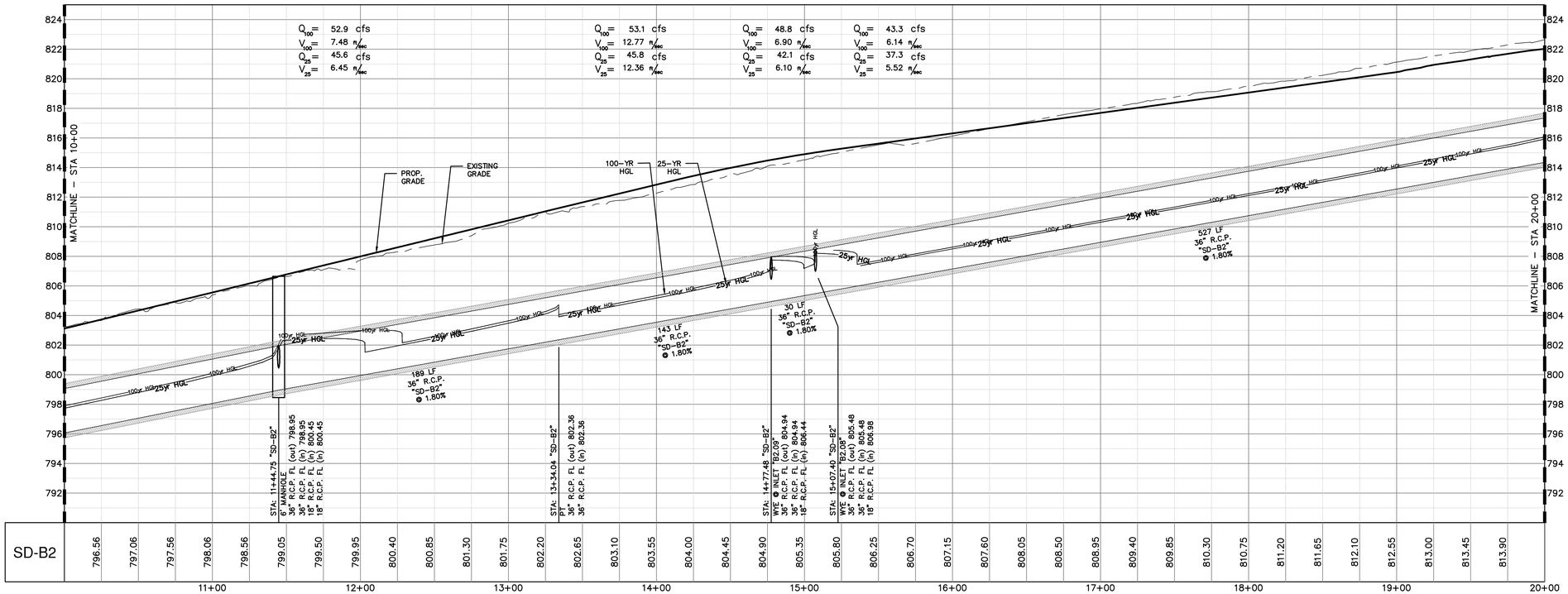
- UGE — EXISTING ELECTRIC LINE
- GAS — EXISTING GAS LINE
- 786 — EXISTING CONTOUR LINE
- 786 — PROPOSED CONTOUR LINE
- 100 YR. FLOODPLAIN
- VEGETATIVE FILTER STRIP
- PROPERTY BOUNDARY
- PROPOSED STORM DRAIN



PROFILE SCALES:

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PROFILE LEGEND:

- NATURAL GROUND
- FINISHED GRADE
- SUBGRADE
- PROPOSED STORM DRAIN
- 100-YR HGL
- 25-YR HGL

DESIGN

STATE OF TEXAS
ANTHONY DOAK
146562
LICENSED
PROFESSIONAL ENGINEER

ANTHONY DOAK, P.E.

9/17/2025
DATE

APPROVAL

STATE OF TEXAS
BRIAN A. ALLEN
123374
LICENSED
PROFESSIONAL ENGINEER

BRIAN A. ALLEN, P.E.

9/16/2025
DATE

NO.	REVISION	DATE

GEORGETOWN
TEXAS
more than welcome

PAPE-DAWSON ENGINEERS
AUSTIN | SAN ANTONIO | HOUSTON | FORT WORTH | DALLAS
10801 N MOPAC EXPY, BLDG 3, STE 200 | AUSTIN, TX 78759 | 512.454.8711
TBPE FIRM REGISTRATION #470 | TBPLS FIRM REGISTRATION #10028801

WOLF RANCH PKWY / MEMORIAL DR
CITY OF GEORGETOWN, TEXAS
SD-B2 - STA 10+00 - 20+00

CITY JOB No.
JOB NO. 51423-04
DATE 9/4/2025
DESIGNER BT
CHECKED AD DRAWN JC
SHEET 261

Date: Sep 04, 2025, 12:04pm User ID: BTa
File: K:\Projects\514\23\04\301 Construction Docs (Drainage)\Civil\SD_B_51423-04.dwg

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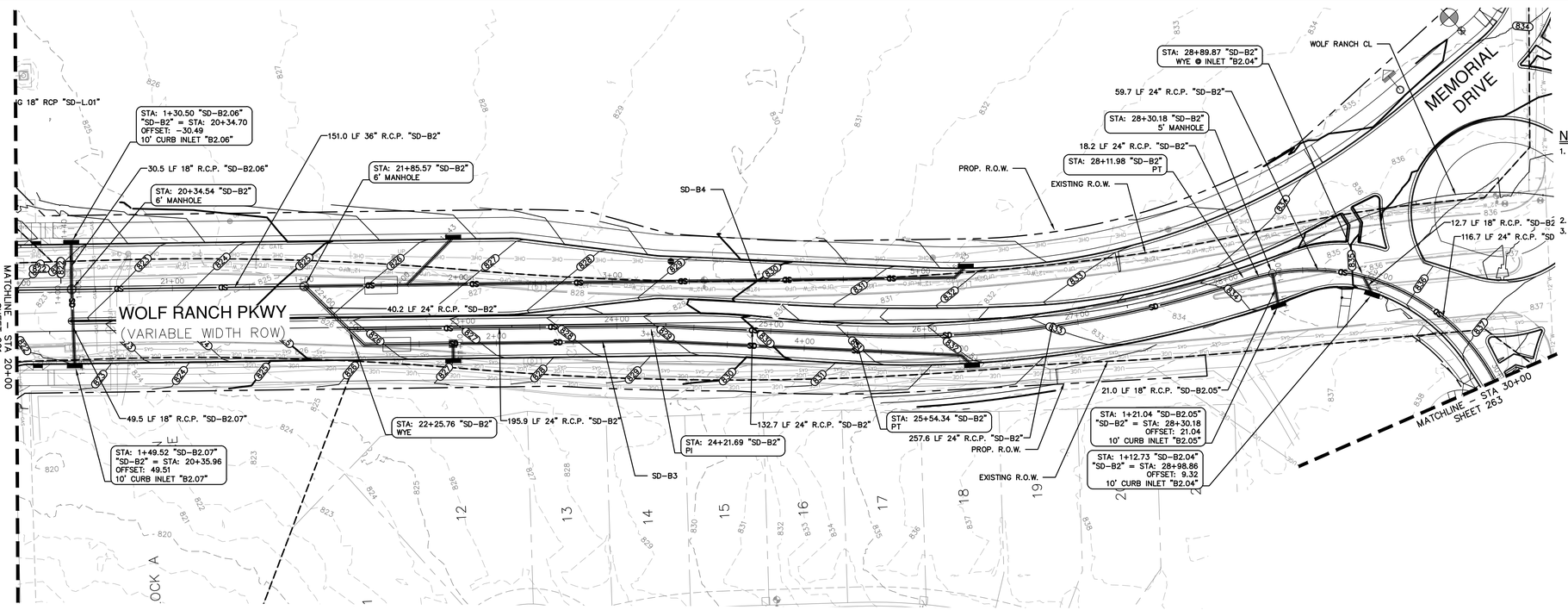

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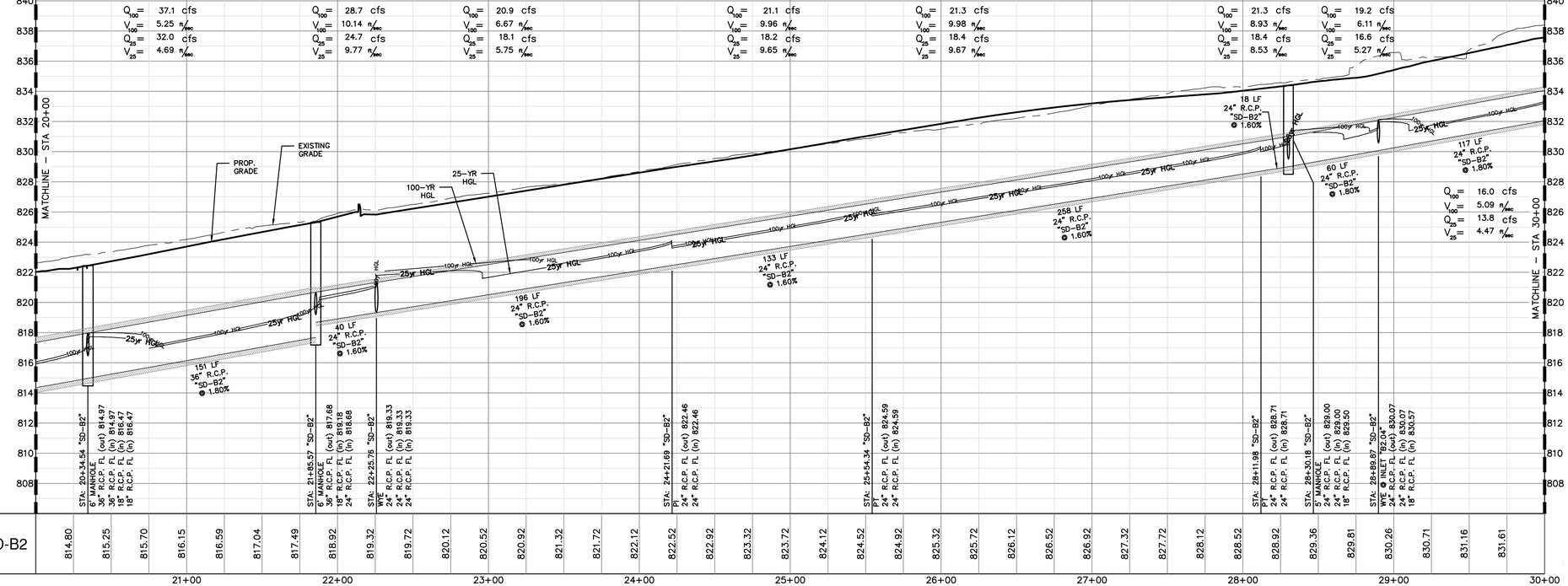
- SD — EXISTING STORM DRAIN LINE
- UGE — EXISTING ELECTRIC LINE
- EXISTING TELECOM LINE
- GAS — EXISTING GAS LINE
- 786 — EXISTING CONTOUR LINE
- 750 — PROPOSED CONTOUR LINE
- 100 YR. FLOODPLAIN
- VEGETATIVE FILTER STRIP
- PROPERTY BOUNDARY
- PROPOSED STORM DRAIN

PROFILE SCALES:

1" = 40' HORIZONTAL
1" = 4' VERTICAL

PROFILE LEGEND:

NATURAL GROUND
FINISHED GRADE
SUBGRADE
PROPOSED STORM DRAIN
100-YR HGL (100y HGL)
25-YR HGL (25y HGL)



DESIGN

STATE OF TEXAS
ANTHONY DOAK
146562
LICENSED
PROFESSIONAL ENGINEER

ANTHONY DOAK, P.E.

9/17/2025
DATE

APPROVAL

STATE OF TEXAS
BRIAN A. ALLEN
123374
LICENSED
PROFESSIONAL ENGINEER

BRIAN A. ALLEN, P.E.

9/16/2025
DATE

NO.	REVISION	DATE

GEORGETOWN TEXAS
more than welcome

PAPE-DAWSON ENGINEERS
AUSTIN | SAN ANTONIO | HOUSTON | FORT WORTH | DALLAS
10801 N MOPAC EXPY, BLDG 3, STE 200 | AUSTIN, TX 78759 | 512.454.8711
TBPE FIRM REGISTRATION #470 | TBPLS FIRM REGISTRATION #10028801

WOLF RANCH PKWY / MEMORIAL DR

CITY OF GEORGETOWN, TEXAS
SD-B2 - STA 20+00 - 30+00

CITY JOB No.
JOB NO. 51423-04
DATE 9/4/2025
DESIGNER BT
CHECKED AD DRAWN JC
SHEET 262

Date: Sep 04, 2025, 1:06pm User ID: BTo
File: H:\Projects\514\23\04\301 Construction Docs (Drainage)\Civil\SD_B_51423-04.dwg

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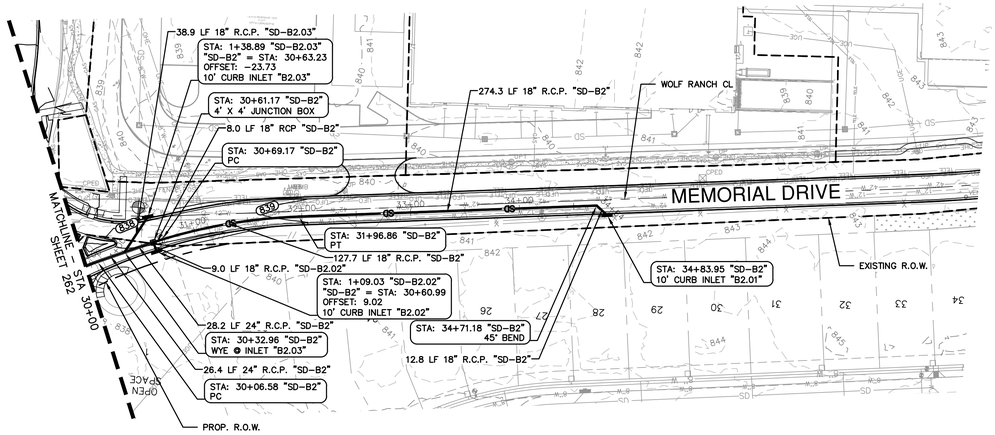

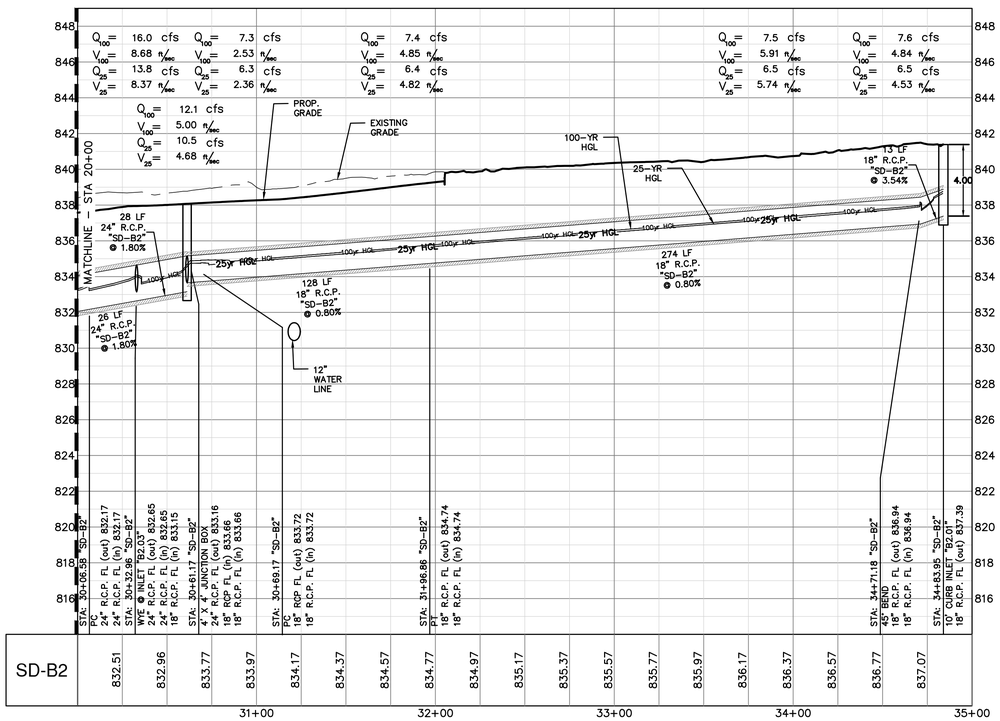

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SCALE: 1"= 40'

0' 40' 80' 120'

LEGEND

- CURB INLET
- W — EXISTING WATER LINE
- WW — EXISTING WASTEWATER LINE
- SD — EXISTING STORM DRAIN LINE
- UGE — UGE — EXISTING ELECTRIC LINE
- EXISTING TELECOM LINE
- GAS — GAS — EXISTING GAS LINE
- 786 — EXISTING CONTOUR LINE
- 790 — PROPOSED CONTOUR LINE
- 100 YR. FLOODPLAIN
- VEGETATIVE FILTER STRIP
- PROPERTY BOUNDARY
- PROPOSED STORM DRAIN

PROFILE SCALES:

1" = 40' HORIZONTAL
1" = 4' VERTICAL

PROFILE LEGEND:

- NATURAL GROUND
- FINISHED GRADE
- SUBGRADE
- PROPOSED STORM DRAIN
- 100-YR HGL — 100yr HGL — 100yr HGL
- 25-YR HGL — 25yr HGL

DESIGN

STATE OF TEXAS
ANTHONY DOAK
146562
LICENSED
PROFESSIONAL ENGINEER

ANTHONY DOAK, P.E.

9/17/2025
DATE

APPROVAL

STATE OF TEXAS
BRIAN A. ALLEN
123374
LICENSED
PROFESSIONAL ENGINEER

BRIAN A. ALLEN, P.E.

9/16/2025
DATE

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GEORGETOWN TEXAS
more than welcome

PAPE-DAWSON ENGINEERS
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10801 N MOPAC EXPY, BLDG 3, STE 200 I AUSTIN, TX 78759 I 512.454.8711
TBPE FIRM REGISTRATION #470 I TBPLS FIRM REGISTRATION #10028801

WOLF RANCH PKWY / MEMORIAL DR
CITY OF GEORGETOWN, TEXAS
SD-B2 - STA 30+00 - END

CITY JOB No.
JOB NO. 51423-04
DATE 9/4/2025
DESIGNER BT
CHECKED AD DRAWN JC
SHEET 263

Date: Sep 04, 2025, 1:08pm User ID: BTo
File: H:\Projects\514\23\04\301 Construction Docs (Drainage)\Civil\SD_B_51423-04.dwg

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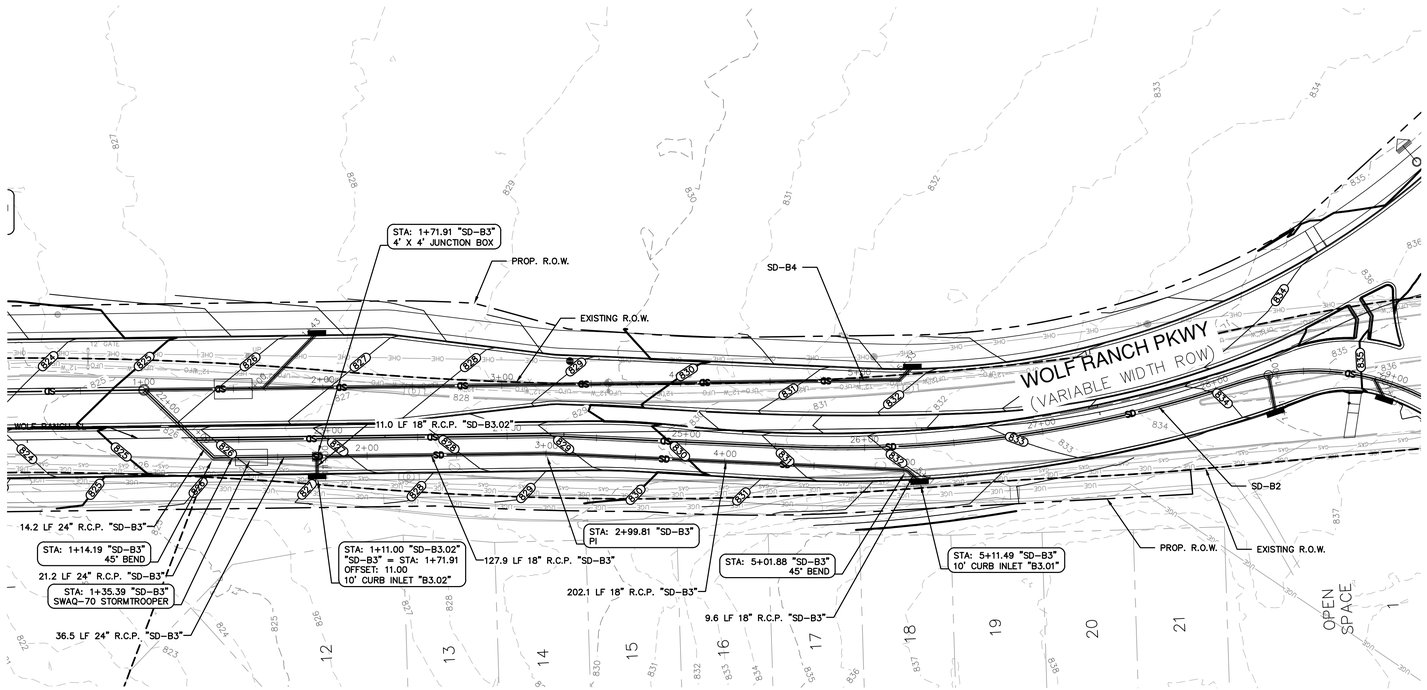

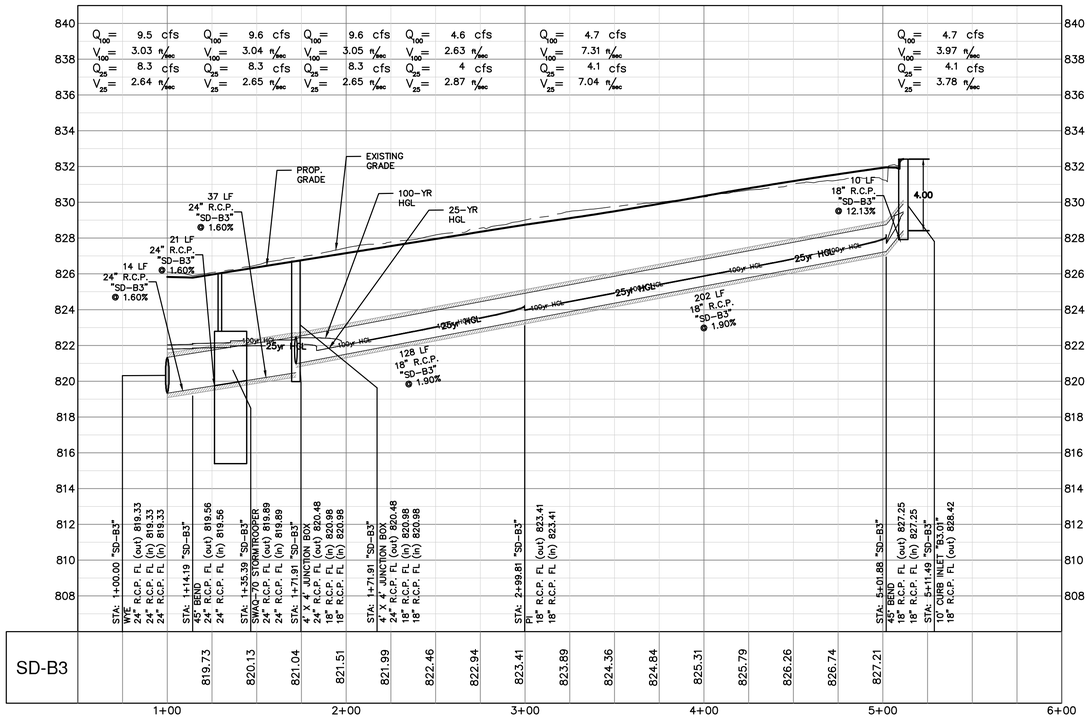

SCALE: 1"= 40'

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- 786 — EXISTING CONTOUR LINE
- 786 — PROPOSED CONTOUR LINE
- 100 YR. FLOODPLAIN
- VEGETATIVE FILTER STRIP
- PROPERTY BOUNDARY
- PROPOSED STORM DRAIN

PROFILE SCALES:

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PROFILE LEGEND:

- NATURAL GROUND
- FINISHED GRADE
- SUBGRADE
- PROPOSED STORM DRAIN
- 100-YR HGL — 100yr HGL — 100yr HGL
- 25-YR HGL — 25yr HGL

DESIGN

STATE OF TEXAS
ANTHONY DOAK
146562
LICENSED
PROFESSIONAL ENGINEER

ANTHONY DOAK, P.E.

9/17/2025
DATE

APPROVAL

STATE OF TEXAS
BRIAN A. ALLEN
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LICENSED
PROFESSIONAL ENGINEER

BRIAN A. ALLEN, P.E.

9/16/2025
DATE

NO.	REVISION	DATE

GEORGETOWN TEXAS
more than welcome

PAPE-DAWSON ENGINEERS

AUSTIN | SAN ANTONIO | HOUSTON | FORT WORTH | DALLAS
10801 N MOPAC EXPY, BLDG 3, STE 200 | AUSTIN, TX 78759 | 512.454.8711
TBPE FIRM REGISTRATION #470 | TBPLS FIRM REGISTRATION #10028801

WOLF RANCH PKWY / MEMORIAL DR
CITY OF GEORGETOWN, TEXAS
SD-B3 - STA 1+00 - END

CITY JOB No.
JOB NO. 51423-04
DATE 9/4/2025
DESIGNER BT
CHECKED AD DRAWN JC
SHEET 264

Date: Sep 04, 2025, 1:11pm User ID: BTa
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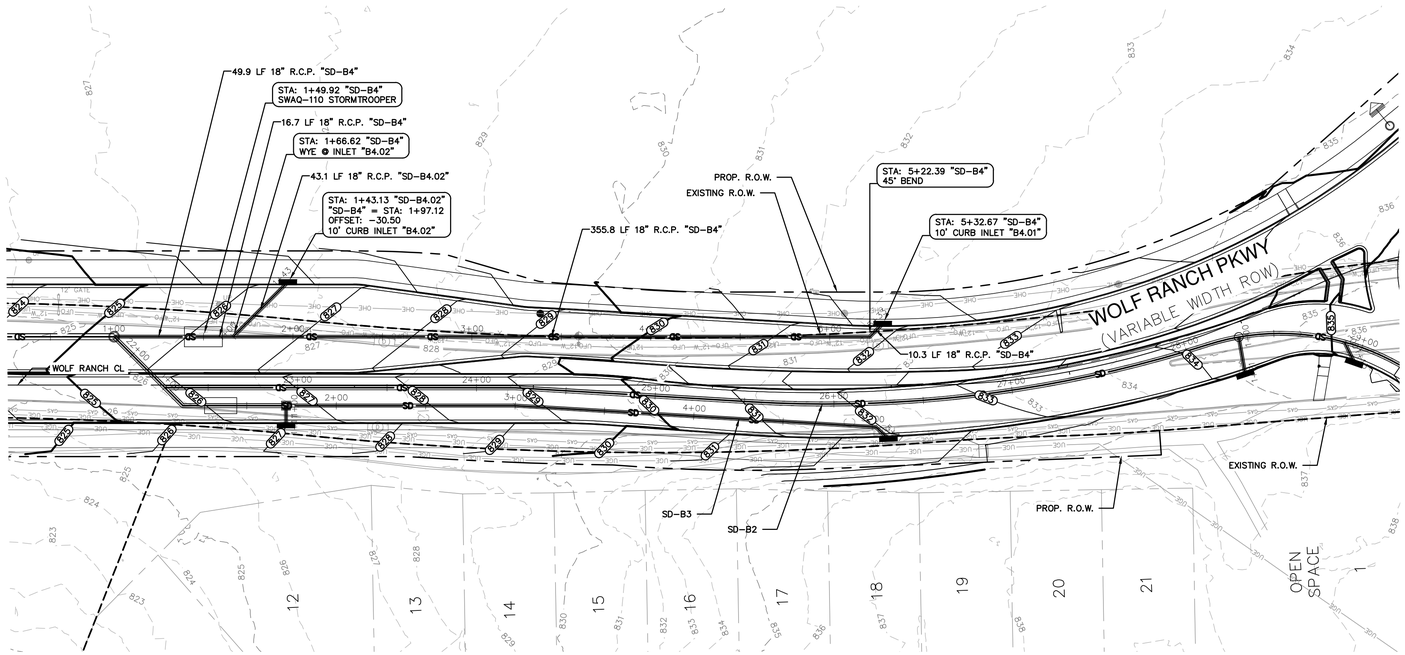

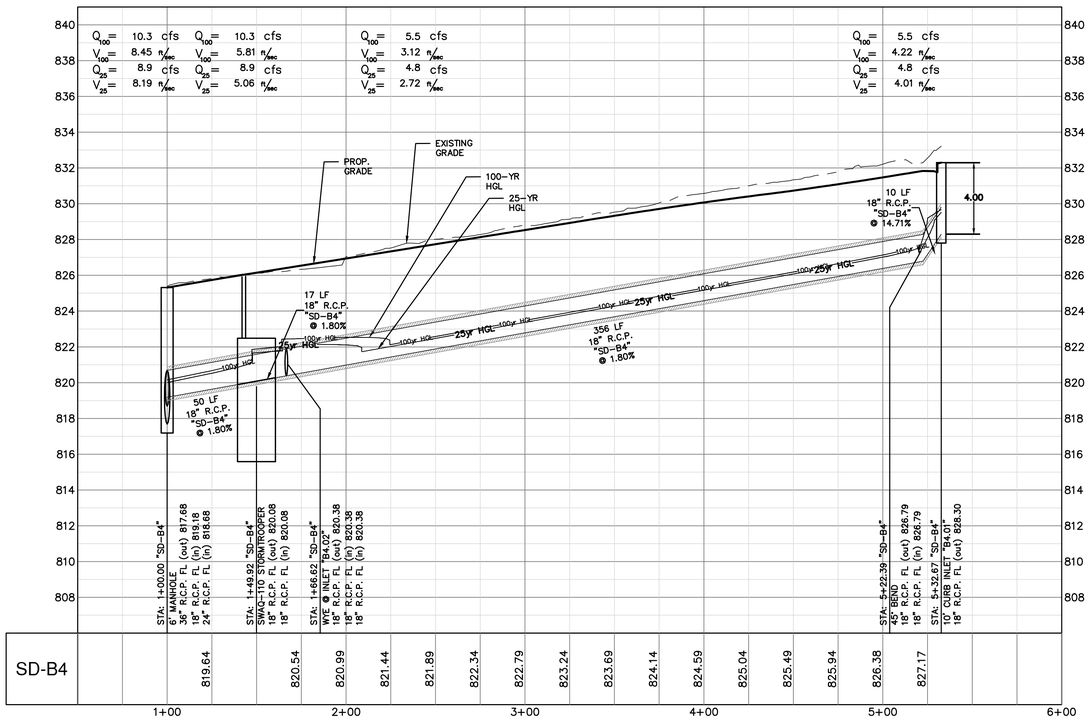

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- CURB INLET
- W — EXISTING WATER LINE
- WW — EXISTING WASTEWATER LINE
- SD — EXISTING STORM DRAIN LINE
- UGE — EXISTING ELECTRIC LINE
- EXISTING TELECOM LINE
- GAS — EXISTING GAS LINE
- 786 — EXISTING CONTOUR LINE
- 786 — PROPOSED CONTOUR LINE
- 100 YR. FLOODPLAIN
- VEGETATIVE FILTER STRIP
- PROPERTY BOUNDARY
- PROPOSED STORM DRAIN

PROFILE SCALES:

1" = 40' HORIZONTAL
1" = 4' VERTICAL

PROFILE LEGEND:

NATURAL GROUND

FINISHED GRADE

SUBGRADE

PROPOSED STORM DRAIN

100-YR HGL — 100yr HGL

25-YR HGL — 25yr HGL

DESIGN

STATE OF TEXAS — ANTHONY DOAK — 146562 — LICENSED PROFESSIONAL ENGINEER

ANTHONY DOAK, P.E.

APPROVAL

9/17/2025
DATE

STATE OF TEXAS — BRIAN A. ALLEN — 123374 — LICENSED PROFESSIONAL ENGINEER

BRIAN A. ALLEN, P.E.

9/16/2025
DATE

NO.	REVISION	DATE

GEORGETOWN TEXAS *more than welcome*

PAPE-DAWSON ENGINEERS

AUSTIN | SAN ANTONIO | HOUSTON | FORT WORTH | DALLAS
10801 N MOPAC EXPY, BLDG 3, STE 200 | AUSTIN, TX 78759 | 512.454.8711
TBPE FIRM REGISTRATION #470 | TBPLS FIRM REGISTRATION #10028801

WOLF RANCH PKWY / MEMORIAL DR

CITY OF GEORGETOWN, TEXAS
SD-B4 - STA 1+00 - END

CITY JOB No.
JOB NO. 51423-04
DATE 9/4/2025
DESIGNER BT
CHECKED AD DRAWN JC
SHEET 265

Date: Sep 04, 2025, 1:14pm User ID: BTx
File: I:\Projects\514\23\04\301 Construction Docs (Drainage)\Civil\SD_B_51423-04.dwg

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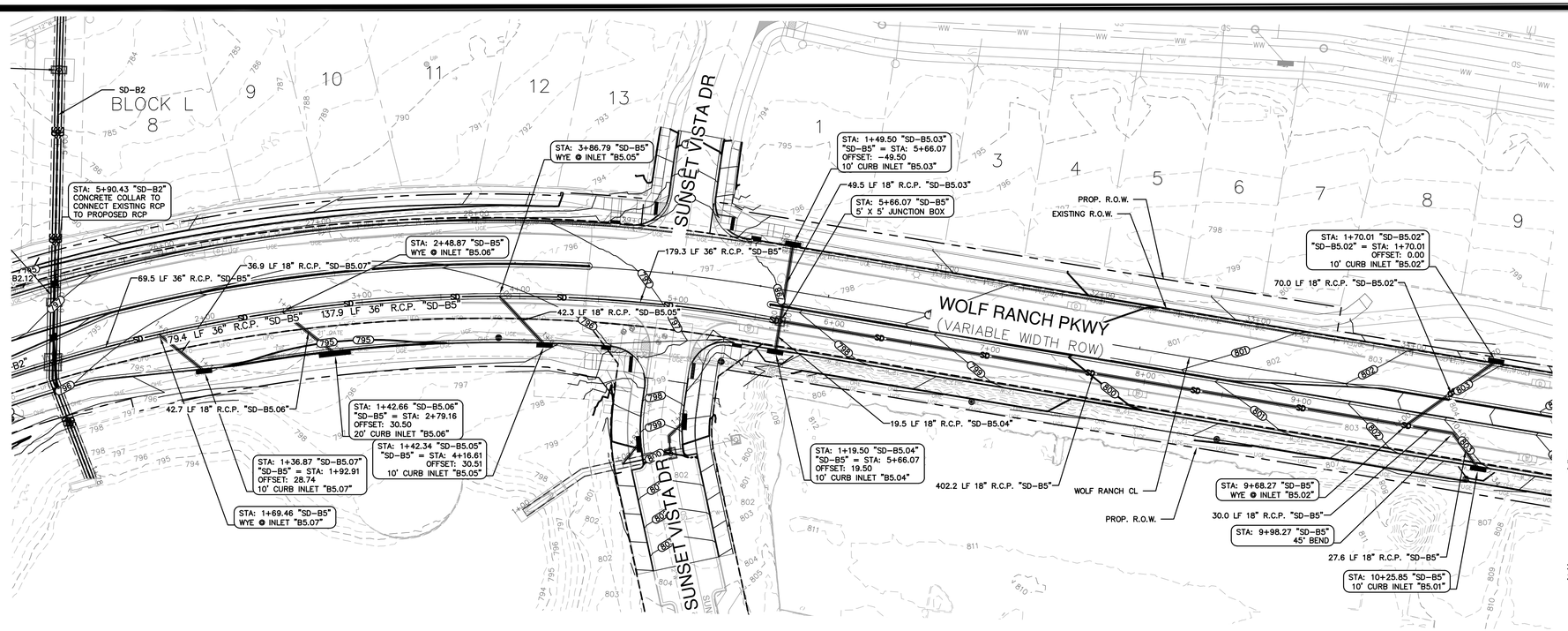

SCALE: 1"= 40'

0' 40' 80' 120'

LEGEND

- CURB INLET
- W — EXISTING WATER LINE
- WW — EXISTING WASTEWATER LINE
- SD — EXISTING STORM DRAIN LINE
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- 786 — PROPOSED CONTOUR LINE
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- VEGETATIVE FILTER STRIP
- PROPERTY BOUNDARY
- PROPOSED STORM DRAIN

NOTES:

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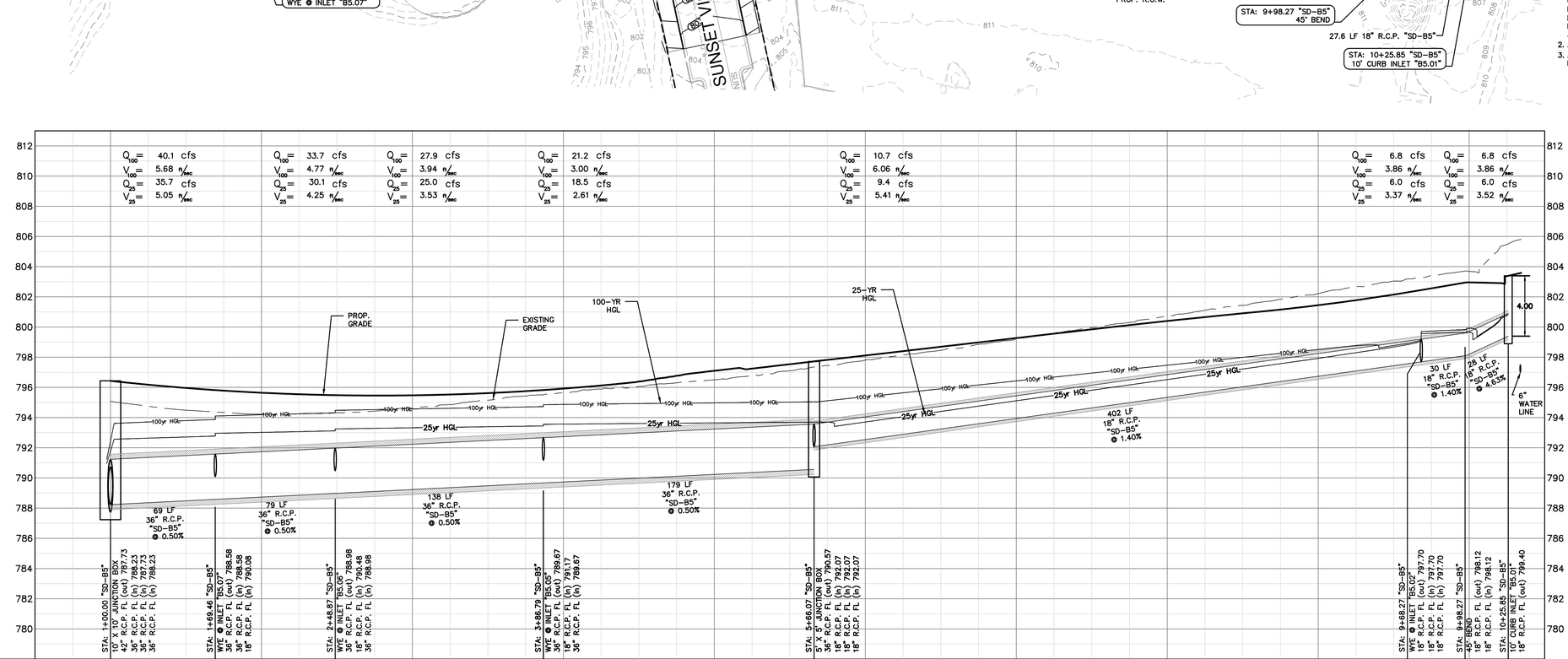
3. ALL FILL AREAS SHALL BE COMPACTED TO 95% PRIOR TO UTILITY INSTALLATION.



PROFILE SCALES:

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1" = 4' VERTICAL

PROFILE LEGEND:

NATURAL GROUND
FINISHED GRADE
SUBGRADE
PROPOSED STORM DRAIN
100-YR HGL
25-YR HGL

DESIGN

STATE OF TEXAS · ANTHONY DOAK · 146562 · LICENSED PROFESSIONAL ENGINEER

ANTHONY DOAK, P.E.

9/17/2025
DATE

APPROVAL

STATE OF TEXAS · BRIAN A. ALLEN · 123374 · LICENSED PROFESSIONAL ENGINEER

BRIAN A. ALLEN, P.E.

9/16/2025
DATE

NO.	REVISION	DATE

GEORGETOWN TEXAS *more than welcome*

PAPE-DAWSON ENGINEERS
AUSTIN | SAN ANTONIO | HOUSTON | FORT WORTH | DALLAS
10801 N MOPAC EXPY, BLDG 3, STE 200 | AUSTIN, TX 78759 | 512.454.8711
TBPE FIRM REGISTRATION #470 | TBPLS FIRM REGISTRATION #10028801

WOLF RANCH PKWY / MEMORIAL DR
CITY OF GEORGETOWN, TEXAS
SD-B5 - STA 1+00 - END

CITY JOB No.
JOB NO. 51423-04
DATE 9/4/2025
DESIGNER BT
CHECKED AD DRAWN JC
SHEET 266

Date: Sep 04, 2025, 1:18pm User ID: BTa
File: I:\Projects\514\23\04\301 Construction Docs (Drainage)\Civil\SD_B_51423-04.dwg

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Date: Sep 04, 2025, 1:22pm User ID: BTa
File: H:\Projects\514\23\04\301 Construction Docs (Drainage)\Civil\SD_B_51423-04.dwg

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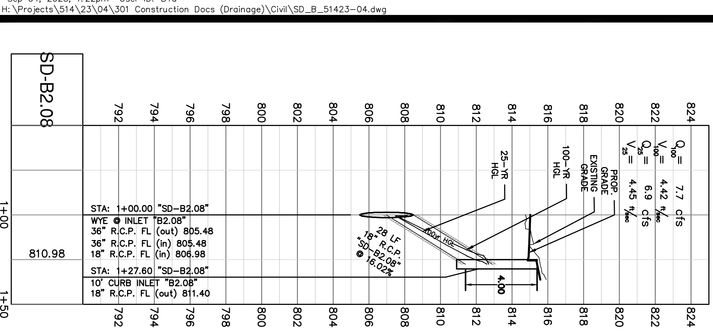

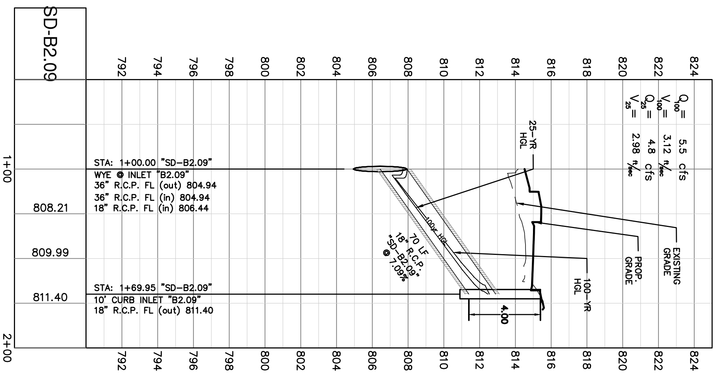

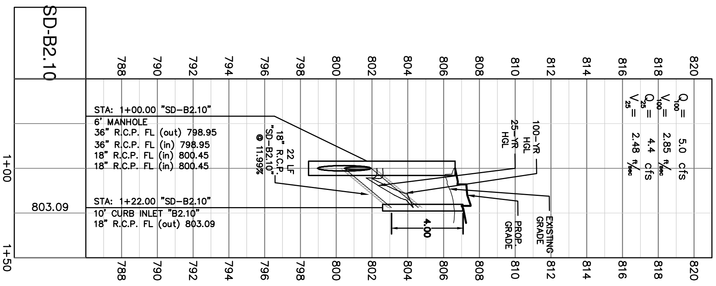

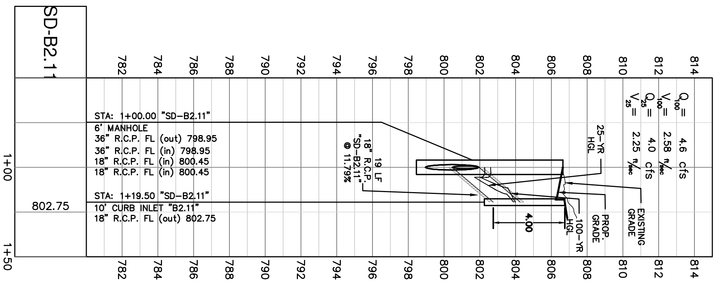

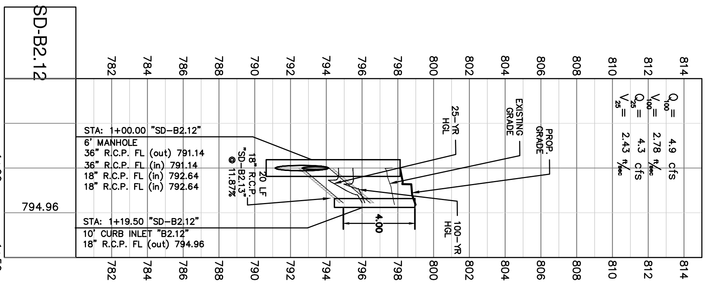

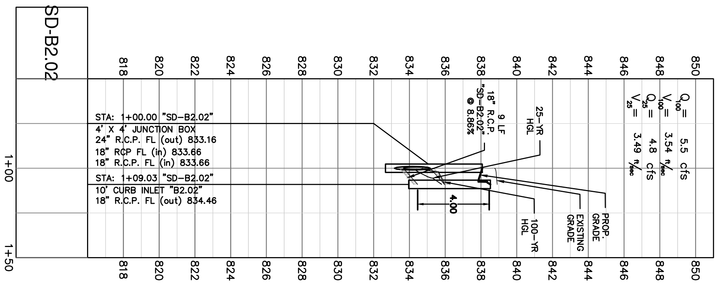

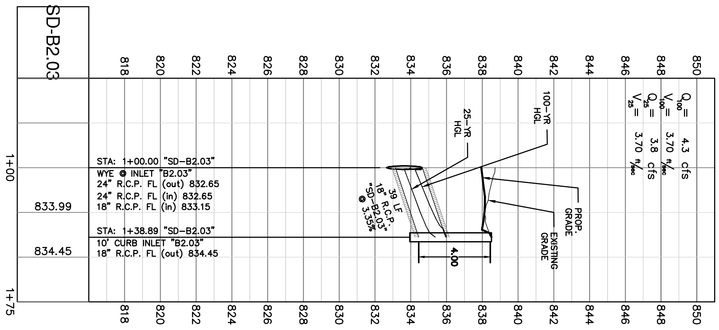

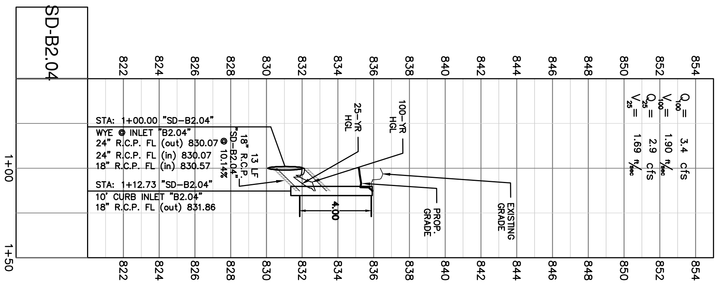

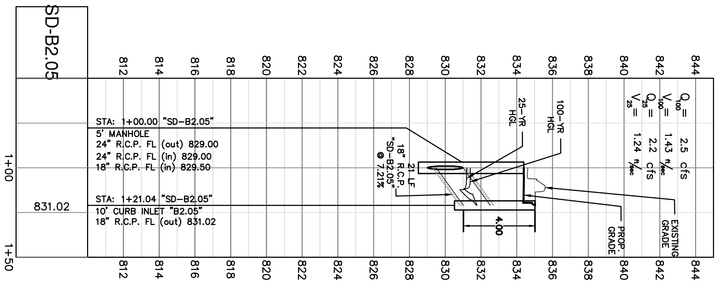

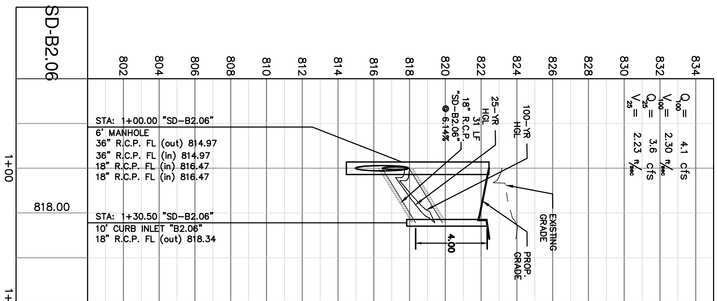

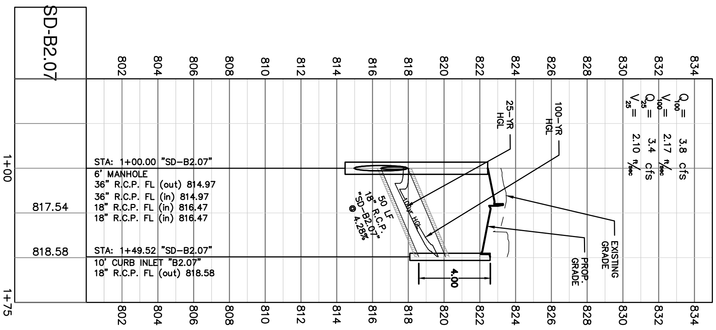

PROFILE SCALES:
1" = 40' HORIZONTAL
1" = 4' VERTICAL

PROFILE LEGEND:
NATURAL GROUND
FINISHED GRADE
SUBGRADE
PROPOSED STORM DRAIN
100-YR HGL
25-YR HGL

DESIGN APPROVAL

STATE OF TEXAS
BRIAN A. ALLEN
123456
LICENSED PROFESSIONAL ENGINEER
BRIAN A. ALLEN, P.E.
9/16/2025
DATE

STATE OF TEXAS
ANTHONY DOAK
146562
LICENSED PROFESSIONAL ENGINEER
ANTHONY DOAK, P.E.
9/17/2025
DATE

WOLF RANCH PKWY / MEMORIAL DR

CITY OF GEORGETOWN, TEXAS
SD-B - STORM DRAIN LATERALS (1 OF 2)

SHEET 267
CITY JOB No.
JOB NO. 51423-04
DATE 9/4/2025
DESIGNER BT
CHECKED AD DRAWN JC

PAPE-DAWSON ENGINEERS
AUSTIN | SAN ANTONIO | HOUSTON | FORT WORTH | DALLAS
10801 N MOPAC EXPY, BLDG 3, STE 200 | AUSTIN, TX 78759 | 512.454.8711
TBPE FIRM REGISTRATION #470 | TBPLS FIRM REGISTRATION #10028801

GEORGETOWN TEXAS
more than welcome

NO.	REVISION	DATE

PROFILE SCALES:
1" = 40' HORIZONTAL
1" = 4' VERTICAL

PROFILE LEGEND:
NATURAL GROUND
FINISHED GRADE
SUBGRADE
PROPOSED STORM DRAIN
100-YR HGL (100yr HGL)
25-YR HGL (25yr HGL)

DESIGN

STATE OF TEXAS — ANTHONY DOAK — 146562 — LICENSED PROFESSIONAL ENGINEER

ANTHONY DOAK, P.E.

9/17/2025
DATE

APPROVAL

STATE OF TEXAS — BRIAN A. ALLEN — 123374 — LICENSED PROFESSIONAL ENGINEER

BRIAN A. ALLEN, P.E.

9/16/2025
DATE

NO.	REVISION	DATE

PAPE-DAWSON ENGINEERS
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10801 N MOPAC EXPY, BLDG 3, STE 200 | AUSTIN, TX 78759 | 512.454.8711
TBPE FIRM REGISTRATION #470 | TBPLS FIRM REGISTRATION #10028801

GEORGETOWN TEXAS more than welcome

WOLF RANCH PKWY / MEMORIAL DR
CITY OF GEORGETOWN, TEXAS
SD-B - STORM DRAIN LATERALS (2 OF 2)

CITY JOB No.
JOB NO. 51423-04
DATE 9/4/2025
DESIGNER BT
CHECKED AD DRAWN JC
SHEET 268

Date: Sep 04, 2025, 1:28pm User ID: BTo
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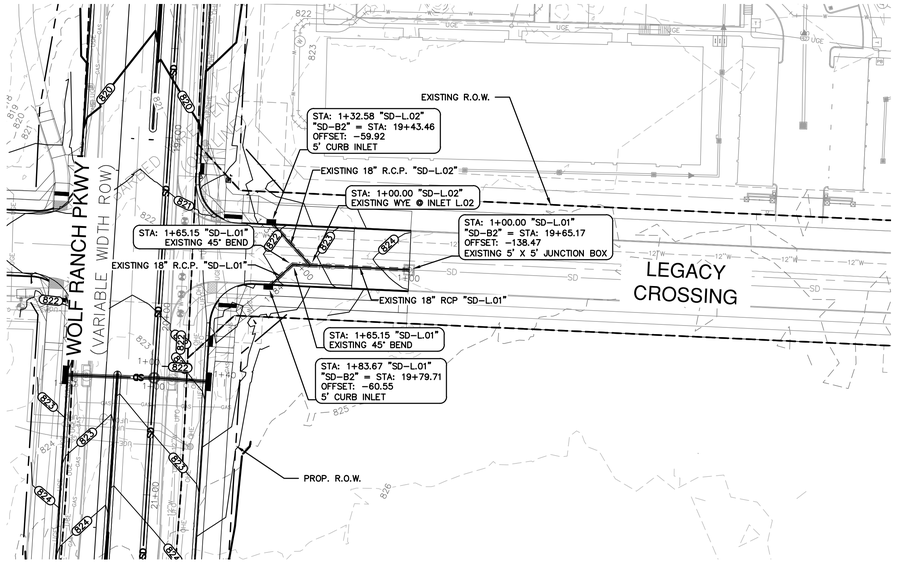

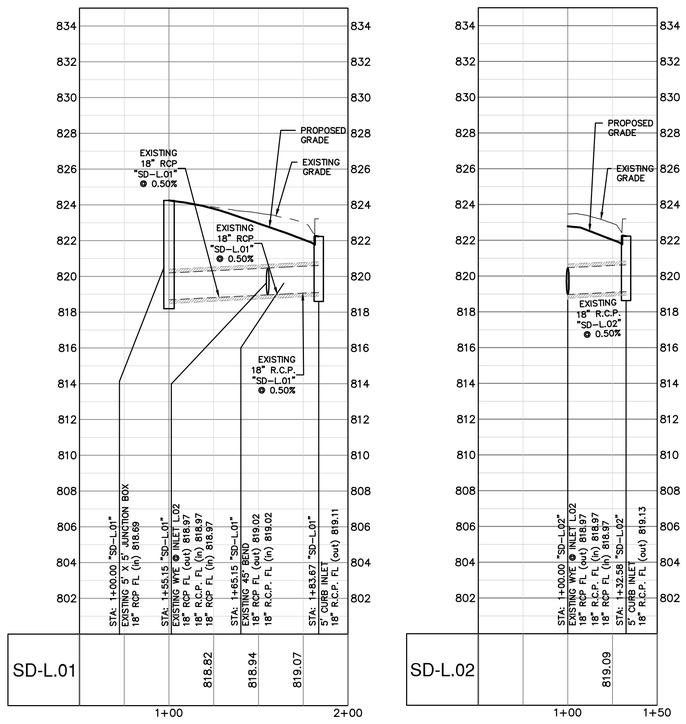

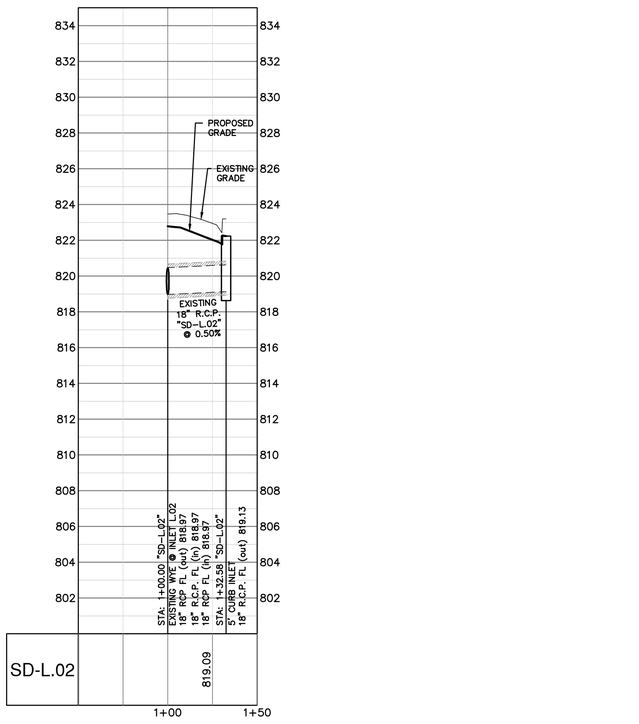

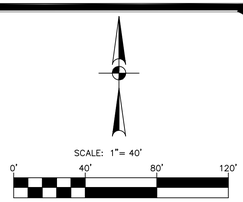

NOTES:

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- 786 — PROPOSED CONTOUR LINE
- 100 YR. FLOODPLAIN
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PROFILE SCALES:

1" = 40' HORIZONTAL
1" = 4' VERTICAL

PROFILE LEGEND:

- NATURAL GROUND
- FINISHED GRADE
- SUBGRADE
- PROPOSED STORM DRAIN
- 100-YR HGL — 100yr HGL — 100yr HGL
- 25-YR HGL — 25yr HGL

DESIGN

STATE OF TEXAS · ANTHONY DOAK · 146562 · LICENSED PROFESSIONAL ENGINEER

ANTHONY DOAK, P.E.

9/17/2025
DATE

APPROVAL

STATE OF TEXAS · BRIAN A. ALLEN · 123374 · LICENSED PROFESSIONAL ENGINEER

BRIAN A. ALLEN, P.E.

9/16/2025
DATE

NO.	REVISION	DATE

GEORGETOWN TEXAS
more than welcome

PAPE-DAWSON ENGINEERS
AUSTIN | SAN ANTONIO | HOUSTON | FORT WORTH | DALLAS
10801 N MOPAC EXPY, BLDG 3, STE 200 | AUSTIN, TX 78759 | 512.454.8711
TBPE FIRM REGISTRATION #470 | TBPLS FIRM REGISTRATION #10028801

WOLF RANCH PKWY / MEMORIAL DR
CITY OF GEORGETOWN, TEXAS
SD-L - STORM DRAIN LATERALS

CITY JOB No.
JOB NO. 51423-04
DATE 9/4/2025
DESIGNER BT
CHECKED AD DRAWN JC
SHEET 269

Date: Sep 04, 2025, 1:30pm User ID: BTa
File: n:\Projects\514\23\04\301 Construction Docs (Drainage)\Civil\SD_B_51423-04.dwg

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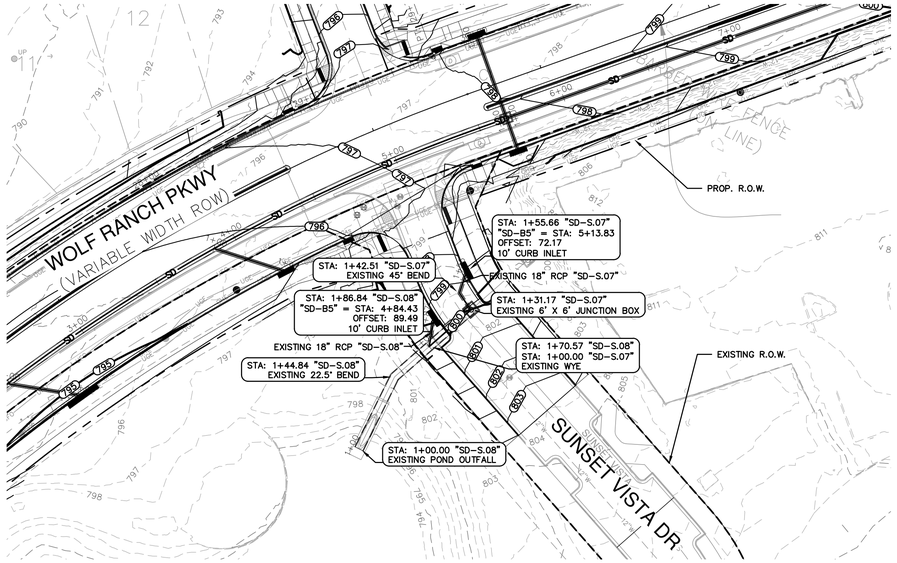

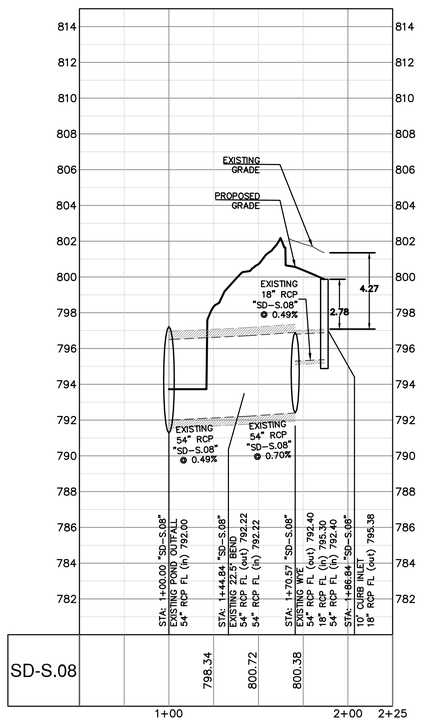

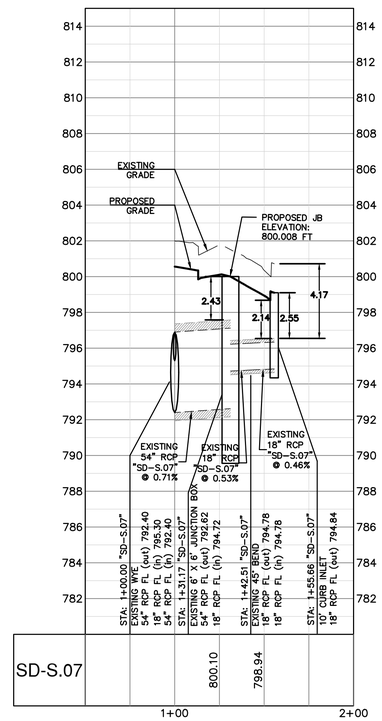

SCALE: 1" = 40'

0' 40' 80' 120'

NOTES:

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PROFILE SCALES:

1" = 40' HORIZONTAL
1" = 4' VERTICAL

PROFILE LEGEND:

NATURAL GROUND

FINISHED GRADE

SUBGRADE

PROPOSED STORM DRAIN

100-YR HGL — 100yr HGL — 100yr HGL

25-YR HGL — 25yr HGL

DESIGN

STATE OF TEXAS · ANTHONY DOAK · 146562 · LICENSED · PROFESSIONAL ENGINEER

ANTHONY DOAK, P.E.

9/17/2025
DATE

APPROVAL

STATE OF TEXAS · BRIAN A. ALLEN · 123374 · LICENSED · PROFESSIONAL ENGINEER

BRIAN A. ALLEN, P.E.

9/16/2025
DATE

NO.	REVISION	DATE

GEORGETOWN TEXAS
more than welcome

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TBPE FIRM REGISTRATION #470 | TBPLS FIRM REGISTRATION #10028801

WOLF RANCH PKWY / MEMORIAL DR
CITY OF GEORGETOWN, TEXAS
SD-S - STORM DRAIN LATERALS

CITY JOB No.
JOB NO. 51423-04
DATE 9/4/2025
DESIGNER BT
CHECKED AD DRAWN JC
SHEET 270

Date: Sep 04, 2025, 1:34pm User ID: BTa
File: I:\Projects\514\23\04\301 Construction Docs (Drainage)\Civil\SD_B_51423-04.dwg

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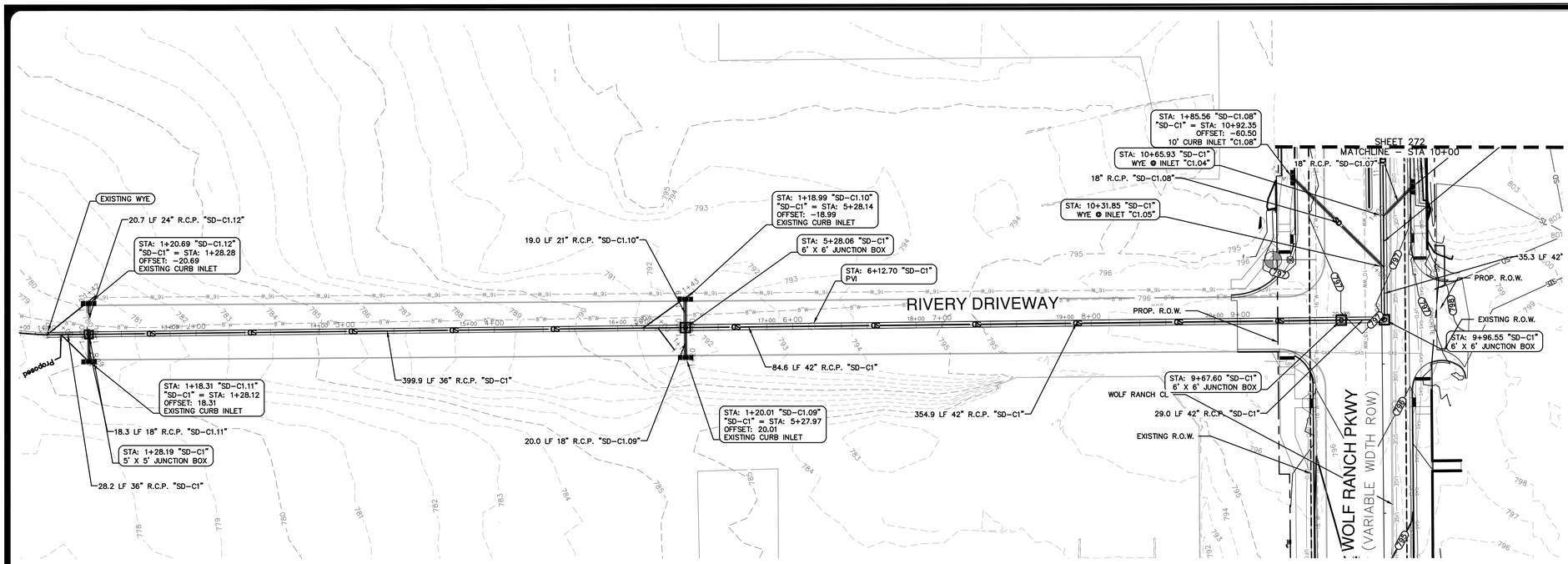

SCALE: 1"= 40'

0' 40' 80' 120'

NOTES:

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LEGEND

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- UGE — EXISTING ELECTRIC LINE
- EXISTING TELECOM LINE
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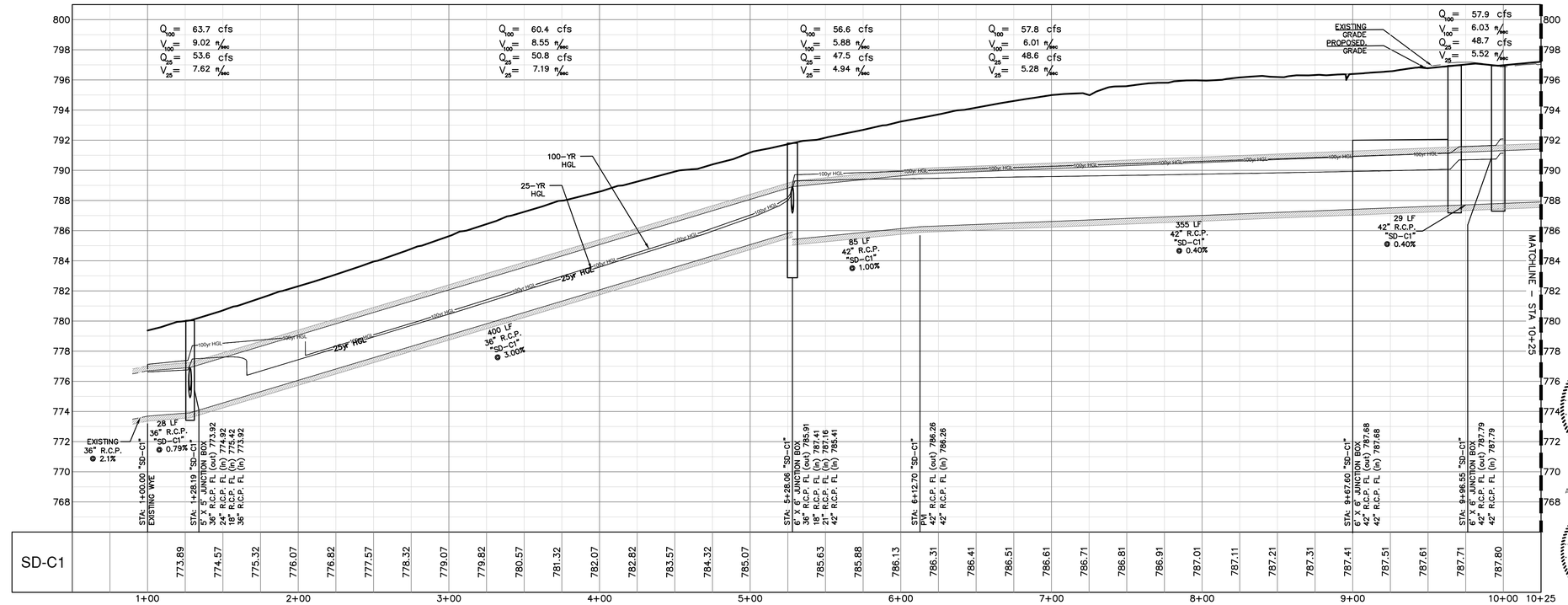
- 786 — PROPOSED CONTOUR LINE
- 100 YR. FLOODPLAIN
- VEGETATIVE FILTER STRIP
- PROPERTY BOUNDARY
- PROPOSED STORM DRAIN



PROFILE SCALES:

1" = 40' HORIZONTAL
1" = 4' VERTICAL

PROFILE LEGEND:

- NATURAL GROUND
- FINISHED GRADE
- SUBGRADE
- PROPOSED STORM DRAIN
- 100-YR HGL
- 25-YR HGL

DESIGN

STATE OF TEXAS — ANTHONY DOAK — 146562 — LICENSED PROFESSIONAL ENGINEER

ANTHONY DOAK, P.E.

9/17/2025
DATE

APPROVAL

STATE OF TEXAS — BRIAN A. ALLEN — 123374 — LICENSED PROFESSIONAL ENGINEER

BRIAN A. ALLEN, P.E.

9/16/2025
DATE

NO.	REVISION	DATE

GEORGETOWN TEXAS *more than welcome*

PAPE-DAWSON ENGINEERS

AUSTIN | SAN ANTONIO | HOUSTON | FORT WORTH | DALLAS
10801 N MOPAC EXPY, BLDG 3, STE 200 | AUSTIN, TX 78759 | 512.454.8711
TBPE FIRM REGISTRATION #470 | TBPLS FIRM REGISTRATION #10028801

WOLF RANCH PKWY / MEMORIAL DR
CITY OF GEORGETOWN, TEXAS
SD-C1 - STA 1+00 - 10+00

CITY JOB No.
JOB NO. 51423-04
DATE 9/4/2025
DESIGNER BT
CHECKED AD DRAWN JC
SHEET 271

Date: Sep 04, 2025, 1:37pm User ID: BTa
File: I:\Projects\514.23\04\301 Construction Docs (Drainage)\Civil\SD_C_51423-04.dwg

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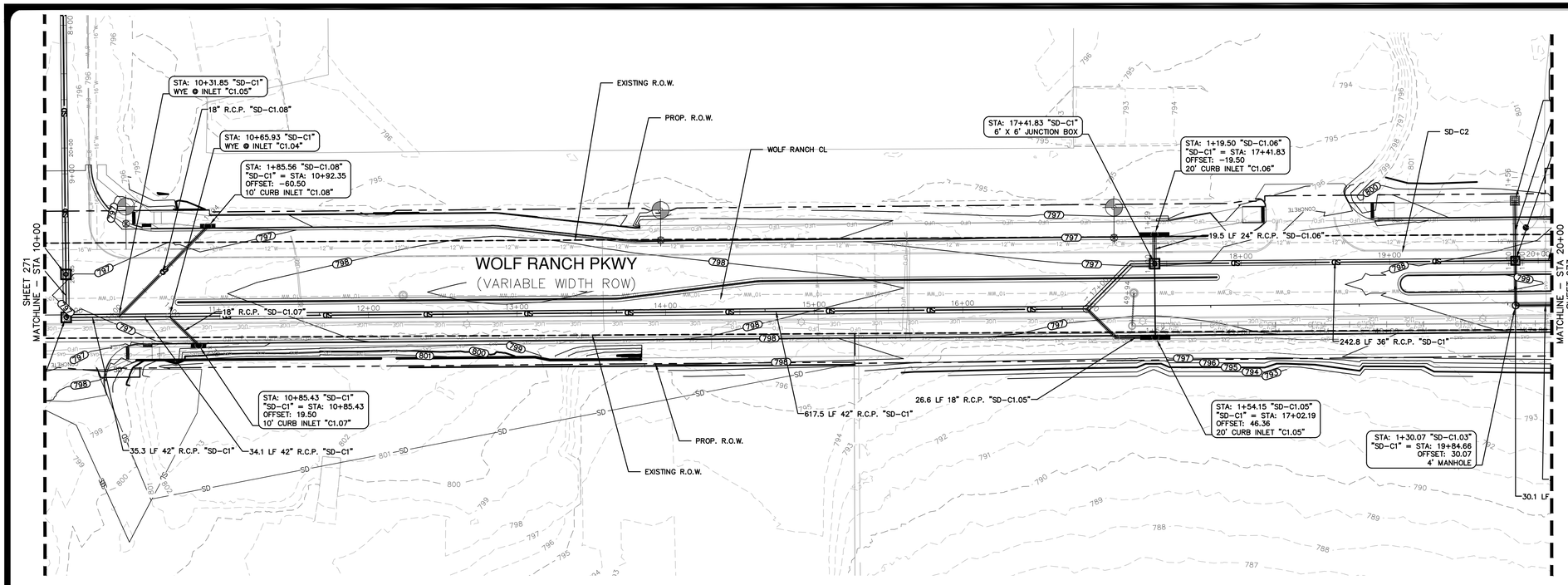


SCALE: 1"= 40'

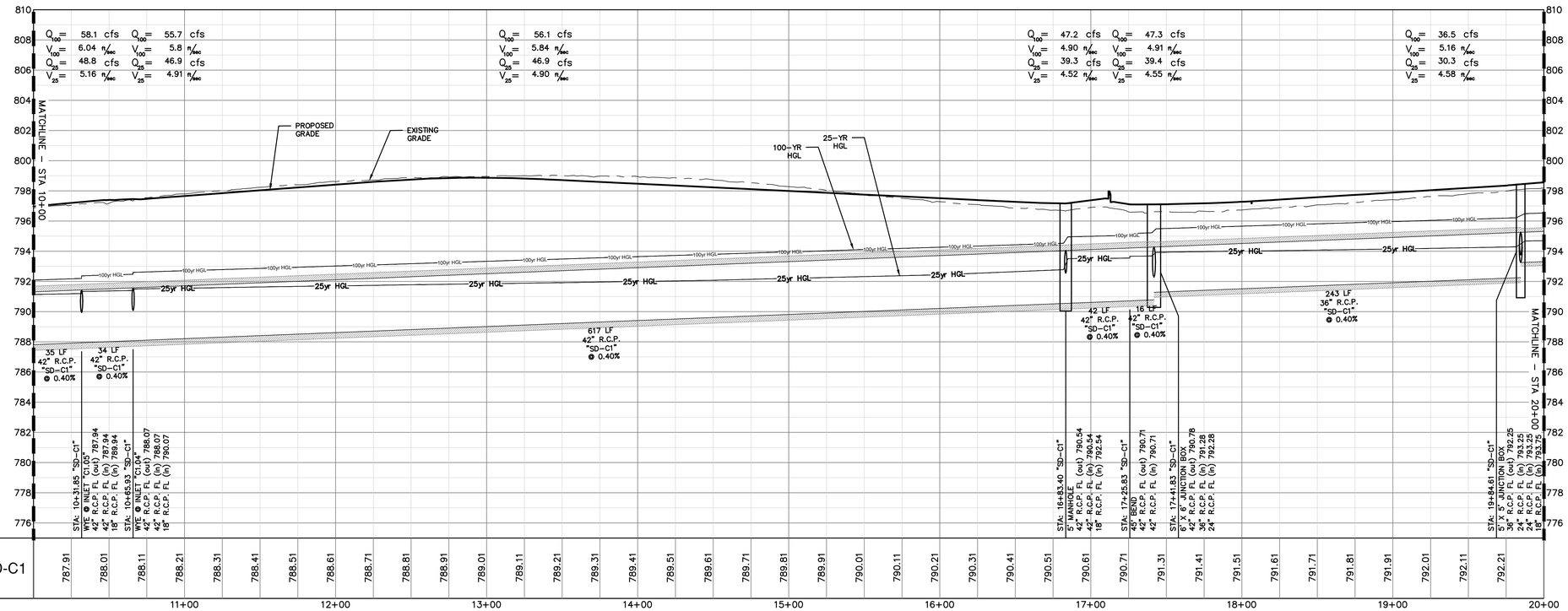
0' 40' 80' 120'

NOTES:

1. THE LOCATIONS OF EXISTING UNDERGROUND UTILITIES ARE SHOWN IN AN APPROXIMATE WAY ONLY AND HAVE NOT BEEN INDEPENDENTLY VERIFIED BY THE OWNER OR ITS REPRESENTATIVE. THE CONTRACTOR SHALL DETERMINE THE EXACT LOCATION OF ALL EXISTING UTILITIES BEFORE COMMENCING WORK, AND AGREES TO BE FULLY RESPONSIBLE FOR ANY AND ALL DAMAGES WHICH MIGHT BE ASSOCIATED BY THE CONTRACTOR'S FAILURE TO EXACTLY LOCATE AND PRESERVE ANY AND ALL UNDERGROUND UTILITIES.
2. ALL RCP IS CLASS III UNLESS OTHERWISE NOTED.
3. ALL FILL AREAS SHALL BE COMPACTED TO 95% PRIOR TO UTILITY INSTALLATION.

LEGEND

- CURB INLET
- W — EXISTING WATER LINE
- WW — EXISTING WASTEWATER LINE
- SD — EXISTING STORM DRAIN LINE
- UGE — EXISTING ELECTRIC LINE
- EXISTING TELECOM LINE
- GAS — EXISTING GAS LINE
- 786 — EXISTING CONTOUR LINE
- 786 — PROPOSED CONTOUR LINE
- 100 YR. FLOODPLAIN
- VEGETATIVE FILTER STRIP
- PROPERTY BOUNDARY
- PROPOSED STORM DRAIN



PROFILE SCALES:

1" = 40' HORIZONTAL
1" = 4' VERTICAL

PROFILE LEGEND:

- NATURAL GROUND
- FINISHED GRADE
- SUBGRADE
- PROPOSED STORM DRAIN
- 100-YR HGL
- 25-YR HGL

DESIGN

STATE OF TEXAS
ANTHONY DOAK
146562
LICENSED
PROFESSIONAL ENGINEER

Anthony Doak
ANTHONY DOAK, P.E.

9/17/2025
DATE

APPROVAL

STATE OF TEXAS
BRIAN A. ALLEN
123374
LICENSED
PROFESSIONAL ENGINEER

BRIAN A. ALLEN, P.E.

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TBPE FIRM REGISTRATION #470 | TBPLS FIRM REGISTRATION #10028801

WOLF RANCH PKWY / MEMORIAL DR
CITY OF GEORGETOWN, TEXAS
SD-C1 - STA 10+00 - 20+00

CITY JOB No.
JOB NO. 51423-04
DATE 9/4/2025
DESIGNER BT
CHECKED AD DRAWN JC
SHEET 272

Date: Sep 04, 2025, 1:38pm User ID: BTa
File: I:\Projects\514\23\04\301 Construction Docs (Drainage)\Civil\SD_C_51423-04.dwg

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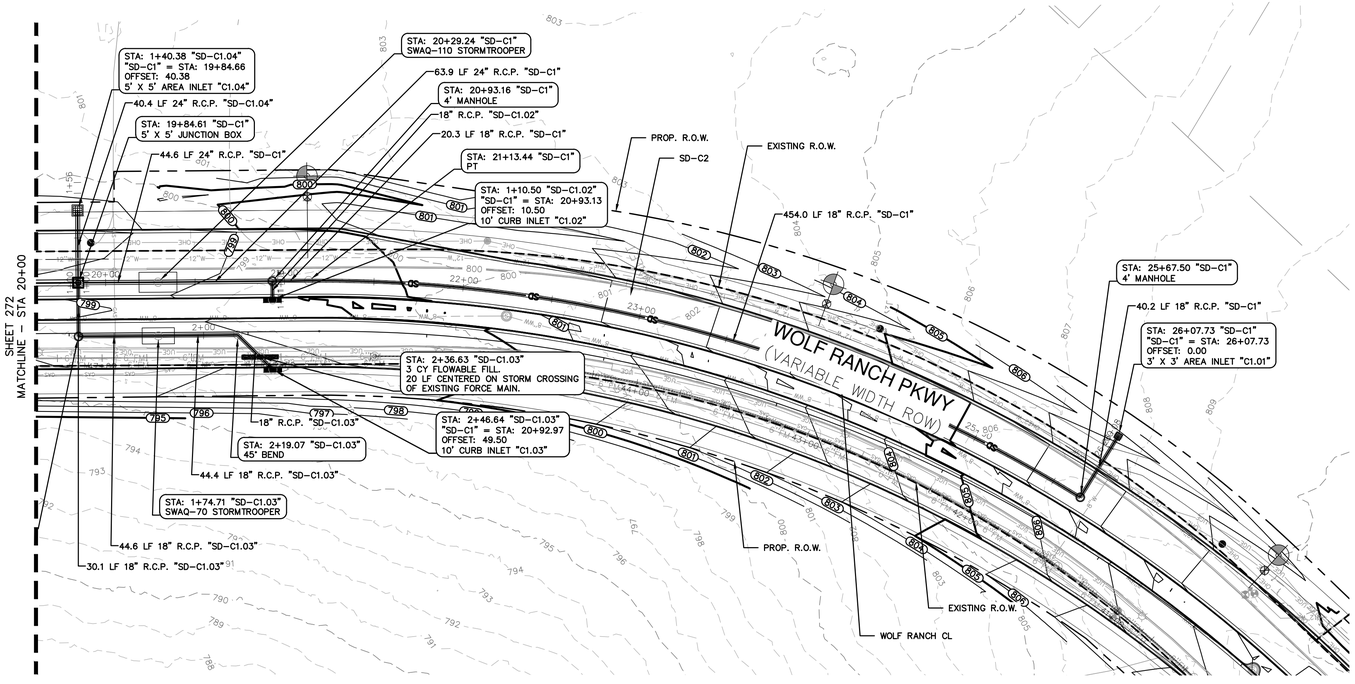

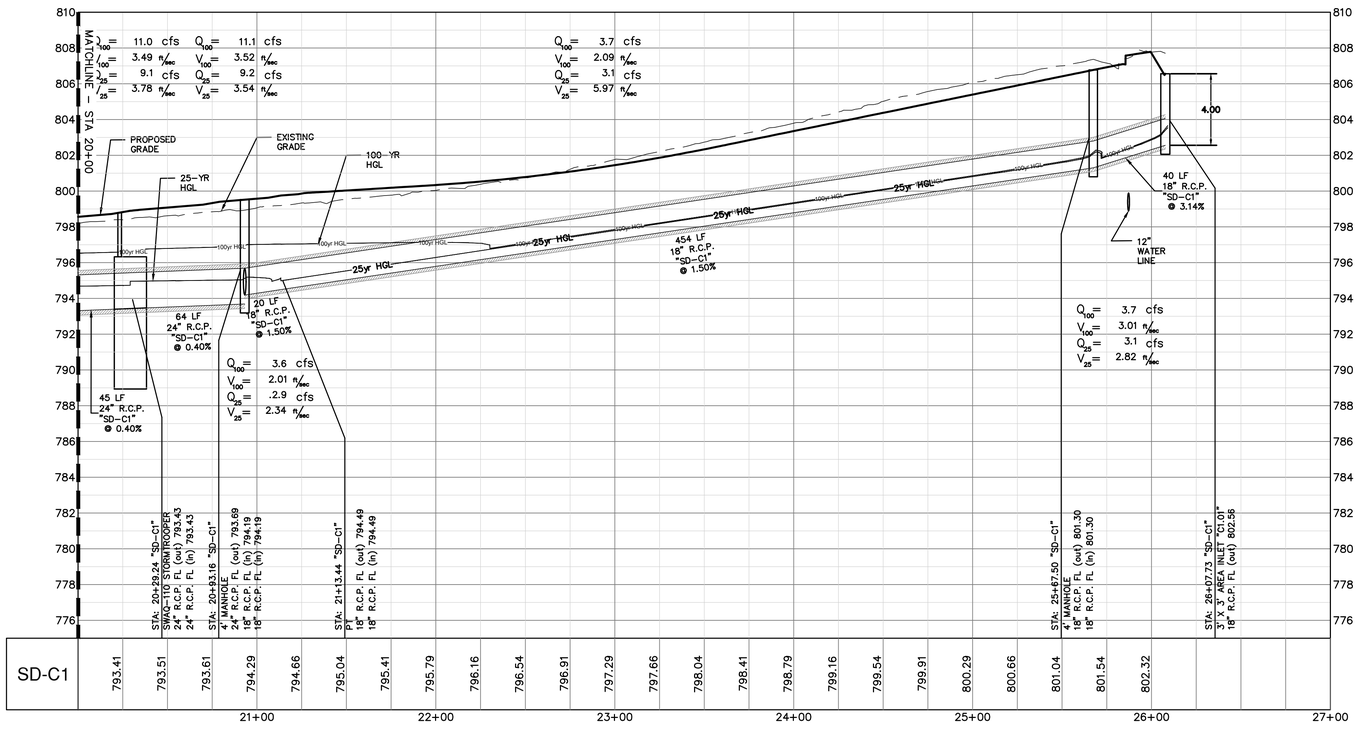

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- 100 YR. FLOODPLAIN
- VEGETATIVE FILTER STRIP
- PROPERTY BOUNDARY
- PROPOSED STORM DRAIN

PROFILE SCALES:

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1" = 4' VERTICAL

PROFILE LEGEND:

- NATURAL GROUND
- FINISHED GRADE
- SUBGRADE
- PROPOSED STORM DRAIN
- 100-YR HGL
- 25-YR HGL

DESIGN

STATE OF TEXAS — ANTHONY DOAK — 146562 — LICENSED PROFESSIONAL ENGINEER

ANTHONY DOAK, P.E.

9/17/2025
DATE

APPROVAL

STATE OF TEXAS — BRIAN A. ALLEN — 123374 — LICENSED PROFESSIONAL ENGINEER

BRIAN A. ALLEN, P.E.

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WOLF RANCH PKWY / MEMORIAL DR
CITY OF GEORGETOWN, TEXAS
SD-C1 - STA 20+00 - END

CITY JOB No.
JOB NO. 51423-04
DATE 9/4/2025
DESIGNER BT
CHECKED AD DRAWN JC
SHEET 273

Date: Sep 04, 2025, 1:41pm User ID: BTs
File: I:\Projects\514\23\04\301 Construction Docs (Drainage)\Civil\SD_C_51423-04.dwg

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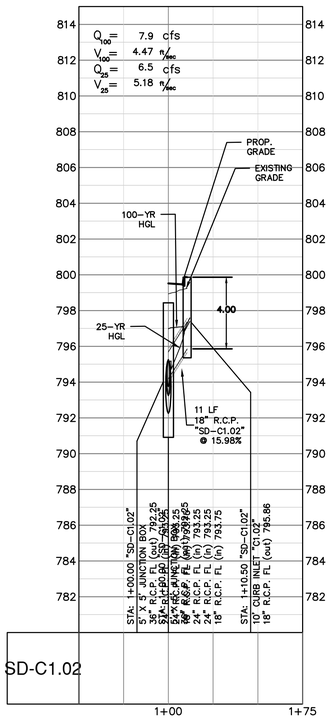

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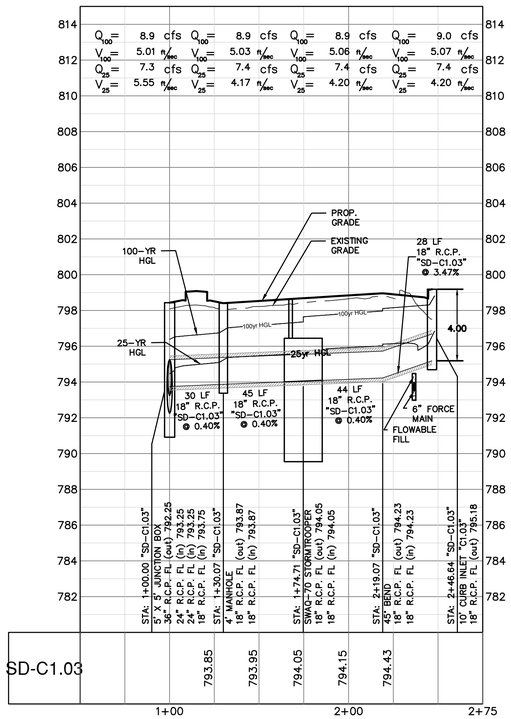

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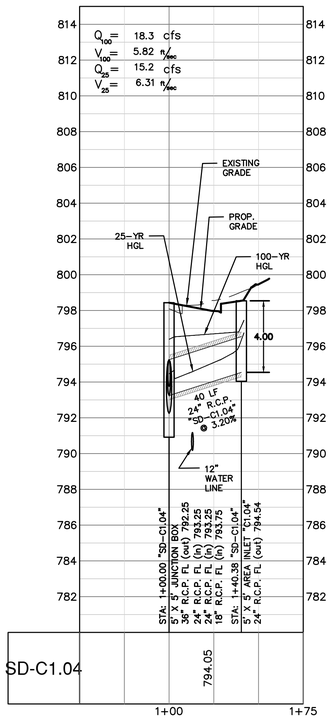

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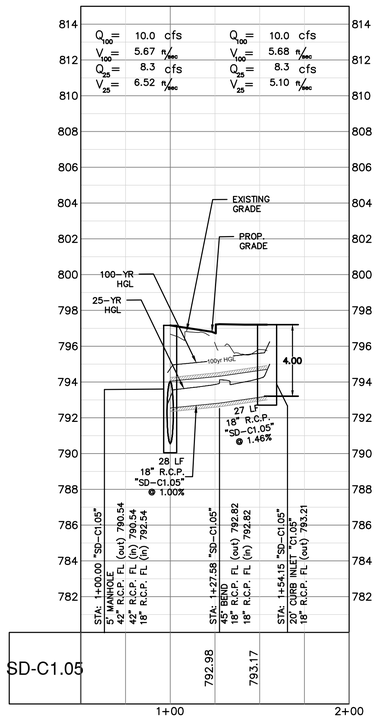

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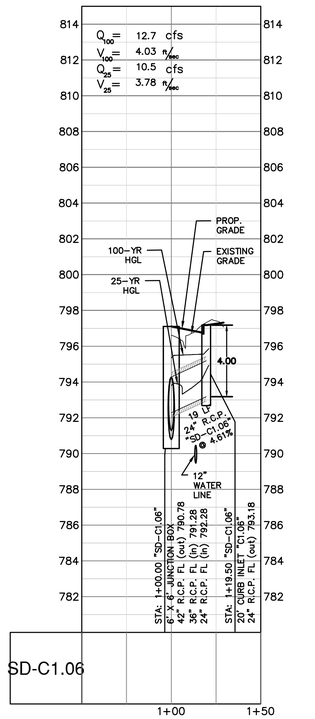

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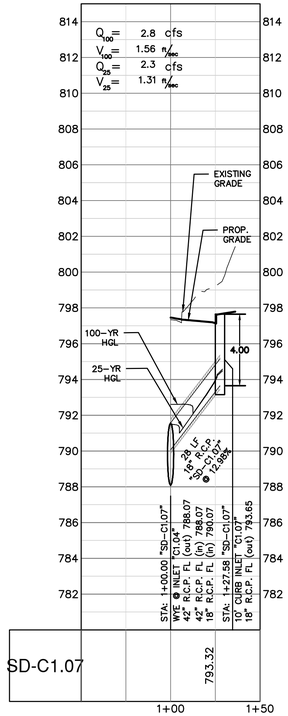

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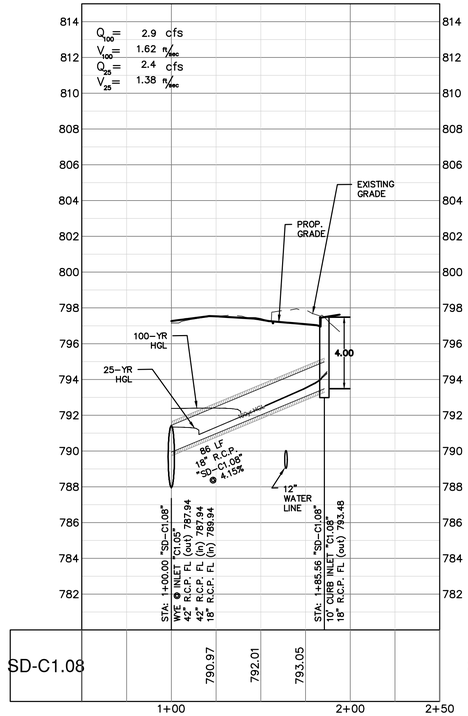

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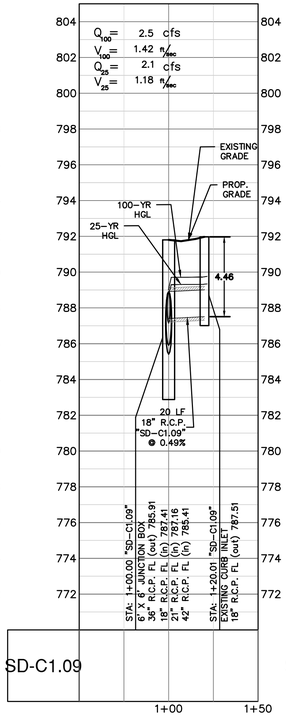

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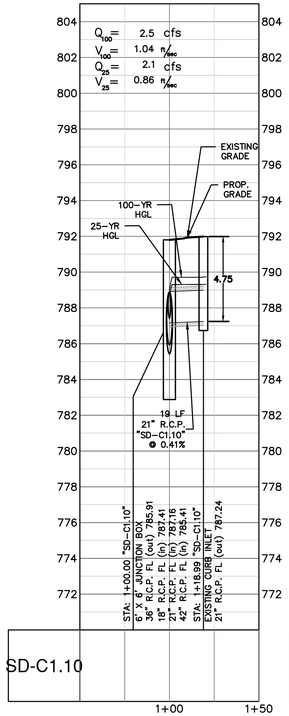

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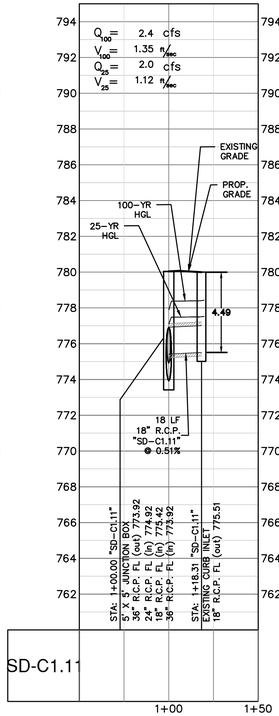

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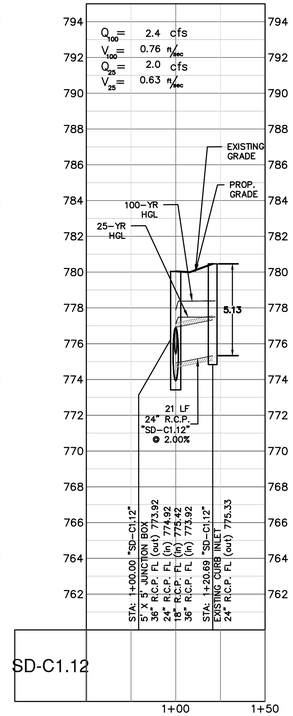

SD-C1.12

PROFILE SCALES:

1" = 40' HORIZONTAL
1" = 4' VERTICAL

PROFILE LEGEND:

NATURAL GROUND

FINISHED GRADE

SUBGRADE

PROPOSED STORM DRAIN

100-YR HGL (100yr HGL)

25-YR HGL (25yr HGL)

NO.	REVISION	DATE

GEORGETOWN TEXAS
more than welcome

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TBPE FIRM REGISTRATION #470 | TBPLS FIRM REGISTRATION #10028801

WOLF RANCH PKWY / MEMORIAL DR

CITY OF GEORGETOWN, TEXAS
STORM DRAIN LATERALS

DESIGN

STATE OF TEXAS — ANTHONY DOAK — 146562 — LICENSED PROFESSIONAL ENGINEER

ANTHONY DOAK, P.E.

9/17/2025
DATE

APPROVAL

STATE OF TEXAS — BRIAN A. ALLEN — 123374 — LICENSED PROFESSIONAL ENGINEER

BRIAN A. ALLEN, P.E.

9/16/2025
DATE

CITY JOB No.
JOB NO. 51423-04
DATE 9/4/2025
DESIGNER BT
CHECKED AD DRAWN JC
SHEET 274

Date: Sep 04, 2025, 1:45pm User ID: BTo
File: I:\Projects\51A\23\04\301 Construction Docs (Drainage)\Civil\SD_C_51423-04.dwg

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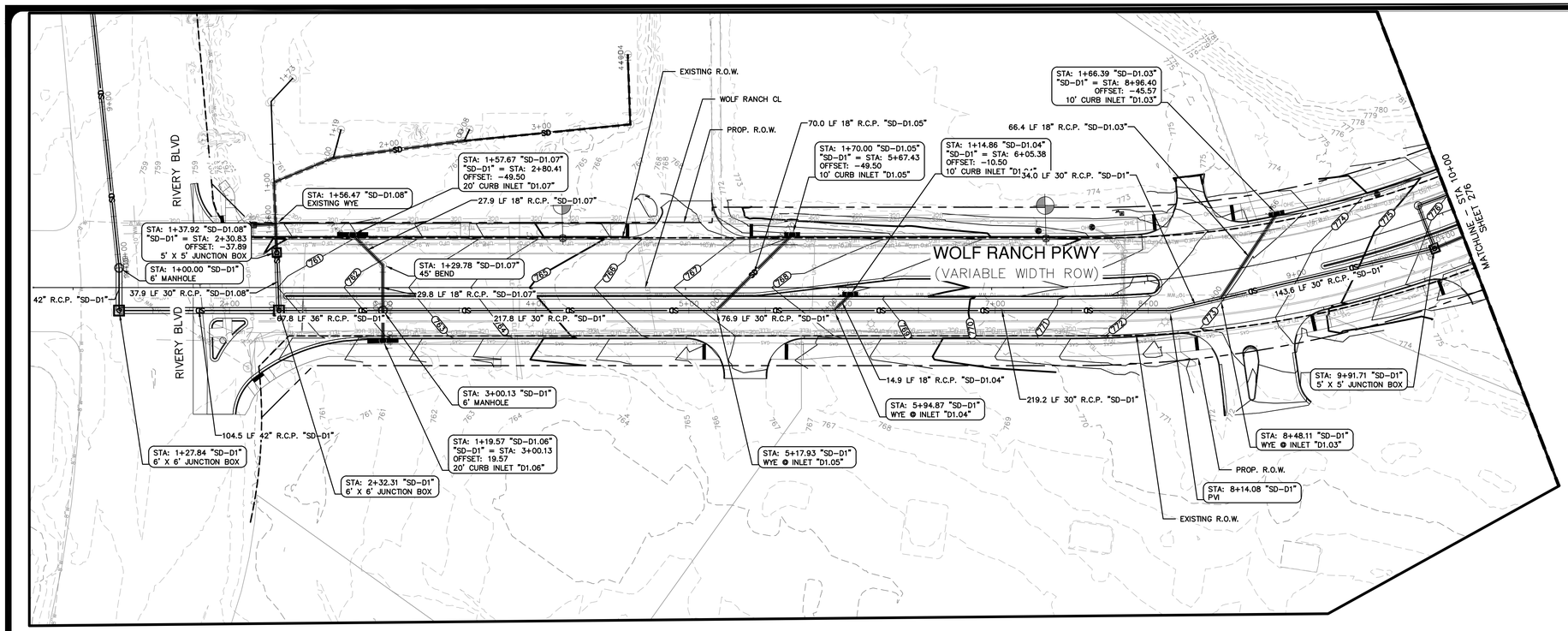

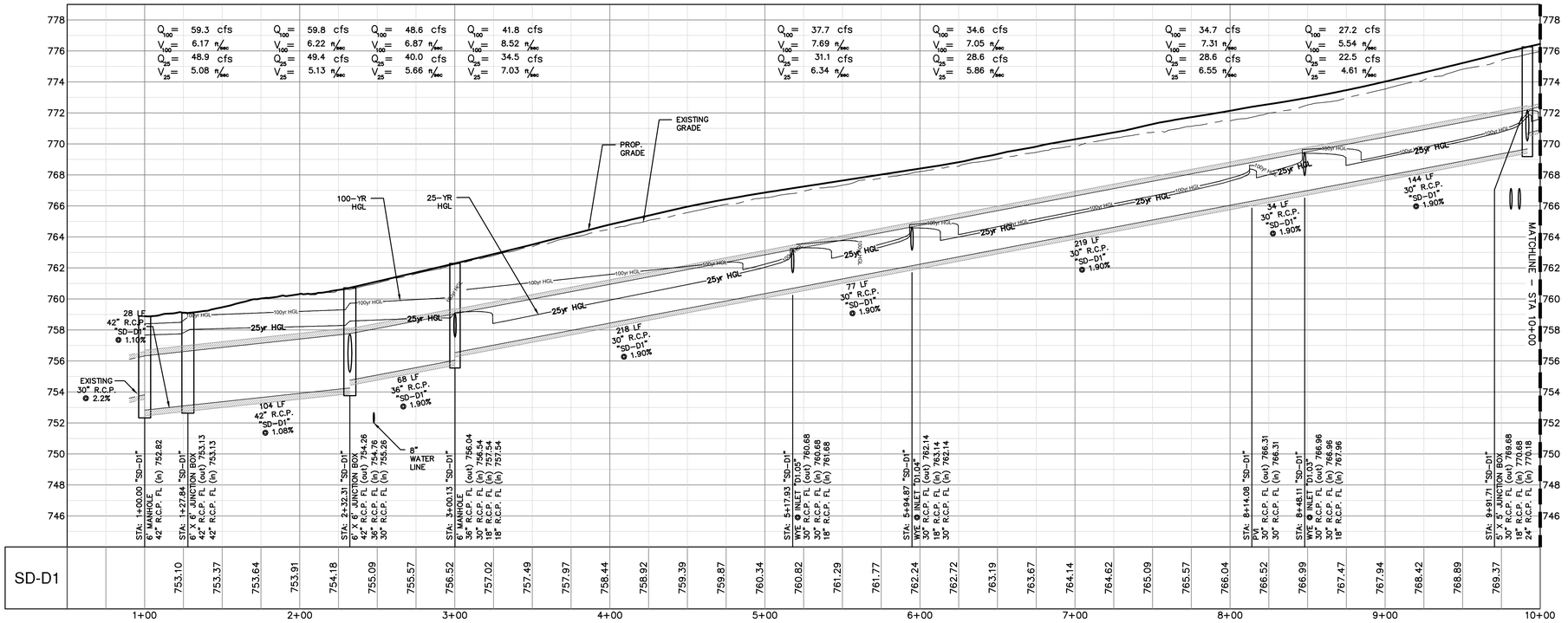

Q_{100}= 59.3 cfs, V_{100}= 6.17 ft/sec, Q_{25}= 48.9 cfs, V_{25}= 5.08 ft/sec

Q_{100}= 59.8 cfs, V_{100}= 6.22 ft/sec, Q_{25}= 49.4 cfs, V_{25}= 5.13 ft/sec

Q_{100}= 48.6 cfs, V_{100}= 6.87 ft/sec, Q_{25}= 40.0 cfs, V_{25}= 5.66 ft/sec

Q_{100}= 41.8 cfs, V_{100}= 8.52 ft/sec, Q_{25}= 34.5 cfs, V_{25}= 7.03 ft/sec

Q_{100}= 37.7 cfs, V_{100}= 7.69 ft/sec, Q_{25}= 31.1 cfs, V_{25}= 6.34 ft/sec

Q_{100}= 34.6 cfs, V_{100}= 7.05 ft/sec, Q_{25}= 28.6 cfs, V_{25}= 5.86 ft/sec

Q_{100}= 34.7 cfs, V_{100}= 7.31 ft/sec, Q_{25}= 28.6 cfs, V_{25}= 6.55 ft/sec

Q_{100}= 27.2 cfs, V_{100}= 5.54 ft/sec, Q_{25}= 22.5 cfs, V_{25}= 4.61 ft/sec

SCALE: 1"= 40'

0' 40' 80' 120'

NOTES:

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LEGEND

- CURB INLET
- SINGLE WATER SERVICE
- DOUBLE WATER SERVICE
- SINGLE WW SERVICE
- DOUBLE WW SERVICE
- GATE VALVE
- FIRE HYDRANT
- EXISTING WATER LINE
- EXISTING WASTEWATER LINE
- EXISTING STORM DRAIN LINE
- EXISTING ELECTRIC LINE
- EXISTING TELECOM LINE
- EXISTING GAS LINE
- EXISTING CONTOUR LINE
- PROPOSED CONTOUR LINE
- 100 YR. FLOODPLAIN
- VEGETATIVE FILTER STRIP
- PROPERTY BOUNDARY

PROFILE SCALES:

1" = 40' HORIZONTAL
1" = 4' VERTICAL

PROFILE LEGEND:

- NATURAL GROUND
- FINISHED GRADE
- SUBGRADE
- PROPOSED STORM DRAIN
- 100-YR HGL
- 25-YR HGL

DESIGN

STATE OF TEXAS — ANTHONY DOAK — 146562 — LICENSED PROFESSIONAL ENGINEER

ANTHONY DOAK, P.E.

9/17/2025
DATE

APPROVAL

STATE OF TEXAS — BRIAN A. ALLEN — 123374 — LICENSED PROFESSIONAL ENGINEER

BRIAN A. ALLEN, P.E.

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GEORGETOWN TEXAS *more than welcome*

PAPE-DAWSON ENGINEERS
AUSTIN | SAN ANTONIO | HOUSTON | FORT WORTH | DALLAS
10801 N MOPAC EXPY, BLDG 3, STE 200 | AUSTIN, TX 78759 | 512.454.8711
TBPE FIRM REGISTRATION #470 | TBPLS FIRM REGISTRATION #10028801

WOLF RANCH PKWY / MEMORIAL DR

CITY OF GEORGETOWN, TEXAS
SD-D1 - STA 1+00 - 10+00

CITY JOB No.
JOB NO. 51423-04
DATE 9/4/2025
DESIGNER BT
CHECKED AD DRAWN JC

SHEET 275

Date: Sep 04, 2025, 1:48pm User ID: BTa
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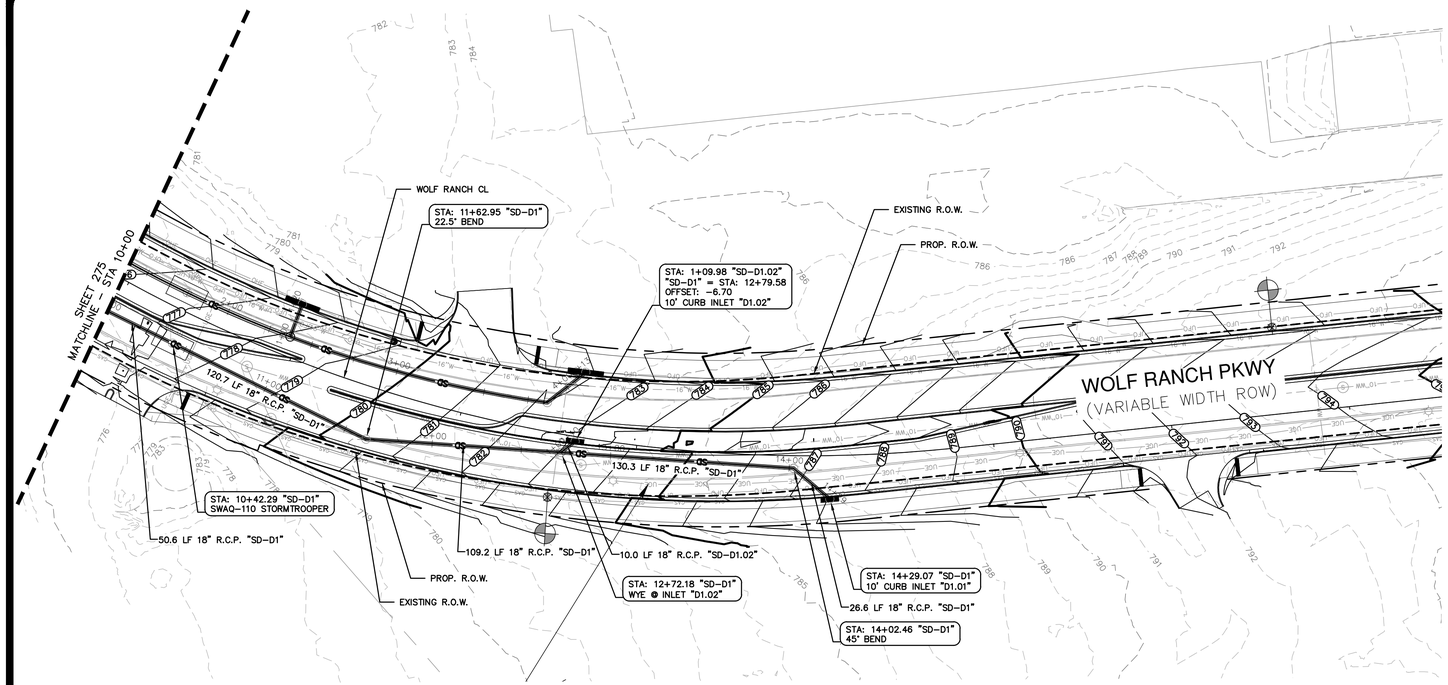

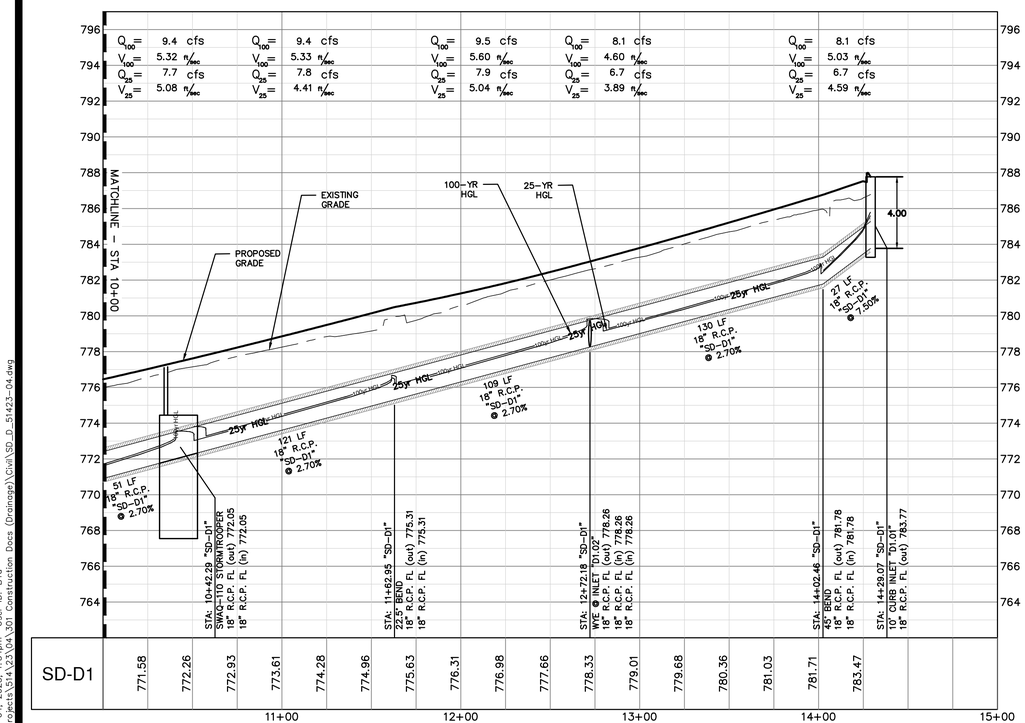

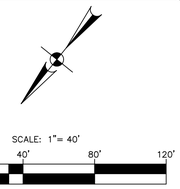

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PROFILE LEGEND:

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- FINISHED GRADE
- SUBGRADE
- PROPOSED STORM DRAIN
- 100-YR HGL — 100yr HGL
- 25-YR HGL — 25yr HGL

DESIGN

STATE OF TEXAS — ANTHONY DOAK — 146562 — LICENSED PROFESSIONAL ENGINEER

ANTHONY DOAK, P.E.

9/17/2025
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SD-D1 - STA 10+00 - END

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SHEET 276

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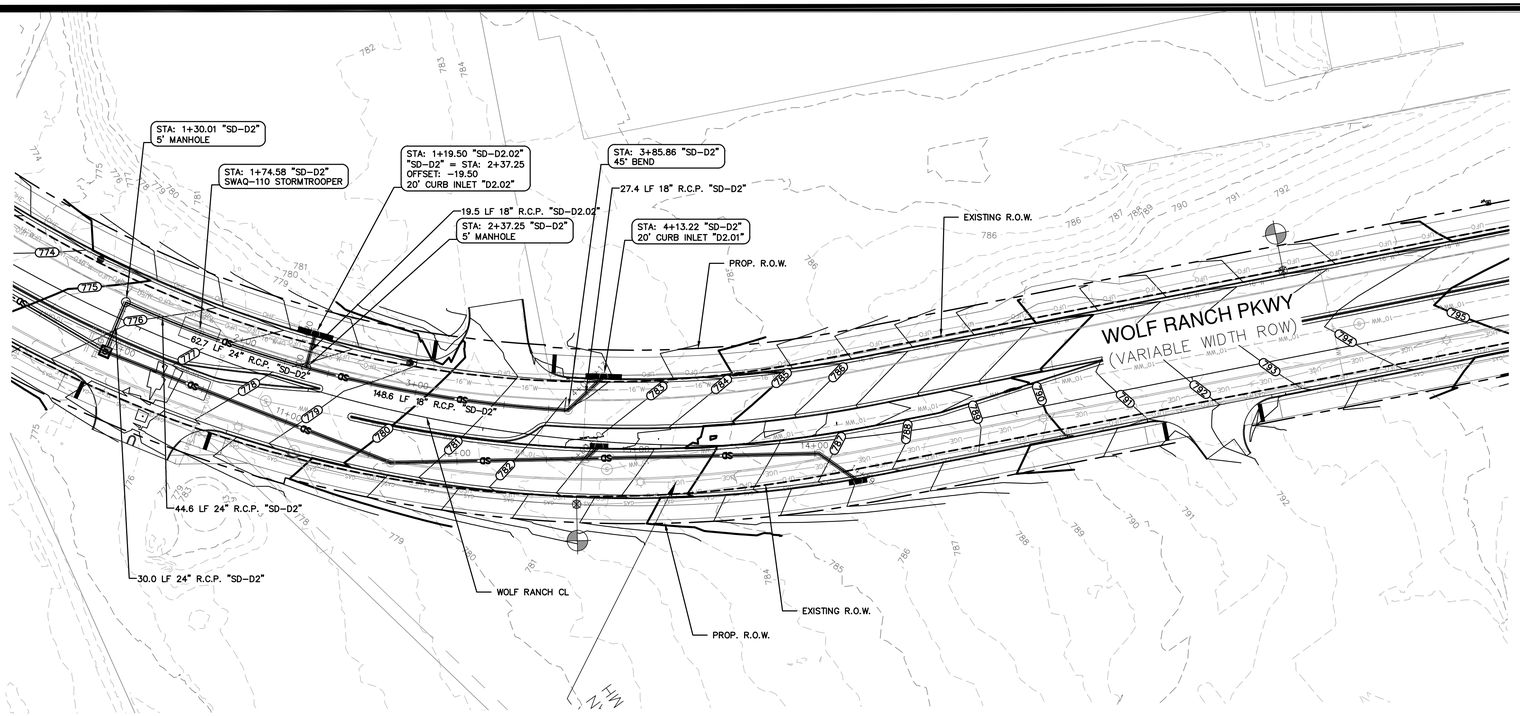

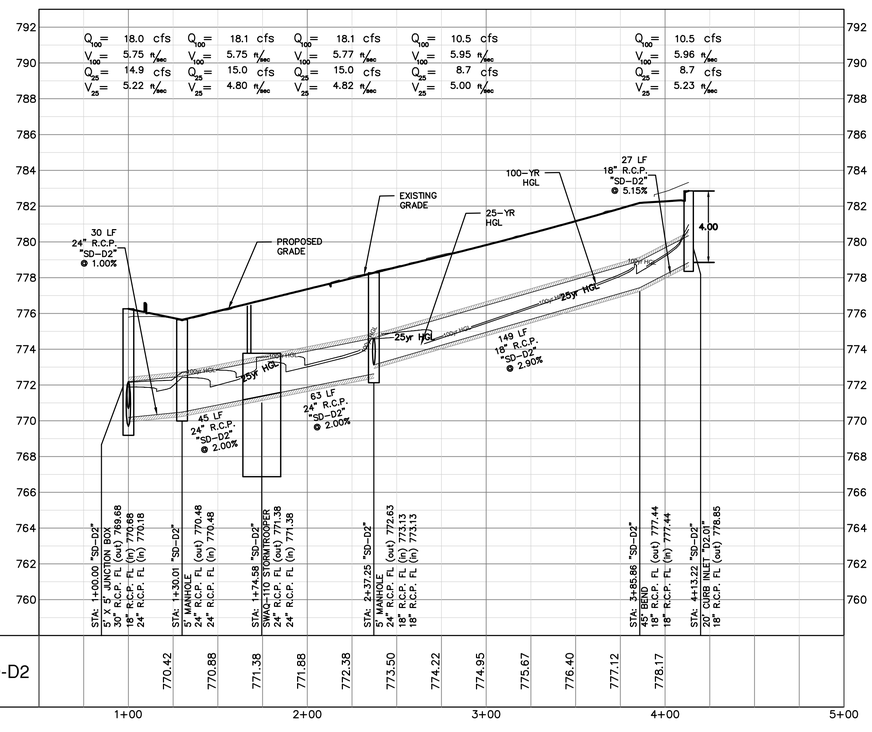

SCALE: 1"= 40'

0' 40' 80' 120'

NOTES:

1. THE LOCATIONS OF EXISTING UNDERGROUND UTILITIES ARE SHOWN IN AN APPROXIMATE WAY ONLY AND HAVE NOT BEEN INDEPENDENTLY VERIFIED BY THE OWNER OR ITS REPRESENTATIVE. THE CONTRACTOR SHALL DETERMINE THE EXACT LOCATION OF ALL EXISTING UTILITIES BEFORE COMMENCING WORK, AND AGREES TO BE FULLY RESPONSIBLE FOR ANY AND ALL DAMAGES WHICH MIGHT BE ASSOCIATED BY THE CONTRACTOR'S FAILURE TO EXACTLY LOCATE AND PRESERVE ANY AND ALL UNDERGROUND UTILITIES.
2. ALL ROP IS CLASS III UNLESS OTHERWISE NOTED.
3. ALL FILL AREAS SHALL BE COMPACTED TO 95% PRIOR TO UTILITY INSTALLATION.

LEGEND

- CURB INLET
- W — EXISTING WATER LINE
- WW — EXISTING WASTEWATER LINE
- SD — EXISTING STORM DRAIN LINE
- UGE — EXISTING ELECTRIC LINE
- EXISTING TELECOM LINE
- GAS — EXISTING GAS LINE
- 786 — EXISTING CONTOUR LINE
- 786 — PROPOSED CONTOUR LINE
- 100 YR. FLOODPLAIN
- VEGETATIVE FILTER STRIP
- PROPERTY BOUNDARY
- PROPOSED STORM DRAIN

PROFILE SCALES:

1" = 40' HORIZONTAL
1" = 4' VERTICAL

PROFILE LEGEND:

- NATURAL GROUND
- FINISHED GRADE
- SUBGRADE
- PROPOSED STORM DRAIN
- 100-YR HGL — 100yr HGL
- 25-YR HGL — 25yr HGL

DESIGN

STATE OF TEXAS
ANTHONY DOAK
146562
LICENSED
PROFESSIONAL ENGINEER

ANTHONY DOAK, P.E.

9/17/2025
DATE

APPROVAL

STATE OF TEXAS
BRIAN A. ALLEN
123374
LICENSED
PROFESSIONAL ENGINEER

BRIAN A. ALLEN, P.E.

9/16/2025
DATE

NO.	REVISION	DATE

GEORGETOWN
TEXAS
more than welcome

PAPE-DAWSON ENGINEERS
AUSTIN | SAN ANTONIO | HOUSTON | FORT WORTH | DALLAS
10801 N MOPAC EXPY, BLDG 3, STE 200 | AUSTIN, TX 78759 | 512.454.8711
TBPE FIRM REGISTRATION #470 | TBPLS FIRM REGISTRATION #10028801

WOLF RANCH PKWY / MEMORIAL DR

CITY OF GEORGETOWN, TEXAS
SD-D2 - STA 1+00 - END

CITY JOB No.
JOB NO. 51423-04
DATE 9/4/2025
DESIGNER BT
CHECKED AD DRAWN JC

SHEET 277

Date: Sep 04, 2025, 1:57pm User ID: BTo
File: H:\Projects\514\23\04_Construction Docs (Drainage)\Civil\SD_D_51423-04.dwg

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PROFILE SCALES:
1" = 40' HORIZONTAL
1" = 4' VERTICAL

PROFILE LEGEND:
NATURAL GROUND
FINISHED GRADE
SUBGRADE
PROPOSED STORM DRAIN
100-YR HGL
25-YR HGL

DESIGN
STATE OF TEXAS
ANTHONY DOAK
146562
LICENSED
PROFESSIONAL ENGINEER
ANTHONY DOAK, P.E.
9/17/2025
DATE

APPROVAL
STATE OF TEXAS
BRIAN A. ALLEN
123374
LICENSED
PROFESSIONAL ENGINEER
BRIAN A. ALLEN, P.E.
9/16/2025
DATE

NO.	REVISION	DATE

GEORGETOWN TEXAS
more than welcome

PAPE-DAWSON ENGINEERS
AUSTIN | SAN ANTONIO | HOUSTON | FORT WORTH | DALLAS
10801 N MOPAC EXPY, BLDG 3, STE 200 | AUSTIN, TX 78759 | 512.454.8711
TBPE FIRM REGISTRATION #470 | TBPLS FIRM REGISTRATION #10028801

WOLF RANCH PKWY / MEMORIAL DR
CITY OF GEORGETOWN, TEXAS
SD-D - STORM DRAIN LATERALS

CITY JOB No.
JOB NO. 51423-04
DATE 9/4/2025
DESIGNER BT
CHECKED AD DRAWN JC
SHEET 278

Date: Sep 04, 2025, 2:03pm User ID: BTo
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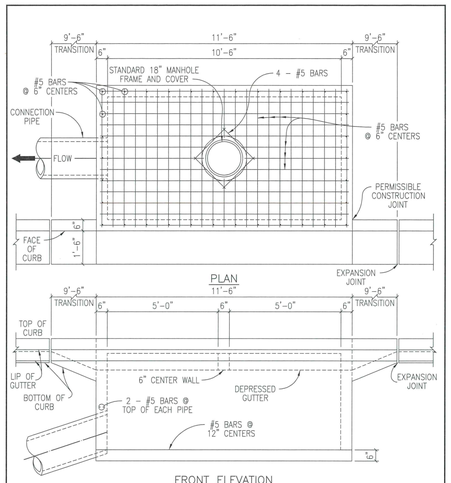
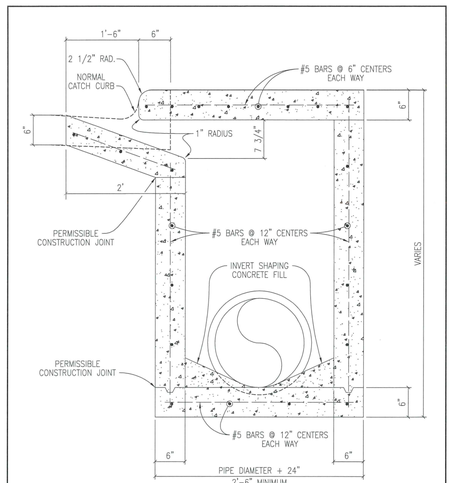


FRONT ELEVATION

NOTES:
1. ALL CONCRETE SHALL BE CLASS "A" 3,000 PSI CONCRETE.
2. STORM SEWER PIPE MATERIAL TO BE R.C.P. (CLASS III) UNLESS OTHERWISE APPROVED BY THE CITY OF GEORGETOWN.

The Architect/Engineer assumes responsibility for appropriate use of this standard.

CITY OF GEORGETOWN CONSTRUCTION STANDARDS AND DETAILS	REVISION NOTE: ADOPTED 6/21/2006
CURB INLET DETAIL	DRAWING NAME: SD09
	SCALE: NTS · DATE: 1/2003 · DRAWN BY: MRS · APPROVED BY: TRB

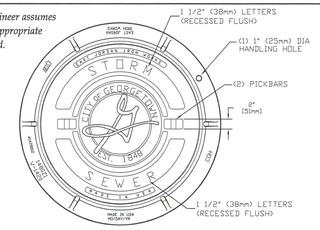


NOTES:
1. ALL CONCRETE SHALL BE CLASS "A" 3,000 PSI CONCRETE.
2. STORM SEWER PIPE MATERIAL TO BE R.C.P. (CLASS III) UNLESS OTHERWISE APPROVED BY THE CITY OF GEORGETOWN.

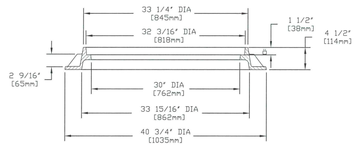
The Architect/Engineer assumes responsibility for appropriate use of this standard.

CITY OF GEORGETOWN CONSTRUCTION STANDARDS AND DETAILS	REVISION NOTE: ADOPTED 6/21/2006
CURB DRAIN INLET TYPICAL SECTION	DRAWING NAME: SD10
	SCALE: NTS · DATE: 1/2003 · DRAWN BY: MRS · APPROVED BY: TRB

The Architect/Engineer assumes responsibility for appropriate use of this standard.



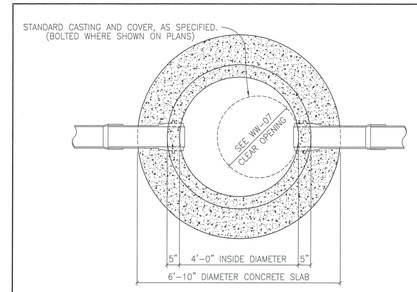
COVER SECTION



FRAME SECTION

NOTES:
4. STANDARD STORM SEWER MANHOLE SET TO BE EAST JORDAN IRON WORKS, INC. CATALOG NO. 1480A V=1420\1480Z1, COVER TO BE STAMPED WITH "STORM SEWER".
2. STANDARD STORM SEWER MANHOLE SET TO BE HEAVY DUTY LOAD RATED.
3. FOR MORE DETAILED SPECIFICATIONS REFER TO EAST JORDAN IRON WORKS, INC. REFERENCE PRODUCT DRAWING 41420012 0014839\.
4. FOR BOLTED STORM SEWER MANHOLE SET REFER TO DETAIL SD11A.

CITY OF GEORGETOWN CONSTRUCTION STANDARDS AND DETAILS	REVISION NOTE: ADOPTED 6/21/2006
STANDARD STORM SEWER MANHOLE SET	DRAWING NAME: SD11
	SCALE: NTS · DATE: 1/2003 · DRAWN BY: MRS · APPROVED BY: TRB



MANHOLE PLAN

CITY OF GEORGETOWN NOTES:

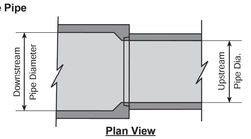
MANHOLE DETAILS SHALL REFLECT THE CITY'S MINIMUM SPECIFICATIONS, AS STATED BELOW:

A. ALL MANHOLES SHALL BE 48" I.D., R.C.P., CLASS III, WITH RUBBER O-RING GASKET JOINTS CONFORMING TO ASTM C478, C433 AND C76.
B. ALL MANHOLES SHALL HAVE FRAME AND COVER, AS MANUFACTURED BY EAST JORDAN IRON WORKS (AS PER DETAIL # WW-07) OR APPROVED EQUIVALENT.
C. ALL MANHOLES SHALL BE CONCRETE WITH CAST IRON FRAME AND COVER.
D. ALL MANHOLES SHALL HAVE AN ECCENTRIC CONE.
E. MANHOLES MAY HAVE A FLAT LID, IF APPROVED BY CITY OF GEORGETOWN, BEING 12" THICK WITH A MINIMUM 30" OPENING, AS MANUFACTURED BY CALVERT CONCRETE OR APPROVED EQUAL, M.F.G. CONFORMING TO ASTM C478, 5000 P.S.I. CONCRETE, TRAFFIC BEARING, AND O-RING JOINT CONFORMING TO ASTM C443.
F. INVERTS AND FLEXIBLE SEAL BOOTS, PER ASTM C-923, SHALL BE CAST INTO BASE SECTION.
G. MINIMUM DROP BETWEEN INVERTS SHALL BE ONE-TENTH OF A FOOT (0.1').
H. GRADE RINGS WITH AN I.D. TO MATCH FRAMES CLEAR OPENING WITH A MAXIMUM OF FIVE (5) GRADE RINGS ARE ALLOWED.

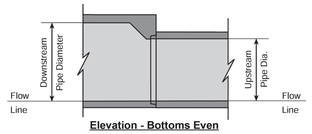
The Architect/Engineer assumes responsibility for appropriate use of this standard.

CITY OF GEORGETOWN CONSTRUCTION STANDARDS AND DETAILS	REVISION NOTE: ADOPTED 6/21/2006
STANDARD STORM SEWER MANHOLE PLAN	DRAWING NAME: SD12
	SCALE: NTS · DATE: 1/2003 · DRAWN BY: MRS · APPROVED BY: TRB

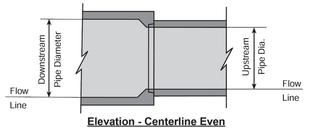
Reinforced Concrete Pipe



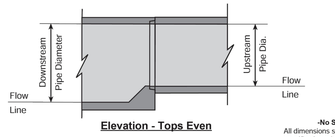
Plan View



Elevation - Bottoms Even



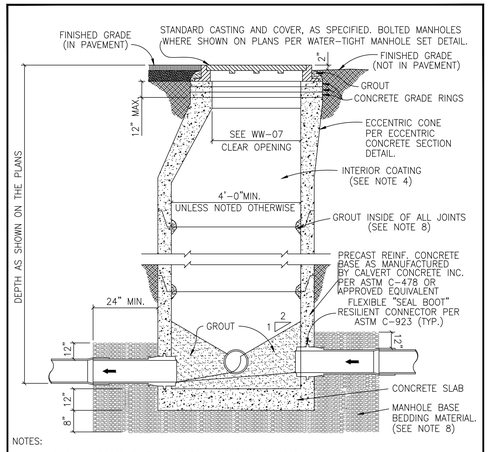
Elevation - Centerline Even



Elevation - Tops Even

-No Scale-
All dimensions subject to allowable specification tolerances.

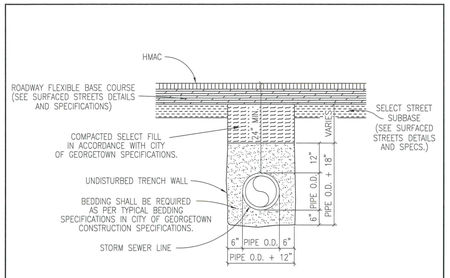
TITLE	PLANT	STATE	SECTION/PAGE	DATE	
Tongue and Groove Pipe Reducers - Option 1	Grand Prairie Houston	TX	2.8	Feb 2016	FORTERRA



NOTES:
1. MANHOLES SHALL BE PRECAST ASTM C-478 BELL AND SPIGOT WITH PROFILE GASKET - SINGLE OFF-SET JOINTS.
2. SEE PLANS AND MANHOLE SCHEDULE, FOR MANHOLE SIZE, LOCATION, CONFIGURATION, TYPE OF TOP SECTION, VENTING REQUIREMENTS, PIPE SIZE AND TYPES.
3. SEE SPECIFICATIONS ON MATERIALS AND CONSTRUCTION.
4. AN 80 MIL COAT OF RAVEN LINING SYSTEMS, RAVEN 405 ULTRA HIGH BUILD EPOXY COATING, OR SPRAY WALL EPOXY COATING, OR APPROVED EQUAL, TO BE APPLIED TO ENTIRE INTERIOR OF EACH STORM SEWER MANHOLE AND UNDERSIDE OF FLAT TOPS.
5. ALL MANHOLE COVERS SHALL BE BOLTED AND GASKETTED WHEN MANHOLES ARE LOCATED OUT FROM PAVEMENT.
6. MANHOLES TO BE VENTED ARE IDENTIFIED ON MANHOLE SCHEDULE. REFERENCE MANHOLE VENT DETAIL.
7. MANHOLES ARE TO BE DESIGNED TO RESIST LATERAL AND VERTICAL SOIL FORCES RESULTING FROM MANHOLE DEPTH. ADDITIONALLY, MANHOLES LOCATED IN PAVEMENT TO BE DESIGNED FOR HS-20 TRAFFIC LOADS.
8. GROUT SHALL MEET THE REQUIREMENTS AS STATED BY THE COATING MANUFACTURER.
8. MANHOLE BASE BEDDING MATERIAL SPECS. FOR 3/4" WASHED GRAVEL:
SIEVE SIZE 2", PERCENT (%) RETAINED 0
SIEVE SIZE 1 1/2", % RETAINED 0-10
SIEVE SIZE 1", % RETAINED 45-80
SIEVE SIZE 3/4", % RETAINED 85-100
SIEVE SIZE 3/8", % RETAINED 95-100

The Architect/Engineer assumes responsibility for appropriate use of this standard.

CITY OF GEORGETOWN CONSTRUCTION STANDARDS AND DETAILS	REVISION NOTE: ADOPTED 6/21/2006
STANDARD STORM SEWER MANHOLE - SECTION	DRAWING NAME: SD13
	SCALE: NTS · DATE: 1/2003 · DRAWN BY: MRS · APPROVED BY: TRB



NOTES:
1. DENSITY TESTS SHALL BE TAKEN IN ACCORDANCE WITH THE CITY OF GEORGETOWN CONSTRUCTION SPECIFICATIONS AND STANDARDS.
2. CONTRACTOR OR ENGINEER MAY USE FLOWABLE BACKFILL AS AN ALTERNATE BACKFILL MATERIAL (SEE C9 FLOWABLE BACKFILL FOR THE SPECIFICATION).

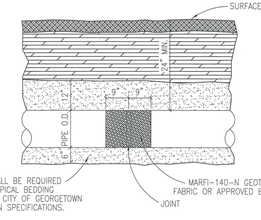
TRENCH WIDTHS
*PIPE LESS THAN 20" DIAMETER
1'-0" + PIPE O.D.
*20" DIAMETER PIPE AND LARGER
2'-0" + PIPE O.D.

The Architect/Engineer assumes responsibility for appropriate use of this standard.

CITY OF GEORGETOWN CONSTRUCTION STANDARDS AND DETAILS	REVISION NOTE: ADOPTED 6/21/2006
TRENCH AND EMBEDMENT DETAIL UNDER PROPOSED ROADWAY FOR STORM SEWER	DRAWING NAME: SD41
	SCALE: NTS · DATE: 1/2003 · DRAWN BY: MRS · APPROVED BY: TRB

STATE OF TEXAS
STEVEN S. CRAUFORD
92677
LICENSED
PROFESSIONAL ENGINEER

09/12/2025



NOTES
1. PIPE SHALL BE REINFORCED CONCRETE PIPE CLASS III UNLESS THE DEPTH OF PIPE REQUIRES A STRONGER CLASS.
2. ALL FITTINGS AND WYES SHALL BE MANUFACTURED AND NOT CONSTRUCTED ON THE PROJECT WITHOUT PRIOR APPROVAL FROM THE CITY.
3. ALL JOINTS SHALL BE WRAPPED WITH MARFI-140-N GEOTEXTILE FABRIC OR APPROVED EQUIVALENT. EACH JOINT SHALL BE WRAPPED WITH 18" WIDE FABRIC CENTERED ON THE JOINT.

The Architect/Engineer assumes responsibility for appropriate use of this standard.

CITY OF GEORGETOWN CONSTRUCTION STANDARDS AND DETAILS	REVISION NOTE: ADOPTED 6/21/2006
TRENCH AND EMBEDMENT DETAIL (PROFILE) FOR STORM SEWER	DRAWING NAME: SD42
	SCALE: NTS · DATE: 1/2003 · DRAWN BY: MRS · APPROVED BY: TRB

NO.	REVISION	DATE

GEORGETOWN TEXAS *more than welcome*

PAPE-DAWSON ENGINEERS
AUSTIN I SAN ANTONIO I HOUSTON I FORT WORTH I DALLAS
10801 N MOPAC EXPY, BLDG 3, STE 200 I AUSTIN, TX 78759 I 512.454.8711
TBPE FIRM REGISTRATION #470 I TBPLS FIRM REGISTRATION #10028801

CITY OF GEORGETOWN, TEXAS
WOLF RANCH PKWY / MEMORIAL DR

CONSTRUCTION DETAILS
STORM DRAIN DETAILS 1 OF 2

CITY JOB No.
JOB NO. 51423-00
DATE 9/12/2025
DESIGNER
CHECKED SC DRAWN WT

SHEET 279

Date: Sep 12, 2025, 10:11am User ID: cashatt
File: H:\Projects\514\23\00\30\Construction Documents\Civil\D751423-00.dwg

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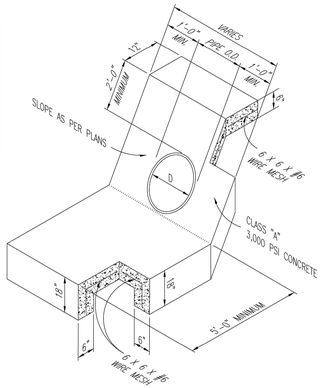
MINIMUM RIP–RAP QUANTITIES	
PIPE	SQ. YDS.
18"	6.2
24"	6.9
27"	7.8
30"	9.5
36"	10.4
42"	12.0
48"	14.3
54"	16.4



NOTES:

1. WHEN HEADWALLS AND WINGWALLS ARE REQUIRED, THEY SHALL CONFORM TO THE TEXAS DEPARTMENT OF TRANSPORTATION STANDARDS, OR AS DIRECTED BY THE CITY.
2. ENERGY DISSIPATERS SHALL BE REQUIRED IF PIPE VELOCITY IS GREATER THAN 5.0 F.P.S. OR AS DIRECTED BY THE CITY OF GEORGETOWN.
3. SUPPORT REINFORCING WIRE MESH REQUIRED AS SUPPORT FOR APPROACH SLAB AND SHALL BE SUPPORTED BY REBAR CHAIRS OR OTHER APPROVED METHODS.

The Architect/Engineer assumes responsibility for appropriate use of this standard.

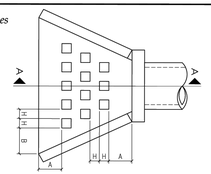
REVISION NOTE	ADOPTED 6/21/2006
DRAWING SHEET	SD19

CITY OF GEORGETOWN
CONSTRUCTION STANDARDS AND DETAILS

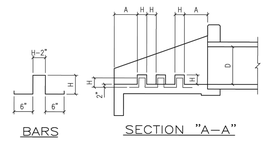
TYPICAL CONCRETE RIP–RAP AT PIPE

SCALE	DATE
NTS	1/2003
DRAWN BY	APPROVED BY
MRS	TRB

The Architect/Engineer assumes responsibility for appropriate use of this standard.



PLAN VIEW



BARS SECTION "A–A"

NOTES:

1. USE CLASS "A" CONCRETE, 3,000 PSI AT 28 DAYS, UNLESS NOTED.
2. REINFORCING STEEL – ASTM A615, GRADE 40, UNLESS NOTED.
3. LAP REINFORCING 30 BAR DIAMETERS MIN. AT SPLICES, UNLESS NOTED.
4. CHAMFER EXPOSED EDGES OF CONCRETE 3/4", UNLESS NOTED.
5. PLACE REINFORCING WITH THE CENTER OF THE OUTSIDE BARS 2 INCHES FROM THE SURFACE OF THE CONCRETE.

TABLE OF DIMENSIONS FOR ENERGY DISSIPATOR DETAIL

D PIPE DIAMETER (INCHES)	NUMBER OF ROWS OF DISSIPATORS	NUMBER OF DISSIPATORS IN FRONT ROW	H (INCHES)	A (INCHES)	B (INCHES)
12	1	3	4	4	9.1875
18	2	4	4 1/2	9 1/2	15.5625
24	2	5	6	14 3/4	16 1/2
30	3	6	7 1/2	12 1/2	14 3/8
36	3	6	9	16 1/4	18 5/16
42	3	6	10 1/2	20	22 1/4
48	3	6	12	23 3/4	26 1/4
54	3	6	13 1/2	27 1/2	27 3/4
60	3	6	15	31 1/4	31 5/8

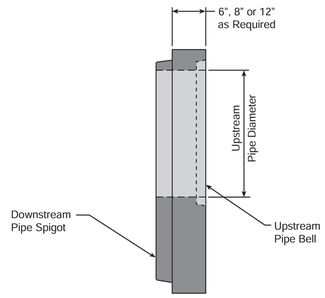
REVISION NOTE	ADOPTED 6/21/2006
DRAWING SHEET	SD20

CITY OF GEORGETOWN
CONSTRUCTION STANDARDS AND DETAILS

ENERGY DISSIPATER DETAIL

SCALE	DATE
NTS	1/2003
DRAWN BY	APPROVED BY
MRS	TRB

Reinforced Concrete Pipe



Reducing Stopper

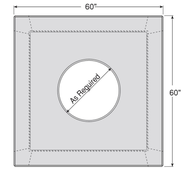
Note:
- Reduction may be centered or offset as required.

-No Scale-
All dimensions subject to allowable specification tolerances.

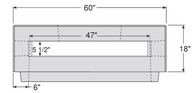
TITLE	PLANT	STATE	SECTION,PAGE	DATE
Tongue and Groove Pipe Reducers - Option 2	Grand Prairie Houston	TX	2.9	Feb 2016

FORTERRA

Precast Drainage Structures

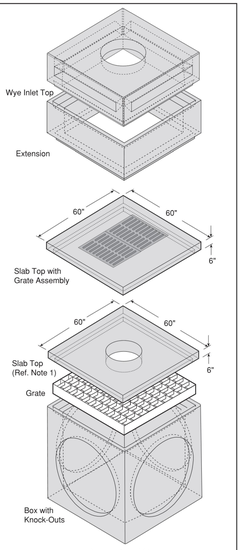


Top View



Front View

Item in Isometric View	Height (Inches)	Approx. Weight (Lbs.)
Wye Inlet Top	18	3,430
Extension	12 15 18 21 24	1,350 1,688 2,025 2,363 2,700
Slab Top	6	1,340
Grate	3 1/4	433
Box	Varies	



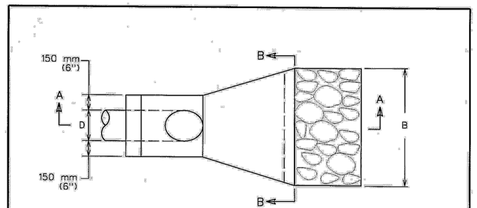
Isometric View

Note:
1.) Customer to specify opening size or cast iron ring and cover.

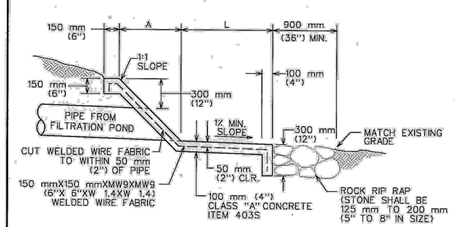
-No Scale-
All dimensions subject to allowable specification tolerances.

TITLE	PLANT	STATE	SECTION,PAGE	DATE
Top Options for 4' x 4' Precast Box	Grand Prairie Houston	TX	9.2	Feb 2016

FORTERRA

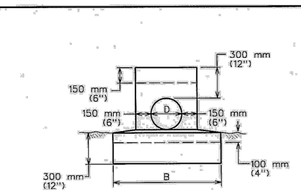


PLAN



SECTION A - A

CITY OF AUSTIN DEPARTMENT OF WATERSHED PROTECTION AND DEVELOPMENT REVIEW	HEADWALL FOR FILTRATION PONDS W/OUTFALL PIPE 150 mm (6") TO 375 mm (15") DIA.	STANDARD NO.
George E. Dawald 3/15/05 ADOPTED	THE ARCHITECT/ENGINEER ASSUMES RESPONSIBILITY FOR APPROPRIATE USE OF THIS STANDARD.	508S-15 1 OF 2

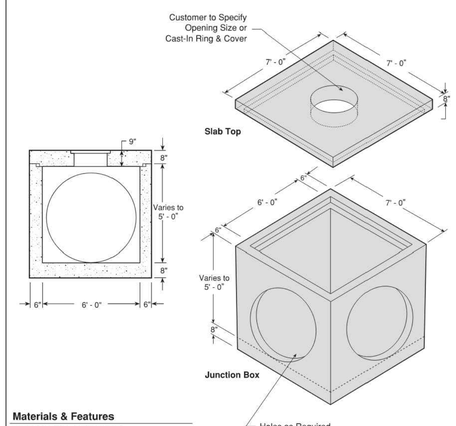


SECTION B - B

A	450 mm (18")	500 mm (20")	550 mm (22")	600 mm (24")	675 mm (27")
B	750 mm (30")	800 mm (32")	850 mm (34")	1.05 m (42")	1.27 m (51")
D	150 mm (6")	200 mm (8")	250 mm (10")	300 mm (12")	375 mm (15")
L	600 mm (24")	600 mm (24")	750 mm (30")	900 mm (36")	1.2 m (48")

CITY OF AUSTIN DEPARTMENT OF WATERSHED PROTECTION AND DEVELOPMENT REVIEW	HEADWALL FOR FILTRATION PONDS W/OUTFALL PIPE 150 mm (6") TO 375 mm (15") DIA.	STANDARD NO.
George E. Dawald 3/15/05 ADOPTED	THE ARCHITECT/ENGINEER ASSUMES RESPONSIBILITY FOR APPROPRIATE USE OF THIS STANDARD.	508S-15 2 OF 2

Precast Drainage Structures



Materials & Features

MAXIMUM PIPE SIZE 48" RCP
CONCRETE: 5,000 PSI
REINFORCING: per ASTM A-615 or A-185
H-20 LOADING
TOP SLAB WEIGHT: 5,600 Lbs.
JUNCTION BOX WEIGHT: 16,600 Lbs. (6' x 6' x 5')
EXTENSION SECTIONS AVAILABLE

-No Scale-
All dimensions subject to allowable specification tolerances.

TITLE	PLANT	STATE	SECTION,PAGE	DATE
6' x 6' Standard Junction Box With Variable Depths	Grand Prairie Houston Waco	TX	9.4	Feb 2016

FORTERRA

STATE OF TEXAS
STEVEN S. CRAUFORD
92677
LICENSED
PROFESSIONAL ENGINEER

09/12/2025

NO.	REVISION	DATE

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TBPE FIRM REGISTRATION #470 | TBPLS FIRM REGISTRATION #10028801

CITY OF GEORGETOWN, TEXAS
WOLF RANCH PKWY / MEMORIAL DR

CONSTRUCTION DETAILS
STORM DRAIN DETAILS 2 OF 2

CITY JOB No.
JOB NO. 51423-00
DATE 9/12/2025
DESIGNER
CHECKED SC DRAWN WT

SHEET 279A

Date: Sep 12, 2025, 10:11am User ID: cschultz
File: I:\Projects\514\23\00\301 Construction Documents\Civil\07514123-00.dwg

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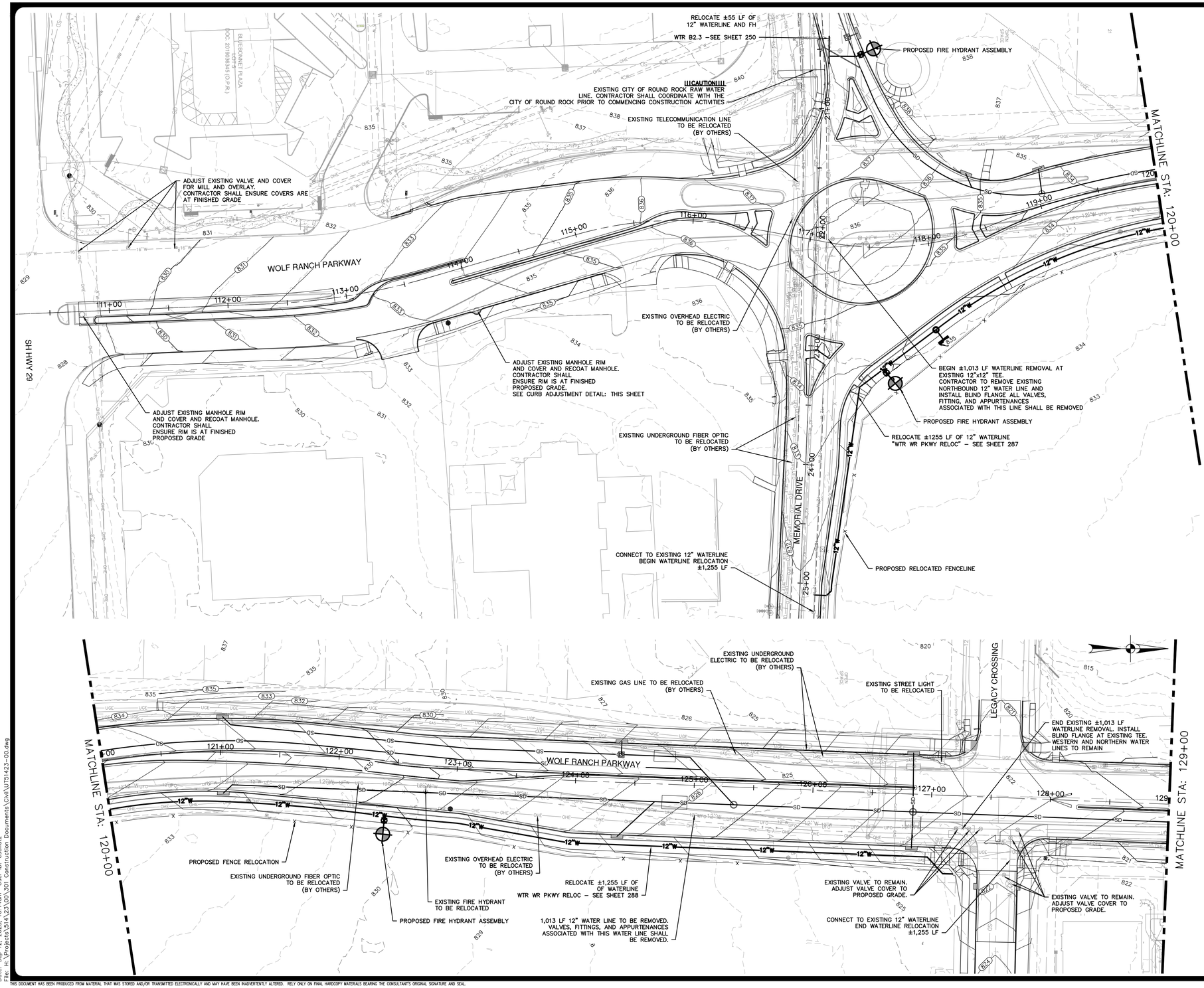

R 4.5 R 5 EXISTING MANHOLE 6" MH BOC FOC

CURB ADJUSTMENT AT EXISTING MANHOLE

STATE OF TEXAS STEVEN S. CRAUFORD 92677 LICENSED PROFESSIONAL ENGINEER

09/12/2025

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CITY OF GEORGETOWN, TEXAS
WOLF RANCH PKWY / MEMORIAL DR

UTILITY RELOCATION PLAN
SHEET 1 OF 7

CITY JOB No.
JOB NO. 51423-00
DATE 9/12/2025
DESIGNER WT
CHECKED ARC DRAWN WT

SHEET 280

Date: Sep 12, 2025, 10:14am User ID: cschultz
File: H:\Projects\51423\001\301 Construction Documents\Civil\U751423-00.dwg

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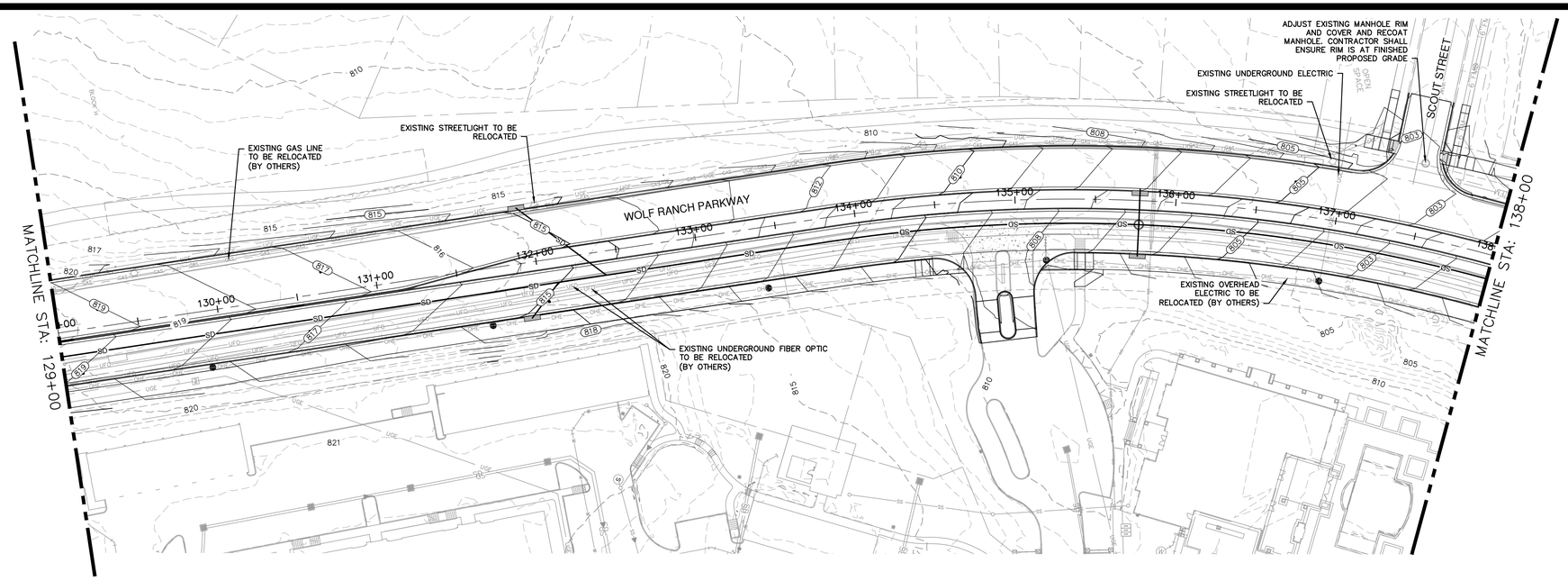

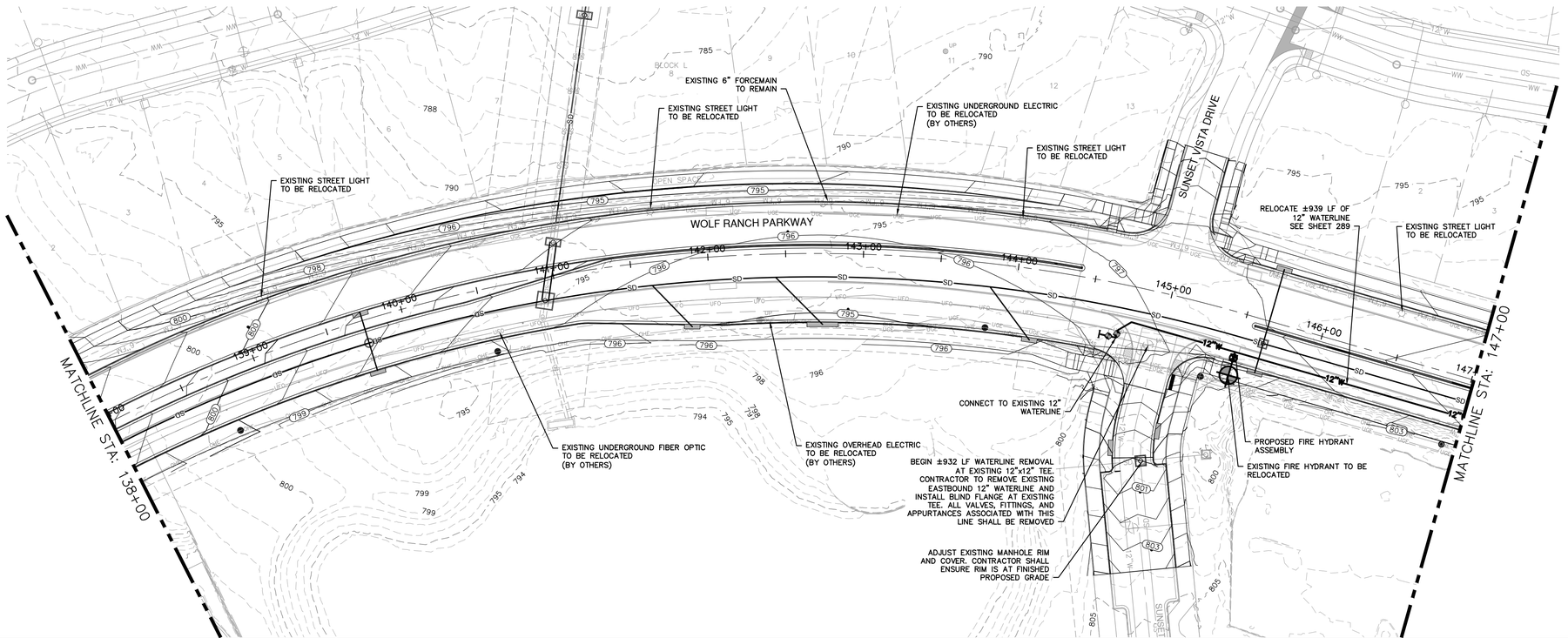

SCALE: 1" = 40'

0' 40' 80' 120'

LEGEND

- PROPOSED WATER LINE
- PROPOSED STORM DRAIN LINE & MH
- PROPOSED STORM DRAIN INLET
- PROPOSED GATE VALVE
- PROPOSED FIRE HYDRANT
- EXISTING GATE VALVE
- EXISTING FIRE HYDRANT
- EXISTING WATER LINE
- EXISTING 8" WATER LINE
- EXISTING 12" WATER LINE
- EXISTING 16" WATER LINE
- EXISTING 42" WATER LINE
- EXISTING WASTEWATER LINE
- EXISTING 8" WASTEWATER LINE
- EXISTING 10" WASTEWATER LINE
- EXISTING STORM DRAIN LINE
- EXISTING OVERHEAD ELECTRIC LINE
- EXISTING GAS LINE
- EXISTING UNDERGROUND FIBER OPTIC
- EXISTING UNDERGROUND TELE-COMM/CABLE TV
- EXISTING UNDERGROUND ELECTRIC
- EXISTING METAL FENCE
- EXISTING WOOD FENCE
- EXISTING BARBED WIRE FENCE
- EXISTING CONTOUR LINE
- PROPOSED CONTOUR LINE

STATE OF TEXAS
STEVEN S. CRAUFORD
92677
LICENSED
PROFESSIONAL ENGINEER

09/12/2025

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CITY OF GEORGETOWN, TEXAS
WOLF RANCH PKWY / MEMORIAL DR

UTILITY RELOCATION PLAN
SHEET 2 OF 7

CITY JOB No.
JOB NO. 51423-00
DATE 9/12/2025
DESIGNER WT
CHECKED ARC DRAWN WT

SHEET 281

Date: Sep 12, 2025, 10:15am User ID: cashatz
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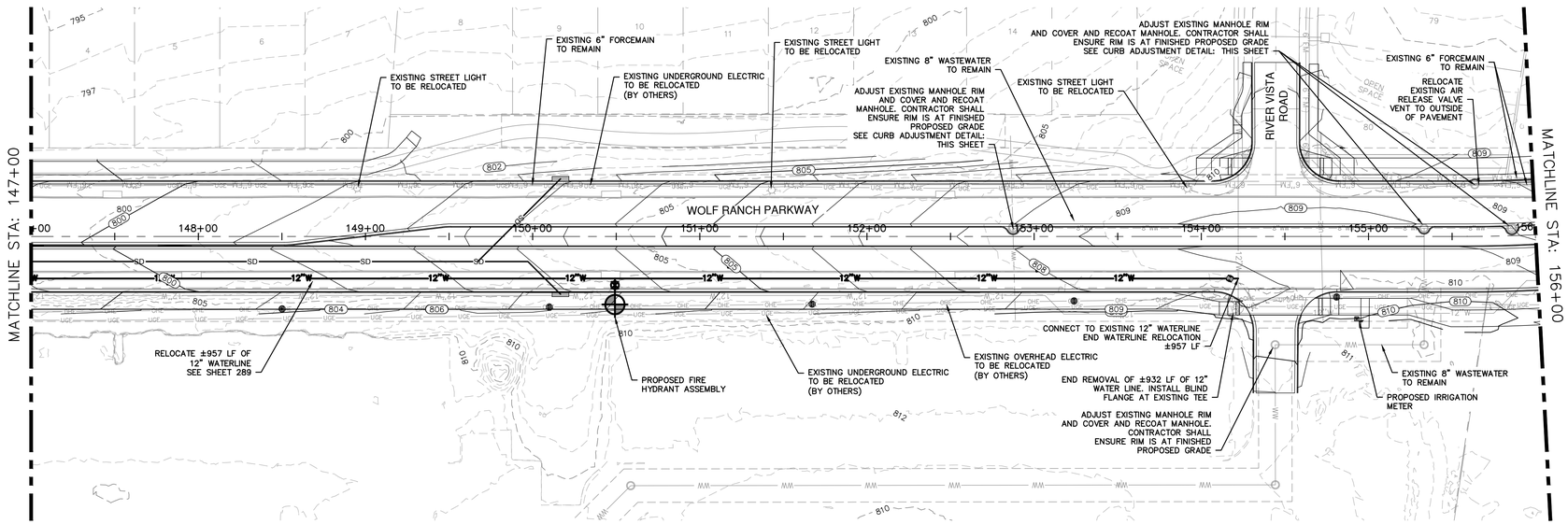

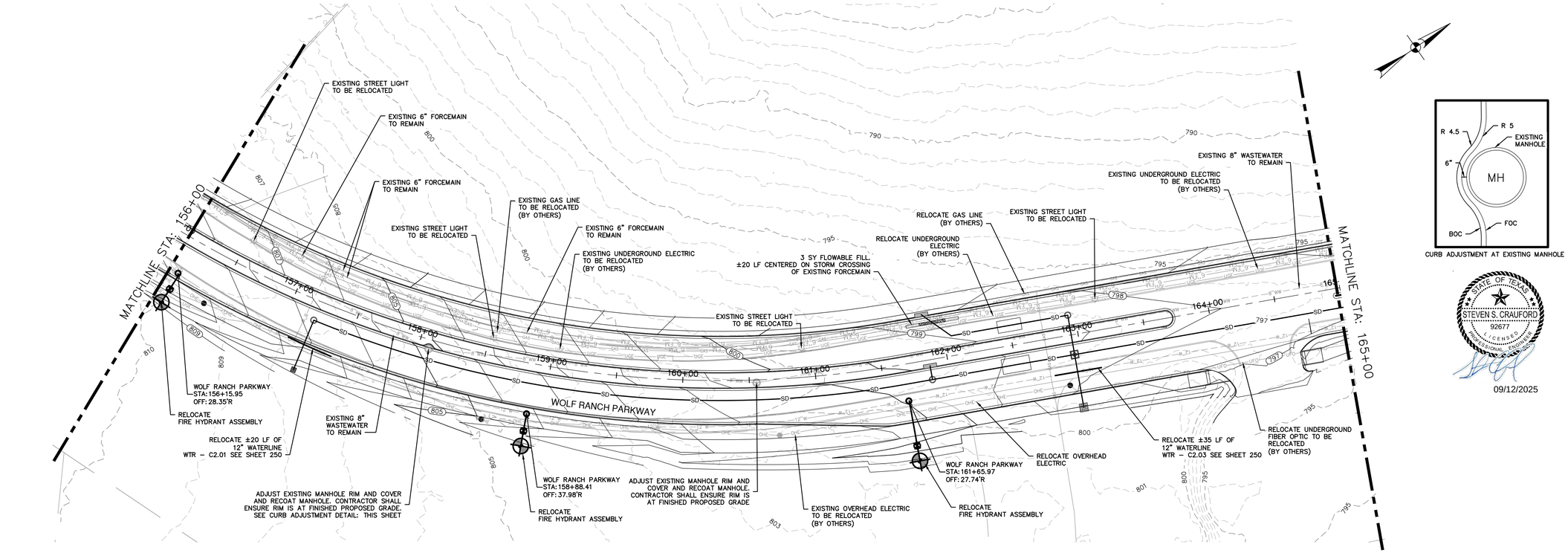

SCALE: 1" = 40'

0' 40' 80' 120'

LEGEND

- PROPOSED WATER LINE
- PROPOSED STORM DRAIN LINE & MH
- PROPOSED STORM DRAIN INLET
- PROPOSED GATE VALVE
- PROPOSED FIRE HYDRANT
- EXISTING GATE VALVE
- EXISTING FIRE HYDRANT
- EXISTING WATER LINE
- EXISTING 8" WATER LINE
- EXISTING 12" WATER LINE
- EXISTING 16" WATER LINE
- EXISTING 42" WATER LINE
- EXISTING WASTEWATER LINE
- EXISTING 8" WASTEWATER LINE
- EXISTING 10" WASTEWATER LINE
- EXISTING STORM DRAIN LINE
- EXISTING OVERHEAD ELECTRIC LINE
- EXISTING GAS LINE
- EXISTING UNDERGROUND FIBER OPTIC
- EXISTING UNDERGROUND TELE-COMM/CABLE TV
- EXISTING UNDERGROUND ELECTRIC
- EXISTING METAL FENCE
- EXISTING WOOD FENCE
- EXISTING BARBED WIRE FENCE
- EXISTING CONTOUR LINE
- PROPOSED CONTOUR LINE

CURB ADJUSTMENT AT EXISTING MANHOLE

STATE OF TEXAS
STEVEN S. CRAUFORD
92677
LICENSED
PROFESSIONAL ENGINEER

09/12/2025

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CITY OF GEORGETOWN, TEXAS
WOLF RANCH PKWY / MEMORIAL DR

UTILITY RELOCATION PLAN
SHEET 3 OF 7

CITY JOB No.
JOB NO. 51423-00
DATE 9/12/2025
DESIGNER WT
CHECKED ARC DRAWN WT

SHEET 282

Date: Sep 12, 2025, 10:17am User ID: cashatz
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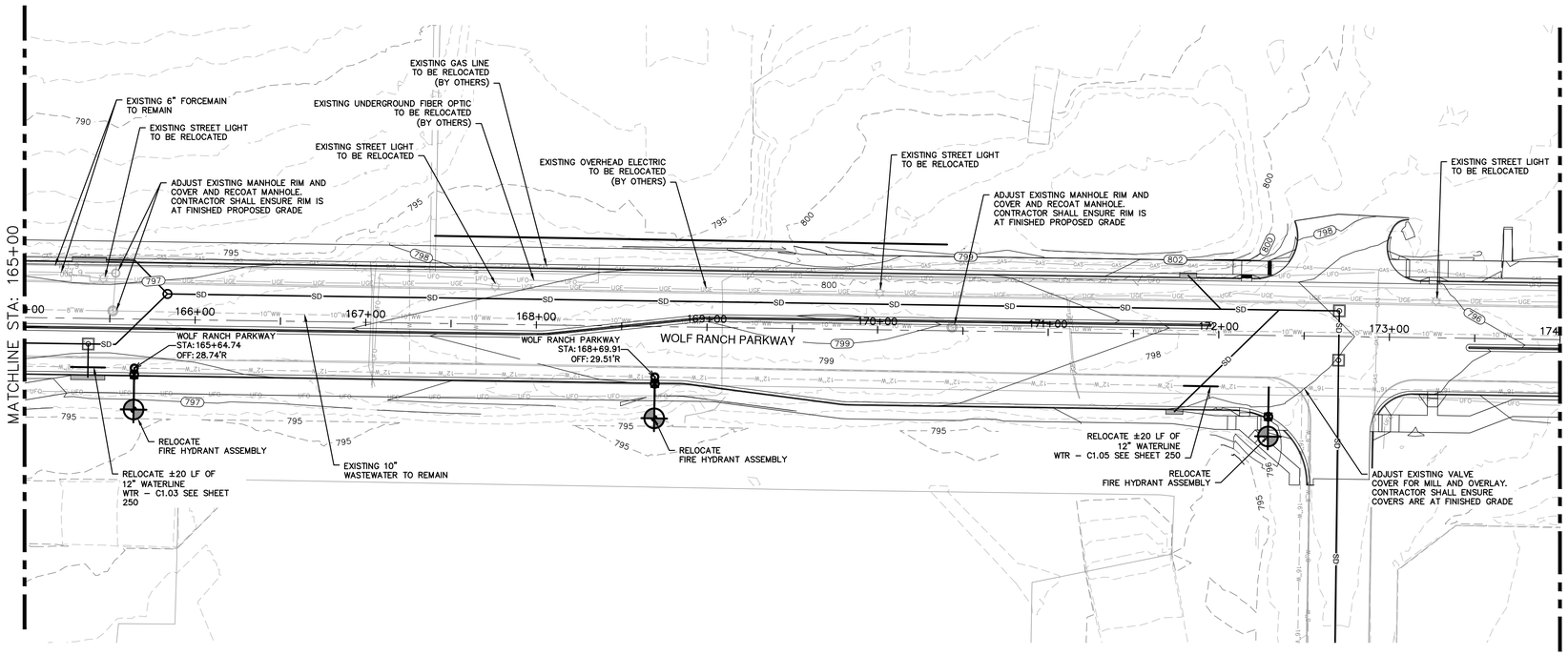

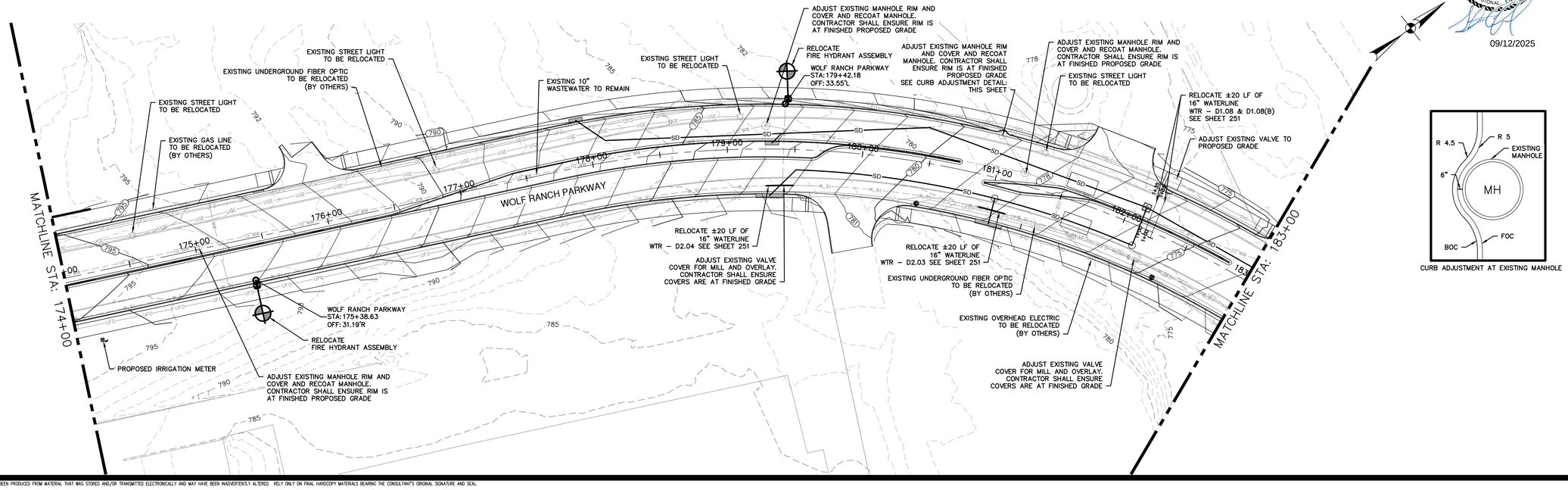

SCALE: 1"= 40'

0' 40' 80' 120'

LEGEND

- W — PROPOSED WATER LINE
- SD — PROPOSED STORM DRAIN LINE & MH
- PROPOSED STORM DRAIN INLET
- PROPOSED GATE VALVE
- PROPOSED FIRE HYDRANT
- EXISTING GATE VALVE
- EXISTING FIRE HYDRANT
- W — EXISTING WATER LINE
- 8"WW — EXISTING 8" WATER LINE
- 12"W — EXISTING 12" WATER LINE
- 16"W — EXISTING 16" WATER LINE
- 42"W — EXISTING 42" WATER LINE
- WW — EXISTING WASTEWATER LINE
- 8"WW — EXISTING 8" WASTEWATER LINE
- 10"WW — EXISTING 10" WASTEWATER LINE
- SD — EXISTING STORM DRAIN LINE
- OHE — OHE — EXISTING OVERHEAD ELECTRIC LINE
- GAS — EXISTING GAS LINE
- UFO — UFO — EXISTING UNDERGROUND FIBER OPTIC
- TELE — TELE — EXISTING UNDERGROUND TELE-COMM/CABLE TV
- UGE — UGE — EXISTING UNDERGROUND ELECTRIC
- EXISTING METAL FENCE
- EXISTING WOOD FENCE
- EXISTING BARBED WIRE FENCE
- 786 — EXISTING CONTOUR LINE
- 786 — PROPOSED CONTOUR LINE

CURB ADJUSTMENT AT EXISTING MANHOLE

STATE OF TEXAS
STEVEN S. CRAUFORD
92677
LICENSED PROFESSIONAL ENGINEER

09/12/2025

NO.	REVISION	DATE

GEORGETOWN TEXAS *more than welcome*

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CITY OF GEORGETOWN, TEXAS
WOLF RANCH PKWY / MEMORIAL DR

UTILITY RELOCATION PLAN
SHEET 4 OF 7

CITY JOB No.
JOB NO. 51423-00
DATE 9/12/2025
DESIGNER WT
CHECKED ARC DRAWN WT

SHEET 283

Date: Sep 12, 2025, 10:18am User ID: cashertz
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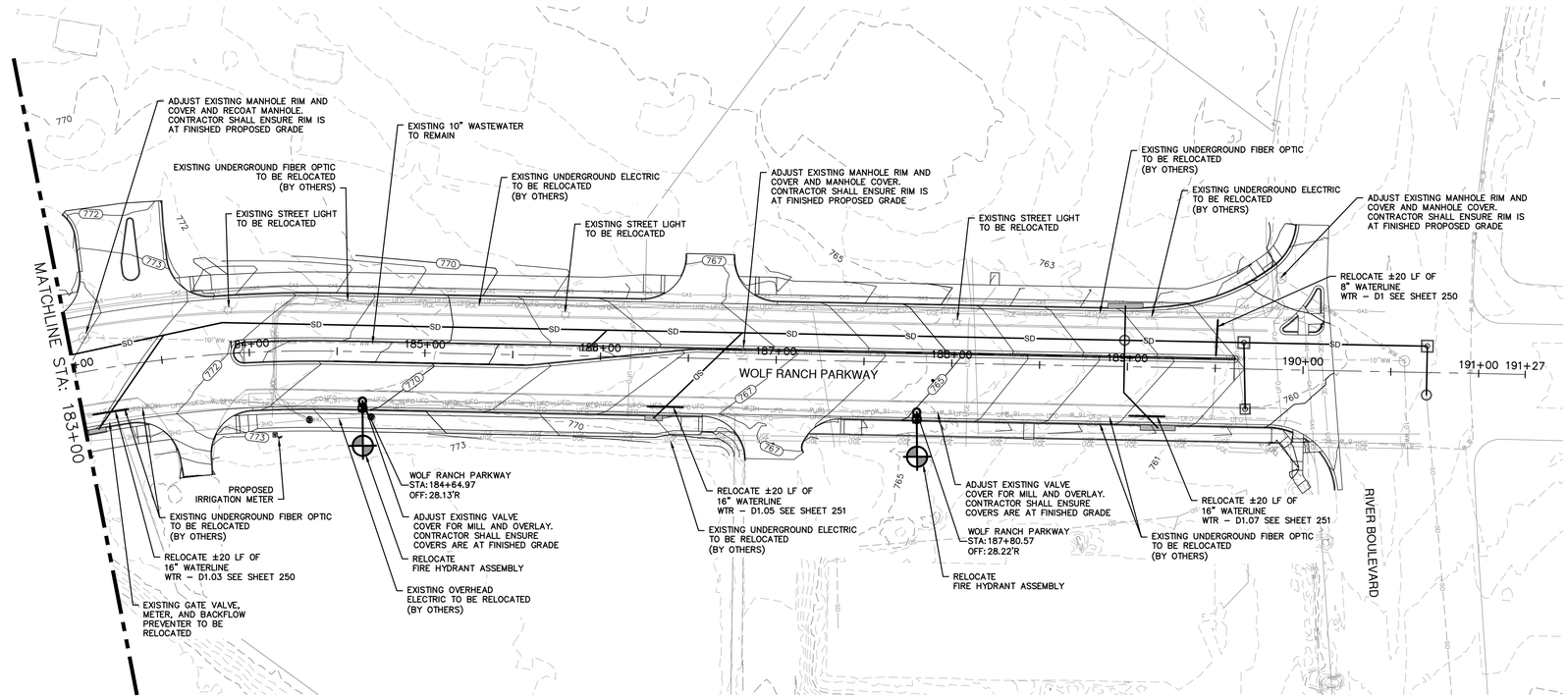

SCALE: 1" = 40'

0' 40' 80' 120'

LEGEND

- PROPOSED WATER LINE
- PROPOSED STORM DRAIN LINE & MH
- PROPOSED STORM DRAIN INLET
- PROPOSED GATE VALVE
- PROPOSED FIRE HYDRANT
- EXISTING GATE VALVE
- EXISTING FIRE HYDRANT
- EXISTING WATER LINE
- EXISTING 8" WATER LINE
- EXISTING 12" WATER LINE
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- EXISTING 42" WATER LINE
- EXISTING WASTEWATER LINE
- EXISTING 8" WASTEWATER LINE
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- EXISTING STORM DRAIN LINE
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- EXISTING GAS LINE
- EXISTING UNDERGROUND FIBER OPTIC
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- EXISTING UNDERGROUND ELECTRIC
- EXISTING METAL FENCE
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- PROPOSED CONTOUR LINE

STATE OF TEXAS
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CITY OF GEORGETOWN, TEXAS
WOLF RANCH PKWY / MEMORIAL DR

UTILITY RELOCATION PLAN
SHEET 5 OF 7

CITY JOB No.
JOB NO. 51423-00
DATE 9/12/2025
DESIGNER WT
CHECKED ARC DRAWN WT

SHEET 284

Date: Sep 12, 2025, 10:18am User ID: cashatz
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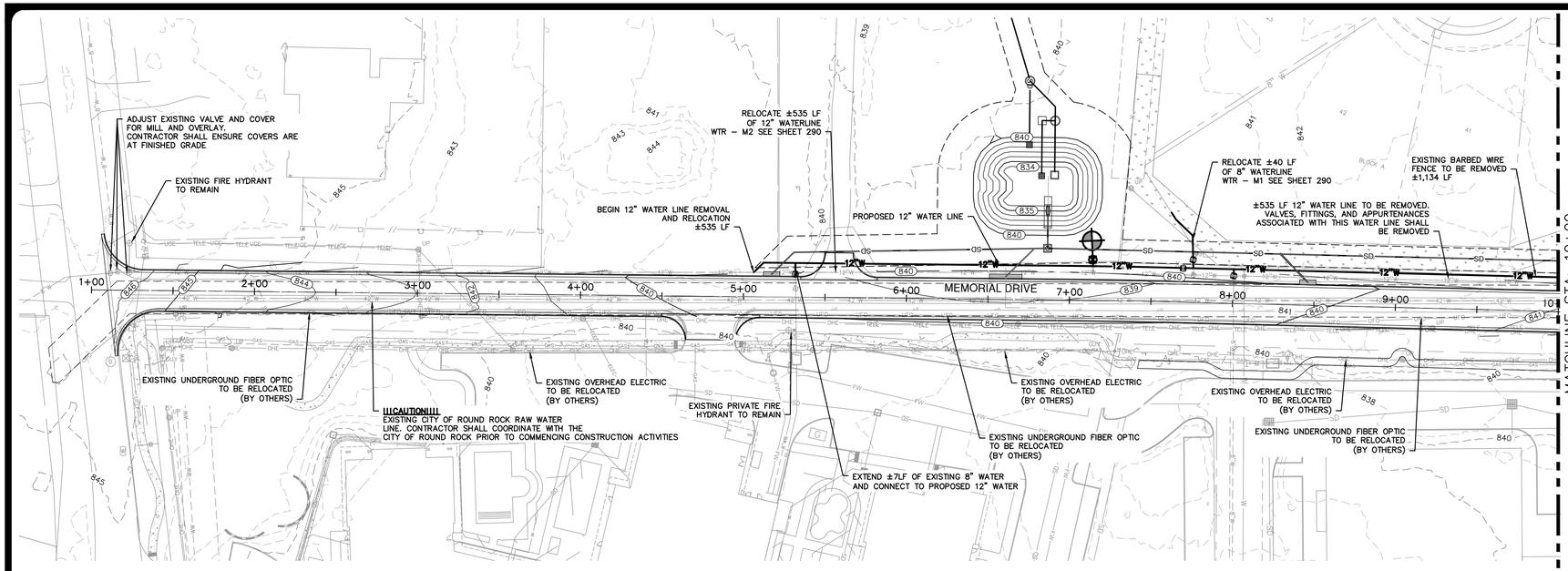

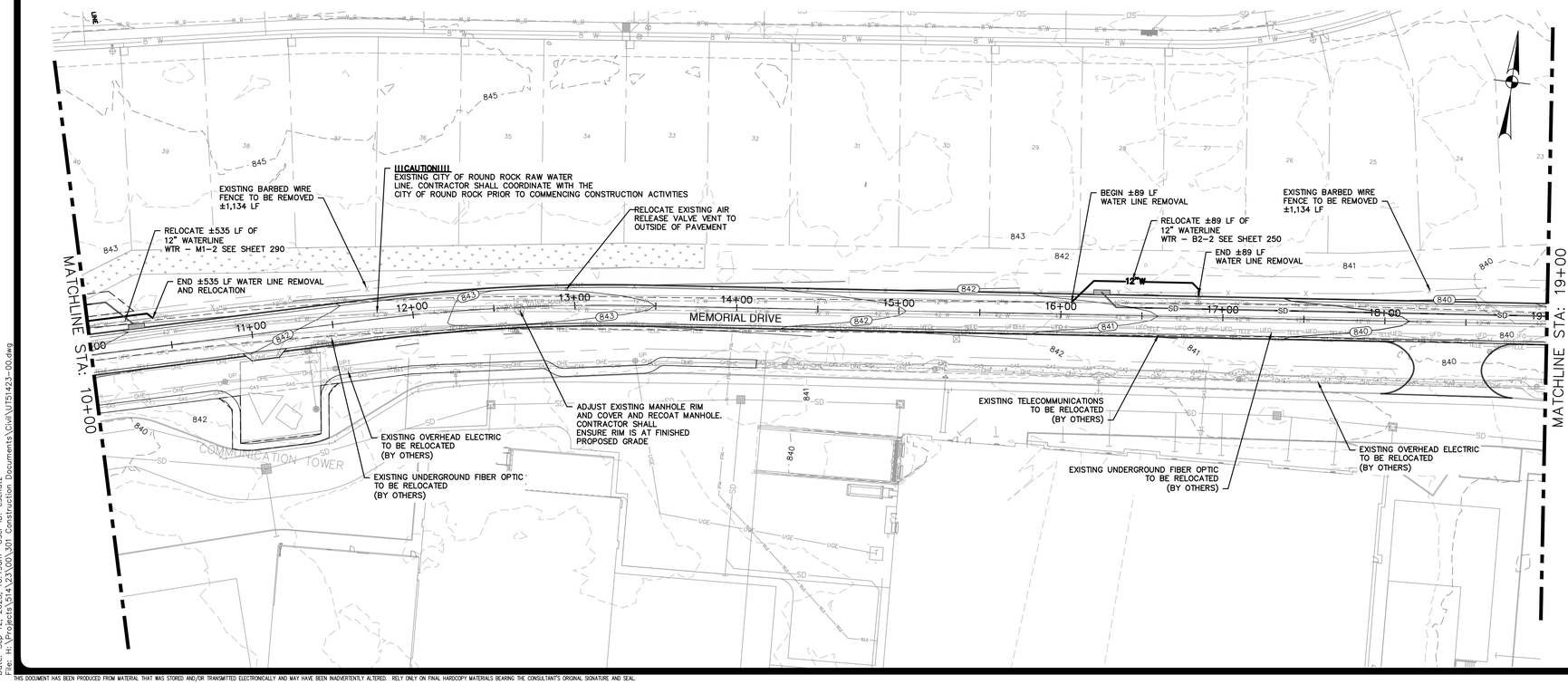

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STATE OF TEXAS
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09/12/2025

CITY OF GEORGETOWN, TEXAS
WOLF RANCH PKWY / MEMORIAL DR

UTILITY RELOCATION PLAN
SHEET 6 OF 7

CITY JOB No.
JOB NO. 51423-00
DATE 9/12/2025
DESIGNER WT
CHECKED ARC DRAWN WT

SHEET 285

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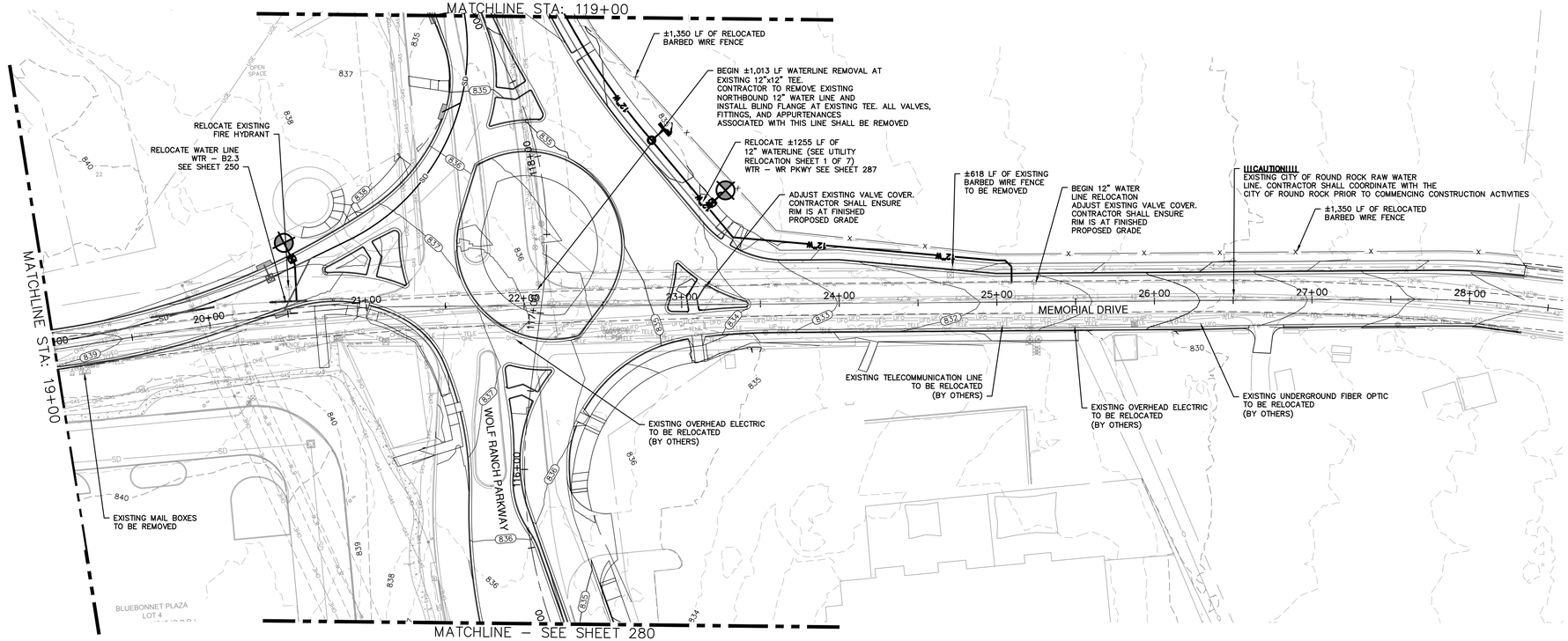

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STATE OF TEXAS
STEVEN S. CRAUFORD
92677
LICENSED PROFESSIONAL ENGINEER
09/12/2025

CITY OF GEORGETOWN, TEXAS
WOLF RANCH PKWY / MEMORIAL DR

UTILITY RELOCATION PLAN
SHEET 7 OF 7

CITY JOB No.
JOB NO. 51423-00
DATE 9/12/2025
DESIGNER WT
CHECKED ARC DRAWN WT

SHEET 286

Date: Sep 12, 2025, 10:20am User ID: cschatz
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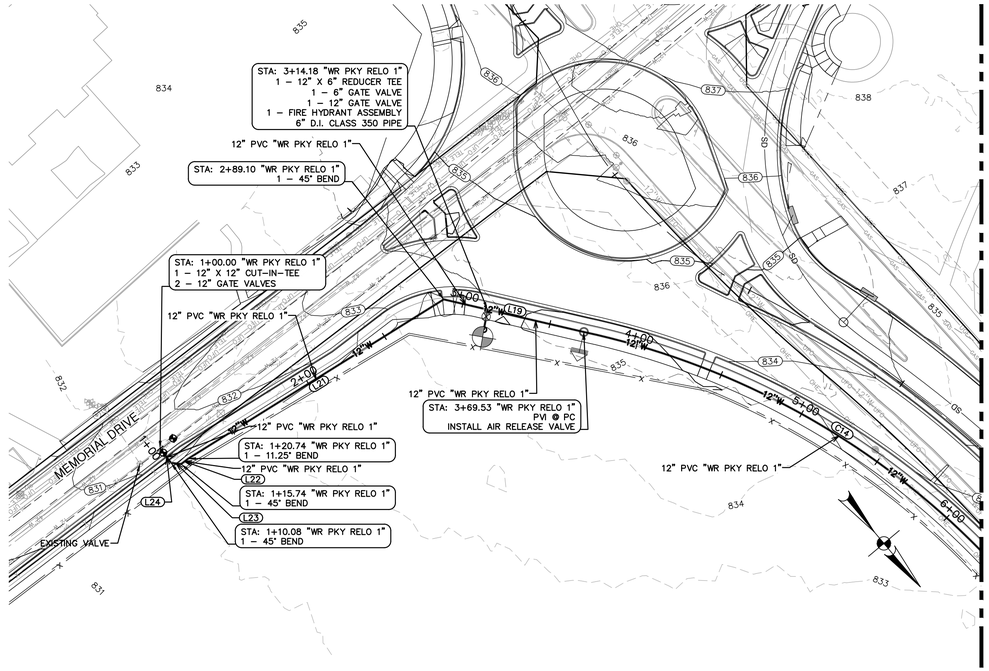


LINE TABLE		
LINE #	LENGTH	BEARING
L19	80.43'	S36°54'07"E
L21	168.37'	S81°56'20"E
L22	5.00'	S87°21'56"E
L23	5.66'	S42°21'56"E
L24	10.08'	S02°38'04"W

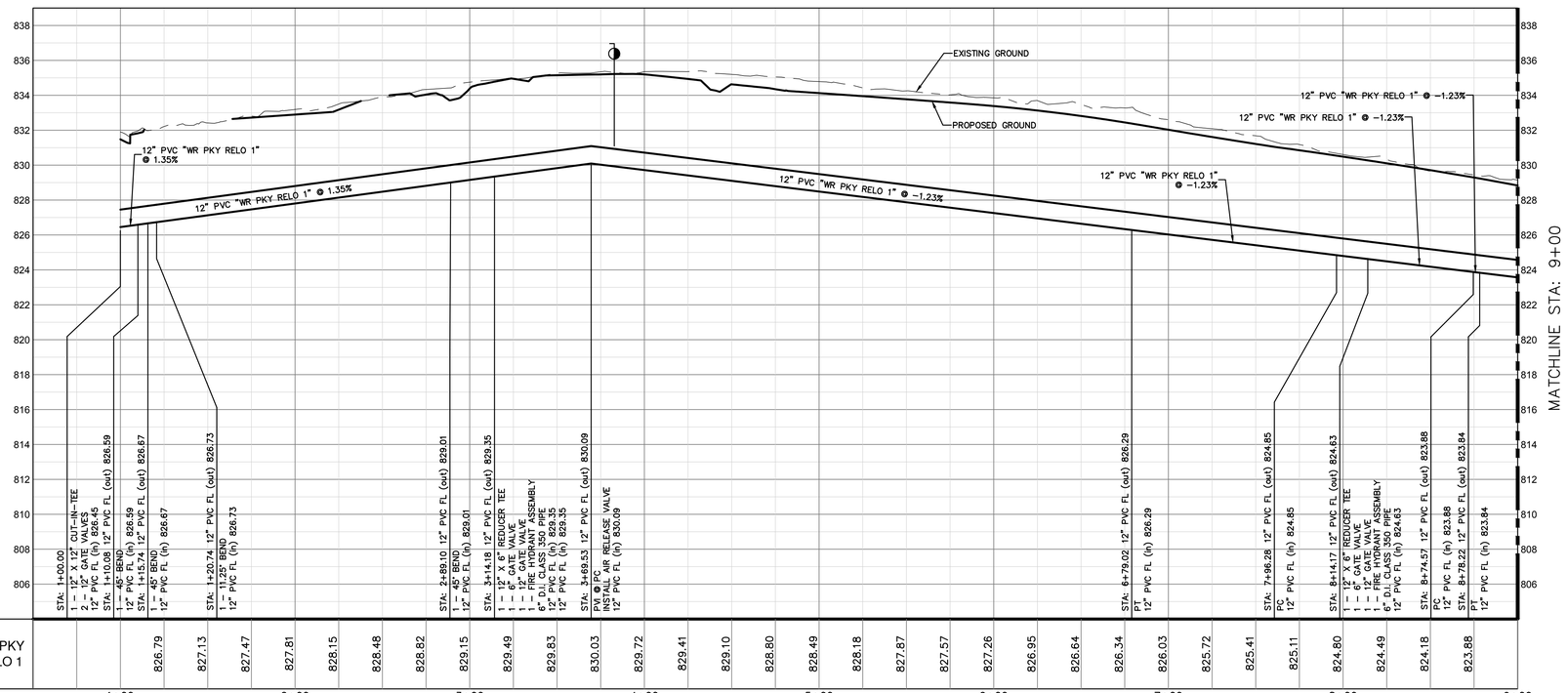
CURVE TABLE					
CURVE #	RADIUS	DELTA	CHORD BEARING	CHORD	LENGTH
C12	1828.05'	002°27'13"	S06°01'44"W	78.28'	78.29'
C13	1368.01'	004°54'41"	S04°52'48"W	117.23'	117.27'
C14	440.00'	040°18'03"	S17°43'34"E	303.15'	309.49'

SCALE: 1" = 40'

0' 40' 80' 120'

LEGEND

- PROPOSED WATER LINE (12"W)
- PROPOSED STORM DRAIN LINE & MH (SD)
- PROPOSED STORM DRAIN INLET
- PROPOSED GATE VALVE
- PROPOSED FIRE HYDRANT
- EXISTING GATE VALVE
- EXISTING FIRE HYDRANT
- EXISTING WATER LINE (W)
- EXISTING 8" WATER LINE (8"W)
- EXISTING 12" WATER LINE (12"W)
- EXISTING 16" WATER LINE (16"W)
- EXISTING 42" WATER LINE (42"W)
- EXISTING WASTEWATER LINE (WW)
- EXISTING 8" WASTEWATER LINE (8"WW)
- EXISTING 10" WASTEWATER LINE (10"WW)
- EXISTING STORM DRAIN LINE (SD)
- EXISTING OVERHEAD ELECTRIC LINE (OHE)
- EXISTING GAS LINE (GAS)
- EXISTING UNDERGROUND FIBER OPTIC (UFO)
- EXISTING UNDERGROUND TELE–COMM/CABLE TV (TELE)
- EXISTING UNDERGROUND ELECTRIC (UGE)
- EXISTING METAL FENCE
- EXISTING WOOD FENCE
- EXISTING BARBED WIRE FENCE
- EXISTING CONTOUR LINE (786)
- PROPOSED CONTOUR LINE (786)



NOTES

1. THE LOCATIONS OF EXISTING UNDERGROUND UTILITIES ARE SHOWN IN AN APPROXIMATE WAY ONLY AND HAVE NOT BEEN INDEPENDENTLY VERIFIED BY THE OWNER OR ITS REPRESENTATIVE. THE CONTRACTOR SHALL DETERMINE THE EXACT LOCATION OF ALL EXISTING UTILITIES BEFORE COMMENCING WORK, AND AGREES TO BE FULLY RESPONSIBLE FOR ANY AND ALL DAMAGES WHICH MIGHT BE ASSOCIATED BY THE CONTRACTOR'S FAILURE TO EXACTLY LOCATE AND PRESERVE ANY AND ALL UNDERGROUND UTILITIES.
2. CONSTRUCTION AROUND 42" RAW WATER LINE SHALL BE COORDINATED WITH CITY OF ROUND ROCK

STATE OF TEXAS
STEVEN S. CRAUFORD
92677
LICENSED PROFESSIONAL ENGINEER

09/12/2025

PROFILE SCALES:

1" = 40' HORIZONTAL
1" = 4' VERTICAL

PROFILE LEGEND:

NATURAL GROUND
SUBGRADE
FINISHED GRADE
PROPOSED WATER
1–JOINT OF PRESSURE PIPE SEE NOTE THIS SHEET.
STEEL ENCASEMENT WITH SPACERS SEE CONSTRUCTION DETAILS

NO.	REVISION	DATE

GEORGETOWN TEXAS more than welcome

PAPE-DAWSON ENGINEERS
AUSTIN | SAN ANTONIO | HOUSTON | FORT WORTH | DALLAS
10801 N MOPAC EXPY, BLDG 3, STE 200 | AUSTIN, TX 78759 | 512.454.8711
TBPE FIRM REGISTRATION #470 | TBPLS FIRM REGISTRATION #10028801

CITY OF GEORGETOWN, TEXAS
WOLF RANCH PKWY / MEMORIAL DR

WR PKWY WATERLINE RELOC - STA 1+00 - 9+00

CITY JOB No.
JOB NO. 51423-00
DATE 9/12/2025
DESIGNER WT
CHECKED ARC DRAWN WT

SHEET 287

Date: Sep 12, 2025, 10:03am User ID: cschultz
File: H:\Projects\51423\00\301 Construction Documents\Civil\WT51423-00.dwg

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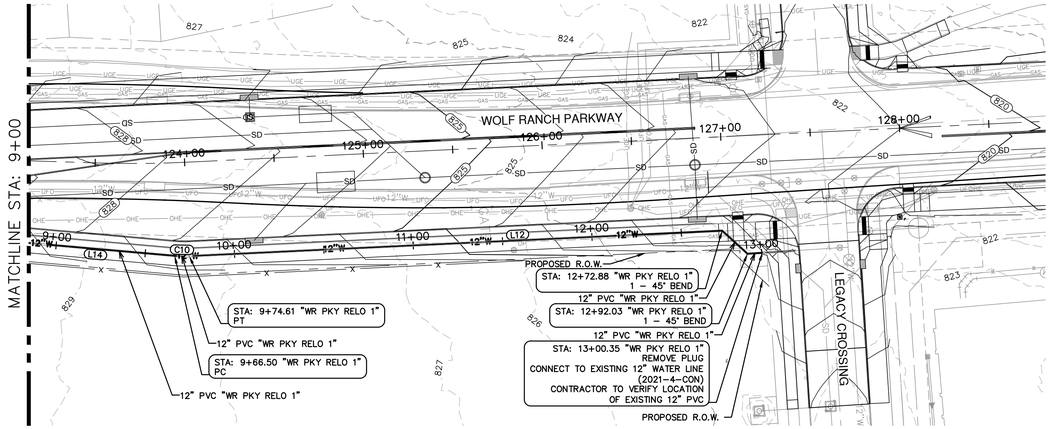

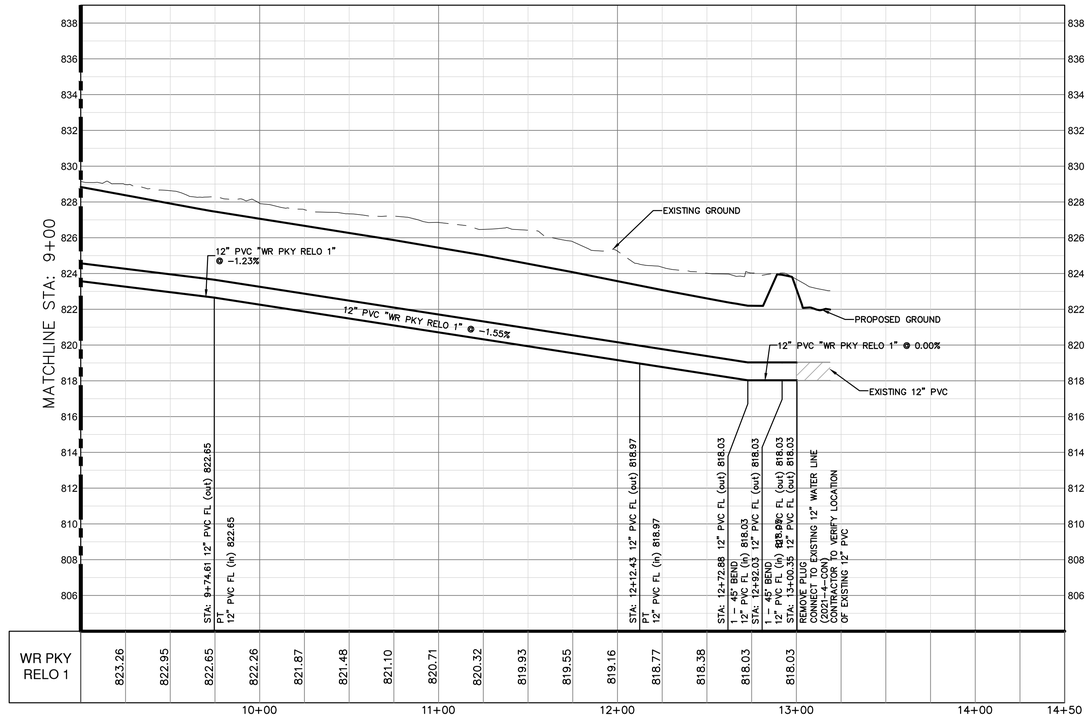



LEGEND

- PROPOSED WATER LINE
- PROPOSED STORM DRAIN LINE & MH
- PROPOSED STORM DRAIN INLET
- PROPOSED GATE VALVE
- PROPOSED FIRE HYDRANT
- EXISTING GATE VALVE
- EXISTING FIRE HYDRANT
- EXISTING WATER LINE
- EXISTING 8" WATER LINE
- EXISTING 12" WATER LINE
- EXISTING 16" WATER LINE
- EXISTING 42" WATER LINE
- EXISTING WASTEWATER LINE
- EXISTING 8" WASTEWATER LINE
- EXISTING 10" WASTEWATER LINE
- EXISTING STORM DRAIN LINE
- EXISTING OVERHEAD ELECTRIC LINE
- EXISTING GAS LINE
- EXISTING UNDERGROUND FIBER OPTIC
- EXISTING UNDERGROUND TELE-COMM/CABLE TV
- EXISTING UNDERGROUND ELECTRIC
- EXISTING METAL FENCE
- EXISTING WOOD FENCE
- EXISTING BARBED WIRE FENCE
- EXISTING CONTOUR LINE
- PROPOSED CONTOUR LINE

NOTES

1. THE LOCATIONS OF EXISTING UNDERGROUND UTILITIES ARE SHOWN IN AN APPROXIMATE WAY ONLY AND HAVE NOT BEEN INDEPENDENTLY VERIFIED BY THE OWNER OR ITS REPRESENTATIVE. THE CONTRACTOR SHALL DETERMINE THE EXACT LOCATION OF ALL EXISTING UTILITIES BEFORE COMMENCING WORK, AND AGREES TO BE FULLY RESPONSIBLE FOR ANY AND ALL DAMAGES WHICH MIGHT BE ASSOCIATED BY THE CONTRACTOR'S FAILURE TO EXACTLY LOCATE AND PRESERVE ANY AND ALL UNDERGROUND UTILITIES.
2. CONSTRUCTION AROUND 42" RAW WATER LINE SHALL BE COORDINATED WITH CITY OF ROUND ROCK

STATE OF TEXAS
STEVEN S. CRAUFORD
92677
LICENSED
PROFESSIONAL ENGINEER

09/12/2025

PROFILE SCALES:

1" = 40' HORIZONTAL
1" = 4' VERTICAL

PROFILE LEGEND:

- NATURAL GROUND
- SUBGRADE
- FINISHED GRADE
- PROPOSED WATER
- 1–JOINT OF PRESSURE PIPE SEE NOTE THIS SHEET.
- STEEL ENCASEMENT WITH SPACERS SEE CONSTRUCTION DETAILS

NO.	REVISION	DATE

GEORGETOWN TEXAS
more than welcome

PAPE-DAWSON ENGINEERS
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10801 N MOPAC EXPY, BLDG 3, STE 200 I AUSTIN, TX 78759 I 512.454.8711
TBPE FIRM REGISTRATION #470 I TBPLS FIRM REGISTRATION #10028801

CITY OF GEORGETOWN, TEXAS
WOLF RANCH PKWY / MEMORIAL DR

WR PKWY WATERLINE RELOC - STA 9+00 - END

CITY JOB No.
JOB NO. 51423-00
DATE 9/12/2025
DESIGNER WT
CHECKED ARC DRAWN WT

SHEET 288

Date: Sep 12, 2025, 10:24am User ID: cashatz
File: I:\Projects\514\23\00\301 Construction Documents\Civil\WT51423-00.dwg
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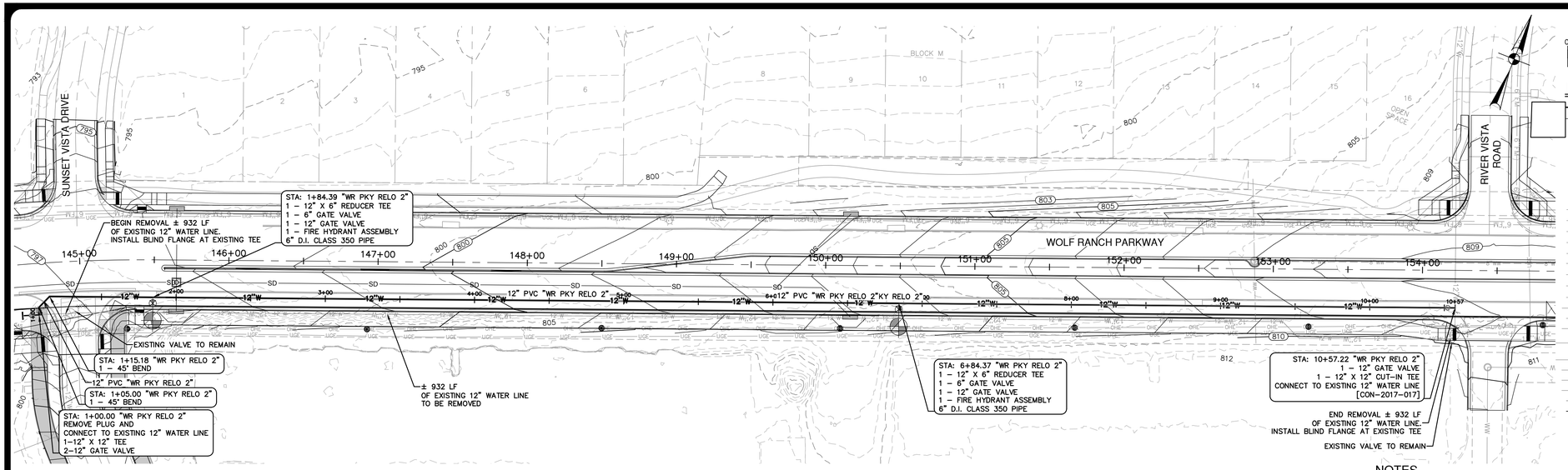

NOTES

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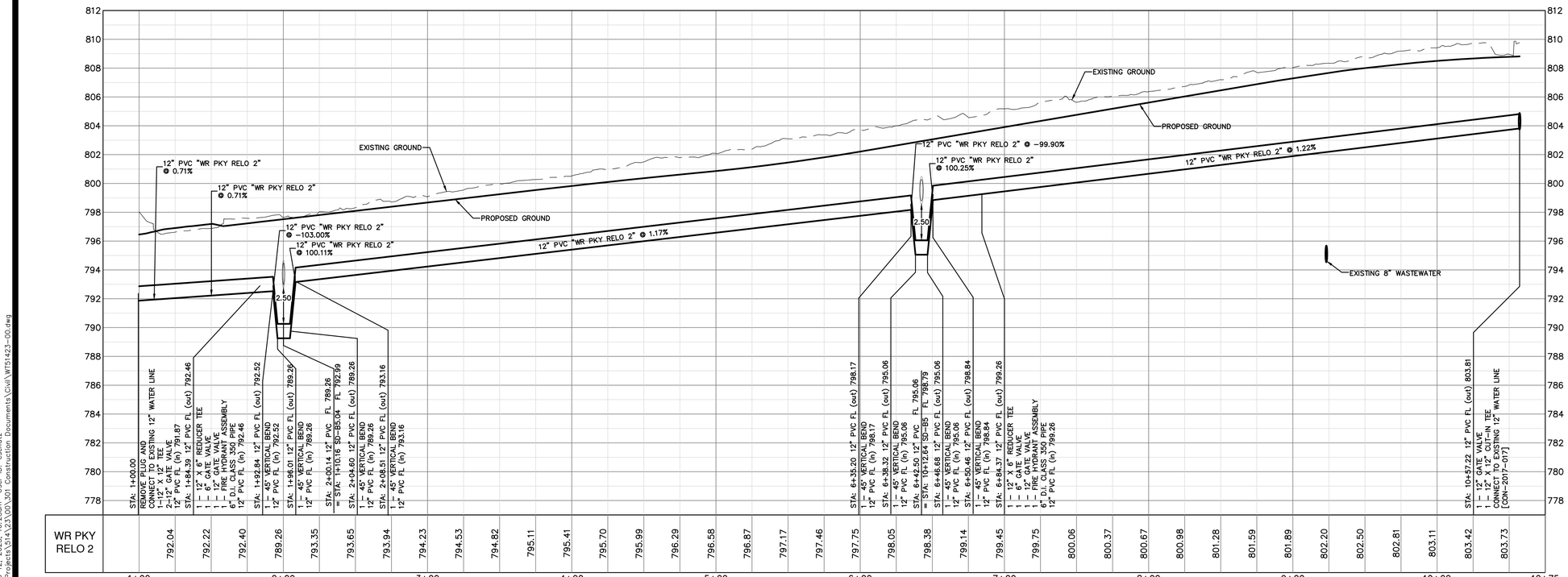
2. CONSTRUCTION AROUND 42" RAW WATER LINE SHALL BE COORDINATED WITH CITY OF ROUND ROCK

PROFILE SCALES:

1" = 40' HORIZONTAL
1" = 4' VERTICAL

PROFILE LEGEND:

NATURAL GROUND
SUBGRADE
FINISHED GRADE
PROPOSED WATER
1–JOINT OF PRESSURE PIPE SEE NOTE THIS SHEET.
STEEL ENCASEMENT WITH SPACERS SEE CONSTRUCTION DETAILS





09/12/2025

DATE
NO. REVISION

GEORGETOWN TEXAS more than welcome

PAPE-DAWSON ENGINEERS
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TBPE FIRM REGISTRATION #470 | TBPLS FIRM REGISTRATION #10028801

CITY OF GEORGETOWN, TEXAS
WOLF RANCH PKWY / MEMORIAL DR

WR PKWY WATERLINE RELOC 2 - STA 1+00 - END

CITY JOB No.
JOB NO. 51423-00
DATE 9/12/2025
DESIGNER WT
CHECKED ARC DRAWN WT

SHEET 289

Date: Sep 12, 2025, 10:25am User ID: rashatz
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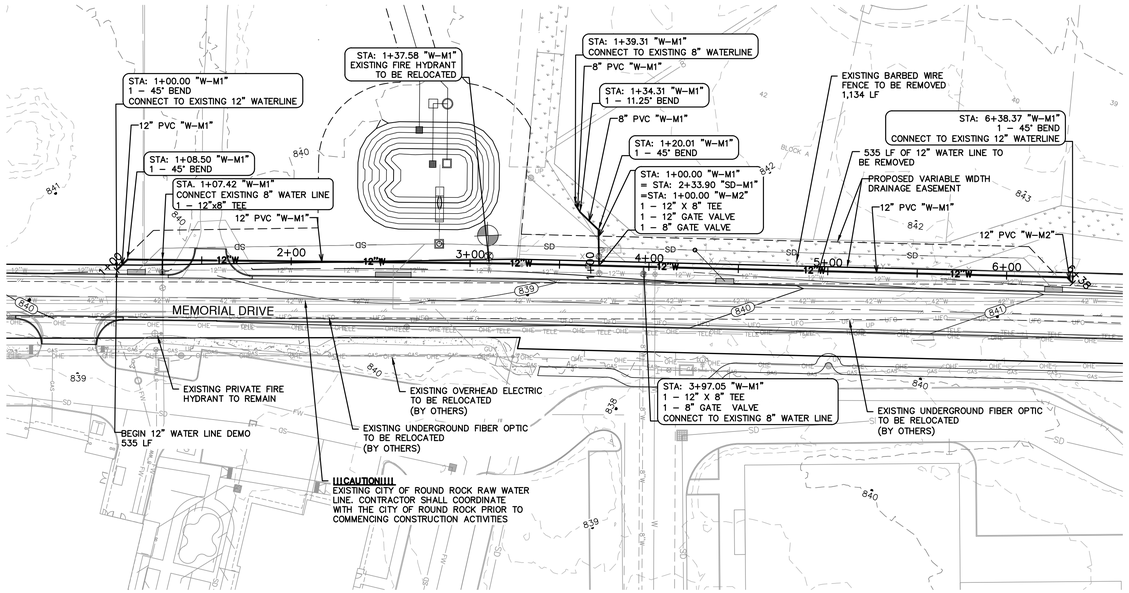
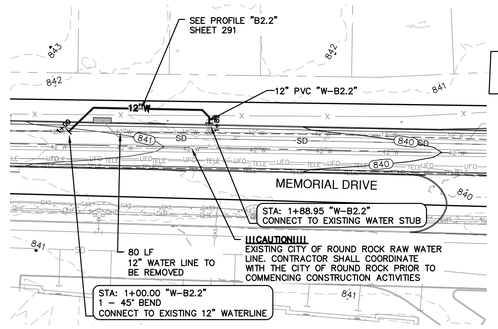
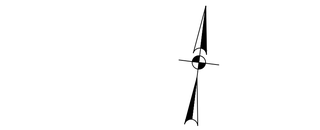
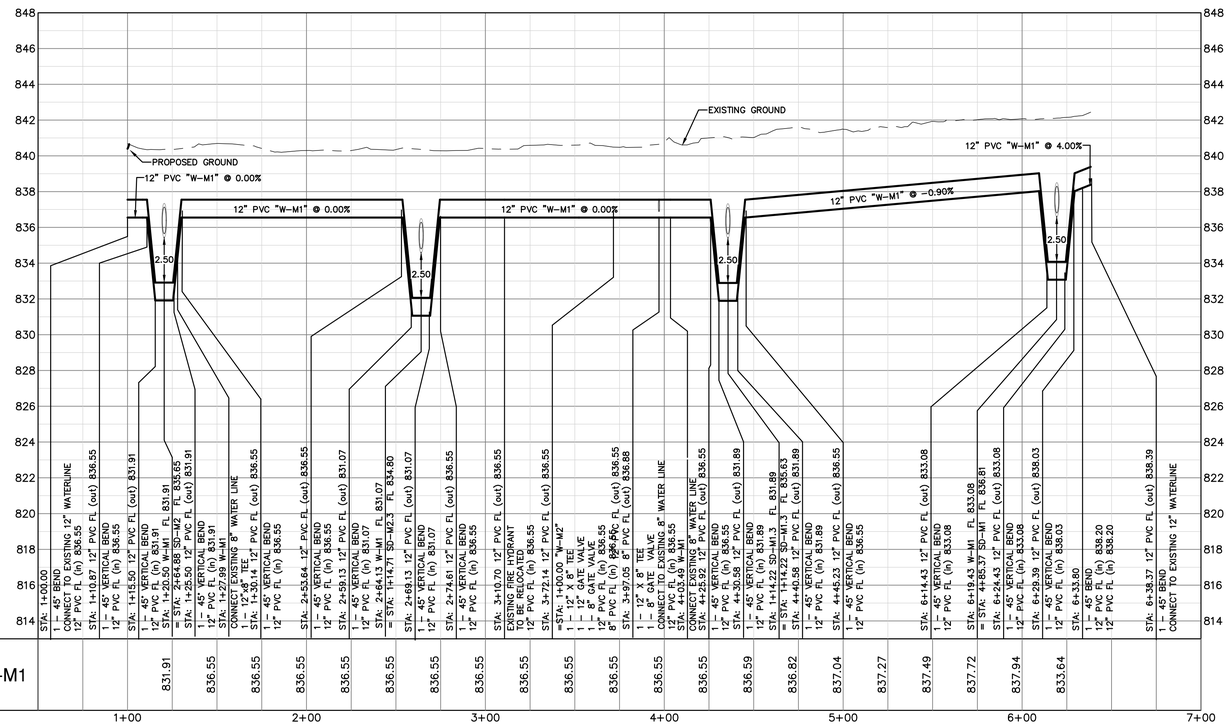






LEGEND

- PROPOSED WATER LINE
- PROPOSED STORM DRAIN LINE & MH
- PROPOSED STORM DRAIN INLET
- PROPOSED GATE VALVE
- PROPOSED FIRE HYDRANT
- EXISTING GATE VALVE
- EXISTING FIRE HYDRANT
- EXISTING WATER LINE
- EXISTING 8" WATER LINE
- EXISTING 12" WATER LINE
- EXISTING 16" WATER LINE
- EXISTING 42" WATER LINE
- EXISTING WASTEWATER LINE
- EXISTING 8" WASTEWATER LINE
- EXISTING 10" WASTEWATER LINE
- EXISTING STORM DRAIN LINE
- EXISTING OVERHEAD ELECTRIC LINE
- EXISTING GAS LINE
- EXISTING UNDERGROUND FIBER OPTIC
- EXISTING UNDERGROUND TELE-COMM/CABLE TV
- EXISTING UNDERGROUND ELECTRIC
- EXISTING METAL FENCE
- EXISTING WOOD FENCE
- EXISTING BARBED WIRE FENCE
- EXISTING CONTOUR LINE
- PROPOSED CONTOUR LINE



NOTES

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2. CONSTRUCTION AROUND 42" RAW WATER LINE SHALL BE COORDINATED WITH CITY OF ROUND ROCK



09/12/2025

PROFILE SCALES:

1" = 40' HORIZONTAL
1" = 4' VERTICAL

PROFILE LEGEND:

NATURAL GROUND
SUBGRADE
FINISHED GRADE
PROPOSED WATER
1–JOINT OF PRESSURE PIPE SEE NOTE THIS SHEET.
STEEL ENCASEMENT WITH SPACERS SEE CONSTRUCTION DETAILS

NO.	REVISION	DATE

GEORGETOWN TEXAS *more than welcome*

PAPE-DAWSON ENGINEERS
AUSTIN I SAN ANTONIO I HOUSTON I FORT WORTH I DALLAS
10801 N MOPAC EXPY, BLDG 3, STE 200 I AUSTIN, TX 78759 I 512.454.8711
TBPE FIRM REGISTRATION #470 I TBPLS FIRM REGISTRATION #10028801

CITY OF GEORGETOWN, TEXAS
WOLF RANCH PKWY / MEMORIAL DR

MEMORIAL DRIVE WATERLINE RELOCATIONS

CITY JOB No.
JOB NO. 51423-00
DATE 9/12/2025
DESIGNER WT
CHECKED ARC DRAWN WT

SHEET 290

Date: Sep 12, 2025, 10:36am User ID: cashatz
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Date: Sep 12, 2025, 10:28am User ID: cschatz
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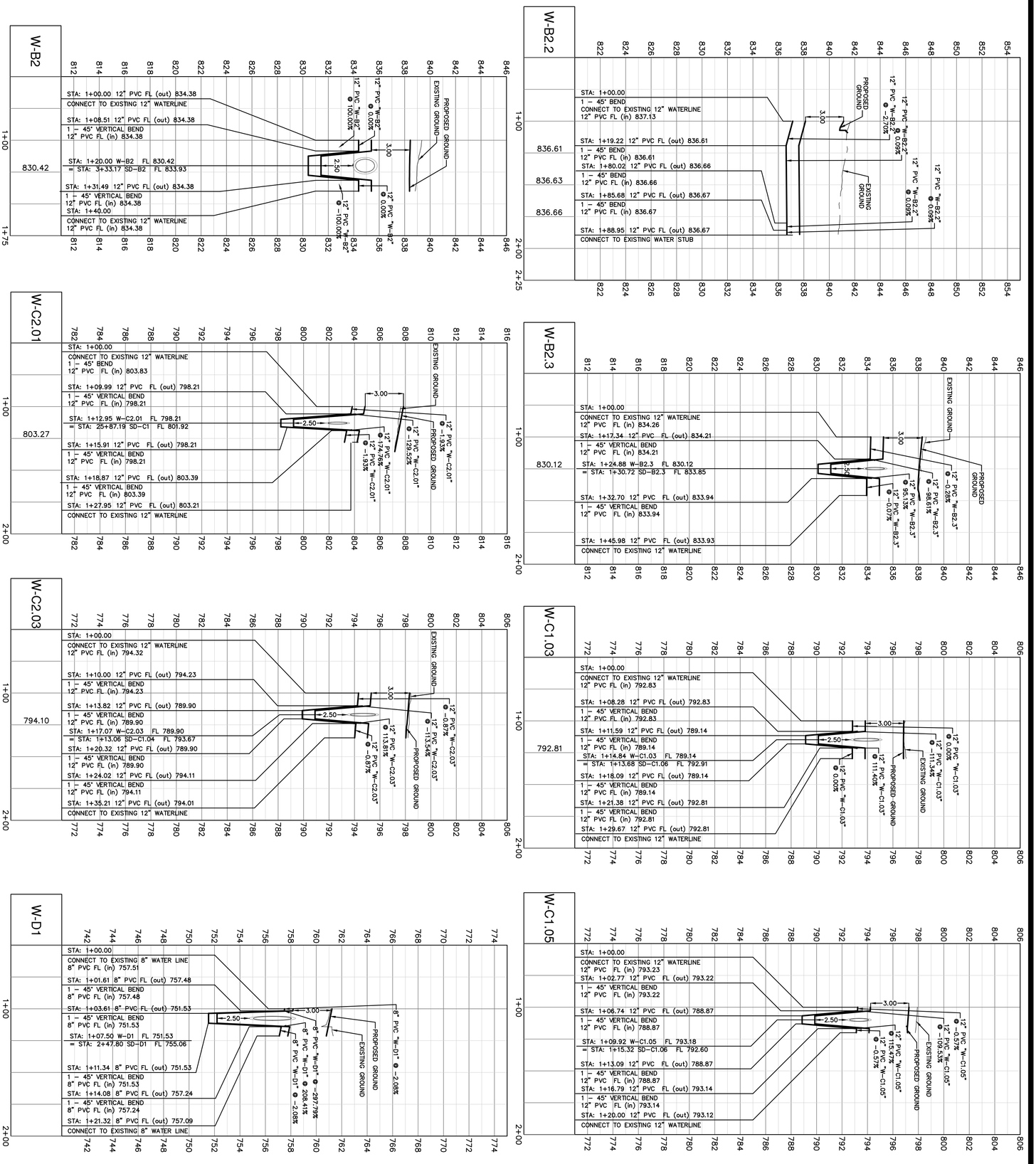

PROFILE SCALES:
1" = 40' HORIZONTAL
1" = 4' VERTICAL

PROFILE LEGEND:
NATURAL GROUND
SUBGRADE
FINISHED GRADE
PROPOSED WATER
JOINT OF PRESSURE PIPE WITH STEEL ENCASEMENT SEE NOTE THIS SHEET.
CONSTRUCTION DETAILS

STATE OF TEXAS
STEVEN S. CRAWFORD
103201
LICENSED PROFESSIONAL ENGINEER
09/12/2025

CITY JOB No. ____
JOB NO. 51423-00
DATE 9/12/2025
DESIGNER WT
CHECKED JRC DRAWN WT
SHEET 291

CITY OF GEORGETOWN, TEXAS
WOLF RANCH PKWY / MEMORIAL DR

WATER RELOCATION PROFILES 1

PAPE-DAWSON ENGINEERS
AUSTIN I SAN ANTONIO I HOUSTON I FORT WORTH I DALLAS
10801 N MOPAC EXPY, BLDG 3, STE 200 I AUSTIN, TX 78759 I 512.454.8711
TBPE FIRM REGISTRATION #470 I TBPLS FIRM REGISTRATION #10028801

GEORGETOWN TEXAS
more than welcome

NO.	REVISION	DATE

NO.	REVISION	DATE

GEORGETOWN TEXAS *more than welcome*

PAPE-DAWSON ENGINEERS
AUSTIN I SAN ANTONIO I HOUSTON I FORT WORTH I DALLAS
10801 N MOPAC EXPY, BLDG 3, STE 200 I AUSTIN, TX 78759 I 512.454.8711
TBPE FIRM REGISTRATION #470 I TBPLS FIRM REGISTRATION #10028801

CITY OF GEORGETOWN, TEXAS
WOLF RANCH PKWY / MEMORIAL DR

WATER RELOCATION PROFILES 2 1 OF 2

STATE OF TEXAS
STEVEN S. CRAUFORD
92677
LICENSED
PROFESSIONAL ENGINEER

09/12/2025

CITY JOB No.
JOB NO. 51423-00
DATE 9/12/2025
DESIGNER WT
CHECKED ARC DRAWN WT

SHEET 292

Date: Sep 12, 2025, 10:29am User ID: cashatt
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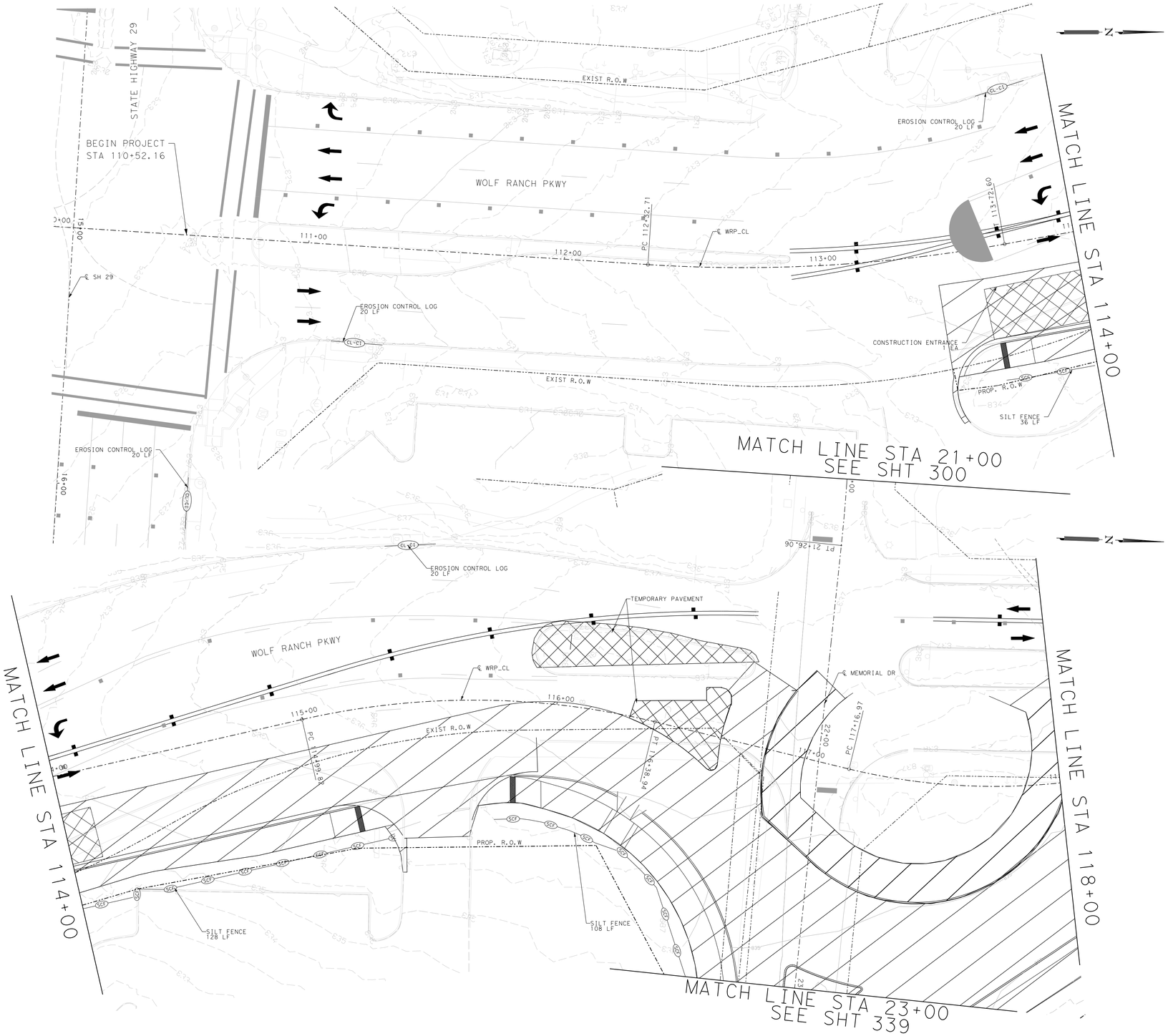


LEGEND

- CONSTRUCTION WORK ZONE
- TYPE III BARRICADE
- TRAFFIC FLOW ARROWS
- SIGN
- FLOW ARROW
- TRAFFIC FLOW ARROWS
- SCF — SILT FENCE
- RFD2 — ROCK BERM
- CONSTRUCTION PHASE
- CONSTRUCTION ENTRANCE/EXIT
- TOPSOIL AND SEEDING
- CL-C1 — EROSION CONTROL LOG
- 850 — EXISTING CONTOURS
- 850 — PROPOSED CONTOURS
- PROPOSED TRUNKLINE

NOTES

1. THE MEASURES SHOWN ARE SUGGESTED PLACEMENTS OF SW3P ITEMS. THE ENGINEER MAY MODIFY AS FIELD CONDITIONS REQUIRE.
2. SW3P LAYOUTS CORRESPOND WITH TCP PHASING.
3. SEDIMENT CONTROL FENCE SHALL BE REPLACED BY CONTRACTOR AS NEEDED IN SUBSEQUENT PHASES OFCONSTRUCTION.
4. STAGING, STORAGE, AND SPOILS LOCATIONS ARE ONLY PERMITTED WITHIN THE CONSTRUCTION AREA.
5. PER TPDES REQUIREMENTS, DISTRIBUTED AREAS ON WHICH CONSTRUCTION ACTIVITIES HAVE CEASED (TEMPORARILY OR PERMANENTLY) SHALL BE STABILIZED WITHIN 14 DAYS UNLESS ACTIVITY RESUMES WITHIN 21 DAYS. SEEDING DOES NOT CONSTITUTE AS STABILIZATION.
6. EROSION CONTROL LOGS TO REMAIN UNTIL THE COMPLETION OF ALL SW3P PHASES UNLESS OTHERWISE NOTED.
7. TOP OF ROCK FILTER DAMS SHALL NOT BE CONSTRUCTED HIGHER THAN ADJACENT EDGE OF PAVEMENT.

DESIGN

STATE OF TEXAS — BRET CHAPMAN — 127293 — LICENSED PROFESSIONAL ENGINEER

BRET CHAPMAN, P.E. — 9/16/2025 DATE

APPROVAL

STATE OF TEXAS — BRIAN A. ALLEN — 123374 — LICENSED PROFESSIONAL ENGINEER

BRIAN A. ALLEN, P.E. — 9/16/2025 DATE

NO.	REVISION	DATE

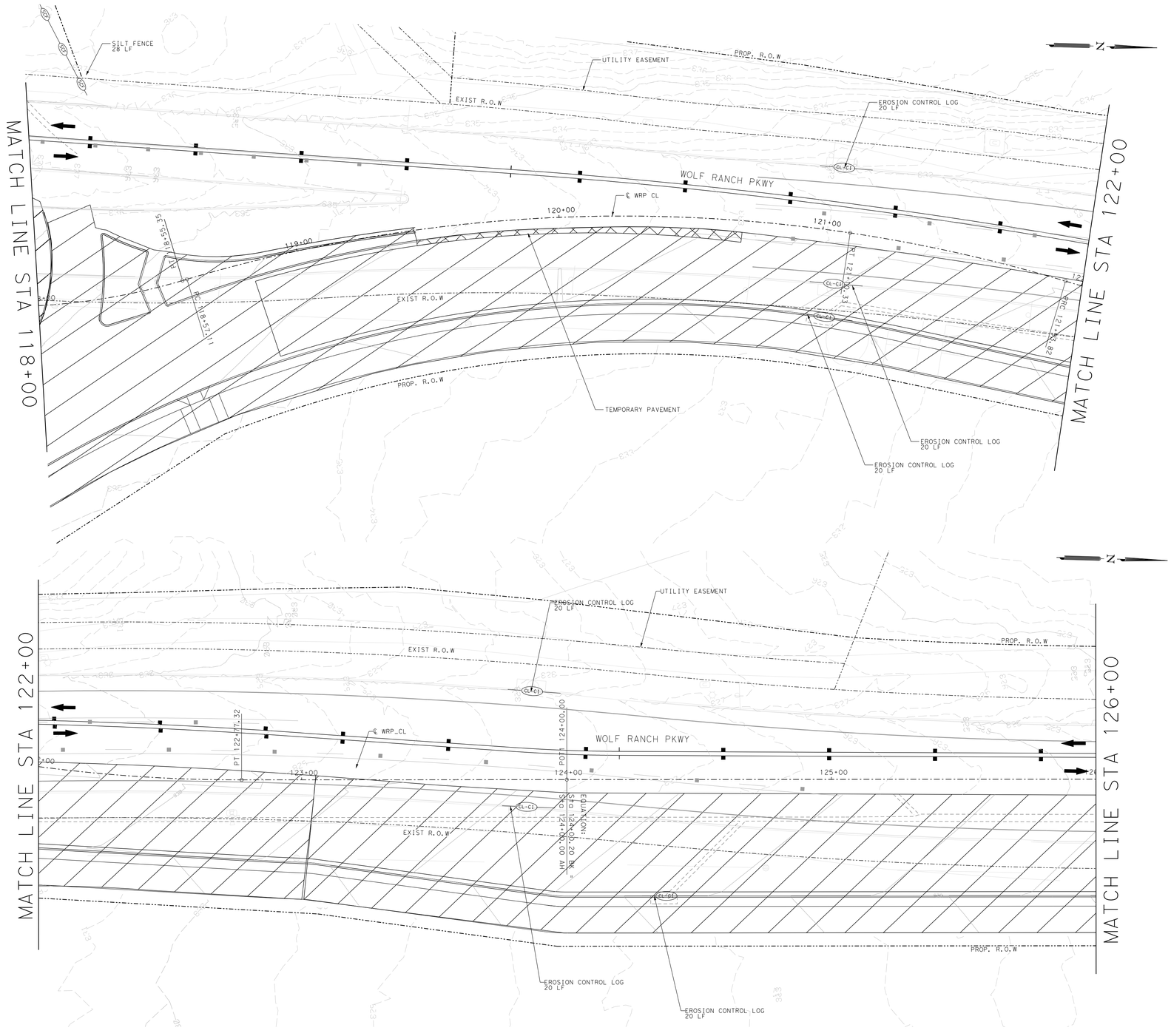
GEORGETOWN TEXAS *more than welcome*

WOLF RANCH PKWY / MEMORIAL DR
SW3P LAYOUT PHASE I

CITY JOB No.
JOB NO. 51423-04
DATE 9/16/2025
DESIGNER
CHECKED DRAWN

SHEET 1 OF 9

SHEET NO. 293



LEGEND

- TRAFFIC FLOW ARROWS
- FLOW ARROW
- SILT FENCE (SCF)
- ROCK BERM (RFD2)
- CONSTRUCTION PHASE
- CONSTRUCTION ENTRANCE/EXIT
- TOPSOIL AND SEEDING
- EROSION CONTROL LOG (EL-CL)
- EXISTING CONTOURS (850)
- PROPOSED CONTOURS (850)
- PROPOSED TRUNKLINE

SCALE: 1"= 20'

0' 20' 40' 60'

NOTES

1. THE MEASURES SHOWN ARE SUGGESTED PLACEMENTS OF SW3P ITEMS. THE ENGINEER MAY MODIFY AS FIELD CONDITIONS REQUIRE.
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DESIGN

STATE OF TEXAS — BRET CHAPMAN — 127293 — LICENSED PROFESSIONAL ENGINEER

BRET CHAPMAN, P.E. — 9/16/2025 DATE

APPROVAL

STATE OF TEXAS — BRIAN A. ALLEN — 123374 — LICENSED PROFESSIONAL ENGINEER

BRIAN A. ALLEN, P.E. — 9/16/2025 DATE

NO.	REVISION	DATE

GEORGETOWN TEXAS *more than welcome*

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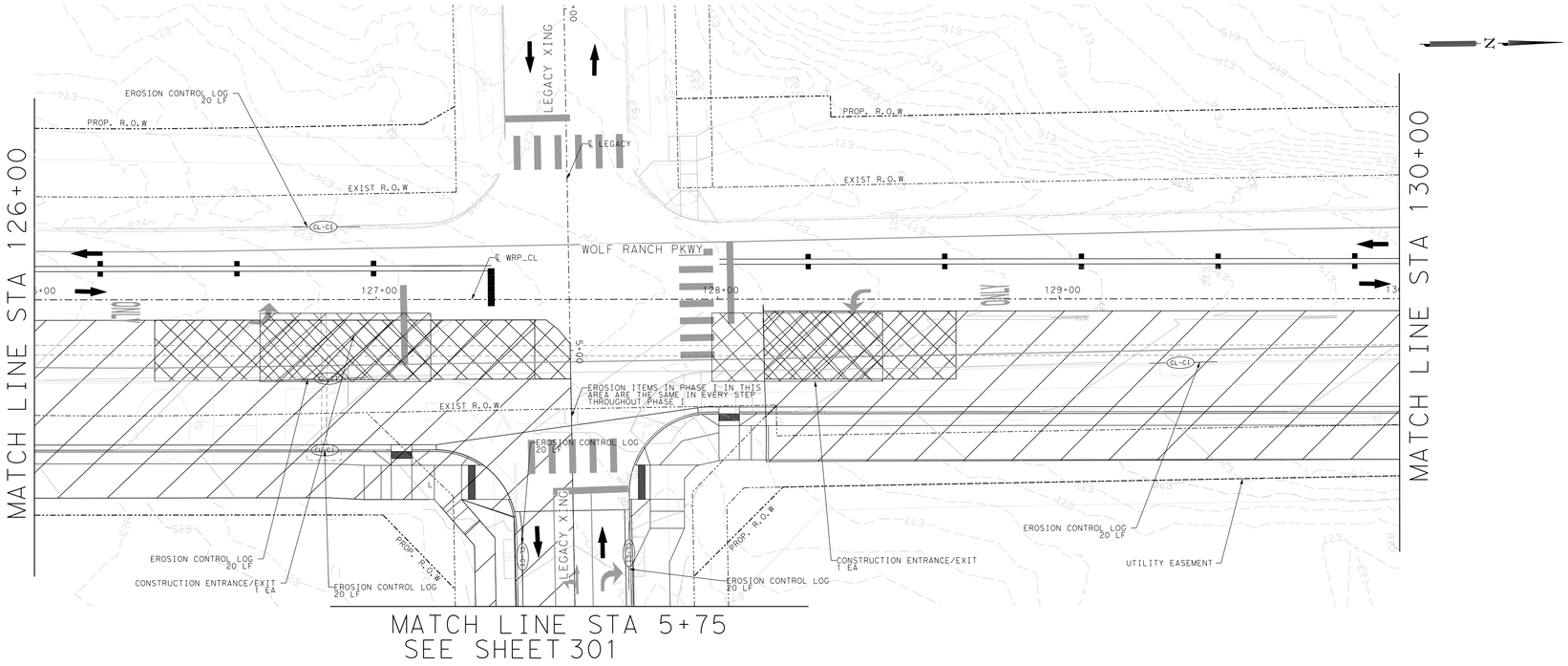
10801 N MOPAC EXPY, BLDG 3, STE 200 I AUSTIN, TX 78759 I 512.454.8711
TEXAS ENGINEERING FIRM #470 I TEXAS SURVEYING FIRM #10028800

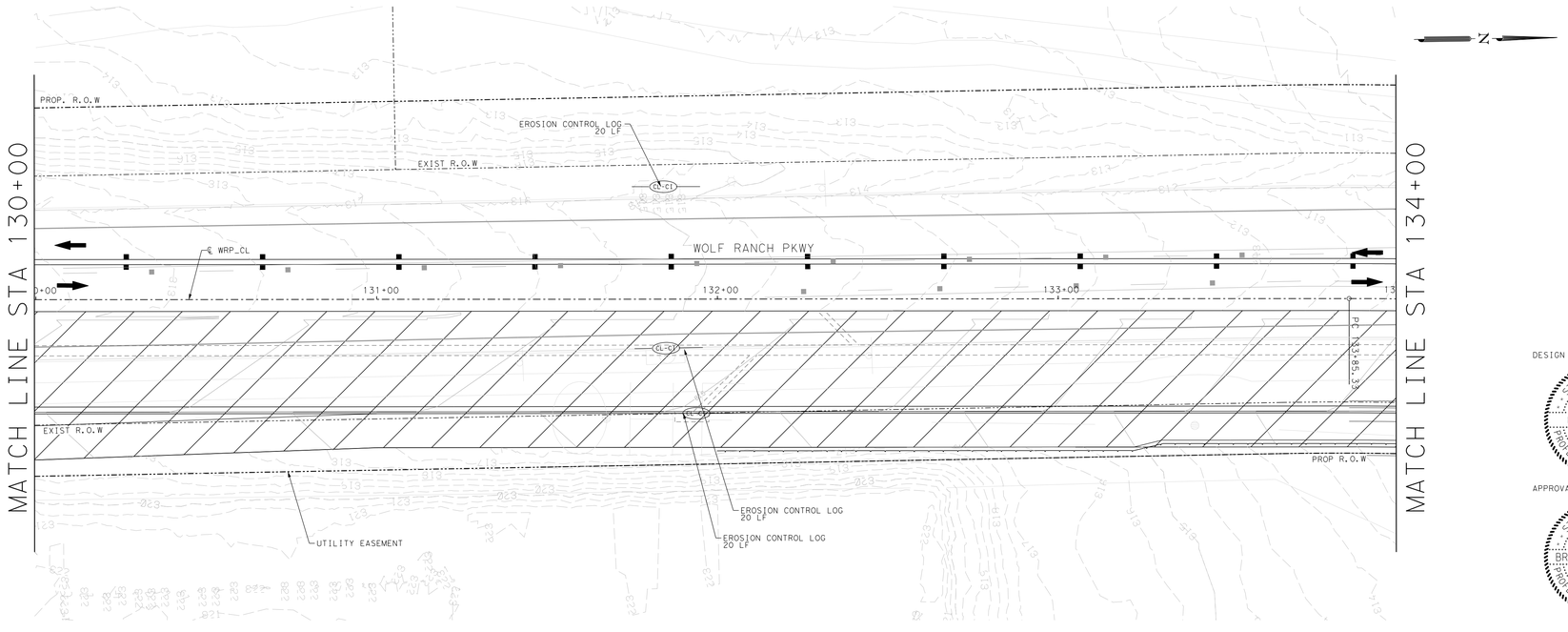
WOLF RANCH PKWY / MEMORIAL DR
SW3P LAYOUT
PHASE I

CITY JOB No.
JOB NO. 51423-04
DATE 9/16/2025
DESIGNER
CHECKED DRAWN

SHEET 2 OF 9

SHEET NO. 294





LEGEND

- TRAFFIC FLOW ARROWS
- FLOW ARROW
- SILT FENCE
- ROCK BERM
- CONSTRUCTION PHASE
- CONSTRUCTION ENTRANCE/EXIT
- TOPSOIL AND SEEDING
- EROSION CONTROL LOG
- EXISTING CONTOURS
- PROPOSED CONTOURS
- PROPOSED TRUNKLINE

SCALE: 1"= 20'

0' 20' 40' 60'

NOTES

1. THE MEASURES SHOWN ARE SUGGESTED PLACEMENTS OF SW3P ITEMS. THE ENGINEER MAY MODIFY AS FIELD CONDITIONS REQUIRE.
2. SW3P LAYOUTS CORRESPOND WITH TCP PHASING.
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7. TOP OF ROCK FILTER DAMS SHALL NOT BE CONSTRUCTED HIGHER THAN ADJACENT EDGE OF PAVEMENT.

DESIGN

STATE OF TEXAS — BRET CHAPMAN — 127293 — LICENSED PROFESSIONAL ENGINEER

BRET CHAPMAN, P.E. — 9/16/2025 DATE

APPROVAL

STATE OF TEXAS — BRIAN A. ALLEN — 123374 — LICENSED PROFESSIONAL ENGINEER

BRIAN A. ALLEN, P.E. — 9/16/2025 DATE

NO.	REVISION	DATE

GEORGETOWN TEXAS *more than welcome*

PAPE-DAWSON ENGINEERS
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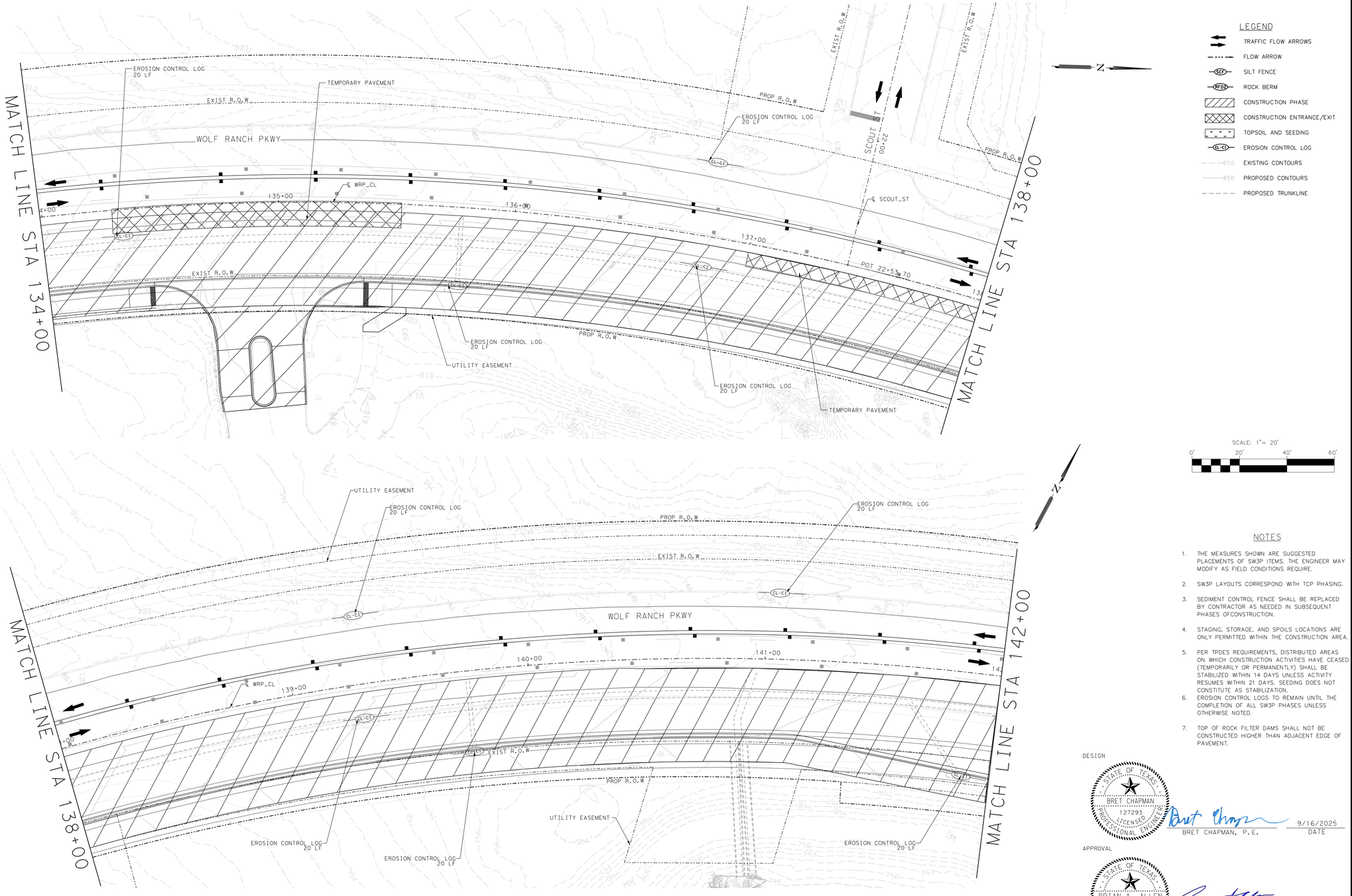
10801 N MOPAC EXPY, BLDG 3, STE 200 I AUSTIN, TX 78759 I 512.454.8711
TEXAS ENGINEERING FIRM #470 I TEXAS SURVEYING FIRM #10028800

WOLF RANCH PKWY / MEMORIAL DR
SW3P LAYOUT PHASE I

CITY JOB No.
JOB NO. 51423-04
DATE 9/16/2025
DESIGNER
CHECKED DRAWN

SHEET 3 OF 9

SHEET NO. 295



LEGEND

- TRAFFIC FLOW ARROWS
- FLOW ARROW
- SILT FENCE
- ROCK BERM
- CONSTRUCTION PHASE
- CONSTRUCTION ENTRANCE/EXIT
- TOPSOIL AND SEEDING
- EROSION CONTROL LOG
- 850 EXISTING CONTOURS
- 850 PROPOSED CONTOURS
- PROPOSED TRUNKLINE

SCALE: 1"= 20'

0' 20' 40' 60'

NOTES

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6. EROSION CONTROL LOGS TO REMAIN UNTIL THE COMPLETION OF ALL SW3P PHASES UNLESS OTHERWISE NOTED.
7. TOP OF ROCK FILTER DAMS SHALL NOT BE CONSTRUCTED HIGHER THAN ADJACENT EDGE OF PAVEMENT.

DESIGN

STATE OF TEXAS
BRET CHAPMAN
127293
LICENSED
PROFESSIONAL ENGINEER

BRET CHAPMAN, P.E. — 9/16/2025 DATE

APPROVAL

STATE OF TEXAS
BRIAN A. ALLEN
123374
LICENSED
PROFESSIONAL ENGINEER

BRIAN A. ALLEN, P.E. — 9/16/2025 DATE

NO.	REVISION	DATE

GEORGETOWN TEXAS *more than welcome*

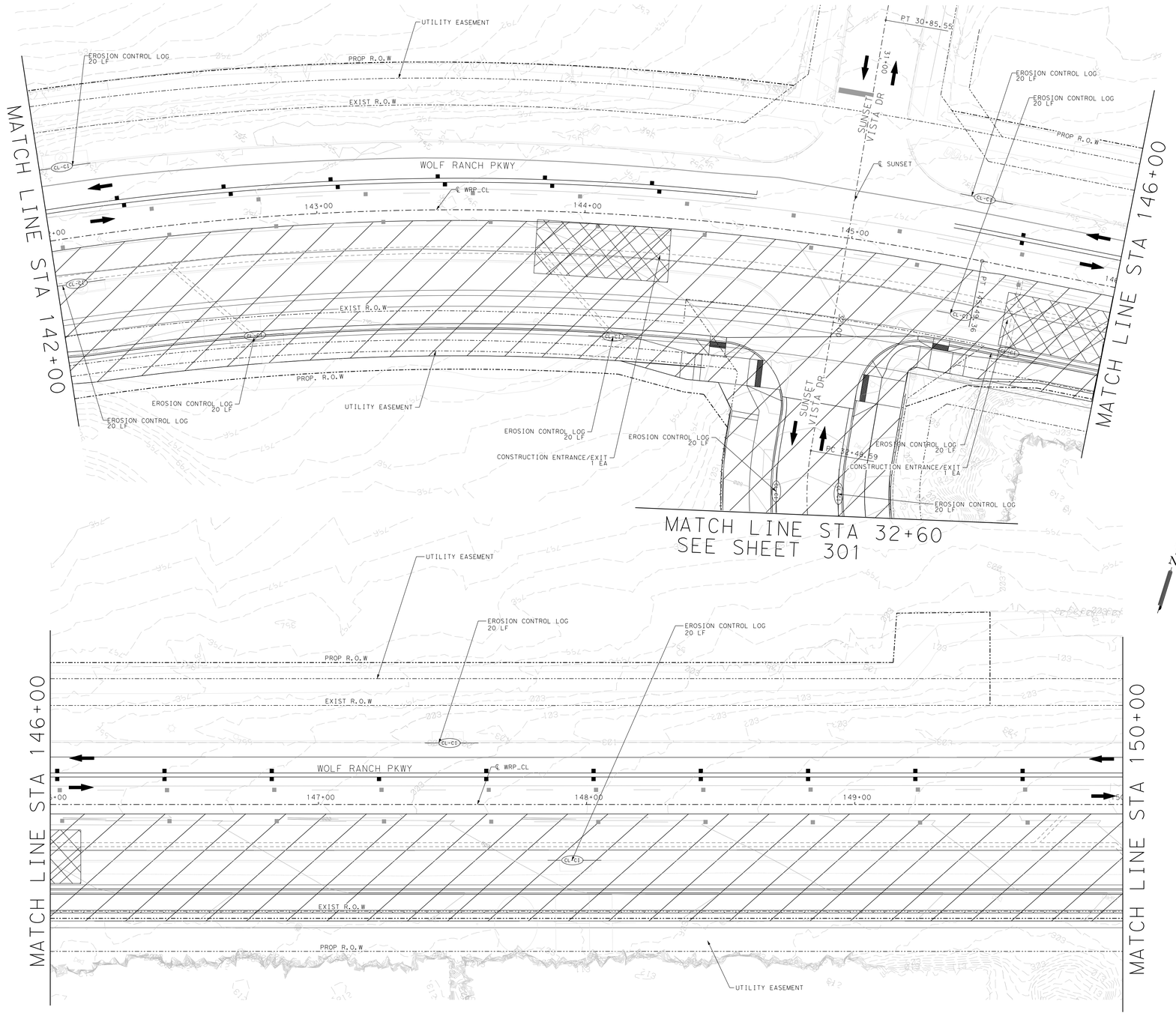
PAPE-DAWSON ENGINEERS
AUSTIN I SAN ANTONIO I HOUSTON I FORT WORTH I DALLAS
10801 N MOPAC EXPY, BLDG 3, STE 200 I AUSTIN, TX 78759 I 512.454.8711
TEXAS ENGINEERING FIRM #470 I TEXAS SURVEYING FIRM #10028800

WOLF RANCH PKWY / MEMORIAL DR
SW3P LAYOUT PHASE I

CITY JOB No.
JOB NO. 51423-04
DATE 9/16/2025
DESIGNER
CHECKED DRAWN

SHEET 4 OF 9

SHEET NO. 296



LEGEND

- TRAFFIC FLOW ARROWS
- FLOW ARROW
- SILT FENCE
- ROCK BERM
- CONSTRUCTION PHASE
- CONSTRUCTION ENTRANCE/EXIT
- TOPSOIL AND SEEDING
- EROSION CONTROL LOG
- 850 EXISTING CONTOURS
- 850 PROPOSED CONTOURS
- PROPOSED TRUNKLINE

SCALE: 1"= 20'

0' 20' 40' 60'

NOTES

1. THE MEASURES SHOWN ARE SUGGESTED PLACEMENTS OF SW3P ITEMS. THE ENGINEER MAY MODIFY AS FIELD CONDITIONS REQUIRE.
2. SW3P LAYOUTS CORRESPOND WITH TCP PHASING.
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STATE OF TEXAS — BRET CHAPMAN — 127293 — LICENSED PROFESSIONAL ENGINEER

BRET CHAPMAN, P.E. — 9/16/2025 DATE

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STATE OF TEXAS — BRIAN A. ALLEN — 123374 — LICENSED PROFESSIONAL ENGINEER

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10801 N MOPAC EXPY, BLDG 3, STE 200 I AUSTIN, TX 78759 I 512.454.8711
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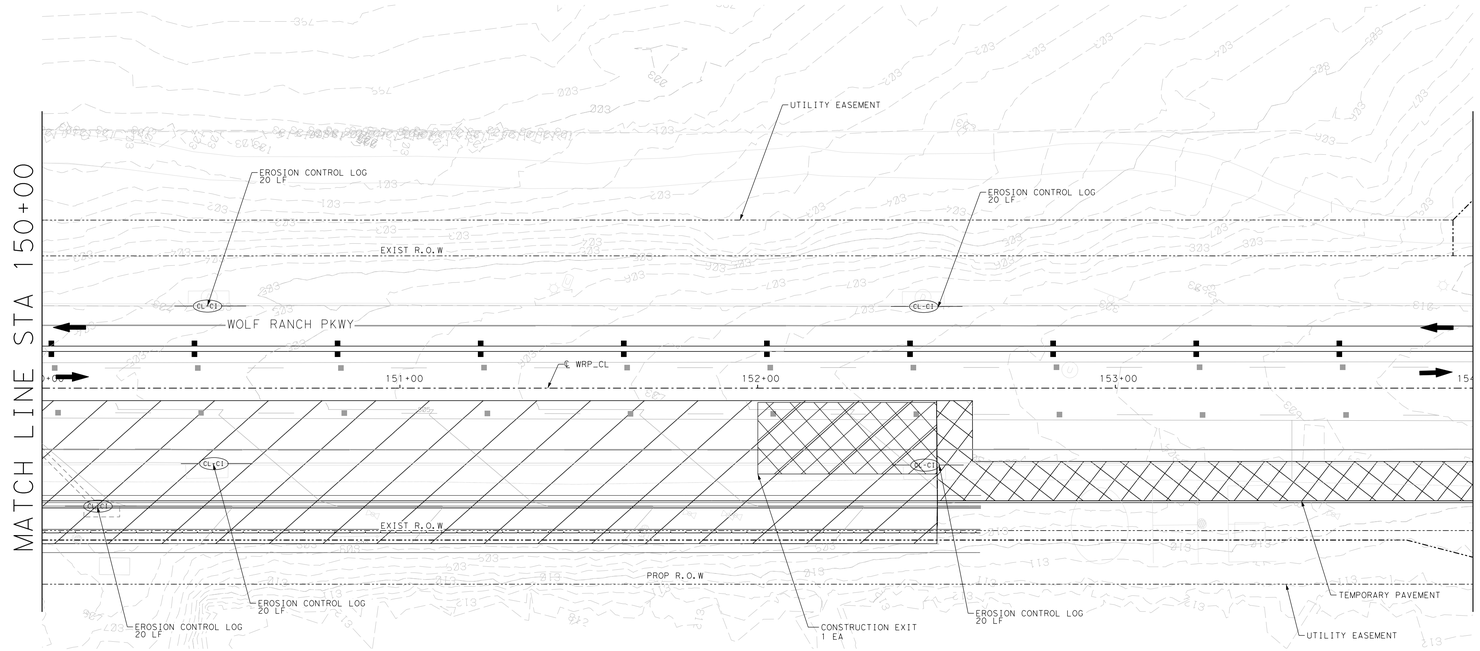
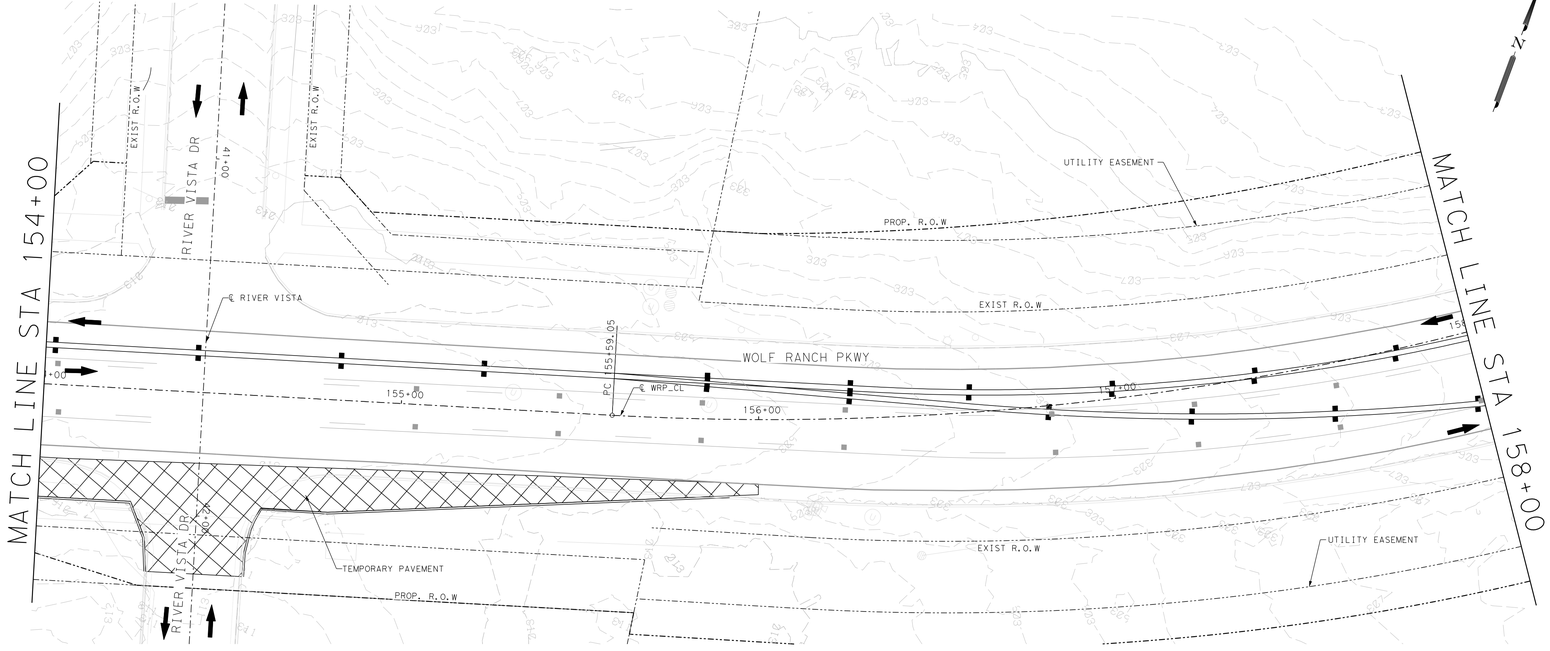
WOLF RANCH PKWY / MEMORIAL DR
SW3P LAYOUT PHASE I

CITY JOB No.
JOB NO. 51423-04
DATE 9/16/2025
DESIGNER
CHECKED DRAWN

SHEET 5 OF 9

SHEET NO. 297





LEGEND

- TRAFFIC FLOW ARROWS
- FLOW ARROW
- SILT FENCE (SCF)
- ROCK BERM (RFDZ)
- CONSTRUCTION PHASE
- CONSTRUCTION ENTRANCE/EXIT
- TOPSOIL AND SEEDING
- EROSION CONTROL LOG (CL-C1)
- 850 EXISTING CONTOURS
- 850 PROPOSED CONTOURS
- PROPOSED TRUNKLINE

SCALE: 1"= 20'

0' 20' 40' 60'

NOTES

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DESIGN

STATE OF TEXAS — BRET CHAPMAN — 127293 — LICENSED PROFESSIONAL ENGINEER

BRET CHAPMAN, P.E. — 9/16/2025 DATE

APPROVAL

STATE OF TEXAS — BRIAN A. ALLEN — 123374 — LICENSED PROFESSIONAL ENGINEER

BRIAN A. ALLEN, P.E. — 9/16/2025 DATE

NO.	REVISION	DATE

GEORGETOWN TEXAS *more than welcome*

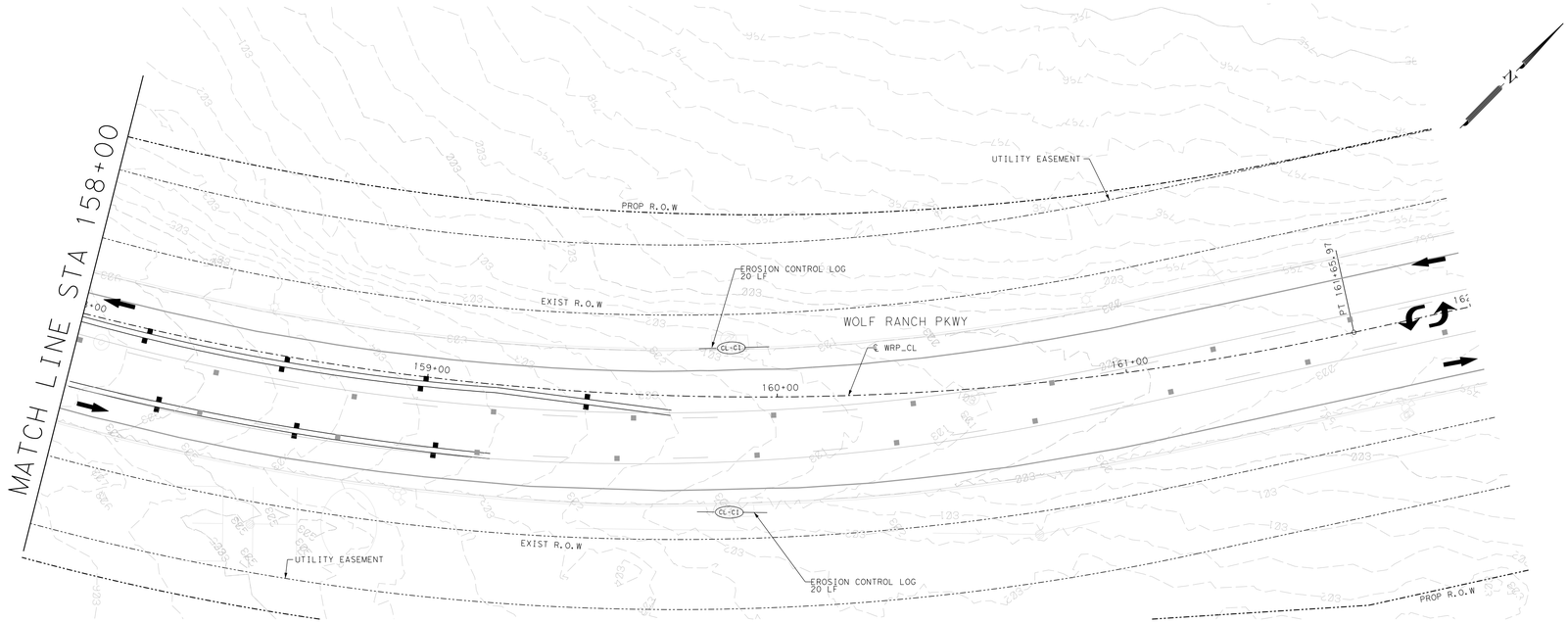
PAPE-DAWSON ENGINEERS
AUSTIN | SAN ANTONIO | HOUSTON | FORT WORTH | DALLAS
10801 N MOPAC EXPY, BLDG 3, STE 200 | AUSTIN, TX 78759 | 512.454.8711
TEXAS ENGINEERING FIRM #470 | TEXAS SURVEYING FIRM #10028800

WOLF RANCH PKWY / MEMORIAL DR
SW3P LAYOUT
PHASE I

CITY JOB No.
JOB NO. 51423-04
DATE 9/16/2025
DESIGNER
CHECKED DRAWN

SHEET 6 OF 9

SHEET NO. 298



LEGEND

- TRAFFIC FLOW ARROWS
- FLOW ARROW
- SILT FENCE
- ROCK BERM
- CONSTRUCTION PHASE
- CONSTRUCTION ENTRANCE/EXIT
- TOPSOIL AND SEEDING
- EROSION CONTROL LOG
- 850 EXISTING CONTOURS
- 850 PROPOSED CONTOURS
- PROPOSED TRUNKLINE

SCALE: 1"= 20'

0' 20' 40' 60'

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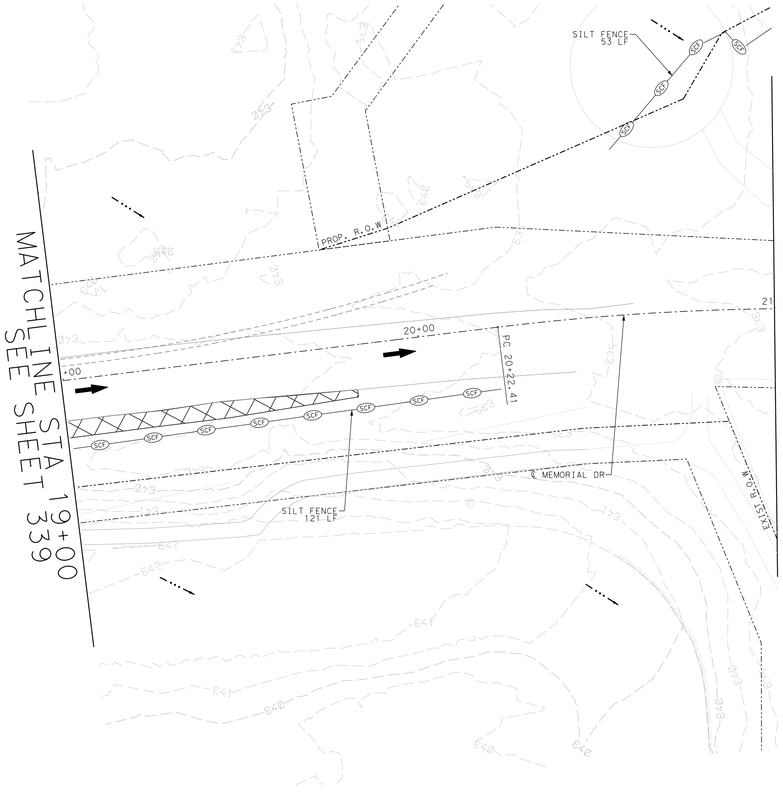
10801 N MOPAC EXPY, BLDG 3, STE 200 I AUSTIN, TX 78759 I 512.454.8711
TEXAS ENGINEERING FIRM #470 I TEXAS SURVEYING FIRM #10028800

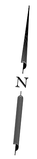
WOLF RANCH PKWY / MEMORIAL DR
SW3P LAYOUT
PHASE I

CITY JOB No.
JOB NO. 51423-04
DATE 9/16/2025
DESIGNER
CHECKED DRAWN

SHEET 7 OF 9

SHEET NO. 299





LEGEND

- TRAFFIC FLOW ARROWS
- FLOW ARROW
- SILT FENCE
- ROCK BERM
- CONSTRUCTION PHASE
- CONSTRUCTION ENTRANCE/EXIT
- TOPSOIL AND SEEDING
- EROSION CONTROL LOG
- 850 EXISTING CONTOURS
- 850 PROPOSED CONTOURS
- PROPOSED TRUNKLINE

SCALE: 1"= 20'

0' 20' 40' 60'

NOTES

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DESIGN

STATE OF TEXAS
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127293
LICENSED
PROFESSIONAL ENGINEER

BRET CHAPMAN, P.E. — 9/16/2025 DATE

APPROVAL

STATE OF TEXAS
BRIAN A. ALLEN
123374
LICENSED
PROFESSIONAL ENGINEER

BRIAN A. ALLEN, P.E. — 9/16/2025 DATE

NO.	REVISION	DATE

GEORGETOWN TEXAS
more than welcome

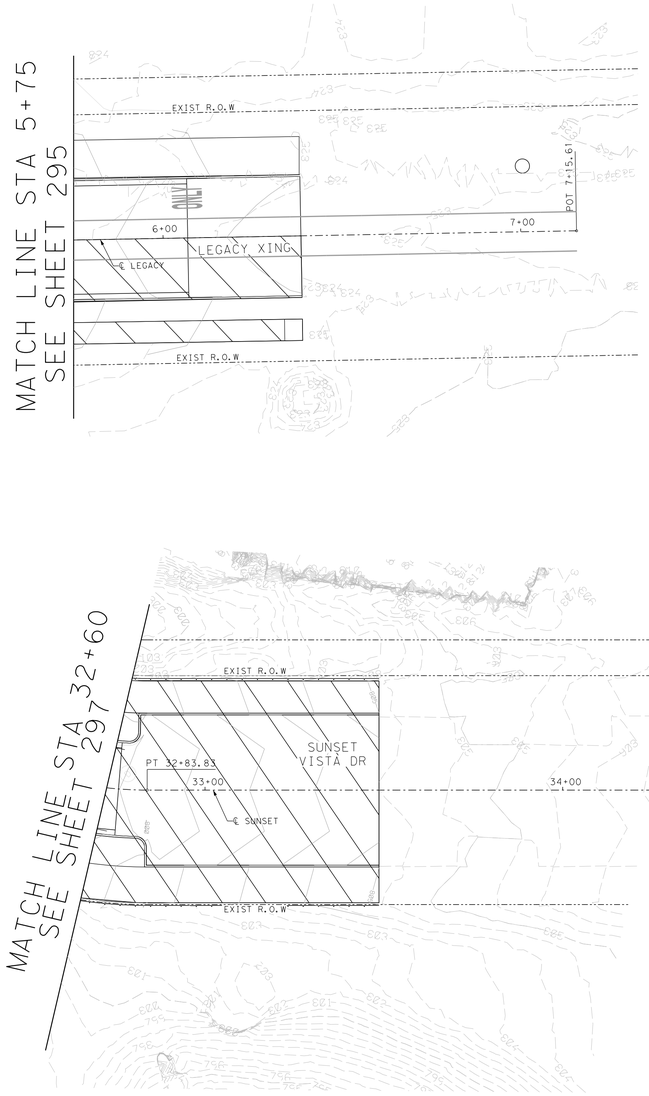
PAPE-DAWSON ENGINEERS
AUSTIN I SAN ANTONIO I HOUSTON I FORT WORTH I DALLAS
10801 N MOPAC EXPY, BLDG 3, STE 200 I AUSTIN, TX 78759 I 512.454.8711
TEXAS ENGINEERING FIRM #470 I TEXAS SURVEYING FIRM #10028800

WOLF RANCH PKWY / MEMORIAL DR
SW3P LAYOUT
PHASE I

CITY JOB No.
JOB NO. 51423-04
DATE 9/16/2025
DESIGNER
CHECKED DRAWN

SHEET 8 OF 9

SHEET NO. 300



LEGEND

- TRAFFIC FLOW ARROWS
- FLOW ARROW
- SILT FENCE (SCF)
- ROCK BERM (RFD2)
- CONSTRUCTION PHASE
- CONSTRUCTION ENTRANCE/EXIT
- TOPSOIL AND SEEDING
- EROSION CONTROL LOG (EL-C2)
- 850 EXISTING CONTOURS
- 850 PROPOSED CONTOURS
- PROPOSED TRUNKLINE

SCALE: 1"= 20'

0' 20' 40' 60'

NOTES

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DESIGN

STATE OF TEXAS · BRET CHAPMAN · 127293 · LICENSED · PROFESSIONAL ENGINEER

BRET CHAPMAN, P.E. — 9/16/2025 DATE

APPROVAL

STATE OF TEXAS · BRIAN A. ALLEN · 123374 · LICENSED · PROFESSIONAL ENGINEER

BRIAN A. ALLEN, P.E. — 9/16/2025 DATE

NO.	REVISION	DATE

GEORGETOWN TEXAS *more than welcome*

PAPE-DAWSON ENGINEERS
AUSTIN I SAN ANTONIO I HOUSTON I FORT WORTH I DALLAS
10801 N MOPAC EXPY, BLDG 3, STE 200 I AUSTIN, TX 78759 I 512.454.8711
TEXAS ENGINEERING FIRM #470 I TEXAS SURVEYING FIRM #10028800

WOLF RANCH PKWY / MEMORIAL DR
SW3P LAYOUT PHASE I

CITY JOB No.
JOB NO. 51423-04
DATE 9/16/2025
DESIGNER
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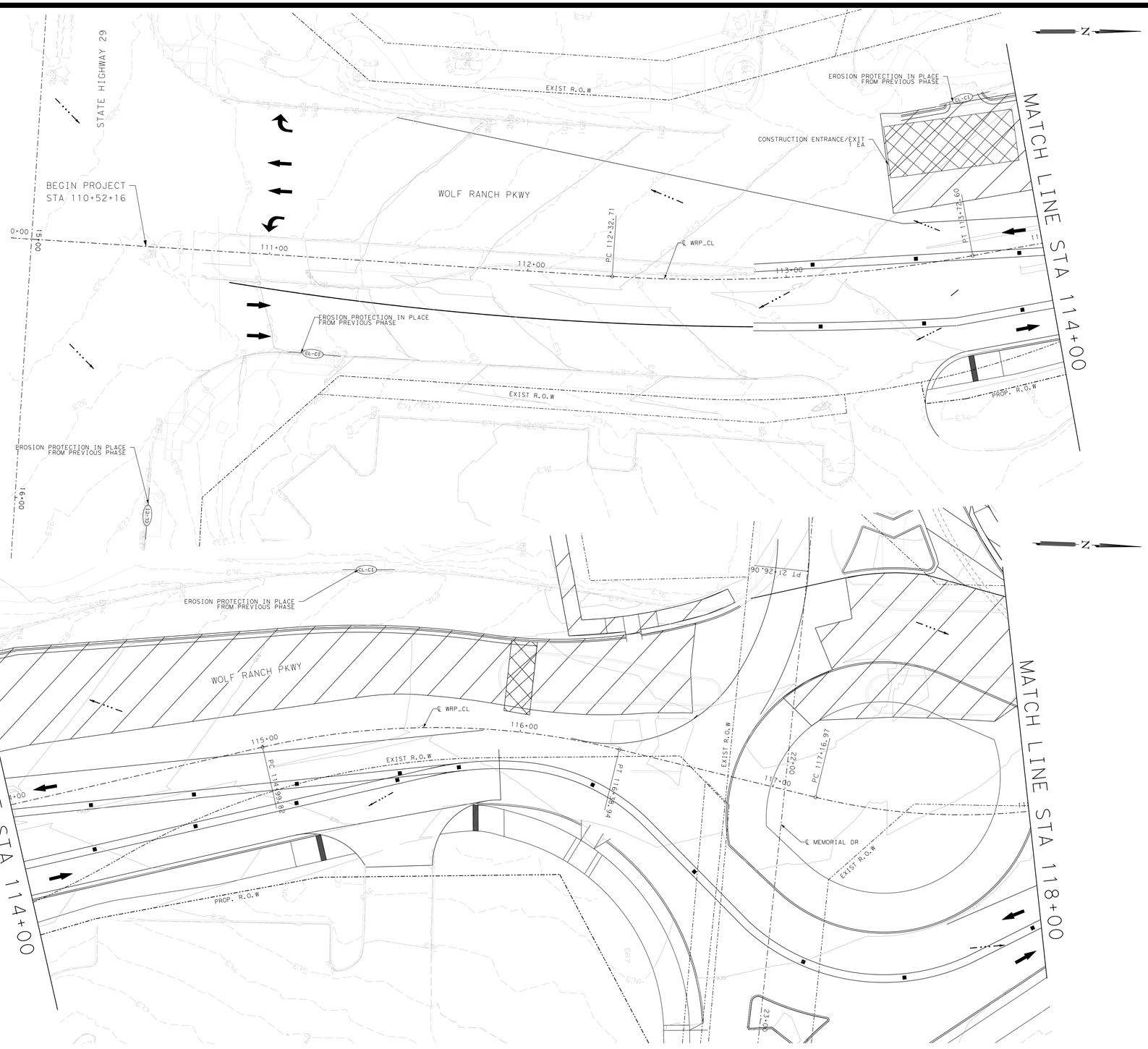
SHEET 9 OF 9

SHEET NO. 301



LEGEND

- TRAFFIC FLOW ARROWS
- FLOW ARROW
- SILT FENCE
- ROCK BERM
- CONSTRUCTION PHASE
- CONSTRUCTION ENTRANCE/EXIT
- TOPSOIL AND SEEDING
- EROSION CONTROL LOG
- EXISTING CONTOURS
- PROPOSED CONTOURS
- PROPOSED TRUNKLINE

SCALE: 1"= 20'

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127293
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BRET CHAPMAN, P.E. — 9/16/2025 DATE

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STATE OF TEXAS
BRIAN A. ALLEN
123374
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PROFESSIONAL ENGINEER

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TEXAS ENGINEERING FIRM #470 | TEXAS SURVEYING FIRM #10028800

WOLF RANCH PKWY / MEMORIAL DR
SW3P LAYOUT
PHASE II

CITY JOB No.
JOB NO. 51423-04
DATE 9/16/2025
DESIGNER
CHECKED DRAWN

SHEET 1 OF 15

SHEET NO. 302

LEGEND

- TRAFFIC FLOW ARROWS
- FLOW ARROW
- SILT FENCE
- ROCK BERM
- CONSTRUCTION PHASE
- CONSTRUCTION ENTRANCE/EXIT
- TOPSOIL AND SEEDING
- EROSION CONTROL LOG
- 850 EXISTING CONTOURS
- 850 PROPOSED CONTOURS
- PROPOSED TRUNKLINE

SCALE: 1"= 20'

0' 20' 40' 60'

NOTES

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STATE OF TEXAS — BRET CHAPMAN — 127293 — LICENSED — PROFESSIONAL ENGINEER

BRET CHAPMAN, P.E. — 9/16/2025 DATE

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STATE OF TEXAS — BRIAN A. ALLEN — 123374 — LICENSED — PROFESSIONAL ENGINEER

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GEORGETOWN TEXAS *more than welcome*

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PHASE II

CITY JOB No.
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DATE 9/16/2025
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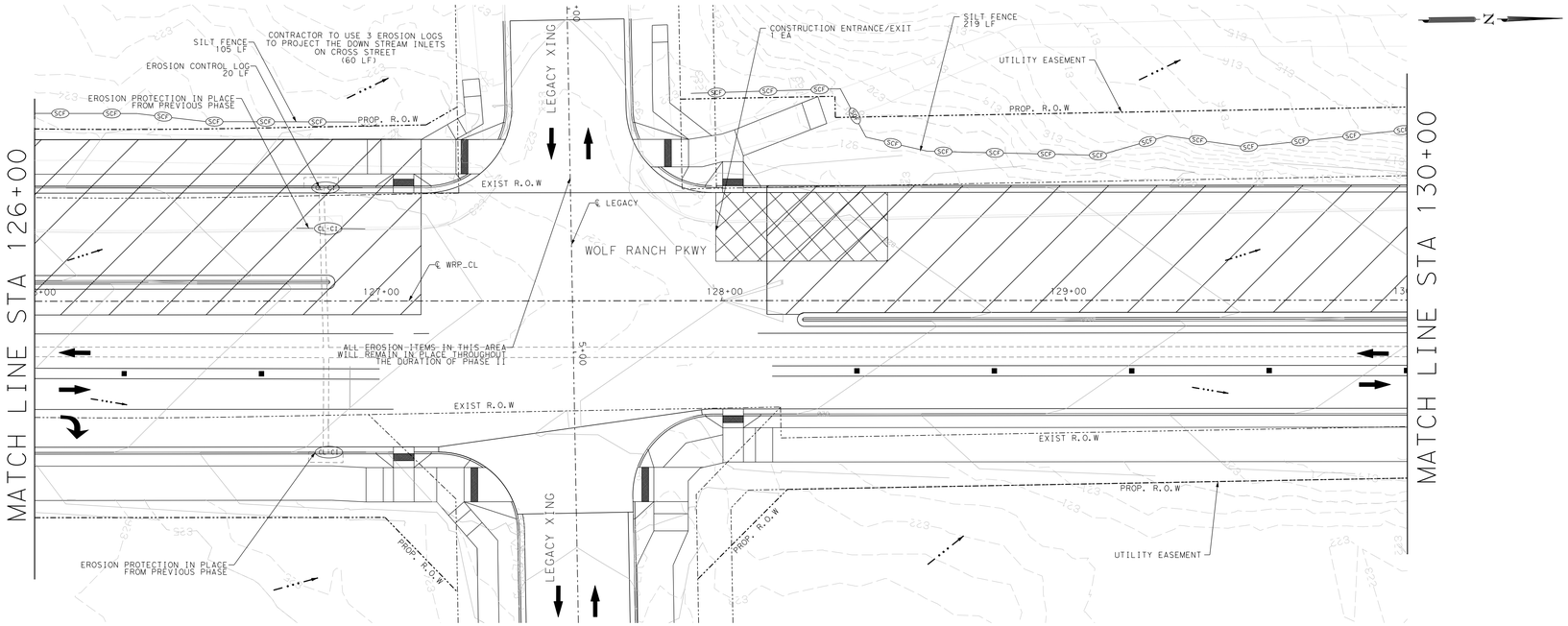
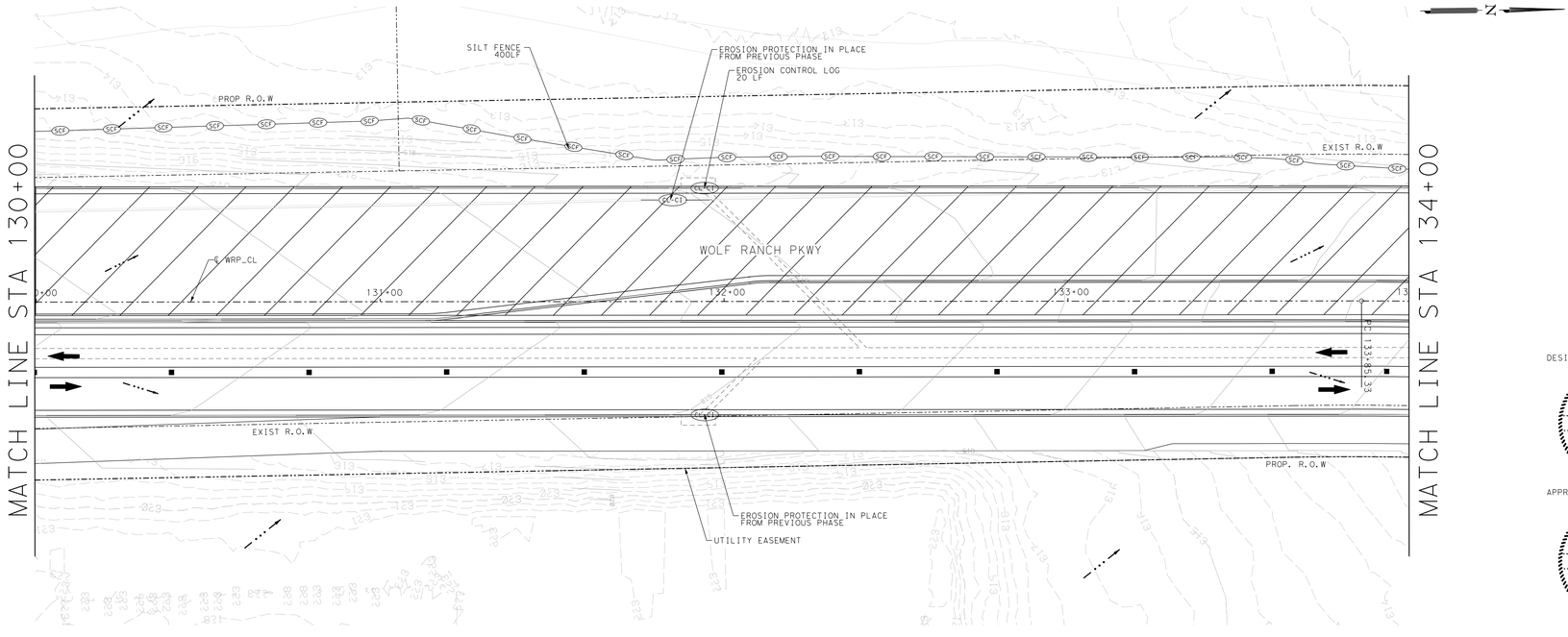
SHEET 2 OF 15

SHEET NO. 303





LEGEND

- TRAFFIC FLOW ARROWS
- FLOW ARROW
- SILT FENCE
- ROCK BERM
- CONSTRUCTION PHASE
- CONSTRUCTION ENTRANCE/EXIT
- TOPSOIL AND SEEDING
- EROSION CONTROL LOG
- EXISTING CONTOURS
- PROPOSED CONTOURS
- PROPOSED TRUNKLINE

SCALE: 1"= 20'

0' 20' 40' 60'

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STATE OF TEXAS · BRET CHAPMAN · 127293 · LICENSED · PROFESSIONAL ENGINEER

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TEXAS ENGINEERING FIRM #470 I TEXAS SURVEYING FIRM #10028800

WOLF RANCH PKWY / MEMORIAL DR
SW3P LAYOUT
PHASE II

CITY JOB No.
JOB NO. 51423-04
DATE 9/16/2025
DESIGNER
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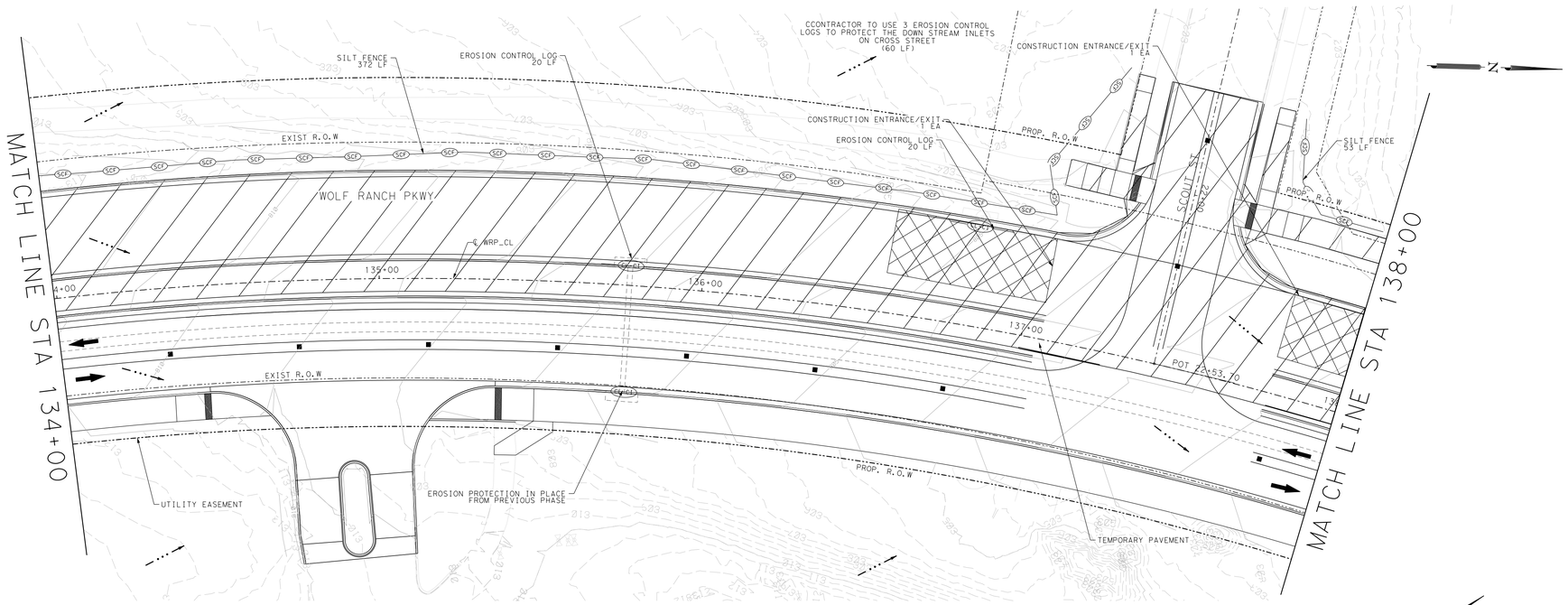
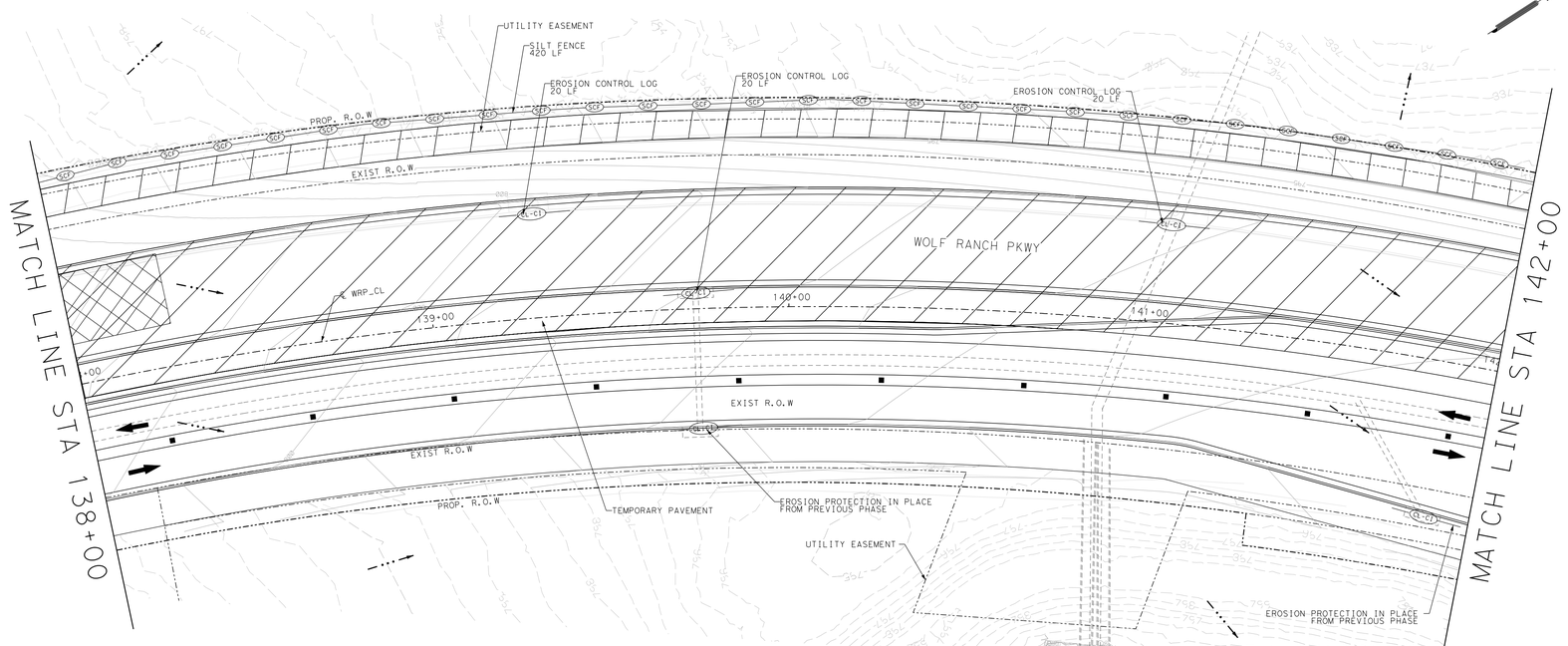
SHEET 3 OF 15

SHEET NO. 304





LEGEND

- TRAFFIC FLOW ARROWS
- FLOW ARROW
- SILT FENCE
- ROCK BERM
- CONSTRUCTION PHASE
- CONSTRUCTION ENTRANCE/EXIT
- TOPSOIL AND SEEDING
- EROSION CONTROL LOG
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- PROPOSED TRUNKLINE

SCALE: 1"= 20'

0' 20' 40' 60'

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6. EROSION CONTROL LOGS TO REMAIN UNTIL THE COMPLETION OF ALL SW3P PHASES UNLESS OTHERWISE NOTED.
7. TOP OF ROCK FILTER DAMS SHALL NOT BE CONSTRUCTED HIGHER THAN ADJACENT EDGE OF PAVEMENT.

DESIGN

STATE OF TEXAS — BRET CHAPMAN — 127293 — LICENSED PROFESSIONAL ENGINEER

BRET CHAPMAN, P.E. — 9/16/2025 DATE

APPROVAL

STATE OF TEXAS — BRIAN A. ALLEN — 123374 — LICENSED PROFESSIONAL ENGINEER

BRIAN A. ALLEN, P.E. — 9/16/2025 DATE

NO.	REVISION	DATE

GEORGETOWN TEXAS *more than welcome*

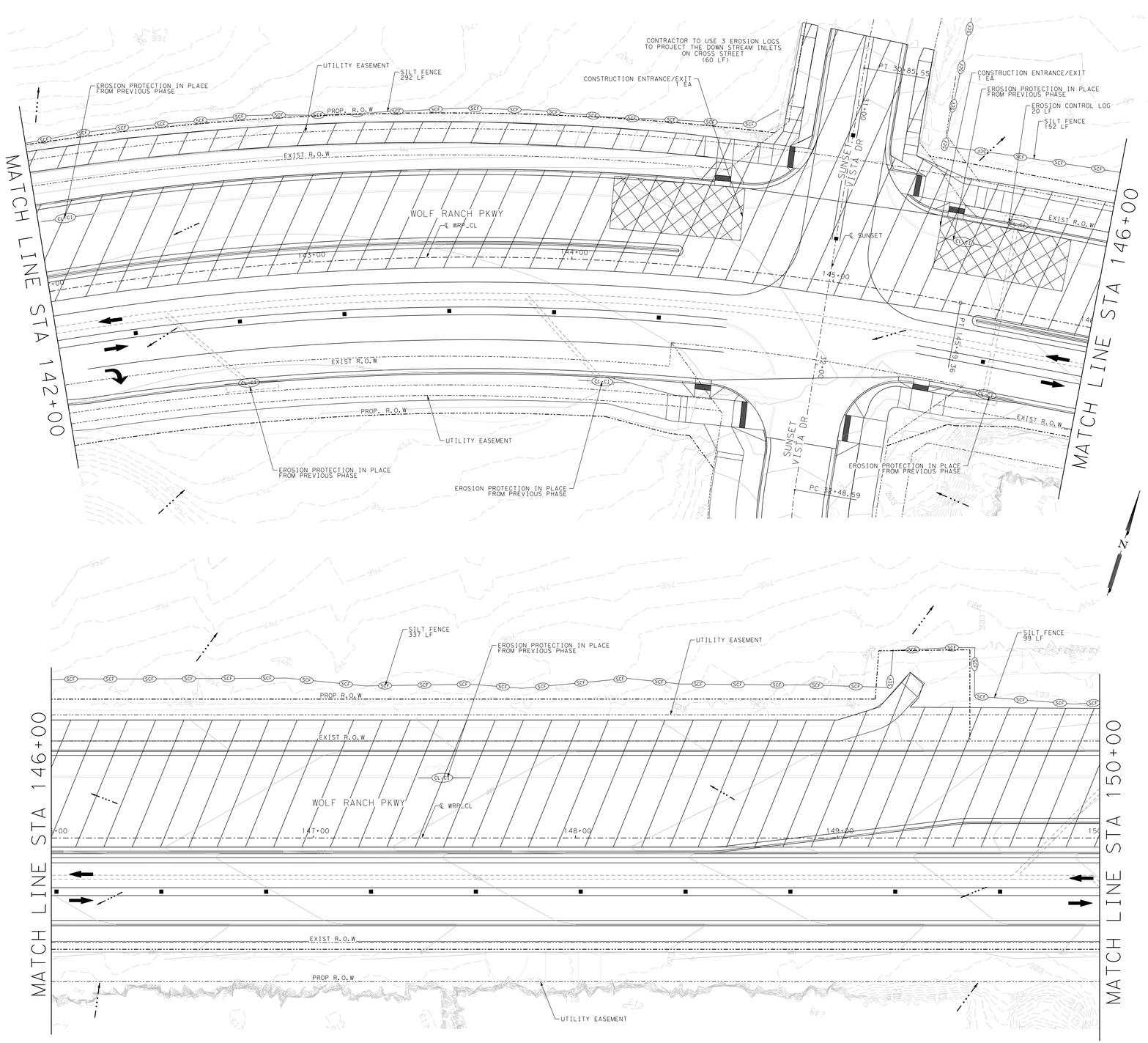
PAPE-DAWSON ENGINEERS
AUSTIN I SAN ANTONIO I HOUSTON I FORT WORTH I DALLAS
10801 N MOPAC EXPY, BLDG 3, STE 200 I AUSTIN, TX 78759 I 512.454.8711
TEXAS ENGINEERING FIRM #470 I TEXAS SURVEYING FIRM #10028800

WOLF RANCH PKWY / MEMORIAL DR
SW3P LAYOUT
PHASE II

CITY JOB No.
JOB NO. 51423-04
DATE 9/16/2025
DESIGNER
CHECKED DRAWN

SHEET 4 OF 15

SHEET NO. 305



LEGEND

- TRAFFIC FLOW ARROWS
- FLOW ARROW
- SILT FENCE (SCF)
- ROCK BERM (RFD2)
- CONSTRUCTION PHASE
- CONSTRUCTION ENTRANCE/EXIT
- TOPSOIL AND SEEDING
- EROSION CONTROL LOG (EL-C2)
- 850 EXISTING CONTOURS
- 850 PROPOSED CONTOURS
- PROPOSED TRUNKLINE

SCALE: 1"= 20'

0' 20' 40' 60'

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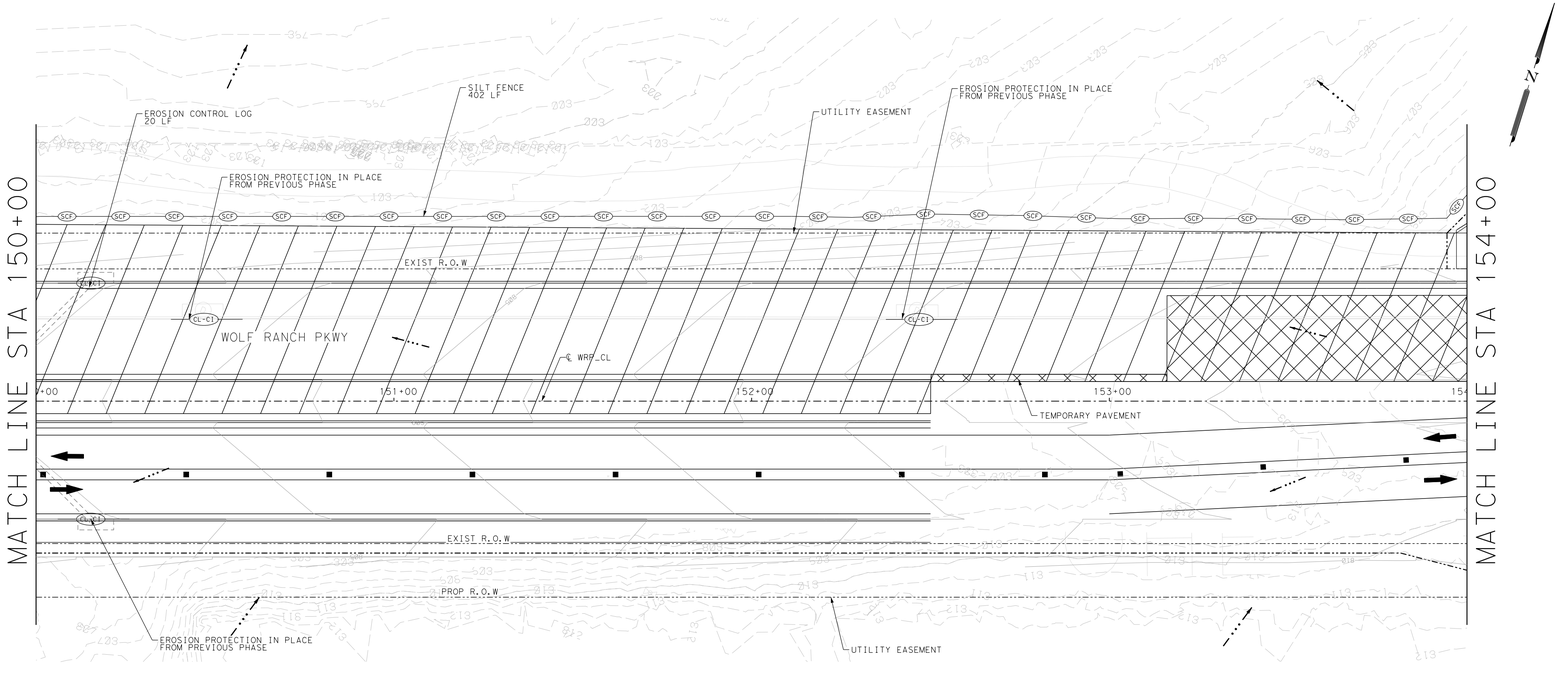
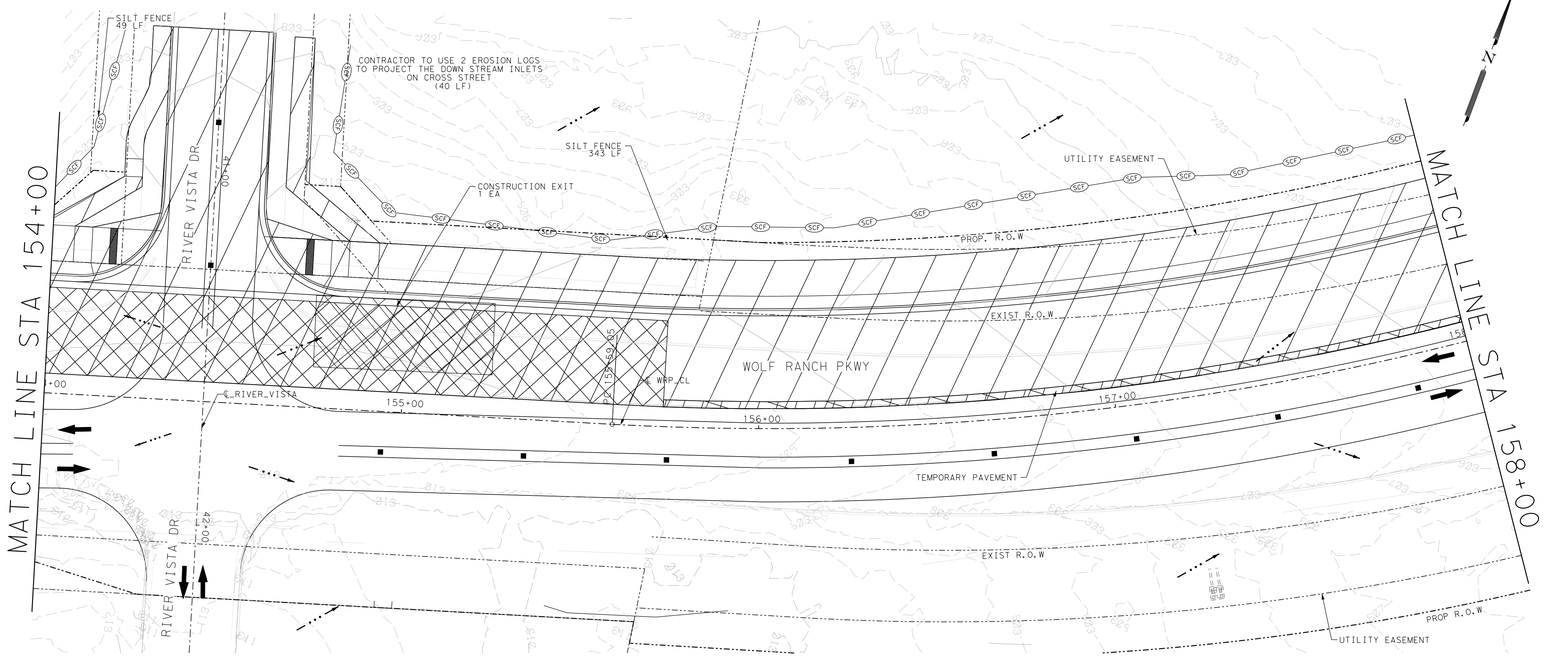
WOLF RANCH PKWY / MEMORIAL DR
SW3P LAYOUT
PHASE II

CITY JOB No.
JOB NO. 51423-04
DATE 9/16/2025
DESIGNER
CHECKED DRAWN

SHEET 5 OF 15

SHEET NO. 306





LEGEND

- TRAFFIC FLOW ARROWS
- FLOW ARROW
- SILT FENCE
- ROCK BERM
- CONSTRUCTION PHASE
- CONSTRUCTION ENTRANCE/EXIT
- TOPSOIL AND SEEDING
- EROSION CONTROL LOG
- 850 EXISTING CONTOURS
- 850 PROPOSED CONTOURS
- PROPOSED TRUNKLINE

SCALE: 1"= 20'

0' 20' 40' 60'

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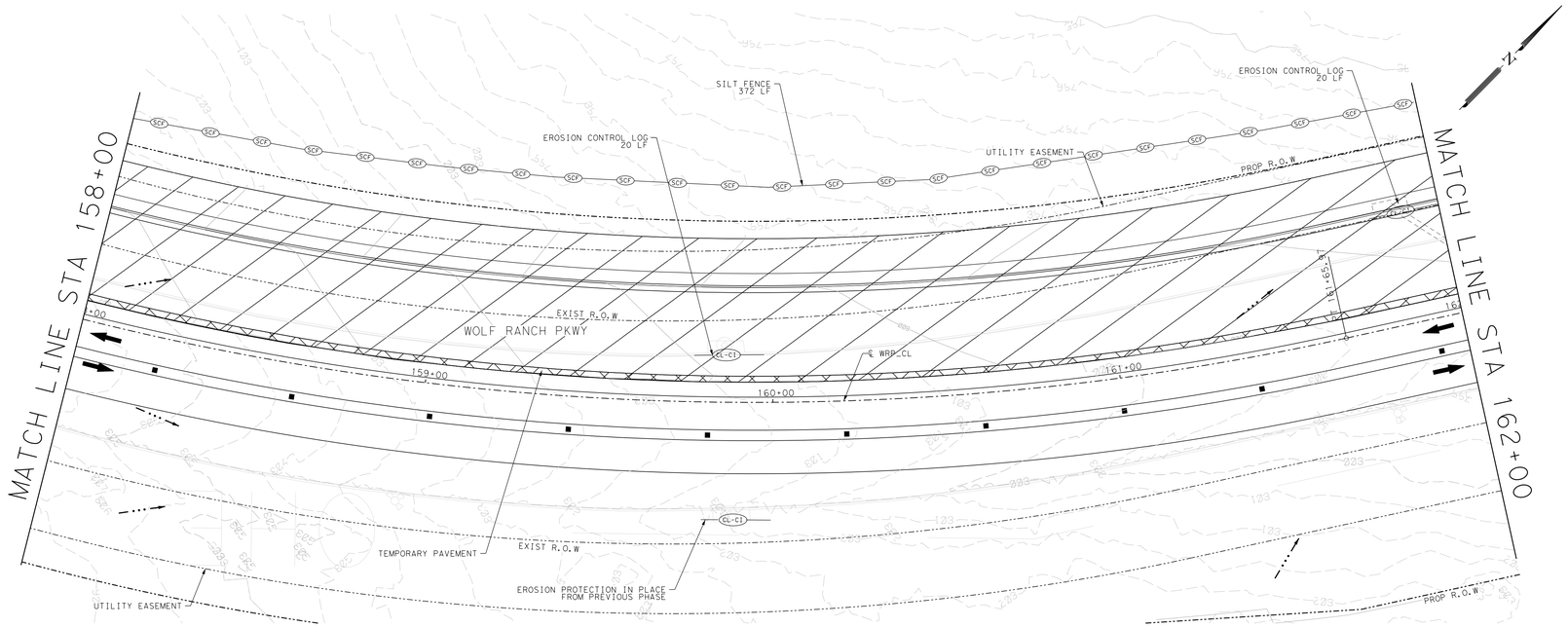
10801 N MOPAC EXPY, BLDG 3, STE 200 I AUSTIN, TX 78759 I 512.454.8711
TEXAS ENGINEERING FIRM #470 I TEXAS SURVEYING FIRM #10028800

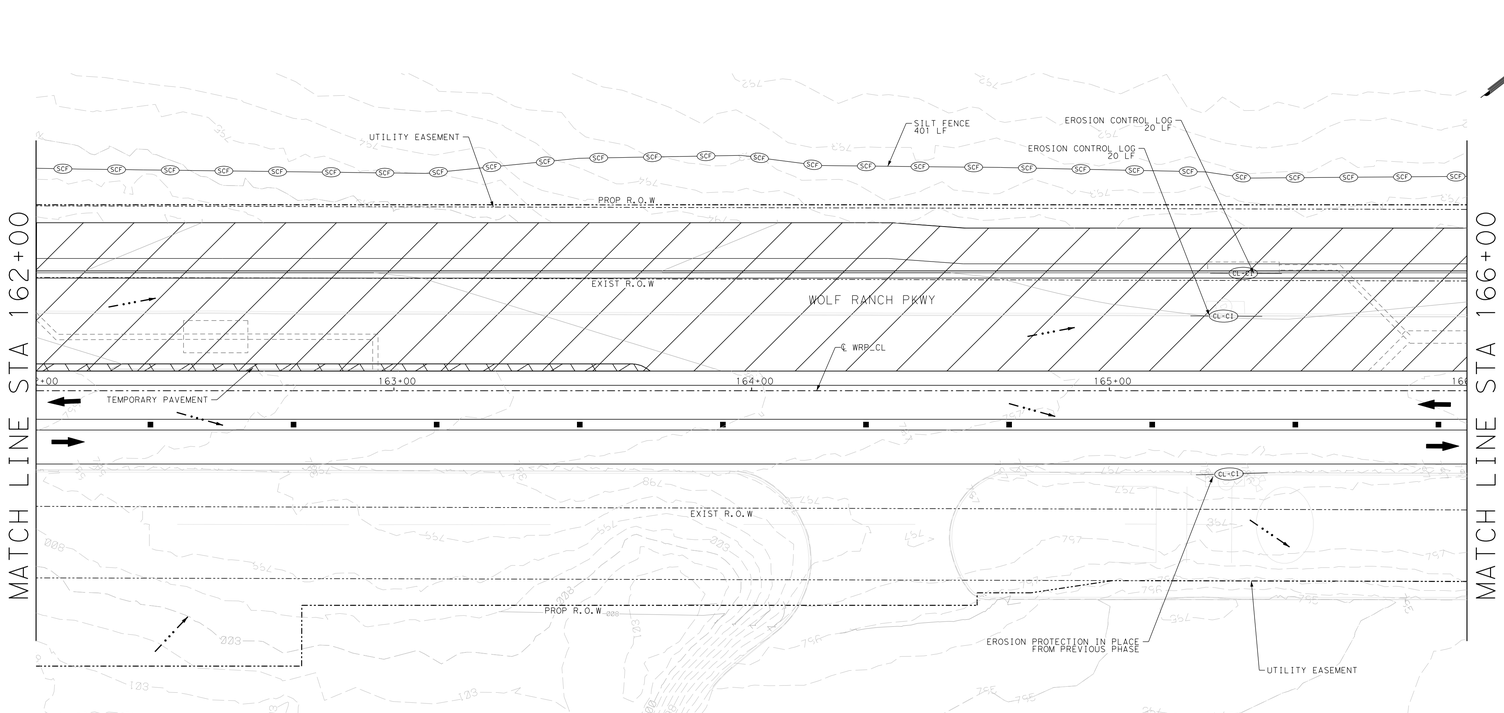
WOLF RANCH PKWY / MEMORIAL DR
SW3P LAYOUT
PHASE II

CITY JOB No.
JOB NO. 51423-04
DATE 9/16/2025
DESIGNER
CHECKED DRAWN

SHEET 6 OF 15

SHEET NO. 307





LEGEND

- TRAFFIC FLOW ARROWS
- FLOW ARROW
- SILT FENCE (SCF)
- ROCK BERM (RFD2)
- CONSTRUCTION PHASE
- CONSTRUCTION ENTRANCE/EXIT
- TOPSOIL AND SEEDING
- EROSION CONTROL LOG (CL-C1)
- 850 EXISTING CONTOURS
- 850 PROPOSED CONTOURS
- PROPOSED TRUNKLINE

SCALE: 1"= 20'

0' 20' 40' 60'

NOTES

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DESIGN

STATE OF TEXAS
BRET CHAPMAN
127293
LICENSED
PROFESSIONAL ENGINEER

BRET CHAPMAN, P.E. — 9/16/2025 DATE

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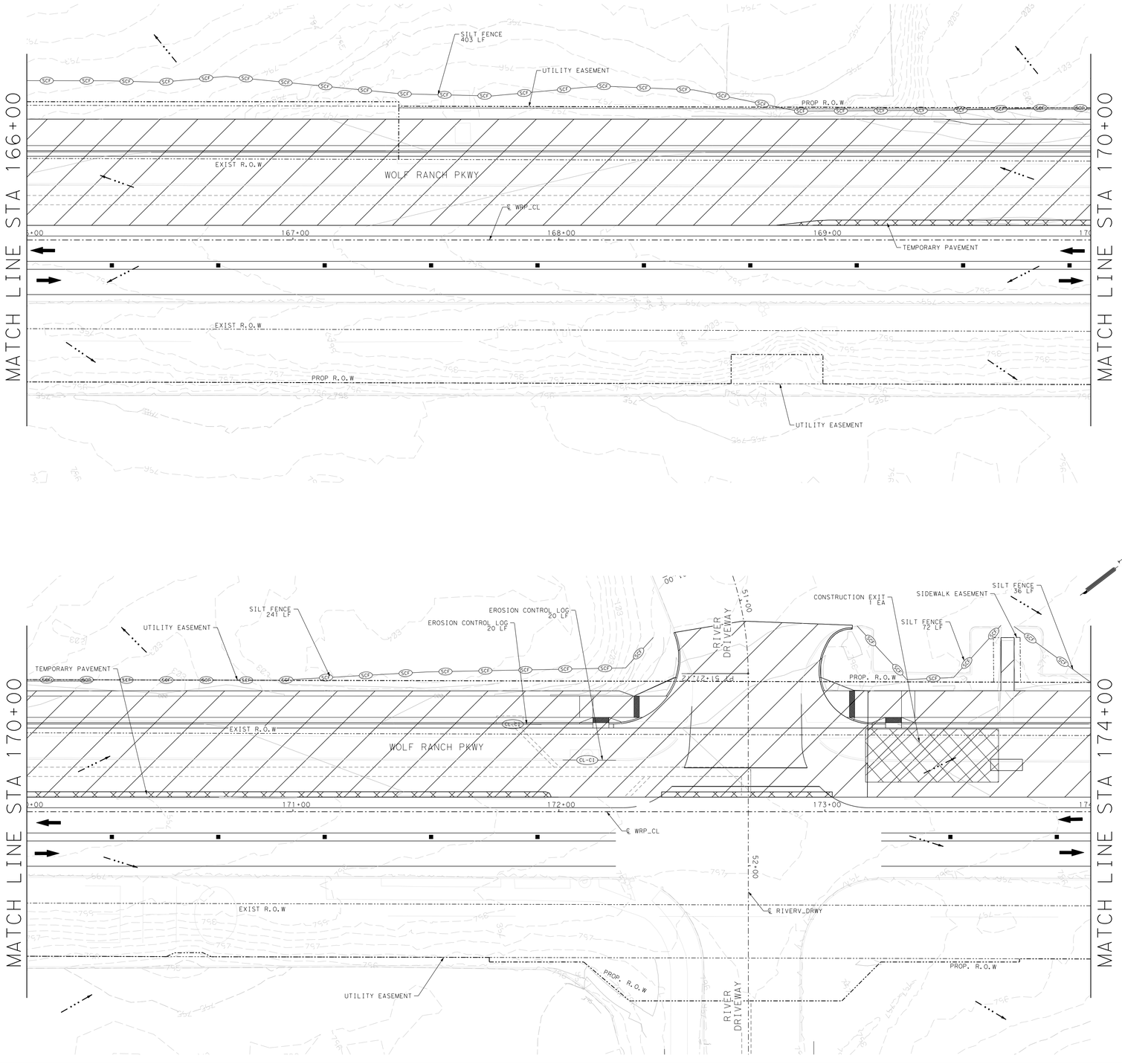
PAPE-DAWSON ENGINEERS
AUSTIN I SAN ANTONIO I HOUSTON I FORT WORTH I DALLAS
10801 N MOPAC EXPY, BLDG 3, STE 200 I AUSTIN, TX 78759 I 512.454.8711
TEXAS ENGINEERING FIRM #470 I TEXAS SURVEYING FIRM #10028800

WOLF RANCH PKWY / MEMORIAL DR
SW3P LAYOUT
PHASE II

CITY JOB No.
JOB NO. 51423-04
DATE 9/16/2025
DESIGNER
CHECKED DRAWN

SHEET 7 OF 15

SHEET NO. 308



LEGEND

- TRAFFIC FLOW ARROWS
- FLOW ARROW
- SILT FENCE
- ROCK BERM
- CONSTRUCTION PHASE
- CONSTRUCTION ENTRANCE/EXIT
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- PROPOSED CONTOURS
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WOLF RANCH PKWY / MEMORIAL DR
SW3P LAYOUT
PHASE II

CITY JOB No.
JOB NO. 51423-04
DATE 9/16/2025
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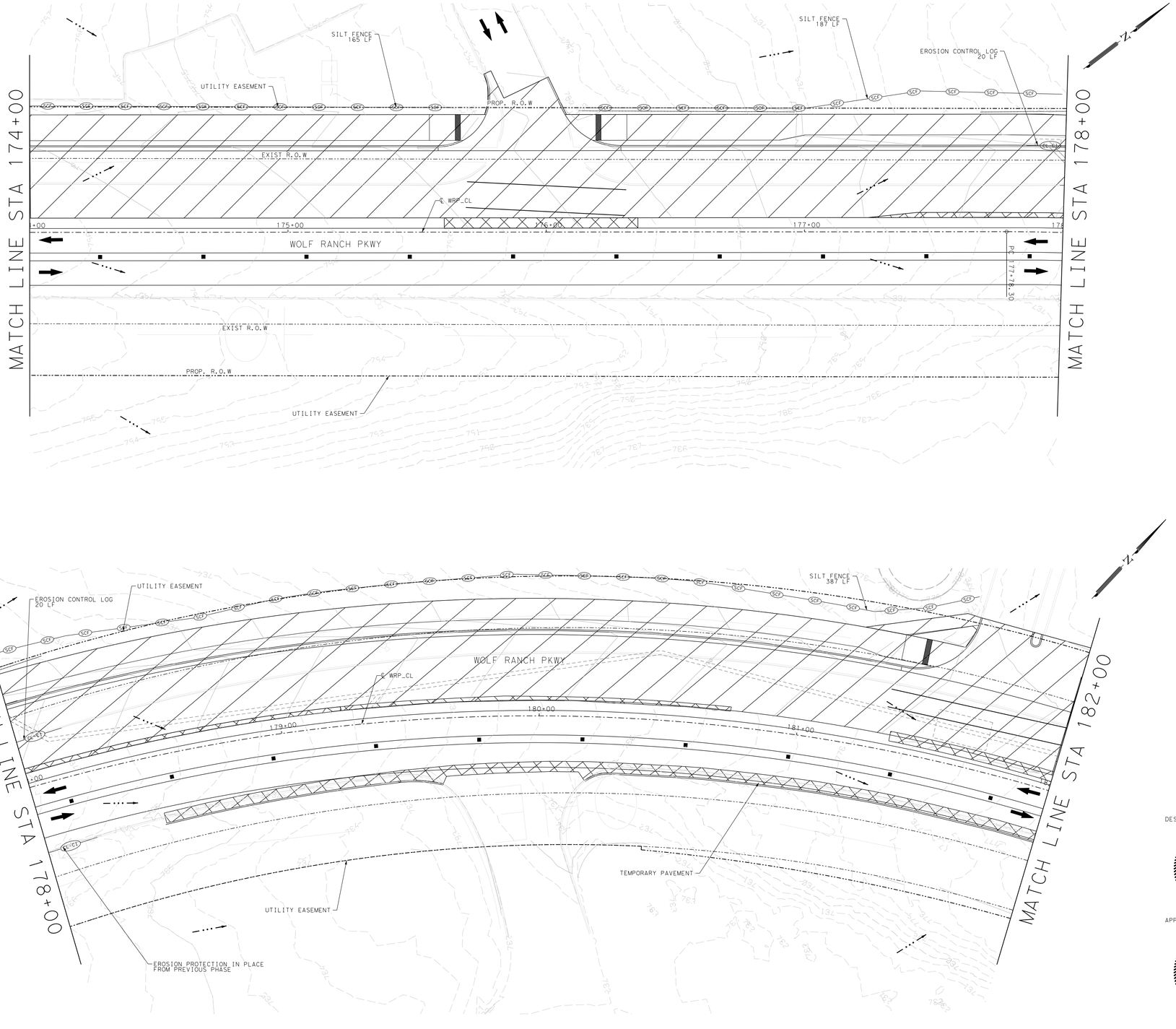
SHEET 8 OF 15

SHEET NO. 309



LEGEND

- TRAFFIC FLOW ARROWS
- FLOW ARROW
- SILT FENCE
- ROCK BERM
- CONSTRUCTION PHASE
- CONSTRUCTION ENTRANCE/EXIT
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10801 N MOPAC EXPY, BLDG 3, STE 200 I AUSTIN, TX 78759 I 512.454.8711
TEXAS ENGINEERING FIRM #470 I TEXAS SURVEYING FIRM #10028800

WOLF RANCH PKWY / MEMORIAL DR
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PHASE II

CITY JOB No.
JOB NO. 51423-04
DATE 9/16/2025
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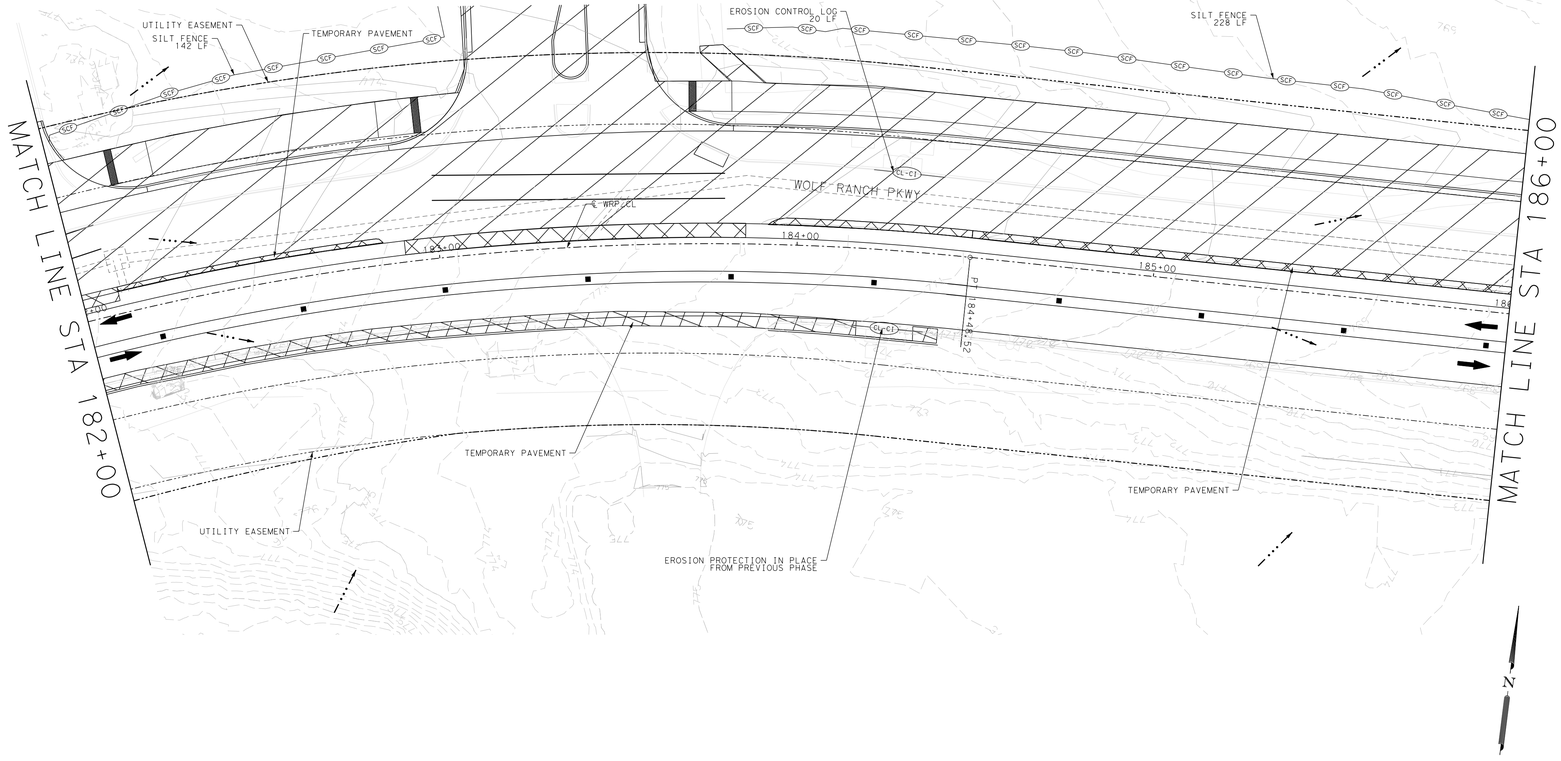
SHEET 9 OF 15

SHEET NO. 310



LEGEND

- TRAFFIC FLOW ARROWS
- FLOW ARROW
- SILT FENCE
- ROCK BERM
- CONSTRUCTION PHASE
- CONSTRUCTION ENTRANCE/EXIT
- TOPSOIL AND SEEDING
- EROSION CONTROL LOG
- 850 EXISTING CONTOURS
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- PROPOSED TRUNKLINE

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DATE 9/16/2025
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SHEET 10 OF 15

SHEET NO. 311



LEGEND

- TRAFFIC FLOW ARROWS
- FLOW ARROW
- SILT FENCE
- ROCK BERM
- CONSTRUCTION PHASE
- CONSTRUCTION ENTRANCE/EXIT
- TOPSOIL AND SEEDING
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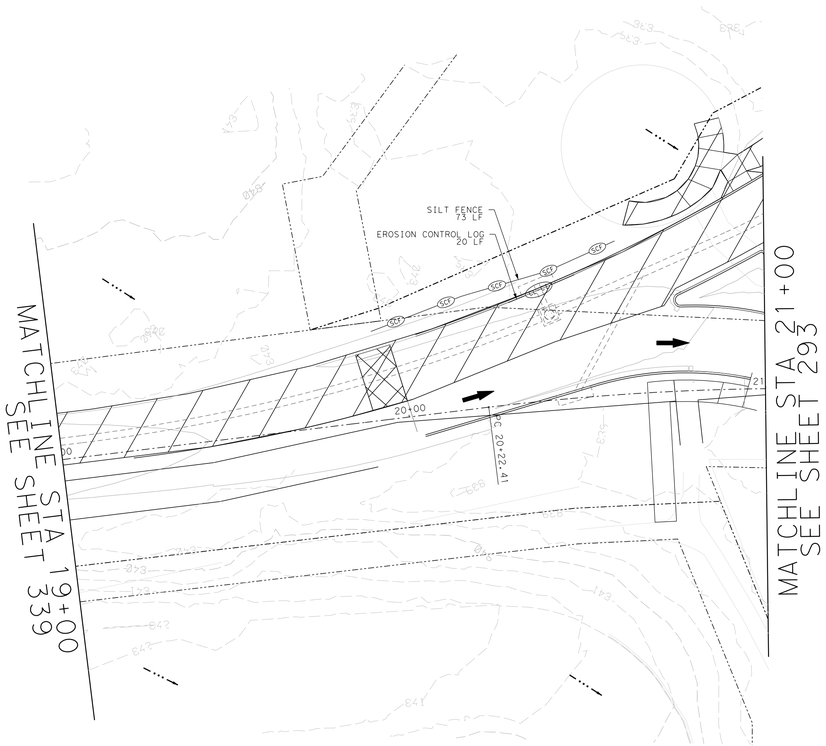
SHEET 11 OF 15

SHEET NO. 312



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LEGEND

- TRAFFIC FLOW ARROWS
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- CONSTRUCTION PHASE
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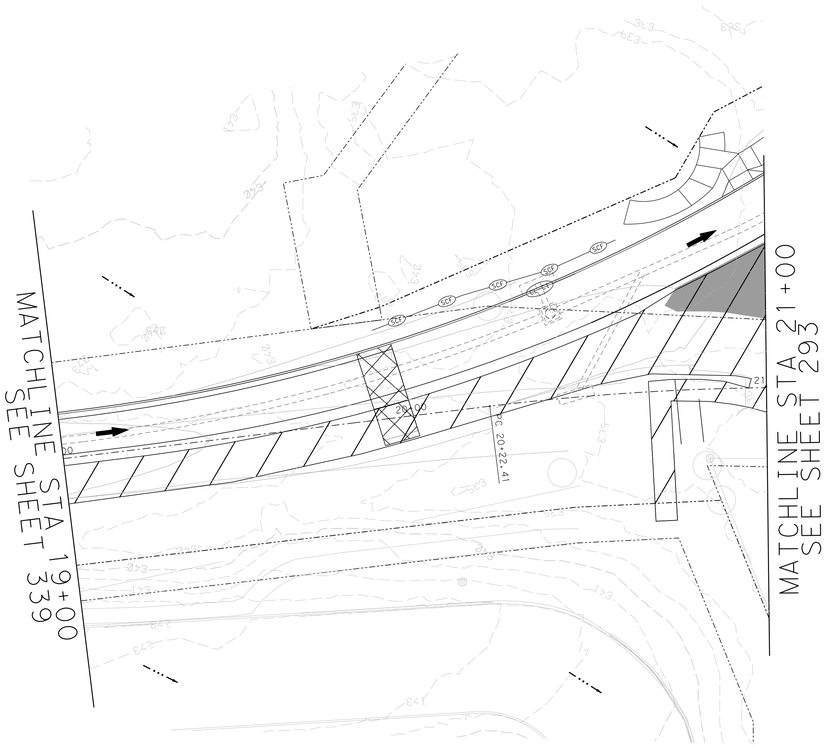



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6. EROSION CONTROL LOGS TO REMAIN UNTIL THE COMPLETION OF ALL SW3P PHASES UNLESS OTHERWISE NOTED.
7. TOP OF ROCK FILTER DAMS SHALL NOT BE CONSTRUCTED HIGHER THAN ADJACENT EDGE OF PAVEMENT.

DESIGN

STATE OF TEXAS
BRET CHAPMAN
127293
LICENSED
PROFESSIONAL ENGINEER

BRET CHAPMAN, P.E. — 9/16/2025 DATE

APPROVAL

STATE OF TEXAS
BRIAN A. ALLEN
123374
LICENSED
PROFESSIONAL ENGINEER

BRIAN A. ALLEN, P.E. — 9/16/2025 DATE

NO.	REVISION	DATE

GEORGETOWN TEXAS
more than welcome

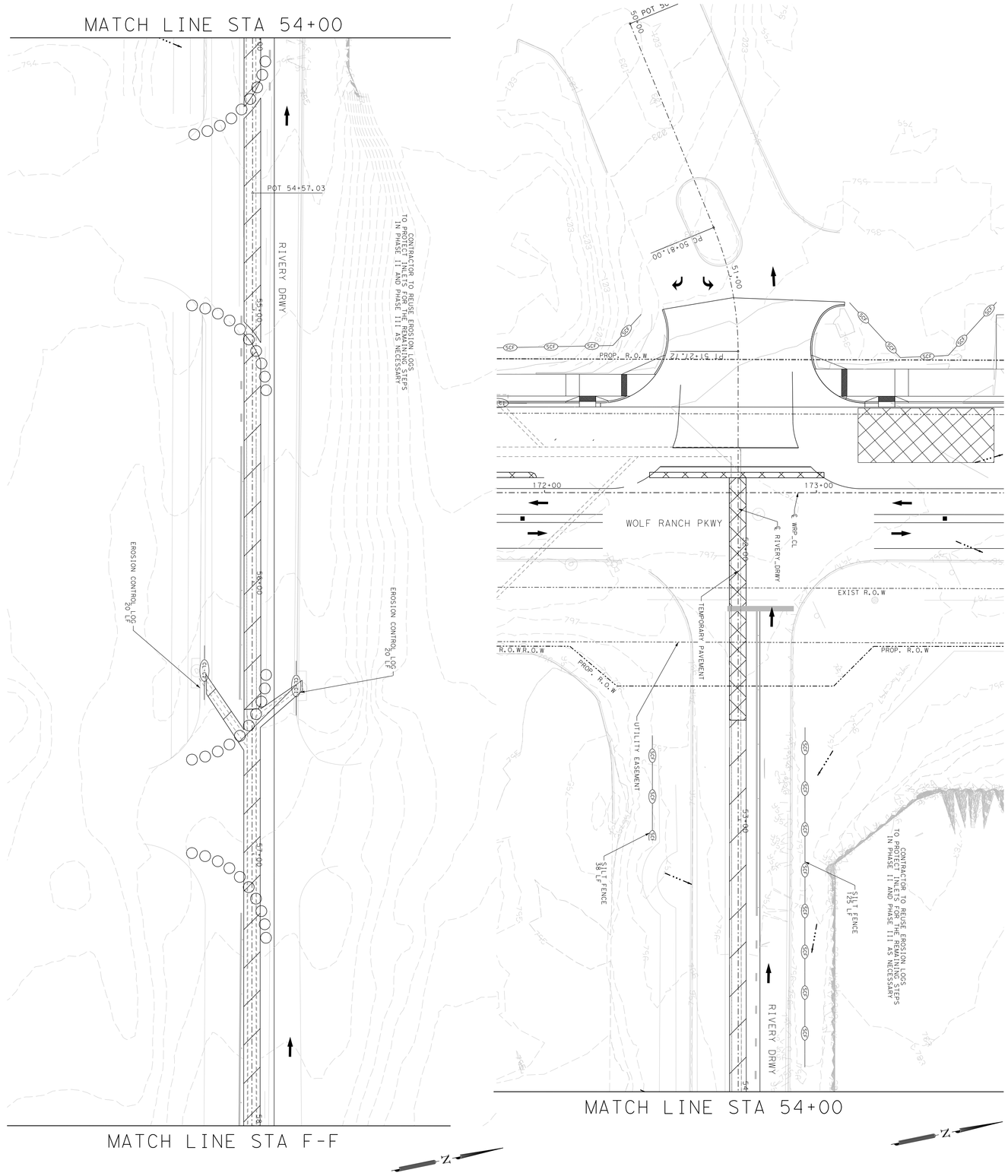
PAPE-DAWSON ENGINEERS
AUSTIN I SAN ANTONIO I HOUSTON I FORT WORTH I DALLAS
10801 N MOPAC EXPY, BLDG 3, STE 200 I AUSTIN, TX 78759 I 512.454.8711
TEXAS ENGINEERING FIRM #470 I TEXAS SURVEYING FIRM #10028800

WOLF RANCH PKWY / MEMORIAL DR
SW3P LAYOUT
PHASE II STEP I

CITY JOB No.
JOB NO. 51423-04
DATE 9/16/2025
DESIGNER
CHECKED DRAWN

SHEET 13 OF 15

SHEET NO. 314



LEGEND

- TRAFFIC FLOW ARROWS
- FLOW ARROW
- SILT FENCE
- ROCK BERM
- CONSTRUCTION PHASE
- CONSTRUCTION ENTRANCE/EXIT
- TOPSOIL AND SEEDING
- EROSION CONTROL LOG
- EXISTING CONTOURS
- PROPOSED CONTOURS
- PROPOSED TRUNKLINE

SCALE: 1" = 20'

NOTES

1. THE MEASURES SHOWN ARE SUGGESTED PLACEMENTS OF SW3P ITEMS. THE ENGINEER MAY MODIFY AS FIELD CONDITIONS REQUIRE.
2. SW3P LAYOUTS CORRESPOND WITH TCP PHASING.
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DESIGN

STATE OF TEXAS
BRET CHAPMAN
PROFESSIONAL ENGINEER
LICENSED
12723

APPROVAL

STATE OF TEXAS
BRIAN A. ALLEN
PROFESSIONAL ENGINEER
LICENSED
123374

BRET CHAPMAN, P.E. — 9/16/2025 DATE

BRIAN A. ALLEN, P.E. — 9/16/2025 DATE

CITY JOB No.
JOB NO. 51423-04
DATE 9/16/2025
DESIGNER
CHECKED DRAWN
SHEET 14 OF 15
SHEET NO. 315

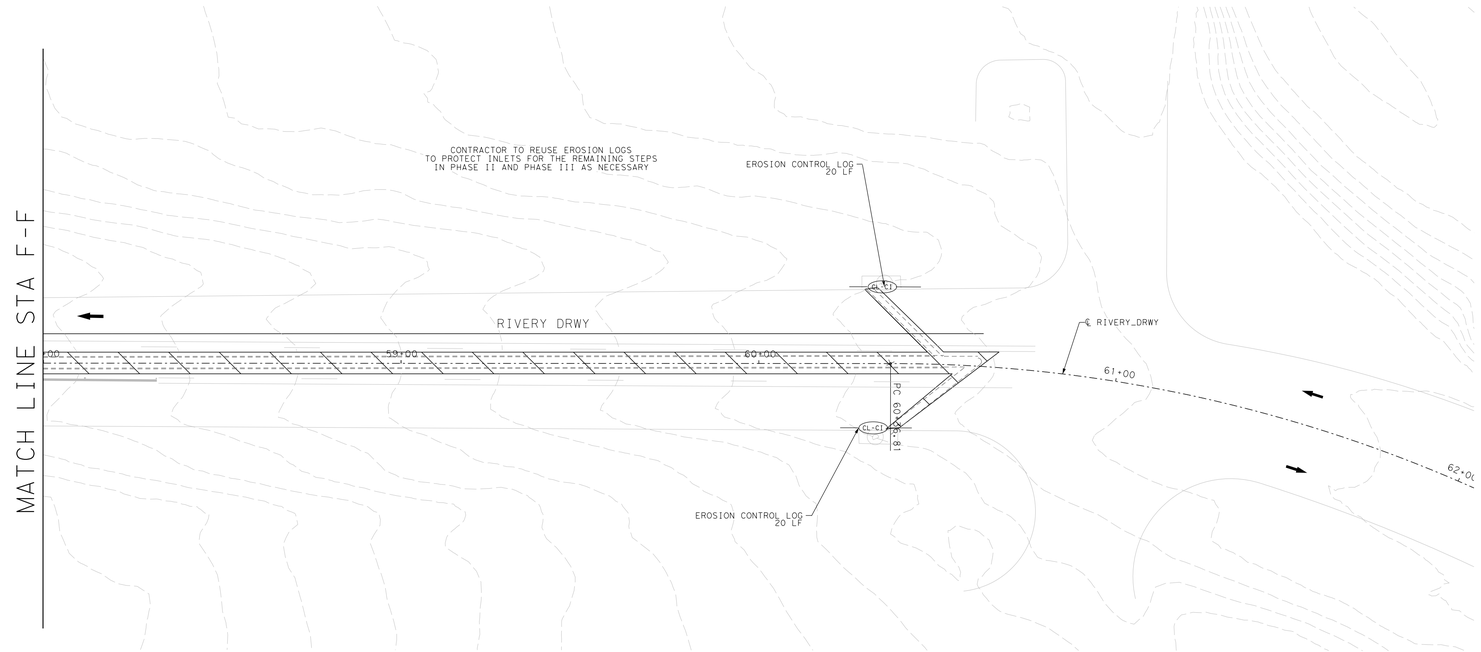
WOLF RANCH PKWY / MEMORIAL DR

SW3P LAYOUT
PHASE II

PAPE-DAWSON ENGINEERS
AUSTIN | SAN ANTONIO | HOUSTON | FORT WORTH | DALLAS
10801 N MOPAC EXPY, BLDG 3, STE 200 | AUSTIN, TX 78759 | 512.454.8711
TEXAS ENGINEERING FIRM #470 | TEXAS SURVEYING FIRM #10028800

GEORGETOWN TEXAS
more than welcome

NO.	REVISION	DATE





LEGEND

- TRAFFIC FLOW ARROWS
- FLOW ARROW
- SILT FENCE
- ROCK BERM
- CONSTRUCTION PHASE
- CONSTRUCTION ENTRANCE/EXIT
- TOPSOIL AND SEEDING
- EROSION CONTROL LOG
- 850 EXISTING CONTOURS
- 850 PROPOSED CONTOURS
- PROPOSED TRUNKLINE

SCALE: 1"= 20'

0' 20' 40' 60'

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DESIGN

STATE OF TEXAS
BRET CHAPMAN
127293
LICENSED
PROFESSIONAL ENGINEER

BRET CHAPMAN, P.E. — 9/16/2025 DATE

APPROVAL

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123374
LICENSED
PROFESSIONAL ENGINEER

BRIAN A. ALLEN, P.E. — 9/16/2025 DATE

NO.	REVISION	DATE

GEORGETOWN TEXAS *more than welcome*

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AUSTIN I SAN ANTONIO I HOUSTON I FORT WORTH I DALLAS
10801 N MOPAC EXPY, BLDG 3, STE 200 I AUSTIN, TX 78759 I 512.454.8711
TEXAS ENGINEERING FIRM #470 I TEXAS SURVEYING FIRM #10028800

WOLF RANCH PKWY / MEMORIAL DR
SW3P LAYOUT PHASE II

CITY JOB No.
JOB NO. 51423-04
DATE 9/16/2025
DESIGNER
CHECKED DRAWN

SHEET 15 OF 15
SHEET NO. 316



LEGEND

- TRAFFIC FLOW ARROWS
- FLOW ARROW
- SILT FENCE
- ROCK BERM
- CONSTRUCTION PHASE
- CONSTRUCTION ENTRANCE/EXIT
- TOPSOIL AND SEEDING
- EROSION CONTROL LOG
- EXISTING CONTOURS
- PROPOSED CONTOURS
- PROPOSED TRUNKLINE

SCALE: 1"= 20'

0' 20' 40' 60'

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DESIGN

STATE OF TEXAS — BRET CHAPMAN — 127293 — LICENSED PROFESSIONAL ENGINEER

BRET CHAPMAN, P.E. — 9/16/2025 DATE

APPROVAL

STATE OF TEXAS — BRIAN A. ALLEN — 123374 — LICENSED PROFESSIONAL ENGINEER

BRIAN A. ALLEN, P.E. — 9/16/2025 DATE

NO.	REVISION	DATE

GEORGETOWN TEXAS *more than welcome*

PAPE-DAWSON ENGINEERS

AUSTIN I SAN ANTONIO I HOUSTON I FORT WORTH I DALLAS

10801 N MOPAC EXPY, BLDG 3, STE 200 I AUSTIN, TX 78759 I 512.454.8711

TEXAS ENGINEERING FIRM #470 I TEXAS SURVEYING FIRM #10028800

WOLF RANCH PKWY / MEMORIAL DR
SW3P LAYOUT
PHASE III STEP I

CITY JOB No.

JOB NO. 51423-04

DATE 9/16/2025

DESIGNER

CHECKED DRAWN

SHEET 1 OF 11

SHEET NO. 317

LEGEND

- TRAFFIC FLOW ARROWS
- FLOW ARROW
- SILT FENCE (SCF)
- ROCK BERM (RFD2)
- CONSTRUCTION PHASE
- CONSTRUCTION ENTRANCE/EXIT
- TOPSOIL AND SEEDING
- EROSION CONTROL LOG (CL-C1)
- 850 EXISTING CONTOURS
- 850 PROPOSED CONTOURS
- PROPOSED TRUNKLINE

SCALE: 1"= 20'

0' 20' 40' 60'

NOTES

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STATE OF TEXAS — BRET CHAPMAN — 127293 — LICENSED PROFESSIONAL ENGINEER

BRET CHAPMAN, P.E. — 9/16/2025 DATE

APPROVAL

STATE OF TEXAS — BRIAN A. ALLEN — 123374 — LICENSED PROFESSIONAL ENGINEER

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GEORGETOWN TEXAS *more than welcome*

PAPE-DAWSON ENGINEERS
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10801 N MOPAC EXPY, BLDG 3, STE 200 I AUSTIN, TX 78759 I 512.454.8711
TEXAS ENGINEERING FIRM #470 I TEXAS SURVEYING FIRM #10028800

WOLF RANCH PKWY / MEMORIAL DR
SW3P LAYOUT
PHASE III STEP I

CITY JOB No.
JOB NO. 51423-04
DATE 9/16/2025
DESIGNER
CHECKED DRAWN

SHEET 2 OF 11

SHEET NO. 318

LEGEND

- TRAFFIC FLOW ARROWS
- FLOW ARROW
- SILT FENCE
- ROCK BERM
- CONSTRUCTION PHASE
- CONSTRUCTION ENTRANCE/EXIT
- TOPSOIL AND SEEDING
- EROSION CONTROL LOG
- EXISTING CONTOURS
- PROPOSED CONTOURS
- PROPOSED TRUNKLINE

SCALE: 1"= 20'

0' 20' 40' 60'

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STATE OF TEXAS — BRET CHAPMAN — 127293 — LICENSED PROFESSIONAL ENGINEER

BRET CHAPMAN, P.E. — 9/16/2025 DATE

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GEORGETOWN TEXAS *more than welcome*

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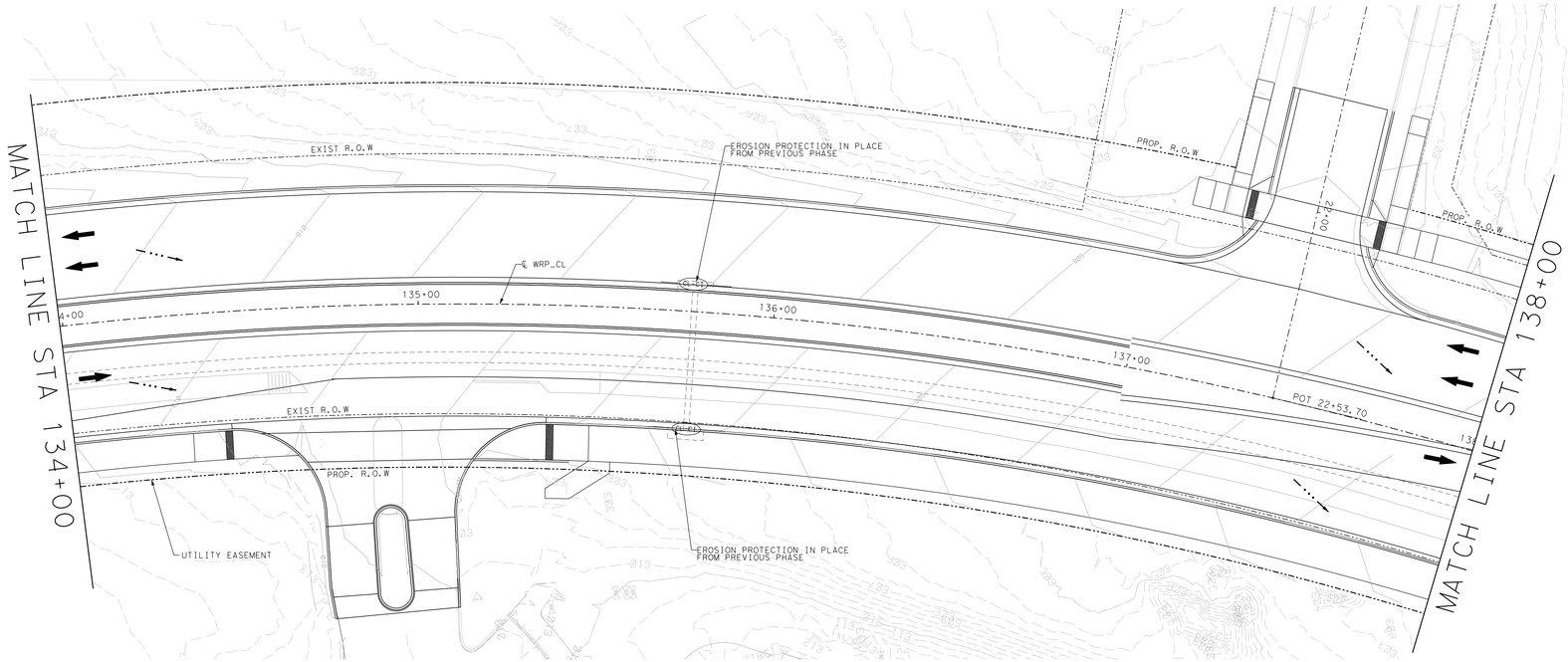
AUSTIN I SAN ANTONIO I HOUSTON I FORT WORTH I DALLAS
10801 N MOPAC EXPY, BLDG 3, STE 200 I AUSTIN, TX 78759 I 512.454.8711
TEXAS ENGINEERING FIRM #470 I TEXAS SURVEYING FIRM #10028800

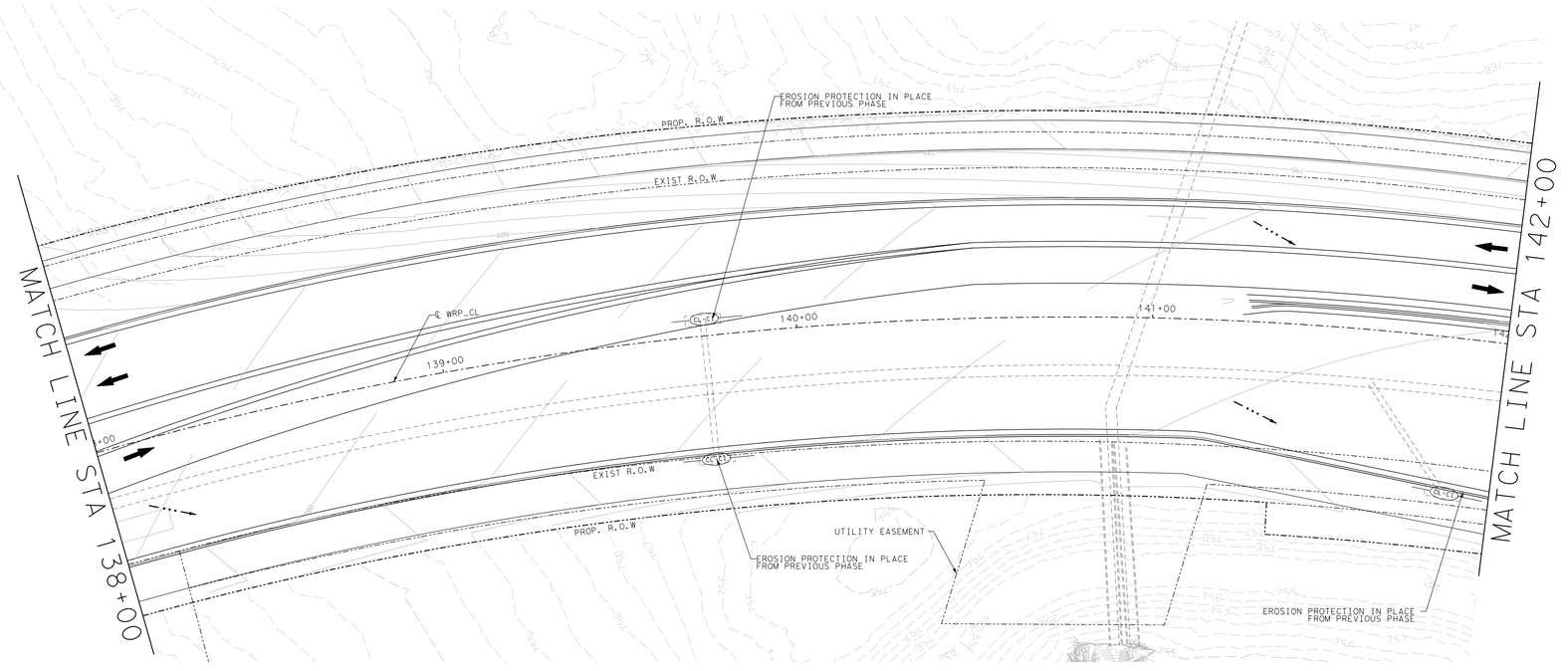
WOLF RANCH PKWY / MEMORIAL DR
SW3P LAYOUT
PHASE III STEP I

CITY JOB No.
JOB NO. 51423-04
DATE 9/16/2025
DESIGNER
CHECKED DRAWN

SHEET 3 OF 11

SHEET NO. 319





LEGEND

- TRAFFIC FLOW ARROWS
- FLOW ARROW
- SILT FENCE
- ROCK BERM
- CONSTRUCTION PHASE
- CONSTRUCTION ENTRANCE/EXIT
- TOPSOIL AND SEEDING
- EROSION CONTROL LOG
- EXISTING CONTOURS
- PROPOSED CONTOURS
- PROPOSED TRUNKLINE

SCALE: 1"= 20'

0' 20' 40' 60'

NOTES

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DESIGN

STATE OF TEXAS — BRET CHAPMAN — 127293 — LICENSED PROFESSIONAL ENGINEER

BRET CHAPMAN, P.E. — 9/16/2025 DATE

APPROVAL

STATE OF TEXAS — BRIAN A. ALLEN — 123374 — LICENSED PROFESSIONAL ENGINEER

BRIAN A. ALLEN, P.E. — 9/16/2025 DATE

NO.	REVISION	DATE

GEORGETOWN TEXAS *more than welcome*

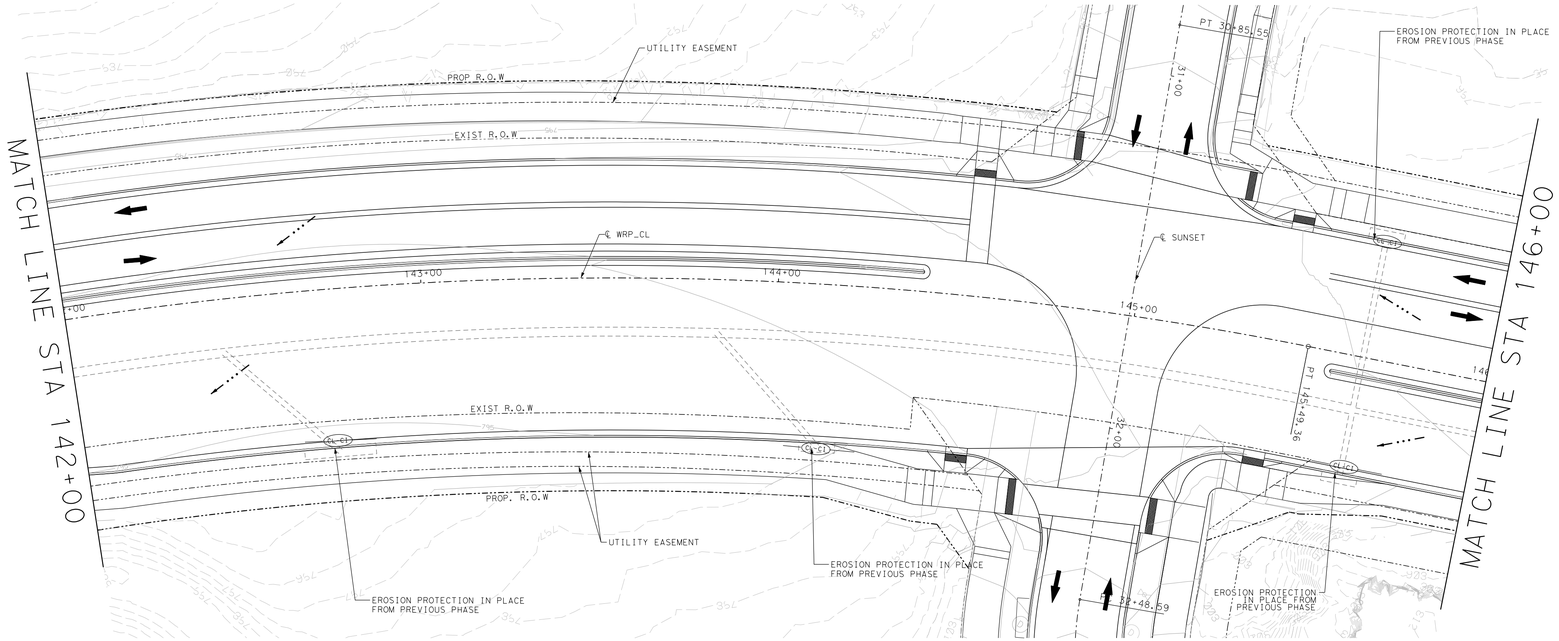
PAPE-DAWSON ENGINEERS
AUSTIN I SAN ANTONIO I HOUSTON I FORT WORTH I DALLAS
10801 N MOPAC EXPY, BLDG 3, STE 200 I AUSTIN, TX 78759 I 512.454.8711
TEXAS ENGINEERING FIRM #470 I TEXAS SURVEYING FIRM #10028800

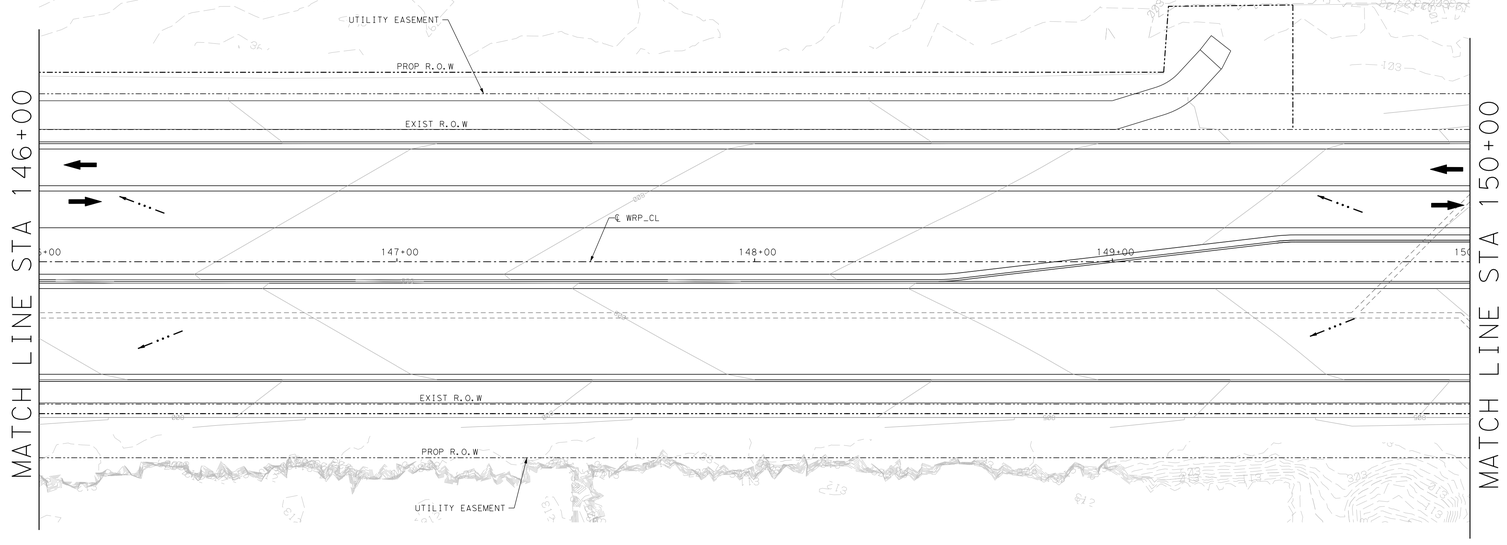
WOLF RANCH PKWY / MEMORIAL DR
SW3P LAYOUT
PHASE III STEP I

CITY JOB No.
JOB NO. 51423-04
DATE 9/16/2025
DESIGNER
CHECKED DRAWN

SHEET 4 OF 11

SHEET NO. 320





LEGEND

- TRAFFIC FLOW ARROWS
- FLOW ARROW
- SILT FENCE (SCF)
- ROCK BERM (RFD2)
- CONSTRUCTION PHASE
- CONSTRUCTION ENTRANCE/EXIT
- TOPSOIL AND SEEDING
- EROSION CONTROL LOG (SL-C1)
- EXISTING CONTOURS (850)
- PROPOSED CONTOURS (850)
- PROPOSED TRUNKLINE

SCALE: 1"= 20'

0' 20' 40' 60'

NOTES

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DESIGN

STATE OF TEXAS · BRET CHAPMAN · 127293 · LICENSED PROFESSIONAL ENGINEER

BRET CHAPMAN, P.E. — 9/16/2025 DATE

APPROVAL

STATE OF TEXAS · BRIAN A. ALLEN · 123374 · LICENSED PROFESSIONAL ENGINEER

BRIAN A. ALLEN, P.E. — 9/16/2025 DATE

NO.	REVISION	DATE

GEORGETOWN TEXAS *more than welcome*

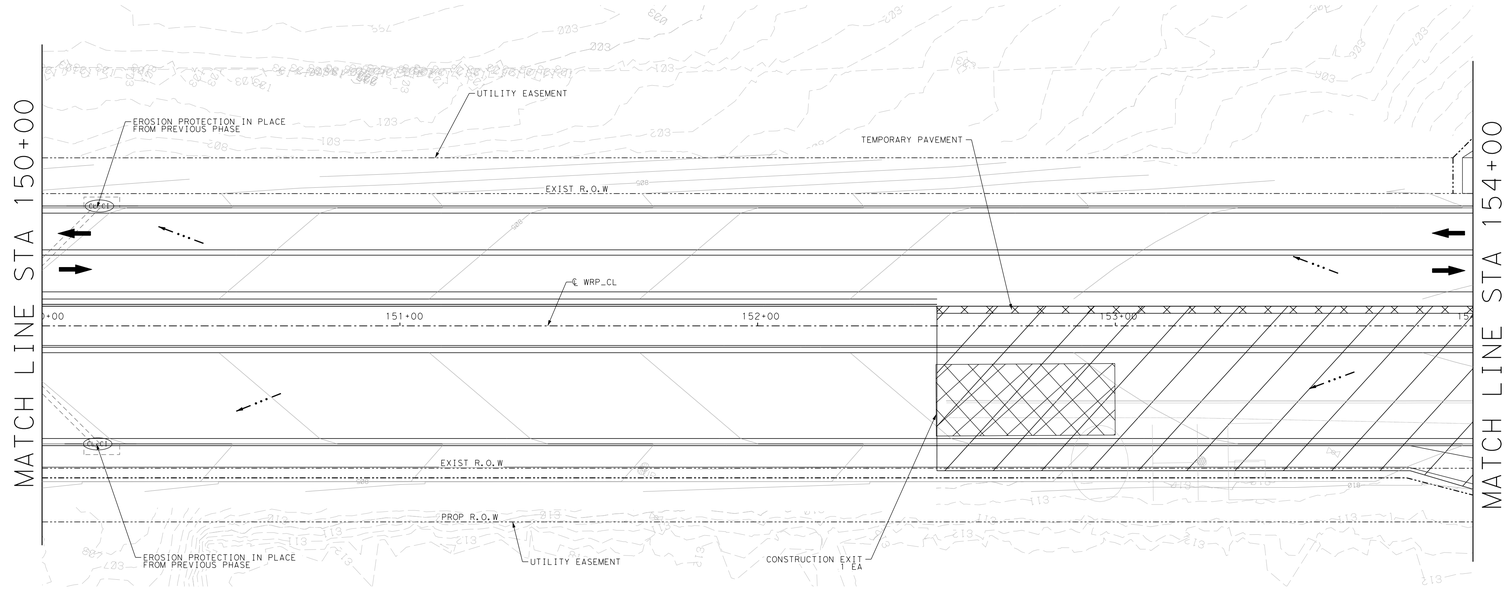
PAPE-DAWSON ENGINEERS
AUSTIN I SAN ANTONIO I HOUSTON I FORT WORTH I DALLAS
10801 N MOPAC EXPY, BLDG 3, STE 200 I AUSTIN, TX 78759 I 512.454.8711
TEXAS ENGINEERING FIRM #470 I TEXAS SURVEYING FIRM #10028800

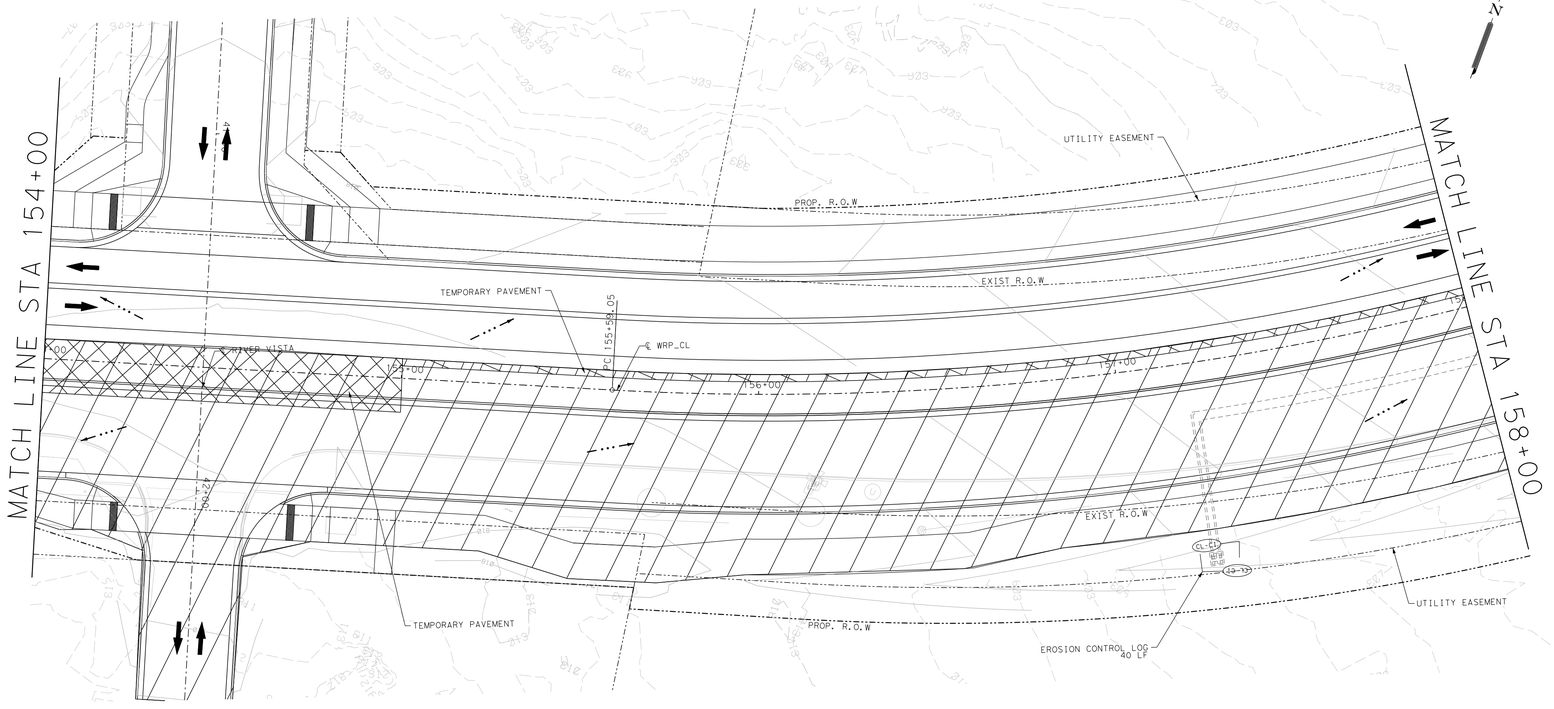
WOLF RANCH PKWY / MEMORIAL DR
SW3P LAYOUT
PHASE III STEP I

CITY JOB No.
JOB NO. 51423-04
DATE 9/16/2025
DESIGNER
CHECKED DRAWN

SHEET 5 OF 11

SHEET NO. 321





LEGEND

- TRAFFIC FLOW ARROWS
- FLOW ARROW
- SCP — SILT FENCE
- RFD2 — ROCK BERM
- CONSTRUCTION PHASE
- CONSTRUCTION ENTRANCE/EXIT
- TOPSOIL AND SEEDING
- CL-CI — EROSION CONTROL LOG
- 850 — EXISTING CONTOURS
- 850 — PROPOSED CONTOURS
- PROPOSED TRUNKLINE

SCALE: 1"= 20'

0' 20' 40' 60'

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DESIGN

STATE OF TEXAS — BRET CHAPMAN — 127293 — LICENSED PROFESSIONAL ENGINEER

BRET CHAPMAN, P.E. — 9/16/2025 DATE

APPROVAL

STATE OF TEXAS — BRIAN A. ALLEN — 123374 — LICENSED PROFESSIONAL ENGINEER

BRIAN A. ALLEN, P.E. — 9/16/2025 DATE

NO.	REVISION	DATE

GEORGETOWN TEXAS *more than welcome*

PAPE-DAWSON ENGINEERS
AUSTIN I SAN ANTONIO I HOUSTON I FORT WORTH I DALLAS
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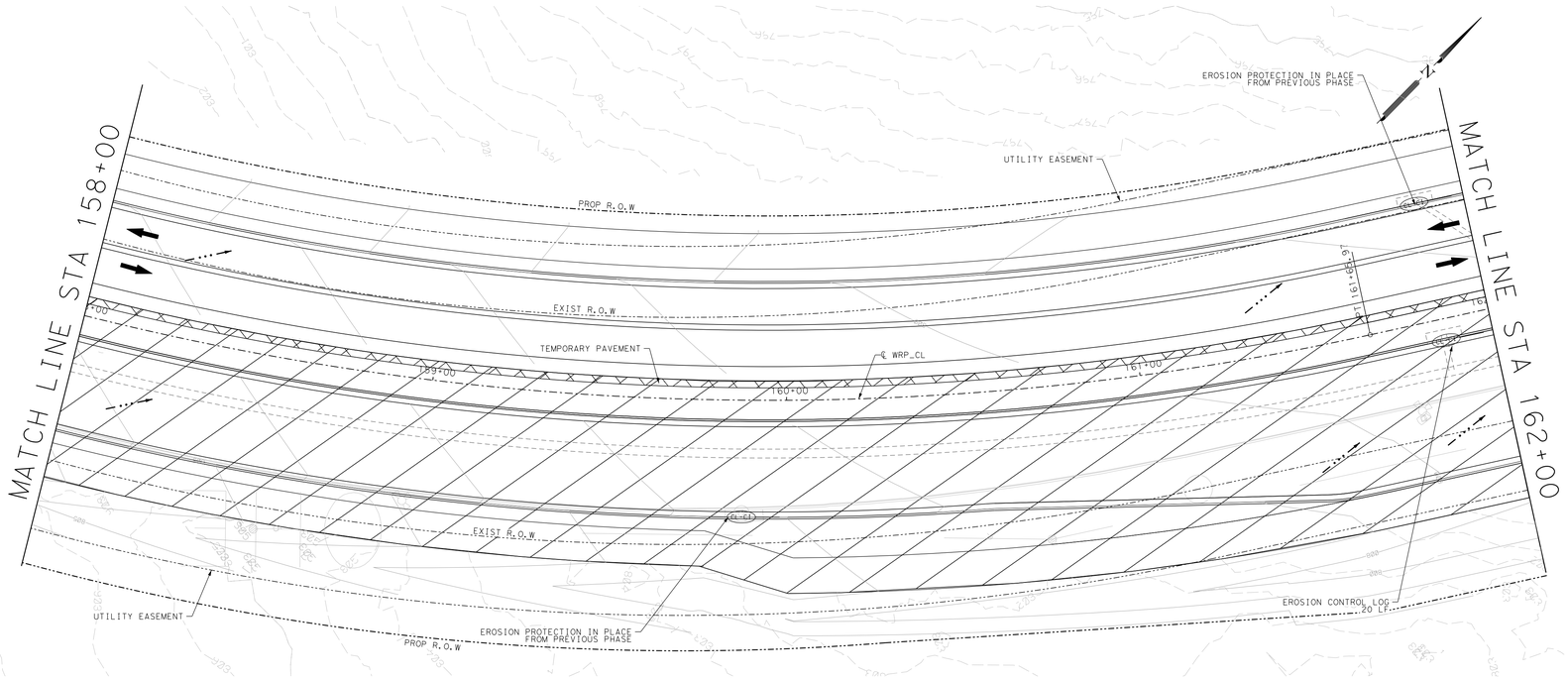
TEXAS ENGINEERING FIRM #470 I TEXAS SURVEYING FIRM #10028800

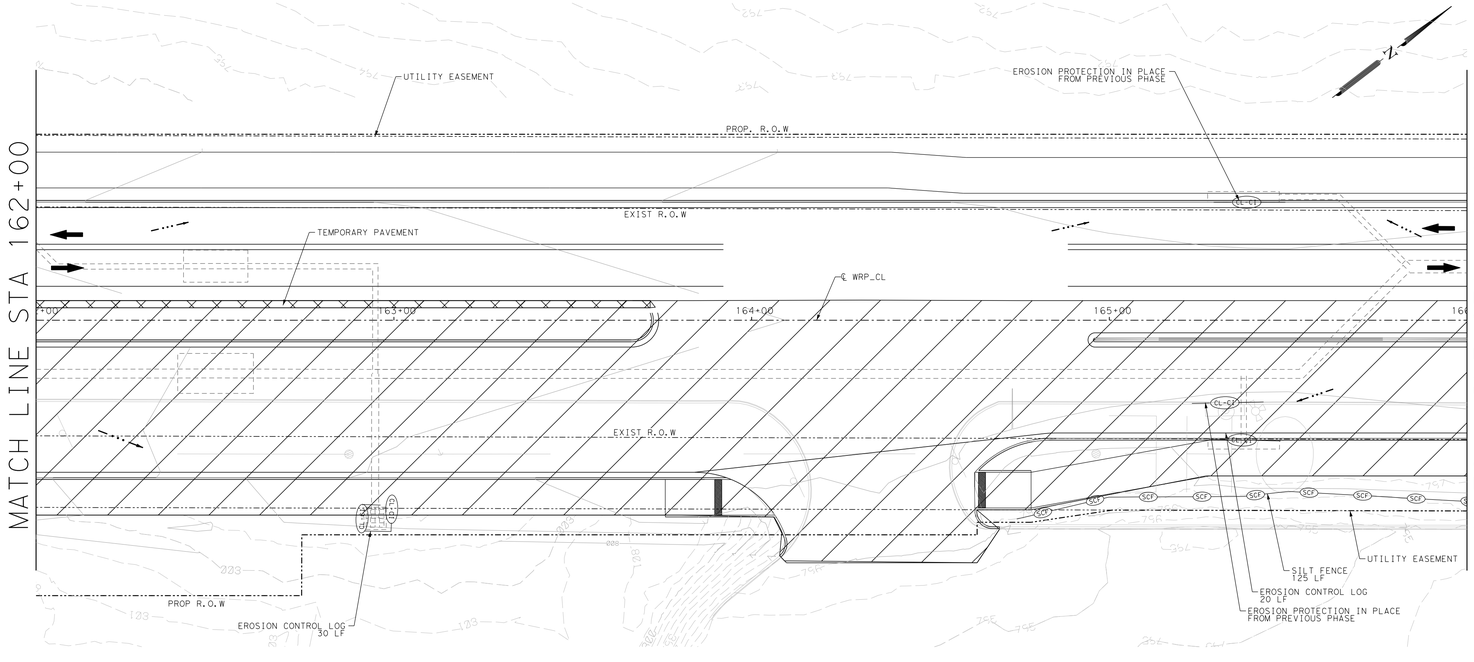
WOLF RANCH PKWY / MEMORIAL DR
SW3P LAYOUT
PHASE III STEP I

CITY JOB No.
JOB NO. 51423-04
DATE 9/16/2025
DESIGNER
CHECKED DRAWN

SHEET 6 OF 11

SHEET NO. 322





LEGEND

- TRAFFIC FLOW ARROWS
- FLOW ARROW
- SILT FENCE (SCF)
- ROCK BERM (RFD2)
- CONSTRUCTION PHASE
- CONSTRUCTION ENTRANCE/EXIT
- TOPSOIL AND SEEDING
- EROSION CONTROL LOG (EL-C2)
- 850 EXISTING CONTOURS
- 850 PROPOSED CONTOURS
- PROPOSED TRUNKLINE

SCALE: 1"= 20'

0' 20' 40' 60'

NOTES

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DESIGN

STATE OF TEXAS — BRET CHAPMAN — 127293 — LICENSED PROFESSIONAL ENGINEER

BRET CHAPMAN, P.E. — 9/16/2025 DATE

APPROVAL

STATE OF TEXAS — BRIAN A. ALLEN — 123374 — LICENSED PROFESSIONAL ENGINEER

BRIAN A. ALLEN, P.E. — 9/16/2025 DATE

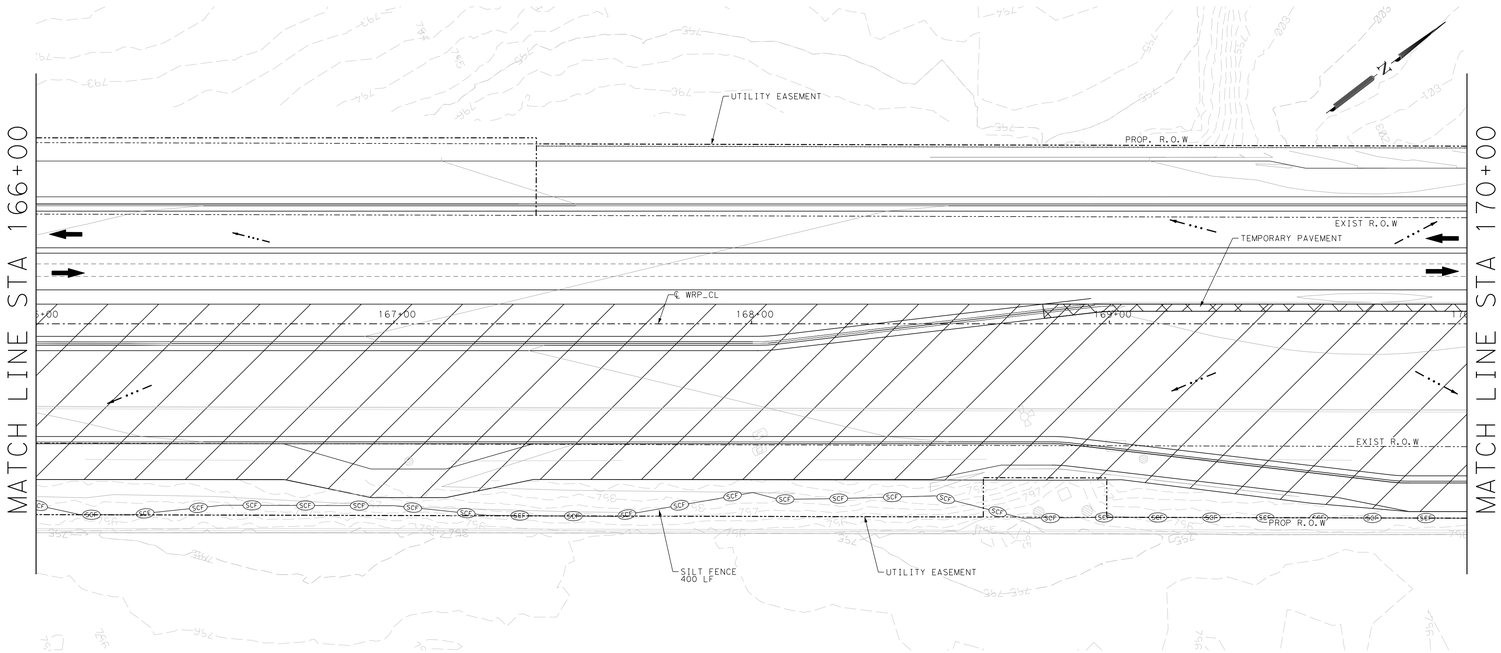
NO.	REVISION	DATE

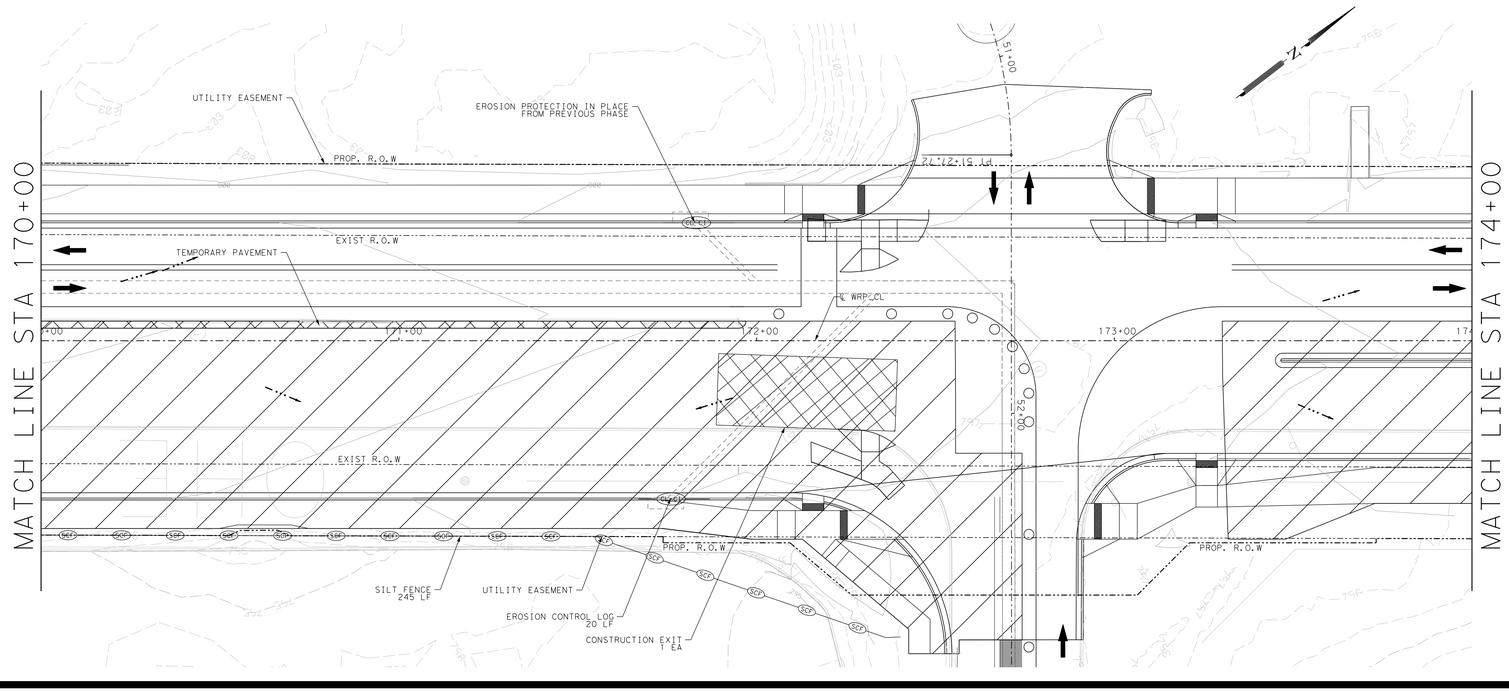
GEORGETOWN TEXAS *more than welcome*

PAPE-DAWSON ENGINEERS
AUSTIN I SAN ANTONIO I HOUSTON I FORT WORTH I DALLAS
10801 N MOPAC EXPY, BLDG 3, STE 200 I AUSTIN, TX 78759 I 512.454.8711
TEXAS ENGINEERING FIRM #470 I TEXAS SURVEYING FIRM #10028800

WOLF RANCH PKWY / MEMORIAL DR
SW3P LAYOUT
PHASE III STEP I

CITY JOB No.
JOB NO. 51423-04
DATE 9/16/2025
DESIGNER
CHECKED DRAWN





LEGEND

- TRAFFIC FLOW ARROWS
- FLOW ARROW
- SILT FENCE (SCF)
- ROCK BERM (RFD2)
- CONSTRUCTION PHASE
- CONSTRUCTION ENTRANCE/EXIT
- TOPSOIL AND SEEDING
- EROSION CONTROL LOG (EL-C2)
- 850 EXISTING CONTOURS
- 850 PROPOSED CONTOURS
- PROPOSED TRUNKLINE

SCALE: 1"= 20'

0' 20' 40' 60'

NOTES

1. THE MEASURES SHOWN ARE SUGGESTED PLACEMENTS OF SW3P ITEMS. THE ENGINEER MAY MODIFY AS FIELD CONDITIONS REQUIRE.
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7. TOP OF ROCK FILTER DAMS SHALL NOT BE CONSTRUCTED HIGHER THAN ADJACENT EDGE OF PAVEMENT.

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STATE OF TEXAS — BRET CHAPMAN — 127293 — LICENSED PROFESSIONAL ENGINEER

BRET CHAPMAN, P.E. — 9/16/2025 DATE

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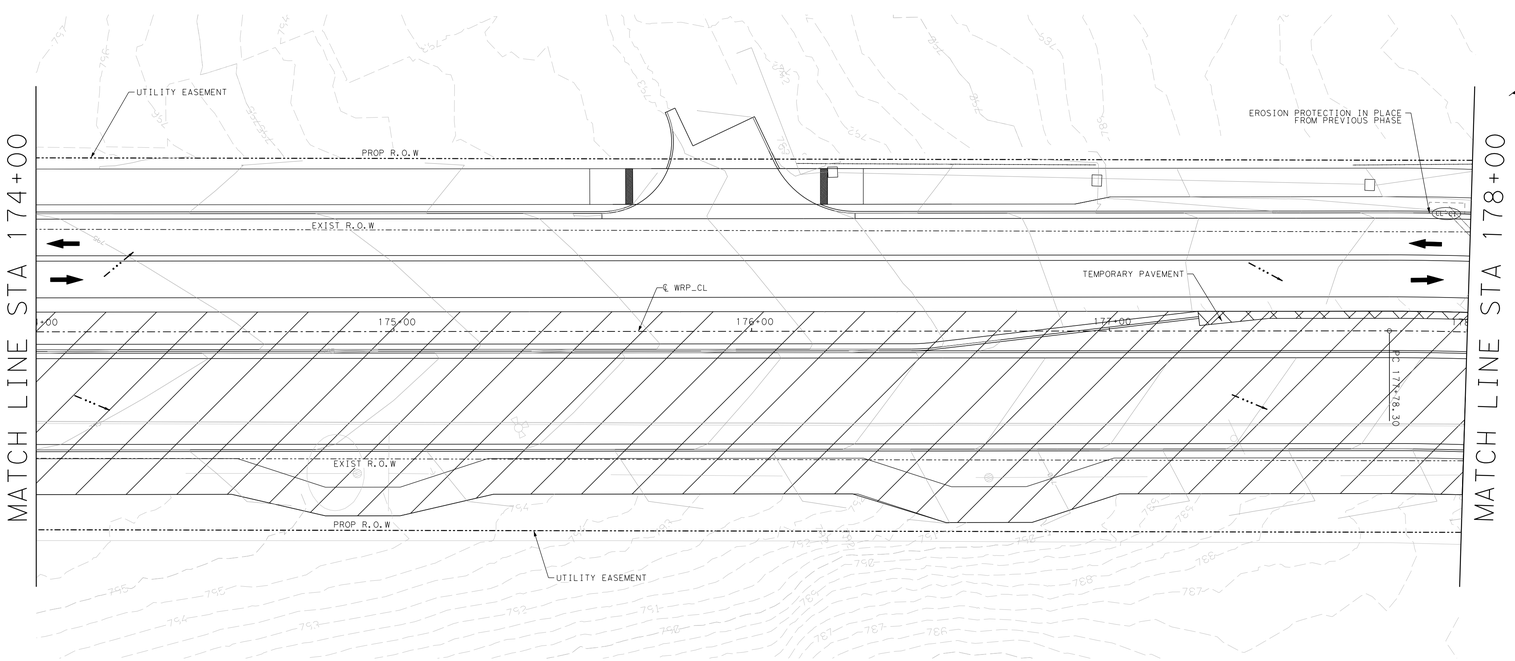
TEXAS ENGINEERING FIRM #470 I TEXAS SURVEYING FIRM #10028800

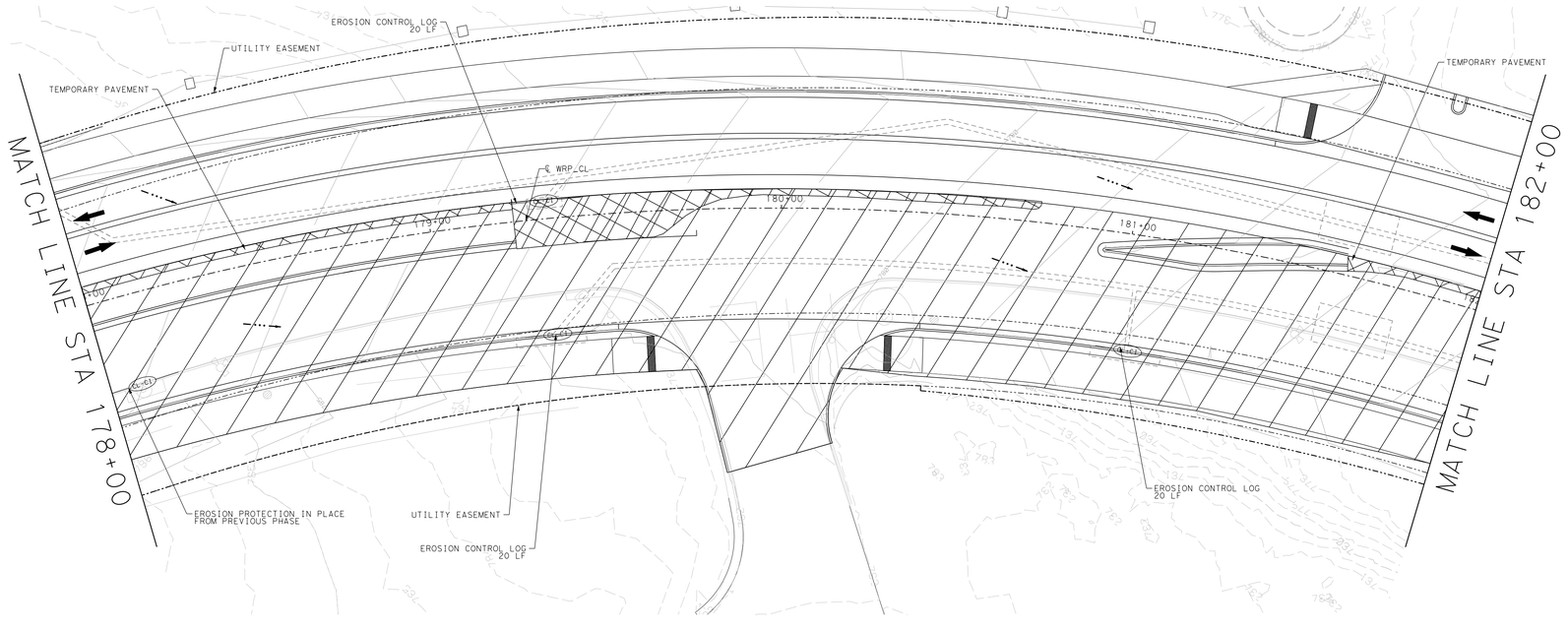
WOLF RANCH PKWY / MEMORIAL DR
SW3P LAYOUT
PHASE III STEP I

CITY JOB No.
JOB NO. 51423-04
DATE 9/16/2025
DESIGNER
CHECKED DRAWN

SHEET 8 OF 11

SHEET NO. 324





LEGEND

- TRAFFIC FLOW ARROWS
- FLOW ARROW
- SILT FENCE
- ROCK BERM
- CONSTRUCTION PHASE
- CONSTRUCTION ENTRANCE/EXIT
- TOPSOIL AND SEEDING
- EROSION CONTROL LOG
- EXISTING CONTOURS
- PROPOSED CONTOURS
- PROPOSED TRUNKLINE

SCALE: 1"= 20'

0' 20' 40' 60'

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STATE OF TEXAS
BRET CHAPMAN
127293
LICENSED
PROFESSIONAL ENGINEER

BRET CHAPMAN, P.E. — 9/16/2025 DATE

APPROVAL

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BRIAN A. ALLEN
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LICENSED
PROFESSIONAL ENGINEER

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GEORGETOWN TEXAS
more than welcome

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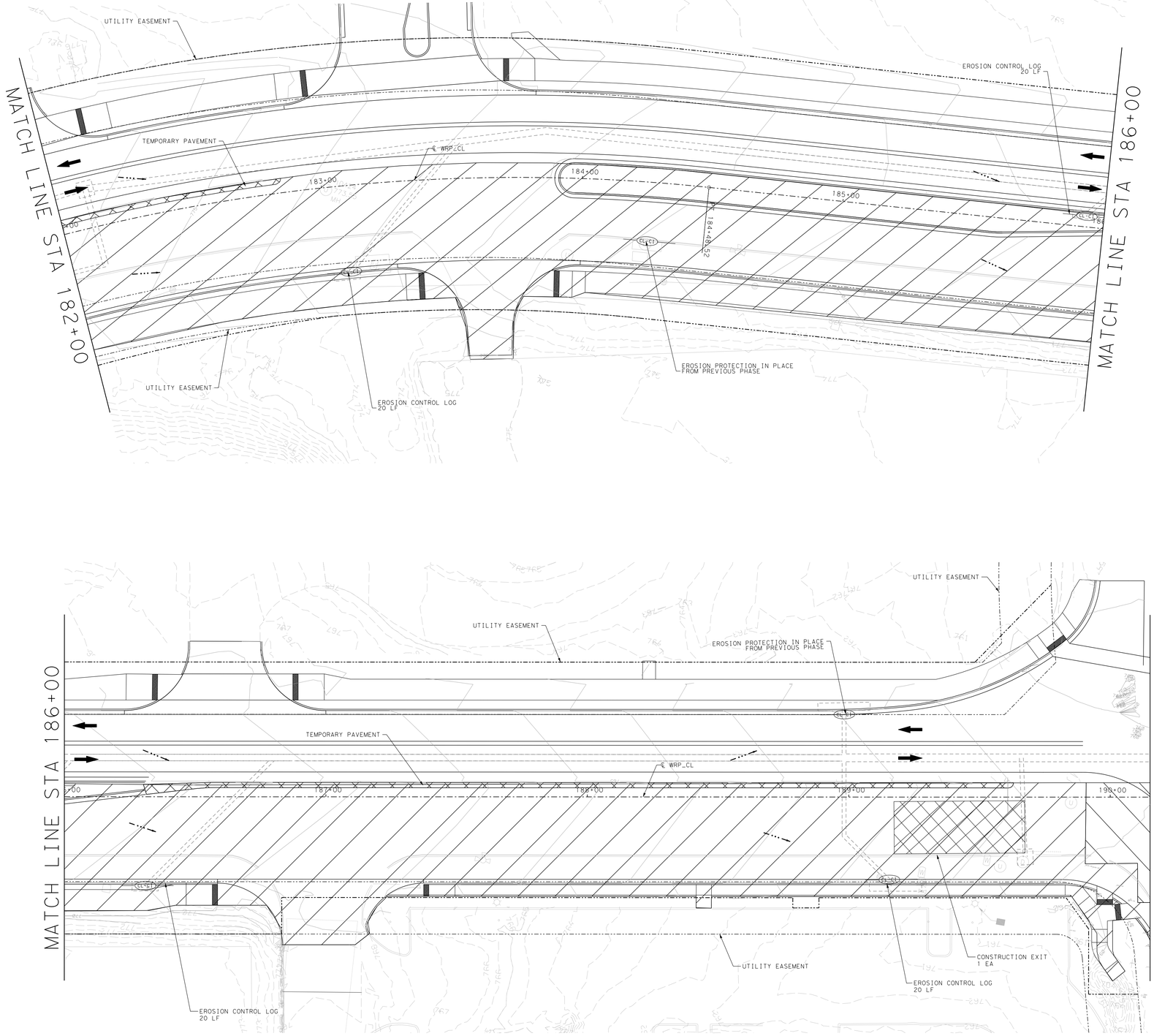
AUSTIN I SAN ANTONIO I HOUSTON I FORT WORTH I DALLAS
10801 N MOPAC EXPY, BLDG 3, STE 200 I AUSTIN, TX 78759 I 512.454.8711
TEXAS ENGINEERING FIRM #470 I TEXAS SURVEYING FIRM #10028800

WOLF RANCH PKWY / MEMORIAL DR
SW3P LAYOUT
PHASE III STEP I

CITY JOB No.
JOB NO. 51423-04
DATE 9/16/2025
DESIGNER
CHECKED DRAWN

SHEET 9 OF 11

SHEET NO. 325



LEGEND

- TRAFFIC FLOW ARROWS
- FLOW ARROW
- SILT FENCE
- ROCK BERM
- CONSTRUCTION PHASE
- CONSTRUCTION ENTRANCE/EXIT
- TOPSOIL AND SEEDING
- EROSION CONTROL LOG
- 850 EXISTING CONTOURS
- 850 PROPOSED CONTOURS
- PROPOSED TRUNKLINE

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GEORGETOWN TEXAS
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10801 N MOPAC EXPY, BLDG 3, STE 200 | AUSTIN, TX 78759 | 512.454.8711
TEXAS ENGINEERING FIRM #470 | TEXAS SURVEYING FIRM #10028800

WOLF RANCH PKWY / MEMORIAL DR
SW3P LAYOUT
PHASE III STEP I

CITY JOB No.
JOB NO. 51423-04
DATE 9/16/2025
DESIGNER
CHECKED DRAWN

SHEET 10 OF 11

SHEET NO. 326

LEGEND

- TRAFFIC FLOW ARROWS
- FLOW ARROW
- SCP — SILT FENCE
- RFD2 — ROCK BERM
- CONSTRUCTION PHASE
- CONSTRUCTION ENTRANCE/EXIT
- TOPSOIL AND SEEDING
- EL-CI — EROSION CONTROL LOG
- 850 — EXISTING CONTOURS
- 850 — PROPOSED CONTOURS
- PROPOSED TRUNKLINE

SCALE: 1"= 20'

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TEXAS ENGINEERING FIRM #470 I TEXAS SURVEYING FIRM #10028800

WOLF RANCH PKWY / MEMORIAL DR
SW3P LAYOUT
PHASE III STEP I

CITY JOB No.

JOB NO. 51423-04

DATE 9/16/2025

DESIGNER

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SHEET 11 OF 11

SHEET NO. 327

LEGEND

- TRAFFIC FLOW ARROWS
- FLOW ARROW
- SILT FENCE
- ROCK BERM
- CONSTRUCTION PHASE
- CONSTRUCTION ENTRANCE/EXIT
- TOPSOIL AND SEEDING
- EROSION CONTROL LOG
- 850 EXISTING CONTOURS
- 850 PROPOSED CONTOURS
- PROPOSED TRUNKLINE

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STATE OF TEXAS — BRET CHAPMAN — 127293 — LICENSED PROFESSIONAL ENGINEER

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GEORGETOWN TEXAS *more than welcome*

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AUSTIN I SAN ANTONIO I HOUSTON I FORT WORTH I DALLAS
10801 N MOPAC EXPY, BLDG 3, STE 200 I AUSTIN, TX 78759 I 512.454.8711
TEXAS ENGINEERING FIRM #470 I TEXAS SURVEYING FIRM #10028800

WOLF RANCH PKWY / MEMORIAL DR

SW3P LAYOUT PHASE III STEP II

CITY JOB No.
JOB NO. 51423-04
DATE 9/16/2025
DESIGNER
CHECKED DRAWN

SHEET 1 OF 11

SHEET NO. 328

LEGEND

- TRAFFIC FLOW ARROWS
- FLOW ARROW
- SILT FENCE
- ROCK BERM
- CONSTRUCTION PHASE
- CONSTRUCTION ENTRANCE/EXIT
- TOPSOIL AND SEEDING
- EROSION CONTROL LOG
- 850 EXISTING CONTOURS
- 850 PROPOSED CONTOURS
- PROPOSED TRUNKLINE

SCALE: 1"= 20'

0' 20' 40' 60'

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10801 N MOPAC EXPY, BLDG 3, STE 200 I AUSTIN, TX 78759 I 512.454.8711

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SW3P LAYOUT
PHASE III STEP II

CITY JOB No.

JOB NO. 51423-04

DATE 9/16/2025

DESIGNER

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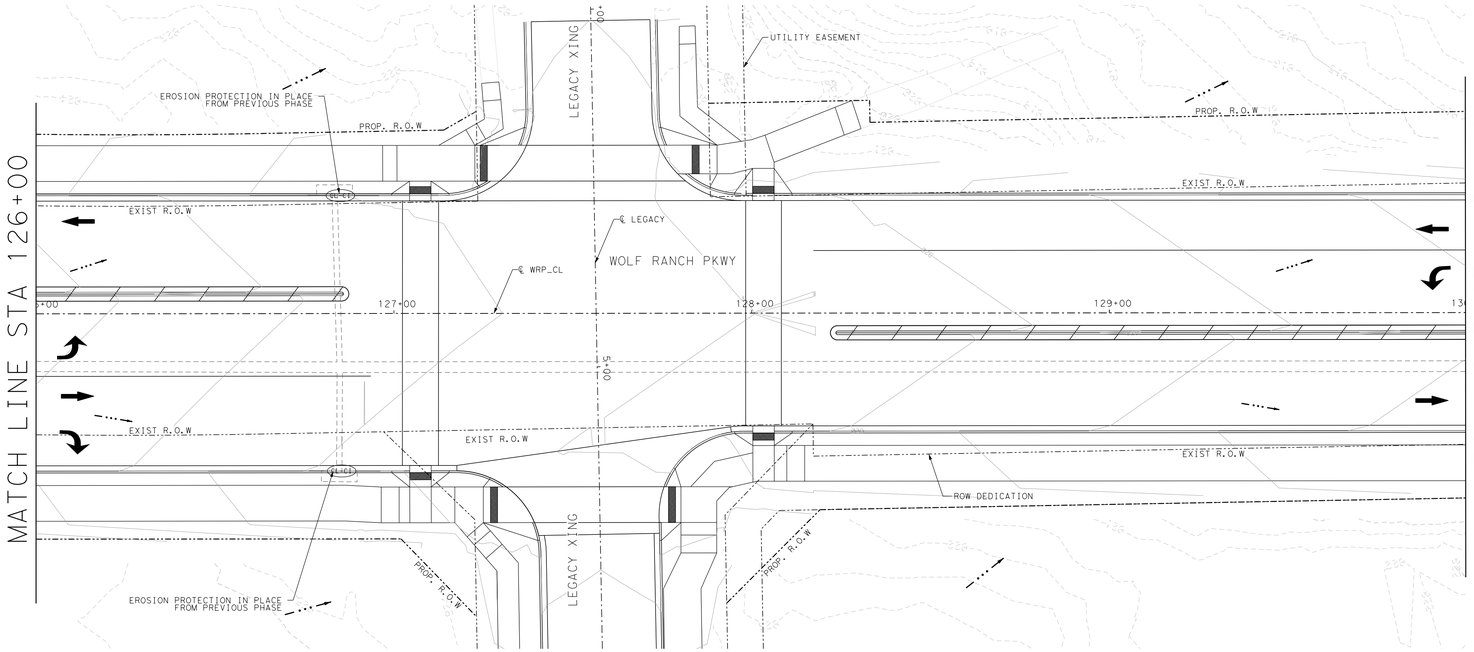
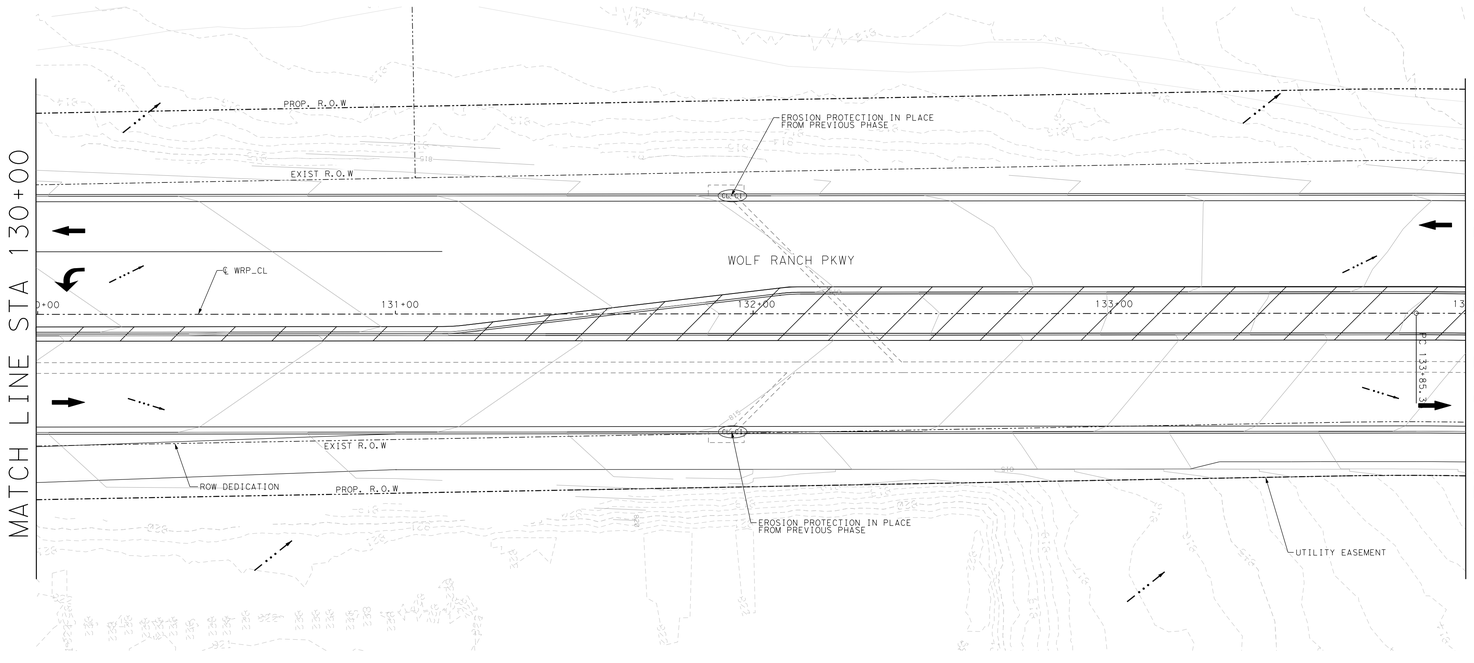
SHEET 2 OF 11

SHEET NO. 329





LEGEND

- TRAFFIC FLOW ARROWS
- FLOW ARROW
- SCP — SILT FENCE
- RFD2 — ROCK BERM
- CONSTRUCTION PHASE
- CONSTRUCTION ENTRANCE/EXIT
- TOPSOIL AND SEEDING
- EL-C1 — EROSION CONTROL LOG
- 850 — EXISTING CONTOURS
- 850 — PROPOSED CONTOURS
- PROPOSED TRUNKLINE

SCALE: 1"= 20'

0' 20' 40' 60'

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STATE OF TEXAS — BRET CHAPMAN — 127293 — LICENSED PROFESSIONAL ENGINEER

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WOLF RANCH PKWY / MEMORIAL DR
SW3P LAYOUT
PHASE III STEP II

CITY JOB No.
JOB NO. 51423-04
DATE 9/16/2025
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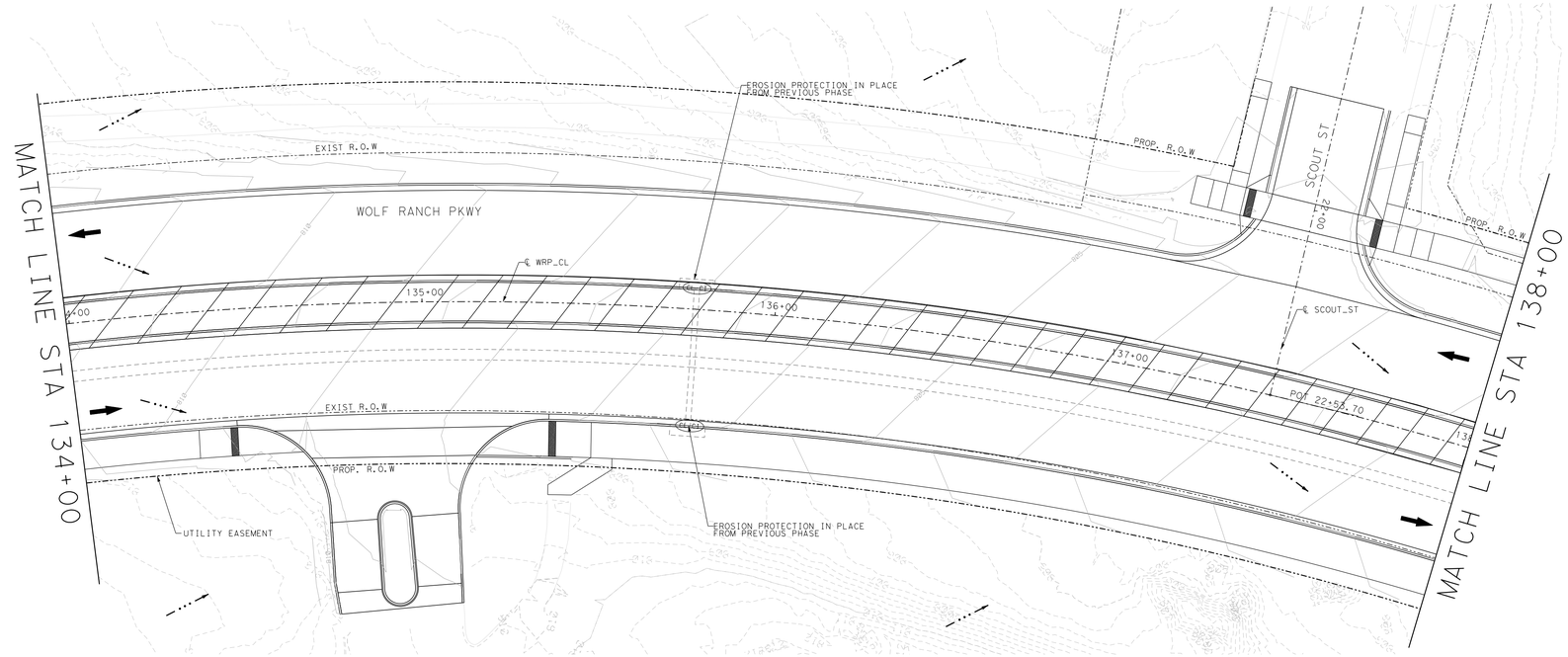
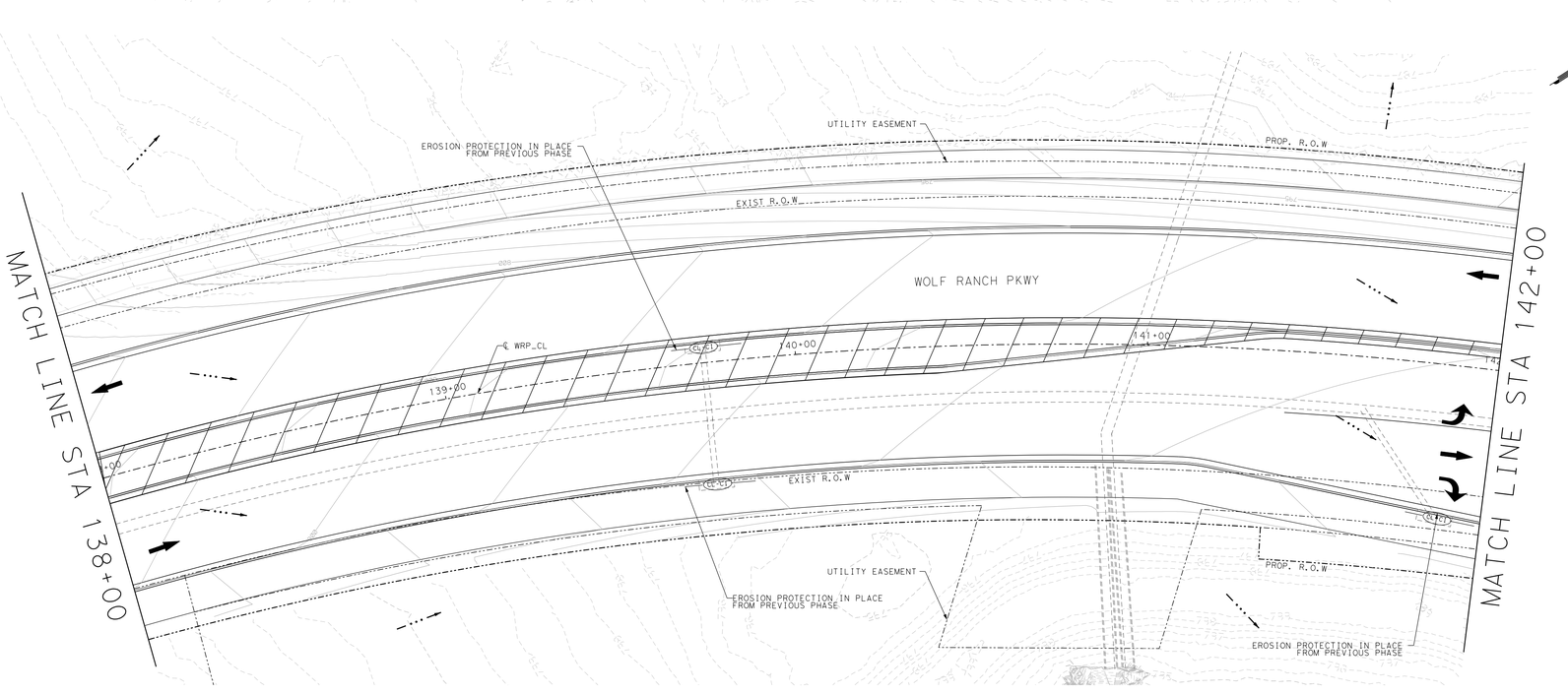
SHEET 3 OF 11

SHEET NO. 330





LEGEND

- TRAFFIC FLOW ARROWS
- FLOW ARROW
- SILT FENCE
- ROCK BERM
- CONSTRUCTION PHASE
- CONSTRUCTION ENTRANCE/EXIT
- TOPSOIL AND SEEDING
- EROSION CONTROL LOG
- 850 EXISTING CONTOURS
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- PROPOSED TRUNKLINE

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SW3P LAYOUT
PHASE III STEP II

CITY JOB No.
JOB NO. 51423-04
DATE 9/16/2025
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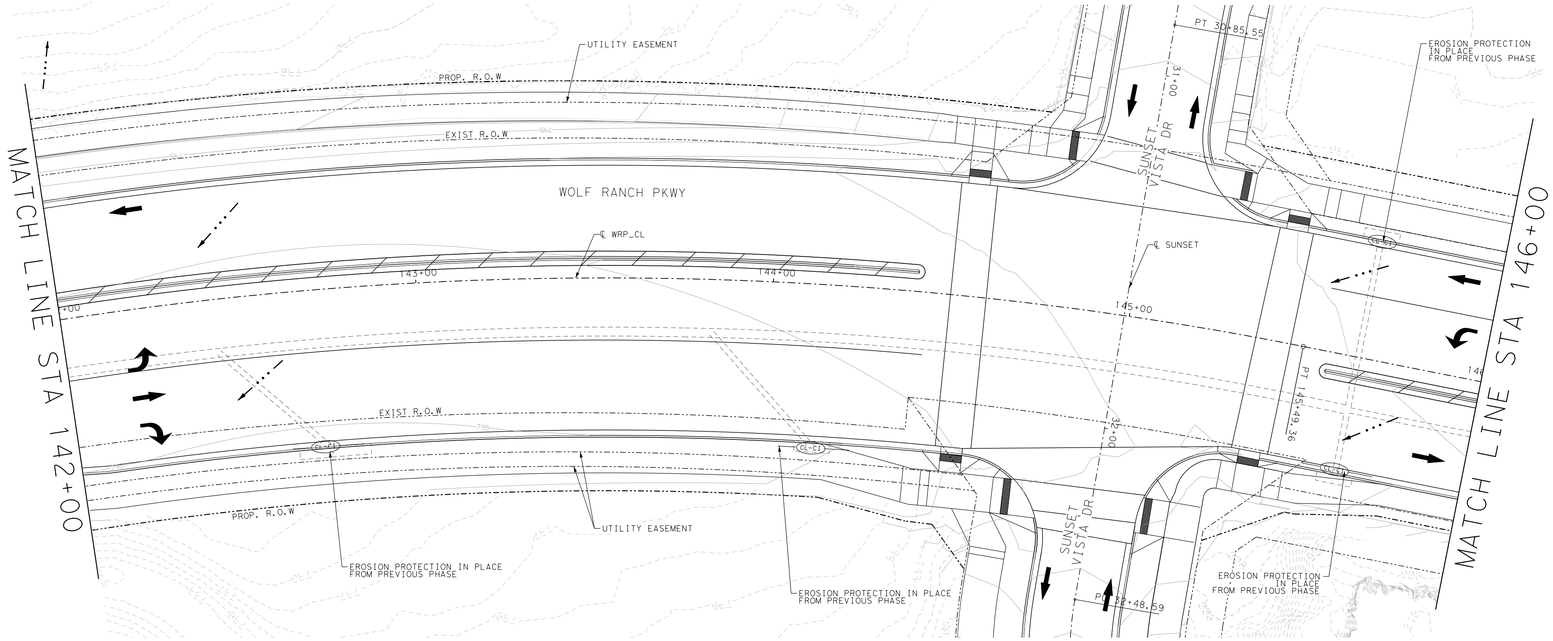
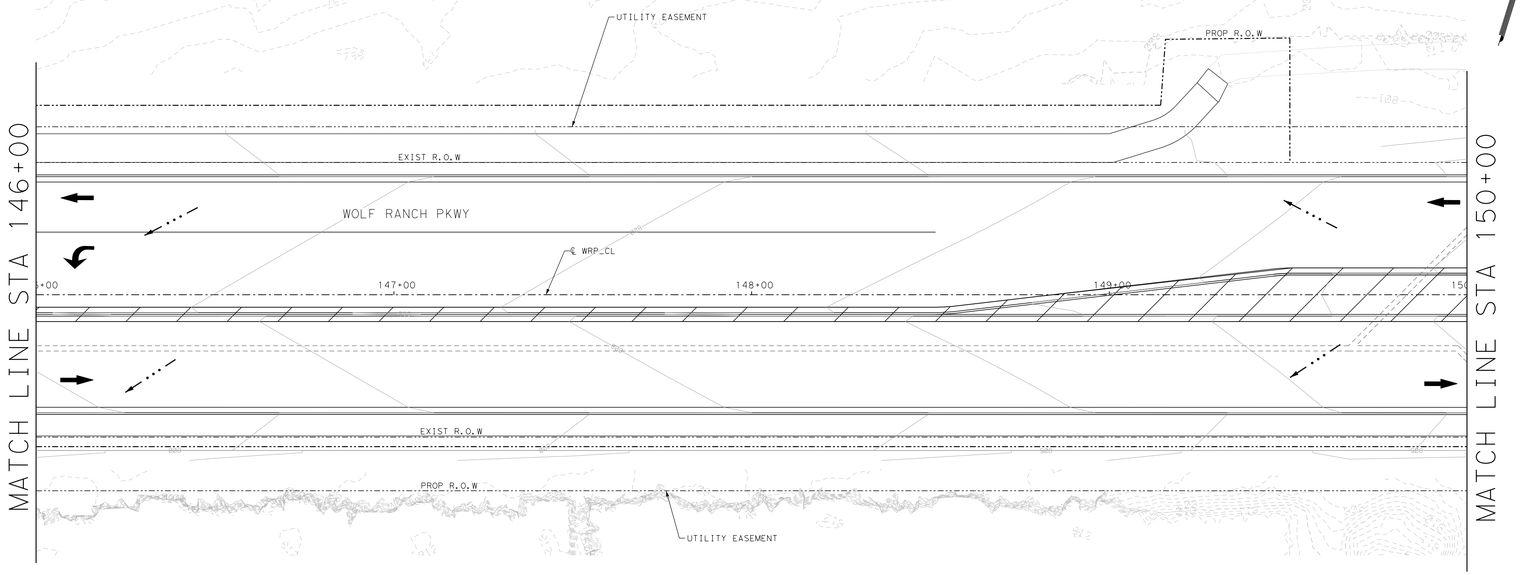
SHEET 4 OF 11

SHEET NO. 331





LEGEND

- TRAFFIC FLOW ARROWS
- FLOW ARROW
- SILT FENCE
- ROCK BERM
- CONSTRUCTION PHASE
- CONSTRUCTION ENTRANCE/EXIT
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STATE OF TEXAS
BRIAN A. ALLEN
123374
LICENSED PROFESSIONAL ENGINEER

BRIAN A. ALLEN, P.E. — 9/16/2025 DATE

NO.	REVISION	DATE

GEORGETOWN TEXAS
more than welcome

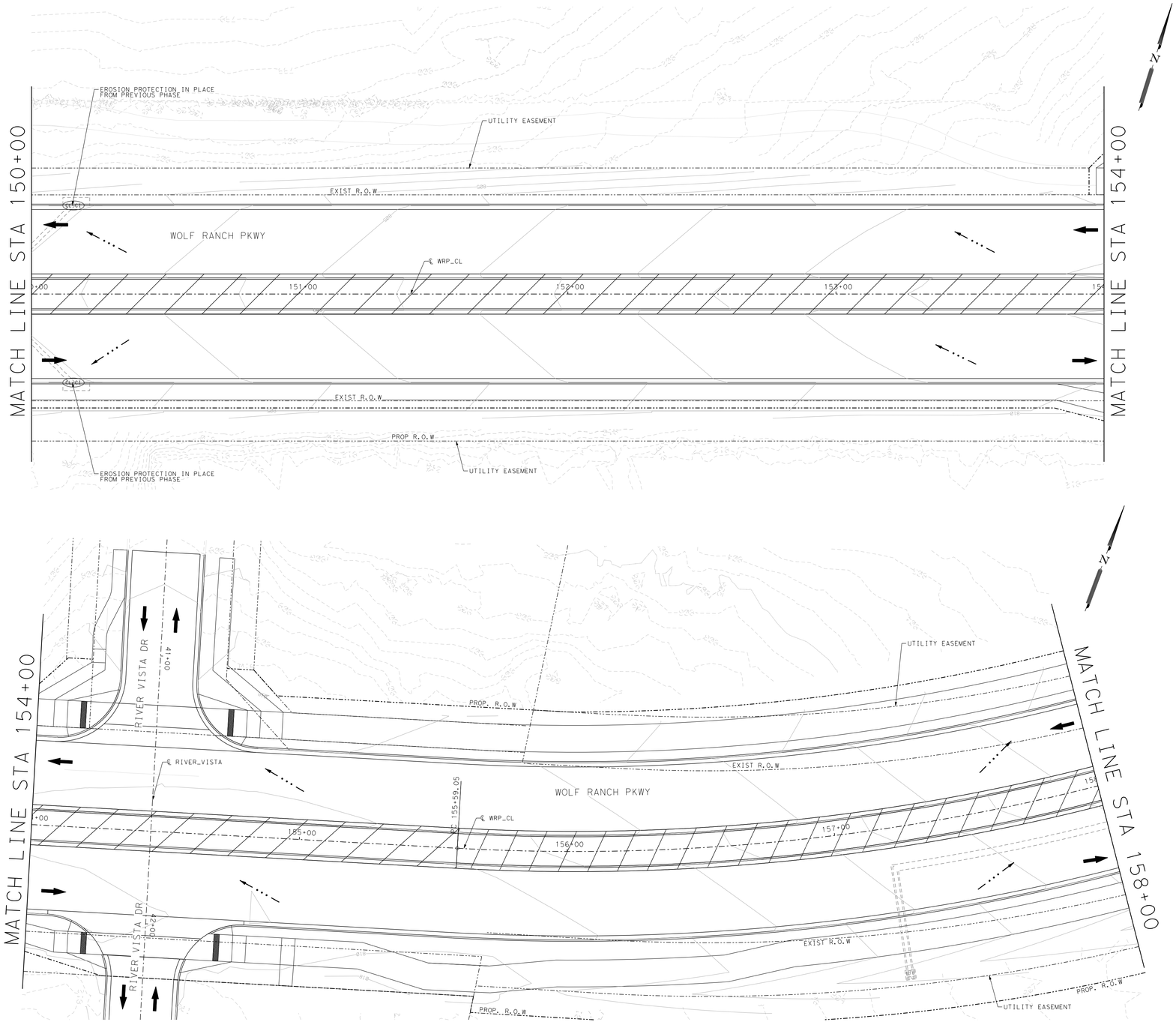
PAPE-DAWSON ENGINEERS
AUSTIN I SAN ANTONIO I HOUSTON I FORT WORTH I DALLAS
10801 N MOPAC EXPY, BLDG 3, STE 200 I AUSTIN, TX 78759 I 512.454.8711
TEXAS ENGINEERING FIRM #470 I TEXAS SURVEYING FIRM #10028800

WOLF RANCH PKWY / MEMORIAL DR
SW3P LAYOUT
PHASE III STEP II

CITY JOB No.
JOB NO. 51423-04
DATE 9/16/2025
DESIGNER
CHECKED DRAWN

SHEET 5 OF 11

SHEET NO. 332



LEGEND

- TRAFFIC FLOW ARROWS
- FLOW ARROW
- SILT FENCE
- ROCK BERM
- CONSTRUCTION PHASE
- CONSTRUCTION ENTRANCE/EXIT
- TOPSOIL AND SEEDING
- EROSION CONTROL LOG
- 850 EXISTING CONTOURS
- 850 PROPOSED CONTOURS
- PROPOSED TRUNKLINE

SCALE: 1"= 20'

0' 20' 40' 60'

NOTES

1. THE MEASURES SHOWN ARE SUGGESTED PLACEMENTS OF SW3P ITEMS. THE ENGINEER MAY MODIFY AS FIELD CONDITIONS REQUIRE.
2. SW3P LAYOUTS CORRESPOND WITH TCP PHASING.
3. SEDIMENT CONTROL FENCE SHALL BE REPLACED BY CONTRACTOR AS NEEDED IN SUBSEQUENT PHASES OFCONSTRUCTION.
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7. TOP OF ROCK FILTER DAMS SHALL NOT BE CONSTRUCTED HIGHER THAN ADJACENT EDGE OF PAVEMENT.

DESIGN

STATE OF TEXAS
BRET CHAPMAN
127293
LICENSED
PROFESSIONAL ENGINEER

BRET CHAPMAN, P.E. — 9/16/2025 DATE

APPROVAL

STATE OF TEXAS
BRIAN A. ALLEN
123374
LICENSED
PROFESSIONAL ENGINEER

BRIAN A. ALLEN, P.E. — 9/16/2025 DATE

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10801 N MOPAC EXPY, BLDG 3, STE 200 I AUSTIN, TX 78759 I 512.454.8711
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WOLF RANCH PKWY / MEMORIAL DR
SW3P LAYOUT
PHASE III STEP II

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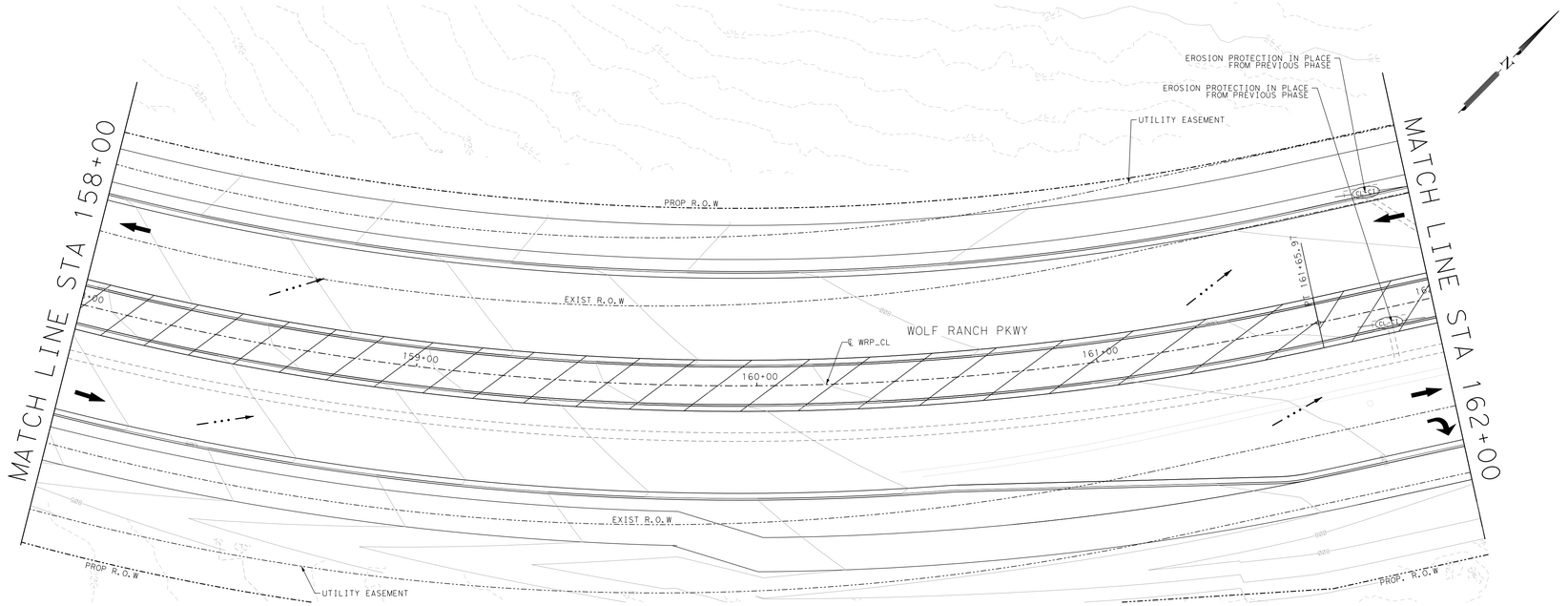

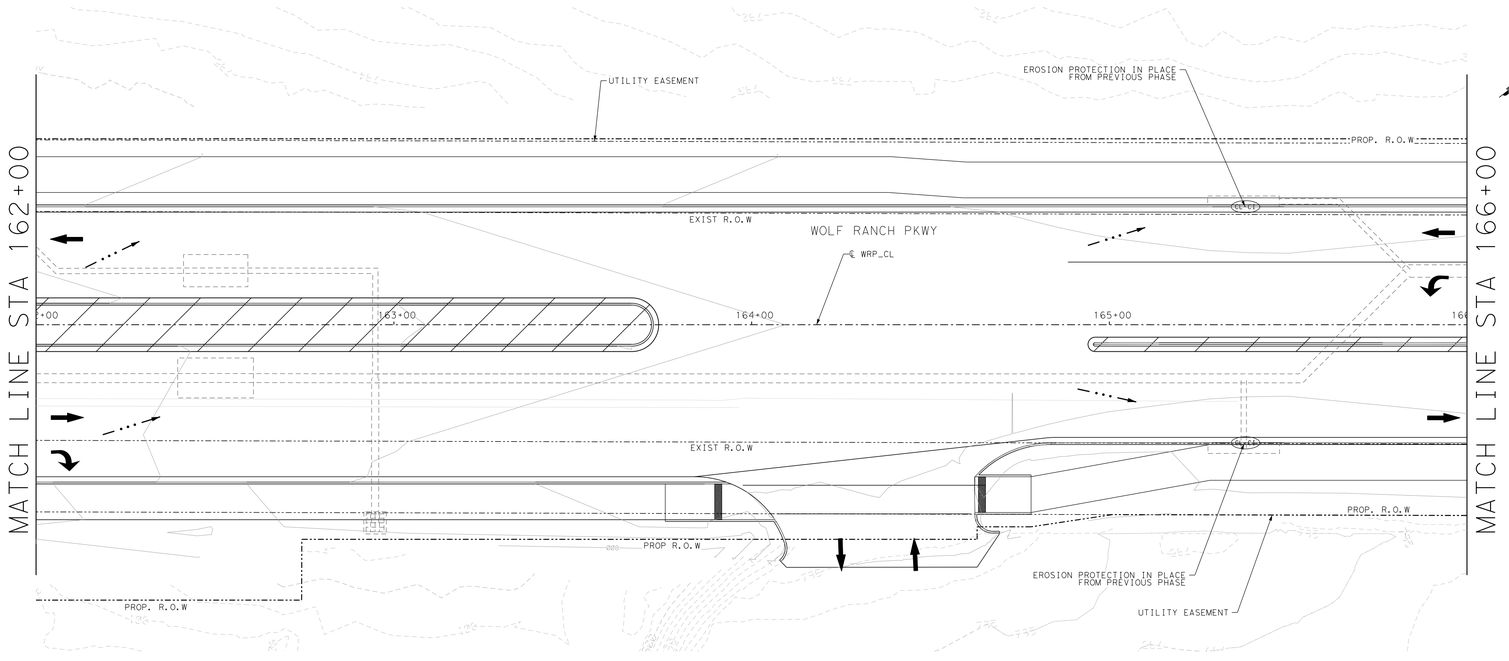

LEGEND

- TRAFFIC FLOW ARROWS
- FLOW ARROW
- SILT FENCE
- ROCK BERM
- CONSTRUCTION PHASE
- CONSTRUCTION ENTRANCE/EXIT
- TOPSOIL AND SEEDING
- EROSION CONTROL LOG
- 850 EXISTING CONTOURS
- 850 PROPOSED CONTOURS
- PROPOSED TRUNKLINE

SCALE: 1"= 20'

0' 20' 40' 60'

NOTES

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6. EROSION CONTROL LOGS TO REMAIN UNTIL THE COMPLETION OF ALL SW3P PHASES UNLESS OTHERWISE NOTED.
7. TOP OF ROCK FILTER DAMS SHALL NOT BE CONSTRUCTED HIGHER THAN ADJACENT EDGE OF PAVEMENT.

DESIGN

STATE OF TEXAS · BRET CHAPMAN · 127293 · LICENSED · PROFESSIONAL ENGINEER

BRET CHAPMAN, P.E. — 9/16/2025 DATE

APPROVAL

STATE OF TEXAS · BRIAN A. ALLEN · 123374 · LICENSED · PROFESSIONAL ENGINEER

BRIAN A. ALLEN, P.E. — 9/16/2025 DATE

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GEORGETOWN TEXAS *more than welcome*

PAPE-DAWSON ENGINEERS
AUSTIN I SAN ANTONIO I HOUSTON I FORT WORTH I DALLAS
10801 N MOPAC EXPY, BLDG 3, STE 200 I AUSTIN, TX 78759 I 512.454.8711
TEXAS ENGINEERING FIRM #470 I TEXAS SURVEYING FIRM #10028800

WOLF RANCH PKWY / MEMORIAL DR
SW3P LAYOUT
PHASE III STEP II

CITY JOB No.
JOB NO. 51423-04
DATE 9/16/2025
DESIGNER
CHECKED DRAWN

LEGEND

- TRAFFIC FLOW ARROWS
- FLOW ARROW
- SILT FENCE (SCF)
- ROCK BERM (RFD2)
- CONSTRUCTION PHASE
- CONSTRUCTION ENTRANCE/EXIT
- TOPSOIL AND SEEDING
- EROSION CONTROL LOG (EL-C2)
- 850 EXISTING CONTOURS
- 850 PROPOSED CONTOURS
- PROPOSED TRUNKLINE

SCALE: 1" = 20'

0' 20' 40' 60'

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SW3P LAYOUT
PHASE III STEP II

CITY JOB No.
JOB NO. 51423-04
DATE 9/16/2025
DESIGNER
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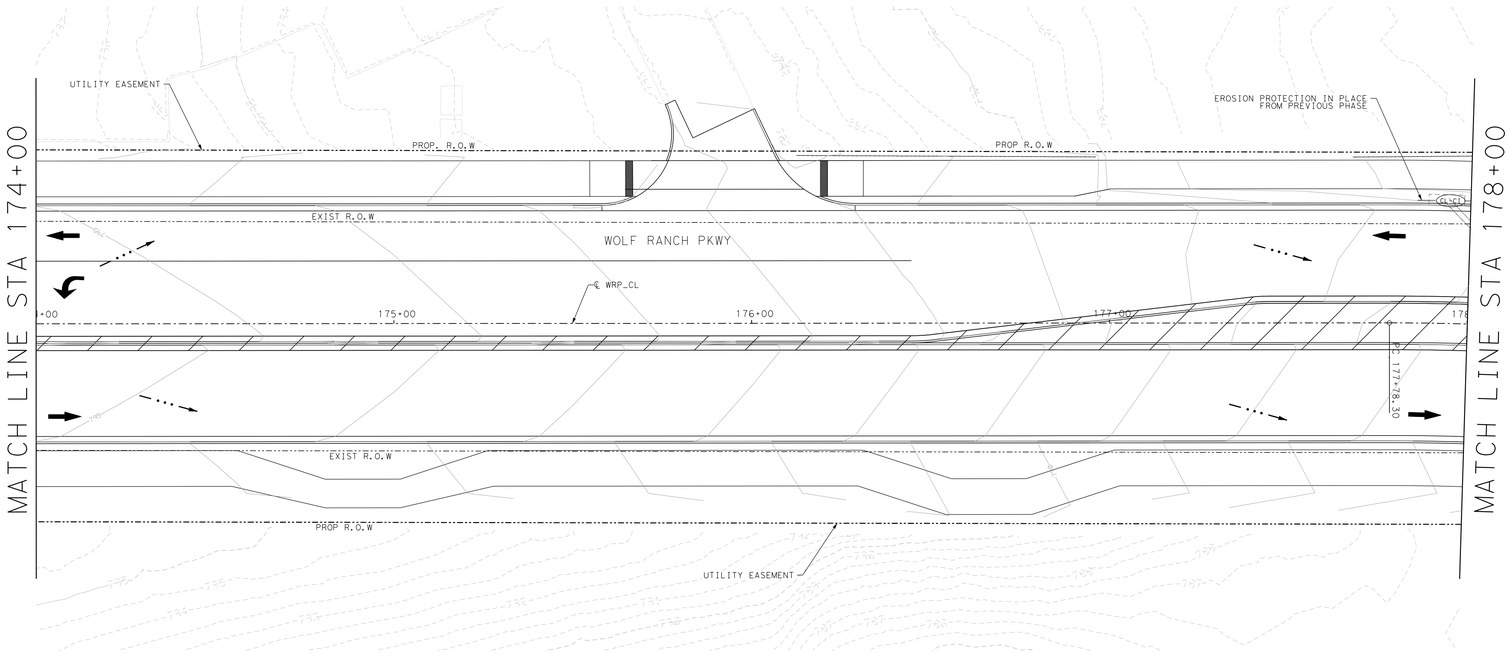
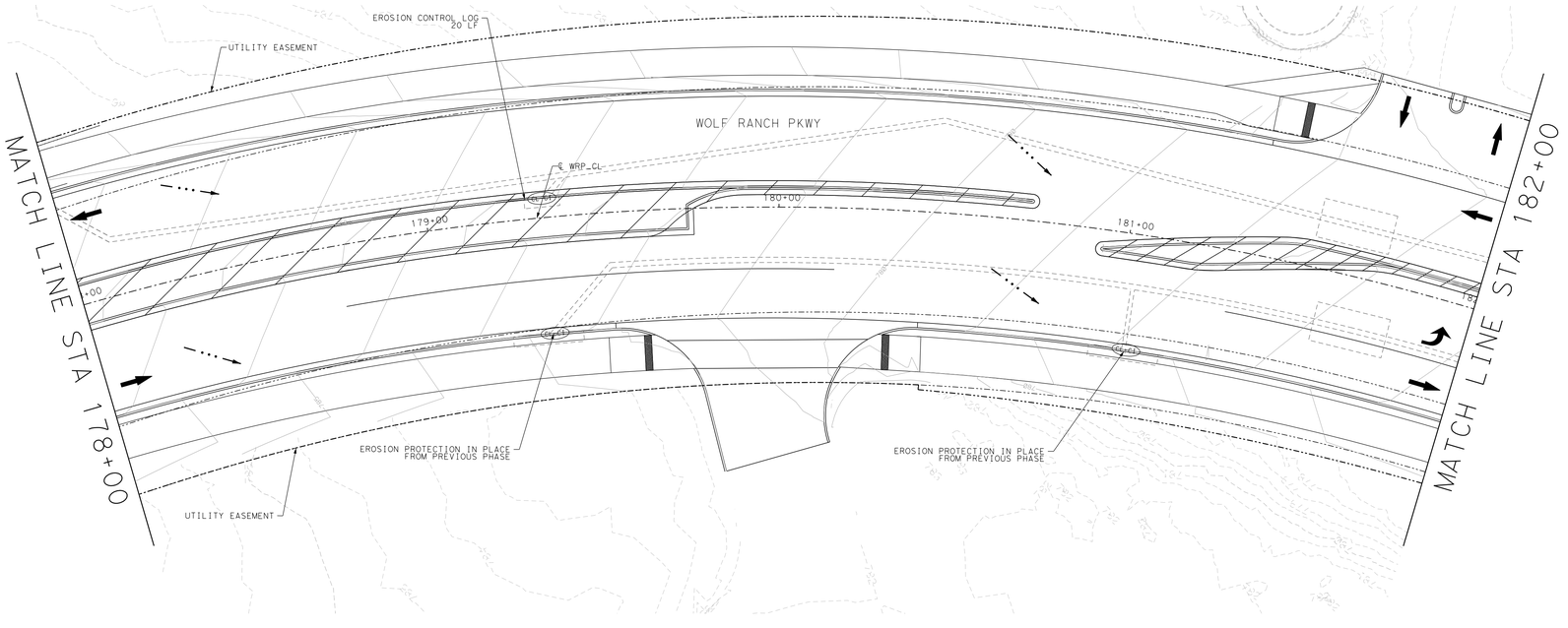
SHEET 8 OF 11

SHEET NO. 335





LEGEND

- TRAFFIC FLOW ARROWS
- FLOW ARROW
- SILT FENCE
- ROCK BERM
- CONSTRUCTION PHASE
- CONSTRUCTION ENTRANCE/EXIT
- TOPSOIL AND SEEDING
- EROSION CONTROL LOG
- EXISTING CONTOURS
- PROPOSED CONTOURS
- PROPOSED TRUNKLINE

SCALE: 1"= 20'

0' 20' 40' 60'

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BRET CHAPMAN
127293
LICENSED
PROFESSIONAL ENGINEER

BRET CHAPMAN, P.E. — 9/16/2025 DATE

APPROVAL

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TEXAS ENGINEERING FIRM #470 I TEXAS SURVEYING FIRM #10028800

WOLF RANCH PKWY / MEMORIAL DR
SW3P LAYOUT
PHASE III STEP II

CITY JOB No.
JOB NO. 51423-04
DATE 9/16/2025
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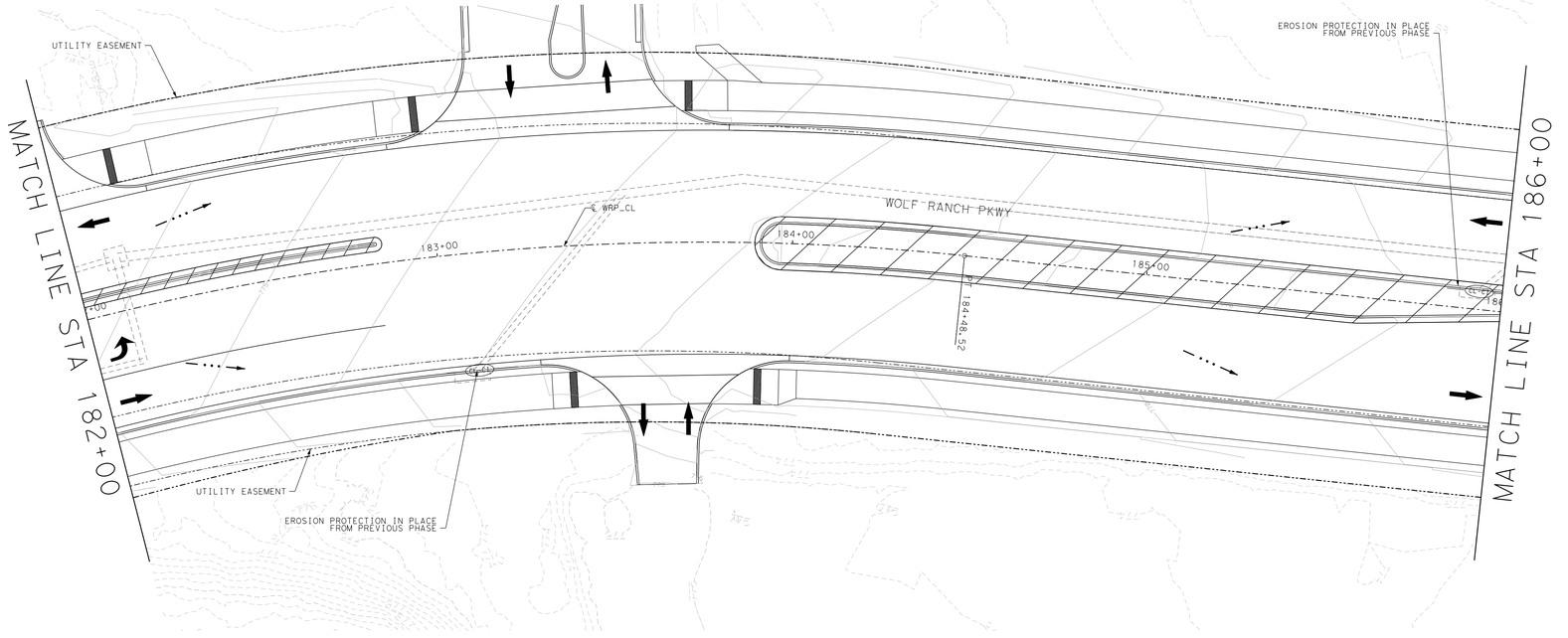
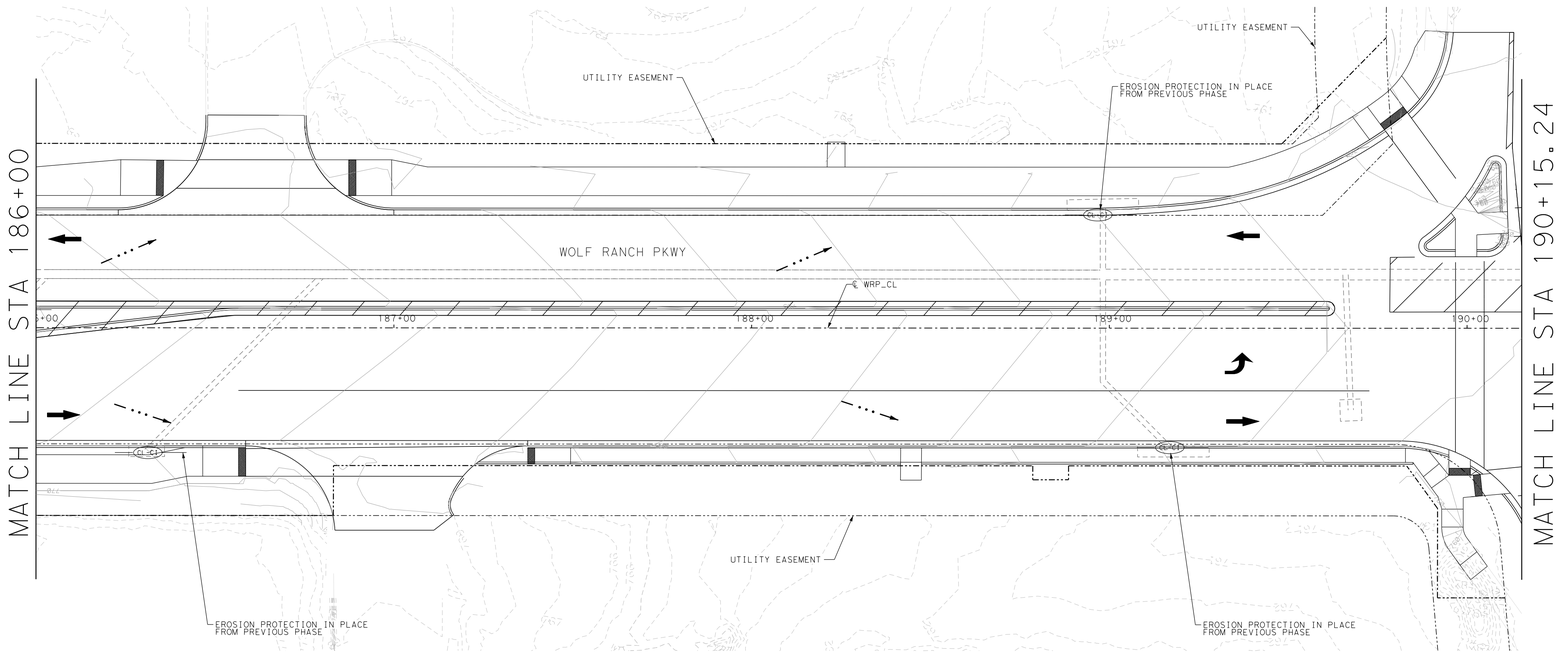
SHEET 9 OF 11

SHEET NO. 336





LEGEND

- TRAFFIC FLOW ARROWS
- FLOW ARROW
- SILT FENCE
- ROCK BERM
- CONSTRUCTION PHASE
- CONSTRUCTION ENTRANCE/EXIT
- TOPSOIL AND SEEDING
- EROSION CONTROL LOG
- 850 EXISTING CONTOURS
- 850 PROPOSED CONTOURS
- PROPOSED TRUNKLINE

SCALE: 1"= 20'

0' 20' 40' 60'

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DESIGN

STATE OF TEXAS — BRET CHAPMAN — 127293 — LICENSED PROFESSIONAL ENGINEER

BRET CHAPMAN, P.E. — 9/16/2025 DATE

APPROVAL

STATE OF TEXAS — BRIAN A. ALLEN — 123374 — LICENSED PROFESSIONAL ENGINEER

BRIAN A. ALLEN, P.E. — 9/16/2025 DATE

NO.	REVISION	DATE

GEORGETOWN TEXAS *more than welcome*

PAPE-DAWSON ENGINEERS
AUSTIN I SAN ANTONIO I HOUSTON I FORT WORTH I DALLAS
10801 N MOPAC EXPY, BLDG 3, STE 200 I AUSTIN, TX 78759 I 512.454.8711
TEXAS ENGINEERING FIRM #470 I TEXAS SURVEYING FIRM #10028800

WOLF RANCH PKWY / MEMORIAL DR
SW3P LAYOUT
PHASE III STEP II

CITY JOB No.
JOB NO. 51423-04
DATE 9/16/2025
DESIGNER
CHECKED DRAWN

SHEET 10 OF 11

SHEET NO. 337



LEGEND

- TRAFFIC FLOW ARROWS
- FLOW ARROW
- SCP — SILT FENCE
- RFD2 — ROCK BERM
- CONSTRUCTION PHASE
- CONSTRUCTION ENTRANCE/EXIT
- TOPSOIL AND SEEDING
- EL-C1 — EROSION CONTROL LOG
- 850 — EXISTING CONTOURS
- 850 — PROPOSED CONTOURS
- PROPOSED TRUNKLINE

SCALE: 1"= 20'

0' 20' 40' 60'

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DESIGN

STATE OF TEXAS — BRET CHAPMAN — 127293 — LICENSED PROFESSIONAL ENGINEER

BRET CHAPMAN, P.E. — 9/16/2025 DATE

APPROVAL

STATE OF TEXAS — BRIAN A. ALLEN — 123374 — LICENSED PROFESSIONAL ENGINEER

BRIAN A. ALLEN, P.E. — 9/16/2025 DATE

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10801 N MOPAC EXPY, BLDG 3, STE 200 I AUSTIN, TX 78759 I 512.454.8711

TEXAS ENGINEERING FIRM #470 I TEXAS SURVEYING FIRM #10028800

WOLF RANCH PKWY / MEMORIAL DR
SW3P LAYOUT
PHASE III STEP II

CITY JOB No.

JOB NO. 51423-04

DATE 9/16/2025

DESIGNER

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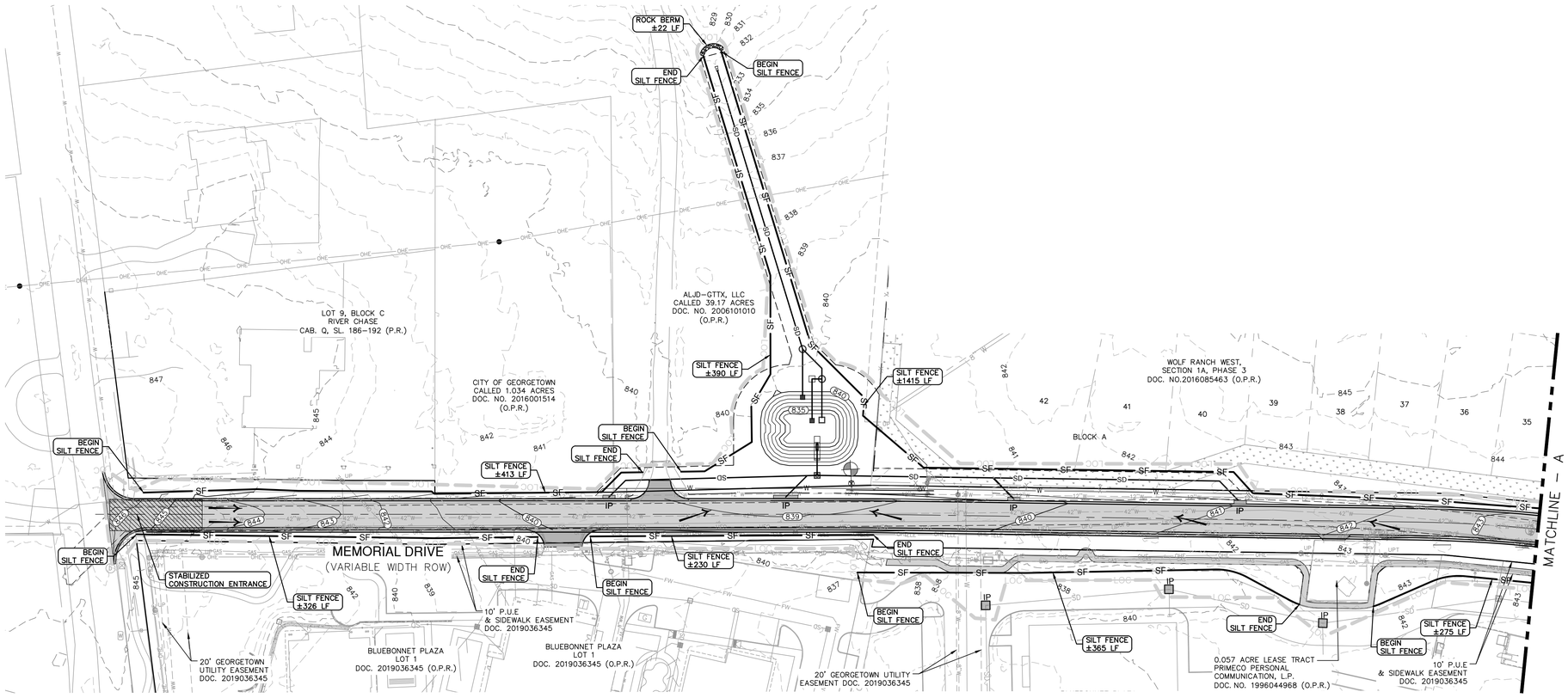
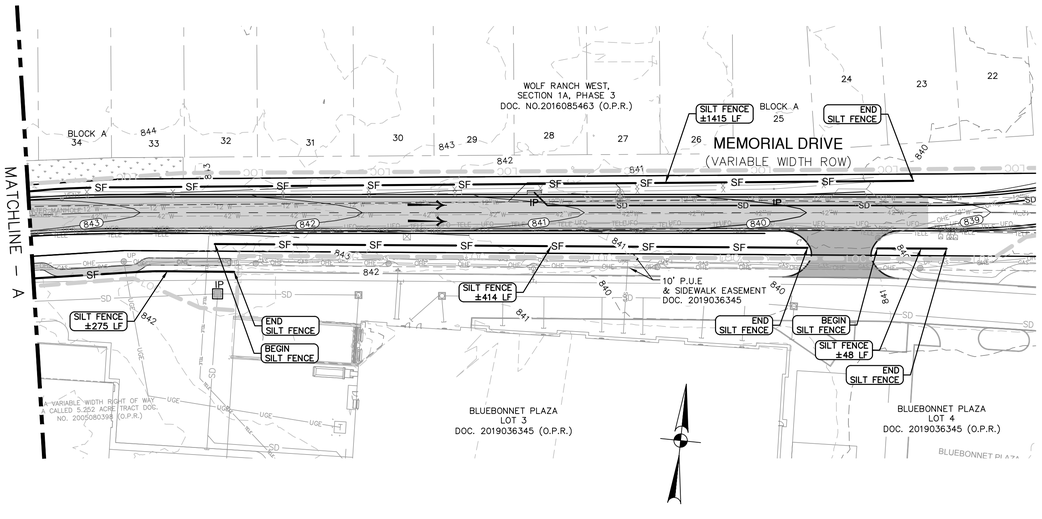
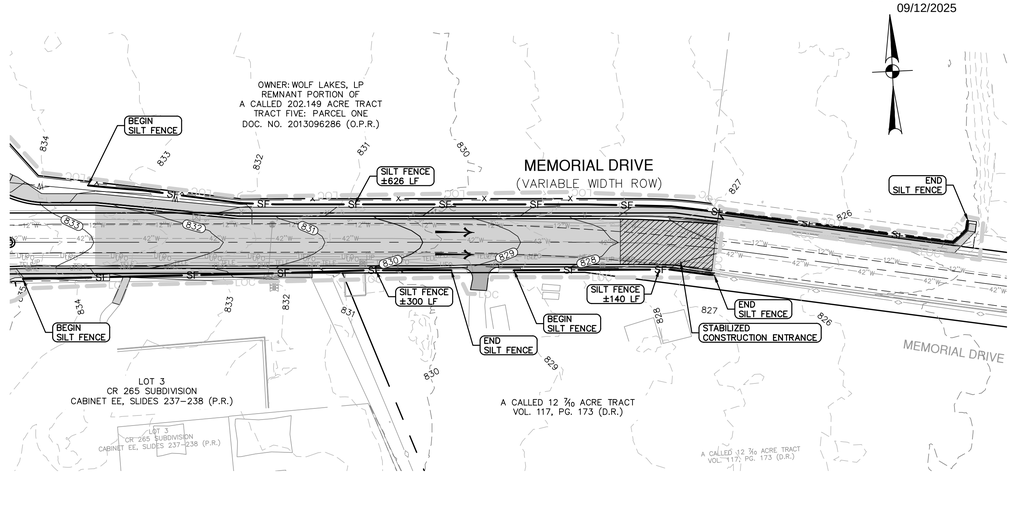
SHEET 11 OF 11

SHEET NO. 338







SCALE: 1" = 50'

0' 50' 100' 150'

LEGEND

- LOC — LIMITS OF CONSTRUCTION
- SF — SILT FENCE
- STABILIZED CONSTRUCTION ENTRANCE
- ROCK BERM
- IP — INLET PROTECTION
- 750 — PROPOSED CONTOUR LINE
- 786 — EXISTING CONTOUR LINE
- DD — DIVERSION DIKE
- FLOW ARROW

NOTES

1. REFERENCE TREE PRESERVATION PLANS FOR PLACEMENT OF TREE PROTECTION FENCING PLACEMENT.
2. SILT FENCE AND LIMITS OF CONSTRUCTION ARE SHOWN SCHEMATICALLY FOR CLARITY. LINEWORK APPEARING TO FOLOW EASEMENT OR PROPERTY LINES SHOULD BE CONSTRUCTED ON THE LINE WHEN POSSIBLE. OFFSETS HAVE BEEN ADDED FOR PLAN READABILITY.

STATE OF TEXAS
STEVEN S. CRAUFORD
92677
LICENSED PROFESSIONAL ENGINEER

09/12/2025

NO.	REVISION	DATE

GEORGETOWN TEXAS
more than welcome

PAPE-DAWSON ENGINEERS
AUSTIN | SAN ANTONIO | HOUSTON | FORT WORTH | DALLAS
10801 N MOPAC EXPY, BLDG 3, STE 200 | AUSTIN, TX 78759 | 512.454.8711
TBPE FIRM REGISTRATION #470 | TBPLS FIRM REGISTRATION #10028801

CITY OF GEORGETOWN, TEXAS
WOLF RANCH PKWY / MEMORIAL DR

EROSION CONTROL - MEMORIAL DRIVE

CITY JOB No.
JOB NO. 51423-00
DATE 9/12/2025
DESIGNER
CHECKED DRAWN

SHEET 339

Date: Sep 12, 2025, 10:31am User ID: cschatz
File: K:\Projects\5141.23\001\301 Construction Documents\Civil\EC51423-00.dwg

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GUIDELINES FOR DESIGN AND INSTALLATION OF TEMPORARY EROSION AND SEDIMENTATION CONTROLS

TYPE OF STRUCTURE	REACH LENGTH	MAXIMUM DRAINAGE AREA	SLOPE
SILT FENCE	N/A	2 ACRES	0 – 10%
	200 FEET	2 ACRES	10 – 20%
	100 FEET	1 ACRE	20 – 30%
	50 FEET	1/2 ACRE	> 30%
TRIANGLE FILTER DIKE	100 FEET	1/2 ACRE	< 30% SLOPE
	50 FEET	1/4 ACRE	> 30% SLOPE
ROCK BERM *, **	500 FEET	< 5 ACRES	0 – 10%

* FOR ROCK BERM DESIGN WHERE PARAMETERS ARE OTHER THAN STATED, DRAINAGE AREA CALCULATIONS AND ROCK BERM DESIGN MUST BE SUBMITTED FOR REVIEW.

** HIGH SERVICE ROCK BERMS MAY BE REQUIRED IN AREAS OF ENVIRONMENTAL SIGNIFICANCE AS DETERMINED BY THE CITY OF GEORGETOWN.

The Architect/Engineer assumes responsibility for appropriate use of this standard.

REVISION NOTE: ADOPTED 6/21/2006

GEORGETOWN EST. 1848 TEXAS Georgetown Utility Systems Your Community Owned Utility

CITY OF GEORGETOWN
CONSTRUCTION STANDARDS AND DETAILS

TEMPORARY EROSION AND SEDIMENTATION CONTROL GUIDELINES

DRAWING NAME: EC01

SCALE:	DATE:
NTS	1/2003
DRAWN BY:	APPROVED BY:
MRS	TRB

NOTE: THIS SECTION IS INTENDED TO ASSIST THOSE PERSONS PREPARING WATER POLLUTION ABATEMENT PLANS (WPAP) OR STORM WATER POLLUTION PREVENTION PLANS (SW3P) THAT COMPLY WITH FEDERAL, STATE AND/OR LOCAL STORM WATER REGULATIONS.

1. THE CONTRACTOR TO INSTALL AND MAINTAIN EROSION/SEDIMENTATION CONTROLS AND TREE/NATURAL AREA PROTECTIVE FENCING PRIOR TO ANY SITE PREPARATION WORK (CLEARING, GRUBBING, GRADING, OR EXCAVATION). CONTRACTOR TO REMOVE EROSION/SEDIMENTATION CONTROLS AT THE COMPLETION OF PROJECT AND GRASS RESTORATION.
2. ALL PROJECTS WITHIN THE RECHARGE ZONE OF THE EDWARD'S AQUIFER SHALL SUBMIT A BEST MANAGEMENT PRACTICES AND WATER POLLUTION AND ABATEMENT PLAN TO THE TNRCC FOR APPROVAL PRIOR TO ANY CONSTRUCTION.
3. THE PLACEMENT OF EROSION/SEDIMENTATION CONTROLS TO BE IN ACCORDANCE WITH THE APPROVED EROSION AND SEDIMENTATION CONTROL PLAN AND WATER POLLUTION ABATEMENT PLAN. DEVIATIONS FROM THE APPROVED PLAN MUST BE SUBMITTED TO AND APPROVED BY THE OWNER'S REPRESENTATIVE.
4. ALL PLANTING SHALL BE DONE BETWEEN MAY 1 AND SEPTEMBER 15 EXCEPT AS SPECIFICALLY AUTHORIZED IN WRITING. IF PLANTING IS AUTHORIZED TO BE DONE OUTSIDE THE DATES SPECIFIED, THE SEED SHALL BE PLANTED WITH THE ADDITION OF WINTER FESCUE (KENTUCKY 31) AT A RATE OF 100lb/ACRE. GRASS SHALL BE COMMON BERMUDA GRASS, HULLED, MINIMUM 82% PURE LIVE SEED. ALL GRASS SEED SHALL BE FREE FROM NOXIOUS WEED, GRADE "A" RECENT CROP, RECLEANED AND TREATED WITH APPROPRIATE FUNGICIDE AT TIME OF MIXING. SEED SHALL BE FURNISHED IN SEALED, STANDARD CONTAINERS WITH DEALER'S GUARANTEED ANALYSIS.
5. ALL DISTURBED AREAS TO BE RESTORED AS NOTED IN THE WATER POLLUTION ABATEMENT PLAN.
6. THE PLANTED AREA TO BE IRRIGATED OR SPRINKLED IN A MANNER THAT WILL NOT ERODE THE TOPSOIL, BUT WILL SUFFICIENTLY SOAK THE SOIL TO A DEPTH OF FOUR (4) INCHES. THE IRRIGATION TO OCCUR AT 10-DAY INTERVALS DURING THE FIRST TWO MONTHS TO INSURE GERMINATION AND ESTABLISHMENT OF THE GRASS . RAINFALL OCCURRENCES OF 1/2 INCH OR GREATER TO POSTPONE THE WATERING SCHEDULE ONE WEEK.
7. RESTORATION TO BE ACCEPTABLE WHEN THE GRASS HAS GROWN AT LEAST 1-1/2 INCHES HIGH WITH 95% *COVERAGE*, PROVIDED NO BARE SPOTS LARGER THAN 25 SQUARE FEET EXIST.
8. A MINIMUM OF FOUR (4) INCHES OF TOPSOIL TO BE PLACED IN ALL AREAS DISTURBED BY CONSTRUCTION.
9. THE CONTRACTOR TO HYDROMULCH OR SOD (AS SHOWN ON PLANS) ALL EXPOSED CUTS AND FILLS UPON COMPLETION OF CONSTRUCTION.
10. EROSION AND SEDIMENTATION CONTROLS TO BE INSTALLED OR MAINTAINED IN A MANNER WHICH DOES NOT RESULT IN SOIL BUILDUP WITHIN TREE DRIPLINE.
11. TO AVOID SOIL COMPACTION, CONTRACTOR SHALL NOT ALLOW VEHICULAR TRAFFIC, PARKING, OR STORAGE OF EQUIPMENT OR MATERIALS IN THE TREE DRIPLINE AREAS.
12. WHERE A FENCE IS CLOSER THAN FOUR (4) FEET TO A TREE TRUNK, PROTECT THE TRUNK WITH STRAPPED-ON PLANKING TO A HEIGHT OF EIGHT (8) FEET (OR TO THE LIMITS OF LOWER BRANCHING) IN ADDITION TO THE FENCING.
13. TREES TO BE REMOVED IN A MANNER WHICH DOES NOT IMPACT TREES TO BE PRESERVED.
14. ANY ROOT EXPOSED BY CONSTRUCTION ACTIVITY TO BE PRUNED FLUSH WITH THE SOIL. BACKFILL ROOT AREAS WITH GOOD QUALITY TOPSOIL AS SOON AS POSSIBLE. IF EXPOSED ROOT AREAS ARE NOT BACKFILLED WITHIN TWO DAYS, COVER THEM WITH ORGANIC MATERIAL IN A MANNER WHICH REDUCES SOIL TEMPERATURE AND MINIMIZES WATER LOSS DUE TO EVAPORATION.
15. CONTRACTOR TO PRUNE VEGETATION TO PROVIDE CLEARANCE FOR STRUCTURES, VEHICULAR TRAFFIC, AND EQUIPMENT BEFORE DAMAGE OCCURS (RIPPING OF BRANCHES, ETC.). ALL FINISHED PRUNING TO BE DONE ACCORDING TO RECOGNIZED, APPROVED STANDARDS OF THE INDUSTRY (REFERENCE THE "NATIONAL ARBORIST ASSOCIATION PRUNING STANDARDS FOR SHADE TREES").
16. THE CONTRACTOR IS TO INSPECT THE CONTROLS AT WEEKLY INTERVALS AND AFTER EVERY RAINFALL EXCEEDING 1/4 INCH TO VERIFY THAT THEY HAVE NOT BEEN SIGNIFICANTLY DISTURBED. ANY ACCUMULATED SEDIMENT AFTER A SIGNIFICANT RAINFALL TO BE REMOVED AND PLACED IN THE OWNER DESIGNATED SPOIL DISPOSAL SITE. THE CONTRACTOR TO CONDUCT PERIODIC INSPECTIONS OF ALL EROSION/SEDIMENTATION CONTROLS AND TO MAKE ANY REPAIRS OR MODIFICATIONS NECESSARY TO ASSURE CONTINUED EFFECTIVE OPERATION OF EACH DEVICE.
17. WHERE THERE IS TO BE AN APPROVED GRADE CHANGE, IMPERMEABLE PAVING SURFACE, TREE WELL, OR OTHER SUCH SITE DEVELOPMENT IMMEDIATELY ADJACENT TO A PROTECTED TREE, ERECT THE FENCE APPROXIMATELY TWO TO FOUR FEET (2'-4') BEHIND THE AREA IN QUESTION.
18. NO ABOVE AND/OR BELOW GROUND TEMPORARY FUEL STORAGE FACILITIES TO BE STORED ON THE PROJECT SITE.
19. IF EROSION AND SEDIMENTATION CONTROL SYSTEMS ARE EXISTING FROM PRIOR CONTRACTS, OWNER'S REPRESENTATIVE AND THE CONTRACTOR TO EXAMINE THE EXISTING EROSION AND SEDIMENTATION CONTROL SYSTEMS FOR DAMAGE PRIOR TO CONSTRUCTION. ANY DAMAGE TO PREEXISTING EROSION AND SEDIMENTATION CONTROLS NOTED TO BE REPAIRED AT OWNERS EXPENSE.
20. INTENTIONAL RELEASE OF VEHICLE OR EQUIPMENT FLUIDS ONTO THE GROUND IS NOT ALLOWED. CONTAMINATED SOIL RESULTING FROM ACCIDENTAL SPILL TO BE REMOVED AND DISPOSED OF PROPERLY.

The Architect/Engineer assumes responsibility for appropriate use of this standard.

REVISION NOTE: ADOPTED 6/21/2006

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CITY OF GEORGETOWN
CONSTRUCTION STANDARDS AND DETAILS

EROSION AND SEDIMENTATION AND TREE PROTECTION NOTES

DRAWING NAME: EC01A

SCALE:	DATE:
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DRAWN BY:	APPROVED BY:
MRS	TRB

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WOLF RANCH PKWY / MEMORIAL DR

SW3P STANDARDS

CITY JOB No.
JOB NO. 51423-04
DATE 9/11/2025
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SHEET NO. 340

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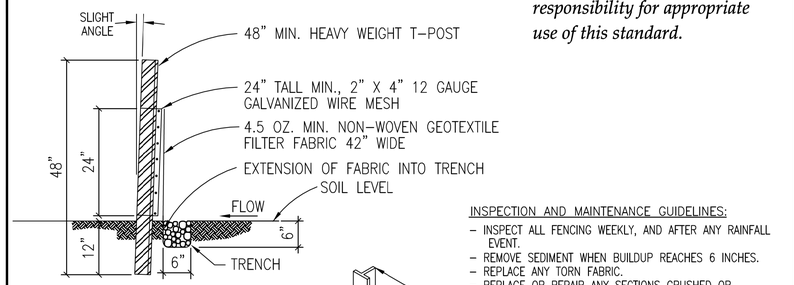
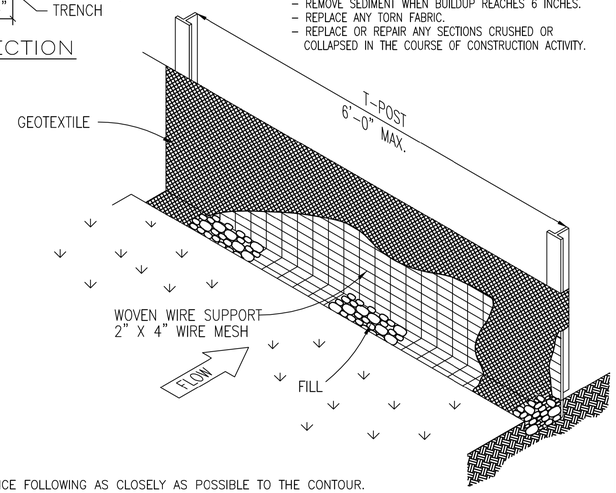


CROSS SECTION

INSPECTION AND MAINTENANCE GUIDELINES:

- INSPECT ALL FENCING WEEKLY, AND AFTER ANY RAINFALL EVENT.
- REMOVE SEDIMENT WHEN BUILDUP REACHES 6 INCHES.
- REPLACE ANY TORN FABRIC.
- REPLACE OR REPAIR ANY SECTIONS CRUSHED OR COLLAPSED IN THE COURSE OF CONSTRUCTION ACTIVITY.



INSTALLATION:

- LAYOUT THE SILT FENCE FOLLOWING AS CLOSELY AS POSSIBLE TO THE CONTOUR.
- CLEAR THE GROUND OF DEBRIS, ROCKS, PLANTS (INCLUDING GRASSES TALLER THAN 2") TO PROVIDE A SMOOTH FLOW APPROACH SURFACE. EXCAVATE 6" DEEP X 6" WIDE TRENCH ON UPSTREAM SIDE OF FACE PER PLANS.
- DRIVE THE HEAVY DUTY T-POST AT LEAST 12 INCHES INTO THE GROUND AND AT A SLIGHT ANGLE TOWARDS THE FLOW.
- ATTACH THE 2" X 4" 12 GAUGE WELDED WIRE MESH TO THE T-POST WITH 11 1/2 GAUGE GALVANIZED T-POST CLIPS. THE TOP OF THE WIRE TO BE 24" ABOVE GROUND LEVEL. THE WELDED WIRE MESH TO BE OVERLAPPED 6" AND TIED AT LEAST 6 TIMES WITH HOG RINGS.
- THE SILT FENCE TO BE INSTALLED WITH A SKIRT A MINIMUM OF 6" WIDE PLACED ON THE UPHILL SIDE OF THE FENCE INSIDE EXCAVATED TRENCH. THE FABRIC TO OVERLAP THE TOP OF THE WIRE BY 1".
- ANCHOR THE SILT FENCE BY BACKFILLING WITH EXCAVATED DIRT AND ROCKS (NOT LARGER THAN 2").
- GEOTEXTILE SPLICES SHOULD BE A MINIMUM OF 18" WIDE ATTACHED IN AT LEAST 6 PLACES. SPLICES IN CONCENTRATED FLOW AREAS WILL NOT BE ACCEPTED.
- SILT FENCE SHALL BE REMOVED WHEN THE SITE IS COMPLETELY STABILIZED SO AS NOT TO BLOCK OR IMPEDE STORM FLOW OR DRAINAGE.

REVISION NOTE: ADOPTED 6/21/2006

CITY OF GEORGETOWN
CONSTRUCTION STANDARDS AND DETAILS

SILT FENCE DETAIL

DRAWING NAME: EC02

SCALE:	DATE:
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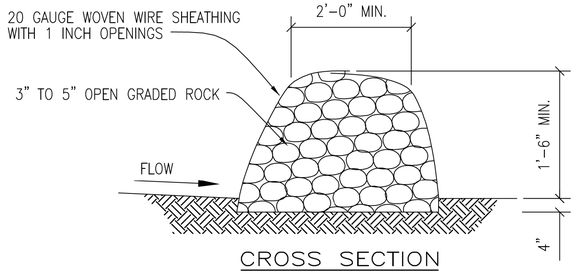
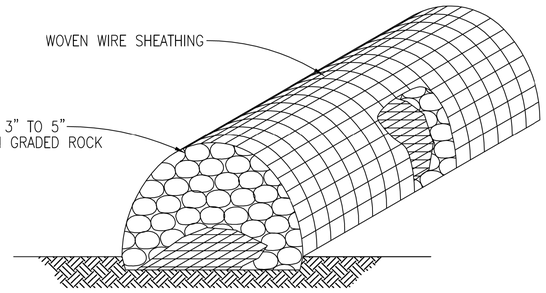


CROSS SECTION



INSTALLATION:

- LAYOUT THE ROCK BERM FOLLOWING AS CLOSELY AS POSSIBLE TO THE CONTOUR.
- CLEAR THE GROUND OF DEBRIS, ROCKS OR PLANTS THAT WILL INTERFERE WITH INSTALLATION.
- PLACE WOVEN WIRE FABRIC ON THE GROUND ALONG THE PROPOSED INSTALLATION WITH ENOUGH OVERLAP TO COMPLETELY ENCIRCLE THE FINISHED SIZE OF THE BERM.
- PLACE THE ROCK ALONG THE CENTER OF THE WIRE TO THE DESIGNATED HEIGHT.
- WRAP THE STRUCTURE WITH THE PREVIOUSLY PLACED WIRE MESH SECURE ENOUGH SO THAT WHEN WALKED ACROSS THE STRUCTURE RETAINS IT'S SHAPE.
- SECURE WITH TIE WIRE.
- THE ENDS OF THE BERM SHOULD BE TIED INTO EXISTING UPSLOPE GRADE AND THE BERM SHOULD BE BURIED IN A TRENCH APPROX. 4 INCHES DEEP TO PREVENT FAILURE OF THE CONTROL.
- THE ROCK BERM SHOULD BE LEFT IN PLACE UNTIL ALL UPSTREAM AREAS ARE STABILIZED AND ACCUMULATED SILT REMOVED.

INSPECTION AND MAINTENANCE GUIDELINES:

- INSPECTION SHOULD BE MADE WEEKLY AND AFTER EACH RAINFALL EVENT BY THE RESPONSIBLE PARTY. FOR INSTALLATIONS IN STREAMBEDS, ADDITIONAL DAILY INSPECTIONS SHOULD BE MADE.
- REMOVE SEDIMENT AND OTHER DEBRIS WHEN BUILDUP REACHES 6 INCHES AND DISPOSE OF THE ACCUMULATED SILT IN AN APPROVED MANNER.
- REPLACE ANY LOOSE WIRE SHEATHING.
- THE BERM SHOULD BE RESHAPED AS NEEDED DURING INSPECTION.
- THE BERM SHOULD BE REPLACED WHEN THE STRUCTURE CEASES TO FUNCTION AS INTENDED DUE TO SILT ACCUMULATION AMONG THE ROCKS, WASHOUT, CONSTRUCTION TRAFFIC DAMAGE, ETC.

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CITY OF GEORGETOWN
CONSTRUCTION STANDARDS AND DETAILS

ROCK BERM DETAIL

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SCALE:	DATE:
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CITY JOB No.
JOB NO. 51423-04
DATE 9/11/2025
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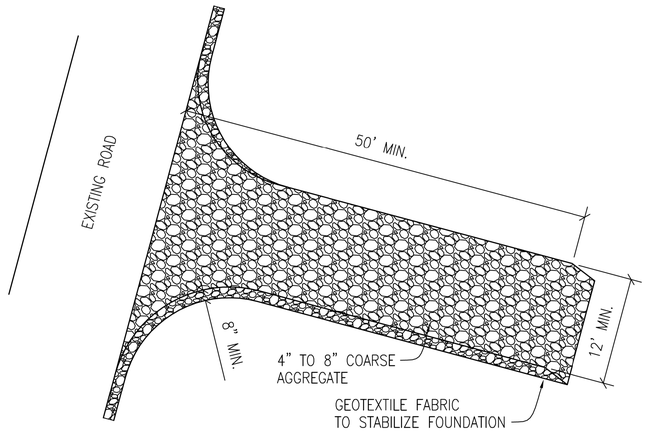

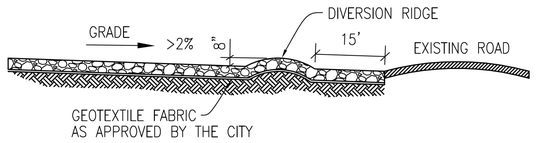

INSTALLATION:

- CLEAR THE AREA OF DEBRIS, ROCKS OR PLANTS THAT WILL INTERFERE WITH INSTALLATION.
- GRADE THE AREA FOR THE ENTRANCE TO FLOW BACK ON TO THE CONSTRUCTION SITE. RUNOFF FROM THE STABILIZED CONSTRUCTION
- PLACE GEOTEXTILE FABRIC AS APPROVED BY THE CITY.
- PLACE ROCK AS APPROVED BY THE CITY.

INSPECTIONS AND MAINTENANCE GUIDELINES:

- THE ENTRANCE SHOULD BE MAINTAINED IN A CONDITION, WHICH WILL PREVENT TRACKING OR FLOWING OF SEDIMENT ONTO PUBLIC RIGHTS-OF-WAY. THIS MAY REQUIRE PERIODIC TOP DRESSING WITH ADDITIONAL STONE AS CONDITIONS DEMAND AND REPAIR AND/OR CLEANOUT OF ANY MEASURES USED TO TRAP SEDIMENT.
- ALL SEDIMENT SPILLED, DROPPED, WASHED OR TRACKED ON TO PUBLIC RIGHTS-OF-WAY SHOULD BE REMOVED IMMEDIATELY BY CONTRACTOR.
- WHEN NECESSARY, WHEELS SHOULD BE CLEANED TO REMOVE SEDIMENT PRIOR TO ENTRANCE ONTO PUBLIC RIGHTS-OF-WAY.
- WHEN WASHING IS REQUIRED, IT SHOULD BE DONE ON AN AREA STABILIZED WITH CRUSHED STONE THAT DRAINS INTO AN APPROVED SEDIMENT TRAP OR SEDIMENT BASIN.
- ALL SEDIMENT SHOULD BE PREVENTED FROM ENTERING ANY STORM DRAIN, DITCH OR WATER COURSE BY USING APPROVED METHODS.

The Architect/Engineer assumes responsibility for appropriate use of this standard.

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CITY OF GEORGETOWN
CONSTRUCTION STANDARDS AND DETAILS
STABILIZED CONSTRUCTION ENTRANCE

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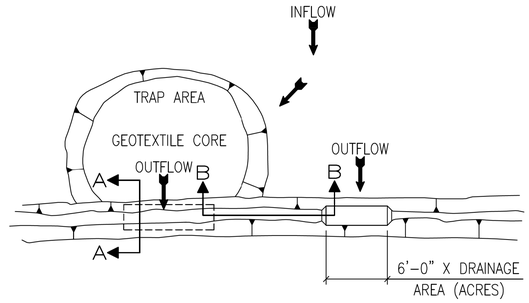
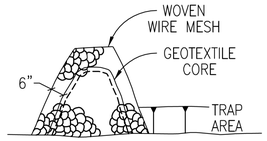
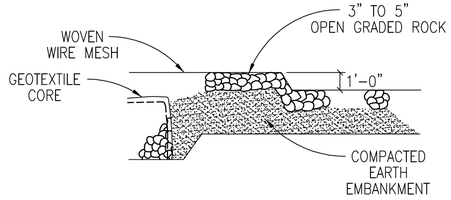


PLAN VIEW



SECTION A-A



SECTION B-B

INSTALLATION:

- LOCATE THE SEDIMENT TRAP SO AS TO DISTURB AS FEW TREES AS POSSIBLE.
- CLEAR AND GRUB THE AREA UNDER THE EMBANKMENT OF ALL VEGETATION AND ROOT MATS.
- LAYOUT THE WIRE MESH AND THEN THE GEOTEXTILE FABRIC.
- CONSTRUCT THE GEOTEXTILE CORE AND CORRESPONDING ROCK EMBANKMENT TO THE DESIGNATED HEIGHT AND CONFIGURATION.
- WRAP THE STRUCTURE WITH THE PREVIOUSLY PLACED WIRE MESH SECURE ENOUGH SO THAT WHEN WALKED ACROSS THE STRUCTURE RETAINS IT'S SHAPE. SECURE WITH TIE WIRE.
- PLACE THE EMBANKMENT MATERIAL IN 8 TO 12 INCH LIFTS AND MACHINE COMPACT.

INSPECTION AND MAINTENANCE GUIDELINES:

- INSPECTION SHOULD BE MADE WEEKLY AND AFTER EACH RAINFALL. CHECK THE EMBANKMENT, SPILLWAYS, AND OUTLET FOR EROSION DAMAGE AND INSPECT THE EMBANKMENT FOR PIPING AND SETTLEMENT. REPAIR SHOULD BE MADE PROMPTLY AS NEEDED BY THE CONTRACTOR.
- TRASH AND OTHER DEBRIS SHOULD BE REMOVED AND THE TRAP RESTORED TO ITS ORIGINAL DIMENSIONS WHEN THE SEDIMENT HAS ACCUMULATED TO HALF OF THE DESIGN DEPTH OF THE TRAP.
- SEDIMENT REMOVED FROM THE TRAP SHOULD BE DEPOSITED IN AN APPROVED SPOILS AREA AND IN SUCH A MANNER THAT IT WILL NOT CAUSE ADDITIONAL SILTATION.

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REVISION NOTE: ADOPTED 6/21/2006

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CITY OF GEORGETOWN
CONSTRUCTION STANDARDS AND DETAILS
SEDIMENT TRAP DETAIL

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JOB NO. 51423-04
DATE 9/11/2025
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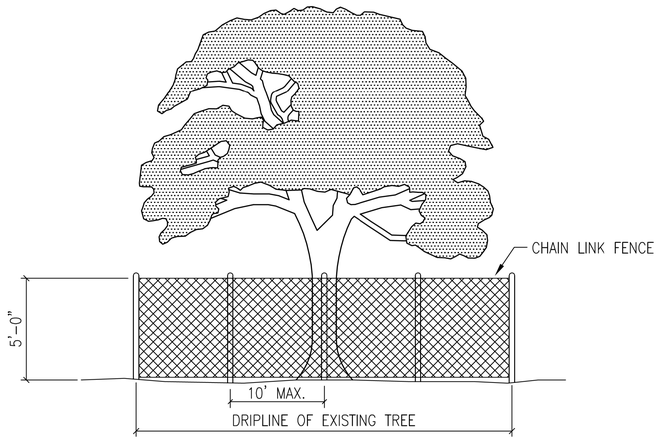

NOTES:

1. TREE PROTECTION FENCES SHALL BE INSTALLED PRIOR TO THE COMMENCEMENT OF ANY SITE PREPARATION WORK (CLEARING, GRUBBING OR GRADING).
2. FENCES SHALL COMPLETELY SURROUND THE TREE, OR CLUSTERS OF TREES; WILL BE LOCATED AT THE OUTERMOST LIMIT OF THE TREE BRANCHES (DRIPLINE), AND WILL BE MAINTAINED THROUGHOUT THE CONSTRUCTION PROJECT IN ORDER TO PREVENT THE FOLLOWING:
   A. SOIL COMPACTION IN THE ROOT ZONE AREA RESULTING FROM VEHICULAR TRAFFIC, OR STORAGE OF EQUIPMENT OR MATERIALS.
   B. ROOT ZONE DISTURBANCES DUE TO GRADE CHANGES (GREATER THAN SIX INCHES (6") CUT OR FILL, OR TRENCHING NOT REVIEWED AND AUTHORIZED BY THE CITY.
   C. WOUNDS TO EXPOSED ROOTS, TRUNKS OR LIMBS BY MECHANICAL EQUIPMENT.
   D. OTHER ACTIVITIES DETRIMENTAL TO TREES, SUCH AS CHEMICAL STORAGE, CEMENT TRUCK CLEANING AND FIRE.
3. EXCEPTIONS TO INSTALLING FENCES AT TREE DRIPLINES MAY BE PERMITTED IN THE FOLLOWING CASES:
   A. WHERE PERMEABLE PAVING IS TO BE INSTALLED, ERECT THE FENCE AT THE OUTER LIMITS OF THE PERMEABLE PAVING AREA.
   B. WHERE TREES ARE CLOSE TO PROPOSED BUILDINGS, ERECT THE FENCE NO CLOSER THAN SIX FEET (6'-0") TO BUILDING.

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CITY OF GEORGETOWN
CONSTRUCTION STANDARDS AND DETAILS

TREE PROTECTION –
CHAIN LINK FENCE

DRAWING NAME: EC09

SCALE:	DATE:
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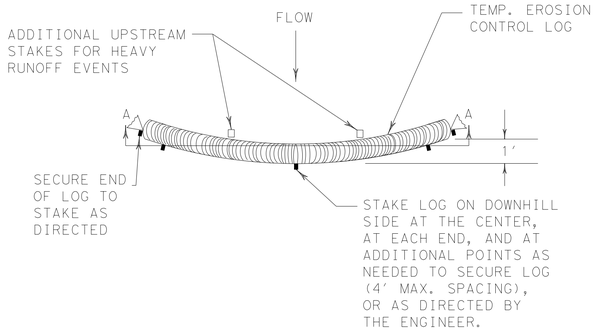
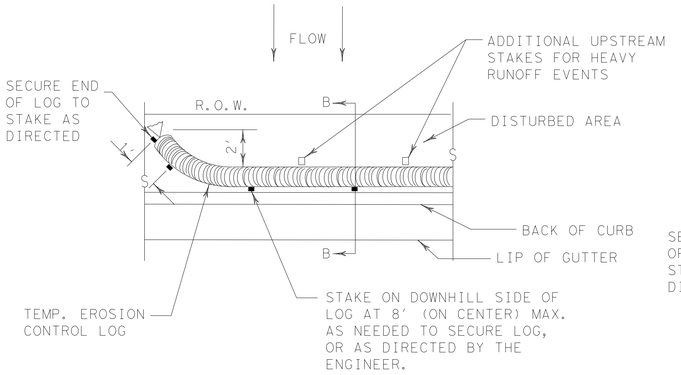


PLAN VIEW



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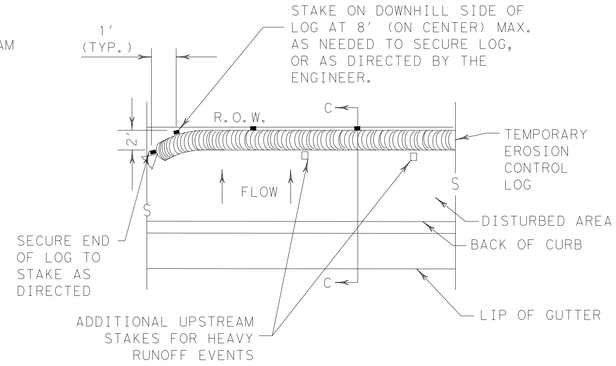

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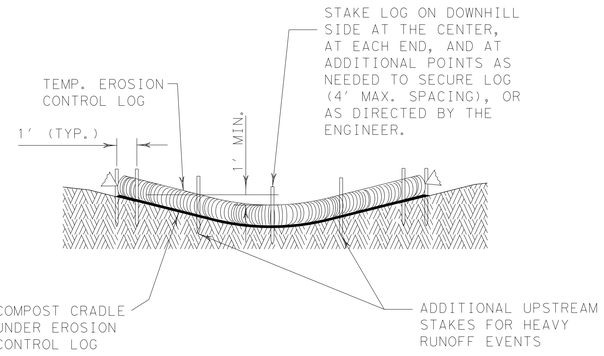
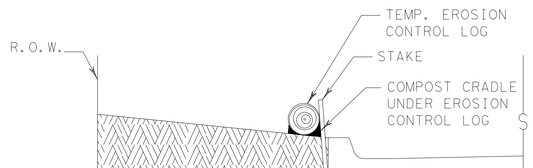


SECTION A-A

EROSION CONTROL LOG DAM

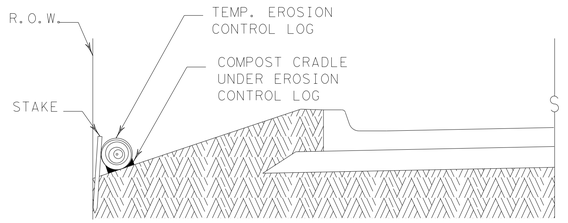
CL-D



SECTION B-B

EROSION CONTROL LOG AT BACK OF CURB

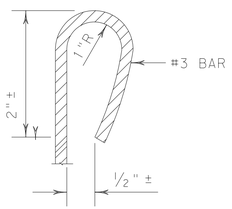
CL-BOC



SECTION C-C

EROSION CONTROL LOG AT EDGE OF RIGHT-OF-WAY

CL-ROW



REBAR STAKE DETAIL

LEGEND

- CL-D — EROSION CONTROL LOG DAM
- CL-BOC — EROSION CONTROL LOG AT BACK OF CURB
- CL-ROW — EROSION CONTROL LOG AT EDGE OF RIGHT-OF-WAY
- CL-SST — EROSION CONTROL LOGS ON SLOPES STAKE AND TRENCHING ANCHORING
- CL-SSL — EROSION CONTROL LOGS ON SLOPES STAKE AND LASHING ANCHORING
- CL-DI — EROSION CONTROL LOG AT DROP INLET
- CL-CI — EROSION CONTROL LOG AT CURB INLET
- CL-GI — EROSION CONTROL LOG AT CURB & GRATE INLET

GENERAL NOTES:

1. EROSION CONTROL LOGS SHALL BE INSTALLED IN ACCORDANCE WITH MANFACTURER'S RECOMMENDATIONS, OR AS DIRECTED BY THE ENGINEER.
2. LENGTHS OF EROSION CONTROL LOGS SHALL BE IN ACCORDANCE WITH MANUFACTURER'S RECOMMENDATIONS AND AS REQUIRED FOR THE PURPOSE INTENDED.
3. UNLESS OTHERWISE DIRECTED, USE BIODEGRADABLE OR PHOTODEGRADABLE CONTAINMENT MESH ONLY WHERE LOG WILL REMAIN IN PLACE AS PART OF A VEGETATIVE SYSTEM. FOR TEMPORARY INSTALLATIONS, USE RECYCLABLE CONTAINMENT MESH.
4. FILL LOGS WITH SUFFICIENT FILTER MATERIAL TO ACHIEVE THE MINIMUM COMPACTED DIAMETER SPECIFIED IN THE PLANS WITHOUT EXCESSIVE DEFORMATION.
5. STAKES SHALL BE 2" X 2" WOOD OR #3 REBAR, 2'-4' LONG, EMBEDDED SUCH THAT 2" PROTRUDES ABOVE LOG, OR AS DIRECTED BY THE ENGINEER.
6. DO NOT PLACE STAKES THROUGH CONTAINMENT MESH.
7. COMPOST CRADLE MATERIAL IS INCIDENTAL & WILL NOT BE PAID FOR SEPARATELY.
8. SANDBAGS USED AS ANCHORS SHALL BE PLACED ON TOP OF LOGS & SHALL BE OF SUFFICIENT SIZE TO HOLD LOGS IN PLACE.
9. TURN THE ENDS OF EACH ROW OF LOGS UPSLOPE TO PREVENT RUNOFF FROM FLOWING AROUND THE LOG.
10. FOR HEAVY RUNOFF EVENTS, ADDITIONAL UPSTREAM STAKES MAY BE NECESSARY TO KEEP LOG FROM FOLDING IN ON ITSELF.

SEDIMENT BASIN & TRAP USAGE GUIDELINES

An erosion control log sediment trap may be used to filter sediment out of runoff draining from an unstabilized area.

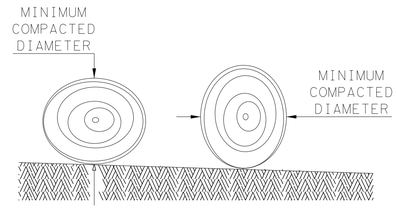
Log Traps: The drainage area for a sediment trap should not exceed 5 acres. The trap capacity should be 1800 CF/Acre (0.5" over the drainage area).

Control logs should be placed in the following locations:

1. Within drainage ditches spaced as needed or min. 500' on center
2. Immediately preceding ditch inlets or drain inlets
3. Just before the drainage enters a water course
4. Just before the drainage leaves the right of way
5. Just before the drainage leaves the construction limits where drainage flows away from the project.

The logs should be cleaned when the sediment has accumulated to a depth of 1/2 the log diameter.

Cleaning and removal of accumulated sediment deposits is incidental and will not be paid for separately.



DIAMETER MEASUREMENTS OF EROSION CONTROL LOGS SPECIFIED IN PLANS

SHEET 1 OF 3

Texas Department of Transportation

Design Division Standard

TEMPORARY EROSION, SEDIMENT AND WATER POLLUTION CONTROL MEASURES

EROSION CONTROL LOG

EC(9)-16

FILE: ec916	DN: TxDOT	CK: KM	DW: LS/PT	CK: LS	
© TxDOT: JULY 2016	CONT	SECT	JOB	HIGHWAY	
REVISIONS					
	DIST	COUNTY		SHEET NO.	
				344	

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DATE: 9/11/2025
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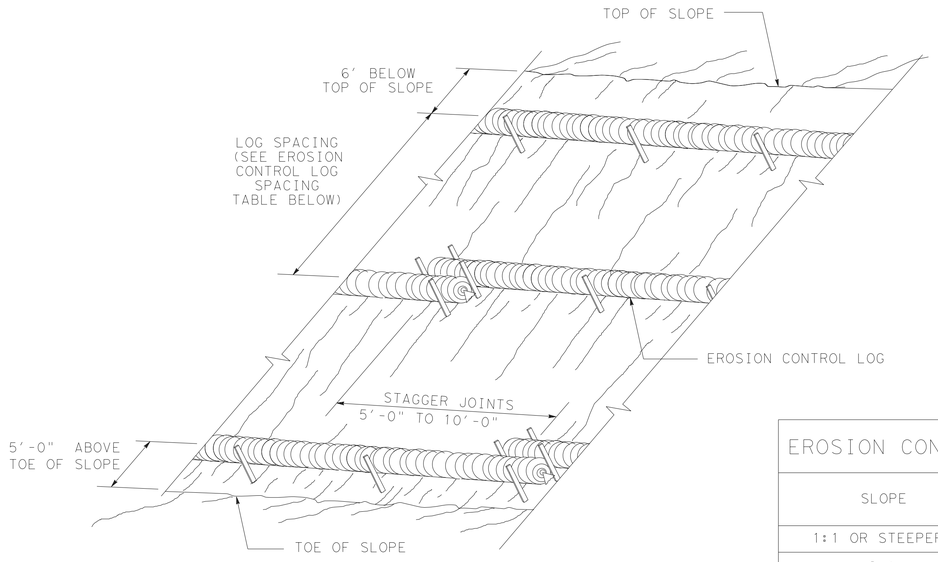
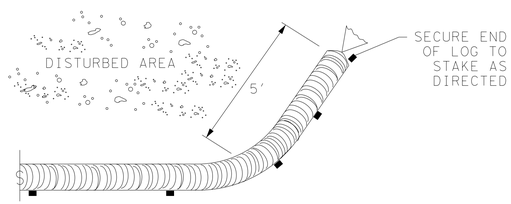


EROSION CONTROL LOGS ON SLOPES
STAKE AND TRENCHING ANCHORING

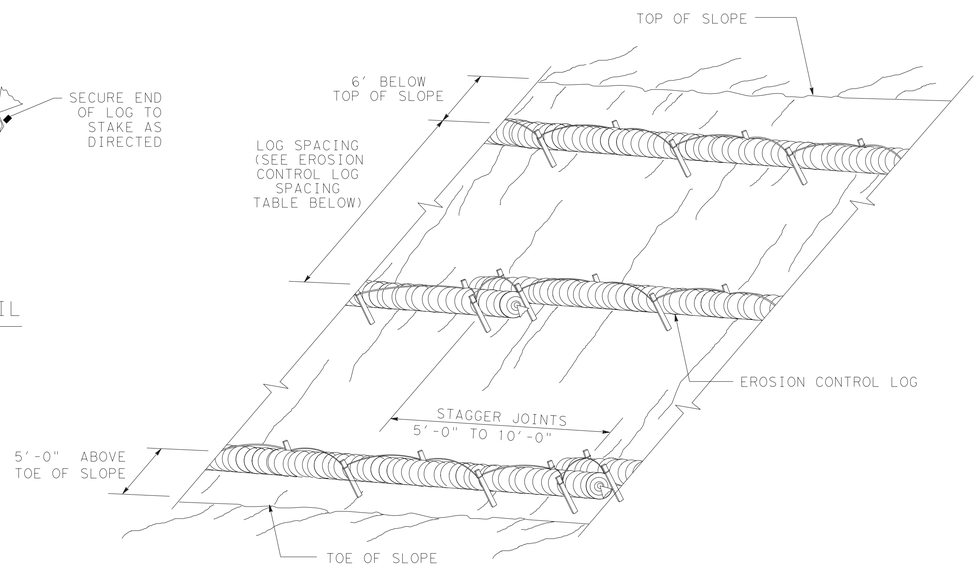
CL-SST



END SECTION RAP DETAIL

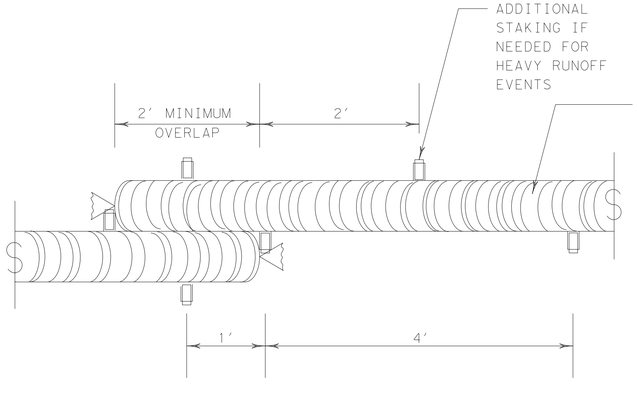
EROSION CONTROL LOG SPACING TABLE				
SLOPE	LOG DIAMETER			
	6"	8"	12"	18"
1:1 OR STEEPER	5'	10'	15'	20'
2:1	10'	20'	30'	40'
3:1	15'	30'	45'	60'
4:1 OR FLATTER	20'	40'	60'	80'

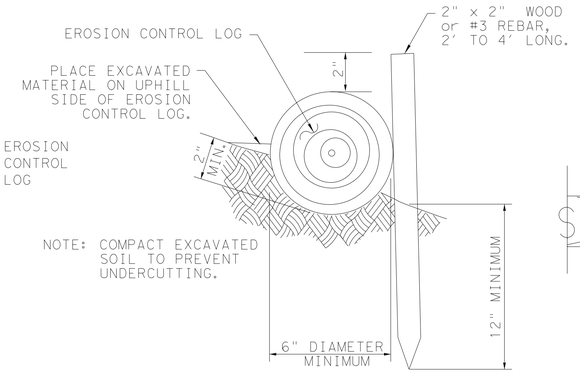
* ADJUSTMENTS CAN BE MADE FOR SOIL TYPE:
SOFT, LOAMY SOILS-ADJUST ROWS CLOSER TOGETHER;
HARD, ROCKY SOILS- ADJUST ROWS FARTHER APART



EROSION CONTROL LOGS ON SLOPES
STAKE AND LASHING ANCHORING

CL-SSL

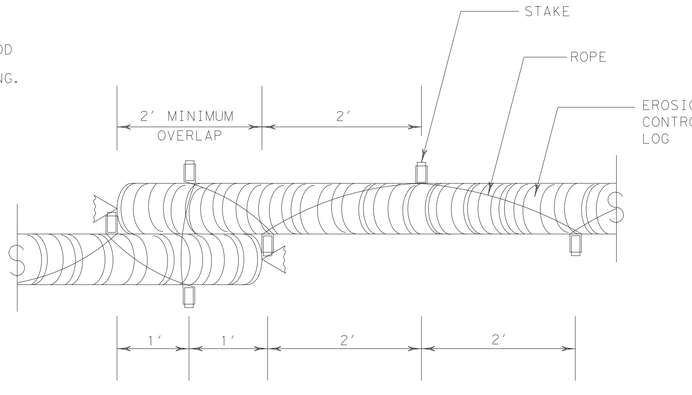




STAKE AND TRENCHING ANCHORING DETAIL

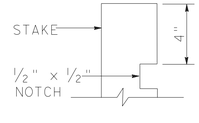
CL-SST

TRENCH DEPTH TABLE	
LOG DIAMETER	DEPTH
6"	2"
8"	3"
12"	4"
18"	5"

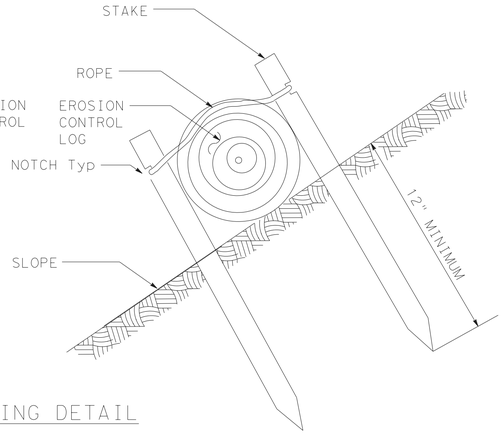


STAKE AND LASHING ANCHORING DETAIL

CL-SSL



STAKE NOTCH DETAIL



SHEET 2 OF 3

Texas Department of Transportation

Design Division Standard

TEMPORARY EROSION, SEDIMENT AND WATER POLLUTION CONTROL MEASURES

EROSION CONTROL LOG

EC(9)-16

FILE: ec116	DN: TxDOT	CK: KM	DW: LS/PT	CK: LS		
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REVISIONS						
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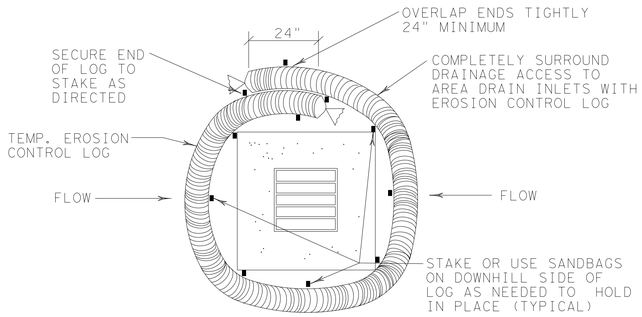
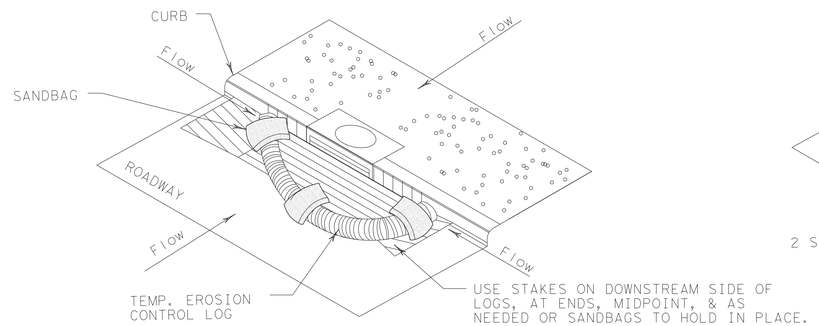


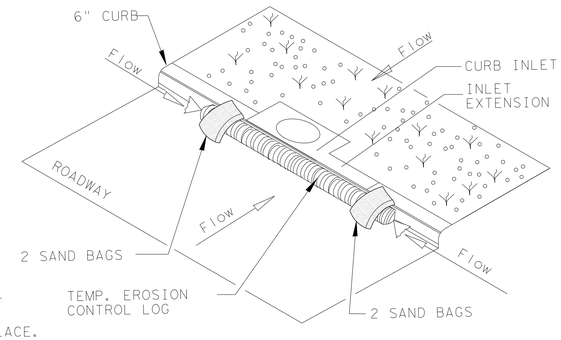
EROSION CONTROL LOG AT DROP INLET

CL-DI



EROSION CONTROL LOG AT CURB INLET

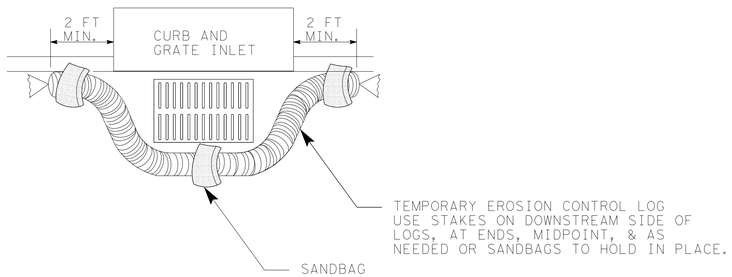
CL-CI



EROSION CONTROL LOG AT CURB INLET

CL-CI

NOTE:
EROSION CONTROL LOGS USED AT CURB INLETS SHOULD ONLY BE USED IF THEY WILL NOT IMPEDE TRAFFIC OR FLOOD THE ROADWAY OR WHEN THE STORM SEWER SYSTEM IS NOT FULLY FUNCTIONAL.

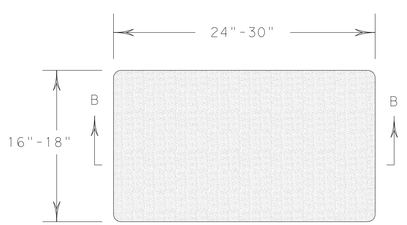


EROSION CONTROL LOG AT CURB & GRADE INLET

CL-GI



SECTION B-B



SANDBAG DETAIL

SHEET 3 OF 3

Texas Department of Transportation | Design Division Standard

TEMPORARY EROSION, SEDIMENT AND WATER POLLUTION CONTROL MEASURES

EROSION CONTROL LOG

EC(9)-16

FILE: ec916	DN: TxDOT	CK: KM	DW: LS/PT	CK: LS			
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REVISIONS							
	DIST	COUNTY		SHEET NO.			
				346			

LEGEND

- (A) 4" WHITE BROKEN THERMOPLASTIC STRIPING
- (B) 8" WHITE SOLID THERMOPLASTIC STRIPING
- (C) 8" WHITE DOT THERMOPLASTIC STRIPING
- (D) 4" YELLOW SOLID THERMOPLASTIC STRIPING
- (E) 12" WHITE SOLID THERMOPLASTIC STRIPING
- (F) 24" WHITE SOLID THERMOPLASTIC STRIPING
- (G) THERMOPLASTIC STRIPING (WORD)
- (H) THERMOPLASTIC STRIPING (ARROW)
- (I) RAISED REFL PAV MRKR TY II-A-A
- (J) RAISED REFL PAV MRKR TY II-C-R
- (K) REFL PAV MRK TY I (W) 18" (YLD TRI)(100MIL)
- (L) 12" YELLOW SOLID THERMOPLASTIC STRIPING
- (M) REFL PAV MRK TY I (W)(SYMBOL)(100MIL)

YIELD TRIANGLES
EXISTING ROW
PROPOSED ROW
EXISTING EASEMENT
SIGN
TRAFFIC FLOW ARROWS

SCALE: 1"= 20'

0' 20' 40' 60'

NOTES:

1. FOR ADDITIONAL DETAILS, SEE TXDOT TYPICAL STANDARD SHEETS.
2. EXISTING FEATURES ARE SHOWN SCREENED BACK.
3. ALL SIGN LOCATIONS ARE APPROXIMATE. EXACT LOCATION ARE TO BE STAKED OUT BY THE CONTRACTOR AND APPROVED BY THE ENGINEER PRIOR TO INSTALLATION.
4. ALL DIMENSIONS ARE TO EDGE OF PAVEMENT AND\OR CENTER OF PAVEMENT MARKINGS, UNLESS OTHERWISE NOTED.
5. CONTRACTOR TO MATCH EXSITNG PAVEMENT MARKINGS AT BOTH ENDS OF THE PROJECT.
6. ANY EXISTING PAVEMENT MARKINGS REMOVED IN THE TCP THAT IS NOT SHOWN IN THE SIGNING AND PAVEMENT MARKING LAYOUT IS CONSIDERED SUBSIDIARY TO OTHER ITEMS OF WORK.

DESIGN

STATE OF TEXAS
BRET CHAPMAN
127293
LICENSED
PROFESSIONAL ENGINEER

BRET CHAPMAN, P.E. — 9/16/2025 DATE

APPROVAL

STATE OF TEXAS
BRIAN A. ALLEN
123374
LICENSED
PROFESSIONAL ENGINEER

BRIAN A. ALLEN, P.E. — 9/16/2025 DATE

NO.	REVISION	DATE

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10801 N MOPAC EXPY, BLDG 3, STE 200 I AUSTIN, TX 78759 I 512.454.8711
TEXAS ENGINEERING FIRM #470 I TEXAS SURVEYING FIRM #10028800

WOLF RANCH PKWY / MEMORIAL DR
SIGNAGE AND PAVEMENT MARKINGS

CITY JOB No.
JOB NO. 51423-04
DATE 9/16/2025
DESIGNER
CHECKED DRAWN

SHEET 1 OF 17
SHEET NO. 347

PROPOSED TRAFFIC SIGNS

1		R1-2 48"X48"X48"	6		R3-8(LTR) 30"X36"
2	ONE WAY	R6-2 30"X36"	7	15 MPH	W2-6 36"X36" CW13-P 24"X24"
3		S1-1 (36"X36") SW16-7PL (24"X12") MULTI LANE ENTRIES AND EXITS WILL HAVE A RRFB, REFER TO SHEET 395 FOR MORE INFORMATION	8		R3-8MR 48"X48"
4		S1-1 (36"X36") SW16-7PR (24"X12") MULTI LANE ENTRIES AND EXITS WILL HAVE A RRFB, REFER TO SHEET 395 FOR MORE INFORMATION			
5		R3-8MM 36"x30"			

LEGEND

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- (C) 8" WHITE DOT THERMOPLASTIC STRIPING
- (D) 4" YELLOW SOLID THERMOPLASTIC STRIPING
- (E) 12" WHITE SOLID THERMOPLASTIC STRIPING
- (F) 24" WHITE SOLID THERMOPLASTIC STRIPING
- (G) THERMOPLASTIC STRIPING (WORD)
- (H) THERMOPLASTIC STRIPING (ARROW)
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- (M) REFL PAV MRK TY I (W)(SYMBOL)(100MIL)

YIELD TRIANGLES
EXISTING ROW
PROPOSED ROW
EXISTING EASEMENT
SIGN
TRAFFIC FLOW ARROWS

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0' 20' 40' 60'

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CITY JOB No.
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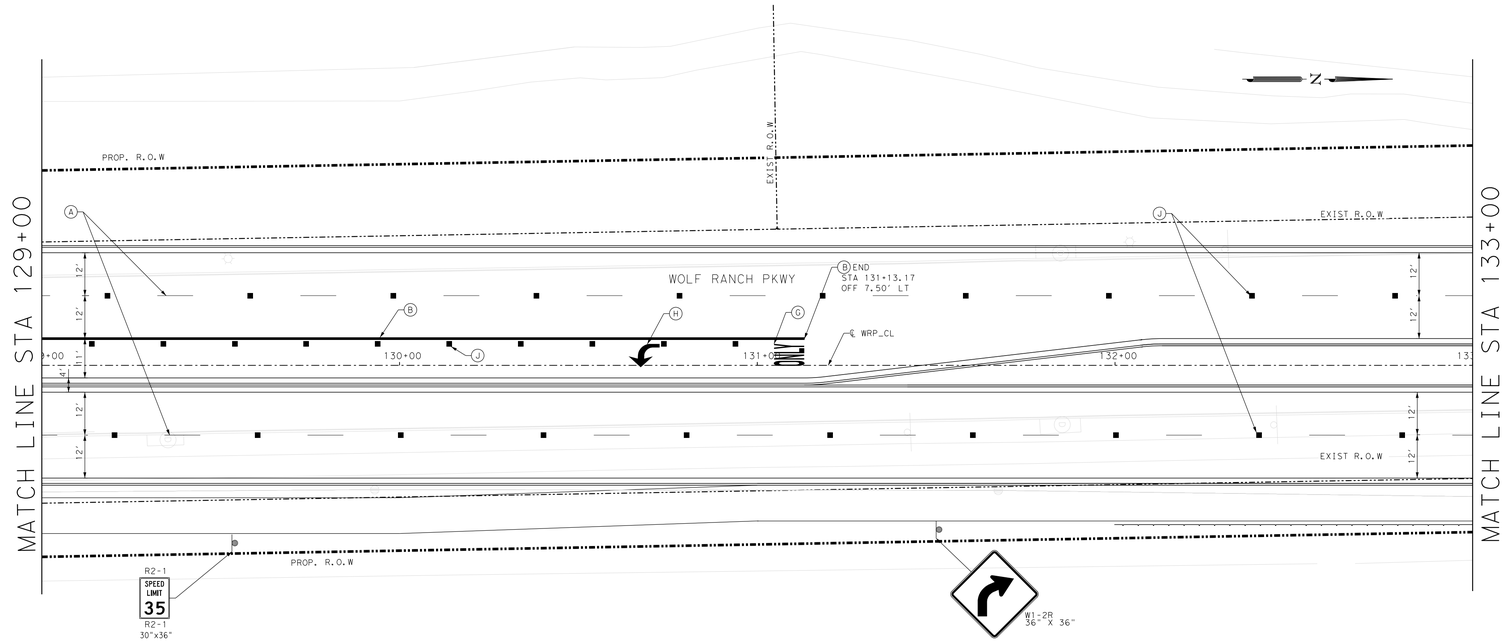
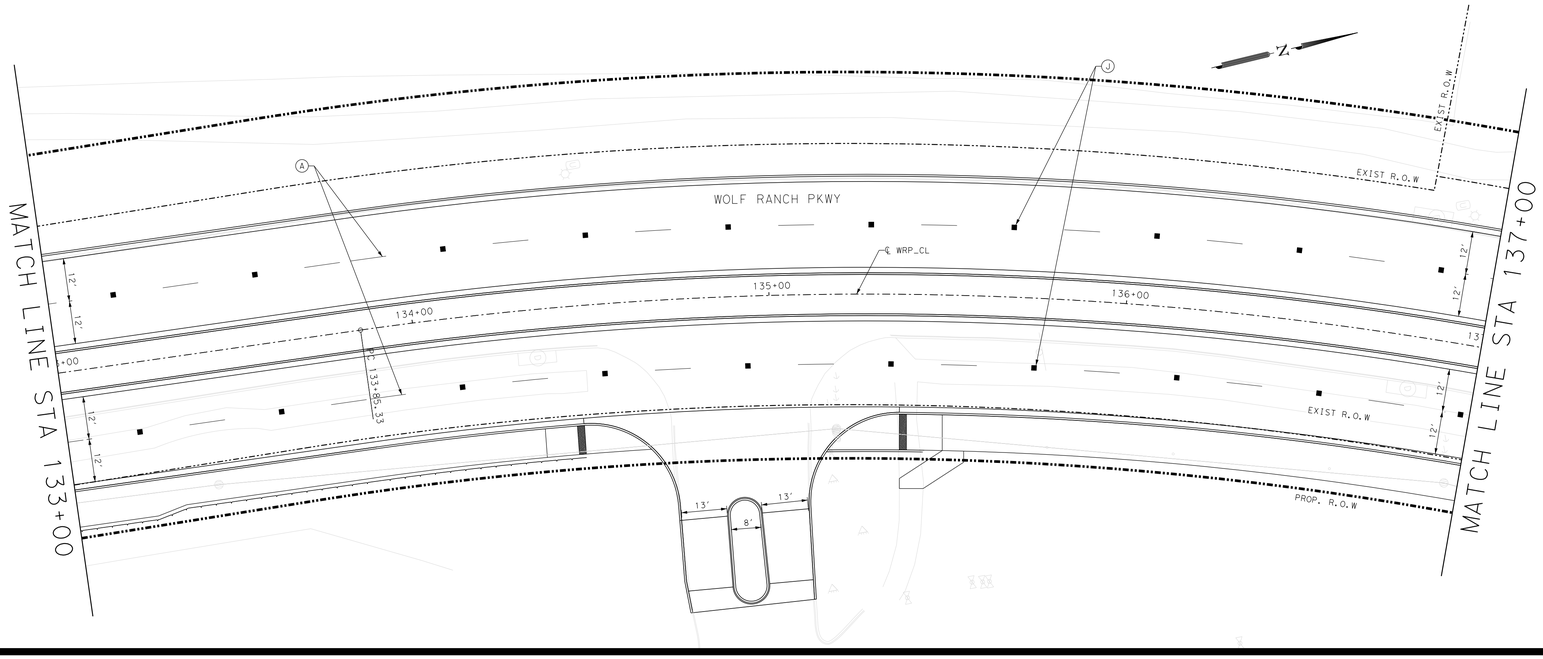
SHEET 3 OF 17

SHEET NO. 349





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SIGNAGE AND PAVEMENT MARKINGS

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JOB NO. 51423-04
DATE 9/16/2025
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SHEET 4 OF 17

SHEET NO. 350

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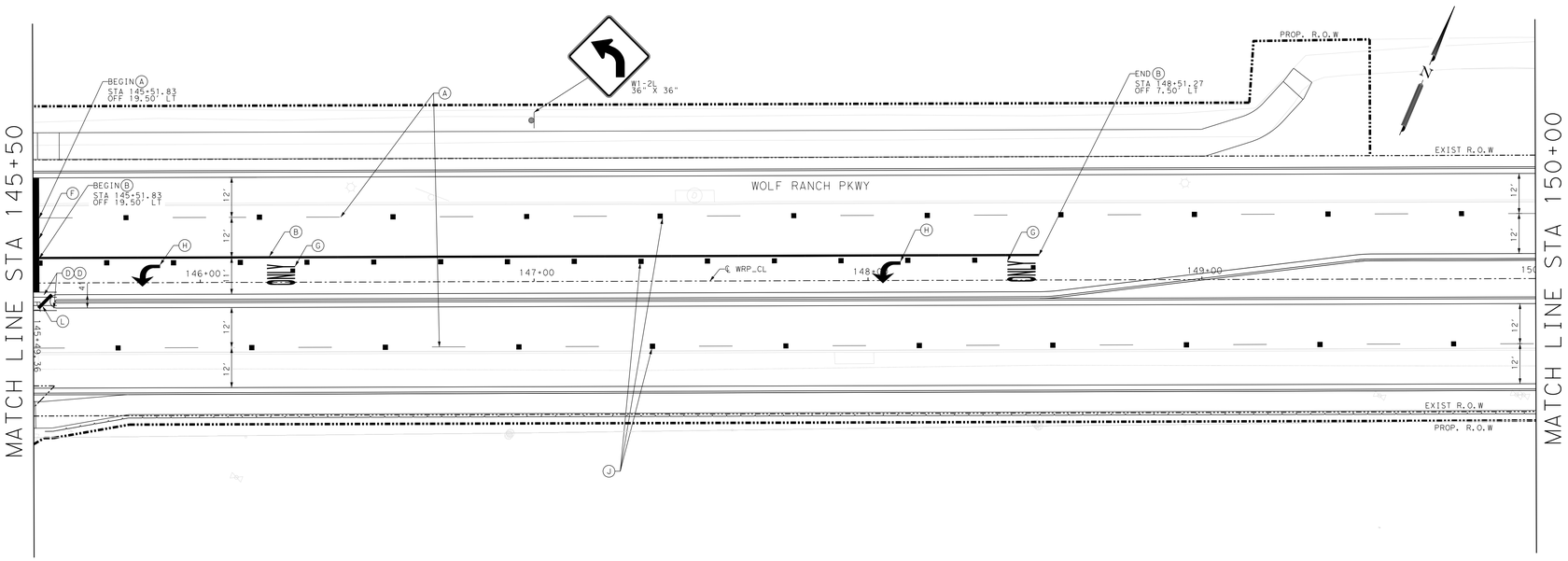
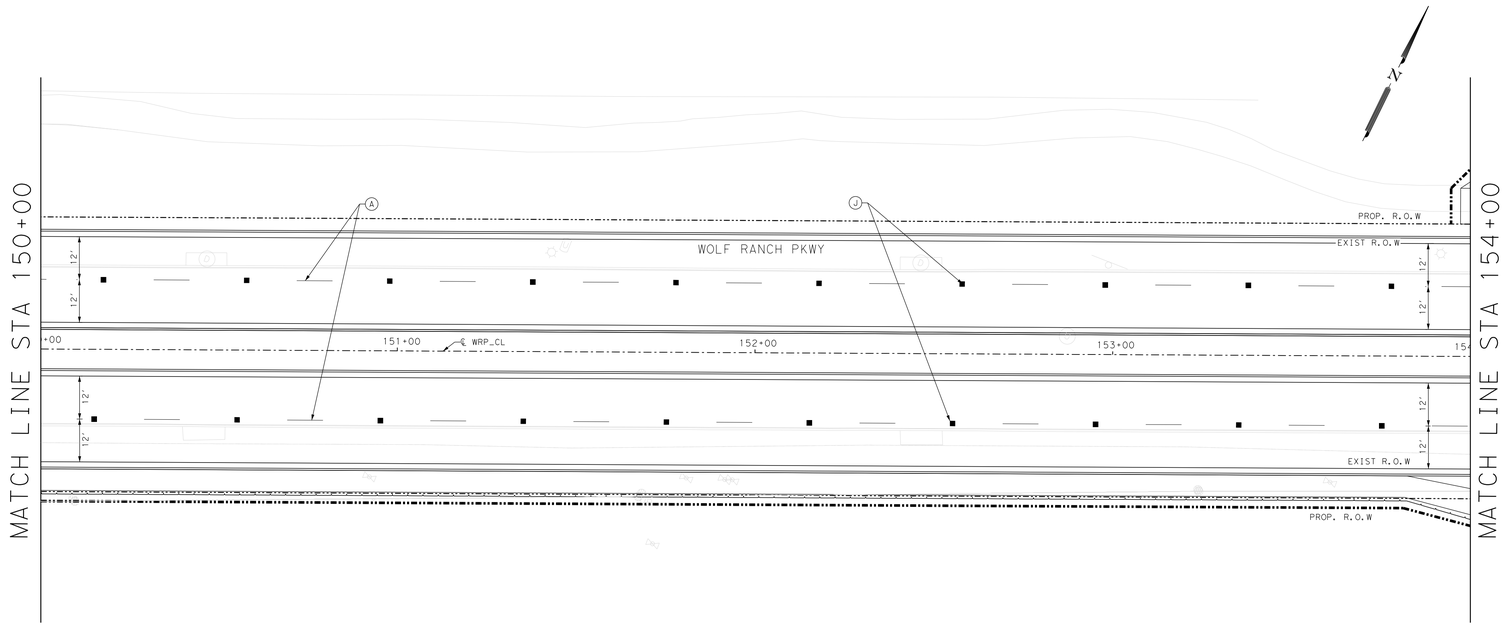
SHEET 5 OF 17

SHEET NO. 351





LEGEND

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- (M) REFL PAV MRK TY I (W)(SYMBOL)(100MIL)

YIELD TRIANGLES
EXISTING ROW
PROPOSED ROW
EXISTING EASEMENT
SIGN
TRAFFIC FLOW ARROWS

SCALE: 1"= 20'

0' 20' 40' 60'

NOTES:

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DESIGN

STATE OF TEXAS
BRET CHAPMAN
127293
LICENSED
PROFESSIONAL ENGINEER

BRET CHAPMAN, P.E. — 9/16/2025 DATE

APPROVAL

STATE OF TEXAS
BRIAN A. ALLEN
123374
LICENSED
PROFESSIONAL ENGINEER

BRIAN A. ALLEN, P.E. — 9/16/2025 DATE

NO.	REVISION	DATE

GEORGETOWN TEXAS *more than welcome*

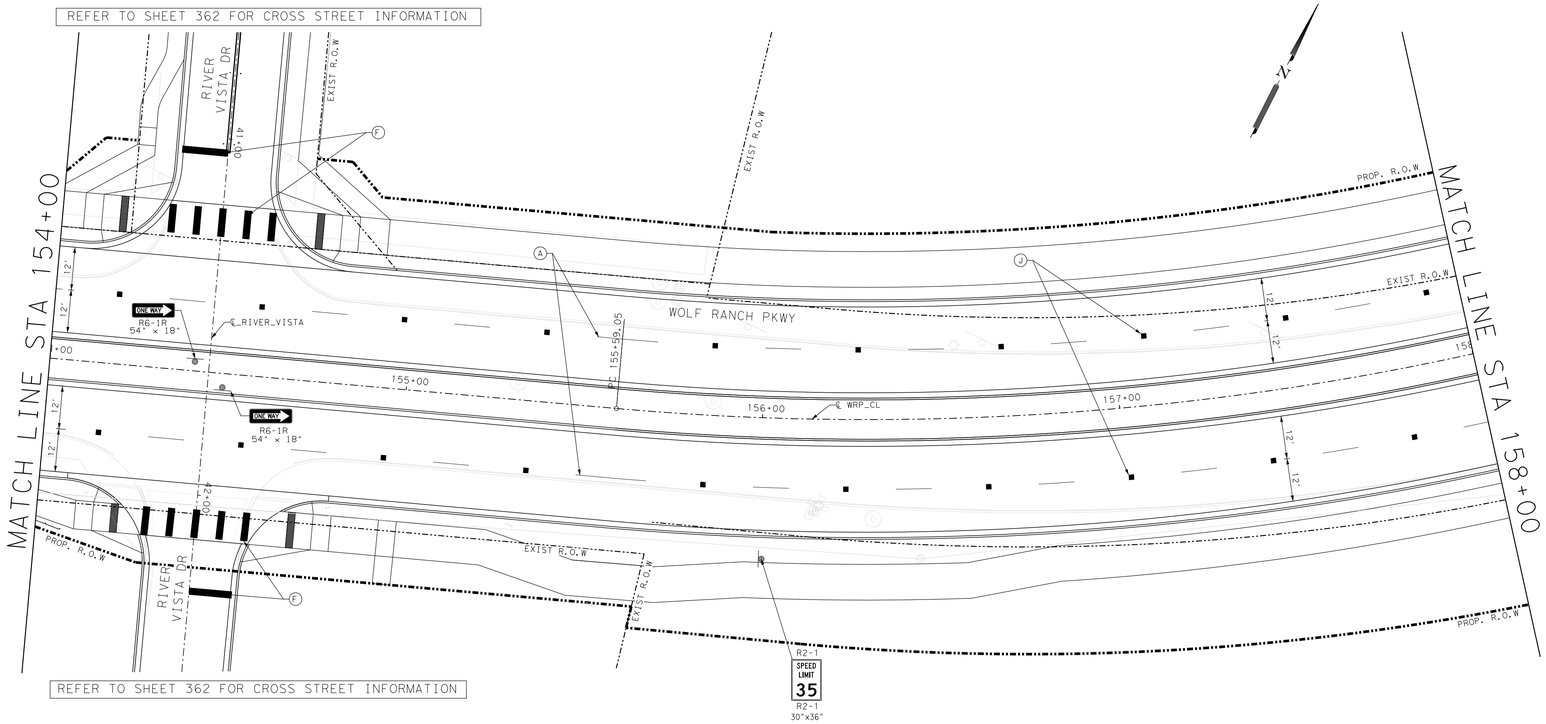
PAPE-DAWSON ENGINEERS
AUSTIN I SAN ANTONIO I HOUSTON I FORT WORTH I DALLAS
10801 N MOPAC EXPY, BLDG 3, STE 200 I AUSTIN, TX 78759 I 512.454.8711
TEXAS ENGINEERING FIRM #470 I TEXAS SURVEYING FIRM #10028800

WOLF RANCH PKWY / MEMORIAL DR
SIGNAGE AND PAVEMENT MARKINGS

CITY JOB No.
JOB NO. 51423-04
DATE 9/16/2025
DESIGNER
CHECKED DRAWN

SHEET 6 OF 17

SHEET NO. 352



LEGEND

- (A) 4" WHITE BROKEN THERMOPLASTIC STRIPING
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- (C) 8" WHITE DOT THERMOPLASTIC STRIPING
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- (E) 12" WHITE SOLID THERMOPLASTIC STRIPING
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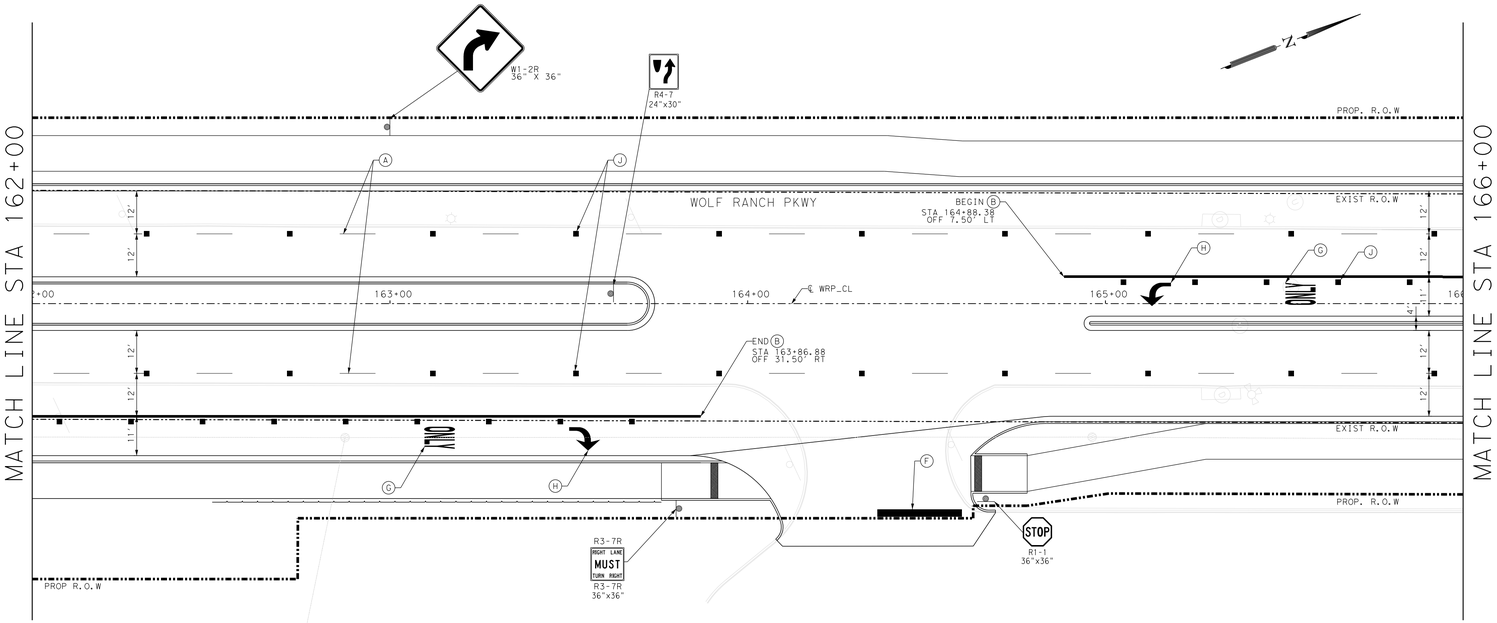
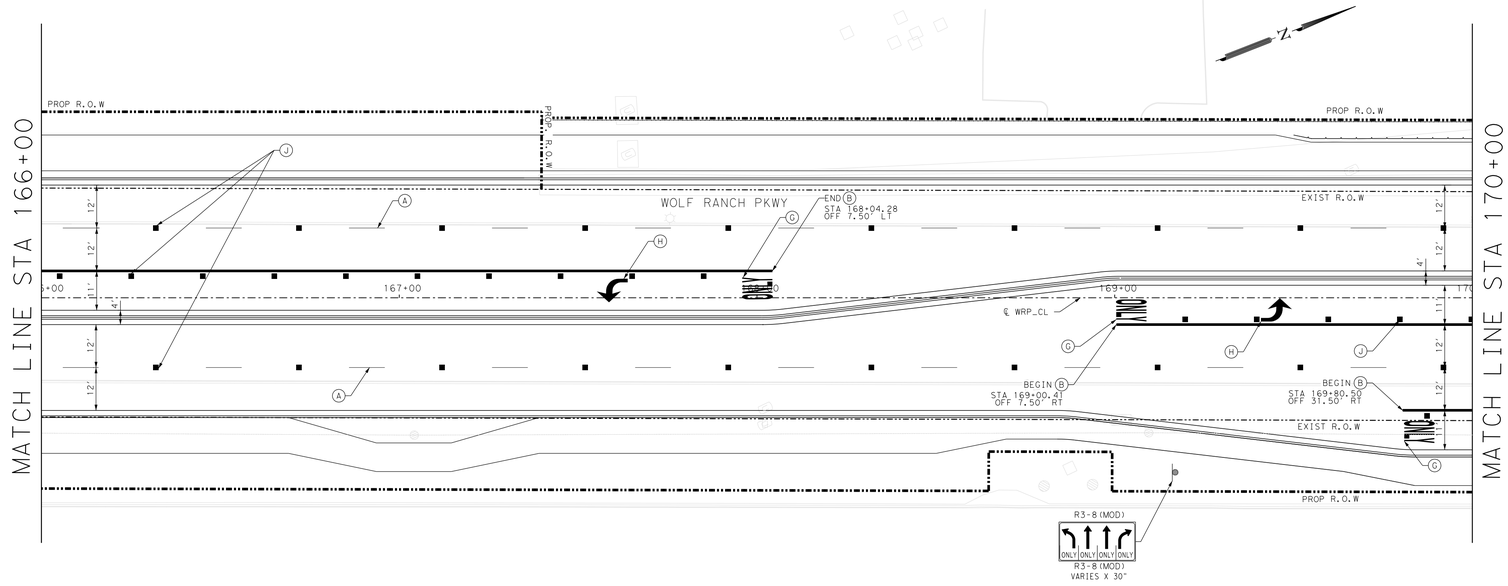
SHEET 7 OF 17

SHEET NO. 353





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SHEET 8 OF 17

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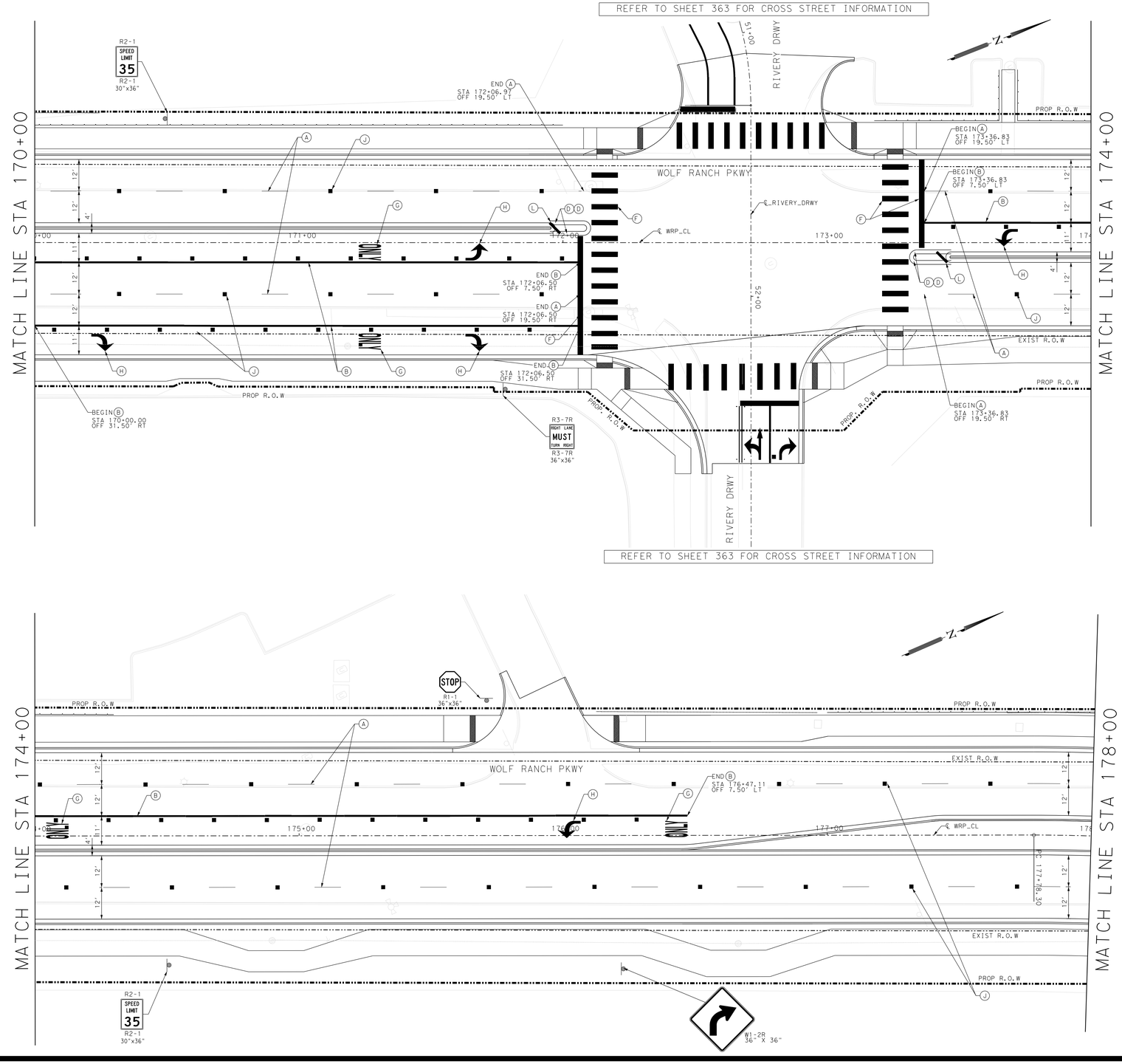

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STATE OF TEXAS — BRET CHAPMAN — 127293 — LICENSED PROFESSIONAL ENGINEER

BRET CHAPMAN, P.E. — 9/16/2025 DATE

APPROVAL

STATE OF TEXAS — BRIAN A. ALLEN — 123374 — LICENSED PROFESSIONAL ENGINEER

BRIAN A. ALLEN, P.E. — 9/16/2025 DATE

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GEORGETOWN TEXAS *more than welcome*

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WOLF RANCH PKWY / MEMORIAL DR
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CITY JOB No.
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CITY JOB No.
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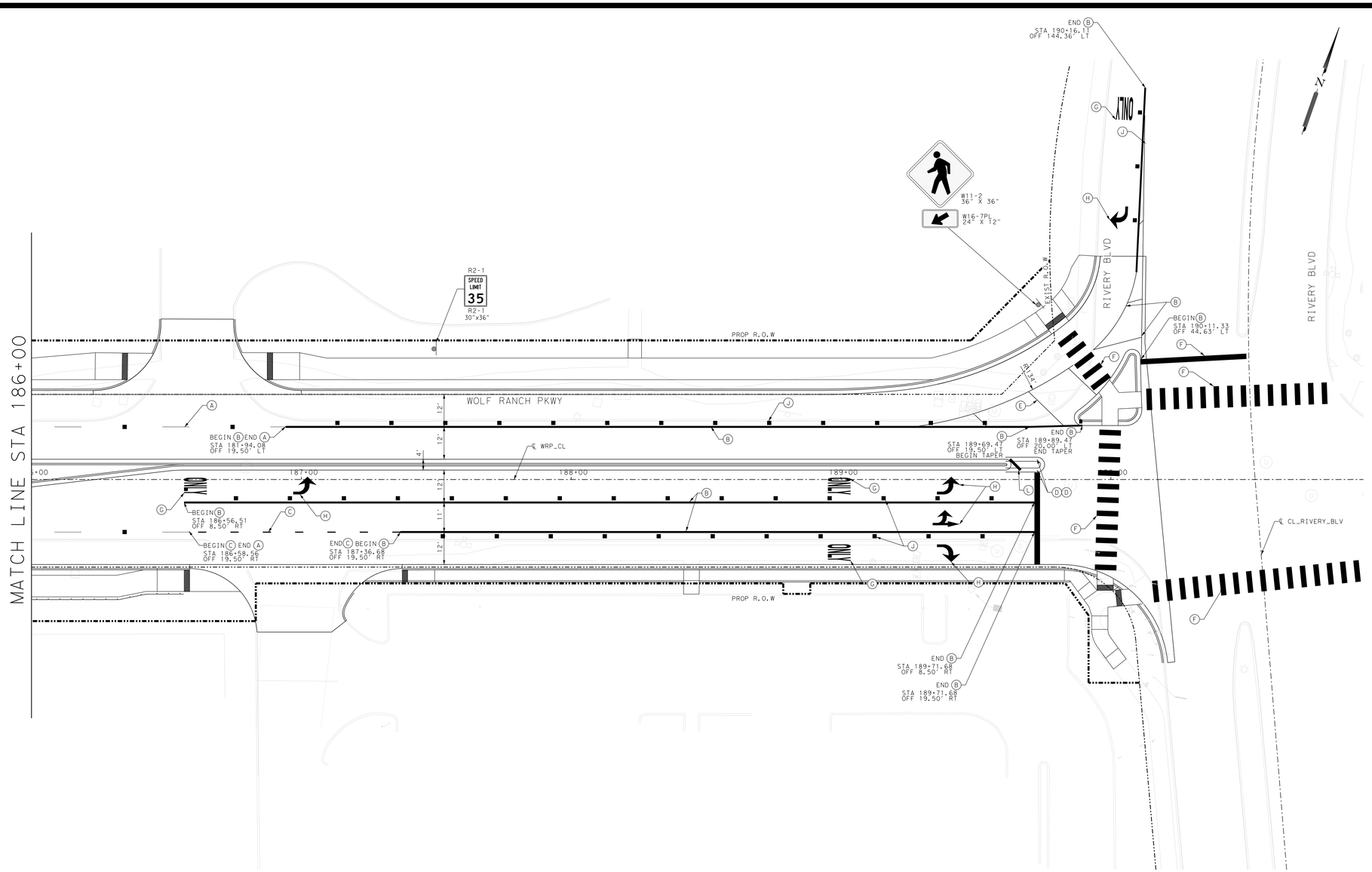
SHEET 10 OF 17

SHEET NO. 356



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YIELD TRIANGLES
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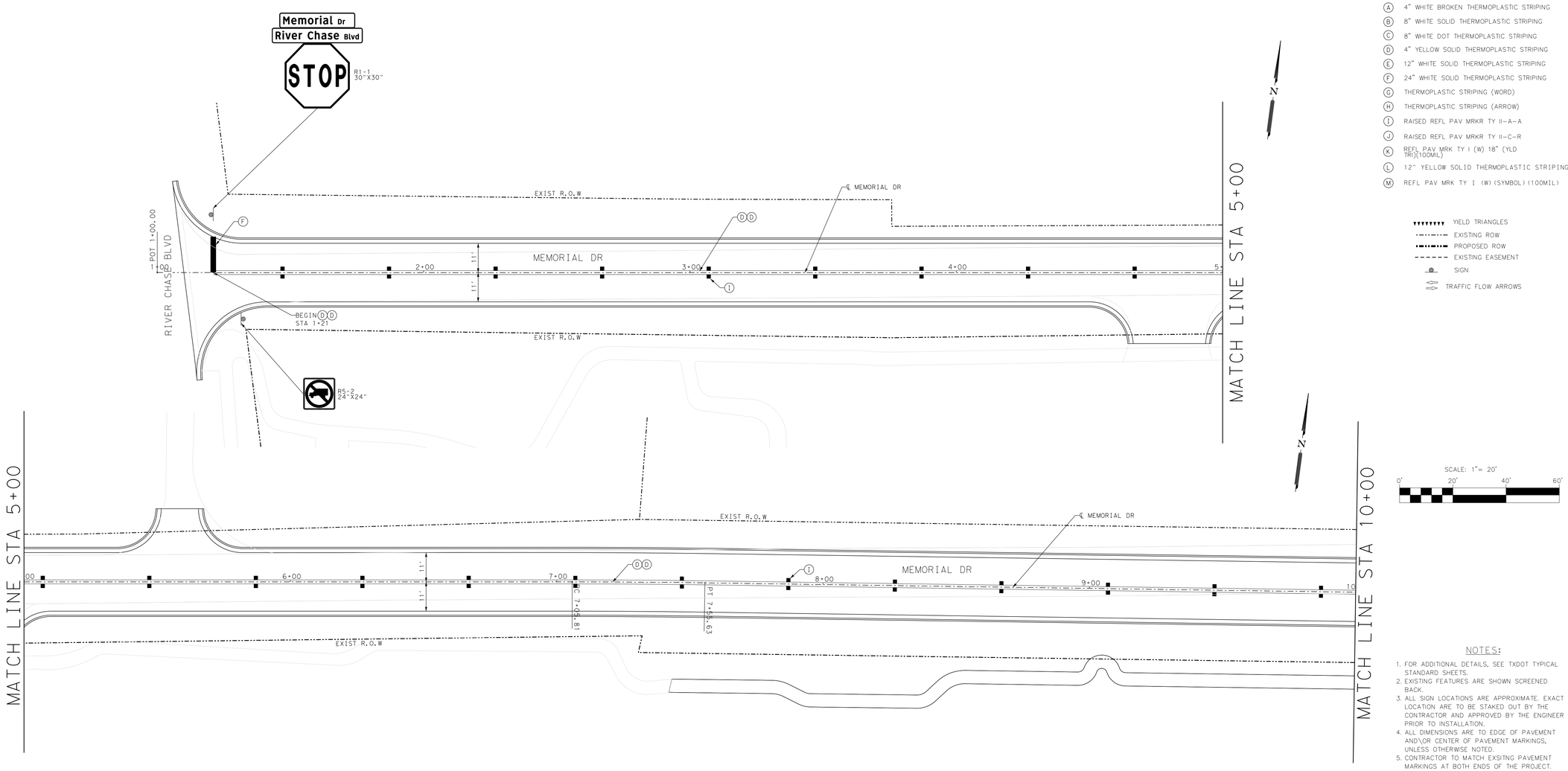
SHEET 11 OF 17
SHEET NO. 357



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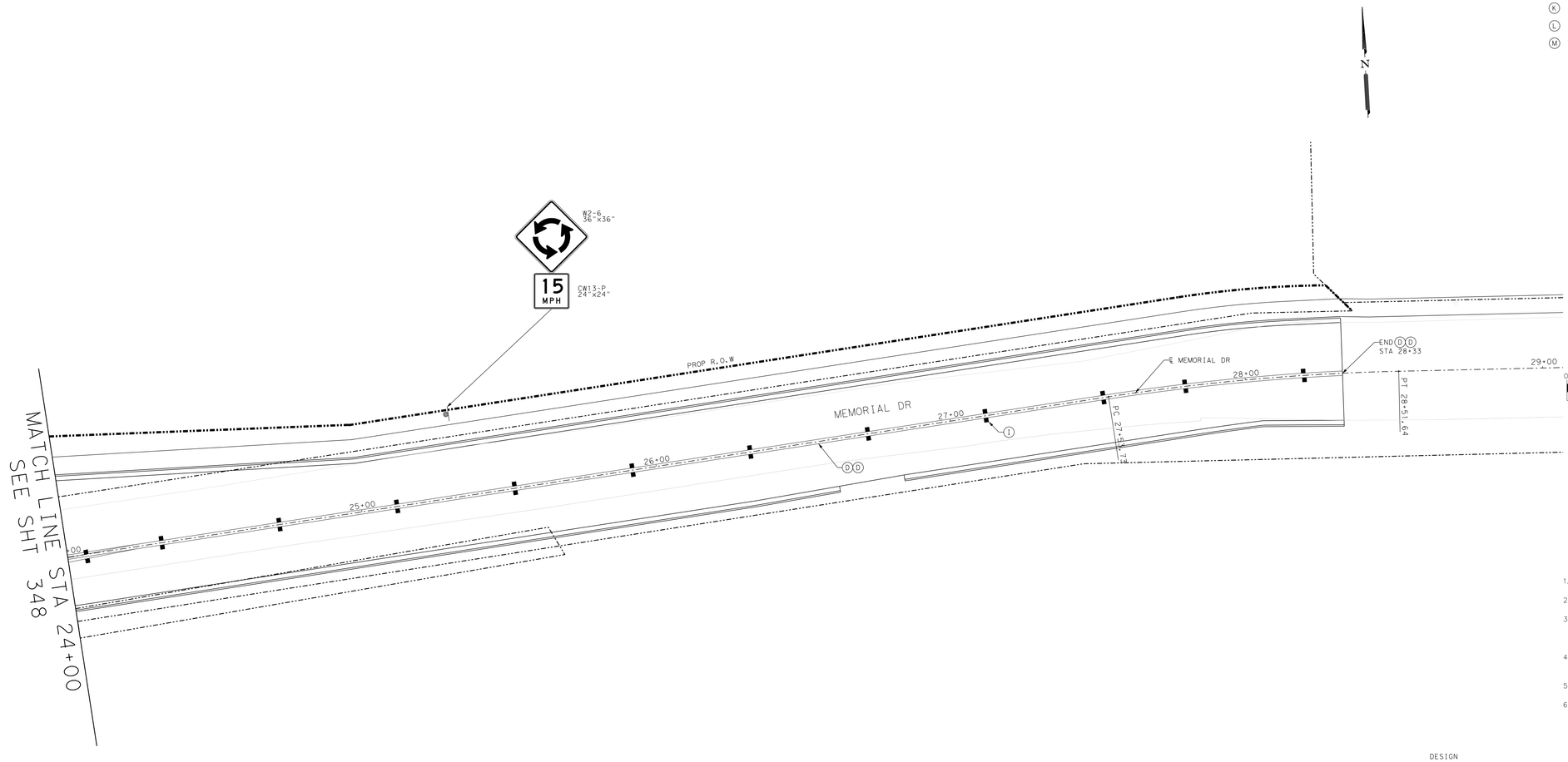

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DESIGN

STATE OF TEXAS
BRET CHAPMAN
127293
LICENSED
PROFESSIONAL ENGINEER

BRET CHAPMAN, P.E. — 9/16/2025 DATE

APPROVAL

STATE OF TEXAS
BRIAN A. ALLEN
123374
LICENSED
PROFESSIONAL ENGINEER

BRIAN A. ALLEN, P.E. — 9/16/2025 DATE

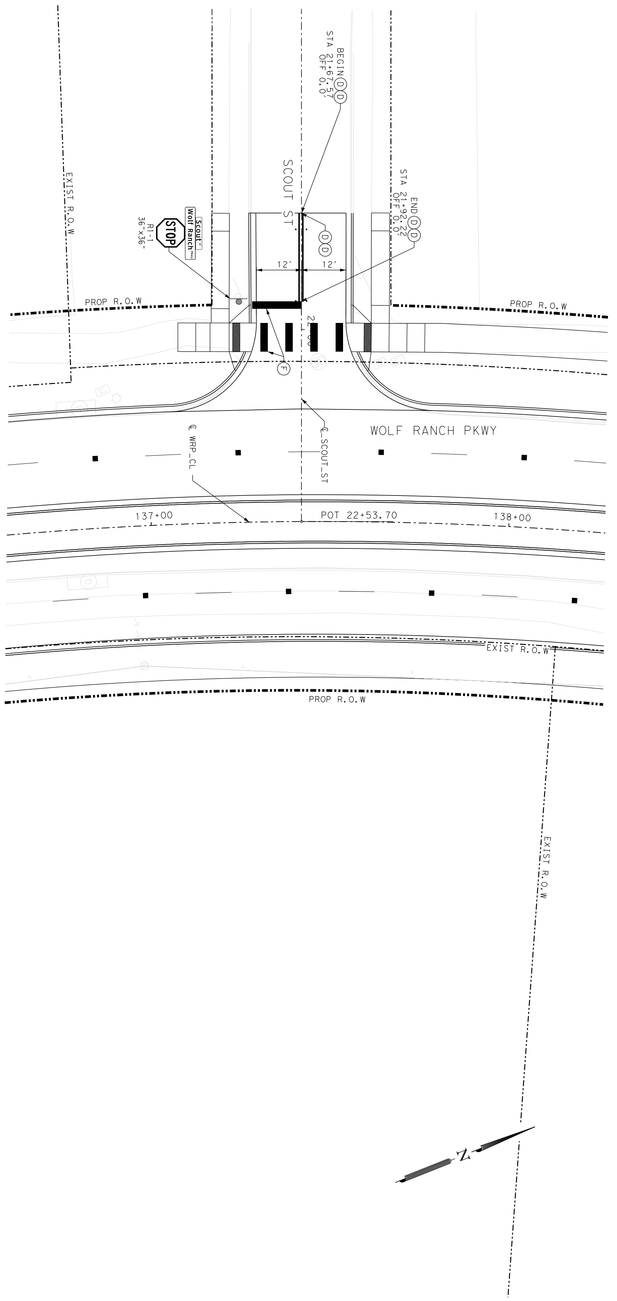
NO.	REVISION	DATE

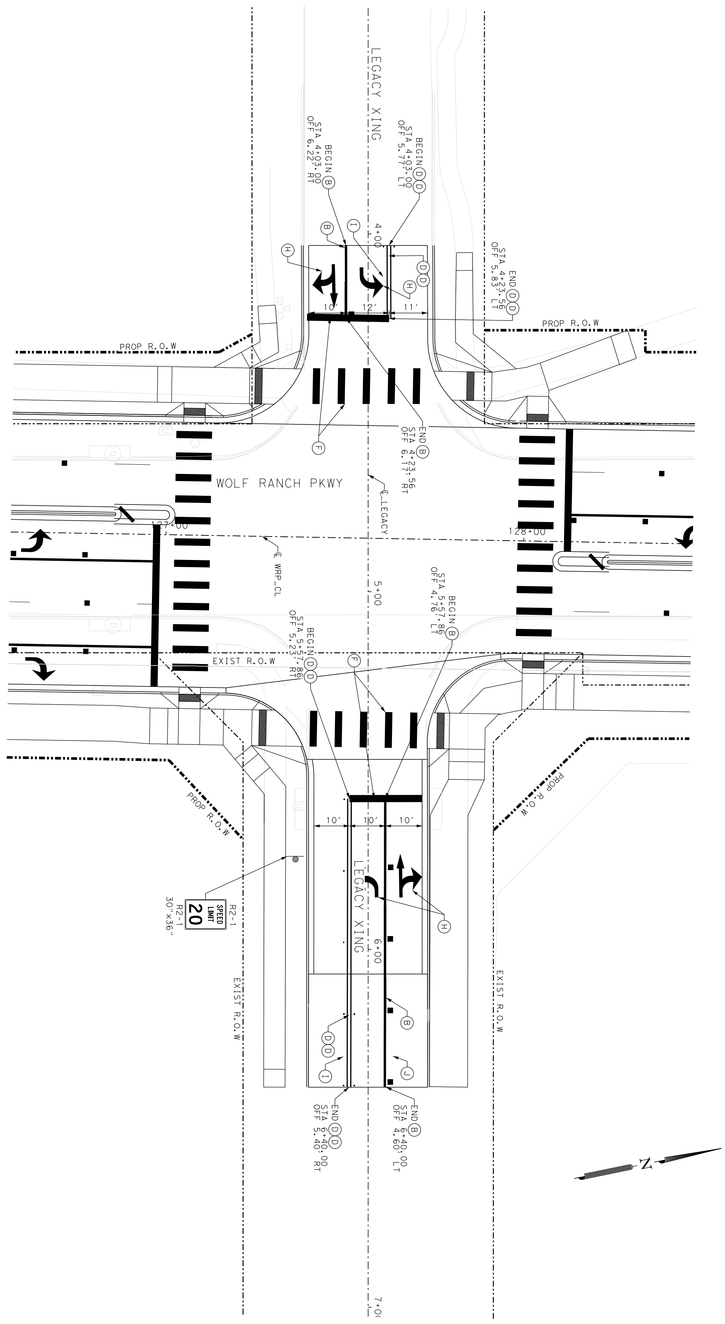
GEORGETOWN TEXAS
more than welcome

PAPE-DAWSON ENGINEERS
AUSTIN I SAN ANTONIO I HOUSTON I FORT WORTH I DALLAS
10801 N MOPAC EXPY, BLDG 3, STE 200 I AUSTIN, TX 78759 I 512.454.8711
TEXAS ENGINEERING FIRM #470 I TEXAS SURVEYING FIRM #10028800

WOLF RANCH PKWY / MEMORIAL DR
SIGNAGE AND PAVEMENT MARKINGS

CITY JOB No.
JOB NO. 51423-04
DATE 9/16/2025
DESIGNER
CHECKED DRAWN





LEGEND

- (A) 4" WHITE BROKEN THERMOPLASTIC STRIPING
- (B) 8" WHITE SOLID THERMOPLASTIC STRIPING
- (C) 8" WHITE DOT THERMOPLASTIC STRIPING
- (D) 4" YELLOW SOLID THERMOPLASTIC STRIPING
- (E) 12" WHITE SOLID THERMOPLASTIC STRIPING
- (F) 24" WHITE SOLID THERMOPLASTIC STRIPING
- (G) THERMOPLASTIC STRIPING (WORD)
- (H) THERMOPLASTIC STRIPING (ARROW)
- (I) RAISED REFL PAV MRKR TY II-A-A
- (J) RAISED REFL PAV MRKR TY II-C-R
- (K) REFL PAV MRK TY I (W) 18" (YLD TRI)(TOOAL)
- (L) 12" YELLOW SOLID THERMOPLASTIC STRIPING
- (M) REFL PAV MRK TY I (W)(SYMBOL)(100MIL)

YIELD TRIANGLES

EXISTING ROW

PROPOSED ROW

EXISTING EASEMENT

SIGN

TRAFFIC FLOW ARROWS

SCALE: 1"= 20'

0' 20' 40' 60'

NOTES:

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DESIGN

APPROVAL

BRIAN A. ALLEN, P.E. — 9/16/2025 DATE

BRET CHAPMAN, P.E. — 9/16/2025 DATE

CITY JOB No. 51435-04

JOB NO. _____

DATE 9/16/2025

DESIGNED _____

DRAWN _____

CHECKED _____

SHEET 15 OF 17

SHEET NO. 361

WOLF RANCH PKWY / MEMORIAL DR
SIGNAGE AND PAVEMENT MARKINGS

PAPE-DAWSON ENGINEERS

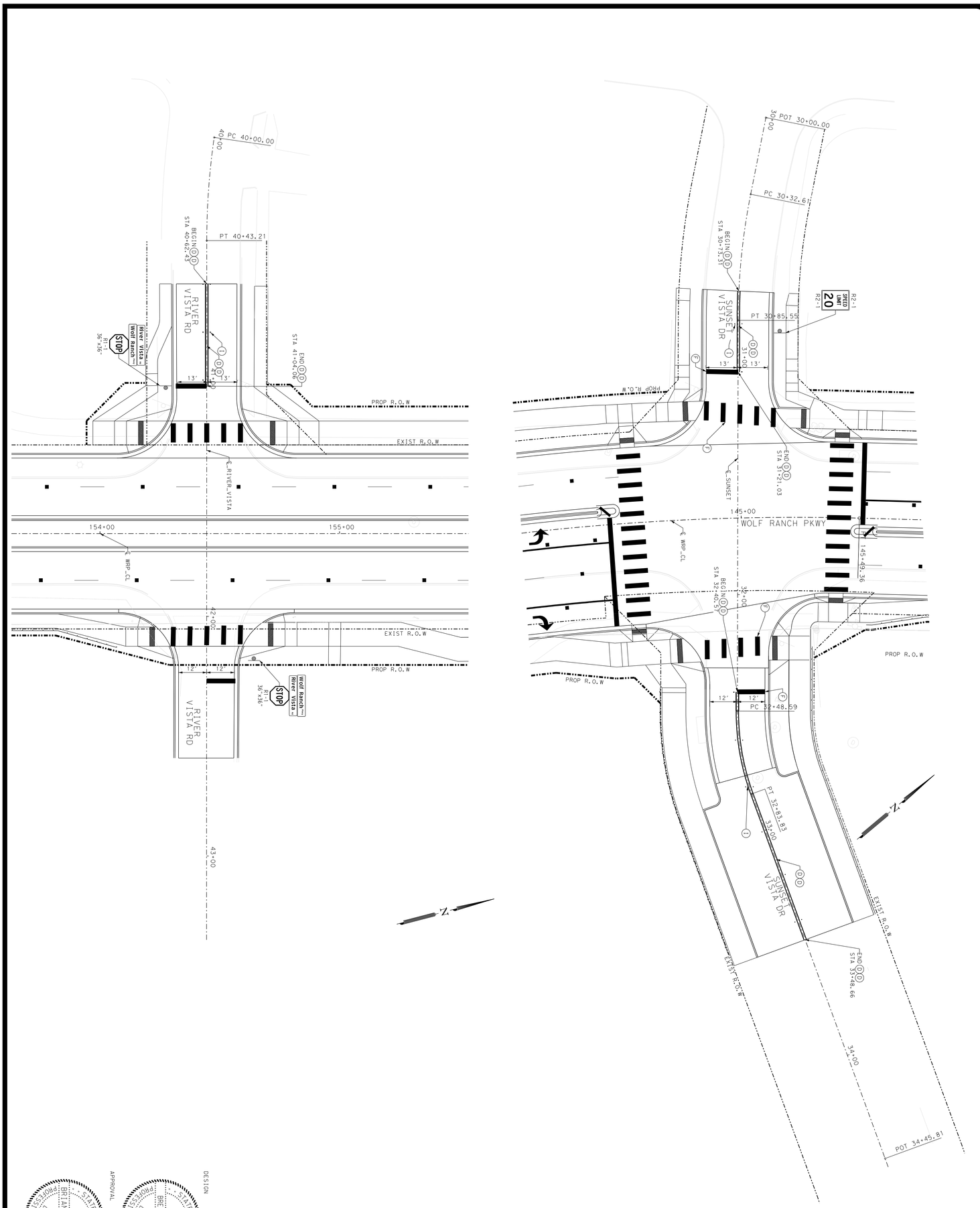
AUSTIN I SAN ANTONIO I HOUSTON I FORT WORTH I DALLAS

10801 N MOPAC EXPY, BLDG 3, STE 200 I AUSTIN, TX 78759 I 512.454.8711

TEXAS ENGINEERING FIRM #470 I TEXAS SURVEYING FIRM #10028800

GEORGETOWN TEXAS
more than welcome

NO.	REVISION	DATE



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YIELD TRIANGLES
EXISTING ROW
PROPOSED ROW
EXISTING EASEMENT
SIGN
TRAFFIC FLOW ARROWS

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0' 20' 40' 60'

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DESIGN APPROVAL

BRIAN A. ALLEN, P.E. — 9/16/2025 DATE

BRET CHAPMAN, P.E. — 9/16/2025 DATE

WOLF RANCH PKWY / MEMORIAL DR
SIGNAGE AND PAVEMENT MARKINGS

PAPE-DAWSON ENGINEERS
AUSTIN | SAN ANTONIO | HOUSTON | FORT WORTH | DALLAS
10801 N MOPAC EXPY, BLDG 3, STE 200 | AUSTIN, TX 78759 | 512.454.8711
TEXAS ENGINEERING FIRM #470 | TEXAS SURVEYING FIRM #10028800

GEORGETOWN TEXAS
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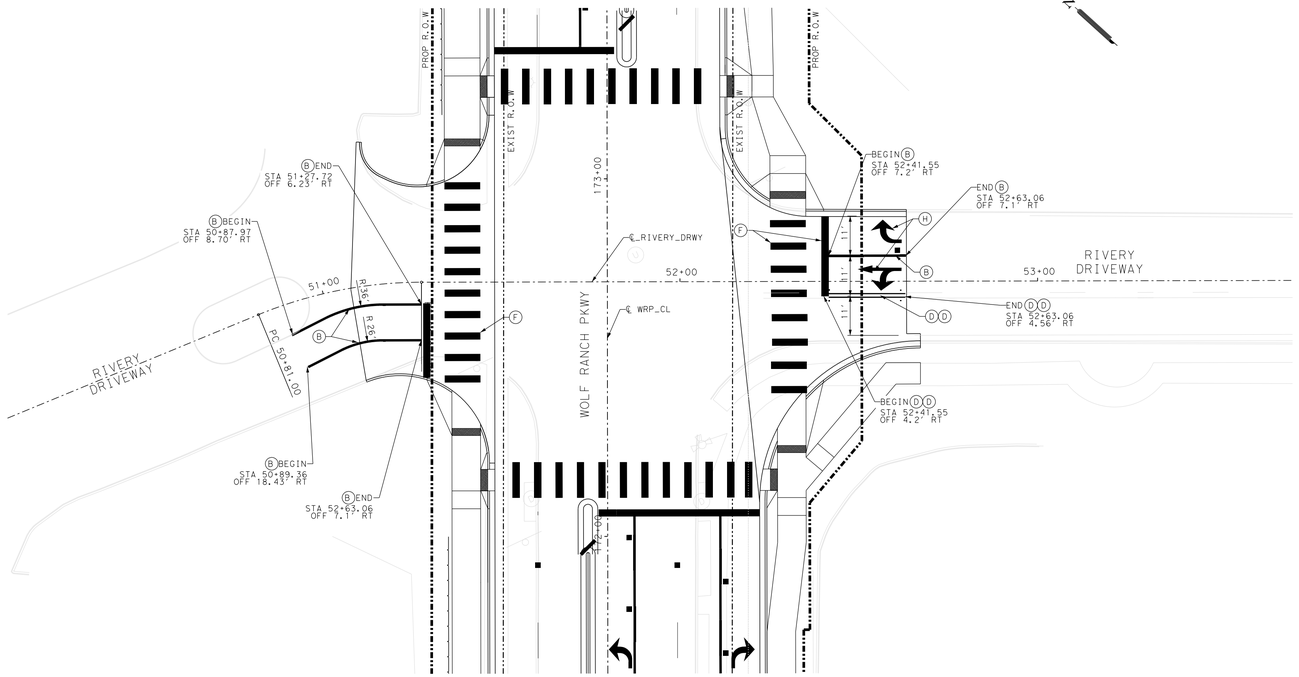
NO.	REVISION	DATE

CITY JOB No. 51435-04
JOB NO.
DATE 9/16/2025
DESIGNED
CHECKED DRAWN
SHEET NO. 362
SHEET 16 OF 17



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YIELD TRIANGLES
EXISTING ROW
PROPOSED ROW
EXISTING EASEMENT
SIGN
TRAFFIC FLOW ARROWS

SCALE: 1"= 20'

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STATE OF TEXAS
BRET CHAPMAN
127293
LICENSED
PROFESSIONAL ENGINEER

BRET CHAPMAN, P.E. — 9/16/2025 DATE

APPROVAL

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123374
LICENSED
PROFESSIONAL ENGINEER

BRIAN A. ALLEN, P.E. — 9/16/2025 DATE

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GEORGETOWN TEXAS *more than welcome*

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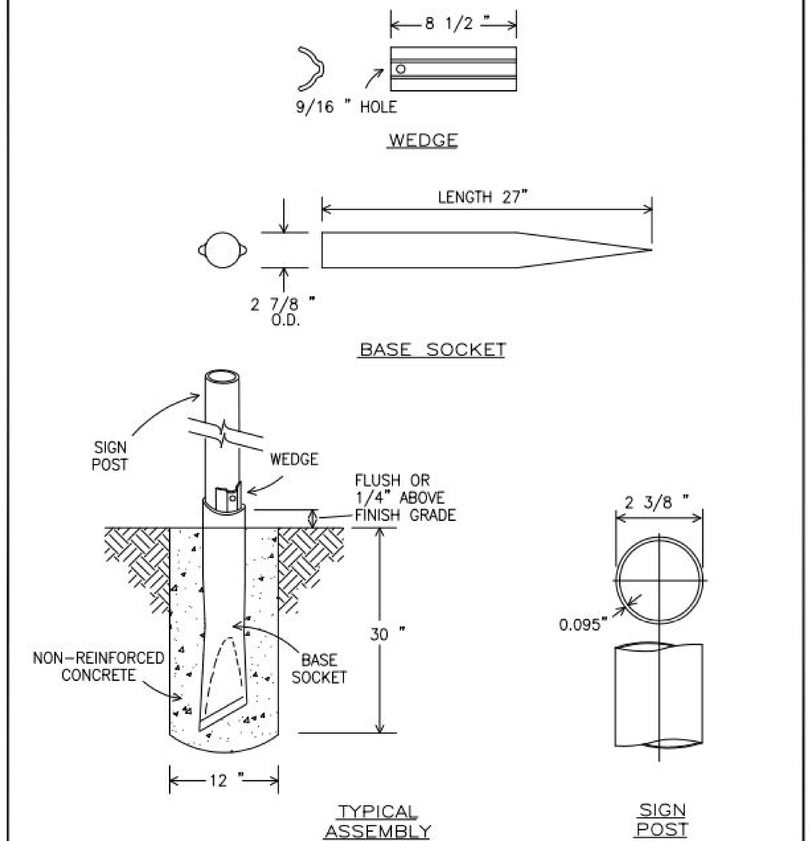
WOLF RANCH PKWY / MEMORIAL DR
SIGNAGE AND PAVEMENT MARKINGS

CITY JOB No.
JOB NO. 51423-04
DATE 9/16/2025
DESIGNER
CHECKED DRAWN

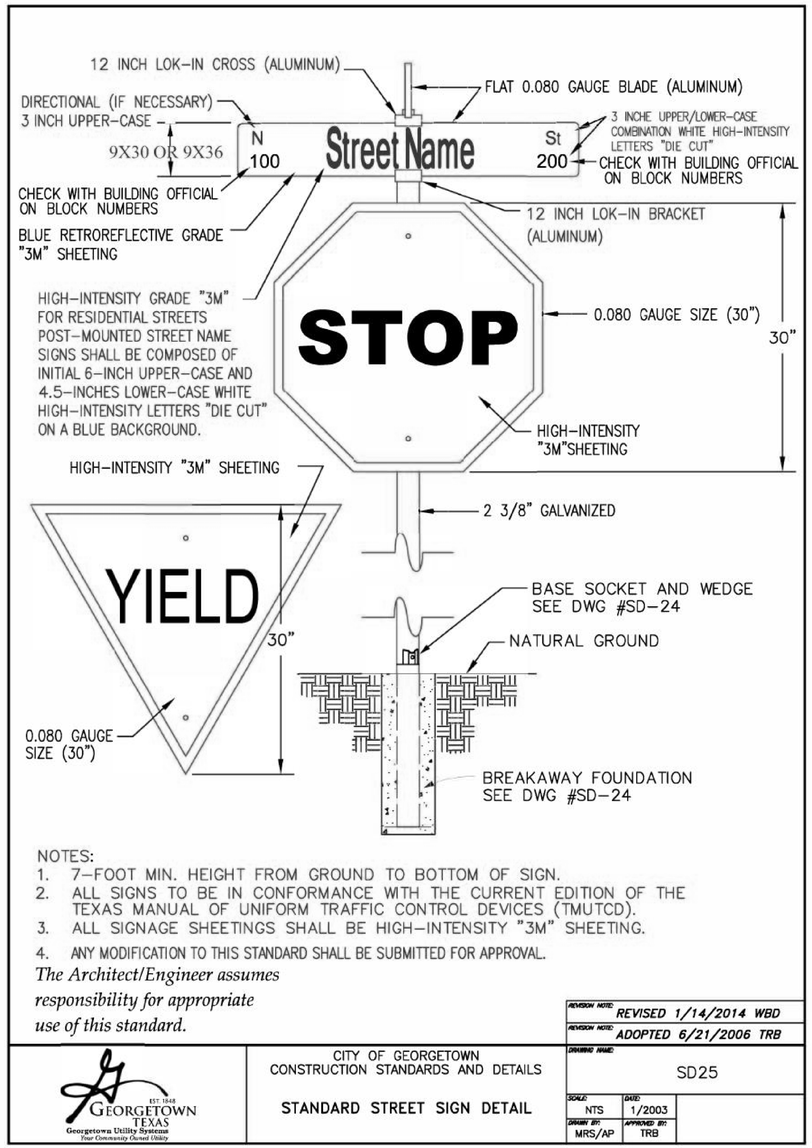
SHEET 17 OF 17

SHEET NO. 363



The Architect/Engineer assumes responsibility for appropriate use of this standard.

	CITY OF GEORGETOWN CONSTRUCTION STANDARDS AND DETAILS POZ-LOC (BREAKAWAY FOUNDATION)	REVISION NOTE: ADOPTED 6/21/2006 DRAWING NAME: SD24 SCALE: NTS · DATE: 1/2003 DRAWN BY: MRS · APPROVED BY: TRB



NOTES:
1. 7-FOOT MIN. HEIGHT FROM GROUND TO BOTTOM OF SIGN.
2. ALL SIGNS TO BE IN CONFORMANCE WITH THE CURRENT EDITION OF THE TEXAS MANUAL OF UNIFORM TRAFFIC CONTROL DEVICES (TMUTCD).
3. ALL SIGNAGE SHEETINGS SHALL BE HIGH-INTENSITY "3M" SHEETING.
4. ANY MODIFICATION TO THIS STANDARD SHALL BE SUBMITTED FOR APPROVAL.

The Architect/Engineer assumes responsibility for appropriate use of this standard.

	CITY OF GEORGETOWN CONSTRUCTION STANDARDS AND DETAILS STANDARD STREET SIGN DETAIL	REVISION NOTE: REVISED 1/14/2014 WBD REVISION NOTE: ADOPTED 6/21/2006 TRB DRAWING NAME: SD25 SCALE: NTS · DATE: 1/2003 DRAWN BY: MRS/AP · APPROVED BY: TRB

NO.	REVISION	DATE

GEORGETOWN TEXAS *more than welcome*

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10801 N MOPAC EXPY, BLDG 3, STE 200 I AUSTIN, TX 78759 I 512.454.8711
TEXAS ENGINEERING FIRM #470 I TEXAS SURVEYING FIRM #10023800

WOLF RANCH PKWY / MEMORIAL DR

PAVEMENT MARKING STANDARD

CITY JOB No.
JOB NO. 51423-04
DATE 9/11/2025
DESIGNER
CHECKED DRAWN

SHEET NO. 364

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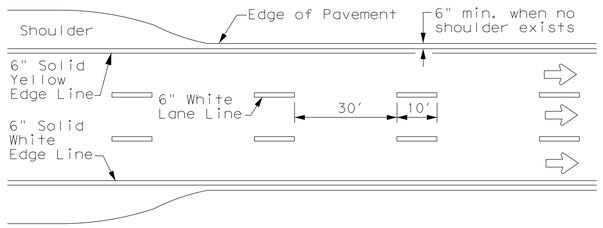
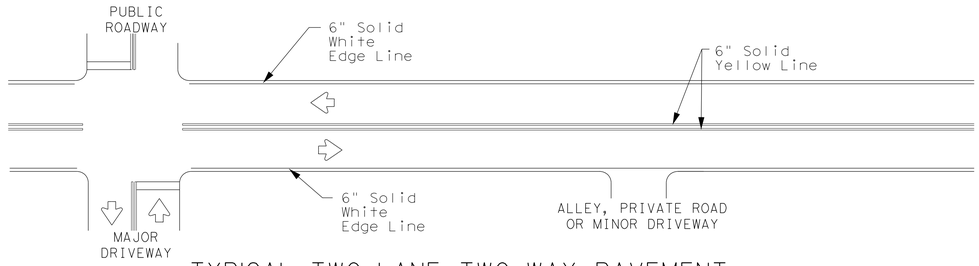
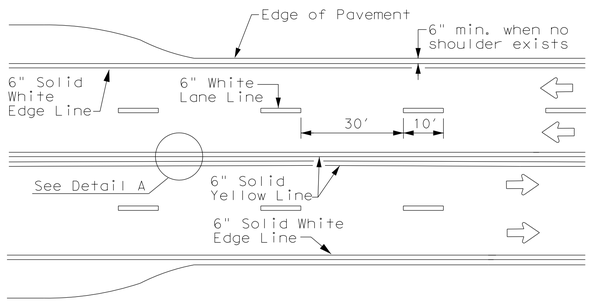
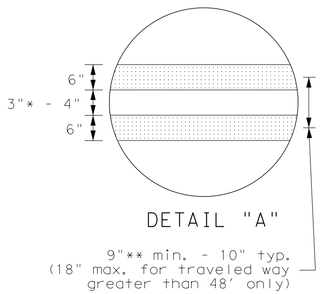


EDGE LINE AND LANE LINES
ONE-WAY ROADWAY
WITH OR WITHOUT SHOULDERS



TYPICAL TWO-LANE, TWO-WAY PAVEMENT
MARKINGS THROUGH INTERSECTIONS

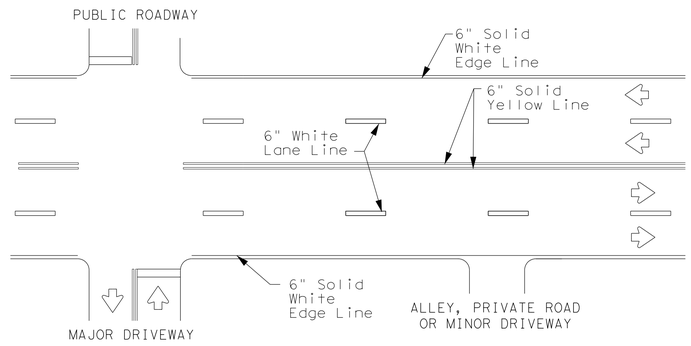




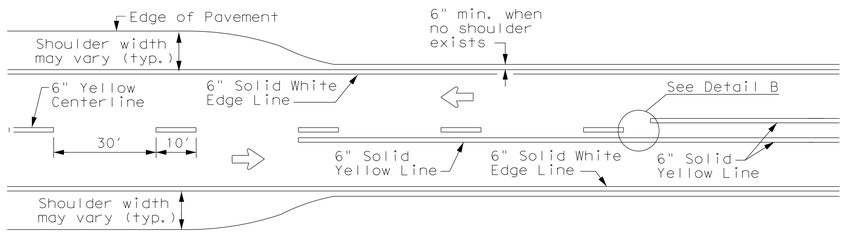
CENTERLINE AND LANE LINES
FOUR LANE TWO-WAY ROADWAY
WITH OR WITHOUT SHOULDERS

* 2" minimum for restripe projects when approved by the Engineer.

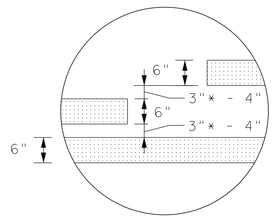
** 8" minimum for restripe projects when approved by the Engineer.



TYPICAL MULTI-LANE, TWO-WAY PAVEMENT
MARKINGS THROUGH INTERSECTIONS

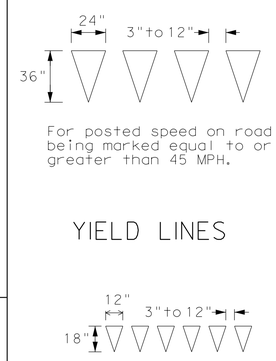


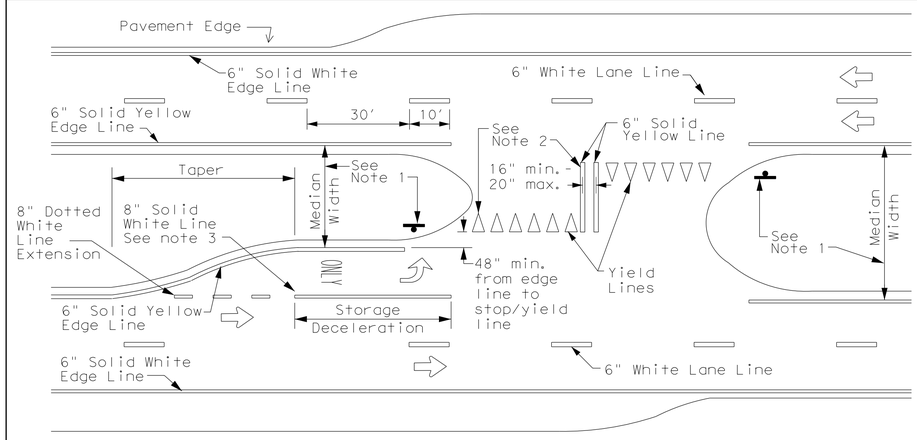
TWO LANE TWO-WAY ROADWAY
WITH OR WITHOUT SHOULDERS



DETAIL "B"

* 2" minimum for restripe projects when approved by the Engineer.





FOUR LANE DIVIDED ROADWAY CROSSOVERS

NOTES

1. Where divided highways are separated by median widths at the median opening itself of 30 feet or more, median openings shall be signed as two separate intersections. Each median opening has two width measurements, with one measurement for each approach. The narrow median width will be the controlling width to determine if signs are required. Yield signs are the typical intersection control. Stop signs and stop bars are optional as determined by the Engineer.

2. Install median striping (double yellow centerlines and stop lines/yield lines) when a 50' or greater median centerline can be placed. Stop lines shall only be used with stop signs. Yield lines shall only be used with yield signs.

3. Length of turn bays, including taper, deceleration, and storage lengths shall be as shown on the plans or as directed by the Engineer.

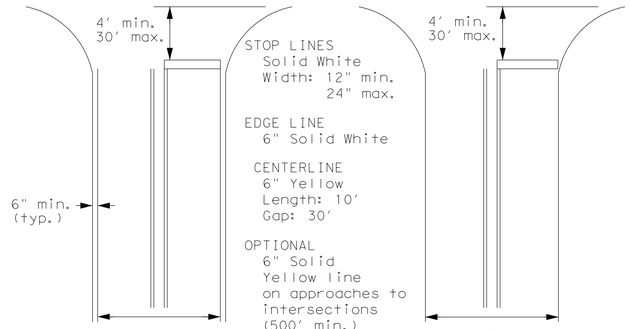
GENERAL NOTES

1. Edge line striping shall be as shown in the plans or as directed by the Engineer. The edge line should not be placed less than 6 inches from the edge of pavement. This distance may vary due to pavement raveling or other conditions. Edge lines are not required in curb and gutter sections of roadways.

2. The traveled way includes only that portion of the roadway used for vehicular travel. It does not include the parking lanes, sidewalks, berms and shoulders. The traveled ways shall be measured from the center of edge line to the center of edge line of a two lane roadway.

MATERIAL SPECIFICATIONS	
PAVEMENT MARKERS (REFLECTORIZED)	DMS-4200
EPOXY AND ADHESIVES	DMS-6100
BITUMINOUS ADHESIVE FOR PAVEMENT MARKERS	DMS-6130
TRAFFIC PAINT	DMS-8200
HOT APPLIED THERMOPLASTIC	DMS-8220
PERMANENT PREFABRICATED PAVEMENT MARKINGS	DMS-8240

All pavement marking materials shall meet the required Departmental Material Specifications as specified by the plans.



NOTE: Traveled way is exclusive of shoulder widths. Refer to General Note 2 for additional details.

GUIDE FOR PLACEMENT OF STOP LINES,
EDGE LINE & CENTERLINE
Based on Traveled Way and Pavement Widths
for Undivided Roadways

Texas Department of Transportation

Traffic Safety Division Standard

TYPICAL STANDARD PAVEMENT MARKINGS

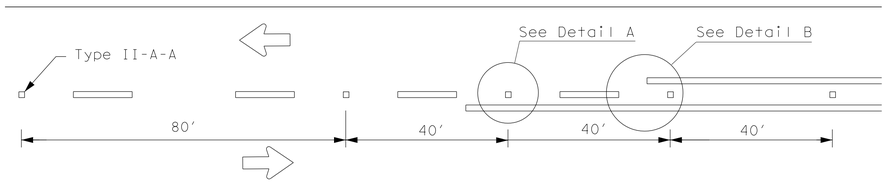
PM(1)-22

FILE: pm1-22.dgn	DN:	CK:	DW:	CK:	
©TxDOT December 2022	CONT	SECT	JOB	HIGHWAY	
REVISIONS	0514	23	04 Wolf Ranch Parkway		
11-78 8-00 6-20	DIST	COUNTY		SHEET NO.	
8-95 3-03 12-22	AUS	Williamson		365	
5-00 2-12					

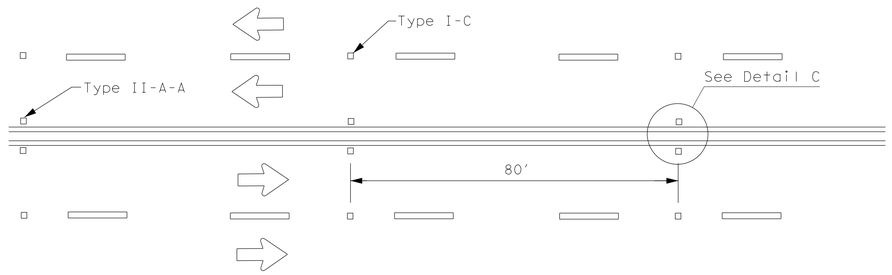
22A

DATE:
FILE:

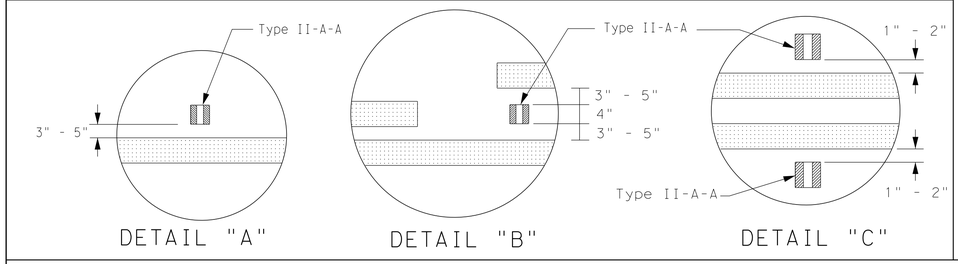
REFLECTIVE RAISED PAVEMENT MARKERS FOR VEHICLE POSITIONING GUIDANCE

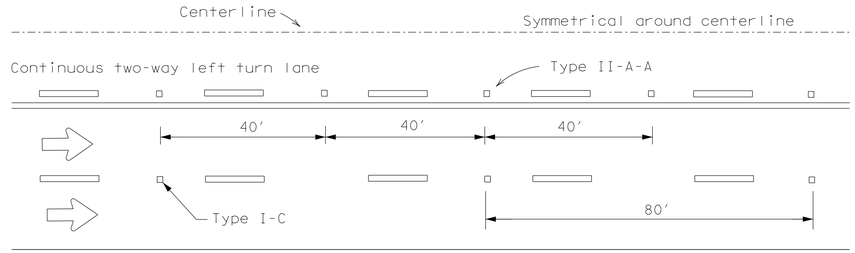


CENTERLINE FOR ALL TWO LANE TWO-WAY ROADWAYS

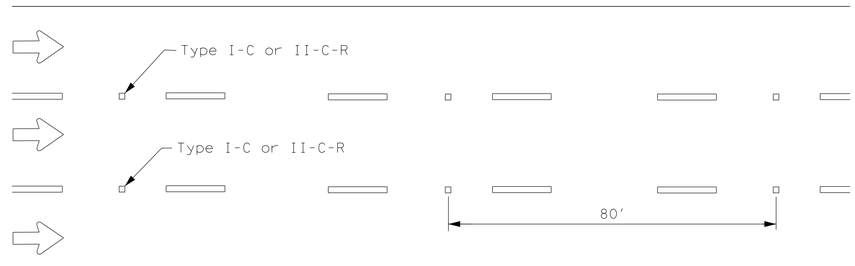


CENTERLINE & LANE LINES FOR FOUR LANE TWO-WAY ROADWAYS





CENTERLINE AND LANE LINES FOR TWO-WAY LEFT TURN LANE



LANE LINES FOR ONE-WAY ROADWAY (NON-FREEWAY FACILITIES)

Raised pavement markers Type II-C-R shall have clear face toward normal traffic and red face toward wrong-way traffic.

See Note 3.

MATERIAL SPECIFICATIONS	
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TRAFFIC PAINT	DMS-8200
HOT APPLIED THERMOPLASTIC	DMS-8220
PERMANENT PREFABRICATED PAVEMENT MARKINGS	DMS-8240

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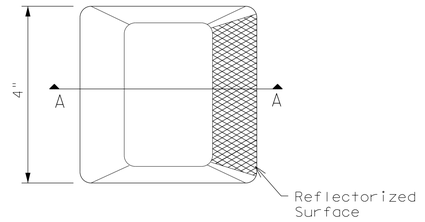

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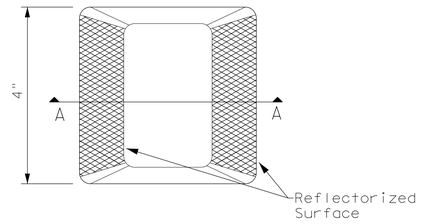

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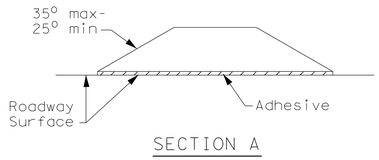
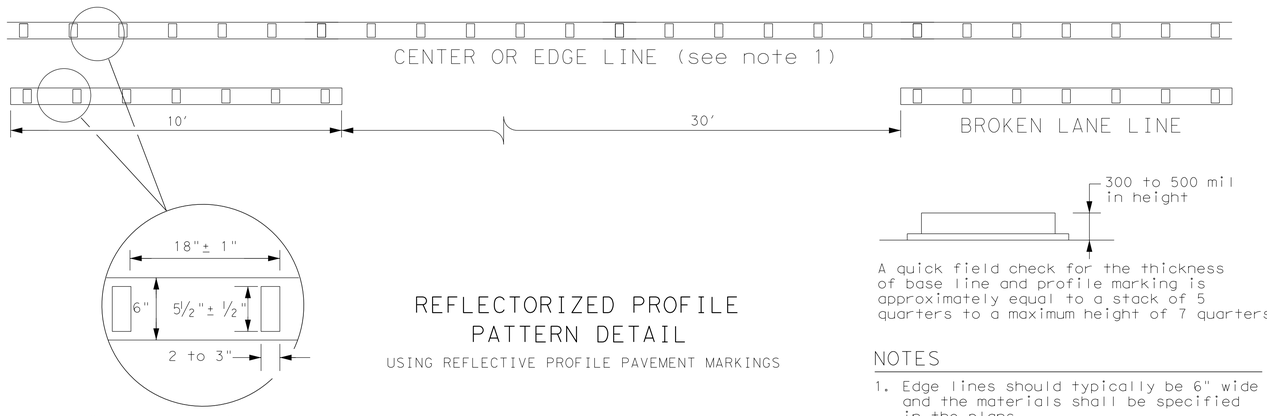


SECTION A

RAISED PAVEMENT MARKERS



REFLECTORIZED PROFILE PATTERN DETAIL

USING REFLECTIVE PROFILE PAVEMENT MARKINGS

A quick field check for the thickness of base line and profile marking is approximately equal to a stack of 5 quarters to a maximum height of 7 quarters.

NOTES

1. Edge lines should typically be 6" wide and the materials shall be specified in the plans.
2. Profile markings shall not be placed on roadways with a posted speed limit of 45 MPH or less.

GENERAL NOTES

1. All raised pavement markers placed along broken lines shall be placed in line with and midway between the stripes.
2. On concrete pavements, the raised pavement markers should be placed to one side of the longitudinal joints.
3. Use raised pavement marker Type I-C with undivided roadways, flush medians, and two way left turn lanes. Use raised pavement marker Type II-C-R with divided highways and raised medians.

Texas Department of Transportation

Traffic Safety Division Standard

POSITION GUIDANCE USING RAISED MARKERS REFLECTORIZED PROFILE MARKINGS PM(2)-22

FILE: pm2-22.dgn	DN:	CK:	DW:	CK:
©TxDOT December 2022	CONT	SECT	JOB	HIGHWAY
REVISIONS	0514	23	04	Wolf Ranch Parkway
4-77 8-00 6-20	DIST	COUNTY		SHEET NO.
4-92 2-10 12-22	AUS	Williamson		366
5-00 2-12				

228

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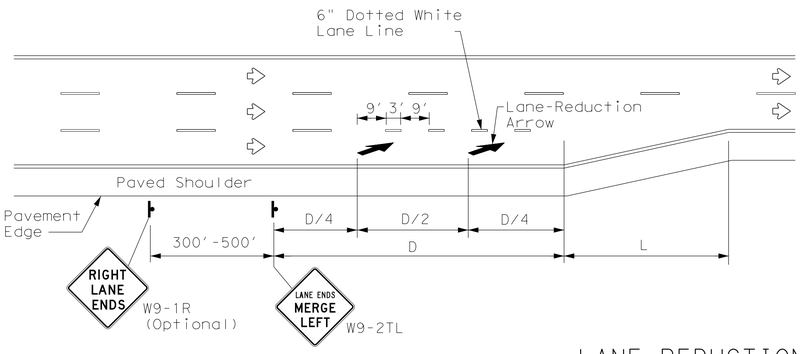
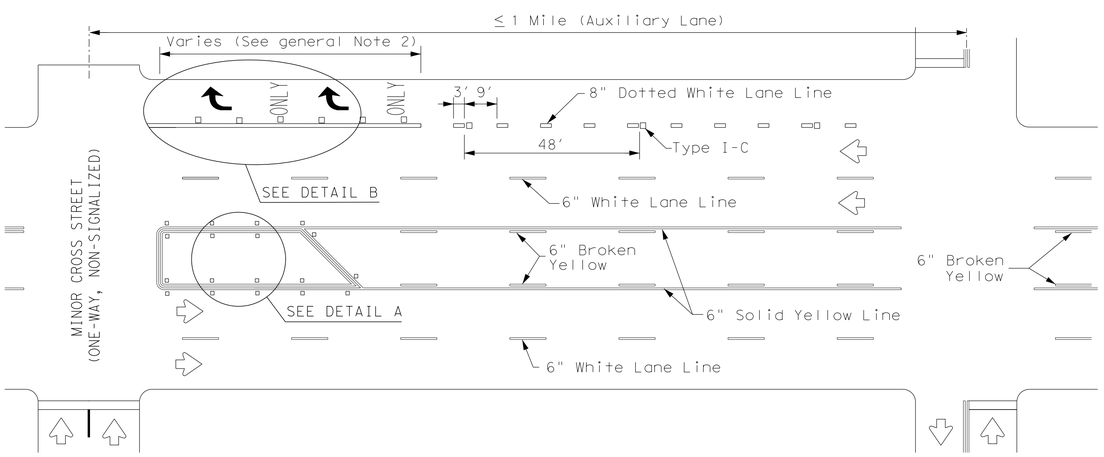


LANE REDUCTION

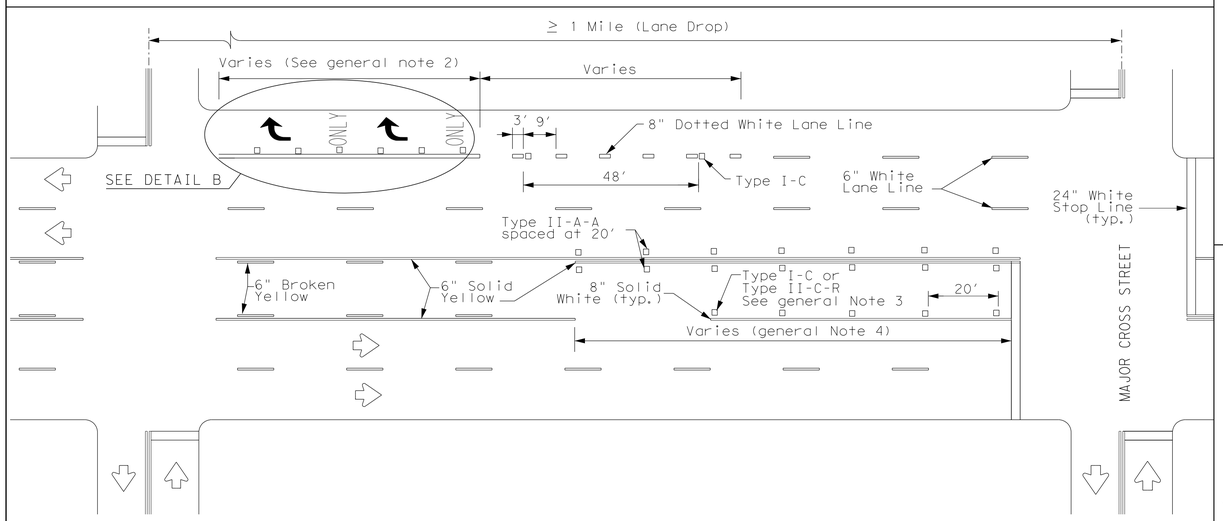
NOTES

1. Lane reduction pavement markings are used where the number of through lanes is reduced because of narrowing of the roadway or because of a section of on-street parking in what would otherwise be a through lane. For Texas Super 2 Passing Lanes, see TS2(PL) standard sheets.
2. On divided highways, an additional RIGHT LANE ENDS (W9-1R) sign may be installed in the median aligned with the W9-1R sign on the right side of the highway.
3. Lane reduction arrows are required for speeds of 45 mph or greater. An optional third lane reduction arrow may be added based on engineering judgement. If used, the optional third lane reduction arrow should be centered between the first and last lane reduction arrows.
4. For lane reductions on Freeways and Expressways, signing shall conform to the TxDOT Freeway Signing Handbook.

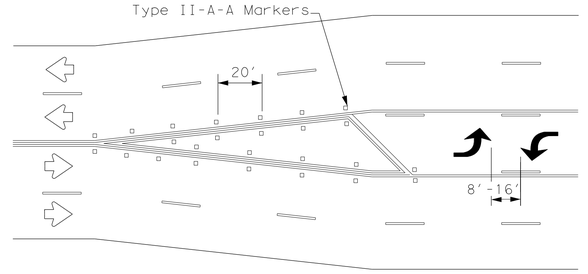
ADVANCED WARNING SIGN DISTANCE (D)		
Posted Speed	D (ft)	L (ft)
30 MPH	460	$L = \frac{WS^2}{60}$
35 MPH	565	
40 MPH	670	
45 MPH	775	L=WS
50 MPH	885	
55 MPH	990	
60 MPH	1,100	
65 MPH	1,200	
70 MPH	1,250	
75 MPH	1,350	



TYPICAL TWLTL AT ONE-WAY STREET AND RIGHT TURN AUXILIARY LANE



TYPICAL TWLTL AT TWO-WAY CROSS STREET AND RIGHT TURN LANE DROP



A two-way left-turn (TWLT) lane-use arrow pavement marking should be used at or just downstream from the beginning of a two-way left-turn lane within a corridor. Repeating the marking after each intersection or dedicated turn bay is not required unless stated elsewhere in the plans.

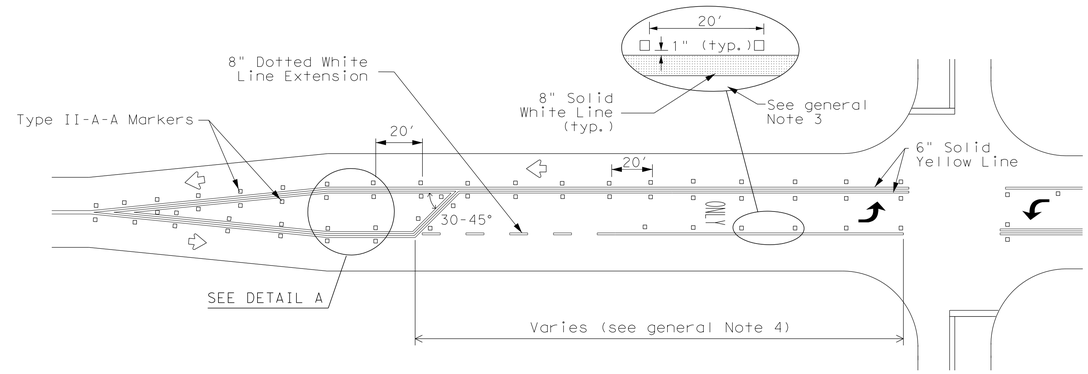
TYPICAL TRANSITION FOR TWLTL AND DIVIDED HIGHWAY

GENERAL NOTES

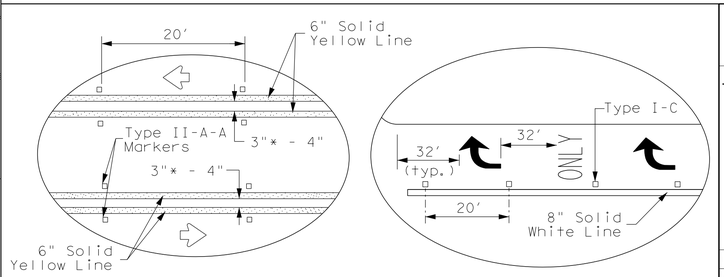
1. Lane use word and arrow markings shall be used where through lanes approaching an intersection become mandatory turn lanes. Lane use word and arrow markings should be used in auxiliary lanes of substantial length. Lane use arrow markings or word and arrow markings may be used in other lanes and turn bays for emphasis. Details for words and arrows are as shown in the Standard Highway Sign Designs for Texas.
2. When lane-use words and arrow markings are used, two sets of arrows should be used if the length of the bay is greater than 180 feet. When a single lane use arrow or word and arrow marking is used for a short turn lane, it should be located at or near the upstream end of the full-width turn lane.
3. Use raised pavement marker Type I-C with undivided highways, flush medians and two way left turn lanes. Use raised pavement marker Type II-C-R with divided highways and raised medians.
4. Length of turn bays, including taper, deceleration, and storage lengths shall be as shown on the plans or as directed by the Engineer. See Chapter 3 of the Roadway Design Manual for additional information on turning lanes or storage lengths.

MATERIAL SPECIFICATIONS	
PAVEMENT MARKERS (REFLECTORIZED)	DMS-4200
EPOXY AND ADHESIVES	DMS-6100
BITUMINOUS ADHESIVE FOR PAVEMENT MARKERS	DMS-6130
TRAFFIC PAINT	DMS-8200
HOT APPLIED THERMOPLASTIC	DMS-8220
PERMANENT PREFABRICATED PAVEMENT MARKINGS	DMS-8240

All pavement marking materials shall meet the required Departmental Material Specifications as specified by the plans.



TYPICAL TWO-LANE ROADWAY INTERSECTION WITH LEFT TURN BAYS



* 2" minimum allowed for restripe projects when approved by the Engineer.

Texas Department of Transportation

Traffic Safety Division Standard

TWO-WAY LEFT TURN LANES, RURAL LEFT TURN BAYS, AND LANE REDUCTION PAVEMENT MARKINGS

PM(3)-22

FILE: pm3-22.dgn	DN:	CK:	DW:	CK:
©TxDOT December 2022	CONT	SECT	JOB	HIGHWAY
REVISIONS	0514	23		04 Wolf Ranch Parkway
4-98 3-03 6-20	DIST	COUNTY		SHEET NO.
5-00 2-10 12-22	AUS	Williamson		367
8-00 2-12				

22C

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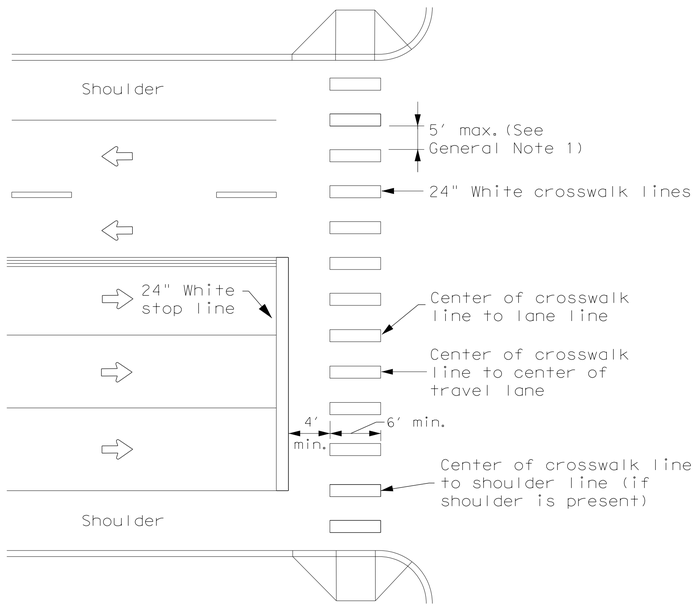
DATE:
FILE:



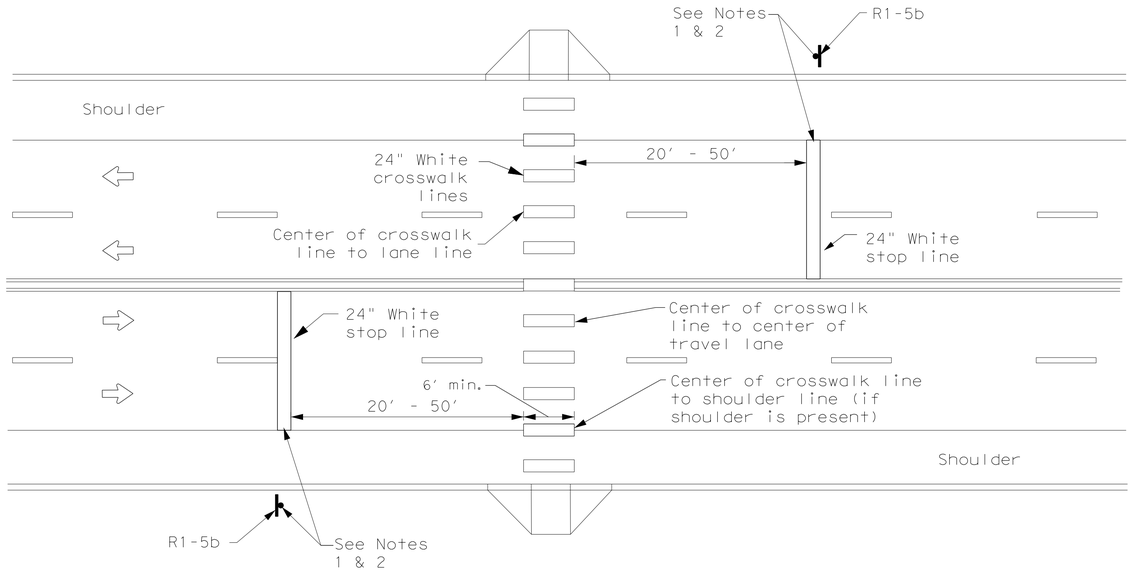
HIGH-VISIBILITY LONGITUDINAL CROSSWALK
AT CONTROLLED APPROACH

GENERAL NOTES

1. Longitudinal crosswalk lines should not be placed in the wheel path of vehicles. Center the crosswalk lines on travel lanes, lane lines, and shoulder lines (if present).
2. A minimum 6" clear distance shall be provided to the curb face. If the last crosswalk line falls into this distance it must be omitted.
3. For divided roadways, adjustments in spacing of the crosswalk lines should be made in the median so that the crosswalk lines are maintained in their proper location across the travel portion of the roadway.
4. At skewed crosswalks, the crosswalk lines are to remain parallel to the lane lines.
5. Each crosswalk shall be a minimum of 6′ wide.
6. The High-Visibility Longitudinal Crosswalk is the preferred crosswalk pattern on State Highways. Other crosswalk patterns as shown in the "Texas Manual on Uniform Traffic Control Devices" may be used. All crosswalk designs and dimension shall comply with the "Texas Manual on Uniform Traffic Control Devices."
7. Final placement of Stop Bar and Crosswalk shall be approved by the Engineer in the field.

MATERIAL SPECIFICATIONS	
PAVEMENT MARKERS (REFLECTORIZED)	DMS-4200
EPOXY AND ADHESIVES	DMS-6100
BITUMINOUS ADHESIVE FOR PAVEMENT MARKERS	DMS-6130
TRAFFIC PAINT	DMS-8200
HOT APPLIED THERMOPLASTIC	DMS-8220
PERMANENT PREFABRICATED PAVEMENT MARKINGS	DMS-8240

All pavement marking materials shall meet the required Departmental Material Specifications as specified by the plans.



UNSIGNALIZED MIDBLOCK HIGH-VISIBILITY
LONGITUDINAL CROSSWALK

NOTES:

1. Use stop bars with Stop Here For Pedestrians (R1-5b) signs at unsignalized midblock cross walks.
2. Use stop bars with STOP HERE ON RED (R10-6 or R10-6a) signs at mid block crosswalks controlled by traffic signals or pedestrian hybrid beacons.

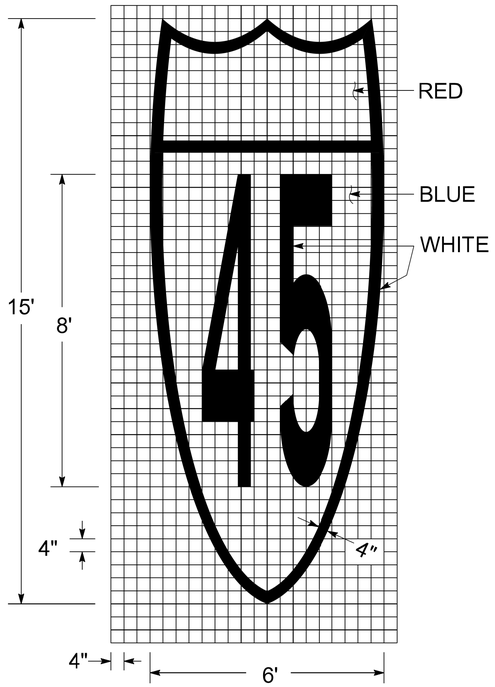
Texas Department of Transportation

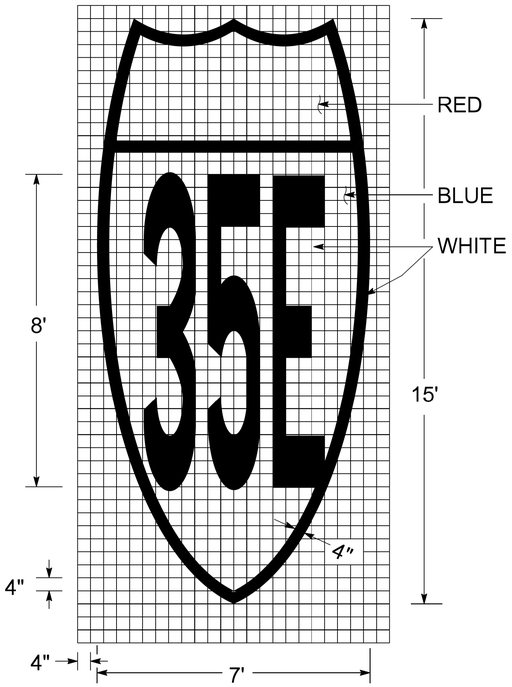
Traffic Safety Division Standard

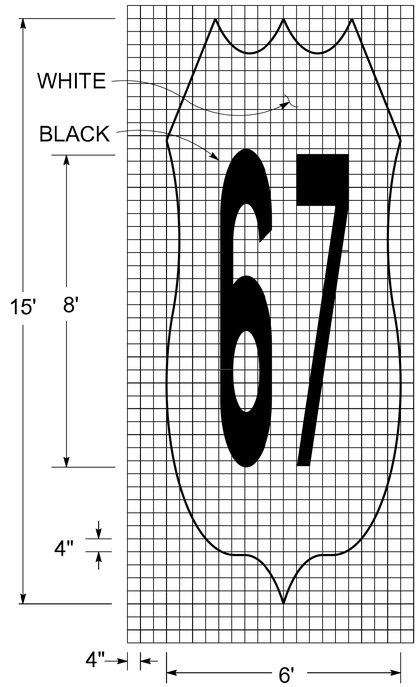
CROSSWALK PAVEMENT MARKINGS

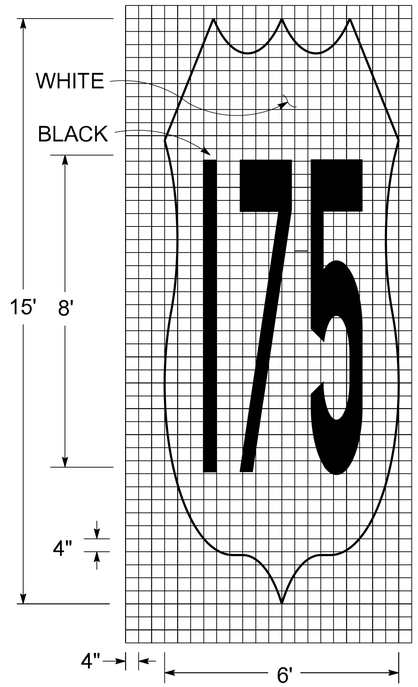
PM(4)-22A

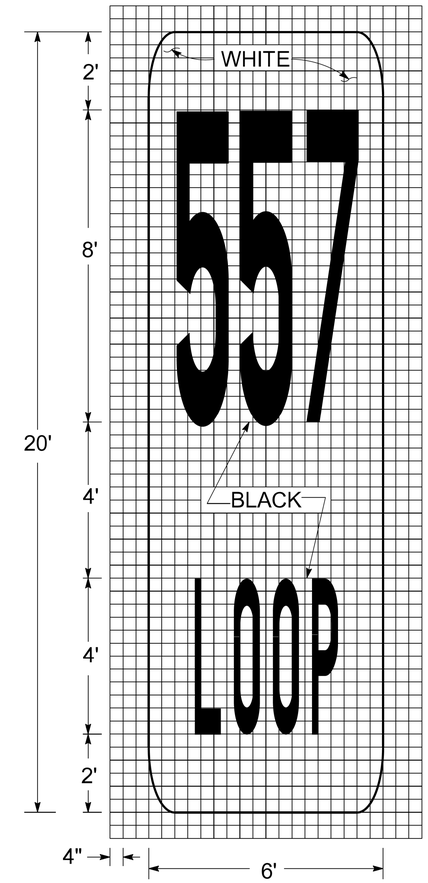
FILE: pm4-22a.dgn	DN:	CK:	DW:	CK:
©TxDOT December 2022	CONT	SECT	JOB	HIGHWAY
REVISIONS	0514	23	04	Wolf Ranch Parkway
6-20	DIST	COUNTY		SHEET NO.
6-22	AUS	Williamson		368
12-22				
22D				

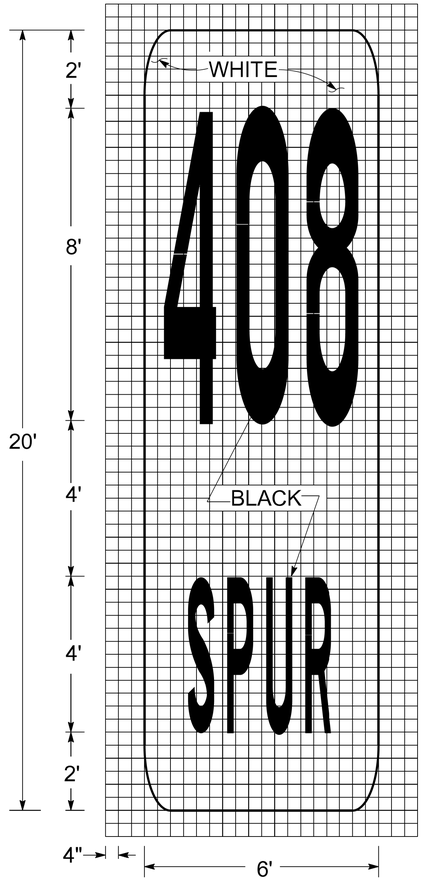


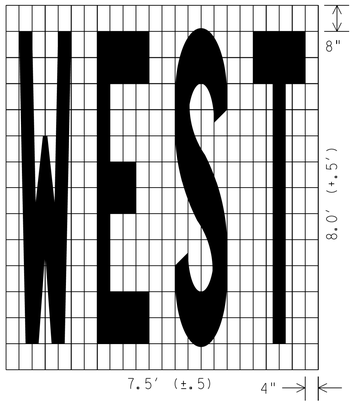


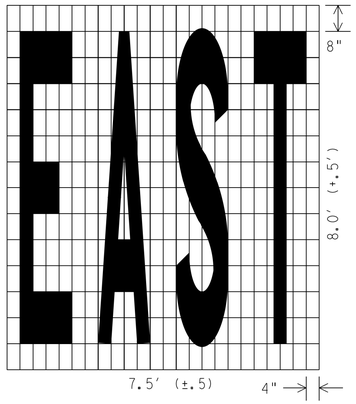


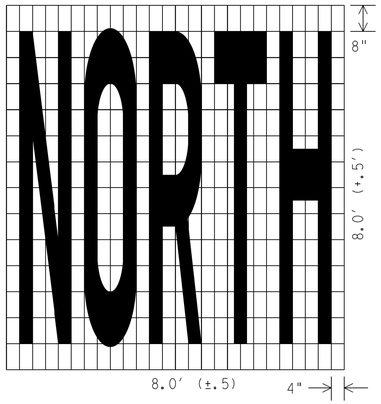


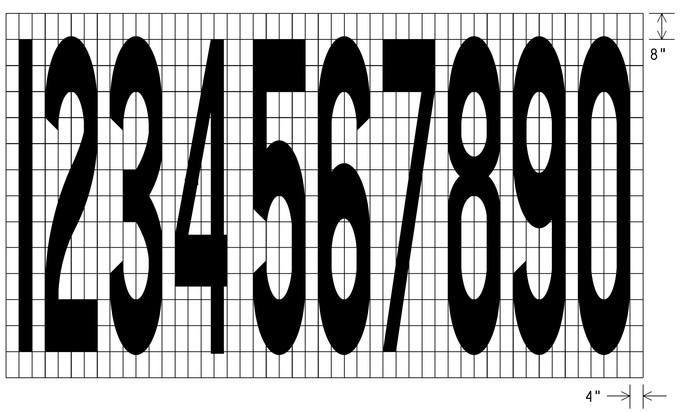


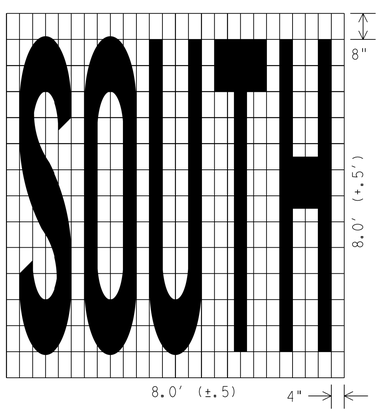


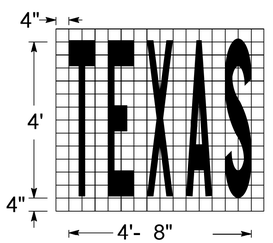


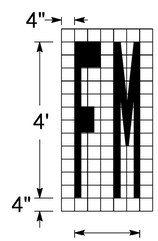












SCALE 1/4" = 1'

Texas Department of Transportation
Dallas District

PAVEMENT MARKING (SHIELD)

PM(SHIELD)-06(DAL)

FILE:	DN:	CK:	DW:	CK:
© TxDOT 2006	DIST	FED REG	PROJECT NO.	SHEET
REVISIONS			(SEE TITLE SHEET)	369
	COUNTY	CONTROL	SECT	JOB	HIGHWAY

CONDUIT AND CONDUCTOR SCHEDULE								
		CONDUIT			CONDUCTOR			
SERVICE NO.	RUN NO.	COND (PVC) (SCD 40) (2")	# COND	COND (PVC) (SCD 80) (2") (BORE)	ELEC CONDR (NO.8) BARE	# BARE	ELEC CONDR (NO.8) INSULATED	# INSUL
		LF		LF	LF		LF	
1	1	200	1	-	200	1	400	2
1	2	55	1	-	55	1	110	2
1	3	-	1	60	60	1	120	2
1	4	80	1	-	80	1	160	2
1	5	200	1	-	200	1	400	2
1	6	200	1	-	200	1	400	2
1	7	120	1	-	120	1	240	2
1	8	150	1	-	300	2	600	4
1	9	CABLES TO BE PULLED BY UTILITY COMPANY						
1	10	80	1	-	80	1	160	2
1	11	200	1	-	200	1	400	2
1	12	200	1	-	200	1	400	2
1	13	200	1	-	200	1	400	2
1	14	200	1	-	200	1	400	2
2	15	15	1	-	15	1	30	2
2	16	-	1	65	65	1	130	2
2	17	130	1	-	130	1	260	2
2	18	5	1	-	5	1	10	2
2	19	150	1	-	300	2	600	4
2	20	CABLES TO BE PULLED BY UTILITY COMPANY						
2	21	195	1	-	195	1	390	2
2	22	10	1	-	10	1	20	2
2	23A	-	1	55	55	1	110	2
2	23B	-	1	75	75	1	150	2
2	24	15	1	-	15	1	30	2
2	25	80	1	-	80	1	160	2
2	26	5	1	-	5	1	10	2
2	27	-	1	40	40	1	80	2
2	28	170	1	-	170	1	340	2
3	29	160	1	-	160	1	320	2
3	30	170	1	-	170	1	340	2
3	31	155	1	-	155	1	310	2
3	32	45	1	-	45	1	90	2
3	33	100	1	-	100	1	200	2
3	34A	-	1	75	75	1	150	2
3	34B	-	1	55	55	1	110	2
3	35	10	1	-	10	1	20	2
3	36	45	1	-	45	1	90	2
3	37	10	1	-	10	1	20	2
3	38	150	1	-	300	2	600	4
3	39	CABLES TO BE PULLED BY UTILITY COMPANY						
3	40	260	1	-	260	1	520	2
3	41	230	1	-	230	1	460	2
3	42	220	1	-	220	1	440	2
3	43	10	1	-	10	1	20	2
3	44	-	1	100	100	1	200	2
3	45	20	1	-	20	1	40	2
3	46	200	1	-	200	1	400	2
4	47	CABLES TO BE PULLED BY UTILITY COMPANY						
4	48	150	1	-	300	2	600	4
4	49 *	-	1	75	75	1	150	2
4	50	75	1	-	75	1	150	2
4	51	265	1	-	265	1	530	2
4	52	-	1	45	45	1	90	2
4	53	-	1	40	40	1	80	2
4	54	45	1	-	45	1	90	2
4	55	240	1	-	240	1	480	2
4	56	200	1	-	200	1	400	2
4	57	225	1	-	225	1	450	2
5	58	215	1	-	215	1	430	2
5	59	20	1	-	20	1	40	2
5	60	-	1	45	45	1	90	2
5	61	240	1	-	240	1	480	2
5	62	-	1	95	95	1	190	2
5	63	5	1	-	5	1	10	2
5	64	105	1	-	105	1	210	2
5	65	150	1	-	300	2	600	4
5	66	CABLES TO BE PULLED BY UTILITY COMPANY						
5	67	5	1	-	5	1	10	2
5	68 *	-	1	80	80	1	160	2
5	69 *	-	1	35	35	1	70	2
5	70	95	1	-	95	1	190	2
5	71	235	1	-	235	1	470	2
5	72	15	1	-	15	1	30	2
5	73	-	1	35	35	1	70	2
5	74	-	1	50	50	1	100	2
5	75	15	1	-	15	1	30	2
5	76	230	1	-	230	1	460	2
5	77	220	1	-	220	1	440	2
5	78	235	1	-	235	1	470	2
5	79	230	1	-	230	1	460	2
5	80	220	1	-	220	1	440	2
6	81	220	1	-	220	1	440	2
6	82	130	1	-	130	1	260	2
6	83	5	1	-	5	1	10	2
6	84	-	1	50	50	1	100	2
6	85	205	1	-	205	1	410	2
6	86	20	1	-	20	1	40	2
6	87	250	1	-	250	1	500	2
6	88	-	1	90	90	1	180	2
6	89	55	1	-	55	1	110	2
6	90	295	1	-	295	1	590	2
6	91	150	1	-	300	2	600	4
6	92	CABLES TO BE PULLED BY UTILITY COMPANY						
6	93	200	1	-	200	1	400	2
6	94	-	1	100	100	1	200	2
6	95	20	1	-	20	1	40	2
6	96	105	1	-	105	1	210	2
6	97 *	-	1	80	80	1	160	2
6	98	120	1	-	120	1	240	2
6	99	215	1	-	215	1	430	2
6	100	70	1	-	70	1	140	2
6	101	-	1	35	35	1	70	2
6	102	125	1	-	125	1	250	2
6	103	-	1	45	45	1	90	2
6	104	85	1	-	85	1	170	2
6	105	5	1	-	5	1	10	2
6	106	-	1	100	100	1	200	2
6	107	120	1	-	120	1	240	2
7	108	100	1	-	100	1	200	2
7	109	-	1	100	100	1	200	2
7	110	30	1	-	30	1	60	2
7	111	25	1	-	25	1	50	2
7	112	-	1	115	115	1	230	2
7	113	100	1	-	100	1	200	2
7	114	-	1	45	45	1	90	2
7	115	20	1	-	20	1	40	2
7	116	-	1	45	45	1	90	2
7	117	95	1	-	95	1	190	2
7	118	-	1	55	55	1	110	2
7	119	240	1	-	240	1	480	2
7	120	150	1	-	300	2	600	4
7	121	CABLES TO BE PULLED BY UTILITY COMPANY						
7	122	115	1	-	115	1	230	2
7	123	-	1	80	80	1	160	2
7	124	5	1	-	5	1	10	2
7	125	205	1	-	205	1	410	2
7	126	155	1	-	155	1	310	2
7	127	15	1	-	15	1	30	2
7	128	-	1	110	110	1	220	2
7	129	130	1	-	130	1	260	2
INTERNAL POLE WIRING			-	-	2394	-	4788	-
TOTALS + 10% CONTINGENCY		12825		2285	18895		37790	-

*SEPARATE TRAFFIC SIGNAL CONDUITS WILL BE BORED ALONGSIDE THIS RUN

Elec. Service No.	Sheet No.	Electrical Service Description (see ED (5) - 14)	Service Conduit Size	Service Conductors No./Size	Safety Switch Amps	Main Ckt. Bkr. Pole/Amp	Two-Pole Contactor Amps	Panelbd/ Loadcenter Amp Rating	Circuit No.	Branch Ckt. Bkr. Pole/Amps	Branch Circuit Amps	KVA Load
1	374	ELEC SERV TY A(240/480)060(NS)SS(E)PS(U)	3"	3/#6	N/A	2P/60	60	N/A	A B	1P/15 1P/15	3 3	1.4
2	376	ELEC SERV TY A(240/480)060(NS)SS(E)PS(U)	3"	3/#6	N/A	2P/60	60	N/A	C D	1P/15 1P/15	1 3	1.0
3	377	ELEC SERV TY A(240/480)060(NS)SS(E)PS(U)	3"	3/#6	N/A	2P/60	60	N/A	E F	1P/15 1P/15	5 3	1.9
4	378	SEE TRAFFIC SIGNAL PLANS							G	2P/15	4	7.4
5	380	SEE TRAFFIC SIGNAL PLANS							H I	2P/15 2P/15	3 5	7.4
6	383	ELEC SERV TY A(240/480)060(NS)SS(E)PS(U)	3"	3/#6	N/A	2P/60	60	N/A	J K	1P/15 1P/15	4 4	1.9
7	385	ELEC SERV TY A(240/480)060(NS)SS(E)PS(U)	3"	3/#6	N/A	2P/60	60	N/A	L M	1P/15 1P/15	3 3	1.4

RDWY ILLUMINATION SUMMARY											
STD NO.	STATION	OFFSET	ALIGNMENT	DRILL SHAFT LENGTH (LF)	MOUNTING HEIGHT	SINGLE OR DUAL ARMS	LUMEN OUTPUT	LUM. WATTS	LLF	STANDARD TYPE	DESCRIPTION
A-1	1+92	20' RT	MEMORIAL DR	6	35	SINGLE	8237	121.8	0.766	DURA-ST25-4K	GR-SCLB-G2
A-2	3+91	20' RT	MEMORIAL DR	6	35	SINGLE	8237	121.8	0.766	DURA-ST25-4K	GR-SCLB-G2
A-3	5+92	20' RT	MEMORIAL DR	6	35	SINGLE	8237	121.8	0.766	DURA-ST25-4K	GR-SCLB-G2
A-4	7+92	20' RT	MEMORIAL DR	6	35	SINGLE	8237	121.8	0.766	DURA-ST25-4K	GR-SCLB-G2
A-5	9+92	20' RT	MEMORIAL DR	6	35	SINGLE	8237	121.8	0.766	DURA-ST25-4K	GR-SCLB-G2
B-1	11+92	20' RT	MEMORIAL DR	6	35	SINGLE	8237	121.8	0.766	DURA-ST25-4K	GR-SCLB-G2
B-2	13+92	20' RT	MEMORIAL DR	6	35	SINGLE	8237	121.8	0.766	DURA-ST25-4K	GR-SCLB-G2
B-3	15+92	20' RT	MEMORIAL DR	6	35	SINGLE	8237	121.8	0.766	DURA-ST25-4K	GR-SCLB-G2
B-4	17+94	20' RT	MEMORIAL DR	6	35	SINGLE	8237	121.8	0.766	DURA-ST25-4K	GR-SCLB-G2
B-5	19+94	16' RT	MEMORIAL DR	6	35	SINGLE	8237	121.8	0.766	DURA-ST25-4K	GR-SCLB-G2
C-1 *	111+32	66' LT	WOLF RANCH	-	35	SINGLE	8237	121.8	0.766	DURA-ST25-4K	GR-SCLB-G2
C-2	112+72	63' LT	WOLF RANCH	6	35	SINGLE	8237	121.8	0.766	DURA-ST25-4K	GR-SCLB-G2
C-3	114+85	51' LT	WOLF RANCH	6	35	SINGLE	8237	121.8	0.766	DURA-ST25-4K	GR-SCLB-G2
D-1	21+29	35' RT	MEMORIAL DR	6	35	SINGLE	8237	121.8	0.766	DURA-ST25-4K	GR-SCLB-G2
D-2	22+81	48' RT	MEMORIAL DR	6	35	SINGLE	8237	121.8	0.766	DURA-ST25-4K	GR-SCLB-G2
D-3	115+69	46' RT	WOLF RANCH	6	35	SINGLE	8237	121.8	0.766	DURA-ST25-4K	GR-SCLB-G2
D-4	113+53	50' RT	WOLF RANCH	6	35	SINGLE	8237	121.8	0.766	DURA-ST25-4K	GR-SCLB-G2
E-1	27+54	28' LT	MEMORIAL DR	6	35	SINGLE	8237	121.8	0.766	DURA-ST25-4K	GR-SCLB-G2
E-2	25+93	28' LT	MEMORIAL DR	6	35	SINGLE	8237	121.8	0.766	DURA-ST25-4K	GR-SCLB-G2
E-3	24+27	30' LT	MEMORIAL DR	6	35	SINGLE	8237	121.8	0.766	DURA-ST25-4K	GR-SCLB-G2
E-4	23+02	97' LT	MEMORIAL DR	6	35	SINGLE	8237	121.8	0.766	DURA-ST25-4K	GR-SCLB-G2
E-5	119+17	52' RT	WOLF RANCH	6	35	SINGLE	8237	121.8	0.766	DURA-ST25-4K	GR-SCLB-G2
E-6 **	121+37	48' RT	WOLF RANCH	-	35	SINGLE	8237	121.8	0.766	DURA-ST25-4K	GR-SCLB-G2
E-7	21+28	105' LT	WOLF RANCH	6	35	SINGLE	8237	121.8	0.766	DURA-ST25-4K	GR-SCLB-G2
E-8	118+88	35' LT	WOLF RANCH	6	35	SINGLE	8237	121.8	0.766	DURA-ST25-4K	GR-SCLB-G2
F-1	121+80	47' LT	WOLF RANCH	6	35	SINGLE	8237	121.8	0.766	DURA-ST25-4K	GR-SCLB-G2
F-2	123+52	48' LT	WOLF RANCH	6	35	SINGLE	15225	121.8	0.766	DURA-ST25-4K	GR-SCLB-G2
F-3	125+69	48' LT	WOLF RANCH	6	35	SINGLE	15225	121.8	0.766	DURA-ST25-4K	GR-SCLB-G2
F-4	125+56	50' RT	WOLF RANCH	6	35	SINGLE	15225	121.8	0.766	DURA-ST25-4K	GR-SCLB-G2
F-5	123+64	45' RT	WOLF RANCH	6	35	SINGLE	15225	121.8	0.766	DURA-ST25-4K	GR-SCLB-G2
G-1	129+23	39' RT	WOLF RANCH	6	35	SINGLE	15225	121.8	0.766	DURA-ST25-4K	GR-SCLB-G2
G-2 **	131+68	48' RT	WOLF RANCH	-	35	SINGLE	15225	121.8	0.766	DURA-ST25-4K	GR-SCLB-G2
G-3	131+45	38' LT	WOLF RANCH	6	35	SINGLE	15225	121.8	0.766	DURA-ST25-4K	GR-SCLB-G2
G-4	129+08	38' LT	WOLF RANCH	6	35	SINGLE	15225	121.8	0.766	DURA-ST25-4K	GR-SCLB-G2
G-5	133+85	0' RT	WOLF RANCH	6	35	DUAL	15225	121.8	0.766	DURA-ST25-4K	GR-SCLB-G2
G-6	136+06	0' RT	WOLF RANCH	6	35	DUAL	15225	121.8	0.766	DURA-ST25-4K	GR-SCLB-G2
H-1	138+34	0' RT	WOLF RANCH	6	35	DUAL	15225	121.8	0.766	DURA-ST25-4K	GR-SCLB-G2
H-2	140+61	0' RT	WOLF RANCH	6	35	DUAL	15225	121.8	0.766	DURA-ST25-4K	GR-SCLB-G2
H-3	142+84	38' LLT	WOLF RANCH	6	35	SINGLE	15225	121.8	0.766	DURA-ST25-4K	GR-SCLB-G2
H-4 **	143+35	57' RT	WOLF RANCH	-	35	SINGLE	15225	121.8	0.766	DURA-ST25-4K	GR-SCLB-G2
I-1	146+57	37' RT	WOLF RANCH	6	35	SINGLE	15225	121.8	0.766	DURA-ST25-4K	GR-SCLB-G2
I-2	148+88	37' RT	WOLF RANCH	6	35	SINGLE	15225	121.8	0.766	DURA-ST25-4K	GR-SCLB-G2
I-3	148+87	50' LT	WOLF RANCH	6	35	SINGLE	15225	121.8	0.766	DURA-ST25-4K	GR-SCLB-G2
I-4	146+58	50' LT	WOLF RANCH	6	35	SINGLE	15225	121.8	0.766	DURA-ST25-4K	GR-SCLB-G2
I-5	151+26	0' RT	WOLF RANCH	6	35	DUAL	15225	121.8	0.766	DURA-ST25-4K	GR-SCLB-G2
I-6	153+56	0' RT	WOLF RANCH	6	35	DUAL	15225	121.8	0.766	DURA-ST25-4K	GR-SCLB-G2
I-7	155+83	0' RT	WOLF RANCH	6	35	DUAL	15225	121.8	0.766	DURA-ST25-4K	GR-SCLB-G2
I-8	158+04	0' RT	WOLF RANCH	6	35	DUAL	15225	121.8	0.766	DURA-ST25-4K	GR-SCLB-G2
J-1	160+68	0' RT	WOLF RANCH	6	35	DUAL	15225	121.8	0.766	DURA-ST25-4K	GR-SCLB-G2
J-2	162+36	0' RT	WOLF RANCH	6	35	DUAL	15225	121.8	0.766	DURA-ST25-4K	GR-SCLB-G2
J-3	163+60	0' RT	WOLF RANCH	6	35	DUAL	15225	121.8	0.766	DURA-ST25-4K	GR-SCLB-G3
J-4	165+98	47' LT	WOLF RANCH	6	35	SINGLE	15225	121.8	0.766	DURA-ST25-4K	GR-SCLB-G2
J-5	168+47	48' LT	WOLF RANCH	6	35	SINGLE	15225	121.8	0.766	DURA-ST25-4K	GR-SCLB-G2
J-6	166+30	45' RT	WOLF RANCH	6	35	SINGLE	15225	121.8	0.766	DURA-ST25-4K	GR-SCLB-G2
J-7 **	169+08	53' RT	WOLF RANCH	-	35	SINGLE	15225	121.8	0.766	DURA-ST25-4K	GR-SCLB-G2
K-1 **	171+18	54' RT	WOLF RANCH	-	35	SINGLE	15225	121.8	0.766	DURA-ST25-4K	GR-SCLB-G2
K-2	171+08	48' LT	WOLF RANCH	6	35	SINGLE	15225	121.8	0.766	DURA-ST25-4K	GR-SCLB-G2
K-3	174+23	37' RT	WOLF RANCH	6	35	SINGLE	15225	121.8	0.766	DURA-ST25-4K	GR-SCLB-G2
K-4	176+50	36' RT	WOLF RANCH	6	35	SINGLE	15225	121.8	0.766	DURA-ST25-4K	GR-SCLB-G2
K-5	178+46	0' RT	WOLF RANCH	6	35	DUAL	15225	121.8	0.766	DURA-ST25-4K	GR-SCLB-G2
K-6	176+40	46' LT	WOLF RANCH	6	35	SINGLE	15225	121.8	0.766	DURA-ST25-4K	GR-SCLB-G2
K-7	174+33	46' LT	WOLF RANCH	6	35	SINGLE	15225	121.8	0.766	DURA-ST25-4K	GR-SCLB-G2
L-1	180+43	46' LT	WOLF RANCH	6	35	SINGLE	15225	121.8	0.766	DURA-ST25-4K	GR-SCLB-G2
L-2	182+65	47' LT	WOLF RANCH	6	35	SINGLE	15225	121.8	0.766	DURA-ST25-4K	GR-SCLB-G2
L-3	184+80	0' LT	WOLF RANCH	6	35	DUAL	15225	121.8	0.766	DURA-ST25-4K	GR-SCLB-G2
L-4 **	182+75	48' RT	WOLF RANCH	-	35	SINGLE	15225	121.8	0.766	DURA-ST25-4K	GR-SCLB-G2
L-5	180+85	37' LT	WOLF RANCH	6	35	SINGLE	15225	121.8	0.766	DURA-ST25-4K	GR-SCLB-G2
M-1	187+02	49' LT	WOLF RANCH	6	35	SINGLE	15225	121.8	0.766	DURA-ST25-4K	GR-SCLB-G2
M-2	189+04	46' LT	WOLF RANCH	6	35	SINGLE	15225	121.8	0.766	DURA-ST25-4K	GR-SCLB-G2
M-3	186+42	48' RT	WOLF RANCH	6	35	SINGLE	15225	121.8	0.766	DURA-ST25-4K	GR-SCLB-G2
M-4	188+84	40' RT	WOLF RANCH	6	35	SINGLE	15225	121.8	0.766	DURA-ST25-4K	GR-SCLB-G2

* TO BE MOUNTED TO EXISTING POWER POLE
** TO BE MOUNTED TO PROPOSED POWER POLE

DESIGN

STATE OF TEXAS
JACOB W. SHELTON
154071
LICENSED
PROFESSIONAL ENGINEER

JACOB W. SHELTON, P.E — 9/16/2025 DATE

APPROVAL

STATE OF TEXAS
JUSTIN W. CLARK
118715
LICENSED
PROFESSIONAL ENGINEER

JUSTIN W. CLARK, P.E. — 9/16/2025 DATE

NO.	REVISION	DATE

GEORGETOWN TEXAS
more than welcome

PAPE-DAWSON ENGINEERS
AUSTIN I SAN ANTONIO I HOUSTON I FORT WORTH I DALLAS
10801 N MOPAC EXPY, BLDG 3, STE 200 I AUSTIN, TX 78759 I 512.454.8711
TEXAS ENGINEERING FIRM #470 I TEXAS SURVEYING FIRM #10028800

WOLF RANCH PKWY / MEMORIAL DR

ILLUMINATION PLAN SUMMARY

CITY JOB No.
JOB NO. 51423-04
DATE 9/16/2025
DESIGNER
CHECKED DRAWN

SHEET NO. 370

CALCULATION SUMMARY AREA									
LABEL	STREET CLASSIFICATION	LAND USE	AREA (SF)	CALCULATION TYPE	UNITS	AVG	MAX	MIN	AVG/MIN
MEMORIAL EAST LANES	COLLECTOR	RESIDENTIAL	14566	ILLUMINANCE **	fc	1.07	2.3	0.3	3.57
NORTH EAST SIDEWALK	COLLECTOR	RESIDENTIAL	6579	ILLUMINANCE **	fc	1.07	2.3	0.3	3.57
MEMORIAL WEST LANES	COLLECTOR	RESIDENTIAL	14977	ILLUMINANCE **	fc	1.09	2.4	0.3	3.63
SOUTH WEST SIDEWALK	COLLECTOR	RESIDENTIAL	1329	ILLUMINANCE **	fc	0.70	1.6	0.1	7.00
ROUNDABOUT	COLLECTOR	RESIDENTIAL	21123	ILLUMINANCE **	fc	1.13	2.5	0.3	3.77
WOLFRANCH NORTH LANES	COLLECTOR	RESIDENTIAL	16801	ILLUMINANCE **	fc	1.21	2.7	0.3	4.03
NORTH WEST SIDEWALK	COLLECTOR	RESIDENTIAL	716	ILLUMINANCE **	fc	0.64	1.3	0.2	3.20
WOLFRANCH SOUTH LANES	COLLECTOR	RESIDENTIAL	51025	ILLUMINANCE **	fc	0.93	2.7	0.2	4.65
SOUTH EAST SIDEWALK	COLLECTOR	RESIDENTIAL	3613	ILLUMINANCE **	fc	0.94	2.2	0.2	4.70

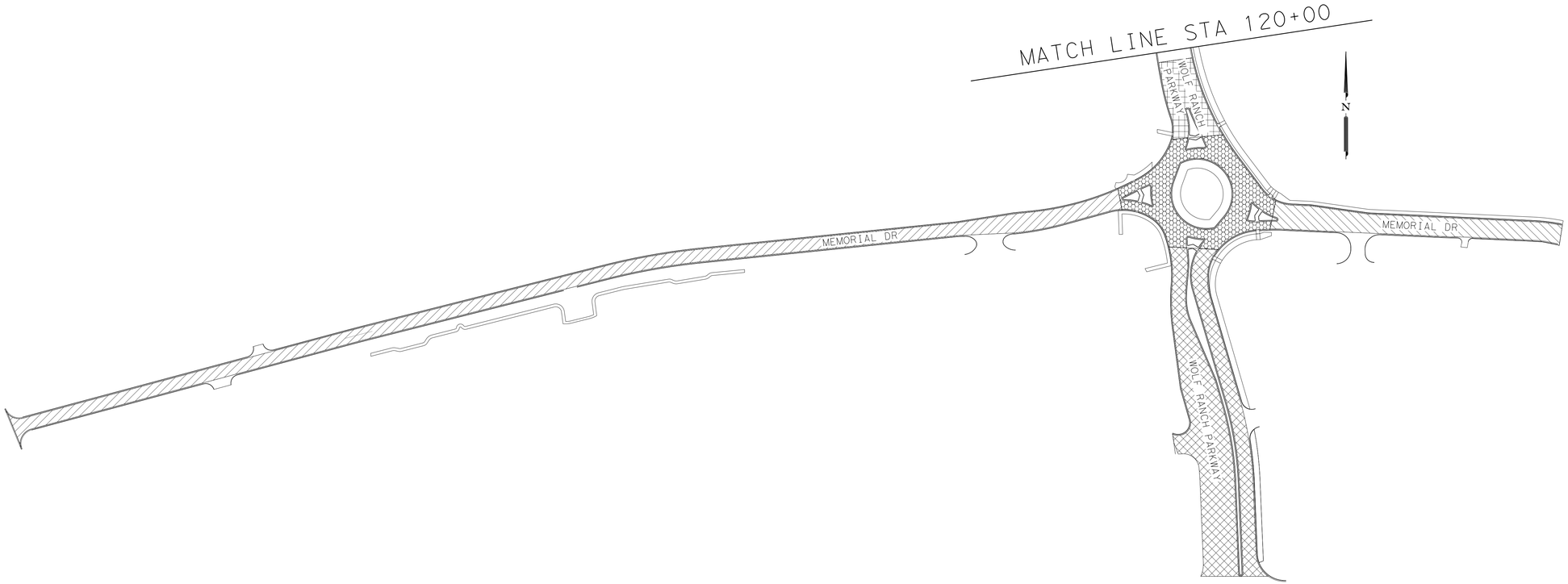
**CALCULATIONS GUIDANCE: AASHTO ROADWAY LIGHTING GUIDE AND ANSI/IESNA RP-8-14: ROADWAY LIGHTING (USERS R-3 TABLE)

ROADWAY ILLUMINANCE TARGET		
LAND USE	AVG	AVG/MIN
INTERMEDIATE	0.8	4

ROUNDABOUT ILLUMINANCE TARGET		
LAND USE	AVG	AVG/MIN
INTERMEDIATE	1.1	4

LEGEND

- MEMORIAL WEST LANES CALCULATION AREA
- MEMORIAL EAST LANES CALCULATION AREA
- WOLF RANCH SOUTH LANES CALCULATION AREA
- ROUNDABOUT CALCULATION AREA
- WOLF RANCH NORTH LANES CALCULATION AREA



DESIGN

STATE OF TEXAS
JACOB W. SHELTON
154071
LICENSED
PROFESSIONAL ENGINEER

JACOB W. SHELTON, P.E — 9/16/2025 DATE

APPROVAL

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JUSTIN W. CLARK, P.E. — 9/16/2025 DATE

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GEORGETOWN TEXAS *more than welcome*

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AUSTIN I SAN ANTONIO I HOUSTON I FORT WORTH I DALLAS
10801 N MOPAC EXPY, BLDG 3, STE 200 I AUSTIN, TX 78759 I 512.454.8711
TEXAS ENGINEERING FIRM #470 I TEXAS SURVEYING FIRM #10028800

WOLF RANCH PKWY / MEMORIAL DR
ILLUMINATION CALCULATION AREAS

CITY JOB No.
JOB NO. 51423-04
DATE 9/16/2025
DESIGNER
CHECKED DRAWN

SHEET NO. 371

CALCULATION SUMMARY AREA									
LABEL	STREET CLASSIFICATION	LAND USE	AREA (SF)	CALCULATION TYPE	UNITS	AVG	MAX	MIN	AVG/MIN
WOLF RANCH 1	COLLECTOR	RESIDENTIAL	35979	ILLUMINANCE **	fc	0.90	2.4	0.3	3.00
WOLF RANCH 2	COLLECTOR	RESIDENTIAL	84974	ILLUMINANCE **	fc	1.07	2.7	0.3	3.57
WOLF RANCH 3	COLLECTOR	RESIDENTIAL	139000	ILLUMINANCE **	fc	1.05	2.8	0.2	5.25
WOLF RANCH 4	COLLECTOR	RESIDENTIAL	95637	ILLUMINANCE **	fc	1.07	2.7	0.3	3.57
EAST SIDEWALK 1	COLLECTOR	RESIDENTIAL	23123	ILLUMINANCE **	fc	0.57	1.7	0.1	5.70
EAST SIDEWALK 2	COLLECTOR	RESIDENTIAL	42297	ILLUMINANCE **	fc	0.58	2	0.1	5.80
WEST SIDEWLAK 1	COLLECTOR	RESIDENTIAL	19564	ILLUMINANCE **	fc	0.54	1.7	0.1	5.40
WEST SIDEWALK 2	COLLECTOR	RESIDENTIAL	41206	ILLUMINANCE **	fc	0.66	1.7	0.1	6.60

**CALCULATIONS GUIDANCE: AASHTO ROADWAY LIGHTING GUIDE AND ANSI/IESNA RP-8-14: ROADWAY LIGHTING (USERS R-3 TABLE)

ROADWAY ILLUMINANCE TARGET		
LAND USE	AVG	AVG/MIN
INTERMEDIATE	0.8	4

DESIGN

STATE OF TEXAS
JACOB W. SHELTON
154071
LICENSED
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JACOB W. SHELTON, P.E — 9/16/2025 DATE

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TEXAS ENGINEERING FIRM #470 | TEXAS SURVEYING FIRM #10028800

WOLF RANCH PKWY / MEMORIAL DR
ILLUMINATION CALCULATION AREAS

CITY JOB No.
JOB NO. 51423-04
DATE 9/16/2025
DESIGNER
CHECKED DRAWN

SHEET NO. 372

LEGEND

- SINGLE ARM ILLUMINATION ASSEMBLY
- DUAL ARM ILLUMINATION ASSEMBLY
- STREET LIGHT TO BE MOUNTED TO UTILITY POLE
- 2" SCH 40 PVC CONDUIT (TRENCH)
- 2" SCH 80 PVC CONDUIT (BORE)
- CONDUIT RUN NUMBER
- GROUND BOX W/APRON (TY A)
- TRAFFIC FLOW ARROW
- CALCULATION POINT (SEE AREA TABLE)
- LUMINARE ISOLINE (0.2 fc)
- —OH E— EXISTING OVERHEAD ELECTRIC
- ELECTRIC SERVICE
- (X)-X-# (X) = SERVICE, X = CIRCUIT, # = POLE NUMBER
- PROP R.O.W
- EXIST R.O.W
- UTILITY EASEMENT R.O.W

NOTES:

1. REFER TO CONDUIT SUMMARY AND ILLUMINATION ASSEMBLIES LOCATIONS ON ILLUMINATION LEGEND
2. REFER TO STANDARD RID(2)-17 FOR DRILL SHAFT FOUNDATION CONSTRUCTION. USE 8FT. DEPTH AND 30 IN DIAMETER
3. FIXTURES ARE TO COMPLY WITH OUTDOOR LIGHTING CRITERIA SPECIFIED IN THE CODE OF ORDINANCES FROM CITY OF GEORGETOWN, TX
4. ALL CALCULATIONS ASSUME DIRECT ILLUMINATION FROM LUMINARES (NO INTERREFLECTED LIGHT)
5. FOR LIGHTS BEHIND OR NEAR RESIDENTIAL HOUSING USE HSS (HOUSE SIDE SHIELD)
6. CONTRACTOR SHALL INSTALL NEW CONDUIT TO INTERCEPT EXISTING. PULL EXISTING WIRING THROUGH NEW CONDUIT TO RELOCATED LIGHT POLE. ALL WORK AND MATERIALS REQUIRED ARE SUBSIDIARY TO LIGHT POLE RELOCATION BID ITEM.

SCALE: 1"= 20'
0' 20' 40' 60'

DESIGN

STATE OF TEXAS · JACOB W. SHELTON · 154071 · LICENSED PROFESSIONAL ENGINEER

JACOB W. SHELTON, P.E — 9/16/2025 DATE

APPROVAL

STATE OF TEXAS · JUSTIN W. CLARK · 118715 · LICENSED PROFESSIONAL ENGINEER

JUSTIN W. CLARK, P.E. — 9/16/2025 DATE

NO.	REVISION	DATE

GEORGETOWN TEXAS *more than welcome*

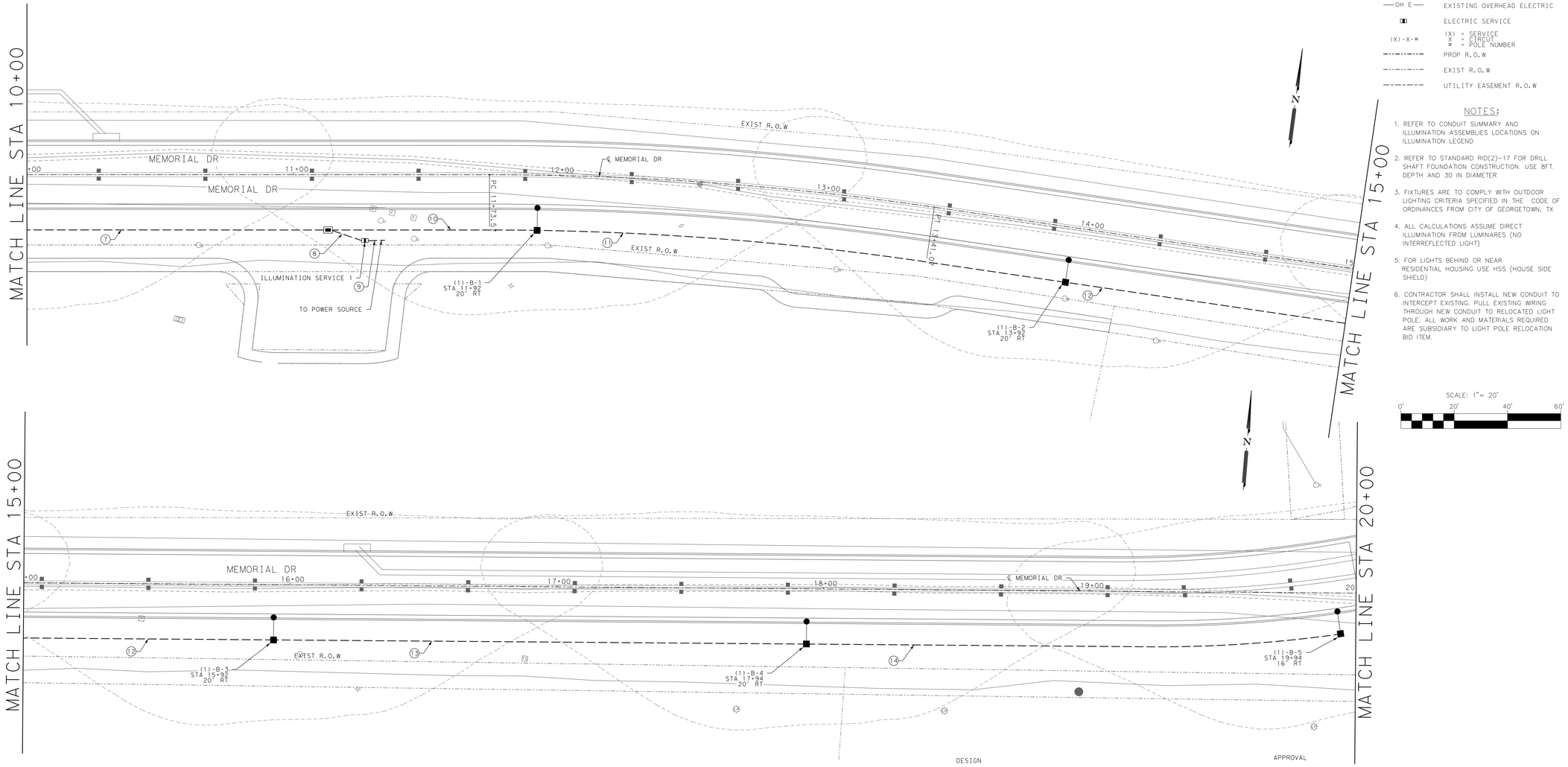
PAPE-DAWSON ENGINEERS
AUSTIN I SAN ANTONIO I HOUSTON I FORT WORTH I DALLAS
10801 N MOPAC EXPY, BLDG 3, STE 200 I AUSTIN, TX 78759 I 512.454.8711
TEXAS ENGINEERING FIRM #470 I TEXAS SURVEYING FIRM #10028800

WOLF RANCH PKWY / MEMORIAL DR

ILLUMINATION LAYOUT

CITY JOB No.
JOB NO. 51423-04
DATE 9/16/2025
DESIGNER
CHECKED DRAWN

SHEET NO. 373



LEGEND

- SINGLE ARM ILLUMINATION ASSEMBLY
- DUAL ARM ILLUMINATION ASSEMBLY
- STREET LIGHT TO BE MOUNTED TO UTILITY POLE
- 2" SCH 40 PVC CONDUIT (TRENCH)
- 2" SCH 80 PVC CONDUIT (BORE)
- CONDUIT RUN NUMBER
- GROUND BOX W/APRON (TY A)
- TRAFFIC FLOW ARROW
- CALCULATION POINT (SEE AREA TABLE)
- LUMINARE ISOLINE (0.2 fc)
- —OH E— EXISTING OVERHEAD ELECTRIC
- ELECTRIC SERVICE
- (X)-X-# (X) = SERVICE, X = CIRCUIT, # = POLE NUMBER
- PROP R.O.W
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DESIGN

STATE OF TEXAS
JACOB W. SHELTON
154071
LICENSED
PROFESSIONAL ENGINEER

JACOB W. SHELTON, P.E — 9/16/2025 DATE

APPROVAL

STATE OF TEXAS
JUSTIN W. CLARK
118715
LICENSED
PROFESSIONAL ENGINEER

JUSTIN W. CLARK, P.E. — 9/16/2025 DATE

NO.	REVISION	DATE

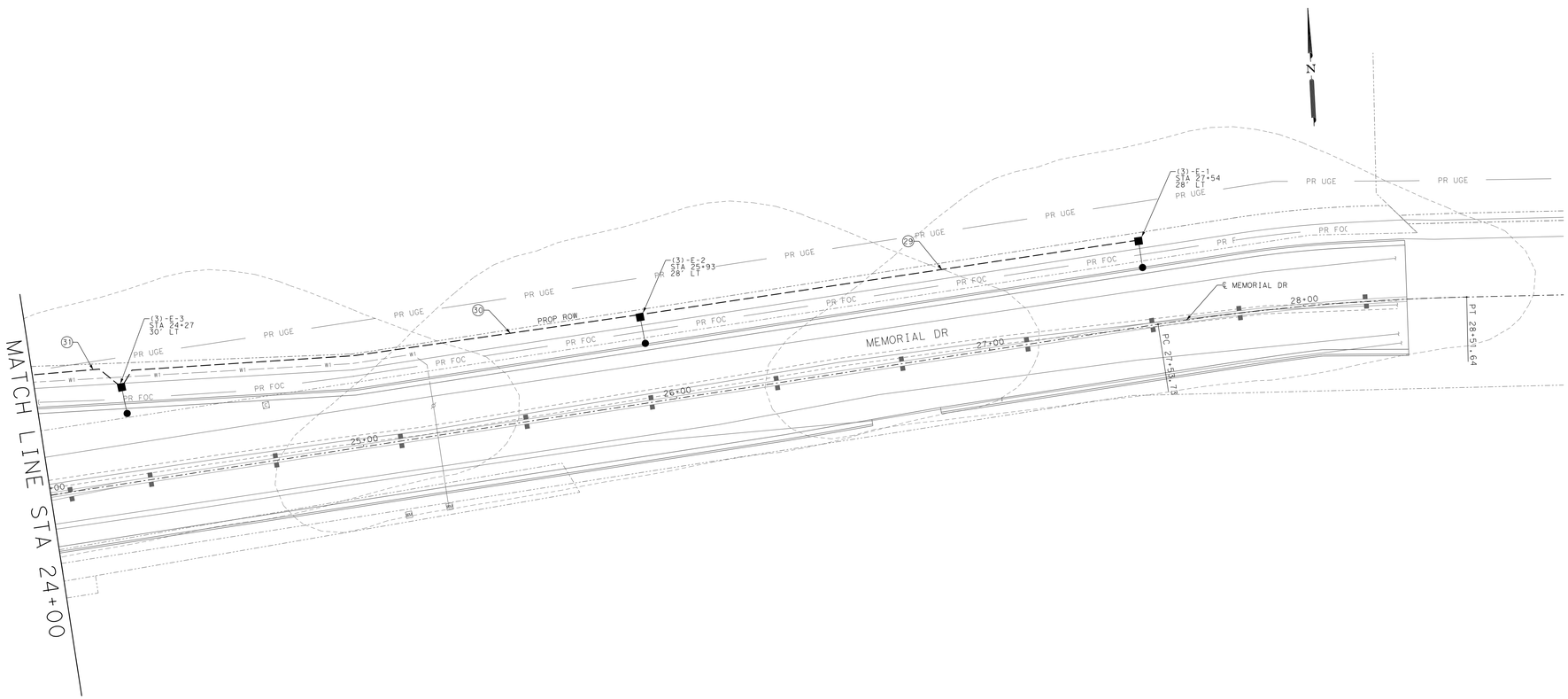
GEORGETOWN TEXAS *more than welcome*

PAPE-DAWSON ENGINEERS
AUSTIN I SAN ANTONIO I HOUSTON I FORT WORTH I DALLAS
10801 N MOPAC EXPY, BLDG 3, STE 200 I AUSTIN, TX 78759 I 512.454.8711
TEXAS ENGINEERING FIRM #470 I TEXAS SURVEYING FIRM #10028800

WOLF RANCH PKWY / MEMORIAL DR
ILLUMINATION LAYOUT

CITY JOB No.
JOB NO. 51423-04
DATE 9/16/2025
DESIGNER
CHECKED DRAWN

SHEET NO. 374



LEGEND

- SINGLE ARM ILLUMINATION ASSEMBLY
- DUAL ARM ILLUMINATION ASSEMBLY
- STREET LIGHT TO BE MOUNTED TO UTILITY POLE
- 2" SCH 40 PVC CONDUIT (TRENCH)
- 2" SCH 80 PVC CONDUIT (BORE)
- CONDUIT RUN NUMBER
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- TRAFFIC FLOW ARROW
- CALCULATION POINT (SEE AREA TABLE)
- LUMINARE ISOLINE (0.2 fc)
- —OH E— EXISTING OVERHEAD ELECTRIC
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SCALE: 1"= 20'
0' 20' 40' 60'

DESIGN

STATE OF TEXAS — JACOB W. SHELTON — 154071 — LICENSED PROFESSIONAL ENGINEER

JACOB W. SHELTON, P.E — 9/16/2025 DATE

APPROVAL

STATE OF TEXAS — JUSTIN W. CLARK — 118715 — LICENSED PROFESSIONAL ENGINEER

JUSTIN W. CLARK, P.E. — 9/16/2025 DATE

NO.	REVISION	DATE

GEORGETOWN TEXAS *more than welcome*

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ILLUMINATION LAYOUT

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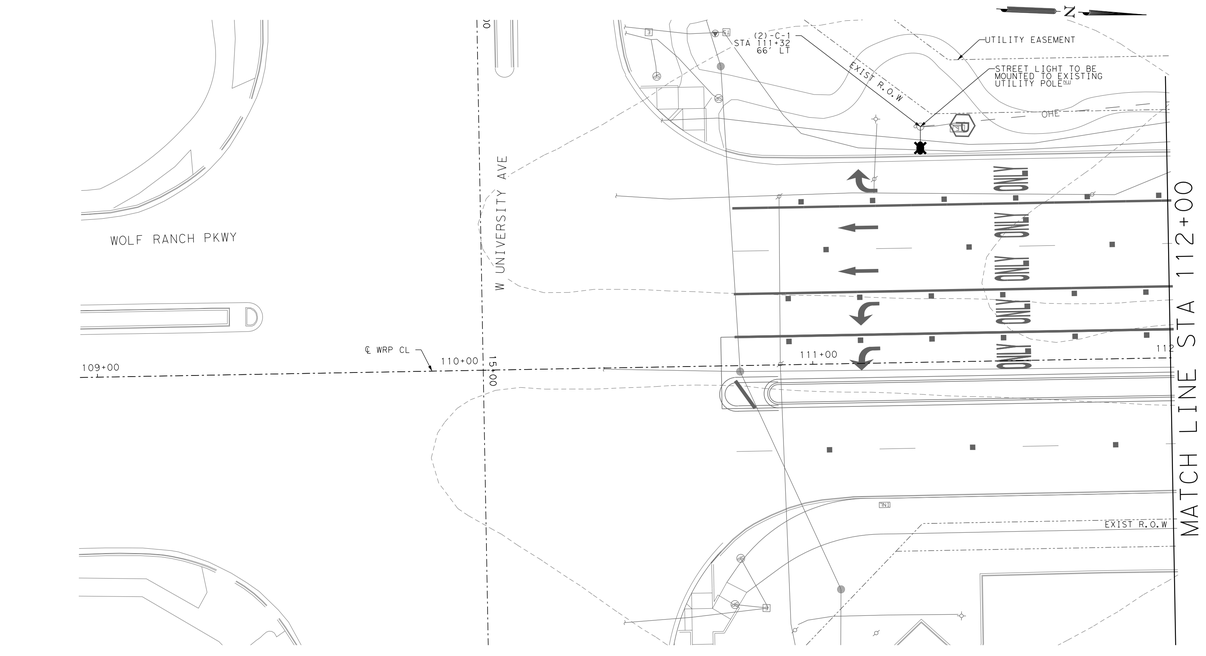

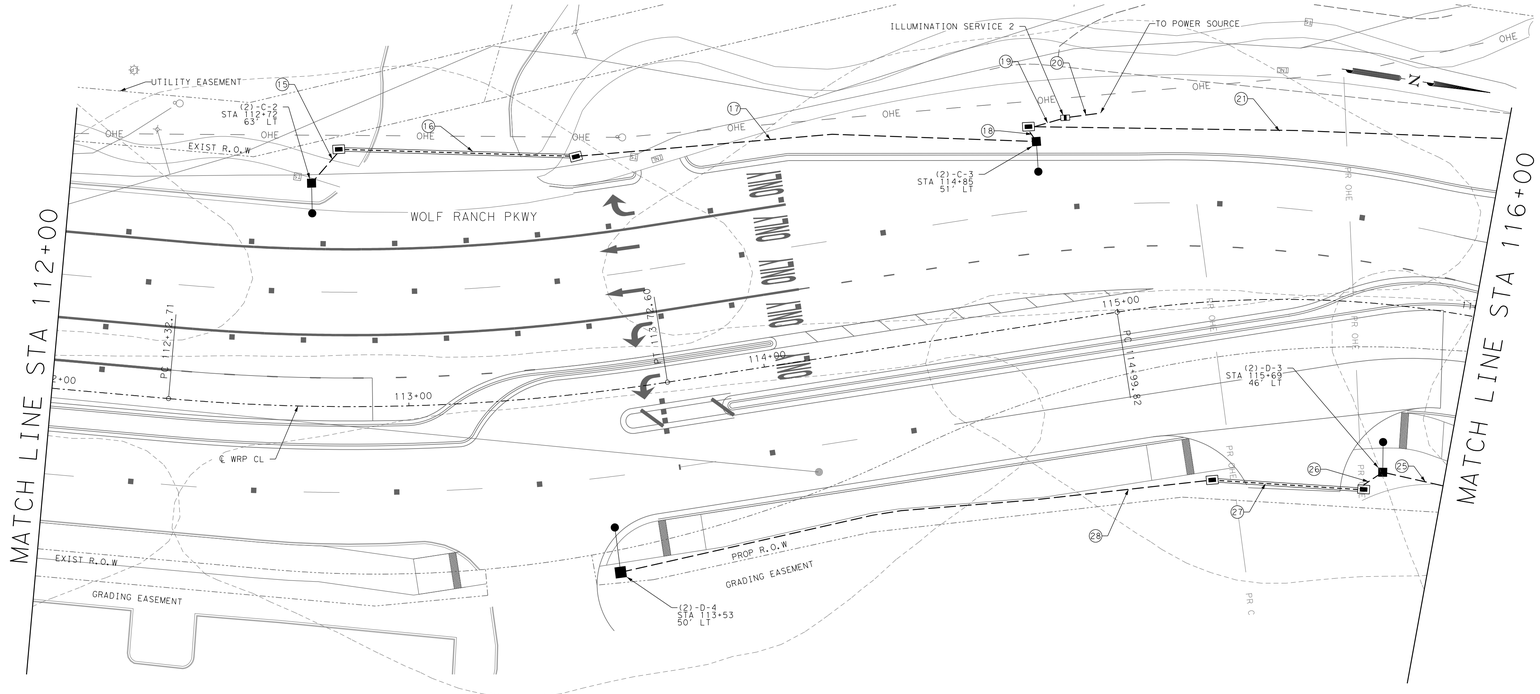

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SCALE: 1"= 20'

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DESIGN

JACOB W. SHELTON 154071 LICENSED PROFESSIONAL ENGINEER STATE OF TEXAS

JACOB W. SHELTON, P.E — 9/16/2025 DATE

APPROVAL

JUSTIN W. CLARK 118715 LICENSED PROFESSIONAL ENGINEER STATE OF TEXAS

JUSTIN W. CLARK, P.E. — 9/16/2025 DATE

NO.	REVISION	DATE

GEORGETOWN TEXAS *more than welcome*

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AUSTIN I SAN ANTONIO I HOUSTON I FORT WORTH I DALLAS
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WOLF RANCH PKWY / MEMORIAL DR

ILLUMINATION LAYOUT

CITY JOB No.
JOB NO. 51423-04
DATE 9/16/2025
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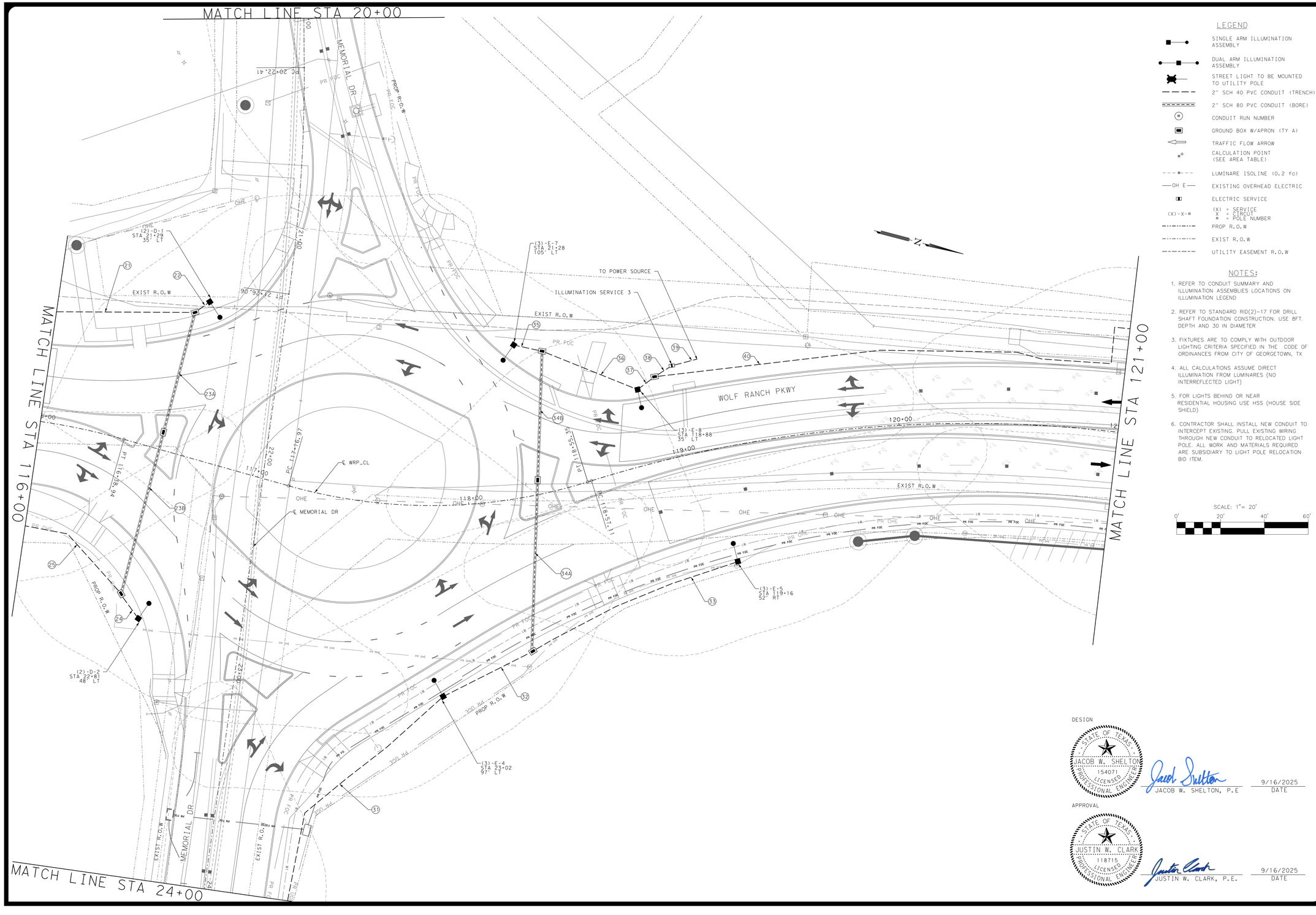
CHECKED DRAWN

SHEET NO. 376



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STATE OF TEXAS — JACOB W. SHELTON — 154071 — LICENSED PROFESSIONAL ENGINEER

JACOB W. SHELTON, P.E — 9/16/2025 DATE

APPROVAL

STATE OF TEXAS — JUSTIN W. CLARK — 118715 — LICENSED PROFESSIONAL ENGINEER

JUSTIN W. CLARK, P.E. — 9/16/2025 DATE

NO.	REVISION	DATE

GEORGETOWN TEXAS *more than welcome*

PAPE-DAWSON ENGINEERS
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TEXAS ENGINEERING FIRM #470 I TEXAS SURVEYING FIRM #10028800

WOLF RANCH PKWY / MEMORIAL DR
ILLUMINATION LAYOUT

CITY JOB No.
JOB NO. 51423-04
DATE 9/16/2025
DESIGNER
CHECKED DRAWN

SHEET NO. 377

LEGEND

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DESIGN

STATE OF TEXAS — JACOB W. SHELTON — 154071 — LICENSED PROFESSIONAL ENGINEER

JACOB W. SHELTON, P.E — 9/16/2025 DATE

APPROVAL

STATE OF TEXAS — JUSTIN W. CLARK — 118715 — LICENSED PROFESSIONAL ENGINEER

JUSTIN W. CLARK, P.E. — 9/16/2025 DATE

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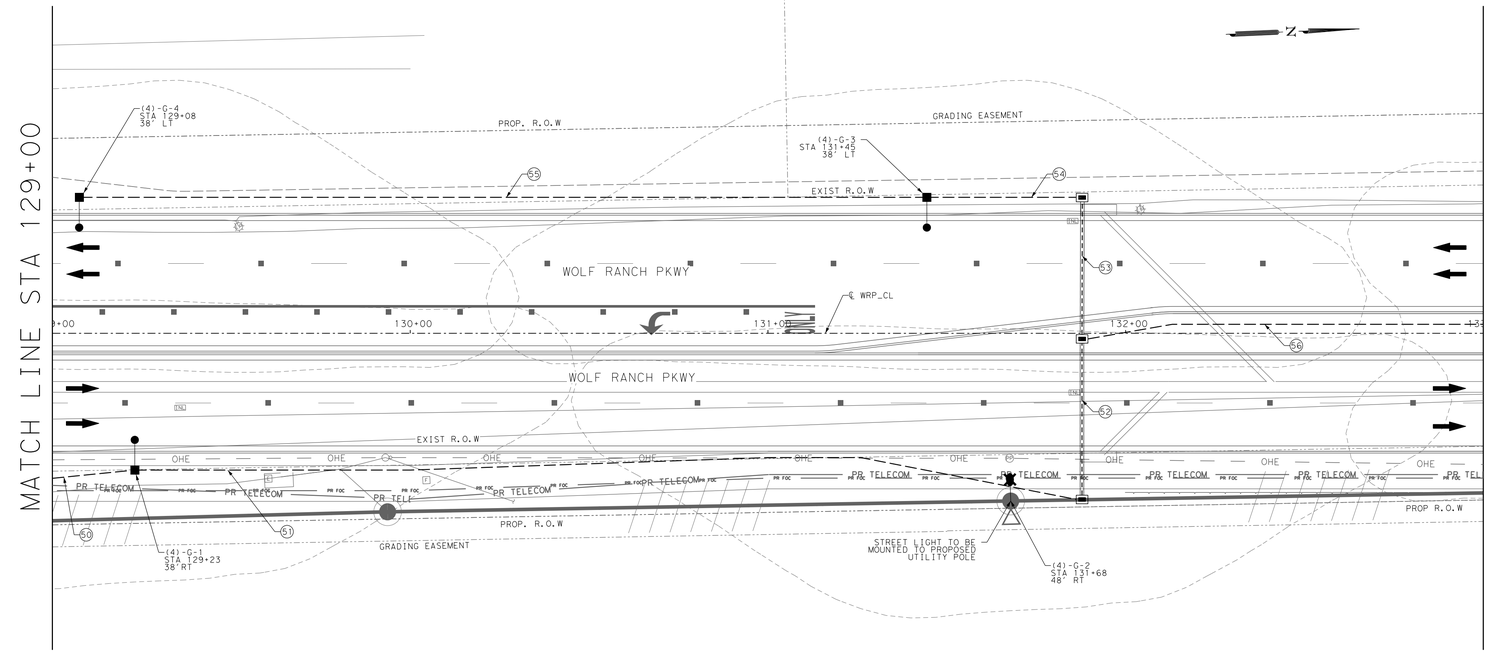

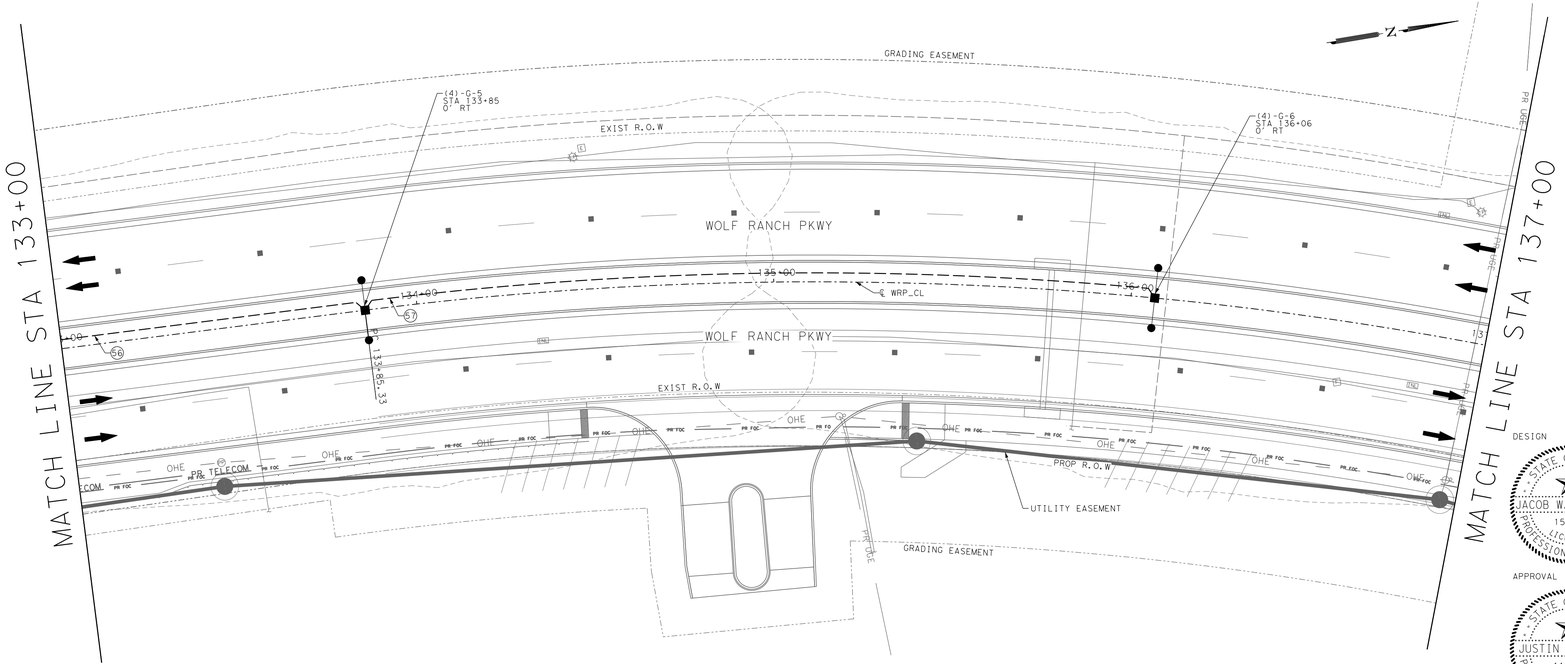

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STATE OF TEXAS · JACOB W. SHELTON · 154071 · LICENSED PROFESSIONAL ENGINEER

JACOB W. SHELTON, P.E — 9/16/2025 DATE

APPROVAL

STATE OF TEXAS · JUSTIN W. CLARK · 118715 · LICENSED PROFESSIONAL ENGINEER

JUSTIN W. CLARK, P.E. — 9/16/2025 DATE

NO.	REVISION	DATE

GEORGETOWN TEXAS *more than welcome*

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ILLUMINATION LAYOUT

CITY JOB No.
JOB NO. 51423-04
DATE 9/16/2025
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SHEET NO. 379

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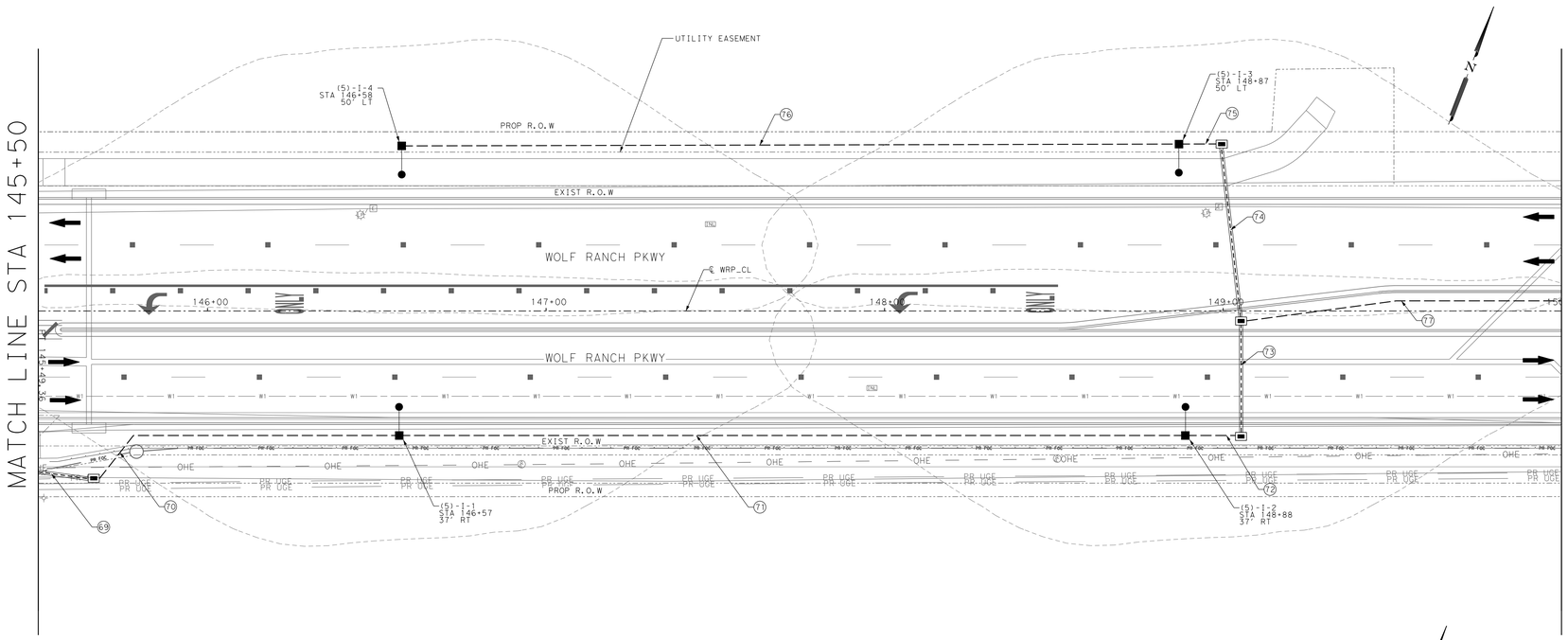

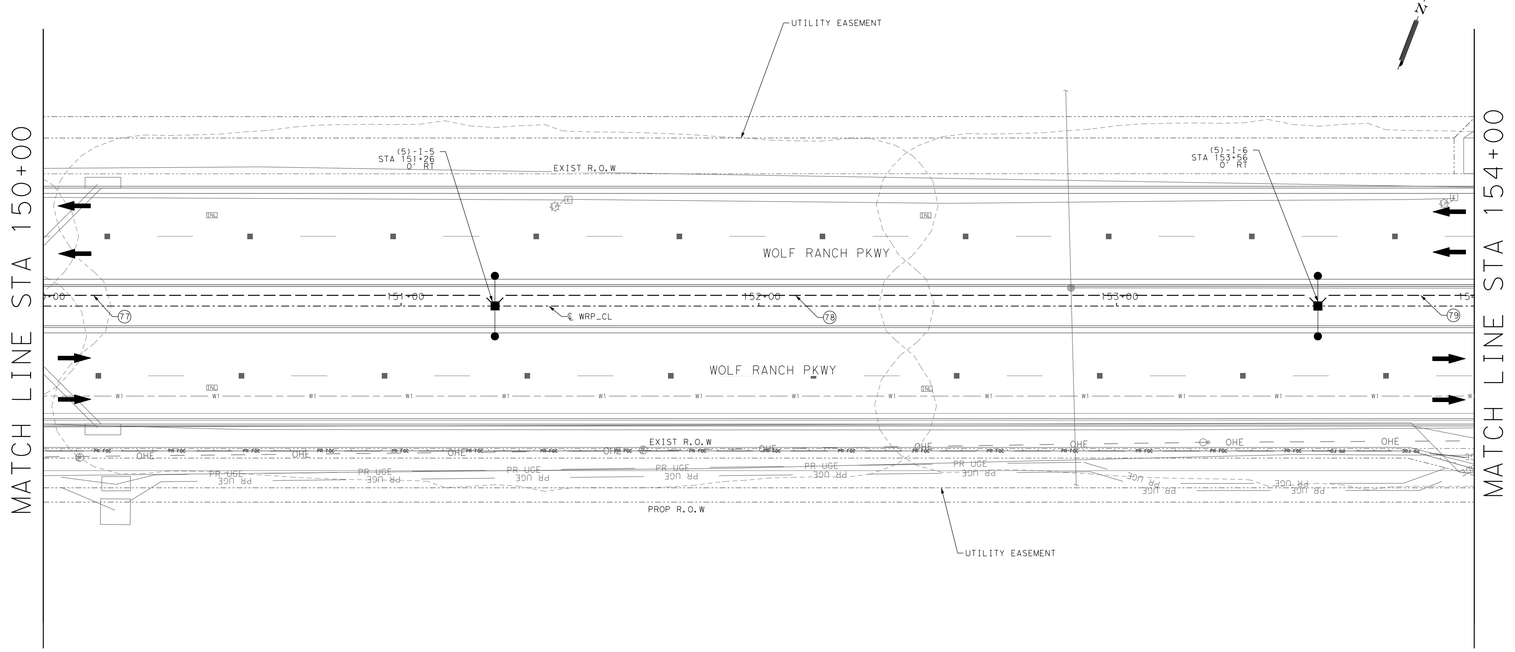

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JACOB W. SHELTON, P.E — 9/16/2025 DATE

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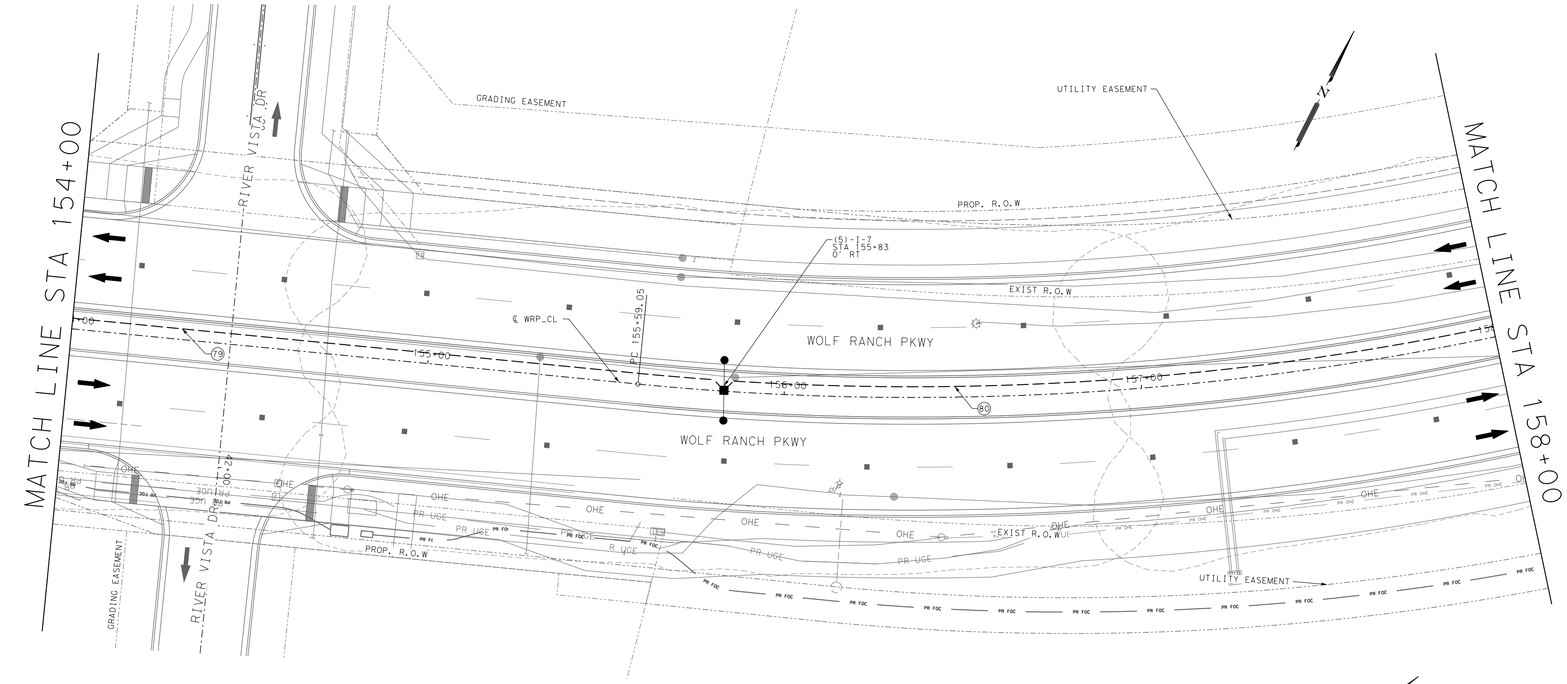

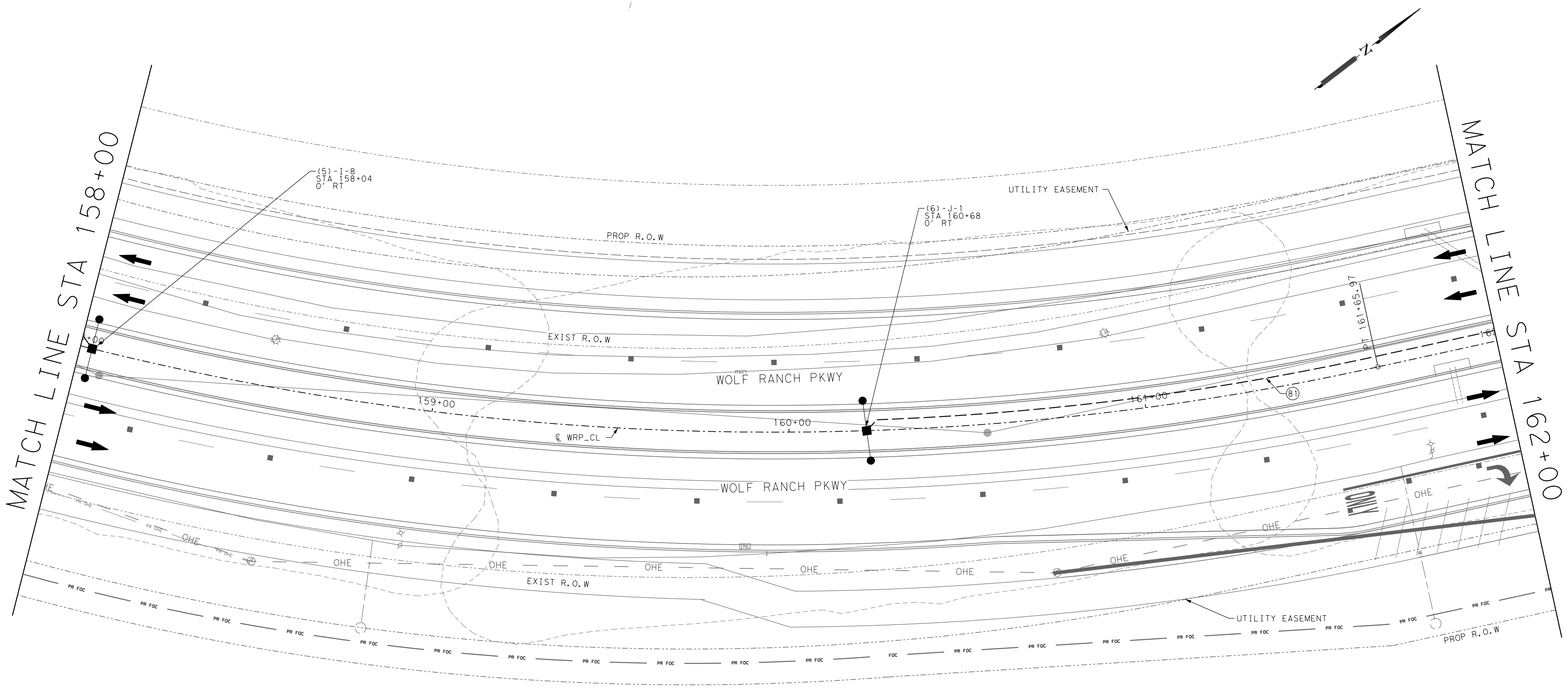

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0' 20' 40' 60'

DESIGN

STATE OF TEXAS
JACOB W. SHELTON
154071
LICENSED
PROFESSIONAL ENGINEER

JACOB W. SHELTON, P.E — 9/16/2025 DATE

APPROVAL

STATE OF TEXAS
JUSTIN W. CLARK
118715
LICENSED
PROFESSIONAL ENGINEER

JUSTIN W. CLARK, P.E. — 9/16/2025 DATE

NO.	REVISION	DATE

GEORGETOWN TEXAS
more than welcome

PAPE-DAWSON ENGINEERS
AUSTIN I SAN ANTONIO I HOUSTON I FORT WORTH I DALLAS
10801 N MOPAC EXPY, BLDG 3, STE 200 I AUSTIN, TX 78759 I 512.454.8711
TEXAS ENGINEERING FIRM #470 I TEXAS SURVEYING FIRM #10028800

WOLF RANCH PKWY / MEMORIAL DR
ILLUMINATION LAYOUT

CITY JOB No.
JOB NO. 51423-04
DATE 9/16/2025
DESIGNER
CHECKED DRAWN

SHEET NO. 382

LEGEND

- SINGLE ARM ILLUMINATION ASSEMBLY
- DUAL ARM ILLUMINATION ASSEMBLY
- STREET LIGHT TO BE MOUNTED TO UTILITY POLE
- 2" SCH 40 PVC CONDUIT (TRENCH)
- 2" SCH 80 PVC CONDUIT (BORE)
- CONDUIT RUN NUMBER
- GROUND BOX W/APRON (TY A)
- TRAFFIC FLOW ARROW
- CALCULATION POINT (SEE AREA TABLE)
- LUMINARE ISOLINE (0.2 fc)
- OH E — EXISTING OVERHEAD ELECTRIC
- ELECTRIC SERVICE
- (X)-X-# — (X) = SERVICE, X = CIRCUIT, # = POLE NUMBER
- PROP R.O.W
- EXIST R.O.W
- UTILITY EASEMENT R.O.W

NOTES:

1. REFER TO CONDUIT SUMMARY AND ILLUMINATION ASSEMBLIES LOCATIONS ON ILLUMINATION LEGEND
2. REFER TO STANDARD RID(2)-17 FOR DRILL SHAFT FOUNDATION CONSTRUCTION. USE 8FT. DEPTH AND 30 IN DIAMETER
3. FIXTURES ARE TO COMPLY WITH OUTDOOR LIGHTING CRITERIA SPECIFIED IN THE CODE OF ORDINANCES FROM CITY OF GEORGETOWN, TX
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NO.	REVISION	DATE

GEORGETOWN TEXAS *more than welcome*

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TEXAS ENGINEERING FIRM #470 I TEXAS SURVEYING FIRM #10028800

WOLF RANCH PKWY / MEMORIAL DR

ILLUMINATION LAYOUT

DESIGN

STATE OF TEXAS — JACOB W. SHELTON — 154071 — LICENSED PROFESSIONAL ENGINEER

JACOB W. SHELTON, P.E — 9/16/2025 DATE

APPROVAL

STATE OF TEXAS — JUSTIN W. CLARK — 118715 — LICENSED PROFESSIONAL ENGINEER

JUSTIN W. CLARK, P.E. — 9/16/2025 DATE

CITY JOB No.

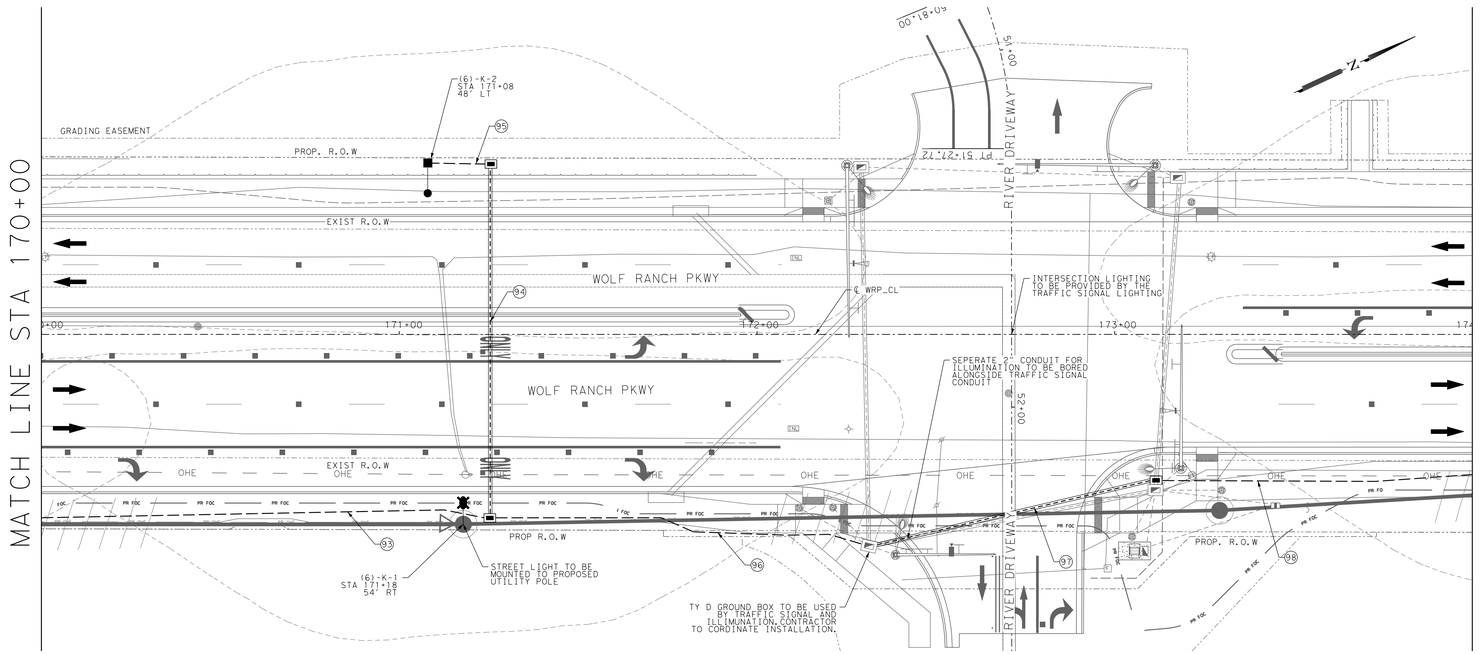
JOB NO. 51423-04

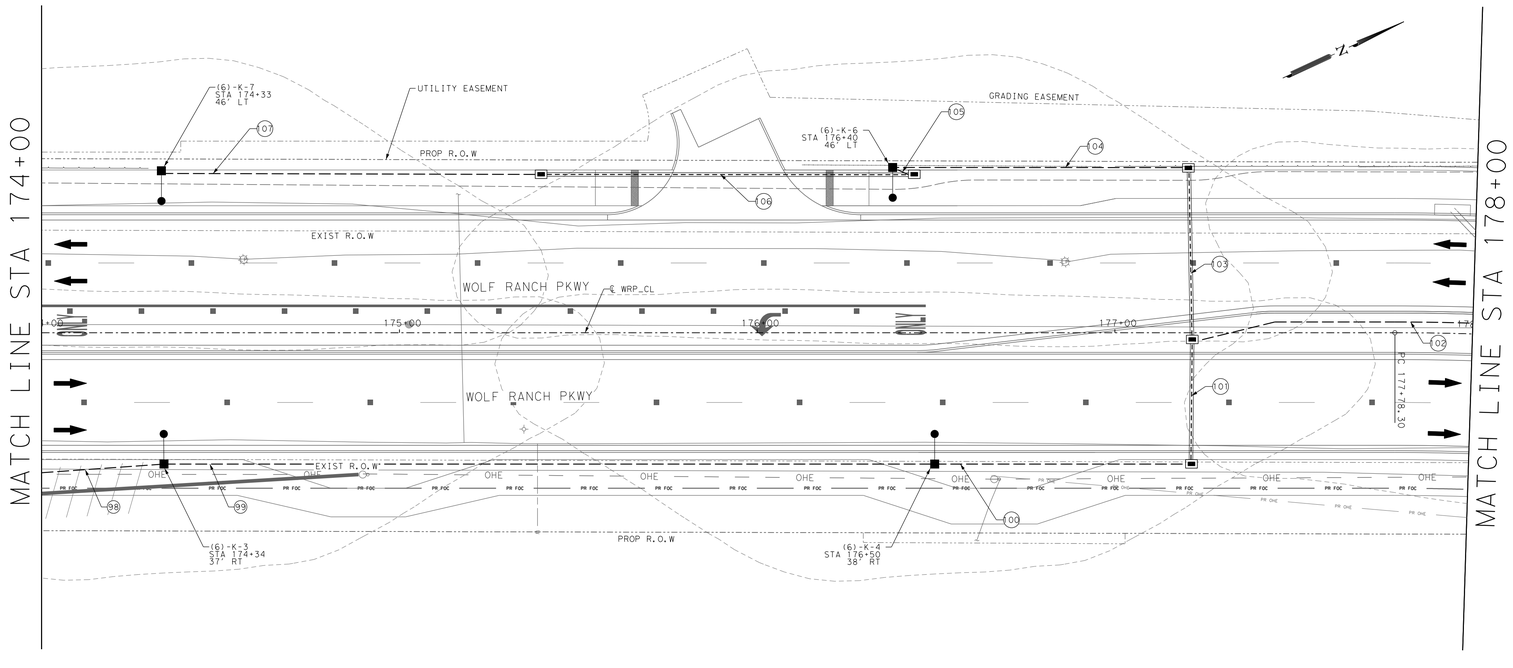
DATE 9/16/2025

DESIGNER

CHECKED DRAWN

SHEET NO. 383





LEGEND

- SINGLE ARM ILLUMINATION ASSEMBLY
- DUAL ARM ILLUMINATION ASSEMBLY
- STREET LIGHT TO BE MOUNTED TO UTILITY POLE
- 2" SCH 40 PVC CONDUIT (TRENCH)
- 2" SCH 80 PVC CONDUIT (BORE)
- CONDUIT RUN NUMBER
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- TRAFFIC FLOW ARROW
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SCALE: 1"= 20'
0' 20' 40' 60'

DESIGN

STATE OF TEXAS — JACOB W. SHELTON — 154071 — LICENSED PROFESSIONAL ENGINEER

JACOB W. SHELTON, P.E — 9/16/2025 DATE

APPROVAL

STATE OF TEXAS — JUSTIN W. CLARK — 118715 — LICENSED PROFESSIONAL ENGINEER

JUSTIN W. CLARK, P.E. — 9/16/2025 DATE

NO.	REVISION	DATE

GEORGETOWN TEXAS *more than welcome*

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TEXAS ENGINEERING FIRM #470 I TEXAS SURVEYING FIRM #10028800

WOLF RANCH PKWY / MEMORIAL DR

ILLUMINATION LAYOUT

CITY JOB No.
JOB NO. 51423-04
DATE 9/16/2025
DESIGNER
CHECKED DRAWN

SHEET NO. 384

LEGEND

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- DUAL ARM ILLUMINATION ASSEMBLY
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STATE OF TEXAS — JACOB W. SHELTON — 154071 — LICENSED PROFESSIONAL ENGINEER

JACOB W. SHELTON, P.E — 9/16/2025 DATE

APPROVAL

STATE OF TEXAS — JUSTIN W. CLARK — 118715 — LICENSED PROFESSIONAL ENGINEER

JUSTIN W. CLARK, P.E. — 9/16/2025 DATE

NO.	REVISION	DATE

GEORGETOWN TEXAS *more than welcome*

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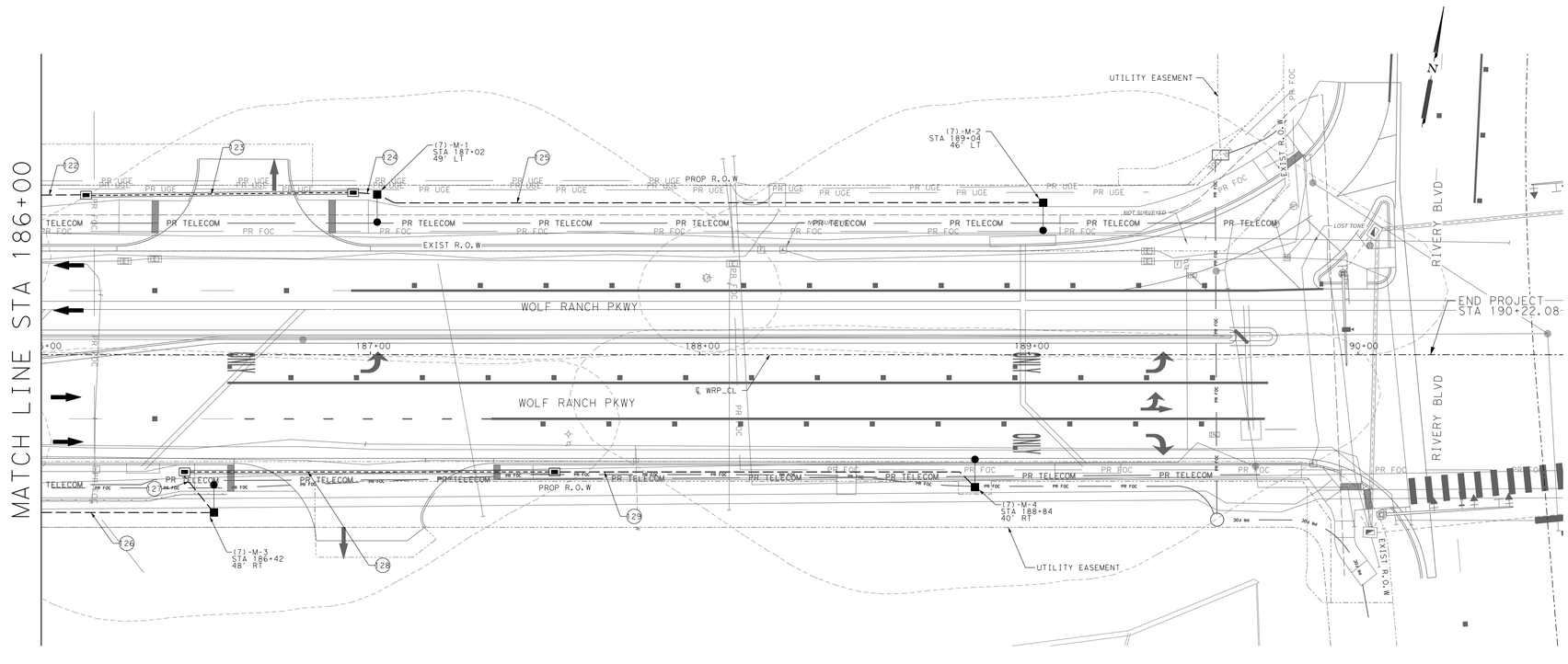
TEXAS ENGINEERING FIRM #470 I TEXAS SURVEYING FIRM #10028800

WOLF RANCH PKWY / MEMORIAL DR
ILLUMINATION LAYOUT

CITY JOB No.
JOB NO. 51423-04
DATE 9/16/2025
DESIGNER
CHECKED DRAWN

SHEET NO. 385



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DESIGN

STATE OF TEXAS — JACOB W. SHELTON — 154071 — LICENSED PROFESSIONAL ENGINEER

JACOB W. SHELTON, P.E — 9/16/2025 DATE

APPROVAL

STATE OF TEXAS — JUSTIN W. CLARK — 118715 — LICENSED PROFESSIONAL ENGINEER

JUSTIN W. CLARK, P.E. — 9/16/2025 DATE

NO.	REVISION	DATE

GEORGETOWN TEXAS *more than welcome*

PAPE-DAWSON ENGINEERS
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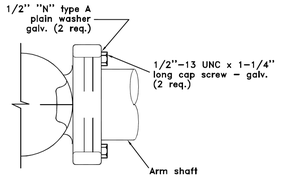
10801 N MOPAC EXPY, BLDG 3, STE 200 I AUSTIN, TX 78759 I 512.454.8711
TEXAS ENGINEERING FIRM #470 I TEXAS SURVEYING FIRM #10028800

WOLF RANCH PKWY / MEMORIAL DR

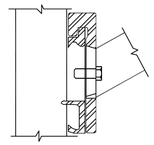
ILLUMINATION LAYOUT

CITY JOB No.
JOB NO. 51423-04
DATE 9/16/2025
DESIGNER
CHECKED DRAWN

SHEET NO. 386

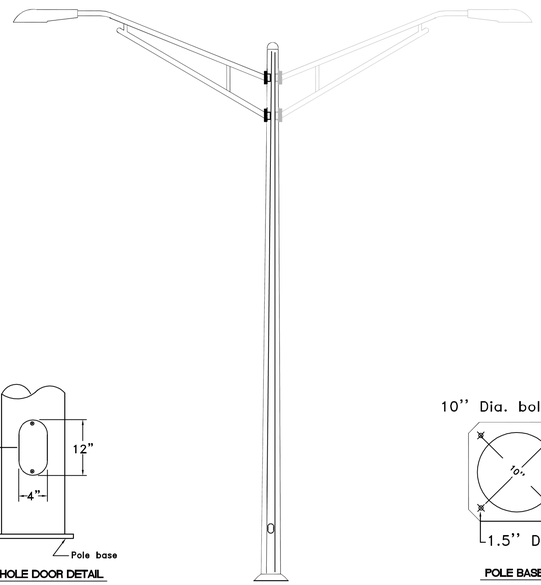


MAST ARM MOUNTING DETAIL
TOP VIEW



MAST ARM MOUNTING DETAIL
SIDE VIEW

SINGLE ARM OR DOUBLE ARM



HAND HOLE DOOR DETAIL

POLE ELEVATION

POLE BASE PLAN

The Architect/Engineer assumes responsibility for appropriate use of this standard.

REVISION NOTE: ADOPTED 6/21/2006

CITY OF GEORGETOWN
CONSTRUCTION STANDARDS AND DETAILS

35' STREETLIGHT POLE AND MAST ARM
GALVANIZED

PAGE 1 OF 2

DRAWING NAME: GEO-117

SCALE:	DATE:	
NTS	6/4/03	GUSL-35-DB1
DRAWN BY: KJH	APPROVED BY: CCS	GUSL-35-DB2

MATERIAL LIST

ITEM NO.	STOCK NO.	DESCRIPTION	GUSL-35-DB1	GUSL-35-DB2
d	360643	Pole, Streetlight 35' w/6' Arm	1	
d	360644	Pole, Streetlight 35' w/2-8' Arms		1
sl	360641	Streetlight Luminaire, Cutoff 200W	58	11

NOTES:

1. Pole shaft conforming to ASTM designation: A595 with 5,000 PSI minimum yield strength linear taper - 0.14"/ft.
2. Arm shafts 2-3/8'' O.D. = .154 wall steel tubing - 36,000 PSI minimum yield strength.
3. Arm struts 3/8" = 2" commercial grade hot rolled milled steel bar.
4. Arm connection - simplex attachments are ASTM designation: A27 grade 65-35, plate gussets are hot rolled commercial grade steel.
5. Cast pole top cap secured in place with 3 plated set screws.
6. Base plate - conforming to ASTM designation: A36.
7. All threaded fasteners to be galvanized to ASTM designation: A153 unless otherwise noted.
8. Pole and arm to be galvanized to ASTM designation: A123 and have polyester powder coating.
9. Accessories to be galvanized to ASTM designation: A153 and have polyester powder coating.
10. All pole bases to use a 10" bolt circle.
11. Four (4) 1-1/4" x 42" anchor bolts, including two (2) hex nuts and two (2) round washers per anchor bolt, shall be furnished with pole.
12. Pole shall be capable of withstanding a sustained wind velocity of not less than 80 mph isotach (mphi) with a gust factor 1.3.
13. Cobra head fixtures to be dark bronze, cutoff type.

The Architect/Engineer assumes responsibility for appropriate use of this standard.

REVISION NOTE: ADOPTED 6/21/2006

CITY OF GEORGETOWN
CONSTRUCTION STANDARDS AND DETAILS

35' STREETLIGHT POLE AND MAST ARM
GALVANIZED

PAGE 2 OF 2

DRAWING NAME: GEO-117A

SCALE:	DATE:	
NTS	6/4/03	GUSL-35-DB1
DRAWN BY: GBY	APPROVED BY: CCS	GUSL-35-DB2

NO.	REVISION	DATE

GEORGETOWN TEXAS
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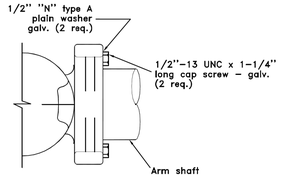
TEXAS ENGINEERING FIRM #470 | TEXAS SURVEYING FIRM #10028800

WOLF RANCH PKWY / MEMORIAL DR

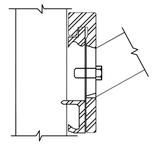
ILLUMINATION STANDARDS

CITY JOB No.
JOB NO. 51423-04
DATE 9/16/2025
DESIGNER
CHECKED DRAWN

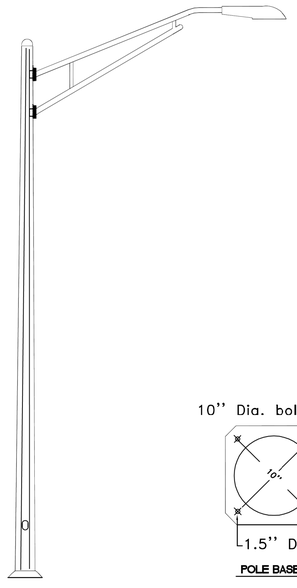
SHEET NO. 387

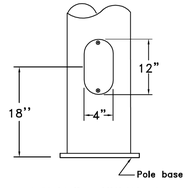


MAST ARM MOUNTING DETAIL
TOP VIEW



MAST ARM MOUNTING DETAIL
SIDE VIEW





HAND HOLE DOOR DETAIL

POLE ELEVATION

POLE BASE PLAN

The Architect/Engineer assumes responsibility for appropriate use of this standard.

	CITY OF GEORGETOWN CONSTRUCTION STANDARDS AND DETAILS STREETLIGHT POLE AND MAST ARM PAGE 1 OF 2	REVISION NOTE: ADOPTED 6/21/2006 DRAWING NAME: GEO-118 SCALE: NTS; DATE: 6/4/03 DRAWN BY: KJH; APPROVED BY: CCS	GUSL-25-BA GUSL-35-BA

Georgetown Utility Systems
Your Community Owned Utility

MATERIAL LIST

FIXTURE TYPE AND WATTAGE

ITEM NO.	STOCK NO.	DESCRIPTION	100W	200W	400W
sl	360380	Streetlight Luminaire, Cobra Head, 100W - Cutoff Fixture	1		
sl	360409	Streetlight Luminaire, Cobra Head, 200W - Cutoff Fixture		1	
sl	360410	Streetlight Luminaire, Cobra Head, 400W - Cutoff Fixture			1

POLE LENGTH

ITEM NO.	STOCK NO.	DESCRIPTION	GUSL-25-BA	GUSL-35-BA
	360624	Pole, Streetlight, Aluminum Round, 25' w/6' Arm	1	
	360404	Pole, Streetlight, Aluminum Round, 35' w/6' Arm		1

NOTES:

1. Pole shaft conforming to ASTM designation: A595 with 5,000 PSI minimum yield strength linear taper - 0.14"/ft.
2. Arm shafts 2-3/8'' O.D. = .154 wall steel tubing - 36,000 PSI minimum yield strength.
3. Arm struts 3/8" = 2" commercial grade hot rolled milled steel bar.
4. Arm connection - simplex attachments are ASTM designation: A27 grade 65-35, plate gussets are hot rolled commercial grade steel.
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10. All pole bases to use a 10" bolt circle.
11. Four (4) 1-1/4" x 42" anchor bolts, including two (2) hex nuts and two (2) round washers per anchor bolt, shall be furnished with pole.
12. Pole shall be capable of withstanding a sustained wind velocity of not less than 80 mph isotach (mphi) with a gust factor 1.3.
13. Cobra head fixtures to be dark bronze, cutoff type.

The Architect/Engineer assumes responsibility for appropriate use of this standard.

	CITY OF GEORGETOWN CONSTRUCTION STANDARDS AND DETAILS STREETLIGHT POLE AND MAST ARM (BRUSHED ALUMINUM ROUND TAPERED) PAGE 2 OF 2	REVISION NOTE: ADOPTED 6/21/2006 DRAWING NAME: GEO-118A SCALE: NTS; DATE: 6/4/03 DRAWN BY: GBY; APPROVED BY: CCS	GUSL-25-BA GUSL-35-BA

Georgetown Utility Systems
Your Community Owned Utility

NO.	REVISION	DATE

GEORGETOWN TEXAS
more than welcome

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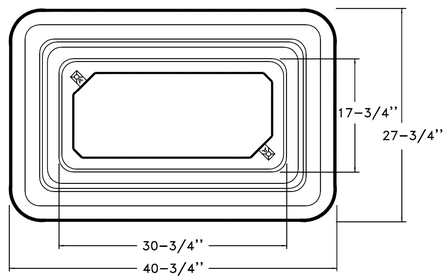
WOLF RANCH PKWY / MEMORIAL DR

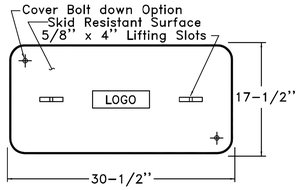
ILLUMINATION STANDARDS

CITY JOB No.
JOB NO. 51423-04
DATE 9/16/2025
DESIGNER
CHECKED DRAWN

SHEET NO. 388

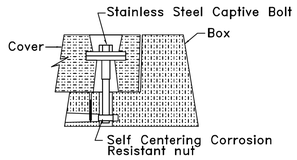


BOX - PLAN VIEW

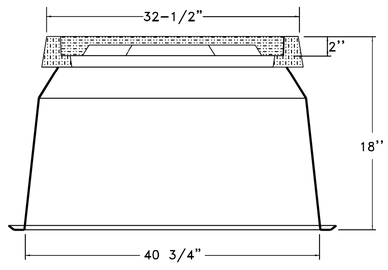


COVER

Optional Cast Iron Reader Lids Available



COVER BOLT DOWN OPTION



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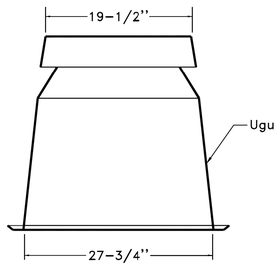

END VIEW

The Architect/Engineer assumes responsibility for appropriate use of this standard.

GEORGETOWN TEXAS Georgetown Utility Systems Your Community Owned Utility	CITY OF GEORGETOWN CONSTRUCTION STANDARDS AND DETAILS 24.9/14.4 kV PRIMARY 600V SECONDARY – (JUNCTION BOX, COVER, AND EXTENSION) PAGE 1 OF 2	REVISION NOTE: ADOPTED 6/21/2006 DRAWING NAME: GEO-206 SCALE: NTS DATE: 5/30/03 DRAWN BY: KJH APPROVED BY: CCS	GUK6, GUK6-SL, GUK6-TL	

MATERIAL LIST

ITEM NO.	STOCK NO.	DESCRIPTION	GUK6	GUK6-SL	GUK6-TL
Ugu	360044	Sub-surface Box and Lid, 13" x 24" x 18"		1	1
Ugu	360045	Sub-surface Box and Lid, 17" x 30" x 18"	1		

Notes:

1. This assembly unit to be constructed out of polymer concrete and reinforced polyester.
2. This unit is to be set even with finish grade.
3. Place in logo area "CITY OF GEORGETOWN ELECTRICAL".

References:

See GUK6 – Used for Secondary Junction Box
See GUK6-SL – Used for Streetlight Circuit
See GUK6-TL – Used for Traffic Light Circuit

The Architect/Engineer assumes responsibility for appropriate use of this standard.

GEORGETOWN TEXAS Georgetown Utility Systems Your Community Owned Utility	CITY OF GEORGETOWN CONSTRUCTION STANDARDS AND DETAILS 24.9/14.4 kV PRIMARY 600V SECONDARY (JUNCTION BOX, COVER, AND EXTENSION) PAGE 2 OF 2	REVISION NOTE: ADOPTED 6/21/2006 DRAWING NAME: GEO-206A SCALE: NTS DATE: 5/30/03 DRAWN BY: GBY APPROVED BY: CCS	GUK6, GUK6-SL, GUK6-TL	

NO.	REVISION	DATE

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TEXAS ENGINEERING FIRM #470 I TEXAS SURVEYING FIRM #10028800

WOLF RANCH PKWY / MEMORIAL DR

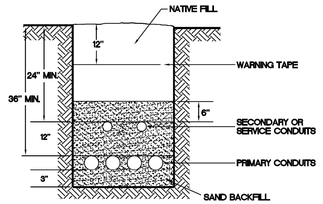
ILLUMINATION STANDARDS

CITY JOB No.
JOB NO. 51423-04
DATE 9/16/2025
DESIGNER
CHECKED DRAWN

SHEET NO. 389

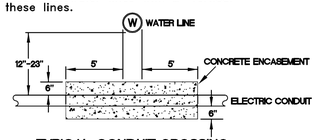
Notes:

1. All electric primary conduit shall be installed below all other utilities and private underground lines whenever possible. All electric secondary conduit shall be installed under water lines whenever possible. Any exception to this specification must have written approval from the City.
2. Electric primary conduit shall be installed with a minimum of 2' vertical and 5' horizontal clearance from water mains, wastewater, storm water, and private underground lines. Any exception to this specification must have written approval from the City.
3. Electric primary conduit shall be installed with a minimum of 2' vertical and 5' horizontal clearance from natural gas lines. Any exception to this specification must have written approval from the City.
4. Electric primary conduit shall be installed with a minimum of 1' vertical and/or 1' horizontal clearance from communi-cations lines. Any exception to this specification must have written approval from the City.



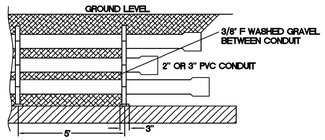
TYPICAL TRENCH DETAIL
CONDUIT SIZE AND NUMBER MAY VARY

5. Electric primary conduit when installed above water mains and pressurized wastewater lines, with 2' of vertical clearance or greater, shall be capped with 6" of concrete when crossing these lines. The concrete cap shall be installed 4" above electric conduit(s); 5' each side of the outside diameter of the water main or pressurized wastewater lines.
6. Electric primary conduit when installed below water mains and pressurized wastewater lines with 2' vertical clearance or greater, does not require a concrete cap when crossing these lines.
7. Electric primary conduit installed with less than 2' of vertical and 5' of horizontal clearance from water mains, pressurized wastewater and private underground lines, shall be encased in 6" of concrete. Concrete encasement to be installed around conduit until a minimum of 2' of vertical and 5' of horizontal clearance has been met. Concrete encasements will began 5' before and end 5' from the end where conduit are installed less than 2' vertical and 5' horizontal from the above lines. This must have City approval before installation of conduit.
8. All concrete shall have red dye or coloring added to concrete before concrete has been placed in trench.



TYPICAL CONDUIT CROSSING
CONDUIT SIZE AND NUMBER MAY VARY

9. Conduit shall be electrical grade, gray schedule #40 PVC conduit. Conduit shall meet the NEC and ASTM standards for installation of underground electrical conduit.
10. All conduit installations shall be owned by the City and shall be inspected by the City before backfill of trench.
11. Where conduit terminates in a pad, install bell end on each conduit.
12. Where multiple rows of conduit are required, duct spacers are to be installed every 5' with 3" of seperation between conduits and trench wall. Then sand backfill is to be installed around conduit.
13. Primary conduit shall have 12" of 3/8" F washed gravel bedding prior to placing 6" wide "CAUTION" tape. Final backfilling can then be placed.
14. 1800 lbs Mule Tape with sequential footage markings, or equivalent, shall be run through all conduit and tied off on both ends of conduit.



TYPICAL DUCT SPACING

15. All conduit for future use shall be stubbed up and capped.
16. Secondary service conduit to be stubbed out 5' outside of the utility easement into prospective lots. End of conduit to be staked with a piece of PVC conduit 30" above ground line.
17. Long sweep elbows shall be used at all bends in conduit runs. 2" and 3" conduit shall require a minimum bend radius of 36". 4" conduit shall require a minimum bend radius of 48".
18. Use long sweep PVC concrete encased elbows at all single-phase transformer pads and in conductor pulls 200' in length or less. Long sweep galvanized steel conduit elbows to be used in all other installations.
19. Water services and taps shall be placed above electric conduit with a minimum separation of 12". Water services and taps maybe placed below electric conduit only with City's written approval.
20. Where electric conduit crosses roadways, the trench shall be backfilled with 3/8" F washed gravel then base and compacted or backfilled with flowable backfill in accordance with City specifications. All trenches outside of roadways shall be backfilled and compacted to 95% standard density in accordance with City specifications.
21. Where electric conduit crosses roadways, the minimum depth of cover is 36" from the top of proposed finished roadway elevation.

References:

GUM50	Conduit Specifications
GUR3	3/8" F washed gravel or approved equal

Specification letter codes

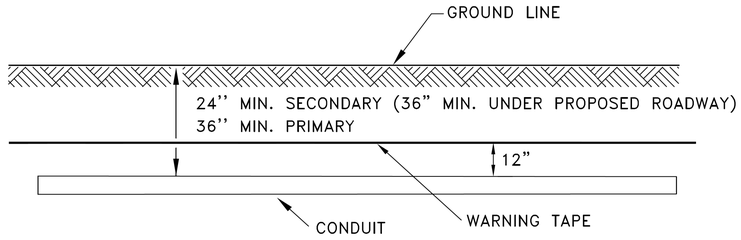
GUR2- R or S + (size)
Example: GUR2-R (42" x 12")
is a trench in rock at 42" deep x 12" wide

The Architect/Engineer assumes responsibility for appropriate use of this standard.

REVISION NOTE: ADOPTED 6/21/2006

CITY OF GEORGETOWN
CONSTRUCTION STANDARDS AND DETAILS
MISCELLANEOUS UG CONDUIT INSTALLATION
PAGE 1 OF 3

DRAWING NAME: GEO-225
SCALE: NTS | DATE: 4/7/05 | DRAWN BY: MRC | APPROVED BY: MRC
GUM-50-P_
GUM-50-S_



SPECIFICATION LETTER AND NUMBER CODES:
GUM50-(P or S)-(DIAMETER)

EXAMPLE: GUM50-S-3
IS 3" STEEL CONDUIT

MATERIAL	-P-2	-P-3	-P-4	-P-6
1-1" PVC Conduit				
1-2" PVC Conduit	1			
1-3" PVC Conduit		1		
1-4" PVC Conduit			1	
1-6" PVC Conduit				1

MATERIAL	-S-2	-S-3	-S-4	-S-6
1-2" Steel Conduit	1			
1-3" Steel Conduit		1		
1-4" Steel Conduit			1	
1-6" Steel Conduit				1

Notes:
Specify trench unit separately

Reference:
GUR2 Trench specifications

The Architect/Engineer assumes responsibility for appropriate use of this standard.

REVISION NOTE: ADOPTED 6/21/2006

CITY OF GEORGETOWN
CONSTRUCTION STANDARDS AND DETAILS
MISCELLANEOUS UG CONDUIT INSTALLATION
PAGE 2 OF 3

DRAWING NAME: GEO-225A
SCALE: NTS | DATE: 6/12/03 | DRAWN BY: MRC | APPROVED BY: CCS
GUM-50-P-_
GUM-50-S-_

NO. | REVISION | DATE

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WOLF RANCH PKWY / MEMORIAL DR
ILLUMINATION STANDARDS

CITY JOB No.
JOB NO. 51423-04
DATE 9/16/2025
DESIGNER
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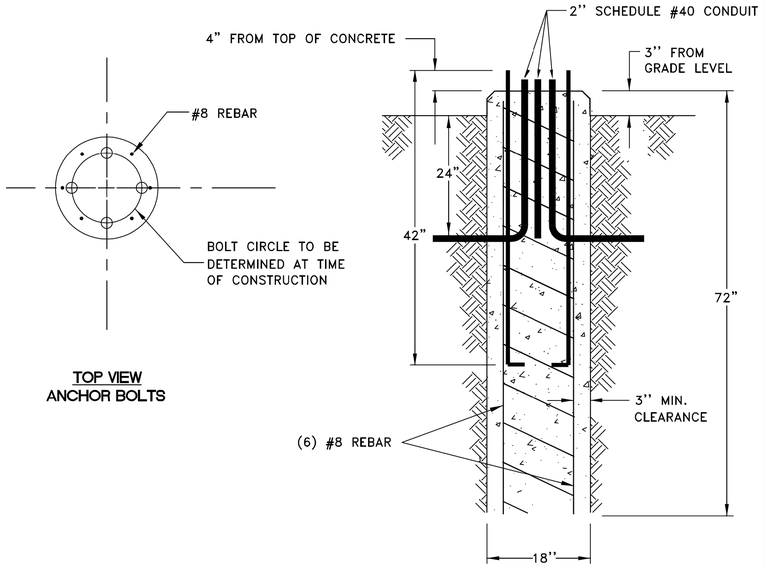

TOP VIEW
ANCHOR BOLTS

SIDE VIEW

Notes:

1. "R" designates installation in rock.
2. #3 Spiral, 4" pitch.
3. 4–1/4" anchor bolt, 42" long with 4" projection from concrete.
4. Anchor bolt: 6" thread top, 2' to be galvanized.
5. Anchor bolt to be a 326, with 2 nuts and 2 square washers.
6. (6) #8 vertical rebar.
7. All concrete to be 3,000 PSI grade.
8. Foundation to have 1" chamfer on top to prevent chipping.

The Architect/Engineer assumes responsibility for appropriate use of this standard.

EST. 1848 GEORGETOWN TEXAS
Georgetown Utility Systems
Your Community Owned Utility

CITY OF GEORGETOWN
CONSTRUCTION STANDARDS AND DETAILS
CONCRETE FOUNDATION
STREETLIGHT POLE
(18" DIAMETER X 72" DEPTH)
PAGE 1 OF 2

REVISION NOTE: ADOPTED 6/21/2006
DRAWING NAME: GEO-236
SCALE: NTS | DATE: 6/2/03 | GUSL-CF-B, GUSL-CF-BR
DRAWN BY: SCE | APPROVED BY: CCS

NO. | REVISION | DATE

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TEXAS ENGINEERING FIRM #470 | TEXAS SURVEYING FIRM #10028800

WOLF RANCH PKWY / MEMORIAL DR
ILLUMINATION STANDARDS

CITY JOB No.
JOB NO. 51423-04
DATE 9/16/2025
DESIGNER
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SHEET NO. 391

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DATE:
FILE:

GENERAL NOTES FOR ALL ELECTRICAL WORK

1. The location of all conduits, junction boxes, ground boxes, and electrical services is diagrammatic and may be shifted to accommodate field conditions.
2. Provide new and unused materials. Ensure that all materials and installations comply with the applicable articles of the National Electrical Code (NEC), TxDOT standards and specifications, National Electrical Manufacturers Association (NEMA), and are listed by Underwriters Laboratories (UL) or a Nationally Recognized Testing Lab (NRTL). NRTLs such as Canadian Standard Association (CSA), Intertek Testing Services NA Inc., or FM Approvals LLC can be considered equivalent to UL. Where reference is made to NEMA listed devices, International Electrotechnical Commission (IEC) listed devices will not be considered an acceptable equal to a NEMA listed device. Acceptable devices may have both a NEMA and IEC listing. Faulty fabrication or poor workmanship in any material, equipment, or installation is justification for rejection. Replace or reinstall rejected material or equipment at no additional cost to the Department.
3. Miscellaneous nuts, bolts and hardware, except for high strength bolts, may be stainless steel when plans specify galvanized, provided the bolt size is $\frac{1}{2}$ in. or less in diameter.
4. Provide the following test equipment as required by the Engineer to confirm compliance with the contract and the NEC: voltmeter, ammeter, megohm meter (1000 volt DC), ground resistance tester, torque wrenches, and torque screwdrivers. Ensure all equipment has been properly calibrated within the last year. Provide calibration certification to the Engineer upon request. Operate test equipment during inspection as requested by the Engineer.
5. Install grounding as shown on the plans and in accordance with the NEC. Ensure all metallic conduits; metal poles; luminaires; and metal enclosures are bonded to the equipment grounding conductor. Provide stranded bare copper or green insulated grounding conductors. Ground rods, connectors, and bonding jumpers are subsidiary to the various bid items.
6. When required by the Engineer, notify the Department in writing of materials from the Material Producers List (MPL) intended for use on each project. Prequalified materials are listed on the MPL on TxDOT's website under "Roadway Illumination and Electrical Supplies." No substitutions will be allowed for materials on this list.

CONDUIT

A. MATERIALS

1. Provide conduit, junction boxes, fittings, and hardware as per TxDOT Departmental Material Specification (DMS) 11030 "Conduit" and Item 618 "Conduit" of TxDOT's "Standard Specifications For Construction And Maintenance Of Highways, Streets, And Bridges," latest edition. Provide conduits listed under Item 618 on the MPL under "Roadway Illumination and Electrical Supplies." Provide conduit types according to the descriptive code or as shown on the plans. Do not substitute other types of conduits for those shown. Provide liquidtight flexible metal conduit (LFMC) when flexible conduit is called for on galvanized steel rigid metallic conduit (RMC) systems. Provide liquidtight flexible nonmetallic conduit (LFNC) when flexible conduit is called for on polyvinyl chloride (PVC) systems.
2. Provide galvanized steel RMC for all exposed conduits, unless otherwise shown on the plans. Properly bond all metal conduits.
3. Unless otherwise shown on the plans, provide junction boxes with a minimum size as shown in the following table, which applies to the greatest number of conductors entering the box through one conduit with no more than four conduits per box. When a mixture of conductor sizes is present, count the conductors as if all are of the larger size. For situations not applicable to the table, size junction boxes in accordance with NEC.

AWG	3 CONDUCTORS	5 CONDUCTORS	7 CONDUCTORS
#1	10" x 10" x 4"	12" x 12" x 4"	16" x 16" x 4"
#2	8" x 8" x 4"	10" x 10" x 4"	12" x 12" x 4"
#4	8" x 8" x 4"	10" x 10" x 4"	10" x 10" x 4"
#6	8" x 8" x 4"	8" x 8" x 4"	10" x 10" x 4"
#8	8" x 8" x 4"	8" x 8" x 4"	8" x 8" x 4"

4. Junction boxes with an internal volume of less than 100 cu. in. and supported by entering raceways must have threaded entries or hubs identified for the intended purpose and supported by connection of two or more rigid metal conduits. Secure conduit within 3 ft. of the enclosure or within 18 in. of the enclosure if all conduit entries are on the same side. Mechanically secure all junction boxes with an internal volume greater than 100 cu. inches.
5. Provide hot dipped galvanized cast iron or sand cast aluminum outlet boxes for junction boxes containing only 10 AWG or 12 AWG conductors. Do not use die cast aluminum boxes. Size outlet boxes according to the NEC.
6. Do not use intermediate metal conduit (IMC) or electrical metallic tubing (EMT) unless specifically required by the plan sheets. When EMT is called for, provide junction boxes made from galvanized steel sheeting, listed and approved for outdoor use, unless otherwise noted on the plans. Size all galvanized steel junction boxes in accordance with the NEC. Provide junction boxes for IMC conduit systems that meet the same requirements for junction boxes used with RMC systems.
7. Provide PVC junction boxes intended for outdoor use on PVC conduit systems, unless otherwise noted on the plans.
8. Provide PVC elbows in PVC conduit systems, unless otherwise shown on the plans. Use only a flat, high tensile strength polyester fiber pull tape for pulling conductors through the PVC conduit system. When galvanized steel RMC elbows are specifically called for in the plans and any portion of the RMC elbow is buried less than 18 in., ground the RMC elbow by means of a grounding bushing on a rigid metal extension. Grounding of the rigid metal elbow is not required if the entire RMC elbow is encased in a minimum of 2 in. of concrete. PVC extensions are allowed on these concrete encased rigid metal elbows. RMC or PVC elbows are subsidiary to various bid items.
9. When required, provide High-Density Polyethylene (HDPE) conduit with factory installed internal conductors according to Item 622 "Duct Cable." At the Contractor's request and with approval by the Engineer, substitute HDPE conduit with no conductors for bored schedule 40 or schedule 80 PVC conduit bid under Item 618. Ensure bored HDPE substituted for PVC is schedule 40 and of the same size PVC called for in the plans. Ensure the substituted HDPE meets the requirements of Item 622, except that the conduit is supplied without factory-installed conductors. Make the transition of the HDPE conduit to PVC (or RMC elbow when required) at the bore pit. Provide conduit of the size and schedule as shown on the plans. Do not extend substituted conduit into ground boxes or foundations. Provide PVC or galvanized steel RMC elbows as called for at all ground boxes and foundations.
10. Use two-hole straps when supporting 2 in. and larger conduits. On electrical service poles, properly sized stainless steel or hot dipped galvanized one-hole standoff straps are allowed on the service riser conduit.

B. CONSTRUCTION METHODS

1. Provide and install expansion joint conduit fittings on all structure-mounted conduits at the structure's expansion joints to allow for movement of the conduit. In addition, provide and install expansion joint fittings on all continuous runs of galvanized steel RMC conduit externally exposed on structures such as bridges at maximum intervals of 150 ft. When requested by the project Engineer, supply manufacturer's specification sheet for expansion joint conduit fittings. Repair or replace expansion joint fittings that do not allow for movement at no additional cost to the Department. Provide the method of determining the amount of expansion to the Engineer upon request. Do not use LFMC or LFNC as a substitute for the required expansion conduit fittings.
2. Space all conduit supports at maximum intervals of 5 ft. Install conduit spacers when attaching metal conduit to surface of concrete structures. See "Conduit Mounting Options" on ED(2). Install conduit support within 3 ft. of all enclosures and conduit terminations.
3. Do not attach conduit supports directly to pre-stressed concrete beams except as shown specifically in the plans or as approved by the Engineer.
4. Unless otherwise shown on the plans, jack or bore conduit placed beneath existing roadways, driveways, sidewalks, or after the base or surfacing operation has begun. Backfill and compact the bore pits below the conduit per Item 476 "Jacking, Boring, or Tunneling Pipe or Box" prior to installing conduit or duct cable to prevent bending of the connections.
5. When placing conduit in the sub-grade of new roadways, backfill all trenches with excavated material unless otherwise noted on the plans. When placing conduit in the sub-base of new roadways, backfill all trenches with cement-stabilized base as per requirements of Items 110 "Excavation", 400 "Excavation and Backfill for Structures", 401 "Flowable Backfill", 402 "Trench Excavation Protection", and 403 "Temporary Special Shoring."
6. Provide and place warning tape approximately 10 in. above all trenched conduit as per Item 618.
7. During construction, temporarily cap or plug open ends of all conduit and raceways immediately after installation to prevent entry of dirt, debris and animals. Temporary caps constructed of durable duct tape are allowed. Tightly fix the tape to the conduit opening. Clean out the conduit and prove it clear in accordance with Item 618 prior to installing any conductors.
8. Ensure conduit entry into the top of any enclosure is waterproof by installing conduit sealing hubs or using boxes with threaded bosses. This includes surface mounted safety switches, meter cans, service enclosures, auxiliary enclosures and junction boxes. Grounding bushings on water tight sealing hubs are not required.
9. Fit the ends of all PVC conduit terminations with bushings or bell end fittings. Provide and install a grounding type bushing on all metal conduit terminations.
10. Install a bonding jumper from each grounding bushing to the nearest ground rod, grounding lug, or equipment grounding conductor. Ensure all bonding jumpers are the same size as the equipment grounding conductor. Bonding of conduit used as a casing under roadways for duct cable is not required, if the duct extends the full length through the casing.
11. At all electrical services, install a 6 AWG solid copper grounding electrode conductor.
12. Place conduits entering ground boxes so that the conduit openings are between 3 in. and 6 in. from the bottom of the box. See the ground box detail on sheet ED(4).
13. Seal ends of all conduits with duct seal, expandable foam, or by other methods approved by the Engineer. Seal conduit immediately after completion of conductor installation and pull tests. Do not use duct tape as a permanent conduit sealant. Do not use silicone caulk as a conduit sealant.
14. File smooth the cut ends of all mounting strut and conduit. Before installing, paint the field cut ends of all mounting strut and RMC (threaded or non-threaded) with zinc rich paint (94% or more zinc content) to alleviate overspray. Use zinc rich paint to touch up galvanized material as allowed under Item 445 "Galvanizing." Do not paint non-galvanized material with a zinc rich paint as an alternative for materials required to be galvanized.

Texas Department of Transportation | Traffic Operations Division Standard

ELECTRICAL DETAILS
CONDUITS & NOTES

ED(1)-14

FILE: ed1-14.dgn	DN:	CK:	DW:	CK:
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REVISIONS	DIST		COUNTY	SHEET NO.

71A

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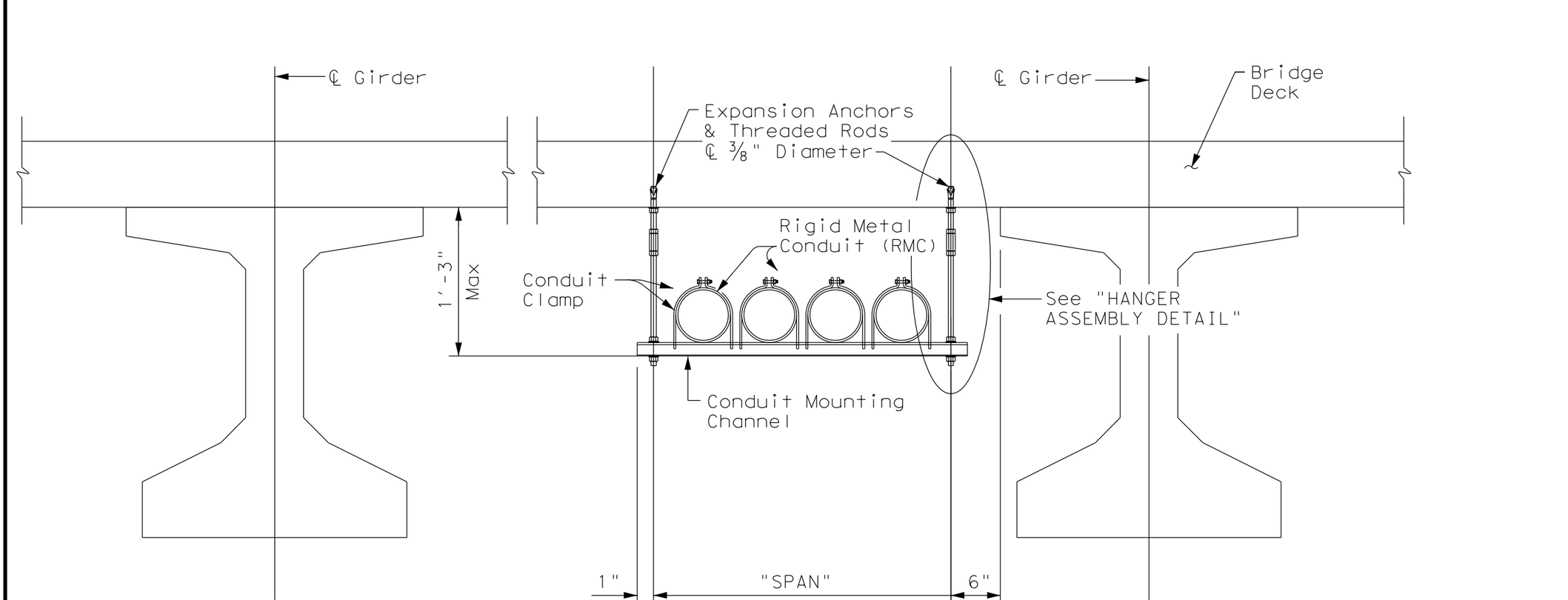
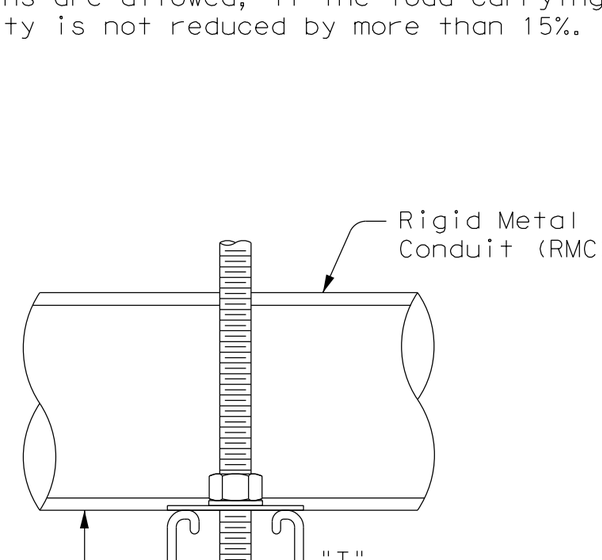
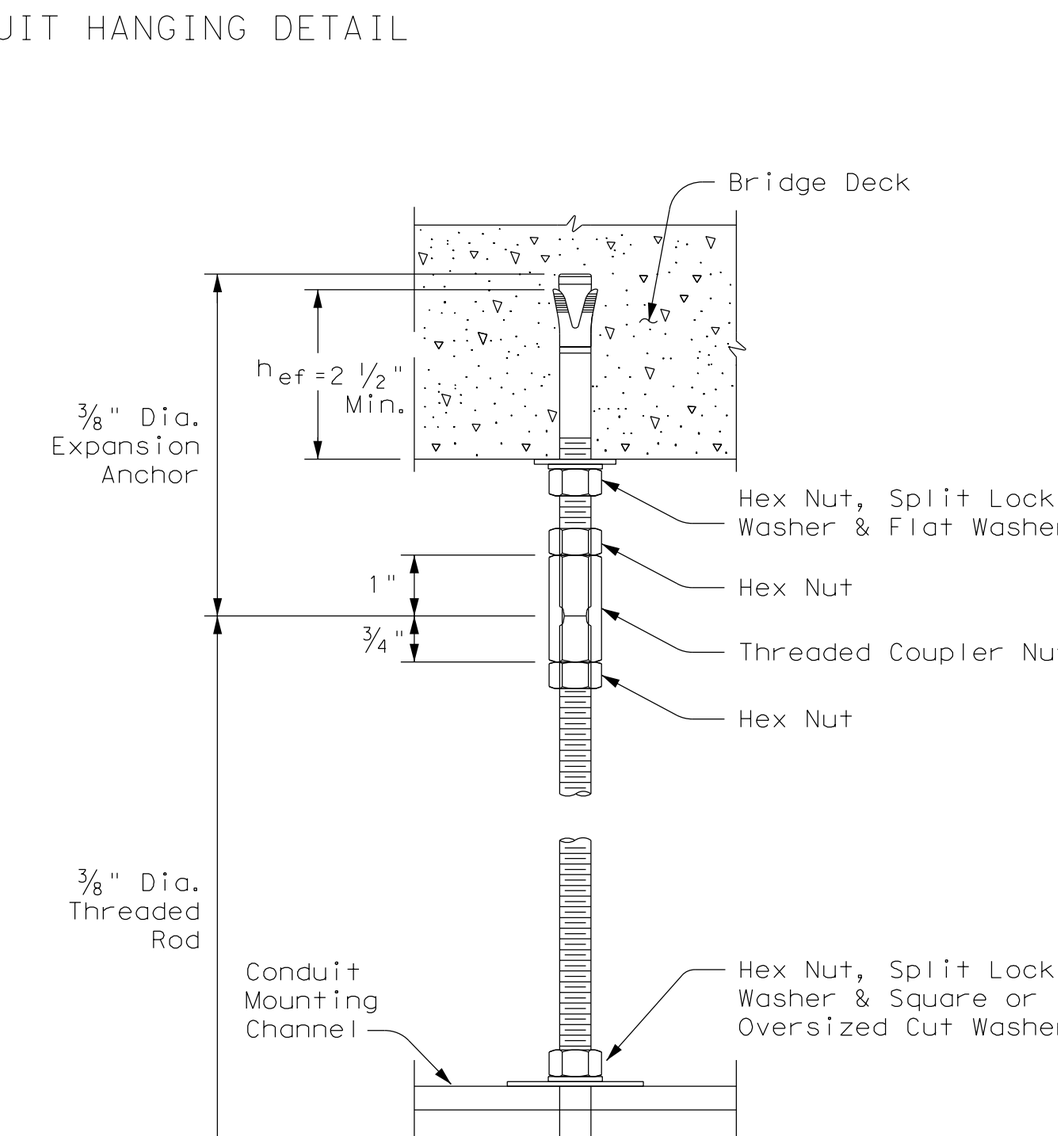


CONDUIT HANGING DETAIL

CONDUIT MOUNTING CHANNEL		
"SPAN"	"W" x "H"	"T"
less than 2'	1 5/8" x 1 3/8"	12 Ga.
2'-0" to 2'-6"	1 5/8" x 1 5/8"	12 Ga.
>2'-6" to 3'-0"	1 5/8" x 2 7/16"	12 Ga.

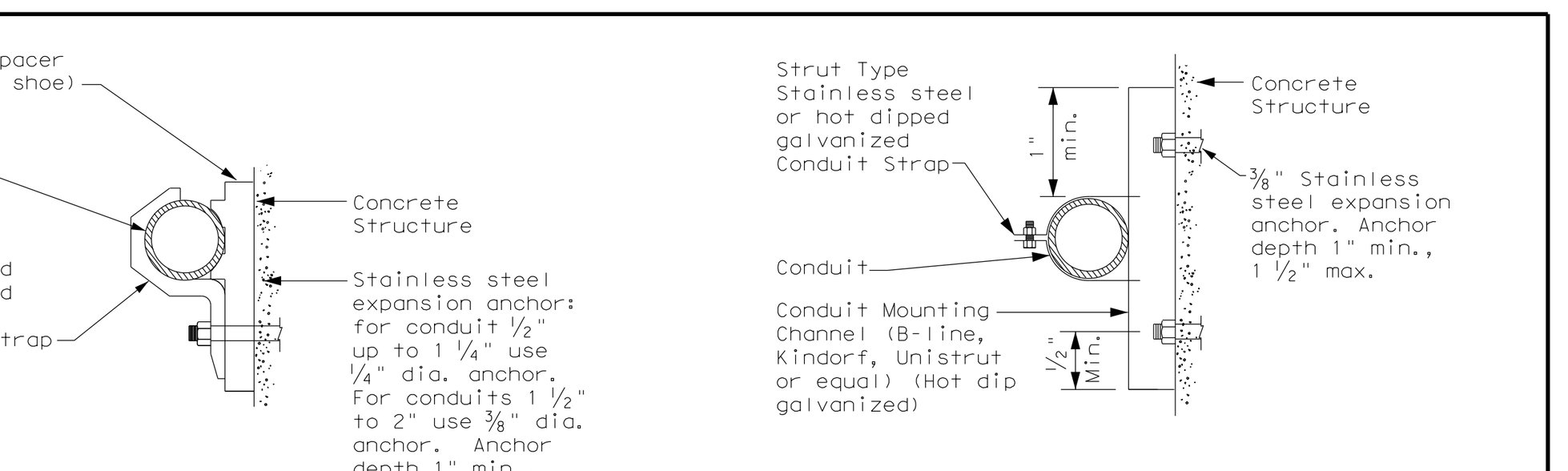
Channels with round or short slotted hole patterns are allowed, if the load carrying capacity is not reduced by more than 15%.



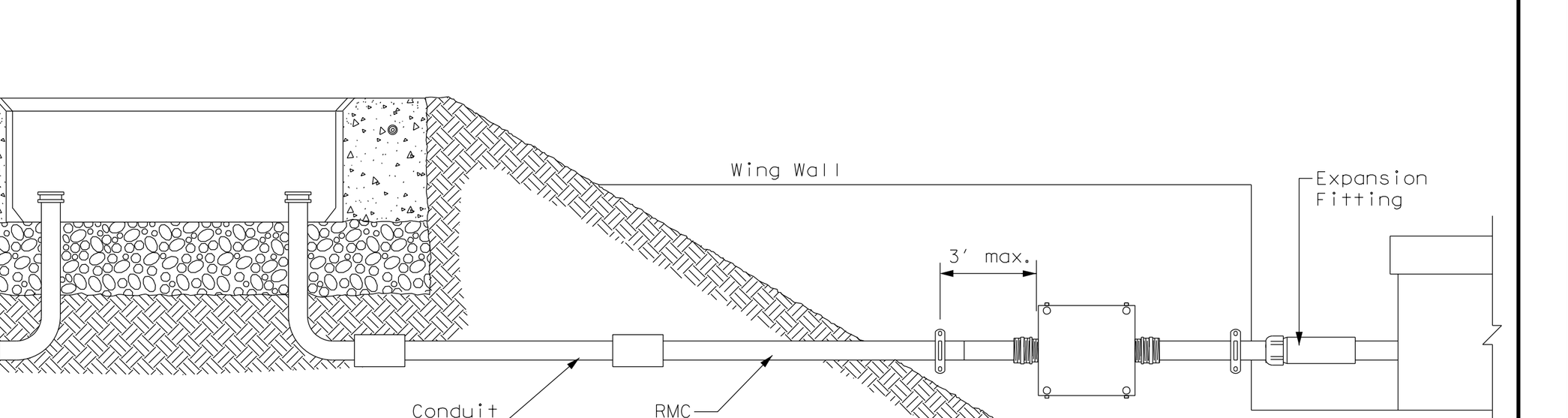


HANGER ASSEMBLY DETAIL

ELECTRIC CONDUIT TO BRIDGE DECK ATTACHMENT



CONDUIT MOUNTING OPTIONS
Attachment to concrete surfaces
See ED(1)B.2



TYPICAL CONDUIT ENTRY TO BRIDGE STRUCTURE DETAIL

EXPANSION ANCHOR NOTES FOR BRIDGE DECK ATTACHMENT

1. Use torque controlled mechanical expansion anchors that are approved for use in cracked concrete by the International Code Council, Evaluation Service (ICC-ES). The chosen anchor product shall have a designated ICC-ES Evaluation Report number, and its approval status shall be maintained on the ICC-ES website under Division 031600 for Concrete Anchors.
2. Unless otherwise approved by the Engineer: do not use adhesive anchors; do not use expansion anchors that are not included in the ICC-ES approval list; and do not use expansion anchors that are only approved for use in uncracked concrete.
3. Use anchors manufactured with stainless steel expansion wedges. Anchors manufactured with carbon steel expansion wedges are not allowed. Anchor bodies can be either zinc-plated carbon steel or stainless steel. For application in marine environment, both the anchor body and expansion wedge shall be stainless steel.
4. Install anchors as shown on the plans and in accordance with the anchor manufacturer's published installation instructions. Arrange a field demonstration test to evaluate the procedures and tools. The test shall be witnessed and approved by the Engineer prior to furnishing anchors on the structure.
5. Prior to hole drilling, use rebar locator to ensure clearing of existing deck strands or reinforcement. Install anchors to ensure a minimum effective embedment depth, (h_{ef}), as shown. Increase (h_{ef}) as needed to ensure sufficient thread length for proper torqueing and tightening of anchors.
6. Use anchors of minimum 1600 Lbs tensile capacity (minimum of steel, concrete breakout, and concrete pullout strengths as determined by ACI 318 Appendix D) at the required minimum embedment depth (h_{ef}). No lateral loads shall be introduced after conduit installation.

Texas Department of Transportation | Traffic Operations Division Standard

ELECTRICAL DETAILS
CONDUIT SUPPORTS

ED(2)-14

FILE: ed2-14.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
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REVISIONS	DIST		COUNTY	SHEET NO.

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ELECTRICAL CONDUCTORS

A. MATERIAL INFORMATION

1. Provide Type XHHW insulated conductors in accordance with Departmental Material Specification (DMS)11040 "Conductors" and Item 620 "Electrical Conductors." Provide conductors as listed on the Material Producers List (MPL) on the Department web site under "Roadway Illumination and Electrical Supplies" Item 620. Color code insulated conductors in conformance with the NEC. Identify grounded (neutral) conductors with white insulation. Identify grounding conductors (ground wires) with green insulation or bare conductors. Identify ungrounded (hot) conductors with any color insulation except green, white, or gray. Keep color scheme consistent throughout the wiring system. Identify conductors 6 American Wire Gauge (AWG) and smaller by continuous color jacket. Identify electrical conductors 4 AWG and larger by continuous color jacket or by colored tape. When identifying conductors with colored tape, mark at least 6 in. of the conductor's insulation with half laps of tape.
2. Provide a solid copper 6 AWG grounding electrode conductor to bond the electrical service equipment to the concrete encased grounding electrode or the ground rod at the service location. Connect the grounding electrode conductor to the ground rod with a UL listed connector in accordance with DMS 11040. Connect the grounding electrode conductor to the concrete encased grounding electrode as shown in the plans.
3. Where two or more circuits are present in one conduit or enclosure, permanently identify the conductors of each branch circuit by attaching a non-metallic tag around both circuit conductors at each accessible location. Provide tags with two straps, large enough to indicate circuit number, letter, or other identification as shown in the plans. Print circuit identification on the tag with a permanent marker.
4. Use listed compression or screw type pressure connectors, terminal blocks, or split bolt connectors for splicing as specified in DMS 11040. Use hot melt adhesive tape to fill the gap and seal the ends of heat shrink tubing. Provide UL listed gel-filled insulating splice covers. Splicing materials, insulating materials, breakaway disconnects, splice covers, and fuse holders are subsidiary to various bid items.

B. CONSTRUCTION METHODS

1. Use only a flat, high tensile strength polyester fiber pull tape for pulling conductors through the conduit system. After installing conductors in conduit, perform conductor pull test. If a conductor cannot be freely pulled, make any needed alterations or repairs at no additional cost to the department. Perform insulation resistance tests in accordance with Item 620. Coordinate with the Engineer to witness the tests.
2. Leave 2 ft. minimum, 3 ft. maximum length for each conductor up to the splice in ground boxes. Leave 3 ft. minimum, 4 ft. maximum length of conductor in ground boxes when pulled through with no splice. Leave 1 ft. minimum, 1.5 ft. maximum length of conductor at enclosures, weatherheads and pole bases.
3. Make splices only in junction boxes, ground boxes, pole bases, or electrical enclosures and use only listed compression or screw type pressure connectors, terminal blocks, or split bolt connectors. Insulate splices with heavy wall heat shrink tubing or gel-filled insulating splice covers to provide a watertight splice. Overlap conductor insulation with heat shrink tubing a minimum of 2 in. past both sides of the splice. Where heat shrink tubing may not shrink sufficiently to provide a watertight seal around the individual conductors, prior to heating the tubing, increase the diameter of the conductor insulation using hot melt adhesive tape to provide a watertight seal between the individual conductors and the heat shrink tubing. Ensure the tape extends past the heat shrink tubing. Use hot melt adhesive tape to fill the gap and seal the ends of heat shrink tubing. Heat shrink tubing that appears to have been burned, or overheated, is considered defective and must be replaced.
4. Size and install gel-filled insulating splice covers according to manufacturer's specifications when used in place of heat shrink tubing.
5. Wire nuts with factory applied waterproof sealant may be used for 8 AWG or smaller conductors in above ground junction boxes, but not in pole bases or ground boxes. Install wire nuts in an upright position to prevent the accumulation of water.
6. Support conductors in illumination poles with a J-hook at the top of the pole.
7. When terminating conductors, remove the insulation and jacketing material without nicking the individual strands of the conductor. Conductors with nicked individual conductor strands or removed strands will be considered damaged.
8. Replace conductors and cables that are damaged beyond repair or that fail an insulation resistance test at no additional cost to the department.
9. Do not repair damaged conductors with duct tape, electrical tape, or wire nuts. Use only approved splicing methods.
10. Do not terminate more than one conductor under a single connector, unless the connector is rated for multiple conductors. Do not exceed the pressure connector's listing for maximum number and size of conductors allowed.
11. Install breakaway connectors on conductors bid under Item 620 whenever those conductors pass through a breakaway support device. Follow manufacturer's instructions when terminating conductors to breakaway connectors. Properly torque threaded connections. Proper terminations are critical to the safe operation of breakaway devices. Trim waterproofing boots on breakaway connectors to fit snugly around the conductor to ensure waterproof connection. Only one conductor may enter a single opening in a boot. Provide waterproof boots with the correct number of openings. Leave unused openings factory sealed. Use prequalified breakaway connectors as shown on the MPL.
12. Provide and install a separate stranded equipment grounding conductor (EGC) in all conduits that contain circuit wiring of 50 volts or more. Unless shown elsewhere, size the EGC to be the same size as the largest current carrying conductor contained in the conduit. Ensure all EGCs are bonded together at every accessible location. For traffic signal installations, provide a minimum size 8 AWG EGC. The EGC is paid for under Item 620.

C. TEMPORARY WIRING

1. Install temporary conductors and electrical equipment in accordance with the NEC article "Temporary Installations" and Department standard sheets.
2. Provide a ground fault circuit interrupter (GFCI) for power outlets for portable electrical equipment, power tools, ice machines, ice storage bins and refrigerators located outdoors at grade. GFCI may be any one of the following: molded cord and plug set, receptacle, or circuit breaker type.
3. Use listed wire nuts with factory applied sealant for temporary wiring where approved.
4. Enclose conductor splices within a listed enclosure or ground box, or ensure the splices are more than 10 ft. above grade vertically and more than 5 ft. horizontally from any metal structure. Where installing temporary conductors in areas subject to vehicle traffic or mobile construction equipment, ensure the vertical clearance to ground is at least 18 ft. when measured at the lowest point. Ground messenger wires that support power conductors in conformance with the NEC.
5. Protect and when necessary repair any existing electrical conduits uncovered during the construction process in a timely manner and in conformance with the NEC.

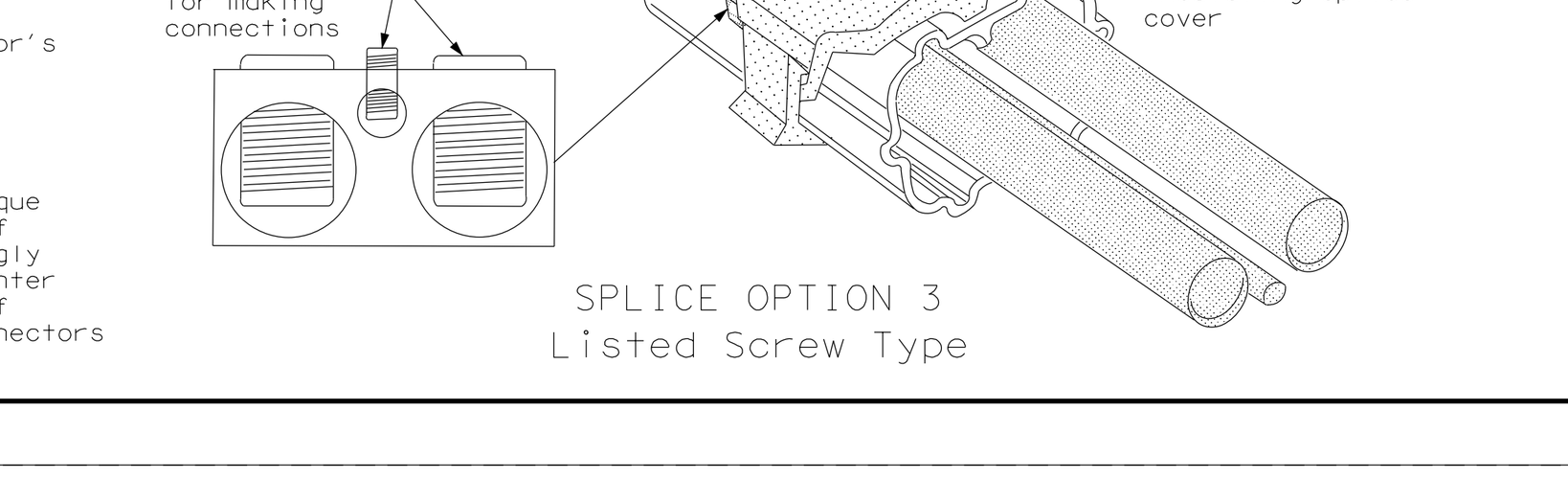
GROUND RODS & GROUNDING ELECTRODES

A. MATERIAL INFORMATION

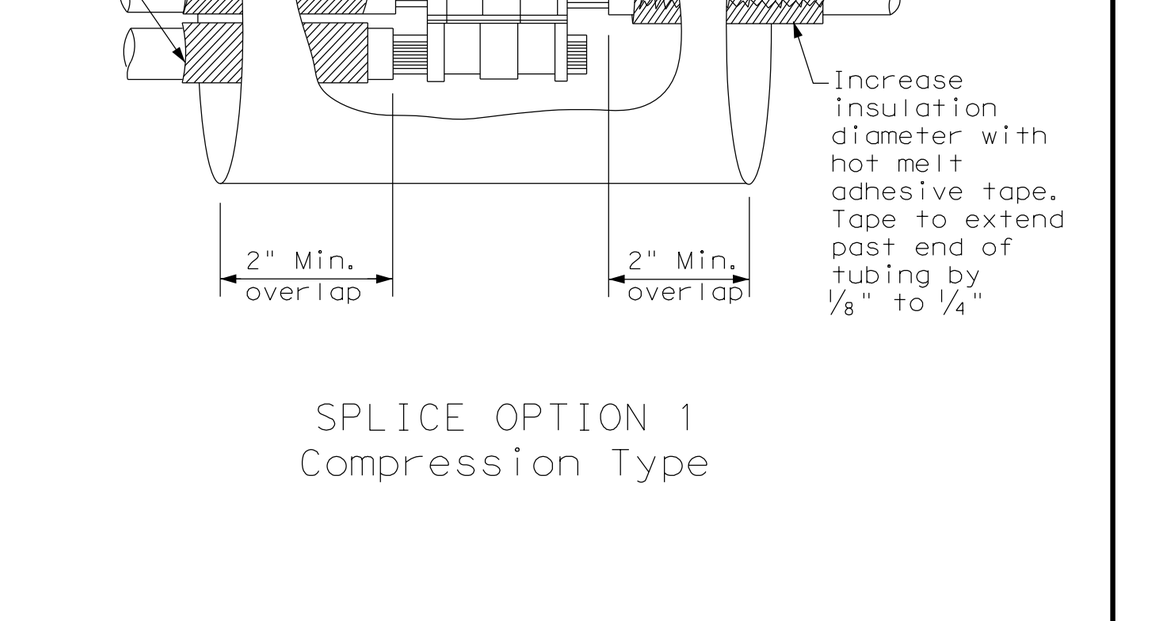
1. Provide and install a grounding electrode at electrical services. Provide ground rods according to DMS 11040 and the plans. Larger diameter or longer length rods may be called for in some specific locations, see the individual plans sheets. Concrete encased grounding electrodes may be called for in specific locations including electrical service, see individual plan sheets.

B. CONSTRUCTION METHODS

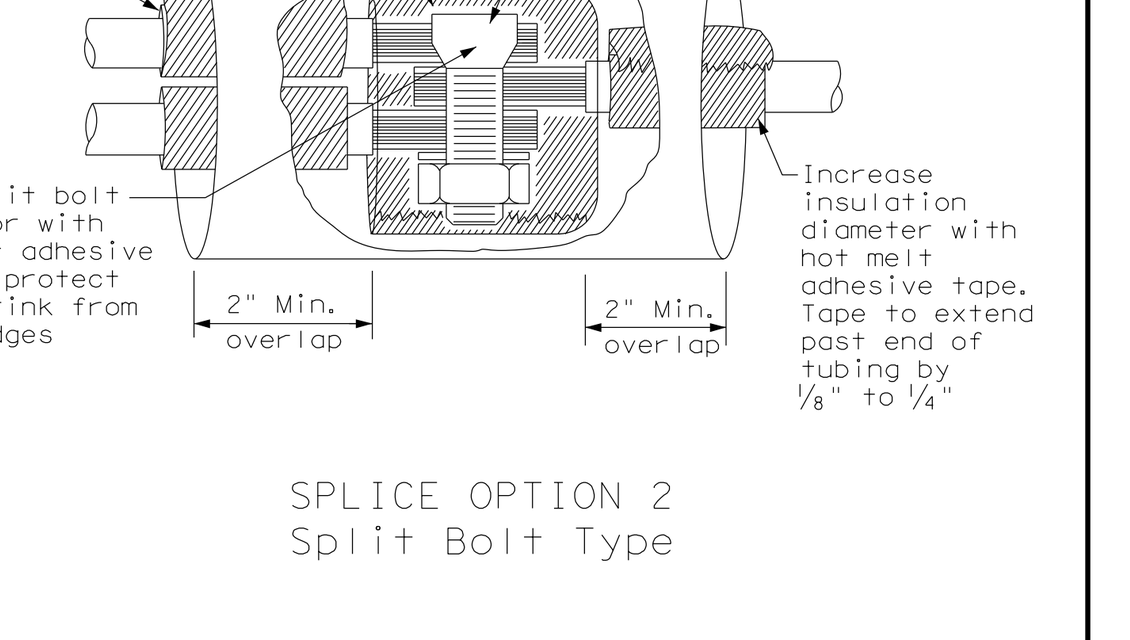
1. Furnish auxiliary ground rods for lightning protection and install in soil, concrete, or both, as called for in the plans. For ground rods installed in concrete, ensure the connection of the conductor to the ground rod is readily accessible for inspection or repairs. For ground rods installed in soil, ensure that the upper end is between 2 to 4 in. below finished grade.
2. Do not place ground rods in the same drilled hole as a timber pole.
3. Install ground rods so the imprinted part number is at the upper end of the rod.
4. Remove all non-conductive coatings such as concrete splatter from the rod at the clamp location.
5. Route all conductors as short and straight as possible for connection to lightning protection ground rods. When a bend is required, ensure a minimum radius bend of four inches for these conductors.
6. Unless otherwise called for in the plans, protect grounding electrode conductors with non-metallic conduit. When protecting grounding electrode conductors with metal conduit, provide and install a grounding type bushing and properly sized bonding jumper on each end of the metal conduit.
7. Written authorization is required before installing a ground rod in a horizontal trench for rocky soil or a solid rock bottom.



SPLICE OPTION 3
Listed Screw Type



SPLICE OPTION 1
Compression Type



SPLICE OPTION 2
Split Bolt Type

Texas Department of Transportation | Traffic Operations Division Standard

ELECTRICAL DETAILS
CONDUCTORS

ED(3)-14

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ELECTRICAL SERVICES NOTES

1. Provide new materials. Ensure installation and materials comply with the applicable provisions of the National Electrical Code (NEC) and National Electrical Manufacturers Association (NEMA) standards. Ensure material is Underwriters Laboratories (UL) listed. Provide and install electrical service conduits, conductors, disconnects, contactors, circuit breaker panels, and branch circuit breakers as shown on the Electrical Service Data chart in the plans. Faulty fabrication or poor workmanship in material, equipment, or installation is justification for rejection. Where manufacturers provide warranties and guarantees as a customary trade practice, furnish these to the State.
2. Provide electrical services in accordance with Electrical Details standard sheets, Departmental Material Specification (DMS) 11080 "Electrical Services,"DMS 11081 "Electrical Services-Type A," DMS 11082 "Electrical Services-Type C," DMS 11083 "Electrical Services-Type D," DMS 11084 "Electrical Services-Type T," DMS 11085 "Electrical Services-Pedestal (PS)", and Item 628 "Electrical Services" of the Standard Specifications. Provide electrical service types A, C, and D, as listed on the Material Producers List (MPL) on the Department web site under "Roadway Illumination and Electrical Supplies," Item 628. Provide other service types as detailed on the plans.
3. Provide all work, materials, services, and any incidentals needed to install a complete electrical service as specified in the plans.
4. Coordinate with the Engineer and the utility provider for metering and compliance with utility requirements. Primary line extensions, connection charges, meter charges, and other charges by the utility company to provide power to the location are paid for in accordance with Item 628. Get approval for the costs associated with these charges prior to engaging the utility company to do the work. Consult with the utility provider to determine costs and requirements, and coordinate the work as approved.
5. The enclosure manufacturer will provide Master Lock Type 2 with brass tumblers keyed #2195 for all custom electrical enclosures. Installing Contractor is to provide Master Lock #2195 Type 2 with brass tumblers for "off the shelf" enclosures. Master Lock #2195 keys and locks become property of the State. Unless otherwise approved, do not energize electrical service equipment until locks are installed.
6. Enclosures with external disconnects that de-energize all equipment inside the enclosure do not need a dead front trim. Protect incoming line terminations from incidental contact as required by the NEC.
7. When galvanized is specified for nuts, screws, bolts or miscellaneous hardware, stainless steel may be used.
8. Provide wiring and electrical components rated for 75°C. Provide red, black, and white colored XHHW service entrance conductors of minimum size 6 American Wire Gauge (AWG). Identify size 6 AWG conductors by continuous color jacket. Identify electrical conductors sized 4 AWG and larger by continuous color jacket or by colored tape. Mark at least 6 inches of the conductor's insulation with half laps of colored tape, when identifying conductors. Ensure each service entrance conductor exits through a separately bushed non-metallic opening in the weatherhead. The lengths of the conductors outside the weatherhead are to be 12 inches minimum, 18 inches maximum, or as required by utility.
9. All electrical service conduit and conductors attached to the electrical service including the riser or the elbow below ground are subsidiary to the electrical service. For an underground utility feed, all service conduit and conductors after the elbow, including service conduit and conductors for the utility pole riser when furnished by the Contractor, will be paid for separately.
10. Provide rigid metal conduit (RMC) for all conduits on service, except for the $\frac{1}{2}$ in. PVC conduit containing the electrical service grounding electrode conductor. Size the service entrance conduit as shown in the plans. Ensure conduit for branch circuit entry to enclosure is the same size as that shown on the layout sheets for branch circuit conduit. Extend all rigid metal conduits a minimum of 6 inches underground and then couple to the type and schedule of the conduit shown on the layout for that particular branch circuit. Install a grounding bushing on the RMC where it terminates in the service enclosure.
11. Use of liquidtight flexible metal conduit (LFMC) is allowed between the meter and service enclosure when they are mounted 90 to 180 degrees to each other. Size the LFMC the same size as service entrance conduit. LFMC must not exceed 3 feet in length. Strap LFMC within 1 foot of each end. LFMC less than 12 inches in length need not be strapped. Each end of LFMC must have a grounding bushing or be terminated with a grounding fitting. The LFMC must contain a grounded (neutral) conductor. Ensure any bend in LFMC never exceeds 180 degrees. A pull test is required on all installed conductors, with at least six inches of free conductor movement demonstrated to the satisfaction of the Engineer.
12. Ensure all mounting hardware and installation details of services conform to utility company specifications.
13. For all electrical service enclosures listed under Item 628 on the MPL, the UL 508 enclosure manufacturers will prepare and submit a schematic drawing unique to each service. Before shipment to the job site, place the applicable laminated schematic drawings and the laminated plan sheet showing the electrical service data chart used to build the enclosure in the enclosure's data pocket. The installing contractor will copy and laminate the actual project plan sheets detailing all equipment and branch circuits supplied by that service. The laminated plan sheets are to be placed in the service enclosure's document pocket. Reduce 11 in. x 17 in. plan sheets to 8 $\frac{1}{2}$ in. x 11 in. before laminating. If the installation differs from the plan sheets, the installing contractor is to redline plan sheets before laminating.
14. When providing an "Off The Shelf" Type D or Type T service, provide laminated plan sheets detailing equipment and branch circuits supplied by that service. Reduce 11 in. x 17 in. plan sheets to 8 $\frac{1}{2}$ in. x 11 in before laminating. Deliver these drawings before completion of the work to the Engineer, instead of placing in enclosure that has no door pocket.
15. Do not install conduit in the back wall of a service enclosure where it would penetrate the equipment mounting panel inside the enclosure. Provide grounding bushings on all metal conduits, and terminate bonding jumpers to grounding bus. Grounding bushings are not required when the end of the metal conduit is fitted with a conduit sealing hub or threaded boss, such as a meter base hub.

SERVICE ASSEMBLY ENCLOSURE

1. Provide threaded hub for all conduit entries into the top of enclosure.
2. Type galvanized steel (GS) enclosures may be used for Type C panelboards and for Type D and T services that do not use an enclosure mounted photocell or lighting contactor. Provide GS enclosures in accordance with DMS 11080, 11082, 11083, and 11084.
3. Provide aluminum (AL) and stainless steel (SS) enclosures for Types A, C, and D in accordance with DMS 11080, 11081, 11082, 11083, and 11084. Do not paint stainless steel.
4. Provide pedestal service (PS) enclosures in accordance with ED(9) and DMS 11080 and 11085. Do not provide GS pedestal services. If GS is shown in the PS descriptive code, provide an AL enclosure.

MAIN DISCONNECT & BRANCH CIRCUIT BREAKERS

1. Field drill flange-mounted remote operator handle if needed, to ensure handle is lockable in both the "On" and "Off" positions.
2. When the utility company provides a transformer larger than 50 KVA, verify that the available fault current is less than the circuit breaker's ampere interrupting capacity (AIC) rating and provide documentation from the electric utility provider to the Engineer.

PHOTOELECTRIC CONTROL

1. Provide photocell as listed on the MPL. Move, adjust, or shield the photocell from stray or ambient night time light to ensure proper operation. Mount photocell facing north when practical. Mount top of pole photocells as shown on Top Mounted Photocell Detail.

*ELECTRICAL SERVICE DATA

Elec. Service ID	Plan Sheet Number	Electrical Service Description	Service Conduit **Size	Service Conductors No./Size	Safety Switch Amps	Main Ckt. Bkr. Pole/Amps	Two-Pole Contractor Amps	Panelbd/Loadcenter Amp Rating	Branch Circuit ID	Branch Ckt. Bkr. Pole/Amps	Branch Circuit Amps	KVA Load
SB 183	289	ELC SRV TY A 240/480 100(SS)AL(E)SF(U)	2"	3/#2	100	2P/100	100	N/A	Lighting NB	2P/40	26	28.1
									Lighting SB	2P/40	25	
									Underpass	1P/20	15	
NB Access	30	ELC SRV TY D 120/240 060(NS)SS(E)TS(O)	1 1/4"	3/#6	N/A	2P/60		100	Sig. Controller	1P/30	23	5.3
							30		Luminaires	2P/20	9	
									CCTV	1P/20	3	
2nd & Main	58	ELC SRV TY T 120/240 000(NS)GS(N)SP(O)	1 1/4"	3/#6	N/A	N/A	N/A	70	Flashing Beacon 1	1P/20	4	1.0
									Flashing Beacon 2	1P/20	4	

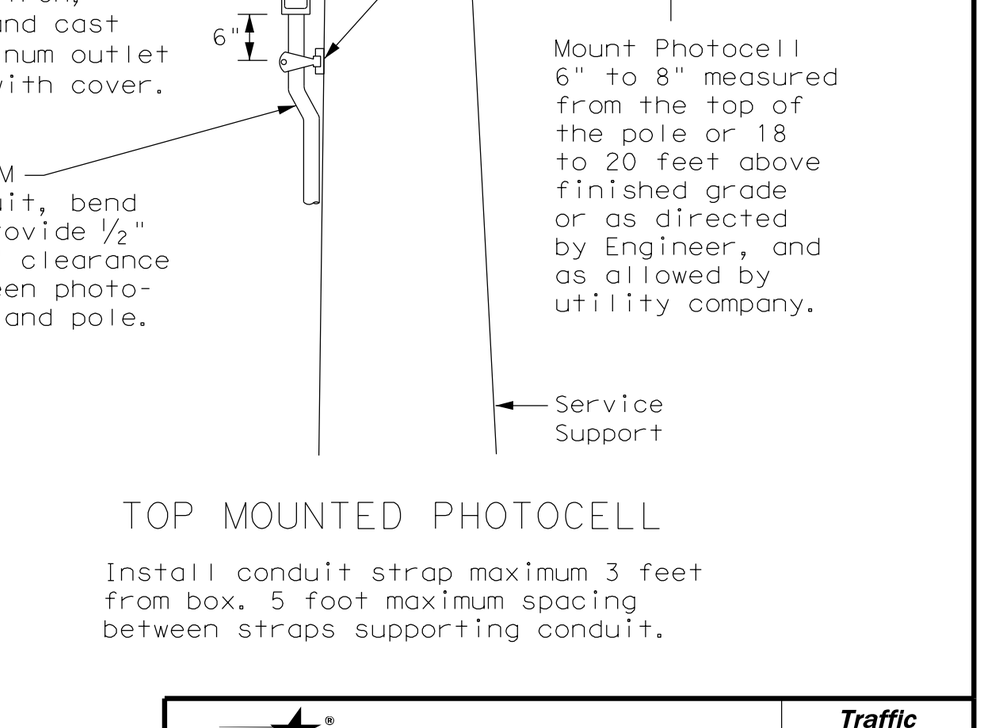
* Example only, not for construction. All new electrical services must have electrical service data chart specific to that service as shown in the plans.

** Verify service conduit size with utility. Size may change due to utility meter requirements. Ensure conduit size meets the National ELectrical Code.

EXPLANATION OF ELECTRICAL SERVICE DESCRIPTIVE CODE

ELEC SERV TY X XXX/XXX XXX (XX) XX (X) XX (X)

- Schematic Type
- Service Voltage V / V
- Disconnect Amp Rating: 000 indicates main lug only/ Typically Type T
- (SS)= Safety Switch Ahead of Meter-Check with Utility; (NS)= No safety Switch Ahead of Meter-Check with Utility
- Enclosure Type: GS= Galvanized steel("off the shelf"); SS= Stainless steel(Custom Enclosure)See MPL; AL= Aluminum (Custom Enclosure)See MPL
- Photocell Mounting Location: (E)= Inside Service/Enclosure Mounted; (T)= Top of pole; (L)= Luminaire mounted; (N)= None/No Photocell or Lighting Contactor Required
- Service Support Type: GC= Granite concrete; OC= Other concrete; TP= Timber pole; SP= Steel pole; SF= Steel frame; OT= Pole by others or paid for separately; EX= Existing pole; TS= Service on traffic signal pole; PS= Pedestal Service
- O= Overhead Service Feed from Utility; U= Underground Service Feed from Utility



TOP MOUNTED PHOTOCELL

Install conduit strap maximum 3 feet from box. 5 foot maximum spacing between straps supporting conduit.

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ELECTRICAL DETAILS
SERVICE NOTES & DATA

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WOLF RANCH PKWY / MEMORIAL DR

ILLUMINATION STANDARDS

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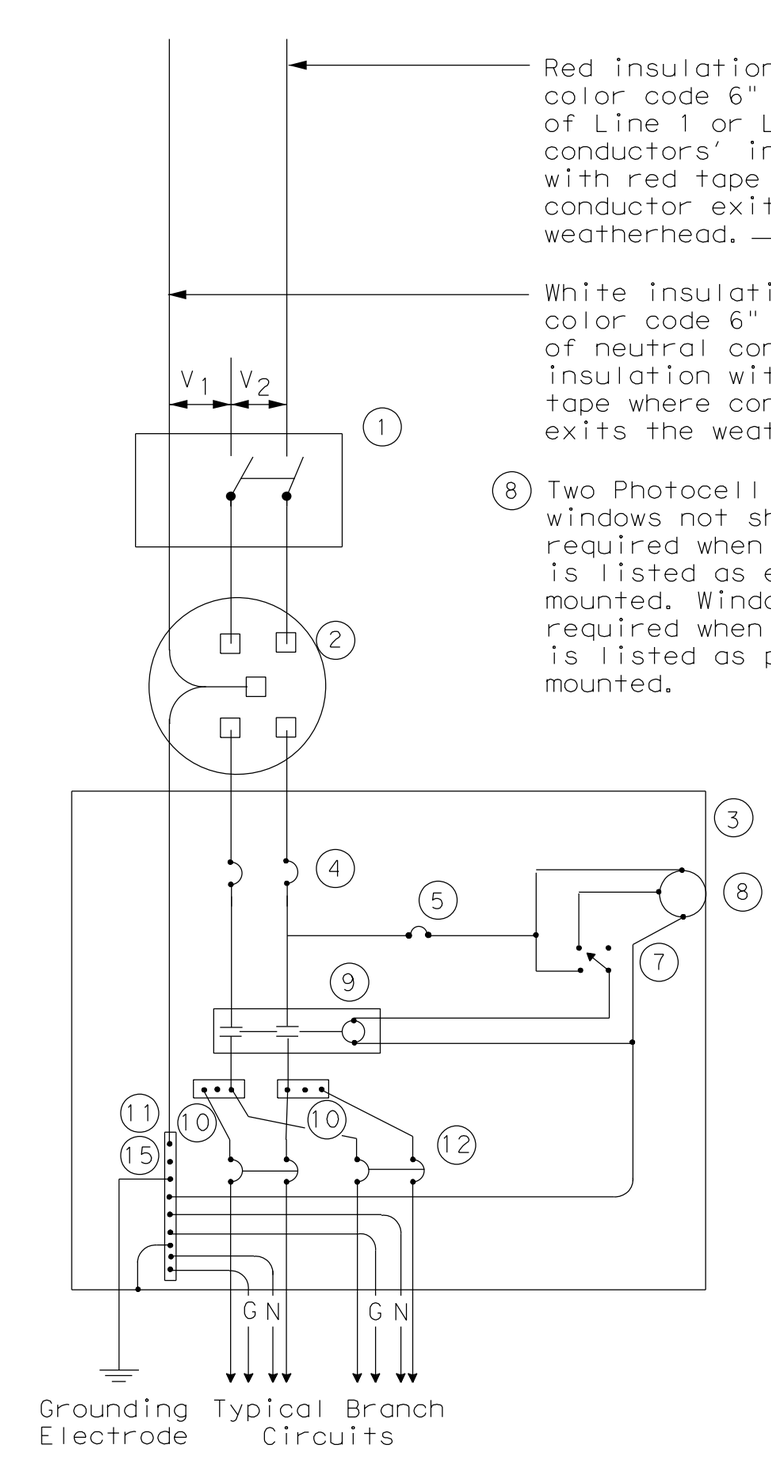
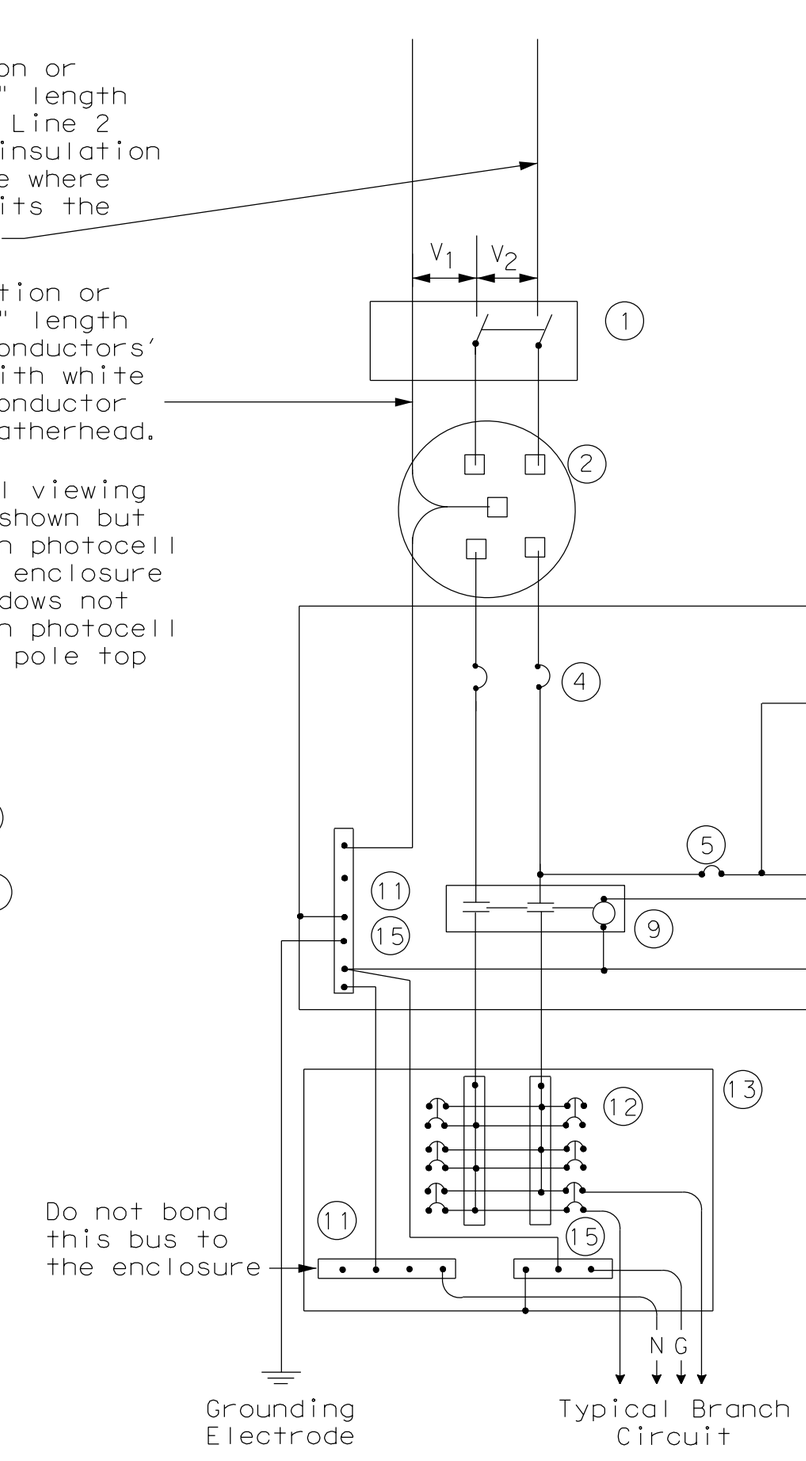
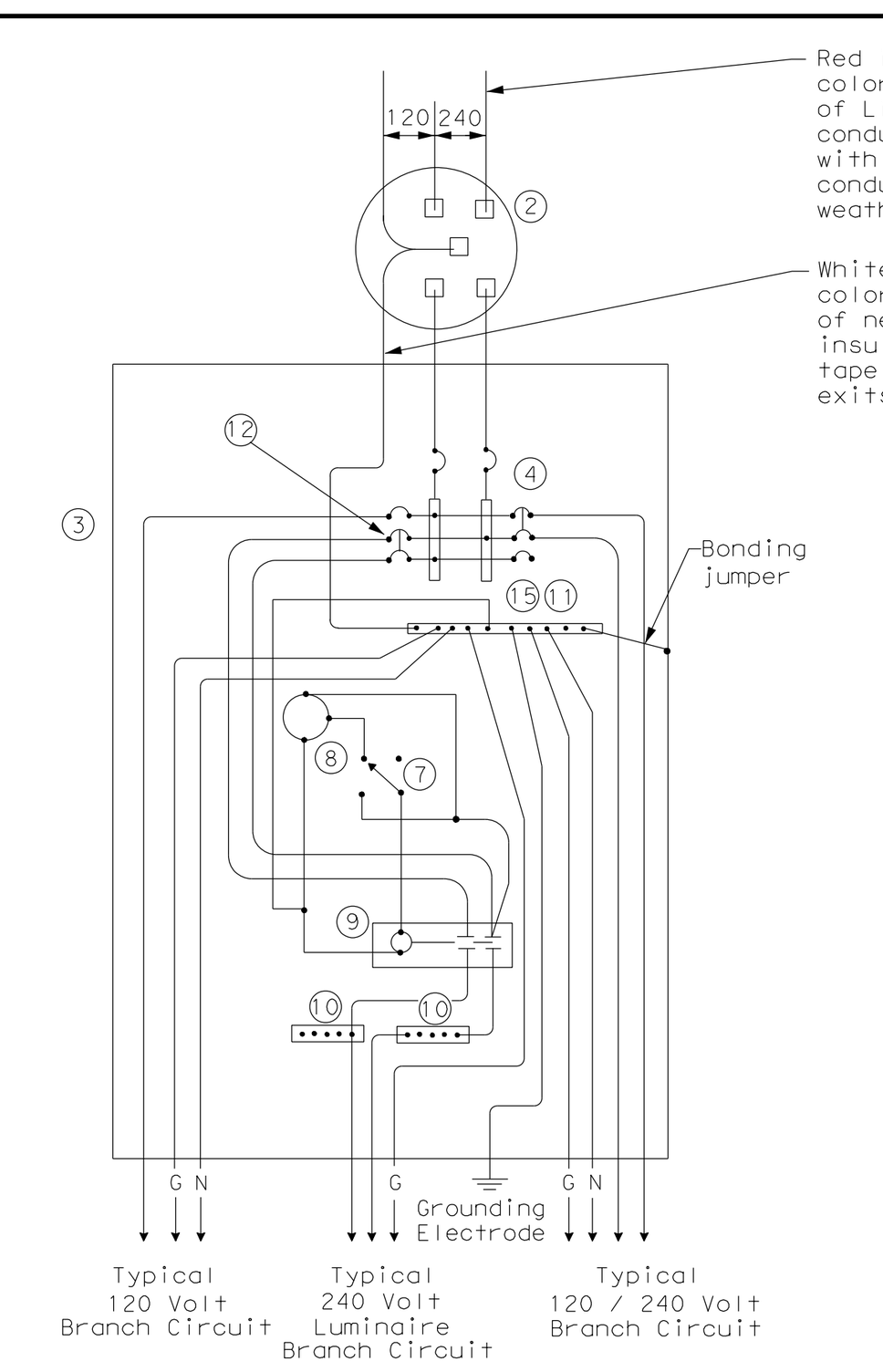


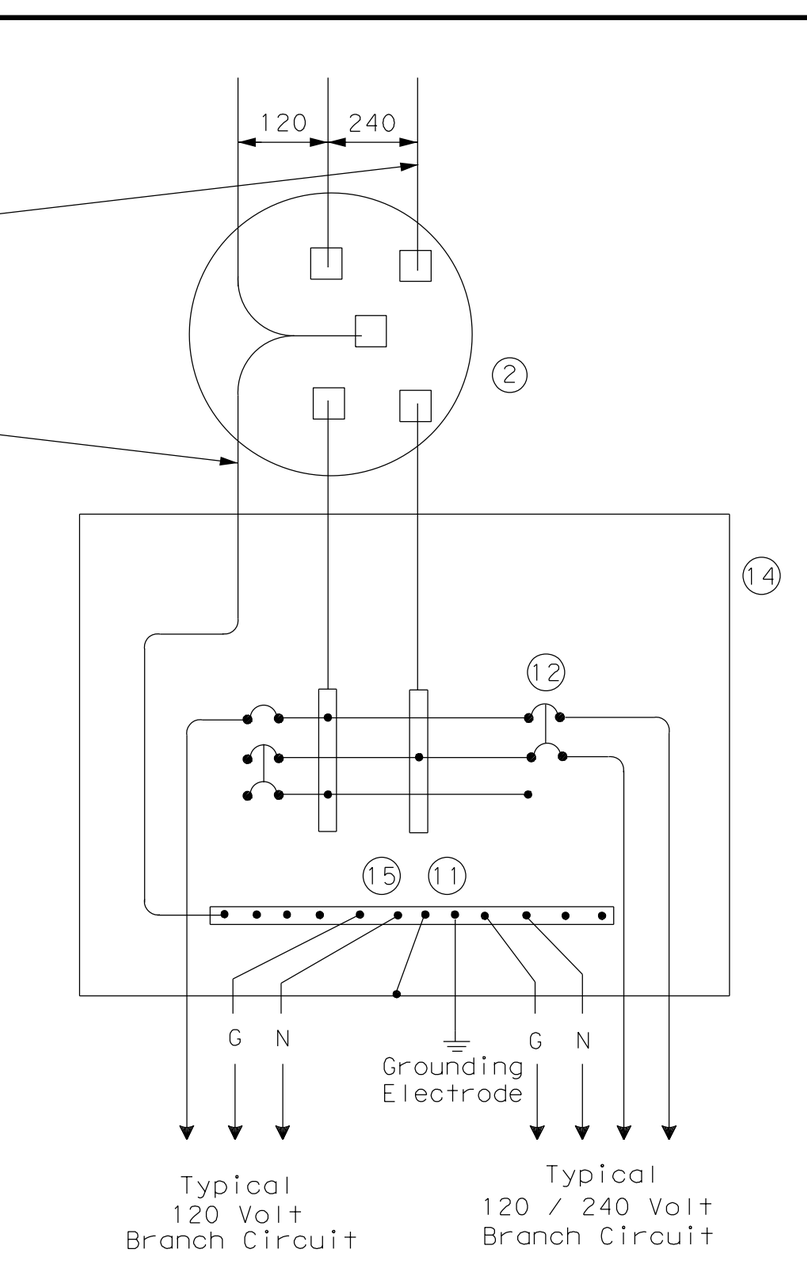
SCHEMATIC TYPE A
THREE WIRE



SCHEMATIC TYPE C
THREE WIRE



SCHEMATIC TYPE D - CUSTOM
120/240 VOLTS - THREE WIRE



SCHEMATIC TYPE T
120/240 VOLTS - THREE WIRE

Galvanized steel-"Buy Off The Shelf" only. When required install photocell top of the pole or on luminaire only, no lighting contractor will be installed.

WIRING LEGEND	
———	Power Wiring
———	Control Wiring
—N—	Neutral Conductor
—G—	Equipment grounding conductor-always required

SCHEMATIC LEGEND	
1	Safety Switch (when required)
2	Meter (when required-verify with electric utility provider)
3	Service Assembly Enclosure
4	Main Disconnect Breaker (See Electrical Service Data)
5	Circuit Breaker, 15 Amp (Control Circuit)
6	Auxiliary Enclosure
7	Control Station ("H-O-A" Switch)
8	Photo Electric Control (enclosure-mounted shown)
9	Lighting Contactor
10	Power Distribution Terminal Blocks
11	Neutral Bus
12	Branch Circuit Breaker (See Electrical Service Data)
13	Separate Circuit Breaker Panelboard
14	Load Center
15	Ground Bus

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ELECTRICAL DETAILS
SERVICE ENCLOSURE
AND NOTES

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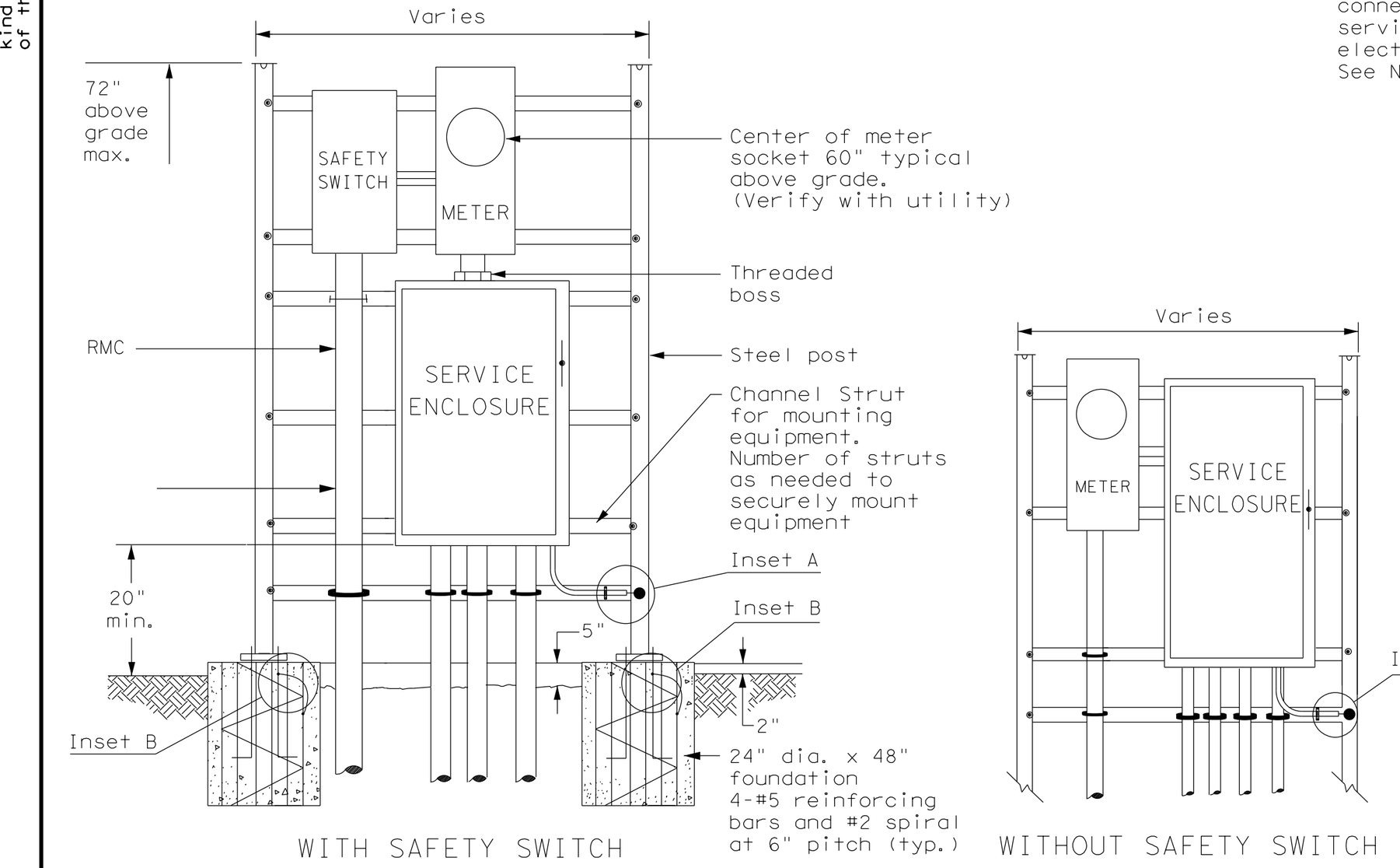
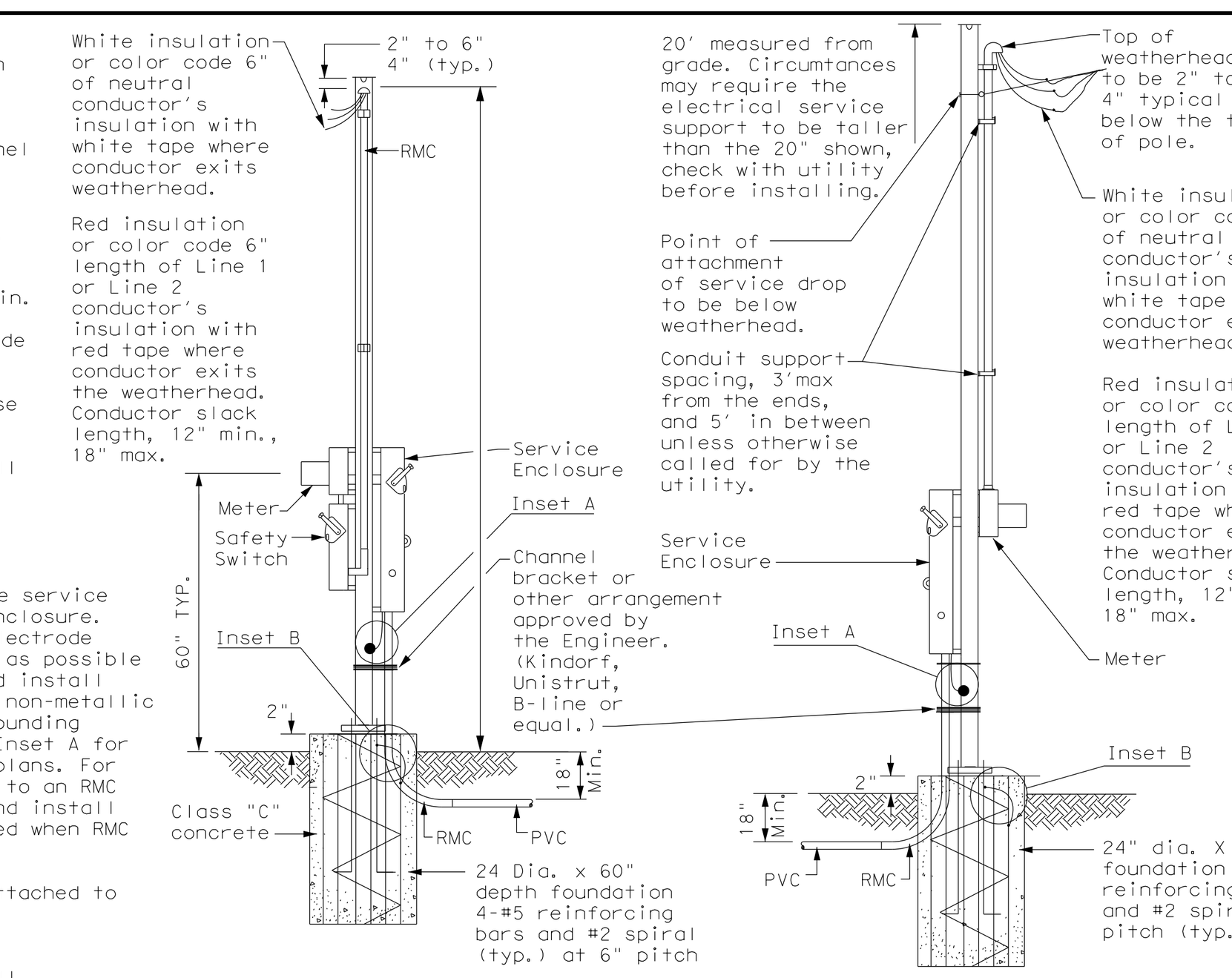
SUPPORT TYPE STEEL POLE (SP) AND STEEL FRAME (SF)

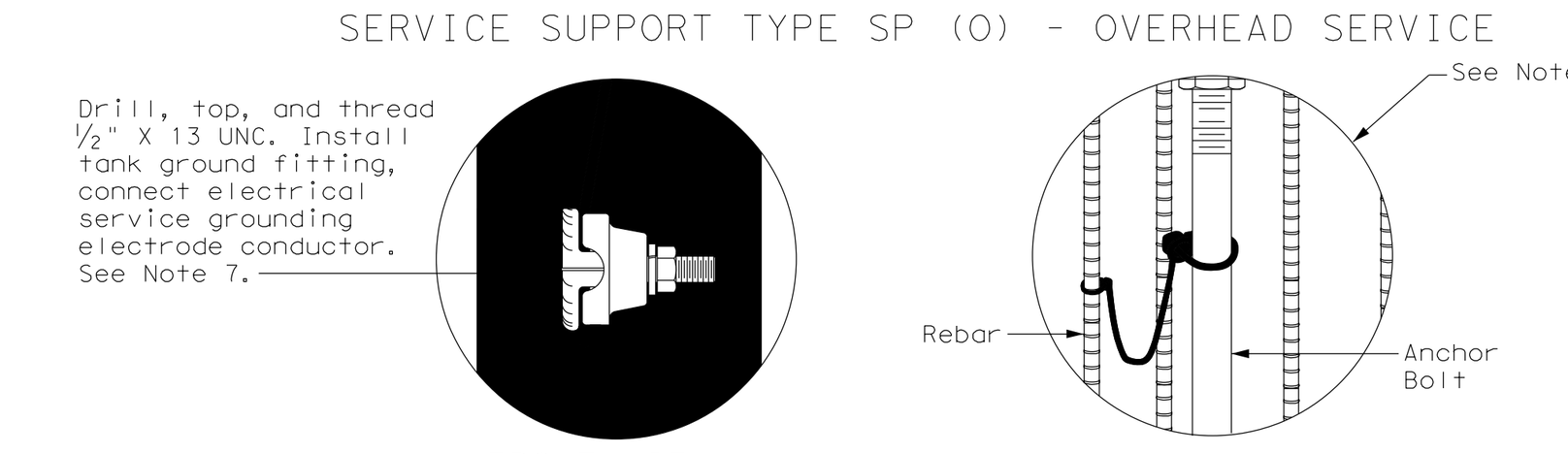
1. Provide steel pole and steel frame supports as per TxDOT Departmental Material Specification (DMS)11080 "Electrical Services." Mount all equipment and conduit on 12 gauge galvanized steel or stainless steel channel strut, 1 ½ in. or 1 ⅝ in. wide by 1 in. up to 3 ¾ in. deep Unistrut, Kindorf, B-line or equal. Bolt or weld all channel and hardware to vertical members as approved. Do not stack channel. File smooth and paint field cut ends of all channel with zinc-rich paint before installing.
2. Provide poles for overhead service with an eyebolt or similar fitting for attachment of the service drop to the pole in conformance with the electric utility provider's specifications.
3. Provide and install galvanized ¾ in. x 18 in. x 4 in. (dia. x length x hook length) anchor bolts for underground service supports. Provide and install galvanized ¾ in. x 56 in. x 4 in. anchor bolts for overhead service supports. Ensure anchor bolts have 3 in of thread, with 3 ¼ in. to 3 ½ in. of the exposed anchor bolt projecting above finished foundation. Provide and install leveling nuts for all anchor bolts.
4. Bond one of the anchor bolts to the rebar cage with 6 AWG bare stranded copper conductor. Use listed mechanical connectors rated for embedment in concrete. See Inset B.
5. Furnish and install rigid metallic ells in all steel pole and steel frame foundations for all conduits entering the service from underground.
6. Use class C concrete for foundations. Ensure reinforcing steel is Grade 60 with 3" of unobstructed concrete cover.
7. Drill and tap steel poles and frames for ½ in. X 13 UNC tank ground fitting. For steel pole service supports, provide and install tank ground fitting 4 in. to 6 in. below electrical service enclosure. Provide properly sized hole through the bottom of the enclosure for the service grounding electrode conductor. Ensure electrical service grounding electrode conductor is as short and straight as possible from the enclosure to the tank ground fitting. For steel frame service supports, provide and install tank ground fitting on steel frame post. Install service grounding electrode conductor in a non-metallic conduit or tubing from the enclosure to the steel frame post. Connect electrical service grounding electrode conductor to the tank ground fitting. See steel frame and steel pole details and Inset A for more information. Size service entrance conduit and branch circuit conduit as shown in the plans. For underground conduit runs from the electrical service, extend RMC from the service enclosure to an RMC elbow, and then connect the schedule type and size of conduit shown in the plans. Provide and install grounding bushings where RMC terminates in the enclosure. Grounding bushings are not required when RMC is fitted into a sealing hub or threaded boss.
8. If Steel pole or frame is painted, bond each separate painted piece with a bonding jumper attached to a tapped hole.
9. Provide ¼" - 20 machine screws for bonding. Do not use sheet metal screws. Remove all non-conductive material at contact points. Terminate bonding jumpers with listed devices. Install minimum size 6 AWG stranded copper bonding jumpers. Make up all threaded bonding connections wrench tight.
10. Avoid contact of the service drop and service entrance conductors with the metal pole to prevent abrasion of the insulated conductors.
11. Shop drawings are not required for service support structure unless specifically stated elsewhere or directed by the Engineer.

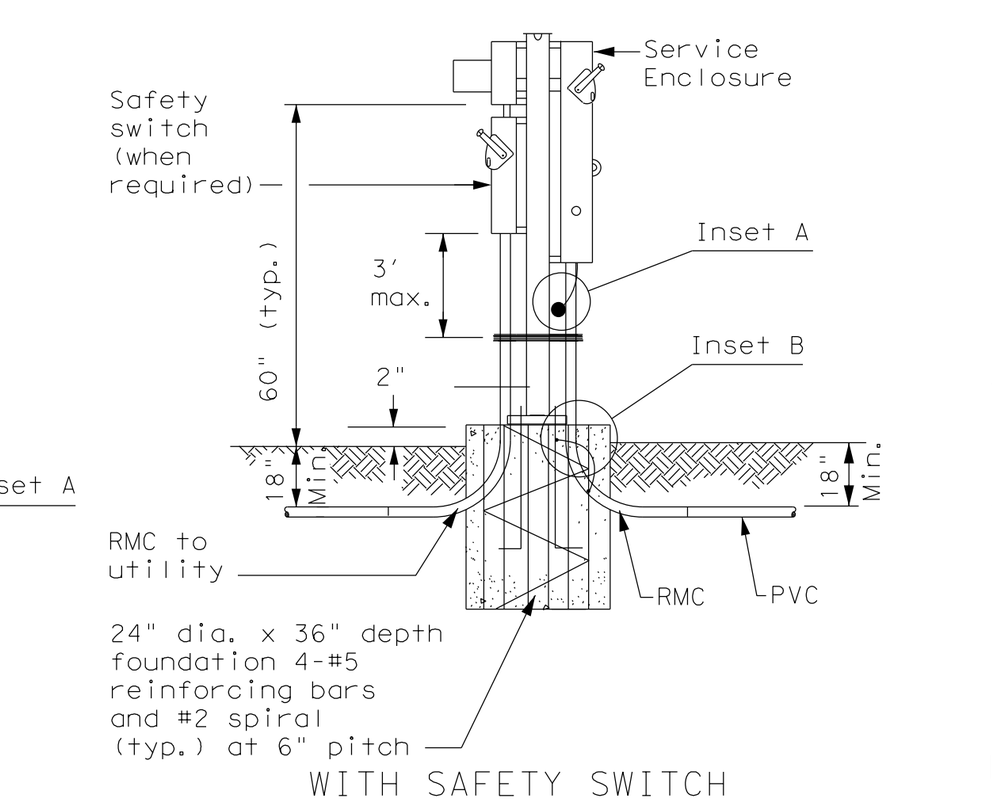


SERVICE SUPPORT TYPE SF(U) - UNDERGROUND SERVICE

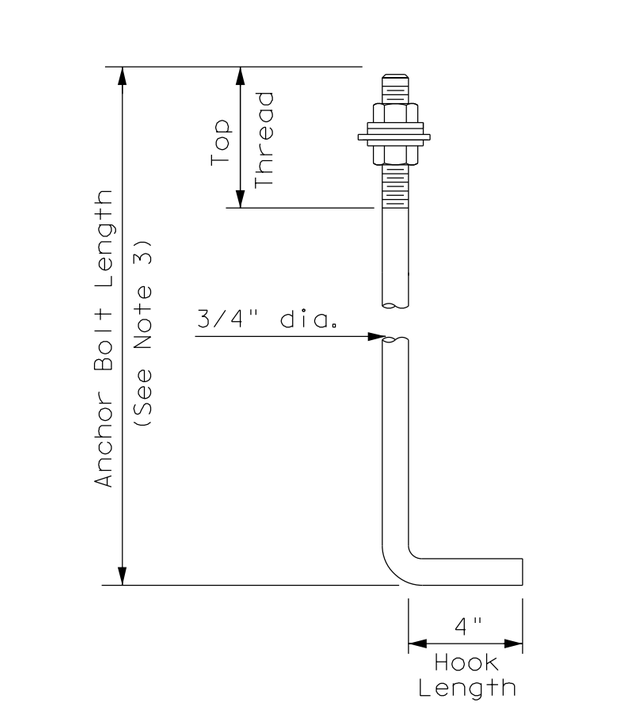


SERVICE SUPPORT TYPE SP (O) - OVERHEAD SERVICE

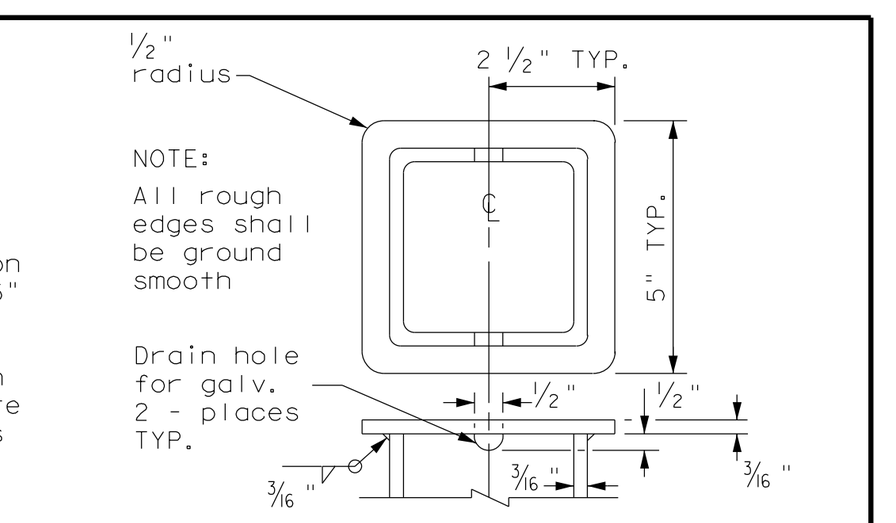




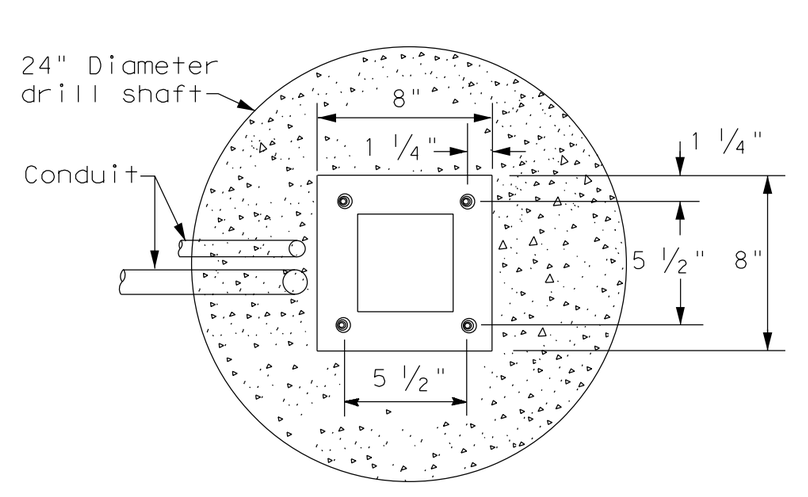
SERVICE SUPPORT TYPE SP(U) - UNDERGROUND SERVICE



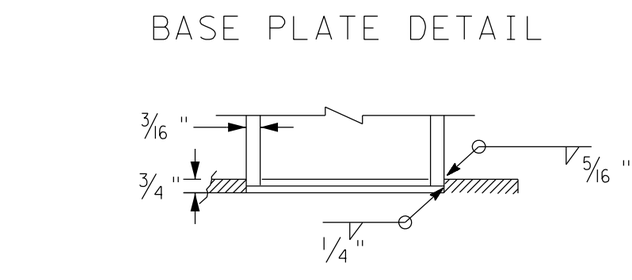
HOOKED ANCHOR DETAIL



POLE TOP PLATE

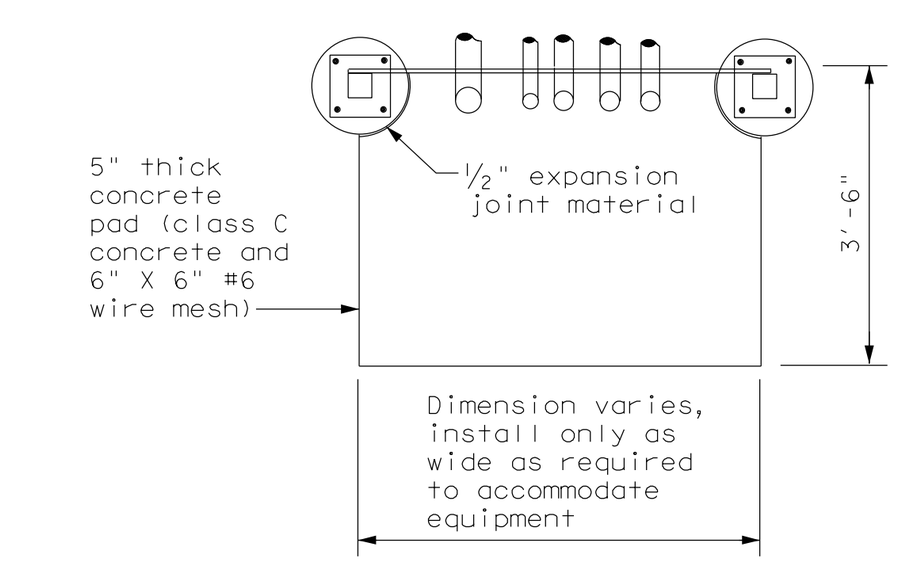


BASE PLATE DETAIL



BOTTOM OF POLE

SERVICE SUPPORT TYPE SF & SP



TOP VIEW
SERVICE SUPPORT TY SF (O) & SF (U)

Texas Department of Transportation — Traffic Operations Division Standard

ELECTRICAL DETAILS
SERVICE SUPPORT
TYPES SF & SP

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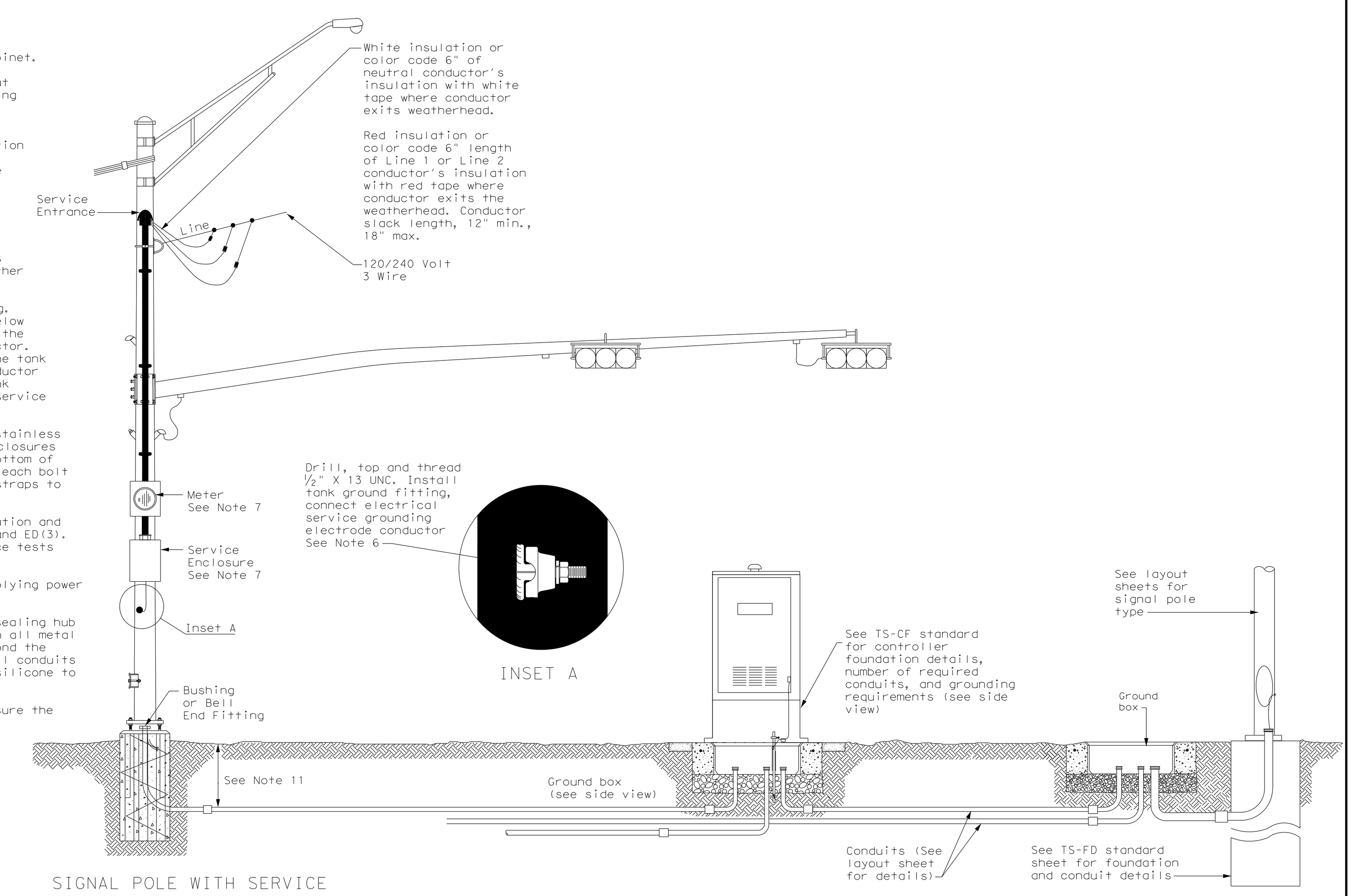
TRAFFIC SIGNAL NOTES

1. Do not pass luminaire conductors through the signal controller cabinet.
2. Include an equipment grounding conductor in all conduits throughout the electrical system. Bond all exposed metal parts to the grounding conductor.
3. Provide roadway luminaires, when required, in accordance with the material and construction sections of Item 610, "Roadway Illumination Assemblies," except for performance testing of luminaires. Test installed roadway luminaires for proper operation as a part of the associated traffic signal system test.
4. If internally illuminated street name signs are approved for use, ground the fixture to the pole with a 12 AWG green XHHW conductor.
5. Bond anchor bolts to rebar cage in two locations using #3 bars or 6 AWG stranded copper conductors. Use listed mechanical connectors rated for embedment in concrete. See TXDOT standard TS-FD for further details.
6. Drill and tap signal poles for ½ in. X 13 UNC tank ground fitting. Provide and install tank ground fitting 4 in. to 6 in. directly below electrical service enclosure. Provide properly sized hole through the bottom of the enclosure for the service grounding electrode conductor. Connect the electrical service grounding electrode conductor to the tank ground fitting. Ensure electrical service grounding electrode conductor is as short and straight as possible from the enclosure to the tank ground fitting. See Inset A detail for further information. Size service entrance conduit and branch circuit conduit as shown in the plans.
7. Mount electrical service enclosure and meter to signal pole with stainless steel bands. Ensure bands are a minimum width of ¾ in. Secure enclosures to bands using two-bolt brackets. Install brackets near top and bottom of each enclosure. Install properly sized stainless steel washers on each bolt in the enclosure. Band or drill and tap properly sized stand-off straps to signal pole for attaching conduit.
8. Conduct pull tests and insulation resistance tests on all illumination and power conductors as required in Item 620 "Electrical Conductors" and ED(3). To prevent electronics damage, do not conduct insulation resistance tests on traffic signal cables after termination.
9. Lock all enclosures and bolt down all ground box covers before applying power to the signal installation.
10. Terminate conduits entering the top of enclosures with a conduit-sealing hub or threaded boss such as meter hub. Install a grounding bushing on all metal conduits not connected to conduit-sealing hub or threaded boss. Bond the grounding bushing to the ground bus with a bonding jumper. Seal all conduits entering enclosures with duct seal or expanding foam. Do not use silicone to seal conduit ends.
11. For all conduits, ensure the burial depth is a minimum of 18". Ensure the minimum burial depth for conduit placed under a roadway is 24".

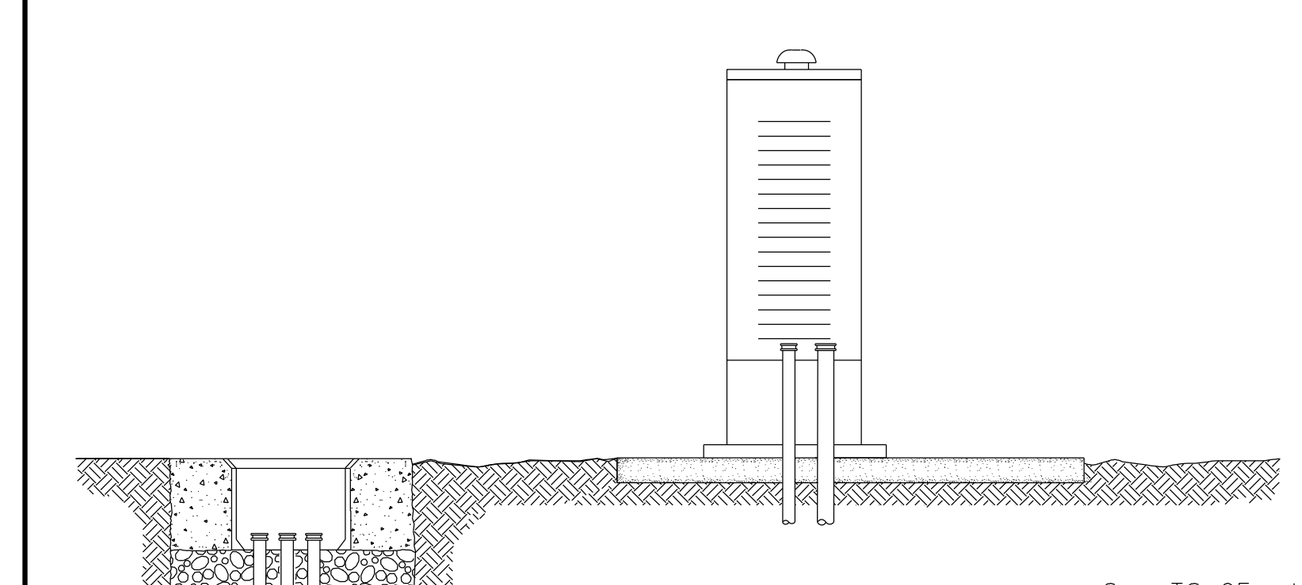


SIGNAL POLE WITH SERVICE

Type T electrical service mounted on signal pole shown as an example. See electrical details, layout sheets, and electrical service data chart for additional details.

SIGNAL CONTROLLER
FRONT VIEW

SIGNAL POLE



SIGNAL CONTROLLER
SIDE VIEW

See TS-CF standard for conduit and grounding requirements. See layout sheets for ground box locations and any additional conduits that are required.

Texas Department of Transportation — Traffic Operations Division Standard

ELECTRICAL DETAILS
TYPICAL TRAFFIC SIGNAL
SYSTEM DETAILS

ED(8)-14

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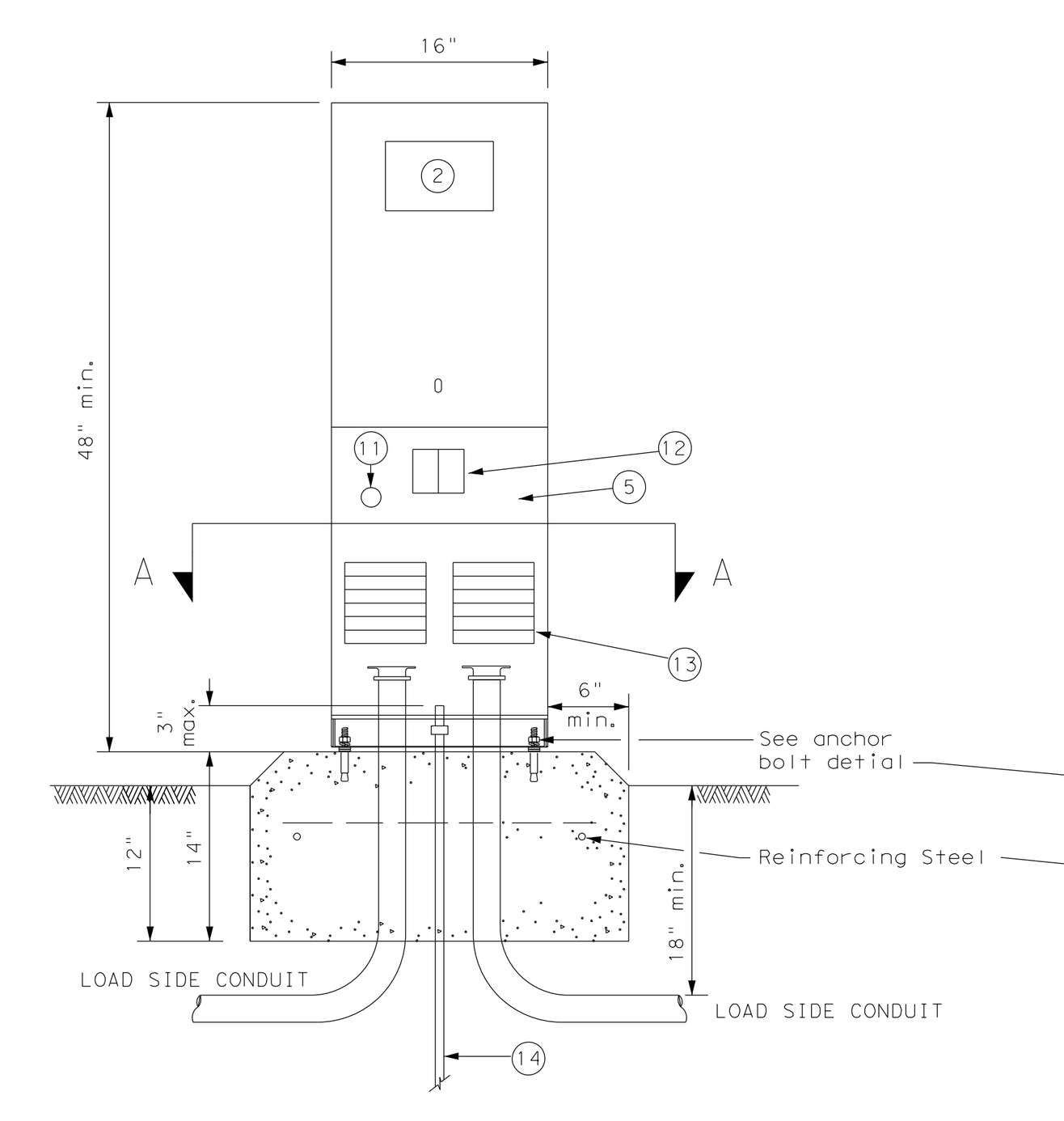
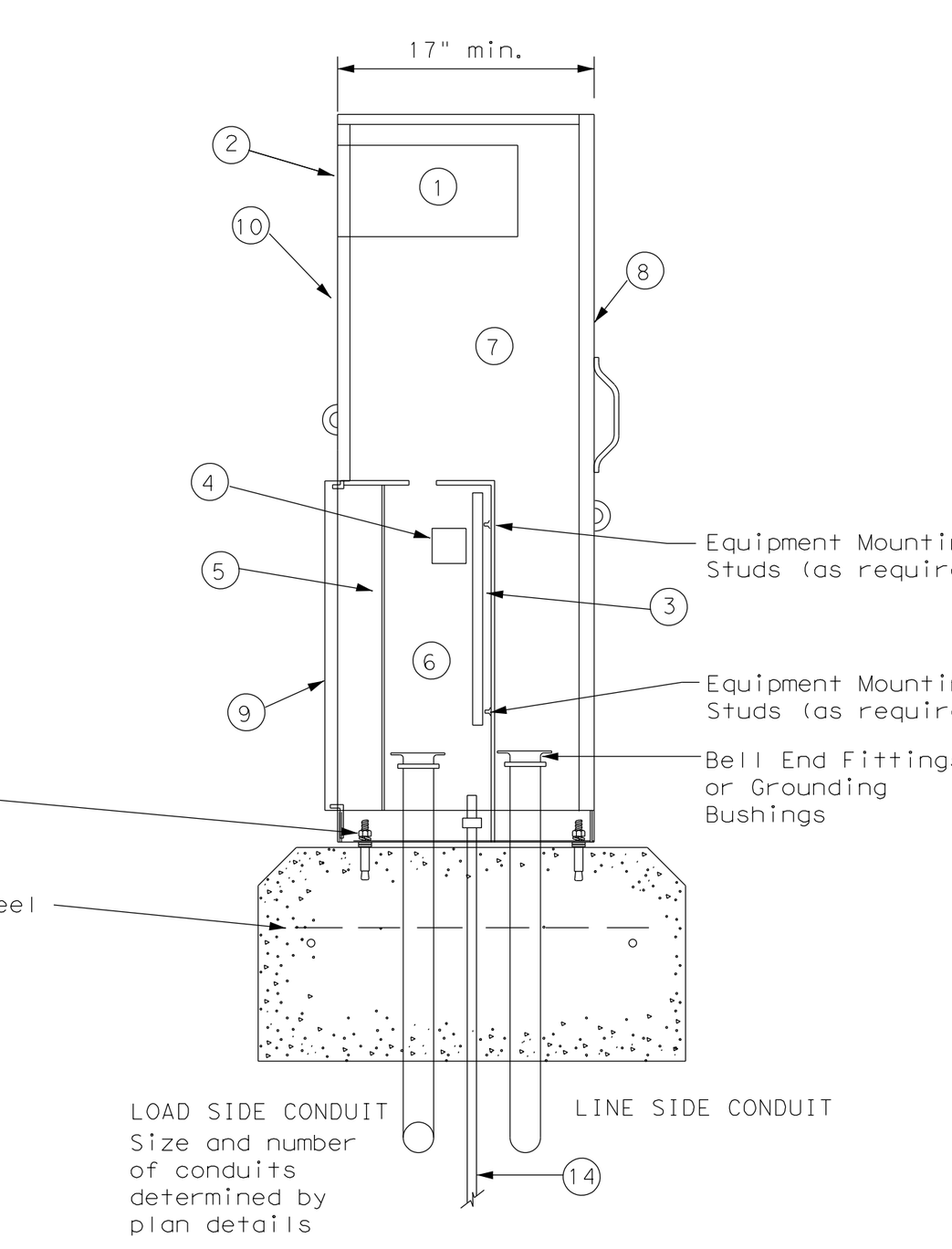
PEDESTAL SERVICE NOTES

1. Manufacture pedestal electrical services in accordance with Departmental Material Specifications (DMS)11080 "Electrical Services", 11085 "Electrical Services-Pedestal (PS)" and Item 628 "Electrical Services. "Provide pedestal electrical services as listed on the Material Producers list (MPL) on the Department's web site under "Roadway Illumination and Electrical Supplies," Item 628. Ensure all mounting hardware and installation details of services meet utility company specifications. Contact the local utility company for approval of pedestal details prior to installing the electrical pedestal service. Submit any changes required by the utility company prior to manufacturing the pedestal enclosure.
2. When a meter socket is required, provide a socket with a minimum 100 amp rating that complies with local utility requirements.
3. Provide Class A or C concrete for pedestal service foundations in accordance with Item 420, "Concrete Substructures," except that concrete will not be paid for directly but is considered subsidiary to Item 628.
4. Provide #4 reinforcing steel for foundations in accordance with Item 440, "Reinforcement for Concrete."
5. Install ½ in. X 2 ⁹⁄₁₆ in. minimum length concrete single expansion type anchors for mounting pedestal enclosure to foundation. Anchor location to match mounting holes in each corner of enclosure. Secure each of the four corners of the pedestal enclosure to the anchors in the foundation with a ½ in. galvanized or stainless steel machine thread bolt, a properly sized locknut and a flat washer.
6. Finish top of concrete foundation in a neat and workmanlike manner. If leveling washers are used, ensure no more than ⅛ in. gap at any corner. Do not exceed a maximum dip or rise in the foundation of ⅛ in. per foot. When properly installed, ensure the top of the service enclosure is level front to back and side to side within ¼ in. Repair rocking or movement of the service enclosure at no additional cost to the department.
7. Do not use liquidtight flexible metal conduit (LFMC) on pedestal type services.
8. Ensure all elbows in the foundation are sized as per utility provider's conduit requirements for underground conduit and feeders. PVC extensions may be installed provided the ends of the rigid metal conduits are more than 2 in. below the top of the concrete foundation. Where extension conduits are metal, grounding bushings must be installed with a bonding jumper properly terminated.

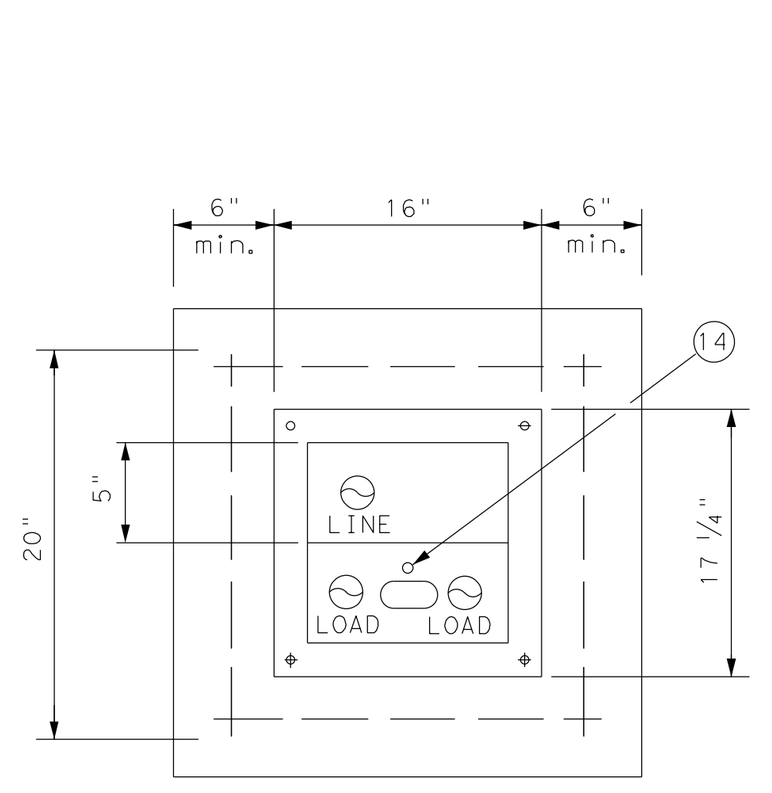


FRONT VIEW

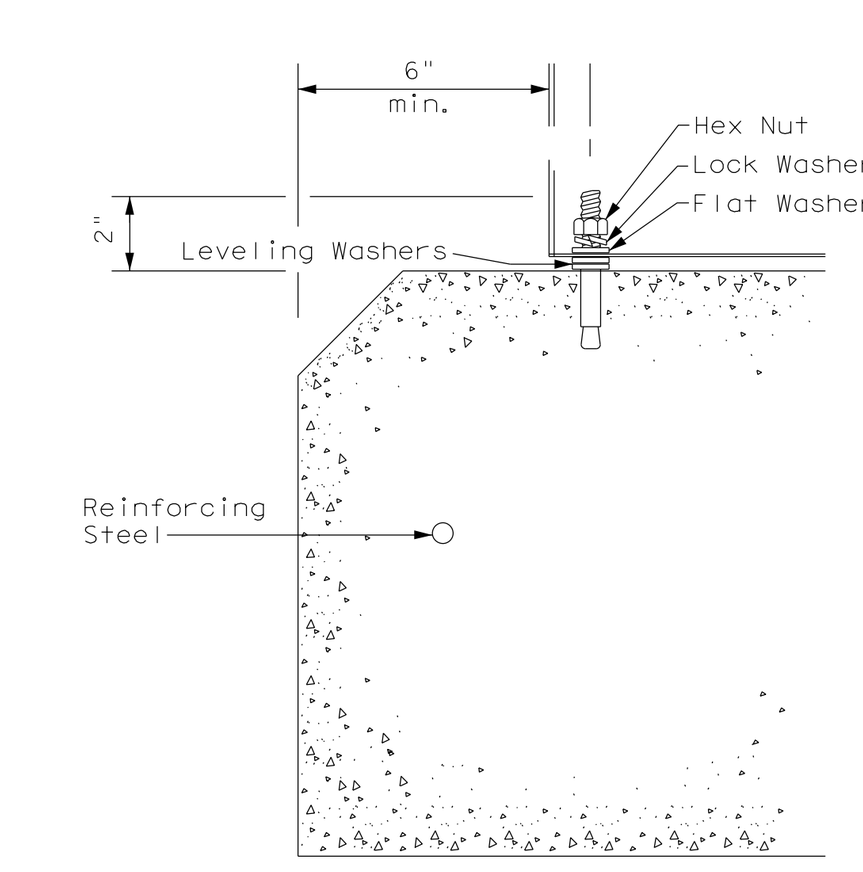
TYPE C shown, TYPE A similar except that TYPE A shall have individual circuit breakers (CB) mounted on an equipment mounting panel. CB Handles shall protrude through hinged deadfront trim.



SIDE VIEW



SECTION A-A



ANCHOR BOLT DETAIL

LEGEND	
1	Meter Socket, (when required)
2	Meter Socket Window, (when required)
3	Equipment Mounting Panel
4	Photo Electric Control Window, (When required)
5	Hinged Deadfront Trim
6	Load Side Conduit Trim
7	Line Side Conduit Area
8	Utility Access Door, with handle
9	Pedestal Door
10	Hinged Meter Access
11	Control Station (H-O-A Switch)
12	Main Disconnect
13	Branch Circuit Breakers
14	Copper Clad Ground Rod - 5/8" X 10'

Texas Department of Transportation — Traffic Operations Division Standard

ELECTRICAL DETAILS
ELECTRICAL SERVICE SUPPORT
PEDESTAL SERVICE TYPE PS

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WOLF RANCH PKWY / MEMORIAL DR

ILLUMINATION STANDARDS

CITY JOB No.
JOB NO. 51423-04
DATE 9/16/2025
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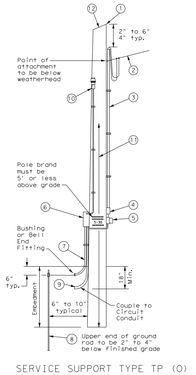
TIMBER POLE (TP) SERVICE SUPPORT NOTES

1. Ensure electrical service support is a class 5 treated timber pole as per Item 627 "Treated Timber Poles." Embed timber pole to depth required in Item 627.
2. Conduit and electrical conductors attached to the electrical service pole and underground within 12 in. of service pole are not paid for directly but are subsidiary to the electrical service.
3. Install pole-top mounted photocell (7) on north side of pole, or in service enclosure (6) as required. See Electrical Service Data chart in plan set.
4. Gain pole as required to provide flat surface for each channel. Gain timber pole to ¾ in. max. depth and 1 ⅛ in. max. height. Gain pole in a neat and workmanlike manner.
5. Mount meter and service equipment on stainless steel or galvanized channel (Unistrut, Kindorf, or equal). Provide channel sized 1 in. to 3 ¾ in. maximum depth, and 1⅝ in. to 1⅝ in. maximum width. File smooth the cut ends of galvanized channel and paint with zinc rich paint before installing on pole. Secure each channel section to timber pole with two galvanized or SS lag bolts, ¼ in. minimum diameter by 1½ in. minimum length. Use a galvanized or SS flat washer on each lag bolt. Do not stack channel.
6. When excess length must be trimmed from poles, trim from the top end only.



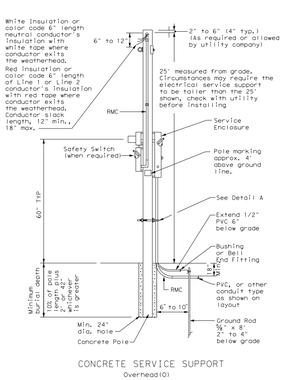
1. Class 5 pole, height as required
2. Service drop from utility company (attached below weatherhead)
3. Service conduit (RMC) and service entrance conductors - One Red, One Black, One White (See Electrical Service Data)
4. Safety switch (when required)
5. Meter (when required)
6. Service enclosure
7. 6 AWG bare grounding electrode conductor in ½ in. PVC to ground rod - extend ½ in. PVC 6 in. underground.
8. ⅝ in. x 8 ft. Copper clad ground rod - drive ground rod to a depth of 2 in. to 4 in. below grade.
9. RMC same size as branch circuit conduit.
10. See pole-top mounted photocell detail on ED(1).
11. When required by the serving utility provide bare 6 AWG copper conductor. Run wire from pole top to butt wrap or copper butt plate. Protect conductor with non-conductive material to a height of 8 ft. above finished grade.
12. When required by utility, cut top of pole at an angle to enhance rain run off.

SERVICE SUPPORT TYPE TP (O)

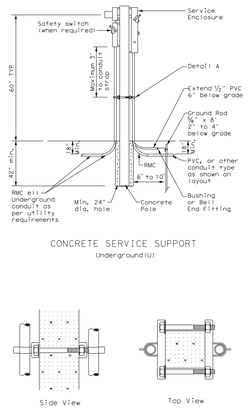
GRANITE CONCRETE (GC) & OTHER CONCRETE (OC) NOTES

Ensure electrical service support structures bid as Type Granite Concrete (GC) or Other Concrete (OC) meet the following requirements.

1. Provide GC and OC poles that meet the requirements of DMS 11080 "Electrical Services."
2. Provide prestressed concrete poles suitable for direct embedment into the ground without special foundations.
3. Verify poles are marked as required on DMS 11080, Location of marking should be approximately 4' above final grade. Use the two-point pickup locations when handling pole in horizontal position, and one-point pickup location for use in raising the pole to a vertical position. These marks are small but conspicuous.
4. Embed poles 42 in. or 10% of the length plus 2 ft., whichever is greater.
5. Ensure all installation details of services are in accordance with utility company specifications.
6. Install a one point rack or eye bolt bracket 6 inches to 12 inches below the weatherhead as an overhead service drop anchoring point for the electric utility.
7. Furnish and install galvanized or stainless steel channel strut 1½ in. or 1⅝ in. wide by 1⅝ in. up to 3 ⅜ in. deep (Unistrut, Kindorf, B-line or equal). Aquaduct channel strut with stainless steel concrete anchors (max. 6" depth). Aquaduct U-bolts or back to back channel strut with long bolts, or other secure mounting as approved by the Engineer. Ensure bolts are galvanized in accordance with ASTM A153. Do not stack channel struts.
8. Backfill the holes thoroughly by tamping in 6 in. lifts. After tamping to grade, place additional backfill material in a 6 inch high cone around the pole to allow for settling. Use material equal in composition and density to the surrounding area. Backfilling will not be paid for directly but is subsidiary to various bid items.



CONCRETE SERVICE SUPPORT
Overhead (O)



CONCRETE SERVICE SUPPORT
Underground (U)

Side View Top View

DETAIL A

See Note 7. Before installing channel that has been cut, file sharp edges and paint with zinc-rich paint. Ensure there is no paint splatter on the pole.

Texas Department of Transportation — Traffic Operations Division Standard

ELECTRICAL DETAILS SERVICE SUPPORT TYPES GC, OC, & TP

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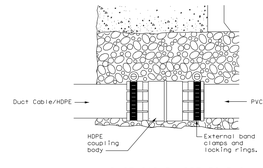
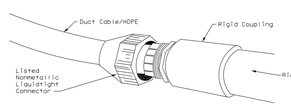
DUCT CABLE & HDPE CONDUIT NOTES

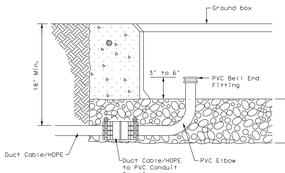
1. Provide duct cable in accordance with Departmental Material Specification (DMS) 11060 "Duct Cable" and Item 622 "Duct Cable." Provide duct cable as listed on the Material Producer List (MPL) on the Department web site under "Roadway Illumination and Electrical Supplies" Item 622.
2. Provide High-Density Polyethylene (HDPE) conduit in accordance with DMS 11060 and Item 618, "Conduit." Provide HDPE as listed on the MPL on the Department web site under "Roadway Illumination and Electrical Supplies," Item 618.
3. Supply duct cable with a minimum 2 in. diameter, unless otherwise shown in the plans. Provide duct cable and HDPE conduit as shown by descriptive code or on the plans. Bend duct cable and HDPE conduit as recommended by the manufacturer, with a minimum bending radius of 24 in. for 2 in. duct. Follow manufacturers' recommendations when handling duct cable and HDPE conduit reels and during installation of duct cable and HDPE conduit.
4. Do not splice conductors within duct cable or HDPE conduit. Couple duct cable and HDPE entering a ground box or foundation to a PVC elbow. When galvanized steel RMC elbows are called for in the plans and any portion of the RMC elbow is buried less than 18" from possible contact, ground the RMC elbow.
5. Furnish and install duct cable with factory installed conductors, sized as shown in the plans and as required by the National Electrical Code (NEC). The NEC contains specific requirements for duct cable in Article, "Nonmetallic Underground Conduit with Conductors: Type NUCC."
6. When conduit casing is called for in the plans, extend duct cable or HDPE conduit through the conduit casing in one continuous length without connection to the casing.
7. Seal the ends of duct cable or HDPE conduit with duct seal, expandable foam, or other approved method after completing the pull tests required by Item 622.
8. Provide minimum cover of 24 in. under roadways, 18 in. in other locations, or as shown on the plans.
9. Furnish and install listed fittings to couple duct cable or HDPE conduit to other types of conduit. Duct cable and HDPE conduit may be field-threaded and spliced with PVC or RMC threaded couplings connected with listed tie-wrap fittings connected using listed coupling made of HDPE with stainless steel external banding clamps and locking rings connected with approved electrofusion conduit couplings or connected using an approved chemical fusion method using an epoxy or adhesive specifically designed for HDPE couplings and connectors all installed in accordance with their manufacturer's instructions. Do not use PVC glue on HDPE. Do not use water pipe fittings, or connect conduit with heat shrink tubing.



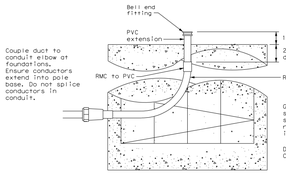
DUCT CABLE/HDPE TO PVC



DUCT CABLE/HDPE TO RMC

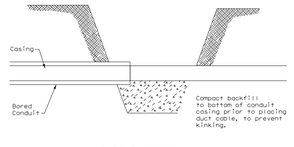


DUCT CABLE/HDPE AT GROUND BOX



When the upper end of an RMC (U) does not enter the ground box, it may be extended with a SCH-40 PVC conduit nipple and bell end, provided there is a minimum of 18" of cover over all parts of the elbow. If not, a rigid extension and ground bushing is required.

DUCT CABLE / HDPE AT FOUNDATION



BORE PIT DETAIL

Texas Department of Transportation — Traffic Operations Division Standard

ELECTRICAL DETAILS DUCT CABLE/ HDPE CONDUIT

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ROADWAY ILLUMINATION ASSEMBLY NOTES

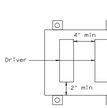
1. Details apply to roadway lighting installations bid or referenced under Item 610, "Roadway Illumination Assemblies." Provide, furnish, and install all other materials not shown on the plans which may be necessary for complete and proper construction. Where manufacturers provide warranties or guarantees as a customary trade practice, furnish to the State such warranties or guarantees.
2. The locations of poles and fixtures may be shifted by the Engineer to accommodate local conditions. Install or remove poles and luminaires located near overhead electrical lines using established industry and utility safety practices and in accordance with laws governing such work. Consult with the appropriate utility company prior to beginning such work.
3. Provide new and unused materials. Ensure that all materials and installations comply with the applicable articles of the National Electrical Code (NEC), TxDOT standards and specifications, National Electrical Manufacturers Association (NEMA), and are listed by Underwriters Laboratories (UL) or a Nationally Recognized Testing Lab (NRTL). NRTLs such as Canadian Standard Association, Intertek Testing Services NA Inc., or FM Approvals LLC can be considered equivalent to UL. Faulty fabrication or poor workmanship in any material, equipment, or installation is justification for rejection.
4. Provide Roadway Illumination Light Fixtures as per TxDOT Departmental Material Specification (DMS) 11010, Item 610, and as shown on the Material Producers List (MPL) for Roadway Illumination and Electrical Supplies.
5. Fabricate steel roadway illumination poles in accordance with Roadway Illumination Poles (RIP) standards and Item 610. Poles fabricated according to RIP standards do not require shop drawing submittals.
   a. Alternate designs to RIP standards or the use of aluminum to fabricate poles will require the submission of shop drawings electronically. For instructions on submitting shop drawings electronically see "Guide to Electronic Shop Drawing Submittal" on the TxDOT web site.
   b. Limitations on use of the RIP standard: The RIP standard details were developed for installations in locations where the 3-second gust basic maximum wind speed is 110 mph, and where the elevation of the base of the pole is less than (i.e. not more than) 25' above the elevation of the surrounding terrain, in accordance with the "AASHTO Standard Specifications for Structural Supports for Highway Signs, Luminaires and Traffic Signals," 6th Edition (2013) of the AASHTO Design Specifications. For poles to be installed in regions where the maximum basic wind speed exceeds 110 mph or to be mounted more than 25' above the surrounding terrain, provide poles meeting the following requirements:
      I. Submittals. Following the electronic shop drawing submittal process (see Guide to Electronic Shop Drawing Submittal on the TxDOT web site), submit to the Engineer for approval fabrication drawings and calculations for the poles, sealed by a Texas licensed professional engineer (P.E.).
      II. Luminaire Structural Support Requirements. Provide light poles, arms, and anchor bolt assemblies with a 25 year design life to safely resist dead loads, ice loads and the required basic wind speeds at the location of installation in accordance with the 6th edition (2013) of the AASHTO Design Specifications. For transformer base poles, include transformer base and connecting hardware in calculations and shop drawing submittals. Structurally test all transformer bases to realist the theoretical plastic moment capacity of the pole. Submit certification of the plastic moment load test and FHWA breakaway requirement test of the model of base being furnished with the shop drawings. Show breakaway base model number, manufacturer's name, and logo on shop drawings. Include on manufacturer's shop drawings the ASTM designations for all materials to be used.
   6. For both transformer and shoe-base type illumination poles, provide and install double-pole breakaway fuse holders as specified by DMS-11040. Breakaway fuse holders are listed on the MPL for Roadway Illumination and Electrical Supplies under Items 610 & 620. Provide 10 amp time delay fuses for breakaway connectors in light poles, or inside the light fixture for underpass luminaires. In each pole, connect luminaires to the breakaway connector with continuous stranded 12 AWG copper conductors as listed on the MPL. Bond all equipment grounding conductors together and to the ground lug in the transformer base or hand hole.
   7. Tighten anchor bolts for shoe base, concrete traffic barrier base, and bridge mount roadway illumination poles, in accordance with Item 449.
   8. Install T-Base with following procedure:
      a. Anchor Bolt Tightening.
         I. Coat the threads of the anchor bolts with electrically conductive lubricant.
         II. Place the T-base over the anchor bolts. Foundation must be level and flat. The maximum permissible gap under any one corner of the t-base is 1/8" before nuts are tightened.
         III. Coat the bearing surfaces of the nuts and washers with electrically conductive lubricant. Install (1) 1/2" hold down washer, (1) lock washer, and (1) nut on each anchor bolt. Turn the nuts onto the bolts so that each is hand-tight against the washer.
         IV. Using a torque wrench, tighten each nut to 150 ft-lb. Uniform contact is required between the foundation and the T-base in the corner regions of the T-base, and all corner gaps must be closed after applying torque. If a gap still exists after torquing to 150 ft-lbs, continue torquing each bolt incrementally until gap is closed or maximum allowable torque of 250 ft. pound is reached, whichever comes first. If 250 ft-lbs is not enough to close the gap the foundation must be leveled. Gaps along the straight sides of the T-bases and the foundation are permissible. Ensure that no high point of contact occurs between the straight sides of the T-base and the foundation.
         V. Check top of T-base for level. If not level then foundation must be leveled.
      b. Top Bolt Procedure
         I. Erect pole over T-base with crane. Coat bolts, nuts, washers, and lock washers with electrically conductive lubricant.
         II. Install bolts and 1/2" connecting washers from the inside of the T-base, thread up through the pole base. Install flat washers, lock washers and nuts snug tight according to Item 441, "Structural Bolting."
         III. Tighten each nut to 150 ft-lb. using a torque wrench.
      c. Level and Plumb
         I. Ensure pole is plumb and mast arm is perpendicular to the roadway according to plans to within 5 degrees.
   9. Construct luminaire pole foundations in accordance with Item 416, "Drilled Shaft Foundations," and TxDOT standard sheet RID(2).
   10. Provide and install underpass luminaires in accordance with Item 610, DMS-11010, and TxDOT standard sheet RID(3). Typical luminaire size for underpass luminaires is 150# HPS or 150W EQ LED.
   11. Mount luminaires on arms level as shown by the luminaire level indicator.
   12. Orient luminaires perpendicular to the roadway intended to be lit unless otherwise shown on the plans.

Wiring Diagram Notes:

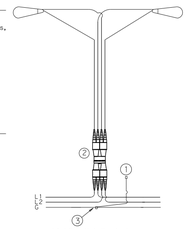
1. Use 1/2 in.-13 UNC threaded, copper or tin-plated copper, pole bonding connector, sized appropriately for conductors, bonded to T-base, or use ground lug in handhole as available.
2. Use pre-qualified two-pole breakaway connectors for all luminaire pole installations. For luminaires fed by a circuit with a neutral conductor, use double pole breakaway connectors with the neutral side unfused and marked white.
3. Split Bolt or other connector.

Decorative LED Lighting Notes:

1. LED Drivers in Remote Outdoor enclosures (for drivers that do not include an enclosure as part of a factory assembly):
   a. Provide NEMA 3R outdoor enclosure or as approved.
   b. Install enclosure at least 12" above ground or other horizontal surface. Mount vertically or on ceiling, and avoid direct sun where possible.
   c. Install drivers with at least 2 inches of space from enclosure walls.
   d. For multiple drivers in an enclosure, provide at least 4 inches side to side and 1 inch end to end from other drivers or electronic equipment
   e. For drivers mounted on back wall of enclosure, mount enclosure on 1 5/8" strut or other standoff to dissipate heat, or mount driver to side of the enclosure or to the metal cover.
   f. Provide remote drivers with a maximum of 100 watts
   g. Provide drivers with documentation of 100,000 hr lifetime at Tcase of 65C or higher.



Driver Spacing In Remote Enclosure



L1,L2 = Hot Conductors
G = Grounding Conductor

TYPICAL WIRING DIAGRAM

LUMINAIRES SERVED AT 480V ON 240/480 VOLT SERVICE OR LUMINAIRES SERVED AT 240V FOR 120/240 VOLT SERVICE.

Texas Department of Transportation — Traffic Safety Division Standard

ROADWAY ILLUMINATION DETAILS

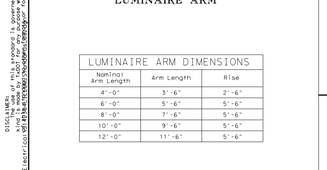
RID(1)-20

FILE:	rid1-20.dgn	DN:	CK:	DW:	CK:
© TxDOT	January 2007	CONT	SECT	JOB	HIGHWAY
REVISIONS 7-17 12-20		DIST	COUNTY		SHEET NO.

TYA

DISCLAIMER:
The use of this standard is governed by the "Texas Engineering Practice Act". No warranty of any kind is made by TxDOT for any purpose whatsoever. TxDOT assumes no responsibility for the conversion of this standard to other formats or for incorrect results or damages resulting from its use.

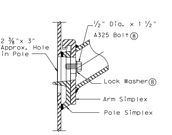
DATE: 9/16/2025
FILE: L:\Traffic\Standards\Illumination\Current\rid1-20.dgn 12:15:04 PM



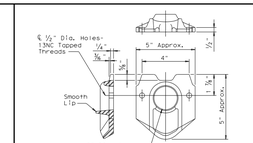
LUMINAIRE ARM

LUMINAIRE ARM DIMENSIONS		
Nominal Arm Length	Arm Length	Rise
4'-0"	3'-6"	2'-6"
6'-0"	5'-6"	5'-6"
8'-0"	7'-6"	5'-6"
10'-0"	9'-6"	5'-6"
12'-0"	11'-6"	5'-6"

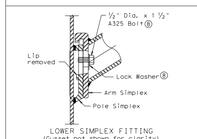
ARM ASSEMBLY FABRICATION TOLERANCES TABLE	
DIMENSION	TOLERANCE
Arm Length	±1"
Arm Rise	±1"
Deviation from flat	1/8" in 12"
Spacing between holes	±1/32"



UPPER SIMPLEX FITTING
(Gusset not shown for clarity)

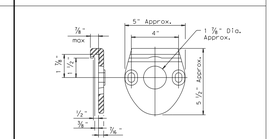


POLE SIMPLEX DETAIL (8)



LOWER SIMPLEX FITTING
(Gusset not shown for clarity)

SECTION B-B

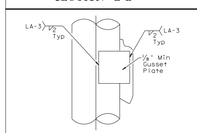


ARM SIMPLEX DETAIL (8)

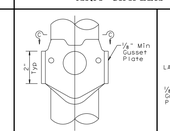
NOTES:

4. Any of the materials listed for plates may be used where the drawings do not specify a particular ASTM designation.
5. A576 must be suitable for forging and also meet minimum tensile strength of 65 ksi, minimum yield of 35 ksi, and elongation in 2 inches of 22 percent.
6. A572, A1008 HSLAS-F, and A1011 HSLAS-F materials may have higher yield strengths but shall not have less elongation than the grade indicated.
7. Dimensional limits are given to show acceptable variation in design. All of a Fabricator's production of a particular arm length shall have the same dimensions within specified tolerances.
8. Each pole simplex fitting shall be supplied with 2 bolts and 2 lock washers of the size specified. The bolts and lock washers shall be secured to the pole with the other hardware items called for in the plans.
9. Proposed deviations in arm simplex dimensions or materials must be submitted to the Department for approval.
10. A welded handhole frame is permissible. Maximum of two (2) CJP weld splices is allowed.

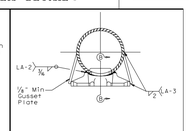
MATERIALS	
Pole or Arm Simplex	ASTM A27 Gr 65-35 or Gr 70-36, A148 Gr 80-50, A576 Gr 1021 (5), or A36 (Arm only)
Arm Pipes	ASTM A53 Gr A or B, A500 Gr B, A501, A 1008 HSLAS-F Gr 50 (5), or A1011 HSLAS-F Gr 50 (5)
Arm Struts and Gusset Plates (4)	ASTM A36, A572 Gr 50 (5), or A588
Misc.	ASTM designations as noted



SIDE

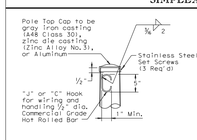


ELEVATION

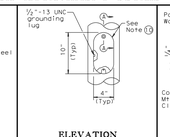


SECTION C-C

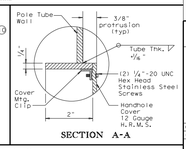
SIMPLEX ATTACHMENT DETAIL



POLE TOP



ELEVATION



SECTION A-A

HANDHOLE

Texas Department of Transportation — Traffic Safety Division Standard

ROADWAY ILLUMINATION POLES

RIP(3)-19

FILE:	rip3-19.dgn	DN:	CK:	DW:	CK:
© TxDOT	January 2007	CONT	SECT	JOB	HIGHWAY
REVISIONS 7-17 12-19		0514	23	04 No.	Ranch Parkway
		DIST	COUNTY		SHEET NO.
		AUS	Williamson	RIP	3-19

SHEET 3 OF 4

TYC

NO.	REVISION	DATE

GEORGETOWN TEXAS more than welcome

PAPE-DAWSON ENGINEERS
AUSTIN I SAN ANTONIO I HOUSTON I FORT WORTH I DALLAS
10801 N MOPAC EXPY, BLDG 3, STE 200 I AUSTIN, TX 78759 I 512.454.8711
TEXAS ENGINEERING FIRM #470 I TEXAS SURVEYING FIRM #10028800

WOLF RANCH PKWY / MEMORIAL DR

ILLUMINATION STANDARDS

CITY JOB No.
JOB NO. 51423-04
DATE 9/16/2025
DESIGNER
CHECKED DRAWN
SHEET NO. 394

PROPOSED TRAFFIC SIGNS



W11-2
(30"x30")

W16-7PL
(24"x12")

SOLAR POWERED
RRFB

S1



W11-2
(30"x30")

W16-7PR
(24"x12")

SOLAR POWERED
RRFB

S2



R10-25
(9"x12")

PB1

CAUTION:

THE CONTRACTOR IS SPECIFICALLY CAUTIONED THAT UNDERGROUND UTILITIES INCLUDING GAS ARE KNOWN TO EXIST IN THE VICINITY OF THIS WORK. CONTRACTOR SHALL CALL FOR LOCATES PRIOR TO BEGINNING WORK AND SHALL EXERCISE CAUTION WHEN INSTALLING SIGNAL EQUIPMENT INCLUDING POLE FOUNDATIONS AND CONDUITS

CONTRACTOR SHALL CONTACT DIGTESS @ 1-800-DIG-TESS OR TEXAS-811 FOR UTILITY LOCATION AT LEAST 72 HOURS PRIOR TO BEGINNING CONSTRUCTION

LEGEND

SYMBOL	DESCRIPTION
	TRAFFIC FLOW
	PEDESTAL POLE ON FOUNDATION
	SPECIAL FOUNDATION
	PEDESTRIAN PUSH BUTTON
	POLE MOUNTED SIGN WITH RRFB
	GROUND BOX (TY A) FOR ILLUMINATION
A	POLE IDENTIFIER
	PROPOSED OVERHEAD ELECTRIC
	PROPOSED FIBER-OPTIC CABLE
	WATER LINE
	LUMINAIRE
PP	POWER POLE

N

SCALE: 1"= 20'

0' 20' 40' 60'

NOTES:

1. ALL DIMENSIONS SHOWN ARE IN FEET UNLESS SPECIFIED OTHERWISE. (ALL EXISTING FEATURES ARE SHOWN SCREENED BACK i.e. FADED).
2. CONTRACTOR TO POTHOLE SIGNAL POLE LOCATIONS NEAR UNDERGROUND UTILITIES PRIOR TO INSTALLING POLE FOUNDATION.
3. PEDESTRIAN PUSH BUTTONS SHALL BE ACCESSIBLE AND NO MORE THAN 10" FROM LANDING AREA OR SIDEWALK FOR EACH INSTALLED PEDESTRIAN POLE.
4. UTILITIES SHOWN ARE APPROXIMATE. CONTRACTOR SHALL CALL FOR LOCATIONS PRIOR TO COMMENCING EXCAVATION. ALL UTILITY LOCATIONS SHALL BE VERIFIED IN THE FIELD BY THE CONTRACTOR.
5. PEDESTRIAN CROSSING FLASHING BEACON ASSEMBLY EQUIPMENT FURNISHED AND INSTALLED BY CONTRACTOR SHALL INCLUDE: PUSH BUTTON AND SIGN, PEDESTAL POLES, CONTROL CABINET AND ASSOCIATED EQUIPMENT, RECTANGULAR RAPID FLASHING BEACON LIGHT BARS. SIGNS AND DRILLED SHAFT FOUNDATIONS FOR POLES ARE TO BE PAID FOR SEPARATELY.
6. SEE SIDEWALK CONSTRUCTION PLAN SHEETS FOR ADVANCED PEDESTRIAN WARNING SIGNS.
7. PEDESTRIAN PUSH BUTTONS SHALL HAVE A LOCATOR TONE AND VOICE MESSAGE SPOKEN TWICE, SAYING "YELLOW LIGHTS ARE FLASHING" WHEN ACTIVATED.
8. EACH RESPECTIVE PEDESTRIAN WARNING SIGN AND PUSH BUTTON IS TO BE BUILT ACCORDING TO THE ORIENTATIONS DEPICTED IN THIS LAYOUT.

POLE & EQUIPMENT INFORMATION

ID	DESCRIPTION/ATTACHMENTS	NORTHING	EASTING	FND. ELEV
A	INSTALL SOLAR POWERED PEDESTRIAN CROSSING FLASHING BEACON ASSEMBLY, 16 FT BRUSHED ALUMINUM PEDESTAL POLE ON 6 FT DRILLED SHAFT FOUNDATION (24-A), TWO RECTANGULAR RAPID FLASHING BEACON LIGHT BARS, ONE W11-2 SIGN, ONE W16-7PL, ONE PEDESTRIAN PUSH BUTTON W/R10-25 SIGN AS ILLUSTRATED.	10204759.4	3124663.1	FLUSH W/ LANDING
B	INSTALL SOLAR POWERED PEDESTRIAN CROSSING FLASHING BEACON ASSEMBLY, 16 FT BRUSHED ALUMINUM PEDESTAL POLE ON 6 FT DRILLED SHAFT FOUNDATION (24-A), TWO RECTANGULAR RAPID FLASHING BEACON LIGHT BARS, ONE W11-2 SIGN, ONE W16-7PL, ONE PEDESTRIAN PUSH BUTTON W/R10-25 SIGN AS ILLUSTRATED.	10204768.0	3124568.9	FLUSH W/ LANDING
C	INSTALL SOLAR POWERED PEDESTRIAN CROSSING FLASHING BEACON ASSEMBLY, 16 FT BRUSHED ALUMINUM PEDESTAL POLE ON 6 FT DRILLED SHAFT FOUNDATION (24-A), TWO RECTANGULAR RAPID FLASHING BEACON LIGHT BARS, ONE W11-2 SIGN, ONE W16-7PL, ONE PEDESTRIAN PUSH BUTTON W/R10-25 SIGN AS ILLUSTRATED.	10204971.0	3124573.2	FLUSH W/ LANDING
D	INSTALL SOLAR POWERED PEDESTRIAN CROSSING FLASHING BEACON ASSEMBLY, 16 FT BRUSHED ALUMINUM PEDESTAL POLE ON 6 FT DRILLED SHAFT FOUNDATION (24-A), TWO RECTANGULAR RAPID FLASHING BEACON LIGHT BARS, ONE W11-2 SIGN, ONE W16-7PL, ONE PEDESTRIAN PUSH BUTTON W/R10-25 SIGN AS ILLUSTRATED.	10204994.1	3124666.2	FLUSH W/ LANDING
E	INSTALL SOLAR POWERED PEDESTRIAN CROSSING FLASHING BEACON ASSEMBLY, 16 FT BRUSHED ALUMINUM PEDESTAL POLE ON 6 FT DRILLED SHAFT FOUNDATION (24-A), TWO RECTANGULAR RAPID FLASHING BEACON LIGHT BARS, ONE W11-2 SIGN, ONE W16-7PL, ONE PEDESTRIAN PUSH BUTTON W/R10-25 SIGN AS ILLUSTRATED.	DESIGN 10204872.7	3124752.6	FLUSH W/ LANDING
F	INSTALL SOLAR POWERED PEDESTRIAN CROSSING FLASHING BEACON ASSEMBLY, 16 FT BRUSHED ALUMINUM PEDESTAL POLE ON 6 FT DRILLED SHAFT FOUNDATION (24-A), TWO RECTANGULAR RAPID FLASHING BEACON LIGHT BARS, ONE W11-2 SIGN, ONE W16-7PL, ONE PEDESTRIAN PUSH BUTTON W/R10-25 SIGN AS ILLUSTRATED.	10204799.0	3124735.8	FLUSH W/ LANDING
G	INSTALL SOLAR POWERED PEDESTRIAN CROSSING FLASHING BEACON ASSEMBLY, 16 FT BRUSHED ALUMINUM PEDESTAL POLE ON 6 FT DRILLED SHAFT FOUNDATION (24-A), TWO RECTANGULAR RAPID FLASHING BEACON LIGHT BARS, ONE W11-2 SIGN, ONE W16-7PR, ONE PEDESTRIAN PUSH BUTTON W/R10-25 SIGN AS ILLUSTRATED.	10204779.6	3124625.5	FLUSH W/ LANDING
H	INSTALL SOLAR POWERED PEDESTRIAN CROSSING FLASHING BEACON ASSEMBLY, 16 FT BRUSHED ALUMINUM PEDESTAL POLE ON 6 FT DRILLED SHAFT FOUNDATION (24-A), TWO RECTANGULAR RAPID FLASHING BEACON LIGHT BARS, ONE W11-2 SIGN, ONE W16-7PR, ONE PEDESTRIAN PUSH BUTTON W/R10-25 SIGN AS ILLUSTRATED.	10204773.7 APPROVAL	3124613.4	FLUSH W/ LANDING
J	INSTALL SOLAR POWERED PEDESTRIAN CROSSING FLASHING BEACON ASSEMBLY, 16 FT BRUSHED ALUMINUM PEDESTAL POLE ON 6 FT DRILLED SHAFT FOUNDATION (24-A), TWO RECTANGULAR RAPID FLASHING BEACON LIGHT BARS, ONE W11-2 SIGN, ONE W16-7PR, ONE PEDESTRIAN PUSH BUTTON W/R10-25 SIGN AS ILLUSTRATED.	10204966.4	3124631.6	FLUSH W/ LANDING
K	INSTALL SOLAR POWERED PEDESTRIAN CROSSING FLASHING BEACON ASSEMBLY, 16 FT BRUSHED ALUMINUM PEDESTAL POLE ON 6 FT DRILLED SHAFT FOUNDATION (24-A), TWO RECTANGULAR RAPID FLASHING BEACON LIGHT BARS, ONE W11-2 SIGN, ONE W16-7PR, ONE PEDESTRIAN PUSH BUTTON W/R10-25 SIGN AS ILLUSTRATED.	10204963.9	3124615.3	FLUSH W/ LANDING
L	INSTALL SOLAR POWERED PEDESTRIAN CROSSING FLASHING BEACON ASSEMBLY, 16 FT BRUSHED ALUMINUM PEDESTAL POLE ON 6 FT DRILLED SHAFT FOUNDATION (24-A), TWO RECTANGULAR RAPID FLASHING BEACON LIGHT BARS, ONE W11-2 SIGN, ONE W16-7PR, ONE PEDESTRIAN PUSH BUTTON W/R10-25 SIGN AS ILLUSTRATED.	10204835.3	3124736.8	FLUSH W/ LANDING
M	INSTALL SOLAR POWERED PEDESTRIAN CROSSING FLASHING BEACON ASSEMBLY, 16 FT BRUSHED ALUMINUM PEDESTAL POLE ON 6 FT DRILLED SHAFT FOUNDATION (24-A), TWO RECTANGULAR RAPID FLASHING BEACON LIGHT BARS, ONE W11-2 SIGN, ONE W16-7PR, ONE PEDESTRIAN PUSH BUTTON W/R10-25 SIGN AS ILLUSTRATED.	10204826.7	3124733.7	FLUSH W/ LANDING

SIGNS SHALL BE ATTACHED TO POLES AS SHOWN ON PLANS.

STATE OF TEXAS
GRANT R WUEBBEN
129717
LICENSED
PROFESSIONAL ENGINEER

GRANT R WUEBBEN, P.E. — 9/16/2025 DATE

STATE OF TEXAS
JUSTIN W. CLARK
118715
LICENSED
PROFESSIONAL ENGINEER

JUSTIN W. CLARK, P.E. — 9/16/2025 DATE

NO.	REVISION	DATE

GEORGETOWN TEXAS *more than welcome*

PAPE-DAWSON ENGINEERS
AUSTIN | SAN ANTONIO | HOUSTON | FORT WORTH | DALLAS
10801 N MOPAC EXPY, BLDG 3, STE 200 | AUSTIN, TX 78759 | 512.454.8711
TEXAS ENGINEERING FIRM #470 | TEXAS SURVEYING FIRM #10028800

WOLF RANCH PKWY / MEMORIAL DR
WOLF RANCH PKWY AT MEMORIAL DR
RRFB LAYOUT

CITY JOB No.
JOB NO. 51423-04
DATE 9/16/2025
DESIGNER
CHECKED

SHEET NO. 395

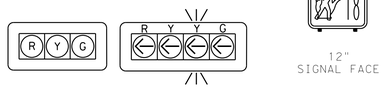
LEGEND

SYMBOL	DESCRIPTION
	TRAFFIC FLOW
12"W	12" WATER PIPE
	OVERHEAD ELECTRIC
SD	STORM PIPE
X	FENCE
G	GAS LINE
	LUMINAIRE
	FIRE HYDRANT
	UTILITY POLE
	GROUND MOUNTED SIGN
	MANHOLE
	GROUND BOX
	APPARENT RIGHT-OF-WAY
	CONDUIT/SPAN
	TRAFFIC SIGNAL TIMBER POLE
	LUMINAIRE
	GROUND BOX (TYPE D)
	POLE MOUNTED CONTROLLER
	WDR CAMERA
	VANTAGE VECTOR (RPDD+RADD)
	TRAFFIC SIGNAL HEAD
	SPAN WIRE MOUNTED SIGN
09	CABLE/CONDUIT RUN
D	POLE/EQUIPMENT IDENTIFIER
	ELECTRIC SERVICE
	PEDESTRIAN POLE
	PEDESTRIAN SIGNAL HEAD

EXISITING TRAFFIC SIGNAL HEADS

SIGNAL FACES
12" LED SIGNAL SECTIONS WITH BACKPLATES

LED COUNTDOWN PEDESTRIAN HEADS



12" SIGNAL FACE — 1 QTY: 8

12" SIGNAL FACE — 2 QTY: 2

12" SIGNAL FACE — W1 THRU W6 QTY: 6

EXISITING TRAFFIC SIGNS

Wolf Ranch Pkwy	SEE DETAILS	S1
Legacy Xing	SEE DETAILS	S2
LEFT TURN YIELD ON FLASHING YELLOW ARROW	R10-17T (30" X 30")	S3
	R9-3 (18" X 18")	S4
	R10-3e(R), (9" x 15")	PB1
	R10-3e(L), (9" x 15")	PB2

CAUTION:

THE CONTRACTOR IS SPECIFICALLY CAUTIONED THAT UNDERGROUND UTILITIES INCLUDING GAS ARE KNOWN TO EXIST IN THE VICINITY OF THIS WORK. CONTRACTOR SHALL CALL FOR LOCATES PRIOR TO BEGINNING WORK AND SHALL EXERCISE CAUTION WHEN INSTALLING SIGNAL EQUIPMENT INCLUDING POLE FOUNDATIONS AND CONDUITS

CONTRACTOR SHALL CONTACT DIGTESS @ 1-800-DIG-TESS OR TEXAS-811 FOR UTILITY LOCATION AT LEAST 72 HOURS PRIOR TO BEGINNING CONSTRUCTION

SCALE: 1" = 20'
0' 20' 40' 60'

NOTES:
1. ALL DIMENSIONS ARE IN FEET UNLESS SPECIFIED OTHERWISE.
2. CONTRACTOR SHALL COORDINATE ALL REMOVAL OF TRAFFIC RELATED EQUIPMENT AND SIGNS WITH CITY OF GEORGETOWN.
3. ALL TRAFFIC EQUIPMENT DEEMED SALVAGEABLE BY THE CITY INSPECTOR SHALL BE DELIVERED TO THE CITY OF GEORGETOWN TRANSPORTATION DEPARTMENT LOCATED AT 300-1 INDUSTRIAL AVE, GEORGETOWN, TEXAS, 78626.
4. UTILITIES SHOWN ARE APPROXIMATE. CONTRACTOR SHALL CALL FOR LOCATES PRIOR TO COMMENCING EXCAVATION. ALL UTILITY LOCATIONS SHALL BE VERIFIED IN THE FIELD BY THE CONTRACTOR.
5. ALL ITEMS NOT SPECIFICALLY CALLED OUT IN THESE PLANS TO BE REMOVED, SHALL REMAIN.

PHASE DIAGRAM

Ø1	PED Ø2	NOT USED Ø3	Ø4
Ø5	PED Ø6	NOT USED Ø7	PED Ø8

CONFLICT FLASH: RED ALL PHASES
START UP FLASH: YELLOW 2 + 6
RED ALL OTHERS

DESIGN

STATE OF TEXAS — GRANT R WUEBBEN — 129717 — LICENSED PROFESSIONAL ENGINEER

GRANT R WUEBBEN, P.E. — 9/16/2025 DATE

APPROVAL

STATE OF TEXAS — JUSTIN W. CLARK — 118715 — LICENSED PROFESSIONAL ENGINEER

JUSTIN W. CLARK, P.E. — 9/16/2025 DATE

NO.	REVISION	DATE

GEORGETOWN TEXAS *more than welcome*

PAPE-DAWSON ENGINEERS
AUSTIN I SAN ANTONIO I HOUSTON I FORT WORTH I DALLAS
10801 N MOPAC EXPY, BLDG 3, STE 200 I AUSTIN, TX 78759 I 512.454.8711
TEXAS ENGINEERING FIRM #470 I TEXAS SURVEYING FIRM #10028800

WOLF RANCH PKWY / MEMORIAL DR
WOLF RANCH PKWY AT LEGACY XING
EXISTING SIGNAL LAYOUT

CITY JOB No.
JOB NO. 51423-04
DATE 9/16/2025
DESIGNER
CHECKED

SHEET NO. 396

LEGEND

SYMBOL	DESCRIPTION
	TRAFFIC FLOW
12"W	12" WATER PIPE
	OVERHEAD ELECTRIC
SD	STORM PIPE
X	FENCE
G	GAS LINE
	LUMINAIRE
	FIRE HYDRANT
	UTILITY POLE
	GROUND MOUNTED SIGN
	MANHOLE
	GROUND BOX
	RIGHT-OF-WAY
	CONDUIT/SPAN
	TRAFFIC SIGNAL TIMBER POLE
	LUMINAIRE
	GROUND BOX (TYPE D)
	POLE MOUNTED CONTROLLER
	WDR CAMERA
	VANTAGE VECTOR (RPDD+RADD)
	TRAFFIC SIGNAL HEAD
	SPAN WIRE MOUNTED SIGN
09	CABLE/CONDUIT RUN
D	POLE/EQUIPMENT IDENTIFIER
	ELECTRIC SERVICE
	PEDESTRIAN POLE
	PEDESTRIAN SIGNAL HEAD

NOTES:
1. ALL DIMENSIONS ARE IN FEET UNLESS SPECIFIED OTHERWISE.
2. UTILITIES SHOWN ARE APPROXIMATE. CONTRACTOR SHALL CALL FOR LOCATES PRIOR TO COMMENCING EXCAVATION. ALL UTILITY LOCATIONS SHALL BE VERIFIED IN THE FIELD BY THE CONTRACTOR.
3. ALL TEMPORARY TRAFFIC SIGNAL EQUIPMENTS DEEMED SALVAGEABLE BY THE CITY INSPECTOR SHALL BE DELIVERED TO CITY OF GEORGETOWN.
4. ALL ITEMS FADED BACK AND NOT SPECIFICALLY CALLED OUT IN THESE PLANS TO BE REMOVED, SHALL REMAIN.
5. TRAFFIC SIGNAL PHASING & TIMINGS SHALL BE MODIFIED IN COMPLIANCE WITH MUTCD DURING CONSTRUCTION BY CONTRACTOR AND APPROVED BY CITY OF GEORGETOWN.
6. CONTRACTORS TO SHIFT SIGNAL HEADS WITH EACH TCP PHASE TO REMAIN COMPLIANT WITH THE LATEST MUTCD REQUIREMENTS.
7. VEHICLE DETECTION WILL NEED TO BE ADJUSTED FOR EACH TCP PHASE.
8. SIDEWALK SHALL BE EXTENDED UP TO THE POLES, AS NEEDED, TO PROVIDE PEDESTRIAN ACCESS TO THE PEDESTRIAN PUSH BUTTONS. PUSH BUTTONS SHALL BE FLUSH WITH THE SIDEWALK AND NOT EXCEED 10" FOR SIDE REACH AND 0" FOR FRONT REACH.

TRAFFIC SIGNS

Wolf Ranch Pkwy	SEE DETAILS	S1
Legacy Xing	SEE DETAILS	S2
LEFT TURN YIELD ON FLASHING YELLOW ARROW	R10-17T (30" X 30")	S3
	R9-3 (18" X 18")	S4
LEFT TURN YIELD ON GREEN	R10-12 (30" x 36")	S5
NO TURN ON RED	R10-11a (24" x 30")	S6
	R3-2 (36" x 36")	S7
	R10-3e(R), (9" x 15")	PB1
	R10-3e(L), (9" x 15")	PB2

CAUTION:

THE CONTRACTOR IS SPECIFICALLY CAUTIONED THAT UNDERGROUND UTILITIES INCLUDING GAS ARE KNOWN TO EXIST IN THE VICINITY OF THIS WORK. CONTRACTOR SHALL CALL FOR LOCATES PRIOR TO BEGINNING WORK AND SHALL EXERCISE CAUTION WHEN INSTALLING SIGNAL EQUIPMENT INCLUDING POLE FOUNDATIONS AND CONDUITS

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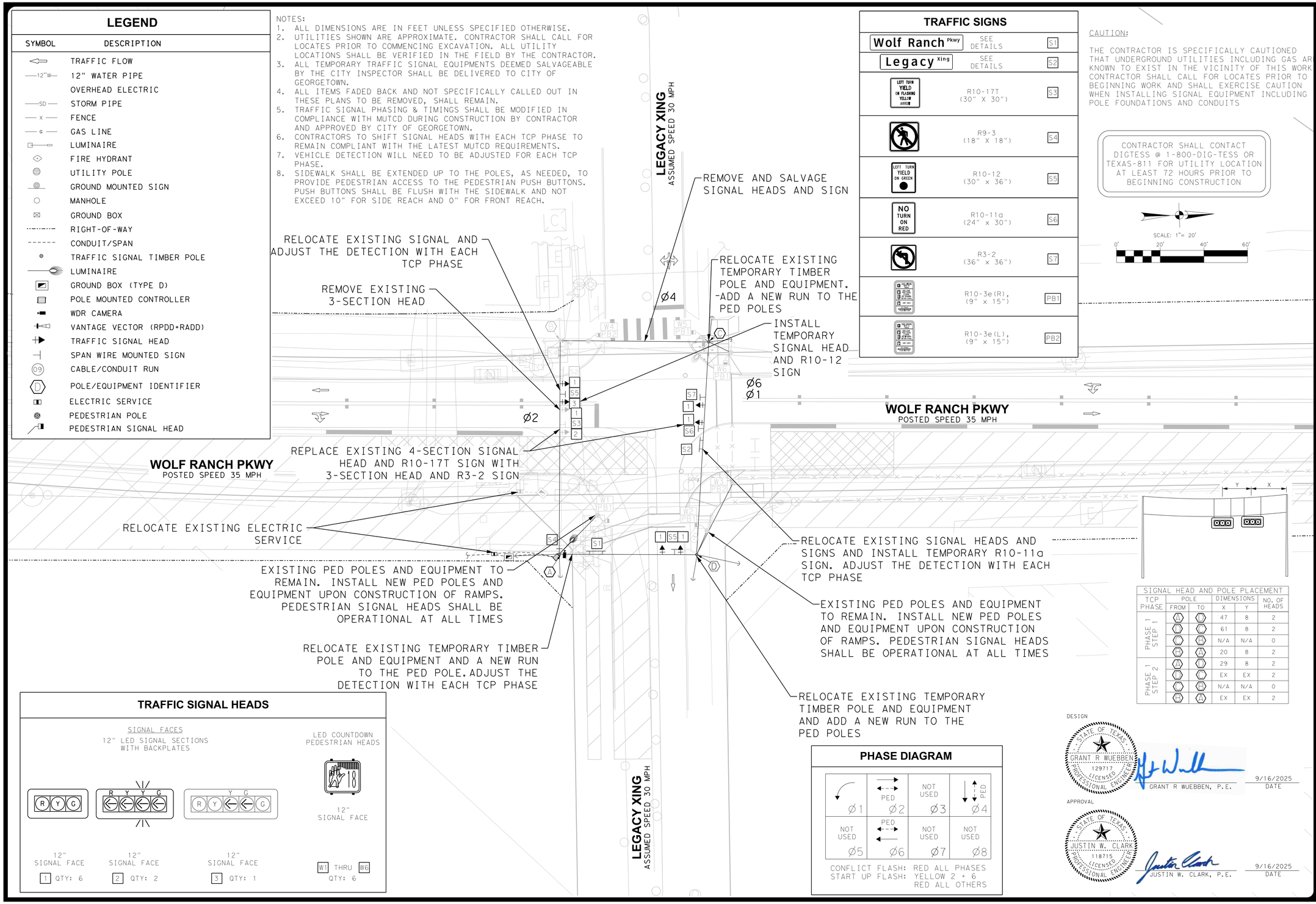
SCALE: 1"= 20'
0' 20' 40' 60'



SIGNAL HEAD AND POLE PLACEMENT					
TCP PHASE	POLE FROM	POLE TO	DIMENSIONS X	DIMENSIONS Y	NO. OF HEADS
PHASE 1 STEP 1	A	C	47	8	2
	C	E	61	8	2
	C	F	N/A	N/A	0
	F	A	20	8	2
PHASE 1 STEP 2	A	C	29	8	2
	C	E	EX	EX	2
	C	F	N/A	N/A	0
	F	A	EX	EX	2

TRAFFIC SIGNAL HEADS

SIGNAL FACES
12" LED SIGNAL SECTIONS WITH BACKPLATES

LED COUNTDOWN PEDESTRIAN HEADS

12" SIGNAL FACE	12" SIGNAL FACE	12" SIGNAL FACE	12" SIGNAL FACE
1 QTY: 6	2 QTY: 2	3 QTY: 1	W1 THRU W6 QTY: 6

PHASE DIAGRAM

Ø1	PED Ø2	NOT USED Ø3	PED Ø4
NOT USED Ø5	PED Ø6	NOT USED Ø7	NOT USED Ø8

CONFLICT FLASH: RED ALL PHASES
START UP FLASH: YELLOW 2 + 6
RED ALL OTHERS

DESIGN

STATE OF TEXAS — GRANT R WUEBBEN — 129717 — LICENSED PROFESSIONAL ENGINEER

GRANT R WUEBBEN, P.E. — 9/16/2025 DATE

APPROVAL

STATE OF TEXAS — JUSTIN W. CLARK — 118715 — LICENSED PROFESSIONAL ENGINEER

JUSTIN W. CLARK, P.E. — 9/16/2025 DATE

NO.	REVISION	DATE

GEORGETOWN TEXAS *more than welcome*

PAPE-DAWSON ENGINEERS
AUSTIN I SAN ANTONIO I HOUSTON I FORT WORTH I DALLAS
10801 N MOPAC EXPY, BLDG 3, STE 200 I AUSTIN, TX 78759 I 512.454.8711
TEXAS ENGINEERING FIRM #470 I TEXAS SURVEYING FIRM #10028800

WOLF RANCH PKWY / MEMORIAL DR
WOLF RANCH PKWY AT LEGACY XING
PHASE 1 TEMPORARY SIGNAL LAYOUT

CITY JOB No.
JOB NO. 51423-04
DATE 9/16/2025
DESIGNER
CHECKED

SHEET NO. 397

LEGEND

SYMBOL	DESCRIPTION
	TRAFFIC FLOW
12"W	12" WATER PIPE
	OVERHEAD ELECTRIC
SD	STORM PIPE
X	FENCE
G	GAS LINE
	LUMINAIRE
	FIRE HYDRANT
	UTILITY POLE
	GROUND MOUNTED SIGN
	MANHOLE
	GROUND BOX
	APPARENT RIGHT-OF-WAY
	CONDUIT/SPAN
	TRAFFIC SIGNAL TIMBER POLE
	LUMINAIRE
	GROUND BOX (TYPE D)
	POLE MOUNTED CONTROLLER
	WDR CAMERA
	VANTAGE VECTOR (RPDD+RADD)
	TRAFFIC SIGNAL HEAD
	SPAN WIRE MOUNTED SIGN
09	CABLE/CONDUIT RUN
D	POLE/EQUIPMENT IDENTIFIER
	ELECTRIC SERVICE
	PEDESTRIAN POLE
	PEDESTRIAN SIGNAL HEAD

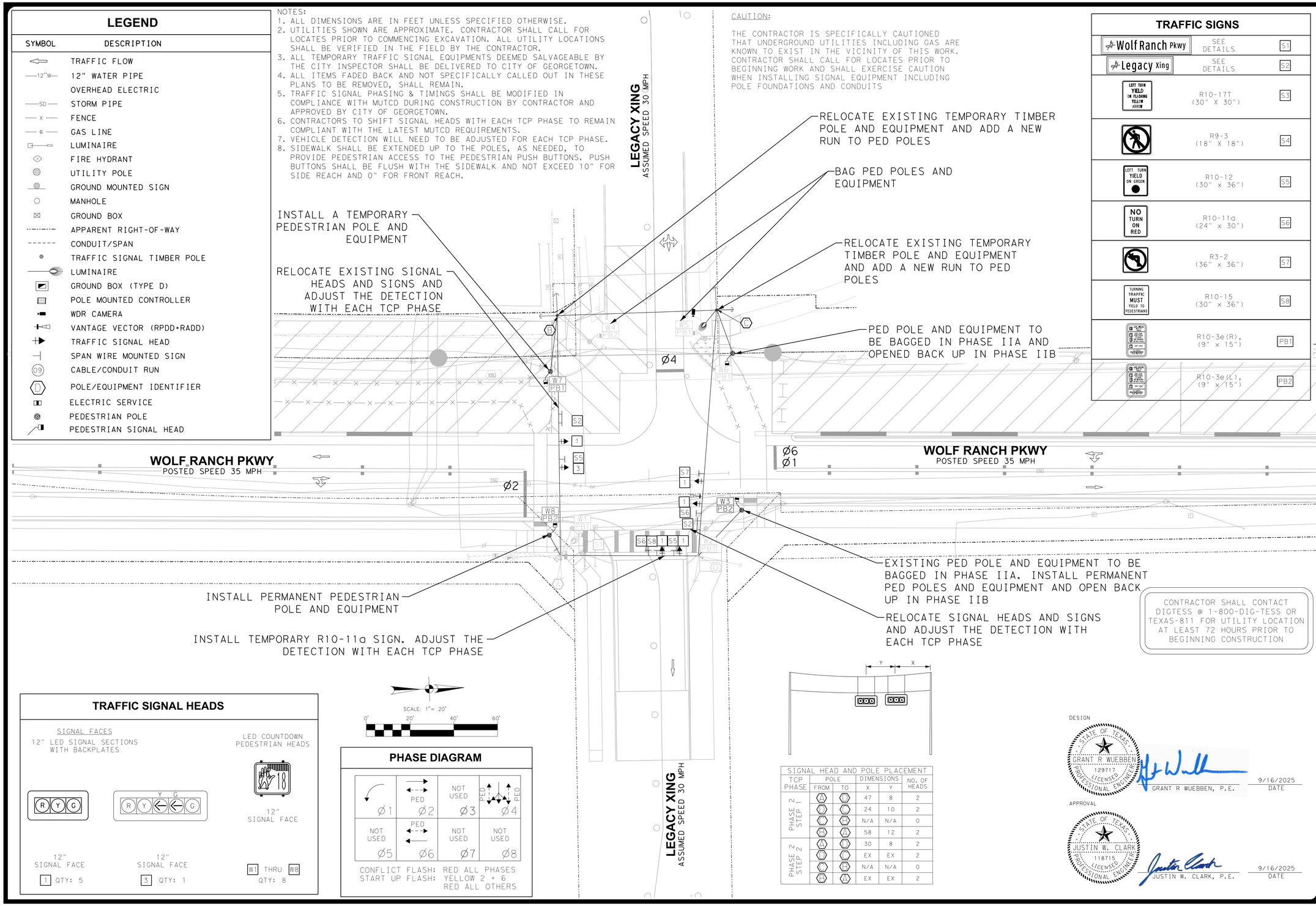
NOTES:
1. ALL DIMENSIONS ARE IN FEET UNLESS SPECIFIED OTHERWISE.
2. UTILITIES SHOWN ARE APPROXIMATE. CONTRACTOR SHALL CALL FOR LOCATES PRIOR TO COMMENCING EXCAVATION. ALL UTILITY LOCATIONS SHALL BE VERIFIED IN THE FIELD BY THE CONTRACTOR.
3. ALL TEMPORARY TRAFFIC SIGNAL EQUIPMENTS DEEMED SALVAGEABLE BY THE CITY INSPECTOR SHALL BE DELIVERED TO CITY OF GEORGETOWN.
4. ALL ITEMS FADED BACK AND NOT SPECIFICALLY CALLED OUT IN THESE PLANS TO BE REMOVED, SHALL REMAIN.
5. TRAFFIC SIGNAL PHASING & TIMINGS SHALL BE MODIFIED IN COMPLIANCE WITH MUTCD DURING CONSTRUCTION BY CONTRACTOR AND APPROVED BY CITY OF GEORGETOWN.
6. CONTRACTORS TO SHIFT SIGNAL HEADS WITH EACH TCP PHASE TO REMAIN COMPLIANT WITH THE LATEST MUTCD REQUIREMENTS.
7. VEHICLE DETECTION WILL NEED TO BE ADJUSTED FOR EACH TCP PHASE.
8. SIDEWALK SHALL BE EXTENDED UP TO THE POLES, AS NEEDED, TO PROVIDE PEDESTRIAN ACCESS TO THE PEDESTRIAN PUSH BUTTONS. PUSH BUTTONS SHALL BE FLUSH WITH THE SIDEWALK AND NOT EXCEED 10" FOR SIDE REACH AND 0" FOR FRONT REACH.

CAUTION:

THE CONTRACTOR IS SPECIFICALLY CAUTIONED THAT UNDERGROUND UTILITIES INCLUDING GAS ARE KNOWN TO EXIST IN THE VICINITY OF THIS WORK. CONTRACTOR SHALL CALL FOR LOCATES PRIOR TO BEGINNING WORK AND SHALL EXERCISE CAUTION WHEN INSTALLING SIGNAL EQUIPMENT INCLUDING POLE FOUNDATIONS AND CONDUITS

TRAFFIC SIGNS

Wolf Ranch Pkwy	SEE DETAILS	S1
Legacy Xing	SEE DETAILS	S2
LEFT TURN YIELD ON FLASHING YELLOW ARROW	R10-17T (30" X 30")	S3
	R9-3 (18" X 18")	S4
LEFT TURN YIELD ON GREEN	R10-12 (30" x 36")	S5
NO TURN ON RED	R10-11g (24" x 30")	S6
	R3-2 (36" x 36")	S7
TURNING TRAFFIC MUST YIELD TO PEDESTRIANS	R10-15 (30" x 36")	S8
	R10-3e(R), (9" x 15")	PB1
	R10-3e(L), (9" x 15")	PB2



CONTRACTOR SHALL CONTACT DIGTESS @ 1-800-DIG-TESS OR TEXAS-811 FOR UTILITY LOCATION AT LEAST 72 HOURS PRIOR TO BEGINNING CONSTRUCTION

TRAFFIC SIGNAL HEADS

SIGNAL FACES
12" LED SIGNAL SECTIONS WITH BACKPLATES

LED COUNTDOWN PEDESTRIAN HEADS

12" SIGNAL FACE — 1 QTY: 5
12" SIGNAL FACE — 3 QTY: 1
12" SIGNAL FACE — W1 THRU W8 QTY: 8

SCALE: 1" = 20'
0' 20' 40' 60'

PHASE DIAGRAM

Ø1	PED Ø2	NOT USED Ø3	PED Ø4
NOT USED Ø5	PED Ø6	NOT USED Ø7	NOT USED Ø8

CONFLICT FLASH: RED ALL PHASES
START UP FLASH: YELLOW 2 + 6
RED ALL OTHERS

SIGNAL HEAD AND POLE PLACEMENT

TCP PHASE	POLE FROM	POLE TO	DIMENSIONS X	DIMENSIONS Y	NO. OF HEADS
PHASE 2 STEP 1	A	C	47	8	2
	C	D	24	10	2
	D	A	N/A	N/A	0
	B	A	58	12	2
PHASE 2 STEP 2	A	C	30	8	2
	C	D	EX	EX	2
	D	B	N/A	N/A	0
	B	A	EX	EX	2

DESIGN

STATE OF TEXAS — GRANT R WUEBBEN — 129717 — LICENSED PROFESSIONAL ENGINEER

GRANT R WUEBBEN, P.E. — 9/16/2025 DATE

APPROVAL

STATE OF TEXAS — JUSTIN W. CLARK — 118715 — LICENSED PROFESSIONAL ENGINEER

JUSTIN W. CLARK, P.E. — 9/16/2025 DATE

NO.	REVISION	DATE

GEORGETOWN TEXAS *more than welcome*

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TEXAS ENGINEERING FIRM #470 I TEXAS SURVEYING FIRM #10028800

WOLF RANCH PKWY / MEMORIAL DR
WOLF RANCH PKWY AT LEGACY XING
PHASE 2 TEMPORARY SIGNAL LAYOUT

CITY JOB No.
JOB NO. 51423-04
DATE 9/16/2025
DESIGNER
CHECKED

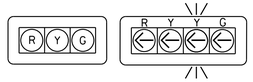
SHEET NO. 398

LEGEND

SYMBOL	DESCRIPTION
	TRAFFIC FLOW
12"W	12" WATER PIPE
	OVERHEAD ELECTRIC
SD	STORM PIPE
X	FENCE
G	GAS LINE
	LUMINAIRE
	FIRE HYDRANT
	UTILITY POLE
	GROUND MOUNTED SIGN
	MANHOLE
	CABLE RUN (BORE)
	APPARENT RIGHT-OF-WAY
	CABLE RUN (TRENCH)
	SIGNAL POLE, FOUNDATION, AND ARM
	LUMINAIRE
	GROUND BOX (TYPE D)
	CONTROLLER, SLAB, AND FOUNDATION
	WDR CAMERA
	VANTAGE VECTOR (RPDD+RADD)
	TRAFFIC SIGNAL HEAD
	MAST ARM SIGN
09	CABLE/CONDUIT RUN
D	POLE/EQUIPMENT IDENTIFIER
	ELECTRIC SERVICE
	PEDESTRIAN POLE
	PEDESTRIAN SIGNAL HEAD
	ILSN SIGN

TRAFFIC SIGNAL HEADS

SIGNAL FACES
12" LED SIGNAL SECTIONS WITH VENTED ALUMINUM REFLECTIVE BACKPLATES



12" SIGNAL FACE
1 QTY: 8

12" SIGNAL FACE
2 QTY: 4

LED COUNTDOWN PEDESTRIAN HEADS



12" SIGNAL FACE
W1 THRU W8
QTY: 8

TRAFFIC SIGNS

Wolf Ranch Pkwy	SEE DETAILS	S1
Legacy Xing	SEE DETAILS	S2
LEFT TURN YIELD ON FLASHING YELLOW ARROW	R10-17T (36" X 42")	S3
	R10-3e(R), (9" x 15")	PB1
	R10-3e(L), (9" x 15")	PB2

SCALE: 1"= 20'
0' 20' 40' 60'

CAUTION:

THE CONTRACTOR IS SPECIFICALLY CAUTIONED THAT UNDERGROUND UTILITIES INCLUDING GAS ARE KNOWN TO EXIST IN THE VICINITY OF THIS WORK. CONTRACTOR SHALL CALL FOR LOCATES PRIOR TO BEGINNING WORK AND SHALL EXERCISE CAUTION WHEN INSTALLING SIGNAL EQUIPMENT INCLUDING POLE FOUNDATIONS AND CONDUITS

CONTRACTOR SHALL CONTACT DIGTESS @ 1-800-DIG-TESS OR TEXAS-811 FOR UTILITY LOCATION AT LEAST 72 HOURS PRIOR TO BEGINNING CONSTRUCTION

NOTES:
1. ALL DIMENSIONS SHOWN ARE IN FEET UNLESS SPECIFIED OTHERWISE. (ALL EXISTING FEATURES ARE SHOWN SCREENED BACK i.e. FADED).
2. MINIMUM CLEARANCE OF 40" RADIUS FROM NEUTRAL AND 10' RADIUS FROM PRIMARY OR SECONDARY SHALL BE MAINTAINED BETWEEN PROPOSED TRAFFIC SIGNAL EQUIPMENT AND EXISTING OVERHEAD ELECTRICAL LINES. CONTRACTOR SHALL CONSIDER ALTERNATIVE FOUNDATION PLACEMENT METHODS IN AREAS WHERE EXISTING OVERHEAD ELECTRIC LINES PROHIBIT THE USE OF CONVENTIONAL DRILL TRUCK.
3. CONTRACTOR TO POTHOLE SIGNAL POLE LOCATIONS NEAR UNDERGROUND UTILITIES PRIOR TO INSTALLING POLE FOUNDATION.
4. LOCATION OF TRAFFIC SIGNAL POLES, CONTROLLER ASSEMBLIES, AND ELECTRICAL SERVICE SHALL BE VERIFIED AND APPROVED BY THE CITY OF GEORGETOWN TRANSPORTATION DEPARTMENT PRIOR TO CONSTRUCTION. THE CONTRACTOR SHALL SUPPLY AND INSTALL THE ADDRESS IN PERMANENT NUMBERS AND LETTERS TO THE STREET SIDE OF THE SERVICE ENCLOSURE. SAID ADDRESS SHALL ALSO BE RECORDED AND GIVEN TO THE CITY OF GEORGETOWN INSPECTOR FOR THE CITY'S RECORDS.
5. UTILITIES SHOWN ARE APPROXIMATE. CONTRACTOR SHALL CALL FOR LOCATES PRIOR TO COMMENCING EXCAVATION. ALL UTILITY LOCATIONS SHALL BE VERIFIED IN THE FIELD BY THE CONTRACTOR.
6. NEATLY CAP/COIL ALL WIRES AND CABLES IN GROUND BOX OR AT TERMINATION.
7. SIGNAL OPERATION WILL BE MONITORED AFTER CONSTRUCTION AND MODIFIED AS NECESSARY.
8. ALL SIGNAL HEADS SHALL HAVE VENTED ALUMINUM REFLECTIVE BACK PLATES.
9. CONTRACTOR SHALL CONTACT THE CITY OF GEORGETOWN TRANSPORTATION DEPARTMENT A MINIMUM OF FOURTEEN (14) DAYS PRIOR TO BEGINNING OF CONSTRUCTION.
10. ALL SIGNAL HEADS SHALL HAVE A MINIMUM CLEARANCE OF 18.5 FEET ABOVE GRADE THROUGHOUT THE DURATION OF THIS PROJECT.
11. TRAFFIC SIGNAL PHASING & TIMINGS SHALL BE MODIFIED DURING CONSTRUCTION BY CONTRACTOR AND APPROVED BY CITY OF GEORGETOWN.
12. LUMINAIRES ARE SHOWN FOR DRAWING PURPOSES ONLY. THE EXACT PLACEMENT SHALL BE DETERMINED IN THE FIELD AND SHALL NOT BE WITHIN 10 FEET OF OVERHEAD UTILITIES.
13. SIDEWALK SHALL BE EXTENDED UP TO THE POLES, AS NEEDED, TO PROVIDE PEDESTRIAN ACCESS TO THE PEDESTRIAN PUSH BUTTONS. PUSH BUTTONS SHALL BE FLUSH WITH THE SIDEWALK AND NO EXCEED 10" FOR SIDE REACH AND 0" FOR FRONT REACH.
14. A SIGNAL TECHNICIAN FROM THE CITY OF GEORGETOWN SHALL BE PRESENT WHEN THE NEW SIGNAL IS PLACED IN OPERATION. THE CONTRACTOR SHALL NOTIFY MR. RANDALL YOUNG WITH THE CITY OF GEORGETOWN AT 512-930-8163 AT LEAST 48 HOURS IN ADVANCE OF THE TURN ON.
15. FOR THE ELECTRIC METER ACCOUNT SET UP, CONTACT MOLLY RITTER - PUBLIC WORKS OPERATIONS MANAGER. Molly.Ritter@georgetowntexas.gov 512-930-8152.
16. THE CONTRACTOR SHALL NOTIFY MR. LUA SALUONE, TRANSPORTATION MANAGER WITH THE CITY OF GEORGETOWN AT 512-930-6574 AT LEAST ONE WEEK PRIOR TO STARTING WORK ON THIS PROJECT.
17. ThruGreen COMMUNICATION SYSTEM SHALL BE INSTALLED IN THE CONTROLLER.

PHASE DIAGRAM

Ø1	PED Ø2	Ø3	PED Ø4
Ø5	PED Ø6	Ø7	PED Ø8

CONFLICT FLASH: RED ALL PHASES
START UP FLASH: YELLOW 2 + 6
RED ALL OTHERS

DESIGN

STATE OF TEXAS · GRANT R WUEBBEN · 129717 · LICENSED PROFESSIONAL ENGINEER

GRANT R WUEBBEN, P.E. — 9/16/2025 DATE

APPROVAL

STATE OF TEXAS · JUSTIN W. CLARK · 118715 · LICENSED PROFESSIONAL ENGINEER

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GEORGETOWN TEXAS more than welcome

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TEXAS ENGINEERING FIRM #470 | TEXAS SURVEYING FIRM #10028800

WOLF RANCH PKWY / MEMORIAL DR
WOLF RANCH PKWY AT LEGACY XING
PROPOSED SIGNAL LAYOUT

CITY JOB No.
JOB NO. 51423-04
DATE 9/16/2025
DESIGNER
CHECKED

SHEET NO. 399

CONDUIT AND CONDUCTOR SCHEDULE

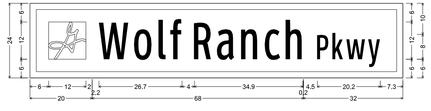
				RUN NUMBER	01	02	03	04		05			06		07		08	09	10		11	12	13		14		15	16	17		18		19	20
				CONDUIT SIZE IN INCHES	3	3	2	3	4*	3	2	2**	3	2	3	2	2	2	3	2	2	2	3	2	3	2	2	2	3	2	3	2	2	2
				NUMBER OF CONDUITS	1	1	2	2	1	2	1	1	2	1	2	1	1	1	2	1	1	1	2	1	2	1	1	1	2	1	2	1	1	1
				LENGTH OF RUN (FT)	100	30	30	10	10	80	80	80	120	120	25	25	15	15	30	30	35	25	65	65	20	20	20	20	115	115	20	20	20	25
				TRENCH (T)/BORE (B)	T	T	T	T	T	B	B	B	B	B	T	T	T	T	T	T	T	T	B	B	T	T	T	T	B	B	T	T	T	T
CABLE	CIRCUIT				NUMBER OF CONDUCTORS																												
#6 XHHW (SOLID)	120 POWER HOT					1																											
	120 POWER COMMON					1																											
#6 BARE (SOLID)	BARE BOND GROUND					1																											
#8 BARE (SOLID)	BARE BOND GROUND						2	2	1	2	1	1	2	1	2	1	1	1	2	1	1	1	2	1	2	1	1	1	2	1	2	1	1	1
7 COND. #14 AWG TYPE "A", SOLID	SIGNALS	ø	2+5					2		2																					2			
		ø	1+6					2					2							2														
		ø	3+8					2		2																2				2				
		ø	4+7					2							2																			
5 COND. #14 AWG TYPE "A", SOLID	PED. SIGNALS	POLE	D					1									1																	
		POLE	E					1										1																
		POLE	F					1					1								1													
		POLE	H					1					1									1												
		POLE	K					1		1																		1	1					
		POLE	L					1		1																1		1						
		POLE	N					1		1																								1
		POLE	P					1		1																						1		
2 COND. #14 AWG TYPE "A", SOLID	PED. APS PUSHBUTTONS	POLE	D					1									1																	
		POLE	E					1										1																
		POLE	F					1					1								1													
		POLE	H					1					1									1												
		POLE	K					1		1																		1	1					
		POLE	L					1		1																1		1						
		POLE	N					1		1																								1
		POLE	P					1		1																						1		
4 COND. #14 AWG TYPE "A", SOLID	ILSN SIGNS	POLE	C			1											1																	
		POLE	G			1								1							1													
		POLE	J			1					1														1				1				
		POLE	M			1					1																				1			
#8 XHHW (SOLID)	LUMINAIRE	POLE	C			2										2																		
		POLE	G			2								2							2													
		POLE	J			2				2															2				2				
		POLE	M			2				2																				2			
#8 BARE (SOLID)		POLE	C			1										1																		
		POLE	G			1								1							1													
		POLE	J			1				1															1				1				
		POLE	M			1				1																				1			
POWER & DATA CABLE	WDR CAMERA	POLE	C				1								1																			
		POLE	J				1		1																	1			1					
	VANTAGE VECTOR	POLE	G				1						1						1															
		POLE	M				1		1																					1				

CABLES PULLED BY ENERGY COMPANY

*4" CONDUIT RUN TO BE USED FOR FUTURE FIBER OPTIC CABLE
**2" CONDUIT TO BE USED FOR STREET LIGHTING. SEE LIGHTING PLANS FOR CONDUIT QUANTITIES AND WIRING.

ILSN DETAILS

ELECTRICAL SERVICE DATA										
Electrical Service Description (see ED (5) - 14)	Service Conduit Size	Service Conductors No./Size	Safety Switch Amps	Main Ckt. Bkr. Pole / Amp	Two - Pole Contactor Amps	Panelbd / Load center Amp Rating	Circuit No.	Branch Ckt. Bkr. Pole / Amps	Branch Circuit Amps	KVA Load
ELEC SERV TY D(120/240)100(NS)AL(E)PS(U)	3"	3/#2	N/A	2P/100	30	100	A (SIG)	1P/50	40	7.4
							B (LUM)	1P/15	10	
							C (ILSN)	1P/15	8	
							G (ILLUM)	2P/15	4	


Wolf Ranch Pkwy
24
6
12
6
6
12
6
6
12
6
6
6
6
12
6
6
6
6

POLE SCHEDULE

	POLE			(C)	(D)	(E)	(F)	(G)	(H)	(J)	(K)	(L)	(M)	(N)	(P)
	POLE TYPE			SMA-80	PED	PED	PED	SMA-80	PED	SMA-80	PED	PED	SMA-80	PED	PED
	POLE HEIGHT (FEET)			30	10	10	10	30	10	30	10	10	30	10	10
	MAST ARM LENGTH (FEET)			28	N/A	N/A	N/A	40	N/A	28	N/A	N/A	44	N/A	N/A
	ILSN** (YES/NO)			YES	N/A	N/A	N/A	YES	N/A	YES	N/A	N/A	YES	N/A	N/A
	LUMINAIRE (YES/NO)			YES	NO	NO	NO	YES	NO	YES	NO	NO	YES	NO	NO
	FOUNDATION TYPE			30-A	24-A	24-A	24-A	36-A	SPL*	30-A	24-A	SPL*	36-A	24-A	24-A
	FOUNDATION DEPTH (FEET)			11	6	6	6	13	SPL*	11	6	SPL*	13	6	6
CABLE	CIRCUIT			NUMBER OF CONDUCTORS											
#8 BARE (SOLID)	BARE BOND GROUND			1	1	1	1	1	1	1	1	1	1	1	1
7 COND. #14 AWG TYPE "A", SOLID	SIGNALS	ø	2•5										3		
		ø	1•6					3							
		ø	3•8							3					
		ø	4•7	3											
5 COND. #14 AWG TYPE "A", SOLID	PED. SIGNALS	POLE	D		1										
		POLE	E			1									
		POLE	F				1								
		POLE	H						1						
		POLE	K								1				
		POLE	L									1			
		POLE	N											1	
		POLE	P												1
2 COND. #14 AWG TYPE "A", SOLID	PED. APS PUSHBUTTONS	POLE	D		1										
		POLE	E			1									
		POLE	F				1								
		POLE	H						1						
		POLE	K								1				
		POLE	L									1			
		POLE	N											1	
		POLE	P												1
4 COND. #14 AWG TYPE "A", SOLID	ILSN SIGNS	POLE	C	1											
		POLE	G					1							
		POLE	J							1					
		POLE	M										1		
#8 XHHW (SOLID)	LUMINAIRE	POLE	C	1											
		POLE	G					1							
		POLE	J							1					
		POLE	M										1		
#8 BARE (SOLID)		POLE	C	1											
		POLE	G					1							
		POLE	J							1					
		POLE	M										1		
POWER & DATA CABLE	WDR CAMERA	POLE	C	1											
		POLE	J							1					
	VANTAGE VECTOR	POLE	G					1							
		POLE	M										1		

* SEE PEDESTRIAN POLE SPECIAL FOUNDATION FOR DETAILS

** ILSN SIGNS TO BE PLACED ON MAST ARMS AS SHOWN IN PLANS.

POLE & EQUIPMENT INFORMATION

ID	DESCRIPTION/ATTACHMENTS	NORTHING	EASTING	FND. ELEV
(A)	PROPOSED FREESTANDING PEDESTAL AND METER WITH TXDOT TYPE D SERVICE	N/A	N/A	N/A
(B)	INSTALL TXDOT STANDARD NEMA CABINET WITH SIEMENS M60 TRAFFIC SIGNAL CONTROLLER ON CONCRETE FOUNDATION	N/A	N/A	N/A
(C)	INSTALL 30 FT SMA-80, 28 FT MAST ARM ON 11 FT DRILLED SHAFT FND (30-A) WITH ONE LUMINAIRE, ONE WDR CAMERA, ONE ILSN SIGN, ONE R10-17T SIGN, AND THREE VEHICLE SIGNAL HEADS AS ILLUSTRATED.	10205851.9	3124686.2	LEVEL W/ CROWN OF ROAD
(D)	INSTALL 10 FT PEDESTAL POLE ON 6 FT DRILLED SHAFT FND (24-A), WITH ONE LED COUNTDOWN PEDESTRIAN SIGNAL HEAD, ONE PEDESTRIAN PUSH BUTTON WITH AUDIBLE PEDESTRIAN SIGNAL UNIT, AND ONE R10-3e(R) SIGN AS ILLUSTRATED.	10205836.6	3124659.4	FLUSH W/ LANDING
(E)	INSTALL 10 FT PEDESTAL POLE ON 6 FT DRILLED SHAFT FND (24-A), WITH ONE LED COUNTDOWN PEDESTRIAN SIGNAL HEAD, ONE PEDESTRIAN PUSH BUTTON WITH AUDIBLE PEDESTRIAN SIGNAL UNIT, AND ONE R10-3e(L) SIGN AS ILLUSTRATED.	10205826.0	3124662.1	FLUSH W/ LANDING
(F)	INSTALL 10 FT PEDESTAL POLE ON 6 FT DRILLED SHAFT FND (24-A), WITH ONE LED COUNTDOWN PEDESTRIAN SIGNAL HEAD, ONE PEDESTRIAN PUSH BUTTON WITH AUDIBLE PEDESTRIAN SIGNAL UNIT, AND ONE R10-3e(L) SIGN AS ILLUSTRATED.	10205821.5	3124572.1	FLUSH W/ LANDING
(G)	INSTALL 30 FT SMA-80, 40 FT MAST ARM ON 13 FT DRILLED SHAFT FND (36-A) WITH ONE LUMINAIRE, ONE VANTAGE VECTOR WITH NEXT UNIT (RPDD•RADD), ONE ILSN SIGN, ONE WIND DAMPER ASSEMBLY, ONE R10-17T SIGN, AND THREE VEHICLE SIGNAL HEADS AS ILLUSTRATED.	10205830.0	3124573.1	LEVEL W/ CROWN OF ROAD
(H)	INSTALL 10 FT PEDESTAL POLE ON SPECIAL FND, WITH ONE LED COUNTDOWN PEDESTRIAN SIGNAL HEAD, ONE PEDESTRIAN PUSH BUTTON WITH AUDIBLE PEDESTRIAN SIGNAL UNIT, AND ONE R10-3e(L) SIGN AS ILLUSTRATED.	10205835.7	3124574.9	FLUSH W/ LANDING
(J)	INSTALL 30 FT SMA-80, 28 FT MAST ARM ON 11 FT DRILLED SHAFT FND (30-A) WITH ONE LUMINAIRE, ONE WDR CAMERA, ONE ILSN SIGN, ONE R10-17T SIGN, AND THREE VEHICLE SIGNAL HEADS AS ILLUSTRATED.	10205899.5	3124562.8	LEVEL W/ CROWN OF ROAD
(K)	INSTALL 10 FT PEDESTAL POLE ON SPECIAL FND (24-A), WITH ONE LED COUNTDOWN PEDESTRIAN SIGNAL HEAD, ONE PEDESTRIAN PUSH BUTTON WITH AUDIBLE PEDESTRIAN SIGNAL UNIT, AND ONE R10-3e(R) SIGN AS ILLUSTRATED.	10205910.7	3124576.9	FLUSH W/ LANDING
(L)	INSTALL 10 FT PEDESTAL POLE ON SPECIAL FND (24-A), WITH ONE LED COUNTDOWN PEDESTRIAN SIGNAL HEAD, ONE PEDESTRIAN PUSH BUTTON WITH AUDIBLE PEDESTRIAN SIGNAL UNIT, AND ONE R10-3e(R) SIGN AS ILLUSTRATED.	10205925.5	3124574.1	FLUSH W/ LANDING
(M)	INSTALL 30 FT SMA-80, 44 FT MAST ARM ON 13 FT DRILLED SHAFT FND (36-A) WITH ONE LUMINAIRE, ONE VANTAGE VECTOR WITH NEXT UNIT (RPDD•RADD), ONE WIND DAMPER ASSEMBLY, ONE ILSN SIGN, ONE R10-17T SIGN, AND THREE VEHICLE SIGNAL HEADS AS ILLUSTRATED.	10205902.9	3124655.5	LEVEL W/ CROWN OF ROAD
(N)	INSTALL 10 FT PEDESTAL POLE ON 6 FT DRILLED SHAFT FND (24-A), WITH ONE LED COUNTDOWN PEDESTRIAN SIGNAL HEAD, ONE PEDESTRIAN PUSH BUTTON WITH AUDIBLE PEDESTRIAN SIGNAL UNIT, AND ONE R10-3e(R) SIGN AS ILLUSTRATED.	10205914.3	3124653.6	FLUSH W/ LANDING
(P)	INSTALL 10 FT PEDESTAL POLE ON 6 FT DRILLED SHAFT FND (24-A), WITH ONE LED COUNTDOWN PEDESTRIAN SIGNAL HEAD, ONE PEDESTRIAN PUSH BUTTON WITH AUDIBLE PEDESTRIAN SIGNAL UNIT, AND ONE R10-3e(L) SIGN AS ILLUSTRATED.	10205897.6	3124661.8	FLUSH W/ LANDING

SIGNS SHALL BE ATTACHED TO POLES AND MAST ARMS AS SHOWN ON PLANS

APS MESSAGE CHART

POLE ID	PEDSETRIAN MOVEMENT	FUNCTIONS	APS PROGRAMMING SETTING WHEN AT LEAST 10' APART
(D)	PHASE 2	BUTTON PUSH ON DON'T WALK	WAIT
		EXTENDED PUSH BUTTON	WAIT TO CROSS WOLF RANCH PKWY AT LEGACY CROSSING
		LOCATOR TONE	SLOW TICK
		WALK INDICATION*	RAPID TICK
(P)	PHASE 2	BUTTON PUSH ON DON'T WALK	WAIT
		EXTENDED PUSH BUTTON	WAIT TO CROSS WOLF RANCH PKWY AT LEGACY CROSSING
		LOCATOR TONE	SLOW TICK
		WALK INDICATION*	RAPID TICK
(E)	PHASE 4	BUTTON PUSH ON DON'T WALK	WAIT
		EXTENDED PUSH BUTTON	WAIT TO CROSS LEGACY CROSSING AT WOLF RANCH
		LOCATOR TONE	SLOW TICK
		WALK INDICATION*	RAPID TICK
(F)	PHASE 4	BUTTON PUSH ON DON'T WALK	WAIT
		EXTENDED PUSH BUTTON	WAIT TO CROSS LEGACY CROSSING AT WOLF RANCH
		LOCATOR TONE	SLOW TICK
		WALK INDICATION*	RAPID TICK
(H)	PHASE 6	BUTTON PUSH ON DON'T WALK	WAIT
		EXTENDED PUSH BUTTON	WAIT TO CROSS WOLF RANCH PKWY AT LEGACY CROSSING
		LOCATOR TONE	SLOW TICK
		WALK INDICATION*	RAPID TICK
(K)	PHASE 6	BUTTON PUSH ON DON'T WALK	WAIT
		EXTENDED PUSH BUTTON	WAIT TO CROSS WOLF RANCH PKWY AT LEGACY CROSSING
		LOCATOR TONE	SLOW TICK
		WALK INDICATION*	RAPID TICK
(L)	PHASE 8	BUTTON PUSH ON DON'T WALK	WAIT
		EXTENDED PUSH BUTTON	WAIT TO CROSS LEGACY CROSSING AT WOLF RANCH
		LOCATOR TONE	SLOW TICK
		WALK INDICATION*	RAPID TICK
(N)	PHASE 8	BUTTON PUSH ON DON'T WALK	WAIT
		EXTENDED PUSH BUTTON	WAIT TO CROSS LEGACY CROSSING AT WOLF RANCH
		LOCATOR TONE	SLOW TICK
		WALK INDICATION*	RAPID TICK

* COUNTDOWN SPEECH MESSAGE = "ON" FOR ALL UNITS.

ITEM 688 - ACCESSIBLE PEDESTRIAN SIGNAL UNITS (APS)	
PED BUTTON PHASE	FURNISH & INSTALL
PHASE 2	2
PHASE 4	2
PHASE 6	2
PHASE 8	2
TOTAL	8

DESIGN

STATE OF TEXAS — GRANT R WUEBBEN — 129717 — LICENSED PROFESSIONAL ENGINEER

GRANT R WUEBBEN, P.E. — 9/16/2025 DATE

APPROVAL

STATE OF TEXAS — JUSTIN W. CLARK — 118715 — LICENSED PROFESSIONAL ENGINEER

JUSTIN W. CLARK, P.E. — 9/16/2025 DATE

NO.	REVISION	DATE

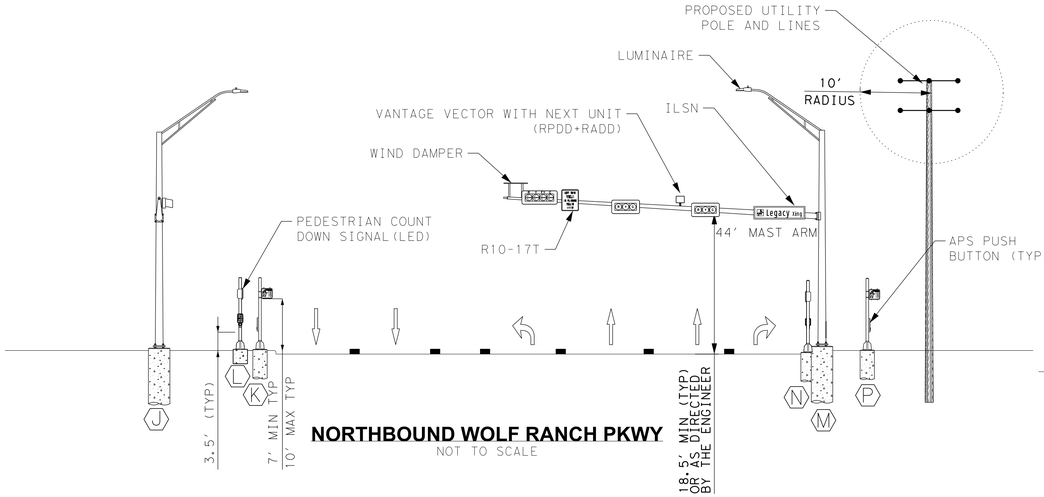
GEORGETOWN TEXAS *more than welcome*

PAPE-DAWSON ENGINEERS
AUSTIN | SAN ANTONIO | HOUSTON | FORT WORTH | DALLAS
10801 N MOPAC EXPY, BLDG 3, STE 200 | AUSTIN, TX 78759 | 512.454.8711
TEXAS ENGINEERING FIRM #470 | TEXAS SURVEYING FIRM #10023800

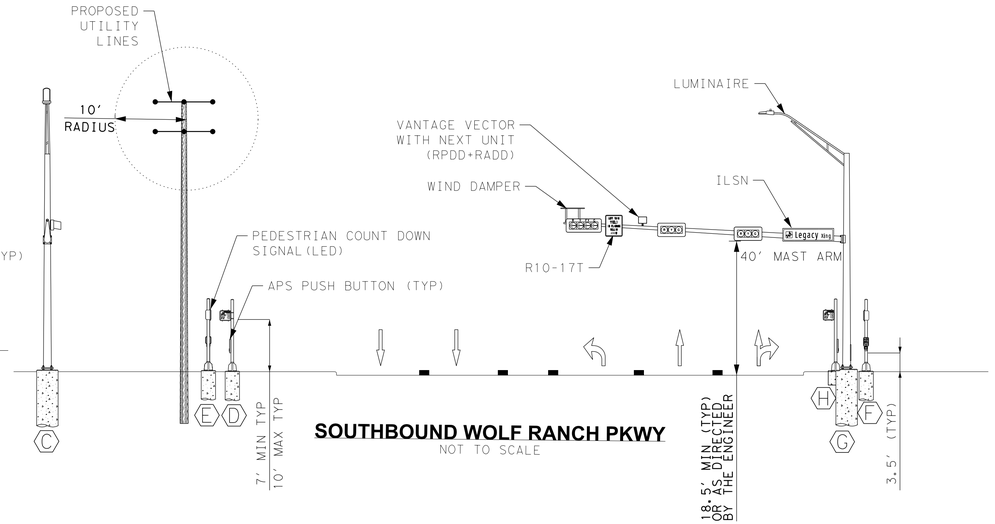
WOLF RANCH PKWY / MEMORIAL DR
WOLF RANCH PKWY / LEGACY XING
CONDUIT & CONDUCTOR SCHEDULE

CITY JOB No.
JOB NO. 51423-04
DATE 9/16/2025
DESIGNER
CHECKED

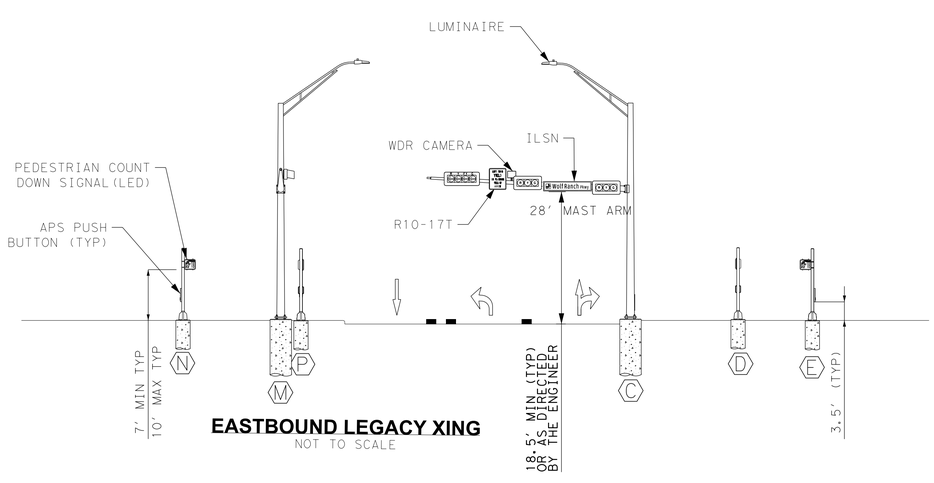
SHEET NO. 401



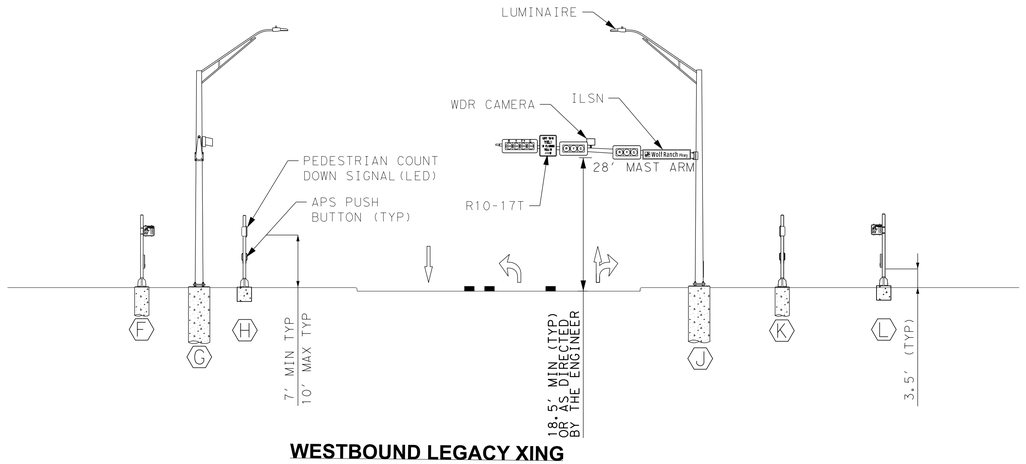
NORTHBOUND WOLF RANCH PKWY
NOT TO SCALE



SOUTHBOUND WOLF RANCH PKWY
NOT TO SCALE



EASTBOUND LEGACY XING
NOT TO SCALE



WESTBOUND LEGACY XING
NOT TO SCALE

DESIGN

STATE OF TEXAS
GRANT R WUEBBEN
129717
LICENSED PROFESSIONAL ENGINEER

GRANT R WUEBBEN, P.E. — 9/16/2025 DATE

APPROVAL

STATE OF TEXAS
JUSTIN W. CLARK
118715
LICENSED PROFESSIONAL ENGINEER

JUSTIN W. CLARK, P.E. — 9/16/2025 DATE

NO.	REVISION	DATE

GEORGETOWN TEXAS
more than welcome

PAPE-DAWSON ENGINEERS
AUSTIN | SAN ANTONIO | HOUSTON | FORT WORTH | DALLAS
10801 N MOPAC EXPY, BLDG 3, STE 200 | AUSTIN, TX 78759 | 512.454.8711
TEXAS ENGINEERING FIRM #470 | TEXAS SURVEYING FIRM #10028800

WOLF RANCH PKWY / MEMORIAL DR
WOLF RANCH PKWY AT LEGACY XING
TRAFFIC SIGNAL ELEVATIONS

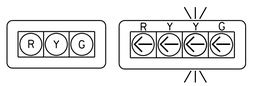
CITY JOB No.
JOB NO. 51423-04
DATE 9/16/2025
DESIGNER
CHECKED

SHEET NO. 402

TRAFFIC SIGNAL HEADS

SIGNAL FACES
12" LED SIGNAL SECTIONS
WITH BACKPLATES

LED COUNTDOWN
PEDESTRIAN HEADS





12" SIGNAL FACE
1 QTY: 8

12" SIGNAL FACE
2 QTY: 4

12" SIGNAL FACE
W1 THRU W8
QTY: 8

SCALE: 1"= 20'
0' 20' 40' 60'

LEGACY XING
ASSUMED SPEED 30 MPH

ø3, LS 3 ø8, LS 8 ø8, LS 8
FYA, RED, YELLOW LS 10
OVL B

ø6, LS 15

ø6, LS 15

ø8, LS 16

ø1, LS 1 ø6, LS 6 ø6, LS 6
FYA, RED, YELLOW LS 9
OVL A

ø4, LS 14

ø4, LS 14

ø8, LS 16

ø2, LS 13

ø2, LS 13

ø5, LS 5 ø2, LS 2 ø2, LS 2
FYA, RED, YELLOW LS 11
OVL C

ø7, LS 7 ø4, LS 4 ø4, LS 4
FYA, RED, YELLOW LS 12
OVL D

WOLF RANCH PKWY
POSTED SPEED 35 MPH

WOLF RANCH PKWY
POSTED SPEED 35 MPH

LEGACY XING
ASSUMED SPEED 30 MPH

ø1 ø2 ø3 ø4 ø5 ø6 ø7 ø8

PR UGE PR TELECOM PR FOC PR OHE PB LM

DESIGN

STATE OF TEXAS
GRANT R WUEBBEN
129717
LICENSED
PROFESSIONAL ENGINEER

GRANT R WUEBBEN, P.E. — 9/16/2025 DATE

APPROVAL

STATE OF TEXAS
JUSTIN W. CLARK
118715
LICENSED
PROFESSIONAL ENGINEER

JUSTIN W. CLARK, P.E. — 9/16/2025 DATE

NO.	REVISION	DATE

GEORGETOWN TEXAS
more than welcome

PAPE-DAWSON ENGINEERS
AUSTIN I SAN ANTONIO I HOUSTON I FORT WORTH I DALLAS
10801 N MOPAC EXPY, BLDG 3, STE 200 I AUSTIN, TX 78759 I 512.454.8711
TEXAS ENGINEERING FIRM #470 I TEXAS SURVEYING FIRM #10028800

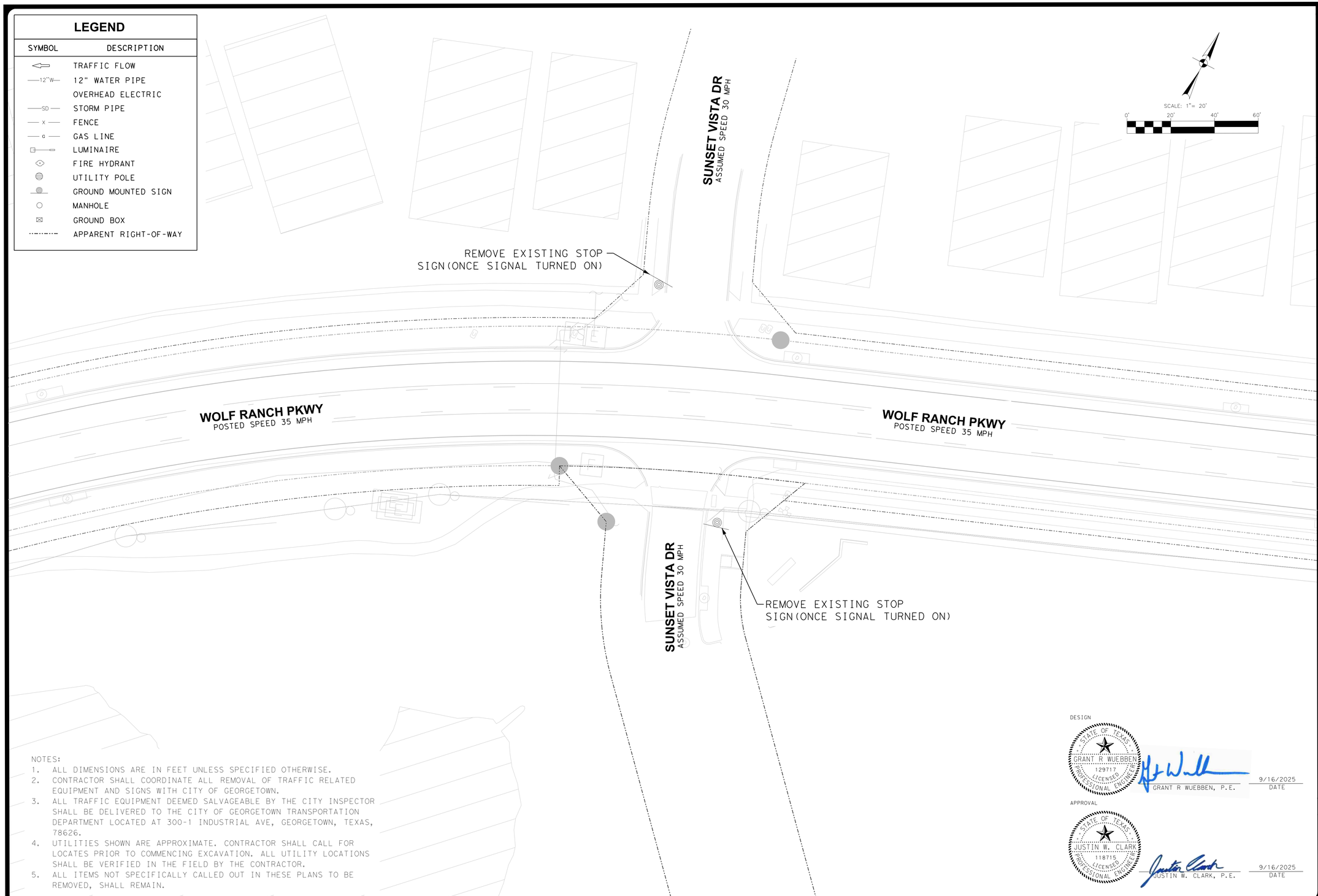
WOLF RANCH PKWY / MEMORIAL DR
WOLF RANCH PKWY AT LEGACY XING
MISCELLANEOUS APS/LOAD SWITCH INFORMATION

CITY JOB No.
JOB NO. 51423-04
DATE 9/16/2025
DESIGNER
CHECKED

SHEET NO. 403

LEGEND

SYMBOL	DESCRIPTION
⇦	TRAFFIC FLOW
—12"W—	12" WATER PIPE
	OVERHEAD ELECTRIC
—SD—	STORM PIPE
— x —	FENCE
— G —	GAS LINE
	LUMINAIRE
	FIRE HYDRANT
	UTILITY POLE
	GROUND MOUNTED SIGN
	MANHOLE
	GROUND BOX
	APPARENT RIGHT-OF-WAY



NOTES:
1. ALL DIMENSIONS ARE IN FEET UNLESS SPECIFIED OTHERWISE.
2. CONTRACTOR SHALL COORDINATE ALL REMOVAL OF TRAFFIC RELATED EQUIPMENT AND SIGNS WITH CITY OF GEORGETOWN.
3. ALL TRAFFIC EQUIPMENT DEEMED SALVAGEABLE BY THE CITY INSPECTOR SHALL BE DELIVERED TO THE CITY OF GEORGETOWN TRANSPORTATION DEPARTMENT LOCATED AT 300-1 INDUSTRIAL AVE, GEORGETOWN, TEXAS, 78626.
4. UTILITIES SHOWN ARE APPROXIMATE. CONTRACTOR SHALL CALL FOR LOCATES PRIOR TO COMMENCING EXCAVATION. ALL UTILITY LOCATIONS SHALL BE VERIFIED IN THE FIELD BY THE CONTRACTOR.
5. ALL ITEMS NOT SPECIFICALLY CALLED OUT IN THESE PLANS TO BE REMOVED, SHALL REMAIN.

DESIGN

STATE OF TEXAS — GRANT R WUEBBEN — 129717 — LICENSED PROFESSIONAL ENGINEER

GRANT R WUEBBEN, P.E. — 9/16/2025 DATE

APPROVAL

STATE OF TEXAS — JUSTIN W. CLARK — 118715 — LICENSED PROFESSIONAL ENGINEER

JUSTIN W. CLARK, P.E. — 9/16/2025 DATE

NO.	REVISION	DATE

GEORGETOWN TEXAS *more than welcome*

PAPE-DAWSON ENGINEERS
AUSTIN | SAN ANTONIO | HOUSTON | FORT WORTH | DALLAS
10801 N MOPAC EXPY, BLDG 3, STE 200 | AUSTIN, TX. 78759 | 512.454.8711
TEXAS ENGINEERING FIRM #470 | TEXAS SURVEYING FIRM #10028800

WOLF RANCH PKWY / MEMORIAL DR
WOLF RANCH PKWY AT SUNSET VISTA DR
EXISTING SIGNAL LAYOUT

CITY JOB No.
JOB NO. 51423-04
DATE 9/16/2025
DESIGNER
CHECKED

SHEET NO. 404

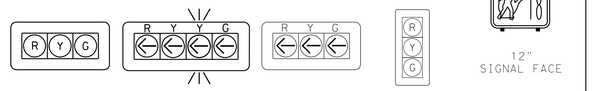
LEGEND

SYMBOL	DESCRIPTION
	TRAFFIC FLOW
12"W	12" WATER PIPE
	OVERHEAD ELECTRIC
SD	STORM PIPE
X	FENCE
G	GAS LINE
	LUMINAIRE
	FIRE HYDRANT
	UTILITY POLE
	GROUND MOUNTED SIGN
	MANHOLE
	CABLE RUN (BORE)
	APPARENT RIGHT-OF-WAY
	CABLE RUN (TRENCH)
	SIGNAL POLE, FOUNDATION, AND ARM
	LUMINAIRE
	GROUND BOX (TYPE D)
	CONTROLLER, SLAB, AND FOUNDATION
	WDR CAMERA
	VANTAGE VECTOR (RPDD+RADD)
	TRAFFIC SIGNAL HEAD
	MAST ARM SIGN
09	CABLE/CONDUIT RUN
D	POLE/EQUIPMENT IDENTIFIER
	ELECTRIC SERVICE
	PEDESTRIAN POLE
	PEDESTRIAN SIGNAL HEAD
	ILSN SIGN
	SPECIAL PEDESTRIAN POLE

TRAFFIC SIGNAL HEADS

SIGNAL FACES
12" LED SIGNAL SECTIONS WITH VENTED ALUMINUM REFLECTIVE BACKPLATES

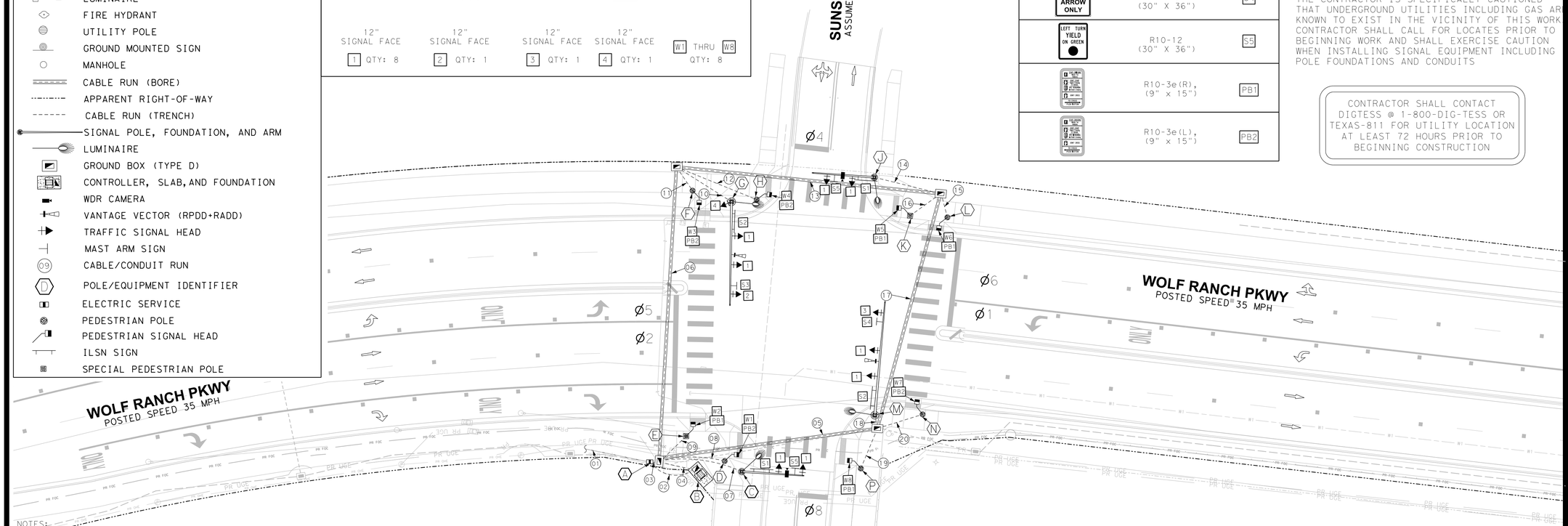
LED COUNTDOWN PEDESTRIAN HEADS



12" SIGNAL FACE 1	12" SIGNAL FACE 2	12" SIGNAL FACE 3	12" SIGNAL FACE 4	12" SIGNAL FACE W1 THRU W8
QTY: 8	QTY: 1	QTY: 1	QTY: 1	QTY: 8

TRAFFIC SIGNS

Wolf Ranch Pkwy	SEE DETAILS	S1
Sunset Vista Dr	SEE DETAILS	S2
LEFT TURN YIELD ON FLASHING YELLOW ARROW	R10-17T (36" X 42")	S3
LEFT ON GREEN ARROW ONLY	R10-5 (30" X 36")	S4
LEFT TURN YIELD ON GREEN	R10-12 (30" X 36")	S5
	R10-3e(R), (9" x 15")	PB1
	R10-3e(L), (9" x 15")	PB2



SCALE: 1" = 20'
0' 20' 40' 60'

CAUTION:

THE CONTRACTOR IS SPECIFICALLY CAUTIONED THAT UNDERGROUND UTILITIES INCLUDING GAS ARE KNOWN TO EXIST IN THE VICINITY OF THIS WORK. CONTRACTOR SHALL CALL FOR LOCATES PRIOR TO BEGINNING WORK AND SHALL EXERCISE CAUTION WHEN INSTALLING SIGNAL EQUIPMENT INCLUDING POLE FOUNDATIONS AND CONDUITS

CONTRACTOR SHALL CONTACT DIGTESS @ 1-800-DIG-TESS OR TEXAS-811 FOR UTILITY LOCATION AT LEAST 72 HOURS PRIOR TO BEGINNING CONSTRUCTION

NOTES:
1. ALL DIMENSIONS SHOWN ARE IN FEET UNLESS SPECIFIED OTHERWISE. (ALL EXISTING FEATURES ARE SHOWN SCREENED BACK i.e. FADED).
2. MINIMUM CLEARANCE OF 40" RADIUS FROM NEUTRAL AND 10' RADIUS FROM PRIMARY OR SECONDARY SHALL BE MAINTAINED BETWEEN PROPOSED TRAFFIC SIGNAL EQUIPMENT AND EXISTING OVERHEAD ELECTRICAL LINES. CONTRACTOR SHALL CONSIDER ALTERNATIVE FOUNDATION PLACEMENT METHODS IN AREAS WHERE EXISTING OVERHEAD ELECTRIC LINES PROHIBIT THE USE OF CONVENTIONAL DRILL TRUCK.
3. CONTRACTOR TO POTHOLE SIGNAL POLE LOCATIONS NEAR UNDERGROUND UTILITIES PRIOR TO INSTALLING POLE FOUNDATION.
4. LOCATION OF TRAFFIC SIGNAL POLES, CONTROLLER ASSEMBLIES, AND ELECTRICAL SERVICE SHALL BE VERIFIED AND APPROVED BY THE CITY OF GEORGETOWN TRANSPORTATION DEPARTMENT PRIOR TO CONSTRUCTION. THE CONTRACTOR SHALL SUPPLY AND INSTALL THE ADDRESS IN PERMANENT NUMBERS AND LETTERS TO THE STREET SIDE OF THE SERVICE ENCLOSURE. SAID ADDRESS SHALL ALSO BE RECORDED AND GIVEN TO THE CITY OF GEORGETOWN INSPECTOR FOR THE CITY'S RECORDS.
5. UTILITIES SHOWN ARE APPROXIMATE. CONTRACTOR SHALL CALL FOR LOCATES PRIOR TO COMMENCING EXCAVATION. ALL UTILITY LOCATIONS SHALL BE VERIFIED IN THE FIELD BY THE CONTRACTOR.
6. NEATLY CAP/COIL ALL WIRES AND CABLES IN GROUND BOX OR AT TERMINATION.
7. SIGNAL OPERATION WILL BE MONITORED AFTER CONSTRUCTION AND MODIFIED AS NECESSARY.
8. ALL SIGNAL HEADS SHALL HAVE VENTED ALUMINUM REFLECTIVE BACK PLATES.
9. CONTRACTOR SHALL CONTACT THE CITY OF GEORGETOWN TRANSPORTATION DEPARTMENT A MINIMUM OF FOURTEEN (14) DAYS PRIOR TO BEGINNING OF CONSTRUCTION.
10. ALL SIGNAL HEADS SHALL HAVE A MINIMUM CLEARANCE OF 18.5 FEET ABOVE GRADE THROUGHOUT THE DURATION OF THIS PROJECT.
11. TRAFFIC SIGNAL PHASING & TIMINGS SHALL BE MODIFIED DURING CONSTRUCTION BY CONTRACTOR AND APPROVED BY CITY OF GEORGETOWN.
12. LUMINAIRES ARE SHOWN FOR DRAWING PURPOSES ONLY. THE EXACT PLACEMENT SHALL BE DETERMINED IN THE FIELD AND SHALL NOT BE WITHIN 10 FEET OF OVERHEAD UTILITIES.
13. SIDEWALK SHALL BE EXTENDED UP TO THE POLES, AS NEEDED, TO PROVIDE PEDESTRIAN ACCESS TO THE PEDESTRIAN PUSH BUTTONS. PUSH BUTTONS SHALL BE FLUSH WITH THE SIDEWALK AND NO EXCEED 10" FOR SIDE REACH AND 0" FOR FRONT REACH.
14. A SIGNAL TECHNICIAN FROM THE CITY OF GEORGETOWN SHALL BE PRESENT WHEN THE NEW SIGNAL IS PLACED IN OPERATION. THE CONTRACTOR SHALL NOTIFY MR. RANDALL YOUNG WITH THE CITY OF GEORGETOWN AT 512-930-8163 AT LEAST 48 HOURS IN ADVANCE OF THE TURN ON.
15. FOR THE ELECTRIC METER ACCOUNT SET UP, CONTACT MOLLY RITTER - PUBLIC WORKS OPERATIONS MANAGER. Molly.Ritter@georgetowntexas.gov 512-930-8152.
16. THE CONTRACTOR SHALL NOTIFY MR. LUA SALUONE, TRANSPORTATION MANAGER WITH THE CITY OF GEORGETOWN AT 512-930-6574 AT LEAST ONE WEEK PRIOR TO STARTING WORK ON THIS PROJECT.
17. ThruGreen COMMUNICATION SYSTEM SHALL BE INSTALLED IN THE CONTROLLER.

PHASE DIAGRAM

Ø1	PED Ø2	NOT USED Ø3	PED Ø4
Ø5	PED Ø6	NOT USED Ø7	PED Ø8

CONFLICT FLASH: RED ALL PHASES
START UP FLASH: YELLOW 2 + 6
RED ALL OTHERS

DESIGN

STATE OF TEXAS · GRANT R WUEBBEN · 129717 · LICENSED · PROFESSIONAL ENGINEER

GRANT R WUEBBEN, P.E. — 9/16/2025 DATE

APPROVAL

STATE OF TEXAS · JUSTIN W. CLARK · 118715 · LICENSED · PROFESSIONAL ENGINEER

JUSTIN W. CLARK, P.E. — 9/16/2025 DATE

NO.	REVISION	DATE

GEORGETOWN TEXAS *more than welcome*

PAPE-DAWSON ENGINEERS
AUSTIN | SAN ANTONIO | HOUSTON | FORT WORTH | DALLAS
10801 N MOPAC EXPY, BLDG 3, STE 200 | AUSTIN, TX 78759 | 512.454.8711
TEXAS ENGINEERING FIRM #470 | TEXAS SURVEYING FIRM #10023800

WOLF RANCH PKWY / MEMORIAL DR
WOLF RANCH PKWY AT SUNSET VISTA DR
PROPOSED SIGNAL LAYOUT

CITY JOB No.
JOB NO. 51423-04
DATE 9/16/2025
DESIGNER
CHECKED

SHEET NO. 405

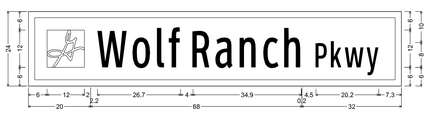
CONDUIT AND CONDUCTOR SCHEDULE

				RUN NUMBER	01	02	03	04		05			06		07		08	09	10		11	12	13		14		15	16	17		18		19	20
				CONDUIT SIZE IN INCHES	3	3	2	3	4*	3	2	2**	3	2	3	2	2	2	3	2	2	2	3	2	3	2	2	2	2	3	2	3	2	2	2
				NUMBER OF CONDUITS	1	1	2	2	1	2	1	1	2	1	2	1	1	1	2	1	1	1	2	1	2	1	1	1	2	1	2	1	1	1
				LENGTH OF RUN (FT)	100	20	10	15	15	85	85	85	115	115	30	30	25	15	30	30	15	35	105	105	30	30	15	20	100	100	10	10	20	20
				TRENCH (T)/BORE (B)	T	T	T	T	T	B	B	B	B	B	T	T	T	T	T	T	T	T	B	B	T	T	T	T	B	B	T	T	T	T
CABLE	CIRCUIT				NUMBER OF CONDUCTORS																												
#6 XHHW (SOLID)	120 POWER HOT				1																												
	120 POWER COMMON				1																												
#6 BARE (SOLID)	BARE BOND GROUND				1																												
#8 BARE (SOLID)	BARE BOND GROUND					2	2	1	2	1	1	2	1	2	1	1	1	2	1	1	1	2	1	2	1	1	1	2	1	2	1	1	1
7 COND. #14 AWG TYPE "A", SOLID	SIGNALS	ø	2+5			3		2			1							1												2			
		ø	1+6			2					2							2															
		ø	8			1		1																	1				1				
		ø	4			1								1																			
5 COND. #14 AWG TYPE "A", SOLID	PED. SIGNALS	POLE	D			1											1																
		POLE	E			1												1																
		POLE	F			1					1										1													
		POLE	H			1					1											1												
		POLE	K			1		1																				1	1					
		POLE	L			1		1																			1		1					
		POLE	N			1		1																									1
		POLE	P			1		1																								1	
2 COND. #14 AWG TYPE "A", SOLID	PED. APS PUSHBUTTONS	POLE	D			1											1																
		POLE	E			1												1																
		POLE	F			1					1										1													
		POLE	H			1					1											1												
		POLE	K			1		1																				1	1					
		POLE	L			1		1																			1		1					
		POLE	N			1		1																									1
		POLE	P			1		1																								1	
4 COND. #14 AWG TYPE "A", SOLID	ILSN SIGNS	POLE	C				1										1																
		POLE	G			1								1							1													
		POLE	J			1					1															1				1				
		POLE	M			1					1																				1			
#8 XHHW (SOLID)	LUMINAIRE	POLE	C			2										2																	
		POLE	G			2								2							2													
		POLE	J			2					2															2				2				
		POLE	M			2					2																				2			
#8 BARE (SOLID)		POLE	C			1										1																	
		POLE	G			1								1							1													
		POLE	J			1					1															1				1				
		POLE	M			1					1																				1			
POWER & DATA CABLE	WDR CAMERA	POLE	C				1								1																			
		POLE	J				1		1																1				1					
	VANTAGE VECTOR	POLE	G				1					1							1															
		POLE	M				1		1																						1			

CABLES PULLED BY ENERGY COMPANY

*4" CONDUIT RUN TO BE USED FOR FUTURE FIBER OPTIC CABLE
**2" CONDUIT TO BE USED FOR STREET LIGHTING. SEE LIGHTING PLANS FOR CONDUIT QUANTITIES AND WIRING.

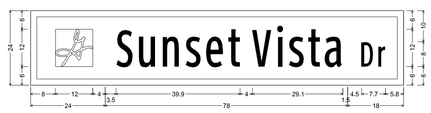
ILSN DETAILS



6.0" Radius, 2.0" Border, Black on Blue;
Rectangle White;

6.0" Radius, 2.0" Border, Black on Blue;
"Wolf" White, ClearviewHwy-1-W 80% spacing; "Ranch" White, ClearviewHwy-1-W 80% spacing;

6.0" Radius, 2.0" Border, Black on Blue;
"Pkwy" White, ClearviewHwy-1-W 80% spacing;



6.0" Radius, 2.0" Border, Black on Blue;
Rectangle White;

6.0" Radius, 2.0" Border, Black on Blue;
"Sunset" White, ClearviewHwy-1-W 80% spacing; "Vista" White, ClearviewHwy-1-W 80% spacing;

6.0" Radius, 2.0" Border, Black on Blue;
"Dr" White, ClearviewHwy-1-W 80% spacing;

NOTE:
FINAL DESIGN OF ILSN TO BE APPROVED BY THE CITY OF GEORGETOWN PRIOR TO FABRICATION.

ELECTRICAL SERVICE DATA

Electrical Service Description (see ED (5) - 14)	Service Conduit Size	Service Conductors No./Size	Safety Switch Amps	Main Ckt. Bkr. Pole / Amp	Two - Pole Contactor Amps	Panelbd / Load center Amp Rating	Circuit No.	Branch Ckt. Bkr. Pole / Amps	Branch Circuit Amps	KVA Load
ELEC SERV TY D(120/240)100(NS)AL(E)PS(U)	3"	3/#2	N/A	2P/100	N/A	100	A (SIG)	1P/50	40	7.4
							B (LUM)	1P/15	10	
							C (ILSN)	1P/15	8	
							H (ILLUM)	2P/15	4	
							I (ILLUM)	2P/15	4	

FSM - FREESTANDING METER SEE CPS ENERGY MANUFACTURED FREESTANDING METER PEDESTALS FOR DETAILS

DESIGN

STATE OF TEXAS · GRANT R WUEBBEN · 129717 · LICENSED PROFESSIONAL ENGINEER

GRANT R WUEBBEN, P.E. — 9/16/2025 DATE

APPROVAL

STATE OF TEXAS · JUSTIN W. CLARK · 118715 · LICENSED PROFESSIONAL ENGINEER

JUSTIN W. CLARK, P.E. — 9/16/2025 DATE

NO.	REVISION	DATE

PAPE-DAWSON ENGINEERS
AUSTIN | SAN ANTONIO | HOUSTON | FORT WORTH | DALLAS
10801 N MOPAC EXPY, BLDG 3, STE 200 | AUSTIN, TX 78759 | 512.454.8711
TEXAS ENGINEERING FIRM #470 | TEXAS SURVEYING FIRM #10028800

GEORGETOWN TEXAS more than welcome

WOLF RANCH PKWY / MEMORIAL DR
WOLF RANCH PKWY / SUNSET VISTA DR
CONDUIT & CONDUCTOR SCHEDULE

CITY JOB No.
JOB NO. 51423-04
DATE 9/16/2025
DESIGNER
CHECKED

SHEET NO. 406

POLE SCHEDULE

	POLE			(C)	(D)	(E)	(F)	(G)	(H)	(J)	(K)	(L)	(M)	(N)	(P)
	POLE TYPE			SMA-80	PED	PED	PED	SMA-80	PED	SMA-80	PED	PED	SMA-80	PED	PED
	POLE HEIGHT (FEET)			30	10	10	10	30	10	30	10	10	30	10	10
	MAST ARM LENGTH (FEET)			24	N/A	N/A	N/A	40	N/A	24	N/A	N/A	44	N/A	N/A
	ILSN** (YES/NO)			YES	N/A	N/A	N/A	YES	N/A	YES	N/A	N/A	YES	N/A	N/A
	LUMINAIRE (YES/NO)			YES	NO	NO	NO	YES	NO	YES	NO	NO	YES	NO	NO
	FOUNDATION TYPE			30-A	24-A	SPL*	24-A	36-A	24-A	30-A	SPL*	24-A	36-A	24-A	24-A
	FOUNDATION DEPTH (FEET)			11	6	SPL*	6	13	6	11	SPL*	6	13	6	6
CABLE	CIRCUIT			NUMBER OF CONDUCTORS											
#8 BARE (SOLID)	BARE BOND GROUND			1	1	1	1	1	1	1	1	1	1	1	1
7 COND. #14 AWG TYPE "A", SOLID	SIGNALS	ø	2+5					1					3		
		ø	1+6					3							
		ø	8							2					
		ø	4	2											
5 COND. #14 AWG TYPE "A", SOLID	PED. SIGNALS	POLE	D		1										
		POLE	E			1									
		POLE	F				1								
		POLE	H						1						
		POLE	K								1				
		POLE	L									1			
		POLE	N											1	
		POLE	P												1
2 COND. #14 AWG TYPE "A", SOLID	PED. APS PUSHBUTTONS	POLE	D		1										
		POLE	E			1									
		POLE	F				1								
		POLE	H						1						
		POLE	K								1				
		POLE	L									1			
		POLE	N											1	
		POLE	P												1
4 COND. #14 AWG TYPE "A", SOLID	ILSN SIGNS	POLE	C	1											
		POLE	G					1							
		POLE	J							1					
		POLE	M										1		
#8 XHHW (SOLID)	LUMINAIRE	POLE	C	1											
		POLE	G					1							
		POLE	J							1					
		POLE	M										1		
#8 BARE (SOLID)		POLE	C	1											
		POLE	G					1							
		POLE	J							1					
		POLE	M										1		
POWER & DATA CABLE	WDR CAMERA	POLE	C	1											
		POLE	J							1					
	VANTAGE VECTOR	POLE	G					1							
		POLE	M										1		

* SEE PEDESTRIAN POLE SPECIAL FOUNDATION FOR DETAILS

** ILSN SIGNS TO BE PLACED ON MAST ARMS AS SHOWN IN PLANS.

POLE & EQUIPMENT INFORMATION

ID	DESCRIPTION/ATTACHMENTS	NORTHING	EASTING	FND. ELEV
(A)	PROPOSED FREESTANDING PEDESTAL AND METER WITH TXDOT TYPE D SERVICE	N/A	N/A	N/A
(B)	INSTALL TXDOT STANDARD NEMA CABINET WITH SIEMENS M60 TRAFFIC SIGNAL CONTROLLER ON CONCRETE FOUNDATION	N/A	N/A	N/A
(C)	INSTALL 30 FT SMA-80, 24 FT MAST ARM ON 11 FT DRILLED SHAFT FND (30-A) WITH ONE LUMINAIRE, ONE WDR CAMERA, ONE ILSN SIGN, ONE R10-12, AND TWO VEHICLE SIGNAL HEADS AS ILLUSTRATED.	10207306.6	3125236.0	LEVEL W/ CROWN OF ROAD
(D)	INSTALL 10 FT PEDESTAL POLE ON 6 FT DRILLED SHAFT FND (24-A), WITH ONE LED COUNTDOWN PEDESTRIAN SIGNAL HEAD, ONE PEDESTRIAN PUSH BUTTON WITH AUDIBLE PEDESTRIAN SIGNAL UNIT, AND ONE R10-3e(L) SIGN AS ILLUSTRATED.	10207307.2	3125228.2	FLUSH W/ LANDING
(E)	INSTALL 10 FT PEDESTAL POLE ON SPECIAL FND, WITH ONE LED COUNTDOWN PEDESTRIAN SIGNAL HEAD, ONE PEDESTRIAN PUSH BUTTON WITH AUDIBLE PEDESTRIAN SIGNAL UNIT, AND ONE R10-3e(R) SIGN AS ILLUSTRATED.	10207308.8	3125210.7	FLUSH W/ LANDING
(F)	INSTALL 10 FT PEDESTAL POLE ON 6 FT DRILLED SHAFT FND (24-A), WITH ONE LED COUNTDOWN PEDESTRIAN SIGNAL HEAD, ONE PEDESTRIAN PUSH BUTTON WITH AUDIBLE PEDESTRIAN SIGNAL UNIT, AND ONE R10-3e(L) SIGN AS ILLUSTRATED.	10207393.7	3125169.1	FLUSH W/ LANDING
(G)	INSTALL 30 FT SMA-80, 40 FT MAST ARM ON 13 FT DRILLED SHAFT FND (36-A) WITH ONE LUMINAIRE, ONE VANTAGE VECTOR WITH NEXT UNIT (RPDD*RADD), ONE WIND DAMPER ASSEMBLY, ONE ILSN SIGN, ONE R10-17T SIGN, AND FOUR VEHICLE SIGNAL HEADS AS ILLUSTRATED.	10207396.8	3125184.4	LEVEL W/ CROWN OF ROAD
(H)	INSTALL 10 FT PEDESTAL POLE ON 6 FT DRILLED SHAFT FND (24-A), WITH ONE LED COUNTDOWN PEDESTRIAN SIGNAL HEAD, ONE PEDESTRIAN PUSH BUTTON WITH AUDIBLE PEDESTRIAN SIGNAL UNIT, AND ONE R10-3e(L) SIGN AS ILLUSTRATED.	10207402.1	3125192.6	FLUSH W/ LANDING
(J)	INSTALL 30 FT SMA-80, 24 FT MAST ARM ON 11 FT DRILLED SHAFT FND (30-A) WITH ONE LUMINAIRE, ONE WDR CAMERA, ONE ILSN SIGN, ONE R10-12, AND TWO VEHICLE SIGNAL HEADS AS ILLUSTRATED.	10207430.6	3125228.8	LEVEL W/ CROWN OF ROAD
(K)	INSTALL 10 FT PEDESTAL POLE ON SPECIAL FND, WITH ONE LED COUNTDOWN PEDESTRIAN SIGNAL HEAD, ONE PEDESTRIAN PUSH BUTTON WITH AUDIBLE PEDESTRIAN SIGNAL UNIT, AND ONE R10-3e(R) SIGN AS ILLUSTRATED.	10207423.9	3125247.8	FLUSH W/ LANDING
(L)	INSTALL 10 FT PEDESTAL POLE ON 6 FT DRILLED SHAFT FND (24-A), WITH ONE LED COUNTDOWN PEDESTRIAN SIGNAL HEAD, ONE PEDESTRIAN PUSH BUTTON WITH AUDIBLE PEDESTRIAN SIGNAL UNIT, AND ONE R10-3e(R) SIGN AS ILLUSTRATED.	10207430.0	3125260.8	FLUSH W/ LANDING
(M)	INSTALL 30 FT SMA-80, 44 FT MAST ARM ON 13 FT DRILLED SHAFT FND (36-A) WITH ONE LUMINAIRE, ONE VANTAGE VECTOR WITH NEXT UNIT (RPDD*RADD), ONE WIND DAMPER ASSEMBLY, ONE ILSN SIGN, ONE R10-5 SIGN, AND THREE VEHICLE SIGNAL HEADS AS ILLUSTRATED.	10207349.5	3125271.3	LEVEL W/ CROWN OF ROAD
(N)	INSTALL 10 FT PEDESTAL POLE ON 6 FT DRILLED SHAFT FND (24-A), WITH ONE LED COUNTDOWN PEDESTRIAN SIGNAL HEAD, ONE PEDESTRIAN PUSH BUTTON WITH AUDIBLE PEDESTRIAN SIGNAL UNIT, AND ONE R10-3e(L) SIGN AS ILLUSTRATED.	10207358.3	3125287.5	FLUSH W/ LANDING
(P)	INSTALL 10 FT PEDESTAL POLE ON 6 FT DRILLED SHAFT FND (24-A), WITH ONE LED COUNTDOWN PEDESTRIAN SIGNAL HEAD, ONE PEDESTRIAN PUSH BUTTON WITH AUDIBLE PEDESTRIAN SIGNAL UNIT, AND ONE R10-3e(R) SIGN AS ILLUSTRATED.	10207328.9	3125276.0	FLUSH W/ LANDING

SIGNS SHALL BE ATTACHED TO POLES AND MAST ARMS AS SHOWN ON PLANS

APS MESSAGE CHART

POLE ID	PEDSETRIAN MOVEMENT	FUNCTIONS	APS PROGRAMMING SETTING WHEN AT LEAST 10' APART
(D)	PHASE 2	BUTTON PUSH ON DON'T WALK	WAIT
		EXTENDED PUSH BUTTON	WAIT TO CROSS WOLF RANCH PKWY AT SUNSET VISTA
		LOCATOR TONE	SLOW TICK
		WALK INDICATION*	RAPID TICK
(P)	PHASE 2	BUTTON PUSH ON DON'T WALK	WAIT
		EXTENDED PUSH BUTTON	WAIT TO CROSS WOLF RANCH PKWY AT SUNSET VISTA
		LOCATOR TONE	SLOW TICK
		WALK INDICATION*	RAPID TICK
(E)	PHASE 4	BUTTON PUSH ON DON'T WALK	WAIT
		EXTENDED PUSH BUTTON	WAIT TO CROSS SUNSET VISTA DRIVE AT WOLF RANCH
		LOCATOR TONE	SLOW TICK
		WALK INDICATION*	RAPID TICK
(F)	PHASE 4	BUTTON PUSH ON DON'T WALK	WAIT
		EXTENDED PUSH BUTTON	WAIT TO CROSS SUNSET VISTA DRIVE AT WOLF RANCH
		LOCATOR TONE	SLOW TICK
		WALK INDICATION*	RAPID TICK
(H)	PHASE 6	BUTTON PUSH ON DON'T WALK	WAIT
		EXTENDED PUSH BUTTON	WAIT TO CROSS WOLF RANCH PKWY AT SUNSET VISTA DRIVE
		LOCATOR TONE	SLOW TICK
		WALK INDICATION*	RAPID TICK
(K)	PHASE 6	BUTTON PUSH ON DON'T WALK	WAIT
		EXTENDED PUSH BUTTON	WAIT TO CROSS WOLF RANCH PKWY AT SUNSET VISTA
		LOCATOR TONE	SLOW TICK
		WALK INDICATION*	RAPID TICK
(L)	PHASE 8	BUTTON PUSH ON DON'T WALK	WAIT
		EXTENDED PUSH BUTTON	WAIT TO CROSS SUNSET VISTA DRIVE AT WOLF RANCH
		LOCATOR TONE	SLOW TICK
		WALK INDICATION*	RAPID TICK
(N)	PHASE 8	BUTTON PUSH ON DON'T WALK	WAIT
		EXTENDED PUSH BUTTON	WAIT TO CROSS SUNSET VISTA DRIVE AT WOLF RANCH
		LOCATOR TONE	SLOW TICK
		WALK INDICATION*	RAPID TICK

* COUNTDOWN SPEECH MESSAGE = "ON" FOR ALL UNITS.

ITEM 688 - ACCESSIBLE PEDESTRIAN SIGNAL UNITS (APS)	
PED BUTTON PHASE	FURNISH & INSTALL
PHASE 2	2
PHASE 4	2
PHASE 6	2
PHASE 8	2
TOTAL	8

DESIGN

STATE OF TEXAS · GRANT R WUEBBEN · 129717 · LICENSED PROFESSIONAL ENGINEER

GRANT R WUEBBEN, P.E. — 9/16/2025 DATE

APPROVAL

STATE OF TEXAS · JUSTIN W. CLARK · 118715 · LICENSED PROFESSIONAL ENGINEER

JUSTIN W. CLARK, P.E. — 9/16/2025 DATE

NO.	REVISION	DATE

GEORGETOWN TEXAS *more than welcome*

PAPE-DAWSON ENGINEERS
AUSTIN I SAN ANTONIO I HOUSTON I FORT WORTH I DALLAS
10801 N MOPAC EXPY, BLDG 3, STE 200 I AUSTIN, TX 78759 I 512.454.8711
TEXAS ENGINEERING FIRM #470 I TEXAS SURVEYING FIRM #10028800

WOLF RANCH PKWY / MEMORIAL DR
WOLF RANCH PKWY / SUNSET VISTA DR
CONDUIT & CONDUCTOR SCHEDULE

CITY JOB No.

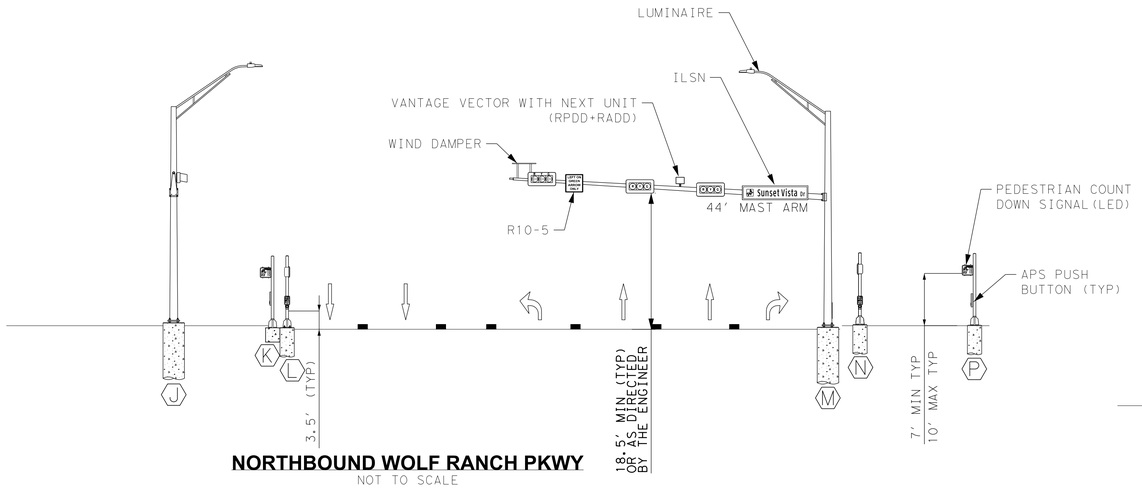
JOB NO. 51423-04

DATE 9/16/2025

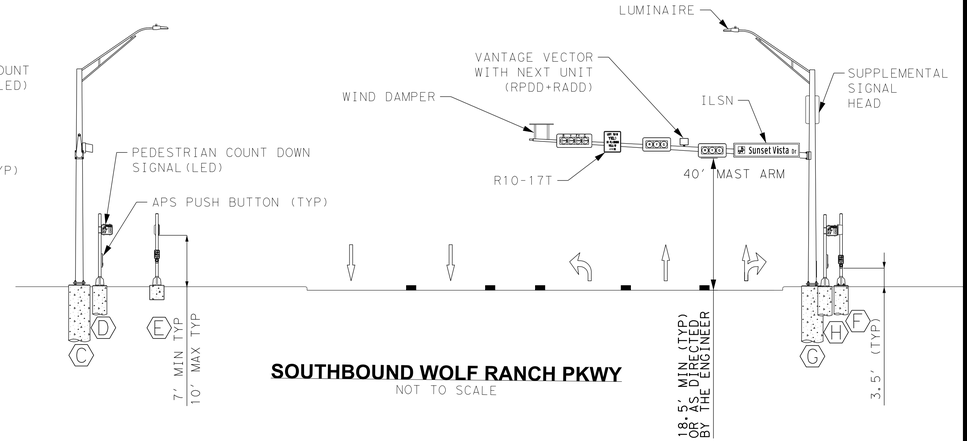
DESIGNER

CHECKED

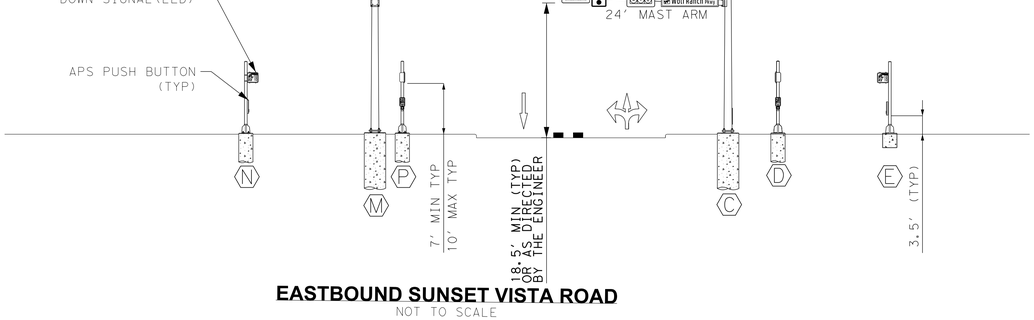
SHEET NO. 407



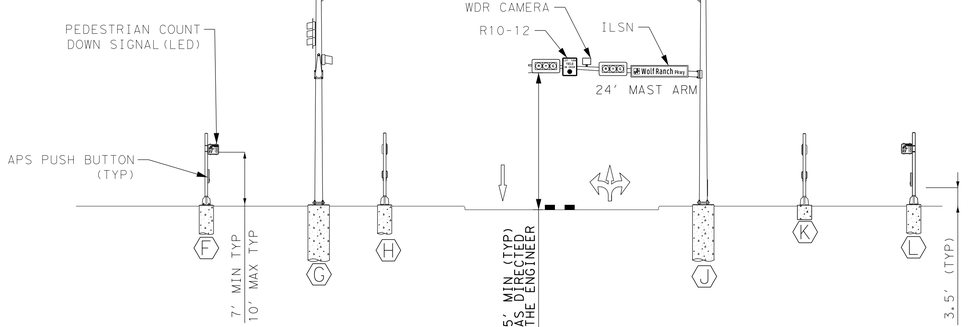
NORTHBOUND WOLF RANCH PKWY
NOT TO SCALE



SOUTHBOUND WOLF RANCH PKWY
NOT TO SCALE



EASTBOUND SUNSET VISTA ROAD
NOT TO SCALE



WESTBOUND SUNSET VISTA ROAD
NOT TO SCALE

DESIGN

STATE OF TEXAS — GRANT R WUEBBEN — 129717 — LICENSED PROFESSIONAL ENGINEER

GRANT R WUEBBEN, P.E. — 9/16/2025 DATE

APPROVAL

STATE OF TEXAS — JUSTIN W. CLARK — 118715 — LICENSED PROFESSIONAL ENGINEER

JUSTIN W. CLARK, P.E. — 9/16/2025 DATE

NO.	REVISION	DATE

GEORGETOWN TEXAS *more than welcome*

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10801 N MOPAC EXPY, BLDG 3, STE 200 I AUSTIN, TX 78759 I 512.454.8711
TEXAS ENGINEERING FIRM #470 I TEXAS SURVEYING FIRM #10028800

WOLF RANCH PKWY / MEMORIAL DR
WOLF RANCH PKWY AT SUNSET VISTA DR
TRAFFIC SIGNAL ELEVATIONS

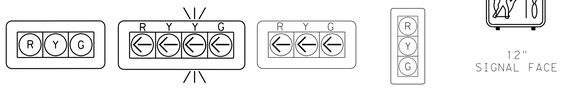
CITY JOB No.
JOB NO. 51423-04
DATE 9/16/2025
DESIGNER
CHECKED

SHEET NO. 408

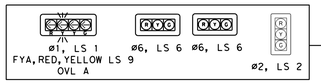
TRAFFIC SIGNAL HEADS

SIGNAL FACES
12" LED SIGNAL SECTIONS
WITH BACKPLATES

LED COUNTDOWN
PEDESTRIAN HEADS



12" SIGNAL FACE 1 QTY: 8
12" SIGNAL FACE 2 QTY: 1
12" SIGNAL FACE 3 QTY: 1
12" SIGNAL FACE 4 QTY: 1
12" SIGNAL FACE W1 THRU W8 QTY: 8



DESIGN

STATE OF TEXAS
GRANT R WUEBBEN
129717
LICENSED
PROFESSIONAL ENGINEER

GRANT R WUEBBEN, P.E. — 9/16/2025 DATE

APPROVAL

STATE OF TEXAS
JUSTIN W. CLARK
118715
LICENSED
PROFESSIONAL ENGINEER

JUSTIN W. CLARK, P.E. — 9/16/2025 DATE

NO.	REVISION	DATE

GEORGETOWN TEXAS
more than welcome

PAPE-DAWSON ENGINEERS
AUSTIN I SAN ANTONIO I HOUSTON I FORT WORTH I DALLAS
10801 N MOPAC EXPY, BLDG 3, STE 200 I AUSTIN, TX 78759 I 512.454.8711
TEXAS ENGINEERING FIRM #470 I TEXAS SURVEYING FIRM #10023800

WOLF RANCH PKWY / MEMORIAL DR
WOLF RANCH PKWY AT SUNSET VISTA DR
MISCELLANEOUS APS/LOAD SWITCH INFORMATION

CITY JOB No.
JOB NO. 51423-04
DATE 9/16/2025
DESIGNER
CHECKED

SHEET NO. 409

LEGEND

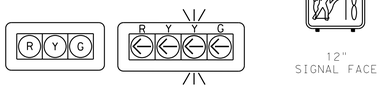
SYMBOL	DESCRIPTION
	TRAFFIC FLOW
12"W	12" WATER PIPE
	OVERHEAD ELECTRIC
SD	STORM PIPE
X	FENCE
G	GAS LINE
	LUMINAIRE
	FIRE HYDRANT
	UTILITY POLE
	GROUND MOUNTED SIGN
	MANHOLE
	GROUND BOX
	APPARENT RIGHT-OF-WAY
	CONDUIT/SPAN
	TRAFFIC SIGNAL TIMBER POLE
	LUMINAIRE
	GROUND BOX (TYPE D)
	POLE MOUNTED CONTROLLER
	WDR CAMERA
	VANTAGE VECTOR (RAPD+RADD)
	TRAFFIC SIGNAL HEAD
	SPAN WIRE MOUNTED SIGN
09	CABLE/CONDUIT RUN
D	POLE/EQUIPMENT IDENTIFIER
	ELECTRIC SERVICE
	PEDESTRIAN POLE
	PEDESTRIAN SIGNAL HEAD

EXISITING TRAFFIC SIGNAL HEADS

SIGNAL FACES

12" LED SIGNAL SECTIONS WITH BACKPLATES

LED COUNTDOWN PEDESTRIAN HEADS



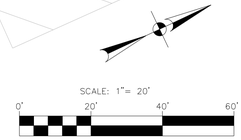
12" SIGNAL FACE — 1 QTY: 8

12" SIGNAL FACE — 2 QTY: 2

12" SIGNAL FACE — W1 THRU W4 QTY: 4

EXISITING TRAFFIC SIGNS

Wolf Ranch Pkwy	SEE DETAILS	S1
Rivery Dr	SEE DETAILS	S2
LEFT TURN YIELD ON FLASHING YELLOW ARROW	R10-17T (36" X 42")	S3
	R9-3 (18" X 18")	S4
	R10-3e(R), (9" x 15")	PB1
	R10-3e(L), (9" x 15")	PB2



NOTES:

1. ALL DIMENSIONS ARE IN FEET UNLESS SPECIFIED OTHERWISE.
2. CONTRACTOR SHALL COORDINATE ALL REMOVAL OF TRAFFIC RELATED EQUIPMENT AND SIGNS WITH CITY OF GEORGETOWN.
3. ALL TRAFFIC EQUIPMENT DEEMED SALVAGEABLE BY THE CITY INSPECTOR SHALL BE DELIVERED TO THE CITY OF GEORGETOWN TRANSPORTATION DEPARTMENT LOCATED AT 300-1 INDUSTRIAL AVE, GEORGETOWN, TEXAS, 78626.
4. UTILITIES SHOWN ARE APPROXIMATE. CONTRACTOR SHALL CALL FOR LOCATES PRIOR TO COMMENCING EXCAVATION. ALL UTILITY LOCATIONS SHALL BE VERIFIED IN THE FIELD BY THE CONTRACTOR.
5. ALL ITEMS NOT SPECIFICALLY CALLED OUT IN THESE PLANS TO BE REMOVED, SHALL REMAIN.
6. RIVERY DRIVEWAY IS A PRIVATE ROADWAY. COORDINATION BETWEEN THE CITY AND OWNERS AND APPROVAL IS REQUIRED BEFORE ANY WORK ALONG RIVERY DRIVEWAY.

CONTRACTOR SHALL CONTACT DIGTESS @ 1-800-DIG-TESS OR TEXAS-811 FOR UTILITY LOCATION AT LEAST 72 HOURS PRIOR TO BEGINNING CONSTRUCTION

CAUTION:

THE CONTRACTOR IS SPECIFICALLY CAUTIONED THAT UNDERGROUND UTILITIES INCLUDING GAS ARE KNOWN TO EXIST IN THE VICINITY OF THIS WORK. CONTRACTOR SHALL CALL FOR LOCATES PRIOR TO BEGINNING WORK AND SHALL EXERCISE CAUTION WHEN INSTALLING SIGNAL EQUIPMENT INCLUDING POLE FOUNDATIONS AND CONDUITS

PHASE DIAGRAM

Ø1	Ø2	NOT USED	PED Ø4
Ø5	PED Ø6	NOT USED	Ø8

CONFLICT FLASH: RED ALL PHASES
START UP FLASH: YELLOW 2 + 6
RED ALL OTHERS

DESIGN

STATE OF TEXAS — GRANT R WUEBBEN — 129717 — LICENSED PROFESSIONAL ENGINEER

GRANT R WUEBBEN, P.E. — 9/16/2025 DATE

APPROVAL

STATE OF TEXAS — JUSTIN W. CLARK — 118715 — LICENSED PROFESSIONAL ENGINEER

JUSTIN W. CLARK, P.E. — 9/16/2025 DATE

NO.	REVISION	DATE

GEORGETOWN TEXAS *more than welcome*

PAPE-DAWSON ENGINEERS
AUSTIN I SAN ANTONIO I HOUSTON I FORT WORTH I DALLAS
10801 N MOPAC EXPY, BLDG 3, STE 200 I AUSTIN, TX 78759 I 512.454.8711
TEXAS ENGINEERING FIRM #470 I TEXAS SURVEYING FIRM #10028800

WOLF RANCH PKWY / MEMORIAL DR
WOLF RANCH PKWY AT RIVERY DWY
EXISTING TRAFFIC LAYOUT

CITY JOB No.
JOB NO. 51423-04
DATE 9/16/2025
DESIGNER
CHECKED

SHEET NO. 410

LEGEND

SYMBOL	DESCRIPTION
	TRAFFIC FLOW
12"W	12" WATER PIPE
	OVERHEAD ELECTRIC
SD	STORM PIPE
X	FENCE
G	GAS LINE
	LUMINAIRE
	FIRE HYDRANT
	UTILITY POLE
	GROUND MOUNTED SIGN
	MANHOLE
	GROUND BOX
	APPARENT RIGHT-OF-WAY
	CONDUIT/SPAN
	TRAFFIC SIGNAL TIMBER POLE
	LUMINAIRE
	GROUND BOX (TYPE D)
	POLE MOUNTED CONTROLLER
	WDR CAMERA
	VANTAGE VECTOR (RAPD+RADD)
	TRAFFIC SIGNAL HEAD
	SPAN WIRE MOUNTED SIGN
09	CABLE/CONDUIT RUN
D	POLE/EQUIPMENT IDENTIFIER
	ELECTRIC SERVICE
	PEDESTRIAN POLE
	PEDESTRIAN SIGNAL HEAD

SCALE: 1"= 20'
0' 20' 40' 60'

RIVERY DWY
ASSUMED SPEED 30 MPH

RELOCATE EXISTING TIMBER POLE AND EQUIPMENT AND ADD NEW RUNS TO PED POLES

REMOVE EXISTING PED POLES AND INSTALL NEW PED POLES AND EQUIPMENT AT THE PROPOSED LOCATION UPON CONSTRUCTION OF RAMPS. PEDESTRIAN SIGNAL HEADS SHALL BE OPERATIONAL AT ALL TIMES

REMOVE EXISTING SIGNAL HEAD AND R10-17T SIGN

REMOVE EXISTING 4 SECTION TRAFFIC SIGNAL HEAD AND R10-17T SIGN

WOLF RANCH PKWY
POSTED SPEED 35 MPH

WOLF RANCH PKWY
POSTED SPEED 35 MPH

INSTALL TEMPORARY SIGNAL HEAD AND R10-12 SIGN

RELOCATE EXISTING TIMBER POLE AND EQUIPMENT AND ADD A NEW RUN TO EXISTING PED POLE

INSTALL TEMPORARY R10-11a SIGN

RELOCATE EXISTING TEMPORARY POLE AND EQUIPMENT. ADJUST THE DETECTION WITH EACH TCP PHASE

RIVERY DWY
ASSUMED SPEED 30 MPH

TRAFFIC SIGNAL HEADS

SIGNAL FACES
12" LED SIGNAL SECTIONS WITH BACKPLATES

LED COUNTDOWN PEDESTRIAN HEADS

12" SIGNAL FACE	12" SIGNAL FACE	12" SIGNAL FACE	12" SIGNAL FACE
1 QTY: 7	2 QTY: 2	3 QTY: 1	W1 THRU W4 QTY: 4

CAUTION:

THE CONTRACTOR IS SPECIFICALLY CAUTIONED THAT UNDERGROUND UTILITIES INCLUDING GAS ARE KNOWN TO EXIST IN THE VICINITY OF THIS WORK. CONTRACTOR SHALL CALL FOR LOCATES PRIOR TO BEGINNING WORK AND SHALL EXERCISE CAUTION WHEN INSTALLING SIGNAL EQUIPMENT INCLUDING POLE FOUNDATIONS AND CONDUITS

CONTRACTOR SHALL CONTACT DIGTESS @ 1-800-DIG-TESS OR TEXAS-811 FOR UTILITY LOCATION AT LEAST 72 HOURS PRIOR TO BEGINNING CONSTRUCTION

TRAFFIC SIGNS

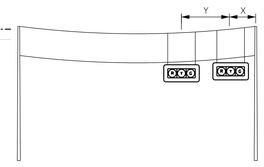
Wolf Ranch Pkwy	SEE DETAILS	S1
Rivery Dr	SEE DETAILS	S2
LEFT TURN YIELD ON FLASHING YELLOW ARROW	R10-17T (36" X 42")	S3
	R9-3 (18" X 18")	S4
LEFT TURN YIELD ON GREEN	R10-12 (30" x 36")	S5
NO TURN ON RED	R10-11a (24" x 30")	S6
	R3-2 (36" x 36")	S7
	R10-3e(R), (9" x 15")	PB1
	R10-3e(L), (9" x 15")	PB2

NOTES:
1. ALL DIMENSIONS ARE IN FEET UNLESS SPECIFIED OTHERWISE.
2. UTILITIES SHOWN ARE APPROXIMATE. CONTRACTOR SHALL CALL FOR LOCATES PRIOR TO COMMENCING EXCAVATION. ALL UTILITY LOCATIONS SHALL BE VERIFIED IN THE FIELD BY THE CONTRACTOR.
3. ALL TEMPORARY TRAFFIC SIGNAL EQUIPMENTS DEEMED SALVAGEABLE BY THE CITY INSPECTOR SHALL BE DELIVERED TO CITY OF GEORGETOWN.
4. ALL ITEMS FADED BACK AND NOT SPECIFICALLY CALLED OUT IN THESE PLANS TO BE REMOVED, SHALL REMAIN.
5. TRAFFIC SIGNAL PHASING & TIMINGS SHALL BE MODIFIED IN COMPLIANCE WITH MUTCD DURING CONSTRUCTION BY CONTRACTOR AND APPROVED BY CITY OF GEORGETOWN.
6. CONTRACTORS TO SHIFT SIGNAL HEADS WITH EACH TCP PHASE TO REMAIN COMPLIANT WITH THE LATEST MUTCD REQUIREMENTS.
7. VEHICLE DETECTION WILL NEED TO BE ADJUSTED FOR EACH TCP PHASE.
8. SIDEWALK SHALL BE EXTENDED UP TO THE POLES, AS NEEDED, TO PROVIDE PEDESTRIAN ACCESS TO THE PEDESTRIAN PUSH BUTTONS. PUSH BUTTONS SHALL BE FLUSH WITH THE SIDEWALK AND NOT EXCEED 10" FOR SIDE REACH AND 0" FOR FRONT REACH.

PHASE DIAGRAM

NOT USED Ø1	Ø2	NOT USED Ø3	PED Ø4
Ø5	PED Ø6	NOT USED Ø7	Ø8

CONFLICT FLASH: RED ALL PHASES
START UP FLASH: YELLOW 2 + 6
RED ALL OTHERS



SIGNAL HEAD AND POLE PLACEMENT

TCP PHA	POLE FROM	POLE TO	DIMENSIONS X	DIMENSIONS Y	NO. OF HEADS
PHASE 2	A	B	12	8	2
	B	C	22	8	2
	C	D	36	8	2
	D	A	33	10	2

DESIGN
STATE OF TEXAS · GRANT R WUEBBEN · 129717 · LICENSED PROFESSIONAL ENGINEER
GRANT R WUEBBEN, P.E. — 9/16/2025 DATE

APPROVAL
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TEXAS ENGINEERING FIRM #470 I TEXAS SURVEYING FIRM #10028800

WOLF RANCH PKWY / MEMORIAL DR
WOLF RANCH PKWY AT RIVERY DWY
PHASE 2 TEMPORARY SIGNAL LAYOUT

CITY JOB No.
JOB NO. 51423-04
DATE 9/16/2025
DESIGNER
CHECKED

SHEET NO. 411

LEGEND

SYMBOL	DESCRIPTION
	TRAFFIC FLOW
12"W	12" WATER PIPE
OHE	OVERHEAD ELECTRIC
SD	STORM PIPE
X	FENCE
G	GAS LINE
	LUMINAIRE
	FIRE HYDRANT
	UTILITY POLE
	GROUND MOUNTED SIGN
	MANHOLE
	GROUND BOX
	APPARENT RIGHT-OF-WAY
	CONDUIT/SPAN
	TRAFFIC SIGNAL TIMBER POLE
	LUMINAIRE
	GROUND BOX (TYPE D)
	POLE MOUNTED CONTROLLER
	WDR CAMERA
	VANTAGE VECTOR (RAPD+RADD)
	TRAFFIC SIGNAL HEAD
	SPAN WIRE MOUNTED SIGN
09	CABLE/CONDUIT RUN
D	POLE/EQUIPMENT IDENTIFIER
	ELECTRIC SERVICE
	PEDESTRIAN POLE
	PEDESTRIAN SIGNAL HEAD

SCALE: 1"= 20'

0' 20' 40' 60'

TRAFFIC SIGNAL HEADS

SIGNAL FACES
12" LED SIGNAL SECTIONS WITH BACKPLATES

LED COUNTDOWN PEDESTRIAN HEADS



12" SIGNAL FACE — 1 QTY: 7

12" SIGNAL FACE — 3 QTY: 1

12" SIGNAL FACE — W1 THRU W4 QTY: 4

CAUTION:

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CONTRACTOR SHALL CONTACT DIGTESS @ 1-800-DIG-TESS OR TEXAS-811 FOR UTILITY LOCATION AT LEAST 72 HOURS PRIOR TO BEGINNING CONSTRUCTION

TRAFFIC SIGNS

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Rivery Dr	SEE DETAILS	S2
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NO TURN ON RED	R10-11a (24" X 30")	S6
	R2-2 (36" X 36")	S7
	R10-3e(R), (9" X 15")	PB1
	R10-3e(L), (9" X 15")	PB2

SIGNAL HEAD AND POLE PLACEMENT

TCP PHA	POLE FROM	POLE TO	DIMENSIONS X	DIMENSIONS Y	NO. OF HEADS
PHASE 3 STEP 1 D	A	D	73	8	2
	D	C	32	8	2
	C	B	17	8	2
	B	A	32	10	2

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PHASE DIAGRAM

NOT USED Ø1	Ø2	NOT USED Ø3	PED Ø4
Ø5	PED Ø6	NOT USED Ø7	Ø8

CONFLICT FLASH: RED ALL PHASES
START UP FLASH: YELLOW 2 + 6
RED ALL OTHERS

DESIGN

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WOLF RANCH PKWY / MEMORIAL DR
WOLF RANCH PKWY AT RIVERY DWY
PHASE 3 TEMPORARY SIGNAL LAYOUT

CITY JOB No.
JOB NO. 51423-04
DATE 9/16/2025
DESIGNER
CHECKED

SHEET NO. 412

LEGEND

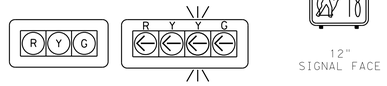
SYMBOL	DESCRIPTION
	TRAFFIC FLOW
12"W	12" WATER PIPE
	OVERHEAD ELECTRIC
SD	STORM PIPE
X	FENCE
G	GAS LINE
	LUMINAIRE
	FIRE HYDRANT
	UTILITY POLE
	GROUND MOUNTED SIGN
	MANHOLE
	CABLE RUN (BORE)
	APPARENT RIGHT-OF-WAY
	CABLE RUN (TRENCH)
	SIGNAL POLE, FOUNDATION, AND ARM
	LUMINAIRE
	GROUND BOX (TYPE D)
	CONTROLLER, SLAB, AND FOUNDATION
	WDR CAMERA
	VANTAGE VECTOR (RAPD+RADD)
	TRAFFIC SIGNAL HEAD
	MAST ARM SIGN
09	CABLE/CONDUIT RUN
D	POLE/EQUIPMENT IDENTIFIER
	ELECTRIC SERVICE
	PEDESTRIAN POLE
	PEDESTRIAN POLE SPECIAL FOUNDATION
	PEDESTRIAN SIGNAL HEAD
	ILSN SIGN

TRAFFIC SIGNAL HEADS

SIGNAL FACES

12" LED SIGNAL SECTIONS WITH VENTED ALUMINUM REFLECTIVE BACKPLATES

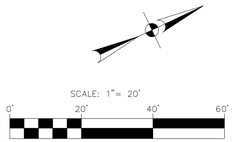
LED COUNTDOWN PEDESTRIAN HEADS



12" SIGNAL FACE 1 QTY: 8

12" SIGNAL FACE 2 QTY: 2

12" SIGNAL FACE W1 THRU W8 QTY: 8



PHASE DIAGRAM

Ø1	PED Ø2	NOT USED Ø3	PED Ø4
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CONFLICT FLASH: RED ALL PHASES
START UP FLASH: YELLOW 2 + 6
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CAUTION:

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CONTRACTOR SHALL CONTACT DIGTESS @ 1-800-DIG-TESS OR TEXAS-811 FOR UTILITY LOCATION AT LEAST 72 HOURS PRIOR TO BEGINNING CONSTRUCTION

NOTES:

1. ALL DIMENSIONS SHOWN ARE IN FEET UNLESS SPECIFIED OTHERWISE. (ALL EXISTING FEATURES ARE SHOWN SCREENED BACK i.e. FADED).
2. MINIMUM CLEARANCE OF 40" RADIUS FROM NEUTRAL AND 10' RADIUS FROM PRIMARY OR SECONDARY SHALL BE MAINTAINED BETWEEN PROPOSED TRAFFIC SIGNAL EQUIPMENT AND EXISTING OVERHEAD ELECTRICAL LINES. CONTRACTOR SHALL CONSIDER ALTERNATIVE FOUNDATION PLACEMENT METHODS IN AREAS WHERE EXISTING OVERHEAD ELECTRIC LINES PROHIBIT THE USE OF CONVENTIONAL DRILL TRUCK.
3. CONTRACTOR TO POTHOLE SIGNAL POLE LOCATIONS NEAR UNDERGROUND UTILITIES PRIOR TO INSTALLING POLE FOUNDATION.
4. LOCATION OF TRAFFIC SIGNAL POLES, CONTROLLER ASSEMBLIES, AND ELECTRICAL SERVICE SHALL BE VERIFIED AND APPROVED BY THE CITY OF GEORGETOWN TRANSPORTATION DEPARTMENT PRIOR TO CONSTRUCTION. THE CONTRACTOR SHALL SUPPLY AND INSTALL THE ADDRESS IN PERMANENT NUMBERS AND LETTERS TO THE STREET SIDE OF THE SERVICE ENCLOSURE. SAID ADDRESS SHALL ALSO BE RECORDED AND GIVEN TO THE CITY OF GEORGETOWN INSPECTOR FOR THE CITY'S RECORDS.
5. UTILITIES SHOWN ARE APPROXIMATE. CONTRACTOR SHALL CALL FOR LOCATES PRIOR TO COMMENCING EXCAVATION. ALL UTILITY LOCATIONS SHALL BE VERIFIED IN THE FIELD BY THE CONTRACTOR.
6. NEATLY CAP/COIL ALL WIRES AND CABLES IN GROUND BOX OR AT TERMINATION.
7. SIGNAL OPERATION WILL BE MONITORED AFTER CONSTRUCTION AND MODIFIED AS NECESSARY.
8. ALL SIGNAL HEADS SHALL HAVE VENTED ALUMINUM REFLECTIVE BACK PLATES.
9. CONTRACTOR SHALL CONTACT THE CITY OF GEORGETOWN TRANSPORTATION DEPARTMENT A MINIMUM OF FOURTEEN (14) DAYS PRIOR TO BEGINNING OF CONSTRUCTION.
10. ALL SIGNAL HEADS SHALL HAVE A MINIMUM CLEARANCE OF 18.5 FEET ABOVE GRADE THROUGHOUT THE DURATION OF THIS PROJECT.
11. TRAFFIC SIGNAL PHASING & TIMINGS SHALL BE MODIFIED DURING CONSTRUCTION BY CONTRACTOR AND APPROVED BY CITY OF GEORGETOWN.
12. LUMINAIRES ARE SHOWN FOR DRAWING PURPOSES ONLY. THE EXACT PLACEMENT SHALL BE DETERMINED IN THE FIELD AND SHALL NOT BE WITHIN 10 FEET OF OVERHEAD UTILITIES.
13. SIDEWALK SHALL BE EXTENDED UP TO THE POLES, AS NEEDED, TO PROVIDE PEDESTRIAN ACCESS TO THE PEDESTRIAN PUSH BUTTONS. PUSH BUTTONS SHALL BE FLUSH WITH THE SIDEWALK AND NO EXCEED 10" FOR SIDE REACH AND 0" FOR FRONT REACH.
14. A SIGNAL TECHNICIAN FROM THE CITY OF GEORGETOWN SHALL BE PRESENT WHEN THE NEW SIGNAL IS PLACED IN OPERATION. THE CONTRACTOR SHALL NOTIFY MR. RANDALL YOUNG WITH THE CITY OF GEORGETOWN AT 512-930-8163 AT LEAST 48 HOURS IN ADVANCE OF THE TURN ON.
15. FOR THE ELECTRIC METER ACCOUNT SET UP, CONTACT MOLLY RITTER - PUBLIC WORKS OPERATIONS MANAGER. Molly.Ritter@georgetowntexas.gov 512-930-8152.
16. THE CONTRACTOR SHALL NOTIFY MR. LUA SALUONE, TRANSPORTATION MANAGER WITH THE CITY OF GEORGETOWN AT 512-930-6574 AT LEAST ONE WEEK PRIOR TO STARTING WORK ON THIS PROJECT.
17. ThruGreen COMMUNICATION SYSTEM SHALL BE INSTALLED IN THE CONTROLLER.

TRAFFIC SIGNS

Wolf Ranch Pkwy	SEE DETAILS	S1
Rivery Dwy	SEE DETAILS	S2
LEFT TURN YIELD ON FLASHING YELLOW ARROW	R10-17T (36" X 42")	S3
LEFT TURN YIELD ON GREEN	R10-12 (30" X 36")	S4
ONLY	R3-5R (30" X 36")	S5
	R10-3e(R), (9" X 15")	PB1
	R10-3e(L), (9" X 15")	PB2

DESIGN

STATE OF TEXAS — GRANT R WUEBBEN — 129717 — LICENSED PROFESSIONAL ENGINEER

GRANT R WUEBBEN, P.E. — 9/16/2025 DATE

APPROVAL

STATE OF TEXAS — JUSTIN W. CLARK — 118715 — LICENSED PROFESSIONAL ENGINEER

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WOLF RANCH PKWY / MEMORIAL DR
WOLF RANCH PKWY AT RIVERY DWY
PROPOSED TRAFFIC SIGNAL PLANS

CITY JOB No.
JOB NO. 51423-04
DATE 9/16/2025
DESIGNER
CHECKED

SHEET NO. 413

CONDUIT AND CONDUCTOR SCHEDULE

				RUN NUMBER	01	02	03	04		05			06		07		08	09	10		11	12	13		14		15	16	17		18		19	20
				CONDUIT SIZE IN INCHES	3	3	2	3	4*	3	2	2**	3	2	3	2	2	2	3	2	2	2	3	2	3	2	2	2	3	2	3	2	2	2
				NUMBER OF CONDUITS	1	1	2	2	1	2	1	1	2	1	2	1	1	1	2	1	1	1	2	1	1	1	2	1	1	1	2	1	2	1	1
				LENGTH OF RUN (FT)	100	45	35	20	20	85	85	85	90	90	10	10	20	15	10	10	20	15	110	110	10	10	15	10	90	90	10	10	10	10
				TRENCH (T)/BORE (B)	T	T	T	T	T	B	B	B	B	B	T	T	T	T	T	T	T	T	B	B	T	T	T	T	B	B	T	T	T	T
CABLE	CIRCUIT			NUMBER OF CONDUCTORS																														
#6 XHHW (SOLID)	120 POWER HOT					1																											
	120 POWER COMMON					1																											
#6 BARE (SOLID)	BARE BOND GROUND					1																											
#8 BARE (SOLID)	BARE BOND GROUND						2	2	1	2	1	1	2	1	2	1	1	1	2	1	1	1	2	1	2	1	1	1	2	1	2	1	1	1
7 COND. #14 AWG TYPE "A", SOLID	SIGNALS	ø	2+5	CABLES PULLED BY ENERGY COMPANY				2							2																			
		ø	1+6					2					2												2				2					
		ø	8					1					1																		1			
		ø	4					1		1									1															
5 COND. #14 AWG TYPE "A", SOLID	PED. SIGNALS	POLE	D					1									1																	
		POLE	E					1										1																
		POLE	F					1		1												1												
		POLE	H					1		1											1													
		POLE	K					1					1														1		1					
		POLE	L					1					1															1	1					
		POLE	N					1					1																			1		
		POLE	P					1					1																					1
2 COND. #14 AWG TYPE "A", SOLID	PED. APS PUSHBUTTONS	POLE	D					1									1																	
		POLE	E					1										1																
		POLE	F					1		1												1												
		POLE	H					1		1											1													
		POLE	K					1					1														1		1					
		POLE	L					1					1															1	1					
		POLE	N					1					1																			1		
		POLE	P					1					1																					1
4 COND. #14 AWG TYPE "A", SOLID	ILSN SIGNS	POLE	C			1										1																	
		POLE	G			1					1									1													
		POLE	J			1								1												1				1				
		POLE	M			1								1																		1		
#8 XHHW (SOLID)	LUMINAIRE	POLE	C			2										2																	
		POLE	G			2					2									2													
		POLE	J			2								2												2				2				
		POLE	M			2								2																		2		
#8 BARE (SOLID)		POLE	C			1										1																	
		POLE	G			1					1									1													
		POLE	J			1								1												1				1				
		POLE	M			1								1																		1		
POWER & DATA CABLE	WDR CAMERA	POLE	G				1		1										1															
		POLE	M				1					1																				1		
	VANTAGE VECTOR	POLE	C				1								1																			
		POLE	J				1				1														1			1						

*4" CONDUIT RUN TO BE USED FOR FUTURE FIBER OPTIC CABLE.
**2" CONDUIT TO BE USED FOR STREET LIGHTING. SEE LIGHTING PLANS FOR CONDUIT QUANTITIES AND WIRING.

ELECTRICAL SERVICE DATA

Electrical Service Description (see ED (5) - 14)	Service Conduit Size	Service Conductors No./Size	Safety Switch Amps	Main Ckt. Bkr. Pole / Amp	Two - Pole Contactor Amps	Panelbd / Load center Amp Rating	Circuit No.	Branch Ckt. Bkr. Pole / Amps	Branch Circuit Amps	KVA Load
ELEC SERV TY D(120/240)100(NS)AL(E)PS(U)	3"	3/#2	N/A	2P/100	N/A	100	A (SIG)	1P/50	40	7.0
							B (LUM)	1P/15	10	
							C (ILSN)	1P/15	8	

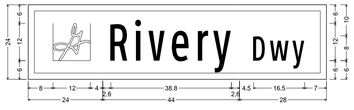
ILSN DETAILS



6.0" Radius, 2.0" Border, Black on Blue;
Rectangle White;

6.0" Radius, 2.0" Border, Black on Blue;
"Wolf" White, ClearviewHwy-1-W 80% spacing; "Ranch" White, ClearviewHwy-1-W 80% spacing;

6.0" Radius, 2.0" Border, Black on Blue;
"Pkwy" White, ClearviewHwy-1-W 80% spacing;



6.0" Radius, 2.0" Border, Black on Blue;
Rectangle White;

6.0" Radius, 2.0" Border, Black on Blue;
"Rivery" White, ClearviewHwy-1-W;

6.0" Radius, 2.0" Border, Black on Blue;
"Dwy" White, ClearviewHwy-1-W;

NOTE:
FINAL DESIGN OF ILSN TO BE APPROVED BY THE CITY OF GEORGETOWN PRIOR TO FABRICATION.

DESIGN

STATE OF TEXAS
GRANT R WUEBBEN
129717
LICENSED
PROFESSIONAL ENGINEER

GRANT R WUEBBEN, P.E. — 9/16/2025 DATE

APPROVAL

STATE OF TEXAS
JUSTIN W. CLARK
118715
LICENSED
PROFESSIONAL ENGINEER

JUSTIN W. CLARK, P.E. — 9/16/2025 DATE

NO.	REVISION	DATE

GEORGETOWN TEXAS
more than welcome

PAPE-DAWSON ENGINEERS
AUSTIN | SAN ANTONIO | HOUSTON | FORT WORTH | DALLAS
10801 N MOPAC EXPY, BLDG 3, STE 200 | AUSTIN, TX 78759 | 512.454.8711
TEXAS ENGINEERING FIRM #470 | TEXAS SURVEYING FIRM #10028800

WOLF RANCH PKWY / MEMORIAL DR
WOLF RANCH PKWY / RIVERY DWY
CONDUIT & CONDUCTOR SCHEDULE

CITY JOB No.
JOB NO. 51423-04
DATE 9/16/2025
DESIGNER
CHECKED

SHEET NO. 414

POLE SCHEDULE

	POLE			C	D	E	F	G	H	J	K	L	M	N	P
	POLE TYPE			SMA-80	PED	PED	PED	SMA-80	PED	SMA-80	PED	PED	SMA-80	PED	PED
	POLE HEIGHT (FEET)			30	10	10	10	30	10	30	10	10	30	10	10
	MAST ARM LENGTH (FEET)			40	N/A	N/A	N/A	28	N/A	48	N/A	N/A	44	N/A	N/A
	ILSN** (YES/NO)			YES	NO	NO	NO	YES	NO	YES	NO	NO	YES	NO	NO
	LUMINAIRE (YES/NO)			YES	NO	NO	NO	YES	NO	YES	NO	NO	YES	NO	NO
	FOUNDATION TYPE			36-A	24-A	24-A	24-A	30-A	24-A	36-A	SPL*	24-A	36-A	24-A	24-A
	FOUNDATION DEPTH (FEET)			13	6	6	6	11	6	13	SPL*	6	13	6	6
CABLE	CIRCUIT			NUMBER OF CONDUCTORS											
#8 BARE (SOLID)	BARE BOND GROUND			1	1	1	1	1	1	1	1	1	1	1	1
7 COND. #14 AWG TYPE "A", SOLID	SIGNALS	ø	2+5	3											
		ø	1+6							3					
		ø	8										2		
		ø	4					2							
5 COND. #14 AWG TYPE "A", SOLID	PED. SIGNALS	POLE	D		1										
		POLE	E			1									
		POLE	F				1								
		POLE	H						1						
		POLE	K								1				
		POLE	L									1			
		POLE	N											1	
		POLE	P												1
2 COND. #14 AWG TYPE "A", SOLID	PED. APS PUSHBUTTONS	POLE	D		1										
		POLE	E			1									
		POLE	F				1								
		POLE	H						1						
		POLE	K								1				
		POLE	L									1			
		POLE	N											1	
		POLE	P												1
4 COND. #14 AWG TYPE "A", SOLID	ILSN SIGNS	POLE	C	1											
		POLE	G					1							
		POLE	J							1					
		POLE	M										1		
#8 XHHW (SOLID)	LUMINAIRE	POLE	C	1											
		POLE	G					1							
		POLE	J							1					
		POLE	M										1		
#8 BARE (SOLID)		POLE	C	1											
		POLE	G					1							
		POLE	J							1					
		POLE	M										1		
POWER & DATA CABLE	WDR CAMERA	POLE	G					1							
		POLE	M										1		
	VANTAGE VECTOR	POLE	C	1											
		POLE	J							1					

* SEE PEDESTRIAN POLE SPECIAL FOUNDATION FOR DETAILS

** ILSN SIGNS TO BE PLACED ON MAST ARMS AS SHOWN IN PLANS.

POLE & EQUIPMENT INFORMATION

ID	DESCRIPTION/ATTACHMENTS	NORTHING	EASTING	FND. ELEV
A	PROPOSED FREESTANDING PEDESTAL AND METER WITH TXDOT TYPE D SERVICE	N/A	N/A	N/A
B	INSTALL TXDOT STANDARD NEMA CABINET WITH SIEMENS M60 TRAFFIC SIGNAL CONTROLLER ON CONCRETE FOUNDATION	N/A	N/A	N/A
C	INSTALL 30 FT SMA-80, 40 FT MAST ARM ON 13 FT DRILLED SHAFT FND (36-A) WITH ONE LUMINAIRE, ONE VANTAGE VECTOR WITH NEXT UNIT (RPDD*RADD), ONE WIND DAMPER ASSEMBLY, ONE ILSN SIGN, ONE R10-17T SIGN, AND THREE VEHICLE SIGNAL HEADS AS ILLUSTRATED.	10209190.9	3127173.7	LEVEL W/ CROWN OF ROAD
D	INSTALL 10 FT PEDESTAL POLE ON 6 FT DRILLED SHAFT FND (24-A), WITH ONE LED COUNTDOWN PEDESTRIAN SIGNAL HEAD, ONE PEDESTRIAN PUSH BUTTON WITH AUDIBLE PEDESTRIAN SIGNAL UNIT, AND ONE R10-3e(L) SIGN AS ILLUSTRATED.	10209198.6	3127184.1	FLUSH W/ LANDING
E	INSTALL 10 FT PEDESTAL POLE ON 6 FT DRILLED SHAFT FND (24-A), WITH ONE LED COUNTDOWN PEDESTRIAN SIGNAL HEAD, ONE PEDESTRIAN PUSH BUTTON WITH AUDIBLE PEDESTRIAN SIGNAL UNIT, AND ONE R10-3e(R) SIGN AS ILLUSTRATED.	10209170.4	3127185.3	FLUSH W/ LANDING
F	INSTALL 10 FT PEDESTAL POLE ON 6 FT DRILLED SHAFT FND (24-A), WITH ONE LED COUNTDOWN PEDESTRIAN SIGNAL HEAD, ONE PEDESTRIAN PUSH BUTTON WITH AUDIBLE PEDESTRIAN SIGNAL UNIT, AND ONE R10-3e(R) SIGN AS ILLUSTRATED.	10209098.1	3127142.7	FLUSH W/ LANDING
G	INSTALL 30 FT SMA-80, 28 FT MAST ARM ON 11 FT DRILLED SHAFT FND (30-A) WITH ONE LUMINAIRE, ONE WDR CAMERA, ONE ILSN SIGN, ONE R10-12 SIGN, AND TWO VEHICLE SIGNAL HEADS AS ILLUSTRATED.	10209108.3	3127162.1	LEVEL W/ CROWN OF ROAD
H	INSTALL 10 FT PEDESTAL POLE ON 6 FT DRILLED SHAFT FND (24-A), WITH ONE LED COUNTDOWN PEDESTRIAN SIGNAL HEAD, ONE PEDESTRIAN PUSH BUTTON WITH AUDIBLE PEDESTRIAN SIGNAL UNIT, AND ONE R10-3e(R) SIGN AS ILLUSTRATED.	10209089.5	3127138.8	FLUSH W/ LANDING
J	INSTALL 30 FT SMA-80, 48 FT MAST ARM ON 13 FT DRILLED SHAFT FND (36-A) WITH ONE LUMINAIRE, ONE VANTAGE VECTOR WITH NEXT UNIT (RPDD*RADD), ONE WIND DAMPER ASSEMBLY, ONE ILSN SIGN, ONE R10-17T SIGN, AND THREE VEHICLE SIGNAL HEADS AS ILLUSTRATED.	10209142.0	3127057.6	LEVEL W/ CROWN OF ROAD
K	INSTALL 10 FT PEDESTAL POLE ON SPECIAL FND, WITH ONE LED COUNTDOWN PEDESTRIAN SIGNAL HEAD, ONE PEDESTRIAN PUSH BUTTON WITH AUDIBLE PEDESTRIAN SIGNAL UNIT, AND ONE R10-3e(R) SIGN AS ILLUSTRATED.	10209133.1	3127064.3	FLUSH W/ LANDING
L	INSTALL 10 FT PEDESTAL POLE ON 6 FT DRILLED SHAFT FND (24-A), WITH ONE LED COUNTDOWN PEDESTRIAN SIGNAL HEAD, ONE PEDESTRIAN PUSH BUTTON WITH AUDIBLE PEDESTRIAN SIGNAL UNIT, AND ONE R10-3e(R) SIGN AS ILLUSTRATED.	10209141.6	3127060.5	FLUSH W/ LANDING
M	INSTALL 30 FT SMA-80, 44 FT MAST ARM ON 13 FT DRILLED SHAFT FND (36-A) WITH ONE LUMINAIRE, ONE WDR CAMERA, ONE WIND DAMPER ASSEMBLY, ONE ILSN SIGN, ONE R10-12 SIGN, AND TWO VEHICLE SIGNAL HEADS AS ILLUSTRATED.	10209220.9	3127093.1	LEVEL W/ CROWN OF ROAD
N	INSTALL 10 FT PEDESTAL POLE ON 6 FT DRILLED SHAFT FND (24-A), WITH ONE LED COUNTDOWN PEDESTRIAN SIGNAL HEAD, ONE PEDESTRIAN PUSH BUTTON WITH AUDIBLE PEDESTRIAN SIGNAL UNIT, AND ONE R10-3e(L) SIGN AS ILLUSTRATED.	10209222.0	3127095.7	FLUSH W/ LANDING
P	INSTALL 10 FT PEDESTAL POLE ON 6 FT DRILLED SHAFT FND (24-A), WITH ONE LED COUNTDOWN PEDESTRIAN SIGNAL HEAD, ONE PEDESTRIAN PUSH BUTTON WITH AUDIBLE PEDESTRIAN SIGNAL UNIT, AND ONE R10-3e(L) SIGN AS ILLUSTRATED.	10209225.0	3127107.5	FLUSH W/ LANDING

SIGNS SHALL BE ATTACHED TO POLES AND MAST ARMS AS SHOWN ON PLANS

APS MESSAGE CHART

POLE ID	PEDESTRIAN MOVEMENT	FUNCTIONS	APS PROGRAMMING SETTING WHEN AT LEAST 10' APART
E	PHASE 2	BUTTON PUSH ON DON'T WALK	WAIT
		EXTENDED PUSH BUTTON	WAIT TO CROSS WOLF RANCH PKWY AT RIVERY DRIVEWAY
		LOCATOR TONE	SLOW TICK
		WALK INDICATION*	RAPID TICK
F	PHASE 2	BUTTON PUSH ON DON'T WALK	WAIT
		EXTENDED PUSH BUTTON	WAIT TO CROSS WOLF RANCH PKWY AT RIVERY DRIVEWAY
		LOCATOR TONE	SLOW TICK
		WALK INDICATION*	RAPID TICK
H	PHASE 4	BUTTON PUSH ON DON'T WALK	WAIT
		EXTENDED PUSH BUTTON	WAIT TO CROSS RIVERY DRIVEWAY AT WOLF RANCH
		LOCATOR TONE	SLOW TICK
		WALK INDICATION*	RAPID TICK
K	PHASE 4	BUTTON PUSH ON DON'T WALK	WAIT TO CROSS RIVERY DRIVEWAY AT WOLF RANCH
		EXTENDED PUSH BUTTON	WAIT TO CROSS RIVERY DRIVEWAY AT WOLF RANCH
		LOCATOR TONE	SLOW TICK
		WALK INDICATION*	RIVERY DRIVEWAY WALK SIGN IS ON TO CROSS RIVERY
L	PHASE 6	BUTTON PUSH ON DON'T WALK	WAIT TO CROSS WOLF RANCH PARKWAY AT RIVERY
		EXTENDED PUSH BUTTON	WAIT TO CROSS WOLF RANCH PARKWAY AT RIVERY DRIVEWAY
		LOCATOR TONE	SLOW TICK
		WALK INDICATION*	WOLF RANCH PARKWAY SIGN IS ON TO CROSS WOLF RANCH
N	PHASE 6	BUTTON PUSH ON DON'T WALK	WAIT
		EXTENDED PUSH BUTTON	WAIT TO CROSS WOLF RANCH PKWY AT RIVERY DRIVEWAY
		LOCATOR TONE	SLOW TICK
		WALK INDICATION*	RAPID TICK
D	PHASE 8	BUTTON PUSH ON DON'T WALK	WAIT
		EXTENDED PUSH BUTTON	WAIT TO CROSS RIVERY DRIVEWAY AT WOLF RANCH
		LOCATOR TONE	SLOW TICK
		WALK INDICATION*	RAPID TICK
P	PHASE 8	BUTTON PUSH ON DON'T WALK	WAIT
		EXTENDED PUSH BUTTON	WAIT TO CROSS RIVERY DRIVEWAY AT WOLF RANCH
		LOCATOR TONE	SLOW TICK
		WALK INDICATION*	RAPID TICK

* COUNTDOWN SPEECH MESSAGE = "ON" FOR ALL UNITS.

ITEM 688 - ACCESSIBLE PEDESTRIAN SIGNAL UNITS (APS)	
PED BUTTON PHASE	FURNISH & INSTALL
PHASE 2	2
PHASE 4	2
PHASE 6	2
PHASE 8	2
TOTAL	8

DESIGN

STATE OF TEXAS · GRANT R WUEBBEN · 129717 · LICENSED · PROFESSIONAL ENGINEER

GRANT R WUEBBEN, P.E. — 9/16/2025 DATE

APPROVAL

STATE OF TEXAS · JUSTIN W. CLARK · 118715 · LICENSED · PROFESSIONAL ENGINEER

JUSTIN W. CLARK, P.E. — 9/16/2025 DATE

NO.	REVISION	DATE

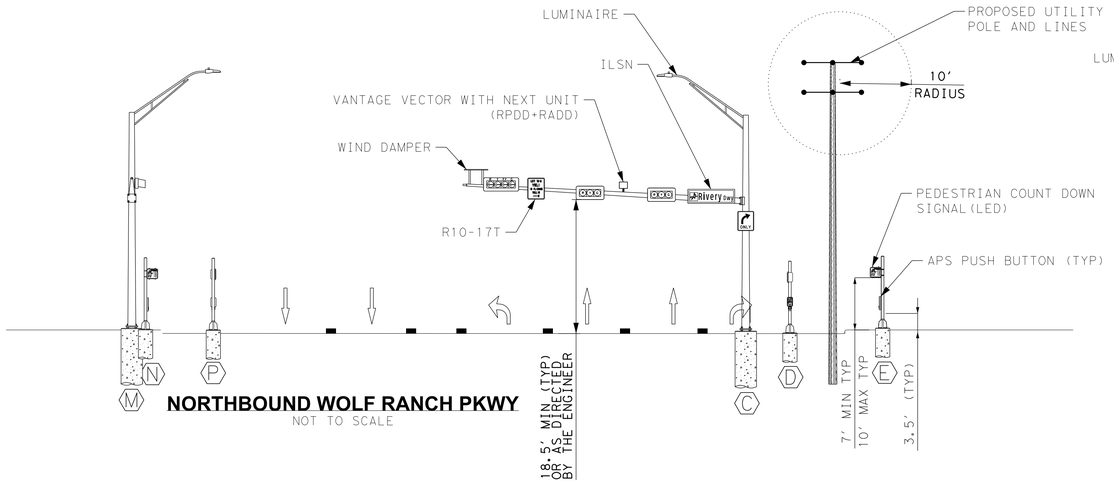
GEORGETOWN TEXAS *more than welcome*

PAPE-DAWSON ENGINEERS
AUSTIN I SAN ANTONIO I HOUSTON I FORT WORTH I DALLAS
10801 N MOPAC EXPY, BLDG 3, STE 200 I AUSTIN, TX 78759 I 512.454.8711
TEXAS ENGINEERING FIRM #470 I TEXAS SURVEYING FIRM #10028800

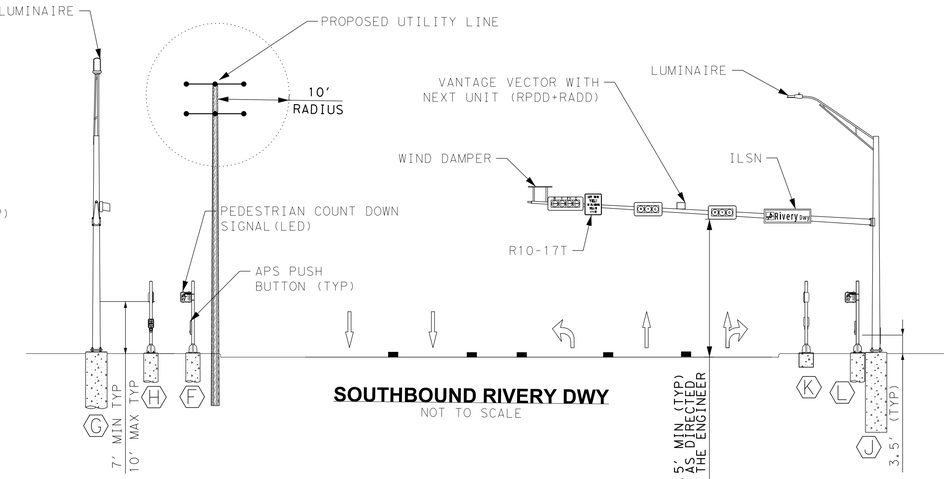
WOLF RANCH PKWY / MEMORIAL DR
WOLF RANCH PKWY / RIVERY DWY
CONDUIT & CONDUCTOR SCHEDULE

CITY JOB No.
JOB NO. 51423-04
DATE 9/16/2025
DESIGNER
CHECKED

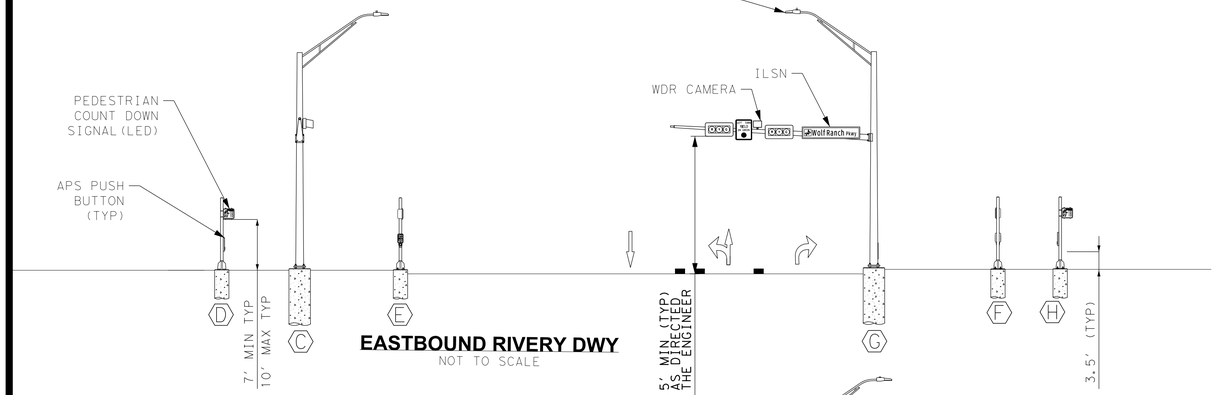
SHEET NO. 415



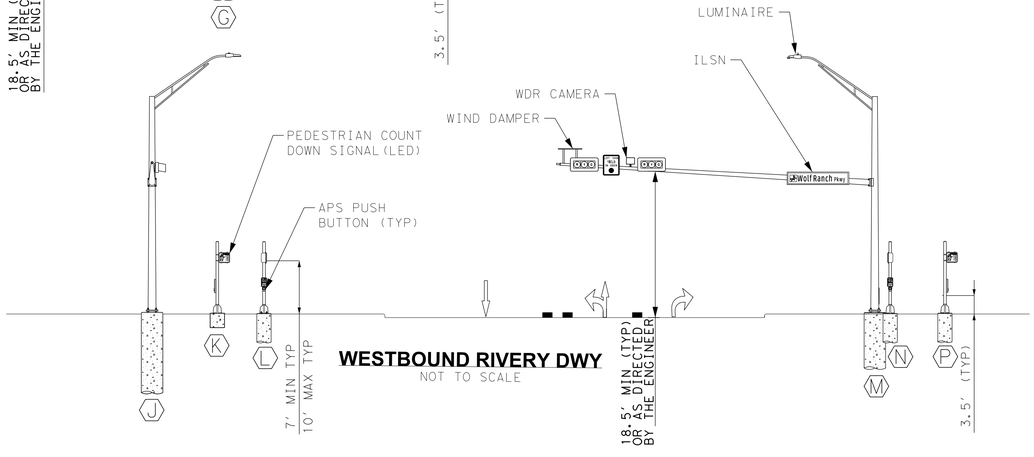
NORTHBOUND WOLF RANCH PKWY
NOT TO SCALE



SOUTHBOUND RIVERY DWY
NOT TO SCALE



EASTBOUND RIVERY DWY
NOT TO SCALE



WESTBOUND RIVERY DWY
NOT TO SCALE

NO.	REVISION	DATE

GEORGETOWN TEXAS
more than welcome

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TEXAS ENGINEERING FIRM #470 I TEXAS SURVEYING FIRM #10028800

WOLF RANCH PKWY / MEMORIAL DR
WOLF RANCH PKWY AT RIVERY DWY
TRAFFIC SIGNAL ELEVATIONS

DESIGN

STATE OF TEXAS — GRANT R WUEBBEN — 129717 — LICENSED PROFESSIONAL ENGINEER

GRANT R WUEBBEN, P.E. — 9/16/2025 DATE

APPROVAL

STATE OF TEXAS — JUSTIN W. CLARK — 118715 — LICENSED PROFESSIONAL ENGINEER

JUSTIN W. CLARK, P.E. — 9/16/2025 DATE

CITY JOB No.
JOB NO. 51423-04
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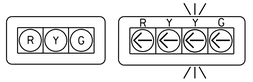
DESIGNER
CHECKED

SHEET NO. 416

TRAFFIC SIGNAL HEADS

SIGNAL FACES
12" LED SIGNAL SECTIONS
WITH BACKPLATES

LED COUNTDOWN
PEDESTRIAN HEADS





12"
SIGNAL FACE
1 QTY: 8

12"
SIGNAL FACE
2 QTY: 2

12"
SIGNAL FACE
W1 THRU W8
QTY: 8

SCALE: 1"= 20'
0' 20' 40' 60'

RIVERY DWY
ASSUMED SPEED 30 MPH

ø8, LS 8 ø8, LS 8 ø8, LS 8

ø6, LS 11

ø8, LS 12

ø1, LS 1 ø6, LS 6 ø6, LS 6
FYA, RED, YELLOW LS 9
OVL A

ø4, LS 10

ø4 ø7

ø6

ø1

WOLF RANCH PKWY
POSTED SPEED 35 MPH

ø5, LS 5 ø2, LS 2 ø2, LS 2
FYA, RED, YELLOW LS 11
OVL C

ø5

ø2

WOLF RANCH PKWY
POSTED SPEED 35 MPH

ø4, LS 10

ø3 ø8

ø2, LS 9

ø8, LS 12

ø2, LS 9

ø4, LS 4 ø4, LS 4 ø4, LS 4

RIVERY DWY
ASSUMED SPEED 30 MPH

DESIGN

STATE OF TEXAS
GRANT R WUEBBEN
129717
LICENSED
PROFESSIONAL ENGINEER

GRANT R WUEBBEN, P.E. 9/16/2025
DATE

APPROVAL

STATE OF TEXAS
JUSTIN W. CLARK
118715
LICENSED
PROFESSIONAL ENGINEER

JUSTIN W. CLARK, P.E. 9/16/2025
DATE

NO.	REVISION	DATE

GEORGETOWN TEXAS
more than welcome

PAPE-DAWSON ENGINEERS
AUSTIN I SAN ANTONIO I HOUSTON I FORT WORTH I DALLAS
10801 N MOPAC EXPY, BLDG 3, STE 200 I AUSTIN, TX 78759 I 512.454.8711
TEXAS ENGINEERING FIRM #470 I TEXAS SURVEYING FIRM #10028800

WOLF RANCH PKWY / MEMORIAL DR
WOLF RANCH PKWY AT RIVERY DWY
MISCELLANEOUS APS/LOAD SWITCH INFORMATION

CITY JOB No.
JOB NO. 51423-04
DATE 9/16/2025
DESIGNER
CHECKED

SHEET NO. 417

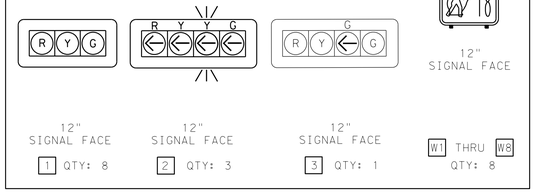
LEGEND

SYMBOL	DESCRIPTION
	TRAFFIC FLOW
12"W	12" WATER PIPE
	OVERHEAD ELECTRIC
SD	STORM PIPE
X	FENCE
G	GAS LINE
	LUMINAIRE
	FIRE HYDRANT
	UTILITY POLE
	GROUND MOUNTED SIGN
	MANHOLE
	GROUND BOX
	APPARENT RIGHT-OF-WAY
	CONDUIT/SPAN
	TRAFFIC SIGNAL TIMBER POLE
	LUMINAIRE
	GROUND BOX (TYPE D)
	POLE MOUNTED CONTROLLER
	RZ SERIES CAMERA
	TRAFFIC SIGNAL HEAD
	SPAN WIRE MOUNTED SIGN
09	CABLE/CONDUIT RUN
D	POLE/EQUIPMENT IDENTIFIER
	ELECTRIC SERVICE
	PEDESTRIAN POLE
	PEDESTRIAN SIGNAL HEAD
	VIVDS DETECTION

EXISITING TRAFFIC SIGNAL HEADS

SIGNAL FACES
12" LED SIGNAL SECTIONS WITH BACKPLATES

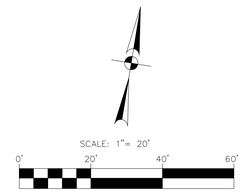
LED COUNTDOWN PEDESTRIAN HEADS



12" SIGNAL FACE	12" SIGNAL FACE	12" SIGNAL FACE	12" SIGNAL FACE
1 QTY: 8	2 QTY: 3	3 QTY: 1	W1 THRU W8 QTY: 8

EXISITING TRAFFIC SIGNS

Wolf Ranch PKWY	EXIST	S1
RIVERY BLVD	EXIST	S2
LEFT TURN YIELD ON FLASHING YELLOW ARROW	R10-17T (36" X 42")	S3
	R10-3e(R), (9" x 15")	PB1
	R10-3e(L), (9" x 15")	PB2



CAUTION:

THE CONTRACTOR IS SPECIFICALLY CAUTIONED THAT UNDERGROUND UTILITIES INCLUDING GAS ARE KNOWN TO EXIST IN THE VICINITY OF THIS WORK. CONTRACTOR SHALL CALL FOR LOCATES PRIOR TO BEGINNING WORK AND SHALL EXERCISE CAUTION WHEN INSTALLING SIGNAL EQUIPMENT INCLUDING POLE FOUNDATIONS AND CONDUITS

CONTRACTOR SHALL CONTACT DIGTESS @ 1-800-DIG-TESS OR TEXAS-811 FOR UTILITY LOCATION AT LEAST 72 HOURS PRIOR TO BEGINNING CONSTRUCTION

NOTES:
1. ALL DIMENSIONS ARE IN FEET UNLESS SPECIFIED OTHERWISE.
2. CONTRACTOR SHALL COORDINATE ALL REMOVAL OF TRAFFIC RELATED EQUIPMENT AND SIGNS WITH CITY OF GEORGETOWN.
3. ALL TRAFFIC EQUIPMENT DEEMED SALVAGEABLE BY THE CITY INSPECTOR SHALL BE DELIVERED TO THE CITY OF GEORGETOWN TRANSPORTATION DEPARTMENT LOCATED AT 300-1 INDUSTRIAL AVE, GEORGETOWN, TEXAS, 78626.
4. UTILITIES SHOWN ARE APPROXIMATE. CONTRACTOR SHALL CALL FOR LOCATES PRIOR TO COMMENCING EXCAVATION. ALL UTILITY LOCATIONS SHALL BE VERIFIED IN THE FIELD BY THE CONTRACTOR.
5. ALL ITEMS NOT SPECIFICALLY CALLED OUT IN THESE PLANS TO BE REMOVED, SHALL REMAIN.

PHASE DIAGRAM

CONFLICT FLASH: RED ALL PHASES
START UP FLASH: YELLOW 2 + 6
RED ALL OTHERS

DESIGN

STATE OF TEXAS — GRANT R WUEBBEN — 129717 — LICENSED PROFESSIONAL ENGINEER

GRANT R WUEBBEN, P.E. — 9/16/2025 DATE

APPROVAL

STATE OF TEXAS — JUSTIN W. CLARK — 118715 — LICENSED PROFESSIONAL ENGINEER

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TEXAS ENGINEERING FIRM #470 | TEXAS SURVEYING FIRM #10023800

WOLF RANCH PKWY / MEMORIAL DR
WOLF RANCH PKWY AT RIVERY BLVD EXISTING SIGNAL LAYOUT

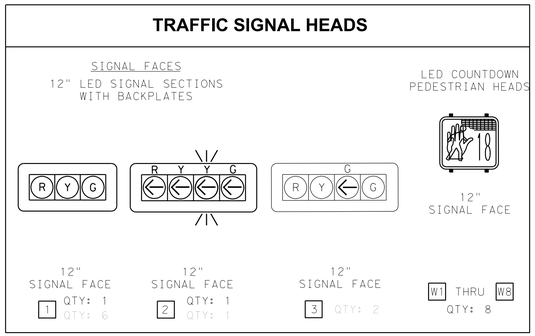
CITY JOB No.
JOB NO. 51423-04
DATE 9/16/2025
DESIGNER
CHECKED

SHEET NO. 418

LEGEND

SYMBOL	DESCRIPTION
	TRAFFIC FLOW
12"W	12" WATER PIPE
	OVERHEAD ELECTRIC
SD	STORM PIPE
X	FENCE
G	GAS LINE
	LUMINAIRE
	FIRE HYDRANT
	UTILITY POLE
	GROUND MOUNTED SIGN
	MANHOLE
	GROUND BOX
	APPARENT RIGHT-OF-WAY
	CONDUIT/SPAN
	TRAFFIC SIGNAL TIMBER POLE
	LUMINAIRE
	GROUND BOX (TYPE D)
	POLE MOUNTED CONTROLLER
	RZ SERIES CAMERA
	TRAFFIC SIGNAL HEAD
	SPAN WIRE MOUNTED SIGN
09	CABLE/CONDUIT RUN
	POLE/EQUIPMENT IDENTIFIER
	ELECTRIC SERVICE
	PEDESTRIAN POLE
	PEDESTRIAN SIGNAL HEAD
	VIVDS DETECTION

TRAFFIC SIGNAL HEADS



TRAFFIC SIGNS

Wolf Ranch Pkwy	SEE DETAILS	S1
Rivery Blvd	SEE DETAILS	S2
LEFT TURN YIELD ON FLASHING YELLOW ARROW	R10-17T (30" X 36")	S3
NO TURN ON RED	R10-11a (24" x 30")	S4
	R10-3e(R), (9" x 15")	PB1
	R10-3e(L), (9" x 15")	PB2

SCALE: 1"= 20'
0' 20' 40' 60'

CAUTION:

THE CONTRACTOR IS SPECIFICALLY CAUTIONED THAT UNDERGROUND UTILITIES INCLUDING GAS ARE KNOWN TO EXIST IN THE VICINITY OF THIS WORK. CONTRACTOR SHALL CALL FOR LOCATES PRIOR TO BEGINNING WORK AND SHALL EXERCISE CAUTION WHEN INSTALLING SIGNAL EQUIPMENT INCLUDING POLE FOUNDATIONS AND CONDUITS

CONTRACTOR SHALL CONTACT DIGTESS @ 1-800-DIG-TESS OR TEXAS-811 FOR UTILITY LOCATION AT LEAST 72 HOURS PRIOR TO BEGINNING CONSTRUCTION

SIGNAL HEAD AND POLE PLACEMENT

TCP PHA	POLE FROM	POLE TO	DIMENSIONS (FT) X	Y	Z	NO. OF HEADS
PHASE 2	L	M	40	14	-	2

PHASE DIAGRAM

CONFLICT FLASH: RED ALL PHASES
START UP FLASH: YELLOW 4 + 8
RED ALL OTHERS

NOTES:
1. ALL DIMENSIONS ARE IN FEET UNLESS SPECIFIED OTHERWISE.
2. UTILITIES SHOWN ARE APPROXIMATE. CONTRACTOR SHALL CALL FOR LOCATES PRIOR TO COMMENCING EXCAVATION. ALL UTILITY LOCATIONS SHALL BE VERIFIED IN THE FIELD BY THE CONTRACTOR.
3. ALL TEMPORARY TRAFFIC SIGNAL EQUIPMENTS DEEMED SALVAGEABLE BY THE CITY INSPECTOR SHALL BE DELIVERED TO CITY OF GEORGETOWN.
4. ALL ITEMS FADED BACK AND NOT SPECIFICALLY CALLED OUT IN THESE PLANS TO BE REMOVED, SHALL REMAIN.
5. TRAFFIC SIGNAL PHASING & TIMINGS SHALL BE MODIFIED IN COMPLIANCE WITH MUTCD DURING CONSTRUCTION BY CONTRACTOR AND APPROVED BY CITY OF GEORGETOWN.
6. CONTRACTORS TO SHIFT SIGNAL HEADS WITH EACH TCP PHASE TO REMAIN COMPLIANT WITH THE LATEST MUTCD REQUIREMENTS.
7. VEHICLE DETECTION WILL NEED TO BE ADJUSTED FOR EACH TCP PHASE.
8. SIDEWALK SHALL BE EXTENDED UP TO THE POLES, AS NEEDED, TO PROVIDE PEDESTRIAN ACCESS TO THE PEDESTRIAN PUSH BUTTONS. PUSH BUTTONS SHALL BE FLUSH WITH THE SIDEWALK AND NOT EXCEED 10" FOR SIDE REACH AND 0" FOR FRONT REACH.
9. TIMBER TRAFFIC SIGNAL POLE SHALL BE INSTALLED AT LEAST 7' BELOW EXISTING GROUND SURFACE.

DESIGN

STATE OF TEXAS · GRANT R WUEBBEN · 129717 · LICENSED PROFESSIONAL ENGINEER

GRANT R WUEBBEN, P.E. — 9/16/2025 DATE

APPROVAL

STATE OF TEXAS · JUSTIN W. CLARK · 118715 · LICENSED PROFESSIONAL ENGINEER

JUSTIN W. CLARK, P.E. — 9/16/2025 DATE

NO.	REVISION	DATE

GEORGETOWN TEXAS *more than welcome*

PAPE-DAWSON ENGINEERS
AUSTIN I SAN ANTONIO I HOUSTON I FORT WORTH I DALLAS
10801 N MOPAC EXPY, BLDG 3, STE 200 I AUSTIN, TX 78759 I 512.454.8711
TEXAS ENGINEERING FIRM #470 I TEXAS SURVEYING FIRM #10028800

WOLF RANCH PKWY / MEMORIAL DR
WOLF RANCH PKWY AT RIVERY BLVD
PHASE 2 TEMPORARY SIGNAL LAYOUT

CITY JOB No.
JOB NO. 51423-04
DATE 9/16/2025
DESIGNER
CHECKED

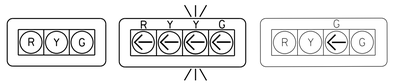
SHEET NO. 419

LEGEND

SYMBOL	DESCRIPTION
	TRAFFIC FLOW
12"W	12" WATER PIPE
	OVERHEAD ELECTRIC
SD	STORM PIPE
X	FENCE
G	GAS LINE
	LUMINAIRE
	FIRE HYDRANT
	UTILITY POLE
	GROUND MOUNTED SIGN
	MANHOLE
	GROUND BOX
	APPARENT RIGHT-OF-WAY
	CONDUIT/SPAN
	TRAFFIC SIGNAL TIMBER POLE
	LUMINAIRE
	GROUND BOX (TYPE D)
	POLE MOUNTED CONTROLLER
	RZ SERIES CAMERA
	TRAFFIC SIGNAL HEAD
	SPAN WIRE MOUNTED SIGN
09	CABLE/CONDUIT RUN
	POLE/EQUIPMENT IDENTIFIER
	ELECTRIC SERVICE
	PEDESTRIAN POLE
	PEDESTRIAN SIGNAL HEAD

TRAFFIC SIGNAL HEADS

SIGNAL FACES
12" LED SIGNAL SECTIONS WITH BACKPLATES



12" SIGNAL FACE 1 QTY: 8
12" SIGNAL FACE 2 QTY: 2
12" SIGNAL FACE 3 QTY: 2

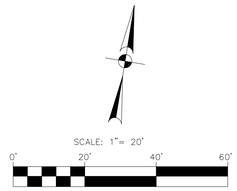
LED COUNTDOWN PEDESTRIAN HEADS



12" SIGNAL FACE
W1 THRU W8 QTY: 8

TRAFFIC SIGNS

Wolf Ranch Pkwy	SEE DETAILS	S1
Rivery Blvd	SEE DETAILS	S2
LEFT TURN YIELD ON FLASHING YELLOW ARROW	R10-17T (36" X 42")	S3
NO TURN ON RED	R10-11a (24" X 30")	S4
	R10-3e(R), (9" X 15")	PB1
	R10-3e(L), (9" X 15")	PB2

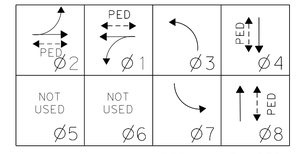


CAUTION:

THE CONTRACTOR IS SPECIFICALLY CAUTIONED THAT UNDERGROUND UTILITIES INCLUDING GAS ARE KNOWN TO EXIST IN THE VICINITY OF THIS WORK. CONTRACTOR SHALL CALL FOR LOCATES PRIOR TO BEGINNING WORK AND SHALL EXERCISE CAUTION WHEN INSTALLING SIGNAL EQUIPMENT INCLUDING POLE FOUNDATIONS AND CONDUITS

CONTRACTOR SHALL CONTACT DIGTESS @ 1-800-DIG-TESS OR TEXAS-811 FOR UTILITY LOCATION AT LEAST 72 HOURS PRIOR TO BEGINNING CONSTRUCTION

PHASE DIAGRAM



CONFLICT FLASH: RED ALL PHASES
START UP FLASH: YELLOW 4 + 8
RED ALL OTHERS

NOTES:
1. ALL DIMENSIONS ARE IN FEET UNLESS SPECIFIED OTHERWISE.
2. UTILITIES SHOWN ARE APPROXIMATE. CONTRACTOR SHALL CALL FOR LOCATES PRIOR TO COMMENCING EXCAVATION. ALL UTILITY LOCATIONS SHALL BE VERIFIED IN THE FIELD BY THE CONTRACTOR.
3. ALL TEMPORARY TRAFFIC SIGNAL EQUIPMENTS DEEMED SALVAGEABLE BY THE CITY INSPECTOR SHALL BE DELIVERED TO CITY OF GEORGETOWN.
4. ALL ITEMS FADED BACK AND NOT SPECIFICALLY CALLED OUT IN THESE PLANS TO BE REMOVED, SHALL REMAIN.
5. TRAFFIC SIGNAL PHASING & TIMINGS SHALL BE MODIFIED IN COMPLIANCE WITH MUTCD DURING CONSTRUCTION BY CONTRACTOR AND APPROVED BY CITY OF GEORGETOWN.
6. CONTRACTORS TO SHIFT SIGNAL HEADS WITH EACH TCP PHASE TO REMAIN COMPLIANT WITH THE LATEST MUTCD REQUIREMENTS.
7. VEHICLE DETECTION WILL NEED TO BE ADJUSTED FOR EACH TCP PHASE.

DESIGN

STATE OF TEXAS · GRANT R WUEBBEN · 129717 · LICENSED · PROFESSIONAL ENGINEER

GRANT R WUEBBEN, P.E. — 9/16/2025 DATE

APPROVAL

STATE OF TEXAS · JUSTIN W. CLARK · 118715 · LICENSED · PROFESSIONAL ENGINEER

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GEORGETOWN TEXAS *more than welcome*

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TEXAS ENGINEERING FIRM #470 | TEXAS SURVEYING FIRM #10028800

WOLF RANCH PKWY / MEMORIAL DR
WOLF RANCH PKWY AT RIVERY BLVD
PHASE 3 TEMPORARY SIGNAL LAYOUT

CITY JOB No.
JOB NO. 51423-04
DATE 9/16/2025
DESIGNER
CHECKED

SHEET NO. 420

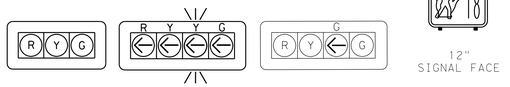
LEGEND

SYMBOL	DESCRIPTION
	TRAFFIC FLOW
12"W	12" WATER PIPE
	OVERHEAD ELECTRIC
SD	STORM PIPE
X	FENCE
G	GAS LINE
	LUMINAIRE
	FIRE HYDRANT
	UTILITY POLE
	GROUND MOUNTED SIGN
	MANHOLE
	GROUND BOX
	APPARENT RIGHT-OF-WAY
	CONDUIT/SPAN
	TRAFFIC SIGNAL TIMBER POLE
	LUMINAIRE
	GROUND BOX (TYPE D)
	POLE MOUNTED CONTROLLER
	RZ SERIES CAMERA
	TRAFFIC SIGNAL HEAD
	SPAN WIRE MOUNTED SIGN
09	CABLE/CONDUIT RUN
	POLE/EQUIPMENT IDENTIFIER
	ELECTRIC SERVICE
	PEDESTRIAN POLE
	PEDESTRIAN SIGNAL HEAD

TRAFFIC SIGNAL HEADS

SIGNAL FACES
12" LED SIGNAL SECTIONS WITH BACKPLATES

LED COUNTDOWN PEDESTRIAN HEADS



12" SIGNAL FACE 1 QTY: 8
12" SIGNAL FACE 2 QTY: 2
12" SIGNAL FACE 3 QTY: 2
12" SIGNAL FACE W1 THRU W8 QTY: 8

TRAFFIC SIGNS

Wolf Ranch Pkwy	SEE DETAILS	S1
Rivery Blvd	SEE DETAILS	S2
LEFT TURN YIELD ON FLASHING YELLOW ARROW	R10-17T (30" X 30")	S3
NO TURN ON RED	R10-11a (24" x 30")	S4
	R3-2 (24" X 24")	S5
	R3-1 (24" x 24")	S6
	R10-3e(R), (9" x 15")	PB1
	R10-3e(L), (9" x 15")	PB2

SCALE: 1"= 20'
0' 20' 40' 60'

CAUTION:

THE CONTRACTOR IS SPECIFICALLY CAUTIONED THAT UNDERGROUND UTILITIES INCLUDING GAS ARE KNOWN TO EXIST IN THE VICINITY OF THIS WORK. CONTRACTOR SHALL CALL FOR LOCATES PRIOR TO BEGINNING WORK AND SHALL EXERCISE CAUTION WHEN INSTALLING SIGNAL EQUIPMENT INCLUDING POLE FOUNDATIONS AND CONDUITS

CONTRACTOR SHALL CONTACT DIGTESS @ 1-800-DIG-TESS OR TEXAS-811 FOR UTILITY LOCATION AT LEAST 72 HOURS PRIOR TO BEGINNING CONSTRUCTION

PHASE DIAGRAM

PED Ø2	PED Ø1	Ø3	PED Ø4
NOT USED Ø5	NOT USED Ø6	Ø7	PED Ø8

CONFLICT FLASH: RED ALL PHASES
START UP FLASH: YELLOW 4 + 8
RED ALL OTHERS

NOTES:
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DESIGN

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GRANT R WUEBBEN, P.E. 9/16/2025 DATE

APPROVAL

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TEXAS ENGINEERING FIRM #470 | TEXAS SURVEYING FIRM #10028800

WOLF RANCH PKWY / MEMORIAL DR
WOLF RANCH PKWY AT RIVERY BLVD
PHASE 3 STEP 2 TEMPORARY SIGNAL LAYOUT

CITY JOB No.
JOB NO. 51423-04
DATE 9/16/2025
DESIGNER
CHECKED

SHEET NO. 421

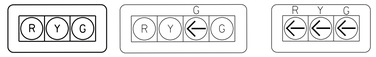
LEGEND

SYMBOL	DESCRIPTION
	TRAFFIC FLOW
12"W	12" WATER PIPE
	OVERHEAD ELECTRIC
SD	STORM PIPE
X	FENCE
G	GAS LINE
	LUMINAIRE
	FIRE HYDRANT
	UTILITY POLE
	GROUND MOUNTED SIGN
	MANHOLE
	CABLE RUN (BORE)
	APPARENT RIGHT-OF-WAY
	CABLE RUN (TRENCH)
	SIGNAL POLE, FOUNDATION, AND ARM
	LUMINAIRE
	GROUND BOX (TYPE D)
	CONTROLLER, SLAB, AND FOUNDATION
	WDR CAMERA
	VANTAGE VECTOR (RAPD+RPDD)
	TRAFFIC SIGNAL HEAD
	MAST ARM SIGN
09	CABLE/CONDUIT RUN
D	POLE/EQUIPMENT IDENTIFIER
	ELECTRIC SERVICE
	PEDESTRIAN POLE
	PEDESTRIAN SIGNAL HEAD

PROPOSED TRAFFIC SIGNAL HEADS

SIGNAL FACES
12" LED SIGNAL SECTIONS WITH VENTED ALUMINUM REFLECTIVE BACKPLATES

LED COUNTDOWN PEDESTRIAN HEADS



12" SIGNAL FACE	12" SIGNAL FACE	12" SIGNAL FACE	12" SIGNAL FACE
1 QTY: 1	3 QTY: 2	4 QTY: 1	W3 THRU W6 QTY: 4

PROPOSED TRAFFIC SIGNS

ONLY	R3-8L (30" X 30")	S4
ONLY	R3-5R (30" X 36")	S5
	R10-3e(R), (9" x 15")	PB1
	R10-3e(L), (9" x 15")	PB2
Rivery Blvd	SEE DETAILS	S1
Wolf Ranch Pkwy	SEE DETAILS	S2

SCALE: 1"= 20'
0' 20' 40' 60'

CAUTION:

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PED Ø2	PED Ø1	Ø3	PED Ø4
NOT USED Ø5	NOT USED Ø6	Ø7	PED Ø8

CONFLICT FLASH: RED ALL PHASES
START UP FLASH: YELLOW 4 + 8
RED ALL OTHERS

NOTES:
1. ALL DIMENSIONS SHOWN ARE IN FEET UNLESS SPECIFIED OTHERWISE. (ALL EXISTING FEATURES ARE SHOWN SCREENED BACK i.e. FADED).
2. MINIMUM CLEARANCE OF 40" RADIUS FROM NEUTRAL AND 10' RADIUS FROM PRIMARY OR SECONDARY SHALL BE MAINTAINED BETWEEN PROPOSED TRAFFIC SIGNAL EQUIPMENT AND EXISTING OVERHEAD ELECTRICAL LINES. CONTRACTOR SHALL CONSIDER ALTERNATIVE FOUNDATION PLACEMENT METHODS IN AREAS WHERE EXISTING OVERHEAD ELECTRIC LINES PROHIBIT THE USE OF CONVENTIONAL DRILL TRUCK.
3. CONTRACTOR TO POTHOLE SIGNAL POLE LOCATIONS NEAR UNDERGROUND UTILITIES PRIOR TO INSTALLING POLE FOUNDATION.
4. LOCATION OF TRAFFIC SIGNAL POLES, CONTROLLER ASSEMBLIES, AND ELECTRICAL SERVICE SHALL BE VERIFIED AND APPROVED BY THE CITY OF GEORGETOWN TRANSPORTATION DEPARTMENT PRIOR TO CONSTRUCTION. THE CONTRACTOR SHALL SUPPLY AND INSTALL THE ADDRESS IN PERMANENT NUMBERS AND LETTERS TO THE STREET SIDE OF THE SERVICE ENCLOSURE. SAID ADDRESS SHALL ALSO BE RECORDED AND GIVEN TO THE CITY OF GEORGETOWN INSPECTOR FOR THE CITY'S RECORDS.
5. UTILITIES SHOWN ARE APPROXIMATE. CONTRACTOR SHALL CALL FOR LOCATES PRIOR TO COMMENCING EXCAVATION. ALL UTILITY LOCATIONS SHALL BE VERIFIED IN THE FIELD BY THE CONTRACTOR.
6. NEATLY CAP/COIL ALL WIRES AND CABLES IN GROUND BOX OR AT TERMINATION.
7. SIGNAL OPERATION WILL BE MONITORED AFTER CONSTRUCTION AND MODIFIED AS NECESSARY.
8. ALL SIGNAL HEADS SHALL HAVE VENTED ALUMINUM REFLECTIVE BACK PLATES.
9. CONTRACTOR SHALL CONTACT THE CITY OF GEORGETOWN TRANSPORTATION DEPARTMENT A MINIMUM OF FOURTEEN (14) DAYS PRIOR TO BEGINNING OF CONSTRUCTION.
10. ALL SIGNAL HEADS SHALL HAVE A MINIMUM CLEARANCE OF 18.5 FEET ABOVE GRADE THROUGHOUT THE DURATION OF THIS PROJECT.
11. TRAFFIC SIGNAL PHASING & TIMINGS SHALL BE MODIFIED DURING CONSTRUCTION BY CONTRACTOR AND APPROVED BY CITY OF GEORGETOWN.
12. LUMINAIRES ARE SHOWN FOR DRAWING PURPOSES ONLY. THE EXACT PLACEMENT SHALL BE DETERMINED IN THE FIELD AND SHALL NOT BE WITHIN 10 FEET OF OVERHEAD UTILITIES.
13. SIDEWALK SHALL BE EXTENDED UP TO THE POLES, AS NEEDED, TO PROVIDE PEDESTRIAN ACCESS TO THE PEDESTRIAN PUSH BUTTONS. PUSH BUTTONS SHALL BE FLUSH WITH THE SIDEWALK AND NO EXCEED 10" FOR SIDE REACH AND 0" FOR FRONT REACH.
14. A SIGNAL TECHNICIAN FROM THE CITY OF GEORGETOWN SHALL BE PRESENT WHEN THE NEW SIGNAL IS PLACED IN OPERATION. THE CONTRACTOR SHALL NOTIFY MR. RANDALL YOUNG WITH THE CITY OF GEORGETOWN AT 512-930-8163 AT LEAST 48 HOURS IN ADVANCE OF THE TURN ON.
15. FOR THE ELECTRIC METER ACCOUNT SET UP, CONTACT MOLLY RITTER - PUBLIC WORKS OPERATIONS MANAGER. Molly.Ritter@georgetowntexas.gov 512-930-8152.
16. THE CONTRACTOR SHALL NOTIFY MR. LUA SALUONE, TRANSPORTATION MANAGER WITH THE CITY OF GEORGETOWN AT 512-930-6574 AT LEAST ONE WEEK PRIOR TO STARTING WORK ON THIS PROJECT.
17. ThruGreen COMMUNICATION SYSTEM SHALL BE INSTALLED IN THE CONTROLLER.

DESIGN

STATE OF TEXAS · GRANT R WUEBBEN · 129717 · LICENSED · PROFESSIONAL ENGINEER

GRANT R WUEBBEN, P.E. — 9/16/2025 DATE

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WOLF RANCH PKWY / MEMORIAL DR
WOLF RANCH PKWY AT RIVERY BLVD
PROPOSED TRAFFIC LAYOUT

CITY JOB No.
JOB NO. 51423-04
DATE 9/16/2025
DESIGNER
CHECKED

SHEET NO. 422

CONDUIT AND CONDUCTOR SCHEDULE

				RUN NUMBER	01	02	03	04	05		06		07		08	09		10	11		12	13		14		15		16		17	18	19	
				CONDUIT SIZE IN INCHES	3	3	2	3	3	2	3	2	3	2	2	3	2	2	3	2	2	3	3	2	2	2	3	2
				NUMBER OF CONDUITS	1	1	1	2	2	1	2	1	2	1	1	2	1	1	2	1	1	1	2	1	1	1	2	1
				LENGTH OF RUN (FT)	15	15	20	10	95	95	105	105	20	20	10	10	10	10	20	95	95	10	20	95	95	10	20	15	15
				TRENCH (T)/BORE (B)/EXISTING	E	E	E	E	E	E	B	B	T	T	E	E	E	E	B	B	T	T	B	B	E	E	T	T
CABLE	CIRCUIT			NUMBER OF CONDUCTORS																												
#8 BARE (SOLID)	BARE BOND GROUND			EXIST				2											2	1	1	1										
7 COND. #14 AWG TYPE "A", SOLID	SIGNALS	ø	2					2					2																			
		ø	1					2			2								2			2										
5 COND. #14 AWG TYPE "A", SOLID	PED. SIGNALS	POLE	G					1			1								1			1										
		POLE	J					1			1								1		1											
		POLE	F					2			2							2														
2 COND. #14 AWG TYPE "A", SOLID	PED. APS PUSHBUTTONS	POLE	G					1			1								1			1										
		POLE	J					1			1								1		1											
		POLE	F					2			2							2														
4 COND. #14 AWG TYPE "A", SOLID	ILSN SIGNS	POLE	C			1								1																		
		POLE	E			1						1						1														
		POLE	G			1						1								1												
		POLE	K			1				1																						1
POWER & DATA CABLE	WDR Camera	POLE	G				1			1									1			1										
	Vantage Vector	POLE	C				1						1																			
		POLE	E				1			1																						
		POLE	K				1	1																								1

EXISTING ELECTRICAL SERVICE DATA

Electrical Service Description (see ED (5) - 14)	Service Conduit Size	Service Conductors No./Size	Safety Switch Amps	Main Ckt. Bkr. Pole / Amp	Two - Pole Contactor Amps	Panelboard Load center Amp Rating	Circuit No.	Branch Ckt. Bkr. Pole / Amps	Branch Circuit Amps	KVA Load
ELEC SERV TY D(120/240)070(NS)AL(E)PS(U)	3"	3/#4	N/A	2P/70	N/A	100	A (SIG)	1P/50	40	6.0
							B (LUM)	1P/15	10	

ITEM 688 - ACCESSIBLE PEDESTRIAN

PED BUTTON PHASE	FURNISH & INSTALL
PHASE 2	2
PHASE 4	2
PHASE 6	1
TOTAL	5

POLE & EQUIPMENT INFORMATION

ID	DESCRIPTION/ATTACHMENTS	NORTHING	EASTING	FND. ELEV
C	INSTALL TWO VEHICLE SIGNAL HEADS, ONE ILSN SIGN, AND ONE R3-8L SIGN TO THE EXISTING MAST ARM AS ILLUSTRATED.	EXIST	EXIST	LEVEL W/ CROWN OF ROAD
E	INSTALL ONE ILSN SIGN ON EXISTING MAST ARM AS ILLUSTRATED.	EXIST	EXIST	LEVEL W/ CROWN OF ROAD
F	INSTALL 10 FT PEDESTAL POLE ON SPECIAL FND, WITH TWO LED COUNTDOWN PEDESTRIAN SIGNAL HEADS, TWO PEDESTRIAN PUSH BUTTONS WITH AUDIBLE PEDESTRIAN SIGNAL UNITS, AND TWO R10-3e(L) SIGNS AS ILLUSTRATED.	10210067.4	3128396.2	FLUSH W/ LANDING
G	INSTALL 19 FT SMA-80, 28 FT MAST ARM ON 11 FT DRILLED SHAFT FND (30-A) WITH ONE RELOCATED RADD, TWO VEHICLE SIGNAL HEADS, ONE ILSN SIGN, ONE LED COUNTDOWN PEDESTRIAN SIGNAL HEAD, ONE PEDESTRIAN PUSH BUTTON WITH AUDIBLE PEDESTRIAN SIGNAL UNIT, AND ONE R10-3e(L) SIGN AS ILLUSTRATED.	10210138.3	3128378.5	LEVEL W/ CROWN OF ROAD
J	INSTALL 10 FT PEDESTAL POLE ON 6 FT DRILLED SHAFT FND (24-A), WITH ONE LED COUNTDOWN PEDESTRIAN SIGNAL HEAD, ONE PEDESTRIAN PUSH BUTTON WITH AUDIBLE PEDESTRIAN SIGNAL UNIT, AND ONE R10-3e(R) SIGN AS ILLUSTRATED.	10210148.2	3128385.0	FLUSH W/ LANDING
K	INSTALL ONE ILSN SIGN ON EXISTING MAST ARM AS ILLUSTRATED.	EXIST	EXIST	LEVEL W/ CROWN OF ROAD

SIGNS SHALL BE ATTACHED TO POLES AND MAST ARMS AS SHOWN ON PLANS

POLE SCHEDULE

	POLE			(C)	(D)	(E)	(F)	(G)	(J)	(K)	(L)	(M)
	POLE TYPE			SMA-80	PED	SM-80	PED	SMA-80	PED	SMA-80	PED	PED
	POLE HEIGHT (FEET)			19	10	19	10	19	10	19	10	10
	MAST ARM LENGTH (FEET)			32	N/A	40	N/A	28	N/A	36	N/A	N/A
	ILSN** (YES/NO)			YES	N/A	YES	N/A	YES	N/A	YES	N/A	N/A
	FOUNDATION TYPE			EXIST	EXIST	EXIST	SPL*	30-A	24-A	EXIST	EXIST	EXIST
	FOUNDATION DEPTH (FEET)			EXIST	EXIST	EXIST	SPL*	11	6	EXIST	EXIST	EXIST
CABLE	CIRCUIT			NUMBER OF CONDUCTORS								
#8 BARE (SOLID)	BARE BOND GROUND			1				1	1			
7 COND. #14 AWG TYPE "A", SOLID	SIGNALS	ø	2	2								
		ø	1					2				
5 COND. #14 AWG TYPE "A", SOLID	PED. SIGNALS	POLE	G					1				
		POLE	J						1			
		POLE	F				2					
2 COND. #14 AWG TYPE "A", SOLID	PED. APS PUSHBUTTONS	POLE	G					1				
		POLE	J						1			
		POLE	F				2					
4 COND. #14 AWG TYPE "A", SOLID	ILSN SIGNS	POLE	C	1								
		POLE	E			1						
		POLE	G					1				
		POLE	K							1		
POWER & DATA CABLE	WDR Camera	POLE	G					1				
	Vantage Vector	POLE	C	1								
		POLE	E			1						
		POLE	K							1		

* SEE PEDESTRIAN POLE SPECIAL FOUNDATION FOR DETAILS

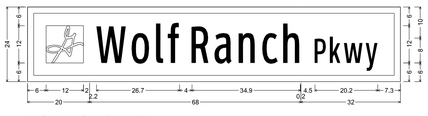
** ILSN SIGNS TO BE PLACED ON MAST ARMS AS SHOWN IN PLANS.

APS MESSAGE CHART

POLE ID	PEDESTRIAN MOVEMENT	FUNCTIONS	APS PROGRAMMING SETTING
D	PHASE 2	BUTTON PUSH ON DON'T WALK	WAIT TO CROSS RIVERY BOULEVARD AT WOLF RANCH
		EXTENDED PUSH BUTTON	WAIT TO CROSS RIVERY BOULEVARD AT WOLF RANCH
		LOCATOR TONE	SLOW TICK
		WALK INDICATION*	RIVERY BOULEVARD WALK SIGN IS ON TO CROSS RIVERY BOULEVARD
F	PHASE 2	BUTTON PUSH ON DON'T WALK	WAIT TO CROSS RIVERY BOULEVARD AT WOLF RANCH
		EXTENDED PUSH BUTTON	WAIT TO CROSS RIVERY BOULEVARD AT WOLF RANCH
		LOCATOR TONE	SLOW TICK
		WALK INDICATION*	RIVERY BOULEVARD WALK SIGN IS ON TO CROSS RIVERY BOULEVARD
F	PHASE 4	BUTTON PUSH ON DON'T WALK	WAIT
		EXTENDED PUSH BUTTON	WAIT TO CROSS WOLF RANCH PARKWAY AT RIVERY
		LOCATOR TONE	WAIT TO CROSS WOLF RANCH PARKWAY AT RIVERY
		WALK INDICATION*	WOLF RANCH PARKWAY WALK SIGN IS ON TO CROSS WOLF RANCH PARKWAY
C	PHASE 4	BUTTON PUSH ON DON'T WALK	WAIT
		EXTENDED PUSH BUTTON	WAIT TO CROSS WOLF RANCH PARKWAY AT RIVERY
		LOCATOR TONE	SLOW TICK
		WALK INDICATION*	RAPID TICK
J	PHASE 6	BUTTON PUSH ON DON'T WALK	WAIT
		EXTENDED PUSH BUTTON	WAIT TO CROSS RIVERY BOULEVARD AT WOLF RANCH PARKWAY
		LOCATOR TONE	SLOW TICK
		WALK INDICATION*	RAPID TICK

* COUNTDOWN SPEECH MESSAGE = "ON" FOR ALL UNITS.

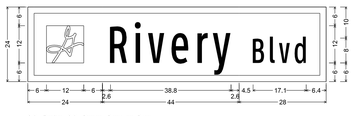
ILSN DETAILS



6.0" Radius, 2.0" Border, Black on Blue;
Rectangle White;

6.0" Radius, 2.0" Border, Black on Blue;
"Wolf" White, ClearviewHwy-1-W 80% spacing; "Ranch" White, ClearviewHwy-1-W 80% spacing;

6.0" Radius, 2.0" Border, Black on Blue;
"Pkwy" White, ClearviewHwy-1-W 80% spacing;



6.0" Radius, 2.0" Border, Black on Blue;
Rectangle White;

6.0" Radius, 2.0" Border, Black on Blue;
"Rivery" White, ClearviewHwy-1-W;

6.0" Radius, 2.0" Border, Black on Blue;
"Blvd" White, ClearviewHwy-1-W;

NOTE:
FINAL DESIGN OF ILSN TO BE APPROVED BY THE CITY OF GEORGETOWN PRIOR TO FABRICATION.

DESIGN

STATE OF TEXAS
GRANT R WUEBBEN
129717
LICENSED
PROFESSIONAL ENGINEER

GRANT R WUEBBEN, P.E. — 9/16/2025 DATE

APPROVAL

STATE OF TEXAS
JUSTIN W. CLARK
118715
LICENSED
PROFESSIONAL ENGINEER

JUSTIN W. CLARK, P.E. — 9/16/2025 DATE

NO.	REVISION	DATE

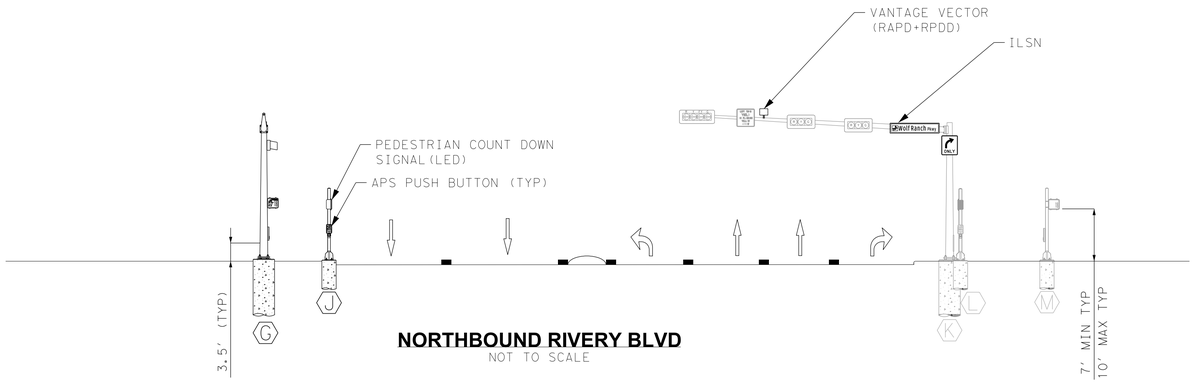
GEORGETOWN TEXAS
more than welcome

PAPE-DAWSON ENGINEERS
AUSTIN | SAN ANTONIO | HOUSTON | FORT WORTH | DALLAS
10801 N MOPAC EXPY, BLDG 3, STE 200 | AUSTIN, TX 78759 | 512.454.8711
TEXAS ENGINEERING FIRM #470 | TEXAS SURVEYING FIRM #10028800

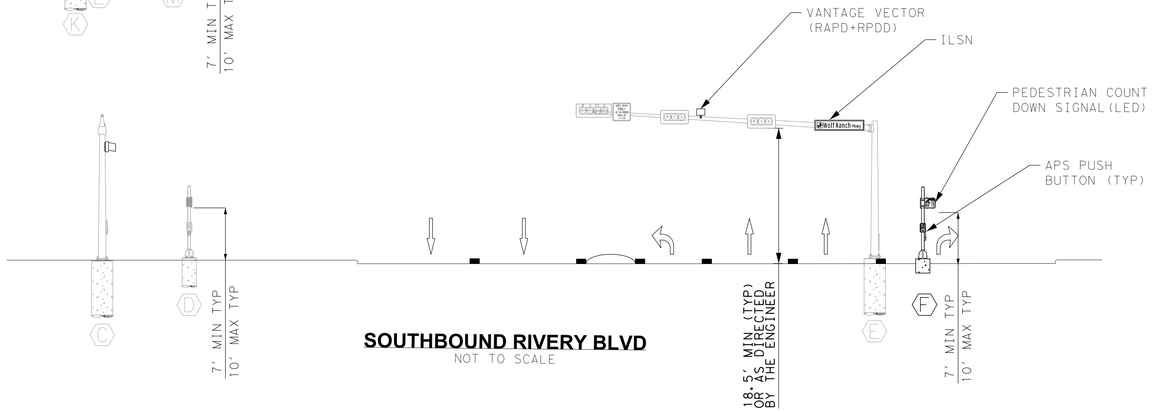
WOLF RANCH PKWY / MEMORIAL DR
WOLF RANCH PKWY / RIVERY BLVD
CONDUIT & CONDUCTOR SCHEDULE

CITY JOB No.
JOB NO. 51423-04
DATE 9/16/2025
DESIGNER
CHECKED

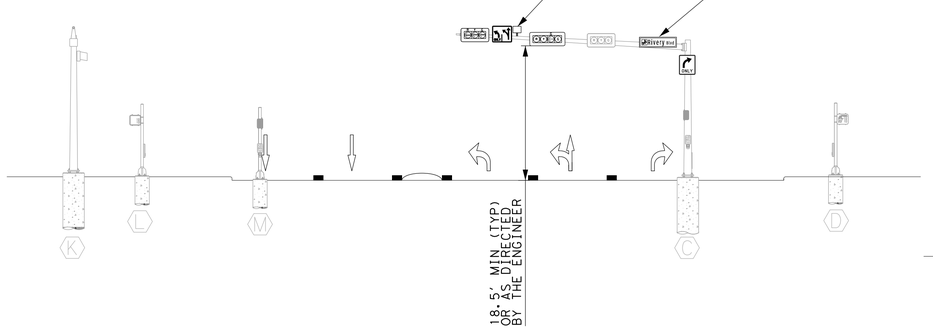
SHEET NO. 423



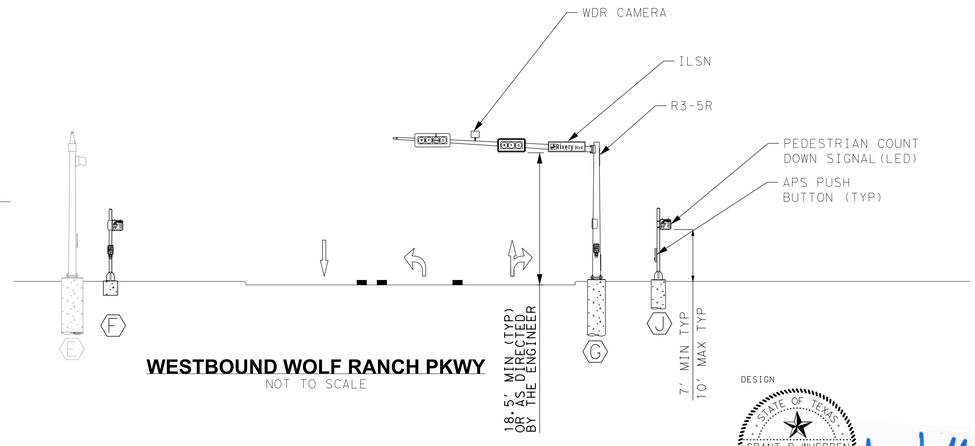
NORTHBOUND RIVERY BLVD
NOT TO SCALE



SOUTHBOUND RIVERY BLVD
NOT TO SCALE



EASTBOUND WOLF RANCH PKWY
NOT TO SCALE



WESTBOUND WOLF RANCH PKWY
NOT TO SCALE

DESIGN

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GRANT R WUEBBEN, P.E. — 9/16/2025 DATE

APPROVAL

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TEXAS ENGINEERING FIRM #470 I TEXAS SURVEYING FIRM #10028800

WOLF RANCH PKWY / MEMORIAL DR
WOLF RANCH PKWY AT RIVERY BLVD
TRAFFIC SIGNAL ELEVATIONS

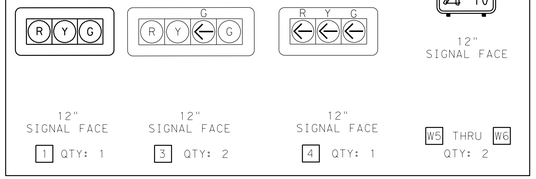
CITY JOB No.
JOB NO. 51423-04
DATE 9/16/2025
DESIGNER
CHECKED

SHEET NO. 424

TRAFFIC SIGNAL HEADS

SIGNAL FACES
12" LED SIGNAL SECTIONS
WITH BACKPLATES

LED COUNTDOWN
PEDESTRIAN HEADS



DESIGN

STATE OF TEXAS
GRANT R WUEBBEN
129717
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PROFESSIONAL ENGINEER

GRANT R WUEBBEN, P.E. — 9/16/2025 DATE

APPROVAL

STATE OF TEXAS
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TEXAS ENGINEERING FIRM #470 I TEXAS SURVEYING FIRM #10028800

WOLF RANCH PKWY / MEMORIAL DR
WOLF RANCH PKWY AT RIVERY BLVD
MISCELLANEOUS APS/LOAD SWITCH INFORMATION

CITY JOB No.
JOB NO. 51423-04
DATE 9/16/2025
DESIGNER
CHECKED

SHEET NO. 425

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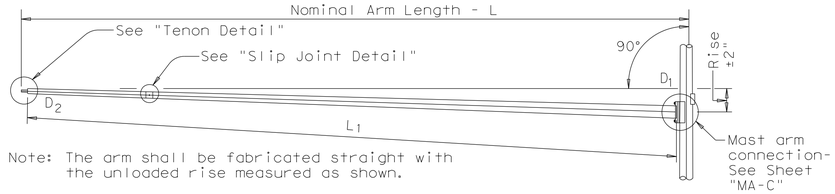
Arm Length	ROUND POLES					POLYGONAL POLES					Foundation Type
	D_B	D_{19}	D_{24}	D_{30}	① thk	D_B	D_{19}	D_{24}	D_{30}	① thk	
ft.	in.	in.	in.	in.	in.	in.	in.	in.	in.	in.	
20	10.5	7.8	7.1	6.3	.179	11.5	8.5	7.7	6.8	.179	30-A
24	11.0	8.3	7.6	6.8	.179	12.0	9.0	8.2	7.3	.179	30-A
28	11.5	8.8	8.1	7.3	.179	12.5	9.5	8.7	7.8	.179	30-A
32	12.5	9.8	9.1	8.3	.179	12.0	9.0	8.2	7.3	.239	30-A
36	12.0	9.3	8.6	7.8	.239	12.5	9.5	8.7	7.8	.239	36-A
40	12.0	9.3	8.6	7.8	.239	13.5	10.5	9.7	8.8	.239	36-A
44	12.5	9.8	9.1	8.3	.239	14.0	11.0	10.2	9.3	.239	36-A
48	13.0	10.3	9.6	8.8	.239	15.0	12.0	11.2	10.3	.239	36-A

Arm Length	ROUND ARMS					POLYGONAL ARMS				
	L_1	D_1	D_2	① thk	Rise	L_1	D_1	② D_2	① thk	Rise
ft.	ft.	in.	in.	in.		ft.	in.	in.	in.	
20	19.1	6.5	3.8	.179	1′-9"	19.1	7.0	3.5	.179	1′-8"
24	23.1	7.5	4.3	.179	1′-10"	23.1	7.5	3.5	.179	1′-9"
28	27.1	8.0	4.2	.179	1′-11"	27.1	8.0	3.5	.179	1′-10"
32	31.0	9.0	4.7	.179	2′-1"	31.0	9.0	3.5	.179	2′-0"
36	35.0	9.5	4.6	.179	2′-4"	35.0	10.0	3.5	.179	2′-1"
40	39.0	9.5	4.1	.239	2′-8"	39.0	9.5	3.5	.239	2′-3"
44	43.0	10.0	4.1	.239	2′-11"	43.0	10.0	3.5	.239	2′-6"
48	47.0	10.5	4.1	.239	3′-4"	47.0	11.0	3.5	.239	2′-9"

D_B = Pole Base O.D.
D_{19} = Pole Top O.D. with no Luminaire and no ILSN
D_{24} = Pole Top O.D. with ILSN w/out Luminaire
D_{30} = Pole Top O.D. with Luminaire
D_1 = Arm Base O.D.
D_2 = Arm End O.D.
L_1 = Shaft Length
L = Nominal Arm Length

① Thickness shown are minimums, thicker materials may be used.

② D_2 may be increased by up to 1" for polygonal arms.



Note: The arm shall be fabricated straight with the unloaded rise measured as shown.

TRAFFIC SIGNAL ARM

(Fixed Mount)

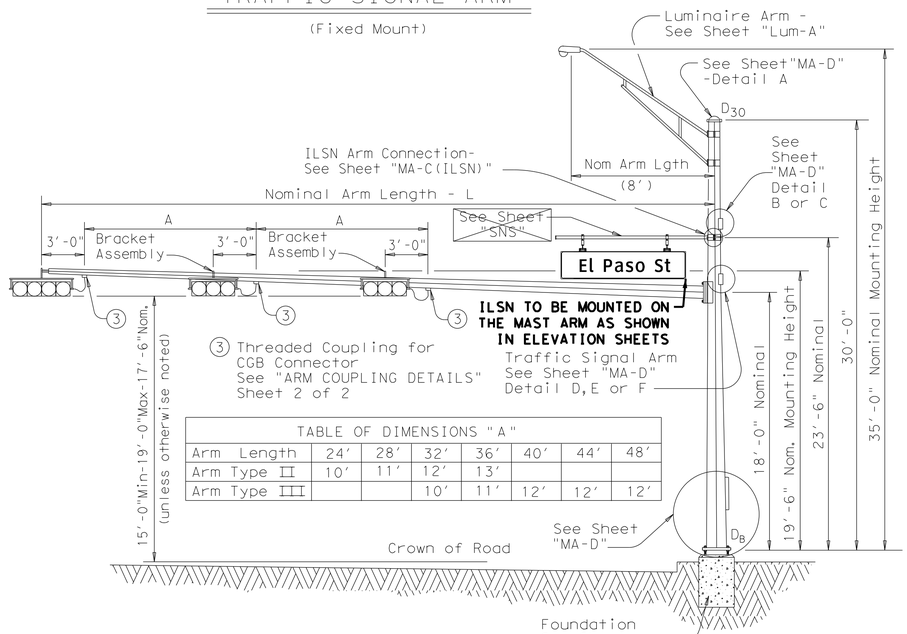


TABLE OF DIMENSIONS "A"							
Arm Length	24′	28′	32′	36′	40′	44′	48′
Arm Type II	10′	11′	12′	13′			
Arm Type III			10′	11′	12′	12′	12′

STRUCTURE ASSEMBLY

SHIPPING PARTS LIST

Ship each pole with the following attached: enlarged hand hole, pole cap, fixed-arm connection bolts and washers and any additional hardware listed in the table.

Nominal Arm Length	30′ Poles With Luminaire		24′ Poles With ILSN		19′ Poles With No Luminaire and No ILSN	
	Above hardware plus: One (or two if ILSN attached) small hand hole, clamp-on simplex		Above hardware plus one small hand hole		See note above	
ft	Designation	Quantity	Designation	Quantity	Designation	Quantity
20	20L-80		20S-80		20-80	
24	24L-80	2	24S-80		24-80	
28	28L-80	3	28S-80		28-80	1
32	32L-80		32S-80		32-80	
36	36L-80		36S-80		36-80	
40	40L-80	3	40S-80		40-80	
44	44L-80	3	44S-80		44-80	
48	48L-80	1	48S-80		48-80	

Traffic Signal Arms (1 per Pole) Ship each arm with the listed equipment attached

Nominal Arm Length	Type I Arm (1 Signal)		Type II Arm (2 Signals)		Type III Arm (3 Signals)	
	1 CGB connector		1 Bracket Assembly and 2 CGB Connectors		2 Bracket Assemblies and 3 CGB Connectors	
ft	Designation	Quantity	Designation	Quantity	Designation	Quantity
20	20I-80					
24	24I-80		24II-80	2		
28	28I-80		28II-80	4		
32			32II-80		32III-80	
36			36II-80		36III-80	
40					40III-80	3
44					44III-80	3
48					48III-80	1

Luminaire Arms (1 per 30′ pole)

Nominal Arm Length	Quantity
8′ Arm	12

ILSN Arm (Max. 2 per pole) Ship with clamps, bolts and washers

Nominal Arm Length	Quantity
7′ Arm	
9′ Arm	

Anchor Bolt Assemblies (1 per pole)

Anchor Bolt Diameter	Anchor Bolt Length	Quantity
¾"	1′-6"	
1 ½"	3′-4"	6
1 ¾"	3′-10"	7

Each anchor bolt assembly consists of the following: Top and Bottom templates, 4 anchor bolts, 8 nuts, 8 flat washers, and 4 nut anchor devices (Type 2) per Standard Drawing "TS-FD".

Templates may be removed for shipment.

Texas Department of Transportation
Traffic Operations Division

TRAFFIC SIGNAL SUPPORT STRUCTURES

SINGLE MAST ARM ASSEMBLY

(80 MPH WIND ZONE)

SMA-80(1)-12

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DN: MS	CK: JSY	DW: MMF	CK: JSY

REVISIONS
5-96
11-99
1-12

CONT	SECT	JOB	HIGHWAY

DIST	COUNTY	SHEET NO.
		426

122A

DATE:
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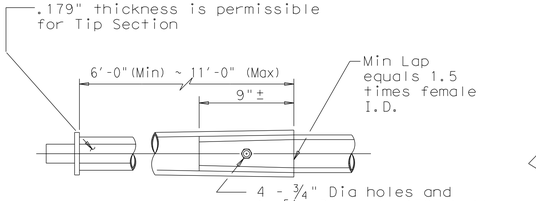
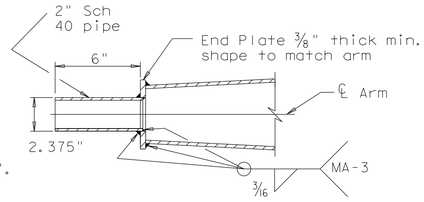


SLIP JOINT DETAIL



TENON DETAIL

VIBRATION WARNING

Mast Arms of SMA and DMA structures and clamp-on Arms of LMA structures of approximately 40 ft or longer are subject to harmonic vertical vibrations in light wind conditions due to the aeroelastic characteristics of a few of the myriads of possible combinations of the following: signal numbers, weights and positions; existence/solidity of backplates; presence of additional attachments to the arm, such as signs and cameras; arm-wind orientation; and arm-pole stiffness.

Such vibrations may cause fatigue damage to the structure and may lead to galloping in moderate wind conditions which may further damage the structure and alarm the public. Tests have indicated that when wind is blowing toward the back side of signal heads having un-vented backplates attached the probability of unacceptable harmonic vibration and/or galloping is rather high.

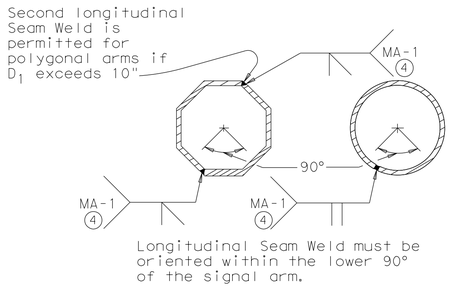
If backplates are not required for improved visibility they should not be applied to the signal heads or, if they must be applied, they should be vented as a first and inexpensive measure to mitigate vibrations.

The traffic signal mast arms shall be visually inspected in 5 to 20 mph wind conditions after installation of signal heads and any attachments, including any required backpates. If vertical movements with a total excursion (maximum upward excursion to maximum downward excursion) of more than approximately 8" are observed at the arm tip, a damping plate shall be fitted to the arm. See "Damping Plate Mounting Details" on standard sheet, MA-DPD-10.

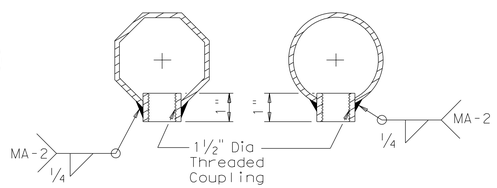
This visual inspection shall be repeated after each modification of the structure that could affect its aeroelastic response. Excessive vibrations shall not be allowed to continue for more than two days.

Stainless steel bands (or Cables) and cast bracket as in "Astro-Brac", "Sky Bracket" or "Easy Bracket" with 1 ½" Dia Threaded Coupling.

BRACKET ASSEMBLY



ARM WELD DETAIL



ARM COUPLING DETAILS

④ 60% Min. penetration 100% pemetration within 6" of circumferential base welds.

GENERAL NOTES:

Design conforms to 1994 AASHTO Standard Specifications for Structural Supports for Highway Signs, Luminaires, and Traffic Signals and Interim Specifications thereto. Design Wind Speed equals 80 mph plus a 1.3 gust factor.

Poles are designed to support one 8'-0" luminaire arm, one 9'-0" internally lighted street name sign and one traffic signal arm with a length as tabulated. The specified luminaire load applied at the end of the luminaire arm equals 60 lbs vertical dead load plus the horizontal wind load on an effective projected area of 1.6 sq ft. The specified internally lighted street name sign load applied 4.5 ft from the centerline of the pole equals 85 lbs vertical dead load plus horizontal wind load on an effective projected area of 11.5 sq ft. The specified signal load applied at the end of the traffic signal arm equals 180 lbs vertical dead load plus the horizontal wind load on an effective projected area of 32.4 sq ft (actual area times drag coefficient).

See Standard Sheet "MA-D" for pole details, "MA-C" for traffic signal arm connection details, "MA-C (ILSN)" for internally lighted street name sign arm connection details, "LUM-A" for luminaire arm and connection details, "SNS" for internally lighted street name sign details, and "TS-FD" for anchor bolt and foundation details. See "MA-C" for material specifications.

Fabrication shall be in accordance with Item 686, "Traffic Signal Pole Assemblies (Steel)" and with the details, dimensions, and weld procedures shown herein. Weld references call for preapproved weld procedures which the Fabricator must obtain prior to fabrication. Materials, fabrication tolerances, and shipping practices shall meet the requirements of this sheet and Item 686, "Traffic Signal Pole Assemblies (Steel)".

Unless otherwise noted, all parts shall be galvanized in accordance with Item 445, "Galvanizing", after fabrication.

Deviation from the details and dimensions shown herein require submission of shop drawings in accordance with Item 441, "Steel Structures". Alternate designs are not acceptable.

Texas Department of Transportation
Traffic Operations Division

TRAFFIC SIGNAL SUPPORT STRUCTURES

SINGLE MAST ARM ASSEMBLY

(80 MPH WIND ZONE)

SMA-80(2)-12

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CONT	SECT	JOB	HIGHWAY

DIST	COUNTY	SHEET NO.
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FOUNDATION DESIGN TABLE

FDN TYPE	DRILLED SHAFT DIA	REINFORCING STEEL		EMBEDDED DRILLED SHAFT LENGTH-ft ④, ⑤, ⑥			ANCHOR BOLT DESIGN ①				FOUNDATION DESIGN LOAD ②		TYPICAL APPLICATION
		VERT BARS	SPIRAL & PITCH	TEXAS CONE PENETROMETER N blows/ft			ANCHOR BOLT DIA	Fy (ksi)	BOLT CIR DIA	ANCHOR TYPE	MOMENT K-ft	SHEAR Kips	
				10	15	40							
24-A	24"	4- #5	#2 at 12"	5.7	5.3	4.5	¾"	36	12 ¾"	1	10	1	Pedestal pole, pedestal mounted controller.
30-A	30"	8- #9	#3 at 6"	11.3	10.3	8.0	1 ½"	55	17"	2	87	3	Mast arm assembly. (see Selection Table)
36-A	36"	10- #9	#3 at 6"	13.2	12.0	9.4	1 ¾"	55	19"	2	131	5	Mast arm assembly. (see Selection Table) 30' strain pole with or without luminaire.
36-B	36"	12- #9	#3 at 6"	15.2	13.6	10.4	2"	55	21"	2	190	7	Mast arm assembly. (see Selection Table) Strain pole taller than 30' & strain pole with mast arm
42-A	42"	14- #9	#3 at 6"	17.4	15.6	11.9	2 ¼"	55	23"	2	271	9	Mast arm assembly. (see Selection Table)

NOTES:

① Anchor bolt design develops the foundation capacity given under Foundation Design Loads.

② Foundation Design Loads are the allowable moments and shears at the base of the structure.

③ Foundations may be listed separately or grouped according to similarity of location and type. Quantities are for the Contractor's information only.

④ Field Penetrometer readings at a depth of approximately 3 to 5 feet may be used to adjust shaft lengths.

⑤ If rock is encountered, the Drilled Shaft shall extend a minimum of two diameters into solid rock.

⑥ Decimal lengths in Design Table are to allow interpolation for other penetrometer values. Round to nearest foot for entry into Summary Table.

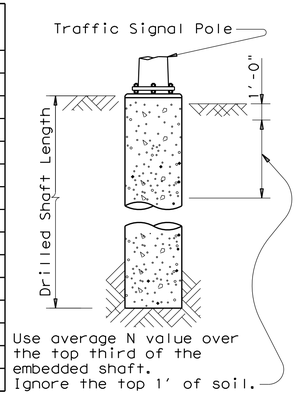
FOUNDATION SUMMARY TABLE ③

LOCATION IDENTIFICATION	AVG. N BLOW /ft.	FDN TYPE	NO. EA	DRILLED SHAFT LENGTH ⑥ (FEET) 24-A	30-A	36-A	36-B	42-A
WOLF RANCH PKWY @ LEGACY XING								
POLES C, J	10	30-A	1		22			
POLES D, E, F	10	24-A	1	18				
POLES K, N, P	10	24-A	1	18				
POLES G, M	10	36-A	1			26		
WOLF RANCH PKWY @ SUNSET VISTA								
POLES C, J	10	30-A	1		22			
POLES D, F, H	10	24-A	1	18				
POLES L, N, P	10	24-A	1	18				
POLES G, M	10	36-A	1			26		
WOLF RANCH PKWY @ RIVERY DWY								
POLE G	10	30-A	1		11			
POLES D, E, F, H	10	24-A	1	24				
POLES L, N, P	10	24-A	1	18				
POLES C, J, M	10	36-A	1			39		
WOLF RANCH PKWY @ RIVERY BLVD								
POLES G	10	30-A	1		11			
POLE J	10	24-A	1	6				
TOTAL DRILLED SHAFT LENGTHS				120*	66	91		

*Item Subsidiery to 687

FOUNDATION SELECTION TABLE FOR STANDARD MAST ARM PLUS ILSN SUPPORT ASSEMBLIES (ft)

		FDN 30-A	FDN 36-A	FDN 36-B	FDN 42-A
80 MPH DESIGN WIND SPEED	MAX SINGLE ARM LENGTH	32'	48'		
	MAXIMUM DOUBLE ARM LENGTH COMBINATIONS	24' X 24'			
		28' X 28'			
		32' X 28'	32' X 32'		
			36' X 36'		
			40' X 36'		
			44' X 28'	44' X 36'	
100 MPH DESIGN WIND SPEED	MAX SINGLE ARM LENGTH		36'	44'	
	MAXIMUM DOUBLE ARM LENGTH COMBINATIONS		24' X 24'		
			28' X 28'		
			32' X 24'	32' X 32'	
				36' X 36'	
				40' x24'	40' X 36'
					44' x 36'



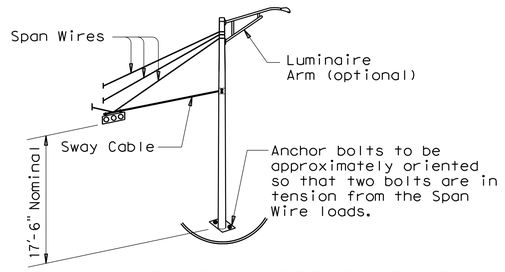
Use average N value over the top third of the embedded shaft. Ignore the top 1' of soil.

ANCHOR BOLT & TEMPLATE SIZES

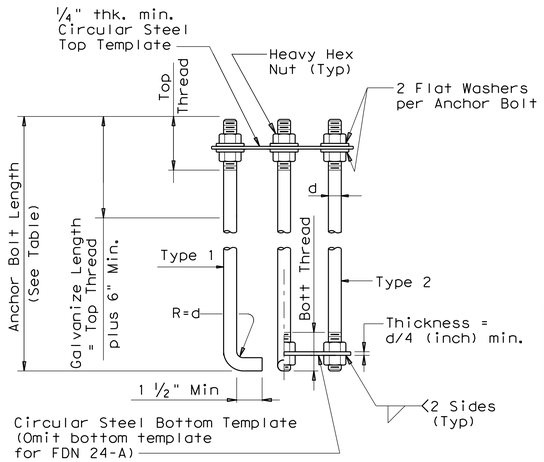
BOLT DIA IN.	⑦ BOLT LENGTH	TOP THREAD	BOTTOM THREAD	BOLT CIRCLE	R2	R1
¾"	1'-6"	3"	—	12 ¾"	7 ⅛"	5 ⅝"
1 ½"	3'-4"	6"	4"	17"	10"	7"
1 ¾"	3'-10"	7"	4 ½"	19"	11 ¼"	7 ¾"
2"	4'-3"	8"	5"	21"	12 ½"	8 ½"
2 ¼"	4'-9"	9"	5 ½"	23"	13 ¾"	9 ¼"

⑦ Min dimensions given, longer bolts are acceptable.

EXAMPLE:
1. For 80mph design wind speed, foundation 30-A can support up to a 32' arm with another arm up to 28'
2. For 100mph design wind speed, foundation 36-A can support a single 36' mast arm.



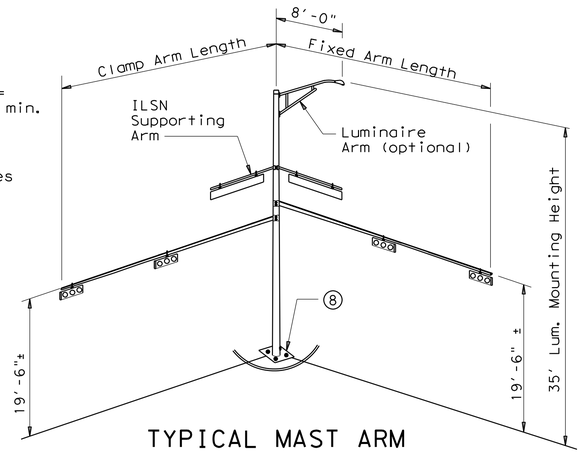
TYPICAL STRAIN POLE ASSEMBLY



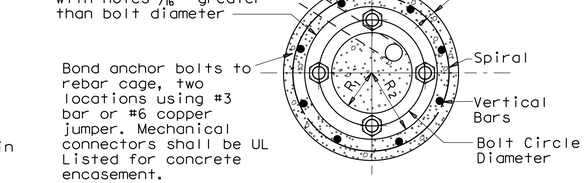
HOOKED ANCHOR (TYPE 1) NUT ANCHOR (TYPE 2)

ANCHOR BOLT ASSEMBLY

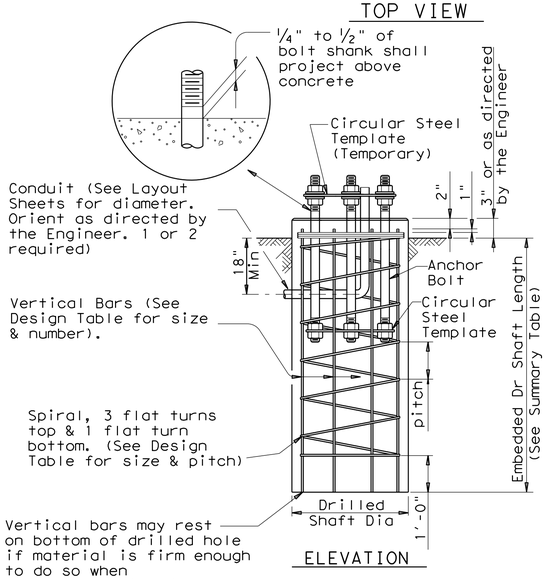
⑧ Orient anchor bolts orthogonal with the fixed arm direction to ensure that two bolts are in tension under dead load.



TYPICAL MAST ARM ASSEMBLY



TOP VIEW



ELEVATION

FOUNDATION DETAILS

GENERAL NOTES:

Design conforms to 1994 AASHTO Standard Specifications for Structural Supports for Highway Signs, Luminaires and Traffic Signals and interim revisions thereto.

Reinforcing steel shall conform to Item 440, "Reinforcing Steel".

Concrete shall be Class "C".

Threads for anchor bolts and nuts shall be rolled or cut threads of 8UN series up to 2" in diameter or UNC series for all sizes. Bolts and nuts shall have Class 2A and 2B fit tolerances. Galvanized nuts shall be tapped after galvanizing.

Anchor bolts that are larger than 1" in diameter shall conform to "alloy steel" or "medium-strength mild steel" per Item 449, "Anchor Bolts". Anchor bolts that are 1" in diameter or less shall conform to ASTM A36. Galvanize a minimum of the top end thread length plus 6" for all anchor bolts unless otherwise noted. Exposed washers and exposed nuts shall be galvanized. All galvanizing shall be in accordance with Item 445, "Galvanizing".

Templates and embedded nuts need not be galvanized. Lubricate and tighten anchor bolts when erecting the structure in accordance with Item 449, "Anchor Bolts".

Texas Department of Transportation
Traffic Operations Division

TRAFFIC SIGNAL POLE FOUNDATION

TS-FD-12

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		428

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FOUNDATION DESIGN TABLE

FDN TYPE	DRILLED SHAFT DIA	REINFORCING STEEL		EMBEDDED DRILLED SHAFT LENGTH-ft ④, ⑤, ⑥			ANCHOR BOLT DESIGN ①				FOUNDATION DESIGN LOAD ②		TYPICAL APPLICATION
		VERT BARS	SPIRAL & PITCH	TEXAS CONE PENETROMETER N blows/ft			ANCHOR BOLT DIA	Fy (ksi)	BOLT CIR DIA	ANCHOR TYPE	MOMENT K-ft	SHEAR Kips	
				10	15	40							
24-A	24"	4- #5	#2 at 12"	5.7	5.3	4.5	¾"	36	12 ¾"	1	10	1	Pedestal pole, pedestal mounted controller.
30-A	30"	8- #9	#3 at 6"	11.3	10.3	8.0	1 ½"	55	17"	2	87	3	Mast arm assembly. (see Selection Table)
36-A	36"	10- #9	#3 at 6"	13.2	12.0	9.4	1 ¾"	55	19"	2	131	5	Mast arm assembly. (see Selection Table) 30' strain pole with or without luminaire.
36-B	36"	12- #9	#3 at 6"	15.2	13.6	10.4	2"	55	21"	2	190	7	Mast arm assembly. (see Selection Table) Strain pole taller than 30' & strain pole with mast arm
42-A	42"	14- #9	#3 at 6"	17.4	15.6	11.9	2 ¼"	55	23"	2	271	9	Mast arm assembly. (see Selection Table)

NOTES:

① Anchor bolt design develops the foundation capacity given under Foundation Design Loads.

② Foundation Design Loads are the allowable moments and shears at the base of the structure.

③ Foundations may be listed separately or grouped according to similarity of location and type. Quantities are for the Contractor's information only.

④ Field Penetrometer readings at a depth of approximately 3 to 5 feet may be used to adjust shaft lengths.

⑤ If rock is encountered, the Drilled Shaft shall extend a minimum of two diameters into solid rock.

⑥ Decimal lengths in Design Table are to allow interpolation for other penetrometer values. Round to nearest foot for entry into Summary Table.

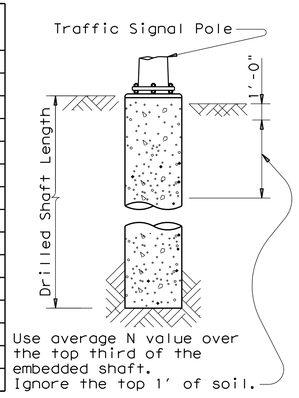
FOUNDATION SUMMARY TABLE ③

LOCATION IDENTIFICATION	AVG. N BLOW /ft.	FDN TYPE	NO. EA	DRILLED SHAFT LENGTH ⑥ (FEET) 24-A	30-A	36-A	36-B	42-A
WOLF RANCH PKWY@ MEMORIAL DR								
POLE A	10	24-A	1	6				
POLE B	10	24-A	1	6				
POLE C	10	24-A	1	6				
POLE D	10	24-A	1	6				
POLE E	10	24-A	1	6				
POLE F	10	24-A	1	6				
POLE G	10	24-A	1	6				
POLE H	10	24-A	1	6				
POLE J	10	SPL	1	6				
POLE K	10	24-A	1	6				
POLE L	10	SPL	1	6				
POLE M	10	24-A	1	6				
TOTAL DRILLED SHAFT LENGTHS				72*				

*SUBSIDIARY TO BID ITEM 6073

FOUNDATION SELECTION TABLE FOR STANDARD MAST ARM PLUS ILSN SUPPORT ASSEMBLIES (ft)

		FDN 30-A	FDN 36-A	FDN 36-B	FDN 42-A
80 MPH DESIGN WIND SPEED	MAX SINGLE ARM LENGTH	32'	48'		
	MAXIMUM DOUBLE ARM LENGTH COMBINATIONS	24' X 24'			
		28' X 28'			
		32' X 28'	32' X 32'		
			36' X 36'		
			40' X 36'		
			44' X 28'	44' X 36'	
100 MPH DESIGN WIND SPEED	MAX SINGLE ARM LENGTH		36'	44'	
	MAXIMUM DOUBLE ARM LENGTH COMBINATIONS		24' X 24'		
			28' X 28'		
			32' X 24'	32' X 32'	
				36' X 36'	
				40' x24'	40' X 36'
					44' x 36'



ANCHOR BOLT & TEMPLATE SIZES

BOLT DIA IN.	⑦ BOLT LENGTH	TOP THREAD	BOTTOM THREAD	BOLT CIRCLE	R2	R1
¾"	1'-6"	3"	—	12 ¾"	7 ⅛"	5 ⅝"
1 ½"	3'-4"	6"	4"	17"	10"	7"
1 ¾"	3'-10"	7"	4 ½"	19"	11 ¼"	7 ¾"
2"	4'-3"	8"	5"	21"	12 ½"	8 ½"
2 ¼"	4'-9"	9"	5 ½"	23"	13 ¾"	9 ¼"

⑦ Min dimensions given, longer bolts are acceptable.

EXAMPLE:
1. For 80mph design wind speed, foundation 30-A can support up to a 32' arm with another arm up to 28'
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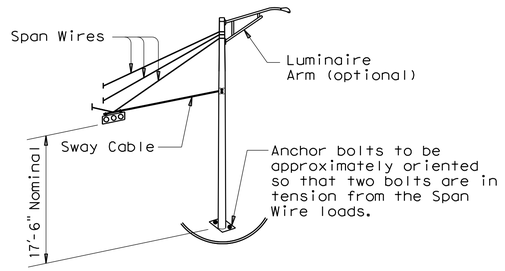
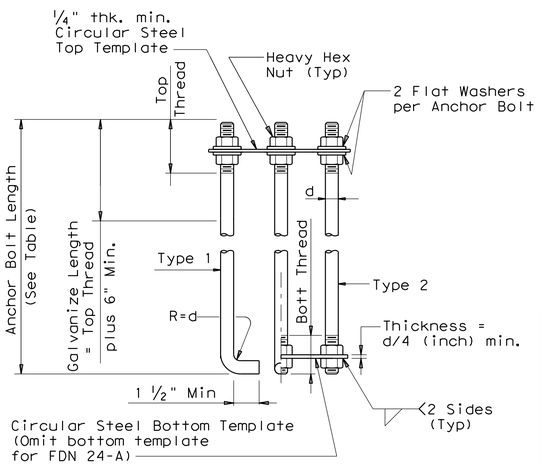


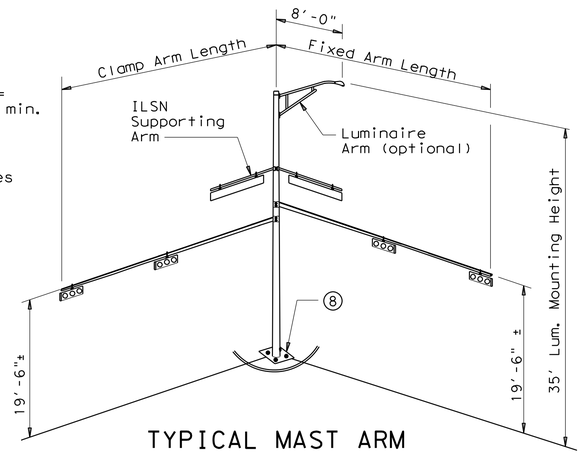
TYPICAL STRAIN POLE ASSEMBLY



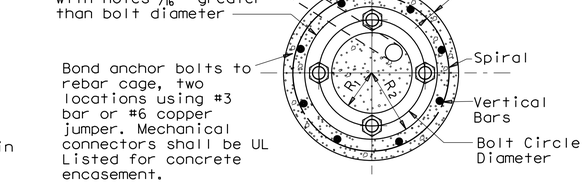
HOOKED ANCHOR (TYPE 1) NUT ANCHOR (TYPE 2)

ANCHOR BOLT ASSEMBLY

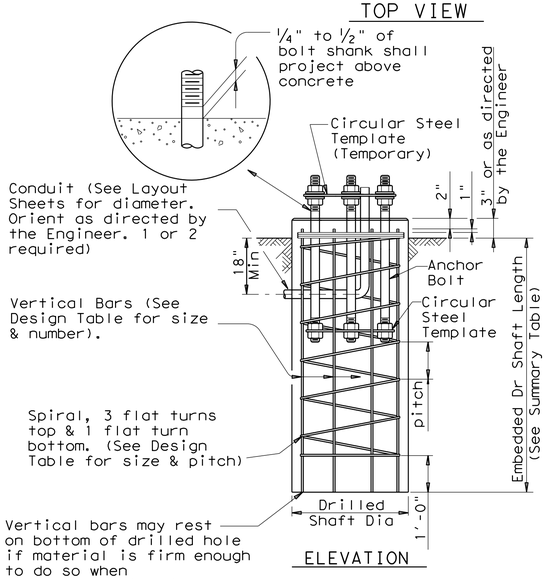
⑧ Orient anchor bolts orthogonal with the fixed arm direction to ensure that two bolts are in tension under dead load.



TYPICAL MAST ARM ASSEMBLY



TOP VIEW



ELEVATION

FOUNDATION DETAILS

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Templates and embedded nuts need not be galvanized. Lubricate and tighten anchor bolts when erecting the structure in accordance with Item 449, "Anchor Bolts".

Texas Department of Transportation
Traffic Operations Division

TRAFFIC SIGNAL POLE FOUNDATION

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CONT	SECT	JOB	HIGHWAY

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NOTES FOR WIRELESS ETHERNET ANTENNAS

1. MOUNT ANTENNAS TO PROVIDE THE HIGHEST LEVEL OF RELIABILITY BETWEEN SENDING AND RECEIVING UNITS.

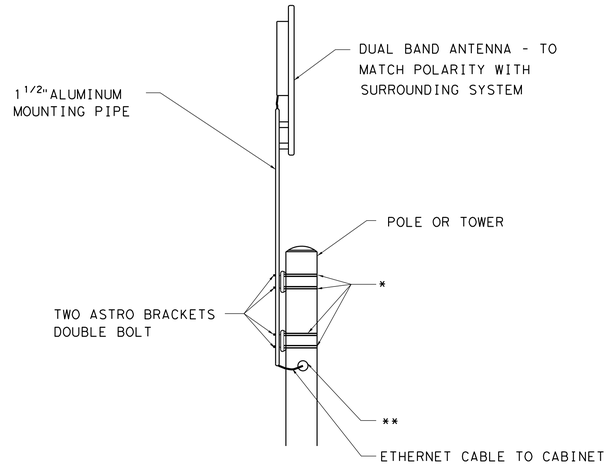
2. INSTALL ANTENNAS AS DETAILED OR AS DIRECTED BY THE ENGINEER.

3. INSTALL PROVIDED MOUNTING BRACKETS FOR ANTENNAS ATTACHED TO VERTICAL PIPE AS DIRECTED.

4. USE 3/4" STAINLESS STEEL BANDING MATERIAL TO INSTALL ANTENNA ASTRO BRACKETS, OR AS DIRECTED.

5. PROVIDE WATER TIGHT CABLE ENTRY AND EXIT POINTS IN THE SIGNAL POLES OR REPEATER POLES.

6. INSTALLATION OF ALL MOUNTING BRACKETS, RISER POLES, CABLES, AND ASSOCIATED MOUNTING MATERIALS ARE SUBSIDIARY TO ITEM 680.



POLE MOUNTED ANTENNA

NOT TO SCALE

*	3/4 " (MIN) STAINLESS STEEL BANDING 4 PLACES MIN.
**	ENTRY INTO STEEL POLE THROUGH GROMMET OR CGB (COMPRESSION FITTING)

Texas Department of Transportation

Austin District Standard

Austin District Traffic

ANTENNA MOUNTING DETAIL

AMD-14 (AUS)

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GENERAL NOTES FOR ALL ELECTRICAL WORK

1. The location of all conduits, junction boxes, ground boxes, and electrical services is diagrammatic and may be shifted to accommodate field conditions.

2. Provide new, unused, and undamaged materials. Ensure that all materials and installations comply with the National Electrical Code (NEC), TxDOT standards and specifications, National Electrical Manufacturers Association (NEMA), and are listed by Underwriters Laboratories (UL) or a Nationally Recognized Testing Lab (NRTL). NRTLs such as CSA Group, Intertek Testing Services, or FM Approvals can be considered equivalent to UL. Where reference is made to NEMA listed devices, International Electrotechnical Commission (IEC) listed devices will not be considered an acceptable equal to NEMA. Faulty fabrication or poor workmanship in any material, equipment, or installation is justification for rejection. Replace or reinstall rejected material or equipment at no additional cost to the Department.

3. Miscellaneous nuts, bolts, and hardware, except for high strength bolts, may be stainless steel when plans specify galvanized, provided the bolt size is 1/2 in. or less in diameter.

4. Provide the following test equipment as required by the Engineer to confirm compliance with the contract and the NEC: voltmeter, ammeter, megohm meter (1000 volt DC), ground resistance tester, torque wrenches, and torque screwdrivers. Ensure all equipment has been properly calibrated within the last year. Provide calibration certification to the Engineer upon request. Operate test equipment during inspection as requested by the Engineer.

5. Install grounding as shown on the plans and in accordance with the NEC. Ensure all metallic conduits, metal poles, luminaires, and metal enclosures are bonded to an equipment grounding conductor. Provide stranded bare copper or green insulated grounding conductors. Ground rods, connectors, and bonding jumpers are subsidiary to the various bid items.

6. When required by the Engineer, notify the Department in writing of materials from the Material Producer List (MPL) intended for use on each project. Prequalified materials are listed on the MPL on TxDOT's website under "Roadway Illumination and Electrical Supplies." No substitutions will be allowed for materials on this list.

CONDUIT

A. MATERIALS

1. Provide conduit, junction boxes, fittings, and hardware per TxDOT Departmental Material Specification DMS-11030, "Conduit" and Item 618, "Conduit" of TxDOT's "Standard Specifications for Construction and Maintenance of Highways, Streets, And Bridges," latest edition. Provide conduits listed under Item 618 on the MPL under "Roadway Illumination and Electrical Supplies." Provide conduit types according to the descriptive code or as shown on the plans. Do not substitute other types of conduits for those shown. Provide Liquidtight Flexible Metal Conduit (LFMC) when flexible conduit is called for on galvanized steel Rigid Metal Conduit (RMC) systems. Provide Liquidtight Flexible Nonmetallic Conduit (LFNC) when flexible conduit is called for on Polyvinyl Chloride (PVC) systems.

2. Provide galvanized steel RMC for all exposed conduits, unless otherwise shown on the plans. Properly bond all metal conduits.

3. Unless otherwise shown on the plans, provide junction boxes with a minimum size as shown in the following table, which applies to the greatest number of conductors entering the box through one conduit with no more than four conduits per box. When a mixture of conductor sizes are present, count the conductors as if all are of the larger size. For situations not applicable to this table, size junction boxes per the NEC.

JUNCTION BOX SIZES

AWG	3 CONDUCTORS	5 CONDUCTORS	7 CONDUCTORS
#1	10" x 10" x 4"	12" x 12" x 4"	16" x 16" x 4"
#2	8" x 8" x 4"	10" x 10" x 4"	12" x 12" x 4"
#4	8" x 8" x 4"	10" x 10" x 4"	10" x 10" x 4"
#6	8" x 8" x 4"	8" x 8" x 4"	10" x 10" x 4"
#8	8" x 8" x 4"	8" x 8" x 4"	8" x 8" x 4"

4. Junction boxes with internal volumes up to 100 cu. in. and that are supported by entering raceways must have threaded entries or hubs identified for the intended purpose and be supported by connection of two or more rigid metal conduits. Secure conduit within 3 ft. of the box or within 18 in. of the box if all conduit entries are on the same side. Mechanically secure all junction boxes with an internal volume greater than 100 cu. in.

5. Provide hot dipped galvanized cast iron or sand cast aluminum outlet boxes for junction boxes containing only 10 AWG or 12 AWG conductors. Do not use die cast aluminum boxes. Size outlet boxes according to the NEC.

6. Do not use Intermediate Metal Conduit (IMC) or Electrical Metallic Tubing (EMT) unless specifically required by the plan sheets. When EMT is called for, provide junction boxes sized as directed above, listed and approved for outdoor use, unless otherwise noted on the plans. Provide junction boxes for IMC conduit systems that meet the same requirements for junction boxes used with RMC systems.

7. Provide PVC junction boxes intended for outdoor use on PVC conduit systems, unless otherwise noted on the plans.

8. Provide PVC elbows, unless otherwise shown in the plans. Use only a flat, high tensile strength polyester fiber pull tape for pulling conductors through the PVC conduit system.

A. MATERIALS (CONTINUED)

9. When galvanized steel RMC elbows are specifically called for in the plans and any portion of the RMC elbow is buried less than 18 in. below grade or bottom of the ground box, ground the RMC elbow with a grounding bushing on a rigid metal extension. Grounding of the rigid metal elbow is not required if the entire RMC elbow is encased in a minimum of 2 in. of concrete. PVC extensions are allowed on these concrete encased rigid metal elbows. Elbows are subsidiary to various bid items.

10. When required, provide High-Density Polyethylene (HDPE) conduit with factory installed internal conductors according to DMS-11060, "Duct Cable." At the Contractor's request and with approval by the Engineer, substitute HDPE conduit with no conductors according to DMS-11030 for PVC conduit bid under Item 618. Provide conduit of the size and schedule as shown on the plans. Do not extend HDPE conduit into ground boxes or foundations. Provide PVC elbows at all ground boxes and foundations.

11. Use two-hole straps or strut straps when supporting 2 in. and larger conduits. On electrical service poles, properly sized stainless steel or hot dipped galvanized strut straps or stand-off straps are allowed on the service riser conduit.

B. CONSTRUCTION METHODS

1. Provide and install expansion joint conduit fittings on all structure-mounted conduits at the structure's expansion joints to allow for movement of the conduit. In addition, provide and install expansion joint fittings on all continuous runs of galvanized steel RMC conduit externally exposed on structures such as bridges at maximum intervals of 150 ft. When requested by the project Engineer, supply manufacturer's specification sheet for expansion joint conduit fittings. Repair or replace expansion joint fittings that do not allow for movement at no additional cost to the Department. Provide the method of determining the amount of expansion to the Engineer upon request. Do not use LFMC or LFNC as a substitute for the required expansion conduit fittings.

2. Space all conduit supports at maximum intervals of 5 ft. Install conduit spacers when attaching metal conduit to surfaces of concrete structures. See "Conduit Mounting Options" on ED(2). Install conduit supports within 3 ft. of all enclosures and conduit terminations.

3. Do not attach conduit supports directly to pre-stressed concrete beams, except as shown specifically in the plans or as approved by the Engineer.

4. Unless otherwise shown on the plans, jack or bore conduit placed beneath existing roadways, driveways, sidewalks, or after the base or surfacing operation has begun. Backfill and compact the bore pits below the conduit per Item 476 "Jacking, Boring, or Tunneling Pipe or Box" prior to installing conduit or duct cable to prevent bending of the connections.

5. When placing conduit in the subgrade of new roadways, backfill all trenches with excavated material unless otherwise noted on the plans. When placing conduit in the subbase of new roadways, backfill all trenches with cement-stabilized base as per requirements of Items: 110, "Excavation;" 400, "Excavation and Backfill for Structures;" 401, "Flowable Backfill;" 402, "Trench Excavation Protection;" and 403, "Temporary Special Shoring."

6. During construction, temporarily cap or plug open ends of all conduit and raceways immediately after installation to prevent entry of dirt, debris and animals. Temporary caps constructed of durable duct tape are allowed. Tightly affix the tape to the conduit opening. Clean out the conduit and prove it clear in accordance with Item 618 prior to installing any conductors.

7. Ensure conduit entry into the top of an enclosure is waterproof by installing conduit sealing hubs or using boxes with threaded bosses. This includes surface mounted safety switches, meter cans, service enclosures, auxiliary enclosures and junction boxes. Grounding bushings on water tight sealing hubs are not required.

8. Fit the ends of all PVC conduit terminations with bushings or bell end fittings. Provide and install a grounding bushing on all metal conduit terminations.

9. Install a bonding jumper from each grounding bushing to the nearest ground rod, grounding lug, or equipment grounding conductor. Ensure all bonding jumpers are the same size as the equipment grounding conductor. Bonding of conduit used as a casing under roadways for duct cable is not required, if the duct extends the full length through the casing.

10. Place conduits entering ground boxes so that the conduit openings are between 3 in. and 6 in. from the bottom of the box. See the ground box detail on sheet ED(4).

11. After completion of conductor installation, immediately seal ends of all conduits emerging from ground with duct seal, expandable foam, or other methods approved by the Engineer. Do not use silicone caulking. Do not use duct tape as a permanent seal.

12. File smooth the cut ends of all mounting strut and conduit. To avoid overspray, paint the field cut ends of all mounting strut and RMC (threaded or non-threaded) with zinc rich paint (94% min. zinc content as specified on DMS-8103 and listed on the MPL for Galvanizing Repair Paints) before installing. Use zinc rich paint to touch up galvanized material as allowed under Item 445 "Galvanizing." Do not paint non-galvanized material with zinc rich paint as an alternative for materials required to be galvanized.

13. For all conduits, ensure the burial depth is 18" min. For conduits placed under a roadway, ensure the burial depth is 24" min.

Texas Department of Transportation

Traffic Safety Division Standard

ELECTRICAL DETAILS CONDUITS & NOTES

ED(1)-25

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ELECTRICAL CONDUCTORS

A. MATERIAL INFORMATION

1. Provide Type XHHW insulated copper conductors in accordance with Departmental Material Specification DMS-11040, "Conductors" and Item 620, "Electrical Conductors." Provide conductors as listed on the Material Producer List (MPL) on the Department web site under "Roadway Illumination and Electrical Supplies" Item 620.

2. Identify grounded (neutral) conductors with white insulation. Identify grounding conductors (ground wires) with green insulation or bare conductors. Identify ungrounded (hot) conductors with any color insulation except green, white, or gray. Keep color scheme consistent throughout the wiring system. Identify conductors 6 American Wire Gauge (AWG) and smaller by continuous color jacket. Identify electrical conductors 4 AWG and larger by continuous color jacket or by colored tape. When identifying conductors with colored tape, mark at least 6 in. of the conductor's insulation with half laps of tape at each accessible location.

3. Insulated grounding conductors may be substituted for bare conductors, unless otherwise shown in the plans. Insulated grounding conductors must be color coded green in accordance with Note 2.

4. Provide a 6 AWG bare solid copper grounding electrode conductor to bond the electrical service equipment to the concrete encased grounding electrode or the ground rod at the service location. Connect the grounding electrode conductor to the ground rod with a UL listed connector in accordance with DMS-11040. Connect the grounding electrode conductor to the concrete encased grounding electrode as shown in the plans.

5. Where two or more circuits are present in one conduit or enclosure, permanently label the conductors of each branch circuit by attaching a non-metallic, weather resistant tag around both circuit conductors at each accessible location. Provide one-piece tags with two $\frac{3}{16}$" straps, large enough to indicate circuit number, letter, or other identification as shown in the plans. Print circuit identification on the tag with a permanent marker.

6. Use listed compression connectors, mechanical lugs, terminal blocks, or split bolt connectors for splicing as specified in DMS-11040. Use hot melt adhesive tape to fill the gap and seal the ends of heat shrink tubing. Provide UL listed gel-filled insulating splice covers. Splicing materials, insulating materials, breakaway disconnects, splice covers, and fuse holders are subsidiary to various bid items.

B. CONSTRUCTION METHODS

1. Use only a flat, high tensile strength polyester fiber pull tape for pulling conductors through the conduit system.

2. Leave 2 ft. to 3 ft. of length for each conductor up to the splice in ground boxes. Leave 3 ft. to 4 ft. of length for each conductor in ground boxes when pulled through with no splice. Leave 1 ft. to 1.5 ft. of length for each conductor at enclosures and pole bases. Leave 1.5 ft. to 3 ft. of length as required by electric utility for conductors exiting weatherheads.

3. Make splices only in junction boxes, ground boxes, pole bases, or electrical enclosures and use only listed compression connectors, mechanical lugs, terminal blocks, or split bolt connectors. Insulate splices with heavy wall heat shrink tubing or gel-filled insulating splice covers to provide a watertight splice. Overlap conductor insulation with heat shrink tubing a minimum of 2 in. past both sides of the splice. Where heat shrink tubing may not shrink sufficiently to provide a watertight seal around the individual conductors, prior to heating the tubing, increase the diameter of the conductor insulation using hot melt adhesive tape to provide a watertight seal between each conductor and the heat shrink tubing. Ensure the tape extends past the heat shrink tubing. Use hot melt adhesive tape to fill the gap and seal the ends of heat shrink tubing. Heat shrink tubing that appears to have been burned or overheated is considered defective and must be replaced.

4. Size and install gel-filled insulating splice covers according to manufacturer's specifications when used in place of heat shrink tubing.

5. Wire nuts with factory applied waterproof sealant may be used for 8 AWG or smaller conductors in above ground junction boxes, but not in pole bases or ground boxes. Install wire nuts in an upright position to prevent the accumulation of water.

6. Support conductors in illumination poles with a J-hook at the top of the pole.

7. When terminating conductors, remove the insulation and jacketing material without nicking the individual strands of the conductor. Conductors with nicked individual conductor strands or removed strands will be considered damaged.

8. Replace conductors and cables that are damaged or that fail an insulation resistance test at no additional cost to the Department.

9. Do not repair damaged conductors with duct tape, electrical tape, or wire nuts. Use only approved splicing methods.

B. CONSTRUCTION METHODS (CONTINUED)

10. Do not terminate more than one conductor under a single lug unless it is rated for multiple conductors. Do not exceed the lug's listing for maximum number and size of conductors allowed.

11. Follow manufacturer's instructions when terminating conductors to breakaway connectors. Properly torque threaded connections. Proper terminations are critical to the safe operation of breakaway devices. Trim waterproofing boots on breakaway connectors to fit snugly around the conductor to ensure a waterproof connection. Only one conductor may enter a single opening in a boot. Provide waterproof boots with the correct number of openings. Leave unused openings factory sealed. Use prequalified breakaway connectors as shown on the MPL.

12. Provide and install a separate stranded equipment grounding conductor (EGC) in all conduits that contain circuit wiring of 50 volts or more. Unless shown elsewhere, size the EGC to be the same size as the largest current carrying conductor in the conduit. Bond all EGCs together at every accessible location. For ITS installations, bond and ground metal ground box covers and other metal equipment as shown on ITS standards.

C. TEMPORARY WIRING

1. Install temporary conductors and electrical equipment in accordance with the NEC article "Temporary Installations" and Department standard sheets.

2. Provide a ground fault circuit interrupter (GFCI) for powering portable electrical equipment, power tools, ice machines, ice storage bins and refrigerators located outdoors at grade. GFCI may be any one of the following: molded cord and plug set, receptacle, or circuit breaker type.

3. Use listed wire nuts with factory applied sealant for temporary wiring where approved.

4. Enclose conductor splices within a listed enclosure or ground box, or ensure the splices are more than 10 ft. above grade vertically and more than 5 ft. horizontally from any metal structure. When installing temporary conductors in areas subject to vehicle traffic or mobile construction equipment, ensure the vertical clearance to ground is at least 18 ft. when measured at the lowest point. Ground messenger wires that support power conductors in conformance with the NEC.

5. Protect and when necessary repair any existing electrical conduits uncovered during the construction process in a timely manner and in conformance with the NEC.

GROUND RODS & GROUNDING ELECTRODES

A. MATERIAL INFORMATION

1. Provide and install a grounding electrode at electrical services. Provide ground rods according to DMS-11040 and the plans. Larger diameter or longer length rods may be called for in some locations. Concrete encased grounding electrodes may be called for in some locations including electrical services — see plan sheets.

B. CONSTRUCTION METHODS

1. Furnish and install ground rods in soil, concrete, or both, as called for in the plans. For ground rods installed in concrete, ensure the connection of the conductor to the ground rod is readily accessible for inspection or repairs. For ground rods installed in soil, ensure that the upper end is between 2 to 4 in. below finished grade.

2. Do not place ground rods in the same drilled hole as a timber or concrete pole.

3. Install ground rods so the imprinted part number is at the upper end of the rod.

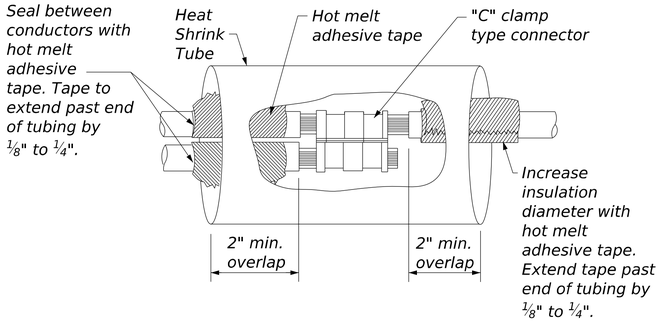
4. Remove all non-conductive material such as concrete splatter from the rod at the clamp location.

5. Route all conductors as short and straight as possible for connection to lightning protection ground rods. When a bend is required, ensure a minimum radius bend of 4 in.

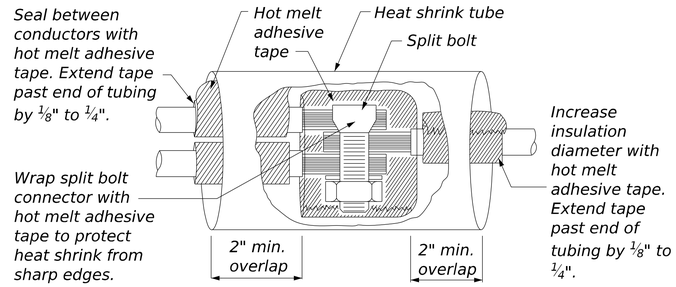
6. Unless otherwise called for in the plans, protect grounding electrode conductors with non-metallic conduit. When protecting grounding electrode conductors with metal conduit, provide and install a grounding bushing and properly sized bonding jumper on each end of the metal conduit.

7. Written authorization is required before installing a ground rod in a horizontal trench for rocky soil or a solid rock bottom.

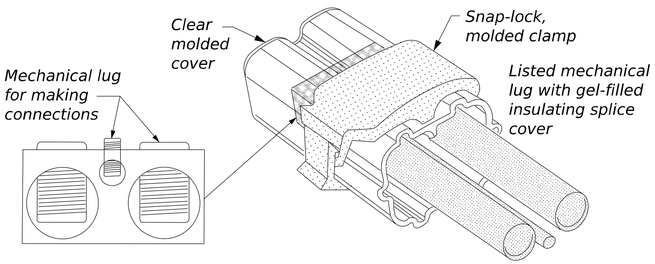
COMPRESSION SPLICE
OPTION 1



SPLIT BOLT SPLICE
OPTION 2



GEL-FILLED INSULATED SPLICE
OPTION 3



Texas Department of Transportation

Traffic Safety Division Standard

ELECTRICAL DETAILS CONDUCTORS

ED(3)-25

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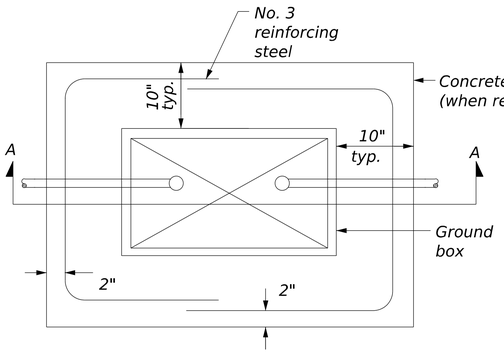
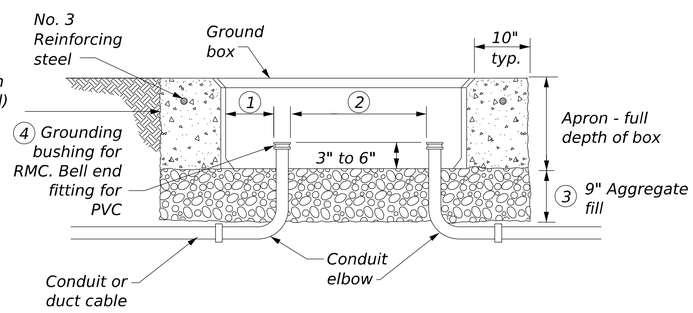
APRON FOR GROUND BOX

PLAN VIEW



SECTION A - A



SECTION A - A NOTES:

1. *Uniformly space ends of conduits within the ground box. Position ends of conduits so that ground box walls do not interfere with the installation of grounding bushings or bell end fittings.*
2. *Maintain sufficient space between conduits to allow for proper installation of bushing.*
3. *Place aggregate under the box, not in the box. Aggregate should not encroach on the interior volume of the box.*
4. *Install a grounding bushing on the upper end of all RMC terminating in a ground box. Ground RMC elbows when any part of the elbow is less than 18 in. below the bottom of the ground box. Install a PVC bushing or bell end fitting on the upper end of all PVC conduits terminating in a ground box.*

GROUND BOXES	
TYPE	OUTSIDE DIMENSIONS (Width x Length X Depth)
A	12" X 23" X 11"
B	12" X 23" X 22"
C	16" X 29" X 11"
D	16" X 29" X 22"
E	12" X 23" X 17"

NOTES:

A. MATERIALS

1. *Provide polymer concrete ground boxes measuring 16 in. x 30 in. x 24 in. (W x L x D) or smaller in accordance with Departmental Material Specification DMS-11070, "Ground Boxes" and Item 624, "Ground Boxes."*
2. *Provide Type A, B, C, D, and E ground boxes as shown in the plans and as listed on the Material Producers List (MPL) on the Department web site under "Roadway Illumination and Electrical Supplies," Item 624.*
3. *Ensure ground box cover is correctly labeled in accordance with DMS-11070.*
4. *Provide larger ground boxes in accordance with Item 624 and as shown in the plans.*

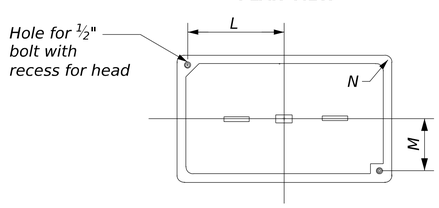
B. CONSTRUCTION METHODS

1. *Before setting ground box and after placing and capping conduits, lay an aggregate bed a minimum of 9 in. deep that extends 10 in. beyond the sides of the ground box. Provide coarse aggregate sized 3/4 in. to 2 in., with no more than 20% material passing through a no. 8 sieve, and as defined by the current ASTM C33/33M standard. Clean aggregate and dirt from conduits according to Item 618.*
2. *Cast ground box aprons in place. Reinforcing steel may be field bent. Ensure the depth of concrete for the apron extends from finished grade to the top of the aggregate bed under the box. Ground box aprons, including concrete and reinforcing steel, are subsidiary to ground boxes when called for by descriptive code.*
3. *Keep bolt holes in the box clear of dirt. Bolt covers down when not working in ground boxes.*
4. *Install all conduits and elbows in a professional and skillful manner. Uniformly space conduits so grounding bushings and bell end fittings can easily be installed.*
5. *Temporarily seal all conduits in the ground box until conductors are installed.*
6. *Permanently seal conduits immediately after the completion of conductor installation. Permanently seal the ends of all conduits with duct seal, expandable foam, or other method as approved. Do not use duct tape as a permanent conduit seal. Do not use silicone caulk as a sealant.*
7. *Bond all equipment grounding conductors in a ground box together with listed connectors.*
8. *When a Type B or D ground box is stacked to meet volume requirements, an appropriately sized hole may be cut for conduit entry in the side wall at least 18 in. below grade.*
9. *If an existing ground box in the contract has a metal cover, bond the cover to the equipment grounding conductor with a 3 ft. long stranded bonding jumper that is the same size as the grounding conductor. The bonding jumper is subsidiary to various bid items. Verify existing ground boxes with metal covers are shown on the plans, with notes fully describing the work required.*
10. *If other ground boxes with metal covers are within the project limits but are not part of the contract, the Engineer may direct the Contractor to bond the metal covers, identifying the specific boxes in writing. This work will be paid for separately.*
11. *Bond metal ground box covers to the grounding conductor with a tank ground type lug.*

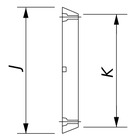
GROUND BOX COVERS								
TYPE	DIMENSIONS							
	H	I	J	K	L	M	N	P
A, B & E	23 1/4"	23"	13 3/4"	13 1/2"	9 7/8"	5 1/8"	1 3/8"	2"
C & D	30 1/2"	30 1/4"	17 1/2"	17 1/4"	13 1/4"	6 3/4"	1 3/8"	2"

GROUND BOX COVER

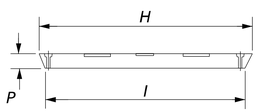
PLAN VIEW



END



SIDE



Texas Department of Transportation

Traffic Safety Division Standard

ELECTRICAL DETAILS GROUND BOXES

ED(4)-25

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ELECTRICAL SERVICES NOTES

1. Provide electrical services in accordance with Electrical Details standard sheets, Departmental Material Specification (DMS)-11080, "Electrical Services" and Item 628, "Electrical Services." Provide electrical service types A, C, and D, as listed on the Material Producers List (MPL) on the Department web site under "Roadway Illumination and Electrical Supplies," Item 628. Provide other service types as detailed on the plans.

2. Coordinate with the Engineer and the utility provider for metering and compliance with utility requirements. Primary line extensions, connection charges, meter charges, and other charges by the utility company to provide power to the location are paid for in accordance with Item 628. Get approval for the costs associated with these charges prior to engaging the utility company to do the work. Consult with the utility provider to determine costs and requirements, and coordinate the work as approved.

3. Provide a Master Lock, Model No. 2, M1, or 6121, keyed to code 2195. Master Lock 2195 keys and locks become property of the Department. Unless otherwise approved, do not energize electrical service equipment until locks are installed.

4. Enclosures with external disconnects that de-energize all equipment inside the enclosure do not need a dead front trim. Protect incoming line terminations from incidental contact as required by the NEC.

5. When galvanized is specified for nuts, screws, bolts or miscellaneous hardware, stainless steel may be used.

6. Provide wiring and electrical components rated for 75°C. Provide red, black, and white colored XHHW service entrance conductors of minimum size 6 American Wire Gauge (AWG). Identify conductors per ED(3). Ensure each service entrance conductor exits through a separately bushed non-metallic opening in the weatherhead. The lengths of the conductors outside the weatherhead are to be 1.5 ft. to 3 ft. as required by electric utility.

7. Provide rigid metal conduit (RMC) for all conduits on service, except for the ½ in. PVC conduit containing the electrical service grounding electrode conductor. Size the service entrance conduit as shown in the plans. Ensure conduit for branch circuit entry to enclosure is the same size as shown on the layout sheets for branch circuit conduit. Extend all rigid metal conduits a minimum of 6 in. underground and then couple to the type and schedule of the conduit shown on the plans. Install a grounding bushing on the RMC where it terminates in the service enclosure.

8. Use of liquidtight flexible metal conduit (LFMC) is allowed between the meter and service enclosure when they are mounted 90 to 180 degrees from each other. Size this LFMC the same size as the service entrance conduit. LFMC must not exceed 3 ft. in length. Strap LFMC within 1 ft. of each end. Terminate each end of the LFMC with a grounding bushing or fitting. The LFMC must contain a grounded (neutral) conductor. Ensure bends in LFMC do not exceed 180 degrees. A pull test is required on all installed conductors, with at least 6 in. of free conductor movement demonstrated to the satisfaction of the Engineer.

9. Ensure all mounting hardware and installation details of services conform to utility company specifications.

10. Provide the following documents in the electrical service document pocket: schematic drawing unique to the service from the UL 508 shop; plan sheet showing Electrical Service Data Chart for the service; plan sheets for the circuits powered by the service; and red lined plan sheets if installation differs from the original design. Reduce larger sheets to 8 ½ in. x 11 in. and laminate all documents.

11. When providing an "Off The Shelf" Type D or Type T service, provide laminated plan sheets detailing equipment and branch circuits supplied by that service. Reduce 11 in. x 17 in. plan sheets to 8 ½ in. x 11 in. before laminating. When the enclosure has no door pocket, deliver these drawings to the Engineer before completion of the work.

12. Do not install conduit in the back wall of a service enclosure where it would penetrate the equipment mounting panel inside the enclosure. Provide grounding bushings on all metal conduits, and terminate bonding jumpers to grounding bus. Grounding bushings are not required when the end of the metal conduit is fitted with a watertight conduit hub or meter hub.

MAIN DISCONNECT & BRANCH CIRCUIT BREAKERS

1. Field drill flange-mounted remote operator handle, if needed, to ensure handle is lockable in both the "On" and "Off" positions.

2. When the utility company provides a transformer larger than 50 KVA, verify that the available fault current is less than the circuit breaker's ampere interrupting capacity (AIC) rating and provide documentation from the electric utility provider to the Engineer.

PHOTOELECTRIC CONTROL

1. Provide photocell as listed on the MPL. Move, adjust, or shield the photocell from stray or ambient night time light to ensure proper operation. Mount photocell facing north when practical. Mount top of pole photocells as shown on Top Mounted Photocell Detail.

ELECTRICAL SERVICE DATA (EXAMPLE) ∗

ELEC. SERVICE ID	PLAN SHEET NUMBER	ELECTRICAL SERVICE DESCRIPTION	SERVICE CONDUIT SIZE ∗∗	SERVICE CONDUCTORS NO./SIZE	SAFETY SWITCH AMPS	MAIN CKT. BKR. POLE/AMPS	LIGHTING CONTACTOR AMPS	PANELBOARD/ LOADCENTER AMP RATING	BRANCH CIRCUIT ID	BRANCH CKT. BKR. POLE/AMPS	BRANCH CIRCUIT AMPS	KVA LOAD
SB 183	289	ELC SRV TY A 240/480 100(SS)AL(E)SF(U)	2"	3/#2	100	2P/100	2P/100	N/A	Lighting NB	2P/40	26	28.1
									Lighting SB	2P/40	25	
									Underpass	1P/20	15	
NB Access	30	ELC SRV TY D 120/240 060(NS)SS(E)TS(O)	1 ¼"	3/#6	N/A	2P/60	2P/30	100	Sig. Controller	1P/30	23	5.3
									Luminaires	2P/20	9	
									CCTV	1P/20	3	
2nd & Main	58	ELC SRV TY T 120/240 000(NS)GS(N)SP(O)	1 ¼"	3/#6	N/A	N/A	N/A	70	Flashing Beacon 1	1P/20	4	1.0
									Flashing Beacon 2	1P/20	4	

∗ Example only, not for construction. All new electrical services must have electrical service data chart specific to that service as shown in the plans.

∗∗ Verify service conduit size with utility. Size may change due to utility meter requirements. Ensure conduit size meets the National Electrical Code.

ELECTRICAL SERVICE BID ITEM DESCRIPTIONS

ELEC SERV TY X XXX/XXX XXX(XX)XX(X)XX(X)

SCHEMATIC TYPE

SERVICE VOLTAGE

DISCONNECT AMP RATING
NOTE: 000 indicates main lug only, typically Type T

SAFETY SWITCH
(SS) = Safety Switch Ahead of Meter - Check with Utility
(NS) = No Safety Switch Ahead of Meter - Check with Utility

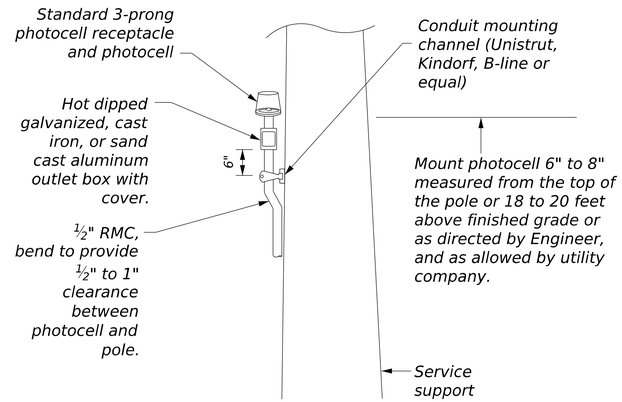
ENCLOSURE TYPE
GS = Galvanized steel ("off the shelf")
SS = Stainless steel (Custom Enclosure) - See MPL
AL = Aluminum (Custom Enclosure) - See MPL

PHOTOCELL MOUNTING LOCATION
(E) = Inside Service/Enclosure Mounted
(T) = Top of pole
(L) = Luminaire mounted
(N) = None - No Photocell or Lighting Contactor Required

SERVICE SUPPORT TYPE
GC = Granite concrete
OC = Other concrete
TP = Timber pole
SP = Steel pole
SF = Steel frame
OT = Pole by others or paid for separately
EX = Existing pole
TS = Service on traffic signal pole
PS = Pedestal Service

SERIVCE FEED
O = Overhead Service Feed from Utility
U = Underground Service Feed from Utility

TOP MOUNTED PHOTOCELL



Install conduit strap maximum 3 ft. from box. Spacing between straps supporting conduit is 5 ft. maximum.

Texas Department of Transportation

Traffic Safety Division Standard

ELECTRICAL DETAILS SERVICE NOTES & DATA

ED(5)-25

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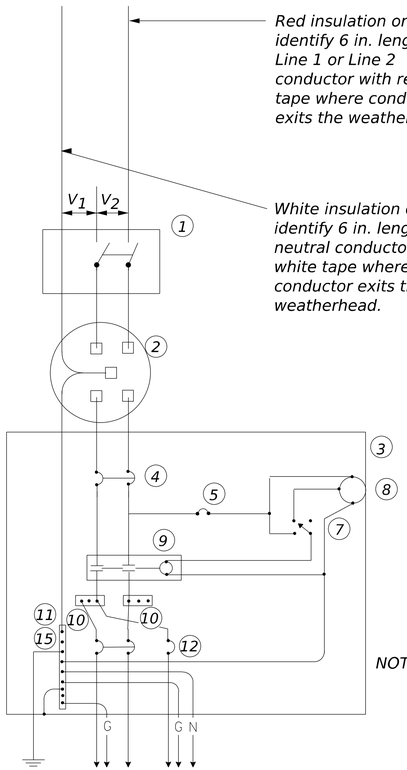
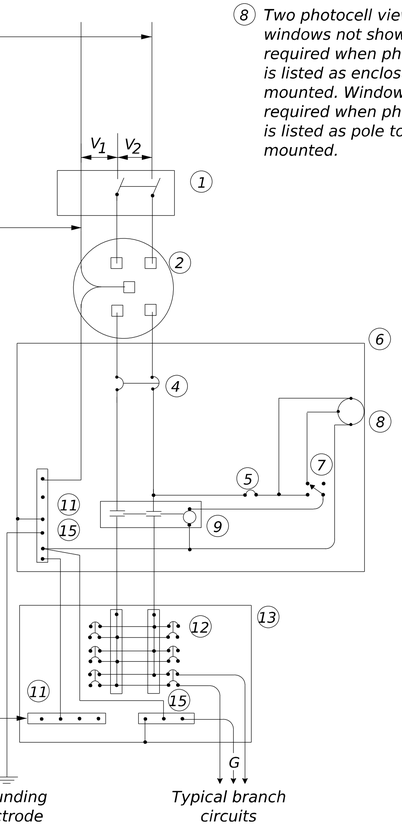
TYPE A
THREE WIRE

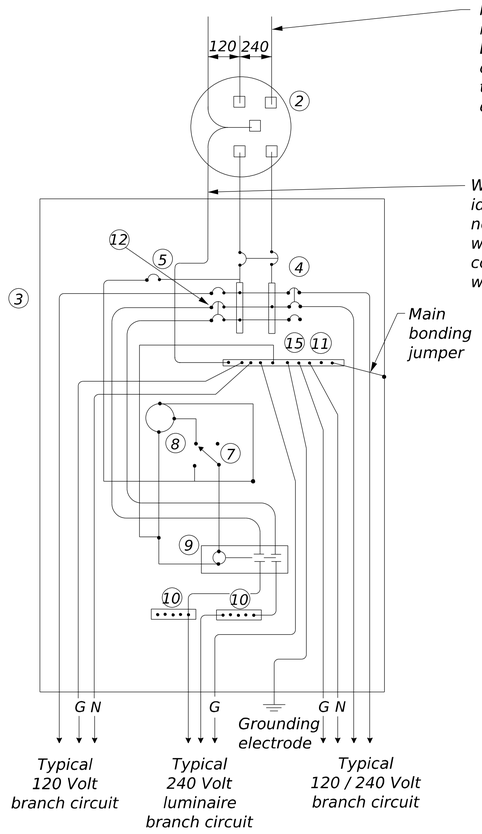


TYPE C
THREE WIRE

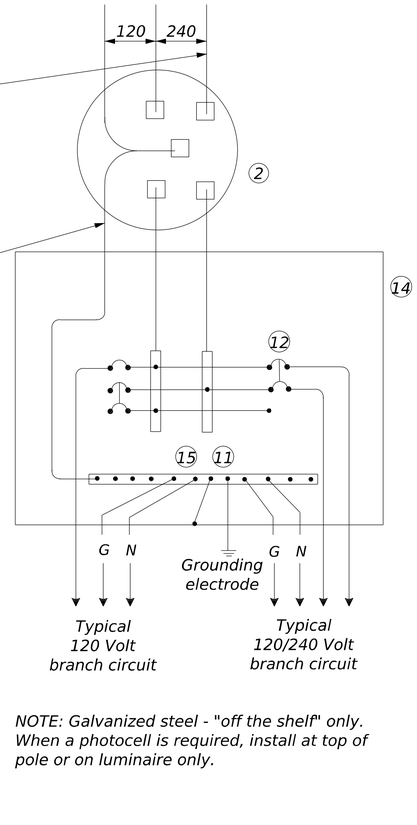
8 Two photocell viewing windows not shown but required when photocell is listed as enclosure mounted. Windows not required when photocell is listed as pole top mounted.



TYPE D - CUSTOM
120/240 VOLTS - THREE WIRE



TYPE T
120/240 VOLTS - THREE WIRE



NOTE: Galvanized steel - "off the shelf" only. When a photocell is required, install at top of pole or on luminaire only.

WIRING LEGEND	
———	Power Wiring
———	Control Wiring
——N——	Neutral Conductor
——G——	Equipment grounding conductor (always required)

SCHEMATIC NOTES:

1. Safety Switch (when required)
2. Meter (when required - verify with electric utility provider)
3. Service Assembly Enclosure
4. Main Disconnect Breaker (See Electrical Service Data)
5. Circuit Breaker, 15 Amp (Control Circuit)
6. Auxiliary Enclosure
7. Control Station ("H-O-A" Switch)
8. Photo Electric Control (enclosure-mounted shown)
9. Lighting Contactor
10. Power Distribution Terminal Blocks
11. Neutral Bus
12. Branch Circuit Breaker (See Electrical Service Data)
13. Separate Circuit Breaker Panelboard
14. Load Center
15. Ground Bus

Texas Department of Transportation

Traffic Safety Division Standard

ELECTRICAL DETAILS SERVICE SCHEMATICS AND NOTES

ED(6)-25

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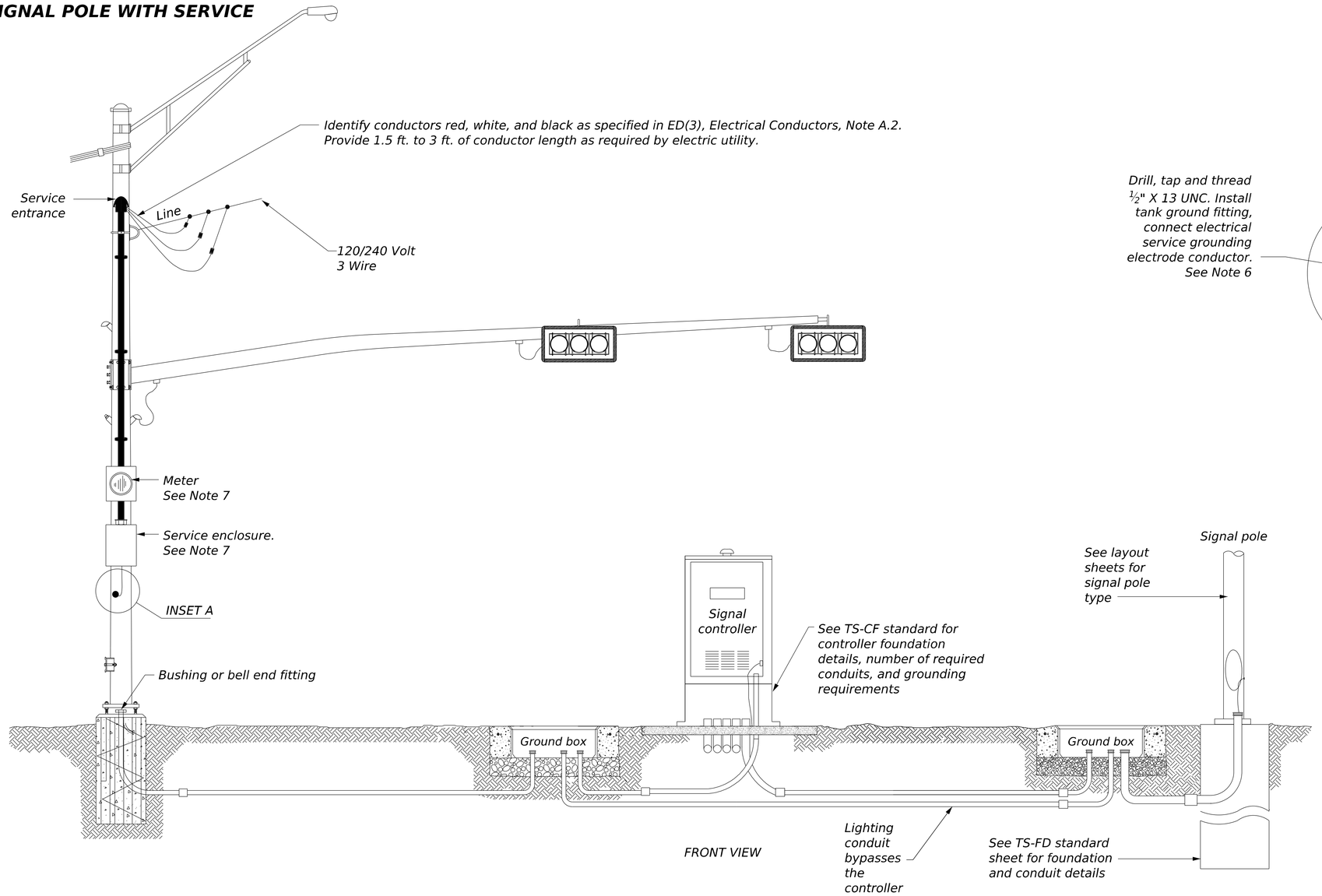
NOTES:

1. *Do not pass luminaire conductors through the signal controller cabinet.*
2. *Include an equipment grounding conductor in all conduits throughout the electrical system. Bond all exposed metal parts to the grounding conductor.*
3. *Provide roadway luminaires, when required, in accordance with Item 610, "Roadway Illumination Assemblies," except for performance testing of luminaires. Test installed roadway luminaires for proper operation as a part of the associated traffic signal system test.*
4. *Ground internally lighted street name (ILSN) signs to the pole with a 12 AWG green XHHW conductor.*
5. *Bond anchor bolts to rebar cage in two locations using #3 bars or 6 AWG stranded copper conductors. Use listed mechanical connectors rated for embedment in concrete. See TXDOT standard TS-FD for further details.*
6. *Drill and tap signal poles for ½ in. x 13 UNC tank ground fitting. Provide and install tank ground fitting 4 in. to 6 in. directly below electrical service enclosure. Provide properly sized hole through the bottom of the enclosure for the service grounding electrode conductor. Connect the electrical service grounding electrode conductor to the tank ground fitting. Ensure electrical service grounding electrode conductor is as short and straight as possible from the enclosure to the tank ground fitting. See Inset A detail for further information. Size service entrance conduit and branch circuit conduit as shown in the plans.*
7. *Mount electrical service enclosure and meter to signal pole with stainless steel bands. Ensure bands are at least ¾ in. wide. Secure enclosures to bands using two-bolt brackets. Install brackets near top and bottom of each enclosure. Install properly sized stainless steel washers on each bolt in the enclosure. Band or drill and tap properly sized stand-off straps to signal pole for attaching conduit.*
8. *Lock all enclosures and bolt down all ground box covers before applying power to the signal installation.*
9. *Terminate conduits entering the top of enclosures with a watertight conduit hub or meter hub. Install a grounding bushing on all metal conduits not connected to conduit-sealing hub or threaded boss. Bond the grounding bushing to the ground bus with a bonding jumper. Seal all conduits entering enclosures with duct seal or expanding foam. Do not use silicone to seal conduit ends.*

SIGNAL POLE WITH SERVICE



FRONT VIEW

INSET A

Texas Department of Transportation

Traffic Safety Division Standard

ELECTRICAL DETAILS TYPICAL TRAFFIC SIGNAL SYSTEM DETAILS

ED(8)-25

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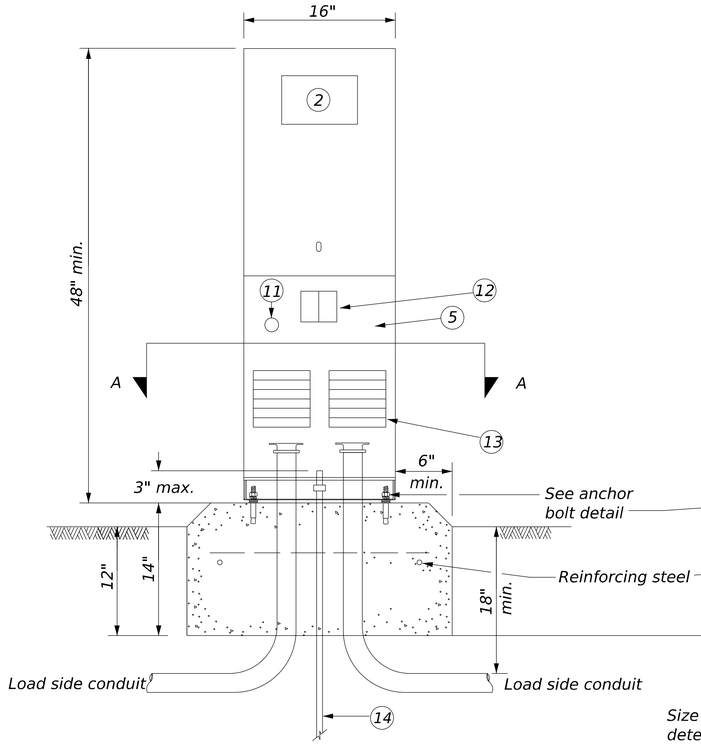
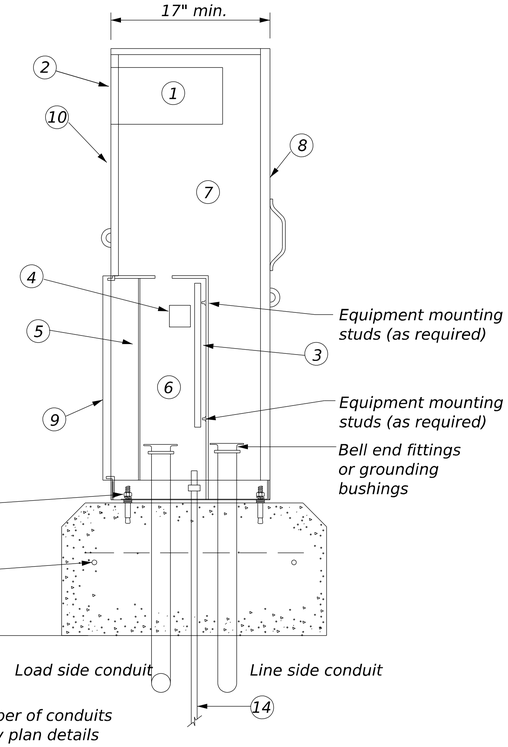
FRONT VIEW

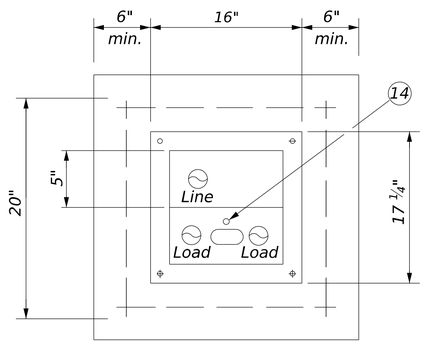


SIDE VIEW

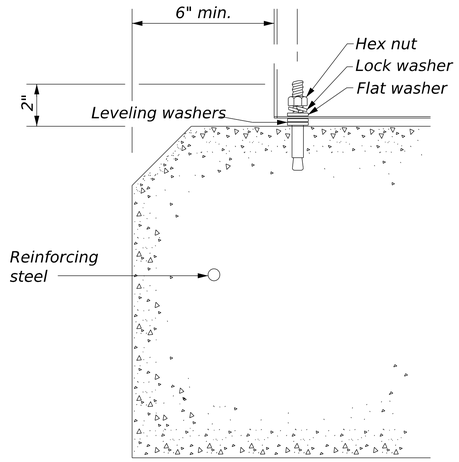


NOTE: Type D shown, Type A similar except that Type A shall have circuit breakers (CB) mounted on an equipment mounting panel. CB handles shall protrude through hinged deadfront trim.

SECTION A-A



ANCHOR BOLT DETAIL



DETAIL CALLOUTS:

1. Meter socket (when required)
2. Meter socket window (when required)
3. Equipment mounting panel
4. Photoelectric control window (when required)
5. Hinged deadfront trim
6. Load side conduit area
7. Line side conduit area
8. Utility access door, with handle
9. Pedestal door
10. Hinged meter access
11. Control station (H-O-A switch)
12. Main disconnect
13. Branch circuit breakers
14. Copper clad ground rod (in load side of cabinet) - 5/8" x 10'

NOTES:

1. Manufacture pedestal electrical services in accordance with Departmental Material Specifications DMS-11080, "Electrical Services," DMS-11085, "Electrical Services-Pedestal (PS)" and Item 628, "Electrical Services." Provide pedestal electrical services listed on the Material Producer list (MPL) under "Roadway Illumination and Electrical Supplies," Item 628. Ensure all mounting hardware and installation details of services meet utility company specifications. Contact the local utility company for approval of pedestal details prior to installing the electrical pedestal service. Submit any changes required by the utility company prior to manufacturing the pedestal enclosure.
2. When a meter socket is required, provide a socket with a 100 amp (minimum) rating that complies with local utility requirements.
3. Provide concrete for pedestal service foundations in accordance with Item 656, "Foundations for Traffic Control Devices" except that concrete will not be paid for directly but is considered subsidiary to Item 628.
4. Provide #4 reinforcing steel for foundations in accordance with Item 440, "Reinforcement for Concrete."
5. Install ½ in. X 2 1/16 in. minimum length concrete single expansion type anchors for mounting pedestal enclosure to foundation. Match anchor location to mounting holes in each corner of enclosure. Secure each of the four corners of the pedestal enclosure to the anchors in the foundation with a ½ in. galvanized or stainless steel machine thread bolt, a properly sized locknut and a flat washer.
6. Finish top of concrete foundation in a professional and skillful manner. If leveling washers are used, ensure no more than ⅛ in. of gap exists at any corner. Do not exceed a maximum dip or rise in the foundation of ⅛ in. per foot. Ensure the top of the service enclosure is level front to back and side to side within ¼ in. Repair rocking or movement of the service enclosure at no additional cost to the Department.
7. Do not use liquidtight flexible metal conduit (LFMC) on pedestal services.
8. Ensure all elbows in the foundation are sized to meet utility provider's conduit requirements for underground conduit and feeders. PVC conduit extensions may be installed provided the ends of the rigid metal conduits are more than 2 in. below the top of the concrete foundation. Where extension conduits are metal, grounding bushings must be installed with a properly terminated bonding jumper.

Texas Department of Transportation

Traffic Safety Division Standard

ELECTRICAL DETAILS PEDESTAL SERVICE TYPE PS

ED(9)-25

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GENERAL NOTES:

1. For overhead services, install a one point rack or eye bolt bracket 6 in. to 12 in. below the weatherhead as a service drop anchoring point for the electric utility. Attaching bolt must pass through the pole and use a nut, washer, and locking washer on the other side. Self-tapping screws or lag bolts are not permitted.
2. Identify service entrance conductors red, white, and black as specified in ED(3), Electrical Conductors, Note A.2. Provide 1.5 ft. to 3 ft. of conductor length as required by electric utility.
3. Install Type A and Type C services so that the center of the grip of the service's external disconnect handle in the on position is no more than 6 ft. 7 in. above grade.

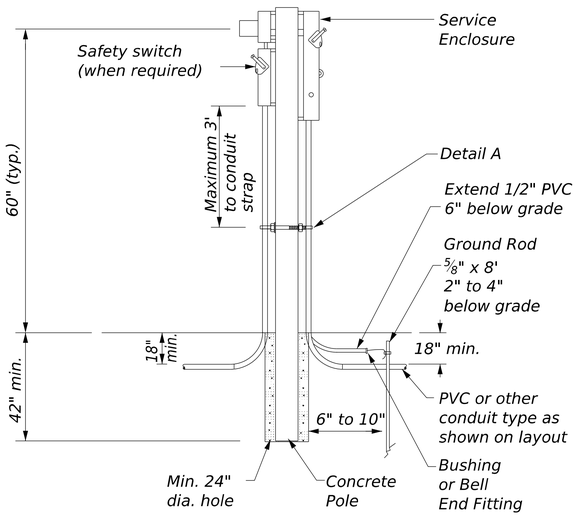
GRANITE CONCRETE (GC) & OTHER CONCRETE (OC) SERVICE NOTES

1. Ensure electrical service support structures bid as type Granite Concrete (GC) or Other Concrete (OC) meet the requirements of DMS-11080, "Electrical Services."
2. Provide prestressed concrete poles suitable for direct embedment into the ground without special foundations.
3. Verify poles are marked as required on DMS-11080. Location of marking should be approximately 4 ft. above final grade. Use the two-point pickup locations when handling pole in horizontal position, and one-point pickup location for use in raising the pole to a vertical position. These marks are small but conspicuous.
4. Embed poles 42 in. or 10% of the length plus 2 ft., whichever is greater.
5. Furnish and install galvanized or stainless steel channel strut 1 ½ in. or 1 $\frac{5}{8}$ in. wide by 1 in. up to 3 ¾ in. deep (Unistrut, Kindorf, B-line or equal). Attach channel strut with stainless steel concrete anchors (max. 1 in. depth), square U-bolts or back to back channel strut with long bolts, or other secure mounting as approved by the Engineer. Ensure bolts are galvanized in accordance with ASTM A153. Do not stack channel struts.

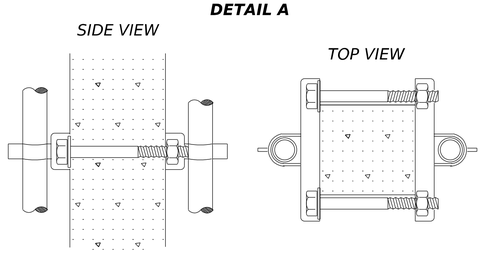
TIMBER POLE (TP) SERVICE NOTES

1. Ensure electrical service support is a class 5 treated timber pole as per Item 627, "Treated Timber Poles." Embed timber pole to depth required in Item 627.
2. Gain pole as required to provide flat surface for each channel. Gain timber pole to $\frac{5}{8}$ in. max. depth and 1 $\frac{7}{8}$ in. max. height. Gain pole in a professional and skillful manner.
3. Mount meter and service equipment on stainless steel or galvanized channel (Unistrut, Kindorf, or equal). Provide channel sized 1 in. to 3 ¾ in. maximum depth, and 1 ½ in. to 1 $\frac{5}{8}$ in. maximum width. File smooth the cut ends of galvanized channel and paint with zinc rich paint before installing on pole. Secure each channel section to timber pole with two galvanized or stainless steel lag bolts, ¼ in. minimum diameter by 1 ½ in. minimum length. Use a galvanized or stainless steel flat washer on each lag bolt. Do not stack channel.
4. When excess length must be trimmed from poles, trim from the top end only.
5. Install point of attachment below weatherhead.

TYPES GC(U) & OC(U)
UNDERGROUND SERVICE

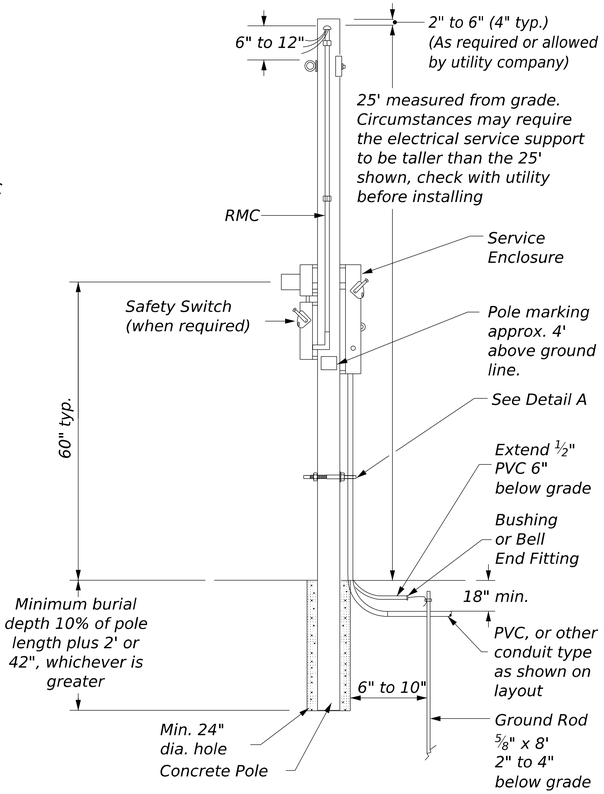


DETAIL A

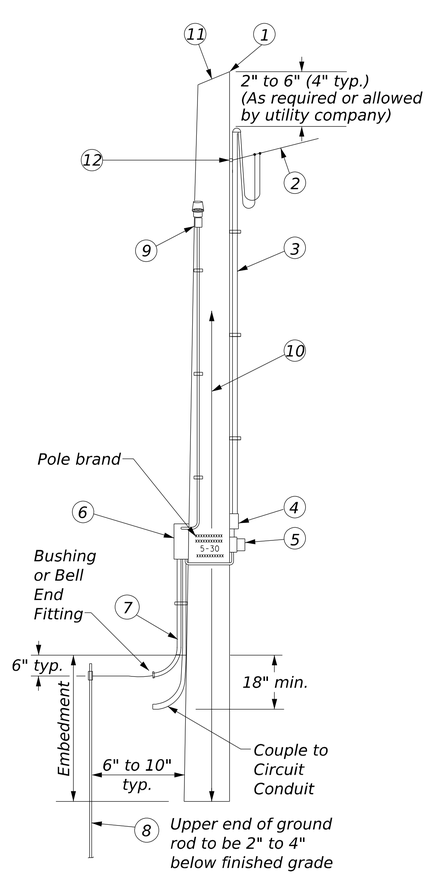


See GC & OC Note 5. Before installing channel that has been cut, file sharp edges and paint with zinc-rich paint. Ensure there is no paint splatter on the pole.

TYPES GC(O) & OC(O)
OVERHEAD SERVICE



TYPE TP(O)
OVERHEAD SERVICE



DETAIL CALLOUTS:

1. Class 5 pole, height as required
2. Service drop from utility company (attached below weatherhead)
3. Service conduit (RMC) and service entrance conductors - one red, one black, one white (see Electrical Service Data)
4. Safety switch (when required)
5. Meter (when required)
6. Service enclosure
7. 6 AWG solid bare copper grounding electrode conductor in ½ in. PVC to ground rod - extend conduit 6 in. underground.
8. $\frac{5}{8}$ in. x 8 ft. copper clad ground rod - drive ground rod to a depth of 2 in. to 4 in. below grade.
9. See pole-top mounted photocell detail on ED(5).
10. When required by the serving utility provide bare 6 AWG copper conductor. Run wire from pole top to butt wrap or copper butt plate. Protect conductor with non-conductive material to a height of 8 ft. above finished grade.
11. When required by utility, cut top of pole at an angle to enhance rain run off.
12. Point of attachment (typ.)

Texas Department of Transportation

Traffic Safety Division Standard

ELECTRICAL DETAILS SERVICE SUPPORT TYPES GC, OC, & TP

ED(10)-25

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NOTES:

1. Provide duct cable in accordance with Departmental Material Specification DMS-11060, "Duct Cable" and Special Specification 6000, "Duct Cable." Provide duct cable as listed on the Material Producer List (MPL) on the Department web site under "Roadway Illumination and Electrical Supplies," Special Specification 6000 - Duct Cable. Provide and install duct cable according to NEC Article 354, Nonmetallic Underground Conduit with Conductors (NUCC).

2. Provide High-Density Polyethylene (HDPE) conduit in accordance with DMS-11030 and Item 618, "Conduit." Provide HDPE as listed on the MPL on the Department web site under "Roadway Illumination and Electrical Supplies," Item 618.

3. Supply duct cable with a minimum 2 in. diameter, unless otherwise shown in the plans. Provide duct cable and HDPE conduit as shown by descriptive code or on the plans. Bend duct cable and HDPE conduit as recommended by the manufacturer, with a minimum bending radius of 26 in. for 2 in. duct. Follow manufacturers' recommendations when handling duct cable and HDPE conduit reels and during installation of duct cable and HDPE conduit.

4. Do not splice conductors within duct cable or HDPE conduit. Couple duct cable and HDPE entering a ground box or foundation to a PVC elbow. When galvanized steel rigid metal conduit (RMC) elbows are called for in the plans and any portion of the RMC elbow is buried less than 18 in. from possible contact, ground the RMC elbow.

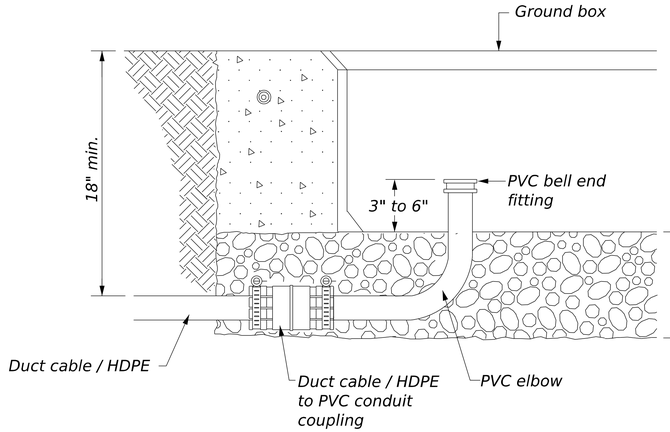
5. When conduit casing is called for in the plans, extend duct cable or HDPE conduit through the conduit casing in one continuous length without connection to the casing.

6. Seal the ends of duct cable or HDPE conduit with duct seal, expandable foam, or other approved method after installation.

7. Provide minimum cover of 24 in. under roadways, 18 in. in other locations, or as shown on the plans.

8. Furnish and install listed fittings to couple duct cable or HDPE conduit to other types of conduit. Duct cable and HDPE conduit may be field-threaded and spliced with PVC or RMC threaded couplings; connected with listed tie-wrap fittings; connected using listed couplings made of HDPE with stainless steel external banding clamps and locking rings; connected with approved electrofusion conduit couplings; or connected using an approved chemical fusion method using an epoxy or adhesive specifically designed for HDPE couplings and connectors. Install connectors in accordance with manufacturer's instructions. Do not use PVC glue on HDPE. Do not use water pipe fittings, or connect conduit with heat shrink tubing.

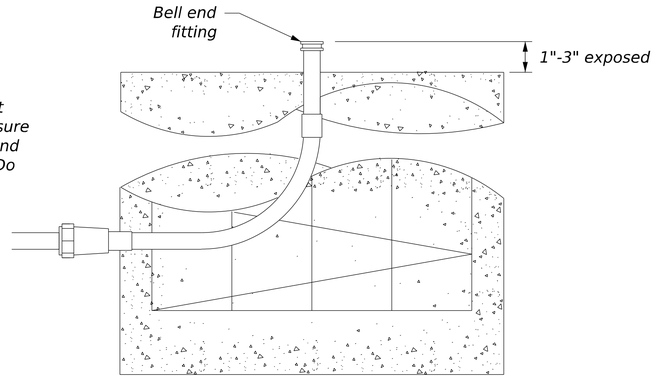
DUCT CABLE/HDPE AT GROUND BOX



When the upper end of an RMC elbow does not enter the ground box,it may be extended with a SCH-40 PVC conduit nipple and bell end, provided there is a minimum of 18 in. of cover over all parts of the elbow. If not, a rigid extension and ground bushing is required.

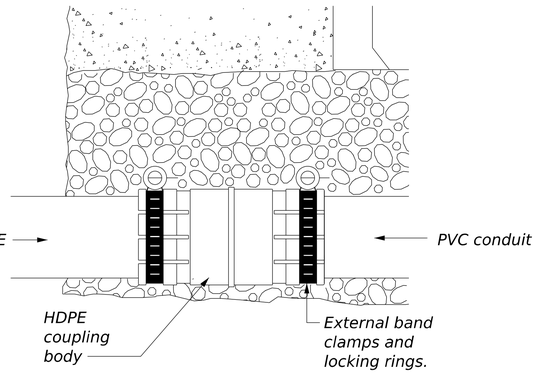
Bed of aggregate is to be a minimum of 9 in. deep, placed under and not in the ground box. Ensure the aggregate does not encroach into the interior of the box.

DUCT CABLE / HDPE AT FOUNDATION

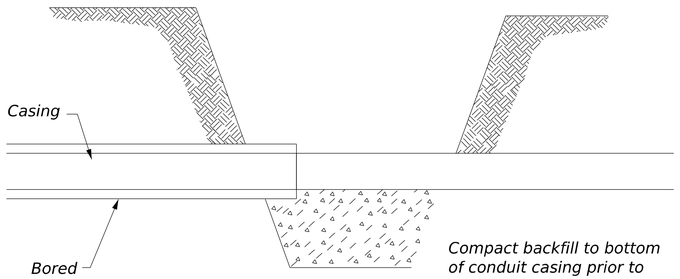


Couple duct to conduit elbow at foundations. Ensure conductors extend into pole base. Do not splice conductors in conduit.

DUCT CABLE / HDPE TO PVC



BORE PIT DETAIL



Compact backfill to bottom of conduit casing prior to placing duct cable, to prevent kinking.

Texas Department of Transportation

Traffic Safety Division Standard

ELECTRICAL DETAILS DUCT CABLE/ HDPE CONDUIT

ED(11)-25

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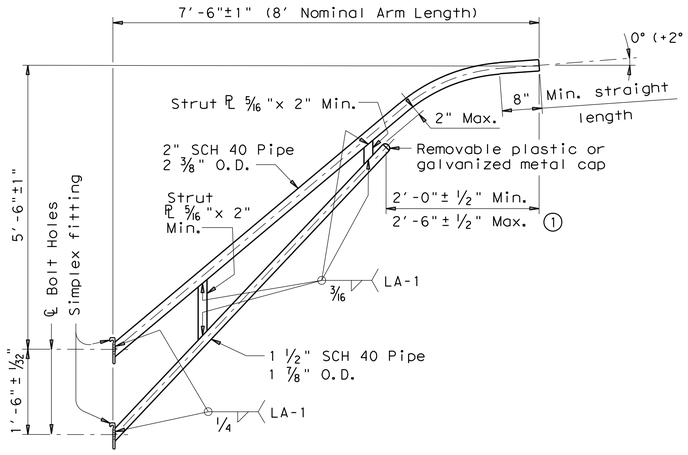
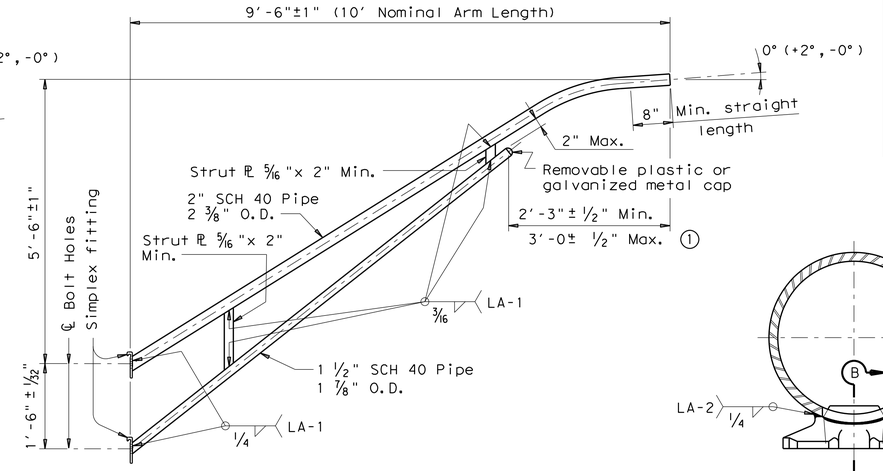


8-FOOT LUMINAIRE ARM



10-FOOT LUMINAIRE ARM

DIRECT ATTACHMENT DETAIL

MATERIALS	
Pole or Arm Simplex	ASTM A27 Gr.65-35 or A148 Gr.80-50, A576 Gr.1021 (3), or A36 (Arm only)
Arm Pipes	ASTM A53 Gr.B, A501, A1008 HSLAS-F Gr.50 (4), or A1011 HSLAS-F Gr.50 (4)
Arm Strut Plates (2)	ASTM A36, A572 Gr.50 (4), or A588
Misc.	ASTM designations as noted

(1) Dimensional limits are given to show acceptable variation in design. All of a Fabricator's production of a particular arm length shall have the same dimensions within specified tolerances.

(2) Any of the materials listed for plates may be used where the drawings do not specify a particular ASTM designation.

(3) A576 must be suitable for forging and also meet minimum tensile strength of 65 ksi, minimum yield of 35 ksi, and elongation in 2 inches of 22 percent.

(4) ASTM A572, A1008 HSLAS-F, and A1011 HSLAS-F may have higher yield strengths but shall not have less elongation than the grade indicated.

GENERAL NOTES:

Design conforms to 1994 AASHTO Standard Specifications for Structural Supports for Highway Signs, Luminaires, and Traffic Signals and Interim Revisions thereto. Design Wind Speed equals 90 mph plus a 1.3 gust factor. Arms are designed to support a 60 lb. luminaire having an effective projected area (actual area times drag coefficient) of 1.6 sq. ft.

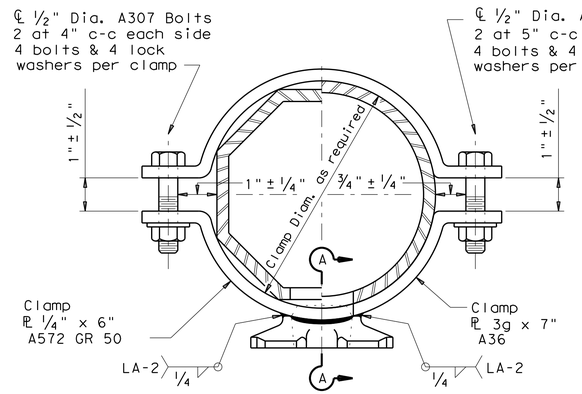
Materials and fabrication shall be in accordance with Item 686, "Traffic Signal Pole Assemblies (Steel)" and with the details, dimensions, and weld procedures shown herein. Weld references call for preapproved weld procedures which the Fabricator must obtain prior to fabrication. In the absense of specified Fabricaton tolerances, dimensions shall be within the tolerances generally obtainable in normal fabrication practice.

Unless otherwise noted, all parts shall be galvanized after fabrication in accordance with Item 445, "Galvanizing".

Deviation from the details and dimensions shown herein require submission of shop drawings in accordance with Item 441, "Steel Structures". Alternate designs are not acceptable.

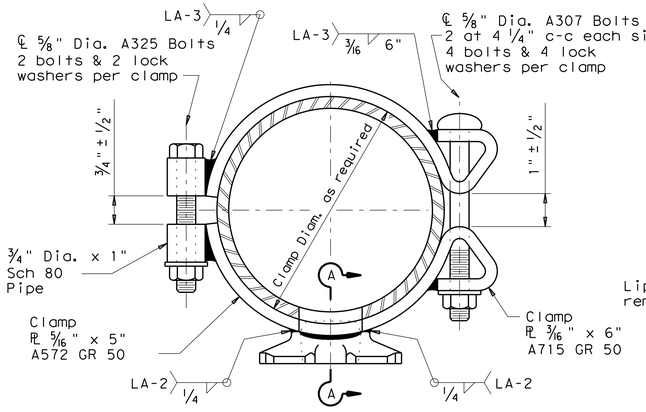
Each pole simplex fitting shall be supplied with 2 ASTM A325 bolts and 2 lock washers of the size specified. The bolts and lock washers shall be secured to the pole with the other hardware items called for in the plans. When clamp attachment is specified, the Fabricator shall ship the clamp assembly securely attached to the pole at the location shown on the plans.

If clamp assemblies are ordered without poles, the Fabricator shall ship one upper and one lower clamp assembly together in a single package, including all nuts and washers required for the clamps and simplex fittings.



CLAMP ATTACHMENT DETAIL NO. 1 (HALF SECTION)

CLAMP ATTACHMENT DETAIL NO. 2 (HALF SECTION)



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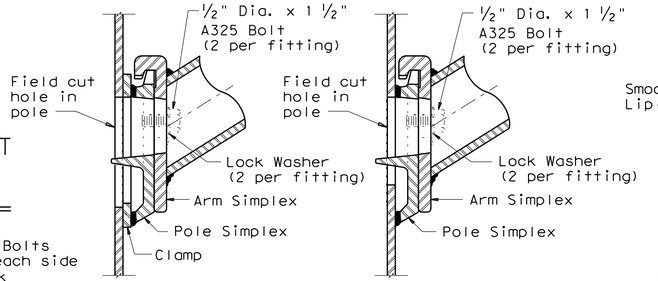
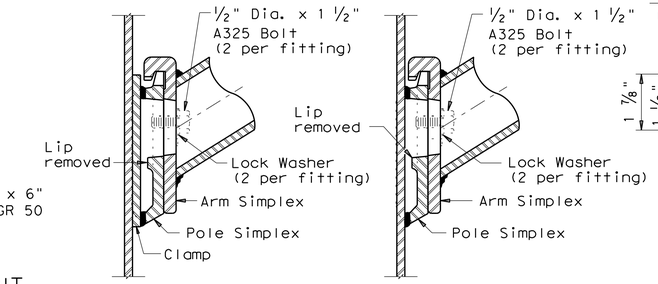
CLAMP ATTACHMENT DETAIL NO. 4 (HALF SECTION)



UPPER SIMPLEX FITTING

UPPER SIMPLEX FITTING

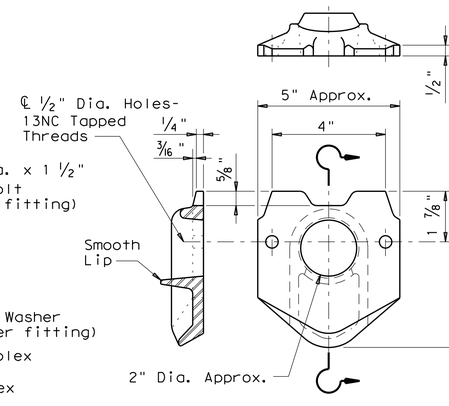


LOWER SIMPLEX FITTING

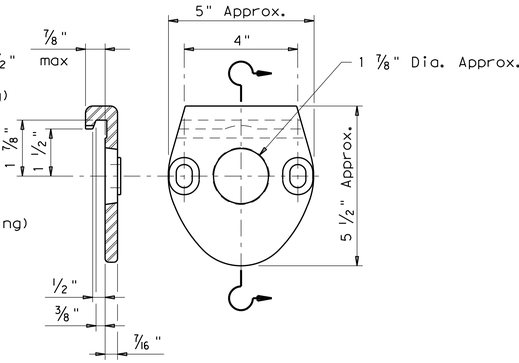
SECTON A-A

LOWER SIMPLEX FITTING

SECTON B-B



POLE SIMPLEX DETAIL



ARM SIMPLEX DETAIL

Texas Department of Transportation
Traffic Operations Division

STANDARD ASSEMBLY DRAWINGS FOR LUMINAIRE SUPPORT STRUCTURES

ARM DETAILS

LUM-A-12

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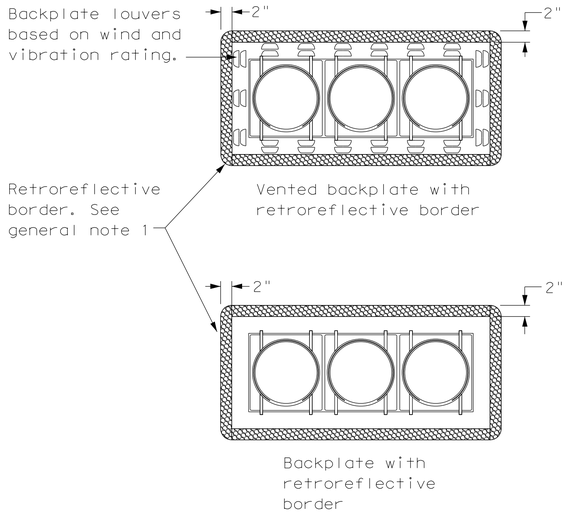
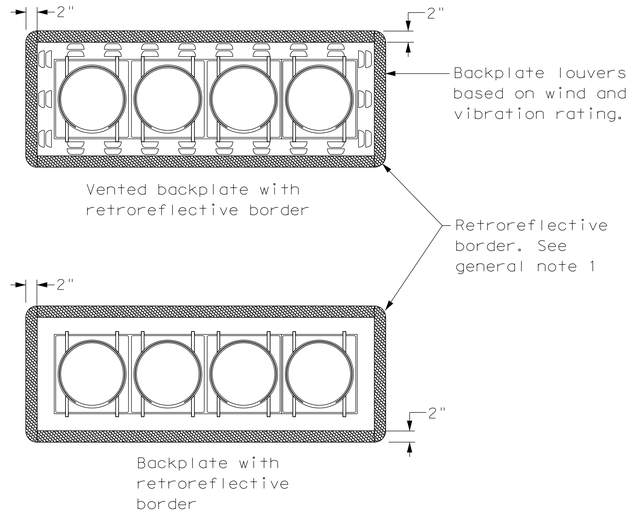
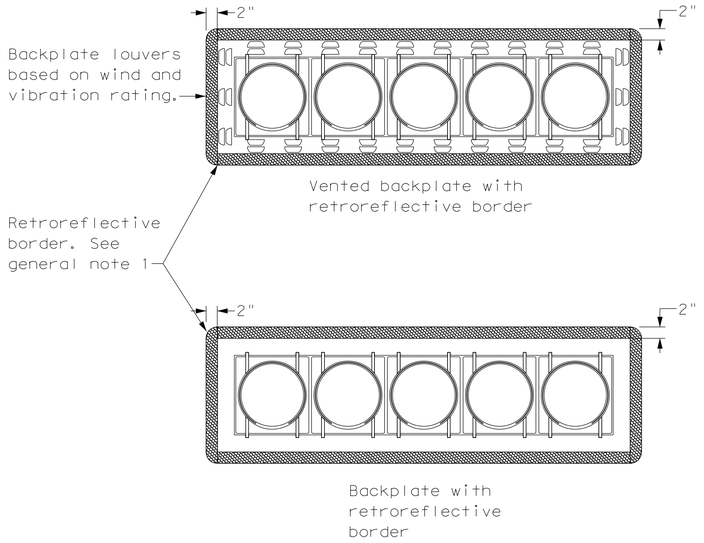


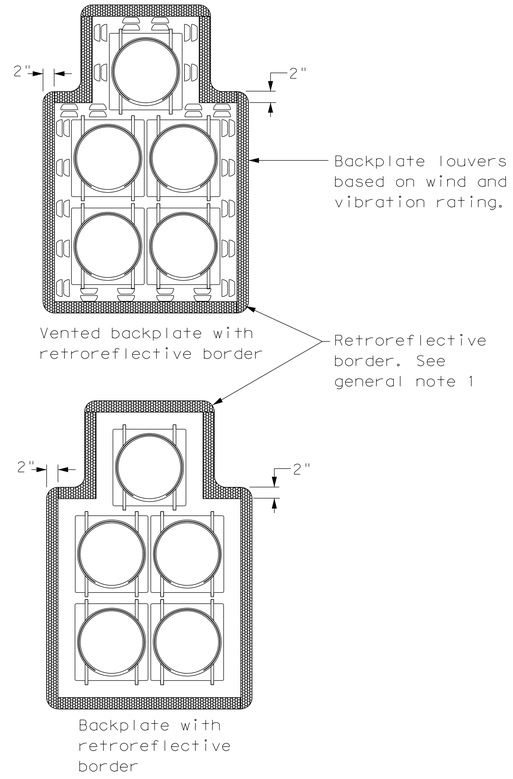
THREE-SECTION HEAD
HORIZONTAL OR VERTICAL



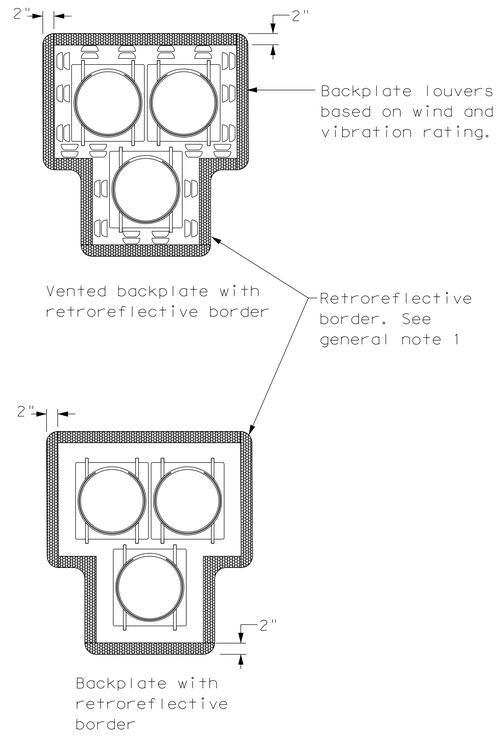
FOUR-SECTION HEAD
HORIZONTAL OR VERTICAL



FIVE-SECTION HEAD
HORIZONTAL OR VERTICAL



FIVE-SECTION HEAD
CLUSTER



PEDESTRIAN HYBRID
BEACON

GENERAL NOTES:

1. Backplates are optional for traffic signals and pedestrian hybrid beacons. When backplates are used, a 2-inch wide fluorescent yellow AASHTO Type B_{FL} or C_{FL} retroreflective border conforming to TxDOT DMS-8300 is required. Place on all approaches when used.
2. Signal head and backplate compatability must be verified by the contractor prior to installation.
3. When using backplates on signal heads, venting is preferred to reduce cyclic vibration stress.
4. When a vented backplate is used, the retroreflective border must not be placed over the louvers.
5. This standard sheet applies to all signal heads with backplates, including but not limited to:
   - Pole mounted
   - Overhead mounted
   - Span wire mounted
   - Mast arm mounted
   - Vertical signal heads
   - Horizontal signal heads
   - Clustered signal heads
   - Pedestrian hybrid beacons

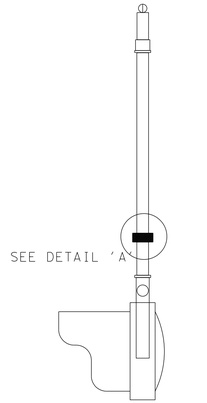
Texas Department of Transportation

Traffic Safety Division Standard

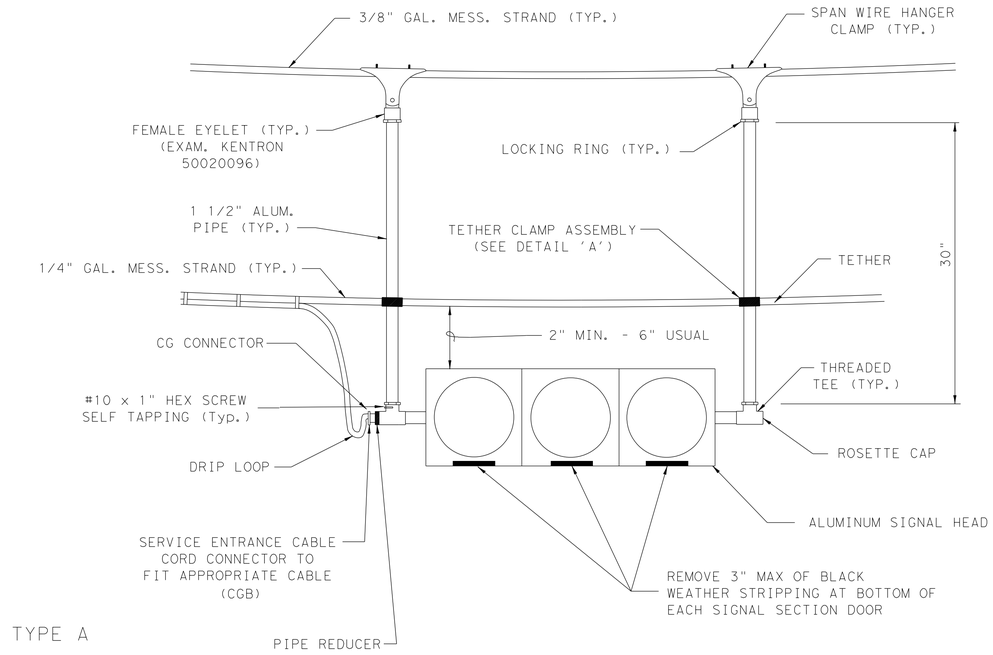
TRAFFIC SIGNAL HEAD WITH BACKPLATE

TS-BP-20

FILE: ts-bp-20.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT June 2020	CONT	SECT	JOB	HIGHWAY
REVISIONS				
	DIST	COUNTY		SHEET NO.
				441

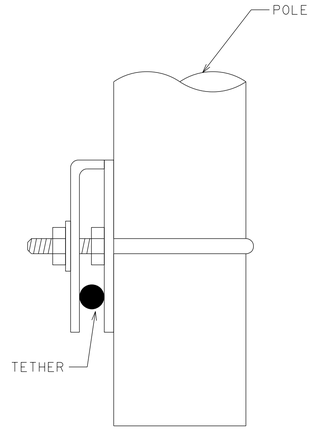


SIDE VIEW



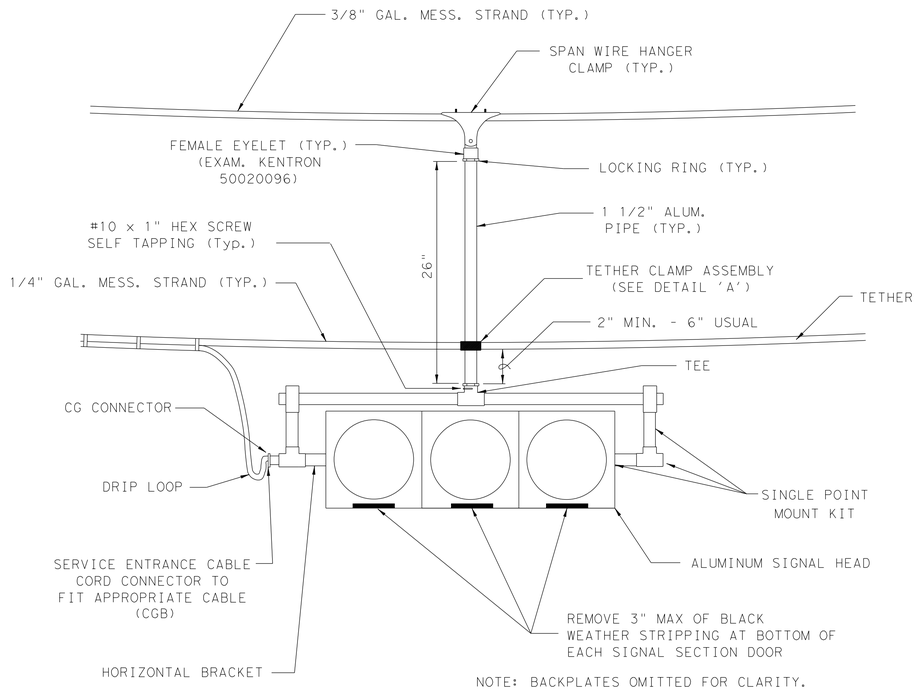
TYPE A

NOTE: BACKPLATES OMITTED FOR CLARITY.



DETAIL 'A'

TETHER CLAMP ASSEMBLY



TYPE B

NOTE: BACKPLATES OMITTED FOR CLARITY.

NO SCALE

Texas Department of Transportation

Austin District Standard

Austin District Traffic

SIGNAL HEAD HORIZONTAL SPAN WIRE MOUNT

HSWM-14 (AUS)

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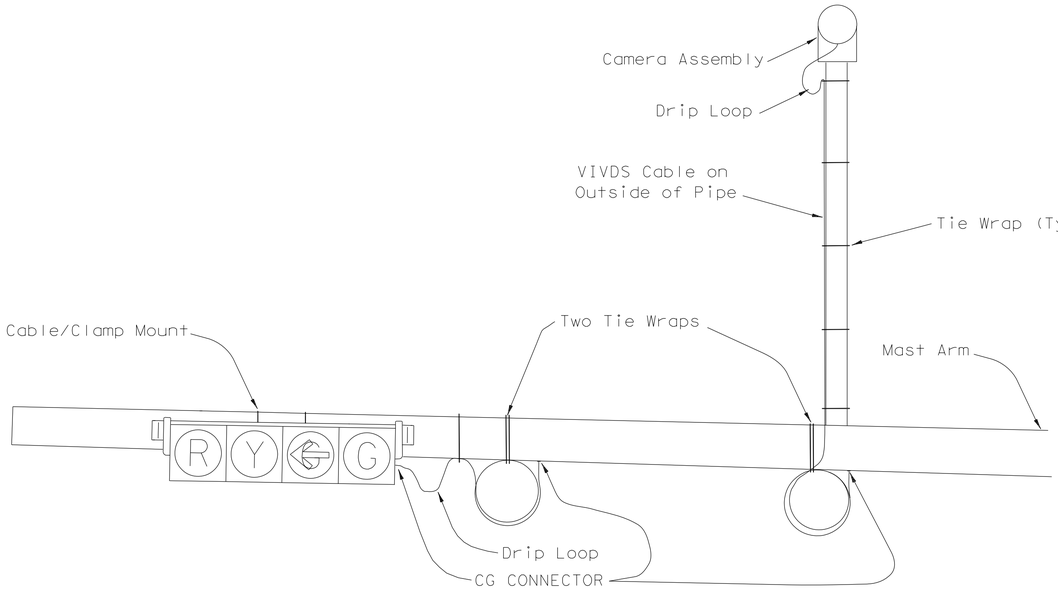
REVISIONS

CONT	SECT	JOB	HIGHWAY

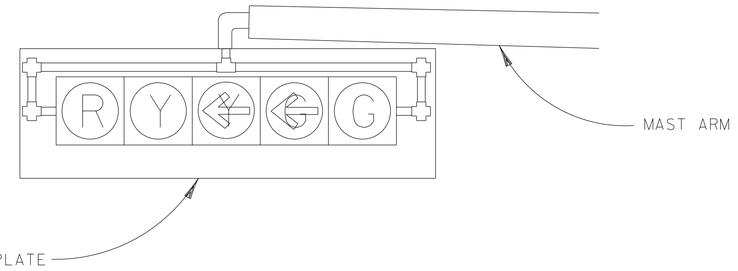
DIST	COUNTY	SHEET NO.
		442

DATE:
FILE:

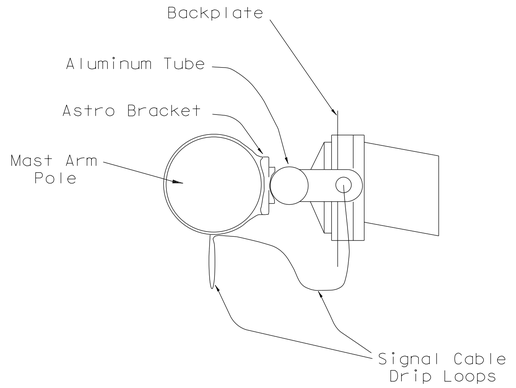


MAST ARM
ELEVATION VIEW

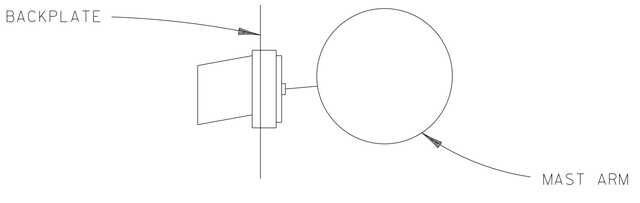
Backplate Not Shown



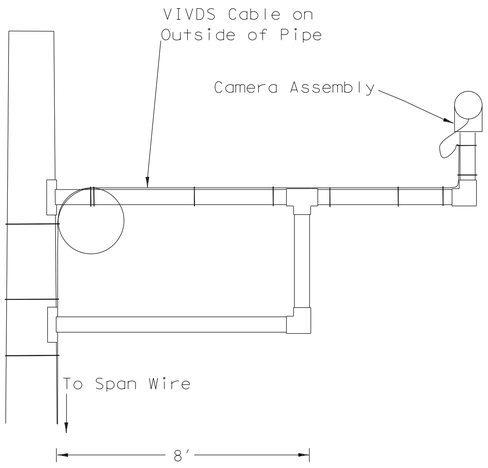
ELEVATION VIEW



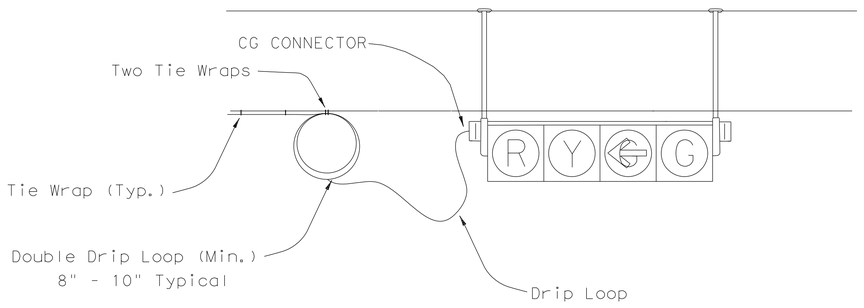
MAST ARM
SECTION VIEW(SIDE)



SECTION VIEW



ELEVATION VIEW - CAMERA BRACKET



ELEVATION VIEW - SPAN WIRE

Backplate Not Shown

Texas Department of Transportation

Austin District Standard

Austin District Traffic

MISCELLANEOUS ATTACHMENT DETAILS

MAD-14 (AUS)

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CONT	SECT	JOB	HIGHWAY

DIST	COUNTY	SHEET NO.
		443

DATE:
FILE:

MOUNTING LOCATIONS

PRESENCE (RPDD)

① PREFERRED PLACEMENT FOR MAST ARMS, STRAIN POLES AND TIMBER POLES. ON MAST ARM POLES, MOUNT BELOW CONNECTION OF MAST ARM TO A MINIMUM OF 15 FT., MOUNT AS HIGH AS POSSIBLE TO A MAXIMUM OF 30 FT ON STRAIN AND TIMBER POLES.

② PREFERRED PLACEMENT FOR MAST ARMS. MOUNT ON AND BELOW MAST ARM ON NEAR SIDE OF ARM.

③ ALTERNATE PLACEMENT LOCATION. MOUNT AS HIGH AS POSSIBLE TO A MAXIMUM OF 30 FT TO PREVENT OCCLUSION OF THE LEFT TURN LANES. THIS PLACEMENT TO BE USED ONLY IF RPDD CANNOT BE MOUNTED IN THE PREFERRED PLACEMENT LOCATIONS.

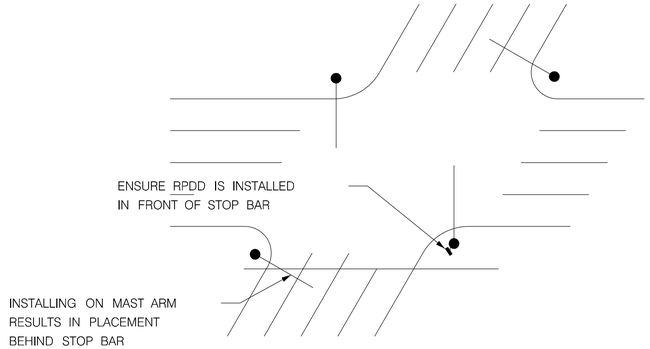
ADVANCE (RADD)

Ⓐ PREFERRED PLACEMENT FOR MAST ARMS. ALIGN RADD WITH CENTER OF TRAVEL LANES.

Ⓑ ALTERNATE PLACEMENT FOR MAST ARMS. MOUNT ON BACK SIDE OF OPPOSING MAST ARM.

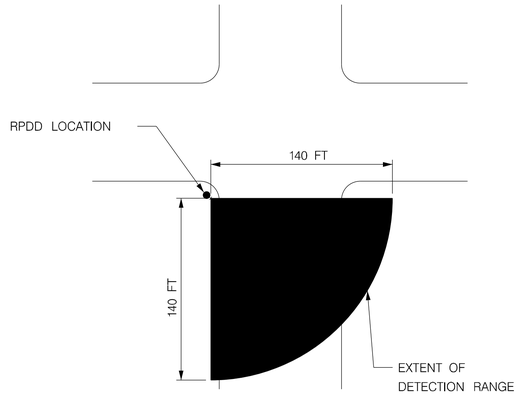
Ⓒ STRAIN OR TIMBER POLE PLACEMENT. MOUNT ON NEAR SIDE POLE.

Ⓓ ALTERNATE STRAIN OR TIMBER POLE PLACEMENT. MOUNT LUMINAIRE ARM ON NEAR SIDE POLE WITH A MAXIMUM 40 FT MOUNTING HEIGHT.



SKEWED INTERSECTION RPDD PLACEMENT

NTS



TYPICAL RPDD DETECTION RANGE

NTS

NOTES:

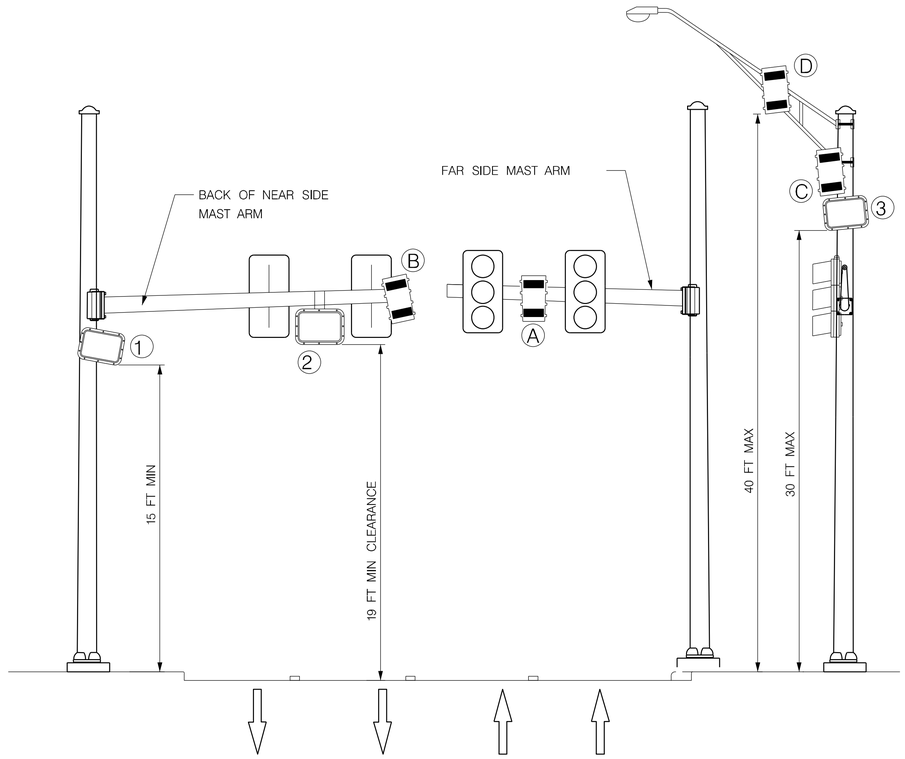
1) A MINIMUM 6 FT HORIZONTAL OFFSET MUST BE MAINTAINED BETWEEN THE RPDD AND THE DETECTION ZONE

2) THE RPDD SHALL BE MOUNTED SUCH THAT AT LEAST 20 FT ALONG THE FARTHEST LANE TO BE MONITORED IS WITHIN THE FIELD OF VIEW OF THE RPDD

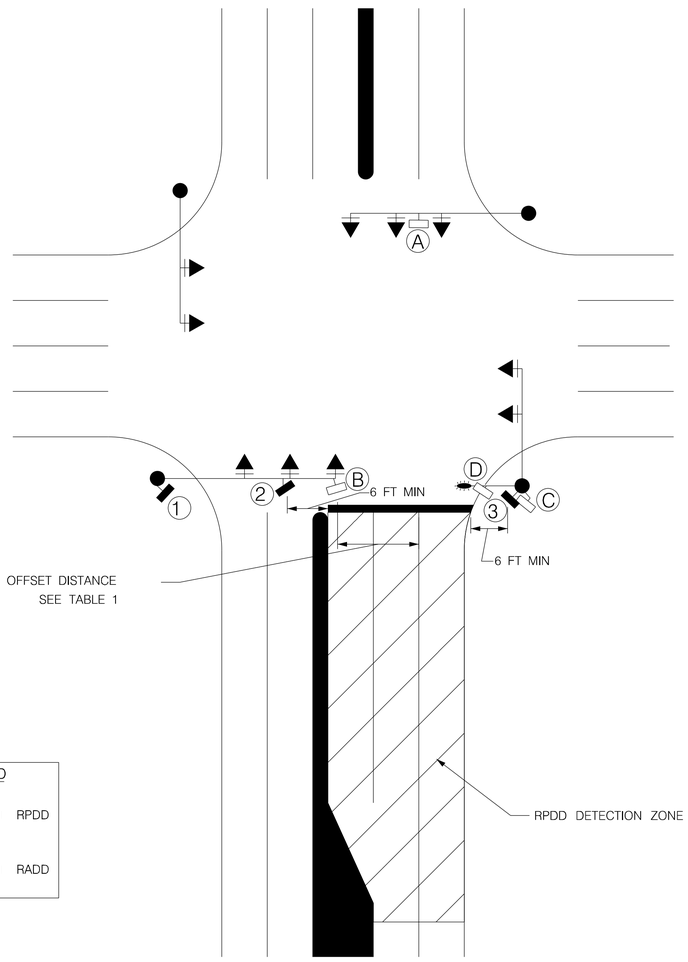
3) AIM RPDD AT THE CENTER OF THE LANES TO BE MONITORED, APPROXIMATELY 50 FT FROM THE RPDD UNIT

4) MOUNT RPDD SO THAT ITS FIELD OF VIEW IS NOT OCCLUDED BY POLES, SIGNS, OR OTHER STRUCTURES

5) RADD MOUNTING HEIGHT SHALL NOT BE LESS THAN 17 FT OR GREATER THAN 40 FT. RADD MOUNTING LOCATION SHALL HAVE A MAXIMUM 50 FT LATERAL OFFSET FROM CENTER OF TRAVEL LANES TO BE MONITORED



ELEVATION VIEW
NTS



PLAN VIEW
NTS

LEGEND

OR ▬ RPDD

OR ▭ RADD

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San Antonio District Standard

RADAR PRESENCE DETECTOR (RPDD)
RADAR ADVANCED DETECTION DEVICE (RADD)
PLACEMENT

SCALE: NS — RPDD-RADD-20

REVISIONS	FED.RD. DIV.NO.	PROJECT NO.	SHEET NO.
MAR 2020			444
	STATE	DIST.	COUNTY
	TEXAS	SAT	
	CONT.	SECT.	JOB / HIGHWAY NO.

LEVELS DISPLAYED
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50 51 52 53 54 55 56 57 58 59 60 61 62 63

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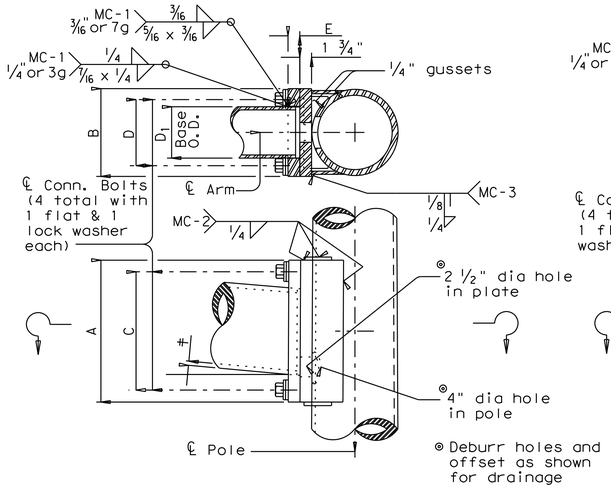
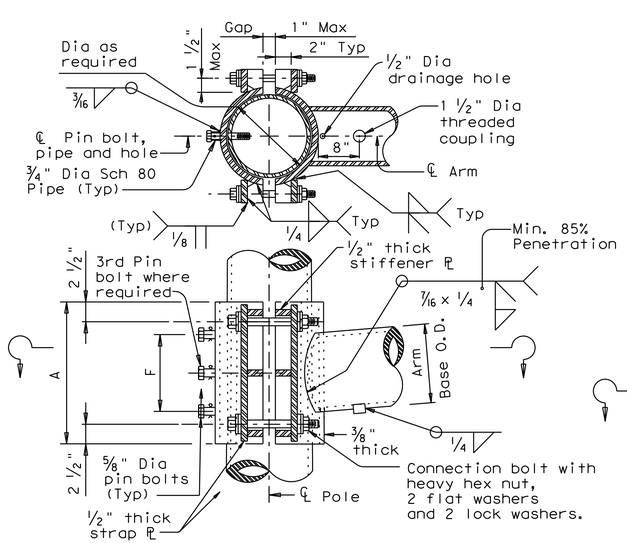
ARM SIZE D_1 in.	ARM SIZE ℄ in.	A in.	B in.	C in.	D in.	E in.	CONN BOLT DIA in.
6.5	.179	12	9	9	6	1 3/4	1
7.5	.179	13	9	10	6	1 3/4	1
8.0	.179	14	10	11	7	2	1 1/4
9.0	.179	16	11	13	8	2	1 1/4
9.5	.179	17	12	14	9	2	1 1/4
9.5	.239	18	12	15	9	2	1 1/4
10.0	.239	18	12	15	9	2	1 1/4
10.5	.239	18	13	15	10	3	1 1/2
11.0	.239	18	13	15	10	3	1 1/2



FIXED MOUNT DETAIL 1

ARM SIZE D_1 in.	ARM SIZE ℄ in.	A in.	F in.	CONN. BOLTS No. ea.	CONN. BOLTS Dia in.	PIN BOLTS No. ea.	PIN BOLTS Dia in.
6.5	.179	12	6	4	1	2	5/8
7.5	.179	14	8	4	1	2	5/8
8.0	.179	14	8	4	1	2	5/8
9.0	.179	16	10	4	1	2	5/8
9.5	.179	18	12	4	1 1/4	3	5/8
9.5	.239	18	12	4	1 1/4	3	5/8
10.0	.239	18	12	4	1 1/4	3	5/8



CLAMP-ON DETAIL 1

ARM SIZE D_1 in.	ARM SIZE ℄ in.	A in.	F in.	T in.	CONN. BOLTS No. ea.	CONN. BOLTS Dia in.	PIN BOLTS No. ea.	PIN BOLTS Dia in.
7.0	.179	12	6	3/4	4	3/4	2	5/8
7.5	.179	14	8	3/4	4	3/4	2	5/8
8.0	.179	14	8	3/4	4	3/4	2	5/8
9.0	.179	16	10	7/8	4	1	2	5/8
10.0	.179	18	10	7/8	4	1	2	5/8
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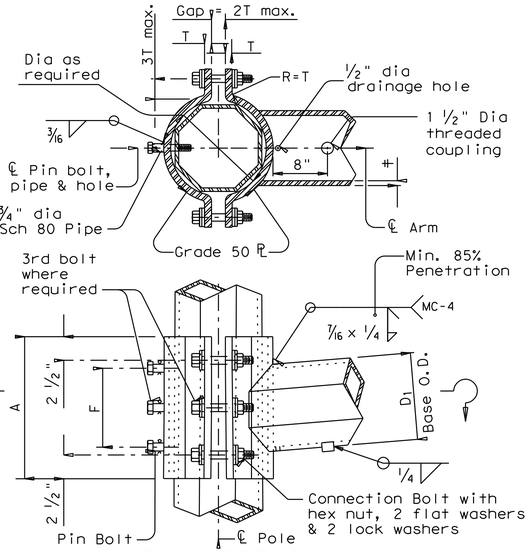

CLAMP-ON DETAIL 2

ARM SIZE D_1 in.	ARM SIZE ℄ in.	A in.	F in.	CONN. BOLTS No. ea.	CONN. BOLTS Dia in.	PIN BOLTS No. ea.	PIN BOLTS Dia in.
6.5	.179	12	6	4	1	2	5/8
7.5	.179	14	8	4	1	2	5/8
8.0	.179	14	8	4	1	2	5/8
9.0	.179	16	10	4	1	2	5/8
9.5	.179	18	12	6	1	3	5/8
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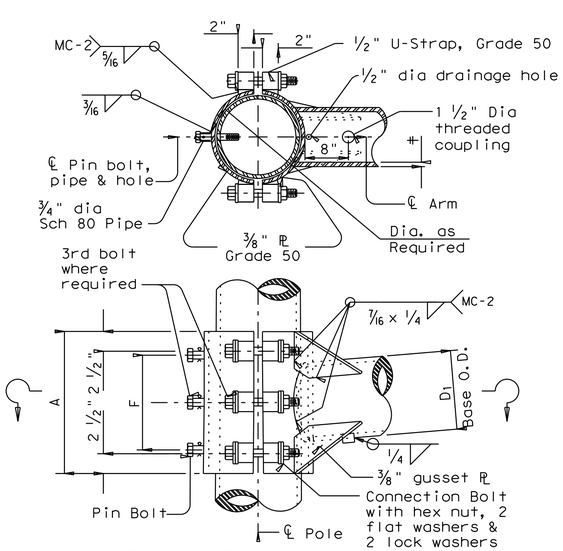
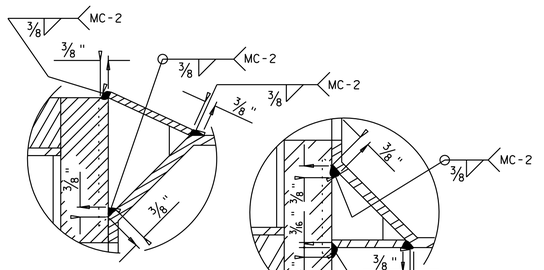
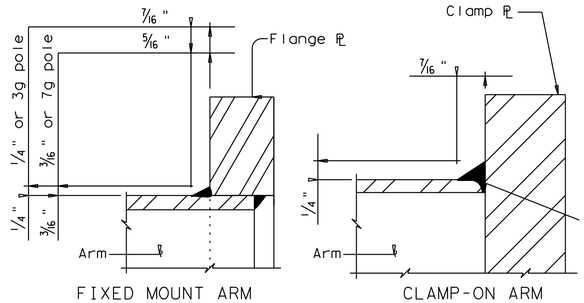


CLAMP-ON DETAIL 3



DETAIL A

DETAIL B



ARM BASE WELD DETAILS

MATERIALS	
Round Shafts or Polygonal Shafts ①	ASTM A595 Gr.A, A588, A1008 HSLAS Gr.50 Class 2, A1011 HSLAS Gr.50 Class 2, A572 Gr.50 or A1011 SS Gr.50 ②
Plates ①	ASTM A36, A588, or A572 Gr.50
Connection Bolts	ASTM A325 or A449, except where noted
Pin Bolts	ASTM A325
Pipe ①	ASTM A53 Gr.B, A501, A1008 HSLAS-F Gr.50, A1011 HSLAS-F Gr.50
Misc. Hardware	Galvanized steel or stainless steel or as noted

① ASTM A572, A1008 HSLAS, A1011 HSLAS, A1008 HSLAS-F, A1011 HSLAS-F or A1011 SS may have higher yield strengths but shall not have less elongation than the grade indicated.

② ASTM A1011 SS Gr.50 material shall also have a minimum elongation of 18 percent in 8 inches or 23 percent in 2 inches. Material thickness in excess of those stipulated under A1011 SS will be acceptable providing the material meets all other A1011 SS requirements and the requirements of this item.

GENERAL NOTES:

Clamp-on details are used for the second arm on dual mast arm assemblies. A Maximum 1 1/2" wide vertical slotted hole shall be cut in the front clamp plate to facilitate drainage during galvanizing. The slot shall be centered behind the arm and shall be no longer than the arm diameter minus 1"

Fixed mount details are used for single mast arm assemblies and for the first arm on dual mast arm assemblies.

Where duplicate parts occur on a detail, welds shown for one part shall apply to all similar parts on the detail.

Pin bolts are required to prevent rotation of clamp-on arms under design wind forces.

NOTE:

Pin bolts shall be A325 with threads excluded from the shear plane. Pin bolt and 3/4" dia pipe shall have 3/16" dia holes for a 1/8" dia galvanized cotter pin. Back clamp plate shall be furnished with a 3/4" dia hole for each pin bolt. An 11/16" dia hole for each pin bolt shall be field drilled through the pole after arm orientations have been approved by the Engineer.

Texas Department of Transportation
Traffic Operations Division

STANDARD ASSEMBLY FOR TRAFFIC SIGNAL SUPPORT STRUCTURES

MAST ARM CONNECTIONS

MA-C-12

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DN: MS	CK: JSY	DW: MMF	CK: JSY
REVISIONS 5-96 5-09 1-12	CONT	SECT	JOB	HIGHWAY
	DIST	COUNTY		SHEET NO.
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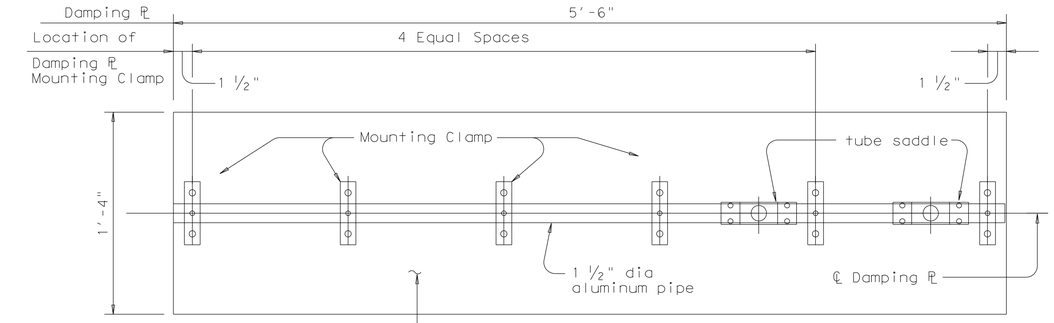
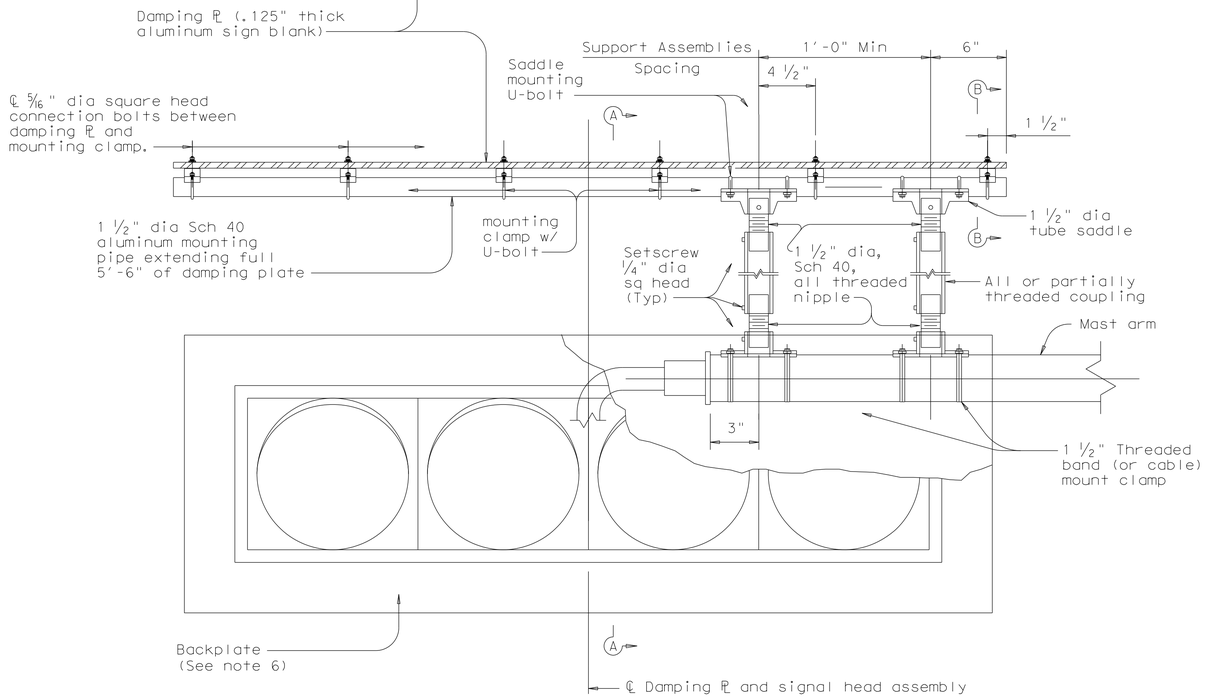


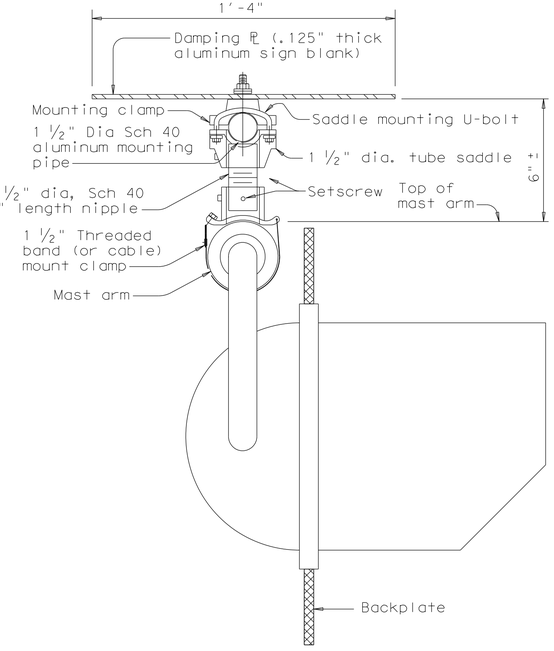
PLAN



ELEVATION

DAMPING PLATE MOUNTING DETAILS

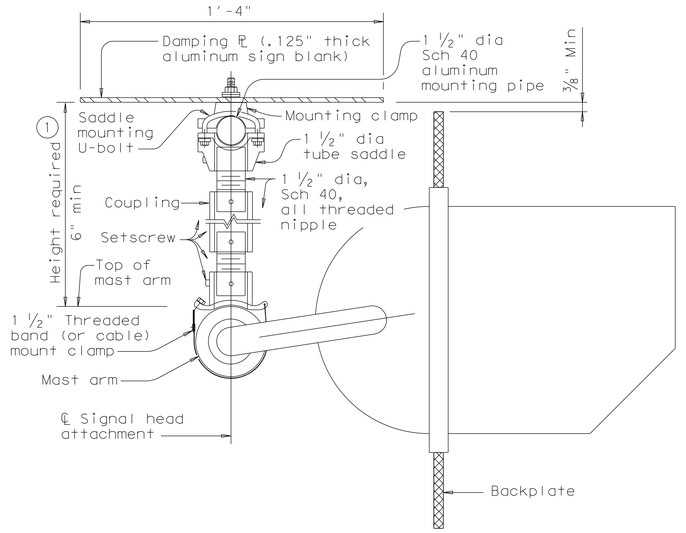
(Showing alternate placement of signal head)



SECTION A-A

(Showing standard placement of signal head)

(Mounting clamp U-bolt is not shown for clarity)

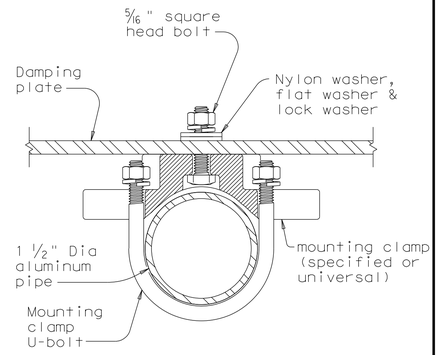


SECTION A-A

(Showing alternate placement of signal head)

(Mounting clamp U-bolt is not shown for clarity)

① Recommended supporting assemblies to achieve required height for horizontal section heads			
Height required	One nipple each length	Two nipples each length plus	One coupling each length
6"-6 ¾"	3"	-	-
7"-8 ½"	4"	-	-
9"-10 ½"	6"	-	-
11"-15 ½"	-	4"	5"
16"-24"	-	6"	10"



SECTION B-B

(Showing damping plate attachment)

GENERAL NOTES:

1. In accordance with the findings of TxDOT sponsored research, the installation of a damping plate in accordance with the details shown here at the end of signal mast arms of SMA and DMA standard structures reduces excessive harmonic vertical vibration, and thus fatigue damage. Any deviation from these details may reduce the effectiveness of this damping device.

2. Aluminum sign blank for damping plate will conform to Departmental Material Specifications DMS-7110. Materials for mast arm mounting clamp and tube saddle will be aluminum castings or aluminum alloys as in accordance with manufacturers' stipulations. Mounting pipe, pipe nipple and coupling will be aluminum alloy 6061-T6 or 6063-T6. Damping plate mounting clamp and u-bolt assemblies will conform to Standard sheet SMD(GEN). U-bolts for saddle mounting will have a minimum yield strength of 36 ksi.

3. Damping plate will be mounted horizontally. Position centerline of damping plate to align with centerline of mast arm or horizontal signal head assembly. Vertical clearance between signal head (with or without backing plate)and bottom of damping plate will be maintained as shown. The attachments shown here are examples only, other supporting details which meet both alignment and vertical clearance requirements are also acceptable.

4. Unless stipulated by the manufacturers, all steel parts will be galvanized finish in accordance with Standard Specification Item 445, "Galvanizing".

5. Contractor will verify applicable field dimensions before the installation.

6. Backplates are optional for traffic signals. When backplates are used, Backplates will have a 2-inch fluorescent yellow AASHTO Type B_{FL} or C_{FL} retroreflective border conforming to TxDOT DMS-8300 "Sign Face Materials." See Sheet TS-BP-20 for backplate details.

Texas Department of Transportation

Traffic Safety Division Standard

MAST ARM DAMPING PLATE DETAILS

MA-DPD-20

FILE: ma-dpd-20.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT January 2012	CONT	SECT	JOB	HIGHWAY
REVISIONS 6-20				
	DIST	COUNTY		SHEET NO.
				446

DISCLAIMER:
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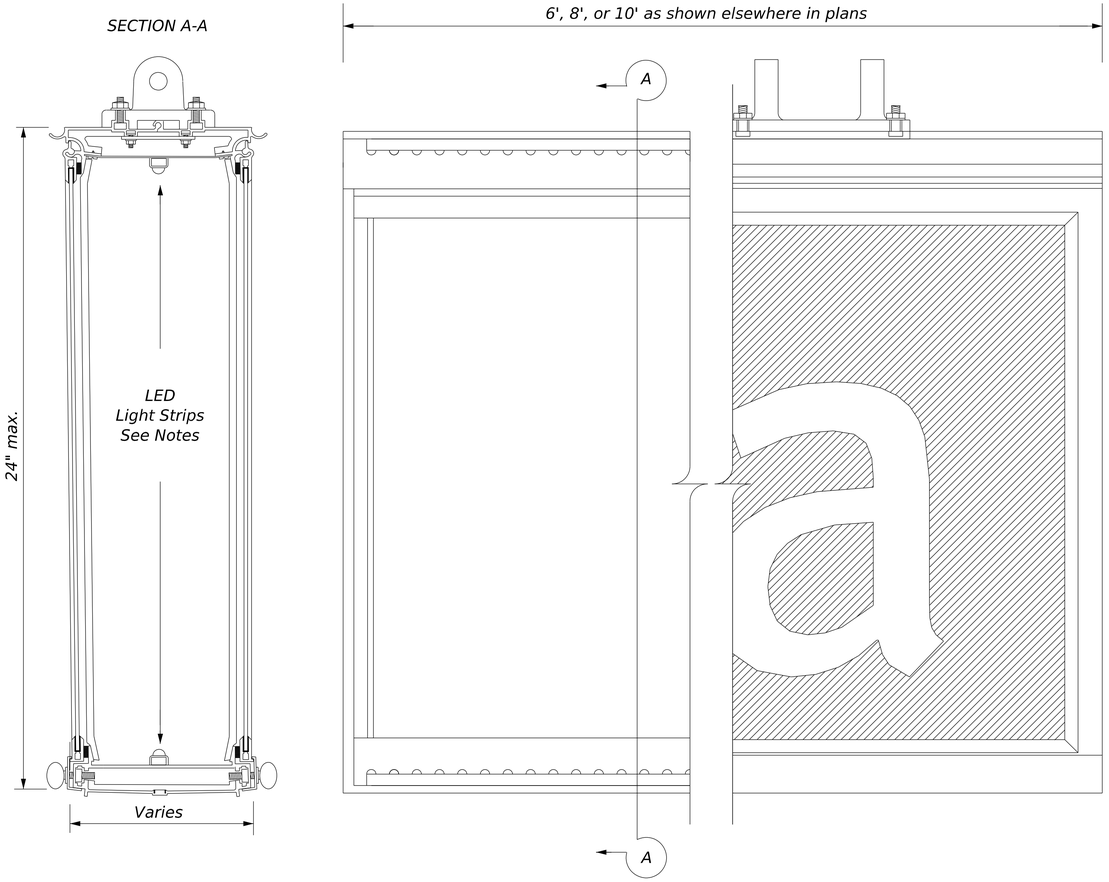
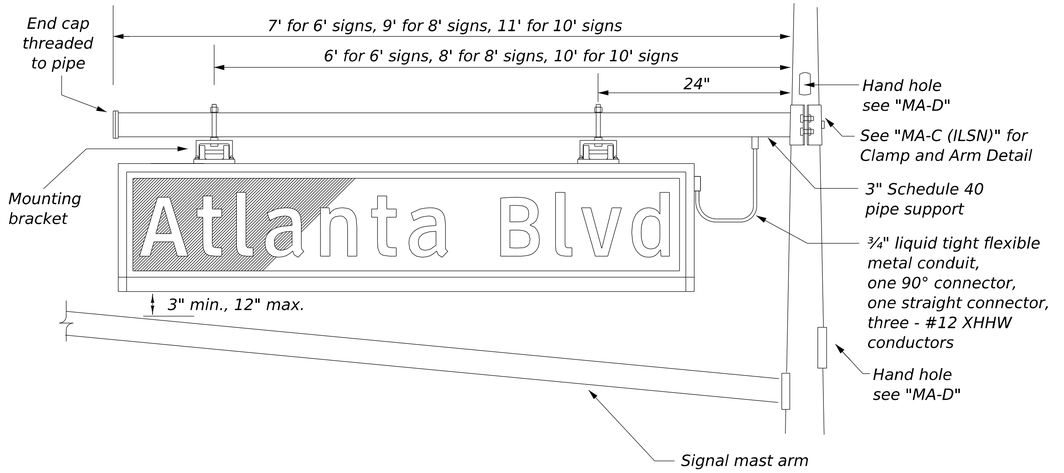
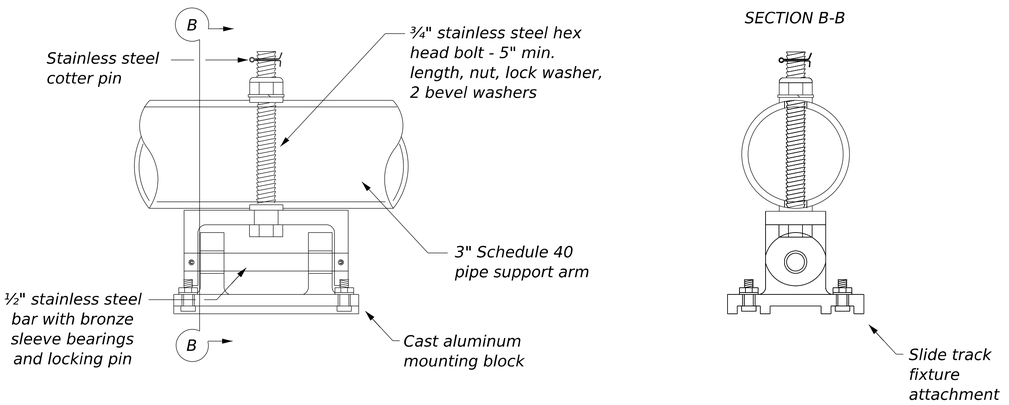
ILSN SIGN



SIGN MOUNTING



MOUNTING BRACKET



ILSN SIGN NOTES:

1. The maximum area of the sign shall not exceed 20 sq.ft.
2. Sign message shall be as shown elsewhere in the plans.
3. See Special Specification, "LED Internally Lighted Street Name Signs" for additional details.
4. Ensure letter font type and letter height are in accordance with the Standard Highway Sign Designs for Texas, D3-1 Overhead Mount.
5. Sign housing and LED configuration may vary by manufacturer.

ILSN SIGN BID ITEM DESCRIPTIONS

ILSN (X X)

INTERNALLY LIGHTED STREET NAME SIGN

SIGN LENGTH
- 6 = 6 ft.
- 8 = 8 ft.
- 10 = 10 ft.

FACES
- S = Single
- D = Double

Texas Department of Transportation

Traffic Safety Division Standard

INTERNALLY LIGHTED STREET NAME (ILSN) SIGN

ILSN-25

FILE: ilsn-25.dgn	DN: TxDOT	CK:TxDOT	DW: TxDOT	CK:TxDOT
© TxDOT March 2025	CONT	SECT	JOB	HIGHWAY
REVISIONS				
8-95 3-25	DIST	COUNTY		SHEET NO. 447

DATE:
FILE:

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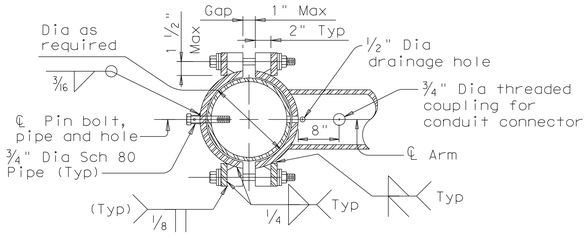
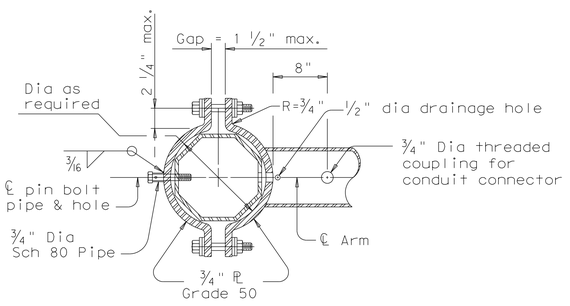
DATE: 9/10/2025
FILE: H:\Projects\514423\04\Design\Civil\Standards\Traffic Signals\macilsn.dgn

TABLE OF DIMENSIONS for ILSN Support Arm Clamp-on Details 1, 2 and 3						
ILSN ARM SIZE	A	F	CONN. BOLTS		PIN BOLTS	
			No.	Dia	No.	Dia
	in.	in.	ea.	in.	ea.	in.
3 in. dia Schedule 40 Pipe	10	4	4	¾	2	⅝



SECTION A-A



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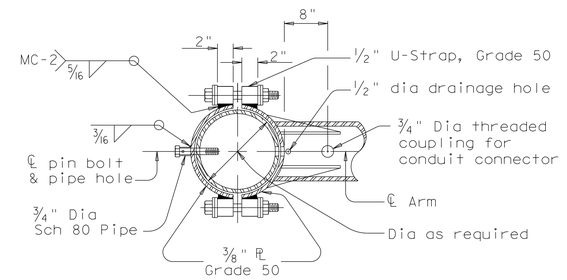

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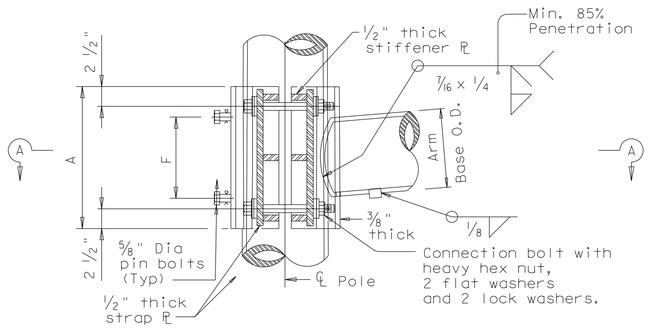
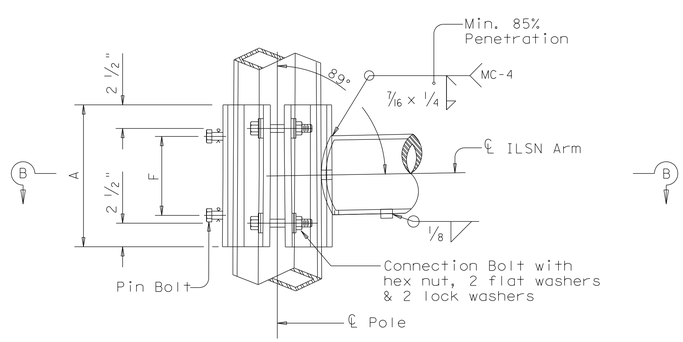
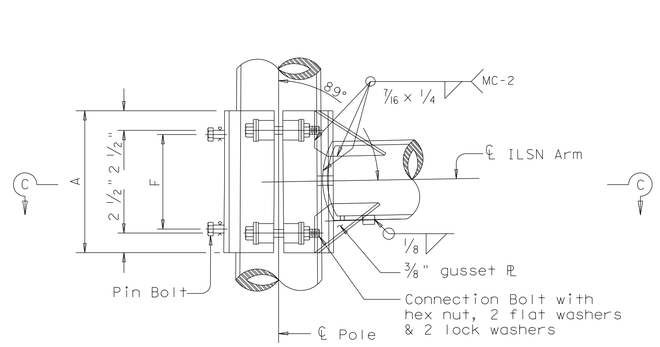


ILSN CLAMP-ON DETAIL 1



ILSN CLAMP-ON DETAIL 2



ILSN CLAMP-ON DETAIL 3

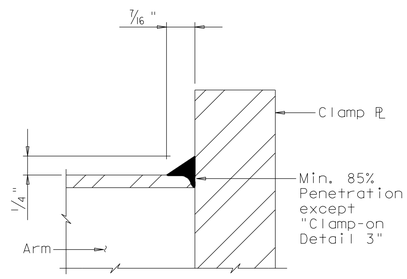
GENERAL NOTES:

Clamp-on details shall be used for ILSN support arm assemblies. A 1 ½" inch diameter hole shall be cut in the front clamp plate for wiring access. A matched hole shall be field drilled through the pole to provide wire access after arm is oriented. Deburr both holes.

Where duplicate parts occur on a detail, welds shown for one part shall apply to all similar parts on the details.

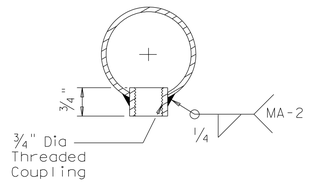
Pin bolts are required to prevent rotation of clamp-on arms under design wind forces.

NOTE:
Pin bolts shall be A325 with threads excluded from the shear plane. Pin bolt and ¾" dia pipe shall have 3/16" dia holes for a ⅛" dia galvanized cotter pin. Back clamp plate shall be furnished with a ¾" dia hole for each pin bolt. An 11/16" dia hole for each pin bolt shall be field drilled through the pole after arm orientations have been approved by the Engineer.



CLAMP-ON ARM

ARM BASE WELD DETAILS



ILSN ARM COUPLING DETAIL

Texas Department of Transportation
Traffic Operations Division

STANDARD ASSEMBLY FOR TRAFFIC SIGNAL SUPPORT STRUCTURES

MAST-ARM CONNECTIONS

MA-C(ILSN)-12

© TxDOT August 1995

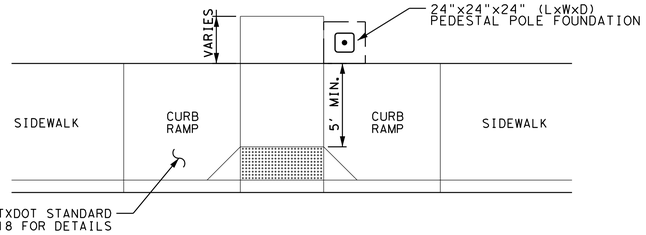
DN: MS	CK: JSY	DW: MMF	CK: JSY

REVISIONS
5-96
1-12

CONT	SECT	JOB	HIGHWAY

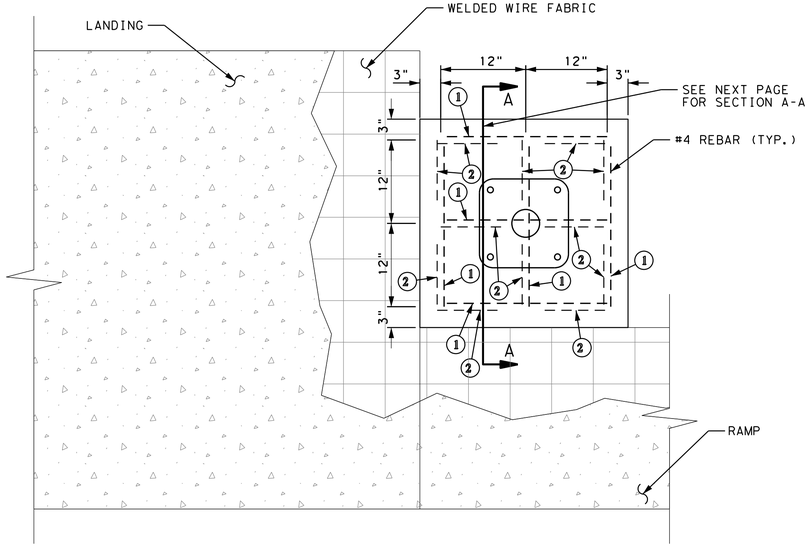
DIST	COUNTY	SHEET NO.
		448

126B



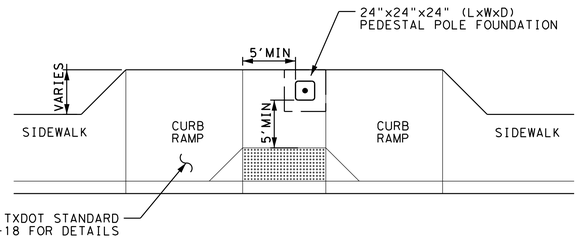
TYPICAL 24" x 24" FOUNDATION WIDE SIDEWALK DETAIL

NOT TO SCALE



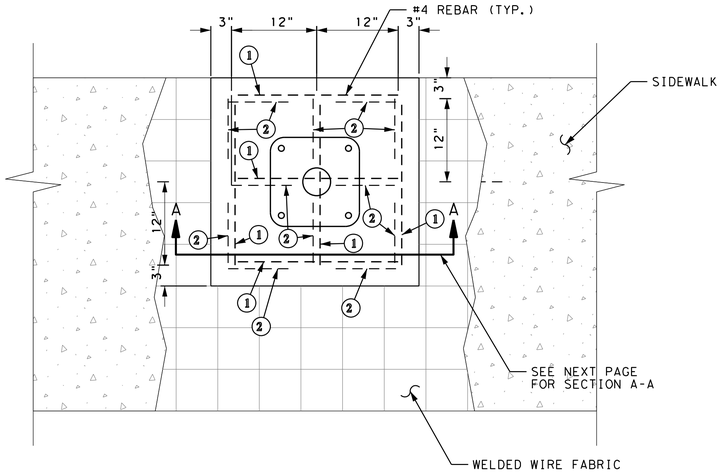
PEDESTAL POLE FOUNDATION PLAN VIEW

NOT TO SCALE



TYPICAL 24" x 24" FOUNDATION NARROW SIDEWALK DETAIL

NOT TO SCALE



PEDESTAL POLE FOUNDATION PLAN VIEW

NOT TO SCALE

KEYNOTES

1. 18"
2. 9" / 18"
3. 12"

NOTES:
1. ALL REBAR SHALL BE #4 BARS.
2. SEE SHEET 2 OF 2 FOR SECTION A-A

DESIGN

STATE OF TEXAS — GRANT R WUEBBEN — 129717 — LICENSED PROFESSIONAL ENGINEER

GRANT R WUEBBEN, P.E. — 9/16/2025 DATE

APPROVAL

STATE OF TEXAS — JUSTIN W. CLARK — 118715 — LICENSED PROFESSIONAL ENGINEER

JUSTIN W. CLARK, P.E. — 9/16/2025 DATE

NO.	REVISION	DATE

GEORGETOWN TEXAS *more than welcome*

PAPE-DAWSON ENGINEERS

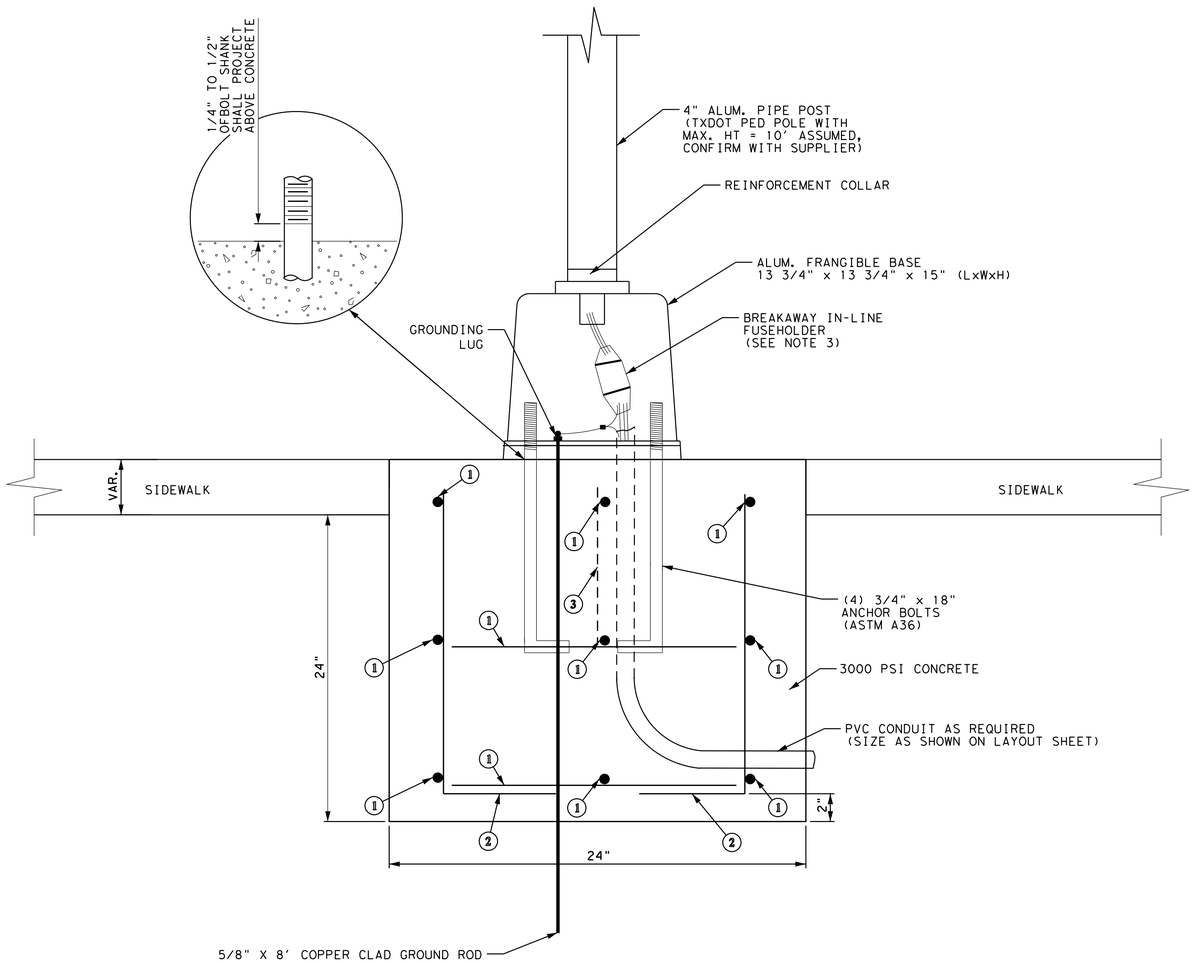
AUSTIN | SAN ANTONIO | HOUSTON | FORT WORTH | DALLAS
10801 N MOPAC EXPY, BLDG 3, STE 200 | AUSTIN, TX 78759 | 512.454.8711
TEXAS ENGINEERING FIRM #470 | TEXAS SURVEYING FIRM #10028800

WOLF RANCH PKWY / MEMORIAL DR

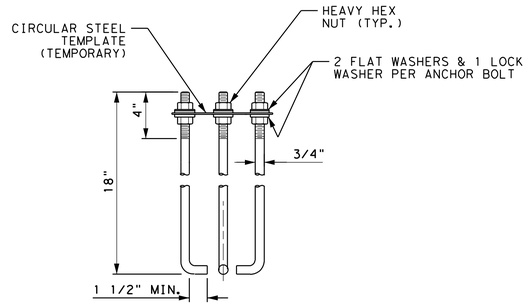
PEDESTAL POLE SPECIAL FOUNDATION

CITY JOB No.
JOB NO. 51423-04
DATE 9/16/2025
DESIGNER
CHECKED DRAWN

SHEET NO. 449



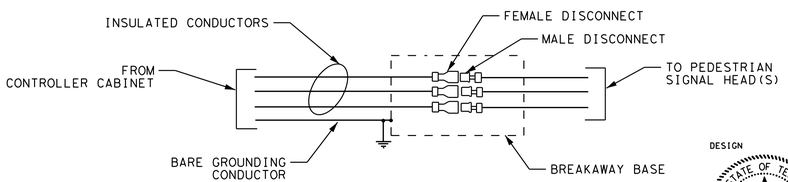
SECTION A-A
NOT TO SCALE



HOOKED ANCHOR
NOT TO SCALE

KEYNOTES

1. 18"
2. 9" × 18"
3. 12"



BREAKAWAY IN-LINE FUSEHOLDERS
NOT TO SCALE

NOTES:
1. THE PEDESTAL POLE ASSEMBLY DEPICTED ON THIS SHEET IS DESIGNED FOR SIGNAL HEADS WHERE ELECTRICAL POWER IS NEEDED WITH A BREAKAWAY POLE.
2. POLE SHAFT SHALL BE ONE PIECE, SCHEDULE 40 ALUMINUM PIPE, ASTM B429 OR B221 (ALLOY 6061-T6 ONLY). ALUMINUM CONDUIT WILL NOT DEVELOP THE NECESSARY STRENGTH AND WILL NOT BE ALLOWED.
3. ALL ELECTRICAL CONNECTORS FOR BREAKAWAY POLES SHALL BE WATER TIGHT BREAKAWAY FUSEHOLDERS (BUCHANNAN 65U, BUSSMANN HEBW, LETTELFUSE LEB, HMC FLOOD-SEAL, FERRAZ-SHAWMUT, OR EQUAL). FUSES SHALL BE 10 AMP TIME DELAY.
4. CONDUIT IN FOUNDATION AND WITHIN 6 INCHES OF FOUNDATION IS SUBSIDIARY TO THE ITEM, "PEDESTAL POLE ASSEMBLY."
5. PER MANUFACTURER'S RECOMMENDATIONS, ENGAGE ALL THREADS ON THE PEDESTAL POLE BASE AND PIPE UNLESS THE PIPE IS FULLY SEATED INTO BASE.

DESIGN

STATE OF TEXAS · GRANT R WUEBBEN · 129717 · LICENSED PROFESSIONAL ENGINEER

GRANT R WUEBBEN, P.E. — 9/16/2025 DATE

APPROVAL

STATE OF TEXAS · JUSTIN W. CLARK · 118715 · LICENSED PROFESSIONAL ENGINEER

JUSTIN W. CLARK, P.E. — 9/16/2025 DATE

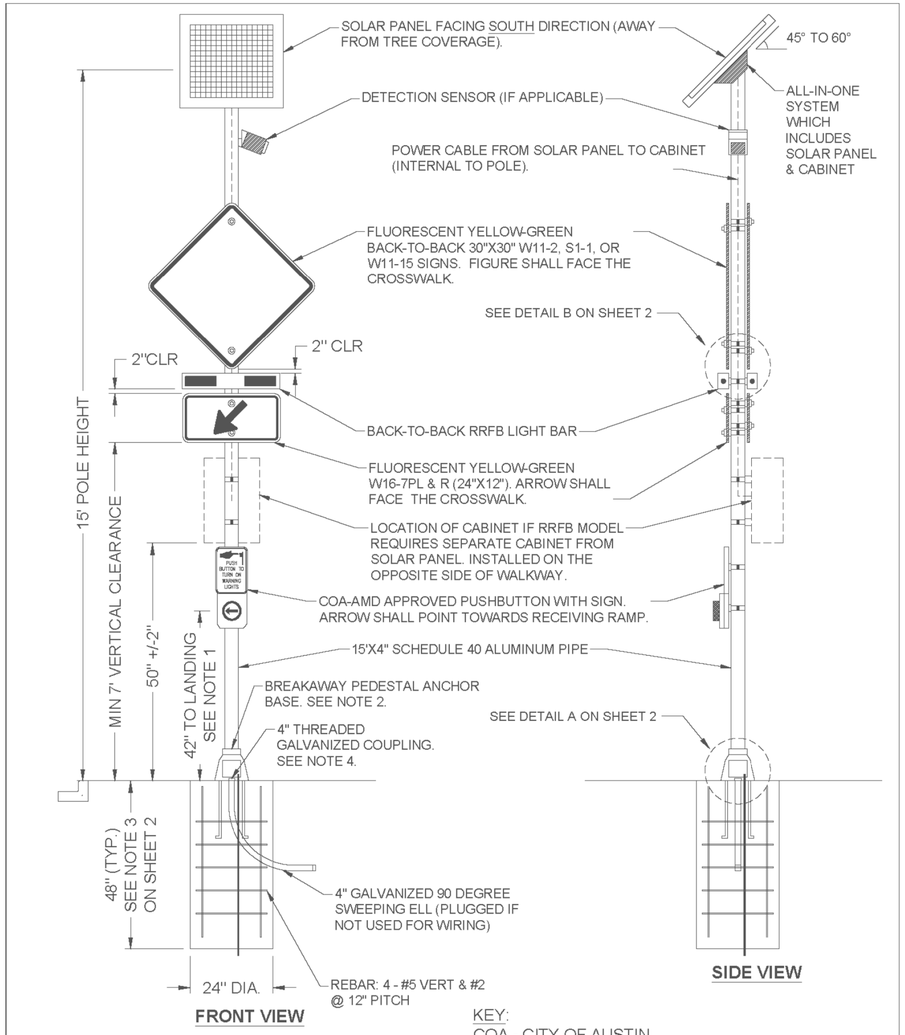
NO.	REVISION	DATE

GEORGETOWN TEXAS *more than welcome*

PAPE-DAWSON ENGINEERS
AUSTIN | SAN ANTONIO | HOUSTON | FORT WORTH | DALLAS
10801 N MOPAC EXPY, BLDG 3, STE 200 | AUSTIN, TX 78759 | 512.454.8711
TEXAS ENGINEERING FIRM #470 | TEXAS SURVEYING FIRM #10028800

WOLF RANCH PKWY / MEMORIAL DR
PEDESTAL POLE
SPECIAL FOUNDATION

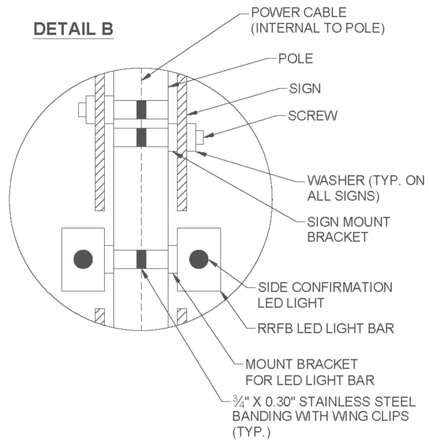
CITY JOB No.
JOB NO. 51423-04
DATE 9/16/2025
DESIGNER
CHECKED DRAWN
SHEET NO. 450



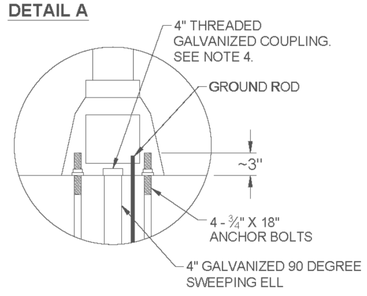
KEY:
COA - CITY OF AUSTIN
AMD - ARTERIAL MANAGEMENT DIVISION
RRFB - RECTANGULAR RAPID FLASHING BEACON

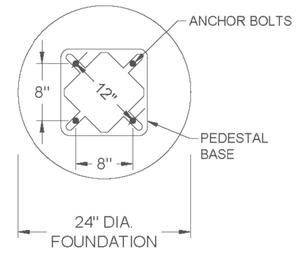
CITY OF AUSTIN DEPARTMENT OF PUBLIC WORKS	SOLAR POWERED RECTANGULAR RAPID FLASHING BEACON	
08/08/2023 ADOPTED	THE ARCHITECT/ENGINEER ASSUMES RESPONSIBILITY FOR APPROPRIATE USE OF THIS STANDARD.	STANDARD NO. 832-3 1 OF 2

DETAIL B



DETAIL A





BOLT CIRCLE DIMENSION

NOTES:

1. PUSH BUTTON HEIGHT IS MEASURED FROM THE ADJACENT LANDING NOT FROM THE BOTTOM OF THE POLE.
2. ENGAGE ALL THREADS ON THE PEDESTAL BASE AND POLE TO PREVENT MOVEMENT OF THE POLE FROM HIGH WINDS.
3. ALTERNATE FOUNDATION DIMENSIONS MAY BE USED UPON CITY ENGINEER'S APPROVAL.
4. ENSURE COUPLING IS LEVEL AND PLUMB AND EXTENDS ABOVE THE SURFACE.

CITY OF AUSTIN DEPARTMENT OF PUBLIC WORKS	SOLAR POWERED RECTANGULAR RAPID FLASHING BEACON	
08/08/2023 ADOPTED	THE ARCHITECT/ENGINEER ASSUMES RESPONSIBILITY FOR APPROPRIATE USE OF THIS STANDARD.	STANDARD NO. 832-3 2 OF 2

NO.	REVISION	DATE

GEORGETOWN TEXAS *more than welcome*

PAPE-DAWSON ENGINEERS
AUSTIN I SAN ANTONIO I HOUSTON I FORT WORTH I DALLAS
10801 N MOPAC EXPY, BLDG 3, STE 200 I AUSTIN, TX 78759 I 512.454.8711
TEXAS ENGINEERING FIRM #470 I TEXAS SURVEYING FIRM #10028800

WOLF RANCH PKWY / MEMORIAL DR

AUS832-3

CITY JOB No.
JOB NO. 51423-04
DATE 9/10/2025
DESIGNER
CHECKED DRAWN

SHEET NO. 451



MATCHLINE - SEE SHEET 453 OF 462

Wolf Ranch Parkway & Memorial Drive Expansions: Water Quality Treatment Summary

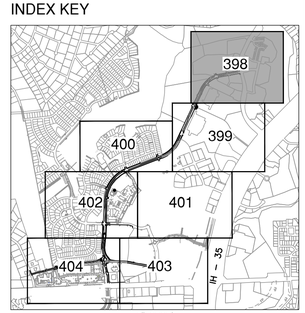
PBMP	Total Watershed Area (ac.)	Existing I.C. (ac.)	Proposed I.C. (ac.)	Total I.C. (ac.)	80% TSS Removal Required (lb.)	85% TSS Removal Required (lb.)	TSS Removal Provided (lb.)	Notes
MEMORIAL DRIVE - BATCH POND 2	3.08	--	0.83	0.83	722	768	768	
TOTAL WOLF RANCH SEC. 1A - VFS 5	1.31	--	0.68	0.68	592	629	629	NO CHANGE FROM APPROVED EAPP ID NO. 11-15032001
TOTAL MEMORIAL DRIVE BASIN	**3.08**	**--**	**1.51**	**1.51**	**1,314**	**1,396**	**1,397**	**DOES NOT TAKE CREDIT FOR EXISTING MEMORIAL DRIVE IC.**
TOTAL WOLF RANCH SECTION - 1A - WET POND BASIN	**61.23**	**0.55**	**34.67**	**34.12**	**29,698**	**31,554**	**32,618**	**EXISTING IC IS FROM WOLF 1A HOMESTEAD**
TOTAL WOLF RANCH TOWN CENTER - WET POND A BASIN*	**57.2**	**--**	**44.00**	**44.00**	**31,077**		**33,427**	**NO CHANGE FROM THE APPROVED EAPP ID NO. 03082601. REQUIRED TSS REMOVAL WAS DERIVED USING OLD CALCS.**
TOTAL WOLF RANCH TOWN CENTER - WET POND B BASIN*	**63.6**	**--**	**47.00**	**47.00**	**31,598**		**33,986**	
WOLF LAKES VILLAGE SEC. 1 PH. 1 & SEC. 2 - POND 1	129.83	--	98.56	98.56	85,787	91,148	91,148	
WOLF LAKES VILLAGE SEC. 1 PH. 1 & SEC. 2 - POND 1 - OVERTREAT	0.31	--	0.31	0.31	269	286	286	
TOTAL WOLF LAKES SEC. 1, PH. 1 & SEC. 2 - POND 1 BASIN	**129.83**	**--**	**98.87**	**98.87**	**86,056**	**91,434**	**91,434**	**NO CHANGE FROM THE APPROVED EAPP ID NO. 11003027**
TOTAL WOLF LAKES VILLAGE SEC. 1 - PH. 2 - POND 1 BASIN	**35.81**	**--**	**25.64**	**25.64**	**22,317**	**23,712**	**23,712**	**NO CHANGE FROM THE APPROVED EAPP ID NO. 11002713**
WOLF RANCH SEC. 2-BATCH DETENTION POND 1	40.93	1.00	24.19	23.19	20,185	21,446	23,961	**EXISTING IC FROM WOLF HOMESTEAD & MEMORIAL DRIVE**
OVERTREAT POND 1	--	--	2.72	2.72	2,367	2,515	--	
STORMTROOPER B2 WEST (SWAQ-110)	1.27	--	0.79	0.79	688	731	750	
STORMTROOPER B2 EAST (SWAQ-110)	1.19	--	0.84	0.84	731	777	796	
TOTAL WOLF RANCH SEC. 1A - VFS 5	0.49	--	0.29	0.29	252	268	268	
TOTAL WOLF RANCH SEC. 2 - POND 1 BASIN	**43.88**	**1.00**	**28.83**	**27.83**	**24,224**	**25,737**	**25,775**	
TOTAL BLUEBONNET PLAZA BATCH DETENTION POND BASIN	**33.96**	**--**	**13.35**	**13.35**	**11,620**	**12,346**	**12,346**	**NO CHANGE FROM THE APPROVED EAPP ID NO. 11001264**
RIVERY POND A*	86.33	10.76	30.96	20.20	20,118		21,633	
STORMTROOPER C1 WEST (SWAQ-40)	0.85	0.32	0.39	0.39	339	361	382	**NO CHANGE FROM THE APPROVED EAPP ID NO. 11-02041701. REQUIRED TSS REMOVAL WAS DERIVED USING OLD CALCS. STORMTROOPERS IN THIS BASIN ONLY TREAT THE ADDITIONAL IC FROM THE WRP EXPANSION.**
STORMTROOPER C2 EAST (SWAQ-25)	1.13	0.43	0.22	0.22	191	203	222	
TOTAL RIVERY POND A BASIN	**88.31**	**10.76**	**31.57**	**20.81**	**18,113**	**19,245**	**22,237**	
RIVERY POND B*	66.28	--	50.27	50.27	37,672		40,522	
STORMTROOPER D1 WEST (SWAQ-40)	0.89	0.37	0.44	0.44	383	407	420	**NO CHANGE FROM THE APPROVED EAPP ID NO. 11-02041701. REQUIRED TSS REMOVAL WAS DERIVED USING OLD CALCS. STORMTROOPERS IN THIS BASIN ONLY TREAT THE ADDITIONAL IC FROM THE WRP EXPANSION.**
STORMTROOPER D2 EAST (SWAQ-40)	1.72	0.55	0.44	0.44	383	407	430	
TOTAL RIVERY POND B BASIN	**68.89**	**0.00**	**51.15**	**51.15**	**44,521**	**47,304**	**41,372**	
TOTAL PROJECT	***460.96***	***12.31***	***376.59***	***364.28***	***300,538***	***315,404***	***318,304***	

*CALCULATED UNDER PREVIOUS TCEQ TSS GUIDANCE

WATER QUALITY POND VOLUME SUMMARY

POND	VOLUME REQUIRED (CF)	VOLUME PROVIDED (CF)	NOTES
RETROFITTED WOLF RANCH SECTION 2 - BATCH DETENTION POND 1	221,386	226,575	
EXISTING BLUEBONNET PLAZA - BATCH DETENTION POND	77,890	100,858	*No change in IC from previously approved pond design
MEMORIAL DRIVE - BATCH DETENTION POND 2	4,871	7,804	
EXISTING WOLF LAKES SEC. 1 PH. 1 & SEC. 2 - WET POND 1 (2021-4-CON)	PERMANENT POOL: 426,021	PERMANENT POOL: 450,170	*No change in IC from previously approved pond design
	WQV: 780,439	WQV: 780,928	
EXISTING WOLF LAKES VILLAGE SEC. 1 - PH. 2 - WET POND 1 (2021-16-CON)	PERMANENT POOL: 130,305	PERMANENT POOL: 226,297	
	WQV: 238,893	WQV: 335,946	
EXISTING WOLF RANCH TOWN CENTER - WET POND A	PERMANENT POOL: 144,449	PERMANENT POOL: 150,148	*No change in IC from previously approved pond design
	WQV: 288,898	WQV: 300,296	

INDEX KEY



1": 2000'

STATE OF TEXAS
STEVEN S. CRAUFORD
92677
LICENSED
PROFESSIONAL ENGINEER

09/12/2025

NO.	REVISION	DATE

GEORGETOWN TEXAS
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TBPE FIRM REGISTRATION #470 | TBPLS FIRM REGISTRATION #10028801

CITY OF GEORGETOWN, TEXAS
WOLF RANCH PKWY / MEMORIAL DR

WATER QUALITY TREATMENT SUMMARY 1 OF 11

CITY JOB No.
JOB NO. 51423-00
DATE 9/12/2025
DESIGNER AK
CHECKED SC DRAWN AK
1 11
SHEET 452

Date: Sep 12, 2025, 10:32am User ID: cashatz
File: I:\Projects\514\23\001\301 Construction Documents\Civil\WQ51423-00.dwg

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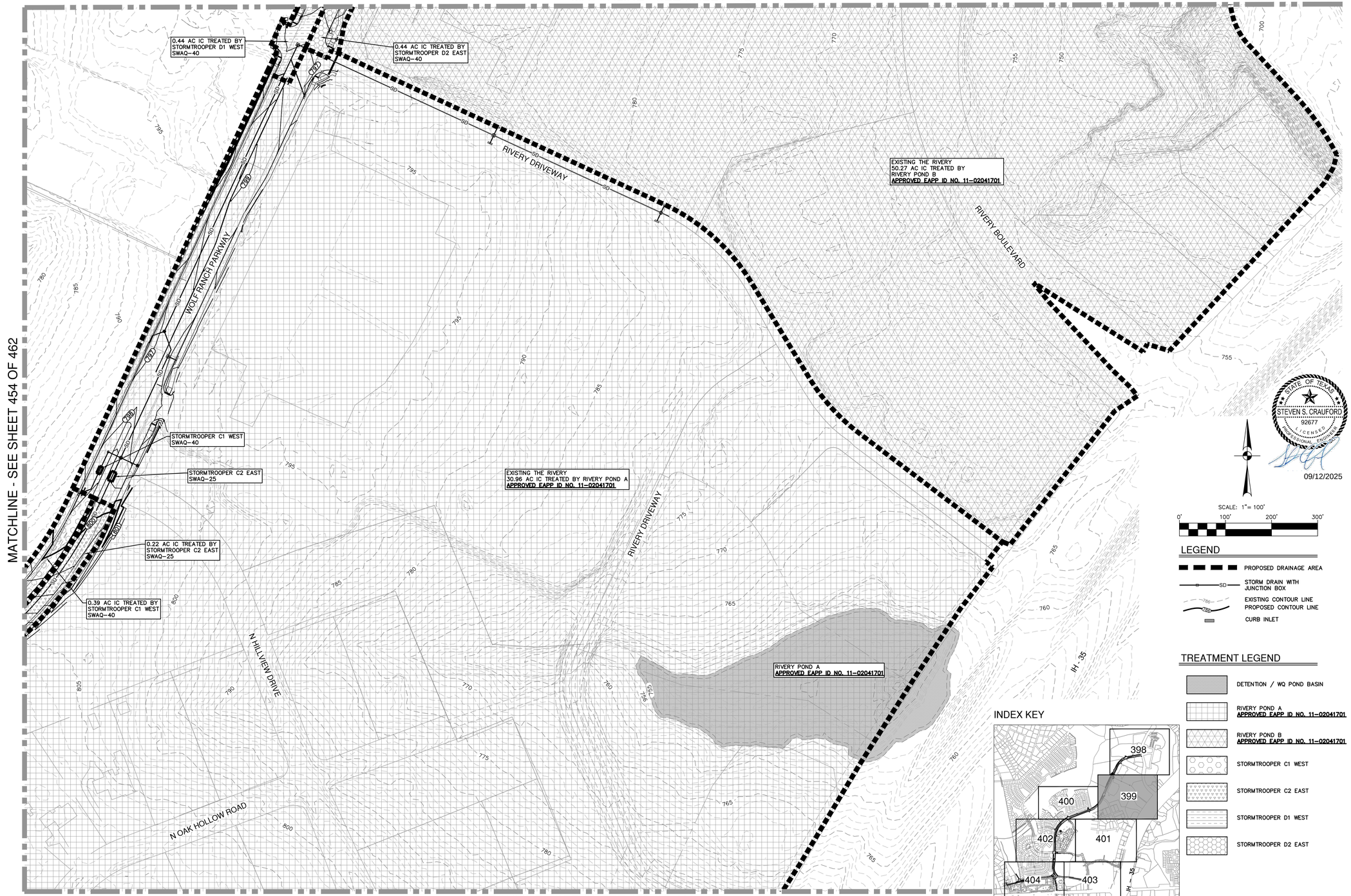
MATCHLINE - SEE SHEET 452 OF 462

MATCHLINE - SEE SHEET 454 OF 462



MATCHLINE - SEE SHEET 455 OF 462

09/12/2025

SCALE: 1"= 100'

0' 100' 200' 300'

LEGEND

- PROPOSED DRAINAGE AREA
- SD — STORM DRAIN WITH JUNCTION BOX
- EXISTING CONTOUR LINE
- PROPOSED CONTOUR LINE
- CURB INLET

TREATMENT LEGEND

- DETENTION / WQ POND BASIN
- RIVERY POND A APPROVED EAPP ID NO. 11-02041701
- RIVERY POND B APPROVED EAPP ID NO. 11-02041701
- STORMTROOPER C1 WEST
- STORMTROOPER C2 EAST
- STORMTROOPER D1 WEST
- STORMTROOPER D2 EAST

INDEX KEY

1": 2000'

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CITY OF GEORGETOWN, TEXAS
WOLF RANCH PKWY / MEMORIAL DR
WATER QUALITY TREATMENT SUMMARY 2 OF 11

CITY JOB No.
JOB NO. 51423-00
DATE 9/12/2025
DESIGNER AK
CHECKED SC DRAWN AK

SHEET 2 11
453

Date: Sep 12, 2025, 11:14am User ID: cshatz
File: H:\Projects\514\23\00\30\Construction Documents\Civil\W051423-00.dwg

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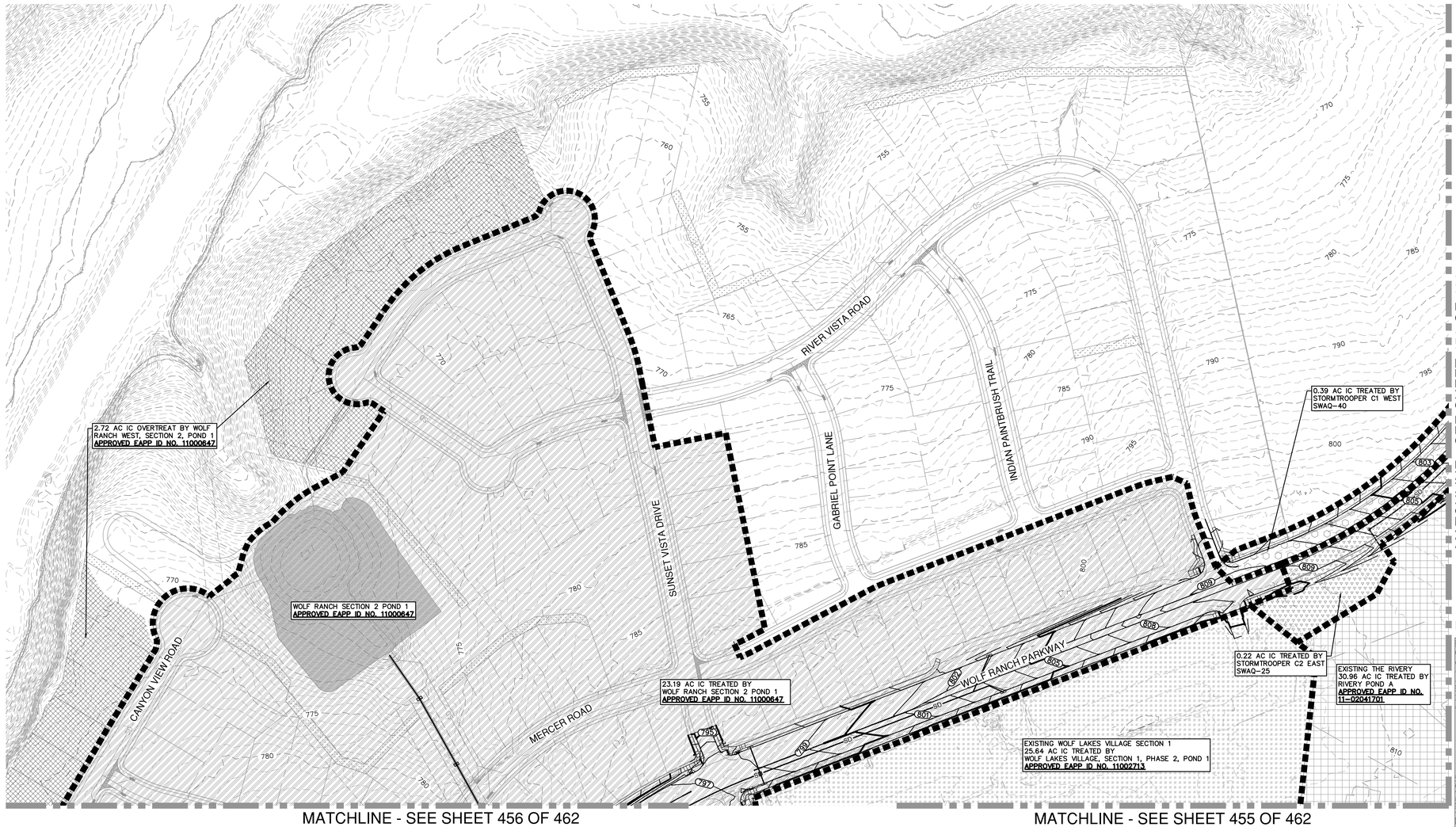

SCALE: 1"= 100'

0' 100' 200' 300'

LEGEND

- PROPOSED DRAINAGE AREA
- STORM DRAIN WITH JUNCTION BOX
- EXISTING CONTOUR LINE
- PROPOSED CONTOUR LINE
- CURB INLET

TREATMENT LEGEND

- DETENTION / WQ POND BASIN
- RIVERY POND A APPROVED EAPP ID NO. 11-02041701
- STORMTROOPER C1 WEST
- STORMTROOPER C2 EAST
- WOLF RANCH SECTION 2 POND 1 APPROVED EAPP ID NO. 11000647
- WOLF LAKES VILLAGE SECTION 1, PHASE 2, POND 1 APPROVED EAPP ID NO. 11002713
- AREAS OF OVERTREAT
- VEGETATIVE FILTER STRIP

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92677
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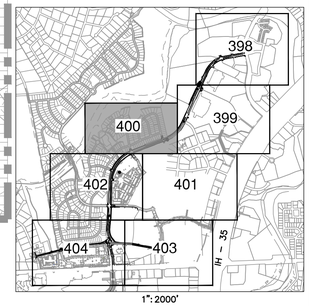
INDEX KEY 09/12/2025



1": 2000'

NO.	REVISION	DATE

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CITY OF GEORGETOWN, TEXAS
WOLF RANCH PKWY / MEMORIAL DR
WATER QUALITY TREATMENT SUMMARY 3 OF 11

CITY JOB No.
JOB NO. 51423-00
DATE 9/12/2025
DESIGNER AK
CHECKED SC DRAWN AK
SHEET 454 3 11

Date: Sep 12, 2025, 11:15am User ID: cashetz
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MATCHLINE - SEE SHEET 454 OF 462

MATCHLINE - SEE SHEET 453 OF 462

MATCHLINE - SEE SHEET 456 OF 462

EXISTING THE RIVERY
30.96 AC IC TREATED BY RIVERY POND A
APPROVED EAPP ID NO. 11-02041701

98.56 AC IC TREATED BY
WOLF LAKES VILLAGE SECTION 1,
PHASE 1 & SECTION 2 - POND 1
APPROVED EAPP ID NO. 11003027

WATER QUALITY DETENTION WET POND 1
APPROVED EAPP ID NO. 11003027

N OAK HOLLOW ROAD

N HILLVIEW DRIVE

RIVER HILLS DRIVE

LEGACY CROSSING

WOLF LAKES DRIVE

BELLA LAGO DRIVE

IH - 35

SCALE: 1" = 100'

0' 100' 200' 300'

LEGEND

- PROPOSED DRAINAGE AREA
- SD — STORM DRAIN WITH JUNCTION BOX
- EXISTING CONTOUR LINE
- PROPOSED CONTOUR LINE
- CURB INLET

TREATMENT LEGEND

- DETENTION / WQ POND BASIN
- RIVERY WET POND A
  APPROVED EAPP ID NO. 11-02041701
- WOLF LAKES VILLAGE SECTION 1,
  PHASE 2, POND 1
  APPROVED EAPP ID NO. 1102713
- WOLF LAKES VILLAGE SECTION 1,
  PHASE 1 & SECTION 2 - POND 1
  APPROVED EAPP ID NO. 11003027

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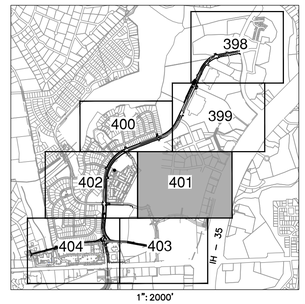
INDEX KEY 09/12/2025



1": 2000'

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CITY OF GEORGETOWN, TEXAS
WOLF RANCH PKWY / MEMORIAL DR
WATER QUALITY TREATMENT SUMMARY 4 OF 11

CITY JOB No.
JOB NO. 51423-00
DATE 9/12/2025
DESIGNER AK
CHECKED SC DRAWN AK
4 11
SHEET 455

Date: Sep 12, 2025, 11:16am User ID: cathatz
File: K:\Proj\514\23\00\301 Construction Documents\Civil\WQ51423-00.dwg

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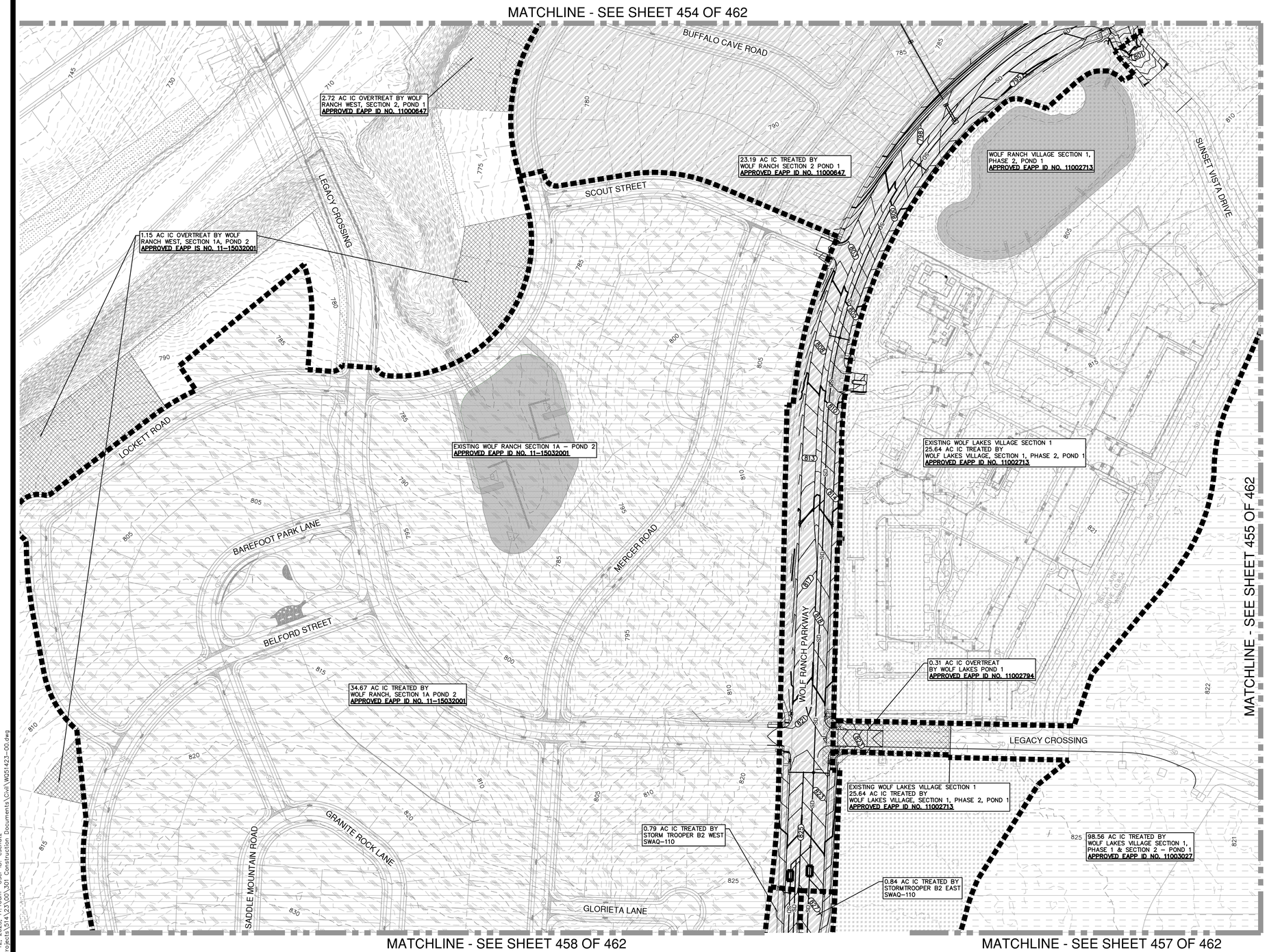

SCALE: 1"= 100'

0' 100' 200' 300'

LEGEND

- PROPOSED DRAINAGE AREA
- STORM DRAIN WITH JUNCTION BOX
- EXISTING CONTOUR LINE
- PROPOSED CONTOUR LINE
- CURB INLET

TREATMENT LEGEND

- DETENTION / WQ POND BASIN
- WOLF LAKES VILLAGE SECTION 1, PHASE 2, POND 1 APPROVED EAPP ID NO. 11002713
- WOLF RANCH SECTION 2 POND 1 APPROVED EAPP ID NO. 11000647
- WOLF LAKES VILLAGE SECTION 1, PHASE 1 & SECTION 2 – POND 1 APPROVED EAPP ID NO. 11003027
- WOLF RANCH SECTION 1A APPROVED EAPP ID NO. 11-15032001
- AREAS OF OVERTREAT

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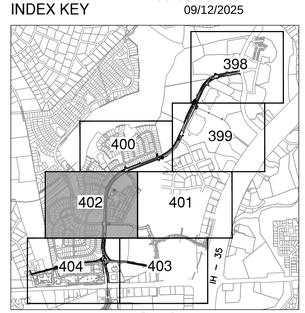
09/12/2025

INDEX KEY



1": 2000'

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CITY OF GEORGETOWN, TEXAS
WOLF RANCH PKWY / MEMORIAL DR
WATER QUALITY TREATMENT SUMMARY 5 OF 11

CITY JOB No.
JOB NO. 51423-00
DATE 9/12/2025
DESIGNER AK
CHECKED SC DRAWN AK
5 11
SHEET 456

Date: Sep 12, 2025, 11:16am User ID: cschatz
File: H:\Projects\514\23\00\301 Construction Documents\Civil\WQ51423-00.dwg

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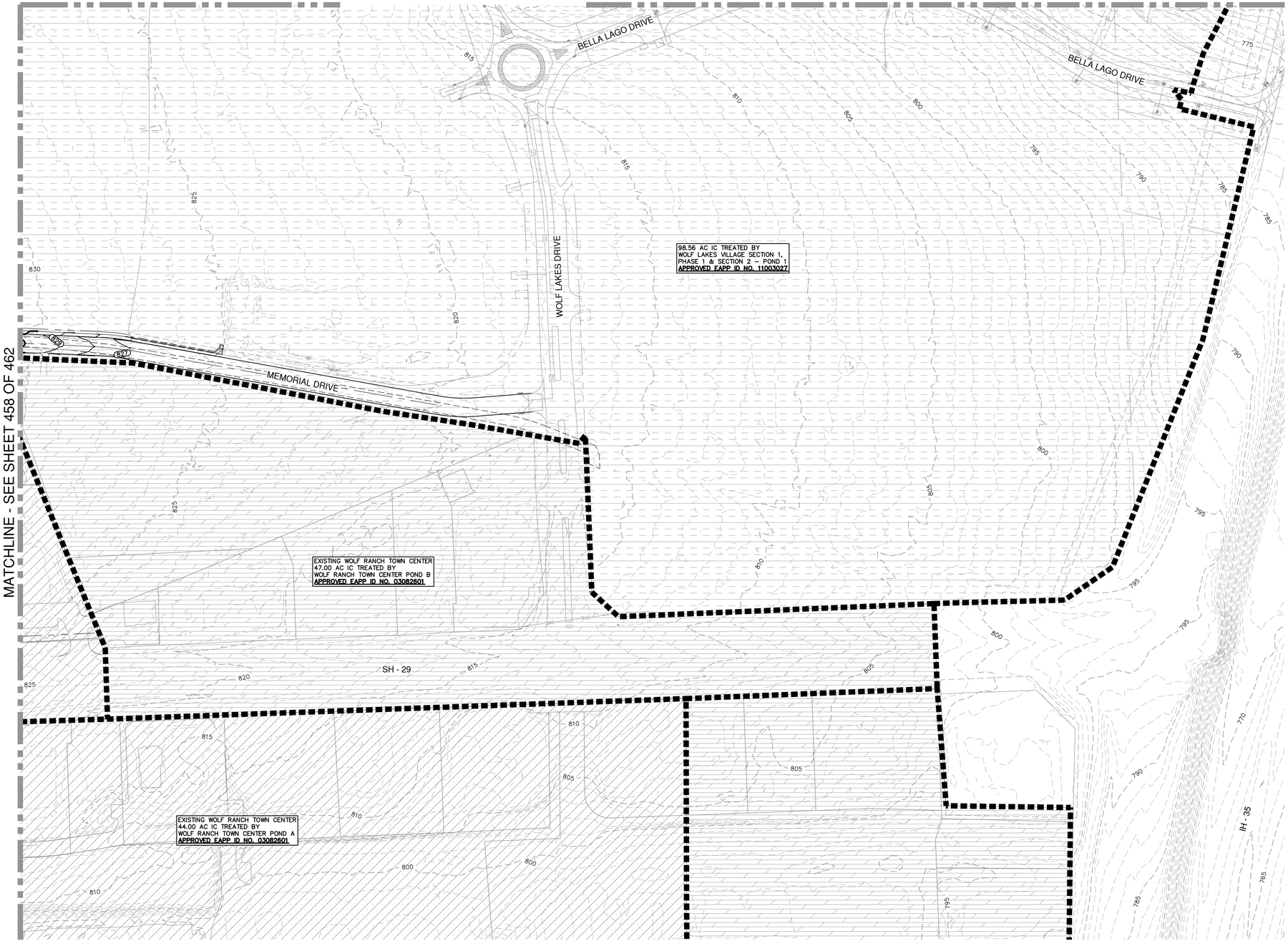
MATCHLINE - SEE SHEET 456 OF 462

MATCHLINE - SEE SHEET 455 OF 462

MATCHLINE - SEE SHEET 458 OF 462



SCALE: 1"= 100'

0' 100' 200' 300'

LEGEND

- PROPOSED DRAINAGE AREA
- SD — STORM DRAIN WITH JUNCTION BOX
- EXISTING CONTOUR LINE
- PROPOSED CONTOUR LINE
- CURB INLET

TREATMENT LEGEND

- WOLF LAKES VILLAGE SECTION 1, PHASE 1 & SECTION 2 – POND 1 APPROVED EAPP ID NO. 11003027
- WOLF RANCH TOWN CENTER POND B APPROVED EAPP ID NO. 03082801
- WOLF RANCH TOWN CENTER POND A APPROVED EAPP ID NO. 03082801

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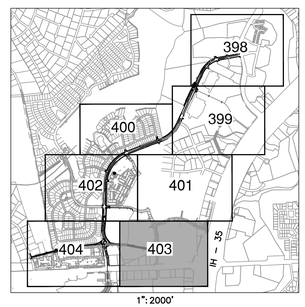
INDEX KEY 09/12/2025



1": 2000'

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CITY OF GEORGETOWN, TEXAS
WOLF RANCH PKWY / MEMORIAL DR
WATER QUALITY TREATMENT SUMMARY 6 OF 11

CITY JOB No.
JOB NO. 51423-00
DATE 9/12/2025
DESIGNER AK
CHECKED SC DRAWN AK
6 11
SHEET 457

Date: Sep 12, 2025, 11:17am User ID: cashatz
File: H:\Projects\514\23\00\30 Construction Documents\Civil\W051423-00.dwg

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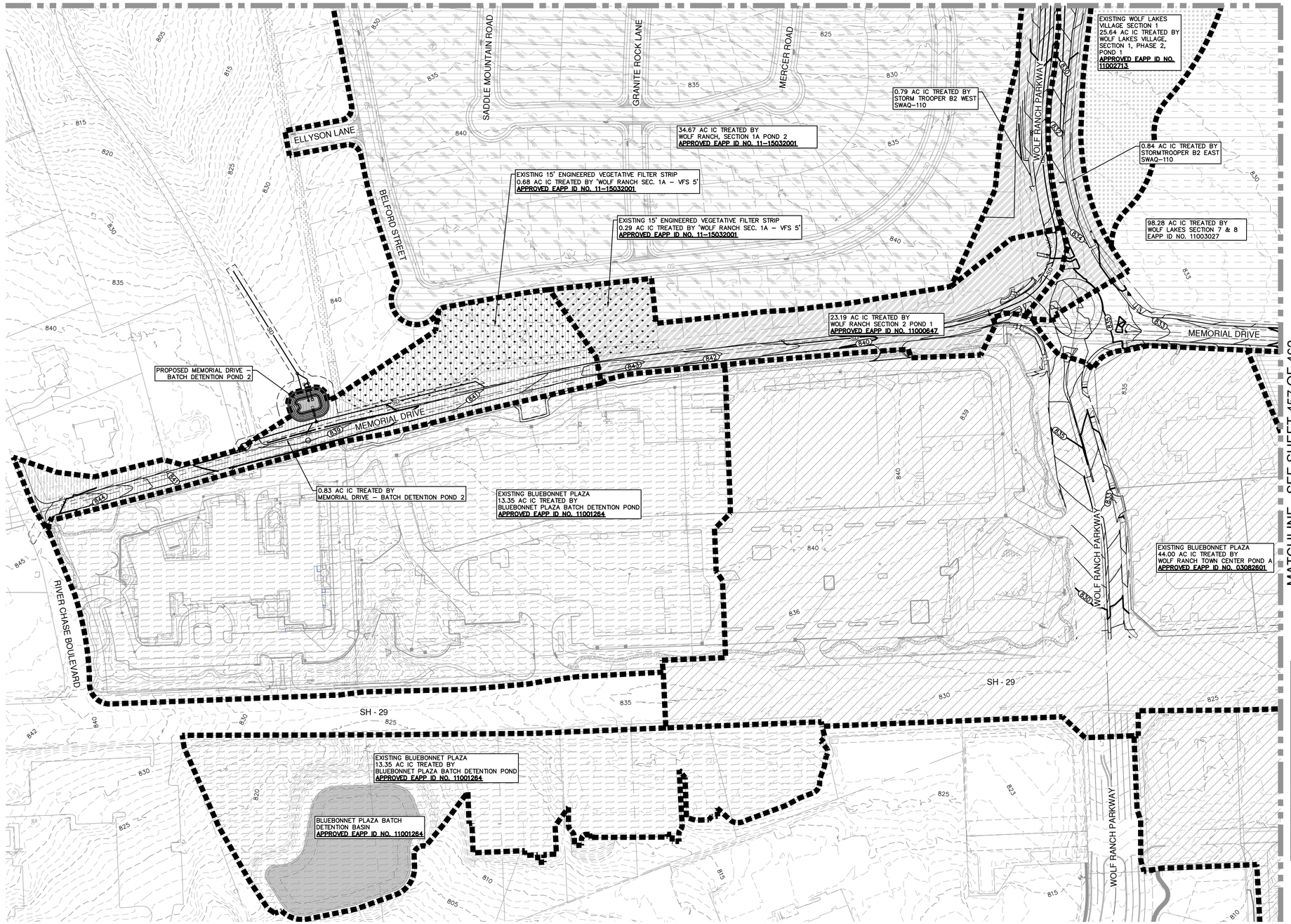
MATCHLINE - SEE SHEET 456 OF 462



MATCHLINE - SEE SHEET 457 OF 462

SCALE: 1"= 100'

0' 100' 200' 300'

LEGEND

- PROPOSED DRAINAGE AREA
- STORM DRAIN WITH JUNCTION BOX
- EXISTING CONTOUR LINE
- PROPOSED CONTOUR LINE
- CURB INLET

TREATMENT LEGEND

- WOLF LAKES SECTIONS 7 & 8 APPROVED EAPP ID NO. 11003027
- WOLF RANCH TOWN CENTER POND A APPROVED EAAP ID NO. 03082601
- WOLF RANCH TOWN CENTER POND B APPROVED EAAP ID NO. 03082601
- WOLF RANCH SECTION 1A POND 2 APPROVED EAPP ID NO. 11-15032001
- WOLF LAKES VILLAGE SECTION 1, PHASE 2, POND 1 APPROVED EAPP ID NO. 11002713
- WOLF RANCH SECTION 2 POND 1 APPROVED EAPP ID NO. 11000647
- BLUEBONNET PLAZA BATCH POND APPROVED EAPP ID NO. 11001264
- MEMORIAL DRIVE BATCH POND 2
- DETENTION / WQ POND BASIN
- LOT AREA TREATED BY VEGETATIVE FILTER STRIP

STATE OF TEXAS
STEVEN S. CRAUFORD
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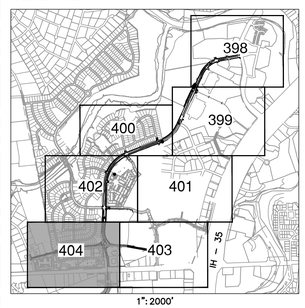
INDEX KEY 09/12/2025



1": 2000'

NO.	REVISION	DATE

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TBPE FIRM REGISTRATION #470 I TBPLS FIRM REGISTRATION #10028801

CITY OF GEORGETOWN, TEXAS
WOLF RANCH PKWY / MEMORIAL DR
WATER QUALITY TREATMENT SUMMARY 7 OF 11

CITY JOB No.
JOB NO. 51423-00
DATE 9/12/2025
DESIGNER AK
CHECKED SC DRAWN AK
7 11
SHEET 458

Date: Sep 12, 2025, 10:37am User ID: cschultz
File: H:\Projects\51423\00\301 Construction Documents\Civil\W051423-00.dwg

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MEMORIAL DRIVE – BATCH DETENTION POND 2

Texas Commission on Environmental Quality

TSS Removal Calculations 04-20-2009

Project Name: Memorial Drive - Batch Detention Pond 2
Date Prepared: 8/8/2025

Additional information is provided for cells with a red triangle in the upper right corner. Place the cursor over the cell.
Text shown in blue indicate location of instructions in the Technical Guidance Manual - RG-348.
Characters shown in red are data entry fields.
Characters shown in black (Bold) are calculated fields. Changes to these fields will remove the equations used in the spreadsheet.

1. The Required Load Reduction for the total project: Calculations from RG-348 Pages 3-27 to 3-30

Page 3-29 Equation 3.3: $L_M = 28.9(A_N \times P)$

where: $L_{M\,TOTAL\,PROJECT}$ = Required TSS removal resulting from t
A_N = Net increase in impervious area for the project
P = Average annual precipitation, inches

Site Data: Determine Required Load Removal Based on the Entire Project

County =	**Williamson**	
Total project area included in plan * =	**460.96**	acres
Predevelopment impervious area within the limits of the plan * =	**12.31**	acres
Total post-development impervious area within the limits of the plan* =	**376.59**	acres
Total post-development impervious cover fraction * =	**0.82**	
P =	**32**	inches
$L_{M\,TOTAL\,PROJECT}$ =	**336886**	lbs.

*** The values entered in these fields should be for the total project area.**

Number of drainage basins / outfalls areas leaving the plan area = **1.00**

2. Drainage Basin Parameters (This information should be provided for each basin):

Drainage Basin/Outfall Area No. = Memorial Pond

Total drainage basin/outfall area =	**3.08**	acres	
Predevelopment impervious area within drainage basin/outfall area =	**0.60**	acres	
Post-development impervious area within drainage basin/outfall area =	**0.83**	acres	***Not including the IC that was already treated with VFS**
Post-development impervious fraction within drainage basin/outfall area =	**0.27**		
$L_{M\,THIS\,BASIN}$ =	**768**	lbs.	

3. Indicate the proposed BMP Code for this basin.

Proposed BMP =	**Batch Detention**	
Removal efficiency =	**91**	percent

4. Calculate Maximum TSS Load Removed (L_R) for this Drainage Basin by the selected BMP Type.

RG-348 Page 3-33 Equation 3.7: $L_R = (\text{BMP efficiency}) \times P \times (A_C \times 34.6 + A_P \times 0.54)$

where: A_C = Total On-Site drainage area in the BMP catchment area
A_I = Impervious area proposed in the BMP catchment area
A_P = Pervious area remaining in the BMP catchment area
L_R = TSS Load removed from this catchment area by the proposed BMP

A_C =	**3.08**	acres	
A_I =	**0.83**	acres	***Not including the IC that was already treated with VFS**
A_P =	**2.25**	acres	
L_R =	**872**	lbs	

5. Calculate Fraction of Annual Runoff to Treat the drainage basin / outfall area

Desired $L_{M\,THIS\,BASIN}$ = **768** lbs.

F = **0.88**

6. Calculate Capture Volume required by the BMP Type for this drainage basin / outfall area. Calculations from RG-348 Pages 3-34 to 3-36

Rainfall Depth =	**1.50**	inches
Post Development Runoff Coefficient =	**0.24**	
On-site Water Quality Volume =	**4059**	cubic feet

Calculations from RG-348 Pages 3-36 to 3-37

Off-site area draining to BMP =	**0.00**	acres
Off-site Impervious cover draining to BMP =	**0.00**	acres
Impervious fraction of off-site area =	**0**	
Off-site Runoff Coefficient =	**0.00**	
Off-site Water Quality Volume =	**0**	cubic feet
Storage for Sediment =	**812**	
Total Capture Volume (required water quality volume(s) x 1.20) =	**4871**	cubic feet

EXISTING WOLF RANCH SEC. 1A – VFS 5 WITHIN THE PROPOSED MEMORIAL DRIVE BATCH POND BASIN

Texas Commission on Environmental Quality

TSS Removal Calculations 04-20-2009

Project Name: Wolf Ranch Sec. 1A - VFS 5
Date Prepared: 8/8/2025

Additional information is provided for cells with a red triangle in the upper right corner. Place the cursor over the cell.
Text shown in blue indicate location of instructions in the Technical Guidance Manual - RG-348.
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Page 3-29 Equation 3.3: $L_M = 28.9(A_N \times P)$

where: $L_{M\,TOTAL\,PROJECT}$ = Required TSS removal resulting from t
A_N = Net increase in impervious area for the project
P = Average annual precipitation, inches

Site Data: Determine Required Load Removal Based on the Entire Project

County =	**Williamson**	
Total project area included in plan * =	**460.96**	acres
Predevelopment impervious area within the limits of the plan * =	**12.31**	acres
Total post-development impervious area within the limits of the plan* =	**376.59**	acres
Total post-development impervious cover fraction * =	**0.82**	
P =	**32**	inches
$L_{M\,TOTAL\,PROJECT}$ =	**336886**	lbs.

*** The values entered in these fields should be for the total project area.**

Number of drainage basins / outfalls areas leaving the plan area = **1.00**

2. Drainage Basin Parameters (This information should be provided for each basin):

Drainage Basin/Outfall Area No. = EX VFS 5

Total drainage basin/outfall area =	**1.31**	acres	
Predevelopment impervious area within drainage basin/outfall area =	**0.00**	acres	
Post-development impervious area within drainage basin/outfall area =	**0.68**	acres	
Post-development impervious fraction within drainage basin/outfall area =	**0.52**		
$L_{M\,THIS\,BASIN}$ =	**592**	lbs.	

3. Indicate the proposed BMP Code for this basin.

Proposed BMP =	**Vegetated Filter Strips**	
Removal efficiency =	**89**	percent

4. Calculate Maximum TSS Load Removed (L_R) for this Drainage Basin by the selected BMP Type.

RG-348 Page 3-33 Equation 3.7: $L_R = (\text{BMP efficiency}) \times P \times (A_C \times 34.6 + A_P \times 0.54)$

where: A_C = Total On-Site drainage area in the BMP catchment area
A_I = Impervious area proposed in the BMP catchment area
A_P = Pervious area remaining in the BMP catchment area
L_R = TSS Load removed from this catchment area by the proposed BMP

A_C =	**1.31**	acres	
A_I =	**0.68**	acres	
A_P =	**0.63**	acres	
L_R =	**680**	lbs	

5. Calculate Fraction of Annual Runoff to Treat the drainage basin / outfall area

Desired $L_{M\,THIS\,BASIN}$ = **629** lbs.

F = **0.93**

EXISTING WOLF RANCH TOWN CENTER – WET POND A

Texas Natural Resource Conservation Commission

Project: Wolf Ranch – Wet Pond A
Date Prepared: 10/7/2002

TSS Removal Calculations:

Existing Load Calculations (Baseline):

Annual Load, $L_E = P(Au \times 0.54 + Ad \times Rv \times 38.4)$

where: L_E = Annual pollutant load, pounds
Au = Area of the Previously undeveloped portion of the tract (acres)
Ad = Area of the Previously developed portion of the tract (acres)
P = Average annual precipitation, inches (32 for Travis and Williamson Counties)
Rv = Runoff coefficient for the fraction of impervious cover
$Rv = 0.546(IC)2 + 0.328(IC) + 0.030$
IC = Fraction of impervious cover (if IC = 0, Rv = 0.030)

Existing Site Data:

Au =	0.0	acres
Ad =	57.2	acres
P =	32	inches
IC =	3.65	acres
IC =	6.4%	

Rv = 0.053

L_E = 3,736 lbs.

Post Development Load Calculations:

Annual Load, $Ld = A \times P \times Rv \times C \times 0.226$

where: Ld = Annual pollutant load, pounds
A = Contributing drainage area to the BMP, acres
P = Average annual precipitation, inches (32 for Travis and Williamson Counties)
Rv = Runoff coefficient for the fraction of impervious cover
$Rv = 0.546(IC)2 + 0.328(IC) + 0.030$
IC = Fraction of impervious cover (if IC = 0, Rv = 0.030)
C = Average TSS concentration, mg/l (170 mg/l for developed land)
0.226 = Units conversion factor

Developed Site Data:

A =	57.2	acres
P =	32	inches
IC =	44.0	acres
IC =	77.0%	
C =	170	mg/l

Rv = 0.606

Ld = 42,582 lbs.

Calculation of Required TSS Load Reduction:

Load reduction, Lr = 0.80 x (Ld – Le)

Lr = 31,077 lbs.

BMP Sizing Calculations

Table 3.4 BMP Removal Efficiency of TSS:

BMP	TSS Reduction (%)
Retention / Irrigation	100
Extended Detention Basin	75
Grassy Swale	70
Vegetated Filter Strips	85
Sand Filter	89
Wet Basin	93
Constructed Wetland	93

Based upon a selected BMP, the required pond volume is determined as follows:

$$Flc = \frac{Lr}{Ld \times BMPre \times Fst}$$

where: Flc = Fraction of the load captured by the BMP
Lr = Required TSS load reduction to achieve 80%
BMPre = BMP removal efficiency from Table 3.4 (above)
Fst = Fraction of the site treated
where: Fst = (A – Bypass)/ A
Abp = Contributing drainage area to the BMP plus any IC bypass, acres
IC bypass = IC area of the site not draining to the BMP

BMPre = 93 BMP Name = Wet Basin
Abp = 57.2 acres
IC bypass = 0 acres

Fst = 1.00

Flc = 0.785

Required BMP Capture Volume to Achieve 80% Removal Efficiency:

Capture Volume = A x Rd x 1.2

where: Rd = Runoff depth from Table 3.3, inches
1.2 = Represents an increase in volume by 20%**

** Capture volume shall be increased by 20% to accommodate reductions in available storage volume due to deposition of solids between full-scale maintenance activities.

Rd = 0.58 inches

Capture Volume = 144,449 cubic feet of volume in pond
24,075 = the increase in volume for deposition of solids

Required Water Quality Volume = 144,449 cu. Ft.
Required Permanent Pool Volume = 144,449 cu. Ft.

TOTAL VOLUME REQUIRED = 288,898 cu. Ft.

Provided BMP Capture Volume:

TOTAL VOLUME PROVIDED = 300,296 cu. Ft.

Required Water Quality Volume = 150,148 cu. Ft.
Required Permanent Pool Volume = 150,148 cu. Ft.

Capture Volume = 125,123 = cubic feet of volume in pond
25,025 = 20% increase in volume for deposition of solids
150,148 = total volume

Rd = V / A / 43560 * 12

Rd = 0.60 inches

where: V = Volume before 20% increase
A = Pond drainage area

FIC 0.793 from Table 3.3

Lr = FIC xLd x BMPre x Fst

Lr = 31,404 lbs

Proposed Load Discharged = Ld – Lr = 11,178 lbs
Existing Load Discharged = Le = 3,736 lbs
Increase in Load Discharged = 7,442 lbs

EXISTING WOLF RANCH TOWN CENTER – WET POND B

Texas Natural Resource Conservation Commission

Project: Wolf Ranch – Wet Pond B
Date Prepared: 10/7/2002

TSS Removal Calculations:

Existing Load Calculations (Baseline):

Annual Load, $L_E = P(Au \times 0.54 + Ad \times Rv \times 38.4)$

where: L_E = Annual pollutant load, pounds
Au = Area of the Previously undeveloped portion of the tract (acres)
Ad = Area of the Previously developed portion of the tract (acres)
P = Average annual precipitation, inches (32 for Travis and Williamson Counties)
Rv = Runoff coefficient for the fraction of impervious cover
$Rv = 0.546(IC)2 + 0.328(IC) + 0.030$
IC = Fraction of impervious cover (if IC = 0, Rv = 0.030)

Existing Site Data:

Au =	0.0	acres
Ad =	63.6	acres
P =	32	inches
IC =	9.3%	

Rv = 0.085

L_E = 5,103 lbs.

Post Development Load Calculations:

Annual Load, $Ld = A \times P \times Rv \times C \times 0.226$

where: Ld = Annual pollutant load, pounds
A = Contributing drainage area to the BMP, acres
P = Average annual precipitation, inches (32 for Travis and Williamson Counties)
Rv = Runoff coefficient for the fraction of impervious cover
$Rv = 0.546(IC)2 + 0.328(IC) + 0.030$
IC = Fraction of impervious cover (if IC = 0, Rv = 0.030)
C = Average TSS concentration, mg/l (170 mg/l for developed land)
0.226 = Units conversion factor

Developed Site Data:

A =	63.6	acres
P =	32	inches
IC =	47.0	acres
IC =	73.9%	
C =	170	mg/l

Rv = 0.570

Ld = 44,601 lbs.

Calculation of Required TSS Load Reduction:

Load reduction, Lr = 0.80 x (Ld – Le)

Lr = 31,598 lbs.

BMP Sizing Calculations

Table 3.4 BMP Removal Efficiency of TSS:

BMP	TSS Reduction (%)
Retention / Irrigation	100
Extended Detention Basin	75
Grassy Swale	70
Vegetated Filter Strips	85
Sand Filter	89
Wet Basin	93
Constructed Wetland	93

Based upon a selected BMP, the required pond volume is determined as follows:

$$Flc = \frac{Lr}{Ld \times BMPre \times Fst}$$

where: Flc = Fraction of the load captured by the BMP
Lr = Required TSS load reduction to achieve 80%
BMPre = BMP removal efficiency from Table 3.4 (above)
Fst = Fraction of the site treated
where: Fst = (A – Bypass)/ A
Abp = Contributing drainage area to the BMP plus any IC bypass, acres
IC bypass = IC area of the site not draining to the BMP

BMPre = 93 BMP Name = Wet Basin
Abp = 63.6 acres
IC bypass = 0 acres

Fst = 1.00

Flc = 0.762

Required BMP Capture Volume to Achieve 80% Removal Efficiency:

Capture Volume = A x Rd x 1.2

where: Rd = Runoff depth from Table 3.3, inches
1.2 = Represents an increase in volume by 20%**

** Capture volume shall be increased by 20% to accommodate reductions in available storage volume due to deposition of solids between full-scale maintenance activities.

Rd = 0.5 inches

Capture Volume = 138,608 cubic feet of volume in pond
23,101 = the increase in volume for deposition of solids

Required Water Quality Volume = 138,608 cu. Ft.
Required Permanent Pool Volume = 138,608 cu. Ft.

TOTAL VOLUME = 277,216 cu. Ft.

Provided BMP Capture Volume to Achieve 80% Removal Efficiency:

TOTAL VOLUME PROVIDED = 309,081 cu. Ft.

Required Water Quality Volume = 154,541 cu. Ft.
Required Permanent Pool Volume = 154,541 cu. Ft.

Capture Volume = 128,784 = cubic feet of volume in pond
25,757 = 20% increase in volume for deposition of solids
154,541 = total volume

Rd = V / A / 43560 * 12

Rd = 0.56 inches

where: V = Volume before 20% increase
A = Pond drainage area

FIC 0.789 from Table 3.3

Lr = FIC xLd x BMPre x Fst

Lr = 32,727 lbs

Proposed Load Discharged = Ld – Lr = 11,874 lbs
Existing Load Discharged = Le = 5,103 lbs
Increase in Load Discharged = 6,771 lbs

NOTES

1. TSS CALCULATIONS FOR MEMORIAL DRIVE POND & RETROFITTED WOLF RANCH SECTION 2 POND ARE SHOWN ON THE POND SHEETS

EXISTING WOLF LAKES SEC. 1, PH. 1 & SEC. 2 – WET POND

Texas Commission on Environmental Quality

TSS Removal Calculations 04-20-2009

Project Name: Wolf Lakes Village Sec 1, Ph 1 & Sec 2 - Pond 1 - Ultimate Conditions
Date Prepared: 8/8/2025

Additional information is provided for cells with a red triangle in the upper right corner. Place the cursor over the cell.
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Characters shown in black (Bold) are calculated fields. Changes to these fields will remove the equations used in the spreadsheet.

1. The Required Load Reduction for the total project: Calculations from RG-348 Pages 3-27 to 3-30

Page 3-29 Equation 3.3: $L_M = 28.9(A_N \times P)$

where: $L_{M\,TOTAL\,PROJECT}$ = Required TSS removal resulting from the proposed development = 80% of increased load
A_N = Net increase in impervious area for the project
P = Average annual precipitation, inches

Site Data: Determine Required Load Removal Based on the Entire Project

County =	**Williamson**	
Total project area included in plan * =	**460.96**	acres
Predevelopment impervious area within the limits of the plan * =	**12.31**	acres
Total post-development impervious area within the limits of the plan* =	**376.59**	acres
Total post-development impervious cover fraction * =	**0.82**	
P =	**32**	inches
$L_{M\,TOTAL\,PROJECT}$ =	**336886**	lbs.

*** The values entered in these fields should be for the total project area.**

Number of drainage basins / outfalls areas leaving the plan area = **1**

2. Drainage Basin Parameters (This information should be provided for each basin):

Drainage Basin/Outfall Area No. = **1**

Total drainage basin/outfall area =	**129.83**	acres
Predevelopment impervious area within drainage basin/outfall area =	**0.00**	acres
Post-development impervious area within drainage basin/outfall area =	**98.56**	acres
Post-development impervious fraction within drainage basin/outfall area =	**0.76**	
$L_{M\,THIS\,BASIN}$ =	**85787**	lbs.

3. Indicate the proposed BMP Code for this basin.

Proposed BMP =	**Wet Basin**	
Removal efficiency =	**93**	percent

Aqualogic Cartridge Filter

4. Calculate Maximum TSS Load Removed (L_R) for this Drainage Basin by the selected BMP Type.

RG-348 Page 3-33 Equation 3.7: $L_R = (\text{BMP efficiency}) \times P \times (A_C \times 34.6 + A_P \times 0.54)$

where: A_C = Total On-Site drainage area in the BMP catchment area
A_I = Impervious area proposed in the BMP catchment area
A_P = Pervious area remaining in the BMP catchment area
L_R = TSS Load removed from this catchment area by the proposed BMP

A_C =	**123.28**	acres	
A_I =	**98.56**	acres	
A_P =	**24.72**	acres	
L_R =	**101884**	lbs	

5. Calculate Fraction of Annual Runoff to Treat the drainage basin / outfall area

Desired $L_{M\,THIS\,BASIN}$ = **86056** lbs.

F = **0.84**

6. Calculate Capture Volume required by the BMP Type for this drainage basin / outfall area. Calculations from RG-348 Pages 3-34 to 3-3

Rainfall Depth =	**1.26**	inches
Post Development Runoff Coefficient =	**0.62**	
On-site Water Quality Volume =	**351353**	cubic feet

Calculations from RG-348 Pages 3-36 to 3-37

Off-site area draining to BMP =	**6.55**	acres
Off-site Impervious cover draining to BMP =	**0.00**	acres
Impervious fraction of off-site area =	**0.00**	
Off-site Runoff Coefficient =	**0.02**	
Off-site Water Quality Volume =	**599**	cubic feet
Storage for Sediment =	**70391**	
Total Capture Volume (required water quality volume(s) x 1.20) =	**422343**	cubic feet

The following sections are used to calculate the required water quality volume(s) for the selected BMP.

11. Wet Basins Designed as Required in RG-348 Pages 3-66 to 3-71

Required capacity of Permanent Pool =	**422343**	cubic **Permanent Pool Capacity is 1.20 times the WQV**
Required capacity at WQV Elevation =	**773697**	cubic **Total Capacity should be the Permanent Pool Capacity plus a second WQV.**

STATE OF TEXAS
STEVEN S. CRAUFORD
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LICENSED
PROFESSIONAL ENGINEER

09/12/2025

NO.	REVISION	DATE

GEORGETOWN TEXAS *more than welcome*

PAPE-DAWSON ENGINEERS
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TBPE FIRM REGISTRATION #470 I TBPLS FIRM REGISTRATION #10028801

CITY OF GEORGETOWN, TEXAS
WOLF RANCH PKWY / MEMORIAL DR
WATER QUALITY TREATMENT SUMMARY 8 OF 11

CITY JOB No.
JOB NO. 51423-00
DATE 9/12/2025
DESIGNER AK
CHECKED SC DRAWN AK
8 11
SHEET 459

Date: Sep 12, 2025, 10:37am User ID: cashcraft
File: H:\Projects\514\23\00\301 Construction Documents\Civil\W051423-00.dwg

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EXISTING WOLF LAKES VILLAGE SEC. 1, PH. 2 – POND 1

Texas Commission on Environmental Quality

TSS Removal Calculations 04-20-2009

Project Name: Wolf Lakes Village, Section 1, Phase 2, Pond 1
Date Prepared: 8/8/2025

Additional information is provided for cells with a red triangle in the upper right corner. Place the cursor over the cell.
Text shown in blue indicate location of instructions in the Technical Guidance Manual - RG-348.
Characters shown in red are data entry fields.
Characters shown in black (Bold) are calculated fields. Changes to these fields will remove the equations used in the spreadsheet.

1. The Required Load Reduction for the total project: Calculations from RG-348 Pages 3-27 to 3-30

Page 3-29 Equation 3.3: $L_M = 28.9(A_N \times P)$

where:
$L_{M\ TOTAL\ PROJECT}$ = Required TSS removal resulting from the proposed development = 80% of increased load
A_N = Net increase in impervious area for the project
P = Average annual precipitation, inches

Site Data: Determine Required Load Removal Based on the Entire Project

County =	**Williamson**	
Total project area included in plan * =	**460.96**	acres
Predevelopment impervious area within the limits of the plan* =	**12.31**	acres
Total post-development impervious area within the limits of the plan* =	**376.59**	acres
Total post-development impervious cover fraction * =	**0.82**	
P =	**32**	inches
$L_{M\ TOTAL\ PROJECT}$ =	**336886**	lbs.

* **The values entered in these fields should be for the total project area.**

Number of drainage basins / outfalls areas leaving the plan area = **1**

2. Drainage Basin Parameters (This information should be provided for each basin):

Drainage Basin/Outfall Area No. = **1**

Total drainage basin/outfall area =	**35.81**	acres
Predevelopment impervious area within drainage basin/outfall area =	**0.00**	acres
Post-development impervious area within drainage basin/outfall area =	**25.64**	acres
Post-development impervious fraction within drainage basin/outfall area =	**0.72**	
$L_{M\ THIS\ BASIN}$ =	**22317**	lbs.

3. Indicate the proposed BMP Code for this basin.

Proposed BMP =	**Wet Basin**	
Removal efficiency =	**93**	percent

4. Calculate Maximum TSS Load Removed (L_M) for this Drainage Basin by the selected BMP Type.

RG-348 Page 3-33 Equation 3.7: $L_R = (\text{BMP efficiency}) \times P \times (A_I \times 34.6 + A_P \times 0.54)$

where:
A_C = Total On-Site drainage area in the BMP catchment area
A_I = Impervious area proposed in the BMP catchment area
A_P = Pervious area remaining in the BMP catchment area
L_R = TSS Load removed from this catchment area by the proposed BMP

A_C =	**35.81**	acres
A_I =	**25.64**	acres
A_P =	**10.17**	acres
L_R =	**26565**	lbs

5. Calculate Fraction of Annual Runoff to Treat the drainage basin / outfall area

Desired $L_{M\ THIS\ BASIN}$ =	**23712**	lbs.
F =	**0.89**	

6. Calculate Capture Volume required by the BMP Type for this drainage basin / outfall area. Calculations from RG-348 Pages 3-34 to 3-36

Rainfall Depth =	**1.60**	inches
Post Development Runoff Coefficient =	**0.52**	
On-site Water Quality Volume =	**108588**	cubic feet

Calculations from RG-348 Pages 3-36 to 3-37

Off-site area draining to BMP =	**0.00**	acres
Off-site Impervious cover draining to BMP =	**0.00**	acres
Impervious fraction of off-site area =	**0**	
Off-site Runoff Coefficient =	**0.00**	
Off-site Water Quality Volume =	**0**	cubic feet
Storage for Sediment =	**21718**	
Total Capture Volume (required water quality volume(s) x 1.20) =	**130305**	cubic feet

The following sections are used to calculate the required water quality volume(s) for the selected BMP.
The values for BMP Types not selected in cell C45 will show N/A.

11. Wet Basins Designed as Required in RG-348 Pages 3-66 to 3-71

Required capacity of Permanent Pool =	**130305**	cubic **Permanent Pool Capacity is 1.20 times the WQV**
Required capacity at WQV Elevation =	**238893**	cubic **Total Capacity should be the Permanent Pool Capacity plus a second WQV.**

EXISTING WOLF RANCH SECTION 2 – POND 1

Texas Commission on Environmental Quality

TSS Removal Calculations 04-20-2009

Project Name: Wolf Ranch Expansion - Wolf Ranch Section 2 - Pond 1
Date Prepared: 8/8/2025

Additional information is provided for cells with a red triangle in the upper right corner. Place the cursor over the cell.
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Characters shown in black (Bold) are calculated fields. Changes to these fields will remove the equations used in the spreadsheet.

1. The Required Load Reduction for the total project: Calculations from RG-348 Pages 3-27 to 3-30

Page 3-29 Equation 3.3: $L_M = 28.9(A_N \times P)$

where:
$L_{M\ TOTAL\ PROJECT}$ = Required TSS removal resulting from the proposed development = 85% of increased load
A_N = Net increase in impervious area for the project
P = Average annual precipitation, inches

Site Data: Determine Required Load Removal Based on the Entire Project

County =	**Williamson**	
Total project area included in plan * =	**460.96**	acres
Predevelopment impervious area within the limits of the plan * =	**12.31**	acres
Total post-development impervious area within the limits of the plan* =	**376.59**	acres
Total post-development impervious cover fraction * =	**0.82**	
P =	**32**	inches
$L_{M\ TOTAL\ PROJECT}$ =	**336886**	lbs. **ADJUSTED FOR 85% TSS REMOVAL**

* **The values entered in these fields should be for the total project area.**

Number of drainage basins / outfalls areas leaving the plan area = **1**

2. Drainage Basin Parameters (This information should be provided for each basin):

Drainage Basin/Outfall Area No. = **S2P1**

Total drainage basin/outfall area =	**40.93**	acres
Predevelopment impervious area within drainage basin/outfall area =	**1.00**	acres
Post-development impervious area within drainage basin/outfall area =	**24.19**	acres
Post-development impervious fraction within drainage basin/outfall area =	**0.59**	
$L_{M\ THIS\ BASIN}$ =	**21446**	lbs. **ADJUSTED FOR 85% TSS REMOVAL**

3. Indicate the proposed BMP Code for this basin.

Proposed BMP =	**Batch Detention**	
Removal efficiency =	**91**	percent

4. Calculate Maximum TSS Load Removed (L_M) for this Drainage Basin by the selected BMP Type.

RG-348 Page 3-33 Equation 3.7: $L_R = (\text{BMP efficiency}) \times P \times (A_I \times 34.6 + A_P \times 0.54)$

where:
A_C = Total On-Site drainage area in the BMP catchment area
A_I = Impervious area proposed in the BMP catchment area
A_P = Pervious area remaining in the BMP catchment area
L_R = TSS Load removed from this catchment area by the proposed BMP

A_C =	**40.93**	acres
A_I =	**24.19**	acres
A_P =	**16.74**	acres
L_R =	**24636**	lbs

5. Calculate Fraction of Annual Runoff to Treat the drainage basin / outfall area

Desired $L_{M\ THIS\ BASIN}$ =	**23961**	lbs.
F =	**0.97**	

6. Calculate Capture Volume required by the BMP Type for this drainage basin / outfall area. Calculations from RG-348 Pages 3-34 to 3-36

Rainfall Depth =	**3.00**	inches
Post Development Runoff Coefficient =	**0.41**	
On-site Water Quality Volume =	**184488**	cubic feet

Calculations from RG-348 Pages 3-36 to 3-37

Off-site area draining to BMP =	**0.00**	acres
Off-site Impervious cover draining to BMP =	**0.00**	acres
Impervious fraction of off-site area =	**0**	
Off-site Runoff Coefficient =	**0.00**	
Off-site Water Quality Volume =	**0**	cubic feet
Storage for Sediment =	**36898**	
Total Capture Volume (required water quality volume(s) x 1.20) =	**221386**	cubic feet

EXISTING WOLF RANCH SEC. 1A – VFS 5 WITHIN THE WOLF RANCH SECTION 2, POND 1 RETROFIT BASIN

Texas Commission on Environmental Quality

TSS Removal Calculations 04-20-2009

Project Name: Wolf Ranch Sec. 1A - VFS 5
Date Prepared: 8/8/2025

Additional information is provided for cells with a red triangle in the upper right corner. Place the cursor over the cell.
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Characters shown in black (Bold) are calculated fields. Changes to these fields will remove the equations used in the spreadsheet.

1. The Required Load Reduction for the total project: Calculations from RG-348 Pages 3-27 to 3-30

Page 3-29 Equation 3.3: $L_M = 28.9(A_N \times P)$

where:
$L_{M\ TOTAL\ PROJECT}$ = Required TSS removal resulting from t
A_N = Net increase in impervious area for the project
P = Average annual precipitation, inches

Site Data: Determine Required Load Removal Based on the Entire Project

County =	**Williamson**	
Total project area included in plan * =	**460.96**	acres
Predevelopment impervious area within the limits of the plan * =	**12.31**	acres
Total post-development impervious area within the limits of the plan* =	**376.59**	acres
Total post-development impervious cover fraction * =	**0.82**	
P =	**32**	inches
$L_{M\ TOTAL\ PROJECT}$ =	**336886**	lbs.

* **The values entered in these fields should be for the total project area.**

Number of drainage basins / outfalls areas leaving the plan area = **1.00**

2. Drainage Basin Parameters (This information should be provided for each basin):

Drainage Basin/Outfall Area No. = **EX VFS 5**

Total drainage basin/outfall area =	**0.49**	acres
Predevelopment impervious area within drainage basin/outfall area =	**0.00**	acres
Post-development impervious area within drainage basin/outfall area =	**0.29**	acres
Post-development impervious fraction within drainage basin/outfall area =	**0.59**	
$L_{M\ THIS\ BASIN}$ =	**252**	lbs.

3. Indicate the proposed BMP Code for this basin.

Proposed BMP =	**Vegetated Filter Strips**	
Removal efficiency =	**80**	percent

4. Calculate Maximum TSS Load Removed (L_M) for this Drainage Basin by the selected BMP Type.

RG-348 Page 3-33 Equation 3.7: $L_R = (\text{BMP efficiency}) \times P \times (A_I \times 34.6 + A_P \times 0.54)$

where:
A_C = Total On-Site drainage area in the BMP catchment area
A_I = Impervious area proposed in the BMP catchment area
A_P = Pervious area remaining in the BMP catchment area
L_R = TSS Load removed from this catchment area by the proposed BMP

A_C =	**0.49**	acres
A_I =	**0.30**	acres
A_P =	**0.19**	acres
L_R =	**299**	lbs

5. Calculate Fraction of Annual Runoff to Treat the drainage basin / outfall area

Desired $L_{M\ THIS\ BASIN}$ =	**268**	lbs.
F =	**0.90**	

STATE OF TEXAS
STEVEN S. CRAUFORD
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PROFESSIONAL ENGINEER

09/12/2025

WOLF RANCH PARKWAY STORMTROOPERS WITHIN WOLF RANCH SECTION 2, POND 1 RETROFIT BASIN

Texas Commission on Environmental Quality

TSS Removal Calculations 04-20-2009

Project Name: Wolf Ranch Expansion - StormTrooper B2 East
Date Prepared: 8/8/2025

Additional information is provided for cells with a red triangle in the upper right corner. Place the cursor over the cell.
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1. StormTrooper Model Sizing based on Individual Catchment Areas to the BMP. Pages 3-27 to 3-30

Page 3-27 Equation 3.3: Effective Area (EA) = (0.9 x Ai) + (0.03 x Ar) Page 3-27 "RG-348" (C=0.90 Imp. Area, C=0.03 for Perv. Area)

Where:

County =	**Williamson**	
Effective Area =	**0.766**	
Total Impervious Area =	**0.84**	
Total Pervious Area =	**0.35**	
Drainage Area	**B2 East**	
From Table 2 choose an initial Model:	**SWAQ-110**	
Surface Area of Model:	**913**	
P =	**32**	
L_{AR} = 27.2 x An x P =	**731**	Lm1 = 27.2 x An x P Equation 3.3 "RG-348"

2. Overflow Rate

$V_{OR} = Q/S.A.$ Equation 3.4 & 3.5 "RG-348"
Page 3-30 "RG-348" (i = 1.1 in./HR., 90% Volume Treated)

Where:

Q =	**i x (EA)**	
Q =	**0.84**	**cfs**
V_{OR} =	**(i x EA)/Model Surface Area**	
V_{OR} =	**0.00092**	**fps**

3. BMP efficiency (Table 3). If the overflow rate is between two percent efficiencies, use the smaller.

V_{OR} =	**0.00092**
BMP Eff (%) =	**85%**

4. Maximum TSS Removal of BMP: L_{BR}

Lr = (BMP Effieniency) x P x (Ai x 34.6 + Ap x 0.54) Equation 3.8 "RG-348"

Where:
Lr = Load Removed by BMP
BMP Efficiency = TSS Removal Efficiency (expressed as a decimal fraction from Table 3)

L_{BR} = **795.65** **#TSS**

TSS removal exceeding required L_M to be counted towards untreated area = L_C

L_C = **L_{AR} - L_{BR}**
L_C = **64.65** **#TSS**

Required TSS removal for untreated area:
L_{AC} = **8.98** < 64.65 #TSS

UNIT IS SUFFICIENTLY SIZED TO REMOVE REQUIRED TSS FROM BOTH CAPTURED AND UNCAPTURED AREAS

Texas Commission on Environmental Quality

TSS Removal Calculations 04-20-2009

Project Name: Wolf Ranch Expansion - StormTrooper B2 West
Date Prepared: 8/8/2025

Text shown in blue indicate location of instructions in the Technical Guidance Manual - RG-348.
Characters shown in red are data entry fields.
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1. StormTrooper Model Sizing based on Individual Catchment Areas to the BMP. Pages 3-27 to 3-30

Page 3-27 Equation 3.3: Effective Area (EA) = (0.9 x Ai) + (0.03 x Ar) Page 3-27 "RG-348" (C=0.90 Imp. Area, C=0.03 for Perv. Area)

Where:

County =	**Williamson**	
Effective Area =	**0.725**	
Total Impervious Area =	**0.79**	
Total Pervious Area =	**0.48**	
Drainage Area	**B2 West**	
From Table 2 choose an initial Model:	**SWAQ-110**	
Surface Area of Model:	**913**	
P =	**32**	
L_{AR} = 27.2 x An x P =	**688**	Lm1 = 27.2 x An x P Equation 3.3 "RG-348"

2. Overflow Rate

$V_{OR} = Q/S.A.$ Equation 3.4 & 3.5 "RG-348"
Page 3-30 "RG-348" (i = 1.1 in./HR., 90% Volume Treated)

Where:

Q =	**i x (EA)**	
Q =	**0.8**	**cfs**
V_{OR} =	**(i x EA)/Model Surface Area**	
V_{OR} =	**0.00087**	**fps**

3. BMP efficiency (Table 3). If the overflow rate is between two percent efficiencies, use the smaller.

V_{OR} =	**0.00087**
BMP Eff (%) =	**85%**

4. Maximum TSS Removal of BMP: L_{BR}

Lr = (BMP Effieniency) x P x (Ai x 34.6 + Ap x 0.54) Equation 3.8 "RG-348"

Where:
Lr = Load Removed by BMP
BMP Efficiency = TSS Removal Efficiency (expressed as a decimal fraction from Table 3)

L_{BR} = **750.49** **#TSS**

TSS removal exceeding required L_M to be counted towards untreated area = L_C

L_C = **L_{AR} - L_{BR}**
L_C = **62.49** **#TSS**

Required TSS removal for untreated area:
L_{AC} = **8.98** < 62.49 #TSS

UNIT IS SUFFICIENTLY SIZED TO REMOVE REQUIRED TSS FROM BOTH CAPTURED AND UNCAPTURED AREAS

NO.	REVISION	DATE

GEORGETOWN TEXAS *more than welcome*

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CITY OF GEORGETOWN, TEXAS
WOLF RANCH PKWY / MEMORIAL DR
WATER QUALITY TREATMENT SUMMARY 9 OF 11

CITY JOB No.
JOB NO. 51423-00
DATE 9/12/2025
DESIGNER AK
CHECKED SC DRAWN AK
9 11
SHEET 460

Date: Sep 12, 2025, 10:37am User ID: casholtz
File: H:\Projects\514\23\00\301 Construction Documents\Civil\W051423-00.dwg

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EXISTING BLUEBONNET PLAZA – BATCH DETENTION POND

Texas Commission on Environmental Quality

TSS Removal Calculations 04-20-2009

Project Name: **Bluebonnet Plaza**
Date Prepared: **8/8/2025**

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1. The Required Load Reduction for the total project: Calculations from RG-348 Pages 3-27 to 3-30

Page 3-29 Equation 3.3: $L_M = 28.9(A_N \times P)$

where:
$L_{M\,TOTAL\,PROJECT}$ = Required TSS removal resulting from t
A_N = Net increase in impervious area for the project
P = Average annual precipitation, inches

Site Data: Determine Required Load Removal Based on the Entire Project

County =	Williamson	
Total project area included in plan * =	460.96	acres
Predevelopment impervious area within the limits of the plan* =	12.31	acres
Total post-development impervious area within the limits of the plan* =	376.59	acres
Total post-development impervious cover fraction * =	0.82	
P =	32	inches
$L_{M\,TOTAL\,PROJECT}$ =	336886	lbs.

* **The values entered in these fields should be for the total project area.**

Number of drainage basins / outfalls areas leaving the plan area = 1

2. Drainage Basin Parameters (This information should be provided for each basin):

Drainage Basin/Outfall Area No. = Bluebonnet Plaza Pond

Total drainage basin/outfall area =	33.96	acres
Predevelopment impervious area within drainage basin/outfall area =	0.00	acres
Post-development impervious area within drainage basin/outfall area =	13.35	acres
Post-development impervious fraction within drainage basin/outfall area =	0.39	
$L_{M\,THIS\,BASIN}$ =	12346	lbs.

3. Indicate the proposed BMP Code for this basin.

Proposed BMP =	Batch Detention	
Removal efficiency =	91	percent

4. Calculate Maximum TSS Load Removed (L_R) for this Drainage Basin by the selected BMP Type.

RG-348 Page 3-33 Equation 3.7: L_R = (BMP efficiency) x P x (A_I x 34.6 + A_P x 0.54)

where:
A_C = Total On-Site drainage area in the BMP catchment area
A_I = Impervious area proposed in the BMP catchment area
A_P = Pervious area remaining in the BMP catchment area
L_R = TSS Load removed from this catchment area by the proposed BMP

A_C =	33.96	acres
A_I =	13.35	acres
A_P =	20.61	acres
L_R =	13777	lbs

5. Calculate Fraction of Annual Runoff to Treat the drainage basin / outfall area

Desired $L_{M\,THIS\,BASIN}$ =	12346	lbs.
F =	0.90	

6. Calculate Capture Volume required by the BMP Type for this drainage basin / outfall area. Calculations from RG-348 Pages 3-34 to 3-36

Rainfall Depth =	1.70	inches
Post Development Runoff Coefficient =	0.30	
On-site Water Quality Volume =	63626	cubic feet

Calculations from RG-348 Pages 3-36 to 3-37

Off-site area draining to BMP =	10.39	acres
Off-site Impervious cover draining to BMP =	0.00	acres
Impervious fraction of off-site area =	0.00	
Off-site Runoff Coefficient =	0.02	
Off-site Water Quality Volume =	1282	cubic feet
Storage for Sediment =	12982	
Total Capture Volume (required water quality volume(s) x 1.20) =	77890	cubic feet

RIVERY POND A

```
POND A WATER QUALITY VOLUME (TNRCC EDWARDS AQUIFER REQUIREMENTS):

        A = Drainage Area (ac):  86.33 ac
            30.73 acres existing development at assumed 35% impervious (River Hills Subdivision)
            55.60 acres onsite area
        P = Average Annual Precipitation, Williamson County (in) = 32

   OFFSITE LOAD:

        Rv = Runoff Coefficient for the fraction of impervious cover
           = 0.546 (IC)^2 + 0.328 (IC) + 0.030 = 0.212  (35% IC)
        C = Average TSS Concentration (mg/L) = 170 (developed)

     Offsite L = A x P x Rv x C x 0.226
               = 30.73 x 32 x 0.212 x 170 x 0.226
               = 8,010 lbs

   ONSITE PRE-DEVELOPMENT (BACKGROUND) LOAD:

        Rv = Runoff Coefficient for the fraction of impervious cover
           = 0.546 (IC)^2 + 0.328 (IC) + 0.030 = 0.030 (0% IC)
        C = Average TSS Concentration (mg/L) = 80 (undeveloped)

     Onsite Predevelopment L = A x P x Rv x C x 0.226
                             = 55.60 x 32 x 0.030 x 80 x 0.226
                             = 965 lbs

   ONSITE POST-DEVELOPMENT LOAD:

        Total Impervious Cover (ac):  30.96
        IC = Impervious Cover = 55.7%

        Rv = Runoff Coefficient for the fraction of impervious cover
           = 0.546 (IC)^2 + 0.328 (IC) + 0.030 = 0.382
        C = Average TSS Concentration (mg/L) = 170 (developed)

     Onsite Postdevelopment L = A x P x Rv x C x 0.226
                              = 55.60 x 32 x 0.382 x 170 x 0.226
                              = 26,112 lbs

   TOTAL PREDEVELOPMENT LOAD:

      Onsite Predevelopment Load + Offsite Load = 8,975 lbs

   TOTAL POSTDEVELOPMENT LOAD:

      Onsite Postdevelopment Load + Offsite Load = 34,122 lbs

   TSS LOAD REDUCTION:

     Lr = 0.8 x (postdevelopment load - predevelopment load)
        = 20,118 lbs

        Lr = (total postdevelopment load) x F x (fraction of site treated) x (TSS removal eff.)
        20,118 = 34,122 x F x 1 x 0.93

   F = fraction of load captured by BMP
   F = 0.634

    Runoff capture depth = 0.25 in
         (48.3% weighted impervious cover over drainage area. 63.4% load captured by pond)

PERMANENT POOL ELEVATION = 752.0
WATER QUALITY ELEVATION = 753.3

REQUIRED WATER QUALITY VOLUME  = 0.25 in x 86.33 ac
                               = 78,345 cf (1.80 AC-FT)
PROVIDED WATER QUALITY VOLUME = 85,001 cf (1.86 AC-FT)

REQUIRED PERMANENT POOL VOLUME = 1.2 x WQV  (20% increase to allow for sediment accumulation)
                               = 94,013 cf (2.16 AC-FT)
PROVIDED PERMANENT POOL VOLUME = 242,630 cf (5.57 AC-FT)

REQUIRED FOREBAY VOLUME = 15 to 25% of permanent pool volume
PROVIDED FOREBAY VOLUME = 44,901 CF (18.2%)
```

STATE OF TEXAS
STEVEN S. CRAUFORD
92677
LICENSED PROFESSIONAL ENGINEER
09/12/2025

WOLF RANCH PARKWAY STORMTROOPERS WITHIN RIVERY POND A BASIN

Texas Commission on Environmental Quality

TSS Removal Calculations 04-20-2009

Project Name: **Wolf Ranch Expansion - StormTrooper C2 East**
Date Prepared: **8/8/2025**

Additional information is provided for cells with a red triangle in the upper right corner. Place the cursor over the cell.
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1. StormTrooper Model Sizing based on Individual Catchment Areas to the BMP. Pages 3-27 to 3-30

Page 3-27 Equation 3.3: Effective Area (EA) = (0.9 x Ai) + (0.03 x Ar) Page 3-27 "RG-348" (C=0.90 Imp. Area, C=0.03 for Perv. Area)

Where:

County =	Williamson	
Effective Area =	0.212	
Total Impervious Area =	0.22	
Total Pervious Area =	0.48	
Drainage Area	C2 East	
From Table 2 choose an initial Model:	SWAQ-25	
Surface Area of Model:	369	
P =	32	
L_{MT} = 27.2 x An x P =	191	Lmt = 27.2 x An x P Equation 3.3 "RG-348"

2. Overflow Rate

V_{OR} = Q/S.A. Equation 3.4 & 3.5 "RG-348"
Page 3-30 "RG-348" (i = 1.1 in./HR., 90% Volume Treated)

Where:

Q =	i x (EA)	
Q =	0.23	cfs
V_{OR} =	(i x EA)/Model Surface Area	
V_{OR} =	0.00063	fps

3. BMP efficiency (Table 3). If the overflow rate is between two percent efficiencies, use the smaller.

V_{OR} =	0.00063
BMP Eff (%) =	88%

4. Maximum TSS Removal of BMP: L_{MR}

Lr = (BMP Effiencieny) x P x (Ai x 34.6 + Ap x 0.54) Equation 3.8 "RG-348"

Where:
Lr = Load Removed by BMP
BMP Efficiency = TSS Removal Efficiency (expressed as a decimal fraction from Table 3)

L_{MR} =	221.65	#TSS

TSS removal exceeding required L_M to be counted towards untreated area = L_C

L_C =	L_{MR} - L_{MT}	
L_C =	30.65	#TSS

Required TSS removal for untreated area:

L_{MC} =	8.98	<	30.65	#TSS

UNIT IS SUFFICIENTLY SIZED TO REMOVE REQUIRED TSS FROM BOTH CAPTURED AND UNCAPTURED AREAS

Texas Commission on Environmental Quality

TSS Removal Calculations 04-20-2009

Project Name: **Wolf Ranch Expansion - StormTrooper C1 West**
Date Prepared: **8/8/2025**

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1. StormTrooper Model Sizing based on Individual Catchment Areas to the BMP. Pages 3-27 to 3-30

Page 3-27 Equation 3.3: Effective Area (EA) = (0.9 x Ai) + (0.03 x Ar) Page 3-27 "RG-348" (C=0.90 Imp. Area, C=0.03 for Perv. Area)

Where:

County =	Williamson	
Effective Area =	0.355	
Total Impervious Area =	0.39	
Total Pervious Area =	0.14	
Drainage Area	C1 West	
From Table 2 choose an initial Model:	SWAQ-40	
Surface Area of Model:	588	
P =	32	
L_{MT} = 27.2 x An x P =	339	Lmt = 27.2 x An x P Equation 3.3 "RG-348"

2. Overflow Rate

V_{OR} = Q/S.A. Equation 3.4 & 3.5 "RG-348"
Page 3-30 "RG-348" (i = 1.1 in./HR., 90% Volume Treated)

Where:

Q =	i x (EA)	
Q =	0.39	cfs
V_{OR} =	(i x EA)/Model Surface Area	
V_{OR} =	0.00066	fps

3. BMP efficiency (Table 3). If the overflow rate is between two percent efficiencies, use the smaller.

V_{OR} =	0.00066
BMP Eff (%) =	88%

4. Maximum TSS Removal of BMP: L_{MR}

Lr = (BMP Effiencieny) x P x (Ai x 34.6 + Ap x 0.54) Equation 3.8 "RG-348"

Where:
Lr = Load Removed by BMP
BMP Efficiency = TSS Removal Efficiency (expressed as a decimal fraction from Table 3)

L_{MR} =	382.12	#TSS

TSS removal exceeding required L_M to be counted towards untreated area = L_C

L_C =	L_{MR} - L_{MT}	
L_C =	43.12	#TSS

Required TSS removal for untreated area:

L_{MC} =	8.98	<	43.12	#TSS

UNIT IS SUFFICIENTLY SIZED TO REMOVE REQUIRED TSS FROM BOTH CAPTURED AND UNCAPTURED AREAS

NO.	REVISION	DATE

GEORGETOWN TEXAS *more than welcome*

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CITY OF GEORGETOWN, TEXAS
WOLF RANCH PKWY / MEMORIAL DR
WATER QUALITY TREATMENT SUMMARY 10 OF 11

CITY JOB No.
JOB NO. 51423-00
DATE 9/12/2025
DESIGNER AK
CHECKED SC DRAWN AK
10 11
SHEET 461

Date: Sep 12, 2025, 10:37am User ID: cschatz
File: H:\Projects\51423\00\301 Construction Documents\Civil\W51423-00.dwg
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RIVERY POND B

POND B WATER QUALITY VOLUME (TNRCC EDWARDS AQUIFER REQUIREMENTS):

A = Drainage Area (ac): 66.28 ac
P = Average Annual Precipitation, Williamson County (in) = 32

PRE-DEVELOPMENT (BACKGROUND) LOAD:

Rv = Runoff Coefficient for the fraction of impervious cover
= 0.546 (IC^2 + 0.328 (IC) + 0.030 = 0.030 (0% IC)
C = Average TSS Concentration (mg/L) = 80 (undeveloped)

Onsite Predevelopment L = A x P x Rv x C x 0.226
= 66.28 x 32 x 0.030 x 80 x 0.226
= 1,150 lbs

POST-DEVELOPMENT LOAD:

Total Impervious Cover (ac): 50.27
IC = Impervious Cover = 75.8%

Rv = Runoff Coefficient for the fraction of impervious cover
= 0.546 (IC^2 + 0.328 (IC) + 0.030 = 0.592
C = Average TSS Concentration (mg/L) = 170 (developed)

Onsite Postdevelopment L = A x P x Rv x C x 0.226
= 66.28 x 32 x 0.592 x 170 x 0.226
= 48,240 lbs

TSS LOAD REDUCTION:

Lr = 0.8 x (postdevelopment load - predevelopment load)
= 37,672 lbs

Lr = (total postdevelopment load) x F x (fraction of site treated) x (TSS removal eff.)
37672 = 48,240 x F x 1 x 0.93

F = fraction of load captured by BMP
F = 0.840

Runoff capture depth = 0.73 in
(75.8% impervious cover, 84.0% load captured by pond)

PERMANENT POOL ELEVATION = 697.0
WATER QUALITY ELEVATION = 699.4

REQUIRED WATER QUALITY VOLUME = 0.73 in x 66.28 ac
= 175,635 cf (4.03 AC-FT)
PROVIDED WATER QUALITY VOLUME = 177,314 cf (4.07 AC-FT)

REQUIRED PERMANENT POOL VOLUME = 1.2 x WQV (20% increase to allow for sediment accumulation)
= 210,762 cf (4.84 AC-FT)
PROVIDED PERMANENT POOL VOLUME = 263,515 cf (6.05 AC-FT)

REQUIRED FOREBAY VOLUME = 15 to 25% of permanent pool volume
PROVIDED FOREBAY VOLUME = 57,690 CF (21.9%)

WOLF RANCH PARKWAY
STORMTROOPERS WITHIN RIVERY
POND B BASIN

Texas Commission on Environmental Quality
TSS Removal Calculations 04-20-2009

Project Name: Wolf Ranch Expansion - StormTrooper D2 East
Date Prepared: 8/8/2025

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1. StormTrooper Model Sizing based on Individual Catchment Areas to the BMP. Pages 3-27 to 3-30

Page 3-27 Equation 3.3: Effective Area (EA) = (0.9 x Ai) + (0.03 x Ar) — Page 3-27 "RG-348" (C=0.90 Imp. Area, C=0.03 for Perv. Area)

	County =	Williamson	
Where:	Effective Area =	0.418	
	Total Impervious Area =	0.44	
	Total Pervious Area =	0.73	
	Drainage Area	D2 East	
	From Table 2 choose an initial Model:	SWAQ-40	
	Surface Area of Model:	588	
	P =	32	
	L_M = 27.2 x An x P =	383	Lm1 = 27.2 x An x P Equation 3.3 "RG-348"

2. Overflow Rate

$V_{OR} = Q/S.A.$ — Equation 3.4 & 3.5 "RG-348"
Page 3-30 "RG-348" (i = 1.1 in./HR., 90% Volume Treated)

Where:	Q =	i x (EA)	
	Q =	0.46	cfs
	V_{OR} =	(i x EA)/Model Surface Area	
	V_{OR} =	0.00078	fps

3. BMP efficiency (Table 3). If the overflow rate is between two percent efficiencies, use the smaller.

V_{OR} =	0.00078	
BMP Eff (%) =	86%	

4. Maximum TSS Removal of BMP: L_M

STORMTROOPER D2 EAST (SWAQ-25)

Lr = (BMP Effiencienc) x P x (Ai x 34.6 + Ap x 0.54) — Equation 3.8 "RG-348"

Where:
Lr = Load Removed by BMP
BMP Efficiency = TSS Removal Efficiency (expressed as a decimal fraction from Table 3)

L_M =	429.81	#TSS		
TSS removal exceeding required L_M to be counted towards untreated area = L_C				
L_C =	L_M - L_{M1}			
L_C =	46.81	#TSS		
Required TSS removal for untreated area:				
L_{MC} =	8.98	<	46.81	#TSS

UNIT IS SUFFICIENTLY SIZED TO REMOVE REQUIRED TSS FROM BOTH CAPTURED AND UNCAPTURED AREAS

Texas Commission on Environmental Quality
TSS Removal Calculations 04-20-2009

Project Name: Wolf Ranch Expansion - StormTrooper D1 West
Date Prepared: 8/8/2025

Additional information is provided for cells with a red triangle in the upper right corner. Place the cursor over the cell.
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1. StormTrooper Model Sizing based on Individual Catchment Areas to the BMP. Pages 3-27 to 3-30

Page 3-27 Equation 3.3: Effective Area (EA) = (0.9 x Ai) + (0.03 x Ar) — Page 3-27 "RG-348" (C=0.90 Imp. Area, C=0.03 for Perv. Area)

	County =	Williamson	
Where:	Effective Area =	0.398	
	Total Impervious Area =	0.44	
	Total Pervious Area =	0.08	
	Drainage Area	D1 West	
	From Table 2 choose an initial Model:	SWAQ-40	
	Surface Area of Model:	588	
	P =	32	
	L_M = 27.2 x An x P =	383	Lm1 = 27.2 x An x P Equation 3.3 "RG-348"

2. Overflow Rate

$V_{OR} = Q/S.A.$ — Equation 3.4 & 3.5 "RG-348"
Page 3-30 "RG-348" (i = 1.1 in./HR., 90% Volume Treated)

Where:	Q =	i x (EA)	
	Q =	0.44	cfs
	V_{OR} =	(i x EA)/Model Surface Area	
	V_{OR} =	0.00075	fps

3. BMP efficiency (Table 3). If the overflow rate is between two percent efficiencies, use the smaller.

V_{OR} =	0.00075	
BMP Eff (%) =	86%	

4. Maximum TSS Removal of BMP: L_M

Lr = (BMP Effiencienc) x P x (Ai x 34.6 + Ap x 0.54) — Equation 3.8 "RG-348"

Where:
Lr = Load Removed by BMP
BMP Efficiency = TSS Removal Efficiency (expressed as a decimal fraction from Table 3)

L_M =	420.15	#TSS		
TSS removal exceeding required L_M to be counted towards untreated area = L_C				
L_C =	L_M - L_{M1}			
L_C =	37.15	#TSS		
Required TSS removal for untreated area:				
L_{MC} =	8.98	<	37.15	#TSS

UNIT IS SUFFICIENTLY SIZED TO REMOVE REQUIRED TSS FROM BOTH CAPTURED AND UNCAPTURED AREAS

WOLF RANCH SECTION 1A
WET POND BASIN

Texas Commission on Environmental Quality
TSS Removal Calculations 04-20-2009

Project Name: Wolf Ranch, Section 1A
Date Prepared: 8/8/2025

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1. The Required Load Reduction for the total project: Calculations from RG-348 — Pages 3-27 to 3-30

Page 3-29 Equation 3.3: $L_M = 28.9(A_N \times P)$

where:
$L_{M\,TOTAL\,PROJECT}$ = Required TSS removal resulting from the proposed development = 80% of increased load
A_N = Net increase in impervious area for the project
P = Average annual precipitation, inches

Site Data: Determine Required Load Removal Based on the Entire Project

County =	Williamson	
Total project area included in plan * =	460.96	acres
Predevelopment impervious area within the limits of the plan * =	12.31	acres
Total post-development impervious area within the limits of the plan* =	376.59	acres
Total post-development impervious cover fraction,* =	0.82	
P =	32	inches
$L_{M\,TOTAL\,PROJECT}$ =	336886	lbs. ADJUSTED FOR 85% TSS REMOVAL AND NOT 80%

* **The values entered in these fields should be for the total project area.**

Number of drainage basins / outfalls areas leaving the plan area = 1

2. Drainage Basin Parameters (This information should be provided for each basin):

Drainage Basin/Outfall Area No. = 1

Total drainage basin/outfall area =	61.23	acres
Predevelopment impervious area within drainage basin/outfall area =	0.55	acres
Post-development impervious area within drainage basin/outfall area =	34.67	acres
Post-development impervious fraction within drainage basin/outfall area =	0.57	
$L_{M\,THIS\,BASIN}$ =	31554	lbs. ADJUSTED FOR 85% TSS REMOVAL AND NOT 80%

3. Indicate the proposed BMP Code for this basin.

Proposed BMP = Wet Basin
Removal efficiency = 93 percent

4. Calculate Maximum TSS Load Removed (L_M) for this Drainage Basin by the selected BMP Type.

RG-348 Page 3-33 Equation 3.7: L_M = (BMP efficiency) x P x (A x 34.6 + A_P x 0.54)

where:
A_C = Total On-Site drainage area in the BMP catchment area
A_I = Impervious area proposed in the BMP catchment area
A_P = Pervious area remaining in the BMP catchment area
L_M = TSS Load removed from this catchment area by the proposed BMP

A_C =	61.23	acres
A_I =	34.67	acres
A_P =	26.56	acres
L_M =	36126	lbs

5. Calculate Fraction of Annual Runoff to Treat the drainage basin / outfall area

Desired $L_{M\,THIS\,BASIN}$ = 32618 lbs. DOUBLE CHECK

F = 0.90

6. Calculate Capture Volume required by the BMP Type for this drainage basin / outfall area. Calculations from RG-348 Pages 3-34 to 3-36

Rainfall Depth =	1.70	inches
Post Development Runoff Coefficient =	0.40	
On-site Water Quality Volume =	150044	cubic feet

Calculations from RG-348 — Pages 3-36 to 3-37

Off-site area draining to BMP =	0.00	acres
Off-site Impervious cover draining to BMP =	0.00	acres
Impervious fraction of off-site area =	0	
Off-site Runoff Coefficient =	0.00	
Off-site Water Quality Volume =	0	cubic feet
Storage for Sediment =	30009	
Total Capture Volume (required water quality volume(s) x 1.20) =	180053	cubic feet

The following sections are used to calculate the required water quality volume(s) for the selected BMP.
The values for BMP Types not selected in cell C45 will show NA.

11. Wet Basins Designed as Required in RG-348 — Pages 3-66 to 3-71

Required capacity of Permanent Pool =	180053	cubic **Permanent Pool Capacity is 1.20 times the WQV**
Required capacity at WQV Elevation =	330097	cubic **Total Capacity should be the Permanent Pool Capacity plus a second WQV.**

STATE OF TEXAS
STEVEN S. CRAUFORD
92677
LICENSED
PROFESSIONAL ENGINEER

09/12/2025

NO. REVISION DATE

PAPE-DAWSON ENGINEERS
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TBPE FIRM REGISTRATION #470 | TBPLS FIRM REGISTRATION #10028801

GEORGETOWN TEXAS
more than welcome

CITY OF GEORGETOWN, TEXAS
WOLF RANCH PKWY / MEMORIAL DR
WATER QUALITY TREATMENT SUMMARY 11 OF 11

CITY JOB No.
JOB NO. 51423-00
DATE 9/12/2025
DESIGNER AK
CHECKED SC DRAWN AK
11 11
SHEET 462

Date: Sep 12, 2025, 10:37am User ID: cashatt
File: H:\Projects\514\23\00\30 Construction Documents\Civil\W051423-00.dwg

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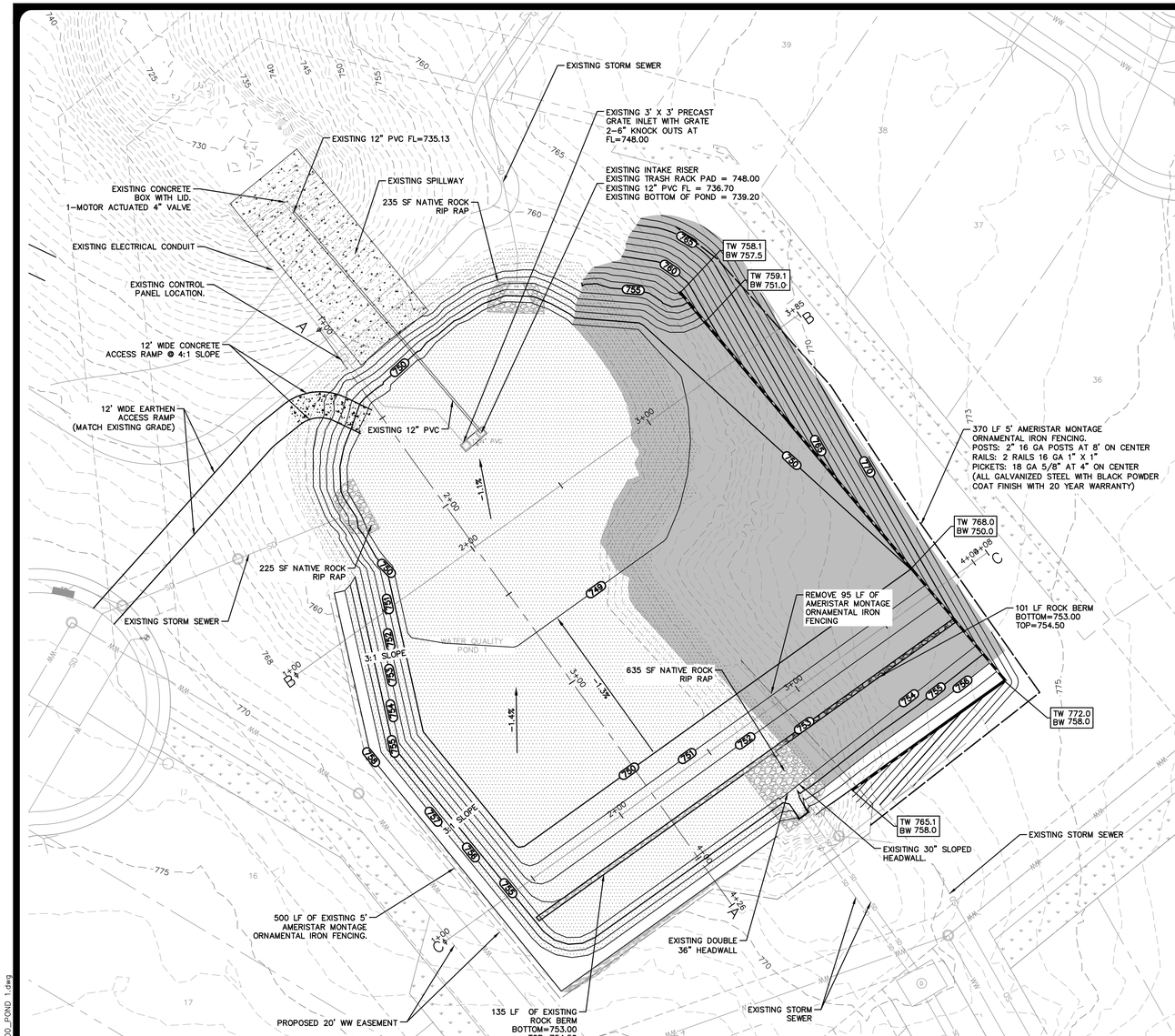


LEGEND

- STORM DRAIN LINE & MH
- CURB INLET
- EXISTING CONTOUR LINE
- EXISTING CONTOUR LINE
- PROPERTY BOUNDARY
- WALL
- TW — TOP OF WALL
- BW — BOTTOM OF WALL
- EG — EXISTING GROUND
- LIMITS OF PROPOSED POND EXPANSION

Texas Commission on Environmental Quality

TSS Removal Calculations 04-20-2009

Project Name: Wolf Ranch Section 2-Pond 1
Date Prepared: 7/19/2017

Additional information is provided for cells with a red triangle in the upper right corner. Place the cursor over the cell.
Text shown in blue indicate location of instructions in the Technical Guidance Manual - RG-348.
Characters shown in red are data entry fields.
Characters shown in black (Bold) are calculated fields. Changes to these fields will remove the equations used in the spreadsheet.

1. The Required Load Reduction for the total project: Calculations from RG-348 Pages 3-27 to 3-30

Page 3-29 Equation 3.3: $L_M = 28.9(A_N \times P)$

where:
$L_{M\,TOTAL\ PROJECT}$ = Required TSS removal resulting from the proposed development = 80% of increased load
A_N = Net increase in impervious area for the project
P = Average annual precipitation, inches

Site Data: Determine Required Load Removal Based on the Entire Project

County =	**Williamson**	
Total project area included in plan * =	**69.61**	acres
Predevelopment impervious area within the limits of the plan * =	**0.66**	acres
Total post-development impervious area within the limits of the plan* =	**38.13**	acres
Total post-development impervious cover fraction * =	**0.64**	
P =	**32**	inches
$L_{M\,TOTAL\ PROJECT}$ =	**34652**	lbs. ADJUSTED FOR 80% TSS REMOVAL AND NOT 80%!!!!!!!!!!!!!!!!!!

* **The values entered in these fields should be for the total project area.**

Number of drainage basins / outfalls areas leaving the plan area = **1**

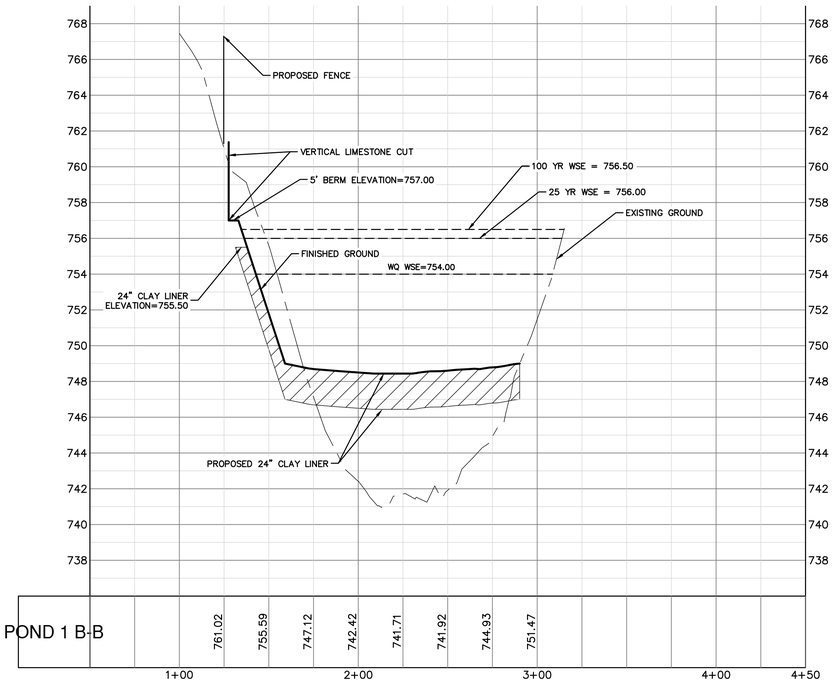
2. Drainage Basin Parameters (This information should be provided for each basin):

Drainage Basin/Outfall Area No. = **1**

Total drainage basin/outfall area =	**36.18**	acres
Predevelopment impervious area within drainage basin/outfall area =	**0.66**	acres
Post-development impervious area within drainage basin/outfall area =	**22.94**	acres
Post-development impervious fraction within drainage basin/outfall area =	**0.63**	
$L_{M\,THIS\ BASIN}$ =	**20605**	lbs. ADJUSTED FOR 80% TSS REMOVAL AND NOT 80%!!!!!!!!!!!!!!!!!!

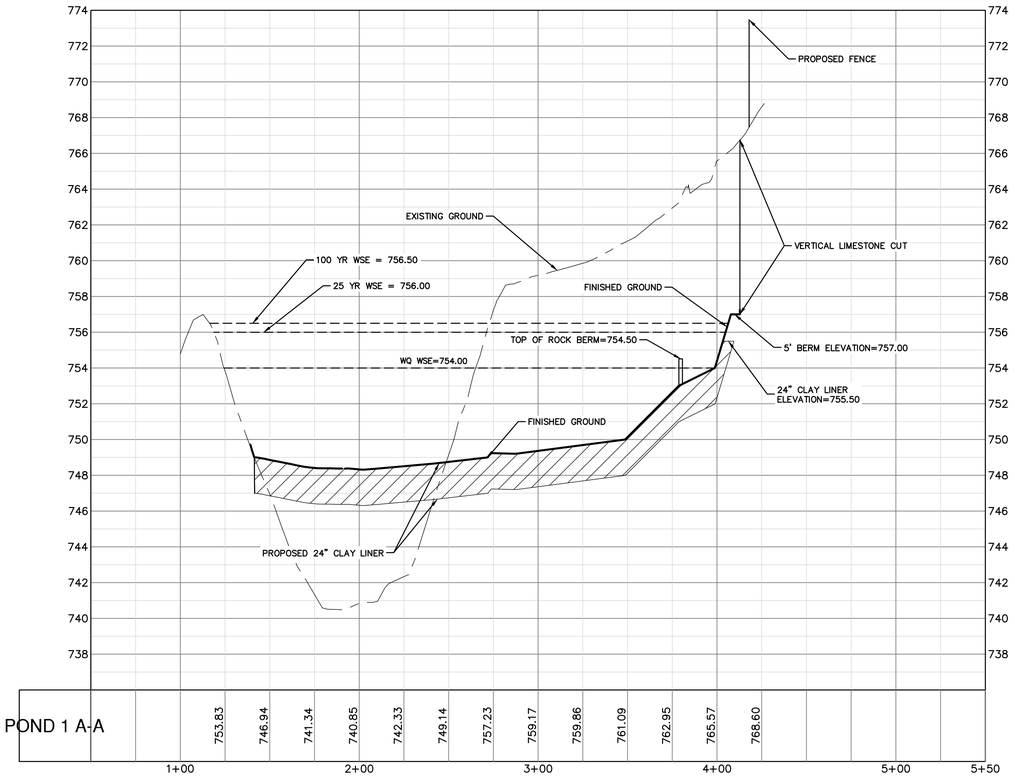
3. Indicate the proposed BMP Code for this basin.

Proposed BMP =	**Batch Detention**	
Removal efficiency =	**91**	percent ADJUST MANUALLY!!!!!!!!!!!!!!!!!



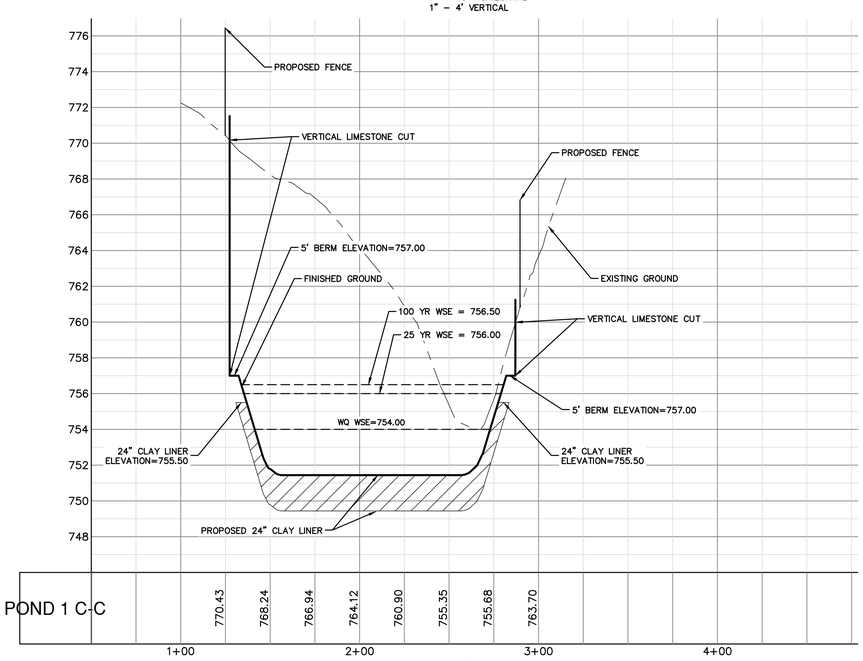
POND 1 SECTION B–B

1" = 40' HORIZONTAL
1" = 4' VERTICAL



POND 1 SECTION A–A

1" = 40' HORIZONTAL
1" = 4' VERTICAL



POND 1 SECTION C–C

1" = 40' HORIZONTAL
1" = 4' VERTICAL

NO.	REVISION	DATE

GEORGETOWN TEXAS
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STATE OF TEXAS
STEVEN S. CRAUFORD
92677
LICENSED
PROFESSIONAL ENGINEER

09/12/2025

CITY OF GEORGETOWN, TEXAS
WOLF RANCH PKWY / MEMORIAL DR

POND 1 DETAILS (2 OF 2)

CITY JOB No.
JOB NO. 51423-00
DATE 9/12/2025
DESIGNER JB
CHECKED SC DRAWN JB

SHEET 465

Date: Sep 12, 2025, 10:38am User ID: csabatr
File: H:\Projects\514\23\00\30 Construction Documents\Civil\PD51423-00_POND 1.dwg

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Water Quality - Memorial Drive Pond - Combined Elevation-Area-Storage Table							
Stage (ft. msl)	Pond Area (sf)	Pond Area (ac)	Incremental Height (ft)	Incremental Volume Avg. End Area (cf)	Cumulative Volume (cf)	Cumulative Volume (ac-ft)	Comments
833.5	130	0.0030	---	---	---	---	
834	944	0.0217	0.5	269	269	0.01	Sed Marker @ 0.5 ft Sed Depth
835	1,366	0.0314	1	1,155	1,424	0.03	
836	1,843	0.0423	1	1,605	3,028	0.07	
837	2,374	0.0545	1	2,109	5,137	0.12	
838	2,961	0.0680	1	2,668	7,804	0.18	Water Quality Volume
838.8	3,281	0.0753	0.8	2,497	10,301	0.24	25 YR WSEL
839	3,601	0.0827	0.2	688	10,989	0.25	100 YR WSEL
840	4,297	0.0986	1	3,949	14,938	0.34	Top of Berm

ORIFICE DRAWDOWN TIME FOR BATCH DETENTION

Contour Elevation (ft)	Contour Area (ft^2)	Average End Area Method $V_{1,2} = \left[\frac{A_1 + A_2}{2}\right] * d$ Incremental Volume (ft^3)	Total Volume (ft^3)	Orifice Discharge (cfs)	Incremental Drawdown Time (hr)	Total Drawdown Time (hr)
838	2,961	-	-	-	-	-
837	2,374	2,668	2,668	0.27	2.8	2.8
836	1,843	2,109	4,776	0.24	2.4	5.2
835	1,366	1,605	6,381	0.22	2.0	7.2
834	944	1,155	7,536	0.19	1.7	8.9
833.5	130	269	7,804	0.17	0.4	9.3

ORIFICE DIAMETER	2.00	in
ORIFICE FL ELEV	831.02	
ORIFICE CENTROID ELEV	**831.10**	
ORIFICE AREA (Ao)	**0.022**	sf
ORIFICE COEFFICIENT	**0.6**	

ORIFICE EQUATION

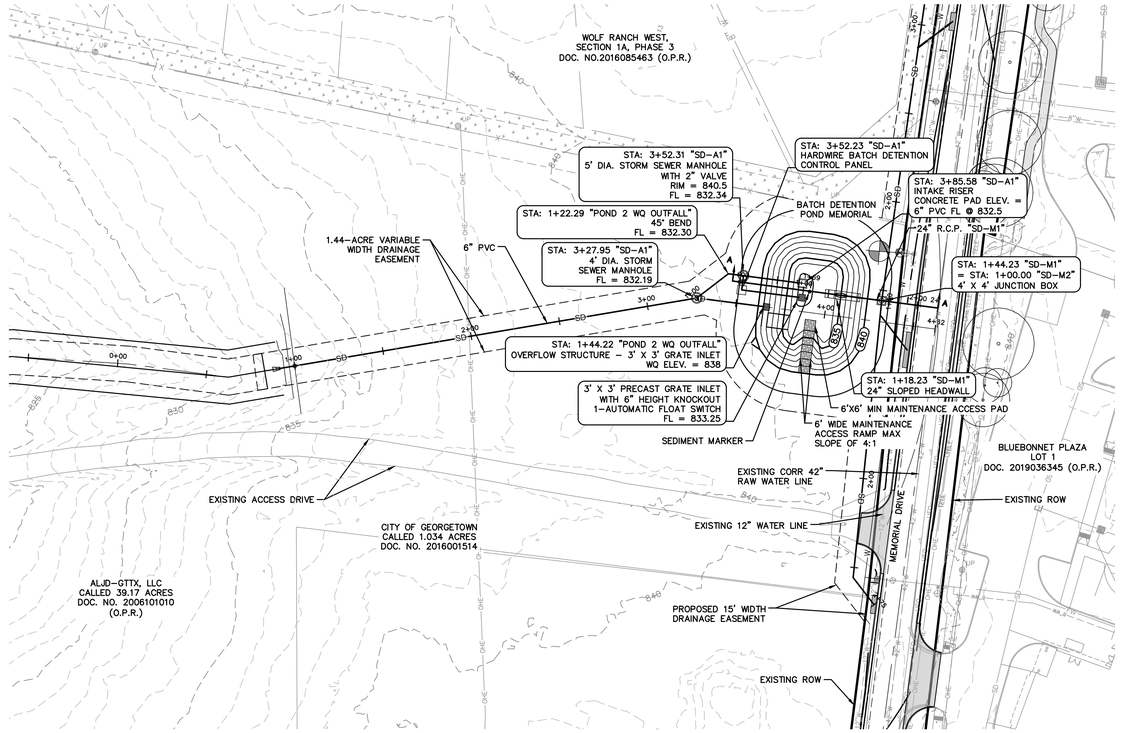
$$Q = CA_o\sqrt{2gH}$$

CALCULATE 24 HR DRAWDOWN ELEVATION FOR WATER QUALITY POND (USE IN DETENTION MODEL)

Total Drawdown Time	9.3	hours
Total Hold + Drawdown Time (Max. 48 Hours)	21.3	hours
Orifice Discharge Rate (Average)	0.23	cfs

POND UNDERDRAIN SIZING CALCULATIONS

DRAIN LINE ID	WATER QUALITY VOLUME **WQV** (cf)	AVERAGE DRAWDOWN FLOWRATE FROM ORIFICE (VALVE) **Q** (cfs)	PIPE DIAMETER **D** (in)	MANNINGS N **n**	PIPE SLOPE **S** (ft/ft)	FULL FLOW CAPACITY **Qcap**	**K**	FRICTION SLOPE **Sf** (ft/ft)
MEMORIAL DRIVE POND DRAIN	7,804	0.23	6	0.010	0.005	0.52	7.29	0.0010



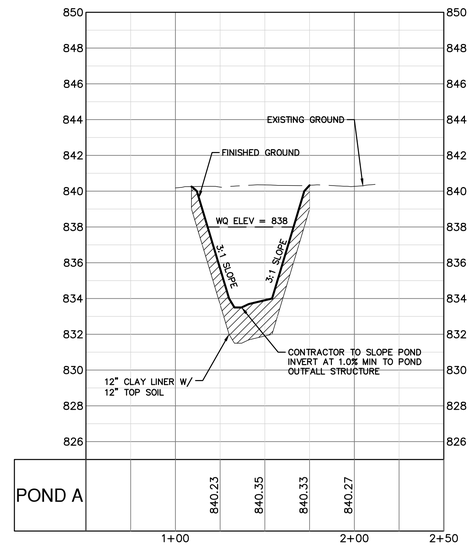
SCALE: 1"= 40'

0' 40' 80' 120'

LEGEND

- WATER LINE
- WASTEWATER LINE & MH
- STORM DRAIN LINE & MH
- CURB INLET
- FLOODPLAIN
- OVERHEAD ELECTRIC LINE
- GATE VALVE
- FIRE HYDRANT
- EXISTING GATE VALVE
- EXISTING FIRE HYDRANT
- EXISTING WATER LINE
- EXISTING WASTEWATER LINE
- EXISTING STORM DRAIN LINE
- EXISTING CONTOUR LINE
- PROPOSED CONTOUR LINE

EXISTING TREES



STATE OF TEXAS
STEVEN S. CRAUFORD
92677
LICENSED PROFESSIONAL ENGINEER

09/12/2025

PROFILE SCALES:

1" = 40' HORIZONTAL
1" = 4' VERTICAL

PROFILE LEGEND:

NATURAL GROUND

FINISHED GRADE

PROPOSED STORM DRAIN

NO.	REVISION	DATE

GEORGETOWN TEXAS *more than welcome*

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CITY OF GEORGETOWN, TEXAS
WOLF RANCH PKWY / MEMORIAL DR

BATCH DETENTION POND 2 PLAN

CITY JOB No.
JOB NO. 51423-00
DATE 9/12/2025
DESIGNER JB
CHECKED SC DRAWN JB

SHEET 466

Date: Sep 12, 2025, 10:40am User ID: cashatz
File: K:\Proj\514\23\001\301 Construction Documents\Civil\PD51423-00_POND 2.dwg

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Texas Commission on Environmental Quality

TSS Removal Calculations 04-20-2009

Project Name: **Memorial Drive - Batch Detention Pond 2**
Date Prepared: **8/8/2025**

Additional information is provided for cells with a red triangle in the upper right corner. Place the cursor over the cell.
Text shown in blue indicate location of instructions in the Technical Guidance Manual - RG-348.
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1. The Required Load Reduction for the total project: Calculations from RG-348 Pages 3-27 to 3-30

Page 3-29 Equation 3.3: $L_M = 28.9(A_N \times P)$

where:
$L_{M\ TOTAL\ PROJECT}$ = Required TSS removal resulting from t
A_N = Net increase in impervious area for the project
P = Average annual precipitation, inches

Site Data: Determine Required Load Removal Based on the Entire Project

County =	**Williamson**	
Total project area included in plan * =	**453.42**	acres
Predevelopment impervious area within the limits of the plan * =	**12.31**	acres
Total post-development impervious area within the limits of the plan* =	**376.59**	acres
Total post-development impervious cover fraction * =	**0.83**	
P =	**32**	inches
$L_{M\ TOTAL\ PROJECT}$ =	**336886**	lbs.

* **The values entered in these fields should be for the total project area.**

Number of drainage basins / outfalls areas leaving the plan area = **1.00**

2. Drainage Basin Parameters (This information should be provided for each basin):

Drainage Basin/Outfall Area No. = Memorial Pond

Total drainage basin/outfall area =	**3.08**	acres	
Predevelopment impervious area within drainage basin/outfall area =	**0.60**	acres	
Post-development impervious area within drainage basin/outfall area =	**0.83**	acres	***Not including the IC that was already treated with VFS**
Post-development impervious fraction within drainage basin/outfall area =	**0.27**		
$L_{M\ THIS\ BASIN}$ =	**768**	lbs.	

3. Indicate the proposed BMP Code for this basin.

Proposed BMP =	**Batch Detention**	
Removal efficiency =	**91**	percent

4. Calculate Maximum TSS Load Removed (L_R) for this Drainage Basin by the selected BMP Type.

RG-348 Page 3-33 Equation 3.7: L_R = (BMP efficiency) x P x (A_C x 34.6 + A_P x 0.54)

where:
A_C = Total On-Site drainage area in the BMP catchment area
A_I = Impervious area proposed in the BMP catchment area
A_P = Pervious area remaining in the BMP catchment area
L_R = TSS Load removed from this catchment area by the proposed BMP

A_C =	**3.08**	acres	
A_I =	**0.83**	acres	***Not including the IC that was already treated with VFS**
A_P =	**2.25**	acres	
L_R =	**872**	lbs	

5. Calculate Fraction of Annual Runoff to Treat the drainage basin / outfall area

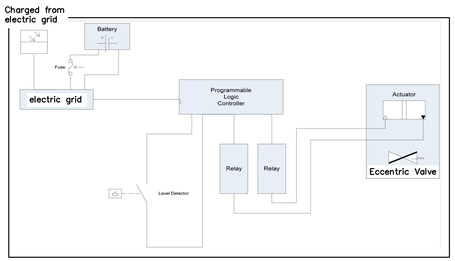
Desired $L_{M\ THIS\ BASIN}$ =	**768**	lbs.
F =	**0.88**	

6. Calculate Capture Volume required by the BMP Type for this drainage basin / outfall area. Calculations from RG-348 Pages 3-34 to 3-36

Rainfall Depth =	**1.50**	inches
Post Development Runoff Coefficient =	**0.24**	
On-site Water Quality Volume =	**4059**	cubic feet

Calculations from RG-348 Pages 3-36 to 3-37

Off-site area draining to BMP =	**0.00**	acres
Off-site Impervious cover draining to BMP =	**0.00**	acres
Impervious fraction of off-site area =	**0**	
Off-site Runoff Coefficient =	**0.00**	
Off-site Water Quality Volume =	**0**	cubic feet
Storage for Sediment =	**812**	
Total Capture Volume (required water quality volume(s) x 1.20) =	**4871**	cubic feet



CONTROLLER CIRCUIT DIAGRAM

CONTROLLER NOTES:
1. REFER TO THE WATER POLLUTION ABATEMENT PLAN FOR LOGIC CONTROLLER CYCLE OVERVIEW.
2. CLEARLY VISIBLE ALARM SYSTEM TO BE PROVIDED TO INDICATE SYSTEM MALFUNCTION.
3. SIGN TO BE POSTED WITH PHONE NUMBERS OF THE OWNER AND APPROPRIATE TCEQ REGIONAL OFFICE.

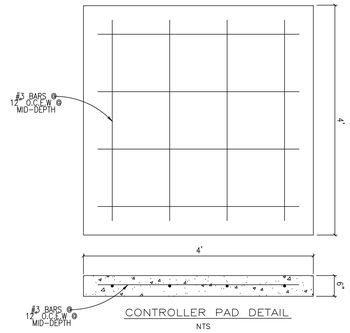
Batch Detention Pond Controller Information

Component	Description	Voltage
Power System	Charged from electric grid 12 VDC Battery (Model MK Powered 8GU1) (Or approved equal).	
Logic Controller	IDEC FL1C-H12RCE (Or approved equal)	12
Parts Enclosure	Southwest Photovoltaic Model BBG-1 (15.75" wide x 9.75" deep x 11.75" tall) (Or approved equal)	
Nature of Event Sensing	Anchor Scientific Float Switch (Or approved equal)	
Valve Type	2" Eccentric Plug Valve with over torque sensors and mechanical hand crank for physical override if necessary. Able to withstand 100 psi minimum. (Or approved equal)	
Actuator	EPI-6 12 VDC. Able to withstand 100 psi minimum. (Or approved equal)	12
Power Consumption (actuator, controller, relay, PLC)	242.58 W, 46.5 W-hours	



POND SIGN DETAIL

SIGN NOTING CONTACT INFORMATION FOR RESPONSIBLE PARTY IN CASE OF ALARM. SHALL HAVE MINIMUM DIMENSION OF 12" WIDE BY 18" HIGH AND SHALL HAVE BLACK LETTERS ON A WHITE REFLECTIVE BACKGROUND. SIGN MUST BE LOCATED NEAR SYSTEM ALARM.

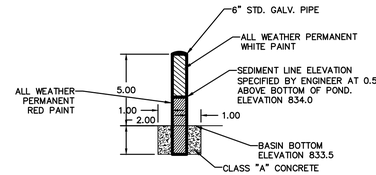


CONTROLLER PAD DETAIL
NTS

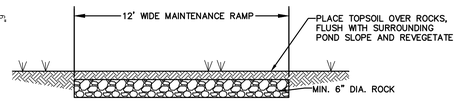
Material Property	Requirement	Testing Standard
Minimum Liquid Limit	> 50	ASTM D 4318
Minimum Plasticity Index	> 30	ASTM D 4318
Minimum Percent Passing # 200 Sieve	> 60 %	ASTM D 422
Maximum Particle Size	< 1 inch	ASTM D 422
Maximum Laboratory Permeability	$< 1 \times 10^{-7}$ cm/sec	ASTM D 5084

*REFER TO GEOTECHNICAL REPORT PREPARED BY MLA LABS, INC., DATED JULY 19, 2024 FOR CLAY LINER RECOMMENDATIONS.

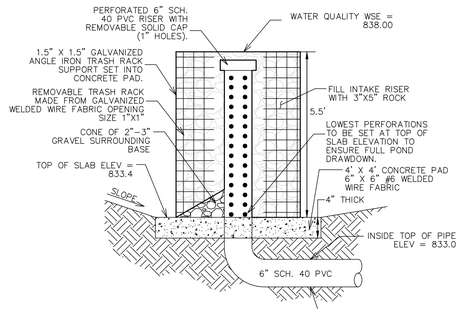
NOTE
1. THE CONSTRUCTED HEIGHT OF AN EARTHEN EMBANKMENT SHALL BE EQUAL TO THE DESIGN HEIGHT PLUS THE AMOUNT NECESSARY TO ENSURE THAT THE DESIGN HEIGHT WILL BE MAINTAINED ONCE ALL SETTLEMENT HAS TAKEN PLACE. THIS AMOUNT SHALL IN NO CASE BE LESS THAN 5% OF THE TOTAL FILL HEIGHT. ALL EARTHEN EMBANKMENTS SHALL BE COMPACTED TO 95% OF MAXIMUM DENSITY IN ACCORDANCE WITH CITY OF SAN MARCOS STANDARD SPECIFICATIONS.
2. UPON COMPLETION OF THE PROPOSED SITE IMPROVEMENT AND PRIOR TO THE RELEASE OF THE CERTIFICATE OF ACCEPTANCE OR OCCUPANCY BY THE PERMIT CENTER, THE DESIGN ENGINEER SHALL CERTIFY IN WRITING THAT THE PROPOSED DETENTION FACILITY, FILTRATION FACILITIES OR WATER QUALITY FACILITIES WERE CONSTRUCTED IN CONFORMANCE WITH THE APPROVED PLANS. ANY SUCH FACILITIES BUILT WITHIN THE CITY OF SAN MARCOS CITY LIMITS WILL NEED TO SHOW COMPLIANCE WITH THE CITY MUNICIPAL SEPARATE STORM SEWER SYSTEM ORDINANCES. PRIOR TO RELEASE OF THE CERTIFICATE OF ACCEPTANCE OR OCCUPANCY A CITY EASEMENT MUST BE SHOWN AROUND ALL SUCH FACILITIES WITH A MAINTENANCE COVENANT FOR EACH FACILITY.
3. STABILIZATION OF POND OR OTHER DISTURBED SLOPES 3:1 OR STEEPER WITH DEGRADABLE SOIL RETENTION BLANKETS, OR EQUIVALENT BMP IS REQUIRED. OR SOD.



SEDIMENT DEPTH MARKER DETAIL
NTS

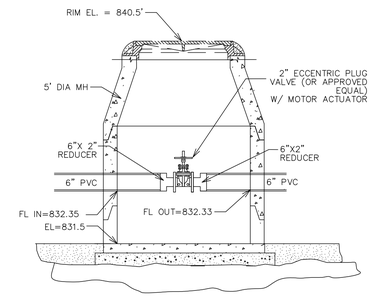


POND MAINTENANCE ACCESS SECTION
N.T.S.



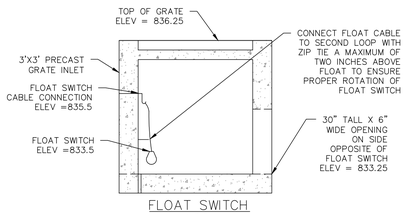
INTAKE RISER DETAIL
NTS

NOTE:
INTAKE RISER TO BE USED AS TEMPORARY SEDIMENT BASIN DEWATERING OUTLET DURING INTERIM CONSTRUCTION ACTIVITIES.

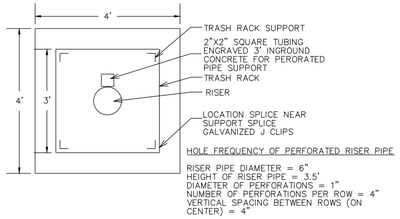


STORM SEWER MANHOLE DETAIL
NTS

NOTE:
CONTROL VALVE TO BE MOTOR ACTUATED VALVE. VALVE SHALL BE WIRED TO A CONTROLLER THAT OPENS VALVE 12 HOURS AFTER RAINFALL EVENT AND CLOSES VALVE ONCE POND HAS DRAINED DRY. CONTROLLER SHALL INCLUDE PROVISIONS FOR A MANUAL OVERRIDE SWITCH.



FLOAT SWITCH
N.T.S.



HOLE FREQUENCY OF PERFORATED RISER PIPE

RISER PIPE DIAMETER = 6"
HEIGHT OF RISER PIPE = 3.5'
DIAMETER OF PERFORATIONS = 1"
NUMBER OF PERFORATIONS PER ROW = 4"
VERTICAL SPACING BETWEEN ROWS (ON CENTER) = 4"

STATE OF TEXAS
STEVEN S. CRAUFORD
92677
LICENSED PROFESSIONAL ENGINEER
09/12/2025

NO.	REVISION	DATE

GEORGETOWN TEXAS more than welcome

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AUSTIN | SAN ANTONIO | HOUSTON | FORT WORTH | DALLAS
10801 N MOPAC EXPY, BLDG 3, STE 200 | AUSTIN, TX 78759 | 512.454.8711
TBPE FIRM REGISTRATION #470 | TBPLS FIRM REGISTRATION #10028801

CITY OF GEORGETOWN, TEXAS
WOLF RANCH PKWY / MEMORIAL DR

POND 2 DETAILS (1 OF 1)

CITY JOB No.
JOB NO. 51423-00
DATE 9/12/2025
DESIGNER JB
CHECKED SC DRAWN JB

SHEET 467

Date: Sep 12, 2025, 10:40am User ID: cashcitz
File: H:\Projects\514\23\00\301 Construction Documents\Civil\P051423-00__POND 2.dwg

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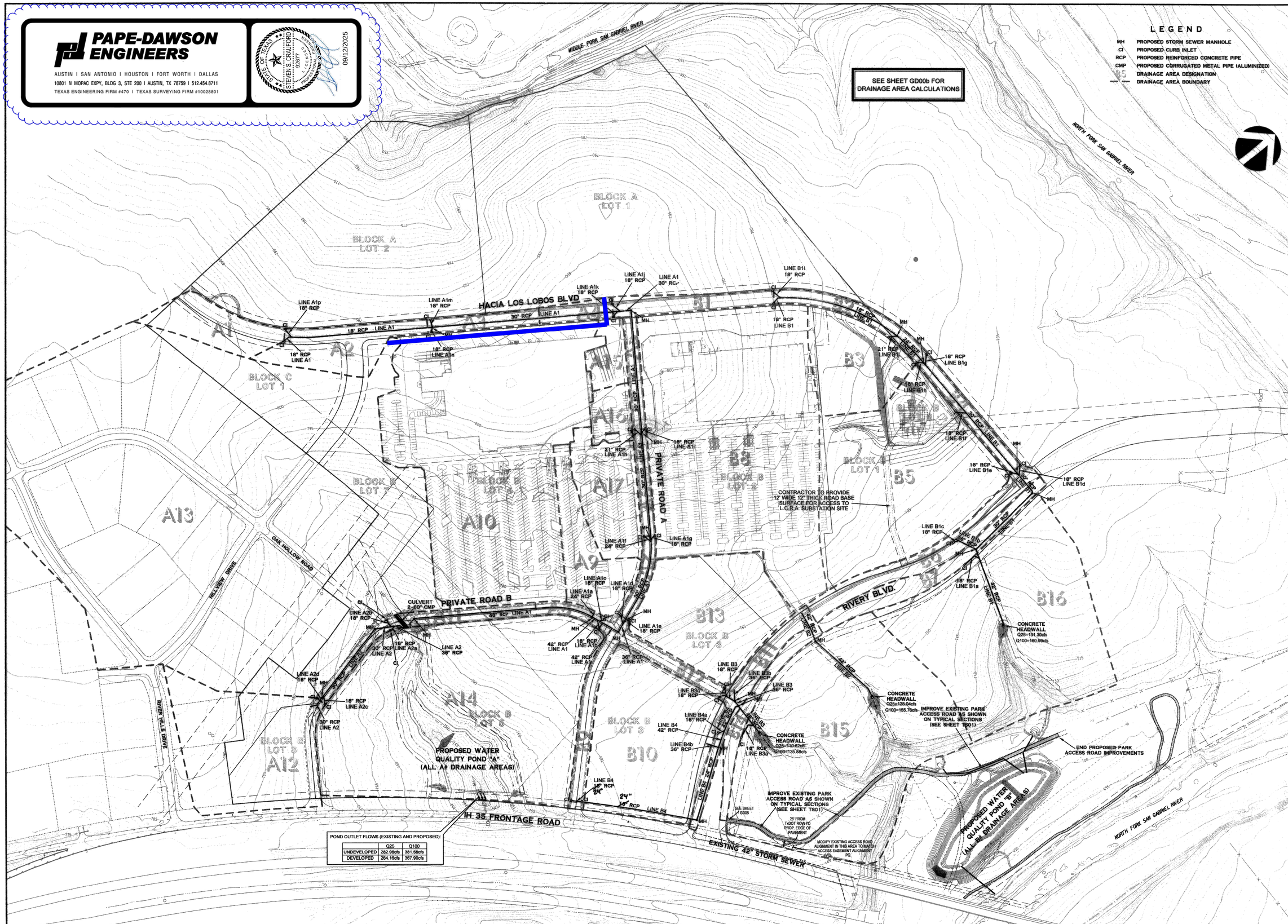
PAPE-DAWSON ENGINEERS
AUSTIN | SAN ANTONIO | HOUSTON | FORT WORTH | DALLAS
10801 N MOPAC EXPY, BLDG 3, STE 200 | AUSTIN, TX 78759 | 512.454.8711
TEXAS ENGINEERING FIRM #470 | TEXAS SURVEYING FIRM #10028801

STATE OF TEXAS
STEVEN S. CRAUFORD
92677
LICENSED PROFESSIONAL ENGINEER
09/12/2025



POND OUTLET FLOWS (EXISTING AND PROPOSED):

	Q25	Q100
UNDEVELOPED	282.96cfs	381.58cfs
DEVELOPED	264.16cfs	367.90cfs

THE RIVERY - PHASE ONE
SUBDIVISION CONSTRUCTION PLANS
OVERALL DRAINAGE PLAN AND PARK ACCESS ROAD IMPROVEMENTS
RIVERY - CONSTRUCTION DRAWINGS - UDG JOB NO. 99-075.010

REVISIONS

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UDG Urban Design Group

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LICENSED PROFESSIONAL ENGINEER
1/23/02

SCALE:
1" = 150'
0 1/2 1
IF THIS BAR DOES NOT MEASURE 1" THEN DRAWING IS NOT TO SCALE

DRAWING
GD00
SHEET 7 468 ITS
JOB NO. 99-075.010

05/23/2002
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RECORD DRAWINGS

POND A DRAINAGE AREAS

25 YR

100 YR

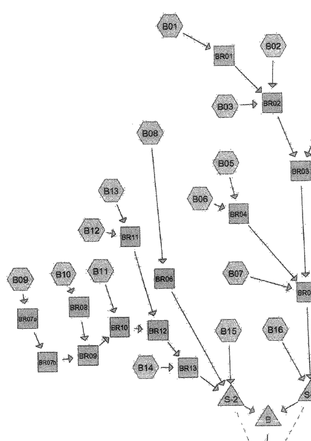
POND B DRAINAGE AREAS

25 YR

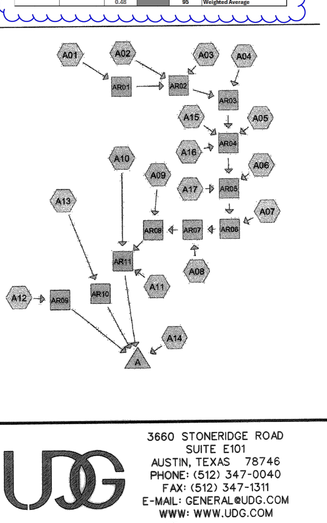
100 YR

25 YR

100 YR

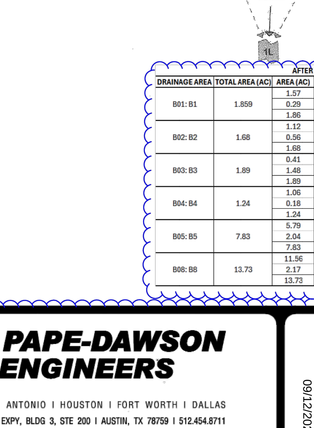


AFTER WRP EXPANSION				
DRAINAGE AREA	TOTAL AREA (AC)	AREA (AC)	CN	DESCRIPTION
B01: B1	1.859	1.57	98	Paved roads w/ curbs & sewers
		0.29	80	> 75% Grass cover, Good, HSG D
		1.86	95	Weighted Average
B02: B2	1.68	1.12	98	Paved roads w/ curbs & sewers
		0.56	80	> 75% Grass cover, Good, HSG D
		1.68	92	Weighted Average
B03: B3	1.89	0.41	98	Paved roads w/ curbs & sewers
		1.48	80	> 75% Grass cover, Good, HSG D
		1.89	84	Weighted Average
B04: B4	1.24	1.06	98	Paved roads w/ curbs & sewers
		0.18	80	> 75% Grass cover, Good, HSG D
		1.24	95	Weighted Average
B05: B5	7.83	5.79	98	Paved roads w/ curbs & sewers
		2.04	80	> 75% Grass cover, Good, HSG D
		7.83	93	Weighted Average
B08: B8	13.73	11.56	98	Paved roads w/ curbs & sewers
		2.17	80	> 75% Grass cover, Good, HSG D
		13.73	95	Weighted Average



AFTER WRP EXPANSION				
DRAINAGE AREA	TOTAL AREA (AC)	AREA (AC)	FRACTION	CN	DESCRIPTION
A1	2.40	0.86	35.8	98	Paved roads w/ curbs & sewers
		1.54	64.2	73	Brush, Good, HSG D
		2.40		82	Weighted Average
A2	2.435	1.07	44.1	98	Paved roads w/ curbs & sewers
		1.36	55.8	73	Brush, Good, HSG D
		2.43		84	Weighted Average
A3	1.142	0.91	79.8	98	Paved roads w/ curbs & sewers
		0.23	20.2	80	> 75% Grass cover, Good, HSG D
		1.14		94	Weighted Average
A4	0.48	0.41	85.1	98	Paved roads w/ curbs & sewers
		0.07	14.9	80	> 75% Grass cover, Good, HSG D
		0.48		95	Weighted Average





AFTER WRP EXPANSION				
DRAINAGE AREA	TOTAL AREA (AC)	AREA (AC)	CN	DESCRIPTION
B01: B1	1.859	1.57	98	Paved roads w/ curbs & sewers
		0.29	80	> 75% Grass cover, Good, HSG D
		1.86	95	Weighted Average
B02: B2	1.68	1.12	98	Paved roads w/ curbs & sewers
		0.56	80	> 75% Grass cover, Good, HSG D
		1.68	92	Weighted Average
B03: B3	1.89	0.41	98	Paved roads w/ curbs & sewers
		1.48	80	> 75% Grass cover, Good, HSG D
		1.89	84	Weighted Average
B04: B4	1.24	1.06	98	Paved roads w/ curbs & sewers
		0.18	80	> 75% Grass cover, Good, HSG D
		1.24	95	Weighted Average
B05: B5	7.83	5.79	98	Paved roads w/ curbs & sewers
		2.04	80	> 75% Grass cover, Good, HSG D
		7.83	93	Weighted Average
B08: B8	13.73	11.56	98	Paved roads w/ curbs & sewers
		2.17	80	> 75% Grass cover, Good, HSG D
		13.73	95	Weighted Average

EXISTING (UNDEVELOPED) DRAINAGE AREA CALCULATIONS

25YR

Subcatchment UD-1: Undeveloped DA UD-1

Runoff = 282.66 cfs @ 2.01 hrs, Volume= 22.864 af

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-5.00 hrs, dt= 0.01 hrs
Austin 3-hr 25-yr Rainfall=5.40"

Area (ac)	CN	Description
10.760	98	River Hills Subdiv. IC
68.980	80	>75% Grass cover, Good, HSG D
79.740	82	Weighted Average

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
35.4	2,200	0.0250	1.0		Lag/CN Method,

Subcatchment UD-2: Undeveloped DA UD-2

Runoff = 97.43 cfs @ 1.97 hrs, Volume= 7.406 af

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-5.00 hrs, dt= 0.01 hrs
Austin 3-hr 25-yr Rainfall=5.40"

Area (ac)	CN	Description
27.390	80	>75% Grass cover, Good, HSG D

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
31.3	2,160	0.0350	1.1		Lag/CN Method,

Subcatchment UD-3: Undeveloped DA UD-3

Runoff = 57.34 cfs @ 1.94 hrs, Volume= 4.067 af

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-5.00 hrs, dt= 0.01 hrs
Austin 3-hr 25-yr Rainfall=5.40"

Area (ac)	CN	Description
18.370	80	>75% Grass cover, Good, HSG D

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
29.6	2,000	0.0350	1.1		Lag/CN Method,

Subcatchment UD-4: Undeveloped DA UD-4

Runoff = 76.05 cfs @ 1.98 hrs, Volume= 5.802 af

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-5.00 hrs, dt= 0.01 hrs
Austin 3-hr 25-yr Rainfall=5.40"

Area (ac)	CN	Description
21.460	80	>75% Grass cover, Good, HSG D

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
32.5	2,200	0.0350	1.2		Lag/CN Method,

100YR

Subcatchment UD-1: Undeveloped DA UD-1

Runoff = 381.58 cfs @ 2.01 hrs, Volume= 31.797 af

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-5.00 hrs, dt= 0.01 hrs
Austin 3-hr 100-yr Rainfall=6.88"

Area (ac)	CN	Description
10.760	98	River Hills Subdiv. IC
68.980	80	>75% Grass cover, Good, HSG D
79.740	82	Weighted Average

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
35.4	2,200	0.0250	1.0		Lag/CN Method,

Subcatchment UD-2: Undeveloped DA UD-2

Runoff = 132.98 cfs @ 1.97 hrs, Volume= 10.421 af

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-5.00 hrs, dt= 0.01 hrs
Austin 3-hr 100-yr Rainfall=6.88"

Area (ac)	CN	Description
27.390	80	>75% Grass cover, Good, HSG D

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
31.3	2,160	0.0350	1.1		Lag/CN Method,

Subcatchment UD-3: Undeveloped DA UD-3

Runoff = 91.60 cfs @ 1.94 hrs, Volume= 6.869 af

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-5.00 hrs, dt= 0.01 hrs
Austin 3-hr 100-yr Rainfall=6.88"

Area (ac)	CN	Description
18.370	80	>75% Grass cover, Good, HSG D

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
29.6	2,000	0.0350	1.1		Lag/CN Method,

Subcatchment UD-4: Undeveloped DA UD-4

Runoff = 102.48 cfs @ 1.98 hrs, Volume= 8.104 af

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-5.00 hrs, dt= 0.01 hrs
Austin 3-hr 100-yr Rainfall=6.88"

Area (ac)	CN	Description
21.460	80	>75% Grass cover, Good, HSG D

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
32.5	2,200	0.0350	1.2		Lag/CN Method,

MIDDLE FORK SAN GABRIEL RIVER

NORTH FORK SAN GABRIEL RIVER

OAK HOLLOW ROAD

HILLVIEW DRIVE

RIVER HILLS DRIVE

IH 35 FRONTAGE ROAD

UD-1

UD-2

UD-3

UD-4

EXISTING
FLOW TO CULVERT:
Q25=282.96cfs
Q100=381.58cfs

LEGEND

MH	PROPOSED STORM SEWER MANHOLE
CI	PROPOSED CURB INLET
RCP	PROPOSED REINFORCED CONCRETE PIPE
CMP	PROPOSED CORRUGATED METAL PIPE (ALUMINIZED)
B5	DRAINAGE AREA DESIGNATION
	DRAINAGE AREA BOUNDARY

THE RIVERY - PHASE ONE

SUBDIVISION CONSTRUCTION PLANS

UNDEVELOPED DRAINAGE AREA MAP

RIVERY - CONSTRUCTION DRAWINGS - UDG JOB NO. 99-075.010

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Urban Design Group

BRIANZ. RUNYEN
85076
LICENSED PROFESSIONAL ENGINEER
5/23/02

SCALE:
1" = 150'
0 1/2 1
IF THIS BAR DOES NOT MEASURE 1" THEN DRAWING IS NOT TO SCALE

05/23/2002

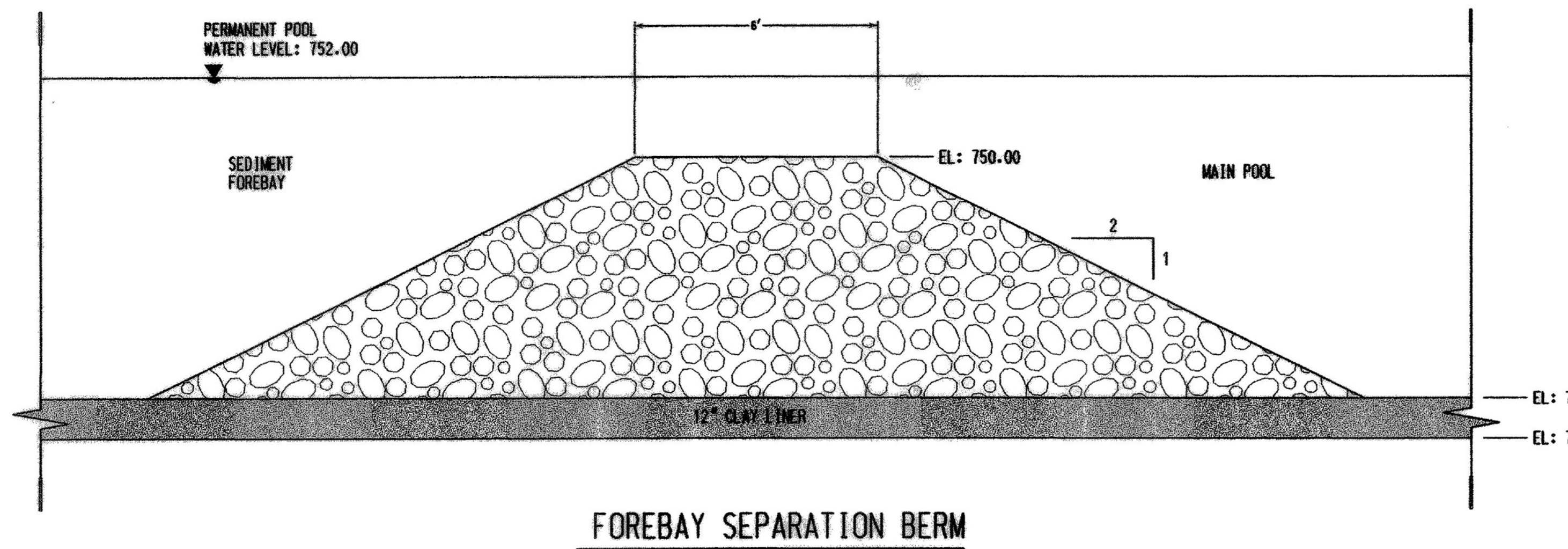
DRAWING
GD00c

SHEET 9 470 SETS

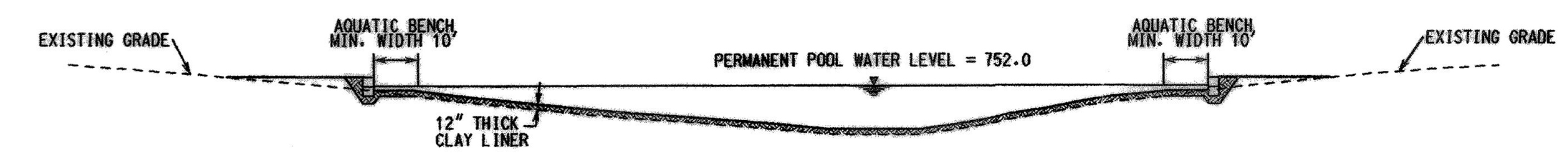
JOB NO. 99-075.010

RECORD DRAWINGS

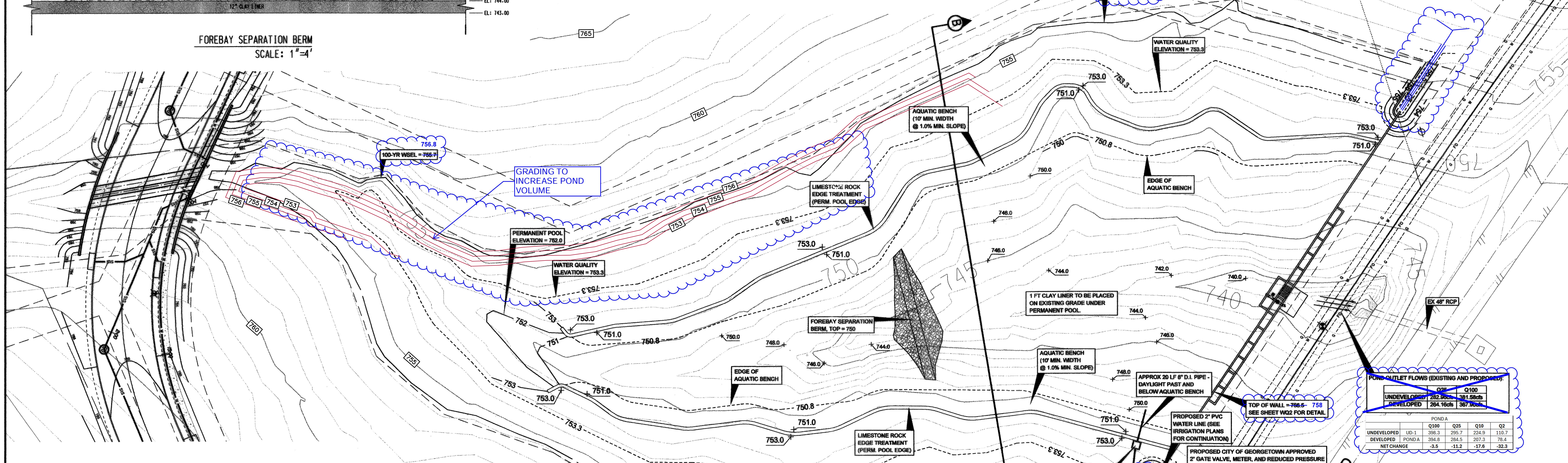
©\Jobfiles\Rivery\Vm-1-gd00c.dgn



FOREBAY SEPARATION BERM
SCALE: 1"=4'



WATER QUALITY POND "A" (SECTION B)
SCALE: 1"=30'



POND OUTLET FLOWS (EXISTING AND PROPOSED):

	Q25	Q100
UNDEVELOPED	282.96cfs	381.58cfs
DEVELOPED	264.16cfs	367.90cfs

POND A

		Q100	Q25	Q10	Q2
UNDEVELOPED	UD-1	398.3	295.7	224.9	110.7
DEVELOPED	POND A	394.8	284.5	207.3	78.4
NET CHANGE		-3.5	-11.2	-17.6	-32.3

POND A WATER QUALITY VOLUME (TNRCC EDWARDS AQUIFER REQUIREMENTS):

A = Drainage Area (ac): 86.33 ac
30.73 acres existing development at assumed 35% impervious (River Hills Subdivision)
55.60 acres onsite area
P = Average Annual Precipitation, Williamson County (in) = 32

OFFSITE LOAD:

Rv = Runoff Coefficient for the fraction of impervious cover
= 0.546 (IC)^2 + 0.328 (IC) + 0.030 = 0.212 (35% IC)
C = Average TSS Concentration (mg/L) = 170 (developed)

Offsite L = A x P x Rv x C x 0.226
= 30.73 x 32 x 0.212 x 170 x 0.226
= 8.010 lbs

ONSITE PRE-DEVELOPMENT (BACKGROUND) LOAD:

Rv = Runoff Coefficient for the fraction of impervious cover
= 0.546 (IC)^2 + 0.328 (IC) + 0.030 = 0.030 (0% IC)
C = Average TSS Concentration (mg/L) = 80 (undeveloped)

Onsite Predevelopment L = A x P x Rv x C x 0.226
= 55.60 x 32 x 0.030 x 80 x 0.226
= 965 lbs

ONSITE POST-DEVELOPMENT LOAD:

Total Impervious Cover (ac): 30.96
IC = Impervious Cover = 55.7%

Rv = Runoff Coefficient for the fraction of impervious cover
= 0.546 (IC)^2 + 0.328 (IC) + 0.030 = 0.382
C = Average TSS Concentration (mg/L) = 170 (developed)

Onsite Postdevelopment L = A x P x Rv x C x 0.226
= 55.60 x 32 x 0.382 x 170 x 0.226
= 26.112 lbs

TOTAL PREDEVELOPMENT LOAD:

Onsite Predevelopment Load + Offsite Load = 8.975 lbs

TOTAL POSTDEVELOPMENT LOAD:

Onsite Postdevelopment Load + Offsite Load = 34.122 lbs

TSS LOAD REDUCTION:

Lr = 0.8 x (postdevelopment load - predevelopment load)
= 20.118 lbs

Lr = (total postdevelopment load) x F x (fraction of site treated) x (TSS removal eff.)
20.118 = 34.122 x F x 1 x 0.93

F = fraction of load captured by BMP
F = 0.634

Runoff capture depth = 0.25 in
(48.3% weighted impervious cover over drainage area, 63.4% load captured by pond)

PERMANENT POOL ELEVATION = 752.0
WATER QUALITY ELEVATION = 753.3

REQUIRED WATER QUALITY VOLUME = 0.25 in x 86.33 ac
= 78.345 cf (1.80 AC-FT)
PROVIDED WATER QUALITY VOLUME = 85.001 cf (1.86 AC-FT)

REQUIRED PERMANENT POOL VOLUME = 1.2 x WQV (20% increase to allow for sediment accumulation)
= 94.013 cf (2.16 AC-FT)
PROVIDED PERMANENT POOL VOLUME = 242.630 cf (5.57 AC-FT)

REQUIRED FOREBAY VOLUME = 15 to 25% of permanent pool volume
PROVIDED FOREBAY VOLUME = 44.901 CF (18.2%)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
739.00	0	0	0
740.00	248	124	124
741.00	817	533	657
742.00	1,877	1,347	2,004
743.00	3,841	2,859	4,863
744.00	7,371	5,606	10,469
745.00	11,751	9,561	20,030
746.00	16,051	13,901	33,931
747.00	20,477	18,264	52,195
748.00	25,585	23,031	75,226
749.00	31,617	28,601	103,827
750.00	39,463	35,540	139,367
750.80	45,986	34,183	173,546
751.00	58,244	10,423	183,969
752.00	59,077	58,661	242,630
[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]

Primary OutFlow (Free Discharge)
1=Culvert
2=Broad-Crested Rectangular Weir
2=Broad-Crested Rectangular Weir

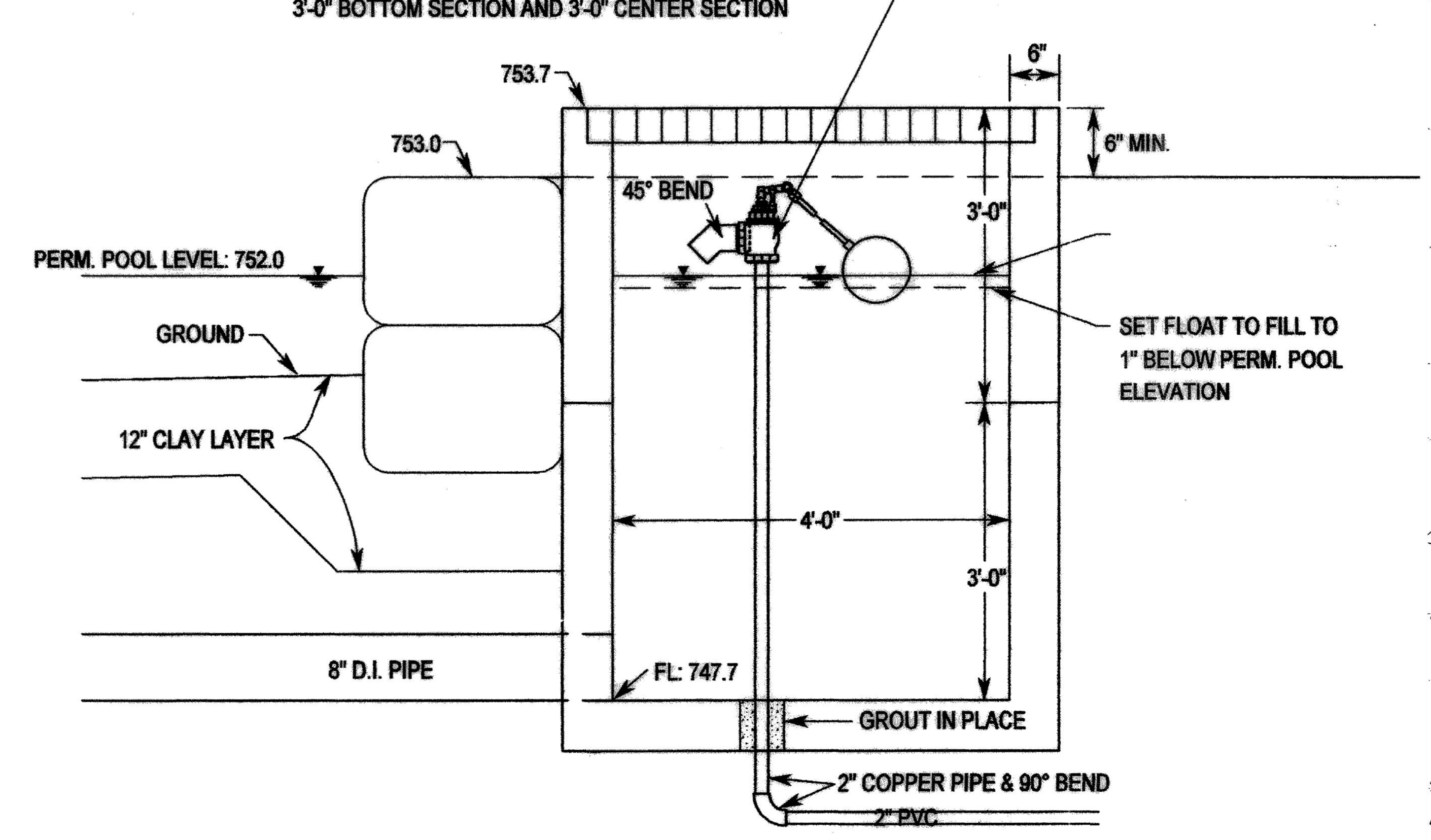
#	Routing	Invert	Outlet Devices
1	Device 3	752.00'	1.5' long x 0.7' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 Coef. (English) 2.76 2.82 2.93 3.00 3.18 3.22 3.27 3.30 3.32 3.31 3.32
2	Device 3	753.30'	28.5' long x 0.7' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 Coef. (English) 2.76 2.82 2.93 3.08 3.18 3.22 3.27 3.30 3.32 3.31 3.32
3	Primary	738.10'	42.0" x 6.0' long Culvert X 2.00 CMP, square edge headwall, Ke= 0.500 Outlet Invert= 738.03' S= 0.0167 '/' n= 0.020 Cc= 0.900

Pond A

AREA DELTA (FT^2)	Elevation	Area (ft^2)	Area (ac)	Incremental Volume (ft^3)	Cumulative Volume (ft^3)	Notes
	739	0	0.000	-	-	
	740	248	0.006	124	124	
	741	817	0.019	533	657	
	742	1,877	0.043	1,347	2,004	
	743	3,841	0.088	2,859	4,863	
	744	7,371	0.169	5,606	10,469	
	745	11,751	0.270	9,561	20,030	
	746	16,051	0.368	13,901	33,931	
	747	20,477	0.470	18,264	52,195	
	748	25,585	0.587	23,031	75,226	
	749	31,617	0.726	28,601	103,827	
	750	39,463	0.906	35,540	139,367	
	750.8	45,986	1.056	34,180	173,546	
	751	58,244	1.337	10,423	183,969	
	752	59,077	1.356	58,661	242,630	PERMANENT POOL
16346	753	78,931	1.812	69,004	311,634	
	753.2	84,899	1.949	16,383	328,017	WATER QUALITY ELEV.
10222	754	108,769	2.497	93,850	405,484	
7019	755	121,750	2.795	115,260	520,744	
2623	756	134,354	3.084	128,052	648,796	
	756.8	145,432	3.339	111,914	760,710	100 YR WSEL
	757	148,201	3.402	29,363	790,073	

Elevation (feet)	Discharge (cfs)	Elevation (feet)	Discharge (cfs)
739.00	0.00	754.00	[illegible]
.	.	754.04	69.56
.	.	754.08	75.25
752.00	0.00	754.12	[illegible]
752.04	0.03	754.16	86.63
752.08	0.09	754.20	92.51
752.12	0.17	754.24	98.57
752.16	0.28	754.28	104.80
752.20	0.37	754.32	111.06
752.24	0.49	754.36	117.32
752.28	0.62	754.40	123.72
752.32	0.76	754.44	130.26
752.36	0.91	754.48	136.93
752.40	1.07	754.52	143.78
752.44	1.24	754.56	150.80
752.48	1.43	754.60	157.96
752.52	1.62	754.64	165.26
752.56	1.83	754.68	172.70
752.60	2.04	754.72	180.18
752.64	2.27	754.76	187.69
752.68	2.52	754.80	195.33
752.72	2.77	754.84	203.08
752.76	3.04	754.88	210.96
752.80	3.32	754.92	218.89
752.84	3.59	754.96	226.88
752.88	3.87	755.00	234.97
752.92	4.16	755.04	243.18
752.96	4.46	755.08	251.49
753.00	4.77	755.12	259.70
753.04	5.07	755.16	267.78
753.08	5.38	755.20	275.94
753.12	5.70	755.24	284.18
753.16	6.02	755.28	292.49
753.20	6.35	755.32	300.99
753.24	6.69	755.36	309.69
753.28	7.04	755.40	318.47
753.32	7.82	755.44	327.34
753.36	8.91	755.48	336.30
753.40	10.61	755.52	345.34
753.44	12.61	755.56	354.46
753.48	14.87	755.60	363.66
753.52	17.38	755.64	368.16
753.56	20.12	755.68	368.63
753.60	23.08	755.72	369.10
753.64	26.24	755.76	369.56
753.68	29.59	755.80	370.02
753.72	33.17	755.84	370.49
753.76	36.98	755.88	370.95
753.80	41.00	755.92	371.41
753.84	45.19	755.96	371.88
753.88	49.57	756.00	372.34
753.92	54.21		
753.96	59.14		

NOTE: USE 4'-0" BY 4'-0" DALWORTH QUICKSET GRATE INLET (GI44) OR EQUIVALENT 3'-0" BOTTOM SECTION AND 3'-0" CENTER SECTION



FLOAT SWITCH BOX DETAIL
SCALE: 1" = 1'

ELEVATION (FT)	OUTFLOW (CFS)	ELEVATION (FT)	OUTFLOW (CFS)	ELEVATION (FT)	OUTFLOW (CFS)
752	0	752.997	4.5	755.615	159.9
752	0	753.039	4.8	755.639	163.8
752	0	753.082	5.1	755.664	167.8
752	0	753.127	5.4	755.69	172
752	0	753.174	5.7	755.709	175.2
752	0	753.224	6.1	755.716	176.3
752	0	753.276	6.5	755.743	180.8
752	0	753.331	6.9	755.771	185.5
752	0	753.388	7.4	755.799	190.3
752	0	753.449	7.8	755.829	195.4
752	0	753.512	8.4	755.859	200.6
752	0	753.579	8.9	755.866	201.7
752	0	753.65	9.5	755.891	206.1
752.001	0	753.724	10.2	755.923	211.7
752.002	0	753.802	10.9	755.956	217.6
752.003	0	753.885	11.6	755.99	223.7
752.006	0	753.973	12.5	756.011	227.5
752.009	0	754.054	13.2	756.023	229.6
752.012	0	754.134	14	756.055	235.5
752.016	0	754.22	14.9	756.088	241.6
752.021	0	754.312	15.9	756.121	247.8
752.027	0	754.409	19.9	756.132	249.7
752.033	0	754.512	26.3	756.155	254.1
752.039	0	754.621	34.6	756.19	260.7
752.046	0	754.735	44.9	756.225	267.3
752.054	0.1	754.855	57.1	756.241	270.4
752.063	0.1	754.982	71.4	756.26	274.1
752.072	0.1	755.107	86.7	756.296	281.1
752.083	0.1	755.175	95.5	756.332	288.2
752.093	0.1	755.187	97	756.339	289.6
752.105	0.2	755.199	98.7	756.368	295.3
752.117	0.2	755.212	100.4	756.404	302.5
752.13	0.2	755.225	102.1	756.427	307.1
752.144	0.2	755.238	103.9	756.44	309.7
752.158	0.3	755.241	104.3	756.475	316.9
752.174	0.3	755.252	105.8	756.504	322.8
752.19	0.4	755.266	107.7	756.511	324.1
752.207	0.4	755.28	109.7	756.545	331.3
752.225	0.5	755.294	111.7	756.57	336.4
752.243	0.5	755.309	113.8	756.579	338.3
752.263	0.6	755.325	116	756.612	345.2
752.284	0.7	755.341	118.2	756.625	347.9
752.306	0.8	755.357	120.6	756.644	351.9
752.329	0.8	755.374	123	756.672	357.8
752.353	0.9	755.388	125.1	756.675	358.4
752.378	1	755.391	125.5	756.704	364.6
752.405	1.2	755.408	128.1	756.713	366.5
752.433	1.3	755.427	130.8	756.731	370.4
752.462	1.4	755.445	133.6	756.748	373.9
752.493	1.6	755.465	136.5	756.756	375.7
752.525	1.7	755.484	139.5	756.776	380.1
752.559	1.9	755.505	142.6	756.778	380.6
752.594	2.1	755.526	145.8	756.798	384.9
752.631	2.3	755.547	149.2	756.799	385.1
752.669	2.5	755.547	149.1	756.815	388.5
752.71	2.7	755.569	152.6	756.817	389.1
752.753	2.9	755.592	156.2	756.828	391.5
752.797	3.2	756.844	395	756.831	392.1
752.844	3.5	756.846	395.4	756.838	393.6
752.893	3.8	756.847	395.6	756.841	394.2
752.944	4.1				

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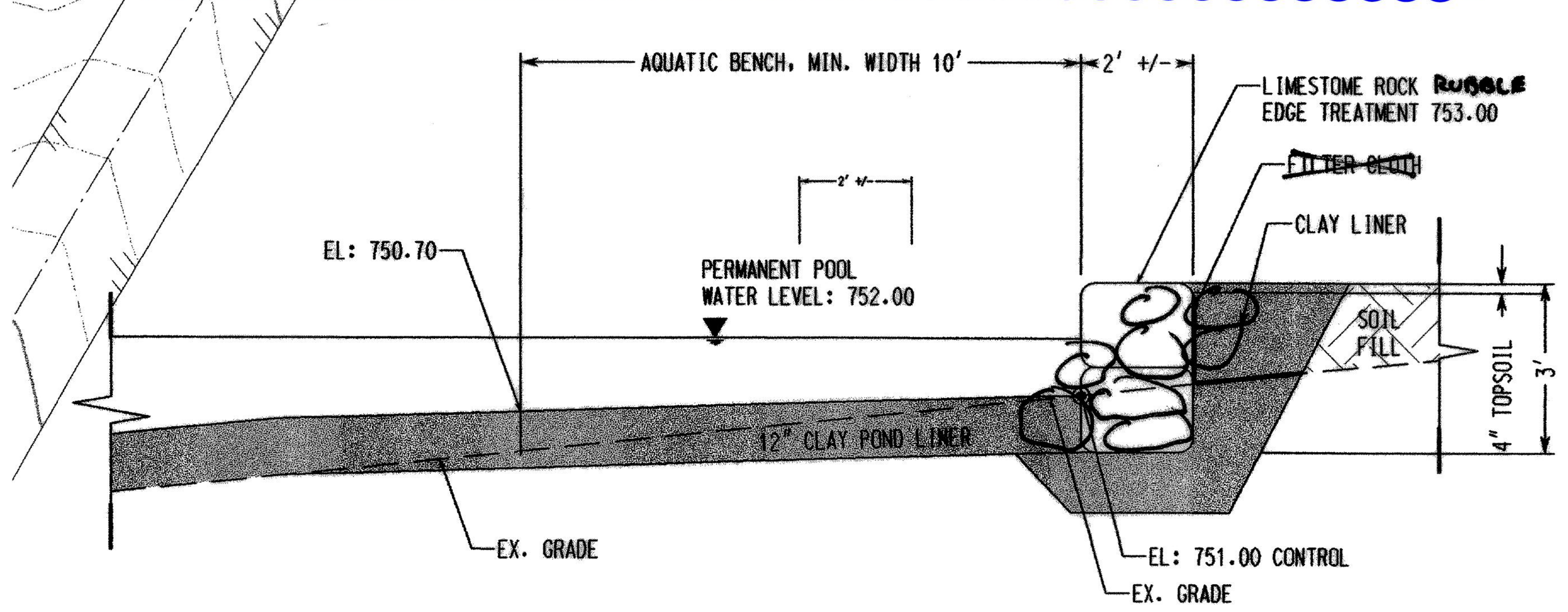
TEXAS ENGINEERING FIRM #470 | TEXAS SURVEYING FIRM #10028801
STATE OF TEXAS
STEVEN S. CRAUFORD
92677
LICENSED PROFESSIONAL ENGINEER
09/12/2025



AQUATIC BENCH. SECTION
SCALE: 1"=2'

THE RIVERY - PHASE ONE
SUBDIVISION CONSTRUCTION PLANS
WATER QUALITY POND "A"
PLAN VIEW LAYOUT

RIVERY - CONSTRUCTION DRAWINGS - UDG JOB NO. 99-075.010

REVISIONS

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UDG Urban Design Group
STATE OF TEXAS
JOHN NOELL
42657
REGISTERED PROFESSIONAL ENGINEER
5/24/02

SCALE:
1" = 30'
0 1/2 1
IF THIS BAR DOES NOT MEASURE 1" THEN DRAWING IS NOT TO SCALE

DRAWING
WQ1
SHEET 471

JOB NO. 99-075.010

05/24/2002

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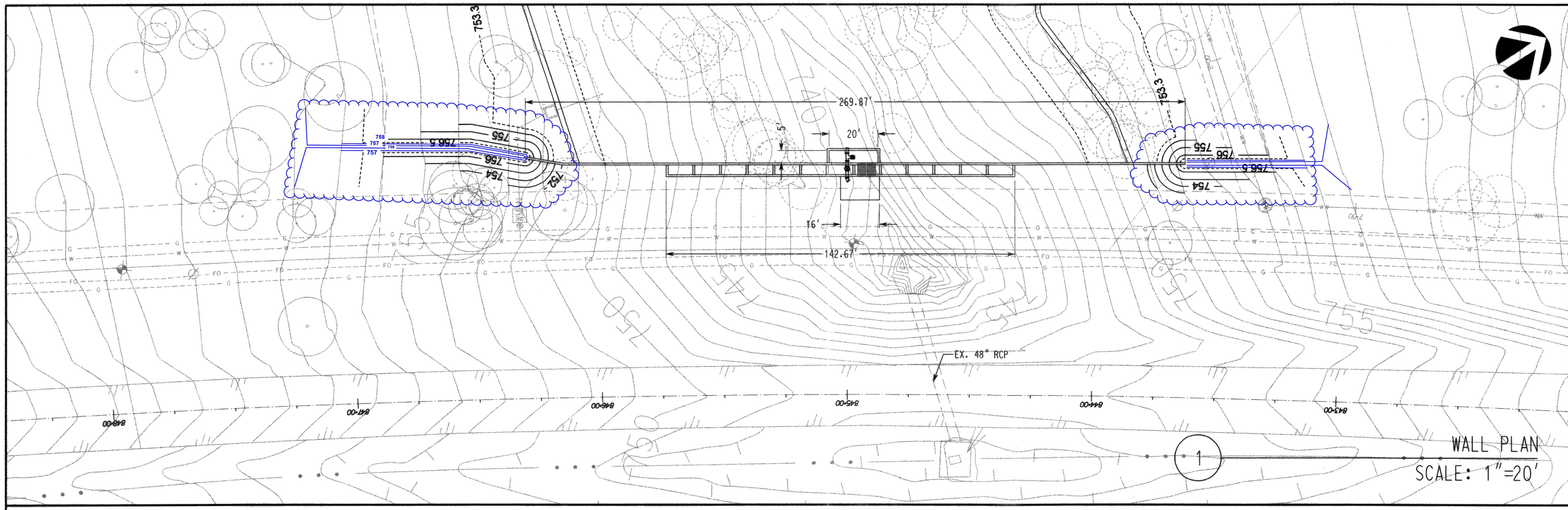
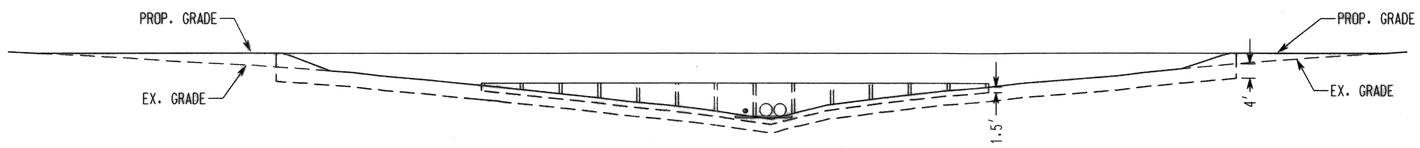
RECORD DRAWINGS



1 WALL PLAN
SCALE: 1"=20'



2 WALL ELEVATION
SCALE: 1"=20'

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TEXAS ENGINEERING FIRM #470 I TEXAS SURVEYING FIRM #10028801

STATE OF TEXAS
STEVEN S. CRAUFORD
92677
LICENSED
PROFESSIONAL ENGINEER
09/12/2025

THE RIVERY - PHASE ONE
SUBDIVISION CONSTRUCTION PLANS
WATER QUALITY POND "A"
RETENTION STRUCTURE LAYOUT
RIVERY - CONSTRUCTION DRAWINGS - UDG JOB NO. 99-075.010

REVISIONS

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STATE OF TEXAS
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42657
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5/26/02

SCALE:
AS SHOWN
0 1/2 1
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DRAWING
WQ2
SHEET 8C 472 SETS

JOB NO. 99-075.010

RECORD DRAWINGS

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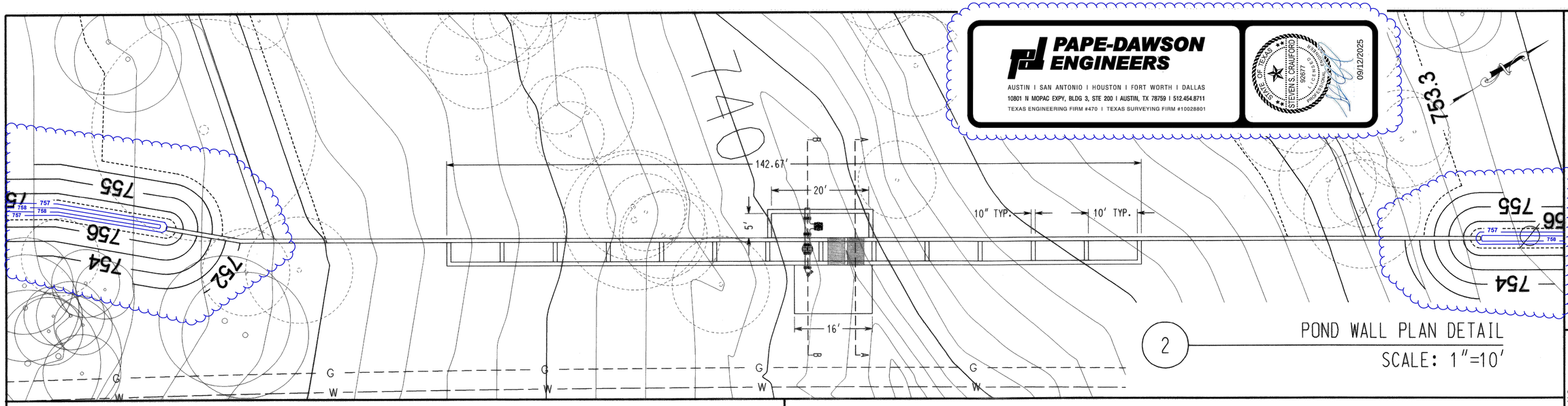
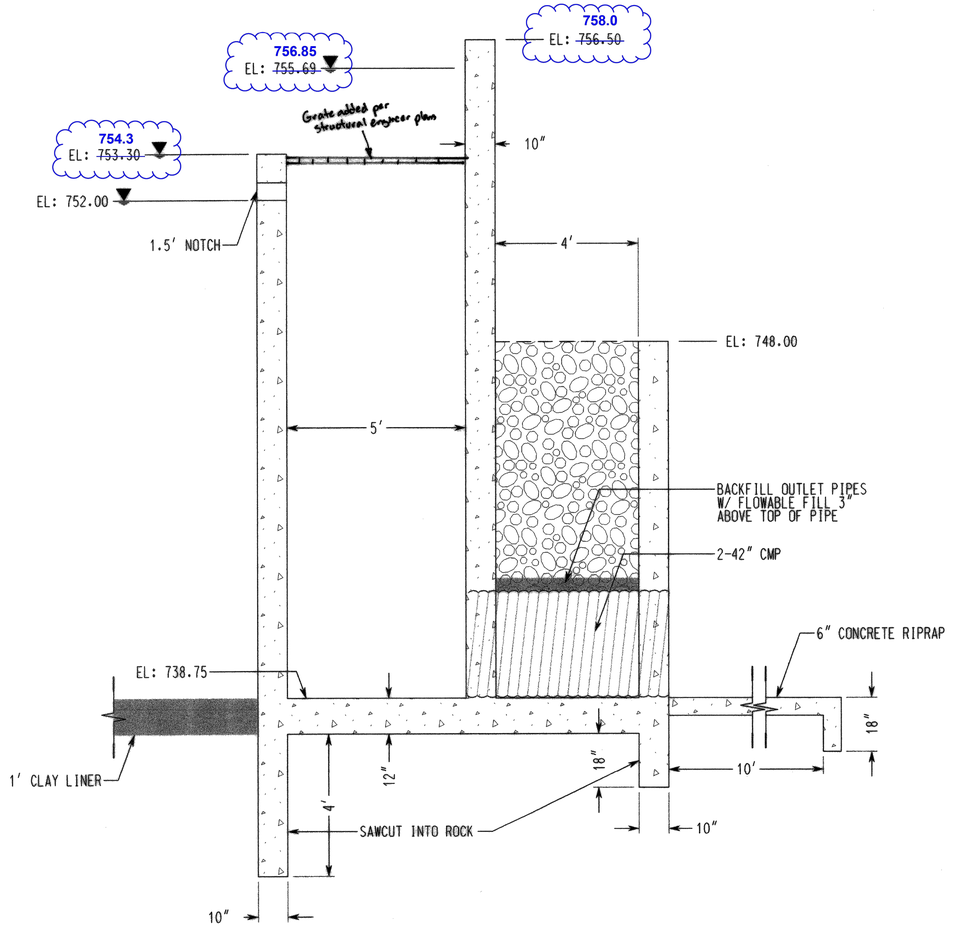
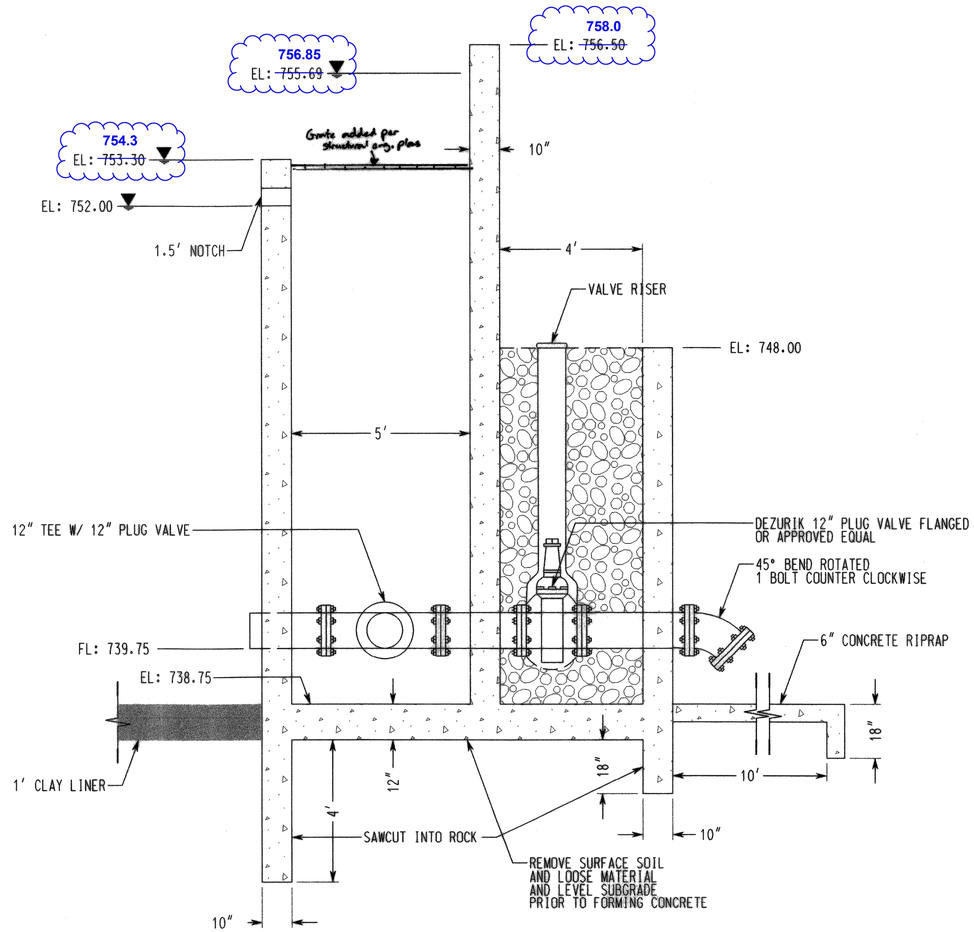
STATE OF TEXAS · STEVEN S. CRAWFORD · 92677 · LICENSED PROFESSIONAL ENGINEER · 09/12/2025



2 POND WALL PLAN DETAIL
SCALE: 1"=10'



3 POND WALL. SECTION A-A
SCALE: 1"=2'



4 POND WALL. SECTION B-B
SCALE: 1"=2'

REVISIONS

THE RIVERY - PHASE ONE
SUBDIVISION CONSTRUCTION PLANS
WATER QUALITY POND "A"
RETENTION STRUCTURE DETAILS

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E-MAIL: GENERAL@UDG.COM
WWW: WWW.UDG.COM
Urban Design Group

STATE OF TEXAS · JOHN NOELL · 42657 · REGISTERED PROFESSIONAL ENGINEER · 09/12/2025

SCALE:
AS SHOWN
0 1/2 1
IF THIS BAR DOES NOT MEASURE 1" THEN DRAWING IS NOT TO SCALE

DRAWING
WQ3
SHEET 8 473 SHEETS

JOB NO. 99-075.010

RECORD DRAWINGS

RIVERY CONSTRUCTION DRAWINGS_UDG JOB NO. 99-075.010

POND B WATER QUALITY VOLUME (TNRCC EDWARDS AQUIFER REQUIREMENTS):

A = Drainage Area (ac): 66.28 ac
P = Average Annual Precipitation, Williamson County (in) = 32

PRE-DEVELOPMENT (BACKGROUND) LOAD:

Rv = Runoff Coefficient for the fraction of impervious cover
= 0.546 (IC)^2 + 0.328 (IC) + 0.030 = 0.030 (0% IC)
C = Average TSS Concentration (mg/L) = 80 (undeveloped)

Onsite Predevelopment L = A x P x Rv x C x 0.226
= 66.28 x 32 x 0.030 x 80 x 0.226
= 1,150 lbs

POST-DEVELOPMENT LOAD:

Total Impervious Cover (ac): 50.27
IC = Impervious Cover = 75.8%

Rv = Runoff Coefficient for the fraction of impervious cover
= 0.546 (IC)^2 + 0.328 (IC) + 0.030 = 0.592
C = Average TSS Concentration (mg/L) = 170 (developed)

Onsite Postdevelopment L = A x P x Rv x C x 0.226
= 66.28 x 32 x 0.592 x 170 x 0.226
= 48,240 lbs

TSS LOAD REDUCTION:

Lr = 0.8 x (postdevelopment load - predevelopment load)
= 37,672 lbs

Lr = (total postdevelopment load) x F x (fraction of site treated) x (TSS removal eff.)
37672 = 48,240 x F x 1 x 0.93

F = fraction of load captured by BMP
F = 0.840

Runoff capture depth = 0.73 in
(75.8% impervious cover, 84.0% load captured by pond)

PERMANENT POOL ELEVATION = 697.0
WATER QUALITY ELEVATION = 699.4

REQUIRED WATER QUALITY VOLUME = 0.73 in x 66.28 ac
= 175,635 cf (4.03 AC-FT)
PROVIDED WATER QUALITY VOLUME = 177,314 cf (4.07 AC-FT)

REQUIRED PERMANENT POOL VOLUME = 1.2 x WQV (20% increase to allow for sediment accumulation)
= 210,762 cf (4.84 AC-FT)
PROVIDED PERMANENT POOL VOLUME = 263,615 cf (6.05 AC-FT)

REQUIRED FOREBAY VOLUME = 15 to 25% of permanent pool volume
PROVIDED FOREBAY VOLUME = 57,690 CF (21.9%)

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TEXAS ENGINEERING FIRM #470 | TEXAS SURVEYING FIRM #10028801

STATE OF TEXAS · STEPHEN S. CRAUFORD · 126277 · LICENSED PROFESSIONAL ENGINEER · 09/12/2025

8 x 5' BOX INLET
TOP = 697.5
36" FL = 695.0

TOP OF 10' SPILLWAY = 699.4

TOP OF WALL = 700

SEE SHEET WQ5 FOR SECTION A

REMOVE EXISTING 18" RCP AND 20' ALUM CULVERTS, GRADE DEPRESSION TO DRAIN ACROSS DRIVEWAY

338.9 LF 36" RCP @ 0.69%

189 LF 27" RCP @ 2.0%

FLOAT SWITCH BOX (SEE DETAIL SHEET WQ5)

APPROX 20 LF 8" D.I. PIPE - DAYLIGHT PAST AND BELOW AQUATIC BENCH

AQUATIC BENCH (10' MIN. WIDTH @ 1.0% MIN. SLOPE)

27" FL: 692.0

36" FL: 692.0

TOP OF ROCK BERM = 695

SEE SHEET WQ6 FOR CROSS SECTION A

PROPOSED 2" PVC WATER

PROPOSED 2"X2" TEE FOR IRRIGATION SYSTEM (SEE IRRIGATION PLANS)

PROPOSED CITY OF GEORGETOWN APPROVED 2" GATE VALVE, METER, AND REDUCED PRESSURE ZONE (RPZ) BACKFLOW PREVENTER.

PROPOSED 2" PVC WATER LINE TO PROPOSED DRINKING FOUNTAIN (SEE LANDSCAPE PLANS)

EXISTING 16" PVC WATER

I-35 BRIDGES

AQUATIC BENCH (10' MIN. WIDTH @ 1.0% MIN. SLOPE)

PROPOSED SPILLWAY (SEE DETAIL SHEET 475A)

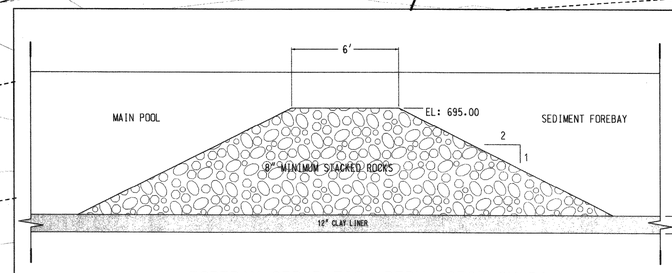
465.5 LF 30" RCP @ 3.30%

30" FL: 686.0

10' x 10' BOX
6" NOTCH FL: 697.0
TOP OF BOX: 699.4
36" FL OUT: 691.5

NOTE: SEE SHEET WQ6 FOR DISC GOLF RELOCATION PLAN.

FOREBAY SEPARATION BERM (SECTION D)
SCALE: 1"=4'



LEGEND

EXISTING DISC GOLF TEE, FAIRWAY & HOLE #

RELOCATED DISC GOLF TEE, FAIRWAY & HOLE #

THE RIVERY - PHASE ONE
SUBDIVISION CONSTRUCTION PLANS
WATER QUALITY POND "B"
PLAN VIEW LAYOUT

RIVERY - CONSTRUCTION DRAWINGS - UDG JOB NO. 99-075.010

REVISIONS

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Urban Design Group

SCALE:
1"=30'
0 1/2 1
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05/08/2003

DRAWING
WQ4
SHEET 82 474 ETS

JOB NO. 99-075.010

RECORD DRAWINGS

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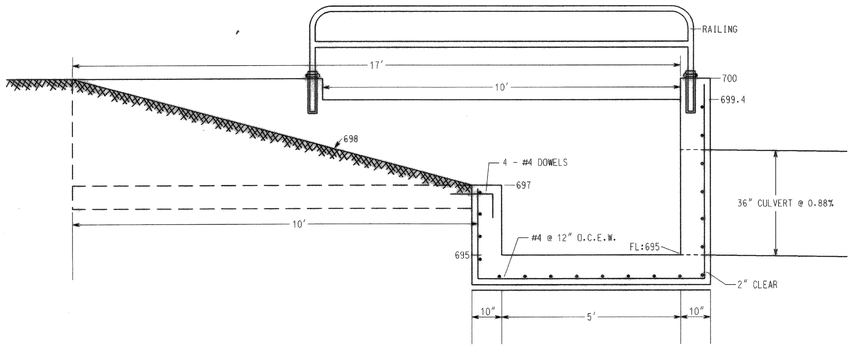
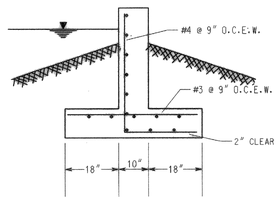


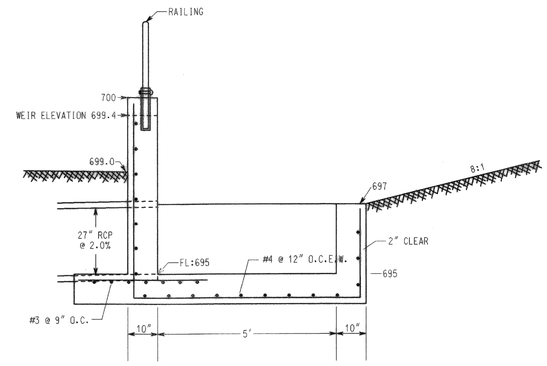
FLOW SPLITTER STRUCTURE 2 (SECTION A)

SCALE: 1"=2'



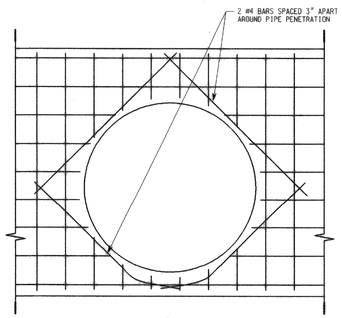
WALL SECTION

SCALE: 1"=2'



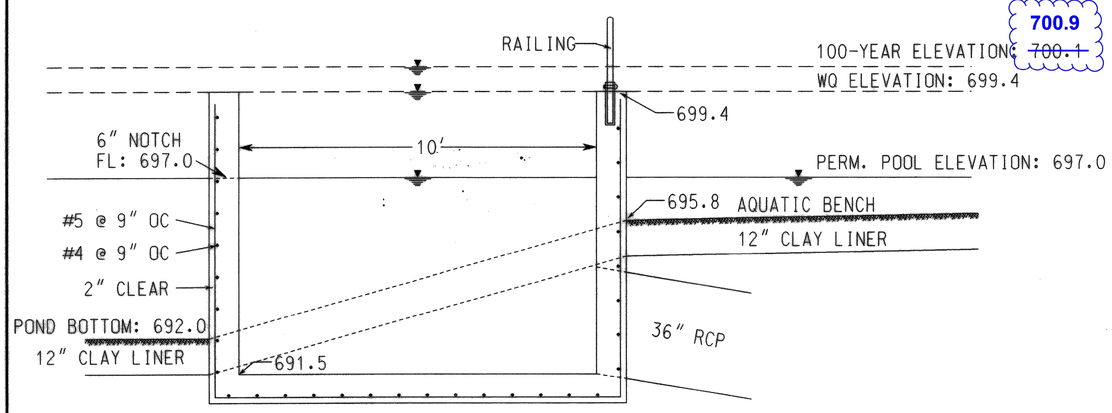
FLOW SPLITTER STRUCTURE (SECTION B)

SCALE: 1"=2'



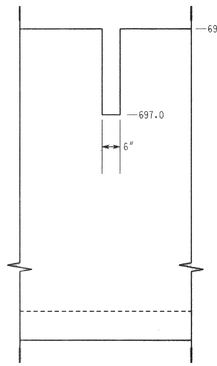
PIPE PENETRATION WALL REINFORCEMENT DETAIL

SCALE: NTS



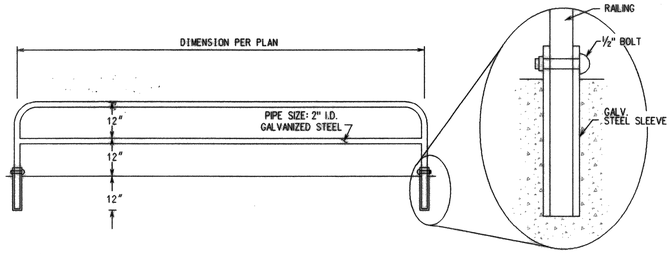
POND B OUTLET STRUCTURE (SECTION C)

SCALE: 1"=2'



POND B NOTCH DETAIL

SCALE: 1"=2'



OUTLET BOX RAILING DETAIL (POND B)

N.T.S.

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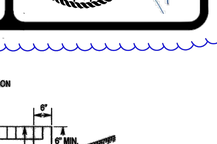
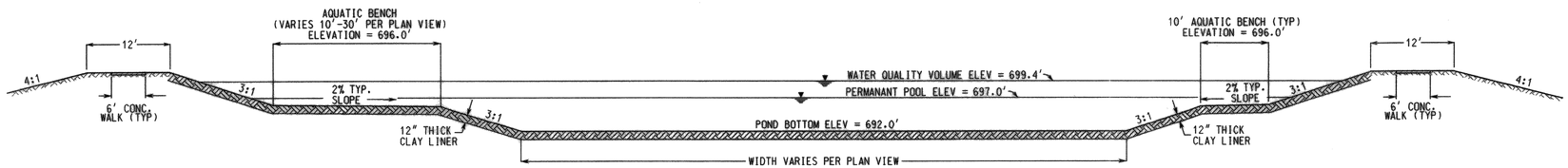
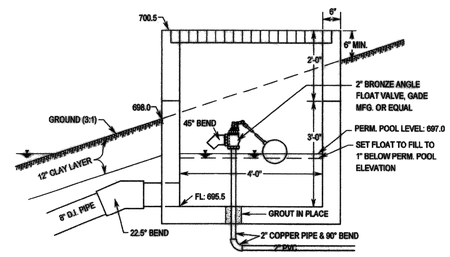




WATER QUALITY POND "B" (SECTION A)

SCALE: 1"=10'

NOTE: USE 4'-0" BY 4'-0" DALWORTH QUICKSET GRATE INLET (G44) OR EQUIVALENT 3'-0" BOTTOM SECTION AND 2'-0" CENTER SECTION



FLOAT SWITCH BOX DETAIL

SCALE: 1" = 1'

THE RIVERY - PHASE ONE

SUBDIVISION CONSTRUCTION PLANS

WATER QUALITY POND "B"

DETAILS

RIVERY - CONSTRUCTION DRAWINGS - UDG JOB NO. 99-075.010

REVISIONS

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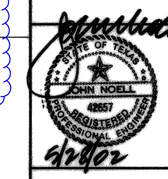


SCALE:

AS SHOWN

0 ½ 1

IF THIS BAR DOES NOT MEASURE 1" THEN DRAWING IS NOT TO SCALE

05/24/2002

DRAWING

WQ5

SHEET 83 475 STS

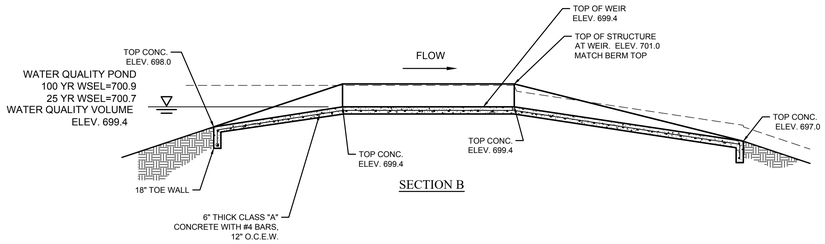
JOB NO. 99-075.010

RECORD DRAWINGS

c:\pw\Rivery\dm-rivery05.dgn

WATER QUALITY POND OVERFLOW STRUCTURE DETAIL - RIVERY POND B

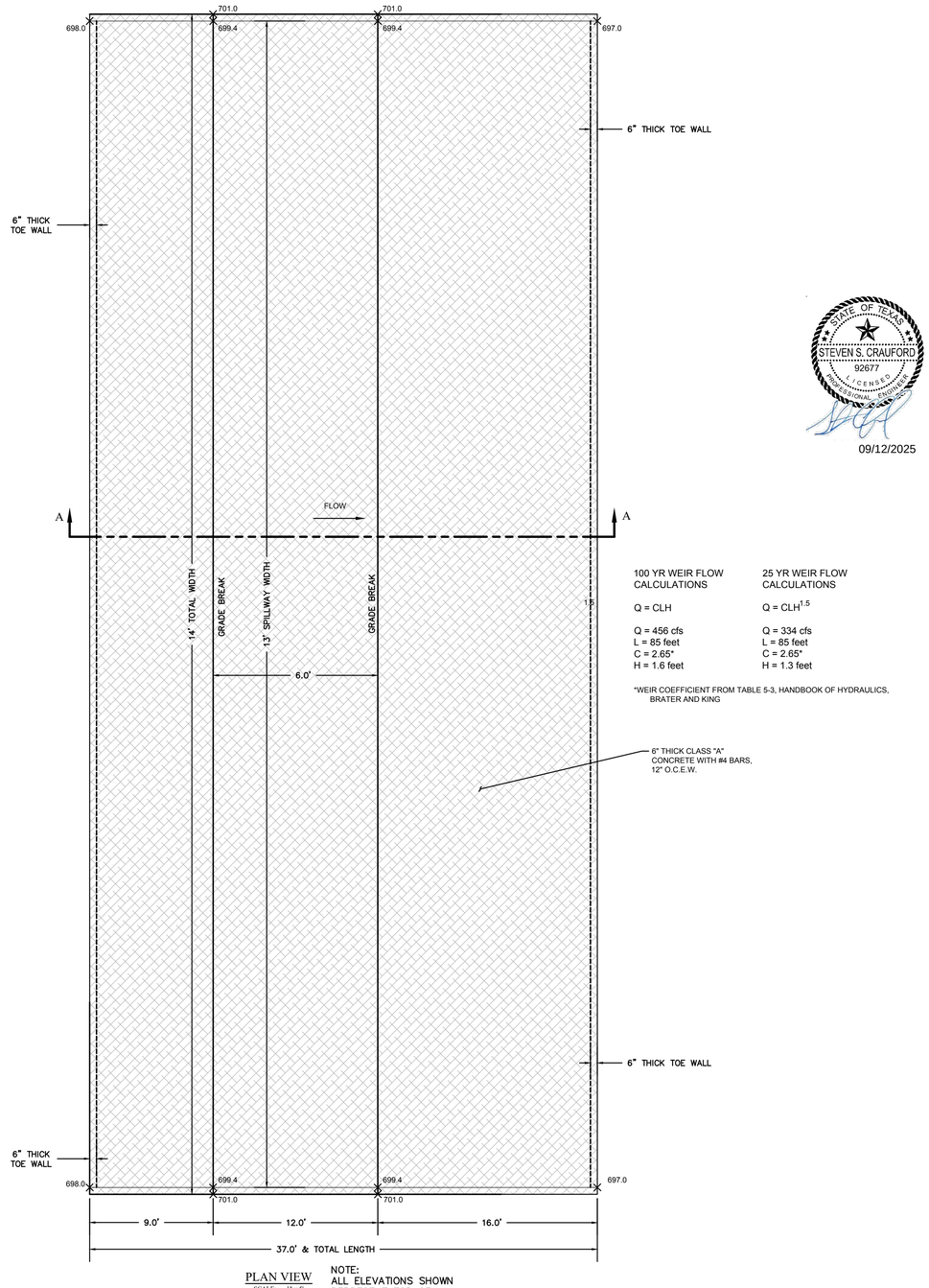
SCALE: 1" = 5'



SECTION B

HEC-HMS: WATER QUALITY/ DETENTION RIVERY POND B - COMBINED OUTLET STRUCTURES RATING TABLE

	OUTLET #1											SPILLWAY "B"					Combined	
	Weir 1 at FL 697.00			Weir 2 at Elev. 699.40			Total	36" RCP at FL 691.5			Outlet #1	Primary Weir 1 at Elev. 699.4			Spillway "B"	Pond 3.E	
Stage	Weir Coeff. C	Weir Length L (ft)	Discharge Q (cfs)	Weir Coeff. C	Weir Length L (ft)	Discharge Q (cfs)	Weir 1 and Weir Q (cfs)	Orifice Coeff. C	Orifice Area A (sf)	Maximum Discharge Q (cfs)	Total Discharge Q (cfs)	Weir Coeff. C	Weir Length L (ft)	Discharge Q (cfs)	Total Discharge Q (cfs)	Total Discharge Q (cfs)	Comment
(ft. msl)																	
697.0	3.0	0.5	**0.0**	3.0	39.5	**0.0**	**0.0**	0.6	7.07	**104.9**	**0.0**	2.65	85.0	**0.0**	**0.0**	**0.0**	Permanent Pool Elev., Top of Weir 1
697.1	3.0	0.5	**0.05**	3.0	39.5	**0.0**	**0.05**	0.6	7.07	**105.5**	**0.05**	2.65	85.0	**0.0**	**0.0**	**0.05**	
697.2	3.0	0.5	**0.1**	3.0	39.5	**0.0**	**0.1**	0.6	7.07	**106.0**	**0.1**	2.65	85.0	**0.0**	**0.0**	**0.1**	
697.3	3.0	0.5	**0.2**	3.0	39.5	**0.0**	**0.2**	0.6	7.07	**106.5**	**0.2**	2.65	85.0	**0.0**	**0.0**	**0.2**	
697.4	3.0	0.5	**0.4**	3.0	39.5	**0.0**	**0.4**	0.6	7.07	**107.1**	**0.4**	2.65	85.0	**0.0**	**0.0**	**0.4**	
697.5	3.0	0.5	**0.5**	3.0	39.5	**0.0**	**0.5**	0.6	7.07	**107.6**	**0.5**	2.65	85.0	**0.0**	**0.0**	**0.5**	
697.6	3.0	0.5	**0.7**	3.0	39.5	**0.0**	**0.7**	0.6	7.07	**108.2**	**0.7**	2.65	85.0	**0.0**	**0.0**	**0.7**	
697.7	3.0	0.5	**0.9**	3.0	39.5	**0.0**	**0.9**	0.6	7.07	**108.7**	**0.9**	2.65	85.0	**0.0**	**0.0**	**0.9**	
697.8	3.0	0.5	**1.1**	3.0	39.5	**0.0**	**1.1**	0.6	7.07	**109.2**	**1.1**	2.65	85.0	**0.0**	**0.0**	**1.1**	
697.9	3.0	0.5	**1.3**	3.0	39.5	**0.0**	**1.3**	0.6	7.07	**109.8**	**1.3**	2.65	85.0	**0.0**	**0.0**	**1.3**	
698.0	3.0	0.5	**1.5**	3.0	39.5	**0.0**	**1.5**	0.6	7.07	**110.3**	**1.5**	2.65	85.0	**0.0**	**0.0**	**1.5**	
698.1	3.0	0.5	**1.7**	3.0	39.5	**0.0**	**1.7**	0.6	7.07	**110.8**	**1.7**	2.65	85.0	**0.0**	**0.0**	**1.7**	
698.2	3.0	0.5	**2.0**	3.0	39.5	**0.0**	**2.0**	0.6	7.07	**111.3**	**2.0**	2.65	85.0	**0.0**	**0.0**	**2.0**	
698.3	3.0	0.5	**2.2**	3.0	39.5	**0.0**	**2.2**	0.6	7.07	**111.9**	**2.2**	2.65	85.0	**0.0**	**0.0**	**2.2**	
698.4	3.0	0.5	**2.5**	3.0	39.5	**0.0**	**2.5**	0.6	7.07	**112.4**	**2.5**	2.65	85.0	**0.0**	**0.0**	**2.5**	
698.5	3.0	0.5	**2.8**	3.0	39.5	**0.0**	**2.8**	0.6	7.07	**112.9**	**2.8**	2.65	85.0	**0.0**	**0.0**	**2.8**	
698.6	3.0	0.5	**3.0**	3.0	39.5	**0.0**	**3.0**	0.6	7.07	**113.4**	**3.0**	2.65	85.0	**0.0**	**0.0**	**3.0**	
698.7	3.0	0.5	**3.3**	3.0	39.5	**0.0**	**3.3**	0.6	7.07	**113.9**	**3.3**	2.65	85.0	**0.0**	**0.0**	**3.3**	
698.8	3.0	0.5	**3.6**	3.0	39.5	**0.0**	**3.6**	0.6	7.07	**114.4**	**3.6**	2.65	85.0	**0.0**	**0.0**	**3.6**	
698.9	3.0	0.5	**3.9**	3.0	39.5	**0.0**	**3.9**	0.6	7.07	**114.9**	**3.9**	2.65	85.0	**0.0**	**0.0**	**3.9**	
699.0	3.0	0.5	**4.2**	3.0	39.5	**0.0**	**4.2**	0.6	7.07	**115.4**	**4.2**	2.65	85.0	**0.0**	**0.0**	**4.2**	
699.1	3.0	0.5	**4.6**	3.0	39.5	**0.0**	**4.6**	0.6	7.07	**115.9**	**4.6**	2.65	85.0	**0.0**	**0.0**	**4.6**	
699.2	3.0	0.5	**4.9**	3.0	39.5	**0.0**	**4.9**	0.6	7.07	**116.4**	**4.9**	2.65	85.0	**0.0**	**0.0**	**4.9**	
699.3	3.0	0.5	**5.2**	3.0	39.5	**0.0**	**5.2**	0.6	7.07	**116.9**	**5.2**	2.65	85.0	**0.0**	**0.0**	**5.2**	
699.4	3.0	0.5	**5.6**	3.0	39.5	**0.0**	**5.6**	0.6	7.07	**117.4**	**5.6**	2.65	85.0	**0.0**	**0.0**	**5.6**	Top of Weir 2, WQV, Top of Spillway E
699.5	3.0	0.5	**5.9**	3.0	39.5	**3.7**	**9.7**	0.6	7.07	**117.9**	**9.7**	2.65	85.0	**7.1**	**7.1**	**16.8**	
699.6	3.0	0.5	**6.3**	3.0	39.5	**10.6**	**16.9**	0.6	7.07	**118.4**	**16.9**	2.65	85.0	**20.1**	**20.1**	**37.0**	
699.7	3.0	0.5	**6.7**	3.0	39.5	**19.5**	**26.1**	0.6	7.07	**118.9**	**26.1**	2.65	85.0	**37.0**	**37.0**	**63.1**	
699.8	3.0	0.5	**7.0**	3.0	39.5	**30.0**	**37.0**	0.6	7.07	**119.4**	**37.0**	2.65	85.0	**57.0**	**57.0**	**94.0**	
699.9	3.0	0.5	**7.4**	3.0	39.5	**41.9**	**49.3**	0.6	7.07	**119.8**	**49.3**	2.65	85.0	**79.6**	**79.6**	**128.9**	
700.0	3.0	0.5	**7.8**	3.0	39.5	**55.1**	**62.9**	0.6	7.07	**120.3**	**62.9**	2.65	85.0	**104.7**	**104.7**	**167.6**	
700.1	3.0	0.5	**8.2**	3.0	39.5	**69.4**	**77.6**	0.6	7.07	**120.8**	**77.6**	2.65	85.0	**131.9**	**131.9**	**209.5**	2 YR WSEL
700.2	3.0	0.5	**8.6**	3.0	39.5	**84.8**	**93.4**	0.6	7.07	**121.3**	**93.4**	2.65	85.0	**161.2**	**161.2**	**254.6**	
700.3	3.0	0.5	**9.0**	3.0	39.5	**101.2**	**110.2**	0.6	7.07	**121.8**	**110.2**	2.65	85.0	**192.3**	**192.3**	**302.5**	
700.4	3.0	0.5	**9.4**	3.0	39.5	**118.5**	**127.9**	0.6	7.07	**122.2**	**122.2**	2.65	85.0	**225.3**	**225.3**	**347.5**	30" or 36" RCP Control - Outlet #1
700.5	3.0	0.5	**9.8**	3.0	39.5	**136.7**	**146.5**	0.6	7.07	**122.7**	**122.7**	2.65	85.0	**259.9**	**259.9**	**382.6**	10 YR WSEL
700.6	3.0	0.5	**10.2**	3.0	39.5	**155.8**	**166.0**	0.6	7.07	**123.2**	**123.2**	2.65	85.0	**296.1**	**296.1**	**419.3**	
700.7	3.0	0.5	**10.7**	3.0	39.5	**175.6**	**186.3**	0.6	7.07	**123.7**	**123.7**	2.65	85.0	**333.9**	**333.9**	**457.5**	25 YR WSEL
700.8	3.0	0.5	**11.1**	3.0	39.5	**196.3**	**207.4**	0.6	7.07	**124.1**	**124.1**	2.65	85.0	**373.1**	**373.1**	**497.3**	
700.9	3.0	0.5	**11.6**	3.0	39.5	**217.7**	**229.3**	0.6	7.07	**124.6**	**124.6**	2.65	85.0	**413.8**	**413.8**	**538.4**	100 YR WSEL
701.0	3.0	0.5	**12.0**	3.0	39.5	**239.8**	**251.8**	0.6	7.07	**125.1**	**125.1**	2.65	85.0	**455.9**	**455.9**	**580.9**	**Top of Pond Berm**



PLAN VIEW

SCALE: 1" = 5'

NOTE:
ALL ELEVATIONS SHOWN REPRESENT TOP OF FINISHED CONCRETE.

100 YR WEIR FLOW CALCULATIONS	25 YR WEIR FLOW CALCULATIONS
Q = CLH	$Q = CLH^{1.5}$
Q = 456 cfs	Q = 334 cfs
L = 85 feet	L = 85 feet
C = 2.65*	C = 2.65*
H = 1.6 feet	H = 1.3 feet

*WEIR COEFFICIENT FROM TABLE 5-3, HANDBOOK OF HYDRAULICS, BRATER AND KING

STATE OF TEXAS
STEVEN S. CRAUFORD
92677
LICENSED
PROFESSIONAL ENGINEER

09/12/2025

NO.	REVISION	DATE

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CITY OF GEORGETOWN, TEXAS
WOLF RANCH PKWY / MEMORIAL DR

RIVERY POND B SPILLWAY DETAIL

CITY JOB No.
JOB NO. 51423-00
DATE 9/12/2025
DESIGNER
CHECKED DRAWN

SHEET 475A

Date: Sep 12, 2025, 3:24pm User ID: cashortz
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SCALE: 1" = 50'

0' 50' 100' 150'

LEGEND

TREES TO BE REMOVED

TREES TO BE PROTECTED

LOC
LIMITS OF CONSTRUCTION

STATE OF TEXAS
STEVEN S. CRAUFORD
92677
LICENSED PROFESSIONAL ENGINEER

09/12/2025

NOTES

1. TREE PROTECTION SHALL BE PLACED PER DETAIL EC09 NOTE 2 OR AS SHOWN SCHEMATICALLY ON THIS SHEET. WHERE CONFLICT EXISTS, TREE PROTECTION SHALL BE PLACED AT THE LOCATION AFFORDING THE MAXIMAL PROTECTION TO THE TREE. CONTRACTOR SHALL CONTACT THE ENGINEER WITH ANY CONCERNS REGARDING TREE PROTECTION.

NO.	REVISION	DATE

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CITY OF GEORGETOWN, TEXAS
WOLF RANCH PKWY / MEMORIAL DR

TREE PROTECTION PLAN - MEMORIAL DRIVE

CITY JOB No.
JOB NO. 51423-00
DATE 9/12/2025
DESIGNER
CHECKED DRAWN ARC

SHEET 476

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NOTES

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LEGEND

TREES TO BE REMOVED

TREES TO BE PROTECTED

LOC LIMITS OF CONSTRUCTION

SCALE: 1" = 50'

0' 50' 100' 150'

CITY OF GEORGETOWN, TEXAS

WOLF RANCH PKWY / MEMORIAL DR

TREE PROTECTION PLAN - WOLF RANCH PKWY 1 OF 4

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JOB NO. 51423-00
DATE 9/12/2025
DESIGNER
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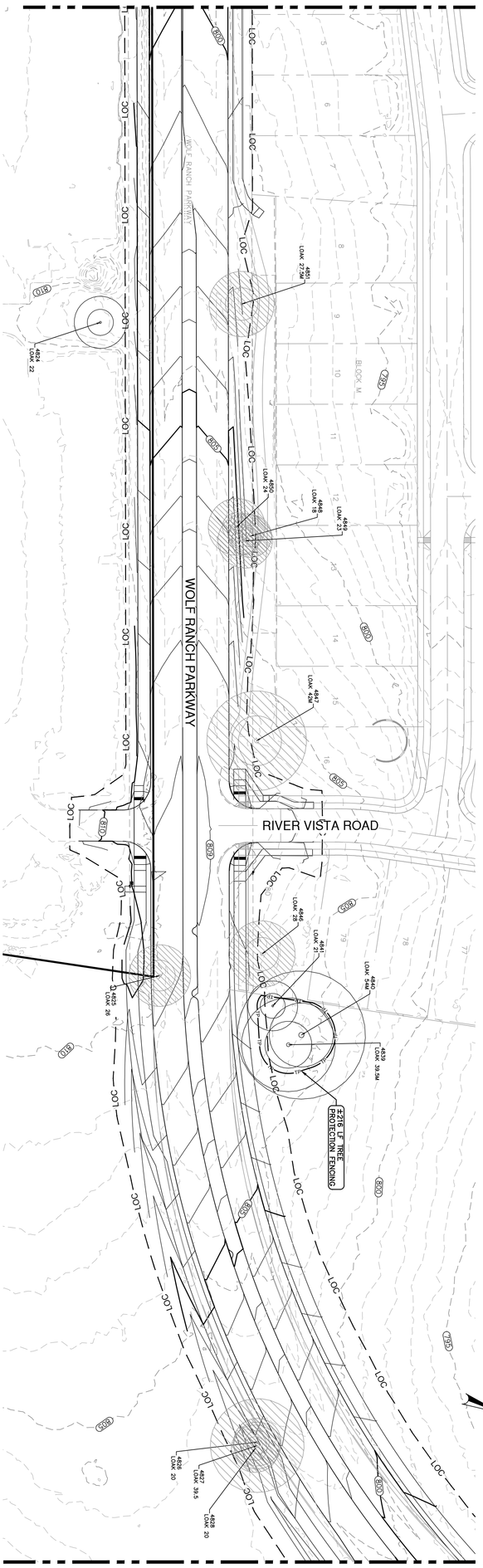

MATCHLINE – SEE SHEET 479

MATCHLINE – SEE SHEET 477



MATCHLINE – SEE THIS SHEET

NOTES

1. TREE PROTECTION SHALL BE INSTALLED AT DRIPLINE (SEE NOTE 2 OR AS SHOWN SCHEMATICALLY ON THIS SHEET, WHERE CONFLICT EXISTS, TREE PROTECTION SHALL BE PLACED AT THE LOCATION APPROVED BY THE TREE PROTECTION TO THE TREE. CONTRACTOR SHALL CONTACT THE ENGINEER WITH ANY CONCERNS REGARDING TREE PROTECTION.

LEGEND

TREES TO BE REMOVED

TREES TO BE PROTECTED

LOC LIMITS OF CONSTRUCTION

SCALE: 1"= 50'

0' 50' 100' 150'

STATE OF TEXAS
STEVEN S. CRAWFORD
103777
LICENSED PROFESSIONAL ENGINEER
09/12/2025

CITY JOB No.
JOB NO. 51423-00
DATE 9/12/2025
DESIGNER
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CITY OF GEORGETOWN, TEXAS
WOLF RANCH PKWY / MEMORIAL DR

TREE PROTECTION PLAN - WOLF RANCH PKWY 2 OF 4

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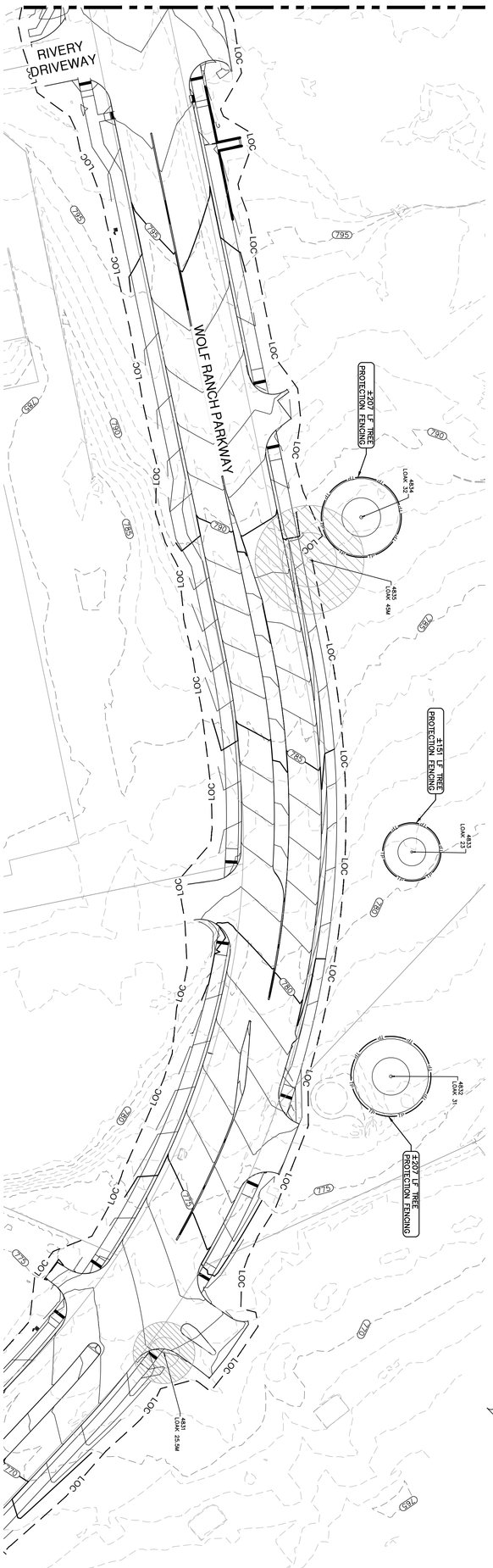
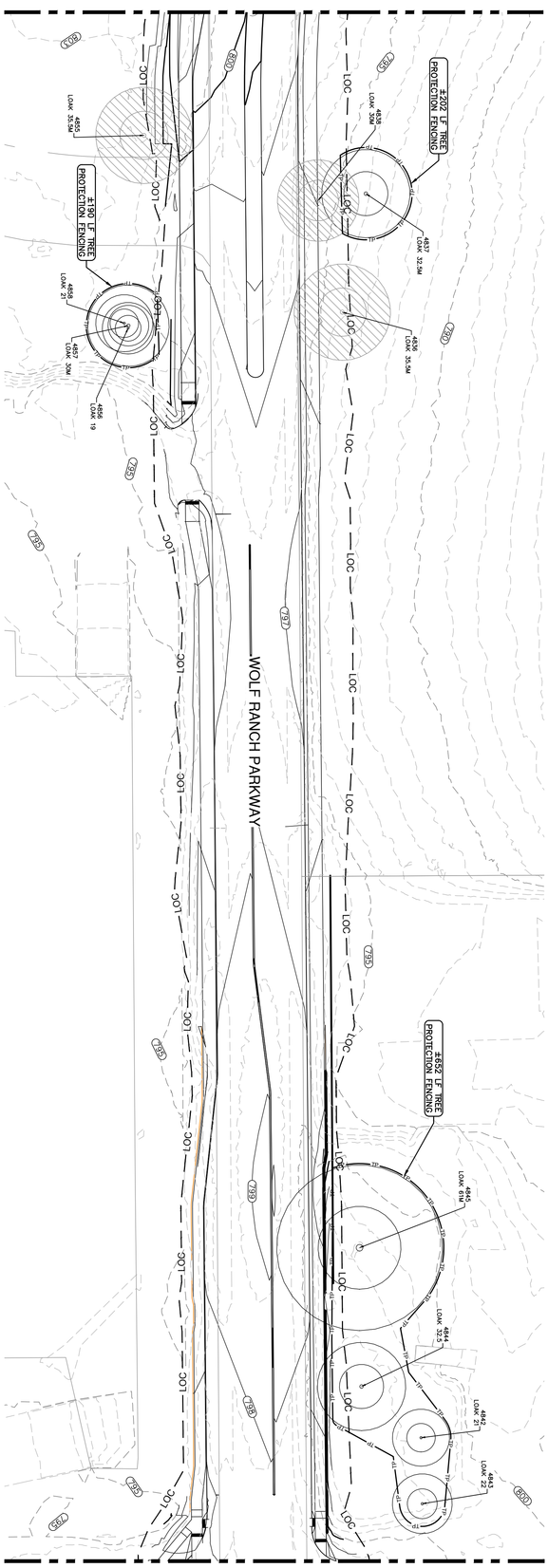


MATCHLINE – SEE SHEET 480

MATCHLINE – SEE SHEET 478



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NOTES

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LEGEND

TREES TO BE REMOVED

TREES TO BE PROTECTED

LOC LIMITS OF CONSTRUCTION

SCALE: 1" = 50'
0' 50' 100' 150'

STATE OF TEXAS
STEVEN S. CRAWFORD
103877
LICENSED PROFESSIONAL ENGINEER
09/12/2025

CITY OF GEORGETOWN, TEXAS
WOLF RANCH PKWY / MEMORIAL DR

TREE PROTECTION PLAN - WOLF RANCH PKWY 3 OF 4

SHEET 479
CITY JOB No.
JOB NO. 51423-00
DATE 9/12/2025
DESIGNER
CHECKED DRAWN ARC

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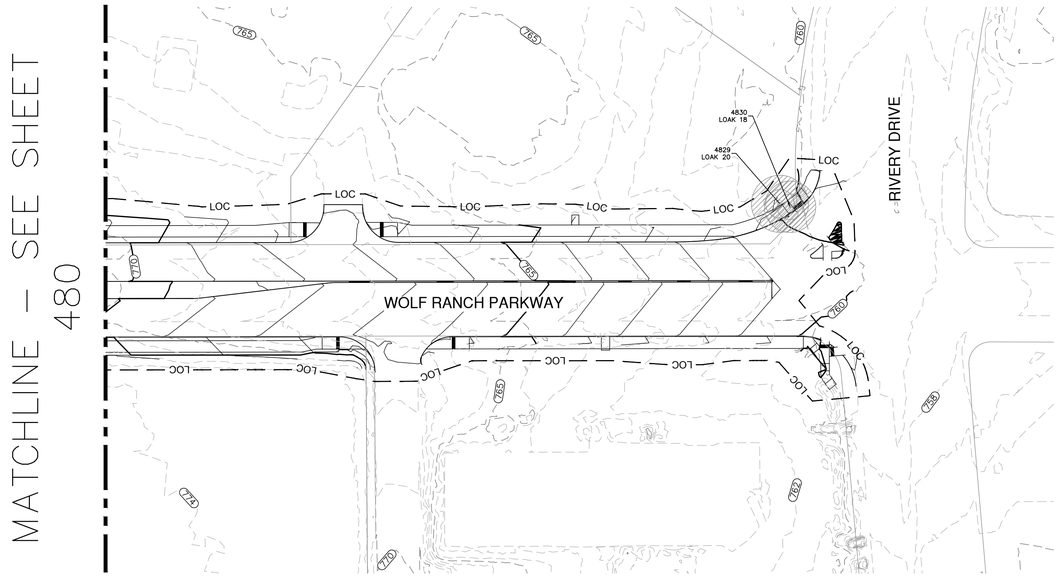

SCALE: 1" = 50'

0' 50' 100' 150'

LEGEND

TREES TO BE REMOVED

TREES TO BE PROTECTED

LOC LIMITS OF CONSTRUCTION

NOTES

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STATE OF TEXAS
STEVEN S. CRAUFORD
92677
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PROFESSIONAL ENGINEER

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CITY OF GEORGETOWN, TEXAS
WOLF RANCH PKWY / MEMORIAL DR

TREE PROTECTION PLAN - WOLF RANCH PKWY 4 OF 4

CITY JOB No.
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General Data

Total Inches Surveyed:	
Total Trees Surveyed	
Total Acres, Site	

Replacement Trees

Replacement Trees, Inches (non-res lots)	
Replacement Trees, Inches (res lots)	

On-Site Credit

Total Trees Surveyed, #	
Total Inches Surveyed	
Total Inches, 3" to 6" (Inches)	
Total Inches, 6" to 11" (Inches)	
Disallowed Inches	
Total Inches Allowed (includes .5 and 2:1 Ratios)	
75% of mitigation due	
Total On-Site Credit Applicable, Inches	

Protected Trees Retention

Total Trees Surveyed, Protected	
Total Inches Surveyed, Protected	
Trees per acre	2.3
Protected Tree Retention Requirement (Trees)	
Total Trees Removed, Protected	0
% Retained, Protected	100.00%
% Removed, Protected	0.00
# of Inches Removed, Total	
# of Inches Removed Allowed, Protected	39.6
# of Inches Removed Beyond Allowance, Protected	-39.60
Protected Tree Escalator, # Inches Due	-59.4

Protected Trees, Removed

Total Inches Removed, Protected (12"-17")

Escalator Inches	
Total Inches to be Mitigated (Above * 0.4)	
Replacement Inches Applied	
On-site Credit Inches Applied	
Remaining Mitigation Inches	
Fee Due ($125/DBH)	

Total Inches Removed, Protected (18" - 26")

Escalator Inches	
Total Inches to be Mitigated (Above * 0.4)	
Replacement Inches Applied	
On-site Credit Inches Applied	
Remaining Mitigation Inches	
Fee Due ($175/DBH)	

Total Inches Removed, Protected (26"+)

Escalator Inches	
Total Inches to be Mitigated (Above * 2)	
Replacement Inches Applied	
On-site Credit Inches Applied	
Remaining Mitigation Inches	
Fee Due ($175/DBH)	

Protected Tree Mitigation

Total Fee Due, Protected	
On-Site Credit Remaining	
Replacement Inches Remaining	

Heritage Trees, Removed

Total Trees Surveyed	35
Total Inches Surveyed	1205
Total Inches Removed	591
Total Inches to be Mitigated (3:1)	1773
Replacement Inches Applied	0
Remaining Mitigation Inches	1773
Fee Due	**$398,925**

Total Mitigation Fee-in-lieu Due

Fee Compilation	$398,925
Soil Aeration and Supp. Nutrients	0
Deep Root Invigoration %	0
	$398,925

Calculations

Tree Tag #	Size-as Surveyed	Size in Whole Inches	Remove	Key	Multi Stem (If Yes, Select "X")	Stem Measurements	Half Critical Root Zone, Radius (in	Common Name	Latin Name
208	16.0	16		P			8	Oak, Escarpment Live*	Quercus fusiformis
409	21.5	22		P	X	#N/A	10.75	Oak, Escarpment Live*	Quercus fusiformis
410	17.0	17		P			8.5	Oak, Escarpment Live*	Quercus fusiformis
411	13.0	13		P			6.5	Oak, Escarpment Live*	Quercus fusiformis
412	18.0	18		P			9	Oak, Escarpment Live*	Quercus fusiformis
413	22.0	22		P	X	#N/A	11	Oak, Escarpment Live*	Quercus fusiformis
414	15.0	15		P			7.5	Oak, Escarpment Live*	Quercus fusiformis
2102	9.0	9		NP			4.5	Other/ Not on list	Other/Not on list
2104	14.0	14		P			7	Sycamore, Mexican	Platanus mexicana
2105	12.0	12		P			6	Pecan	Carya illinoiensis
4801	24.5	25	X		X	20/9///	12.25	Other/ Not on list	Other/Not on list
4802	33.0	33	X	R-HT			16.5	Oak, Escarpment Live*	Quercus fusiformis
4803	22.0	22		P			11	Oak, Escarpment Live*	Quercus fusiformis
4804	25.0	25		P			12.5	Oak, Escarpment Live*	Quercus fusiformis
4805	27.0	27	X	R-HT	X	19/16///	13.5	Oak, Escarpment Live*	Quercus fusiformis
4806	24.0	24	X	R			12	Oak, Escarpment Live*	Quercus fusiformis
4807	21.0	21	X	R			10.5	Oak, Escarpment Live*	Quercus fusiformis
4808	21.0	21	X	R			10.5	Oak, Escarpment Live*	Quercus fusiformis
4809	20.0	20		P			10	Oak, Escarpment Live*	Quercus fusiformis
4810	27.5	28		HT	X	19/17///	13.75	Oak, Escarpment Live*	Quercus fusiformis
4811	19.0	19		P			9.5	Oak, Escarpment Live*	Quercus fusiformis
4812	19.0	19		P			9.5	Oak, Escarpment Live*	Quercus fusiformis
4813	30.0	30	X	R-HT			15	Oak, Escarpment Live*	Quercus fusiformis
4814	22.0	22	X	R			11	Oak, Escarpment Live*	Quercus fusiformis
4815	19.0	19	X	R			9.5	Oak, Escarpment Live*	Quercus fusiformis
4816	48.0	48		HT			24	Oak, Escarpment Live*	Quercus fusiformis
4817	29.0	29	X	R-HT			14.5	Oak, Escarpment Live*	Quercus fusiformis
4818	44.0	44	X	R-HT			22	Oak, Escarpment Live*	Quercus fusiformis
4819	38.0	38	X	R-HT			19	Oak, Escarpment Live*	Quercus fusiformis
4820	29.0	29		HT			14.5	Oak, Escarpment Live*	Quercus fusiformis
4821	18.0	18		P			9	Oak, Post	Quercus stellata
4822	25.0	25		P			12.5	Oak, Post	Quercus stellata
4823	38.0	38		HT			19	Oak, Escarpment Live*	Quercus fusiformis
4824	22.0	22		P			11	Oak, Escarpment Live*	Quercus fusiformis
4825	26.0	26	X	R-HT			13	Oak, Escarpment Live*	Quercus fusiformis
4826	20.0	20	X	R			10	Oak, Escarpment Live*	Quercus fusiformis
4827	39.5	40		HT	X	26/17/10//	19.75	Oak, Escarpment Live*	Quercus fusiformis
4828	20.0	20		P			10	Oak, Escarpment Live*	Quercus fusiformis
4829	20.0	20	X	R			10	Oak, Escarpment Live*	Quercus fusiformis
4830	18.0	18	X	R			9	Oak, Escarpment Live*	Quercus fusiformis
4831	25.5	26	X	R-HT	X	18/15///	12.75	Oak, Escarpment Live*	Quercus fusiformis
4832	31.0	31		HT			15.5	Oak, Escarpment Live*	Quercus fusiformis
4833	23.0	23		P			11.5	Oak, Escarpment Live*	Quercus fusiformis
4834	32.0	32		HT			16	Oak, Escarpment Live*	Quercus fusiformis
4835	45.0	45	X	R-HT	X	20/18/17/15/	22.5	Oak, Escarpment Live*	Quercus fusiformis
4836	35.5	36	X	R-HT	X	19/13///	17.75	Oak, Escarpment Live*	Quercus fusiformis
4837	32.5	33		HT	X	17/17/14//	16.25	Oak, Escarpment Live*	Quercus fusiformis
4838	30.0	30	X	R-HT	X	18/14/10//	15	Oak, Escarpment Live*	Quercus fusiformis
4839	39.5	40		HT	X	32/15///	19.75	Oak, Escarpment Live*	Quercus fusiformis
4840	54.0	54		HT	X	18/18/16/14/14	27	Oak, Escarpment Live*	Quercus fusiformis
4841	21.0	21		P			10.5	Oak, Escarpment Live*	Quercus fusiformis
4842	21.0	21		P			10.5	Oak, Escarpment Live*	Quercus fusiformis
4843	22.0	22		P			11	Oak, Escarpment Live*	Quercus fusiformis
4844	32.5	33		HT	X	26/13///	16.25	Oak, Escarpment Live*	Quercus fusiformis
4845	61.0	61		HT	X	25/22/21/20/9	30.5	Oak, Escarpment Live*	Quercus fusiformis
4846	28.0	28	X	R-HT			14	Oak, Escarpment Live*	Quercus fusiformis
4847	42.0	42	X	R-HT	X	18/17/16/15/	21	Oak, Escarpment Live*	Quercus fusiformis
4848	18.0	18	X	R			9	Oak, Escarpment Live*	Quercus fusiformis
4849	23.0	23	X	R			11.5	Oak, Escarpment Live*	Quercus fusiformis
4850	24.0	24	X	R			12	Oak, Escarpment Live*	Quercus fusiformis
4851	27.5	28	X	R-HT	X	19/17///	13.75	Oak, Escarpment Live*	Quercus fusiformis
4852	19.0	19	X				9.5	Other/ Not on list	Other/Not on list
4853	29.0	29		HT			14.5	Oak, Post	Quercus stellata
4854	25.0	25	X	R	X	15/18/8//	12.5	Elm, Cedar	Ulmus crassifolia
4855	35.5	36	X	R-HT	X	26/19///	17.75	Oak, Escarpment Live*	Quercus fusiformis
4856	19.0	19		P			9.5	Oak, Escarpment Live*	Quercus fusiformis
4857	30.0	30		HT	X	22/16///	15	Oak, Escarpment Live*	Quercus fusiformis
4858	21.0	21		P			10.5	Oak, Escarpment Live*	Quercus fusiformis
4859	31.0	31	X	R-HT			15.5	Oak, Post	Quercus stellata
4860	23.0	23	X				11.5	Other/ Not on list	Other/Not on list
4861	32.0	32	X	R-HT			16	Oak, Escarpment Live*	Quercus fusiformis
4862	18.0	18	X	R			9	Oak, Escarpment Live*	Quercus fusiformis
4863	24.0	24	X	R			12	Oak, Escarpment Live*	Quercus fusiformis
4864	32.0	32	X	R-HT			16	Oak, Escarpment Live*	Quercus fusiformis
4865	21.0	21		P			10.5	Oak, Escarpment Live*	Quercus fusiformis
4866	27.0	27	X	R-HT			13.5	Elm, Cedar	Ulmus crassifolia
4867	26.0	26	X	R-HT			13	Oak, Escarpment Live*	Quercus fusiformis
4868	33.0	33	X	R-HT			16.5	Oak, Escarpment Live*	Quercus fusiformis
4869	15.0	15	X	R			7.5	Oak, Escarpment Live*	Quercus fusiformis
4870	18.0	18	X	R			9	Oak, Escarpment Live*	Quercus fusiformis
4871	11.0	11		P			5.5	Elm, Cedar	Ulmus crassifolia
4872	25.0	25	X	R			12.5	Oak, Escarpment Live*	Quercus fusiformis
4873	23.0	23	X	R			11.5	Oak, Escarpment Live*	Quercus fusiformis
9070	15.0	15	X	R			7.5	Oak, Escarpment Live*	Quercus fusiformis
9071	10.0	10	X				5	Elm, Cedar	Ulmus crassifolia
9074	12.0	12		P			6	Oak, Escarpment Live*	Quercus fusiformis
9099	15.0	15	X	R			7.5	Elm, Cedar	Ulmus crassifolia
9114	12.0	12		P			6	Oak, Escarpment Live*	Quercus fusiformis
9115	10.0	10	X				5	Oak, Escarpment Live*	Quercus fusiformis
9118	17.5	18	X	R			8.75	Oak, Escarpment Live*	Quercus fusiformis
9120	18.0	18		P	X	#N/A	9	Oak, Escarpment Live*	Quercus fusiformis
9121	9.0	9					4.5	Oak, Escarpment Live*	Quercus fusiformis
9122	9.0	9					4.5	Oak, Escarpment Live*	Quercus fusiformis
9123	14.0	14	X	R			7	Oak, Escarpment Live*	Quercus fusiformis
9124	19.5	20	X	R	X	#N/A	9.75	Oak, Escarpment Live*	Quercus fusiformis
9125	14.0	14	X	R			7	Oak, Escarpment Live*	Quercus fusiformis
9148	10.0	10					5	Oak, Escarpment Live*	Quercus fusiformis
9149	15.0	15		P	X	#N/A	7.5	Oak, Escarpment Live*	Quercus fusiformis
9401	11.5	12		P	X	#N/A	5.75	Elm, Cedar	Ulmus crassifolia
9463	16.0	16		P			8	Elm, Cedar	Ulmus crassifolia
9464	17.0	17		P			8.5	Elm, Cedar	Ulmus crassifolia

NO. | REVISION | DATE

GEORGETOWN TEXAS *more than welcome*

PAPE-DAWSON ENGINEERS
AUSTIN I SAN ANTONIO I HOUSTON I FORT WORTH I DALLAS
10801 N MOPAC EXPY, BLDG 3, STE 200 I AUSTIN, TX 78759 I 512.454.8711
TBPE FIRM REGISTRATION #470 I TBPLS FIRM REGISTRATION #10028801

STATE OF TEXAS
STEVEN S. CRAUFORD
92677
LICENSED
PROFESSIONAL ENGINEER

09/12/2025

CITY OF GEORGETOWN, TEXAS
WOLF RANCH PKWY / MEMORIAL DR

TREE MITIGATION CALCULATIONS

CITY JOB No.
JOB NO. 51423-00
DATE 9/12/2025
DESIGNER
CHECKED DRAWN ARC

SHEET 481

Date: Sep 12, 2025, 10:56am User ID: cashatz
File: H:\Projects\514\23\00\301 Construction Documents\Civil\TREES\1423-00.dwg

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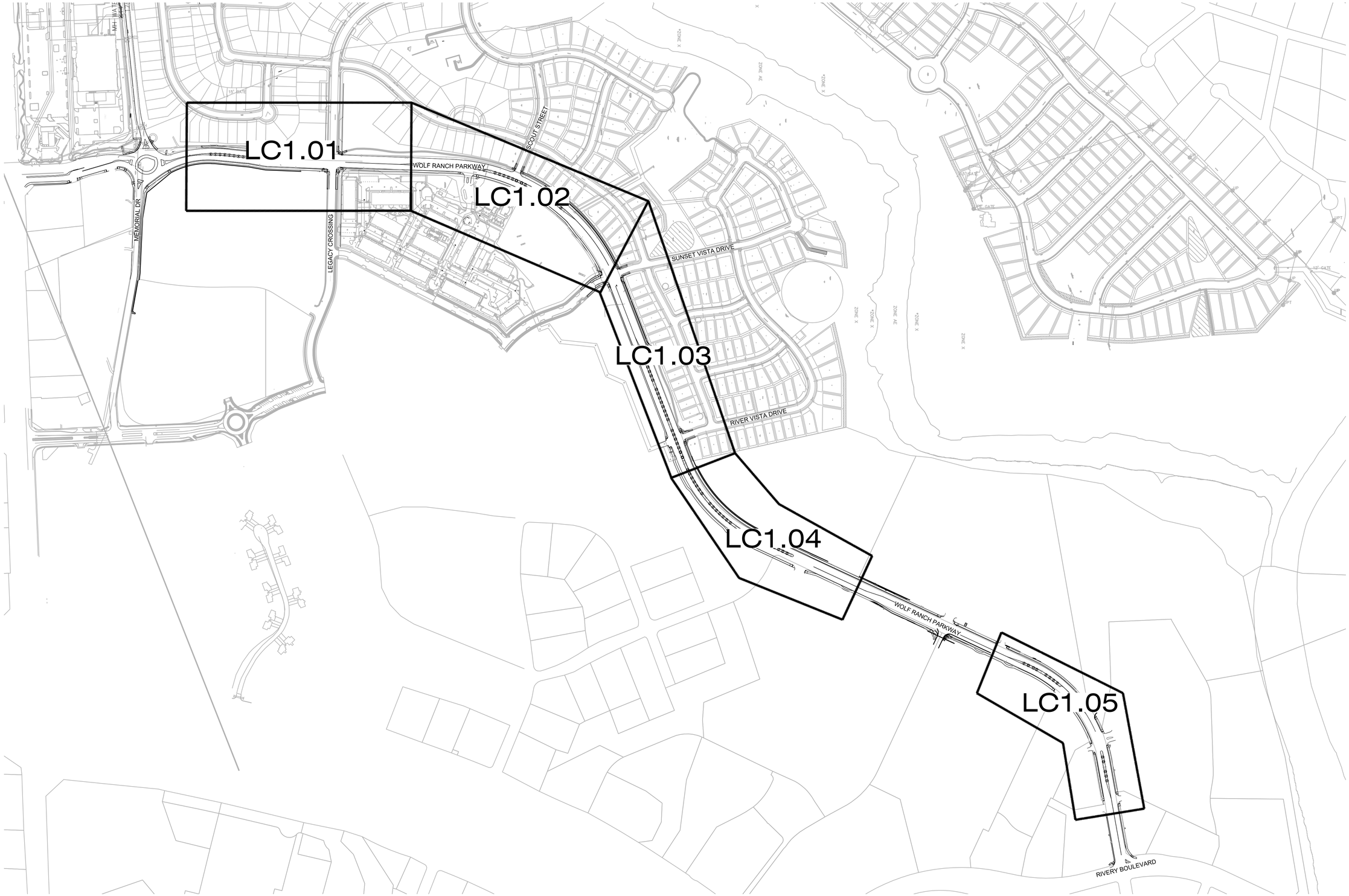

A TREE COORDINATES KEY PLAN

NOT TO SCALE

PAPE-DAWSON ENGINEERS

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TBPE FIRM REGISTRATION #470 | TBPLS FIRM REGISTRATION #10028800

51423-01

WOLF RANCH
TREE COORDINATES EXHIBIT
WOLF RANCH PARKWAY
GEORGETOWN, TX

REGISTERED LANDSCAPE ARCHITECT
STATE OF TEXAS

PRINTS ISSUED

Date	Item	NO.
03-17-2025	90% FOR PRELIMINARY REVIEW	
06-30-2025	100% FOR PRELIMINARY REVIEW	
09-10-2025	100% SET	

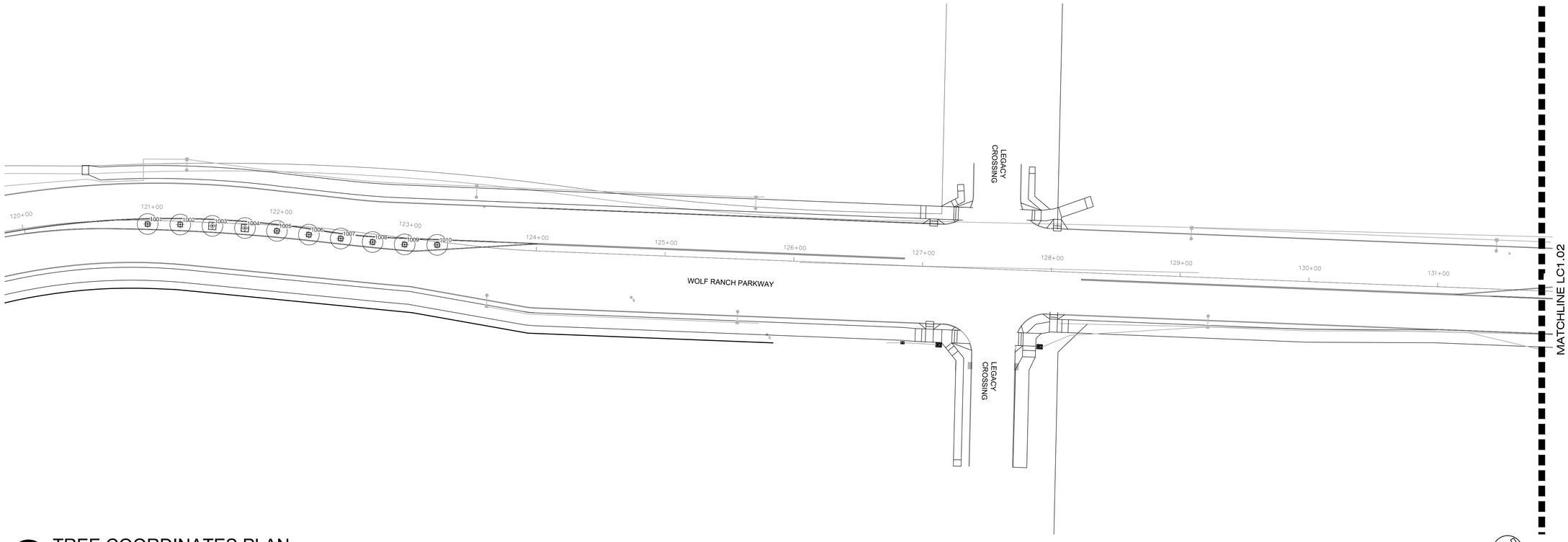
Drawn By: JB
Designed By: JB
Reviewed By: DS

Scale (Horz.): AS SHOWN

TREE COORDINATES KEY PLAN

LC0.01

SHEET 482 OF 523

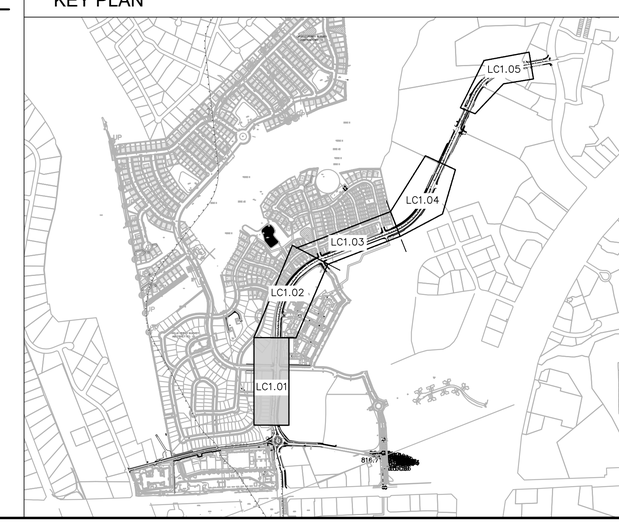


A TREE COORDINATES PLAN

NORTHING/EASTING POINT SCHEDULE

POINT	NORTHING	EASTING
1001	N 10205215.1929	E 3124578.3742
1002	N 10205240.5040	E 3124578.7566
1003	N 10205265.4147	E 3124579.8124
1004	N 10205290.7052	E 3124581.4492
1005	N 10205315.4966	E 3124583.6885
1006	N 10205340.2962	E 3124586.6283
1007	N 10205364.9936	E 3124589.6323
1008	N 10205389.7720	E 3124592.3228
1009	N 10205414.5938	E 3124594.1952
1010	N 10205439.8851	E 3124594.5114

KEY PLAN



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WOLF RANCH
TREE COORDINATES EXHIBIT
WOLF RANCH PARKWAY
GEORGETOWN, TX

REGISTERED LANDSCAPE ARCHITECT
STATE OF TEXAS

PRINTS ISSUED

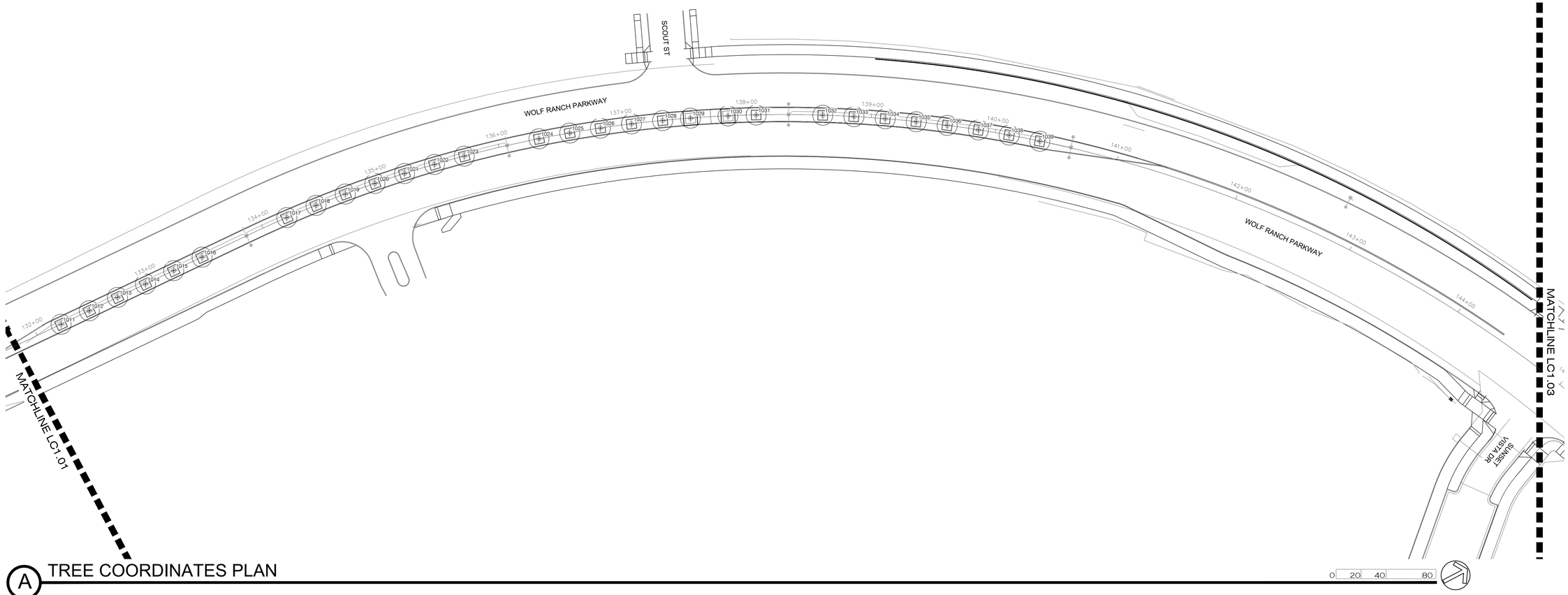
Date	Item	NO.
07-17-2025	90% FOR PRELIMINARY REVIEW	
08-08-2025	100% FOR PRELIMINARY REVIEW	
09-10-2025	100% SET	

Drawn By: JB
Designed By: JB
Reviewed By: DS

Scale (Horz.): AS SHOWN

TREE COORDINATES PLAN

LC1.01

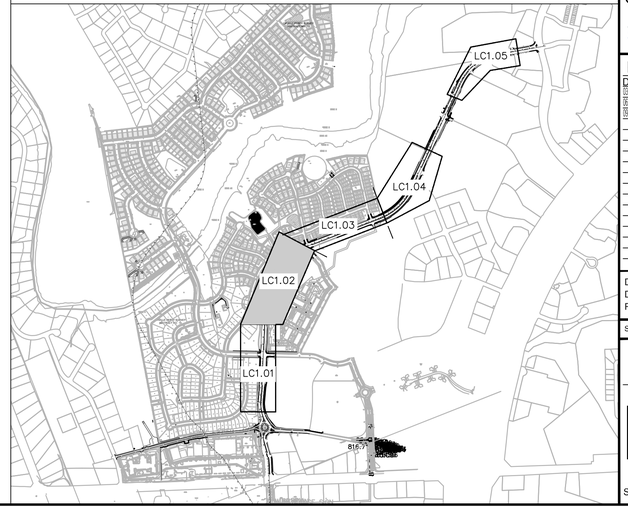


A TREE COORDINATES PLAN

NORTHING/EASTING POINT SCHEDULE

1011	N 10206337.1647	E 3124631.8858
1012	N 10206362.1388	E 3124632.8796
1013	N 10206387.1243	E 3124633.8739
1014	N 10206411.9045	E 3124634.8602
1015	N 10206436.9216	E 3124635.8558
1016	N 10206461.9901	E 3124636.8539
1017	N 10206536.8116	E 3124640.4716
1018	N 10206561.9677	E 3124642.6913
1019	N 10206586.9930	E 3124645.5369
1020	N 10206611.8904	E 3124649.0042
1021	N 10206636.5703	E 3124653.0763
1022	N 10206661.1570	E 3124657.7670
1023	N 10206685.3961	E 3124663.0184
1024	N 10206744.8076	E 3124678.5368
1025	N 10206768.6994	E 3124685.9298
1026	N 10206792.2336	E 3124693.8652
1027	N 10206815.8167	E 3124702.4721
1028	N 10206839.1146	E 3124711.6472
1029	N 10206859.7484	E 3124720.3326
1030	N 10206887.1596	E 3124732.7504
1031	N 10206907.4742	E 3124742.6066
1032	N 10206954.5472	E 3124767.5899
1033	N 10206976.1302	E 3124780.1761
1034	N 10206997.4844	E 3124793.3298
1035	N 10207018.3354	E 3124806.9685
1036	N 10207038.9482	E 3124821.1476
1037	N 10207059.3522	E 3124835.9478
1038	N 10207079.1993	E 3124851.1494
1039	N 10207098.6665	E 3124866.8334

KEY PLAN



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WOLF RANCH
TREE COORDINATES EXHIBIT

WOLF RANCH PARKWAY
GEORGETOWN, TX

51423-01

REGISTERED LANDSCAPE ARCHITECT
JOSEPH BRADLEY BURLESON
6029
STATE OF TEXAS

PRINTS ISSUED

Date	Item	NO.
03-17-2025	90% FOR PRELIMINARY REVIEW	
06-30-2025	100% FOR PRELIMINARY REVIEW	
09-12-2025	100% SET	

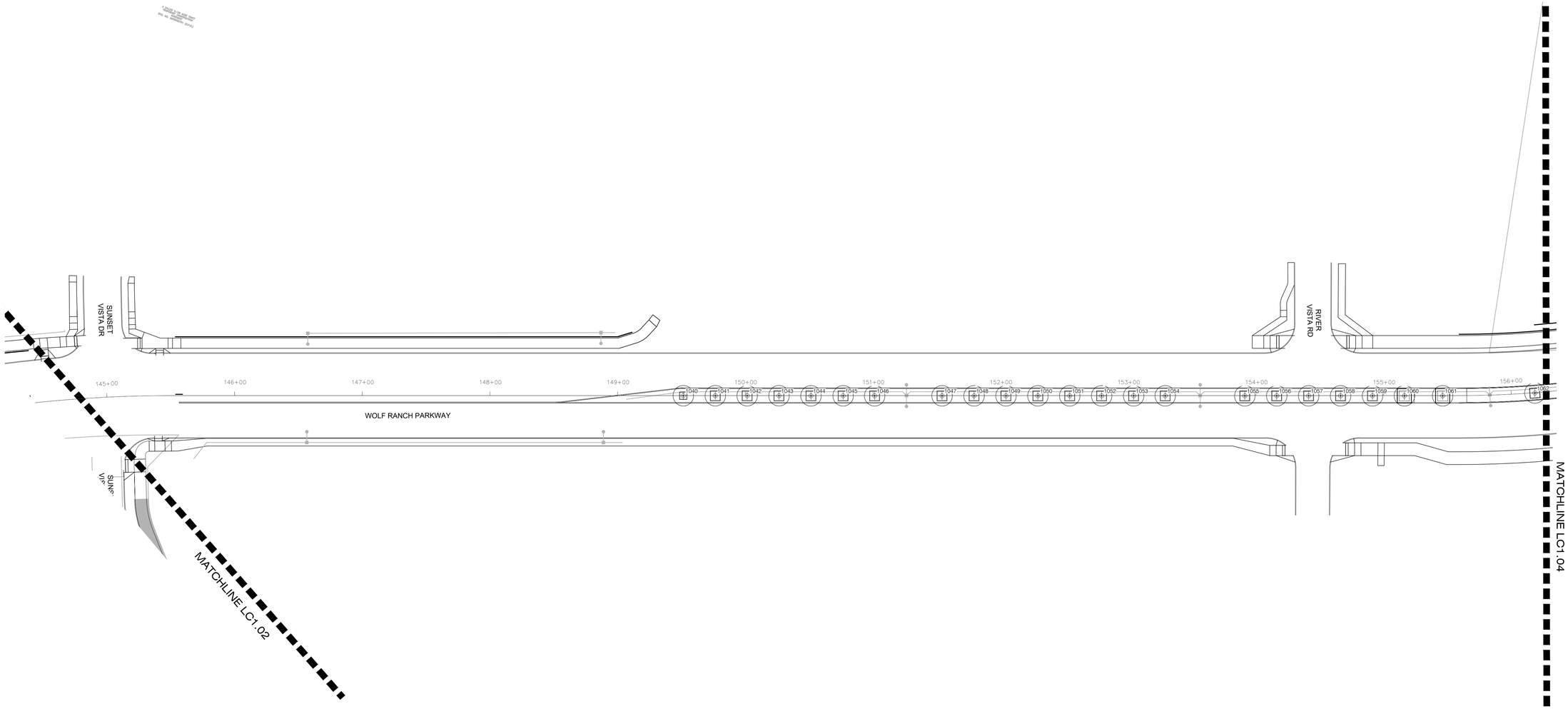
Drawn By: JB
Designed By: JB
Reviewed By: DS

Scale (Horz.): AS SHOWN

TREE COORDINATES PLAN

LC1.02

SHEET 484 OF 523



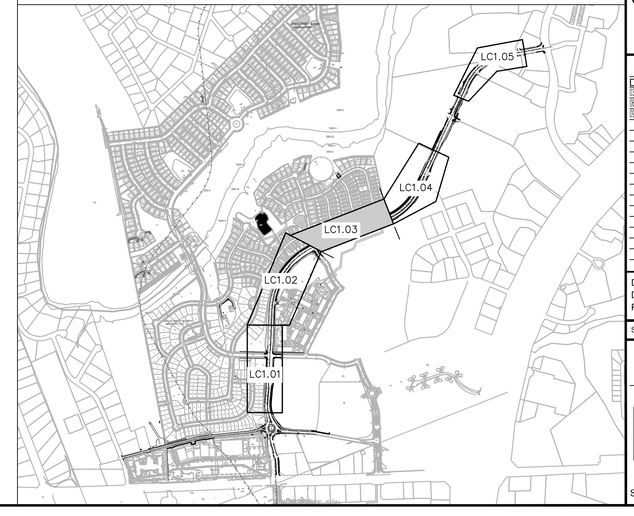
A TREE COORDINATES PLAN

0 20 40 80

NORTHING/EASTING POINT SCHEDULE

1040	N 10207539.2289	E 3125653.9159
1041	N 10207548.2115	E 3125677.2845
1042	N 10207557.1652	E 3125700.5693
1043	N 10207566.1132	E 3125723.8472
1044	N 10207575.1204	E 3125747.2716
1045	N 10207584.1469	E 3125770.7498
1046	N 10207592.9972	E 3125793.7728
1047	N 10207611.9495	E 3125843.0656
1048	N 10207620.9353	E 3125866.4381
1049	N 10207629.9119	E 3125889.7824
1050	N 10207638.8900	E 3125913.1348
1051	N 10207647.8380	E 3125936.4131
1052	N 10207656.8072	E 3125959.7426
1053	N 10207665.8079	E 3125983.1536
1054	N 10207674.6684	E 3126006.2003
1055	N 10207697.0257	E 3126064.3800
1056	N 10207706.0106	E 3126087.7190
1057	N 10207714.9814	E 3126111.0518
1058	N 10207723.9523	E 3126134.3846
1059	N 10207732.9200	E 3126157.7159
1060	N 10207741.8935	E 3126181.0499
1061	N 10207752.6615	E 3126209.0347
1062	N 10207780.6468	E 3126275.6484

KEY PLAN



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TBPE FIRM REGISTRATION #470 | TBPLS FIRM REGISTRATION #10028800

51423-01

WOLF RANCH
TREE COORDINATES EXHIBIT
WOLF RANCH PARKWAY
GEORGETOWN, TX

REGISTERED LANDSCAPE ARCHITECT
STATE OF TEXAS
4028

PRINTS ISSUED

Date	Item	NO.
03-17-2025	90% FOR PRELIMINARY REVIEW	
06-30-2025	100% FOR PRELIMINARY REVIEW	
09-10-2025	100% SET	

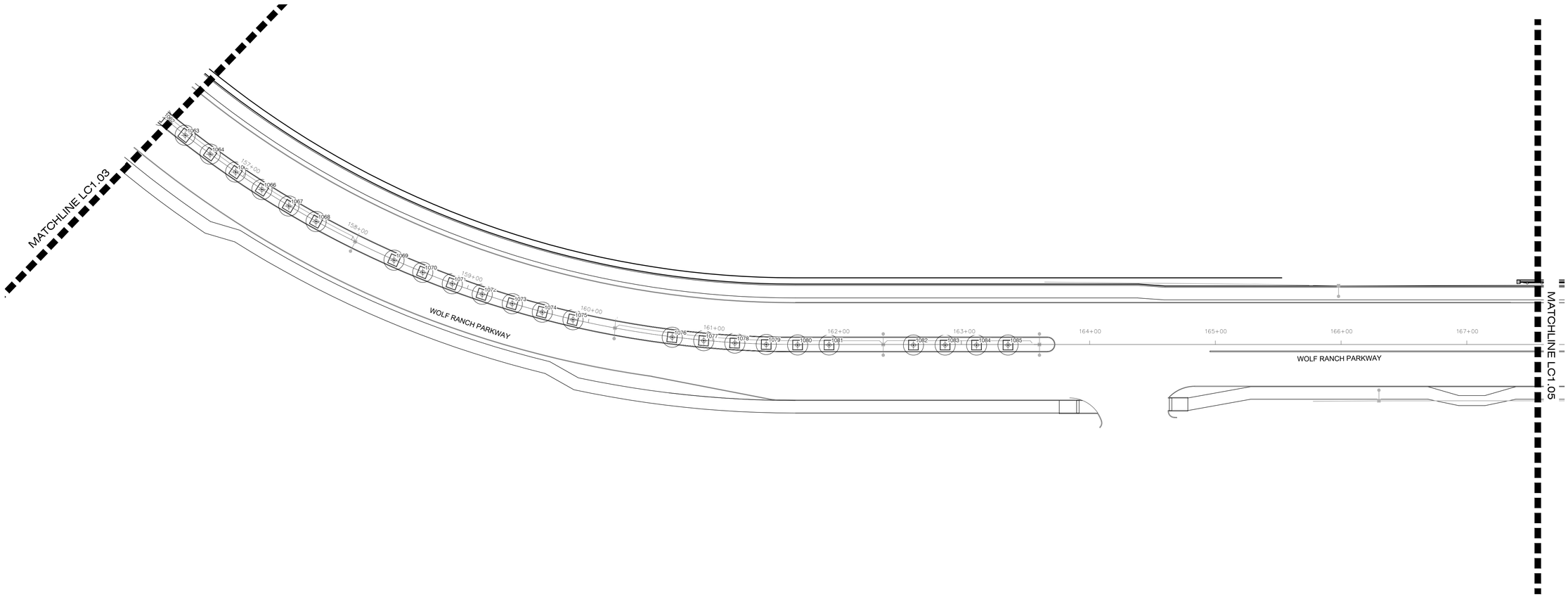
Drawn By: JB
Designed By: JB
Reviewed By: DS

Scale (Horz.): AS SHOWN

TREE COORDINATES PLAN

LC1.03

SHEET 485 OF 523



A TREE COORDINATES PLAN

0 20 40 80

NORTHING/EASTING POINT SCHEDULE

1063	N 10207791.7592	E 3126298.1891
1064	N 10207803.4566	E 3126320.1366
1065	N 10207815.8066	E 3126341.6502
1066	N 10207828.9821	E 3126363.0128
1067	N 10207842.8397	E 3126383.9569
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1070	N 10207917.1835	E 3126476.7397
1071	N 10207934.5925	E 3126494.8128
1072	N 10207952.6908	E 3126512.4434
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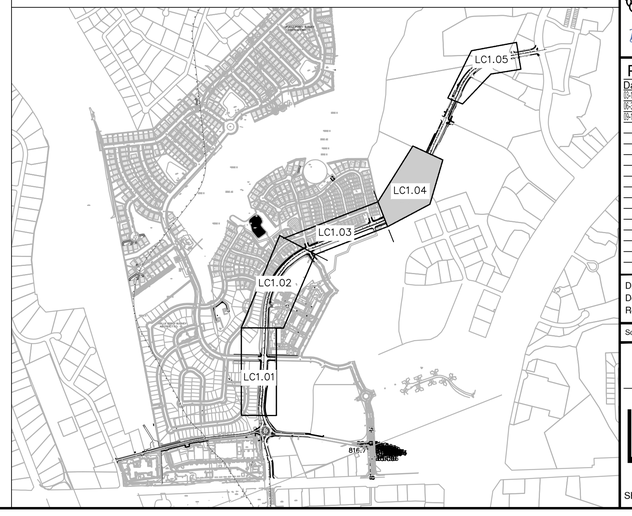
KEY PLAN



PAPE-DAWSON ENGINEERS
TEXAS | FLORIDA | GEORGIA | TENNESSEE
10801 N MOPAC EXPY, BLDG 3, STE 200 | AUSTIN, TX 78759 | 512.454.8711
TBPE FIRM REGISTRATION #470 | TBPLS FIRM REGISTRATION #10028800

WOLF RANCH
TREE COORDINATES EXHIBIT

WOLF RANCH PARKWAY
GEORGETOWN, TX

51423-01

REGISTERED LANDSCAPE ARCHITECT
STATE OF TEXAS

PRINTS ISSUED

Date	Item	NO.
08-01-2025	90% FOR PRELIMINARY REVIEW	
09-30-2025	100% FOR PRELIMINARY REVIEW	
10-10-2025	100% SET	

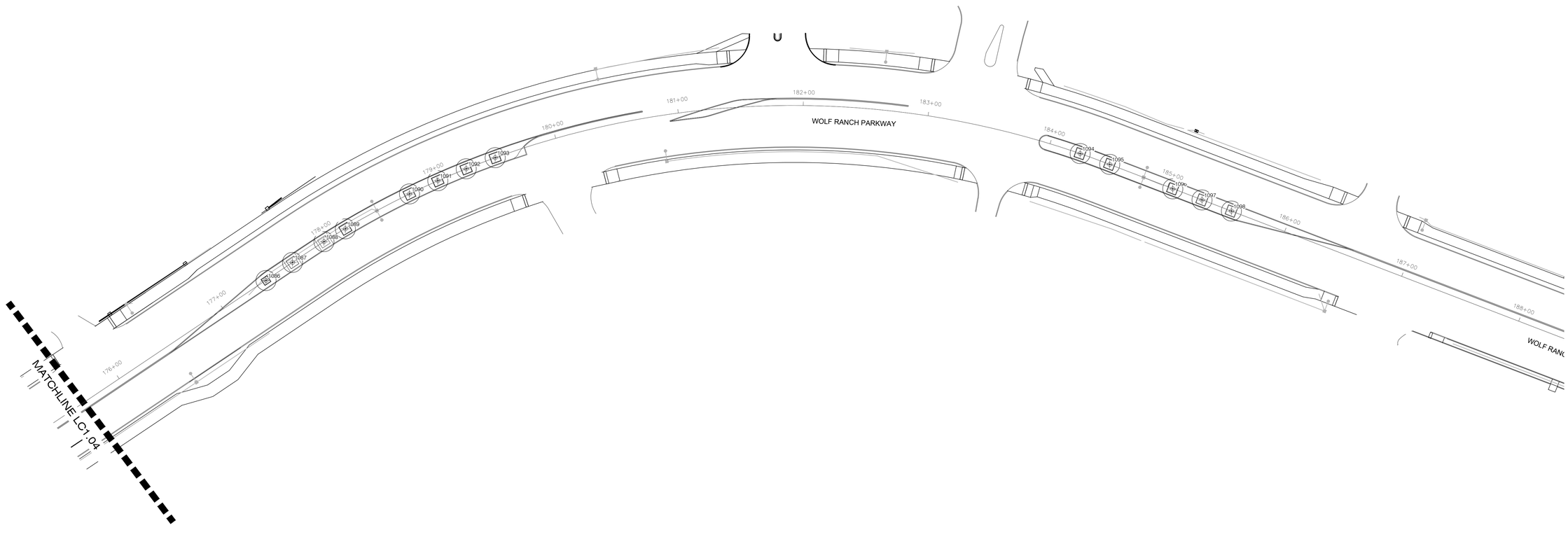
Drawn By: JB
Designed By: JB
Reviewed By: DS

Scale (Horz.): AS SHOWN

TREE COORDINATES PLAN

LC1.04

SHEET 486 OF 523



A TREE COORDINATES PLAN

0 20 40 80

NORTHING/EASTING POINT SCHEDULE

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1094	N 10210012.7361	E 3127821.7608
1095	N 10210017.5640	E 3127846.3849
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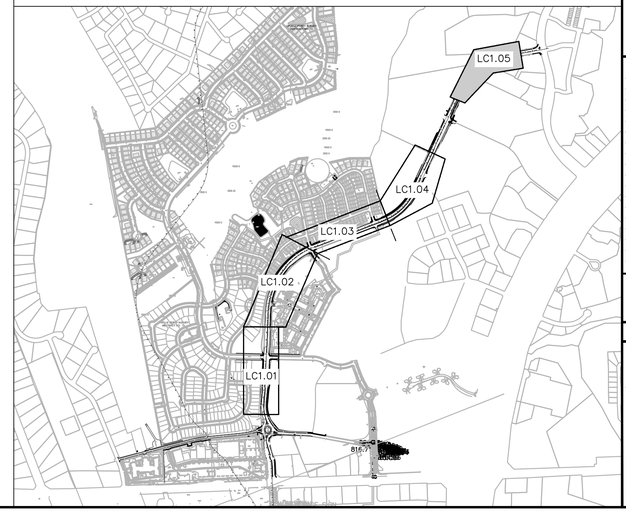
KEY PLAN



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51423-01

WOLF RANCH
TREE COORDINATES EXHIBIT
WOLF RANCH PARKWAY
GEORGETOWN, TX

REGISTERED LANDSCAPE ARCHITECT
STATE OF TEXAS

PRINTS ISSUED

Date	Item	NO.
05-17-2025	90% FOR PRELIMINARY REVIEW	
06-30-2025	100% FOR PRELIMINARY REVIEW	
09-10-2025	100% SET	

Drawn By: JB
Designed By: JB
Reviewed By: DS

Scale (Horz.): AS SHOWN

TREE COORDINATES PLAN

LC1.05

LANDSCAPE GRADING SPECIFICATIONS

PART 1 - GENERAL
1.1 SECTION INCLUDES
A. FINAL GRADE TOPSOIL FOR FINISH LANDSCAPING.

1.2 RELATED SECTIONS

A. THE DRAWINGS, OTHER SPECIFICATIONS, THE GENERAL AND SUPPLEMENTARY CONDITIONS OF THE CONTRACT APPLY TO WORK SPECIFIED IN THIS SECTION.

PART 2 - PRODUCTS

2.1 MATERIAL
A. EXISTING TOPSOIL:

1. EXISTING 3 INCH OF TOPSOIL REMOVED/EXCAVATED FROM SITE AND STOCKPILED.

2. STOCKPILED TOPSOIL SHALL BE CLEANED OF ALL STUMPS, STONES OVER 2 INCH IN DIAMETER, TRASH, DEBRIS AND OTHER MATERIALS DELETERIOUS TO PLANT GROWTH AND FREE DRAINAGE OF SOIL.

3. CONTRACTOR SHALL OBTAIN, AT THE CONTRACTOR'S COST, AN AGRICULTURAL SUITABILITY ANALYSIS OF THE ON SITE TOPSOIL FOR TURF ESTABLISHMENT FROM AN ACCEPTED SOILS TESTING LABORATORY.

4. CONTRACTOR SHALL AMEND THE ON-SITE TOPSOIL PER THE RECOMMENDATIONS OF THE SOILS ANALYSIS, AND SHALL SUBMIT A COPY OF THE SOILS ANALYSIS TO THE OWNER'S REPRESENTATIVE FOR ACCEPTANCE.

5. IF ADDITIONAL TOPSOIL IS REQUIRED IT SHALL CONFORM TO THE FOLLOWING STEPS.

B. IMPORTED TOPSOIL (IF REQ'D):

1. SANDY LOAM FROM SOURCE APPROVED BY THE OWNER'S REPRESENTATIVE; 100 PERCENT PASSING THROUGH 1-INCH SCREEN.
   a. SAND (2,000 MM TO 0.50 MM): 40 TO 50 PERCENT.
   b. SILT (0.050 MM TO 0.005 MM): 30 TO 40 PERCENT.
   c. CLAY (0.005 MM AND SMALLER): 10 TO 30 PERCENT.

2. FREE OF SUBSOIL, BRUSH, STUMPS, ROOTS, ORGANIC LITTER, OBJECTIONABLE WEEDS, CLODS, SHALE, STONES 1-INCH MINIMUM DIMENSION OR LARGER, OR OTHER MATERIAL HARMFUL TO GRADING, PLANTING, PLANT GROWTH, OR MAINTENANCE OPERATIONS.

3. PRESENCE OF VEGETATIVE PARTS OF BERMUDA GRASS, JOHNSON GRASS, NUT GRASS (CYPERUS ROTUNDUS), AND OTHER HARD TO ERADICATE WEEDS OR GRASS WILL BE CAUSE FOR REJECTION OF TOPSOIL.

PART 3 - EXECUTION
3.1 EXAMINATION
A. VERIFY TRENCH BACKFILLING HAVE BEEN INSPECTED.

3.2 SUBSTRATE PREPARATION
A. APPLY HERBICIDE, PER MANUFACTURER'S SPECIFICATIONS, TO ALL AREAS OF THE PROJECT SITE SHOWN TO RECEIVE NEW SEEDING, SODDING, LANDSCAPE IMPROVEMENTS, OR MULCHING.
B. ELIMINATE UNEVEN AREAS AND LOW SPOTS.
C. REMOVE DEBRIS, ROOTS, BRANCHES, STONES, IN EXCESS OF 2 INCHES IN SIZE. REMOVE SUBSOIL CONTAMINATED WITH PETROLEUM PRODUCTS.
D. SCARIFY SURFACE TO DEPTH OF 3 INCHES WHERE TOPSOIL IS SCHEDULED. SCARIFY IN AREAS WHERE EQUIPMENT USED FOR HAULING AND SPREADING TOPSOIL HAS COMPACTED SUBSOIL.

3.3 PLACING TOPSOIL
A. PLACE TOPSOIL IN 4 INCH LIFTS MAXIMUM IN AREAS WHERE NEW LANDSCAPE PLANTING IS REQUIRED. PLACE TOPSOIL DURING DRY WEATHER.

B. PLACE TOPSOIL AS REQUIRED IN NEW PARKING AREAS AND ADJACENT TO BUILDING AREAS TO PROVIDE ADEQUATE SOIL FOR NEW PLANTING AND INSURE PROPER DRAINAGE. PROVIDE A MINIMUM 4-INCH LAYER OF STOCKPILED, AMENDED, OR IMPORTED TOPSOIL OVER ALL NEW LANDSCAPE AREAS, EXCEPT 3 INCHES WITHIN SODDED AREAS.

C. FINE GRADE TOPSOIL TO ELIMINATE ROUGH OR LOW AREAS. MAINTAIN PROFILES AND CONTOUR OF SUBGRADE.

D. REMOVE ROOTS, WEEDS, ROCKS, AND FOREIGN MATERIAL IN EXCESS OF 1 INCH IN SIZE WHILE SPREADING.

E. MANUALLY SPREAD TOPSOIL CLOSE TO EXISTING PLANT LIFE, TO PREVENT DAMAGE.

F. ROLL PLACED TOPSOIL.

G. DISPOSE OF SURPLUS SUBSOIL AND TOPSOIL AS DIRECTED BY THE OWNER'S REPRESENTATIVE. ON-SITE SURPLUS SOILS MAY BE USED PROVIDED THAT AN ANALYSIS IS PROVIDED INDICATING THE ON-SITE MATERIAL MEETS THE IMPORTED TOPSOIL SPECIFICATIONS.

H. LEAVE STOCKPILE AREA AND SITE CLEAN AND RAKED, READY TO RECEIVE LANDSCAPING.

3.4 TOLERANCES
A. TOP OF TOPSOIL: PLUS OR MINUS 1 INCH.

3.5 PROTECTION
A. PROTECT LANDSCAPING AND OTHER FEATURES REMAINING AS FINAL WORK.

B. PROTECT EXISTING STRUCTURES, FENCES, SIDEWALKS, UTILITIES, PAVING, AND CURBS.

END OF SECTION

LANDSCAPE SPECIFICATIONS TREES, SHRUBS, AND GROUND COVER

PART 1 - GENERAL
1.1 SECTION INCLUDES
A. FURNISH AND INSTALL TREES, SHRUBS, GROUND COVER, AND SOIL AMENDMENTS.

B. MAINTENANCE.

1.2 UNIT PRICE - MEASUREMENT AND PAYMENT
A. PLANTS: BY THE UNIT. PRICE INCLUDES PREPARATION OF PLANTING SOIL MIX, PLANTING, WATERING AND MAINTENANCE TO SPECIFIED TIME PERIOD.

1.3 REFERENCES
A. NAA (NATIONAL ARBORIST ASSOCIATION) PRUNING STANDARDS FOR SHADE TREES.

B. AMERICAN NURSERY & LANDSCAPE ASSOCIATION; AMERICAN STANDARD FOR NURSERY STOCK, 2004 (ANSI PUBLICATION Z60.1 - 2004).

C. AMERICAN JOINT COMMITTEE ON HORTICULTURAL NOMENCLATURE; STANDARDIZED PLANT NAMES.

1.4 DEFINITIONS
A. WEEDS: INCLUDE DANDELION, JIMSONWEED, QUACKGRASS, HORSETAIL, MORNING GLORY, RUSH GRASS, MUSTARD, LAMBSQUARTER, CHICKWEED, CRESS, CRABGRASS, CANADIAN THISTLE, NUTGRASS, POISON OAK, BLACKBERRY, TANSY RAGWORT, BERMUDA GRASS, JOHNSON GRASS, POISON IVY, NUT SEDGE, NIMBLE WILL, BINDWEED, BENT GRASS, WILD GARLIC, PERENNIAL SORREL, AND BROME GRASS.

B. PLANTS: LIVING TREES, PLANTS, AND GROUND COVER SPECIFIED IN THIS SECTION, AND DESCRIBED IN ANSI Z60.1.

1.5 SUBMITTALS
A. CERTIFICATES

1. SUBMIT FERTILIZER ANALYSIS WITH INVOICE.

2. FILE WITH THE OWNER'S REPRESENTATIVE PRIOR TO MATERIAL ACCEPTANCE.

3. PRODUCT DATA: SUBMIT LIST OF PLANT LIFE SOURCES.

4. MAINTENANCE INSTRUCTIONS: SUBMIT WRITTEN MAINTENANCE SCHEDULE FOR MAINTAINING PLANT MATERIAL AFTER COMPLETION OF JOB TO THE OWNER'S REPRESENTATIVE BEFORE FINAL INSPECTION.

1.6 QUALITY ASSURANCE

A. NURSERY QUALIFICATIONS: COMPANY SPECIALIZING IN GROWING AND CULTIVATING THE PLANTS WITH THREE YEARS DOCUMENTED EXPERIENCE.

B. INSTALLER QUALIFICATIONS: COMPANY SPECIALIZING IN INSTALLING AND PLANTING THE PLANTS WITH THREE YEARS DOCUMENTED EXPERIENCE ON PROJECTS OF SIMILAR SIZE.

C. MAINTENANCE SERVICES: PERFORMED BY INSTALLER.

D. PEST CONTROL APPLICATOR: LICENSED LANDSCAPE PEST CONTROL ADVISOR.

E. COMPLY WITH AMERICAN JOINT COMMITTEE ON HORTICULTURAL NOMENCLATURE "STANDARDIZED PLANT NAMES", AMERICAN NURSERY & LANDSCAPE ASSOCIATION (ANLA) "AMERICAN STANDARD FOR NURSERY STOCK."

F. PROVIDE PLANT MATERIAL AS SHOWN ON DRAWINGS. PLANTS SHALL BE SUBJECT TO INSPECTION AND APPROVAL BY THE OWNER'S REPRESENTATIVE AT PLACE OF GROWTH OR UPON DELIVERY TO SITE FOR CONFORMITY TO SPECIFIED REQUIREMENTS.

G. SAMPLES: THE OWNER'S REPRESENTATIVE RESERVES RIGHT TO TAKE AND ANALYZE SAMPLES OF MATERIALS. FURNISH SAMPLES UPON REQUEST.

1.7 DELIVERY, STORAGE, AND HANDLING

A. PREPARATION FOR DELIVERY

1. BALLED AND BURLAPPED (BB) PLANTS
   a. DIG AND PREPARE FOR SHIPMENT IN MANNER THAT WILL NOT DAMAGE ROOTS, BRANCHES, SHAPE, AND FUTURE DEVELOPMENT AFTER PLANTING.
   b. BALL WITH FIRM, NATURAL BALL OF SOIL.
   c. WRAP BALL FIRMLY WITH BURLAP.
   d. BALL SIZE AND RATIOS: CONFORM TO AMERICAN NURSERY & LANDSCAPE ASSOCIATION (ANLA) STANDARD SIZES AND PLANT LIST, IF CONFLICT OCCURS, NOTIFY THE OWNER'S REPRESENTATIVE.

2. PACK PLANT MATERIAL TO PROTECT AGAINST CLIMATIC, SEASONAL, AND BREAKAGE INJURIES DURING TRANSIT.

3. SECURELY COVER PLANT TOPS WITH TARPAULIN OR CANVAS TO MINIMIZE WINDWHIPPING AND DRYING. USE ANTIDESICCANT UPON APPROVAL OF THE OWNER'S REPRESENTATIVE.

4. DELIVERY AND CAREFUL HANDLING TO POINT OF DELIVERY AT PLANTING JOB SITE.

B. DELIVERY

1. FERTILIZER AND SOIL AMENDMENTS: ORIGINAL UNOPENED CONTAINERS BEARING MANUFACTURER'S GUARANTEED CHEMICAL ANALYSIS, NAME, TRADEMARK AND CONFORMANCE TO STATE LAW.

2. PLANTS: PROVIDE LEGIBLE IDENTIFICATION LABELS. MINIMUM ONE PLANT OF EACH SPECIES DELIVERED TO SITE SHALL HAVE IDENTIFICATION TAG. DO NOT REMOVE TAG UNTIL AFTER FINAL INSPECTION.
   a. PREVENT DAMAGE TO ROOT BALL OR DESICCATION OF LEAVES.
   b. NOTIFY THE OWNER'S REPRESENTATIVE 10 DAYS IN ADVANCE OF DELIVERY.

3. PEAT MOSS: ORIGINAL, UNOPENED AND UNBROKEN PACKAGES.

C. INSPECT TREES, SHRUBS, AND GROUND COVER PLANTS FOR INJURY, INSECT INFESTATION, AND TREES AND SHRUBS FOR IMPROPER SIZE AND SHAPE.

D. STORAGE

1. PROTECT ROOTS OF PLANT MATERIAL FROM DRYING OR OTHER POSSIBLE INJURY WITH SOIL OR ACCEPTABLE MATERIAL.

2. STORE PLANT MATERIAL IN AREA WHICH IS SHADED AND PROTECTED FROM WEATHER.

3. MAINTAIN AND PROTECT PLANT MATERIAL NOT TO BE PLANTED IMMEDIATELY UPON DELIVERY IN HEALTHY, VIGOROUS CONDITION.

E. HANDLING

1. DO NOT DROP PLANTS.

2. DO NOT PICK UP CONTAINER OR BALLED PLANTS BY STEM OR TRUNKS.

3. LIFT AND HANDLE BALLED PLANTS FROM BOTTOM OF BALL.

1.8 PROJECT CONDITIONS

A. FIELD MEASUREMENTS: VERIFY ACTUAL GRADE ELEVATIONS, SERVICE AND UTILITY LOCATIONS, IRRIGATION SYSTEM COMPONENTS, AND DIMENSIONS OF PLANTINGS AND CONSTRUCTION CONTIGUOUS WITH NEW PLANTINGS BY FIELD MEASUREMENTS BEFORE PROCEEDING WITH PLANTING WORK.

B. INTERRUPTION OF EXISTING SERVICES OR UTILITIES: DO NOT INTERRUPT SERVICES OR UTILITIES TO FACILITIES OCCUPIED BY OWNER OR OTHERS UNLESS PERMITTED UNDER THE FOLLOWING CONDITIONS AND THEN ONLY AFTER ARRANGING TO PROVIDE TEMPORARY SERVICES OR UTILITIES ACCORDING TO REQUIREMENTS INDICATED:

1. NOTIFY LANDSCAPE ARCHITECT NO FEWER THAN TWO DAYS IN ADVANCE OF PROPOSED INTERRUPTION OF EACH SERVICE OR UTILITY.

C. WEATHER LIMITATIONS: PROCEED WITH PLANTING ONLY WHEN EXISTING AND FORECASTED WEATHER CONDITIONS PERMIT PLANTING TO BE PERFORMED WHEN BENEFICIAL AND OPTIMUM RESULTS MAY BE OBTAINED. APPLY PRODUCTS DURING FAVORABLE WEATHER CONDITIONS ACCORDING TO MANUFACTURER'S WRITTEN INSTRUCTIONS AND WARRANTY REQUIREMENTS.

D. COORDINATION WITH TURF AREAS (LAWNS): PLANT TREES, SHRUBS, AND OTHER PLANTS AFTER FINISH GRADES ARE ESTABLISHED AND BEFORE PLANTING TURF AREAS UNLESS OTHERWISE INDICATED.

1. WHEN PLANTING TREES, SHRUBS, AND OTHER PLANTS AFTER PLANTING TURF AREAS, PROTECT TURF AREAS, AND PROMPTLY REPAIR DAMAGE CAUSED BY PLANTING OPERATIONS.

1.9 ENVIRONMENTAL REQUIREMENTS

A. DO NOT INSTALL PLANT LIFE WHEN AMBIENT TEMPERATURES MAY DROP BELOW 35 DEGREES F (2 DEGREES C) OR RISE ABOVE 95 DEGREES F (32 DEGREES C).

B. DO NOT INSTALL PLANT LIFE WHEN WIND VELOCITY EXCEEDS 30 MPH (48 K/HR).

1.10 SCHEDULING

A. INSTALL TREES, SHRUBS, AND GROUND COVER PLANTS PRIOR TO LAWN INSTALLATION.

B. COORDINATE SCHEDULING WITH UNDERGROUND IRRIGATION SYSTEM INSTALLATION.

1.11 WARRANTY
A. SPECIAL WARRANTY: INSTALLER AGREES TO REPAIR OR REPLACE PLANTINGS AND ACCESSORIES THAT FAIL IN MATERIALS, WORKMANSHIP, OR GROWTH WITHIN SPECIFIED WARRANTY PERIOD.

1. FAILURES INCLUDE, BUT ARE NOT LIMITED TO, THE FOLLOWING:

   a. DEATH AND UNSATISFACTORY GROWTH, EXCEPT FOR DEFECTS RESULTING FROM ABUSE, LACK OF ADEQUATE MAINTENANCE, OR NEGLECT BY OWNER, OR INCIDENTS THAT ARE BEYOND CONTRACTOR'S CONTROL.
   b. STRUCTURAL FAILURES INCLUDING PLANTINGS FALLING OR BLOWING OVER.
   c. FAULTY PERFORMANCE OF TREE STABILIZATION AND EDGINGS.
   d. DETERIORATION OF METALS, METAL FINISHES, AND OTHER MATERIALS BEYOND NORMAL WEATHERING.

2. WARRANTY PERIODS FROM DATE OF SUBSTANTIAL COMPLETION:

   a. TREES, SHRUBS, VINES, AND ORNAMENTAL GRASSES: 12 MONTHS.
   b. GROUND COVERS, BIENNIALS, PERENNIALS, AND OTHER PLANTS: 90 DAYS.
   c. ANNUALS: 60 DAYS.

3. INCLUDE THE FOLLOWING REMEDIAL ACTIONS AS A MINIMUM:
   a. IMMEDIATELY REMOVE DEAD PLANTS AND REPLACE UNLESS REQUIRED TO PLANT IN THE SUCCEEDING PLANTING SEASON.
   b. REPLACE PLANTS THAT ARE MORE THAN 25 PERCENT DEAD OR IN AN UNHEALTHY CONDITION AT END OF WARRANTY PERIOD.
   c. A LIMIT OF ONE REPLACEMENT OF EACH PLANT WILL BE REQUIRED EXCEPT FOR LOSSES OR REPLACEMENTS DUE TO FAILURE TO COMPLY WITH REQUIREMENTS.

1.12 MAINTENANCE SERVICE
A. INITIAL MAINTENANCE SERVICE FOR TREES AND SHRUBS: PROVIDE MAINTENANCE BY SKILLED EMPLOYEES OF LANDSCAPE INSTALLER. MAINTAIN AS REQUIRED IN PART 3. BEGIN MAINTENANCE IMMEDIATELY AFTER PLANTS ARE INSTALLED AND CONTINUE UNTIL PLANTINGS ARE ACCEPTABLY HEALTHY AND WELL ESTABLISHED BUT FOR NOT LESS THAN MAINTENANCE PERIOD BELOW.

B. MAINTENANCE PERIOD: 60 DAYS FROM DATE OF SUBSTANTIAL COMPLETION.
INITIAL MAINTENANCE SERVICE FOR GROUND COVER AND OTHER PLANTS: PROVIDE MAINTENANCE BY SKILLED EMPLOYEES OF LANDSCAPE INSTALLER. MAINTAIN AS REQUIRED IN PART 3. BEGIN MAINTENANCE IMMEDIATELY AFTER PLANTS ARE INSTALLED AND CONTINUE UNTIL PLANTINGS ARE ACCEPTABLY HEALTHY AND WELL ESTABLISHED BUT FOR NOT LESS THAN MAINTENANCE PERIOD BELOW.

C. MAINTENANCE PERIOD: 60 DAYS FROM DATE OF SUBSTANTIAL COMPLETION

PART 2 - PRODUCTS
2.1 TREES, PLANTS, AND GROUND COVER
A. PLANTS:

1. TYPE AND SIZE: AS SHOWN ON DRAWINGS.

2. PLANTS SHALL HAVE NORMAL HABIT OF GROWTH AND SHALL BE SOUND, HEALTHY, VIGOROUS, AND FREE OF INSECT INFESTATIONS, PLANT DISEASES, SUNSCALDS, WINDBURN, KNOTS, INJURIES, FRESH ABRASIONS OF BARK, EXCESSIVE ABRASIONS, OR OTHER OBJECTIONABLE DISFIGUREMENTS.

3. ROOT CONDITIONS OF PLANTS FURNISHED IN CONTAINERS: DETERMINE CONDITION BY REMOVAL OF EARTH FROM ROOTS OF NOT LESS THAN TWO PLANTS OR MORE THAN 2 PERCENT OF TOTAL NUMBER OF PLANTS OF EACH SPECIES OR VARIETY. WHERE CONTAINER GROWN PLANTS ARE FROM SEVERAL SOURCES, ROOTS OF NOT LESS THAN TWO PLANTS OF EACH SPECIES OR VARIETY FROM EACH SOURCE WILL BE INSPECTED. IN CASE SAMPLE PLANTS INSPECTED ARE FOUND TO BE DEFECTIVE, THE OWNER'S REPRESENTATIVE RESERVES RIGHT TO REJECT ENTIRE LOT OR LOTS OF PLANTS REPRESENTED BY DEFECTIVE SAMPLES. THE OWNER'S REPRESENTATIVE WILL BE SOLE JUDGE AS TO ACCEPTABILITY. PLANTS RENDERED UNSUITABLE FOR PLANTING WILL BE CONSIDERED SAMPLES.

4. ROOT CONDITIONS OF BALLED AND BURLAPPED PLANTS: DETERMINE CONDITION BY EXAMINATION OF PLANT BALLS AND REMOVAL OF 1/3 TO 1/2 OF BURLAP COVERING FROM NOT LESS THAN TWO PLANTS OR MORE THAN 2 PERCENT OF THE TOTAL NUMBER OF PLANTS OF EACH SPECIES OR VARIETY. WHERE BALLED AND BURLAPPED PLANTS ARE FROM SEVERAL SOURCES, BALLS OF NOT LESS THAN TWO PLANTS OF EACH SPECIES OR VARIETY FROM EACH SOURCE WILL BE INSPECTED. IN CASE SAMPLE PLANTS INSPECTED ARE FOUND TO BE DEFECTIVE, THE OWNER'S REPRESENTATIVE RESERVES RIGHT TO REJECT ENTIRE LOT OR LOTS OF PLANTS REPRESENTED BY DEFECTIVE SAMPLES. THE OWNER'S REPRESENTATIVE WILL BE SOLE JUDGE AS TO ACCEPTABILITY. PLANTS RENDERED UNSUITABLE FOR PLANTING WILL BE CONSIDERED SAMPLES.

5. SIZE AND SHAPE OF PLANTS SHALL CORRESPOND WITH THAT NORMALLY EXPECTED FOR SPECIES AND VARIETY OF COMMERCIALLY AVAILABLE NURSERY STOCK PER SIZES SHOWN ON DRAWINGS. OVERALL SHAPE AND MINIMUM ACCEPTABLE SIZE OF PLANTS MEASURED BEFORE PRUNING WITH BRANCHES IN NORMAL POSITION SHALL CONFORM TO ANLA STANDARDS. PLANTS LARGER IN SIZE THAN SPECIFIED MAY BE USED WITH APPROVAL OF THE OWNER'S REPRESENTATIVE, AT NO ADDITIONAL COST TO THE OWNER. IF USE OF LARGER PLANTS IS APPROVED, BALL OF EARTH OR SPREAD OF ROOTS FOR EACH PLANT WILL BE INCREASED PROPORTIONATELY.

6. PLANT MATERIAL SHALL BE TRUE TO BOTANICAL AND COMMON NAME AND VARIETY.

B. TREES:

1. WEAK, THIN TRUNKS INCAPABLE OF SUPPORT WILL NOT BE ACCEPTED.

2. TREES WITH SPECIFIED TRUNK CALIPER OF 3 INCHES OR MORE SHALL NOT BRANCH LESS THAN 5 FEET ABOVE FINISH GRADE, UNLESS SPECIFIED AS MULTI-TRUNK.

3. TRUNKS:
   a. STURDY, WITH HARDENED SYSTEMS AND VIGOROUS AND FIBROUS ROOT SYSTEMS WHICH ARE NOT ROOT OR POT-BOUND.
   b. SINGLE STRAIGHT TRUNKS UNLESS OTHERWISE SHOWN ON DRAWINGS.

C. NURSERY GROWN AND COLLECTED STOCK:

1. PROVIDE NURSERY GROWN STOCK EXCEPT AS SHOWN ON DRAWINGS OR AS APPROVED BY LANDSCAPE ARCHITECT; GROWN UNDER CLIMATIC CONDITIONS SIMILAR TO THOSE IN LOCALITY OF PROJECT.

2. PROVIDE CONTAINER GROWN OR BALLED AND BURLAPPED STOCKS (AS INDICATED ON DRAWINGS) IN VIGOROUS, HEALTHY CONDITION. PLANTS THAT ARE ROOT BOUND, WITH ROOT SYSTEM HARDENED OFF, OR WITH DAMAGED ROOT BALLS WILL NOT BE ACCEPTABLE.

3. BALLED AND BURLAPPED STOCK WILL HAVE FIRM ROOT BALLS WITH NO LOOSE OR FRACTURED SOIL, BALLED AND BURLAPPED STOCK WILL HAVE BEEN COLLECTED AND RE-BALLED IF NECESSARY NO LESS THAN 4 MONTHS PRIOR TO DELIVERY AT JOB SITE.

4. USED WELL ESTABLISHED LINER STOCK PLANT MATERIAL, IN REMOVABLE CONTAINERS OR FORMED HOMOGENEOUS SOIL SECTIONS.

2.2 SOIL AND AMENDMENT MATERIALS

SOIL BLEND TO BE FURNISHED FROM THE GROUND UP: MIX OF ORGANIC COMPOST, FLOWERBED GARDEN SOIL, ENRICHED TOP SOIL, TURF PREMIUM MIX

A. IMPORTED TOPSOIL FOR PREPARED SOIL MIXTURES
1. SANDY LOAM FROM SOURCE APPROVED BY THE OWNER'S REPRESENTATIVE; 100 PERCENT PASSING THROUGH 1-INCH SCREEN.
   a. SAND (2,000 MM TO 0.50 MM): 40 TO 50 PERCENT. SILT (0.050 MM TO 0.005 MM): 30 TO 40 PERCENT. CLAY (0.005 MM AND SMALLER): 10 TO 30 PERCENT.

2. FREE OF SUBSOIL, BRUSH, STUMPS, ROOTS, ORGANIC LITTER, OBJECTIONABLE WEEDS, CLODS, SHALE, STONES 1-INCH MINIMUM DIMENSION OR LARGER, OR OTHER MATERIAL HARMFUL TO GRADING, PLANTING, PLANT GROWTH, OR MAINTENANCE OPERATIONS.

3. PRESENCE OF VEGETATIVE PARTS OF BERMUDA GRASS, JOHNSON GRASS, NUT GRASS (CYPERUS ROTUNDUS), AND OTHER HARD TO ERADICATE WEEDS OR GRASS WILL BE CAUSE FOR REJECTION OF TOPSOIL.

B. FERTILIZER: UNIFORM COMPOSITION, PELLETIZED; TO THE FOLLOWING MINIMUM PROPORTIONS:
1. NITROGEN: 10 PERCENT OR 12 PERCENT.

2. PHOSPHORIC ACID: 10 PERCENT OR 12 PERCENT.

3. POTASH: 10 PERCENT OR 12 PERCENT.

C. ORGANIC SOIL CONDITIONER: SOIL BUILDING SYSTEMS, "ACID GRO PREMIX"; (214) 239-4777, OR APPROVED EQUAL.

D. SHARP SAND: CLEAN, WASHED SAND, FINE TO COARSE SIZES, FREE OF CLAY LUMPS OR OTHER OBJECTIONABLE MATERIALS.

E. ROOT ACTIVATOR: CARL POOL ROOT ACTIVATOR.

F. MULCH: COMPOSTED AND FINELY SHREDDED HARDWOOD OF NO MORE THAN 2 INCH SIZE IN ANY DIMENSION FREE OF INSECTS, DEBRIS, TRASH, WEEDS, SEEDS, AND OTHER FOREIGN OR NOXIOUS MATERIALS. TEXAS NATIVE HARDWOOD MULCH OR APPROVED EQUAL

G. CONTROLLED RELEASE FERTILIZER TABLETS:
1. 21 GRAM TABLETS WITH FOLLOWING PERCENTAGES OF AVAILABLE NUTRIENTS BY WEIGHT
   a. NITROGEN: 28 PERCENT.
   b. PHOSPHORUS: 8 PERCENT.
   c. POTASSIUM: 4 PERCENT.
2. PRODUCT: SIERRA CHEMICAL CO., "AGRIFORM".

H. PEAT MOSS: SHREDDED, LOOSE, CANADIAN, DUTCH, OR GERMAN SPHAGNUM MOSS; FREE OF LUMPS, ROOTS, INORGANIC MATERIAL OR ACIDIC MATERIALS; MINIMUM OF 85 PERCENT ORGANIC MATERIAL MEASURED BY OVEN DRY WEIGHT, PH RANGE OF 4 TO 5; MOISTURE CONTENT OF 30 PERCENT.

I. WATER: POTABLE, AVAILABLE ON SITE.

2.3 ACCESSORIES
A. STAKES: STAKES FOR SUPPORTING TREES SHALL BE STEEL "T" STAKES OF APPROPRIATE LENGTH.
B. TREE TIES: "ARBOR TIE" SYNTHETIC TREE TIE, BY DEEPROOT INC.

PART 3 - EXECUTION
3.1 EXAMINATION

A. VERIFY ESTABLISHED GRADES ARE CORRECT; DETERMINE LOCATIONS OF UNDERGROUND UTILITIES PRIOR TO PLANTING.

B. AREAS SHALL BE FREE OF WEED AND FOREIGN MATERIAL PRIOR TO PLANTING.

C. DO NOT BEGIN PLANTING UNTIL DEFICIENCIES ARE CORRECTED, OR PLANTS REPLACED. TO BEGIN WORK INDICATES ACCEPTANCE OF SITE CONDITIONS.

D. DO NOT BEGIN PLANTING UNTIL IRRIGATION SYSTEM HAS BEEN INSTALLED AND IT PROPER FUNCTION CONFIRMED

E. SATURATE SOIL WITH WATER TO TEST DRAINAGE.

3.2 PROTECTION
A. PROTECT LAWN AREAS FROM VEHICULAR TRAFFIC AND FROM MATERIAL STORAGE.

3.3 SOIL PREPARATION
A. PLANT LOCATIONS AND MEASUREMENTS:
1. STAKE OUTLINE OF PLANTING BEDS ON GROUND.
2. STAKE LOCATIONS OF TREES.
3. PLACE SHRUBS AND GROUND COVER IN INDICATED LOCATIONS.
4. NOTIFY THE OWNER'S REPRESENTATIVE OF DISCREPANCIES BETWEEN PLANTS INDICATED ON DRAWINGS AND ACTUAL CONDITIONS PRIOR TO PLANTING.
5. PLANT LOCATIONS WILL BE APPROVED BY THE OWNER'S REPRESENTATIVE PRIOR TO PLANTING.

B. PITS
1. SHAPE: VERTICAL SIDES AND CROWNED BOTTOM; PLANT PITS SHALL BE CIRCULAR.
2. SIZE FOR TREES: 2 FEET WIDER AND 6 INCHES DEEPER THAN ROOT BALL.
3. SIZE FOR BALLED AND BURLAPPED SHRUBS: 1 FOOT WIDER AND 3 INCHES DEEPER THAN ROOT BALL.
4. SIZE FOR SEEDLING TREES: 6 INCHES LARGER THAN ROOT BALL AND 6 INCHES DEEPER THAN ROOT BALL.
5. SCARIFY SIDES OF BOTTOM OF PLANTING PITS TO IMPROVE ROOT PENETRATION.

C. GROUND COVER AND SHRUB BEDS: EXCAVATE EXISTING SOIL TO DEPTH SPECIFIED.

D. OBSTRUCTIONS BELOW GROUND
1. REMOVE ROCK OR UNDERGROUND OBSTRUCTIONS TO DEPTH OF 6 INCHES BELOW BOTTOM OF PLANT BALL OR ROOT, MEASURED WHEN PLANT IS PROPERLY SET AT THE REQUIRED GRADE.
2. IF UNDERGROUND OBSTRUCTIONS CANNOT BE REMOVED, NOTIFY THE OWNER'S REPRESENTATIVE FOR NEW INSTRUCTIONS.
3. AVOID DAMAGING UNDERGROUND UTILITY LINES.
4. REPAIR DAMAGE TO EXISTING UTILITIES.

E. FINAL GRADES:
1. MINOR MODIFICATION TO GRADE MAY BE REQUIRED TO ESTABLISH FINAL GRADE.
2. ENSURE PROPER DRAINAGE OF SITE AS DETERMINED BY LANDSCAPE ARCHITECT.
3. FINE GRADE AREAS SO FINISHED GRADES SHALL BE 1 INCH IN LAWN AND 2 INCHES IN SHRUB BEDS, BELOW ADJACENT PAVED AREAS, SIDEWALKS, VALVE BOXES, HEADERS, CLEAN-OUTS, DRAINS, AND MANHOLES, ETC.
4. SURFACE DRAINAGE SHALL BE AWAY FROM BUILDING FOUNDATIONS AT 2 PERCENT MINIMUM, FOR 5-FOOT MINIMUM.
5. FILL EROSION SCARS AND COMPACT PRIOR TO PLANTING.

F. DISPOSAL OF EXCESS SOIL
1. USE ACCEPTABLE EXCESS EXCAVATED TOPSOIL FOR FILLING HOLES, PITS, AND BEDS AS DIRECTED BY THE OWNER'S REPRESENTATIVE.
2. DISPOSE OF UNACCEPTABLE OR UNUSED EXCESS SOIL AT OFF-SITE LOCATION AS DIRECTED BY THE OWNER'S REPRESENTATIVE.

G. SHRUB AND GROUND COVER BEDS
1. PREPLANT WEED CONTROL:
   a. IF LIVE PERENNIAL WEEDS EXIST ON SITE AT BEGINNING OF WORK, SPRAY WITH NONSELECTIVE SYSTEMIC CONTACT HERBICIDE, AS RECOMMENDED AND APPLIED BY APPROVED LICENSED LANDSCAPE PEST CONTROL ADVISOR AND APPLICATOR. LEAVE SPRAYED PLANTS INTACT FOR MINIMUM 15 DAYS TO ALLOW SYSTEMIC KILL. APPLY HERBICIDE IN ACCORDANCE WITH MANUFACTURER'S INSTRUCTIONS.

   b. CLEAR AND REMOVE EXISTING WEEDS BY SCRAPING OR GRUBBING OFF PLANT PARTS AT LEAST ¼-INCH BELOW SURFACE OF SOIL OVER ENTIRE AREA TO BE PLANTED.
2. SOIL AMENDMENT:
   a. SUBGRADE: 10 INCHES BELOW FINISH GRADE. LAYER OF SOIL AMENDMENTS SHALL BE 8 INCHES DEEP, LEAVING FINISH GRADE AFTER WATERING AND SETTLING 2 INCHES BELOW ADJACENT PAVED AREAS. EXCAVATION AND FILL MAY BE REQUIRED TO ACHIEVE GRADES.
      i. ORGANIC SOIL CONDITIONER: 4-INCH DEEP LAYER.
      ii. TOPSOIL: 4-INCH DEEP LAYER.
      iii. FERTILIZER: 5 POUNDS PER 1000 SQUARE FEET OF BED AREA.

   b. SPREAD AMENDMENTS UNIFORMLY, CULTIVATE THOROUGHLY TO LIGHT AND FRIABLE CONSISTENCY, USING MECHANICAL ROTOTILLER INTO TOP 2 INCHES OF SUBGRADE. MAKE BED APPROXIMATELY 6-INCH TOTAL DEPTH OF AMENDED SOIL.
3. PRE-EMERGENCE HERBICIDE: APPLY AT RATES RECOMMENDED BY MANUFACTURER. INCORPORATE INTO TOP ½-INCH OF SOIL BY HAND RAKING.
4. TOP 2 INCHES OF AREAS TO BE PLANTED SHALL BE FREE OF STONES, STUMPS, OR OTHER DELETERIOUS MATTER 1-INCH IN DIAMETER OR LARGER; FREE FROM WIRE, PLASTER, OR SIMILAR OBJECTS THAT HINDER PLANTING OR MAINTENANCE.

H. PLANTING MIXTURE FOR TREES AND POCKET PLANTING OF LARGE SHRUBS 5 GALLONS AND LARGER:
1. TOPSOIL: TWO PARTS.
2. ORGANIC SOIL CONDITIONER: ONE PART.
3. SHARP SAND: ONE PART.

3.4 PLANTING
A. PLANT DURING PERIODS WHEN WEATHER AND SOIL CONDITIONS ARE SUITABLE AND IN ACCORDANCE WITH LOCALLY ACCEPTED PRACTICE, OR AS APPROVED BY THE OWNER'S REPRESENTATIVE.

B. DISTRIBUTE NUMBER OF PLANTS WHICH CAN BE PLANTED AND WATERED ON SAME DAY.

C. OPEN CONTAINERS AND REMOVE PLANTS IN MANNER TO NOT BREAK ROOT BALL. PLANT AND WATER AS SPECIFIED IMMEDIATELY AFTER REMOVAL FROM CONTAINERS. DO NOT OPEN CONTAINERS PRIOR TO PLACING PLANTS IN PLANTING PITS.

D. SET PLANTS IN PITS AT LEVEL SHOWN ON DRAWINGS. SET PLANTS PLUMB AND RIGIDLY BRACED IN POSITION UNTIL PLANTING MIXTURE HAS BEEN TAMPED SOLIDLY AROUND PLANT BALL. THOROUGHLY SETTLE PLANT BY WATERING AND TAMPING MIXTURE. RAKE PLANTING BEDS LEVEL BEFORE AND AFTER PLANTING. THOROUGHLY WATER TREES AND SHRUBS. STAKE AND GUY TREES AS SHOWN ON DRAWINGS.

E. BALLED PLANTS
1. PLACE IN PIT ON HAND TAMPED PLANTING MIXTURE.
2. PLACE WITH BURLAP INTACT SO LOCATION OF GROUND LINE AT TOP OF PLANT BALL SHALL BE SAME AS PRIOR TO DIGGING.
3. REMOVE BINDING AT TOP OF BALL AND LAY BURLAP BACK FROM TOP OF PLANT BALL.
4. DO NOT PULL WRAPPING FROM UNDER BALL.
5. DO NOT PLANT IF

GENERAL CONSTRUCTION NOTES:

1. CONTRACTOR SHALL BE FAMILIAR WITH EXISTING SITE CONDITIONS AND UNDERGROUND UTILITIES, PIPES, AND STRUCTURES. CONTRACTOR SHALL TAKE SOLE RESPONSIBILITY FOR ANY COST INCURRED DUE TO BODILY INJURY AND/OR DAMAGE TO OWNER'S PROPERTY, PROPERTY OF OTHERS, OR OF SAID UTILITIES. CONTRACTOR IS RESPONSIBLE FOR CONTACTING UTILITY COMPANIES BEFORE EXCAVATION. UTILITY LOCATES SHALL BE MAINTAINED THROUGHOUT THE DURATION OF THE WORK.

2. LOCATE AND VERIFY CONDITION OF UTILITIES PRIOR TO MOBILIZATION FOR CONSTRUCTION. CONTRACTOR SHALL BE FULLY RESPONSIBLE FOR ANY AND ALL DAMAGE TO EXISTING PUBLIC OR PRIVATE UTILITY LINES, INCLUDING BUT NOT LIMITED TO WATER LINES, WASTEWATER COLLECTION SYSTEMS AND STORM SEWERS, DURING CONSTRUCTION. EXTREME CARE SHALL BE EXERCISED IN EXCAVATING AND WORKING NEAR EXISTING UTILITIES. CONTRACTOR SHALL HAND DIG AS REQUIRED.

3. CONTRACTOR SHALL PROTECT TREES ADJACENT TO THE WORK AREA. NO TREES OR PLANT MATERIAL SHALL BE REMOVED WITHOUT PERMISSION OF THE OWNER. REFER TO TREE PROTECTION NOTES AND SPECIFICATIONS. TREE PROTECTION MEASURES MUST BE IN PLACE PRIOR TO STARTING CONSTRUCTION.

4. CONTRACTOR IS RESPONSIBLE FOR LOCATING AND PROTECTING EXISTING IRRIGATION AND LANDSCAPE ON SITE FROM DAMAGE. CONTRACTOR SHALL NOTIFY LANDSCAPE ARCHITECT OF ANY CONFLICTS IMMEDIATELY.

5. CONTRACTOR SHALL NOTIFY OWNER AND LANDSCAPE ARCHITECT 48 HOURS PRIOR TO COMMENCEMENT OF WORK TO COORDINATE PROJECT INSPECTION SCHEDULES.

6. CONFLICTING INFORMATION SHALL BE BROUGHT TO THE ATTENTION OF THE LANDSCAPE ARCHITECT IN WRITING IMMEDIATELY. WITHOUT A WRITTEN REQUEST FOR CLARIFICATION, IT IS REQUIRED FOR THE CONTRACTOR TO INCORPORATE THE COSTLIEST ITEM.

7. DO NOT WILLFULLY PROCEED WITH CONSTRUCTION AS DESIGNED WHEN OBSTRUCTIONS AND/OR CONFLICTS ARE DISCOVERED THAT MAY HAVE NOT BEEN KNOWN DURING DESIGN. SUCH CONDITIONS SHALL BE IMMEDIATELY BROUGHT TO THE ATTENTION OF THE LANDSCAPE ARCHITECT. THE CONTRACTOR SHALL ASSUME FULL RESPONSIBILITY FOR NECESSARY REVISIONS/CHANGES REQUIRED DUE TO FAILURE TO GIVE SUCH NOTIFICATION.

8. THE CONTRACTOR SHALL PROVIDE LABOR , MATERIALS, AND SUPERVISION NECESSARY TO ACCOMPLISH THE WORK AS SHOWN AND NOTED ON THE DRAWINGS UNLESS OTHERWISE NOTED.

9. CONTRACTOR SHALL BE RESPONSIBLE FOR COORDINATION WITH HIS SUBCONTRACTORS TO ACCOMPLISH HIS SCOPE OF WORK. CONTRACTOR SHALL COORDINATE WITH OTHER TRADES WORKING ON THE SITE SIMULTANEOUSLY. CONTRACTOR SHALL ANTICIPATE AND COORDINATE TIME REQUIRED FOR BEST ORDER OF OPERATIONS IN THE SEQUENCING OF WORK. FAILURE TO DO SO SHALL NOT CONSTITUTE REASON FOR ADDITIONAL MOBILIZATION COSTS.

10. THE CONTRACTOR SHALL BE RESPONSIBLE FOR FIELD VERIFICATION OF EXISTING CONDITIONS, AND SHALL PERFORM FIELD MEASUREMENTS PRIOR TO FABRICATION AND/OR PURCHASE OF ANY MATERIAL AND SHALL CONTACT THE LANDSCAPE ARCHITECT SHOULD EXISTING CONDITIONS BE DIFFERENT FROM THE DESIGN DRAWINGS FOR THIS PROJECT. CONFLICTS ARISING DUE TO LACK OF COORDINATION SHALL BE THE RESPONSIBILITY AND EXPENSE OF THE CONTRACTOR.

11. ANY REQUIRED CHANGES TO THE DRAWINGS RESULTING FROM THE ACCEPTANCE OF CONTRACTOR'S ALTERNATES AND /OR SUBSTITUTIONS ARE THE RESPONSIBILITY OF THE CONTRACTOR AND SHALL BE SUBMITTED TO THE LANDSCAPE ARCHITECT AND THE OWNER FOR APPROVAL.

12. CONTRACTOR SHALL PROVIDE UNIT PRICES BASED ON QUANTITIES ON DOCUMENTS. FIELD CONDITIONS MAY REVISE ACTUAL LOCATION, INCREASING OR DECREASING THE EXTENT OF WORK PERFORMED. CHANGES TO THE EXTENT OF WORK RESULTING IN AN INCREASE OR DECREASE WILL BE BASED ON UNIT PRICES AND PERFORMED SUBJECT TO APPROVAL OF THE OWNER AND THE LANDSCAPE ARCHITECT IN THE FORM OF A CHANGE ORDER.

13. UNIT PRICES SHALL NOT ONLY INCLUDE THE COST OF THE ITEM BUT ALSO LABOR, EQUIPMENT, AND OTHER MATERIALS (I.E. BACKFILL MIX, MULCH, STEEL EDGING, ETC.) ASSOCIATED WITH AND NECESSARY TO DELIVER THE ITEM COMPLETE AS DOCUMENTED IN THE SPECIFICATIONS AND CONSTRUCTION DRAWINGS.

14. THE CONTRACTOR SHALL COORDINATE THE STORING OF MATERIALS, PARKING OF VEHICLES AND RESTRICTIONS OF WORK AND ACCESS WITH THE OWNER. **UNDER NO CIRCUMSTANCES SHALL ANY CONTRACTOR STORE MATERIALS OR PARK VEHICLES UNDER THE CANOPY OF EXISTING TREES.**

15. CONTRACTOR SHALL COMPLY WITH ALL APPLICABLE ORDINANCES AND LOCAL, STATE AND/OR FEDERAL CODES. CONTRACTOR SHALL OBTAIN REQUIRED CONSTRUCTION PERMITS PRIOR TO STARTING CONSTRUCTION. CONTRACTOR SHALL OBTAIN PERMITS REQUIRED BY THE REGULATION OF MONTGOMERY COUNTY DRAINAGE DISTRICT, AND BY OTHER ENTITIES HAVING JURISDICTION, PRIOR TO STARTING CONSTRUCTION.

16. CONTRACTOR SHALL BE RESPONSIBLE FOR MAINTAINING PERMIT(S) AND OPERATE IN COMPLIANCE WITH REQUIRED PERMITS.

17. CONSTRUCTION COVERED BY THESE CONTRACT DOCUMENTS SHALL BE IN CONFORMANCE WITH THE LATEST EDITION OF ALL APPLICABLE CITY, COUNTY, AND STATE CODES/REGULATIONS; IN COMPLIANCE WITH OSHA REQUIREMENTS; FEDERAL CODES AND GUIDELINES; AND STANDARDS. THESE INCLUDE, BUT ARE NOT LIMITED TO: TCEQ, ANSI, THE UNIFORM BUILDING CODE OR IBC AS APPLICABLE, THE NATIONAL ELECTRIC CODE, AND USADAAG (MOST RECENT EDITIONS, AND AMENDMENTS AS ADOPTED BY LOCAL GOVERNMENT).

18. CONTRACTOR SHALL COMPLY WITH FEDERAL, STATE, AND LOCAL LAWS AND REGULATIONS OF UTILITY COMPANIES CONCERNING SAFETY AND HEALTH PRACTICES.

19. THESE PLANS PREPARED BY Pape-Dawson Engineers DO NOT EXTEND TO OR INCLUDE DESIGNS OR SYSTEMS PERTAINING TO THE SAFETY OF THE CONTRACTOR OR ITS EMPLOYEES, AGENTS, OR REPRESENTATIVES IN THE PERFORMANCE OF WORK. THE SEAL OF Pape-Dawson Engineers OR THEIR CONSULTANTS SEALS HEREON DOES NOT EXTEND TO ANY SUCH SAFETY SYSTEMS THAT MAY NOW HEREAFTER BE INCORPORATED IN THESE PLANS. THE CONTRACTOR SHALL PREPARE OR OBTAIN THE APPROPRIATE SAFETY SYSTEM (S).

20. CONTRACTOR SHALL REMOVE ALL MUD, DIRT AND DEBRIS DEPOSITED OR DROPPED ON EXISTING PAVEMENT DUE TO CONTRACTOR'S CONSTRUCTION ACTIVITY DAILY. MATERIAL THAT IS HAZARDOUS TO TRAFFIC, OR DAMAGING TO EXISTING MATERIALS/FINISHES SHALL BE REMOVED IMMEDIATELY. HAZARDOUS MATERIALS SHALL BE HANDLED, STORED, CLEANED UP, AND DISPOSED OF AS REQUIRED BY LAW.

21. CONTRACTORS AND SUBCONTRACTORS ARE RESPONSIBLE FOR REMOVAL OF TRASH AND REPAIR OF HAZARDOUS CONDITIONS (I.E. TOOLS, OPEN HOLES, ETC.) ON A DAILY BASIS BY END OF WORK DAY.

22. UPON COMPLETION OF CONSTRUCTION AND PRIOR TO FINAL APPROVAL, CONTRACTOR SHALL THOROUGHLY CLEAN UP THE PROJECT SITE OF ALL TRASH , SCRAPS, BRICK, ROCKS, MORTAR, ETC. REPAIR ALL DAMAGE TO FINISH GRADE INCLUDING TAILINGS FROM EXCAVATIONS, WHEEL RUTS , OR ANY SETTLING OR EROSION OCCURRING PRIOR TO COMPLETION.

23. CONTRACTORS SHALL NOT BLOCK TRAFFIC AT ANY TIME. PARTIAL OBSTRUCTION MAY BE PERMITTED BY OWNERS REPRESENTATIVE FOR SHORT DURATIONS, DURING WHICH TIME CONTRACTOR SHALL PROVIDE PERSONNEL AND SIGNAGE/TRAFFIC CONTROL DEVICES AS REQUIRED FOR SAFETY. AT NO TIME SHALL FIRST RESPONDERS (FIRE, AMBULANCE, POLICE) BE HINDERED.

TREE PROTECTION NOTES

1. ALL TREES SHOWN ON PLAN TO BE RETAINED OR REPLANTED SHALL BE PROTECTED DURING CONSTRUCTION WITH TEMPORARY FENCING.

2. TREE PROTECTION FENCES SHALL BE INSTALLED PRIOR TO THE COMMENCEMENT OF ANY SITE PREPARATION WORK (CLEARING, GRUBBING OR GRADING) IN ACCORDANCE TO THE DETAILS SHOWN ON THIS SHEET, AND SHALL BE MAINTAINED THROUGHOUT ALL PHASES OF THE CONSTRUCTION PROJECT. GENERAL CONTRACTOR SHALL COORDINATE ALL WORK TO ENSURE THAT TREES REMAIN IN GOOD HEALTH. IN THE EVENT OF CONFLICTS WITH UTILITY PLANS THE CONTRACTOR SHALL NOTIFY THE LANDSCAPE ARCHITECT OR OWNER PRIOR TO REMOVAL OR RELOCATION OF FENCING.

3. EROSION AND SEDIMENTATION CONTROL BARRIERS SHALL BE IN STALLED AND MAINTAINED IN A MANNER WHICH DOES NOT RESULT IN SOIL BUILDUP WITHIN TREES DRIPLINE.

4. FENCES SHALL COMPLETELY SURROUND THE TREE OR CLUSTERS OF TREES; SHALL BE LOCATED AT THE OUTERMOST LIMITS OF THE TREE BRANCHES (DRIPLINE); AND SHALL BE MAINTAINED THROUGHOUT THE CONSTRUCTION PROJECT IN ORDER TO PREVENT THE FOLLOWING:
   a. SOIL COMPACTION IN THE ROOT ZONE AREA RESULTING FROM VEHICULAR TRAFFIC OR STORAGE OF EQUIPMENT OR MATERIALS
   b. ROOT ZONE DISTURBANCES DUE TO GRADE CHANGES (GREATER THAN 6 INCHES CUT OR FILL)
   c. WOUNDS TO EXPOSED ROOTS, TRUNK OR LIMBS BY MECHANICAL EQUIPMENT
   d. OTHER ACTIVITIES DETRIMENTAL TO TREES SUCH AS CHEMICAL STORAGE OR DUMPING, CLEANING OF EQUIPMENT OR VEHICLES, AND FIRES. PARKING EQUIPMENT OR VEHICLES WITHIN DRIPLINE AREA.

5. EXCEPTIONS TO INSTALLING FENCES AT TREE DRIPLINES MAY BE PERMITTED IN THE FOLLOWING CASES:
   a. WHERE PERMEABLE PAVING IS TO BE INSTALLED, ERECT THE FENCE AT THE OUTER LIMITS OF THE PERMEABLE PAVING AREA.
   b. WHERE TREES ARE CLOSE TO PROPOSED BUILDINGS, ERECT THE FENCE NO CLOSER THAN 6 FEET TO THE BUILDING.
   c. WHERE THERE ARE SEVERE SPACE CONSTRAINTS DUE TO TRACT SIZE, OR OTHER SPECIAL REQUIREMENTS, CONTACT A WILLIAMSON COUNTY APPROVED ARBORIST AND THE LANDSCAPE ARCHITECT TO DISCUSS ALTERNATIVES.

6. WHERE ANY OF THE ABOVE EXCEPTIONS RESULT IN A FENCE THAT IS CLOSER THAN 4 FEET TO A TREE TRUNK, PROTECT THE TRUCK WITH STRAPPED-ON PLANKING TO A HEIGHT OF 8 FEET (OR TO THE LIMITS OF LOWER BRANCHING) IN ADDITION TO THE REDUCED FENCING PROVIDED.

7. WHERE ANY OF THE ABOVE EXCEPTIONS RESULT IN AREAS OF UNPROTECTED ROOT ZONES (UNDER DRIPLINES) THOSE AREAS SHOULD BE COVERED WITH 4 INCHES OF ORGANIC MULCH OR GRAVEL TO MINIMIZE SOIL COMPACTION.

8. TREES APPROVED FOR REMOVAL SHALL BE REMOVED IN A MANNER WHICH DOES NOT IMPACT TREES TO REMAIN. NO HEAVY EQUIPMENT MAY BE USED TO REMOVE STUMPS WHEN THE ROOTS MAY BE ENTWINED WITH ROOTS OF TREES TO REMAIN.

9. ALL GRADING WITHIN PROTECTED ROOT ZONE AREAS SHALL BE DONE BY HAND OR WITH SMALL EQUIPMENT TO MINIMIZE ROOT DAMAGE. PRIOR TO GRADING, RELOCATE PROTECTIVE FENCING TO 2 FEET BEHIND THE GRADE CHANGE AREA.

10. ANY ROOTS EXPOSED BY CONSTRUCTION ACTIVITY SHALL BE PRUNED FLUSH WITH THE SOIL. BACKFILL ROOT AREAS WITH GOOD QUALITY TOP SOIL AS SOON AS POSSIBLE. IF EXPOSED ROOT AREAS ARE NOT BACKFILLED WITHIN 2 DAYS, COVER THEM WITH ORGANIC MATERIAL IN A MANNER WHICH REDUCES SOIL TEMPERATURE AND MINIMIZES WATER LOSS DUE TO EVAPORATION.

11. PRIOR TO EXCAVATION OR GRADE CUTTING WITHIN TREE DRIPLINES, A CLEAN CUT SHALL BE MADE BETWEEN THE DISTURBED AND UNDISTURBED ROOT ZONES WITH A ROCK SAW OR SIMILAR EQUIPMENT TO MINIMIZE DAMAGE TO REMAINING ROOTS.

12. TREES MOST HEAVILY IMPACTED BY CONSTRUCTION ACTIVITIES WILL BE WATERED DEEPLY ONCE A WEEK DURING PERIODS OF HOT, DRY WEATHER. TREE CROWNS ARE TO BE SPRAYED WITH WATER PERIODICALLY TO REDUCE DUST ACCUMULATION ON THE LEAVES.

13. WHEN INSTALLING CONCRETE ADJACENT TO THE ROOT ZONE OF A TREE USE A PLASTIC VAPOR BARRIER BEHIND THE CONCRETE TO PROHIBIT LEACHING OF LIME INTO THE ROOT ZONE.

14. ANY TRENCHING REQUIRED FOR THE INSTALLATION OF LANDSCAPE IRRIGATION SHALL BE PLACED AS FAR FROM EXISTING TREE TRUNKS AS POSSIBLE.

15. NO LANDSCAPE TOPSOIL DRESSING GREATER THAN 4 INCHES SHALL BE PERMITTED WITHIN THE DRIPLINE OF TREES. NO SOIL IS PERMITTED ON THE ROOT FLARE OF ANY TREE.

16. PRUNING TO PROVIDE CLEARANCE FOR STRUCTURES, VEHICULAR TRAFFIC AND CONSTRUCTION EQUIPMENT SHALL TAKE PLACE BEFORE CONSTRUCTION BEGINS (BEFORE DAMAGE OCCURS). NO LOW LIMBS GREATER THAN 6" MAY BE REMOVED WITHOUT THE APPROVAL OF THE LANDSCAPE ARCHITECT OR OWNER. ALL FINISHED PRUNING MUST BE DONE ACCORDING TO RECOGNIZED, APPROVED STANDARDS OF THE INDUSTRY; REFERENCE THE NATIONAL ARBORIST ASSOCIATION PRUNING STANDARDS FOR SHADE TREES, CLASS IV OF PRUNING.

17. ALL WOUNDS WHICH OCCUR TO TREE TRUNKS AND LIMBS MUST BE REPAIRED WITHIN 24 HOURS OF OCCURRENCE BY BARK TRACING TO REMOVE DAMAGED WOOD AND BARK AND THOROUGHLY SEALED WITH AN ACCEPTABLE TREE WOUND DRESSING. THIS SPECIFICALLY APPLIES TO WOUNDS CREATED BY CONSTRUCTION VEHICLES AND EQUIPMENT, INSTALLATION OF TOWERS AND PIERS, AND STRINGING OF ELECTRICAL LINES.

18. WHEN TREES OTHER THAN THOSE APPROVED FOR REMOVAL ARE DESTROYED, KILLED OR BADLY DAMAGED AS A RESULT OF NEGLIGENCE, OR DISREGARD OF THESE NOTES THE CONTRACT SUM WILL BE REDUCED BY THE AMOUNT DETERMINED FROM THE FOLLOWING ISTC FORMULA "DIAMETER SQUARED x .07854 X $50.00". DIAMETER TO BE MEASURED IN INCHES AT 12" HEIGHT.

PLANTING NOTES

1. CONTRACTOR SHALL BE RESPONSIBLE FOR BECOMING FAMILIAR WITH ALL UNDERGROUND UTILITIES, PIPES AND STRUCTURES PRIOR TO INSTALLATION OF ANY PLANT MATERIALS. CONTRACTOR SHALL TAKE SOLE RESPONSIBILITY FOR ANY COST INCURRED DUE TO DAMAGE OF THESE UTILITIES.

2. CONTRACTOR SHALL NOTIFY THE LANDSCAPE ARCHITECT AND/OR OWNER'S REPRESENTATIVE OF ANY DISCREPANCIES IN THE DRAWINGS WITH ACTUAL SITE CONDITIONS THAT MAY AFFECT THE PROPER INSTALLATION OF THE WORK. THE CONTRACTOR SHALL BE RESPONSIBLE FOR CORRECTING ANY WORK THAT IS NECESSARY DUE TO FAILURE ON THE CONTRACTOR'S PART TO NOTIFY THE LANDSCAPE ARCHITECT AND/OR OWNER'S REPRESENTATIVE OF ANY DISCREPANCIES.

3. CONTRACTOR SHALL LAYOUT PLANT MATERIALS IN THE FIELD PRIOR TO INSTALLATION FOR APPROVAL BY THE LANDSCAPE ARCHITECT AND/OR OWNER'S REPRESENTATIVE. CONTRACTOR SHALL BE RESPONSIBLE FOR CORRECTIVE WORK, IF NECESSARY FOR FAILING TO SEEK AN APPROVED LAYOUT BY THE LANDSCAPE ARCHITECT AND/OR OWNER'S REPRESENTATIVE. TREE MATERIAL SHALL BE PLANTED A MINIMUM OF 5'-0" FROM ANY PROPOSED OR EXISTING STREET CURBS AND PAVED AREAS, UNLESS OTHERWISE NOTED ONT HE PLAN.

4. ALL PLANT MATERIAL SHALL CONFORM TO THE SIZES GIVEN IN THE PLANT LIST AND SHALL BE NURSERY GROWN IN ACCORDANCE WITH THE "AMERICAN STANDARD FOR NURSERY STOCK, 2004".

5. ALL PLANTINGS SHALL BE IN ACCORDANCE WITH THE STANDARD AMERICAN NURSERY & LANDSCAPE ASSOCIATION (ANLA) PROCEDURES AND SPECIFICATIONS

6. ALL AREAS DISTURBED BY PLANTING OPERATIONS SHALL BE FINE GRADED AND SEEDED.

7. OBTAIN APPROVAL FROM LANDSCAPE ARCHITECT OR OWNER'S REPRESENTATIVE BEFORE MAKING ANY SUBSTITUTIONS OR CHANGES.

8. QUANTITIES SHOWN ON THE PLANT LIST ARE FOR THE CONTRACTOR'S CONVENIENCE ONLY AD ARE NOT GUARANTEED TO BE ACCURATE. IN THE EVENT OF A DISCREPANCY BETWEEN QUANTITIES SHOWN ON THE PLAN AND QUANTITIES SHOWN ON THE PLANT LIST, THE QUANTITIES ON THE PLAN SHALL APPLY.

9. CONTRACTOR SHALL INSTALL TEMPORARY IRRIGATION FOR PLANT ESTABLISHMENT

10. PLANT AND LANDSCAPE MATERIALS SUBMITTALS:
10.1. CONTRACTOR SHALL SUBMIT PHOTOS OF REPRESENTATIVE TREES AND SHRUBS WITH THE REQUIRED SPECIFICATIONS TO INCLUDE, BUT NOT LIMITED TO HEIGHT, WIDTH, CALIPER, AND A REFERENCE SCALE.
10.2. THE LANDSCAPE ARCHITECT AND/OR OWNER'S REPRESENTATIVE, AT THEIR DISCRETION, MAY REQUEST A NURSERY SITE VISIT TO REVIEW PLANT MATERIALS PRIOR TO DELIVERY TO THE SITE.
10.3. THE LANDSCAPE ARCHITECT AND/OR OWNER'S REPRESENTATIVE RESERVE THE RIGHT TO REJECT ANY PLANT MATERIAL DELIVERED TO THE SITE THAT DOES NOT MEET THE REQUIREMENTS WITH OR WITHOUT A NURSERY SITE VISIT.
10.4. ADDITIONAL LANDSCAPE MATERIALS MAY INCLUDE SOIL MIXES, MULCHES, FERTILIZERS, STAKING EQUIPMENT, SEED MIXES, INSTALLATION METHODS, HERBICIDES, AND MISCELLANEOUS ITEMS AS NEEDED FOR LANDSCAPE WORK TO BE COMPLETE AND IN PLACE.

11. LANDSCAPE CONTRACTOR SHALL BE RESPONSIBLE FOR ANY COORDINATION WITH THE GENERAL CONTRACTOR AND SITE CIVIL CONTRACTOR.

12. CONTRACTOR SHALL NOTIFY THE OWNER'S AUTHORIZED REPRESENTATIVE 72 HOURS (WEEKENDS NOT INCLUDED PRIOR TO COMMENCEMENT OF WORK EFFORTS.

13. CONTRACTOR SHALL PROTECT ALL EXISTING TREES TO REMAIN (IF APPLICABLE). CONTRACTOR SHALL REPLACE ANY TREES DAMAGED DURING CONSTRUCTION ON A 1" TO 1" RATIO. SEE TREE PRESERVATION SPECIFICATIONS AND/OR DETAILS.

14. ALL PLANT MATERIALS FREE OF PESTS AND DISEASES. PRE-SELECTED OR "TAGGED" MATERIAL MUST BE INSPECTED BY THE CONTRACTOR AND CERTIFIED PEST AND DISEASE FREE. CONTRACTOR SHALL WARRANTY ALL PLANT MATERIALS FOR A PERIOD OF TWO (2) YEARS.

15. CONTRACTOR SHALL INSTALL TREE MATERIALS WITH PROPER STAKING METHOD ACCORDING TO THE SPECIFICATION AND PLANTING DETAILS. SHRUBS AND GROUND COVERS SHALL BE TRIANGULARLY SPACED AT THE DIMENSIONS SHOWN ON THE PLANS AND DETAILS UNLESS OTHERWISE INDICATED.

16. ALL PLANTING BEDS SHALL RECEIVE A MINIMUM OF 4" OF APPROVED DOUBLE GROUND NATIVE HARDWOOD BROWN BARK MULCH UNLESS OTHERWISE NOTED ON DRAWINGS OR SPECIFICATIONS.

17. CONTRACTOR SHALL FINE GRADE ALL DISTURBED AREAS TO PROVIDE FOR PROPER DRAINAGE TO REMOVE ROCKS LARGER THAN 1", DEBRIS, AND DELETERIOUS MATERIAL PRIOR TO PLANT MATERIAL INSTALLATION.

18. CONTRACTOR SHALL INCORPORATE REQUIRED SOIL AMENDMENTS AND TREATMENTS INTO THE TOP 6" OF SUBGRADE MATERIAL AS PER THE SPECIFICATIONS AND DETAILS.

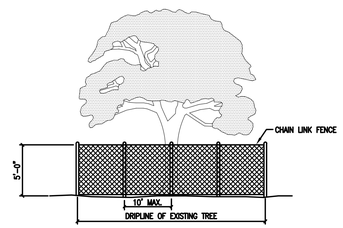
REFERENCE NOTES SCHEDULE WOLF RANCH PLANTING PLAN

SYMBOL	CODE	DESCRIPTION	QTY	DETAIL
CONCRETE PAVING				
	32-13-03	Concrete Tree Well Collar At Maintenance Vehicle Pull In Space	342 sf	6/LP2.01
	32-13-04	4" Concrete Band	888 sf	5/LP2.01
	32-13-05	Herringbone Brick Pattern Stamped 6" Concrete with 4" Item 247 Flex Base, Terra Cotta Deep Color	27,992 sf	4/LP2.01
	32-13-06	Running Bond Brick Pattern Stamped 6" Concrete with 4" Item 247 Flex Base, Terra Cotta Deep Color	629 sf	4/LP2.01
PLANTING ACCESSORIES				
	32-94-01	Natural Undyed Mulch, 4" Depth	60.3 cy	1/LP2.01
FENCE				
	F-301	6' AMERISTAR IRON FENCE	378 lf	8/LP2.01

PLANT SCHEDULE WOLF RANCH PLANTING PLAN

SYMBOL	CODE	QTY	BOTANICAL / COMMON NAME	SIZE	CONTAINER
TREES					
	QG	14	Quercus glaucoides / Lacey Oak	65 gal.	Nursery Grown Container
ORNAMENTAL TREES					
	CL	15	Chilopsis linearis / Desert Willow	30 gal.	Nursery Grown Container
	IV	27	Ilex vomitoria / Yaupon Holly	30 gal.	Nursery Grown Container
	RL	20	Rhus lanceolata / Prairie Sumac	30 gal.	Nursery Grown Container
	SS	22	Sophora secundiflora / Texas Mountain Laurel	30 gal.	Nursery Grown Container
SOD/SEED					
	NGSM	144,813 sf	Thunder Turf Seed Mix, Found at Native American Seed Co Contains mixture of buffalo grass, blue grama, and curly mesquite. Hydromulched areas to receive 2" of screened loam/top soil.	---	

SHEET NO.	6" CONCRETE MEDIAN WITH ITEM 247 FLEX BASE	UNDYED MULCH	LANDSCAPE BED MIX	LACEY OAK TREE	DESERT WILLOW TREE	YAUPON HOLLY TREE	PRAIRIE SUMAC TREE	TEXAS MOUNTAIN LAUREL TREE	TREE STAKES	LOAM AND HYDROSEEDING INCLUDING WATER AND FERTILIZER	LIMESTONE COLUMN (TO MATCH EXISTING)	AMERISTAR ECHELON II "CLASSIC" STYLE FENCE
	LA-01	LA-02	LA-03	LA-04	LA-05	LA-06	LA-07	LA-08	LA-09	LA-10	LA-11	LA-12
	SY	CY	CY	EA	EA	EA	EA	EA	2 PER TREE	SY	EA	LF
LP1.01	183.06	1.25	5.61	0	0	0	6	0	12	692	0	0
LP1.02	329.84	4.54	20.43	0	0	3	7	0	20	3398	0	0
LP1.03	606.61	13.94	62.72	7	8	5	0	0	40	1307	0	0
LP1.04	275.47	2.74	10.93	0	0	3	3	0	12	2543	0	0
LP1.05	1116.87	25.63	113.94	7	7	11	0	11	72	3187	0	0
LP1.06	255.14	4.64	20.89	0	0	0	4	3	14	1918	3	282
LP1.07	121.39	1.67	7.50	0	0	0	0	4	8	1064	3	96
LP1.08	247.23	3.24	20.89	0	0	1	0	4	10	1131	0	0
LP1.09	181.17	2.65	11.94	0	0	4	0	0	8	850	0	0
TOTALS	3316.78	60.30	274.85	14	15	27	20	22	196	16090	6	378



NOTES:
1. TREE PROTECTION SHALL BE INSTALLED PRIOR TO THE COMMENCEMENT OF ANY SITE PREPARATION WORK (CLEARING, GRUBBING OR GRADING).
2. FENCES SHALL COMPLETELY SURROUND THE TREE OR CLUSTERS OF TREES; WILL BE LOCATED AT THE OUTERMOST LIMIT OF THE TREE BRANCHES (DRIPLINE), AND WILL BE MAINTAINED THROUGHOUT THE CONSTRUCTION PROJECT IN ORDER TO PREVENT THE FOLLOWING:
   A. SOIL COMPACTION IN THE ROOT ZONE AREA RESULTING FROM VEHICULAR TRAFFIC, OR STORAGE OF EQUIPMENT OR MATERIALS.
   B. ROOT ZONE DISTURBANCES DUE TO GRADE CHANGES (GREATER THAN SIX INCHES (6") CUT OR FILL, OR TRENCHING NOT REVIEWED AND AUTHORIZED BY THE CITY.
   C. WOUNDS TO EXPOSED ROOTS, TRUNKS OR LIMBS BY MECHANICAL EQUIPMENT.
   D. OTHER ACTIVITIES DETRIMENTAL TO TREES, SUCH AS CHEMICAL STORAGE, CEMENT TRUCK CLEANING AND FIRE.
3. EXCEPTIONS TO INSTALLING FENCES AT TREE DRIPLINES MAY BE PERMITTED IN THE FOLLOWING CASES:
   A. WHERE PERMEABLE PAVING IS TO BE INSTALLED, ERECT THE FENCE AT THE OUTER LIMITS OF THE PERMEABLE PAVING AREA.
   B. WHERE TREES ARE CLOSE TO PROPOSED BUILDINGS, ERECT THE FENCES NO CLOSER THAN SIX FEET (6'-0") TO BUILDING.

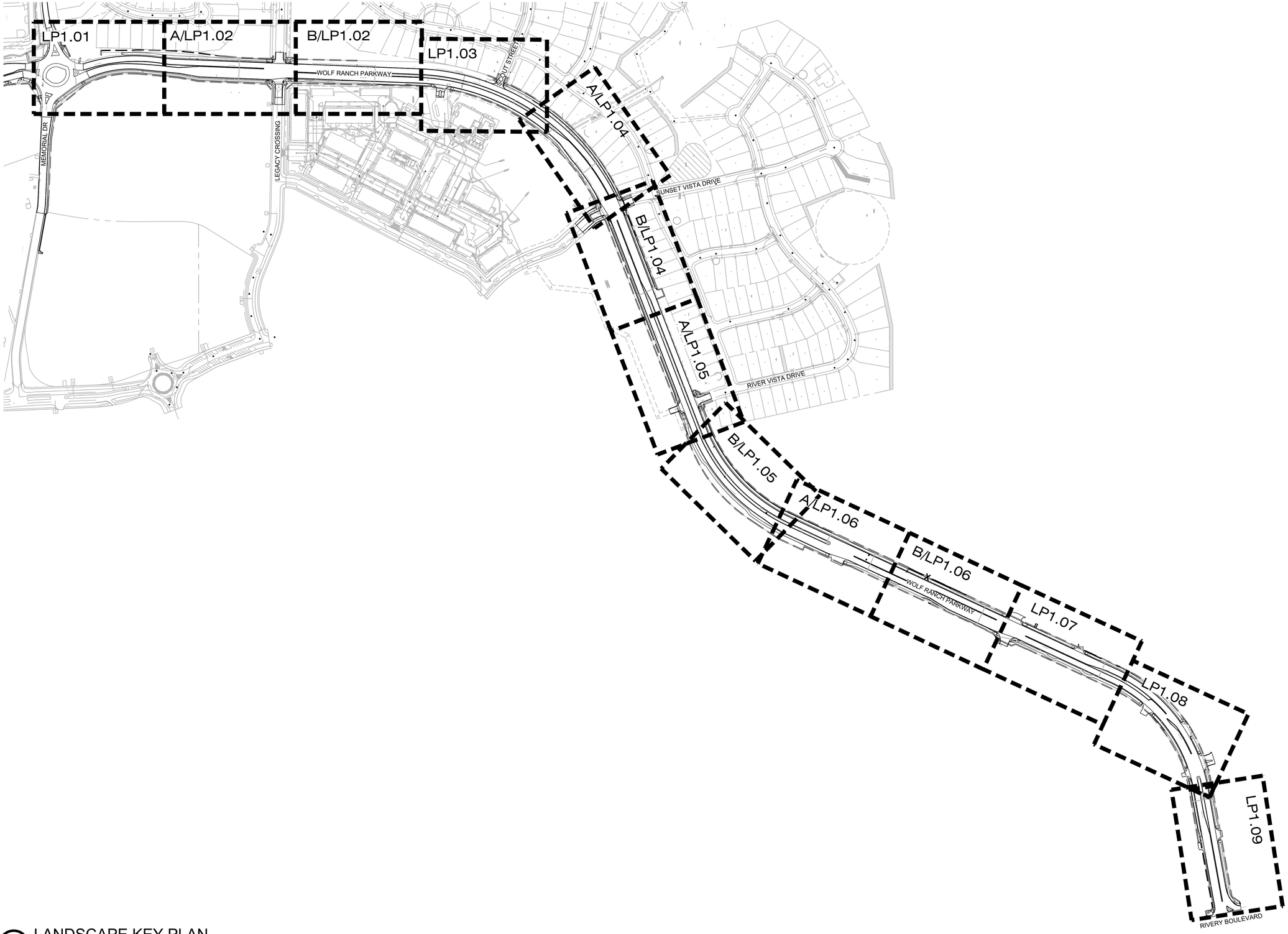
The Architect/Engineer assumes responsibility for appropriate use of this standard.

CITY OF GEORGETOWN CONSTRUCTION STANDARDS AND DETAILS
TREE PROTECTION – CHAIN LINK FENCE

ADOPTED 6/21/2006 | EC09 | NTS | T.2003 | MRS | TRB

NOTE: THIS SECTION IS INTENDED TO ASSIST THOSE PERSONS PREPARING WATER POLLUTION ABATEMENT PLANS (WPAP) OR STORM WATER POLLUTION PREVENTION PLANS (SWSP) THAT COMPLY WITH FEDERAL, STATE AND/OR LOCAL STORM WATER REGULATIONS

1. THE CONTRACTOR TO INSTALL AND MAINTAIN EROSION/SEDIMENTATION CONTROLS AND TREE/NATURAL AREA PROTECTIVE FENCING PRIOR TO ANY SITE PREPARATION WORK (CLEARING, GRUBBING, GRADING, OR EXCAVATION). CONTRACTOR TO REMOVE EROSION/SEDIMENTATION CONTROLS AT THE COMPLETION OF PROJECT AND GRASS RESTORATION.
2. ALL PROJECTS WITHIN THE RECHARGE ZONE OF THE EDWARDS AQUIFER SHALL SUBMIT A BEST MANAGEMENT PRACTICES AND WATER POLLUTION AND ABATEMENT PLAN TO THE TNRCC FOR APPROVAL PRIOR TO ANY CONSTRUCTION.
3. THE PLACEMENT OF EROSION/SEDIMENTATION CONTROLS TO BE IN ACCORDANCE WITH THE APPROVED EROSION AND SEDIMENTATION CONTROL PLAN AND WATER POLLUTION ABATEMENT PLAN. DEVIATIONS FROM THE APPROVED PLAN MUST BE SUBMITTED TO AND APPROVED BY THE OWNER'S REPRESENTATIVE.
4. ALL PLANTING SHALL BE DONE BETWEEN MAY 1 AND SEPTEMBER 15 EXCEPT AS SPECIFICALLY AUTHORIZED IN WRITING. IF PLANTING IS AUTHORIZED TO BE DONE OUTSIDE THE DATES SPECIFIED, THE SEED SHALL BE PLANTED WITH THE ADDITION OF WINTER FESCUE (KENTUCKY 31) AT A RATE OF 10/BU/ACRE. GRASS SHALL BE COMMON BERMUDA GRASS, HULLED, MINIMUM 82% PURE LIVE SEED. ALL GRASS SEED SHALL BE FREE FROM NOXIOUS WEED, GRADE "A" RECENT CROP, RECLEANED AND TREATED WITH APPROPRIATE FUNGICIDE AT THE TIME OF MIXING. SEED SHALL BE FURNISHED IN SEALED, STANDARD CONTAINERS WITH DEALER'S GUARANTEED ANALYSIS.
5. ALL DISTURBED AREAS TO BE RESTORED AS NOTED IN THE WATER POLLUTION ABATEMENT PLAN.
6. THE PLANTED AREA TO BE IRRIGATED OR SPRINKLED IN A MANNER THAT WILL NOTE ERODE THE TOPSOIL, BUT WILL SUFFICIENTLY SOAK THE SOIL TO A DEPTH OF FOUR (4) INCHES. THE IRRIGATION TO OCCUR AT 10-DAY INTERVALS DURING THE FIRST TWO MONTHS TO INSURE GERMINATION AND ESTABLISHMENT OF THE GRASS. RAINFALL OCCURRENCES OF 1 INCH OR GREATER TO POSTPONE THE WATERING SCHEDULE ONE WEEK.
7. RESTORATION TO BE ACCEPTABLE WHEN THE GRASS HAS GROWN AT LEAST 1-1/2 INCHES HIGH WITH 95% COVERAGE PROVIDED NO BARE SPOTS LARGER THAN 25 SQUARE FEET EXIST.
8. A MINIMUM OF FOUR (4) INCHES OF TOPSOIL TO BE PLACED IN ALL AREAS DISTURBED BY CONSTRUCTION.
9. THE CONTRACTOR TO HYDROMULCH OR SOD (AS SHOWN ON PLANS) ALL EXPOSED CUTS AND FILLS UPON COMPLETION OF CONSTRUCTION.
10. EROSION AND SEDIMENTATION CONTROLS TO BE INSTALLED OR MAINTAINED IN A MANNER WHICH DOES NOT RESULT IN SOIL BUILDUP WITHIN TREE DRIPLINE.
11. TO AVOID SOIL COMPACTION, CONTRACTOR SHALL NOT ALLOW VEHICULAR TRAFFIC, PARKING, OR STORAGE OF EQUIPMENT OR MATERIALS IN THE TREE DRIPLINE AREAS.
12. WHERE A FENCE IS CLOSER THAN FOUR (4) FEET TO A TREE TRUNK, PROTECT THE TRUNK WITH STRAPPED-ON PLANKING TO A HEIGHT OF EIGHT (8) FEET (OR TO THE LIMITS OF LOWER BRANCHING) IN ADDITION TO THE FENCING.
13. TREES TO BE REMOVED IN A MANNER OF WHICH DOES NOT IMPACT TREES TO BE PRESERVED.
14. ANY ROOT EXPOSED BY CONSTRUCTION ACTIVITY TO BE PRUNED FLUSH WITH THE SOIL. BACKFILL ROOT AREAS WITH GOOD QUALITY TOPSOIL AS SOON AS POSSIBLE. IF EXPOSED ROOT AREAS ARE



A LANDSCAPE KEY PLAN

NOT TO SCALE

PAPE-DAWSON ENGINEERS

TEXAS | FLORIDA | GEORGIA | TENNESSEE

10801 N MOPAC EXPY, #200 | AUSTIN, TX 78759 | 512.454.8711

TBPE FIRM REGISTRATION #470 | TBPLS FIRM REGISTRATION #10028800

51423-01

WOLF RANCH
LANDSCAPE EXHIBIT

WOLF RANCH PARKWAY
GEORGETOWN, TEXAS

REGISTERED LANDSCAPE ARCHITECT
STATE OF TEXAS
4028

PRINTS ISSUED

Date	Item	NO.
03-17-2025	90% FOR PRELIMINARY REVIEW	
06-30-2025	100% FOR PRELIMINARY REVIEW	
09-10-2025	100% SET	

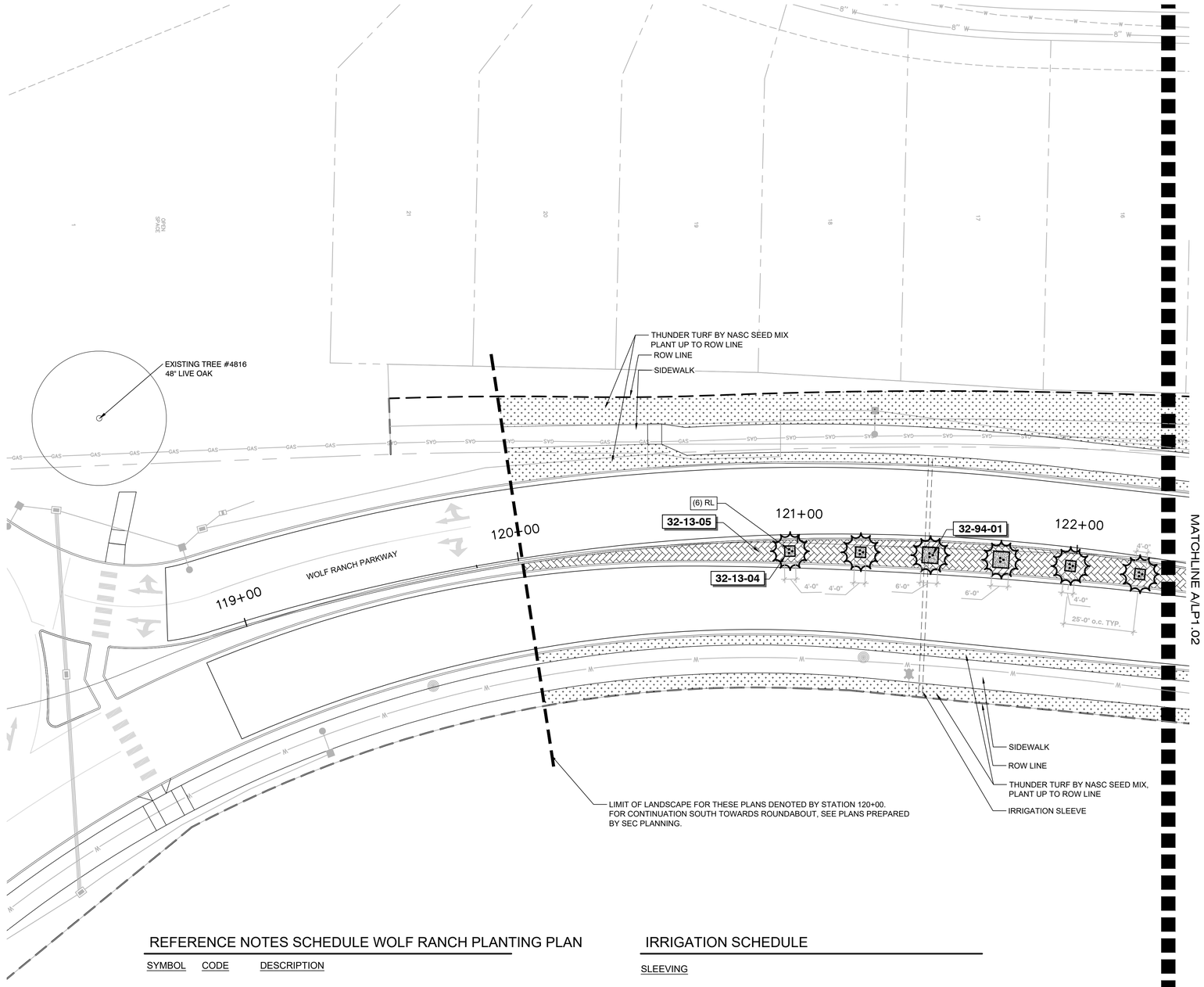
Drawn By: JB
Designed By: JB
Reviewed By: DS

Scale (Horz.): AS SHOWN

LANDSCAPE
KEY PLAN

LP0.03

SHEET 490 OF 523



REFERENCE NOTES SCHEDULE WOLF RANCH PLANTING PLAN

SYMBOL	CODE	DESCRIPTION
CONCRETE PAVING		
	32-13-03	Concrete Tree Well Collar At Maintenance Vehicle Pull In Space
	32-13-04	4" Concrete Band
	32-13-05	Herringbone Brick Pattern Stamped 6" Concrete with 4" Item 247 Flex Base, Terra Cotta Deep Color
	32-13-06	Running Bond Brick Pattern Stamped 6" Concrete with 4" Item 247 Flex Base, Terra Cotta Deep Color
PLANTING ACCESSORIES		
	32-94-01	Natural Undyed Mulch, 4" Depth
FENCE		
	F-301	6' AMERISTAR IRON FENCE

IRRIGATION SCHEDULE

SLEEVING	
	SCH-40 sleeve, reference irrigation plans sheets LI1.01 - LI1.09 for size and lengths

PLANT SCHEDULE WOLF RANCH PLANTING PLAN

SYMBOL	CODE	BOTANICAL / COMMON NAME
SOD/SEED		
	NGSM	Thunder Turf Seed Mix, Found at Native American Seed Co Contains mixture of buffalo grass, blue grama, and curly mesquite. Hydromulched areas to receive 2' of screened loam/top soil.

A LANDSCAPE PLAN

0 10 20 40

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TBPE FIRM REGISTRATION #470 | TBPLS FIRM REGISTRATION #10028800

WOLF RANCH
LANDSCAPE EXHIBIT
WOLF RANCH PARKWAY
GEORGETOWN, TEXAS

514423-01

REGISTERED LANDSCAPE ARCHITECT
DAVID SHELBURNE
2479
STATE OF TEXAS

PRINTS ISSUED

Date	Item	NO.
09-17-2025	90% FOR PRELIMINARY REVIEW	
09-30-2025	100% FOR PRELIMINARY REVIEW	
09-19-2025	100% SET	

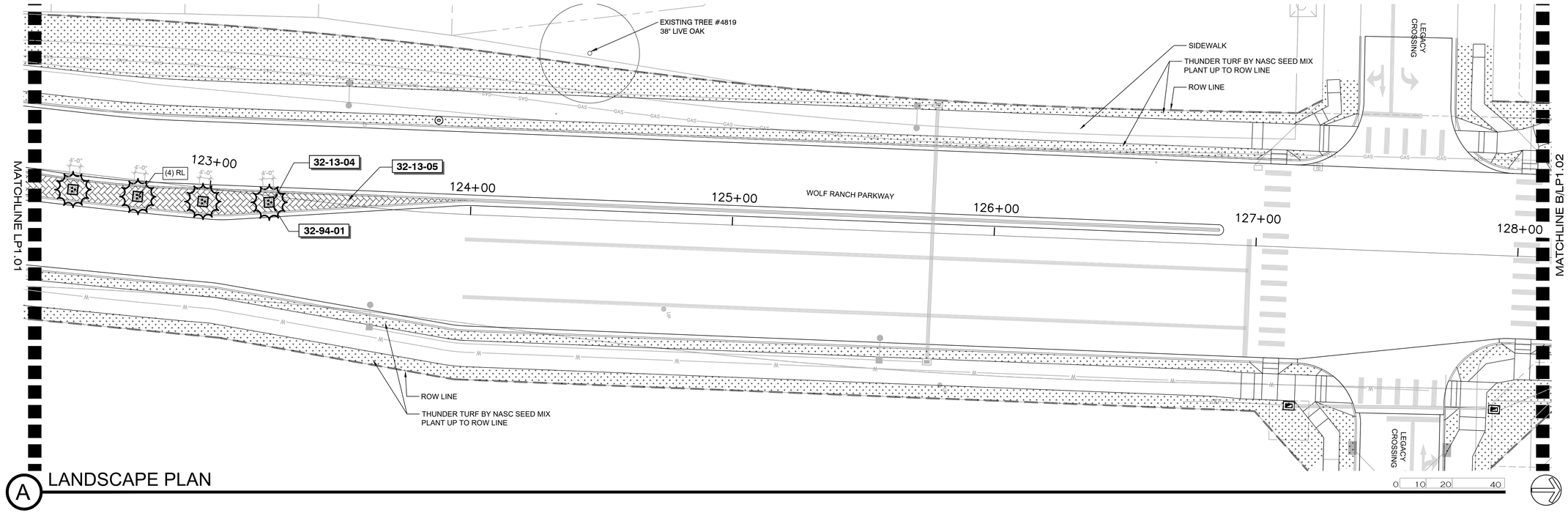
Drawn By: JB
Designed By: JB
Reviewed By: DS

Scale (Horz.): AS SHOWN

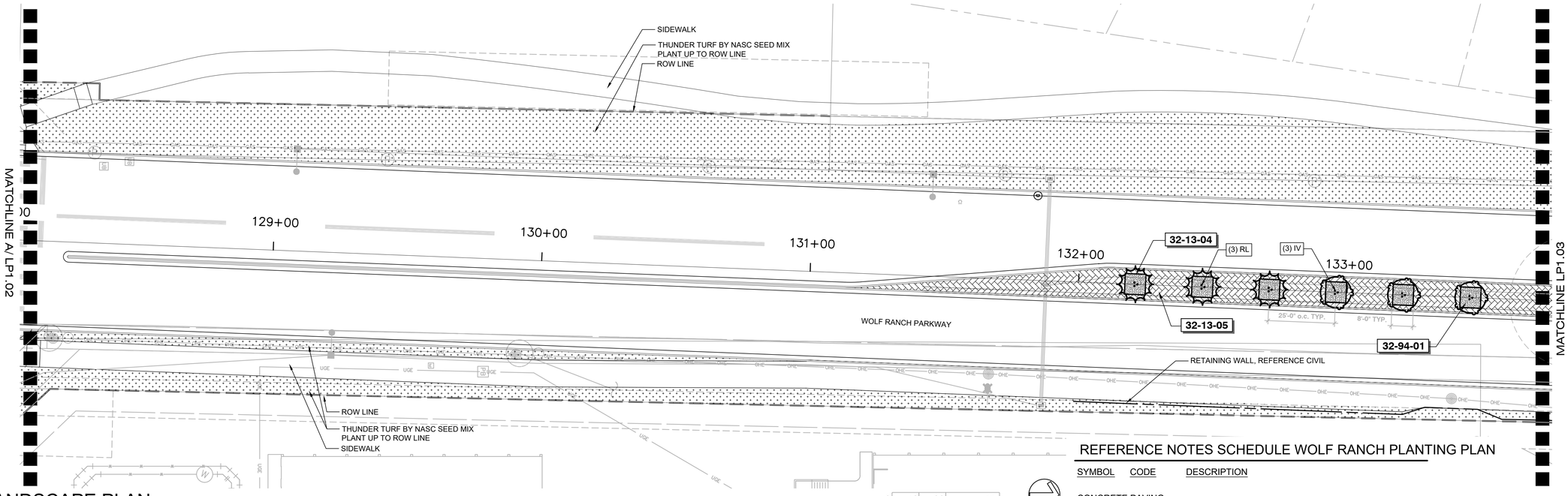
PLANTING PLAN

LP1.01

SHEET 491 OF 523



A LANDSCAPE PLAN



B LANDSCAPE PLAN

REFERENCE NOTES SCHEDULE WOLF RANCH PLANTING PLAN

SYMBOL	CODE	DESCRIPTION
CONCRETE PAVING		
	32-13-03	Concrete Tree Well Collar At Maintenance Vehicle Pull In Space
	32-13-04	4" Concrete Band
	32-13-05	Herringbone Brick Pattern Stamped 6" Concrete with 4" Item 247 Flex Base, Terra Cotta Deep Color
	32-13-06	Running Bond Brick Pattern Stamped 6" Concrete with 4" Item 247 Flex Base, Terra Cotta Deep Color
PLANTING ACCESSORIES		
	32-94-01	Natural Undyed Mulch, 4" Depth
FENCE		
	F-301	6' AMERISTAR IRON FENCE

PLANT SCHEDULE WOLF RANCH PLANTING PLAN

SYMBOL	CODE	BOTANICAL / COMMON NAME
SOD/SEED		
	NGSM	Thunder Turf Seed Mix, Found at Native American Seed Co Contains mixture of buffalo grass, blue grama, and curly mesquite. Hydromulched areas to receive 2" of screened loam/top soil.

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51423-01

WOLF RANCH
LANDSCAPE EXHIBIT
WOLF RANCH PARKWAY
GEORGETOWN, TEXAS

REGISTERED LANDSCAPE ARCHITECT
STATE OF TEXAS

PRINTS ISSUED

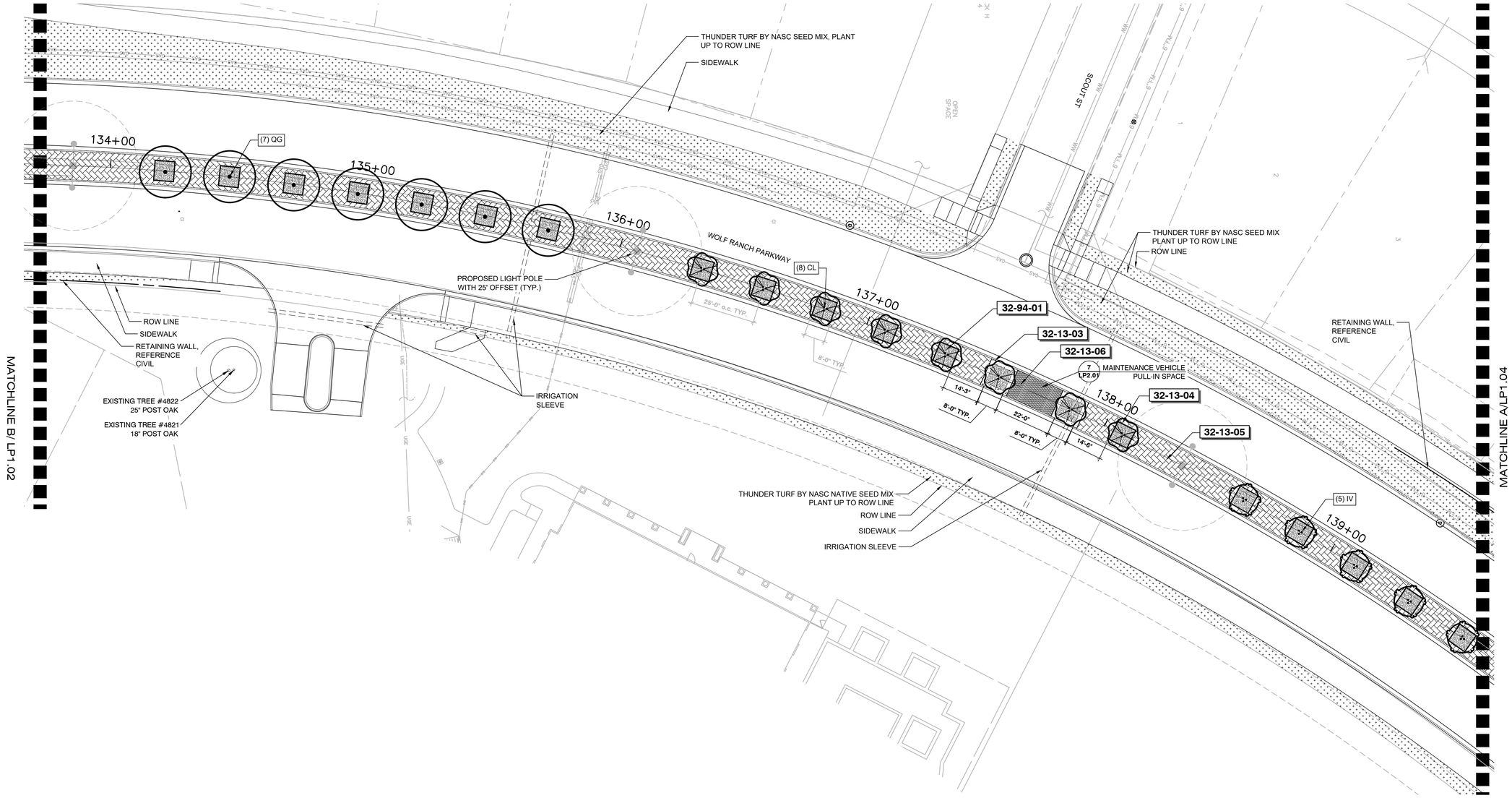
Date	Item	NO.
03-17-2025	90% FOR PRELIMINARY REVIEW	
06-30-2025	100% FOR PRELIMINARY REVIEW	
09-10-2025	100% SET	

Drawn By: JB
Designed By: JB
Reviewed By: DS

Scale (Horz.): AS SHOWN

PLANTING PLAN

LP1.02



A LANDSCAPE PLAN

0 10 20 40

REFERENCE NOTES SCHEDULE WOLF RANCH PLANTING PLAN

SYMBOL	CODE	DESCRIPTION
CONCRETE PAVING		
	32-13-03	Concrete Tree Well Collar At Maintenance Vehicle Pull In Space
	32-13-04	4" Concrete Band
	32-13-05	Herringbone Brick Pattern Stamped 6" Concrete with 4" Item 247 Flex Base, Terra Cotta Deep Color
	32-13-06	Running Bond Brick Pattern Stamped 6" Concrete with 4" Item 247 Flex Base, Terra Cotta Deep Color
PLANTING ACCESSORIES		
	32-94-01	Natural Undyed Mulch, 4" Depth
FENCE		
	F-301	6' AMERISTAR IRON FENCE

IRRIGATION SCHEDULE

SLEEVING	
	SCH-40 sleeve, reference irrigation plans sheets LI1.01 - LI1.09 for size and lengths

PLANT SCHEDULE WOLF RANCH PLANTING PLAN

SYMBOL	CODE	BOTANICAL / COMMON NAME
SOD/SEED		
	NGSM	Thunder Turf Seed Mix, Found at Native American Seed Co Contains mixture of buffalo grass, blue grama, and curly mesquite. Hydromulched areas to receive 2" of screened loam/top soil.

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WOLF RANCH
LANDSCAPE EXHIBIT
WOLF RANCH PARKWAY
GEORGETOWN, TEXAS

51423-01

REGISTERED LANDSCAPE ARCHITECT
DAVID SHADBURY
6174
STATE OF TEXAS

PRINTS ISSUED

Date	Item	NO.
04-15-2025	90% FOR PRELIMINARY REVIEW	
06-30-2025	100% FOR PRELIMINARY REVIEW	
09-19-2025	100% SET	

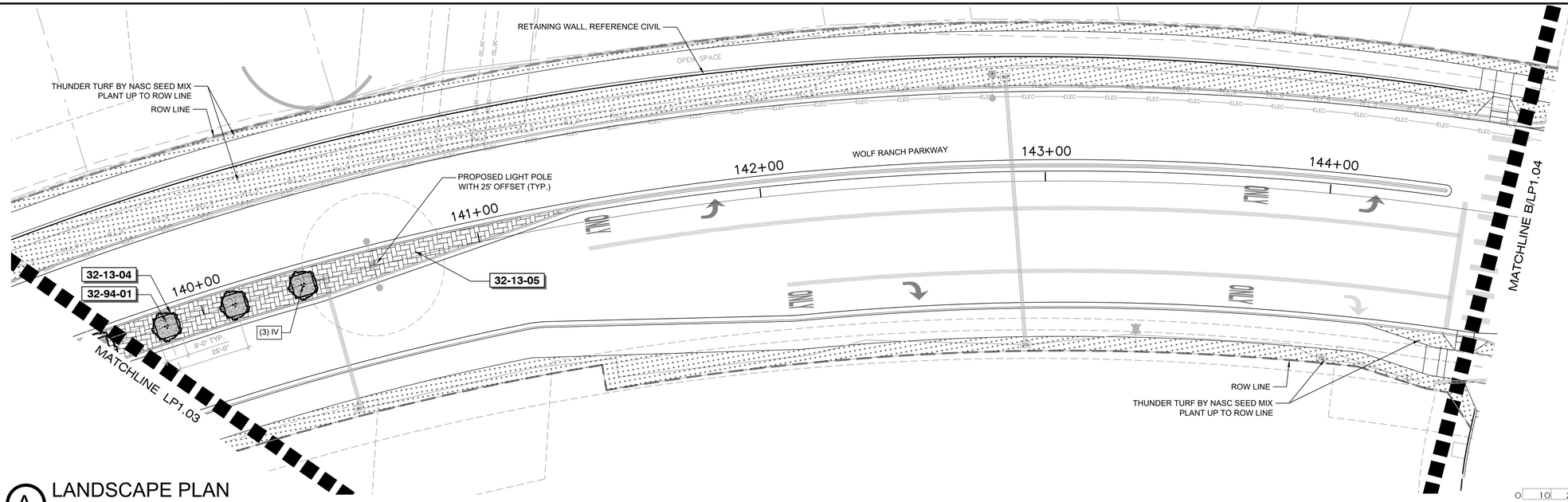
Drawn By: JB
Designed By: JB
Reviewed By: DS

Scale (Horz.): AS SHOWN

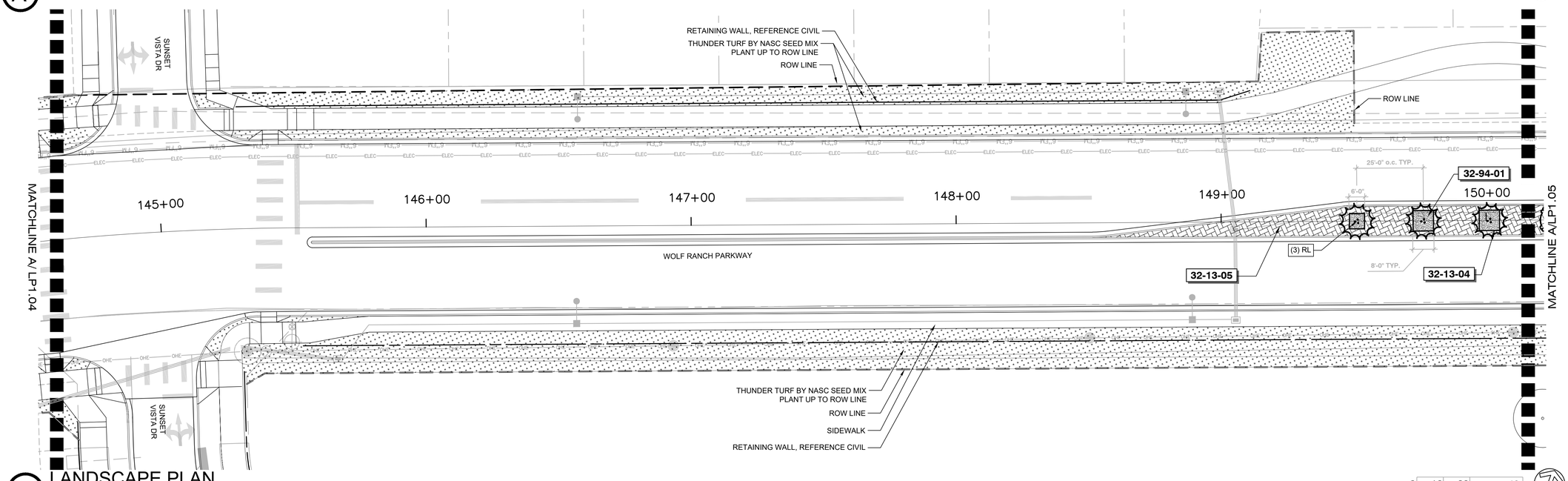
PLANTING PLAN

LP1.03

SHEET 493 OF 523



A LANDSCAPE PLAN



B LANDSCAPE PLAN

PLANT SCHEDULE WOLF RANCH PLANTING PLAN

SYMBOL	CODE	BOTANICAL / COMMON NAME
SOD/SEED		
	NGSM	Thunder Turf Seed Mix, Found at Native American Seed Co Contains mixture of buffalo grass, blue grama, and curly mesquite. Hydromulched areas to receive 2" of screened loam/top soil.

REFERENCE NOTES SCHEDULE WOLF RANCH PLANTING PLAN

SYMBOL	CODE	DESCRIPTION
CONCRETE PAVING		
	32-13-03	Concrete Tree Well Collar At Maintenance Vehicle Pull In Space
	32-13-04	4" Concrete Band
	32-13-05	Herringbone Brick Pattern Stamped 6" Concrete with 4" Item 247 Flex Base, Terra Cotta Deep Color
	32-13-06	Running Bond Brick Pattern Stamped 6" Concrete with 4" Item 247 Flex Base, Terra Cotta Deep Color
PLANTING ACCESSORIES		
	32-94-01	Natural Undyed Mulch, 4" Depth
FENCE		
	F-301	6' AMERISTAR IRON FENCE

PAPE-DAWSON ENGINEERS
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51423-01

WOLF RANCH
LANDSCAPE EXHIBIT
WOLF RANCH PARKWAY
GEORGETOWN, TEXAS

REGISTERED LANDSCAPE ARCHITECT
STATE OF TEXAS

PRINTS ISSUED

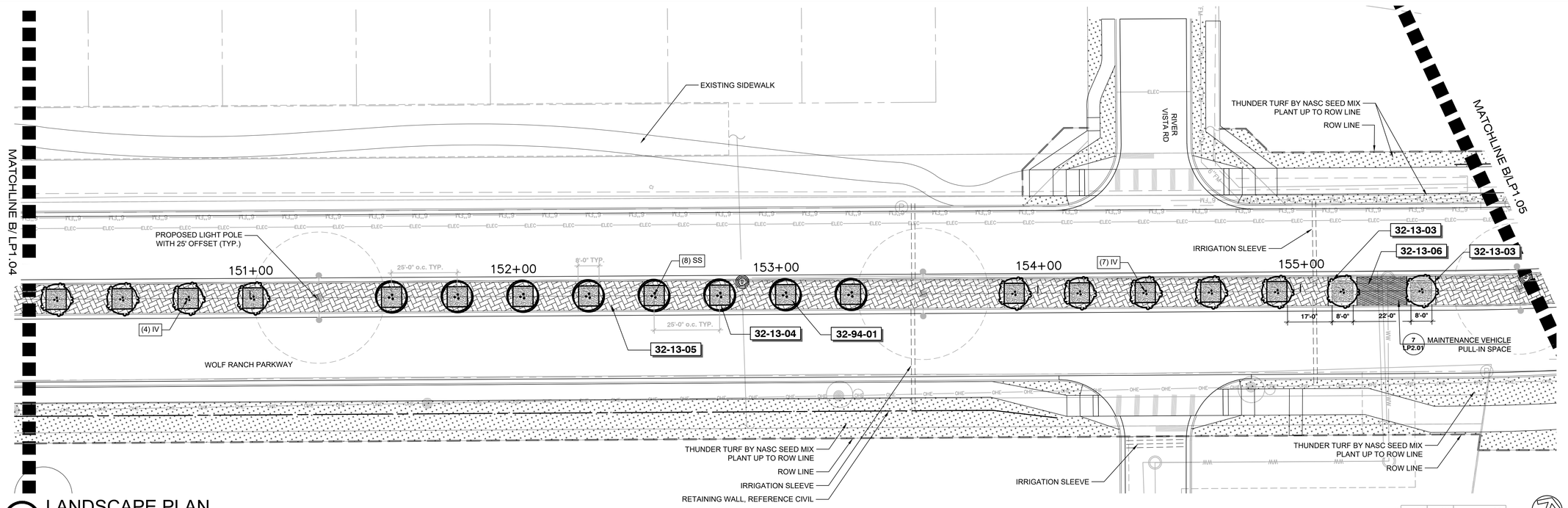
Date	Item	NO.
03-17-2025	90% FOR PRELIMINARY REVIEW	
06-30-2025	100% FOR PRELIMINARY REVIEW	
09-10-2025	100% SET	

Drawn By: JB
Designed By: JB
Reviewed By: DS

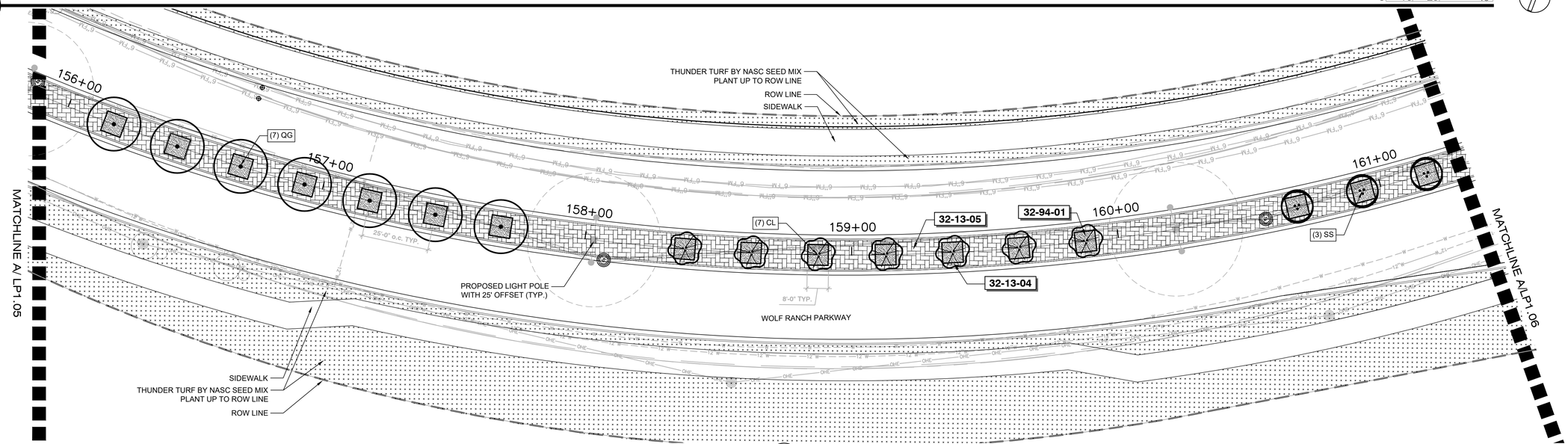
Scale (Horz.): AS SHOWN

PLANTING PLAN

LP1.04



A LANDSCAPE PLAN



B LANDSCAPE PLAN

REFERENCE NOTES SCHEDULE WOLF RANCH PLANTING PLAN

SYMBOL	CODE	DESCRIPTION
CONCRETE PAVING		
	32-13-03	Concrete Tree Well Collar At Maintenance Vehicle Pull In Space
	32-13-04	4" Concrete Band
	32-13-05	Herringbone Brick Pattern Stamped 6" Concrete with 4" Item 247 Flex Base, Terra Cotta Deep Color
	32-13-06	Running Bond Brick Pattern Stamped 6" Concrete with 4" Item 247 Flex Base, Terra Cotta Deep Color
PLANTING ACCESSORIES		
	32-94-01	Natural Undyed Mulch, 4" Depth
FENCE		
	F-301	6' AMERISTAR IRON FENCE

IRRIGATION SCHEDULE

SLEEVING

SCH-40 sleeve, reference irrigation plans sheets LI1.01 - LI1.09 for size and lengths

PLANT SCHEDULE WOLF RANCH PLANTING PLAN

SYMBOL	CODE	BOTANICAL / COMMON NAME
SOD/SEED		
	NGSM	Thunder Turf Seed Mix, Found at Native American Seed Co Contains mixture of buffalo grass, blue grama, and curly mesquite. Hydromulched areas to receive 2" of screened loam/top soil.

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51423-01

WOLF RANCH
LANDSCAPE EXHIBIT
WOLF RANCH PARKWAY
GEORGETOWN, TEXAS

REGISTERED LANDSCAPE ARCHITECT
STATE OF TEXAS

PRINTS ISSUED

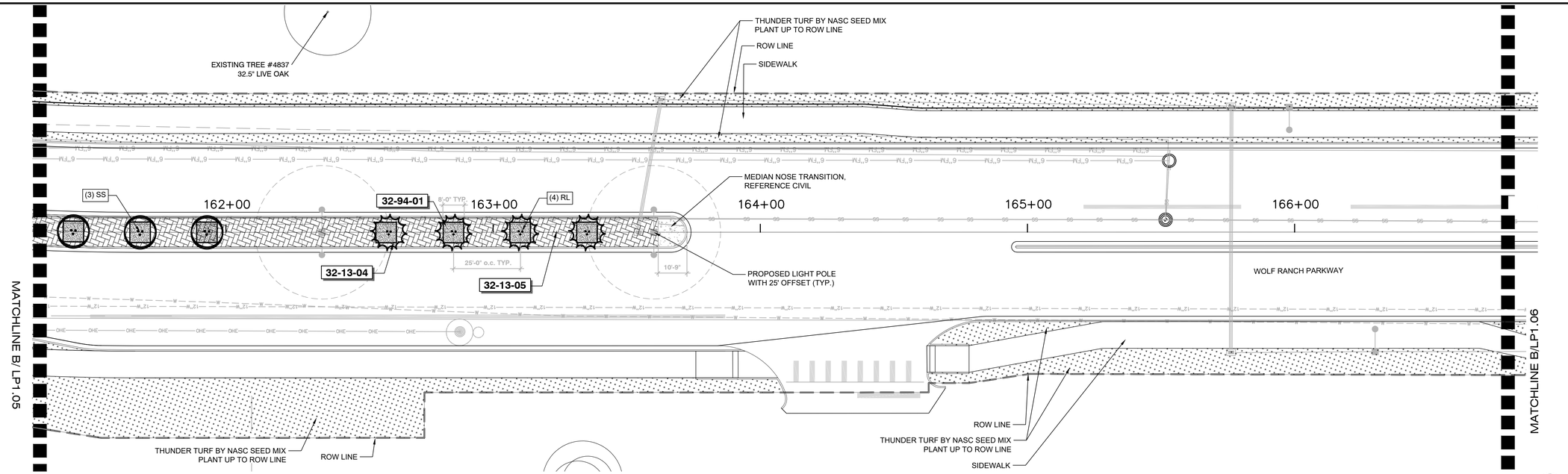
Date	Item	NO.
03-17-2025	90% FOR PRELIMINARY REVIEW	
06-30-2025	100% FOR PRELIMINARY REVIEW	
09-10-2025	100% SET	

Drawn By: JB
Designed By: JB
Reviewed By: DS

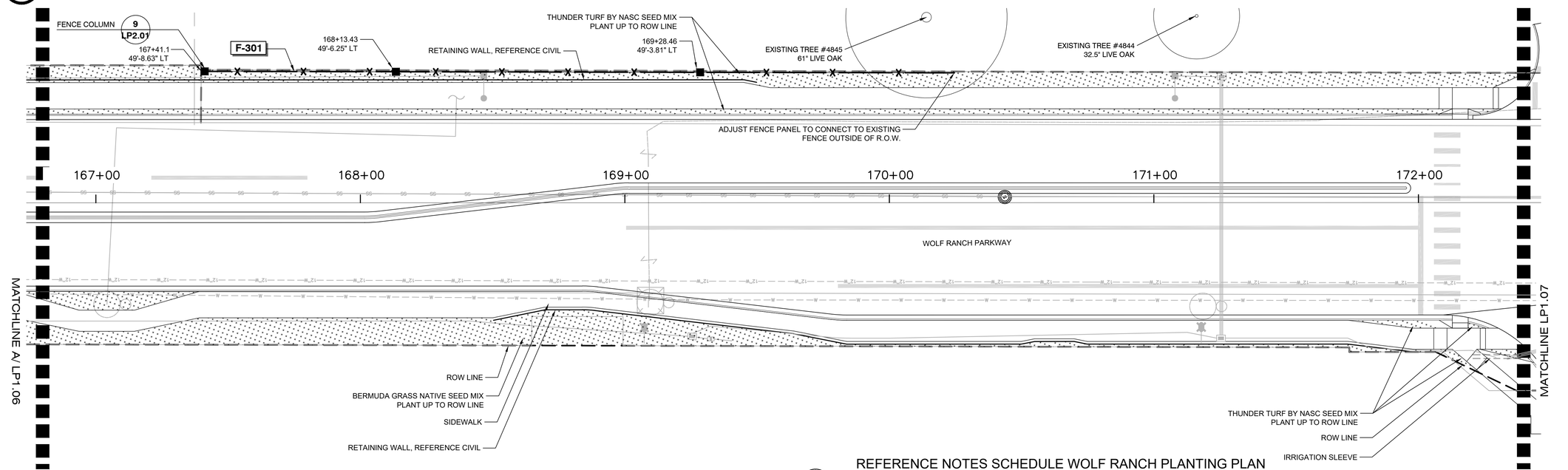
Scale (Horz.): AS SHOWN

PLANTING PLAN

LP1.05



A LANDSCAPE PLAN



B LANDSCAPE PLAN

REFERENCE NOTES SCHEDULE WOLF RANCH PLANTING PLAN

SYMBOL	CODE	DESCRIPTION
CONCRETE PAVING		
	32-13-03	Concrete Tree Well Collar At Maintenance Vehicle Pull In Space
	32-13-04	4" Concrete Band
	32-13-05	Herringbone Brick Pattern Stamped 6" Concrete with 4" Item 247 Flex Base, Terra Cotta Deep Color
	32-13-06	Running Bond Brick Pattern Stamped 6" Concrete with 4" Item 247 Flex Base, Terra Cotta Deep Color
PLANTING ACCESSORIES		
	32-94-01	Natural Undyed Mulch, 4" Depth
FENCE		
	F-301	6' AMERISTAR IRON FENCE

IRRIGATION SCHEDULE

SLEEVING	
= = = = =	SCH-40 sleeve, reference irrigation plans sheets LI1.01 - LI1.09 for size and lengths

PLANT SCHEDULE WOLF RANCH PLANTING PLAN

SYMBOL	CODE	BOTANICAL / COMMON NAME
SOD/SEED		
	NGSM	Thunder Turf Seed Mix, Found at Native American Seed Co Contains mixture of buffalo grass, blue grama, and curly mesquite. Hydromulched areas to receive 2" of screened loam/top soil.

PAPE-DAWSON ENGINEERS
TEXAS | FLORIDA | GEORGIA | TENNESSEE
10801 N MOPAC EXPY. #200 | AUSTIN, TX 78759 | 512.454.8711
TBPE FIRM REGISTRATION #470 | TBPLS FIRM REGISTRATION #10028800

51423-01

WOLF RANCH
LANDSCAPE EXHIBIT

WOLF RANCH PARKWAY
GEORGETOWN, TEXAS

REGISTERED LANDSCAPE ARCHITECT
STATE OF TEXAS

PRINTS ISSUED

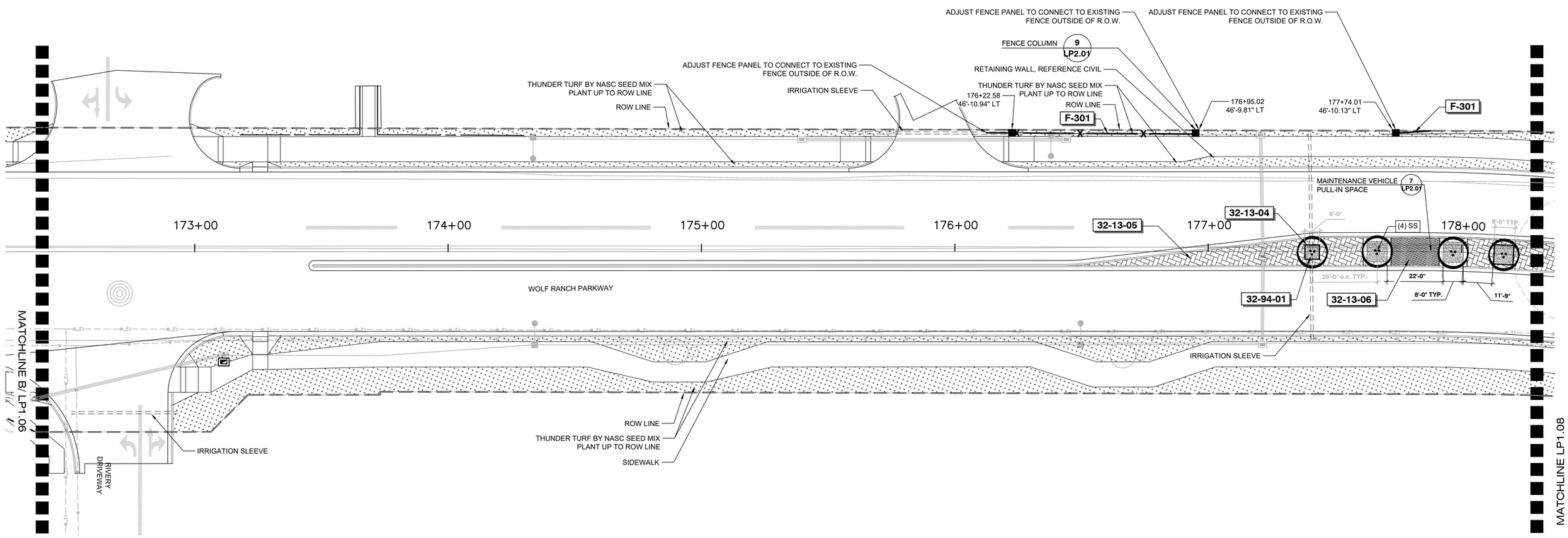
Date	Item	NO.
03-17-2025	90% FOR PRELIMINARY REVIEW	
06-30-2025	100% FOR PRELIMINARY REVIEW	
09-10-2025	100% SET	

Drawn By: JB
Designed By: JB
Reviewed By: DS

Scale (Horz.): AS SHOWN

PLANTING PLAN

LP1.06



A LANDSCAPE PLAN

0 10 20 40

REFERENCE NOTES SCHEDULE WOLF RANCH PLANTING PLAN

SYMBOL	CODE	DESCRIPTION
CONCRETE PAVING		
	32-13-03	Concrete Tree Well Collar At Maintenance Vehicle Pull In Space
	32-13-04	4" Concrete Band
	32-13-05	Herringbone Brick Pattern Stamped 6" Concrete with 4" Item 247 Flex Base, Terra Cotta Deep Color
	32-13-06	Running Bond Brick Pattern Stamped 6" Concrete with 4" Item 247 Flex Base, Terra Cotta Deep Color
PLANTING ACCESSORIES		
	32-94-01	Natural Undyed Mulch, 4" Depth
FENCE		
	F-301	6' AMERISTAR IRON FENCE

IRRIGATION SCHEDULE

SLEEVING

SCH-40 sleeve, reference irrigation plans sheets LI1.01 - LI1.09 for size and lengths

PLANT SCHEDULE WOLF RANCH PLANTING PLAN

SYMBOL	CODE	BOTANICAL / COMMON NAME
SOD/SEED		
	NGSM	Thunder Turf Seed Mix, Found at Native American Seed Co Contains mixture of buffalo grass, blue grama, and curly mesquite. Hydromulched areas to receive 2" of screened loam/top soil.

PAPE-DAWSON ENGINEERS
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TBPE FIRM REGISTRATION #470 | TBPLS FIRM REGISTRATION #10028800

51423-01

WOLF RANCH
LANDSCAPE EXHIBIT
WOLF RANCH PARKWAY
GEORGETOWN, TEXAS

REGISTERED LANDSCAPE ARCHITECT
DAVID SCHWARTZ
4024
STATE OF TEXAS

PRINTS ISSUED

Date	Item	NO.
05-17-2025	90% FOR PRELIMINARY REVIEW	
06-30-2025	100% FOR PRELIMINARY REVIEW	
09-19-2025	100% SET	

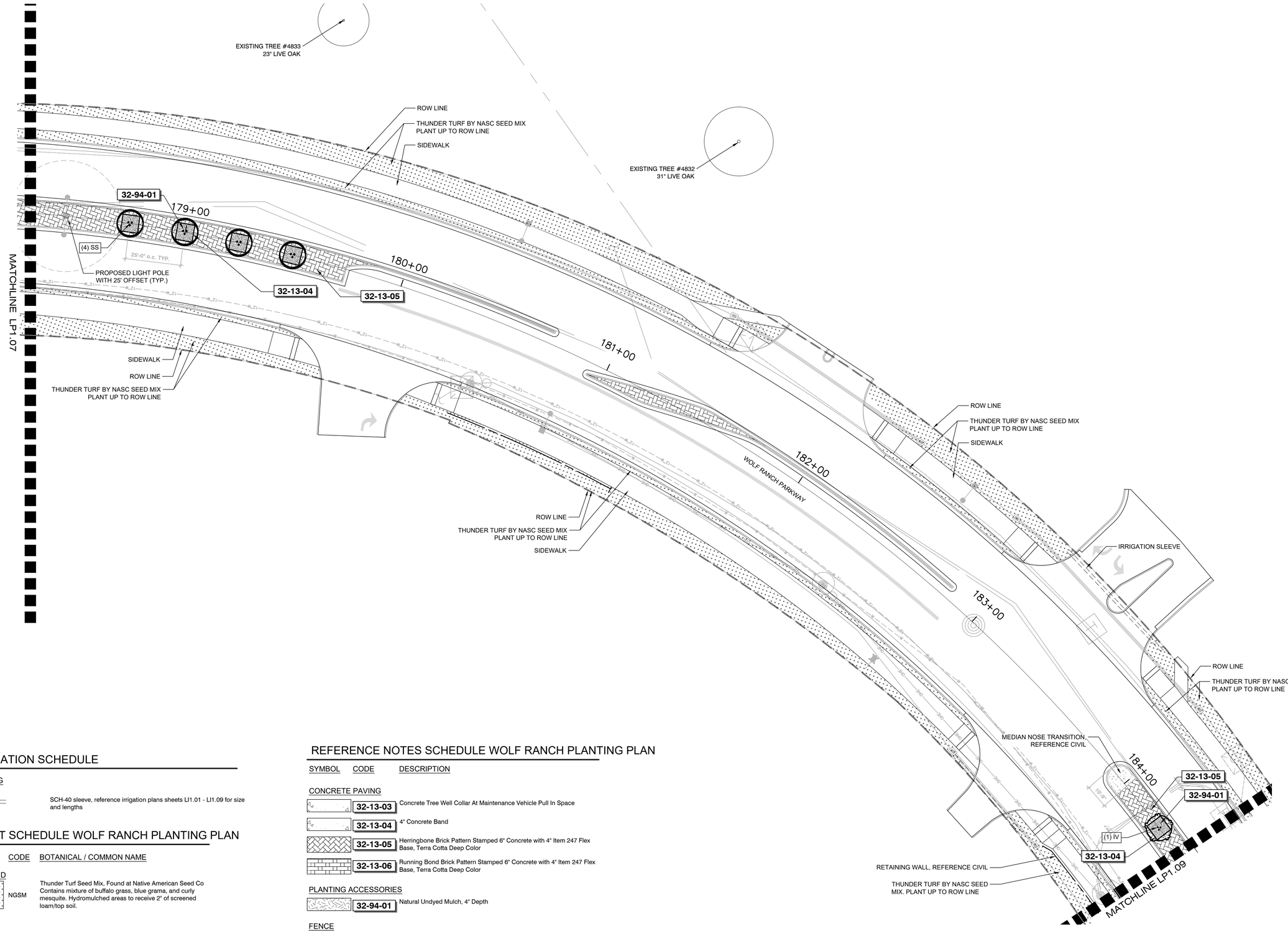
Drawn By: JB
Designed By: JB
Reviewed By: DS

Scale (Horz.): AS SHOWN

PLANTING PLAN

LP1.07

SHEET 497 OF 523



IRRIGATION SCHEDULE

SLEEVING

SCH-40 sleeve, reference irrigation plans sheets LI1.01 - LI1.09 for size and lengths

PLANT SCHEDULE WOLF RANCH PLANTING PLAN

SYMBOL	CODE	BOTANICAL / COMMON NAME
SOD/SEED		
	NGSM	Thunder Turf Seed Mix, Found at Native American Seed Co Contains mixture of buffalo grass, blue grama, and curly mesquite. Hydromulched areas to receive 2" of screened loam/top soil.

REFERENCE NOTES SCHEDULE WOLF RANCH PLANTING PLAN

SYMBOL	CODE	DESCRIPTION
CONCRETE PAVING		
	32-13-03	Concrete Tree Well Collar At Maintenance Vehicle Pull In Space
	32-13-04	4" Concrete Band
	32-13-05	Herringbone Brick Pattern Stamped 6" Concrete with 4" Item 247 Flex Base, Terra Cotta Deep Color
	32-13-06	Running Bond Brick Pattern Stamped 6" Concrete with 4" Item 247 Flex Base, Terra Cotta Deep Color
PLANTING ACCESSORIES		
	32-94-01	Natural Undyed Mulch, 4" Depth
FENCE		
	F-301	6' AMERISTAR IRON FENCE

A LANDSCAPE PLAN

PAPE-DAWSON ENGINEERS
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TBPE FIRM REGISTRATION #470 | TBPLS FIRM REGISTRATION #10028800

51423-01

WOLF RANCH
LANDSCAPE EXHIBIT
WOLF RANCH PARKWAY
GEORGETOWN, TEXAS

REGISTERED LANDSCAPE ARCHITECT
STATE OF TEXAS

PRINTS ISSUED

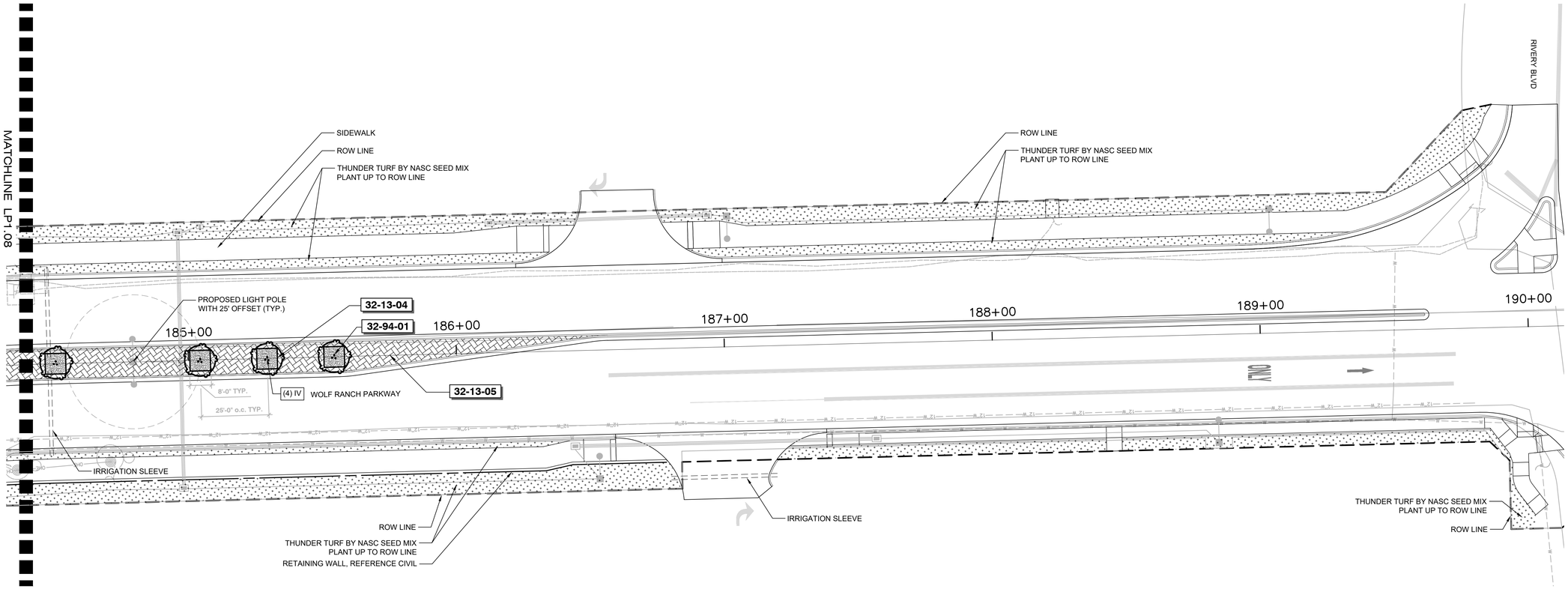
Date	Item	NO.
03-17-2025	90% FOR PRELIMINARY REVIEW	
06-30-2025	100% FOR PRELIMINARY REVIEW	
09-10-2025	100% SET	

Drawn By: JB
Designed By: JB
Reviewed By: DS

Scale (Horz.): AS SHOWN

PLANTING PLAN

LP1.08



A LANDSCAPE PLAN

REFERENCE NOTES SCHEDULE WOLF RANCH PLANTING PLAN

SYMBOL	CODE	DESCRIPTION
CONCRETE PAVING		
	32-13-03	Concrete Tree Well Collar At Maintenance Vehicle Pull In Space
	32-13-04	4" Concrete Band
	32-13-05	Herringbone Brick Pattern Stamped 6" Concrete with 4" Item 247 Flex Base, Terra Cotta Deep Color
	32-13-06	Running Bond Brick Pattern Stamped 6" Concrete with 4" Item 247 Flex Base, Terra Cotta Deep Color
PLANTING ACCESSORIES		
	32-94-01	Natural Undyed Mulch, 4" Depth
FENCE		
	F-301	6' AMERISTAR IRON FENCE

IRRIGATION SCHEDULE

SLEEVING

SCH-40 sleeve, reference irrigation plans sheets LI1.01 - LI1.09 for size and lengths

PLANT SCHEDULE WOLF RANCH PLANTING PLAN

SYMBOL	CODE	BOTANICAL / COMMON NAME
SOD/SEED		
	NGSM	Thunder Turf Seed Mix, Found at Native American Seed Co Contains mixture of buffalo grass, blue grama, and curly mesquite. Hydromulched areas to receive 2" of screened loam/top soil.

PAPE-DAWSON ENGINEERS
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10801 N MOPAC EXPY, #200 | AUSTIN, TX 78759 | 512.454.8711
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51423-01

WOLF RANCH
LANDSCAPE EXHIBIT

WOLF RANCH PARKWAY
GEORGETOWN, TEXAS

REGISTERED LANDSCAPE ARCHITECT
STATE OF TEXAS

PRINTS ISSUED

Date	Item	NO.
03-17-2025	90% FOR PRELIMINARY REVIEW	
06-30-2025	100% FOR PRELIMINARY REVIEW	
09-10-2025	100% SET	

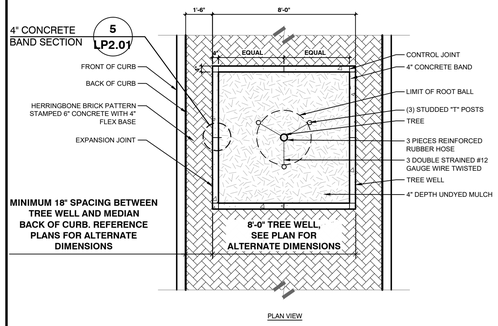
Drawn By: JB
Designed By: JB
Reviewed By: DS

Scale (Horz.): AS SHOWN

PLANTING PLAN

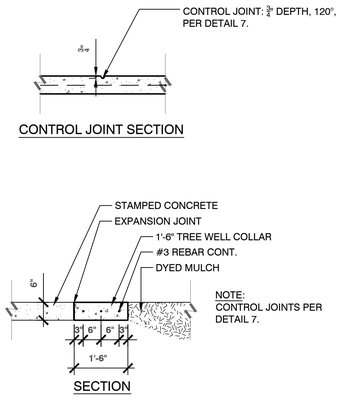
LP1.09

SHEET 499 OF 523



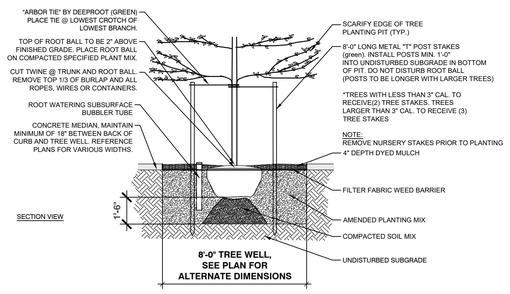
3 TREE WELL PLAN VIEW DETAIL

1/4" = 1'-0" C-WO-329343-07



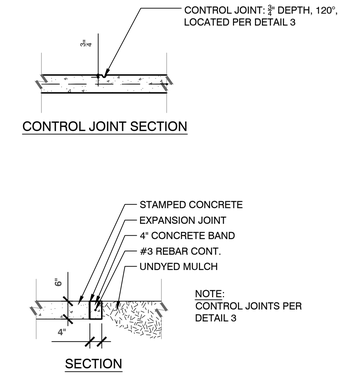
6 TREE WELL COLLAR SECTION

1/2" = 1'-0" C-WO-033519-02



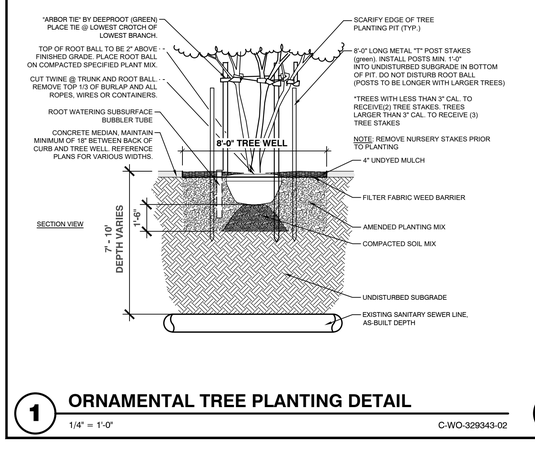
2 DECIDUOUS TREE PLANTING DETAIL

1/4" = 1'-0" C-WO-329343-06



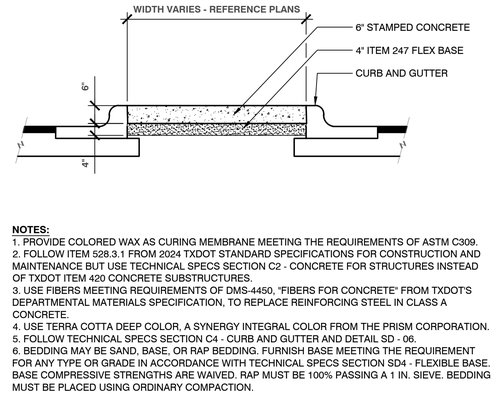
5 4" CONCRETE BAND SECTION

1/2" = 1'-0" C-WO-033519-01



1 ORNAMENTAL TREE PLANTING DETAIL

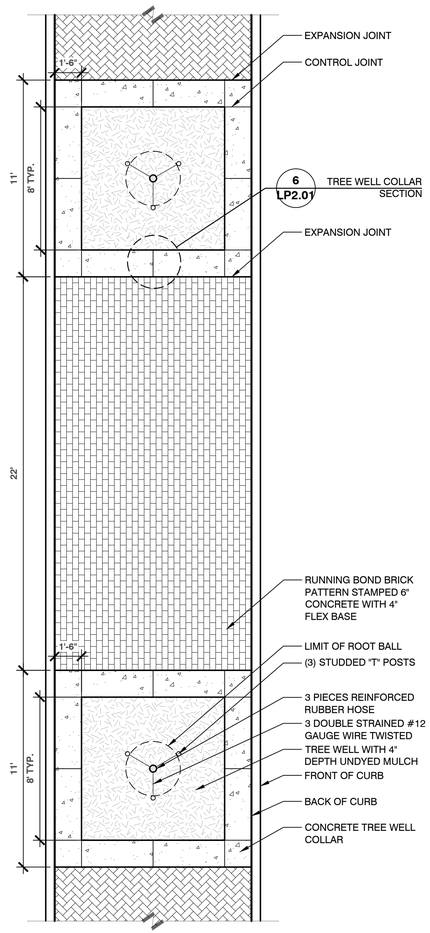
1/4" = 1'-0" C-WO-329343-02



NOTES:
1. PROVIDE COLORED WAX AS CURING MEMBRANE MEETING THE REQUIREMENTS OF ASTM C309.
2. FOLLOW ITEM 528.3.1 FROM 2024 TXDOT STANDARD SPECIFICATIONS FOR CONSTRUCTION AND MAINTENANCE BUT USE TECHNICAL SPECS SECTION C2 - CONCRETE FOR STRUCTURES INSTEAD OF TXDOT ITEM 420 CONCRETE SUBSTRUCTURES.
3. USE FIBERS MEETING REQUIREMENTS OF DMS-4450, "FIBERS FOR CONCRETE" FROM TXDOT'S DEPARTMENTAL MATERIALS SPECIFICATION, TO REPLACE REINFORCING STEEL IN CLASS A CONCRETE.
4. USE TERRA COTTA DEEP COLOR, A SYNERGY INTEGRAL COLOR FROM THE PRISM CORPORATION.
5. FOLLOW TECHNICAL SPECS SECTION C4 - CURB AND GUTTER AND DETAIL SD - 06.
6. BEDDING MAY BE SAND, BASE, OR RAP BEDDING. FURNISH BASE MEETING THE REQUIREMENT FOR ANY TYPE OR GRADE IN ACCORDANCE WITH TECHNICAL SPECS SECTION SD4 - FLEXIBLE BASE. BASE COMPRESSIVE STRENGTHS ARE WAIVED. RAP MUST BE 100% PASSING A 1 IN. SIEVE. BEDDING MUST BE PLACED USING ORDINARY COMPACTION.

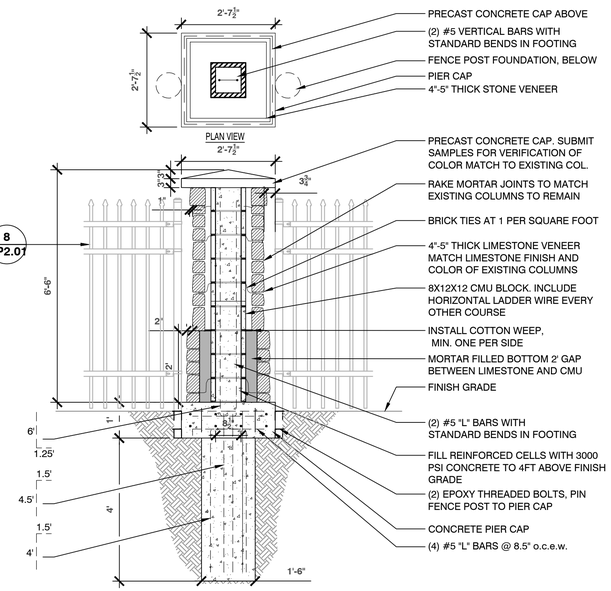
4 AMENDED CITY OF GEORGETOWN CONCRETE DETAIL

1/2" = 1'-0" C-WO-321623-04



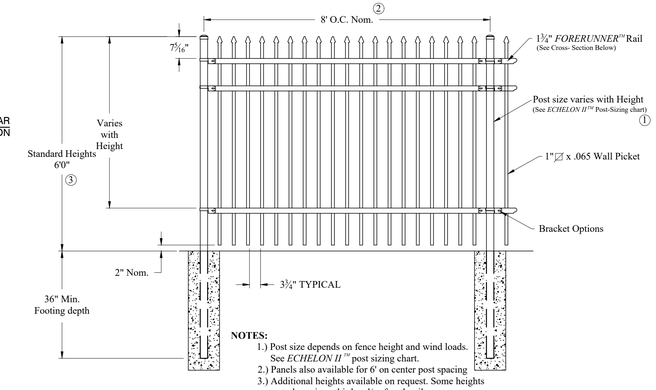
7 MAINTENANCE VEHICLE PULL-IN SPACE

1/4" = 1'-0" C-WO-329343-08



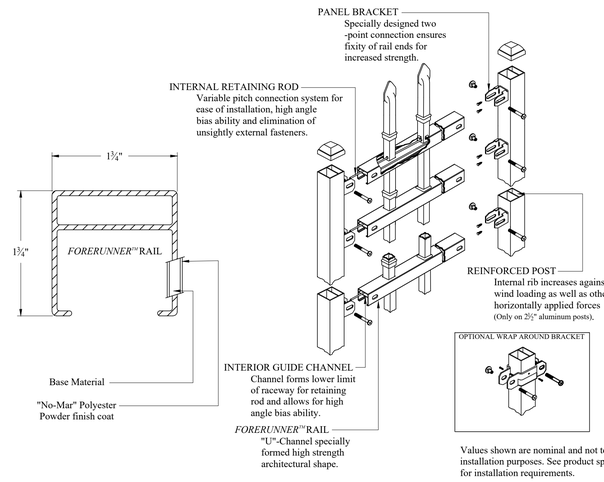
9 COLUMN SIDE SECTION (TO MATCH EXISTING)

1/2" = 1'-0" C-WO-323219-07



8 AMERISTAR ECHELON II "CLASSIC" STYLE

1/2" = 1'-0" C-WO-323119-04



Values shown are nominal and not to be used for installation purposes. See product specification for installation requirements.

PAPE-DAWSON ENGINEERS
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TBPE FIRM REGISTRATION #470 I TBPLS FIRM REGISTRATION #10028800

WOLF RANCH
LANDSCAPE EXHIBIT
WOLF RANCH PARKWAY
GEORGETOWN, TEXAS

51423-01

REGISTERED LANDSCAPE ARCHITECT
DAVID SCHWARTZ
4024
STATE OF TEXAS

PRINTS ISSUED

Date	Item	NO.
03-17-2025	90% FOR PRELIMINARY REVIEW	
06-30-2025	100% FOR PRELIMINARY REVIEW	
09-19-2025	100% SET	

Drawn By: JB
Designed By: JB
Reviewed By: DS

Scale (Horz.): AS SHOWN

LANDSCAPE DETAILS

LP2.01

SHEET 500 OF 523

PRESSURE REQUIREMENT CALCULATIONS @ ZONE No. 5-1	
DESIGN STATISTICS FOR CALCULATIONS	
Total Zone Flow:	3.0 g.p.m.
Electric Valve Size:	1"
Static Pressure Less 10% (static @ 65 psi):	58.5 p.s.i.
ACCUMULATIVE LOSSES FROM CITY MAIN TO FURTHEST HEAD	
Sprinkler head requirement:	30 p.s.i.
Zone Pipe/Fitting Loss:	2.89 p.s.i.
1" Electric Valve Loss:	3.0 p.s.i.
Elevation Net Loss (+- FT.):	n/a
System Mainline Loss (1.5" Sch-40 Main):	0.01 p.s.i.
Backflow Preventer Loss (1"):	3.0 p.s.i.
Water Meter Loss (3/4"):	0.3 p.s.i.
Master Electric Valve Loss (1.5"):	1.5 p.s.i.
Type K Copper Service Loss:	
Total Net Loss:	10.70 p.s.i.
Design Pressure:	40.70 p.s.i.

Notes: System requires a minimum of 41 psi static pressure for system to operate properly. Irrigation Contractor shall conduct on site pressure test to verify site pressure prior to starting work. Contractor shall notify Owner's Representative of pressure deficiencies or any other on site problems that may alter the effectiveness of the system. Pipe has been size to insure that velocity does not exceed 5 FPS. do not change pipe size in the field without consulting system designer.

12 CRITICAL LOSS CHART
SYSTEM 5

TYPICAL WEEKLY SCHEDULE BASED ON PRECIPITATION RATE

Precipitation Rate (in/hr)		Water Desired (in/wk)	Time/Cycle (min)	No. of Zones	Total Time * Min.	Hrs.
Turf Rotor Zone	.64	.80				
MP Rotator Spray	.44	.80				
Turf Drip Zones	.85	.80				
Drip Zones	.55	.80				
RZWS Zones	2.75	.80	18.0	1	18	0.3
Total System Hours of Operation Per Week						0.3

* IT WILL BE NECESSARY TO WATER MULTIPLE ZONES AT ONE TIME TO MEET WATERING WINDOW . A TYPICAL SCHEDULE WOULD ALLOW WATERING TO OCCUR TWO TIMES PER WEEK. TOTAL WATERING TIME WOULD BE DIVIDED BY THE NUMBER OF WATERING DAYS. THIS SCHEDULE IS DESIGNED FOR SUMMER WATER USAGE AND ESTABLISHMENT OF NEW PLANTING.

11 VALVE SCHEDULE
SYSTEM 5

PRESSURE REQUIREMENT CALCULATIONS @ ZONE No. 4-1	
DESIGN STATISTICS FOR CALCULATIONS	
Total Zone Flow:	4.0 g.p.m.
Electric Valve Size:	1"
Static Pressure Less 10% (static @ 65 psi):	58.5 p.s.i.
ACCUMULATIVE LOSSES FROM CITY MAIN TO FURTHEST HEAD	
Sprinkler head requirement:	30 p.s.i.
Zone Pipe/Fitting Loss:	3.91 p.s.i.
1" Electric Valve Loss:	3.0 p.s.i.
Elevation Net Loss (+- FT.):	n/a
System Mainline Loss (1.5" Sch-40 Main):	0.10 p.s.i.
Backflow Preventer Loss (1"):	3.0 p.s.i.
Water Meter Loss (3/4"):	0.3 p.s.i.
Master Electric Valve Loss (1.5"):	1.5 p.s.i.
Type K Copper Service Loss:	
Total Net Loss:	13.31 p.s.i.
Design Pressure:	43.31 p.s.i.

Notes: System requires a minimum of 44 psi static pressure for system to operate properly. Irrigation Contractor shall conduct on site pressure test to verify site pressure prior to starting work. Contractor shall notify Owner's Representative of pressure deficiencies or any other on site problems that may alter the effectiveness of the system. Pipe has been size to insure that velocity does not exceed 5 FPS. do not change pipe size in the field without consulting system designer.

10 CRITICAL LOSS CHART
SYSTEM 4

TYPICAL WEEKLY SCHEDULE BASED ON PRECIPITATION RATE

Precipitation Rate (in/hr)		Water Desired (in/wk)	Time/Cycle (min)	No. of Zones	Total Time * Min.	Hrs.
Turf Rotor Zone	.64	.80				
MP Rotator Spray	.44	.80				
Turf Drip Zones	.85	.80				
Drip Zones	.55	.80				
RZWS Zones	2.75	.80	18.0	1	18	0.3
Total System Hours of Operation Per Week						0.3

* IT WILL BE NECESSARY TO WATER MULTIPLE ZONES AT ONE TIME TO MEET WATERING WINDOW . A TYPICAL SCHEDULE WOULD ALLOW WATERING TO OCCUR TWO TIMES PER WEEK. TOTAL WATERING TIME WOULD BE DIVIDED BY THE NUMBER OF WATERING DAYS. THIS SCHEDULE IS DESIGNED FOR SUMMER WATER USAGE AND ESTABLISHMENT OF NEW PLANTING.

9 VALVE SCHEDULE
SYSTEM 4

PRESSURE REQUIREMENT CALCULATIONS @ ZONE No. 3.2	
DESIGN STATISTICS FOR CALCULATIONS	
Total Zone Flow:	16.5 g.p.m.
Electric Valve Size:	1"
Static Pressure Less 10% (static @ 65 psi):	58.5 p.s.i.
ACCUMULATIVE LOSSES FROM CITY MAIN TO FURTHEST HEAD	
Sprinkler head requirement:	30 p.s.i.
Zone Pipe/Fitting Loss:	13.81 p.s.i.
1" Electric Valve Loss:	3.0 p.s.i.
Elevation Net Loss (+- FT.):	n/a
System Mainline Loss (2" Sch-40 Main):	0.12 p.s.i.
Backflow Preventer Loss (1.5"):	4.3 p.s.i.
Water Meter Loss (1.5"):	2 p.s.i.
Master Electric Valve Loss (1.5"):	1.5 p.s.i.
Type K Copper Service Loss:	
Total Net Loss:	24.72 p.s.i.
Design Pressure:	54.72 p.s.i.

Notes: System requires a minimum of 55 psi static pressure for system to operate properly. Irrigation Contractor shall conduct on site pressure test to verify site pressure prior to starting work. Contractor shall notify Owner's Representative of pressure deficiencies or any other on site problems that may alter the effectiveness of the system. Pipe has been size to insure that velocity does not exceed 5 FPS. do not change pipe size in the field without consulting system designer.

8 CRITICAL LOSS CHART
SYSTEM 3

TYPICAL WEEKLY SCHEDULE BASED ON PRECIPITATION RATE

Precipitation Rate (in/hr)		Water Desired (in/wk)	Time/Cycle (min)	No. of Zones	Total Time * Min.	Hrs.
Turf Rotor Zone	.64	.80				
MP Rotator Spray	.44	.80				
Turf Drip Zones	.85	.80				
Drip Zones	.55	.80				
RZWS Zones	2.75	.80	18.0	2	36	0.6
Total System Hours of Operation Per Week						0.6

* IT WILL BE NECESSARY TO WATER MULTIPLE ZONES AT ONE TIME TO MEET WATERING WINDOW . A TYPICAL SCHEDULE WOULD ALLOW WATERING TO OCCUR TWO TIMES PER WEEK. TOTAL WATERING TIME WOULD BE DIVIDED BY THE NUMBER OF WATERING DAYS. THIS SCHEDULE IS DESIGNED FOR SUMMER WATER USAGE AND ESTABLISHMENT OF NEW PLANTING.

7 VALVE SCHEDULE
SYSTEM 3

PRESSURE REQUIREMENT CALCULATIONS @ ZONE No. 2-1	
DESIGN STATISTICS FOR CALCULATIONS	
Total Zone Flow:	10.0 g.p.m.
Electric Valve Size:	1"
Static Pressure Less 10% (static @ 65 psi):	58.5 p.s.i.
ACCUMULATIVE LOSSES FROM CITY MAIN TO FURTHEST HEAD	
Sprinkler head requirement:	30 p.s.i.
Zone Pipe/Fitting Loss:	7.87 p.s.i.
1" Electric Valve Loss:	3.0 p.s.i.
Elevation Net Loss (+- FT.):	n/a
System Mainline Loss (2" Sch-40 Main):	0.06 p.s.i.
Backflow Preventer Loss (1.5"):	4.2 p.s.i.
Water Meter Loss (1"):	0.8 p.s.i.
Master Electric Valve Loss (1.5"):	1.5 p.s.i.
Type K Copper Service Loss:	
Total Net Loss:	17.43 p.s.i.
Design Pressure:	47.43 p.s.i.

Notes: System requires a minimum of 48 psi static pressure for system to operate properly. Irrigation Contractor shall conduct on site pressure test to verify site pressure prior to starting work. Contractor shall notify Owner's Representative of pressure deficiencies or any other on site problems that may alter the effectiveness of the system. Pipe has been size to insure that velocity does not exceed 5 FPS. do not change pipe size in the field without consulting system designer.

6 CRITICAL LOSS CHART
SYSTEM 2

TYPICAL WEEKLY SCHEDULE BASED ON PRECIPITATION RATE

Precipitation Rate (in/hr)		Water Desired (in/wk)	Time/Cycle (min)	No. of Zones	Total Time * Min.	Hrs.
Turf Rotor Zone	.64	.80				
MP Rotator Spray	.44	.80				
Turf Drip Zones	.85	.80				
Drip Zones	.55	.80				
RZWS Zones	2.75	.80	18.0	2	36	0.6
Total System Hours of Operation Per Week						0.6

* IT WILL BE NECESSARY TO WATER MULTIPLE ZONES AT ONE TIME TO MEET WATERING WINDOW . A TYPICAL SCHEDULE WOULD ALLOW WATERING TO OCCUR TWO TIMES PER WEEK. TOTAL WATERING TIME WOULD BE DIVIDED BY THE NUMBER OF WATERING DAYS. THIS SCHEDULE IS DESIGNED FOR SUMMER WATER USAGE AND ESTABLISHMENT OF NEW PLANTING.

5 VALVE SCHEDULE
SYSTEM 2

PRESSURE REQUIREMENT CALCULATIONS @ ZONE No. 1-1	
DESIGN STATISTICS FOR CALCULATIONS	
Total Zone Flow:	5.0 g.p.m.
Electric Valve Size:	1"
Static Pressure Less 10% (static @ 65 psi):	58.5 p.s.i.
ACCUMULATIVE LOSSES FROM CITY MAIN TO FURTHEST HEAD	
Sprinkler head requirement:	30 p.s.i.
Zone Pipe/Fitting Loss:	2.97 p.s.i.
1" Electric Valve Loss:	3.0 p.s.i.
Elevation Net Loss (+- FT.):	n/a
System Mainline Loss (1.5" Sch-40 Main):	0.03 p.s.i.
Backflow Preventer Loss (1"):	3.0 p.s.i.
Water Meter Loss (3/4"):	0.6 p.s.i.
Master Electric Valve Loss (1.5"):	1.5 p.s.i.
Type K Copper Service Loss:	
Total Net Loss:	11.10 p.s.i.
Design Pressure:	41.10 p.s.i.

Notes: System requires a minimum of 42 psi static pressure for system to operate properly. Irrigation Contractor shall conduct on site pressure test to verify site pressure prior to starting work. Contractor shall notify Owner's Representative of pressure deficiencies or any other on site problems that may alter the effectiveness of the system. Pipe has been size to insure that velocity does not exceed 5 FPS. do not change pipe size in the field without consulting system designer.

4 CRITICAL LOSS CHART
SYSTEM 1

TYPICAL WEEKLY SCHEDULE BASED ON PRECIPITATION RATE

Precipitation Rate (in/hr)		Water Desired (in/wk)	Time/Cycle (min)	No. of Zones	Total Time * Min.	Hrs.
Turf Rotor Zone	.64	.80				
MP Rotator Spray	.44	.80				
Turf Drip Zones	.85	.80				
Drip Zones	.55	.80				
RZWS Zones	2.75	.80	18.0	1	18	0.3
Total System Hours of Operation Per Week						0.3

* IT WILL BE NECESSARY TO WATER MULTIPLE ZONES AT ONE TIME TO MEET WATERING WINDOW . A TYPICAL SCHEDULE WOULD ALLOW WATERING TO OCCUR TWO TIMES PER WEEK. TOTAL WATERING TIME WOULD BE DIVIDED BY THE NUMBER OF WATERING DAYS. THIS SCHEDULE IS DESIGNED FOR SUMMER WATER USAGE AND ESTABLISHMENT OF NEW PLANTING.

3 VALVE SCHEDULE
SYSTEM 1

CONSTRUCTION NOTES:

1. IRRIGATION CONTRACTOR SHALL BE RESPONSIBLE FOR MAKING HIMSELF FAMILIAR WITH THE SPECIFICATIONS AND ALL SUBMITTAL REQUIREMENTS. IT IS THE RESPONSIBILITY OF THE IRRIGATION CONTRACTOR TO NOTIFY THE OWNER'S REPRESENTATIVE FOR SITE INSPECTIONS AS SPECIFIED IN THE SPECIFICATIONS. FAILURE TO NOTIFY THE OWNER'S REPRESENTATIVE DOES NOT RELIEVE THE CONTRACTOR FROM INSPECTION APPROVAL AND WILL REQUIRE THE CONTRACTOR TO UNCOVER WORK AS REQUIRED FOR APPROVAL AT THE COST OF THE CONTRACTOR. IRRIGATION CONTRACTOR IS TO INFORM OWNER'S REPRESENTATIVE OF THE START DATE OF WORK.
2. THE IRRIGATION CONTRACTOR IS REQUIRED BY LAW TO NOTIFY TEXAS ONE CALL (800-245-4545) 72 HOURS PRIOR TO ANY EXCAVATION. IRRIGATION CONTRACTOR SHALL BE RESPONSIBLE FOR MAKING HIMSELF FAMILIAR WITH ALL UNDERGROUND UTILITIES, PIPES AND STRUCTURES. IRRIGATION CONTRACTOR SHALL TAKE SOLE RESPONSIBILITY FOR ANY COST INCURRED DUE TO DAMAGE OF SAID UTILITIES WHETHER OR NOT TEXAS ONE CALL IS NOTIFIED.
3. DO NOT WILLFULLY PROCEED WITH CONSTRUCTION AS DESIGNED WITHOUT VERIFYING ACTUAL ON-SITE WATER PRESSURE FROM THE SOURCE. DO NOT WILLFULLY PROCEED WITH CONSTRUCTION AS DESIGNED WHEN IT IS OBVIOUS THAT UNKNOWN OBSTRUCTIONS AND/OR GRADE DIFFERENCES EXIST THAT MAY NOT HAVE BEEN KNOWN DURING DESIGN. SUCH CONDITIONS SHALL BE IMMEDIATELY BROUGHT TO THE ATTENTION OF THE OWNER'S REPRESENTATIVE. THE IRRIGATION CONTRACTOR SHALL ASSUME FULL RESPONSIBILITY FOR ALL NECESSARY REVISIONS DUE TO FAILURE TO GIVE SUCH NOTIFICATION.
4. IRRIGATION CONTRACTOR SHALL BE RESPONSIBLE FOR ANY COORDINATION WITH OTHER CONTRACTORS AS REQUIRED TO ACCOMPLISH IRRIGATION INSTALLATION.
5. DUE TO SCALE OF DRAWINGS, IT IS NOT POSSIBLE TO INDICATE ALL OFFSETS, FITTINGS SLEEVES, ETC., WHICH MAY BE REQUIRED. IRRIGATION CONTRACTOR SHALL CAREFULLY INVESTIGATE THE STRUCTURAL AND FINISHED CONDITIONS AFFECTING ALL OF HIS WORK AND PLAN HIS WORK ACCORDINGLY. FURNISHING SUCH FITTINGS, ETC., AS MAY BE REQUIRED TO MEET SUCH CONDITIONS. DRAWINGS ARE GENERALLY DIAGRAMMATIC AND INDICATIVE OF THE WORK TO BE INSTALLED. THE WORK SHALL BE INSTALLED IN SUCH A MANNER AS TO AVOID CONFLICTS BETWEEN IRRIGATION SYSTEM, PLANTING AND ARCHITECTURAL FEATURES. THIS DESIGN IS DIAGRAMMATIC. ALL PIPING, VALVES, ETC., SHOWN WITHIN PAVED AREAS IS FOR DESIGN CLARIFICATION ONLY AND SHALL BE INSTALLED IN PLANTING AREAS AND WITHIN PROPERTY LINES.
6. DURING INSTALLATION IT IS THE IRRIGATION CONTRACTOR'S RESPONSIBILITY TO COORDINATE PIPING WITH THE LANDSCAPE SUBCONTRACTOR TO AVOID CONFLICT WITH PROPOSED PLANTING. IT WILL BE THE RESPONSIBILITY OF THE IRRIGATION SUBCONTRACTOR TO MOVE PIPING TO ALLOW PROPER PLACEMENT OF PLANT MATERIAL. THE IRRIGATION CONTRACTOR SHALL MAKE MINOR ADJUSTMENTS TO ENSURE PROPER COVERAGE AT NO ADDITIONAL COST TO THE OWNER.
7. NO MACHINE TRENCHING IS TO BE DONE WITHIN THE DRIPLINE OF EXISTING TREES. TRENCHING IS TO BE DONE BY HAND, AIR-SPADE OR BY TUNNELING UNDER ROOT SYSTEM BY METHOD APPROVED BY LANDSCAPE ARCHITECT. PIPING LAYOUT IS DIAGRAMMATIC AND PIPING SHALL BE ROUTED AROUND EXISTING TREES AS POSSIBLE TO AVOID DAMAGE TO THE ROOT SYSTEMS. DO NOT CUT ANY ROOT OVER 3/4" DIAMETER UNLESS APPROVAL FROM THE LANDSCAPE ARCHITECT IS FIRST OBTAINED. ANY CUTS MADE SHALL BE CLEAN AND WITHOUT FRAYED ENDS.
8. IRRIGATION CONTRACTOR SHALL BE RESPONSIBLE FOR SLEEVES AND CHASES WHEREVER PIPING OR CONDUIT PASSES, UNDER ALL PAVING, THROUGH WALLS, ETC. ALL SLEEVE LOCATIONS MAY NOT BE SHOWN ON PLAN, COORDINATE WITH ARCHITECTURAL AND CIVIL DRAWINGS, GENERAL CONTRACTOR AND OTHER SUBCONTRACTORS AS REQUIRED. ALL SLEEVE AND CHASE LOCATIONS ARE NOT NOTED ON PLAN. ALL SLEEVES 4" OR LESS SHALL BE SCH-40 PVC, ALL SLEEVES 6" OR GREATER SHALL BE CLASS-200 PVC. ALL SLEEVES TO BE SIZED TWICE THE DIAMETER OF PIPE OR COMBINATION OF PIPES ENCLOSED WITHIN THE SLEEVE.
9. CONFIRM STATIC WATER PRESSURE AT LEAST 7 DAYS BEFORE BEGINNING WORK. IF STATIC WATER PRESSURE IS LESS THAN STATED IN PRESSURE CALCULATIONS DO NOT PROCEED UNTIL DIRECTED SO BY THE LANDSCAPE ARCHITECT. IF ACTUAL SITE STATIC PRESSURE EXCEEDS DESIGN PRESSURE BY 15 P.S.I. IN ANY ZONE, A PRESSURE REDUCING VALVE SHALL BE INSTALLED. REFER TO DETAILS FOR MODEL.
10. ADJUSTABLE FLOW CONTROLS SHALL BE REQUIRED ON CIRCUIT REMOTE CONTROL VALVE. PRESSURE AT ANY POINT WITHIN A ZONE SHALL NOT VARY BY MORE THAN 10% FROM THE DESIGN SPRINKLER OPERATING PRESSURE. SEE SPECIFICATIONS FOR TESTING.
11. THE CONTRACTOR SHALL BE A REGISTERED LICENSED IRRIGATOR IN THE STATE OF TEXAS. CONTRACTOR MUST CONFORM TO ALL CODES AS STATED IN SECTION 344 OF THE TEXAS WATER CODE AS OUTLINED BY TCEQ.
12. OBTAIN COVERAGE TEST APPROVAL FROM OWNER'S REPRESENTATIVE PRIOR TO PLANTING, SODDING OR SEEDING.
13. ALL UNDESIGNATED END LATERAL PIPING SHALL BE ½" IN SPRAY ZONES AND ¾" IN ROTOR ZONES.
14. SPRINKLER HEAD SPACING SHALL NOT EXCEED 50% OF SPRAY DIAMETER BASED ON MANUFACTURERS OPERATING SPECIFICATIONS. SPRINKLER HEAD SPACING SHALL BE DESIGNED FOR HEAD-TO-HEAD COVERAGE OR HEADS SHALL BE SPACED AS PER MANUFACTURER'S RECOMMENDATIONS AND ADJUSTED FOR PREVAILING WINDS. THE SYSTEM SHALL BE DESIGNED SO THAT IRRIGATION IS NOT APPLIED TO VEHICULAR TRAFFIC LANES, OTHER PAVEMENT OR STRUCTURES.
15. ALL ROTORS SHALL BE LOCATED 12" FROM PAVEMENT, CURBS OR EDGE OF STRUCTURE, ALL SPRAY HEADS SHALL BE LOCATED 6" FROM PAVEMENT, CURBS OR EDGE OF STRUCTURE.
16. VALVE AND CIRCUITS SHALL BE SEPARATED BASED ON WATER USE, SO THAT TURF AREAS ARE WATERED SEPARATELY FROM SHRUB AND GROUND COVER AREAS. IRRIGATION HEADS IN THE TURF AREAS WILL BE VALVED SEPARATELY FROM SHRUB AND/OR GROUND COVER AREAS. IT IS RECOMMENDED THAT SEASONAL COLOR AREAS BE WATERED SEPARATELY. UNDER NO CIRCUMSTANCES ARE ZONE TYPES TO BE COMBINED I.E. ROTARY HEADS WITH SPRAYS, TURF AREAS WITH PLANTING BEDS.
17. IT IS THE CONTRACTORS RESPONSIBILITY TO CONFIRM STATIC PRESSURE ON SITE PRIOR TO STARTING WORK. REFER TO NOTES #9 AND #10.
18. IT IS THE IRRIGATION CONTRACTOR'S RESPONSIBILITY TO SECURE ALL REQUIRED PERMITS AND PAY ALL ASSOCIATED FEES UNLESS OTHERWISE NOTED. ALL LOCAL CODES SHALL PREVAIL OVER ANY DISCREPANCIES CONTAINED IN THESE DOCUMENTS.
19. UNSLEEVED PIPES MAY BE SHOWN UNDER PAVEMENT FOR GRAPHIC CLARITY. INSTALL PIPES IN ADJACENT SLEEVES WITHIN LANDSCAPE AREAS.
20. 120 VAC ELECTRICAL POWER SOURCE AT CONTROLLER LOCATION SHALL BE PROVIDED BY GENERAL CONTRACTOR. THE IRRIGATION CONTRACTOR SHALL MAKE THE FINAL CONNECTION FROM THE ELECTRICAL SOURCE TO THE CONTROLLER WITH A HARDWIRE CONNECTION APPROVED AND INSTALLED BY A LICENSED ELECTRICIAN.
21. SPRINKLER HEADS SHALL HAVE MATCHED PRECIPITATION RATES WITHIN EACH CONTROL VALVE CIRCUIT.
22. SERVICEABLE CHECK VALVES SHALL BE REQUIRED ADJACENT TO PAVED AREAS WHERE ELEVATION DIFFERENCES MAY CAUSE LOW HEAD DRAINAGE.
23. ALL AUTOMATIC IRRIGATION SYSTEMS SHALL BE EQUIPPED WITH A CONTROLLER CAPABLE OF DUAL OR MULTIPLE PROGRAMMING. CONTROLLERS SHALL HAVE MULTIPLE CYCLE START CAPACITY AND A FLEXIBLE CALENDAR PROGRAM, INCLUDING THE CAPABILITY OF BEING SET TO WATER EVERY FIVE DAYS. ALL AUTOMATIC IRRIGATION SYSTEMS SHALL BE EQUIPPED WITH A RAIN SENSOR SHUT-OFF DEVICE.
24. ALL IRRIGATION WIRES SHALL BE UL LISTED FOR DIRECT UNDERGROUND BURIAL AND SHALL BE SIZED PER THE MANUFACTURER'S RECOMMENDATIONS. 3M-DBY WATERPROOF CONNECTORS TO BE USED ON ALL WIRE CONNECTIONS. SUBMIT SAMPLE TO LANDSCAPE ARCHITECT.
25. ALL IRRIGATION HEADS SHALL BE ADJUSTED TO MINIMIZE OVER-SPRAY ONTO ALL IMPERVIOUS SURFACES.
26. ALL PIPE CONNECTIONS SHALL BE PRIMED WITH AN APPROVED COLOR PRIMER BEFORE BEING CHEMICAL WELDED.
27. AFTER AWARD OF CONTRACT AND BEFORE ANY IRRIGATION SYSTEM MATERIALS ARE ORDERED FROM SUPPLIERS OR DELIVERED TO THE JOB SITE, SUBMIT TO THE OWNER A COMPLETE LIST OF ALL IRRIGATION SYSTEM MATERIALS, OR PROCESSES PROPOSED TO BE FURNISHED AND INSTALLED AS PART OF THIS CONTRACT. THE LANDSCAPE ARCHITECT OR OWNER'S AUTHORIZED REPRESENTATIVE WILL ALLOW NO SUBSTITUTIONS WITHOUT PRIOR WRITTEN ACCEPTANCE. MANUFACTURER'S WARRANTIES SHALL NOT RELIEVE THE CONTRACTOR OF HIS LIABILITY UNDER THE GUARANTEE. SUCH WARRANTIES SHALL ONLY SUPPLEMENT THE GUARANTEE.
29. ALL TEMPORARY IRRIGATION SHALL BE DESIGNED PRIOR TO INSTALLATION BY A STATE OF TEXAS LICENSED IRRIGATOR. THE DESIGN IS TO BE SUBMITTED FOR APPROVAL PRIOR TO COMMENCING INSTALLATION OF THE TEMPORARY SYSTEM.
30. IRRIGATION CLOSEOUT DOCUMENTS SHALL INCLUDE A WATER BUDGET. A LAMINATED COPY OF THE WATER BUDGET SHALL BE PERMANENTLY INSTALLED INSIDE THE IRRIGATION CONTROLLER DOOR.
    A. CHART CONTAINING ZONE NUMBER, PRECIPITATION RATE AND GPM.
    B. LOCATION OF EMERGENCY IRRIGATION SYSTEM SHUT-OFF VALVE.

2 NOTES

SYSTEM 1 IRRIGATION EQUIPMENT

1 W DEDICATED 3/4" IRRIGATION WATER METER.
1 DC DOUBLE CHECK BACKFLOW DEVICE, 1" WATTS 007 PER LOCAL CODES.
1 M MASTER VALVE, HUNTER ICV-151G NORMALLY CLOSED VALVE
1 C CONTROLLER - PEDESTAL MOUNT HUNTER ICC2 CONTROLLER WITH EZ DECODER MODULE, FINAL LOCATION IS TO BE DETERMINED AFTER CONSULTING WITH LANDSCAPE ARCHITECT.
1 W WEATHER SENSOR - HUNTER SOLAR-SYNC WEATHER SENSOR. FINAL LOCATION IS TO BE DETERMINED AFTER CONSULTING WITH LANDSCAPE ARCHITECT.

SYSTEM 2 IRRIGATION EQUIPMENT

2 W DEDICATED 1" IRRIGATION WATER METER.
2 DC DOUBLE CHECK BACKFLOW DEVICE, 1.5" WATTS 007 PER LOCAL CODES.
2 M MASTER VALVE, HUNTER ICV-151G NORMALLY CLOSED VALVE
2 C CONTROLLER - PEDESTAL MOUNT HUNTER ICC2 CONTROLLER WITH EZ DECODER MODULE, FINAL LOCATION IS TO BE DETERMINED AFTER CONSULTING WITH LANDSCAPE ARCHITECT.
2 W WEATHER SENSOR - HUNTER SOLAR-SYNC WEATHER SENSOR. FINAL LOCATION IS TO BE DETERMINED AFTER CONSULTING WITH LANDSCAPE ARCHITECT.

SYSTEM 3 IRRIGATION EQUIPMENT

3 W DEDICATED 1" IRRIGATION WATER METER.
3 DC DOUBLE CHECK BACKFLOW DEVICE, 1.5" WATTS 007 PER LOCAL CODES.
3 M MASTER VALVE, HUNTER ICV-151G NORMALLY CLOSED VALVE
3 C CONTROLLER - PEDESTAL MOUNT HUNTER ICC2 CONTROLLER WITH EZ DECODER MODULE, FINAL LOCATION IS TO BE DETERMINED AFTER CONSULTING WITH LANDSCAPE ARCHITECT.
3 W WEATHER SENSOR - HUNTER SOLAR-SYNC WEATHER SENSOR. FINAL LOCATION IS TO BE DETERMINED AFTER CONSULTING WITH LANDSCAPE ARCHITECT.

SYSTEM 4 IRRIGATION EQUIPMENT

4 W DEDICATED 3/4" IRRIGATION WATER METER.
4 DC DOUBLE CHECK BACKFLOW DEVICE, 1" WATTS 007 PER LOCAL CODES.
4 M MASTER VALVE, HUNTER ICV-151G NORMALLY CLOSED VALVE
4 C CONTROLLER - PEDESTAL MOUNT HUNTER ICC2 CONTROLLER WITH EZ DECODER MODULE, FINAL LOCATION IS TO BE DETERMINED AFTER CONSULTING WITH LANDSCAPE ARCHITECT.
4 W WEATHER SENSOR - HUNTER SOLAR-SYNC WEATHER SENSOR. FINAL LOCATION IS TO BE DETERMINED AFTER CONSULTING WITH LANDSCAPE ARCHITECT.

SYSTEM 5 IRRIGATION EQUIPMENT

5 W DEDICATED 3/4" IRRIGATION WATER METER.
5 DC DOUBLE CHECK BACKFLOW DEVICE, 1" WATTS 007 PER LOCAL CODES.
5 M MASTER VALVE, HUNTER ICV-151G NORMALLY CLOSED VALVE
5 C CONTROLLER - PEDESTAL MOUNT HUNTER ICC2 CONTROLLER WITH EZ DECODER MODULE, FINAL LOCATION IS TO BE DETERMINED AFTER CONSULTING WITH LANDSCAPE ARCHITECT.
5 W WEATHER SENSOR - HUNTER SOLAR-SYNC WEATHER SENSOR. FINAL LOCATION IS TO BE DETERMINED AFTER CONSULTING WITH LANDSCAPE ARCHITECT.

GENERAL IRRIGATION EQUIPMENT

- REMOTE CONTROL VALVE, HUNTER ICV, SIZE AS INDICATED ON PLANS
- SUPERIOR QB33NP07 QUICK COUPLING VALVE WITH QB33K07 KEY
- MANUAL VALVE- SIZE OF MAINLINE
- #-# / #"/##: SYSTEM - ZONE IDENTIFICATION; ZONE SIZE IN GALLONS PER MINUTE; VALVE SIZE THIS ZONE
- 1-ROWS 2-ROWS: HUNTER ROOT ZONE WATERING SYSTEM. NUMBER PER TREE PER PLAN. REF DETAILS 6-7/LI2.01
- MAIN LINE - USE SCH-40 PVC PIPE, SIZE AS INDICATED ON PLANS
- 1-1/2": LATERAL LINE - USE CLASS 315 ON 1/2" PIPE AND CLASS 200 IPS PVC ON 3/4" AND LARGER PIPE. DO NOT DEVIATE ON SIZING WITHOUT CONSULTING WITH PROJECT DESIGNER.
- SLEEVE - USE SCH-40 PVC PIPE, VALVE WIRING MAY BE RUN IN THE SAME SLEEVES. ALL MAINLINE CROSSINGS TO BE (2) 4" SLEEVES, ALL OTHER CROSSINGS TO BE (1) 4" SLEEVE.

NOTE: REFER TO SHEET LI2.01 FOR DETAILS

FIELD LOCATE BY STAKING, THE CONTROLLER, WATER METER, BACKFLOW DEVICE, MASTER VALVE AND FLOW SENSOR FOR APPROVAL BY LANDSCAPE ARCHITECT PRIOR TO INSTALLATION.

1 LEGEND

STATEMENT OF IRRIGATION DESIGN STANDARDS CONFORMITY:
This plan is complete and conforms to the design and installation parameters of the irrigation design and equipment standards set out by the City of Georgetown, TX and TCEQ (Texas Commission on Environmental Quality).

Wade O. Radlet TX LI # 22397

SPECIAL NOTES:
1. THE IRRIGATION CONTRACTOR SHALL COMPLY WITH ALL LOCAL AND STATE MANDATED IRRIGATION ORDINANCES AND CODES AND WILL SECURE ALL REQUIRED PERMITS.
2. ALL WIRES, CONTROL VALVES, AND PRESSURIZED WATER SUPPLY LINES SHALL NOT BE LOCATED WITHIN THE EXISTING ROW OR OUTSIDE PROPERTY BOUNDARIES.

"Irrigation in Texas is regulated by the Texas Commission on Environmental Quality (TCEQ), MC-178, PO Box 13087, Austin, Texas 78711-3087 TCEQ's website is: www.tceq.state.tx.us"

811

PAPE-DAWSON ENGINEERS
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TBPE FIRM REGISTRATION #470 I TBPLS FIRM REGISTRATION #10028800

PRA IRRIGATION CONSULTANTS

51423-01

WOLF RANCH
IRRIGATION PLANS
WOLF RANCH PARKWAY
GEORGETOWN, TEXAS

STATE OF TEXAS
WADE O. RADLET
22397
LICENSED IRRIGATOR
09.10.25

PRINTS ISSUED

Date	Item	NO.
06-18-2025	90% FOR PRELIMINARY REVIEW	
09-14-2025	ISSUE FOR PERMIT	
09-30-2025	ISSUE FOR CONSTRUCTION	
10-10-2025	100% SET	

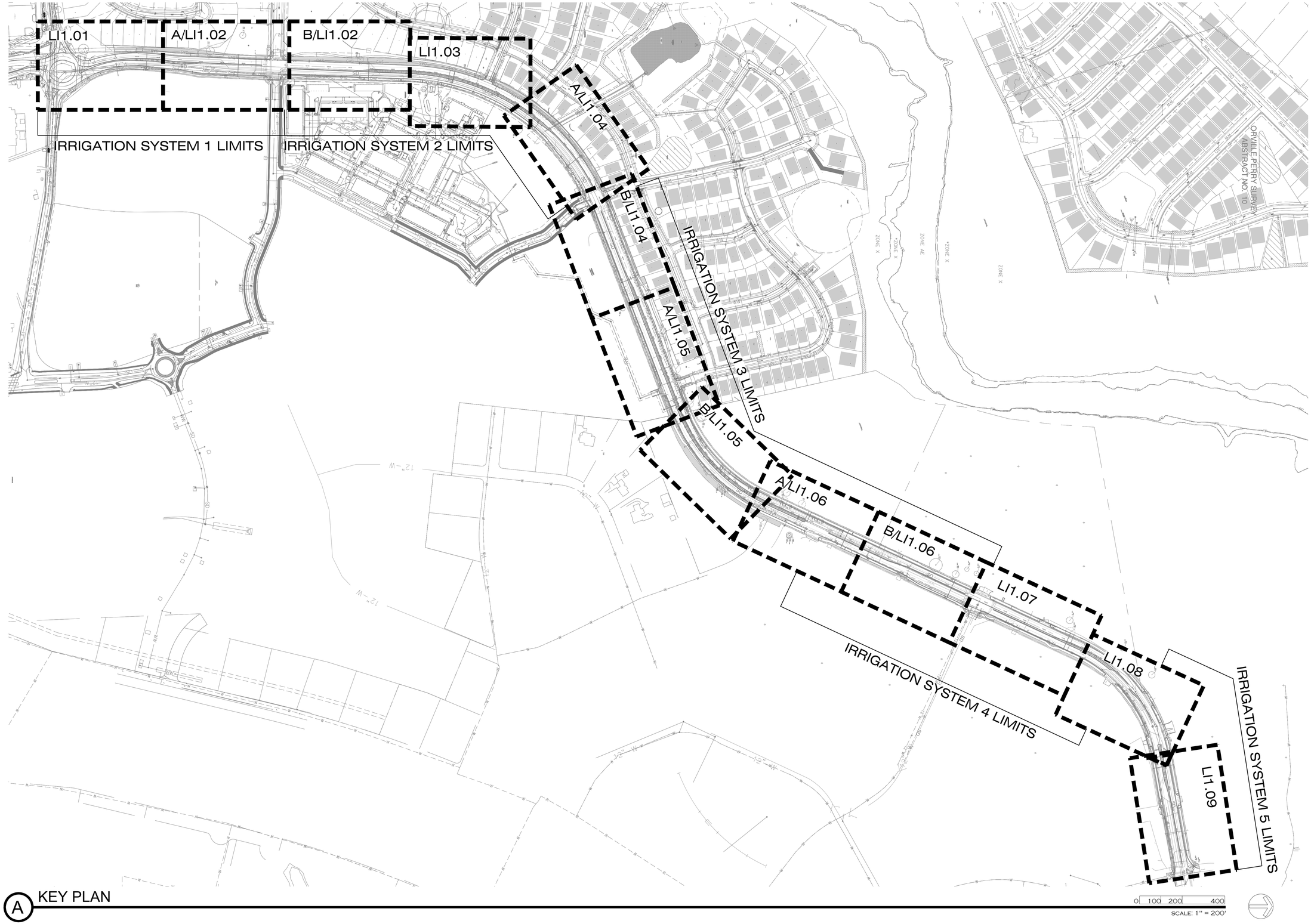
Drawn By: AH
Designed By: AH
Reviewed By: WR

Scale (Horz.): AS SHOWN

IRRIGATION NOTES AND LEGEND

LI0.01

SHEET 501 OF 523



A KEY PLAN

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TBPE FIRM REGISTRATION #470 | TBPLS FIRM REGISTRATION #10028800

PRA
IRRIGATION CONSULTANTS

WOLF RANCH
IRRIGATION EXHIBIT

WOLF RANCH PARKWAY
GEORGETOWN, TEXAS

51423-01

STATE OF TEXAS
WADE O. RADLEY
22397
09.10.25

PRINTS ISSUED

Date	Item	NO.
09-18-2025	90% FOR PRELIMINARY REVIEW	
09-14-2025	ISSUE FOR PERMIT	
09-30-2025	ISSUE FOR CONSTRUCTION	

Drawn By: AH
Designed By: AH
Reviewed By: WR

Scale (Horz.): AS SHOWN

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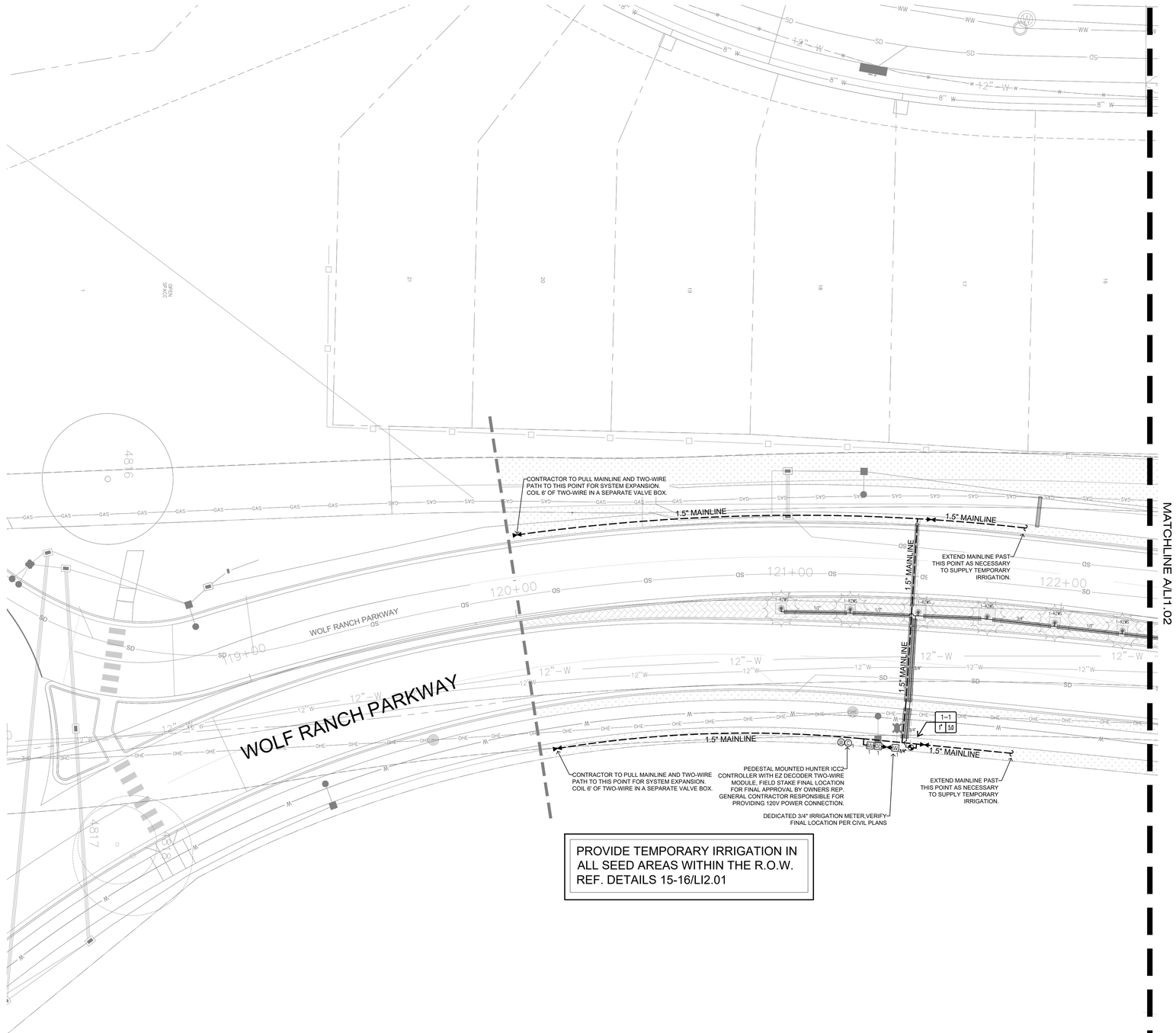
LI0.02

SHEET 502 OF 523



PROVIDE TEMPORARY IRRIGATION IN ALL SEED AREAS WITHIN THE R.O.W. REF. DETAILS 15-16/LI2.01

A IRRIGATION PLAN

0 10 20 40

SCALE: 1" = 20'

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PRA IRRIGATION CONSULTANTS

WOLF RANCH
IRRIGATION EXHIBIT
WOLF RANCH PARKWAY
GEORGETOWN, TEXAS

51423-01

STATE OF TEXAS
WADE O. RADLEY
22397
REGISTERED
09.10.25

PRINTS ISSUED

Date	Item	NO
12-9-2025	90% FOR PRELIMINARY REVIEW	
03-14-2025	ISSUE FOR PERMIT	
06-30-2025	ISSUE FOR CONSTRUCTION	

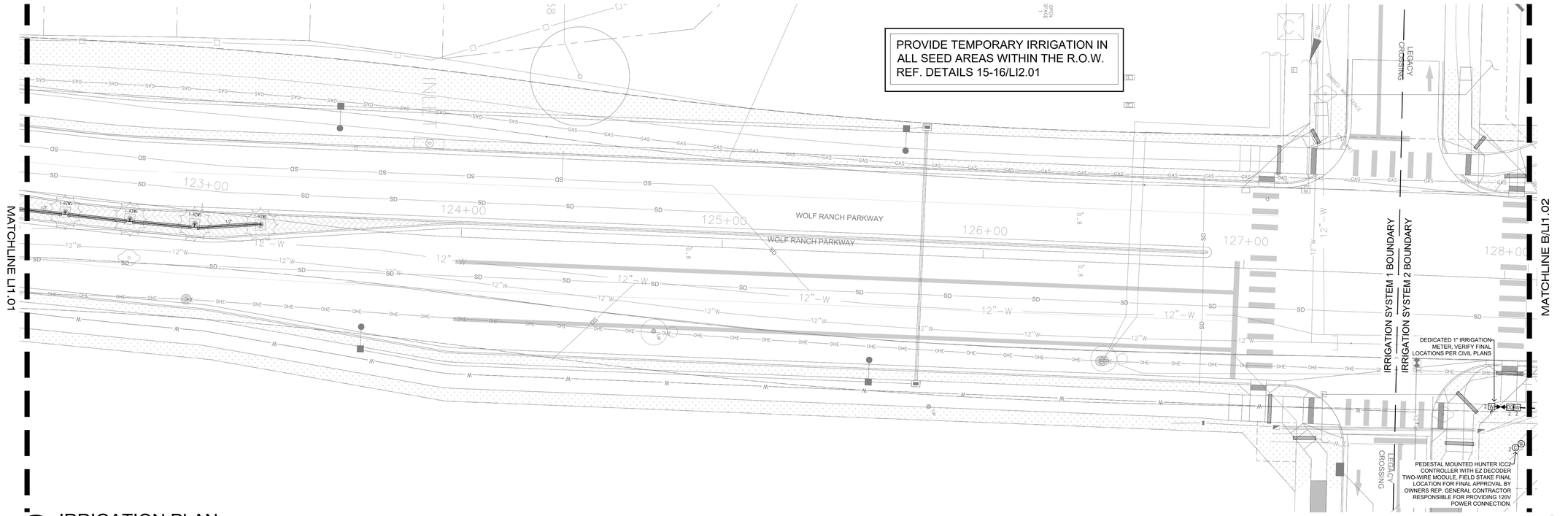
Drawn By: AH
Designed By: AH
Reviewed By: WR

Scale (Horz.): AS SHOWN

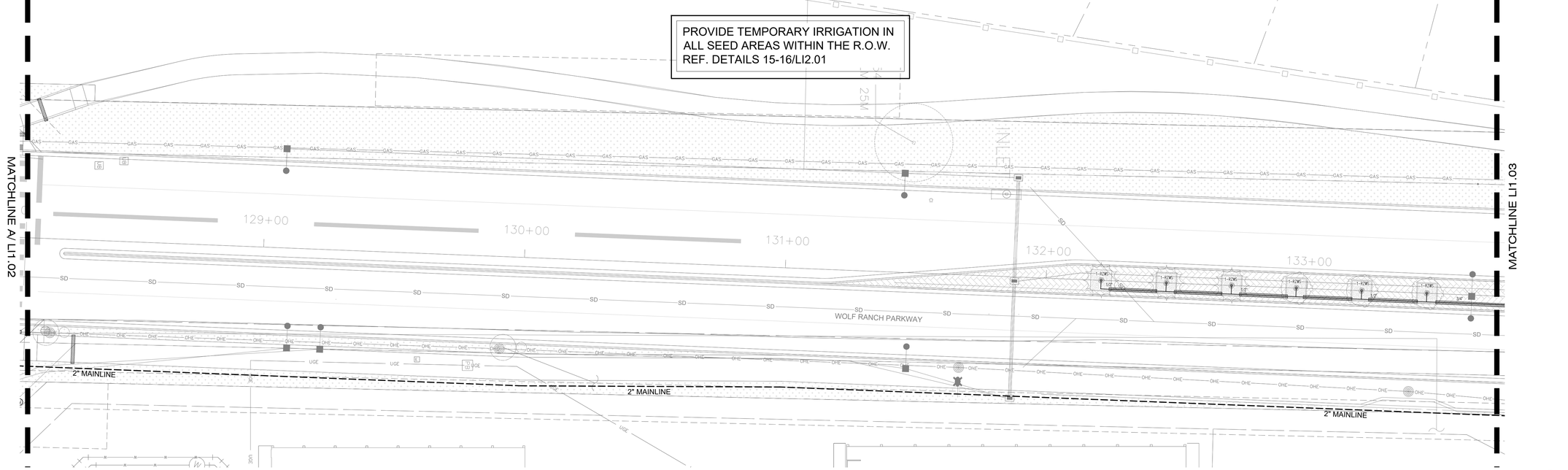
IRRIGATION PLAN

LI1.01

SHEET 503 OF 523



A IRRIGATION PLAN



B IRRIGATION PLAN

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TBPE FIRM REGISTRATION #470 I TBPLS FIRM REGISTRATION #10028800
PRA IRRIGATION CONSULTANTS

51423-01

WOLF RANCH
IRRIGATION EXHIBIT
WOLF RANCH PARKWAY
GEORGETOWN, TEXAS

STATE OF TEXAS
WADE O. RADLET
22397
REGISTERED
PROFESSIONAL
LANDSCAPE ARCHITECT
09.10.25

PRINTS ISSUED

Date	Item	NO.
07-25-2025	90% FOR PRELIMINARY REVIEW	
10-14-2025	ISSUE FOR PERMIT	
10-30-2025	ISSUE FOR CONSTRUCTION	

Drawn By: AH
Designed By: AH
Reviewed By: WR

Scale (Horz.): AS SHOWN

IRRIGATION PLAN

LI1.02

SHEET 504 OF 523

PROVIDE TEMPORARY IRRIGATION IN ALL SEED AREAS WITHIN THE R.O.W. REF. DETAILS 15-16/LI2.01

EXTEND MAINLINE PAST THIS POINT AS NECESSARY TO SUPPLY TEMPORARY IRRIGATION.

2" MAINLINE

WOLF RANCH PARKWAY

SCOUT ST

MATCHLINE B/ LI1.02

MATCHLINE A/LI1.04

A IRRIGATION PLAN

0 10 20 40

SCALE: 1" = 20'

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TBPE FIRM REGISTRATION # 470 I TBPLS FIRM REGISTRATION # 10028800

PRA IRRIGATION CONSULTANTS

WOLF RANCH
IRRIGATION EXHIBIT
WOLF RANCH PARKWAY
GEORGETOWN, TEXAS

51423-01

STATE OF TEXAS
WADE O. RADLEY
22397
09.10.25

PRINTS ISSUED

Date	Item	NO.
01-16-2025	30% PLAN PRELIMINARY REVIEW	
03-14-2025	ISSUE FOR PERMIT	
06-30-2025	ISSUE FOR CONSTRUCTION	

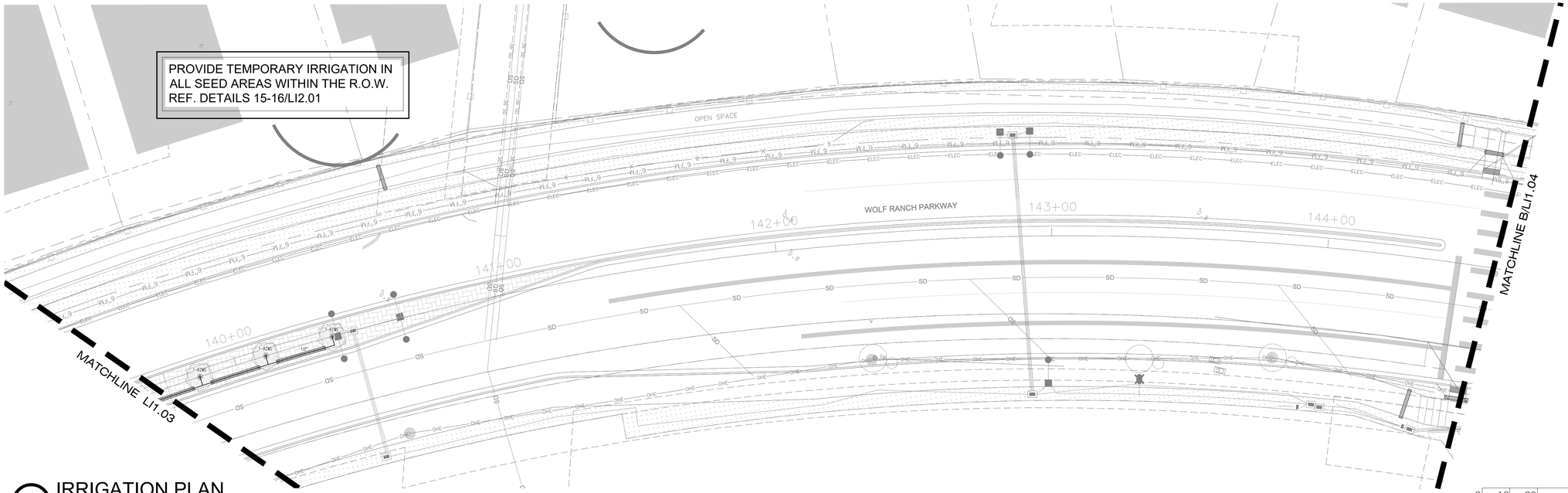
Drawn By: AH
Designed By: AH
Reviewed By: WR

Scale (Horz.): AS SHOWN

IRRIGATION PLAN

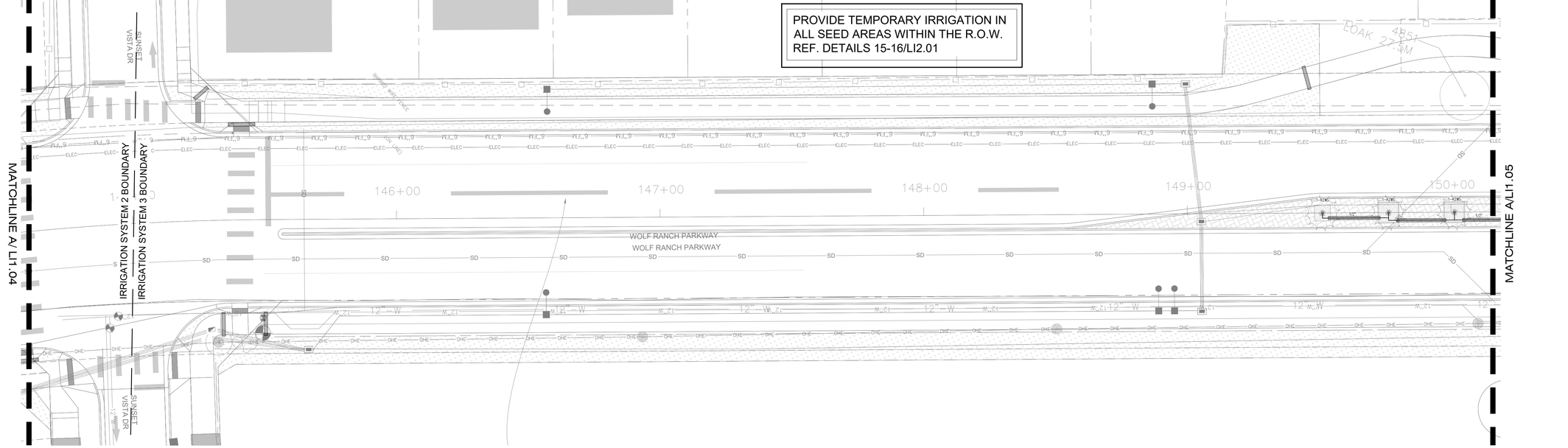
LI1.03

SHEET 505 OF 523



A IRRIGATION PLAN

SCALE: 1" = 20'



B IRRIGATION PLAN

SCALE: 1" = 20'

PAPE-DAWSON ENGINEERS
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10801 N MOPAC EXPY, BLDG 1 I AUSTIN, TX 78759 I 512.454.8711
TBPE FIRM REGISTRATION # 470 I TBPLS FIRM REGISTRATION # 10028800

PRA IRRIGATION CONSULTANTS

51423-01

WOLF RANCH
IRRIGATION EXHIBIT
WOLF RANCH PARKWAY
GEORGETOWN, TEXAS

STATE OF TEXAS
WADE O. RADLET
2397
REGISTERED
09.10.25

PRINTS ISSUED

Date	Item	NO.
05-30-2025	90% FOR PRELIMINARY REVIEW	
10-14-2025	ISSUE FOR PERMIT	
10-30-2025	ISSUE FOR CONSTRUCTION	

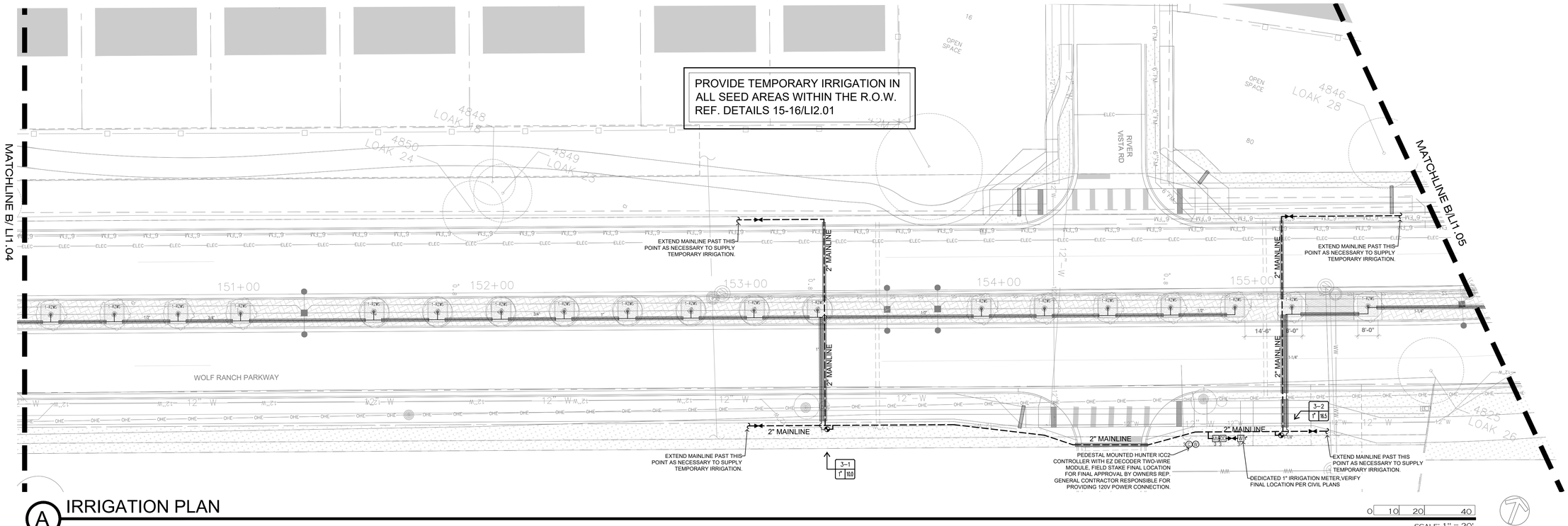
Drawn By: AH
Designed By: AH
Reviewed By: WR

Scale (Horz.): AS SHOWN

IRRIGATION PLAN

LI1.04

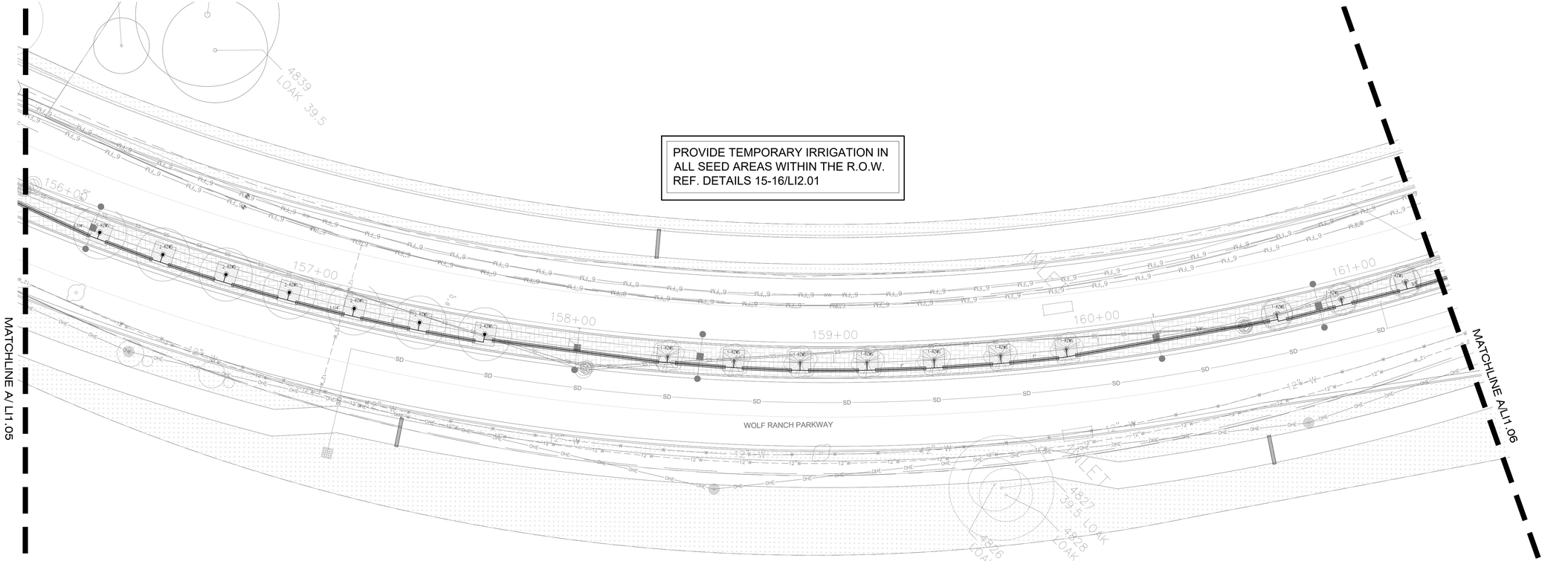
SHEET 506 OF 523



A IRRIGATION PLAN

0 10 20 40

SCALE: 1" = 20'



B IRRIGATION PLAN

0 10 20 40

SCALE: 1" = 20'

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10801 N MOPAC EXPY, BLDG 1 I AUSTIN, TX 78759 I 512.454.8711
TBPE FIRM REGISTRATION #470 I TBPLS FIRM REGISTRATION #10028800
PRA IRRIGATION CONSULTANTS

51423-01

WOLF RANCH
IRRIGATION EXHIBIT
WOLF RANCH PARKWAY
GEORGETOWN, TEXAS

STATE OF TEXAS
WADE O. RADLET
22397
LICENSED IRRIGATION CONSULTANT
09.10.25

PRINTS ISSUED

Date	Item	NO.
07-25-2025	90% FOR PRELIMINARY REVIEW	
09-14-2025	ISSUE FOR PERMIT	
09-30-2025	ISSUE FOR CONSTRUCTION	

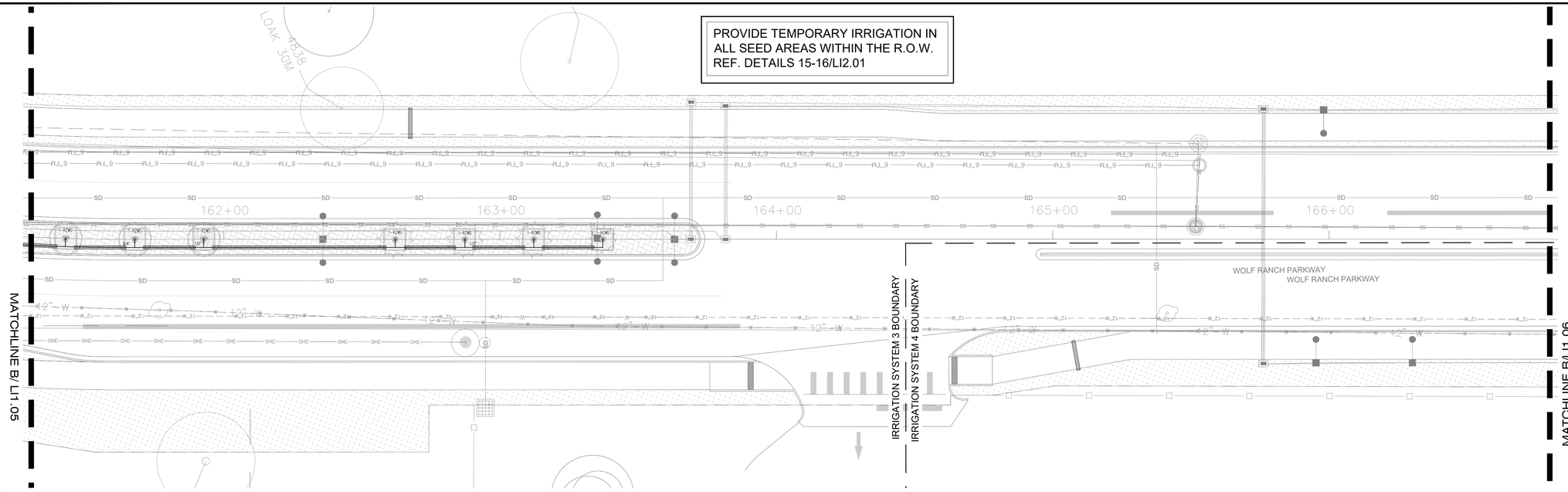
Drawn By: AH
Designed By: AH
Reviewed By: WR

Scale (Horz.): AS SHOWN

IRRIGATION PLAN

LI1.05

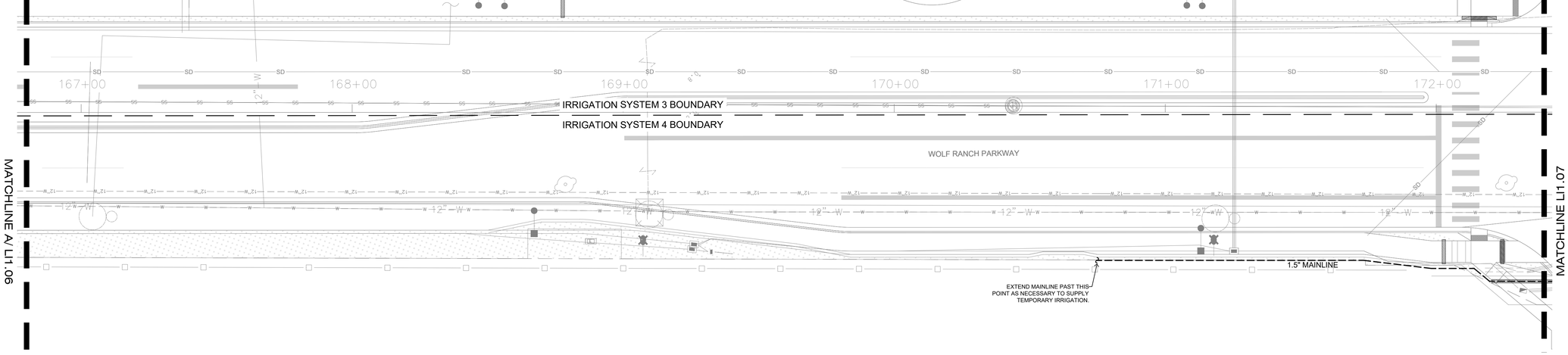
SHEET 507 OF 523



A IRRIGATION PLAN

0 10 20 40

SCALE: 1" = 20'



B IRRIGATION PLAN

0 10 20 40

SCALE: 1" = 20'

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IRRIGATION EXHIBIT

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GEORGETOWN, TEXAS

STATE OF TEXAS
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LICENSED IRRIGATOR
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Date	Item	NO.
12-9-2025	90% FOR PRELIMINARY REVIEW	
03-14-2025	ISSUE FOR PERMIT	
06-30-2025	ISSUE FOR CONSTRUCTION	

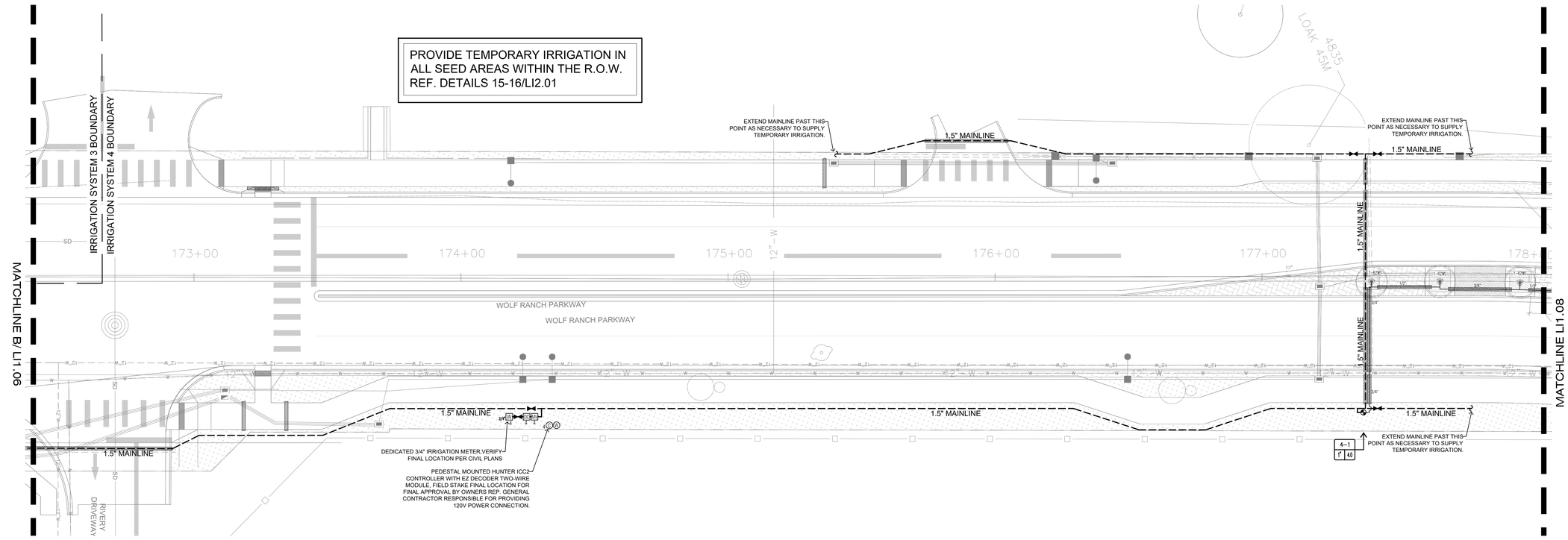
Drawn By: AH
Designed By: AH
Reviewed By: WR

Scale (Horz.): AS SHOWN

IRRIGATION PLAN

LI1.06

SHEET 508 OF 523



A IRRIGATION PLAN

0 10 20 40

SCALE: 1" = 20'

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WOLF RANCH PARKWAY
GEORGETOWN, TEXAS

STATE OF TEXAS
WADE O. RADLET
22397
REGISTERED
IRRIGATION CONSULTANT
09.10.25

PRINTS ISSUED

Date	Item	NO.
07-25-2025	90% FOR PRELIMINARY REVIEW	
09-14-2025	ISSUE FOR PERMIT	
09-30-2025	ISSUE FOR CONSTRUCTION	

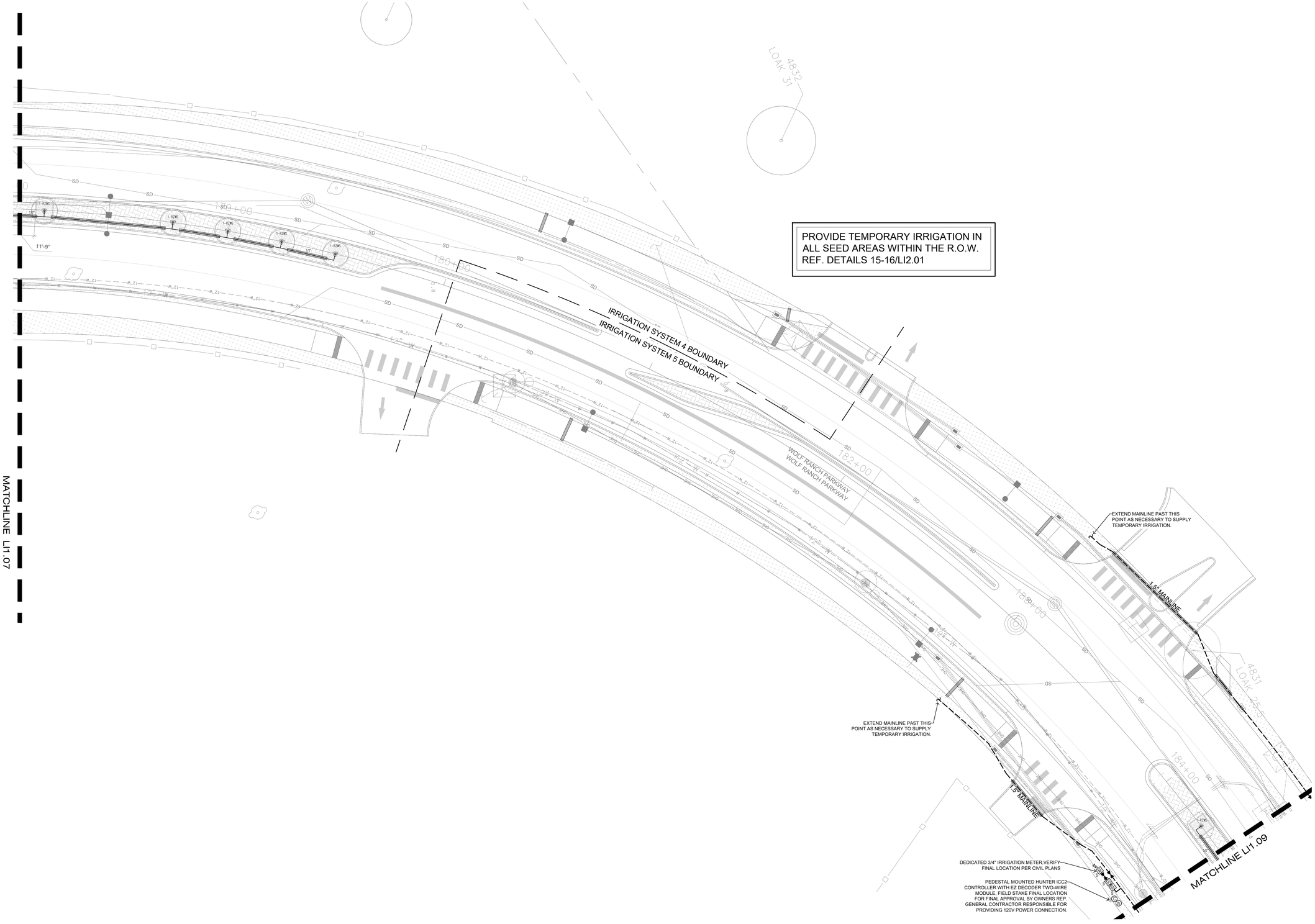
Drawn By: AH
Designed By: AH
Reviewed By: WR

Scale (Horz.): AS SHOWN

IRRIGATION PLAN

LI1.07

SHEET 509 OF 523



A IRRIGATION PLAN

0 10 20 40

SCALE: 1" = 20'

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PRA IRRIGATION CONSULTANTS

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IRRIGATION EXHIBIT

WOLF RANCH PARKWAY
GEORGETOWN, TEXAS

51423-01

STATE OF TEXAS
WADE O. RADLET
22397
LICENSED IRRIGATOR
09.10.25

PRINTS ISSUED

Date	Item	NO.
08-29-2025	90% FOR PRELIMINARY REVIEW	
09-14-2025	ISSUE FOR PERMIT	
09-30-2025	ISSUE FOR CONSTRUCTION	

Drawn By: AH
Designed By: AH
Reviewed By: WR

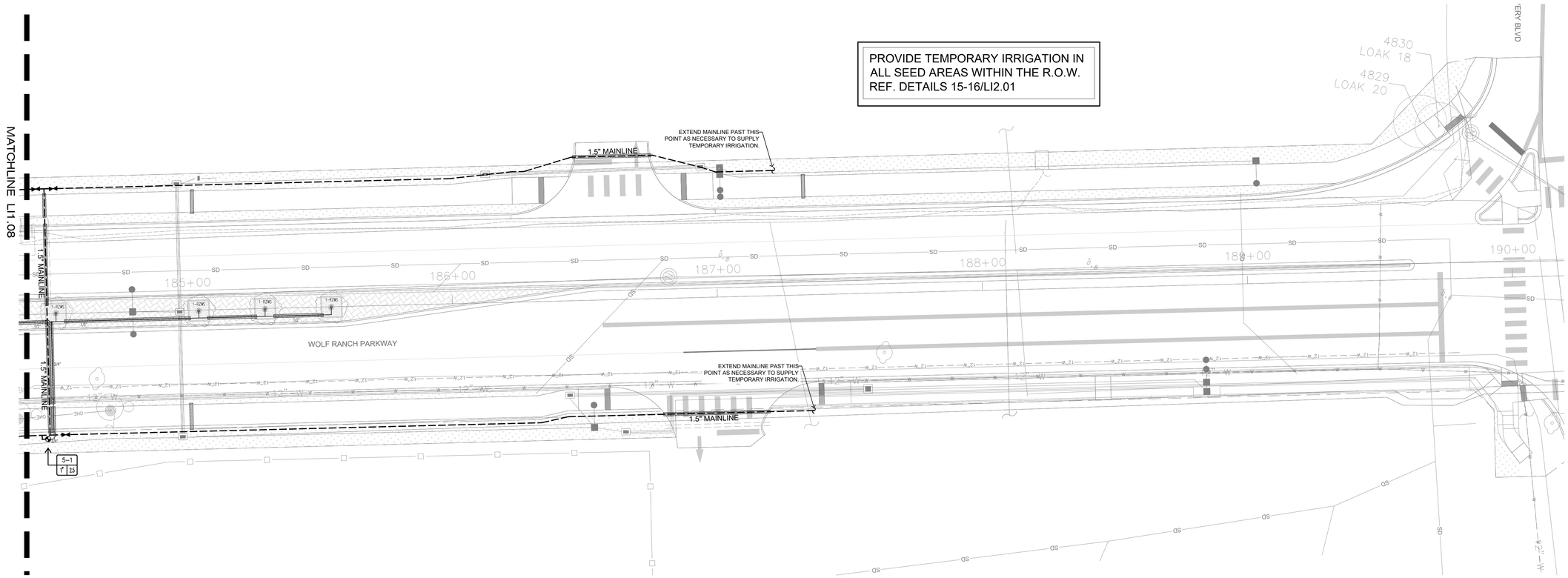
Scale (Horz.): AS SHOWN

IRRIGATION PLAN

LI1.08

SHEET 510 OF 523

PROVIDE TEMPORARY IRRIGATION IN ALL SEED AREAS WITHIN THE R.O.W. REF. DETAILS 15-16/LI2.01



A IRRIGATION PLAN

PAPE-DAWSON ENGINEERS
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PRA IRRIGATION CONSULTANTS

51423-01

WOLF RANCH
IRRIGATION EXHIBIT

WOLF RANCH PARKWAY
GEORGETOWN, TEXAS

STATE OF TEXAS
WADE O. RADLET
22397
LICENSED IRRIGATOR
09.10.25

PRINTS ISSUED

Date	Item	NO.
06.18.2025	90% FOR PRELIMINARY REVIEW	
09.14.2025	ISSUE FOR PERMIT	
09.30.2025	ISSUE FOR CONSTRUCTION	

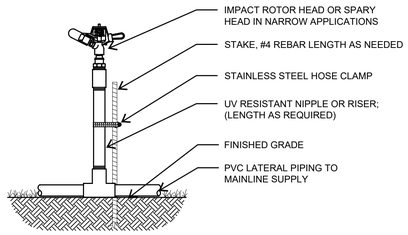
Drawn By: AH
Designed By: AH
Reviewed By: WR

Scale (Horz.): AS SHOWN

IRRIGATION PLAN

LI1.09

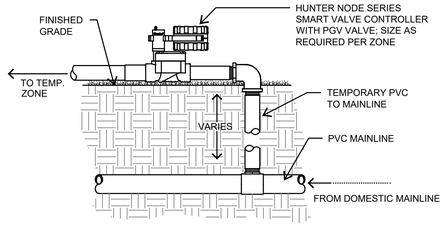
SHEET 511 OF 523



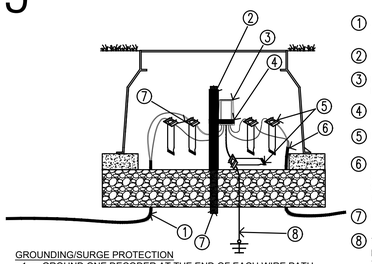
NOTE

1. TEMPORARY IRRIGATION SYSTEMS MUST BE INSTALLED BY A LICENSED IRRIGATOR OR AN IRRIGATION TECHNICIAN UNDER THE SUPERVISION OF A LICENSED IRRIGATOR.
2. TEMPORARY IRRIGATION SYSTEMS MUST MEET THE BACKFLOW PREVENTION REQUIREMENTS IN SUBCHAPTER E OF THIS CHAPTER (RELATING TO BACKFLOW PREVENTION AND CROSS-CONNECTIONS).
3. TEMPORARY IRRIGATION SYSTEMS MUST BE INSTALLED IN ACCORDANCE WITH §344.1(45) OF THIS TITLE (RELATING TO DEFINITIONS).
4. TEMPORARY IRRIGATION SYSTEMS MUST HAVE ESTABLISHED A DEFINITE END DATE AT WHICH TIME THE TEMPORARY IRRIGATION SYSTEM MUST BE REMOVED.
5. ALL COVERAGE SHALL BE HEAD TO HEAD.
6. SYSTEM SHALL BE DESIGNED TO AVOID ANY OVERSPRAY ONTO SIDEWALKS AND STREETS.
7. TEMPORARY IRRIGATION SYSTEM ZONE VALVES SHALL BE HUNTER NODE CONTROLLER VALVES. CONTRACTOR SHALL CLUSTER VALVE LOCATIONS WHERE POSSIBLE TO COMBINE ZONES ON MULTIPLE VALVE CONTROLLERS (NODE-200, NODE-400, ETC...)
8. NO PIPING SHALL BE RUN WITHIN THE PROTECTION ZONE OF EXISTING TREES UNLESS APPROVED BY LANDSCAPE ARCHITECT.
9. CONTRACTOR SHALL VERIFY ON-SITE AND BY CONSULTING WITH LANDSCAPE ARCHITECT AREAS THAT WILL REQUIRE TEMPORARY IRRIGATION PRIOR TO DESIGN AND INSTALLATION OF SYSTEM.
10. USE #4 X 24" REBAR ROD WITH "J" HOOKED RADIUS AT ONE END TO HOLD PIPE SECURELY IN PLACE. INSTALL AT INTERVALS OF 10 FEET.

16 TEMPORARY IRRIGATION ROTOR



15 TEMPORARY IRRIGATION NODE

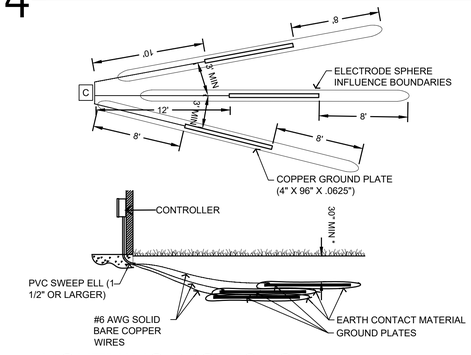


1. JACKETED ID WIRE PATH TO NEXT DECODER
2. PVC PIPE 1" SCH 40
3. MODEL DUAL-S SURGE PROTECTION MODULE
4. ELECTRICAL CABLE TIE - 12"
5. DBR\Y-6 (5)
6. JACKETED ID WIRE PATH FROM CONTROLLER ALLOW 5 ft/1.5M SLACK PER SURGE DEVICE 1/2 ON EITHER SIDE
7. PVC PIPE .75" SCH 40
8. TO EARTH GROUND 8FT/2.5M FROM DUAL-S AT RIGHT ANGLE TO THE 2-WIRE PATH

GROUNDING/SURGE PROTECTION

1. GROUND ONE DECODER AT THE END OF EACH WIRE PATH.
2. GROUND ONE DECODER EVERY 1,000 FT/300 M OR 12TH DECODER.
3. FOR HIGHER LEVELS OF PROTECTION, GROUND THE DECODERS MORE FREQUENTLY. THERE IS NO LIMIT ON THE NUMBER OF GROUND CONNECTIONS IN A DECODER SYSTEM.

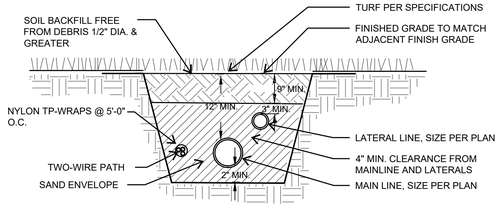
14 SURGE ARRESTER



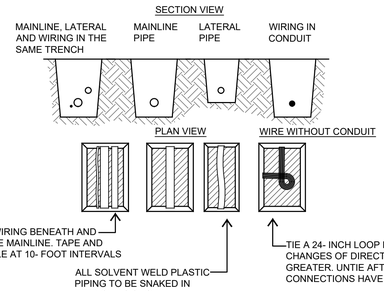
13 LIGHTNING PROTECTION

NOTE:

1. MAINLINE DEPTH MAY VARY BETWEEN 12" AND 24" WITH 12" MIN. AT TOP OF PIPE
2. LATERAL DEPTH MAY VARY BETWEEN 12" AND 18" WITH 12" MIN.
3. SAND ENVELOPE SHALL BE INSTALLED IF ROCK IS PRESENT



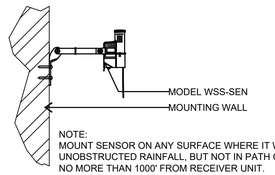
12 TRENCH PROFILE



NOTES:

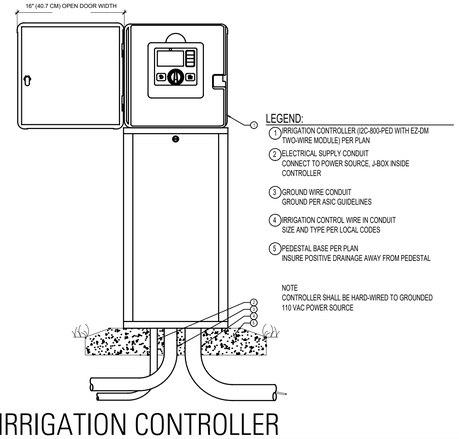
1. SLEEVE BELOW ALL HARDSCAPE ELEMENTS WITH SCH-40 PVC TWICE THE DIAMETER OF THE PIPE OR WIRE BUNDLE WITHIN
2. FOR PIPE AND WIRE BURIAL DEPTHS SEE TRENCH PROFILE DETAIL

11 IRRIGATION TRENCH

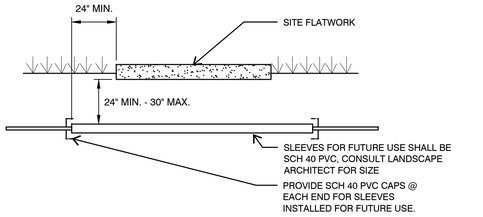


NOTE:
MOUNT SENSOR ON ANY SURFACE WHERE IT WILL BE EXPOSED TO UNOBSTRUCTED RAINFALL, BUT NOT IN PATH OF SPRINKLER SPRAY, NO MORE THAN 1000' FROM RECEIVER UNIT.
MOUNT RECEIVER UNIT NO FURTHER THAN 6' FROM CONTROLLER.

10 WEATHER SENSOR



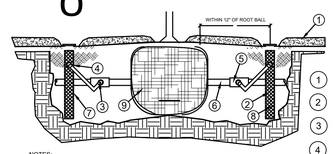
9 IRRIGATION CONTROLLER



IRRIGATION SLEEVE NOTES:

1. PIPING AND CONTROL WIRES SHALL BE INSTALLED IN SEPARATE SLEEVES UNDER PAVING. REFER TO IRRIGATION SLEEVE PLAN FOR SIZE AND LOCATION.
2. SLEEVE ELEVATION SHALL BE TWENTY-FOUR (24") INCHES BELOW TOP OF PAVEMENT.
3. SLEEVES SHALL EXTEND ONE (1') FOOT BEYOND THE EDGE OF PAVEMENT AND BE STAKED FOR LOCATION.
4. ALL SLEEVES 4" OR LESS, SHALL BE SCH-40 PVC, ALL SLEEVES GREATER THAN 4" SHALL BE CLASS-200 SDR-21. SLEEVES SHALL BE CAPPED ON BOTH ENDS AND SIZED A MIN. OF TWO (2) TIMES THE DIAMETER OF THE PIPE INSIDE THE SLEEVE.
5. SLEEVE LOCATIONS SHALL BE MARKED ONTO THE TOP OF CURB WITH A SAW-CUT OF TWO PARALLEL LINES THAT ARE TWO (2') INCHES LONG AND ONE (1") INCH APART ON BOTH SIDES OF THE STREET OR CROSSING.
6. THE CONTRACTOR RESPONSIBLE FOR INSTALLATION OF SLEEVES SHALL ALSO BE RESPONSIBLE TO LOCATE ANY SLEEVE WHICH CANNOT BE FOUND DURING THE INSTALLATION OF THE IRRIGATION SYSTEM.

8 IRRIGATION SLEEVE

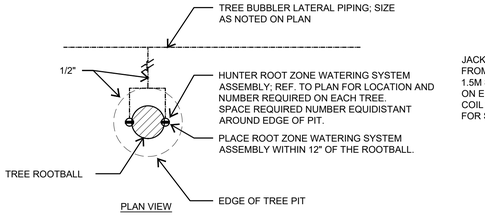


NOTES:

1. POSITION 2 UNITS EVENLY SPACED AROUND PLANT. FOR NEW TREES PLACE NEAR ROOT BALL. FOR EXISTING TREES PLACE HALF THE DISTANCE BETWEEN CANOPY EDGE AND TREE TRUNK.
2. INSTALL PRODUCT WITH TOP EVEN WITH GROUND SURFACE.
3. RZWS SERIES MODEL: RZWS-18-SOCV: 0.50 GPM, CHECK VALVE
4. WHEN INSTALLING IN EXTREMELY HARD OR CLAY SOILS, ADD 3/4" (1.9 CM) GRAVEL UNDER AND AROUND THE UNIT TO ALLOW FASTER WATER INFILTRATION AND ROOT PENETRATION.
5. ONCE RZWS HAS BEEN INSTALLED FILL THE BASKET WITH PEA GRAVEL BEFORE LOCKING LID.
6. OPTIONAL RWS-SOCK FOR USE IN SANDY SOILS.

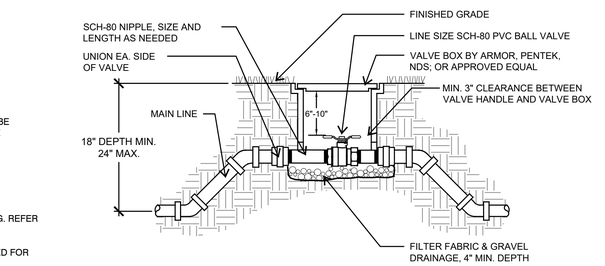
1. FINISH GRADE/TOP OF MULCH
2. ROOT WATERING SYSTEM: HUNTER RZWS
3. SWING ASSEMBLY (INCLUDED)
4. 1/2" (1,3 CM) MALE NPT INLET (INCLUDED)
5. PVC SCH 40 TEE OR EL
6. PVC OR POLYETHYLENE LATERAL PIPE
7. OPTIONAL SOCK (RWS-SOCK) FOR SANDY SOILS
8. 4" (10,2 CM) WIDE X 36" (91,4 CM) LONG RIGID BASKET WEAVE CANISTER (INCLUDED)
9. PLANT ROOT BALL

7 ROOT ZONE WATERING SYSTEM ASSEMBLY - SECTION



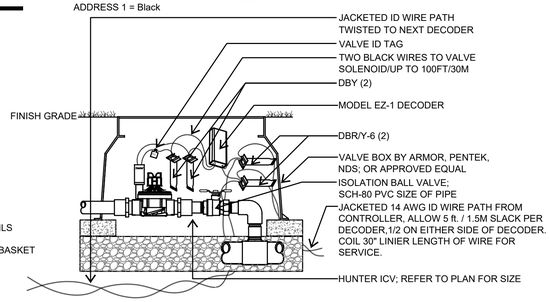
6 ROOT ZONE WATERING SYSTEM ASSEMBLY- PLAN

5 QUICK COUPLER VALVE

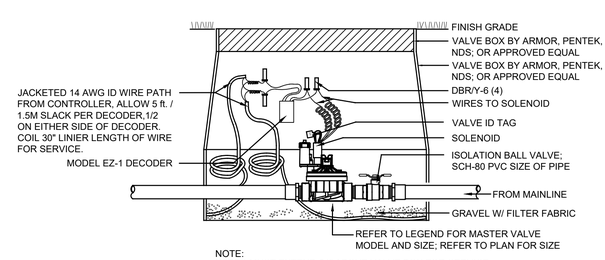


4 MANUAL ISOLATION VALVE

NOTE: All EZ-1 DECODERS SHALL HAVE THE FOLLOWING ADDRESS AND CORRESPONDING COLOR
ADDRESS 1 = Black

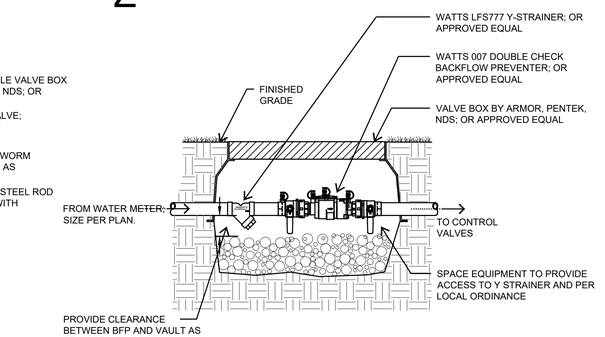


3 ZONE VALVE



NOTE:
WIRES MUST EXTEND 24" ABOVE VALVE BOX FOR SERVICE.

2 MASTER VALVE



1 BACKFLOW DEVICE

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PRA IRRIGATION CONSULTANTS

WOLF RANCH
IRRIGATION EXHIBIT
WOLF RANCH PARKWAY
GEORGETOWN, TEXAS

51423-01

WADE O. RADLET 22397 LICENSED IRRIGATOR
09.10.25

PRINTS ISSUED

Date	Item	NO
07-8-2025	90% FOR PRELIMINARY REVIEW	
07-14-2025	ISSUE FOR PERMIT	
08-8-2025	ISSUE FOR CONSTRUCTION	

Drawn By: AH
Designed By: AH
Reviewed By: WR

Scale (Horz.): AS SHOWN

IRRIGATION DETAILS

LI2.01

SHEET 512 OF 523

DESIGN PRESSURE NOTES:
TEN DAYS PRIOR TO START OF CONSTRUCTION, IRRIGATION CONTRACTOR SHALL VERIFY AVAILABLE WATER PRESSURE AND FLOW AT FROM PUBLIC SYSTEM. SHOULD THE DESIGN PRESSURE FOR THE SYSTEM BE HIGHER THAN THE EXISTING PRESSURE, THE IRRIGATION CONTRACTOR SHALL NOTIFY THE IRRIGATION DESIGNER IMMEDIATELY.

THE EXACT AVAILABLE PRESSURE WAS NOT KNOWN AT THE TIME OF DESIGN. A STATIC PRESSURE OF 65 PSI WAS ASSUMED AT THE TIME OF DESIGNS.

THE SYSTEM UTILIZES A 1.5" MAINLINE (LOOPS WITH IRRIGATION DESIGN TO THE NORTH) WITH A MAXIMUM FLOW OF 12 GPM FOR DRIP ZONES AND OVERALL PRESSURE OF 65 PSI.

MULTIPLE IRRIGATION ZONES CAN BE SCHEDULED TO OPERATE AT THE SAME TIME BUT SHOULD NOT EXCEED DESIGN PRESSURE OR FLOWS.

ZONE FLOW CHART

Zone #	Description	Head Type	GPM
T1	Trees	Tree Bubblers	2.5
D1	Shrubs	Drip	4.7
D2	Shrubs	Drip	4.2
D3	Shrubs	Drip	3.8
D4	Shrubs	Drip	5.2
D5	Shrubs	Drip	5.9

Drip	DESIRED HEAD PRESSURE (psi):				45	
ZONE#	**D3**					
Loss #/	Length	Flow	Diameter	Loss/100'	Individual Loss	Cumulative Loss
Type						
Laterals	Varies	11.2	0.66			0.00
Valve		3.8	1		2.50	2.50
Main*	710	12	1.5	0.44	3.12	5.62
Valve		12	1		1.50	7.12
Backflow		12	0.75		10.00	17.12
Meter		12	0.75		2.20	19.32
		Grand Total Loss			19.32	19.32
		Assumed Starting psi:			65	
		Total Losses:			19.32	
		Actual Head Pressure:			45.68	
		Designed Pressure:			64.32	
		Difference of Start and Actual:			0.68	

*Mainline shown with additional flow up to 12 gpm

IRRIGATION LEGEND

SYMBOL	DESCRIPTION	MANUFACTURER	MODEL NO.
10ft	SPRAYS WITH PRO ADJ. NOZZLES	HUNTER	PROS-06-PRS30 (SEE PLAN FOR RADIUS)
R20	MP ROTATORS	HUNTER	PROS-06-PRS40 (SEE PLAN FOR RADIUS)
25ft	ROTORS WITH MPR NOZZLES	HUNTER	PGP-06-PRB (SEE PLAN FOR RADIUS)
	MULTI-STREAM BUBBLERS	HUNTER	PROS-06-PRS30 W/ MSBN50H NOZZLES
	REMOTE CONTROL VALVE	HUNTER	ICV
	BACKFLOW DEVICE (PER OTHER'S DESIGNS)		
	DRIP- TECHLINE CV XR	NETAFIM	TLCVXR-6-12
F	LINE FLUSHING VALVE	NETAFIM	TL050MFV-1 OR TLFV-1
PI	PRESSURE OPERATOR INDICATOR	NETAFIM	10-F-01
	DRIP CONTROL VALVE	NETAFIM	LVCZS8010075-LF (.25 to 4.4 GPM) LVCZ10075-HFHP (4.5 to 17.6 GPM) LVCZ150HP (11.0 to 35.0 GPM)

IRRIGATION LEGEND

SYMBOL	DESCRIPTION
	3/4" IRRIGATION METER (PER OTHER'S DESIGN)
A	HUNTER - ICC CONTROLLER AND WEATHER SENSORS (PROVIDED BY OTHERS/PREVIOUS DESIGN)
	ISOLATION VALVE
	LATERAL PIPING REFER TO PLAN SCH. 40 PVC PER CITY REQUEST
	MAINLINE PIPING REFER TO PLAN SCH. 40 PVC, SIZED AS SHOWN (INSTALL THRUST BLOCKS AND AIR/VACUUM RELIEF VALVES AS NECESSARY TO PROTECT MAINLINE SYSTEM)
	IRRIGATION SLEEVE, SCH. 40 PVC, MIN. TWICE SIZE OF PIPE TO BE INSERTED, ONE SLEEVE PER PIPE CONTROL WIRING SLEEVE, 2" SCH. 40 PVC
D1 1"/8.8	VALVE STATION # (WHERE D = DRIP TUBING, S = SPRAY, R = ROTOR, T = TREE DRIP) VALVE SIZE GPM

SLEEVING NOTES

1. PIPING AND CONTROL WIRES SHALL BE INSTALLED IN SEPARATE SLEEVES UNDER PAVING. REFERENCE DRAWINGS FOR SLEEVE SIZE AND LOCATION.
2. SLEEVES SHALL BE FURNISHED AND INSTALLED BY GENERAL CONTRACTOR.
3. SLEEVES SHALL EXTEND ONE (1') FOOT BEYOND EDGE OF ALL PAVEMENT AND STAKED FOR LOCATION.
4. ALL SLEEVES SHALL BE SCHEDULE 40 PVC PIPE, CAPPED ON BOTH ENDS AND SIZED AT LEAST TWO TIMES LARGER THAN THE DIAMETER OF THE PIPE INSIDE THE SLEEVE.
5. SLEEVE LOCATIONS SHALL BE MARKED ONTO THE CURB WITH A SAWCUT OF TWO PARALLEL LINES THAT ARE TWO (2") INCHES LONG AND ONE (1") APART.
6. CONTRACTOR IS RESPONSIBLE FOR THE INSTALLATION OF SLEEVES AND SHALL ALSO BE RESPONSIBLE FOR LOCATING ANY SLEEVE THAT CANNOT BE FOUND DURING THE INSTALLATION OF THE SYSTEM.
7. CONTRACTOR SHALL FURNISH OWNER AND IRRIGATION CONTRACTOR WITH AN 'AS-BUILT' DRAWING SHOWING ALL SLEEVE LOCATIONS.
8. CITY REQUESTED MINIMUM DEPTHS:
   - 12" FOR LATERALS
   - 18" FOR LATERALS UNDER NON VEHICULAR PAVING
   - 24" FOR LATERALS UNDER VEHICULAR PAVING
   - 24" FOR PRESSURIZED LINES UNDER NON VEHICULAR PAVING
   - 30" FOR PRESSURIZED LINES UNDER VEHICULAR PAVING

IRRIGATION GENERAL NOTES

1. THE IRRIGATION CONTRACTOR SHALL COORDINATE INSTALLATION OF THE IRRIGATION SYSTEM WITH THE LANDSCAPE CONTRACTOR SO THAT ALL PLANT MATERIAL WILL BE WATERED IN ACCORDANCE WITH THE INTENT OF THE PLANS AND SPECIFICATIONS.
2. THE CONTRACTOR SHALL BE RESPONSIBLE TO NOTIFY THE IRRIGATION DESIGNER OF SITE CONDITIONS OR ASSUME FULL RESPONSIBILITY FOR ANY AND ALL ON SITE REVISIONS NECESSARY.
3. CONTRACTOR TO VERIFY DESIGN AND ITS INTENT TO PROVIDE FULL COVERAGE TO ALL NEW PLANTING MATERIAL.
4. NOTIFY IRRIGATION DESIGNER OF ANY LAYOUT DISCREPANCIES PRIOR TO BIDDING.
5. LOCATE ALL UTILITIES AND SITE LIGHTING CONDUITS BEFORE IRRIGATION INSTALLATION BEGINS.
6. IRRIGATION CONTRACTOR TO PROCURE ALL PERMITS, LICENSES AND GIVE ALL NECESSARY NOTICES THROUGHOUT THE DURATION OF THE PROJECT.
7. THE CONTRACTOR SHALL BE A REGISTERED LICENSED IRRIGATOR IN GOOD STANDING WITH THE STATE OF TEXAS BOARDS AND REGULATORS.
8. THE CONTRACTOR SHALL BE RESPONSIBLE FOR ANY AND ALL PLANT MATERIAL UPON ACCEPTANCE AND THROUGH THE WARRANTY PERIOD FOR DAMAGE DUE TO IRRIGATION SYSTEM FAILURE.
9. ALL ASPECTS OF THE IRRIGATION INSTALLATION SHALL CONFORM WITH THE PROPER GOVERNING AUTHORITIES, CODES AND ORDINANCES.
10. SLEEVES SHALL BE FURNISHED AND INSTALLED BY GENERAL CONTRACTOR. SLEEVE MATERIAL SHALL BE SCHEDULE 40, SIZE AS INDICATED ON PLAN. REFER TO SLEEVING NOTES.
11. ALL MAIN LINE AND LATERAL LINE PIPING IN PLANTING AND LAWN AREAS SHALL HAVE A MINIMUM OF 12 INCHES OF COVER. ALL PIPING UNDER PAVING SHALL HAVE A MINIMUM OF 18 INCHES OF COVER. CONTRACTOR TO VERIFY LOCAL FREEZE DEPTHS AND ADJUST DEPTH OF COVER ACCORDINGLY.
12. ZONE VALVES SHALL NOT BE LOCATED WITHIN THREE (3') FEET OF ANY DRIVEWAY, TRAFFIC AISLE, ISLAND ETC. WHERE THEY WILL BE DAMAGED BY VEHICLES DRIVING OVER CURBS.
13. ALL NOZZLES IN PARKING LOT ISLANDS AND PLANTING BEDS SHALL BE LOW ANGLE NOZZLES TO MINIMIZE OVER SPRAY ON PAVEMENT SURFACES.
14. AUTOMATIC CONTROLLER SHALL BE INSTALLED AT LOCATION SHOWN. POWER (120V) SHALL BE LOCATED IN A JUNCTION BOX WITHIN FIVE (5) FEET OF CONTROLLER, LOCATION BY OTHER TRADES. RAIN AND FREEZE SENSORS SHALL BE INSTALLED WITH EACH CONTROLLER.
15. ELECTRICAL SPLICES SHOULD BE LOCATED AT EACH VALVE AND CONTROLLER ONLY.
16. PROVIDE A 3/4" BLOW DOWN DRAIN TEE TO ALLOW WATER TO BE BLOWN FROM THE IRRIGATION LINES/SYSTEM.
17. DISTURBED AREAS IN NEED OF TURF ESTABLISHMENT MAY EXIST BEYOND COVERAGE LIMITS OF THE PERMANENT IRRIGATION SYSTEM. IN THESE AREAS, CONTRACTOR TO DETERMINE A TEMPORARY MEANS TO ESTABLISH NECESSARY TURF. CONTRACTOR IS ENCOURAGED TO BEGIN TURF ESTABLISHMENT IMMEDIATELY UPON FINAL GRADE IN ACCORDANCE WITH AND TO SATISFY SWPPP.
18. PROVIDE WITH OWNER A COPY OF ALL INSTALLED EQUIPMENT AND LINES (AS BUILT PLANS.)
19. PLACE COPY OF ZONE MAP WITH ALL ZONE VALVE LOCATIONS SHOWN AND APPROVED IRRIGATION PLAN IN PROTECTIVE JACKET IN MAIN CONTROL PANEL.
20. IRRIGATION IN TEXAS IS REGULATED BY:
    THE TEXAS COMMISSION ON ENVIRONMENTAL QUALITY (TCEQ)
    MC-178 / PO BOX 13087
    AUSTIN, TEXAS 78711-3087
    WWW.TECQ.STATE.TX.US.

IRRIGATION PROJECT NOTES

1. THE LOCATION OF MAINLINE AND VALVES ON THIS PLAN MAY BE SHOWN IN PAVED AREAS FOR DESIGN CLARITY ONLY. IRRIGATION ELEMENTS HAVE BEEN SHOWN ON THIS PLAN AS ACCURATELY AS POSSIBLE WITHOUT THE FORFEIT OF DESIGN CLARITY AND INTENT. ALL PIPES AND VALVES SHALL BE INSTALLED WITHIN **PERVIOUS** AREAS. ALL PIPE AND WIRES THAT CROSS UNDER PAVING SHALL BE INSTALLED IN SEPARATE SLEEVES AS SPECIFIED.
2. ALL SPRINKLER EQUIPMENT NUMBERS REFERENCE THE HUNTER EQUIPMENT CATALOG UNLESS OTHERWISE INDICATED.
3. TEN DAYS PRIOR TO START OF CONSTRUCTION, IRRIGATION CONTRACTOR SHALL VERIFY STATIC WATER PRESSURE. THE IRRIGATION SYSTEM FOR THIS SITE IS DESIGNED TO OPERATE WITH A PRESSURE OF SIXTY FIVE (65 PSI) POUNDS PER SQUARE INCH. SHOULD THE DESIGN PRESSURE FOR THE SYSTEM BE HIGHER THAN THE EXISTING PRESSURE, THE IRRIGATION CONTRACTOR SHALL NOTIFY THE IRRIGATION DESIGNER IMMEDIATELY.
4. IRRIGATION CONTRACTOR SHALL COORDINATE THE LOCATION OF THE CONTROLLER AND SENSORS WITH THE GENERAL CONTRACTOR AND OWNER. A 110 VOLT ELECTRICAL SERVICE TO POWER THE IRRIGATION CONTROLLER SHALL BE PROVIDED BY THE GENERAL CONTRACTOR AT THE LOCATION SHOWN ON THIS PLAN.
5. WATER SERVICE TAP, METER AND LEAD FOR THE IRRIGATION SYSTEM SHALL BE PROVIDED AND INSTALLED BY THE GENERAL CONTRACTOR. SERVICE LINE AND METER SHALL BE SIZED AS NOTED ON THIS PLAN.
6. TYPE AND INSTALLATION OF THE WATER METER AND BACK FLOW PREVENTION DEVICE SHALL BE DETERMINED BY THE GOVERNING AUTHORITY. AN ISOLATION VALVE SHALL BE PROVIDED BETWEEN THE WATER METER AND BACK FLOW DEVICE.
7. ALL CALCULATIONS FOR THIS IRRIGATION SYSTEM ARE BASED ON PRODUCTS AND EQUIPMENT INFORMATION PROVIDED BY HUNTER. INSTALLATION OF THESE PRODUCTS SHALL NOT EXCEED MANUFACTURERS RECOMMENDATIONS.
8. REFERENCE HUNTER GUIDELINES AND SPECIFICATIONS PRIOR TO INSTALLATION. CONFIRM REQUIREMENTS FOR CONTROLLER, WATERPROOF CONNECTIONS, GROUNDING, SURGE PROTECTORS, DECODERS, VALUES, AND WIRING PRIOR TO INSTALLATION. HUNTER TECHNICAL SERVICES (760) 591-7383. WWW.HUNTERINDUSTRIES.COM
9. SPRAY HEADS LOCATED IN TURF AREAS SHALL BE HUNTER PROS-06-PRS30 SPRAY BODIES WITH PRO ADJUSTABLE NOZZLES, FIXED ARC NOZZLES, AND STRIP PATTERN NOZZLES. SEE RADIUS AS INDICATED ON THE PLAN.
10. MP ROTATOR HEADS SHALL BE PROS-06-PRS40 SPRAY BODIES WITH MP1000, MP2000, MP3000, MP3500, MPRSS530, MPRCS515, AND MPLCS515 NOZZLES. RADIUS LESS THAN 12 FEET SHALL BE PRS30 AND PRS40 SPRAY BODIES WITH MP800SR. MP ROTATOR AREAS WITH LESS THAN 90 DEGREES SHALL BE MP CORNER NOZZLES. SEE RADIUS AS INDICATED ON THE PLAN.
11. IRRIGATION ROTOR HEADS SHALL BE PGP ULTRA MODELS PGP-06-PRB WITH MPR NOZZLES. SEE RADIUS AS INDICATED ON THE PLAN.
12. IRRIGATION REMOTE CONTROL VALVES SHALL BE 1" AND/OR 1.5" HUNTER ICV AS INDICATED. PRIOR TO ALL REMOTE CONTROL VALVES, INSTALL A NOMINALLY SIZED BALL VALVE WITHIN THE SAME BOX.
13. SIZE OF VALVES ARE AS SHOWN ON PLAN. VALVES SHALL BE INSTALLED IN APPROVED BOXES WITH COVERS LARGE ENOUGH TO PERMIT MANUAL OPERATION, REMOVAL OF SOLENOID AND / OR VALVE COVER WITHOUT ANY EARTH EXCAVATION. OWNERS MAY ELECT LOCKING BOXES ON A PROJECT BY PROJECT BASIS.
14. QUICK COUPLING VALVES SHALL BE HUNTER INSTALLED PER DETAIL SHOWN. SWING JOINTS SHALL BE CONSTRUCTED USING ½" SCHEDULE 80 ELBOWS. CONTRACTOR SHALL SUPPLY OWNER WITH TWO (2) HQ-3-RC COUPLERS WITH (2) HK-33 KEYS AND TWO (2) HS-0 HOSE SWIVELS AS PART OF THIS CONTRACT.
15. IRRIGATION SYSTEM AUTOMATIC CONTROLLER SHALL BE HUNTER ICC2 (REFERENCE OTHERS/PREVIOUS DESIGN FOR LOCATION). USE TWO-WIRE EZDM DECODER SYSTEM. USE EZ-1 SINGLE-STATION DECODER WITH STATUS LED PER ZONE. INSTALL RAIN AND FREEZE SENSORS. INSTALL PER MANUFACTURERS RECOMMENDATIONS. USE HUNTER MODEL DUAL-S SURGE ARRESTORS AND CONNECT THE SURGE ARRESTOR GROUND WIRE TO EARTH GROUND HARDWARE. CONFIRM WIRING, GROUNDING AND SURGE PROTECTION REQUIREMENTS BEFORE INSTALLING.
16. DRIP IRRIGATION REMOTE CONTROL ZONE VALVES SHALL BE NETAFIM LVCZS8010075-LF (.25 to 4.4 GPM), LVCZ10075-HFHP (4.5 to 17.6 GPM), OR LVCZ150HP (11.0 to 35.0 GPM).
17. DRIP TUBING SHALL BE NETAFIM TECHLINE CV XR DRIPLIEN; PRODUCT TLCVXR-6-12. DRIP TUBING SHALL BE SPACED 18" APART IN SHRUB AREAS. REFER TO MANUFACTURERS RECOMMENDATIONS.
18. INSTALL DRIP TUBING/LINES PER MANUFACTURERS RECOMMENDATIONS. USE NETAFIM 12MM AND 17MM BARBED FITTINGS; OR NETAFIM 12MM AND 17MM TECHLOCK FITTINGS. USE OPERATIONAL INDICATOR MODEL 10-F-01. USE NETAFIM FLUSH VALVE MODEL TL050MFV-1 OR TLFV-1. USE NETAFIM AIR VACUUM RELIEF AIR VENT MODEL TLAVRV.
19. TREE BUBBLERS SHALL USE HUNTER PROS-06-PRS30 BODIES WITH HUNTER MULTI-STREAM BUBBLERS MODEL MSBN-50H NOZZLES.
20. ALL VALVE CONTROL WIRE SHALL BE SIZED PER MANUFACTURER GUIDELINES BY THE CONTRACTOR ACCORDING TO THE ACTUAL FIELD DISTANCE. ALL CONNECTIONS SHALL BE WATER-PROOF, KEPT TO A MINIMUM, AND LOCATED IN AN APPROVED BOX.

NOTE:
1. ENTIRE SYSTEM SHALL BE INSTALLED PER TCEQ STANDARDS, MANUFACTURER'S SPECIFICATIONS AND ALL CITY CODES.

2. THIS DESIGN IS DIAGRAMMATIC, ALL PIPING, VALVES, AND OTHER EQUIPMENT SHOWN WITHIN PAVED AREAS OR OUT OF PROPERTY BOUNDARIES ARE FOR DESIGN CLARIFICATION ONLY, AND SHALL BE INSTALLED IN PLANTING AREAS WITHIN THE PROPERTY LINES OR LIMITS INDICATED ON PLAN. THE IRRIGATION CONTRACTOR SHALL VERIFY THE LOCATIONS OF ALL ABOVE GROUND IRRIGATION EQUIPMENT WITH THE OWNER'S AUTHORIZED REPRESENTATIVE PRIOR TO INSTALLATION, OR IRRIGATION CONTRACTOR MAY BE REQUIRED TO MOVE SUCH ITEMS AT HIS OWN COST.

3. VARIOUS AREAS ON PLAN ARE SHOWING SINGLE HEAD COVERAGE. IF OWNER SHOULD ELECT FOR FULL COVERAGE, CONTRACTOR TO PROCURE THE PROPER PERMITS AND BID ALTERNATE FOR THESE ADDITIONAL SPRAY HEADS, ZONES, AND CONTROLLER EXPANSION FOR THE SYSTEM.

4. IRRIGATION CONTRACTOR IS TO COORDINATE LOCATION AND PLACEMENT OF ALL IRRIGATION ITEMS WITH THE GENERAL CONTRACTOR. CONTRACTOR IS TO USE EXTREME CAUTION IN TRENCHING TO AVOID EXISTING AND PROPOSED UTILITIES. CONTRACTOR TO LOCATE ALL UTILITIES PRIOR TO IRRIGATION INSTALLATION.

5. IRRIGATION SPRAY NOZZLES TO BE ADJUSTED TO AVOID PAVEMENT, BUILDING, WALLS, FENCES, UTILITIES, EQUIPMENT, SIGNAGE, AND CALL BOX

6. REFERENCE LANDSCAPE PLAN FOR LOCATION OF GRAVEL, STEEL EDGING AND ALL PROPOSED PLANT MATERIAL.

7. IN TURF AREAS (BOTH SOD AND HYDROMULCH AREAS) OUTSIDE OF IRRIGATION PERMANENT COVERAGE, CONTRACTOR TO PROVIDE TEMPORARY IRRIGATION UNTIL ESTABLISHED, TYP.

8. CONTRACTOR TO TAKE ALL NECESSARY MEASURES TO PREVENT WATER HAMMER AND SYSTEM COLLAPSE BY DISCHARGING AIR DURING STARTUP AND ALLOWING AIR TO ENTER DURING SHUTDOWN. INSTALL THRUST BLOCKS AND AIR/VACUUM RELIEF VALVES AS NECESSARY TO PROTECT MAINLINE SYSTEM. FOR 3 INCH AND LARGER MAINLINE, INSTALL JOINT RESTRAINTS AT TURNS. INSTALL PER MANUFACTURE'S RECOMMENDATIONS.

9. ALL MAINLINE PIPING 3 INCHES AND LARGER SHALL BE BELL AND GASKETED CLASS 200 PVC PIPE, SDR 21. INSTALL PER MANUFACTURERS RECOMMENDATIONS. CONTACT MANUFACTURE OR DISTRIBUTOR FOR PRODUCT DEMONSTRATION.

10. GROUP VALVES IN FIELD AS NECESSARY FOR MAINLINE SIZING. CENTER FEED LATERALS WHEN POSSIBLE.

ADDITIONAL CITY NOTES TO CONTRACTOR:
1. ALL VALVE BOXES TO INCLUDE BOLTS, NUTS AND WASHERS.
2. NO CLASS PIPE FOR PIPE UNDER 3 INCHES.
3. REMOVE TEMPORARY IRRIGATION AFTER SEED IS ESTABLISHED.

NOTE TO CONTRACTOR:
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STATE OF TEXAS
CODY S RICHARDSON
23713
LICENSED IRRIGATOR

06/24/2025

MEMORIAL DRIVE ROUNDABOUT
PROJECT ROUNDABOUT
GEORGETOWN, TEXAS

Drawing File Name
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Issue Date: 6-24-25

Drawn By: LD
Reviewed By: JW

Project No. 230016 - PADA

IRRIGATION NOTES

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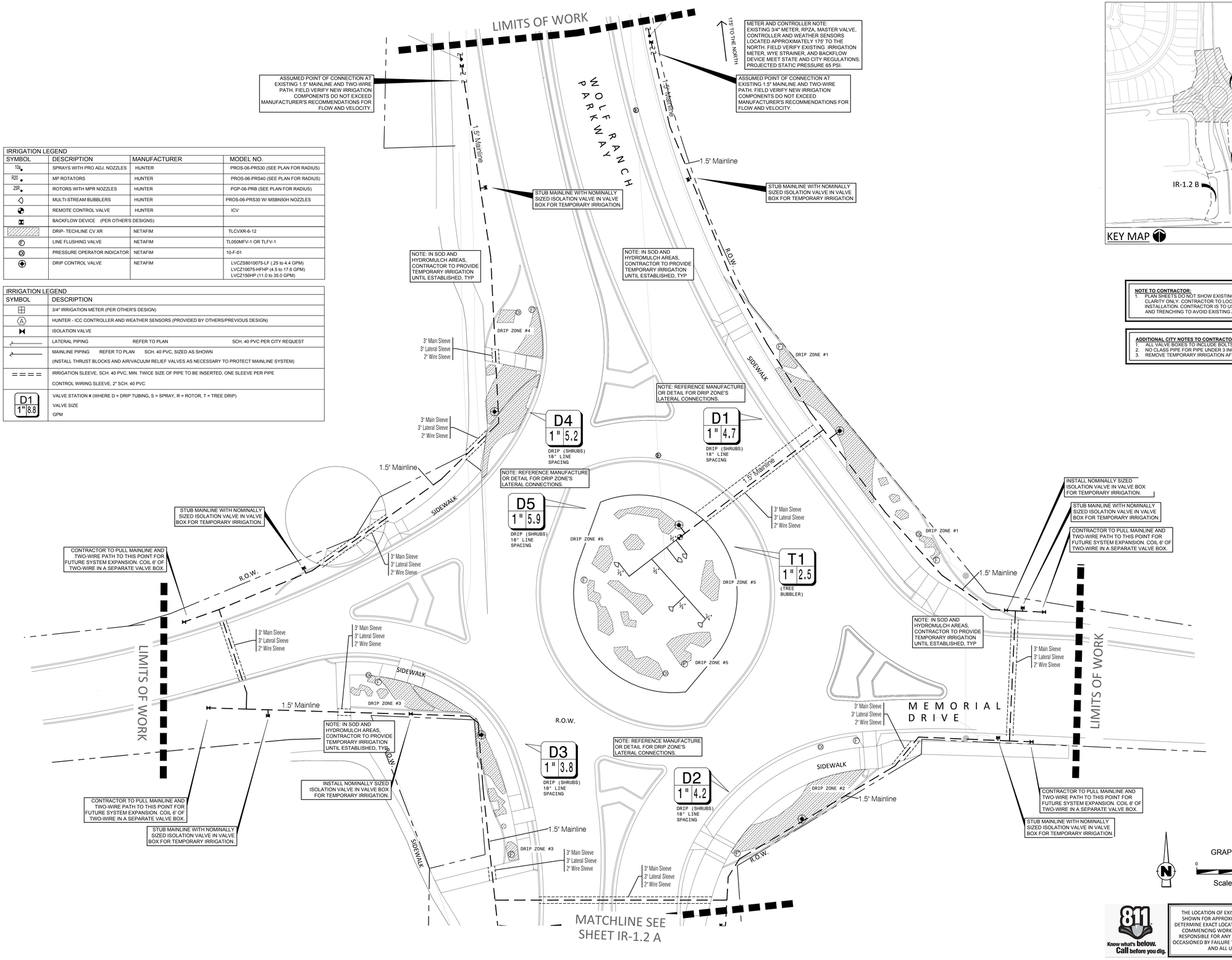
IRRIGATION LEGEND			
SYMBOL	DESCRIPTION	MANUFACTURER	MODEL NO.
10a	SPRAYS WITH PRO ADJ. NOZZLES	HUNTER	PROS-06-PRS30 (SEE PLAN FOR RADIUS)
R20	MP ROTATORS	HUNTER	PROS-06-PRS40 (SEE PLAN FOR RADIUS)
25R	ROTORS WITH MPR NOZZLES	HUNTER	PGP-06-PRB (SEE PLAN FOR RADIUS)
	MULTI-STREAM BUBBLERS	HUNTER	PROS-06-PRS30 W/ MSBN50H NOZZLES
	REMOTE CONTROL VALVE	HUNTER	ICV
	BACKFLOW DEVICE (PER OTHER'S DESIGNS)		
	DRIP- TECHLINE CV XR	NETAFIM	TLCVXR-6-12
F	LINE FLUSHING VALVE	NETAFIM	TL050MFV-1 OR TLFV-1
PI	PRESSURE OPERATOR INDICATOR	NETAFIM	10-F-01
	DRIP CONTROL VALVE	NETAFIM	LVCZS8010075-LF (.25 to 4.4 GPM) LVCZ10075-HFHP (4.5 to 17.6 GPM) LVCZ150HP (11.0 to 35.0 GPM)

IRRIGATION LEGEND	
SYMBOL	DESCRIPTION
	3/4" IRRIGATION METER (PER OTHER'S DESIGN)
A	HUNTER - ICC CONTROLLER AND WEATHER SENSORS (PROVIDED BY OTHERS/PREVIOUS DESIGN)
	ISOLATION VALVE
	LATERAL PIPING REFER TO PLAN SCH. 40 PVC PER CITY REQUEST
	MAINLINE PIPING REFER TO PLAN SCH. 40 PVC, SIZED AS SHOWN (INSTALL THRUST BLOCKS AND AIR/VACUUM RELIEF VALVES AS NECESSARY TO PROTECT MAINLINE SYSTEM)
	IRRIGATION SLEEVE, SCH. 40 PVC, MIN. TWICE SIZE OF PIPE TO BE INSERTED, ONE SLEEVE PER PIPE CONTROL WIRING SLEEVE, 2" SCH. 40 PVC
D1 1" 8.8	VALVE STATION # (WHERE D = DRIP TUBING, S = SPRAY, R = ROTOR, T = TREE DRIP) VALVE SIZE GPM



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GRAPHIC SCALE
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Scale 1"=20' - 0"

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STATE OF TEXAS
CODY S RICHARDSON
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LICENSED IRRIGATOR

06/24/2025

MEMORIAL DRIVE
PROJECT ROUNDABOUT
GEORGETOWN, TEXAS

Drawing File Name
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Reviewed By: JW

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IRRIGATION PLAN

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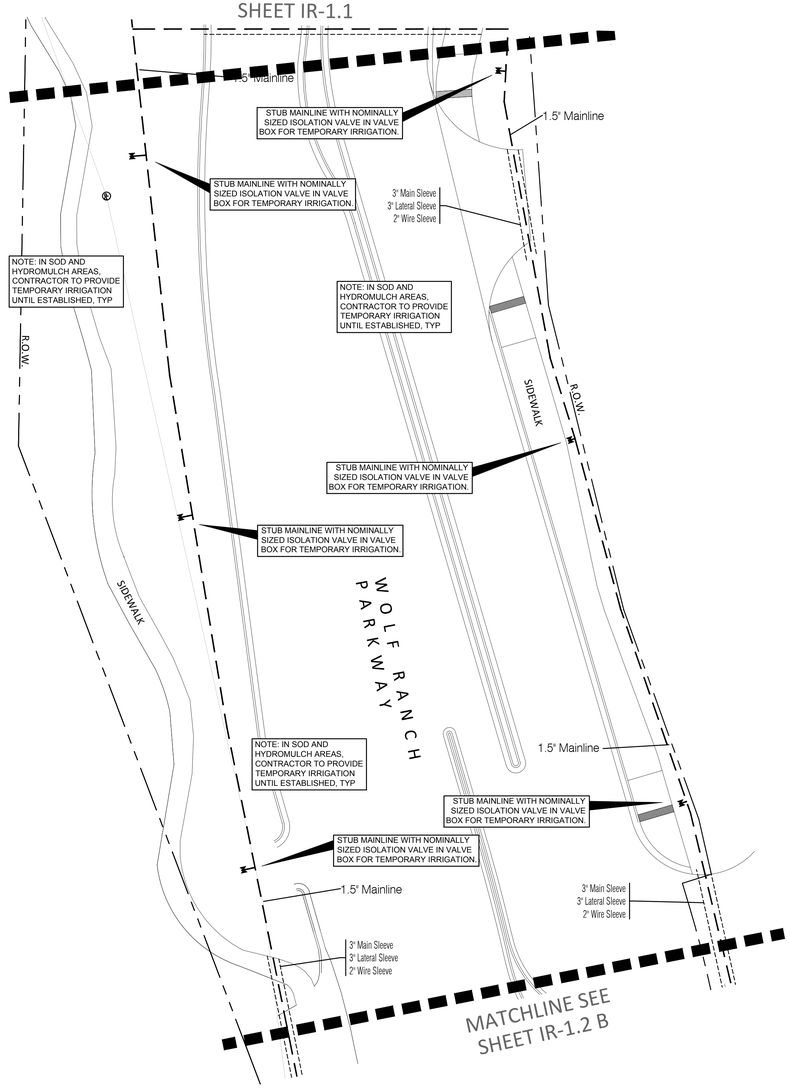
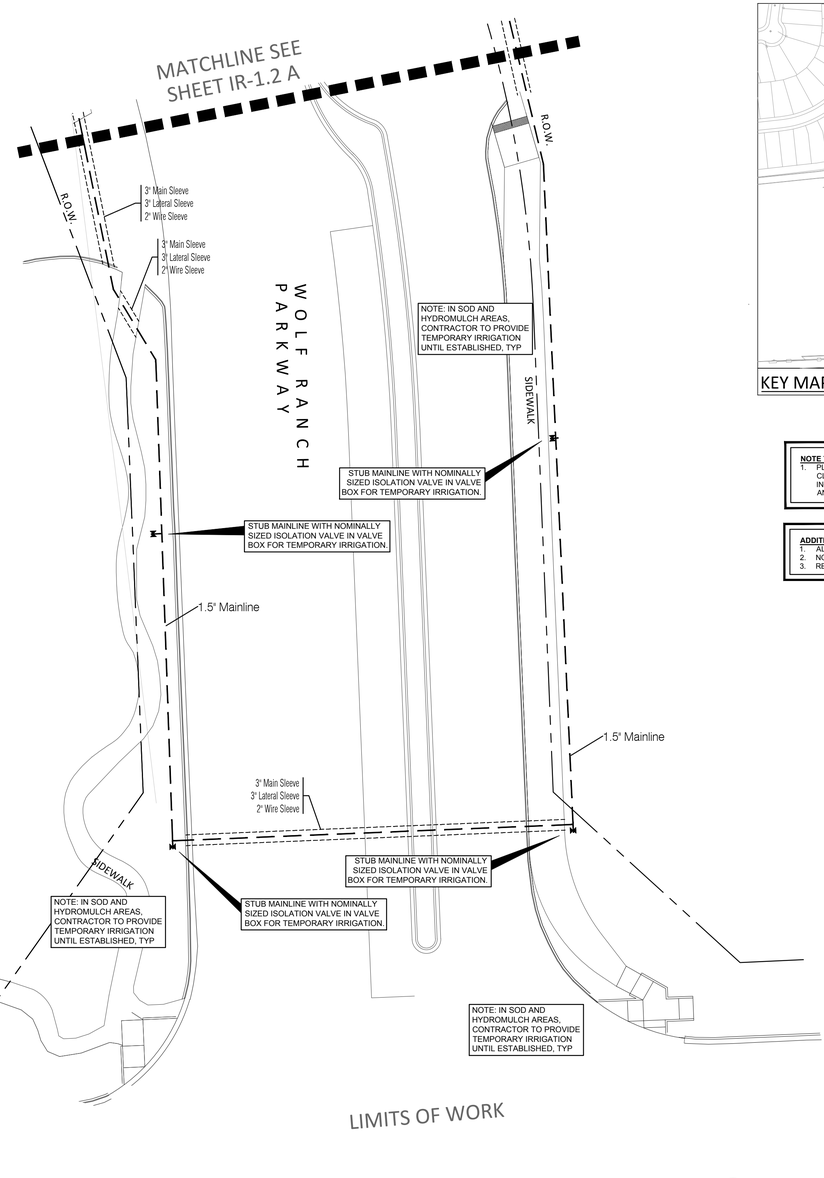


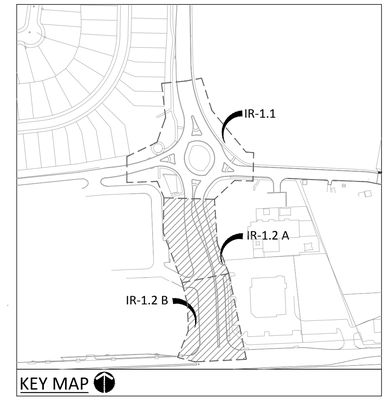
A IRRIGATION PLAN
SCALE: 1" = 20'-0"

NORTH



B IRRIGATION PLAN
SCALE: 1" = 20'-0"

NORTH



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IRRIGATION PLAN

Sheet No.
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SECTION 32 8423 - UNDERGROUND IRRIGATION SLEEVES AND UTILITY CONDUITS

PART 1 - GENERAL

1.1 DESCRIPTION

A. PROVIDE UNDERGROUND IRRIGATION SLEEVES AS INDICATED ON THE DRAWINGS.

1.2 RELATED WORK

A. SECTION 32 8424 - IRRIGATION SYSTEM.

1.3 REFERENCE STANDARDS

A. AMERICAN STANDARD FOR TESTING AND MATERIALS (ASTM) - LATEST EDITION.

PART 2 - MATERIALS

2.1 GENERAL

A. POLYVINYL CHLORIDE PIPE (PVC) - SCHEDULE 40 SHALL BE USED FOR ALL SLEEVING PURPOSES.

B. PVC PIPES SHALL BE MARKED WITH SDR NUMBER, ASTM STANDARD NUMBER, AND THE NSF SEAL.

C. SOLVENT SHALL BE USED AS RECOMMENDED BY MANUFACTURER TO MAKE SOLVENT WELDED JOINTS. PIPE AND FITTINGS SHOULD BE CLEANED BEFORE APPLYING SOLVENT.

PART 3 - EXECUTION

3.1 INSTALLATION

A. A MINIMUM OF TWENTY FOUR (24) INCHES COVER SHALL BE PROVIDED OVER THE TOP OF SLEEVE FROM FINISH GRADE.

B. SLEEVES SHALL BE EXTENDED ONE (1) FOOT PAST THE EDGE OF PAVEMENT OF WALLS. INSTALL A NINETY DEGREE ELBOW ON EACH SLEEVE AND ADD ADDITIONAL LENGTH TO EXTEND ABOVE FINISH GRADE BY TWELVE (12) INCHES. CAP PIPE ENDS.

3.2 BACKFILL

A. BACKFILL SHALL BE PLACED OVER SLEEVES IN SIX (6) INCH LIFTS. SOIL SHALL BE TAMPED INTO PLACE, TAKING CARE TO NOT DAMAGE SLEEVE.

B. REPAIR ANY DAMAGE FROM IMPROPER COMPACTION.

END OF SECTION

SECTION 32 8424 - IRRIGATION SYSTEM

PART 1 - GENERAL

1.1 DESCRIPTION

A. PROVIDE A COMPLETE IRRIGATION SYSTEM INSTALLATION AS DETAILED AND SPECIFIED. THIS SHALL INCLUDE FURNISHING ALL LABOR, MATERIAL, EQUIPMENT AND SERVICES NECESSARY TO PROVIDE COMPLETE INSTALLATION. WORK INCLUDES:

a. TRENCHING

b. BACKFILL

c. AUTOMATIC CONTROLLED SYSTEM

d. AS BUILT DRAWINGS

B. SLEEVING AS SHOWN SHALL BE FURNISHED BY THE GENERAL CONTRACTOR.

C. METER AND POWER SHALL BE PROVIDED BY THE GENERAL CONTRACTOR.

1.2 RELATED WORK

C. REFERENCE IRRIGATION PLANS FOR CONTROLLER, HEAD AND ALL VALVE LOCATIONS.

D. REFERENCE LANDSCAPE PLANS, NOTES, DETAILS FOR ADDITIONAL REQUIREMENTS.

E. SECTION 32 9300 - LANDSCAPE

F. SECTION 32-8423 - UNDERGROUND IRRIGATION SLEEVE AND UTILITY CONDUITS

1.3 REFERENCE STANDARDS

A. AMERICAN STANDARD FOR TESTING AND MATERIALS (ASTM) - LATEST EDITION.

1.4 QUALITY ASSURANCE AND REQUIREMENTS

A. PERMITS AND FEES: THE CONTRACTOR SHALL OBTAIN AND PAY FOR ANY PERMITS NECESSARY AND ALL OBSERVATIONS AS REQUIRED.

B. MANUFACTURER'S DIRECTIONS: MANUFACTURER'S DIRECTIONS AND DETAILED DRAWINGS SHALL BE FOLLOWED IN ALL CASES WHERE THE MANUFACTURERS OF ARTICLES USED IN THIS CONTRACT FURNISH DIRECTIONS COVERING POINTS NOT SHOWN IN THE DRAWINGS AND SPECIFICATIONS.

C. ORDINANCES, CODES, AND REGULATIONS: ALL LOCAL, MUNICIPAL AND STATE LAWS, AND RULES AND REGULATIONS GOVERNING OR RELATING TO ANY PORTION OF THIS WORK ARE HEREBY INCORPORATED INTO AND MADE A PART OF THESE SPECIFICATIONS, AND THEIR PROVISIONS SHALL BE CARRIED OUT BY THE CONTRACTOR. ANYTHING CONTAINED IN THESE SPECIFICATIONS SHALL NOT BE CONSTRUED TO CONFLICT WITH ANY OF THE ABOVE RULES AND REGULATIONS AND REQUIREMENTS OF THE SAME.

D. HOWEVER, WHEN THESE SPECIFICATIONS AND DRAWINGS CALL FOR OR DESCRIBE MATERIALS, WORKMANSHIP, OR CONSTRUCTION OF A BETTER QUALITY, HIGHER STANDARD OR LARGER SIZE THAN IS REQUIRED BY THE ABOVE RULES AND REGULATIONS, THESE SPECIFICATIONS AND DRAWINGS SHALL TAKE PRECEDENCE.

1.5 SCHEDULE OF MATERIALS

A. MATERIALS LIST:

a. ALL EQUIPMENT MANUFACTURERS AND MODEL NUMBERS SHALL BE AS NOTED ON THE PLANS.

b. THE CONTRACTOR SHALL FURNISH THE ARTICLES, EQUIPMENT, MATERIALS, OR PROCESSES SPECIFIED BY NAME IN THE DRAWINGS AND SPECIFICATIONS. NO SUBSTITUTION WILL BE ALLOWED WITHOUT PRIOR WRITTEN APPROVAL OF THE LANDSCAPE ARCHITECT.

c. A COMPLETE MATERIAL LIST OF EQUIPMENT SHALL BE SUBMITTED BEFORE PERFORMING ANY WORK. SUBMITTAL SHOULD INCLUDE ALL MANUFACTURERS' SPECIFICATIONS AND LITERATURE FOR APPROVAL BY THE LANDSCAPE ARCHITECT PRIOR TO INSTALLATION.

d. EQUIPMENT OR MATERIALS INSTALLED OR FURNISHED WITHOUT PRIOR APPROVAL OF THE LANDSCAPE ARCHITECT MAY BE REJECTED.

e. APPROVAL OF ANY ITEM, ALTERNATE OR SUBSTITUTE INDICATES ONLY THAT THE PRODUCT OR PRODUCTS APPARENTLY MEET THE REQUIREMENTS OF THE DRAWINGS AND SPECIFICATIONS ON THE BASIS OF THE INFORMATION OR SAMPLES SUBMITTED.

f. MANUFACTURER'S WARRANTIES SHALL NOT RELIEVE THE CONTRACTOR OF HIS LIABILITY UNDER THE GUARANTEE. SUCH WARRANTIES SHALL ONLY SUPPLEMENT THE GUARANTEE.

1.4 RECORD AND AS BUILT DRAWINGS/SUBMITTALS

A. CONTRACTOR SHALL PROVIDE AND KEEP UP TO DATE AND COMPLETE "AS-BUILT" RECORD SET OF PRINTS.

B. CONTRACTOR SHOULD USE ALL SYMBOLS AND NOTATIONS CONSISTENT WITH THE ORIGINAL DRAWINGS.

C. IN "AS-BUILT" DRAWINGS, CONTRACTOR SHALL LOCATE:

a. CONNECTION TO EXISTING WATER LINES

b. CONNECTION TO ELECTRICAL POWER

c. GATE VALVES

d. ROUTING OF SPRINKLER PRESSURE LINES

e. SPRINKLER CONTROL VALVES

f. QUICK COUPLING VALVES

g. OTHER RELATED EQUIPMENT

D. SUBMIT COMPLETED TRACINGS PRIOR TO FINAL ACCEPTANCE. DATE AND SIGN ALL DRAWINGS.

E. EQUIPMENT TO BE FURNISHED:

a. SUPPLY AS PART OF THIS CONTRACT THE FOLLOWING TOOLS:

i. QUICK COUPLING KEYS, THREE (3) WITH BOILER DRAINS ATTACHED USING BRASS REDUCER.

ii. THREE (3) KEYS FOR EACH AUTOMATIC CONTROLLER

b. THE ABOVE MENTIONED EQUIPMENT SHALL BE TURNED OVER TO THE OWNER AT THE CONCLUSION OF THE PROJECT.

F. THE IRRIGATION CONTRACTOR SHOULD DEMONSTRATE THAT THE FINAL INSTALLED SYSTEM WILL OPERATE ACCORDING TO THE INTENT OF THE DESIGNED AND SPECIFIED SYSTEM. IRRIGATION CONTRACTOR SHALL GUARANTEE 100% COVERAGE TO ALL AREAS TO BE IRRIGATION.

1.5 MAINTENANCE AND GUARANTEE

A. MAINTENANCE AND WORKMANSHIP SHALL BE GUARANTEED FULLY FOR ONE (1) YEAR AFTER FINAL ACCEPTANCE.

B. PROVIDE MAINTENANCE OF SYSTEM, CLEANING AND ADJUSTMENT OF THE HEADS, FOR ONE (1) YEAR AFTER COMPLETION OF INSTALLATION.

C. GUARANTEE IS LIMITED TO REPAIR AND REPLACEMENT OF DEFECTIVE MATERIALS AND WORKMANSHIP, INCLUDING THE REPAIR OF BACKFILL SETTLEMENT.

1.6 TESTING

A. PERFORM TESTING REQUIRED WITH OTHER TRADES INCLUDING EARTHWORK, PAVING, PLUMBING, ETC. TO AVOID CUTTING, PATCHING OR BORING.

B. WATER PRESSURE SHOULD BE FOUND PRIOR TO STARTING CONSTRUCTION. DETERMINE/CONFIRM THAT STATIC WATER PRESSURE IS MORE THAN THE WATER PRESSURE NEEDED FOR THE SYSTEM TO FUNCTION PROPERTY. IF STATIC PRESSURE IS LESS THAN THE DESIGN PRESSURE NEEDED, DO NOT START WORK UNTIL THE LANDSCAPE ARCHITECT IS NOTIFIED.

1.7 COORDINATION

A. COORDINATE INSTALLATION OF ALL PRODUCTS, INCLUDING EARTHWORK, PAVING AND PLUMBING.

B. COORDINATE TO ENSURE THAT ELECTRICAL POWER SOURCE IS IN PLACE.

C. COORDINATE INSTALLATION WITH WORK SPECIFIED IN OTHER SECTIONS.

D. COORDINATE WITH THE LANDSCAPE CONTRACTOR TO ENSURE PLANT MATERIAL IS UNIFORMLY WATERED IN ACCORDANCE WITH INTENT SHOWN ON DRAWINGS.

PART 2 - PRODUCTS

2.1 MATERIALS

B. REFER TO CONSTRUCTION DRAWINGS AND NOTES.

C. SPRINKLER HEADS IN LAWN AREAS AS SPECIFIED ON PLAN

D. PVC PIPE: CLASS 200 SPR 21

E. COPPER TUBING (FOR CITY CONNECTIONS): TYPE "M"

F. 24V WIRE - SIZE 14, TYPE UF

G. ELECTRIC VALVES TO BE ALL PLASTIC CONSTRUCTION AS INDICATED ON PLANS.

H. REFER TO DRAWING FOR BACKFLOW PREVENTION LOCATION - COORDINATE EXACT LOCATION WITH THE GENERAL CONTRACTOR.

PART 3 - EXECUTION

3.1 INSPECTION:

A. SITE CONDITIONS:

a. ALL SCALED DIMENSIONS ARE APPROXIMATE. THE CONTRACTOR SHALL CHECK AND VERIFY ALL SIZE DIMENSIONS.

b. EXERCISE EXTREME CARE IN EXCAVATING AND WORKING NEAR UTILITIES. CONTRACTOR SHALL BE RESPONSIBLE FOR DAMAGES TO UTILITIES WHICH ARE CAUSED BY ANY OF HIS OPERATIONS OR NEGLECT.

c. COORDINATE INSTALLATION OF IRRIGATION MATERIALS, INCLUDING PIPE, SO THERE SHALL BE NO INTERFERENCE WITH UTILITIES OR OTHER CONSTRUCTION DIFFICULTY IN PLANTING TREES, SHRUBS, AND GROUNDCOVERS. COORDINATE WORK WITH OTHER SITE CONTRACTORS.

3.2 PREPARATION

A. PHYSICAL LAYOUT:

a. PIPING AND HEAD LAYOUT AS SHOWN ON PLANS IS SCHEMATIC ONLY. ALL PIPES TO BE INSTALLED DIRECTLY BEHIND CURBS, WALKS AND WALLS WHEREVER POSSIBLE.

b. PRIOR TO INSTALLATION CONTRACTOR SHALL STAKE OUT ALL PRESSURE SUPPLY LINES, ROUTING AND LOCATION OF SPRINKLER HEADS.

c. ALL LAYOUTS SHALL BE APPROVED BY THE LANDSCAPE ARCHITECT OR OWNER'S REPRESENTATIVE PRIOR TO INSTALLATION.

B. WATER SUPPLY:

a. IRRIGATION SYSTEM SHALL BE CONNECTED TO WATER SUPPLY POINTS OF CONNECTION AS INDICATED ON THE DRAWINGS.

b. CONNECTIONS SHOULD BE MADE AT APPROXIMATE LOCATIONS AS SHOWN ON DRAWINGS. CONTRACTOR SHALL VERIFY IN FIELD AND BE RESPONSIBLE FOR MINOR CHANGES CAUSED BY ACTUAL SITE CONDITIONS.

3.3 INSTALLATION

A. TRENCHING

a. DIG TRENCHES STRAIGHT 6" WIDE WITH NEAR VERTICAL SIDE AND SUPPORT PIPE CONTINUOUSLY ON BOTTOM OF TRENCH. REMOVE LUMBER, RUBBISH, LARGE ROCKS ETC. FROM TRENCHES. LAY PIPE TO AN EVEN GRADE - WITH A FIRM, UNIFORM BEARING FOR ENTIRE LENGTH OF PIPE.

b. REMOVE FOREIGN MATTER OR DIRT FROM INSIDE OF PIPE BEFORE WELDING AND KEEP PIPING CLEAN BY ANY MEANS POSSIBLE DURING AND AFTER LAYING OF PIPE.

c. PROVIDE A MINIMUM OF EIGHTEEN (18) INCHES OF COVER FOR ALL PRESSURE SUPPLY LINES.

d. PROVIDE A MINIMUM OF TWELVE (12) INCHES OF COVER FOR ALL NON-PRESSURE LINES.

e. PROVIDE A MINIMUM COVER OF EIGHTEEN (18) INCHES FOR ALL CONTROL WIRING.

f. NO MACHINE TRENCHING, UNLESS APPROVED BY THE LANDSCAPE ARCHITECT, SHALL BE DONE WITHIN DRIP LINE OF EXISTING TREES. TRENCHING SHOULD BE DONE BY HAND, TUNNELING OR BORING OR OTHER METHODS APPROVED BY THE LANDSCAPE ARCHITECT. IT SHOULD BE UNDERSTOOD THAT PIPING LAYOUT IS DIAGRAMMATIC AND PIPING SHALL BE ROUTED AROUND TREES AND SHRUBS IN SUCH A MANNER TO AVOID DAMAGE TO PLANTS.

B. BACKFILL

a. TRENCHES SHALL NOT BE BACKFILLED UNTIL ALL REQUIRED TESTS ARE PERFORMED. TRENCHES SHALL BE CAREFULLY BACKFILLED WITH THE EXCAVATED MATERIALS APPROVED FOR BACKFILLING, CONSISTING OF EARTH, LOAM, SANDY CLAY, SAND OR OTHER APPROVED MATERIALS, FREE FROM LARGE CLODS, STONES OR STICKS.

b. IF SETTLEMENT OCCURS AND SUBSEQUENT ADJUSTMENTS IN PIPE, VALVES, SPRINKLER HEADS, LAWN OR PLANTING OR OTHER CONSTRUCTION ARE NECESSARY, THE CONTRACTOR SHALL MAKE ALL REQUIRED ADJUSTMENTS WITHOUT THE COST TO THE OWNER.

C. TRENCHING AND BACKFILL UNDER PAVING:

a. ALL IRRIGATION MAIN LINE AND LATERAL LINES OR WIRING LOCATED UNDER AREAS WHERE PAVING, ASPHALTIC PAVING, OR CONCRETE SHALL BE INSTALLED IN SCHEDULE 40 PVC SLEEVES OF ADEQUATE SIZE. SEE SECTION 32 8423.

D. ASSEMBLIES

a. INSTALL ALL ASSEMBLIES SPECIFIED HEREIN IN ACCORDANCE WITH RESPECTIVE DETAILS. IN ABSENCE OF DETAIL DRAWINGS OR SPECIFICATIONS, PERFORM SUCH WORK IN ACCORDANCE WITH BEST STANDARD PRACTICES OR MANUFACTURER'S RECOMMENDATIONS AS APPROVED BY THE LANDSCAPE ARCHITECT.

b. MAKE SOLVENT WELDED JOINTS USING ONLY THE SOLVENT RECOMMENDED BY THE MANUFACTURER. PIPES AND FITTINGS SHOULD BE CLEANED OF ALL DIRT AND DUST AND MOISTENED BEFORE APPLYING SOLVENT.

c. ON PVC TO METAL CONNECTIONS, THE CONTRACTOR SHALL WORK METAL CONNECTIONS FIRST. USE NON HARDENING PIPE DOPE OR TEFLON TAPE ON THREADED PVC ADAPTERS INTO WHICH PIPE MAY BE WELDED. LIGHT WRENCH PRESSURE IS ALL THAT IS REQUIRED, USE THREADED PVC ADAPTERS INTO WHICH THE PIPE MAY BE WELDED.

E. LINE CLEARANCE: ALL LINES SHALL HAVE A MINIMUM CLEARANCE OF SIX (6) INCHES FROM EACH OTHER AND FROM OTHER TRADES. PARALLEL LINES SHALL NOT BE DIRECTLY INSTALLED ONE OVER THE OTHER.

F. WIRING: SUPPLY WIRE FROM THE AUTOMATIC CONTROLLER TO ALL THE VALVES. A SEPARATE WIRE IS REQUIRED TO EACH ELECTRIC VALVE. A COMMON NEUTRAL WIRE IS ALSO REQUIRED FROM EACH CONTROL TO EACH OF THE VALVES. BUNDLE MULTIPLE WIRES AND TAPE THEM TOGETHER AT TEN FOOT INTERVALS. EXPANSION COILS OF TEN INCHES SHALL BE INSTALLED APPROXIMATELY EVERY 100 FEET. MAKE ALL SPLICES WATERPROOF.

G. AUTOMATIC CONTROLLER: INSTALL AS PER MANUFACTURER'S SPECIFICATIONS AND INSTRUCTIONS. REMOVE CONTROL VALVES SHALL BE CONNECTED TO CONTROLLER IN NUMERICAL SEQUENCE AS SHOWN ON THE DRAWINGS. EACH REMOVE CONTROL VALVE SHALL BE WIRED TO ONE STATION OF THE CONTROLLER.

H. REMOTE CONTROL VALVES:

a. INSTALL WHERE SHOWN ON DRAWINGS AND DETAILS. VALVES SHALL BE SIZED ACCORDING TO THE DRAWINGS.

b. INSTALL IN A LEVEL POSITION IN ACCORDANCE TO MANUFACTURER'S SPECIFICATIONS.

c. WHEN GROUPED TOGETHER, ALLOW AT LEAST TWELVE (12) INCHES BETWEEN VALVES. INSTALL EACH REMOTE CONTROL VALVE IN A SEPARATE VALVE BOX. EACH VALVE NUMBER AND ITS CONTROLLER LETTER SHALL BE STENCILED INSIDE VALVE BOX TOP WITH EXTERIOR PAINT.

I. FLUSHING OF SYSTEM:

a. AFTER ALL NEW SPRINKLER PIPE LINES AND RISERS ARE IN PLACE AND CONNECTED, ALL NECESSARY WORK HAS BEEN COMPLETED, AND PRIOR TO INSTALLATION OF SPRINKLER HEADS, THE CONTROL VALVES SHALL BE OPENED AND A FULL HEAD OF WATER USED TO FLUSH OUT THE SYSTEM.

b. SPRINKLER HEADS SHALL BE INSTALLED ONLY AFTER FLUSHING OF THE SYSTEM HAS BEEN ACCOMPLISHED.

J. SPRINKLER HEADS:

a. INSTALL HEADS AS DESIGNED ON THE DRAWINGS. MAKE APPROPRIATE ADJUSTMENTS TO HEAD LAYOUT TO ACCOMMODATE FOR ACTUAL FIELD CONDITIONS.

b. SPACING OF HEADS SHALL NOT EXCEED THE MAXIMUM INDICATED ON THE DRAWINGS. IN NO CASE SHALL THE SPACING EXCEED THE MAXIMUM RECOMMENDED BY THE MANUFACTURER.

c. ALL SPRINKLERS TO ATTACH TO LATERAL LINES WITH FLEXIBLE CONNECTORS. REFERENCE DETAILS ON DRAWINGS.

3.4 TESTING

A. THE CONTRACTOR SHALL TEST SPRINKLER MAIN FOR TWELVE TO FOURTEEN HOURS UNDER NORMAL PRESSURE. IF LEAKS ARE PRESENT, REPLACE JOINT OR JOINS AND REPEAT TEST.

B. A COMPLETE TEST SHALL BE MADE PRIOR TO BACKFILLING. BACKFILLING MATERIALS MAY BE PLACED IN TRENCHES IN LIFTS TO ENSURE STABILITY OF THE LINE UNDER THE PRESSURE OF BACKFILL. IN EACH CASE, LEAVE FITTINGS AND COUPLINGS OPEN TO VISUALLY INSPECT FOR FULL PERIOD OF TEST.

C. WHEN SYSTEM IS COMPLETE, A COVERAGE TEST SHALL BE PERFORMED IN THE PRESENCE OF THE LANDSCAPE ARCHITECT OR OWNER'S REPRESENTATIVE. IT SHALL BE DETERMINED IF THE WATER COVERAGE FOR ALL PLANTING AREAS IS COMPLETE AND ADEQUATE. FURNISH ALL MATERIALS AND PERFORM ALL WORK REQUIRED TO CORRECT ANY INADEQUACIES OF COVERAGE.

D. UPON COMPLETION OF EACH PHASE OF WORK, THE ENTIRE SYSTEM SHOULD BE TESTED AND ADJUSTED TO MEET SITE REQUIREMENTS.

END OF SECTION

ADDITIONAL TWO-WIRE INFORMATION

HUNTER TECHNICAL HOTLINE

PLEASE CALL THE HUNTER TECHNICAL HOTLINE NUMBER AT (760) 591-7383

HUNTER RESOURCE GUIDES

GUIDES, INFORMATION, AND MATERIALS FOR IRRIGATION COMPONENTS ARE LOCATED AT HTTPS://WWW.HUNTERINDUSTRIES.COM/RESOURCE-GUIDE

REFERENCE HUNTER DECODER SYSTEMS DESIGN GUIDE, SPECIFICATIONS AND PUBLICATIONS PRIOR TO INSTALLATION. CONFIRM REQUIREMENTS FOR CONTROLLER, WATERPROOF CONNECTIONS, GROUNDING, SURGE PROTECTORS, DECODERS, VALUES, AND WIRING PRIOR TO INSTALLATION. HUNTER TECHNICAL SERVICES (760) 591-7383. WWW.HUNTERINDUSTRIES.COM

EZ DECODER

THE EZ DECODER SYSTEM IS A UNIQUE TWO-WIRE OUTPUT OPTION FOR HUNTER ICC2 AND HCC CONTROLLER MODELS ONLY.

- DO NOT ATTEMPT TO USE THIS SYSTEM WITH ANY OTHER MODEL OR BRAND OF CONTROLLER.
- DO NOT ATTEMPT TO USE EZ-1 DECODERS WITH ANY OTHER DECODER CONTROLLER.

EZ DECODERS ARE DESIGNED TO BE EASY. THEY DO NOT REQUIRE SPECIAL WIRE.

- THEY DO REQUIRE DIRECT BURIAL WIRE OF ADEQUATE SIZE FOR THE DISTANCE OF EACH WIRE RUN (SEE CHART). IT IS EVEN POSSIBLE TO USE EXISTING WIRE FROM "CONVENTIONAL" INSTALLATIONS TO CREATE A TWO- WIRE PATH FOR EZ DECODERS.
- THE EZ DECODER SYSTEM DOES NOT REQUIRE WATERPROOF CONNECTIONS IN ORDER TO OPERATE. HOWEVER, JUST AS IN CONVENTIONAL SYSTEMS, WATERPROOF CONNECTORS SHOULD BE USED TO MAINTAIN THE INTEGRITY OF THE SPLICE AND THE WIRE.

INSTALLING THE EZ-DM IN HUNTER ICC2 AND HCC CONTROLLERS

IF THE WHOLE SYSTEM WILL BE TWO-WIRE, INSTALL THE EZ-DM MODULE IN THE FIRST SLOT IN THE CONTROLLER.

PRESS THE RESET BUTTON ON THE BACK OF THE CONTROLLER FACE PANEL FOR THE NEW MODULE TO BE RECOGNIZED.

- OPEN BLUE LOCK LEVER.
- INSERT MODULE TABS INTO END OF SLOT, AND TIP INTO PLACE.
- CLOSE LOCKING LEVER.
- PRESS CONTROLLER RESET BUTTON. CONTROLLER WILL THEN RECOGNIZE THE NEW MODULE, AND THE CONTROLLER SIZE WILL CHANGE TO 54 STATIONS.

EZ-DM MAY ALSO BE COMBINED WITH ICM-800 AND ICM-400 MODULES FOR "HYBRID" OPERATION. THEY CAN USE "CONVENTIONAL" SOLENOID WIRING AND TWO-WIRE TECHNOLOGY AT THE SAME TIME, UP TO 54 STATIONS MAXIMUM.

IT IS RECOMMENDED TO INSTALL ALL CONVENTIONAL MODULES IN THE LOWER- NUMBERED SLOTS, AND INSTALL THE EZ-DM IN THE NEXT AVAILABLE SLOT.

- THE CONVENTIONAL MODULES WILL OPERATE THE STATION NUMBERS THAT ARE SHOWN ON THE BACKPLANE OF THE CONTROLLER, NEXT TO THE SLOT.
- THE EZ-DM MODULE CAN OPERATE REMAINING STATION NUMBERS UP TO 54 VIA THE TWO-WIRE PATHS.
- DO NOT PROGRAM DUPLICATE STATION NUMBERS WHEN COMBINING CONVENTIONAL MODULES AND THE EZ-DM. IF AN EZ DECODER IS PROGRAMMED TO STATION 1, AND THERE IS A CONVENTIONAL MODULE IN THE FIRST OUTPUT SLOT WITH STATION 1, BOTH STATION "ONES" WILL TURN ON AT THE SAME TIME. THIS MAY CAUSE A STATION ERROR IF IT CAUSES AN OVERLOADED CURRENT CONDITION.
- ONLY PROGRAM DECODER STATION NUMBERS THAT ARE NOT IN USE ON CONVENTIONAL OUTPUT MODULES.

DECODER PROGRAMMING

- EACH EZ-1 DECODER MUST BE PROGRAMMED WITH A STATION NUMBER (OR AS THE P/MV) BEFORE USE.
- INSERT EZ-1 RED AND BLUE WIRES INTO PORTS ON THE EZ-DM OUTPUT MODULE. IT DOES NOT MATTER WHICH COLOR GOES IN WHICH HOLE. USE THE CONTROLLER FACE PANEL (OR REMOTE CONTROL, IF SO EQUIPPED) TO START THE STATION NUMBER YOU WANT TO PROGRAM INTO THE DECODER.
- WHEN THE STATION IS SHOWN RUNNING IN THE CONTROLLER DISPLAY, PRESS THE PRG BUTTON ON THE EZDM. WHEN THE LED ILLUMINATES ON THE DECODER, THE DECODER IS PROGRAMMED WITH THAT STATION'S NUMBER. WRITE THE STATION NUMBER ON THE DECODER LABEL WITH A PERMANENT MARKER. IT IS NOW READY TO INSTALL IN THE TWO-WIRE PATH AT A VALVE LOCATION.

P/MV (PUMP/MASTER VALVE)

TO PROGRAM P/MV OUTPUT FOR DECODER: WITH NO STATIONS RUNNING, CONNECT THE DECODER TO THE PORT, AND PRESS THE PRG BUTTON ON THE EZDM. WHEN THE DECODER LED ILLUMINATES, THE DECODER IS PROGRAMMED AS THE P/MV OUTPUT.

IMPORTANT: CONNECT A JUMPER WIRE FROM THE P/MV TERMINAL ON THE CONTROLLER POWER MODULE, TO THE P/MV TERMINAL ON THE DECODER OUTPUT MODULE, FOR DECODER OPERATION OF P/MV. IF THE P/ MV OUTPUT WILL NOT BE USED, OR IF THE P/MV IS NEARBY AND WILL BE WIRED DIRECTLY TO THE CONTROLLER WITHOUT A DECODER, DO NOT INSTALL A JUMPER WIRE. THE P/MV OUTPUT ON THE CONTROLLER POWER MODULE WILL OPERATE NORMALLY IF THE JUMPER WIRE IS NOT CONNECTED.

TWO-WIRE PATH CONNECTIONS AND RULES

- THE OUTPUT OF THE EZ-DM WIRE PATHS IS 24VAC, 50/60 HZ. VOLTAGE IS ONLY PRESENT ON THE PATHS WHEN STATIONS ARE ACTIVE.
- THE RED AND BLUE WIRE PATH TERMINALS ON THE EZ-DM INDICATE THAT THEY ARE CONNECTED TO THE EZ-1 DECODER RED AND BLUE WIRES, BUT THE WIRE THAT EXTENDS THE TWO-WIRE PATH DOES NOT NEED TO BE COLOR-CODED. IT DOES NOT MATTER IF THE DECODER "RED" CONNECTS TO THE TERMINAL "BLUE."
- THERE IS NO POLARITY ON THE EZ DECODER SYSTEM. USE DIRECT BURIAL-RATED IRRIGATION WIRE.
- THE SIZE OF THE WIRE DETERMINES THE EFFECTIVE DISTANCE OF THE TWO-WIRE PATH.
- SEE THE WIRING TABLE FOR DISTANCE SPECIFICATIONS WITH VARIOUS WIRE SIZES.
- USE IRRIGATION-GRADE WIRE CONNECTORS FOR ALL SPLICES. THEY CAN BE OF THE SAME TYPE USED FOR SOLENOID CONNECTIONS.

CONVERTING EXISTING WIRING

IT IS POSSIBLE TO CONVERT AN EXISTING CONVENTIONALLY WIRED SYSTEM TO EZ DECODER OPERATION BY USING EXISTING WIRE BUNDLES TO CREATE A TWO-WIRE PATH TO EACH VALVE LOCATION AND ADDING AN EZ-1 DECODER AT EACH VALVE.

TEE-SPLICING THE TWO-WIRE PATHS

TEE-SPLICING THE TWO-WIRE PATH IS PERMISSIBLE. USE WATERPROOF CONNECTORS IN A VALVE BOX, AND ADEQUATE SLACK AT THE SPLICES (5 FT/1.5 M) TO INSURE A RELIABLE CONNECTION. SIZE THE WIRE FOR THE MOST DISTANT DECODER FROM THE CONTROLLER.

EARTH GROUNDING

EARTH GROUNDING IS NOT REQUIRED IN THE TWO-WIRE PATH. HOWEVER, IT MAY BE ADDED IN HIGH-LIGHTNING AREAS FOR ADDITIONAL PROTECTION. USE HUNTER MODEL DUAL-S SURGE ARRESTORS AND CONNECT THE SURGE ARRESTOR GROUND WIRE TO EARTH GROUND HARDWARE. EARTH GROUNDING HARDWARE SHOULD CONSIST OF A 8' (2.5 M) COPPER-CLAD STEEL ROD, OR A COPPER PLATE, INSTALLED AT LEAST 8' (2.5 M) AWAY FROM THE TWO-WIRE PATH. PLEASE NOTE PROJECTS IN TEXAS AND OKLAHOMA ARE CONSIDERED HIGH-LIGHTNING AREAS. FOR PROJECTS IN TEXAS AND OKLAHOMA, USE HUNTER MODEL DUAL-S SURGE ARRESTORS EVERY 10 DECODERS OR EVERY 1000' AND AT THE ENDS OF EACH WIRE PATH.

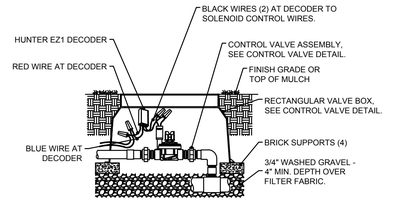
THE ICC2 OR HCC CONTROLLER SHOULD BE GROUNDED TO EARTH WITH THE GROUND ATTACHMENT ON SIDE OF THE TRANSFORMER COVER, TO APPROVED EARTH GROUND HARDWARE, IDEALLY TO A RESISTANCE OF 10 OHMS OR LESS, AS SHOWN IN THE CONTROLLER INSTALLATION INSTRUCTIONS.

OPERATION

EZ DECODERS DO NOT REQUIRE SPECIAL OPERATING PROCEDURES, AND THE PROGRAMMED DECODERS WILL OPERATE EXACTLY LIKE CONVENTIONALLY- WIRED STATIONS. WHEN A DECODER STATION BEGINS TO OPERATE, THE EZ-DM LIGHT WILL BLINK RAPIDLY WHILE FIRST COMMUNICATING, THEN BLINK AT APPROXIMATELY ONE-SECOND INTERVALS DURING THE STATION RUN TIME. WHEN THE EZ-1 DECODER IS ACTIVELY RUNNING, THE DECODER LED WILL ALSO BLINK AT APPROXIMATELY ONE-SECOND INTERVALS. IF THE DECODER LIGHT DOES NOT BLINK WHEN THE CONTROLLER DISPLAY INDICATES THE STATION IS RUNNING, THE DECODER MAY BE EITHER DISCONNECTED OR DAMAGED.

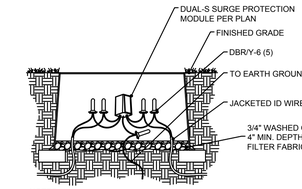
American Wire Gauge	Distance Feet	International Wire mm²	Distance meters
18 AWG	908	0.8 mm²	267
16 AWG	1446	1 mm²	333
14 AWG	2292	1.5 mm²	500
12 AWG	3650	2.5 mm²	833
		4 mm²	1333

NOTE: Distances in the Wiring Table are calculated based on 60 Hz for American Wire Gauge, and 50 Hz for International, with wire temperature of 122°F (50°C), and a 10% safety factor.



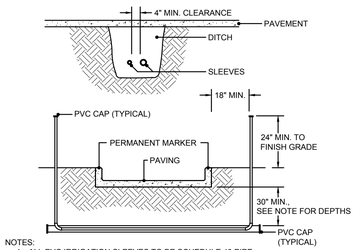
NOTES:
1. INSTALLATION TO BE COMPLETED IN ACCORDANCE WITH MANUFACTURER'S SPECIFICATIONS.
2. CONTROLLER ACCEPTS 120 VOLTS A.C. OR 230 VOLTS A.C.
3. SEE PLAN LEGEND FOR MODEL NUMBER AND SPECIFICATIONS.
4. ALWAYS REFER TO PRODUCT INSTALLATION NOTES PRIOR TO INSTALLATION.

1 EZ-1 DECODER AT CONTROL VALVE
N.T.S.



NOTES:
1. EARTH GROUND TO BE A MINIMUM OF 8' AWAY FROM DUAL-S AND AT A RIGHT ANGLE TO THE TWO WIRE PATH

2 DUAL-S SURGE PROTECTION MODULE
N.T.S.



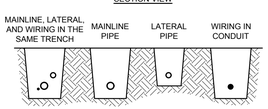
NOTES:
1. ALL PVC IRRIGATION SLEEVES TO BE SCHEDULE 40 PIPE.
2. ALL JOINTS TO BE SOLVENT WELDED AND WATERTIGHT.
3. WHERE THERE IS MORE THAN ONE SLEEVE, EXTEND THE SMALLER SLEEVE TO 24-INCHES MINIMUM ABOVE FINISH GRADE.
4. MECHANICALLY TAMP TO 95% PROCTOR.
5. SLEEVE LOCATIONS SHALL BE MARKED ONTO THE TOP OF CURB WITH A SAWCUT OF TWO PARALLEL LINES THAT ARE 2" LONG AND 1" APART.

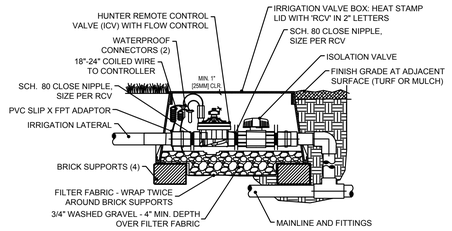
CITY REQUESTED MINIMUM DEPTHS:
1. 12" FOR LATERALS
2. 18" FOR LATERALS UNDER NON VEHICULAR PAVING
3. 24" FOR LATERALS UNDER VEHICULAR PAVING
4. 24" FOR PRESSURIZED LINES UNDER NON VEHICULAR PAVING
5. 30" FOR PRESSURIZED LINES UNDER VEHICULAR PAVING

3 IRRIGATION PVC SLEEVES
N.T.S.

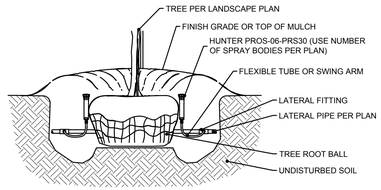
ADDITIONAL CITY NOTES TO CONTRACTOR:
1. ALL VALVE BOXES TO INCLUDE BOLTS, NUTS AND WASHERS.
2. NO CLASS PIPE FOR PIPE UNDER 3 INCHES.
3. REMOVE TEMPORARY IRRIGATION AFTER SEED IS ESTABLISHED.

SECTION VIEW


MAINLINE, LATERAL, A



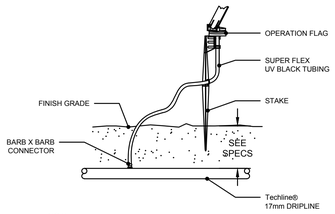
1 **IN-LINE VALVE (ICV) WITH ISOLATION VALVE**
N.T.S.



SECTION VIEW

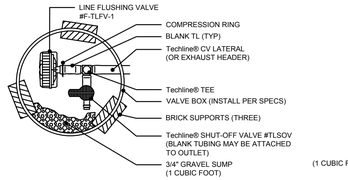
NOTE:
1. PLACE POP-UP BUBBLER DIRECTLY AT THE EDGE OF THE ROOT BALL. ENSURE THAT THE STREAM BUBBLERS SPRAYS DIRECTLY ONTO THE ROOT BALL TO WET THOROUGHLY.
2. SPACE REQUIRED NUMBER OF SPRAY BODIES EQUIDISTANT AROUND EDGE OF ROOT BALL.
2. USE NUMBER OF SPRAY BODIES PER PLAN.

2 **TREE BUBBLER ASSEMBLY WITH HUNTER PROS-06-PRS30**
N.T.S.

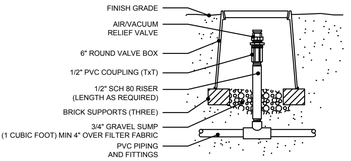


NOTE:
1. LOCATE INDICATOR STAKE AT THE FARTHEST AND/OR HIGHEST POINT ON THE ZONE.

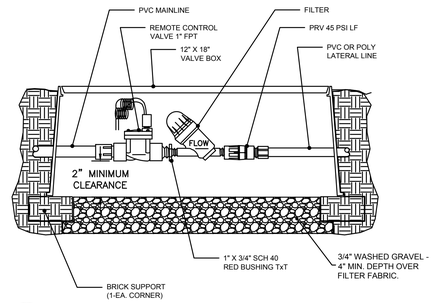
3 **Techline® OPERATION PRESSURE INDICATOR STAKE**
N.T.S.



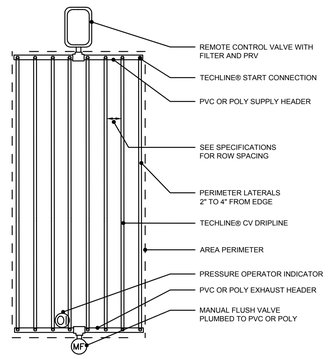
4 **Techline® LINE FLUSHING VALVE WITH SHUT-OF VALVE**
N.T.S.



5 **Techline® AIR/VACUUM RELIEF (PLUMBED TO PVC)**
N.T.S.

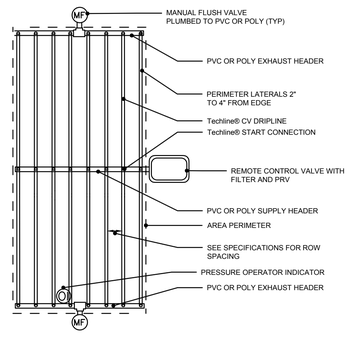


6 **LOW-VOLUME CONTROL ZONE: P/N LVCZS80-10075-LF - 4.4 GPM**
N.T.S.



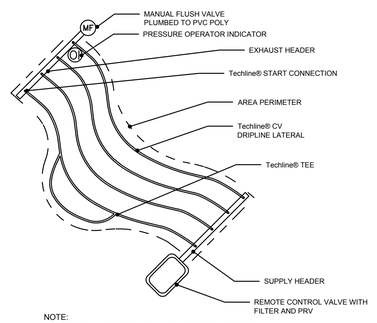
NOTE:
1. RECOMMENDED MINIMUM FILTRATION: 120 MESH
2. PRESSURE AT FLUSH VALVE SHALL BE MIN 14.5 PSI
3. 2 PSI CHECK VALVE (MAX 4.6' OF WATER (ELEVATION CHANGE))
4. REFER TO MAXIMUM LENGTH OF A SINGLE LATERAL CHART

7 **Techline® CV END FEED LAYOUT**
N.T.S.



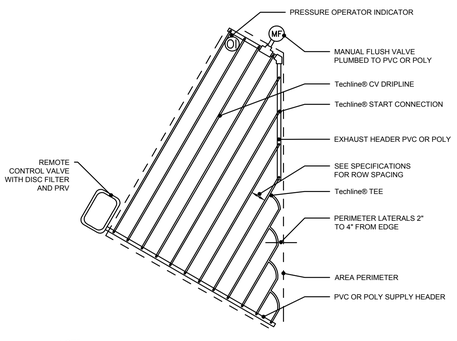
NOTE:
1. RECOMMENDED MINIMUM FILTRATION: 120 MESH
2. PRESSURE AT FLUSH VALVE SHALL BE MIN 14.5 PSI
3. 2 PSI CHECK VALVE (MAX 4.6' OF WATER (ELEVATION CHANGE))
4. REFER TO MAXIMUM LENGTH OF A SINGLE LATERAL CHART

8 **Techline® CV CENTER FEED LAYOUT**
N.T.S.



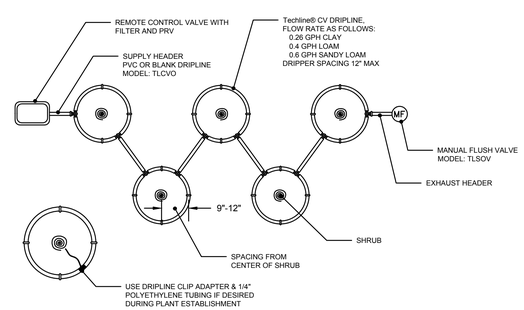
NOTE:
1. RECOMMENDED MINIMUM FILTRATION: 120 MESH
2. PRESSURE AT FLUSH VALVE SHALL BE MIN 14.5 PSI
3. 2 PSI CHECK VALVE (MAX 4.6' OF WATER (ELEVATION CHANGE))
4. REFER TO MAXIMUM LENGTH OF A SINGLE LATERAL CHART

9 **Techline® CV IRREGULAR AREAS: CURVES LAYOUT**
N.T.S.



NOTE:
1. RECOMMENDED MINIMUM FILTRATION: 120 MESH
2. PRESSURE AT FLUSH VALVE SHALL BE MIN 14.5 PSI
3. 2 PSI CHECK VALVE (MAX 4.6' OF WATER (ELEVATION CHANGE))
4. REFER TO MAXIMUM LENGTH OF A SINGLE LATERAL CHART

10 **Techline® CV IRREGULAR AREAS: TRIANGLE LAYOUT**
N.T.S.

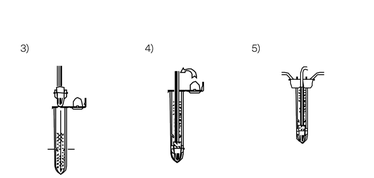


11 **Techline® CV MULTIPLE SHRUB RING LAYOUT**
N.T.S.

3M™ Direct Bury Splice Kit DBR/Y-6

Installation Instructions

Warning
Turn power off before installing or removing connector. All electrical work should be done according to appropriate electrical codes.



1) Strip insulation ¾ in.
2) With wire ends even, insert wires into the connector and tighten until secure.
3) Insert the connector all the way into the tube until the connector rests on the bottom.
4) Fold the wire into the channels.
5) Close the cap.

Installation Tip:
If having difficulty getting the twist-on connector down into the tube when using small gauge wires, use a thin non-conductive object to push the connector to the bottom of the tube. Upon removal of the object, ensure that no voids or water paths remain in the grease.

12 **3M DBR-Y6 Direct Bury Splice Kit DBR/Y-6**
N.T.S.

ADDITIONAL CITY NOTES TO CONTRACTOR:
1. ALL VALVE BOXES TO INCLUDE BOLTS, NUTS AND WASHERS.
2. NO CLASS PIPE FOR PIPE UNDER 3 INCHES.
3. REMOVE TEMPORARY IRRIGATION AFTER SEED IS ESTABLISHED.

811 Know what's below. Call before you dig.

THE LOCATION OF EXISTING UNDERGROUND UTILITIES ARE SHOWN FOR APPROXIMATION ONLY. CONTRACTOR SHALL DETERMINE EXACT LOCATION OF ALL EXISTING UTILITIES BEFORE COMMENCING WORK. CONTRACTOR AGREES TO BE FULLY RESPONSIBLE FOR ANY AND ALL DAMAGES WHICH MIGHT BE OCCASIONED BY FAILURE TO EXACTLY LOCATE AND PRESERVE ANY AND ALL UNDERGROUND UTILITIES.

...NNING
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...A Suite 220
..., TX 78727
...2.246.7003
...secplanning.com
... info@secplanning.com

STATE OF TEXAS
CODY S RICHARDSON
23713
LICENSED IRRIGATOR

06/24/2025

MEMORIAL DRIVE
PROJECT ROUNDABOUT
GEORGETOWN, TEXAS

Drawing File Name
S:\awr\Jobs\2025\25027_Memorial Drive Roundabout, Georgetown\AutoCAD\sheets\25027_Irrigation Details.dwg

Issued:
1. ISSUANCE 3/7/25
2.
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6.

Revisions:
1.
2.
3.
4.

Issue Date: 6-24-25

Drawn By: LD
Reviewed By: JW

Project No.
230016 - PADA

IRRIGATION SPECIFICATIONS AND DETAILS

Sheet No.
IR-1.4 517 of 523

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GENERAL CONSTRUCTION NOTES

1. These drawings and documents are submitted to the Owner of the project for review and approval prior to any release for bidding or construction. Contractors shall receive all bid information, instructions, bid forms, general terms and conditions, and all other required clarification from the Owner's Authorized Representative administering this project. Unless otherwise indicated, the Owner's Representative for this project shall be a specifically designated Landscape Architect from SEC Planning. The contractor will also be required to coordinate and correspond with the Landscape Architect from SEC Planning and key consultants for the Owner.

2. These drawings supplement other contractual information which includes Bid Instructions and Project Specifications. Anything mentioned in the Project Specifications and not in the drawings, or vice-versa, shall be of like effect as if shown on or mentioned in both. In case of a discrepancy between Drawings or Project Specifications, the matter shall be immediately submitted to the Owners Representative; without his decision said discrepancy shall not be adjusted by the Contractor, save only at his own risk and expense. The contractor shall not take advantage of any apparent error or omission on the Drawings or in the Specifications. In the event the Contractor discovers such error or omission, they shall immediately notify the Owner's Representative. The Owner's Representative will then make such clarification and interpretations as may be deemed necessary for the Contractor to fulfill the intent of the Contract.

3. The intent of these drawings, details and associated specifications is for the Contractor to provide the Owner with a complete, accurate, functionally and technically sound project as generally described in these documents. In most cases, unless explicitly noted otherwise, drawing symbols are used to represent complete-in-place systems to be provided as part of the base bid. All elements shown or implied by the drawings, if not specifically detailed or specified, shall be installed per building codes, manufacturer's recommendations, state highway department standards, city standards and specifications and standard industry practices.

4. All plan quantities provided are approximate only. The Contractor is responsible for their own plan take-off's and accuracy of their bid based on actual site conditions. The contractor shall not take advantage of any apparent error or omission on the Drawings or in the Specifications. In the event the Contractor discovers such error or omission, they shall immediately notify the Owner's Representative. The Owner's Representative will then make such clarification and interpretations as may be deemed necessary for the Contractor to fulfill the intent of the Contract.

5. All work within this project shall conform to current local codes, ordinances, as well as all other applicable governing regulations in effect.

6. All range points, ties, benchmarks or other survey control points which may be encountered during construction, must be preserved or modified/recorded by a registered surveyor at the Contractor's expense. Immediately upon discovery, the Contractor shall notify the Owner's Representative of any survey control points found and obtain direction prior to proceeding with construction.

7. The Contractor shall coordinate and obtain all permits which are necessary to perform the proposed work. Owner is to pay for all construction permits unless otherwise indicated in the Contract Documents. Contractor shall obtain, at his expense, all specialty permits needed for specific items included with the work, unless otherwise indicated in the Contract Documents. Should the Contractor commence work, prior to obtaining the required permits or jurisdictional approvals, the Contractor shall be responsible corrections, modifications, replacement or removal of the non-permitted work.

8. It is the Contractor's responsibility to be aware of and comply with all notifications and inspection requirements of the Jurisdiction.

9. Unless specifically noted otherwise in the Contract Documents, the Contractor shall obtain and coordinate all technical tests and reports by a certified independent laboratory or agency as outlined in the Specifications or these Drawings. The Owner may, at the Owner's sole discretion, provide separate testing and/or inspection service and the Contractor is required to fully coordinate with those consultants/contractors. Owner is to pay for all soils and materials testing.

10. An Existing Condition Survey may have been provided to the Owner by registered surveyors under separate contracts for the basis of design. It is not to be considered as part of these Contract Documents. If provided, these survey plans may have been reformatted and included in these documents. The Contractor is required to visit the site to verify information. Without exception, any deviations or omissions found between these plans and existing site conditions shall immediately be brought to the attention of the Owner's Representative, but will not be considered as basis for additional payment except as allowed in change order process per General Conditions and Supplementary Conditions under the "Owner-Contractor Agreements/Contracts. For official survey information, Contractor may wish to contact the Owner, or Owner's surveyor at the Contractors expense.

11. Existing utility information and utility information for proposed work by others that is shown in these documents is approximate and for general information only. It is not intended to depict exact locations of all utilities. The Contractor shall notify all utility companies to stake and field verify the locations including depths of all utilities (existing, proposed by others, or currently under construction), prior to commencing any related operations. Contractor shall maintain utility locations/structures during all remaining phases of work. The Contractor shall report to the Owner's Representative any utilities that may conflict with proposed work. This Contractor shall explore, understand, and coordinate (with subcontractors and others) all utilities impacts prior to submitting bid and shall be responsible for any modifications or damages to utility lines, structures or injuries therefrom. For existing utility information contact Texas 811. A minimum notice of 3 business days in advance of locational needs is required.

12. These drawings do not specify safety materials, staffing, equipment, methods or sequencing to protect persons and property. It shall be the Contractor's sole responsibility to direct and implement safety operations, staffing, procedures to protect the Owner and his representatives, new improvements, property, other contractors, the public and others.

13. The Contractor shall meet periodically with the Owner's Representative to determine marshalling areas, on-site storage, and contractor staff parking and to coordinate security issues, construction sequencing/phasing, scheduling, and maintaining public, emergency, handicapped or operations access before starting the related work. The Contractor shall meet any "Construction Criteria" or requirements shown on any Contract Documents, phasing plans or any imposed plan by the Owner as a part of the Base Bid.

14. Some work in this Contract may occur concurrent with work by others. Phasing, sequencing and coordination, with work by others, and on-going facility operations in and around the site area, is a part of the scope of work for this project. Notice to proceed with work in any general area shall be obtained from the Owner.

15. The Contractor will be required to complete all the work of this project according to these proposed drawings or subsequent clarification. A strict period of performance, including dates of substantial completion (for all and/or portions) and liquidation damages may be an integral element of the Contract.

16. Any site improvements requiring removal under this contract shall be properly and legally disposed off-site or, at the Owner's option, surrendered/stockpiled in an approved on-site location per the direction of the Owner or Owner's Representative.

17. The Contractor is required to maintain a complete and "up-to-date" set of all Contract Documents, including clarifications, change orders, etc., in good condition, at the construction site at all times. This set of documents will be made immediately available for review by the Owner's Representative and/or authorized Consultants upon request. Complete "As-Built" drawings and document submittals are also a requirement of this contract.

18. Maintenance, warranties and performance guarantees may be a requirement of this contract - see specifications.

19. Notes and details on specific drawings shall take precedence over general notes and typical details. The Contractor shall refer to all other Division Notes, Sheets Notes, Drawings and Project Contract Documents for additional information.

20. Contractor shall refer to other related drawings for all other related improvements that will impact this project and require coordination. Drawings may be made available to the Contractors at request.

TREE PROTECTION NOTE

1. All existing trees shall be protected from construction activities within construction zone, as per local code and regulations. During which time, the use of a silt or chain link fence is required around each singular or group of protected trees. Parking of construction vehicles, equipment, and stockpiles within tree root zones is strictly prohibited. Contractor shall be responsible for any damage incurred to existing trees, including replacement, fees, fines or reimbursement to owner for said damages and, or to the City or Jurisdiction with governing authority per the Tree Ordinance.

OAK WILT PREVENTION NOTE

1. If Oak Wilt is found on site within the work zone, Owner must be notified and the following procedures must be followed in accordance with USDA standards; (http://www.na.fs.fed.us) including disinfecting construction removal devices, tree removal and treatment to prevent development of spore mats. These treatments include debarking, chipping and drying the wood, covering dead wood with plastic, burying the edges for six months and air drying for a similar amount of time to kill fungus and associated insects off site at state designated facility.

SIDEWALK NOTES:

1. Layout of concrete walkways shall be staked in the field and review by the Owner or Owner's Representative prior to construction. At that time walkways may be adjusted, as needed, using the Hardscape Plan as a guide. All grades and layout shall be confirmed prior to construction. Notify Owner and Owner's Representative of any conflicts or deviations to the issued plans.

2. All pedestrian paths shall be in compliance with all current Texas Accessibility Standards (T.A.S.) and ADA standards.

3. All walkway grades shall have a running slope of no greater than 4.7% (1:21) and a cross-slope that is not greater than 1.5% (1:66) unless otherwise noted on plans.

4. Slopes at or between 5.0% (1:20) and 8.3% (1:12) must have hand rails on both sides with ADA compliant level landings, and cross-slopes shall not exceed 1.5% (1:66).

HARDSCAPE LAYOUT AND INSTALLATION

1. Hardscape improvements that are to be constructed per the drawings, shall be coordinated on site with the Owner's Representative, and be field staked or painted for approval of layout by the Owner's Representative prior to installation. Notify the Owner's Representative a minimum of 24 hours in advance for review. Improvements installed without field approval by Owner's Representative may be rejected and will be replaced at Contractors expense. At the time of staking, the Contractor shall confirm the quantity of the improvements match the approved contract. In the event the Contractor discovers such a discrepancy, he shall immediately notify the Owner's or Owner's Representative for direction on how to proceed, prior to commencing work.

2. To expedite layout of the site, layout coordinates and/or grids may have been established in the Drawings. These points shall be field staked by the Contractor's surveyor as a part of this contract. The establishment of these points shall be approved by the Owner's Representative prior to any construction in those areas and will assist the Contractor in the layout of all site improvements as shown on drawing or otherwise.

3. The construction tolerances for this project are minimal and the dimensions shown are to be strictly adhered to. Contractor to notify Landscape Architect of any areas where construction tolerances may not be compliant with the plans as drawn.

4. Computed dimensions shall take precedence over scaled dimensions. Large scale drawings shall take precedence over small scale drawings. Dimensions shown with (+/-) shall be the only layout information allowed to vary, and may only vary to the tolerances given.

5. The Contractor is responsible to provide complete-in-place systems, and a complete project. Any intermittent or periodic approvals received for portions of work, stakes, grades, or forms (by the Owner or Owner's Representative, Architects, Engineers, or others) shall not waive the Contractor's requirements to comply with the intent of any and all portions of this contract.

6. All locations for walks, roads, swales, walls, curbs, structures etc. shall be staked by the Contractor. All layout information is based on ground coordinates and the Contractor shall meet with the owner's surveyors and engineers to clarify all datum, benchmark and control point requirements. Specific layout information will be provided to the Contractor by the Owner's Representative in AutoCAD (.dwg) format when requested.

7. It is the intent and requirement of this contract to provide curvilinear walks, walls and curbs with smooth transitions and arcs (both horizontal and vertical). Straight segments and abrupt transitions will not be accepted unless shown as such on the plans. Curving forms may be required to obtain the proper effects.

8. All lot fencing or lot screen walls shall be placed on the property line or property boundary. Contractor shall confirm final location by field staking, to be reviewed by the Owner or Owner's Representative prior to construction.

9. Gravel, rock mulch, wood mulch, synthetic mulch and all other mulched areas should be installed over weed barrier fabric, 4 o.z. weight minimum. Weed barrier fabric should overlap edges a minimum of 6".

GRADING NOTES

1. The Contractor shall obtain and review the Summary Report and Recommendations prepared by the geotechnical engineers and fully understand the existing soil conditions encountered prior to submitting bid. The Contractor shall comply with all recommendations made by the geotechnical engineers, civil engineers, structural engineers and Owner's Representative, as designated in the soil report, on these drawings, specified, or as directed during field observations and inspections.

2. All earthwork operations will be subject to full inspection and regular testing by a qualified soils and materials engineer and this Contractor shall be responsible to coordinate scheduling, notification and procuring test results and documentation as required. The Contractor shall notify the Owner's Representative of any subsoil conditions encountered, which vary from those found during previous soil investigations and/or that may not have been known during design. Any failed tests which must be retested will be a Contractor's expense.

3. All earthwork operations shall be conducted in strict compliance with the project specifications including but not limited to:

   a. Full locating, investigating and protection of ALL existing utilities to remain.
   b. Removal of any organic materials or debris.
   c. Stripping and stockpiling of all topsoil in approved location(s).
   d. Removal of all unstable fill materials encountered.
   e. Scarification and re-compaction to the minimum depth as specified and/or directed within all areas to receive fill, pavements or structures.
   f. All classifications of "excavation" as required to meet proposed lines, grades, typical cross sections and improvement elevations.
   g. Placement, shaping, and structural compaction of all classifications of "fill" or "embankment" as required to meet proposed lines, grades, typical cross sections and improvement elevations.
   h. Providing dewatering, optimum moisture control, climate protection, dust control, erosion control and all other specified treatments.
   i. Replacement of topsoil after grading changes have been accomplished.

4. See, and comply with, all specifications for depth of moisture density treatments, controls and compaction requirements.

5. These grading plans are intended to show vertical control of the site and are based upon the benchmarks, existing elevations and topography as provided by the Owner's surveyor or civil engineer. However, the Contractor, upon submittal of bid, agrees to accept the site grades and make all adjustments required to accomplish the work as proposed. Additionally proposed design elevations for adjacent construction projects may have to be incorporated if necessary. (Construction drawings for work by others, if applicable, are available upon request). Staking of future adjacent improvements, by this contract phase or by others, may be required if directed by the Owner's Representative to ensure proper coordination and requested staking is to be provided as part of this Base Bid.

6. This Contractor shall verify all existing grades to remain and all adjacent new construction grades for compliance with those shown, prior to bid and construction. All deviations or conflicts with proposed work shall be reported immediately (with follow-up written) notice within 24 hours to the Owner's Representative for direction to proceed, but will not be considered as basis for additional payment except as allowed in change order process per General Conditions and Supplementary Conditions under the existing "Owner-Contractor Agreements/Contracts".

7. The plans may call for specific temporary benchmarks to be transferred to the site by a certified surveyor and accurately established on site as a part of this contract. Contractor shall verify all benchmarks and information used in design and compare to existing conditions.

8. It is this Contractor's responsibility to provide proper positive drainage throughout this contract area. Field conditions shall be verified in conjunction with the proposed elevations to ensure that adequate drainage is provided. Report deviations or conflicts to Owner's Representative. Unless otherwise indicated, minimum slope for paved surfaces shall be 1% and minimum slope for non-paved areas shall be 2%. Slope away from all structures shall be 3% minimum, for a distance of 5' minimum. Maximum ground slopes to be 4' horizontal to 1' vertical, unless otherwise approved in advance.

9. All design elevations shown are "finished grades" unless otherwise indicated. Contractors shall refer to drawings, details and specifications regarding depth of sub-grade materials required to construct project improvements.

10. All topsoil and/or drainage way muck excavation shall be saved and stockpiled in approved locations for future use.

11. All grading information is derived from the survey and other site improvement plans. Contractor to verify that site conditions roughly match that of the survey and/or Civil grading plans prior to construction. Contractor to notify Landscape Architect if site conditions do not reflect the rough grading plans as shown by Civil or Architect.

12. Subsurface drainage engineering is not provided by Landscape Architect. Landscape Architect will provide inlet elevations and drain sizes; all subsurface piping and elevations to be provided by others unless explicitly shown on Grading Plans

13. Contractor to provide a minimum of 2% slope away from all foundations, buildings, and structures.

14. 42" height minimum guardrail to be installed on top of any walls, curbs, or other hardscape improvements that have more than a 30" or more vertical drop.

15. Accessible routes are to be installed in compliance with Americans with Disabilities Act, Fair Housing Act, and all other local and national ordinances.

16. Cross slope on all pedestrian routes must not exceed 1.5%.

17. Accessible routes shall not a exceed 4.9% slope in the direction of travel without handrails or level landings per code. Path of travel slope shall never exceed 8.33% in any location.

18. Level landings may not exceed 2% in any directions, walking path shall have slopes no greater than 4.9% in the path of travel.

19. All drains located in plant beds are to have grates installed that do not allow mulch, gravel, plant material, etc. to impede flow of water into structure

20. All drains located in concrete deck or other hard surfaces are to be flush with surrounding hardscape, and must be oriented in a way that flows with the design of the hardscape.

21. Transitions between flush materials shall have no more than 1/4" step between the two surfaces, per Americans with Disabilities Act.

LIGHTING AND ELECTRIC NOTES

1. Landscape lighting system is to be installed by a licensed electrician with documented experience in installing lighting systems of similar scope within the last two years. The Contractor is to supply a complete lighting system including all associated equipment such as conduit, weather proof and/or water proof junction boxes, ballasts, connectors, harnesses, time clocks, photocells, etc.

2. The Contractor shall review proposed layout of lighting system and all related equipment locations with the Owner or Owner's Representative prior to commencing installation.

3. After installation the Contractor will be required to adjust light fixtures until the Owner's Representative is satisfied with the desired effect. This will require the Contractor and/or the Contractor's electrician to meet with the Owner and Owner's Representative after sunset. This adjustment is to be included in the base Bid amount.

4. The Contractor shall provide a minimum two year warranty on all equipment including lamps, ballasts and installation.

5. Independent ballasts, if required, shall be "ganged" in an inconspicuous, accessible location in a horizontal, weatherproof box or tray near ground level. Mounting of ballast in trees will not be allowed without written authorization from the Owner's Representative.

6. All exposed boxes, trays, conduit, etc. shall be painted by the contractor to blend in with surrounding landscape elements, or be located out of line of sight. Contractor to provide all above ground junction box, electrical equipment, and other appurtenance locations on shop drawings for Landscape Architect review prior to installation.

7. All equipment shall be U.L. listed and installation shall comply with N.E.C. and all other applicable codes.

8. All lights are to be controlled by a photocell on and timer off system unless specified otherwise on the drawings.

9. All wire run underground must be in rigid conduit.

10. Plan layout of underground wiring to minimize disturbance to the roots of existing trees. If underground wiring must pass through the critical root zone of protected trees, trenching and related work must be preformed by hand. No mechanical trenching is permitted within the Critical Root Zone.

11. Tree lighting (if applicable):
    a) Install Karlock (or equal) flexible conduit from base of tree to a minimum eight foot height above ground. At the end of the conduit install a waterproof hub (for single cable) or W-P bell box for multiple cables. Paint conduit and box to match tree trunk. Use SJTO electrical cord from conduit to light fixture. Attach cord to tree using long galvanized cord staples or other approved method. Provide a 36" loop of extra cord at the light fixture to allow for light adjustment and tree growth.
    b) Attach light fixtures to trees utilizing galvanized mounting plates drilled for hub connection with a minimum of two mounting screws or nylon non-damaging strap style mounts. Mounting screws are to be ¼-20 threads x 5" length (one end wood screw threads and the other end bolt threads). Install at least two inches of thread into tree and install with at least two inches between tree and mounting plate.
    c) All tree downlights are to be mounted in the top third of the tree canopy.
    d) All fixtures are to be located, adjusted as needed and shielded to prevent glare, light trespass on to adjacent properties or Rights-of-way.

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REGISTERED LANDSCAPE ARCHITECT
JOEL DAVID WARD
2811
STATE OF TEXAS

09/03/2025

MEMORIAL DRIVE
PROJECT ROUNDABOUT
GEORGETOWN, TEXAS

Drawing File Name
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Issued:

1.	**90% SET**	**03/10/2025**
2.	**CITY UPDATE 1**	**06/24/2025**
3.	**CITY UPDATE 2**	**09/03/2025**
4.		
5.		
6.		

Revisions:

1.
2.
3.
4.

Issue Date: 09/03/2025

Drawn By: LD
Reviewed By: JW

Project No.
230016 - PADA

GENERAL NOTES

Sheet No.
LN-1.0 518 of 523

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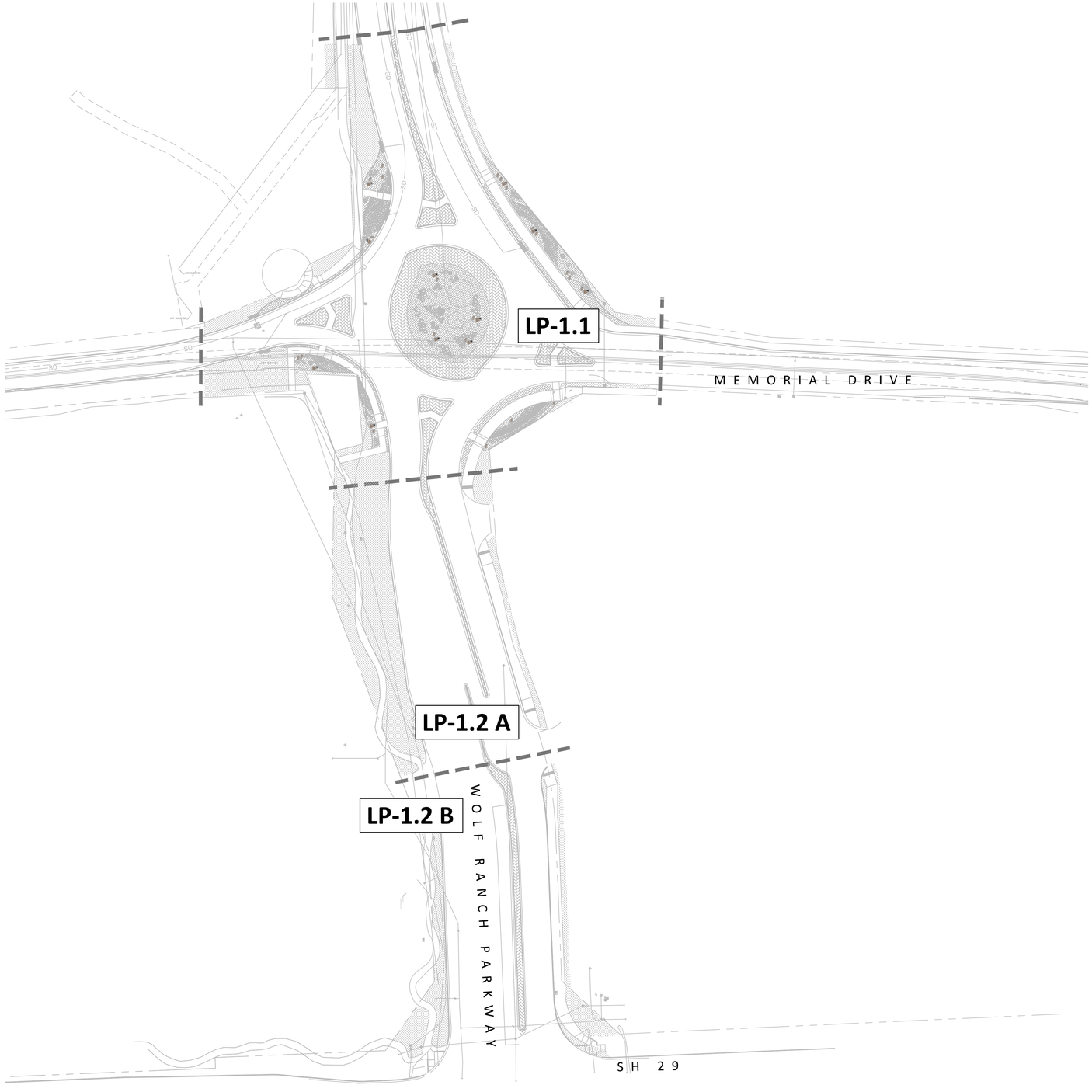

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09/03/2025

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Reviewed By: JW

Project No.
230016 - PADA

OVERALL
PLANTING PLAN

Sheet No.
LP-1.0 519 of 523

NORTH
FULL SIZE SCALE: 1" = 10'
0' 5' 10' 20'

811
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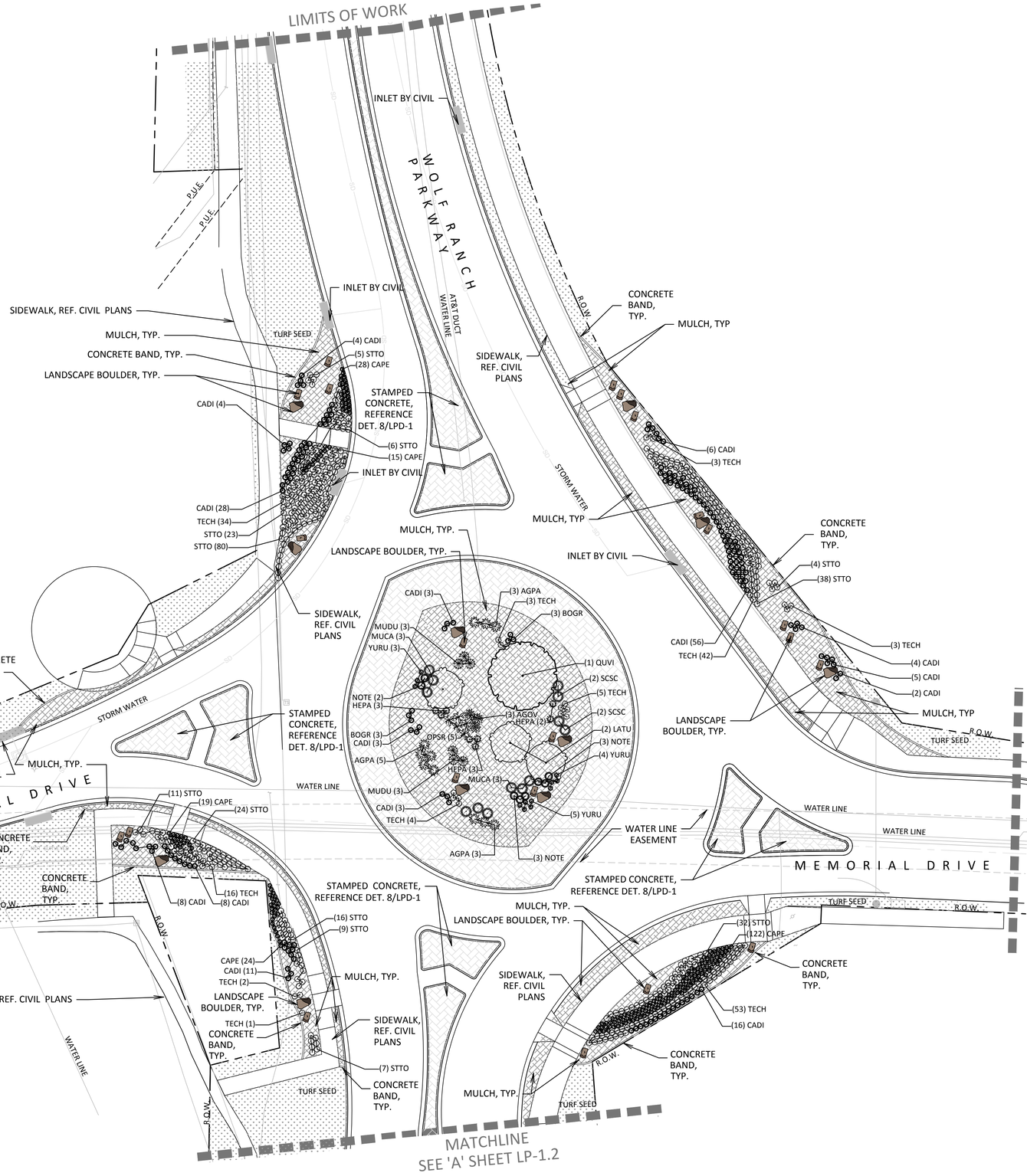

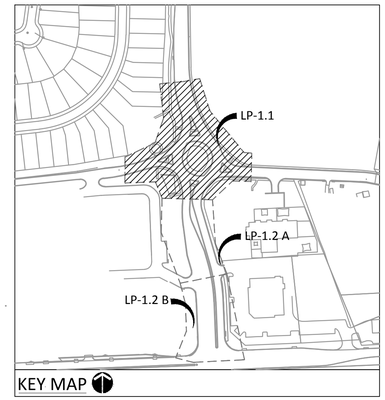

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Project No.
230016 - PADA

PLANTING PLAN

Sheet No.
LP-1.1 520 of 523

LEGEND
- TURF SEED
- LANDSCAPE BOULDERS

NORTH
FULL SIZE SCALE: 1" = 10'
0' 5' 10' 20'

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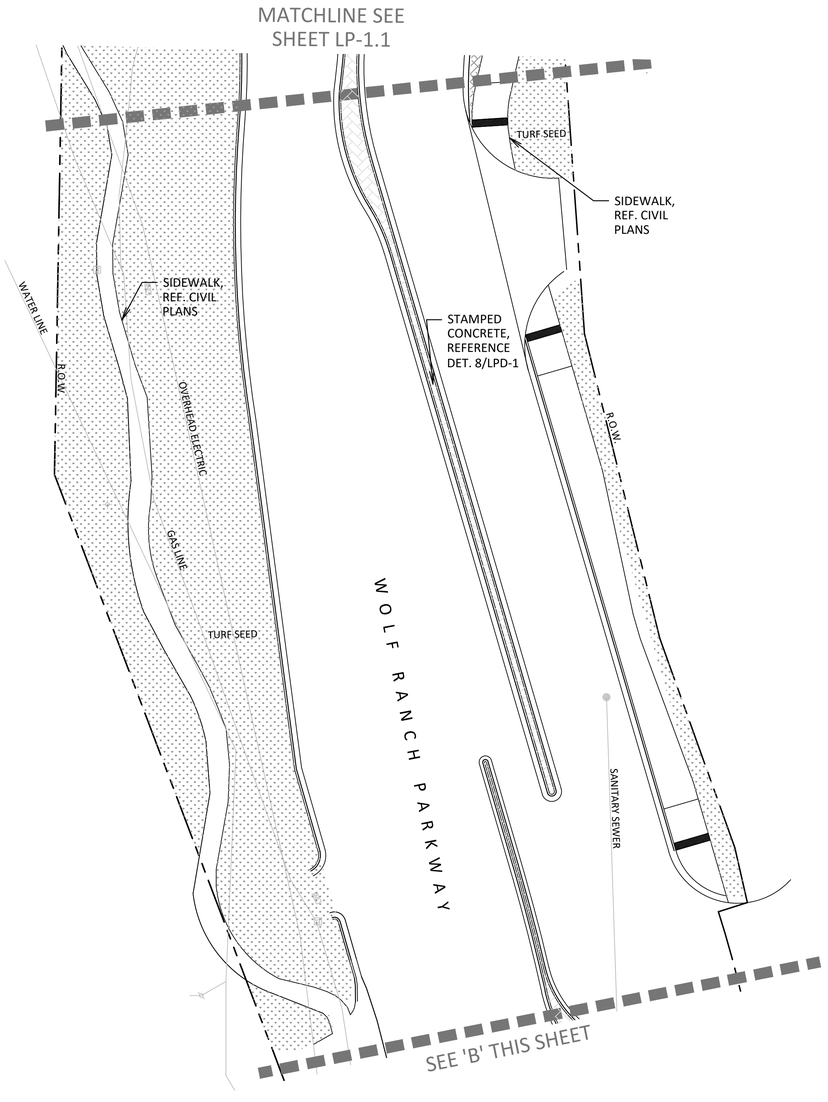
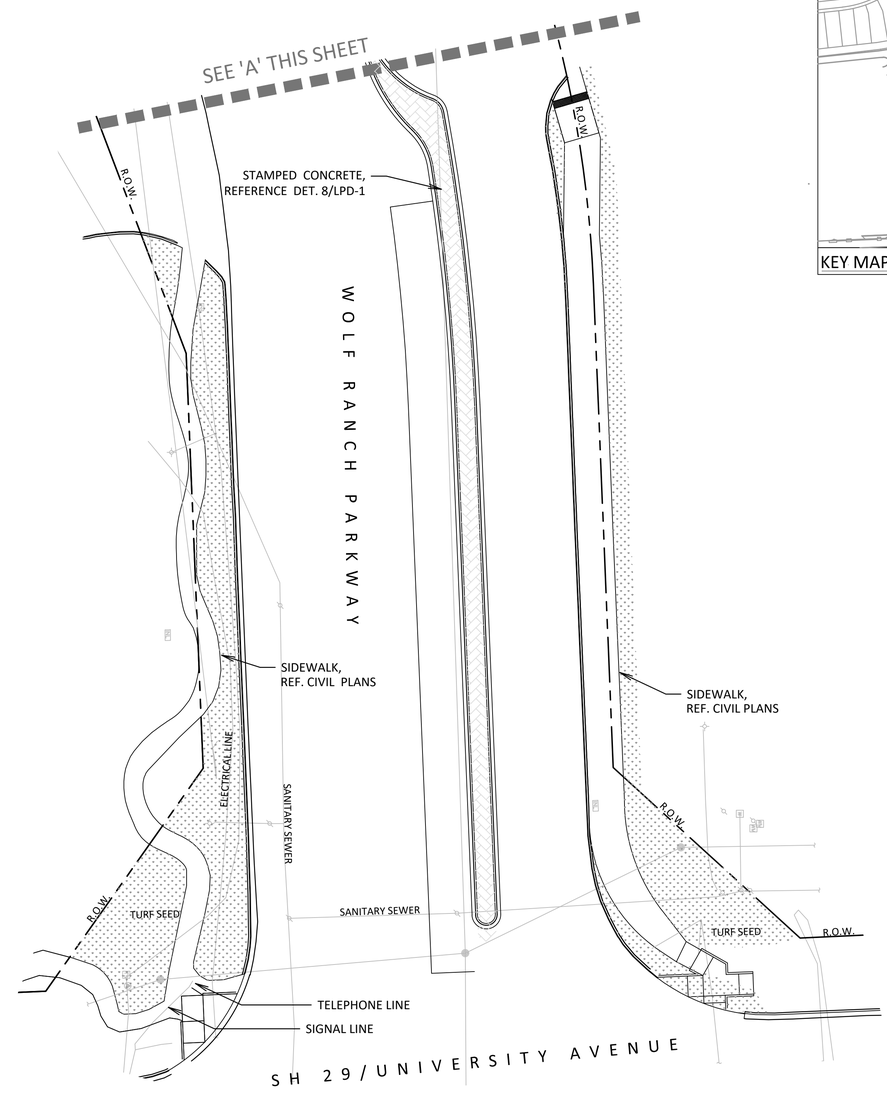


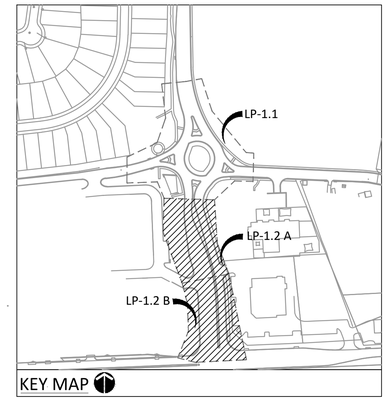
A PLANTING PLAN
SCALE: 1" = 20'-0"

NORTH



B PLANTING PLAN
SCALE: 1" = 20'-0"

NORTH



LEGEND

- TURF SEED
- LANDSCAPE BOULDERS

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PLANTING PLAN

Sheet No.
LP-1.2 521 of 523

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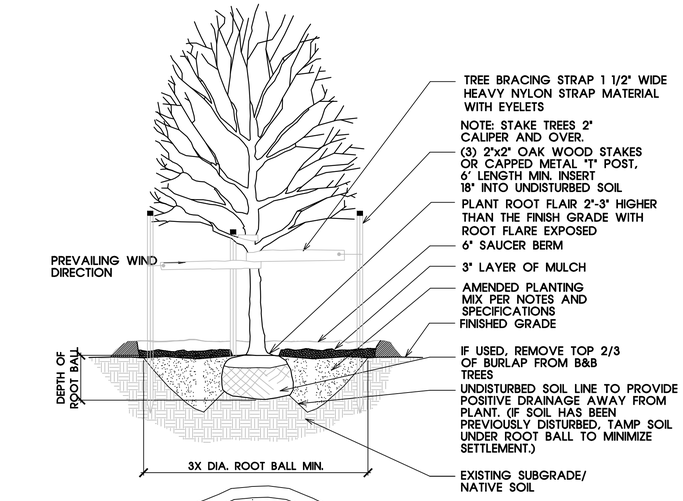
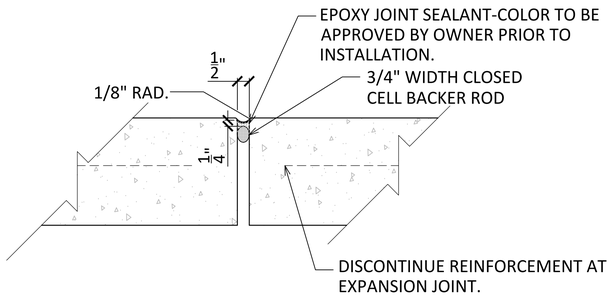


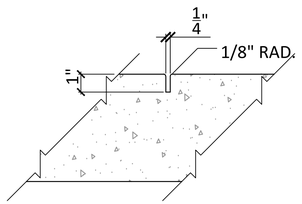
NOTE:
REMOVE ALL TREATED OR PLASTIC COATED BURLAP, STRAPPING, WIRE OR NYLON TWINE FROM ROOT BALL. AFTER SETTING IN HOLE, CUT AWAY TOP AND SIDES OF WIRE BASKET AND REMOVE IF ANY. ANY BROKEN OR CRUMBLING ROOTBALL WILL BE REJECTED. REMOVING THE WIRE WILL NOT BE AN EXCUSE FOR DAMAGE ROOTBALLS.

1 TREE PLANTING
SCALE: 3/4" = 1'-0"

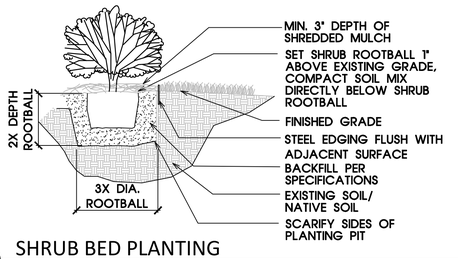


EXPANSION JOINT SECTION
SCALE 3"=1'-0"

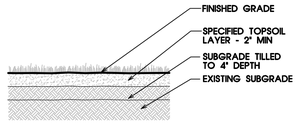
2 EXPANSION JOINT SECTION
SCALE: 3" = 1'-0"



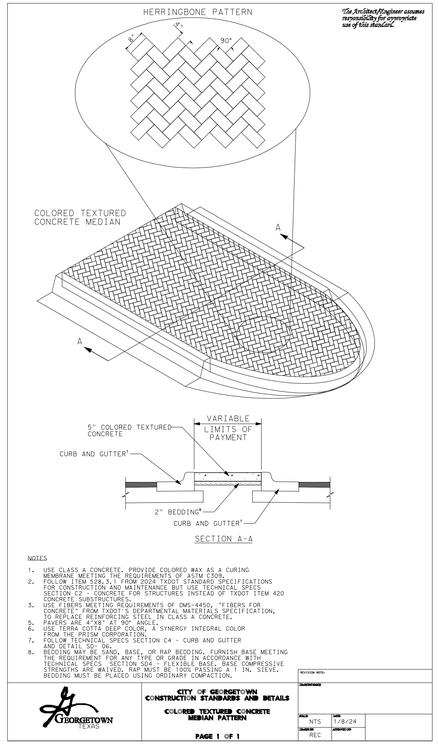
3 CONTROL JOINT SECTION
SCALE: 3" = 1'-0"



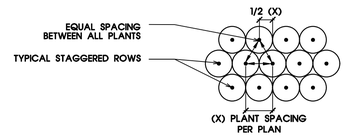
4 SHRUB BED PLANTING
SCALE: 1/2" = 1'-0"



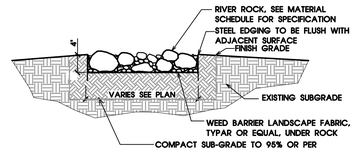
5 TURF SEED
SCALE: 3/8" = 1'-0"



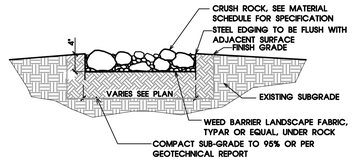
6 STAMPED CONCRETE DETAIL STANDARD DETAIL OF CITY GEORGETOWN
SCALE: NOT TO SCALE



7 PLANTING BED PLANTING
SCALE: 3/4" = 1'-0"

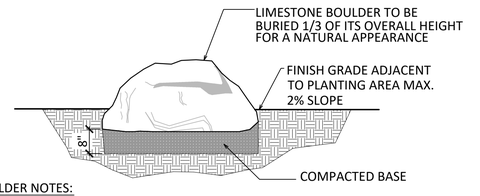


8 RIVER ROCK AREAS
SCALE: 1/2" = 1'-0"



9 CRUSH ROCK AREAS
SCALE: 1/2" = 1'-0"

10 CONCRETE BAND DETAIL
SCALE: 1/2" = 1'-0"



BOULDER NOTES:
1. BOULDERS SHALL BE CLEANED PRIOR TO INSTALLATION.
2. ALL BOULDERS SHALL BE INTEGRAL IN COMPOSITION W/ NO GOUGES/ NICKS CAUSED BY MACHINERY OR CONTAIN OTHER MAN MADE SCARING.

11 LANDSCAPE BOULDERS
SCALE: 1/2" = 1'-0"

FULL SIZE SCALE: 1" = 10'
NORTH 0' 5' 10' 20'

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Drawn By: LD
Reviewed By: JW

Project No.
230016 - PADA

PLANTING DETAILS

Sheet No.
LPD-1 522 of 523

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GENERAL PLANTING NOTES

1. Contractor shall be responsible for becoming aware of all existing conditions, utilities, pipes and structures, etc. related to the project prior to bidding and construction. The Contractor shall be held responsible for contacting all utility companies for locating all underground utility lines, including depths, prior to any excavation. The Contractor shall notify the Owner's representative of apparent conflicts with construction and utilities so that adjustments can be planned prior to installation. Contractor shall take sole responsibility for any and all cost or other liabilities incurred due to damage of said utilities/structures/etc.

2. The Contractor shall not willfully proceed with construction as designed when it is apparent that unknown obstructions and/or grade differences exist that may not have been known during design. Such conditions shall be immediately brought to the attention of the Owner's Representative for clarification. The Contractor shall assume full responsibility for all liabilities, including necessary revisions due to failure to give such notification.

3. Contractor shall be responsible for coordination with subcontractors and other contractors of related trades as required to accomplish the planting and related operations.

4. The acceptable tolerances for this project are minimal and specific layout is required as shown on the layout, planting and other plans. Final location and staking of all plant materials shall be accepted by the Owner's Representative in advance of beginning installation of all plant materials.

5. Coordinate installation of all plant materials with other ongoing work on the project, including but not limited to irrigation, pavements, curb and related constructions. Any damage to existing improvements is the responsibility of said Contractor. The contractor shall notify the owner of the damages and shall be responsible for all repairs.

6. Contractor shall notify Owner's Representative 48 hours prior to commencement of work to coordinate project inspection schedules.

7. The Contractor shall take all necessary scheduling and other precautions to avoid climatic damage to plants. A “planting” of specific calendar days is required to be submitted by the Contractor for approval and planting operations should occur per this approved schedule.

8. If conflicts arise between site conditions or size of areas and scaled plans, Contractor is required to contact Owner's Representative for resolution. Failure to make such conflicts known to the Owner's Representative will result in Contractor's liability to relocate the materials.

9. Plant names may be abbreviated on the drawings. See plant legend for symbols, abbreviations, botanical/common names, sizes, estimated quantities (if given) and other remarks.

10. It is the Contractor's responsibility to furnish all plant materials free of pests or plant diseases. Pre-selected or “tagged” material must be inspected by the Contractor and certified pest and disease free. It is the Contractor's obligation to maintain and warranty all plant materials per the specifications. All plants shall be subject to Owner's approval prior to installation.

11. Where provided, area takeoffs and plant quantity estimates in plant list are for information only. Contractor is responsible to do their own quantity take-offs for all plant materials and sizes shown on plans. In case of any discrepancies, plans take precedence over call-outs and/or the plant list(s).

12. Contractor shall provide “per-unit costs” for every size of plant material, and by type, as called out on Planting Plans in the Bid Proposal. Unit cost to include the plant material itself and installation, including all labor, amendments, fertilizers, warranty, etc., as detailed and specified for each size, “complete in place”.

13. The Contractor is responsible to restore all areas of the site, or adjacent areas, where disturbed by operations of or related to the Contractor's work. Sod areas disturbed shall be restored with new sod. Native areas disturbed, if not already improved to meet other requirements of this contract, shall be restored consistent with type, rates and species of existing condition.

14. During plant establishment, native and wetland areas shall be protected from sedimentation and erosion. Prior to construction activities, native and wetland areas outside of the project limits shall be protected with silt fence. Any such disturbance will require full restoration to natural pre-construction conditions at the contractors expense.

15. When planting trees and shrubs in existing natural areas, minimize disturbance to adjacent existing vegetation. Any such disturbance will require full restoration to natural pre-construction conditions at the contractors expense.

16. No Ball & Burlap (B&B) material is allowed or accepted unless specifically specified in the plans or approved through a formal submittal by the Landscape Architect.

17. All plants shall be nursery grown, Grade 1 plants meeting American Nursery and Landscape Association (ANLA) standards set forth in the “American Standard for Nursery Stock” (ANSI Z60.1-2004). Plants are to be typical in shape and size for species. Plants shall not be root-bound or loose in their containers. Handle all plants with care in transporting, planting and maintenance until inspection and final acceptance.

18. Warranty: Provide a minimum one-year replacement warranty for all plant materials. Warranty shall cover plants which have died or partially died (thereby ruining their natural shape), but shall not include damage by vandalism, browsing, hail, abnormal freezes, drought or negligence by the Owner. The Warranty is intended to cover Contractor negligence, infestations, disease and damage or shock to plants. Plants replaced under Warranty will be warranted for one year following replacement.

PLANTING LAYOUT AND INSTALLATION

1. The Contractor shall be responsible for accurately laying out the plant beds and lawn areas by scaling the Drawings. The Contractor shall provide paint lines/stakes/hose or other means to fully indicate the specific layout geometry of all bed lines for approval by Owner's Representative prior to installation. The Contractor's Base Bid shall anticipate minor adjustments as directed by the Landscape Architect in the field. Changes affecting quantities will be covered by unit prices.

2. Following the approval of layout, the Contractor shall closely coordinate the installation of the irrigation system to conform to the approved layout.

3. All planting beds are to be separated from adjacent Turf Sod, Turf Seed and Native Seed areas with edging per specifications and details. Additional locations may be indicated on the Drawings. Install edging following manufacture's installation instructions. Maintain an accurate layout with smooth curves and transitions, free of kinks and abrupt bends. Top of edging is to be 1” above soil level of adjacent turf. In Bid Proposal furnish a unit price per linear foot of edging installed.

4. Provide matching sizes and forms for all species of trees and plants installed on grid or spaced equally in rows as shown on drawings. Adjust spacing (to “equal-equal”) as necessary, subject to acceptance by the Owner's Representative.

5. Unless otherwise indicated:
   a. All groupings of groundcovers, perennials, ornamental grasses and annuals shall be triangularly spaced (equal-equal).
   b. All planting areas including sod, seed and planting beds, shall receive soil amendments per the notes and specifications.
   c. Sodded lawn shall have been grown between 9 and 18 months and shall be vigorous, well-rooted and healthy turf. Minimum thatch thickness shall be ¾”.
   d. All bulb planting shall occur after mid-October and before ground is frozen. See details for bulb planting layout.

6. All Plant Beds and pit planted plants shall receive a 3” depth layer of shredded hardwood mulch. Refer to plans, details and specifications for location and type of any alternate mulch used. In Bid Proposal furnish a unit price(s) per cubic yard of mulch(es) placed. This unit price(s) will be used in the adjustment of bed areas.

7. Planting pits for 1 and 5 gallon shrubs shall be at least 8” larger in diameter than the container size. Larger container sizes and B&B plants shall be planted in pits at least 3 times larger in diameter than the root ball size.

8. Plants shall be installed to present their best side facing the viewer.

9. Owner's representative shall have final approval of plant material layout.

PLANT SCHEDULE

CODE	QTY	BOTANICAL / COMMON NAME	CONTAINER	CALIPER	HT/SPD	WATER USE	NOTES
TREES							
QUVI	1	Quercus virginiana / Southern Live Oak	Container Grown	3"Cal	12-15` H X 8` Spd	L	Must be from a Single Root Stock
ORNAMENTAL TREES							
LATU	3	Lagerstroemia indica `Tuscarora` / Crape Myrtle	Container Grown	1" Cal @ 3 trunks, min.	8-9` H X 3-4` Spd	M	Must be from a Single Root Stock
CODE	QTY	BOTANICAL / COMMON NAME	CONTAINER	CONTAINER SIZE	NOTES	WATER USE	
SHRUBS							
AGOV	3	Agave ovatifolia / Whale's Tongue Agave	Pots	30 Gallon			
AGPA	11	Agave parryi / Parry's Agave	Pots	15 gallon			
CADI	161	Carex divulsa / European Grey Sedge	Container Grown	1 gallon	Full Canopy, Shrub Form	L	
CAPE	208	Carex perdentata / Meadow Sedge	Container Grown	1 gallon		L	
BUTTERFLY GARDENS							
SCSC	7	Schizachyrium scoparium / Little Bluestem Grass	Container Grown	1 gallon			
GRASSES							
MUCA	6	Muhlenbergia capillaris / Gulf Coast Muhly	Container Grown	3 gallon	Full	L	
MUDU	6	Muhlenbergia dubia / Pine Muhly	Container Grown	5 gallon	Espalier	L	
NOTE	8	Nolina texana / Texas Sacahuista	Container Grown	3 gallon	Full	L	
GROUNDCOVERS							
TECH	166	Teucrium chamaedrys / Wall Germander	1 gal.				
SUCCULENTS							
HEPA	8	Hesperaloe parviflora / Red Yucca	Container Grown	5 gallon	Full, Unbroken Blades	VL	
OPSR	5	Opuntia santa-rita / Santa Rita Pricklypear	7 gal, cont. grwn	5 gallon			
YURU	12	Yucca rupicola / Twistleaf Yucca	Container Grown	5 gallon	Full, Unbroken Blades	VL	
GROUNDCOVER							
BOGR	6	Bouteloua gracilis / Blue Grama Grass	Container Grown	1 gallon	Full	L	
STTO	255	Stemodia tomentosa / Wooly Stemodia	Container Grown	1 gallon	Full	L	
SYMBOL	QTY	BOTANICAL / COMMON NAME	SPECIFICATIONS	RATE			
SOD/SEED							
	11,162 sf	Cynodon dactylon / Bermuda Grass Seed	Sultan Bermuda Grass	3 lbs/1,000 s.f.			
	11,162 sf	Cynodon dactylon / Bermuda Grass Seed	Sultan Bermuda Grass	3 lbs/1,000 s.f.			

TURF GRASS/ PLANT BEDS

NAME	TOTAL	UNITS	DESCRIPTION	
Plant Bed	11,976	sf		
	222	cy	Planting mix	6" depth (Pro-Gro Soil Mix by Whittlesey Landscape Supply or approved equal)
	111	cy	Mulch	3" Depth (Native Hardwood Mulch)
Cynodon dactylon / Bermuda Seed Hydromulch	26,960	sf	*Cynodon dactylon*	
	2,996	sy	Turf Seed	Common Bermuda
	166	cy	Top Soil	

MISCELANEOUS

NAME	TOTAL	UNITS	DESCRIPTION	COMMENTS
Landscape Boulders	35	ea.	Size: 2.5' x 3.5' x 3', Stone Type: Limestone	
Herringbone Pattern Pavement	9,495	s.f.	Size: 8" x 4" x 5", Stone Type: Concrete	

IRRIGATION

SYMB	QTY	UNITS	DESCRIPTION	COMMENTS
CONTROLLER	1	ea.	Rainbird, Hunter, or Approved Equal	
PLANT BEDS	11,976	s.f.	Drip/Spray	
TREES	4	ea.	Drip/Bubbler	
SEED	26,960	s.f.	Temporary Irrigation	

811 Know what's below. Call before you dig.

THE LOCATION OF EXISTING UNDERGROUND UTILITIES ARE SHOWN FOR APPROXIMATION ONLY. CONTRACTOR SHALL DETERMINE EXACT LOCATION OF ALL EXISTING UTILITIES BEFORE COMMENCING WORK. CONTRACTOR AGREES TO BE FULLY RESPONSIBLE FOR ANY AND ALL DAMAGES WHICH MIGHT BE OCCASIONED BY FAILURE TO EXACTLY LOCATE AND PRESERVE ANY AND ALL UNDERGROUND UTILITIES.

SEC Planning, LLC
Austin, Texas

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COMMUNITY BRANDING

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GEORGETOWN TEXAS
more than welcome

REGISTERED LANDSCAPE ARCHITECT
JOEL DAVID WOOD
2811
STATE OF TEXAS

09/03/2025

MEMORIAL DRIVE
PROJECT ROUNDABOUT
GEORGETOWN, TEXAS

Drawing File Name
K:\230016-PADA\Cadfiles\LA\Sheets\LPN-1.dwg

Issued:
1. 90% SET 03/10/2025
2. CITY UPDATE 1 06/24/2025
3. CITY UPDATE 2 09/03/2025
4.
5.
6.

Revisions:
1.
2.
3.
4.

Issue Date: 09/03/2025

Drawn By: LD
Reviewed By: JW

Project No. 230016 - PADA

PLANTING NOTES

Sheet No. LPN - 1.0 523 of 523

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ATTACHMENT H

MAINTENANCE PROCEDURES FOR PERMANENT BMPs

Note: Additional guidance can be obtained from TCEQ's Technical Guidance Manual (TGM) RG-348 (2005) Section 3.5 & Addendum.

A written record will be kept of inspection results and maintenance performed.

3.5.20 Batch Detention Basin

Batch detention basins may have somewhat higher maintenance requirements than an extended detention basin since they are active stormwater controls. The maintenance activities are identical to those of extended detention basins with the addition of maintenance and inspections of the automatic controller and the valve at the outlet.

- *Inspections*. Inspections should take place a minimum of twice a year. One inspection should take place during wet weather to determine if the basin is meeting the target detention time of 12 hours and a drawdown time of no more than 48 hours. The remaining inspections should occur between storm events so that manual operation of the valve and controller can be verified. The level sensor in the basin should be inspected and any debris or sediment in the area should be removed. The outlet structure and the trash screen should be inspected for signs of clogging. Debris and sediment should be removed from the orifice and outlet(s) as described in previous sections. Debris obstructing the valve should be removed. During each inspection, erosion areas inside and downstream of this BMP should be identified and repaired/revegetated immediately.

- *Mowing*. The basin, basin side-slopes, and embankment of the basin must be mowed to prevent woody growth and control weeds. A mulching mower should be used, or the grass clippings should be caught and removed. Mowing should take place at least twice a year, or more frequently if vegetation exceeds 18 inches in height. More frequent mowing to maintain aesthetic appeal may be necessary in landscaped areas.

- *Litter and Debris Removal*. Litter and debris removal should take place at least twice a year, as part of the periodic mowing operations and inspections. Debris and litter should be removed from the surface of the basin. Particular attention should be paid to floatable debris around the outlet structure. The outlet should be checked for possible clogging or obstructions and any debris removed.

- *Erosion control*. The basin side slopes and embankment all may periodically suffer from slumping and erosion. To correct these problems, corrective action, such as regrading and revegetation, may be necessary. Correction of erosion control should take place whenever required based on the periodic inspections.

- *Nuisance Control*. Standing water or soggy conditions may occur in the basin. Some standing water may occur after a storm event since the valve may close with 2 to 3 inches of water in the basin. Some flow into the basin may also occur between storms due to spring flow and residential water use that enters the storm sewer system. Twice a year, the facility should be evaluated in terms of nuisance control (insects, weeds, odors, algae, etc.).

- *Structural Repairs and Replacement*. With each inspection, any damage to structural elements of the basin (pipes, concrete drainage structures, retaining walls, etc.) should be identified and repaired immediately. An example of this type of repair can include patching of cracked concrete, sealing of voids, removal of vegetation from cracks and joints. The various inlet/outlet structures in a basin will eventually deteriorate and must
be replaced.

- *Sediment Removal*. A properly designed batch detention basin will accumulate quantities of sediment over time. The accumulated sediment can detract from the appearance of the facility and reduce the pollutant removal performance of the facility. The sediment also tends to accumulate near the outlet structure and can interfere with the level sensor operation. Sediment shall be removed from the basin at least every 5 years, when sediment depth exceeds 6 inches, when the sediment interferes with the level sensor or when the basin does not drain within 48 hours. Care should be taken not to compromise the basin lining during maintenance.

- *Logic Controller*. The Logic Controller should be inspected as part of the twice yearly investigations. Verify that the external indicators (active, cycle in progress) are operating properly by turning the controller off and on, and by initiating a cycle by triggering the level sensor in the basin. The valve should be manually opened and closed using the open/close switch to verify valve operation and to assist in inspecting the valve for debris. The solar panel should be inspected and any dust or debris on the panel should be carefully removed. The controller and all other circuitry and wiring should be inspected for signs of corrosion, damage from insects, water leaks, or other damage. At the end of the inspection, the controller should be reset.

3.5.24 StormTrooper®

A preventative maintenance cleanout schedule is the most valuable tool for maintaining the proper operation of StormTrooper. Separator maintenance costs will be greatly reduced if a good housekeeping plan for the property is developed i.e., trash pickup, lawn maintenance, dumpster control, etc.

StormTrooper separators have no moving parts and no filter cartridges. The manufacturer recommends quarterly ongoing inspections for accumulated pollutants. Pollutant deposition may vary from year to year. Quarterly inspections ensure that the system is serviced at the appropriate times. Table 4 lists recommended maximum capacities of oil and sediment. Professional vacuum services should be considered when capacities exceed these recommended levels.

Table 4. StormTrooper®
Maintenance Levels

Model Number	Oil Depth	Sediment Depth
SWAQ-05	12"	12"
SWAQ-10	12"	12"
SWAQ-20	12"	12"
SWAQ-25	12"	12"
SWAQ-40	12"	12"
SWAQ-70	12"	12"
SWAQ-110	12"	12"

It is very useful to keep a record of each inspection.

Inspection Procedures

1. Easiest observation and maintenance is best accomplished during non-flow (dry weather) conditions 3-4 days after the most recent rain.
2. Remove interceptor covers or open hatchway to observe conditions. Remove hatchway safety net ("EnterNet"). Observe for trash and debris and remove if necessary. This is the most important maintenance requirement. If absorbent pillows are utilized, observe their condition. Uniform browning or gray color of the pillow means they should be replaced. Observe baffle debris screen and clean if necessary.
3. Coalescing plates are self-cleaning and seldom require maintenance unless damaged. Do not walk on or stand on plate packs. Call ParkUSA (888-611- PARK) for replacement parts.

4. Check of the depth (level) of oil and sediment with a tank sampler device designed for this purpose.

5.Other recommended maintenance guidelines include:

- *Inspections*. BPM facilities should be inspected at least twice a year (once during or immediately following wet weather) to evaluate facility operation. During each inspection, erosion areas inside and downstream of the BPM must be identified and repaired or revegetated immediately.

- *Sediment Removal*. Remove sediment from the facility when sediment depth reaches 3 inches or when the sediment interferes with the health of vegetation or ability of the facility to meet required drawdown times. Sediment removal should be performed at least every 2 years.

- *Drain Time*. When the drain time exceeds 72 hours as observed in the observation well, the filter media should be removed and replaced with more permeable material.

- *Vegetation*. All dead and diseased vegetation considered beyond treatment shall be removed and replaced during semi-annual inspections. Diseased trees and shrubs should be treated during inspections. Remulch any bare areas by hand whenever needed. Replace mulch annually in the spring, or more frequently if needed, in landscaped areas of the basin where grass or groundcover is not planted. Grass areas in and around bioretention facilities must be mowed at least twice annually to limit vegetation height to 18 inches. More frequent mowing to maintain aesthetic appeal may be necessary in landscaped areas.

- *Debris and Litter Removal*. Debris and litter will accumulate in the facility and should be removed during regular mowing operations and inspections.

- *Filter Undrain*. Clean underdrain piping network to remove any sediment buildup every 5 years, or as needed to maintain design drawdown time.

Hunter Anderson — 9/22/2025

Signature
Hunter Anderson, Utility Project Manager
City of Georgetown

Date

ATTACHMENT J

MEASURES FOR MINIMIZING SURFACE STREAM CONTAMINATION

Any points where discharge from the site is concentrated and erosive velocities exist will include appropriately sized energy dissipators to reduce velocities to non-erosive levels.

ATTACHMENT K

VOLUME AND CHARACTER OF STORMWATER

Stormwater runoff will increase as a result of this development. The additional flow generated from the project will be routed to three (3) existing ponds and one (1) proposed pond. For the 100-year storm event, the proposed batch pond within the Memorial Drive basin will discharge approximately 26.6 cfs. The runoff coefficient for the Memorial Drive basin increases from approximately 80 to 88.82 in the developed condition. For the 100-year storm event, the existing Wolf Ranch Section 2 – Pond 1 basin will discharge approximately 421.2 cfs. The runoff coefficient for the Wolf Ranch Section 2 – Pond 1 basin increases from approximately 80.44 to 90.64 in the developed condition. For the 100-year storm event, the existing Rivery Pond A basin will discharge approximately 394.8 cfs. The runoff coefficient for the Rivery Pond A basin increases from approximately 82.42 to 92.44 in the developed condition. For the 100-year storm event, the existing Rivery Pond B basin will discharge approximately 580.9 cfs. The runoff coefficient for the Rivery Pond B basin increased from approximately 80 to 92.70 in the developed condition. Values are based on the SCS Method using runoff coefficients per the City of Georgetown Drainage Criteria Manual. Stormwater runoff from the project can be characterized as overland, shallow-concentrated and channelized flow from a proposed road expansion and a mix of existing residential and commercial developments.

GEOLOGIC ASSESSMENT

Geologic Assessment

Texas Commission on Environmental Quality

For Regulated Activities on The Edwards Aquifer Recharge/transition Zones and Relating to 30 TAC §213.5(b)(3), Effective June 1, 1999

To ensure that the application is administratively complete, confirm that all fields in the form are complete, verify that all requested information is provided, consistently reference the same site and contact person in all forms in the application, and ensure forms are signed by the appropriate party.

Note: Including all the information requested in the form and attachments contributes to more streamlined technical reviews.

Signature

To the best of my knowledge, the responses to this form accurately reflect all information requested concerning the proposed regulated activities and methods to protect the Edwards Aquifer. My signature certifies that I am qualified as a geologist as defined by 30 TAC Chapter 213.

Print Name of Geologist: **Henry E. Stultz III, P.G.** Telephone: **210-375-9000**

Date: August 11, 2025 Fax: **210-375-9090**

Representing: **Pape-Dawson Engineers, Inc., TBPG registration number 50351**

Signature of Geologist:



Regulated Entity Name: Wolf Ranch and Memorial Drive

Project Information

1. Date(s) Geologic Assessment was performed: **September 11, 2024, and June 24, 2025**
2. Type of Project:
   - ☒ WPAP
   - ☐ SCS
   - ☐ AST
   - ☐ UST
3. Location of Project:
   - ☒ Recharge Zone
   - ☐ Transition Zone
   - ☐ Contributing Zone within the Transition Zone

4. ☒ **Attachment A - Geologic Assessment Table**. Completed Geologic Assessment Table (Form TCEQ-0585-Table) is attached.

5. ☒ Soil cover on the project site is summarized in the table below and uses the SCS Hydrologic Soil Groups* (Urban Hydrology for Small Watersheds, Technical Release No. 55, Appendix A, Soil Conservation Service, 1986). If there is more than one soil type on the project site, show each soil type on the site Geologic Map or a separate soils map.

Table 1 - Soil Units, Infiltration Characteristics and Thickness

Soil Name	Group*	Thickness(feet)
Eckrant stony clay, 0 to 3 percent slopes, stony (EeB)	D	3-4
Eckrant-Rock outcrop association, 1 to 10 percent slopes (ErE)	D	0-2
Eckrant-Rock outcrop association, 8 to 30 percent slopes (ErG)	D	1-2
Georgetown stony clay loam, 1 to 3 percent slopes (GsB)	D	1-3

** Soil Group Definitions (Abbreviated)*

A. Soils having a high infiltration rate when thoroughly wetted.

B. Soils having a moderate infiltration rate when thoroughly wetted.

C. Soils having a slow infiltration rate when thoroughly wetted.

D. *Soils having a very slow infiltration rate when thoroughly wetted.*

6. ☒ **Attachment B – Stratigraphic Column**. A stratigraphic column showing formations, members, and thicknesses is attached. The outcropping unit, if present, should be at the top of the stratigraphic column. Otherwise, the uppermost unit should be at the top of the stratigraphic column.

7. ☒ **Attachment C – Site Geology**. A narrative description of the site specific geology including any features identified in the Geologic Assessment Table, a discussion of the potential for fluid movement to the Edwards Aquifer, stratigraphy, structure(s), and karst characteristics is attached.

8. ☒ **Attachment D – Site Geologic Map(s)**. The Site Geologic Map must be the same scale as the applicant's Site Plan. The minimum scale is 1": 400'

   Applicant's Site Plan Scale: 1" = **150'**
   Site Geologic Map Scale: 1" = **150'**
   Site Soils Map Scale (if more than 1 soil type): 1" = **900'**

9. Method of collecting positional data:

   ☒ Global Positioning System (GPS) technology.
   ☐ Other method(s). Please describe method of data collection:_____

10. ☒ The project site and boundaries are clearly shown and labeled on the Site Geologic Map.
11. ☒ Surface geologic units are shown and labeled on the Site Geologic Map.
12. ☒ Geologic or manmade features were discovered on the project site during the field investigation. They are shown and labeled on the Site Geologic Map and are described in the attached Geologic Assessment Table.

    ☐ Geologic or manmade features were not discovered on the project site during the field investigation.
13. ☒ The Recharge Zone boundary is shown and labeled, if appropriate.
14. All known wells (test holes, water, oil, unplugged, capped and/or abandoned, etc.): If applicable, the information must agree with Item No. 20 of the WPAP Application Section.

    ☐ There are ____(#) wells present on the project site and the locations are shown and labeled. (Check all of the following that apply.)
    - ☐ The wells are not in use and have been properly abandoned.
    - ☐ The wells are not in use and will be properly abandoned.
    - ☐ The wells are in use and comply with 16 TAC Chapter 76.

    ☒ There are no wells or test holes of any kind known to exist on the project site.

Administrative Information

15. ☒ Submit one (1) original and one (1) copy of the application, plus additional copies as needed for each affected incorporated city, groundwater conservation district, and county in which the project will be located. The TCEQ will distribute the additional copies to these jurisdictions. The copies must be submitted to the appropriate regional office.

ATTACHMENT A
Geologic Assessment Table

GEOLOGIC ASSESSMENT TABLE			PROJECT NAME: Wolf Ranch and Memorial Drive																
LOCATION			FEATURE CHARACTERISTICS											EVALUATION			PHYSICAL SETTING		
1A	1B *	1C*	2A	2B	3	4			5	5A	6	7	8A	8B	9	10		11		12
FEATURE ID	LATITUDE	LONGITUDE	FEATURE TYPE	POINTS	FORMATION	DIMENSIONS (FEET)			TREND (DEGREES)	DOM	DENSITY (NO/FT)	APERTURE (FEET)	INFILL	RELATIVE INFILTRATION RATE	TOTAL	SENSITIVITY		CATCHMENT AREA (ACRES)		TOPOGRAPHY
						X	Y	Z		10						<40	≥40	<1.6	≥1.6	
S-1	30.64288	-97.69525	MB	30	Ked								F,C	5	35	35		X		Hillside
S-2	30.64289	-97.69526	MB	30	Ked								F,C	5	35	35		X		Hillside
S-3	30.64483	-97.69331	MB	30	Ked								F,C	5	35	35		X		Hillside
S-4	30.64046	-97.70023	MB	30	Ked								F,C	5	35	35		X		Hillside
S-5	30.63324	-97.70017	MB	30	Ked								F,C	5	35	35		X		Hillside
S-6	30.64912	-97.68831	MB	30	Ked								F,C	5	35	35			X	Hillside
S-7	30.64661	-97.69225	MB	30	Ked								F,C	5	35	35			X	Hillside
S-8	30.64257	-97.69622	MB	30	Ked								F,C	5	35	35			X	Hillside
S-9	30.64150	-97.69836	MB	30	Ked								F,C	5	35	35		X		Hillside
S-10	30.63769	-97.70021	MB	30	Ked								F,C	5	35	35		X		Hillside
S-11	30.63395	-97.70062	MB	30	Ked								F,C	5	35	35		X		Hillside
S-12	30.64215	30.64215	MB	30	Ked								F,C	20	50		50	X		Hillside
S-13	30.63956	-97.70234	CD	5	Ked	282	185	15					F	5	10	10			X	Drainage
S-14	30.64282	-97.68968	MB	30	Ked								F,C	20	50		50	X		Hillside
S-15	30.64274	-97.68861	CD	5	Ked	582	275	7					F	5	10	10			X	Drainage

** DATUM: NAD 83



2A TYPE	TYPE	2B POINTS
C	Cave	30
SC	Solution cavity	20
SF	Solution-enlarged fracture(s)	20
F	Fault	20
O	Other natural bedrock features	5
MB	Manmade feature in bedrock	30
SW	Swallow hole	30
SH	Sinkhole	20
CD	Non-karst closed depression	5
Z	Zone, clustered or aligned features	30

8A INFILLING	
N	None, exposed bedrock
C	Coarse - cobbles, breakdown, sand, gravel
O	Loose or soft mud or soil, organics, leaves, sticks, dark colors
F	Fines, compacted clay-rich sediment, soil profile, gray or red colors
V	Vegetation. Give details in narrative description
FS	Flowstone, cements, cave deposits
X	Other materials

12 TOPOGRAPHY
Cliff, Hilltop, Hillside, Drainage, Floodplain, Streambed

I have read, I understood, and I have followed the Texas Commission on Environmental Quality's Instructions to Geologists.
The information presented here complies with that document and is a true representation of the conditions observed in the field.
My signature certifies that I am qualified as a geologist as defined by 30 TAC Chapter 213.

Date August 11, 2025

TCEQ-0585-Table (Rev. 10-01-04)

ATTACHMENT A

ATTACHMENT B
Stratigraphic Column

Attachment B – Stratigraphic Column

Period	Epoch	Group	Formation	Member	Maximum Thickness	Lithology	Hydrologic Unit
Cretaceous	Late Cretaceous	Washita	Georgetown		100	Reddish-brown, gray to light tan, shaley mudstone and wackestone; commonly contains black dendrites, iron nodules, and iron staining; often fossiliferous with *Plesioturrilites brazoensis* , *Waconella wacoensis* common	Edwards Aquifer
	Early Cretaceous	Fredericksburg	Edwards	1	80–90	Gray to tan, hard, dense, thick-to thin-bedded, fine-grained limestone with soft dolomitic limestone zone near middle	
				2		Gray to tan, soft, nodular-weathering marly limestone	
				3		Light gray to tan, fine-to-medium-grained, hard, thin-to thick-bedded limestone; chert nodules in lower third	
				4		Gray-brown, thin-to medium-bedded, porous dolomite, dolomitic limestone, and limestone; chert common; solution collapse zone at top	
			Comanche Peak		60-64	White, irregularly bedded nodular limestone interbedded with marl to gray fine-grained, nodular limestone, marly limestone, and marl. Large gastropods and pelecypods occur in abundance throughout the limestone.	
			Walnut	Keys Valley	70-120	Gray to tan, soft marl and nodular limestone with abundant fossils	
				Whitestone		Gray to tan, hard, fine-to medium-grained, thin-to thick-bedded fossiliferous limestone	
				Cedar Park		Gray to tan, thin-to thick-bedded, fine-to medium-grained, hard limestone	
				Bee Cave		Gray to tan, soft, nodular-weathering, fine-grained limestone, marly limestone, and marl with abundant fossil shells	
				Bull Creek		Gray to tan, hard, fine-to medium-grained, thin to thick-bedded limestone; shell fragments common	
		Trinity	Glen Rose	Upper Glen Rose	450	Alternating resistant and nonresistant beds of blue shale, nodular marl, and impure, fossiliferous limestone; gray to yellowish gray; stair-step topography; contains two distinct evaporite zones; distinct *Corbula* sp. bed marks the contact with the underlying lower member of the Glen Rose Limestone; *Orbitulina texana*	Upper Trinity

ATTACHMENT C
Site Geology

Attachment C – Site Geology

SUMMARY

The ±27-acre Wolf Ranch Pkwy and Memorial Dr Improvements (project site) is located in the City of Georgetown, Williamson County, Texas.

Based on the results of the field survey conducted in accordance with *Instructions for Geologists for Geologic Assessments in the Edwards Aquifer Recharge/Transition Zones (TCEQ-0585 Instructions),* no naturally occurring sensitive features were identified on site. No springs or streams were identified on site. The overall potential for fluid migration to the Edwards Aquifer for the site is low.

Middle Fork Fissure Cave was identified in the geologic assessment for the Carroll at Rivery Ranch project. The cave is located adjacent to the project site. The buffer for this cave was approved by TCEQ with the Water Pollution Abatement Plan (WPAP) for Carroll at Rivery Ranch. No portion of the buffer is within the project limits of this geologic assessment.

SITE GEOLOGY

As observed through field evidence, the geologic formation which outcrops at the surface within the subject site is the Edwards formation (Ked). The Edwards limestone is characterized as massive, brittle, vugular limestone and mite with nodular chert, gypsum, anhydrite, and solution-collapsed features.

The predominant trend of faults in the vicinity of the site is approximately N12°E, based on faults identified during the previous mapping of the area.

FEATURE DESCRIPTIONS:

A description of the features observed onsite is provided below:

Features S-1 through S-5

Features S-1 through S-5 are a series of existing sewer lines that are located beneath pavement. The sewer lines have been trenched through bedrock and backfilled with a mix of fine and course fill material that

may be more permeable than surrounding undisturbed areas. Due to the impervious cover, the probability of rapid infiltration is low.

Features S-6 through S-11

Features S-6 through S-11 are a series of existing storm drain lines that are located beneath pavement. The storm drain lines have been trenched through bedrock and backfilled with a mix of fine and course fill material that may be more permeable than surrounding undisturbed areas. Due to the impervious cover, the probability of rapid infiltration is low.

Features S-12 and S-14

Features S-12 and S-14 are a series of existing sewer lines that are not located beneath pavement. The sewer lines have been trenched through bedrock and backfilled with a mix of fine and course fill material that may be more permeable than surrounding undisturbed areas. Therefore, the probability of rapid infiltration is intermediate.

Features S-13 and S-15

Features S-13 and S-15 are non-karst closed depressions within drainage channels. Manmade dams have been placed downstream within the drainage. Due to the non-karst origin, the probability for rapid infiltration is low.

REFERENCES

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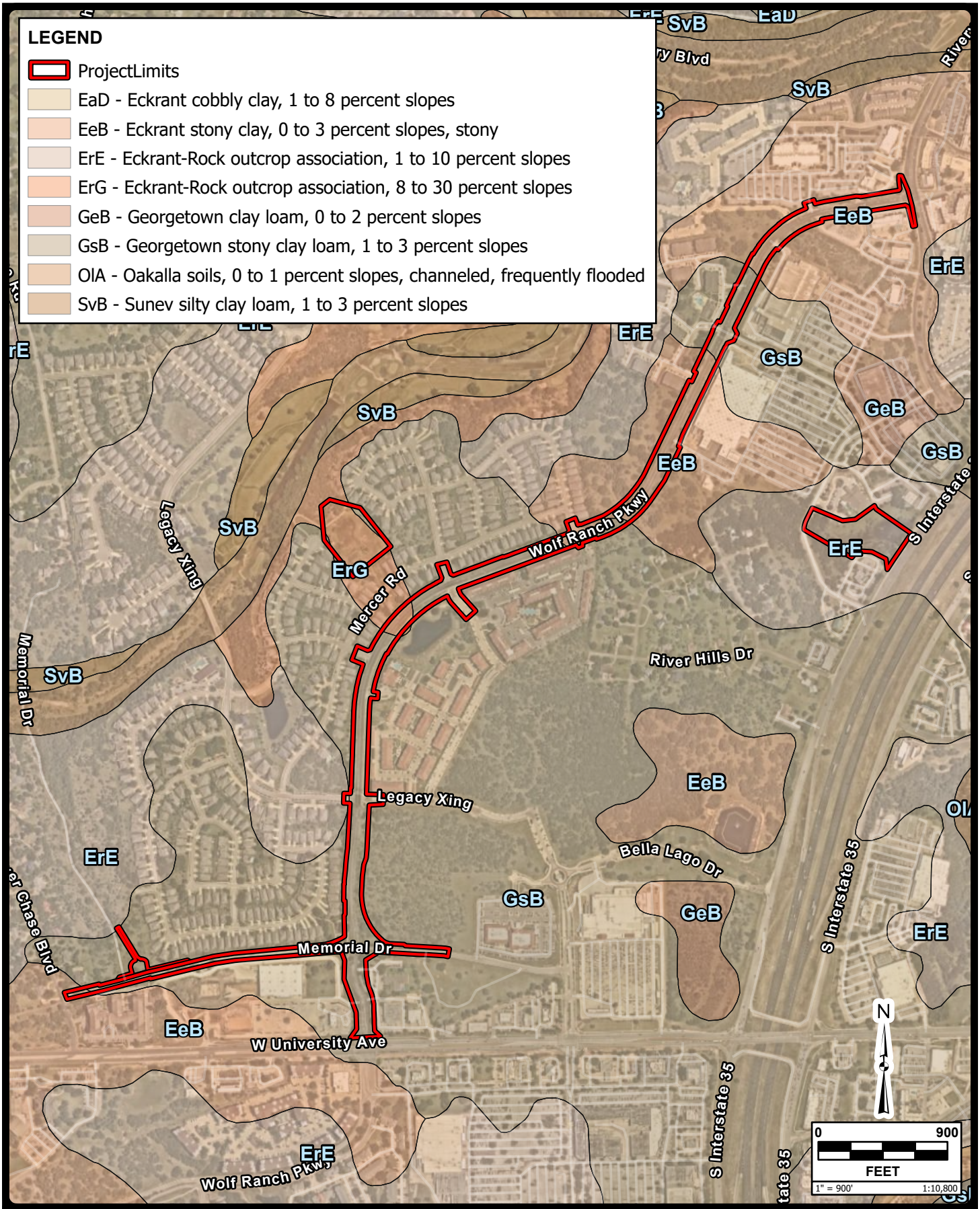
Texas Water Development Board, Wells in TWDB Groundwater Database Viewer, https://www3.twdb.texas.gov/apps/waterdatainteractive/groundwaterdataviewer, October 25, 2024.

U.S. Geological Survey, National Water Information System: Mapper, https://maps.waterdata.usgs.gov/mapper/index.html, October 25, 2024.

ATTACHMENT D
Site Geologic Map(s)



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JOB NO.	51423-00
DATE	Jul 2025
DESIGNER	HS
CHECKED	HDJ
SHEET	ATTACHMENT D

WOLF RANCH PKWY AND MEMORIAL DR IMPROVEMENTS

GEORGETOWN, TEXAS
SITE SOILS MAP

PAPE-DAWSON ENGINEERS
2000 NW LOOP 410 | SAN ANTONIO, TX 78213 | 210.375.9000
TEXAS ENGINEERING FIRM #470 | TEXAS SURVEYING FIRM #10028800

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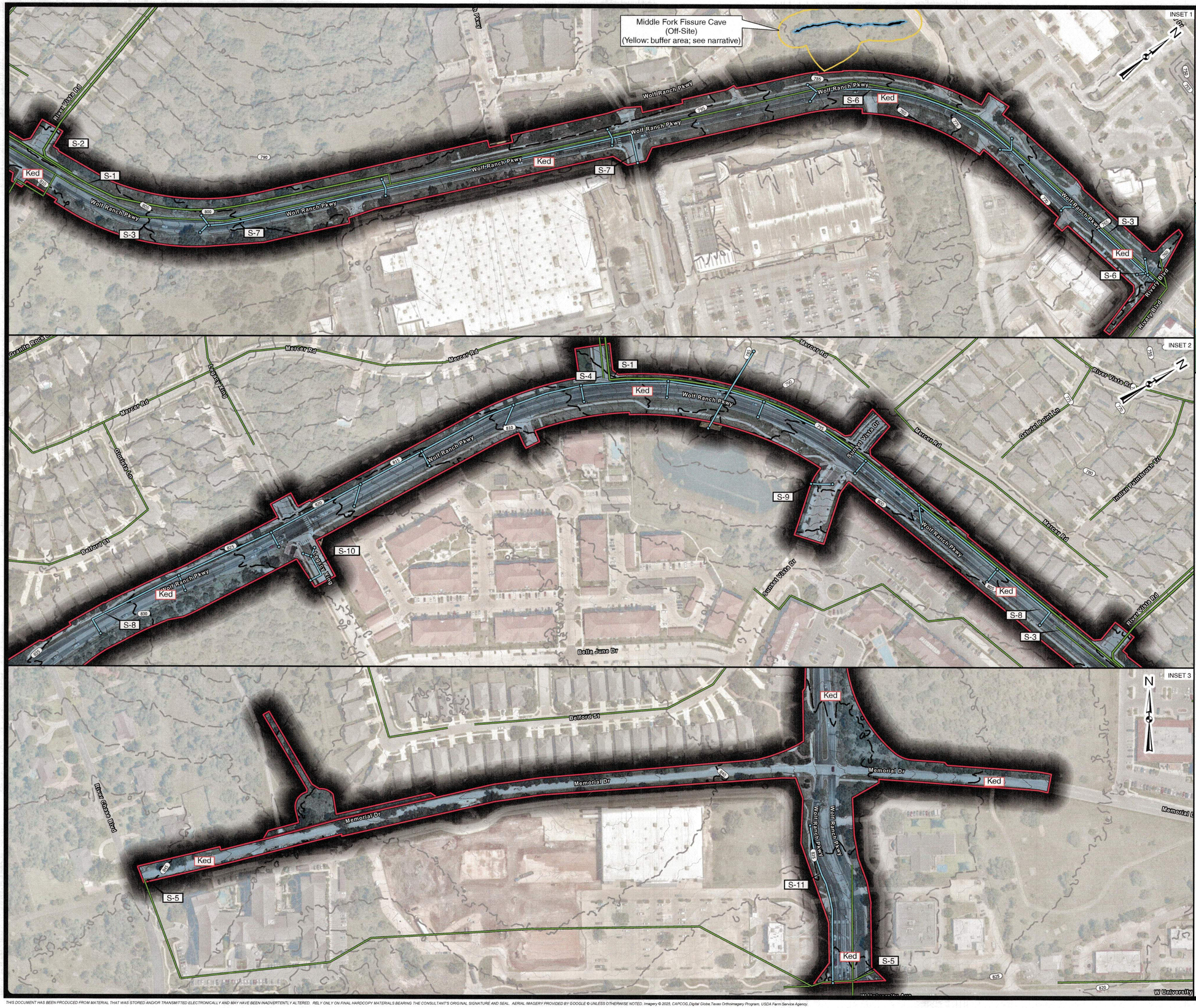

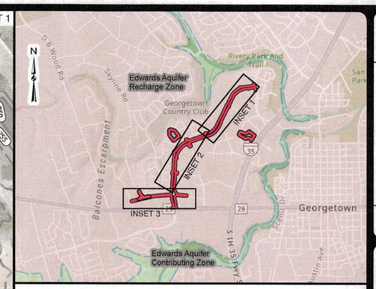

Location Map
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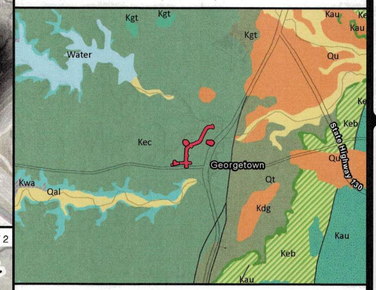

Regional Geology Map (Douglas 2005)
(not-to-scale)

Scale: 1 in = 150 ft

0 150 300 450

FEET

LEGEND

PROJECT LIMITS

EXISTING CONTOUR LINE — 760 —

100 YEAR FLOODPLAIN

STREAM

GEOLOGIC FORMATIONS

Qal	ALLUVIUM	Kgt	GEORGETOWN
Kef	EAGLE FORD	Ked	EDWARDS
Kbu	BUDA	Kgr	GLEN ROSE
Kdr	DEL RIO		

SYMBOLS AND LINES

- S-1 — POTENTIAL RECHARGE FEATURE
- CONTACT, LOCATED APPROXIMATELY
- CONTACT, INFERRED
- FAULT, LOCATED APPROXIMATELY (D, DOWNTHROWN SIDE; U, UPTHROWN SIDE)
- FAULT, EXTRAPOLATED
- FAULT, INFERRED
- STRIKE AND DIP OF BEDDING
- STRIKE AND DIP OF JOINTS
- STRIKE OF VERTICAL JOINTS
- CAVE
- SOLUTION CAVITY
- SOLUTION ENLARGED FRACTURE
- SWALLOW HOLE
- SINKHOLE
- NON-KARST CLOSED DEPRESSION
- ZONE
- OTHER NATURAL BEDROCK FEATURES
- SPRING/SEEP
- MB — MAN-MADE FEATURE IN BEDROCK
- W — WATER WELL
- SANITARY SEWER LINE
- STORM DRAIN LINE

NOTE: THE RECHARGE ZONE BOUNDARY IS NOT WITHIN THE AREA SHOWN ON THIS SHEET. THE SITE IS LOCATED ENTIRELY WITHIN THE RECHARGE ZONE.

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NOTE: NO NATURALLY OCCURING GEOLOGIC FEATURES WERE DISCOVERED DURING THIS ASSESSMENT. MANMADE FEATURES ARE INDICATED AS OBSERVED.

NO.	REVISION	DATE

STATE OF TEXAS
HENRY STULTZ III
GEOLOGY
12121
LICENSED
PROFESSIONAL GEOSCIENTIST
August 8, 2025

PAPE-DAWSON ENGINEERS
SAN ANTONIO | AUSTIN | HOUSTON | FORT WORTH | DALLAS
2000 NW LOOP 410 | SAN ANTONIO, TX 78213 | 210.375.9000
TBPE FIRM REGISTRATION #470 | TBPLS FIRM REGISTRATION #10028800

WOLF RANCH PKWY AND MEMORIAL DR IMPROVEMENTS
CITY OF GEORGETOWN
SITE GEOLOGIC MAP
WATER POLLUTION ABATEMENT PLAN

PLAT NO.	--
JOB NO.	51423-00
DATE	Aug 2025
DESIGNER	HS
CHECKED	HDJ
DRAWN	HS
SHEET	ATT D

Date: Aug 04, 2025 1:32 PM User: hstultz
File: H:\Projects\51423\00\Environmental\GIA\GIS\Working.aprx

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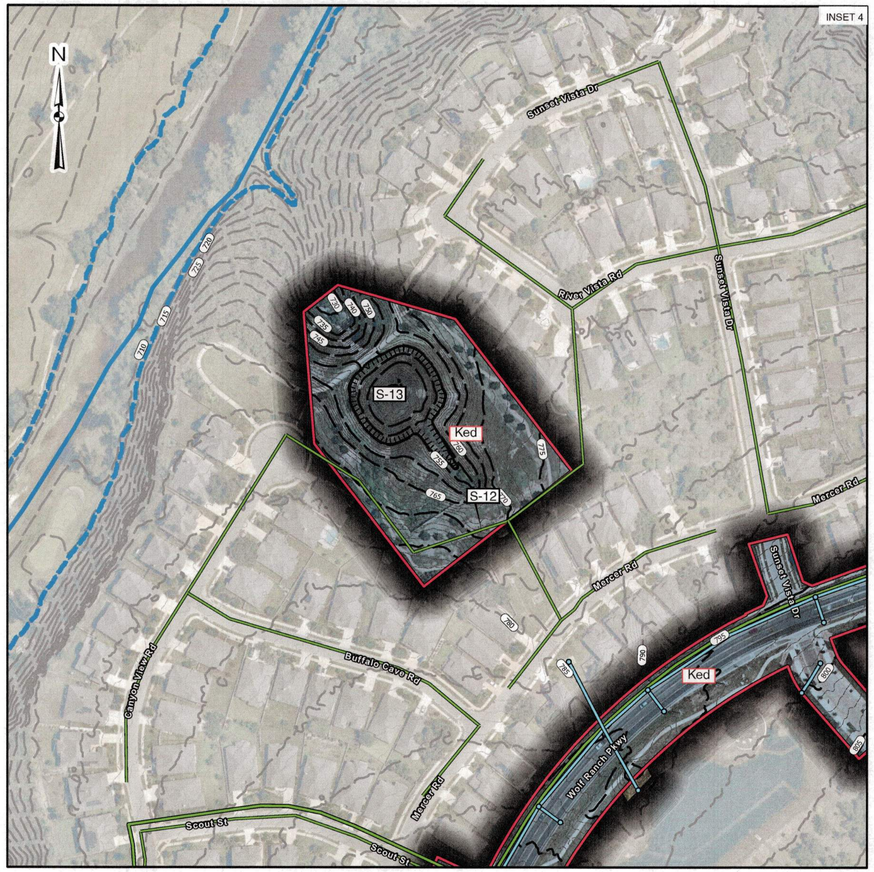

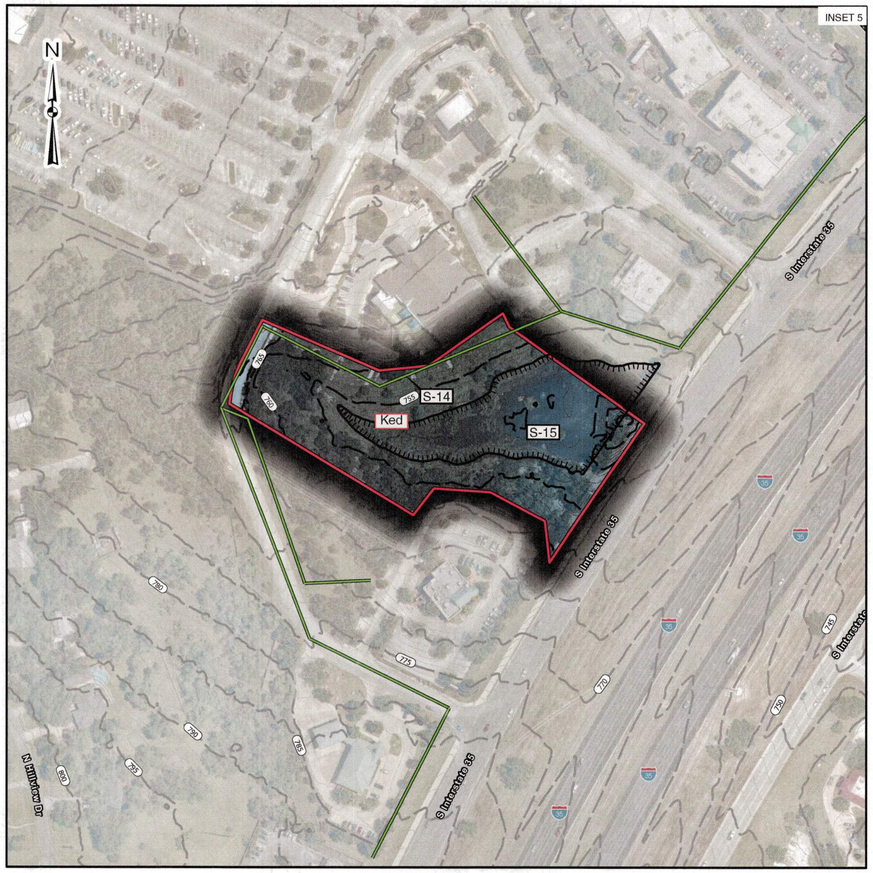

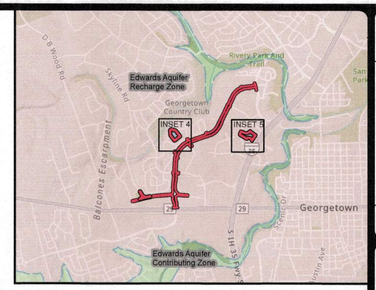

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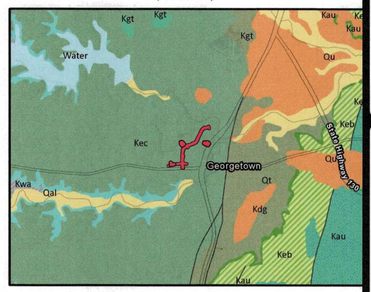

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EXISTING CONTOUR LINE — — — —760— — — —

100 YEAR FLOODPLAIN

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NO.	REVISION	DATE

STATE OF TEXAS
HENRY STULTZ III
GEOLOGY
12121
LICENSED
PROFESSIONAL GEOLOGIST
August 11, 2025

PAPE-DAWSON ENGINEERS
SAN ANTONIO | AUSTIN | HOUSTON | FORT WORTH | DALLAS
2000 NW LOOP 410 | SAN ANTONIO, TX 78213 | 210.375.9000
TBPE FIRM REGISTRATION #470 | TBPLS FIRM REGISTRATION #10028800

WOLF RANCH PKWY AND MEMORIAL DR IMPROVEMENTS
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SITE GEOLOGIC MAP
WATER POLLUTION ABATEMENT PLAN

PLAT NO. --
JOB NO. 51423-00
DATE Aug 2025
DESIGNER HS
CHECKED HDJ DRAWN HS
SHEET ATT D

Date: Aug 04, 2025 1:36 PM User: hstultz
File: I:\Projects\51423\00\Environmental\GA\GIS\Working.aprx

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TEMPORARY STORMWATER

Temporary Stormwater Section

Texas Commission on Environmental Quality

for Regulated Activities on the Edwards Aquifer Recharge Zone and Relating to 30 TAC §213.5(b)(4)(A), (B), (D)(I) and (G); Effective June 1, 1999

To ensure that the application is administratively complete, confirm that all fields in the form are complete, verify that all requested information is provided, consistently reference the same site and contact person in all forms in the application, and ensure forms are signed by the appropriate party.

Note: Including all the information requested in the form and attachments contributes to more streamlined technical reviews.

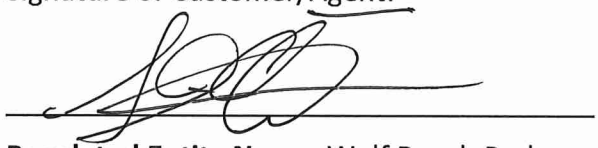
Signature

To the best of my knowledge, the responses to this form accurately reflect all information requested concerning the proposed regulated activities and methods to protect the Edwards Aquifer. This **Temporary Stormwater Section** is hereby submitted for TCEQ review and executive director approval. The application was prepared by:

Print Name of Customer/Agent: Steven Crauford, P.E.

Date: 9/2/25

Signature of Customer/Agent:



Regulated Entity Name: Wolf Ranch Parkway/Memorial Drive

Project Information

Potential Sources of Contamination

Examples: Fuel storage and use, chemical storage and use, use of asphaltic products, construction vehicles tracking onto public roads, and existing solid waste.

1. Fuels for construction equipment and hazardous substances which will be used during construction:

   ☒ The following fuels and/or hazardous substances will be stored on the site: Oil and petroleum products and substances

   These fuels and/or hazardous substances will be stored in:

   ☒ Aboveground storage tanks with a cumulative storage capacity of less than 250 gallons will be stored on the site for less than one (1) year.

☐ Aboveground storage tanks with a cumulative storage capacity between 250 gallons and 499 gallons will be stored on the site for less than one (1) year.

☐ Aboveground storage tanks with a cumulative storage capacity of 500 gallons or more will be stored on the site. An Aboveground Storage Tank Facility Plan application must be submitted to the appropriate regional office of the TCEQ prior to moving the tanks onto the project.

☐ Fuels and hazardous substances will not be stored on the site.

2. ☒ **Attachment A - Spill Response Actions**. A site specific description of the measures to be taken to contain any spill of hydrocarbons or hazardous substances is attached.

3. ☒ Temporary aboveground storage tank systems of 250 gallons or more cumulative storage capacity must be located a minimum horizontal distance of 150 feet from any domestic, industrial, irrigation, or public water supply well, or other sensitive feature.

4. ☒ **Attachment B - Potential Sources of Contamination**. A description of any activities or processes which may be a potential source of contamination affecting surface water quality is attached.

Sequence of Construction

5. ☒ **Attachment C - Sequence of Major Activities**. A description of the sequence of major activities which will disturb soils for major portions of the site (grubbing, excavation, grading, utilities, and infrastructure installation) is attached.

   ☒ For each activity described, an estimate (in acres) of the total area of the site to be disturbed by each activity is given.

   ☒ For each activity described, include a description of appropriate temporary control measures and the general timing (or sequence) during the construction process that the measures will be implemented.

6. ☒ Name the receiving water(s) at or near the site which will be disturbed or which will receive discharges from disturbed areas of the project: South & Middle Fork San Gabriel River

Temporary Best Management Practices (TBMPs)

Erosion control examples: tree protection, interceptor swales, level spreaders, outlet stabilization, blankets or matting, mulch, and sod. Sediment control examples: stabilized construction exit, silt fence, filter dikes, rock berms, buffer strips, sediment traps, and sediment basins. Please refer to the Technical Guidance Manual for guidelines and specifications. All structural BMPs must be shown on the site plan.

7. ☒ **Attachment D – Temporary Best Management Practices and Measures**. TBMPs and measures will prevent pollution of surface water, groundwater, and stormwater. The construction-phase BMPs for erosion and sediment controls have been designed to retain sediment on site to the extent practicable. The following information is attached:

☒ A description of how BMPs and measures will prevent pollution of surface water, groundwater or stormwater that originates upgradient from the site and flows across the site.

☒ A description of how BMPs and measures will prevent pollution of surface water or groundwater that originates on-site or flows off site, including pollution caused by contaminated stormwater runoff from the site.

☒ A description of how BMPs and measures will prevent pollutants from entering surface streams, sensitive features, or the aquifer.

☒ A description of how, to the maximum extent practicable, BMPs and measures will maintain flow to naturally-occurring sensitive features identified in either the geologic assessment, TCEQ inspections, or during excavation, blasting, or construction.

8. ☒ The temporary sealing of a naturally-occurring sensitive feature which accepts recharge to the Edwards Aquifer as a temporary pollution abatement measure during active construction should be avoided.

☐ **Attachment E - Request to Temporarily Seal a Feature**. A request to temporarily seal a feature is attached. The request includes justification as to why no reasonable and practicable alternative exists for each feature.

☒ There will be no temporary sealing of naturally-occurring sensitive features on the site.

9. ☒ **Attachment F - Structural Practices**. A description of the structural practices that will be used to divert flows away from exposed soils, to store flows, or to otherwise limit runoff discharge of pollutants from exposed areas of the site is attached. Placement of structural practices in floodplains has been avoided.

10. ☒ **Attachment G - Drainage Area Map**. A drainage area map supporting the following requirements is attached:

☒ For areas that will have more than 10 acres within a common drainage area disturbed at one time, a sediment basin will be provided.

☐ For areas that will have more than 10 acres within a common drainage area disturbed at one time, a smaller sediment basin and/or sediment trap(s) will be used.

☐ For areas that will have more than 10 acres within a common drainage area disturbed at one time, a sediment basin or other equivalent controls are not attainable, but other TBMPs and measures will be used in combination to protect down slope and side slope boundaries of the construction area.

☐ There are no areas greater than 10 acres within a common drainage area that will be disturbed at one time. A smaller sediment basin and/or sediment trap(s) will be used in combination with other erosion and sediment controls within each disturbed drainage area.

☐ There are no areas greater than 10 acres within a common drainage area that will be disturbed at one time. Erosion and sediment controls other than sediment basins or sediment traps within each disturbed drainage area will be used.

11. ☐ **Attachment H - Temporary Sediment Pond(s) Plans and Calculations**. Temporary sediment pond or basin construction plans and design calculations for a proposed temporary BMP or measure have been prepared by or under the direct supervision of a Texas Licensed Professional Engineer. All construction plans and design information must be signed, sealed, and dated by the Texas Licensed Professional Engineer. Construction plans for the proposed temporary BMPs and measures are attached.

☒ N/A

12. ☒ **Attachment I - Inspection and Maintenance for BMPs.** A plan for the inspection of each temporary BMP(s) and measure(s) and for their timely maintenance, repairs, and, if necessary, retrofit is attached. A description of the documentation procedures, recordkeeping practices, and inspection frequency are included in the plan and are specific to the site and/or BMP.

13. ☒ All control measures must be properly selected, installed, and maintained in accordance with the manufacturer's specifications and good engineering practices. If periodic inspections by the applicant or the executive director, or other information indicate a control has been used inappropriately, or incorrectly, the applicant must replace or modify the control for site situations.

14. ☒ If sediment escapes the construction site, off-site accumulations of sediment must be removed at a frequency sufficient to minimize offsite impacts to water quality (e.g., fugitive sediment in street being washed into surface streams or sensitive features by the next rain).

15. ☒ Sediment must be removed from sediment traps or sedimentation ponds not later than when design capacity has been reduced by 50%. A permanent stake will be provided that can indicate when the sediment occupies 50% of the basin volume.

16. ☒ Litter, construction debris, and construction chemicals exposed to stormwater shall be prevented from becoming a pollutant source for stormwater discharges (e.g., screening outfalls, picked up daily).

Soil Stabilization Practices

Examples: establishment of temporary vegetation, establishment of permanent vegetation, mulching, geotextiles, sod stabilization, vegetative buffer strips, protection of trees, or preservation of mature vegetation.

17. ☒ **Attachment J - Schedule of Interim and Permanent Soil Stabilization Practices**. A schedule of the interim and permanent soil stabilization practices for the site is attached.

18. ☒ Records must be kept at the site of the dates when major grading activities occur, the dates when construction activities temporarily or permanently cease on a portion of the site, and the dates when stabilization measures are initiated.

19. ☒ Stabilization practices must be initiated as soon as practicable where construction activities have temporarily or permanently ceased.

Administrative Information

20. ☒ All structural controls will be inspected and maintained according to the submitted and approved operation and maintenance plan for the project.

21. ☒ If any geologic or manmade features, such as caves, faults, sinkholes, etc., are discovered, all regulated activities near the feature will be immediately suspended. The appropriate TCEQ Regional Office shall be immediately notified. Regulated activities must cease and not continue until the TCEQ has reviewed and approved the methods proposed to protect the aquifer from any adverse impacts.

22. ☒ Silt fences, diversion berms, and other temporary erosion and sediment controls will be constructed and maintained as appropriate to prevent pollutants from entering sensitive features discovered during construction.

ATTACHMENT A

Spill Response Actions

In the event of an accidental leak or spill:

- Onsite personnel will be trained to follow the spill response actions for the site.
- Spill must be contained and cleaned up immediately.
- Spills will not be merely buried or washed with water.
- Contractor shall take action to contain spill. Contractor may use sand or other absorbent material stockpiled on site to absorb spill. Absorbent material should be spread over the spill area to absorb the spilled product.
- In the event of an uncontained discharge the contractor shall utilize onsite equipment to construct berms downgradient of the spill with sand or other absorbent material to contain and absorb the spilled product.
- Spill containment/absorbent materials along with impacted media must be collected and stored in such a way so as not to continue to affect additional media (soil/water). Once the spill has been contained, collected material should be placed on poly or plastic sheeting until removed from the site. The impacted media and cleanup materials should be covered with plastic sheeting and the edges weighed down with paving bricks or other similarly dense objects as the material is being accumulated. This will prevent the impacted media and cleanup materials from becoming airborne in windy conditions or impacting runoff during a rain event. The stockpiled materials should not be located within an area of concentrated runoff such as along a curb line or within a swale.
- Contaminated soils and cleanup materials will be sampled for waste characterization. When the analysis results are known the contaminated soils and cleanup materials will be removed from the site and disposed in a permitted landfill in accordance with applicable regulations.
- The contractor will be required to notify the owner, who will in turn contact TCEQ to notify them in the event of a significant hazardous/reportable quantity spill. Additional notifications as required by the type and amount of spill will be conducted by owner or owner's representative.

In the event of an accidental significant or hazardous spill:

- The contractor will be required to report significant or hazardous spills in reportable quantities as soon as possible and within 24 hours to:
  - the National Response Center at (800) 424-8802
  - the TCEQ Regional Office (512) 339-2929 (if during business hours: 8 AM to 5 PM) or
  - the State Emergency Response Center (800) 832-8224 (if after hours)

- Contaminated soils will be sampled for waste characterization. When the analysis results are known the contaminated soils will be removed from the site and disposed in a permitted landfill in accordance with applicable regulations.

Additional guidance can be obtained from TCEQ's Technical Guidance Manual (TGM) RG-348 (2005) Section 1.4.16. Contractor shall review this section.

ATTACHMENT B

POTENTIAL SOURCES OF CONTAMINATION

Potential Source: Asphalt products used on this project.

Preventative Measure:

- After placement of asphalt, emulsion or coatings, the contractor will be responsible for immediate cleanup should an unexpected rain occur. For the duration of the asphalt product curing time, the contractor will maintain standby personnel and equipment to contain any asphalt wash-off should an unexpected rain occur. The contractor will be instructed not to place asphalt products on the ground within 48 hours of a forecasted rain.

Potential Source: Oil, grease, fuel and hydraulic fluid contamination from construction equipment and vehicle dripping.

Preventative Measure:

- Vehicle maintenance, when possible, will be performed within the construction staging area.
- Construction vehicles and equipment shall be checked regularly for leaks and repaired immediately.

Potential Source: Accidental leaks or spills of oil, petroleum products and substances listed under 40 CFR parts 110, 117, and 302 used or stored temporarily on site.

Preventative Measure:

- Contractor to incorporate into regular safety meetings, a discussion of spill prevention and appropriate disposal procedures.

- Contractor's superintendent or representative overseer shall enforce proper spill prevention and control measures.
- Hazardous materials and waste shall be stored in covered containers and protected from vandalism.
- A stockpile of spill cleanup materials shall be stored on site where it will be readily accessible.

Potential Source: Miscellaneous trash and litter from construction workers and material wrappings.

Preventative Measure:

- Trash containers will be placed throughout the site to encourage proper trash disposal.

Potential Source: Construction debris.

Preventive Measure:

- Construction debris will be monitored daily by contractor. Debris will be collected weekly and placed in disposal bins. Situations requiring immediate attention will be addressed on a case-by-case basis.

Potential Source: Spills/Overflow of waste from portable toilets

Preventative Measure:

- Portable toilets will be placed away from high traffic vehicular areas and storm drain inlets
- Portable toilets will be placed on level ground surface
- Portable toilets will be inspected regularly for leaks and will be serviced and sanitized at time intervals that will maintain sanitary conditions

ATTACHMENT C

SEQUENCE OF MAJOR ACTIVITIES

The sequence of major activities which disturb soil during construction on this site are listed below.

1) Set erosion controls – approximately 12,329 LF of silt fence, and 22 LF of rock berm.
2) Clear and grub streets – approximately 19.14 acres
3) Rough grade streets – approximately 19.14 acres
4) Pond excavation – approximately 2.53 acres
5) Trench utilities – approximately 14,030 LF
6) Install water, wastewater, and storm – approximately 14,030 LF
7) Install subbase/base for streets – approximately 19.14 acres
8) Pave streets – approximately 19.14 acres
9) Pond completion – approximately 2.53 acres
10) Site cleanup – approximately 34.97 acres
11) Remove erosion controls – approximately 12,329 LF of silt fence, and 22 LF of rock berm.

ATTACHMENT D

TEMPORARY BEST MANAGEMENT PRACTICES AND MEASURES

Please see the Erosion Control sheets included in the Construction Plans Section for TBMP layout and the responses below for more details.

There are no offsite areas up gradient from the site that will flow onto the project area.

Site preparation, which is the initiation of all activity on the project, will disturb the largest amount of soil. Therefore, before any of this work can begin, the clearing and grading contractor will be responsible for the installation of all on-site control measures. The methodology for pollution prevention of on-site stormwater will include: (1) erection of silt fences along the downgradient boundary of construction activities for temporary erosion and sedimentation controls, (2) installation of stabilized construction entrance/exit(s) to reduce the dispersion of sediment from the site, and (3) installation of construction staging area(s).

Prior to the initiation of construction, all previously installed control measures will be repaired or reestablished for their designed or intended purpose. This work, which is the remainder of all activities on the project, may also disturb additional soil. The construction contractor will be responsible for the installation of all remaining on-site control measures that includes installation of the concrete truck washout pit(s), as construction phasing warrants.

Temporary measures are intended to provide a method of slowing the flow of runoff from the construction site in order to allow sediment and suspended solids to settle out of the runoff. By containing the sediment and solids within the site, they will not enter the aquifer, surface streams and/or sensitive features that may exist downstream of the site.

The South Fork of the San Gabriel River is located south of the site. A combination of TBMPs including silt fence is proposed to capture sediment from on-site stormwater runoff and preserve the quality of the river.

Temporary measures are intended to provide a method of slowing the flow of runoff from the construction site in order to allow sediment and suspended solids to settle out of the runoff. By containing the sediment and solids within the site, they will not enter the aquifer, surface streams and/or sensitive features that may exist downstream of the site. BMP measures utilized in this plan are intended to allow stormwater to continue downstream after passing through the BMPs. This will allow stormwater runoff to continue downgradient to streams or features that may exist downstream of the site. Features discovered during construction will be reported and assessed in accordance with applicable regulations.

ATTACHMENT F

STRUCTURAL PRACTICES

The following structural measures will be installed prior to the initiation of site preparation activities:

- Erection of silt fences along the downgradient boundary of construction activities and rock berms for secondary protection, as located on the Erosion Control Plan sheets and illustrated on the Construction Details - Erosion Control sheet.
- Installation of stabilized construction entrance/exit(s) and construction staging area(s), as located on the Erosion Control Plan sheets and illustrated on the Construction Details - Erosion Control sheet.

The following structural measures will be installed at the initiation of construction activities or as appropriate based on the construction sequencing:

- Installation of inlet protection, as required and located on the Erosion Control Plan sheets and illustrated on the Construction Details - Erosion Control sheet.
- Installation of concrete truck washout pit(s), as required and located on the Erosion Control Plan sheets and illustrated on the Construction Details - Erosion Control sheet.

ATTACHMENT G



MATCHLINE - SEE SHEET 453 OF 462

Wolf Ranch Parkway & Memorial Drive Expansions: Water Quality Treatment Summary

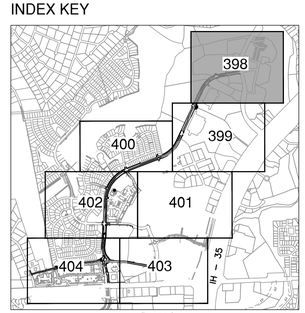
PBMP	Total Watershed Area (ac.)	Existing I.C. (ac.)	Proposed I.C. (ac.)	Total I.C. (ac.)	80% TSS Removal Required (lb.)	85% TSS Removal Required (lb.)	TSS Removal Provided (lb.)	Notes
MEMORIAL DRIVE - BATCH POND 2	3.08	--	0.83	0.83	722	768	768	
TOTAL WOLF RANCH SEC. 1A - VFS 5	1.31	--	0.68	0.68	592	629	629	NO CHANGE FROM APPROVED EAPP ID NO. 11-15032001
TOTAL MEMORIAL DRIVE BASIN	**3.08**	**--**	**1.51**	**1.51**	**1,314**	**1,396**	**1,397**	**DOES NOT TAKE CREDIT FOR EXISTING MEMORIAL DRIVE IC.**
TOTAL WOLF RANCH SECTION - 1A - WET POND BASIN	**61.23**	**0.55**	**34.67**	**34.12**	**29,698**	**31,554**	**32,618**	**EXISTING IC IS FROM WOLF 1A HOMESTEAD**
TOTAL WOLF RANCH TOWN CENTER - WET POND A BASIN*	**57.2**	**--**	**44.00**	**44.00**	**31,077**		**33,427**	**NO CHANGE FROM THE APPROVED EAPP ID NO. 03082601. REQUIRED TSS REMOVAL WAS DERIVED USING OLD CALCS.**
TOTAL WOLF RANCH TOWN CENTER - WET POND B BASIN*	**63.6**	**--**	**47.00**	**47.00**	**31,598**		**33,986**	
WOLF LAKES VILLAGE SEC. 1 PH. 1 & SEC. 2 - POND 1	129.83	--	98.56	98.56	85,787	91,148	91,148	
WOLF LAKES VILLAGE SEC. 1 PH. 1 & SEC. 2 - POND 1 - OVERTREAT	0.31	--	0.31	0.31	269	286	286	
TOTAL WOLF LAKES SEC. 1, PH. 1 & SEC. 2 - POND 1 BASIN	**129.83**	**--**	**98.87**	**98.87**	**86,056**	**91,434**	**91,434**	**NO CHANGE FROM THE APPROVED EAPP ID NO. 11003027**
TOTAL WOLF LAKES VILLAGE SEC. 1 - PH. 2 - POND 1 BASIN	**35.81**	**--**	**25.64**	**25.64**	**22,317**	**23,712**	**23,712**	**NO CHANGE FROM THE APPROVED EAPP ID NO. 11002713**
WOLF RANCH SEC. 2-BATCH DETENTION POND 1	40.93	1.00	24.19	23.19	20,185	21,446	23,961	**EXISTING IC FROM WOLF HOMESTEAD & MEMORIAL DRIVE**
OVERTREAT POND 1	--	--	2.72	2.72	2,367	2,515	--	
STORMTROOPER B2 WEST (SWAQ-110)	1.27	--	0.79	0.79	688	731	750	
STORMTROOPER B2 EAST (SWAQ-110)	1.19	--	0.84	0.84	731	777	796	
TOTAL WOLF RANCH SEC. 1A - VFS 5	0.49	--	0.29	0.29	252	268	268	
TOTAL WOLF RANCH SEC. 2 - POND 1 BASIN	**43.88**	**1.00**	**28.83**	**27.83**	**24,224**	**25,737**	**25,775**	
TOTAL BLUEBONNET PLAZA BATCH DETENTION POND BASIN	**33.96**	**--**	**13.35**	**13.35**	**11,620**	**12,346**	**12,346**	**NO CHANGE FROM THE APPROVED EAPP ID NO. 11001264**
RIVERY POND A*	86.33	10.76	30.96	20.20	20,118		21,633	
STORMTROOPER C1 WEST (SWAQ-40)	0.85	0.32	0.39	0.39	339	361	382	**NO CHANGE FROM THE APPROVED EAPP ID NO. 11-02041701. REQUIRED TSS REMOVAL WAS DERIVED USING OLD CALCS. STORMTROOPERS IN THIS BASIN ONLY TREAT THE ADDITIONAL IC FROM THE WRP EXPANSION.**
STORMTROOPER C2 EAST (SWAQ-25)	1.13	0.43	0.22	0.22	191	203	222	
TOTAL RIVERY POND A BASIN	**88.31**	**10.76**	**31.57**	**20.81**	**18,113**	**19,245**	**22,237**	
RIVERY POND B*	66.28	--	50.27	50.27	37,672		40,522	
STORMTROOPER D1 WEST (SWAQ-40)	0.89	0.37	0.44	0.44	383	407	420	**NO CHANGE FROM THE APPROVED EAPP ID NO. 11-02041701. REQUIRED TSS REMOVAL WAS DERIVED USING OLD CALCS. STORMTROOPERS IN THIS BASIN ONLY TREAT THE ADDITIONAL IC FROM THE WRP EXPANSION.**
STORMTROOPER D2 EAST (SWAQ-40)	1.72	0.55	0.44	0.44	383	407	430	
TOTAL RIVERY POND B BASIN	**68.89**	**0.00**	**51.15**	**51.15**	**44,521**	**47,304**	**41,372**	
TOTAL PROJECT	***460.96***	***12.31***	***376.59***	***364.28***	***300,538***	***315,404***	***318,304***	

*CALCULATED UNDER PREVIOUS TCEQ TSS GUIDANCE

WATER QUALITY POND VOLUME SUMMARY

POND	VOLUME REQUIRED (CF)	VOLUME PROVIDED (CF)	NOTES
RETROFITTED WOLF RANCH SECTION 2 - BATCH DETENTION POND 1	221,386	226,575	
EXISTING BLUEBONNET PLAZA - BATCH DETENTION POND	77,890	100,858	*No change in IC from previously approved pond design
MEMORIAL DRIVE - BATCH DETENTION POND 2	4,871	7,804	
EXISTING WOLF LAKES SEC. 1 PH. 1 & SEC. 2 - WET POND 1 (2021-4-CON)	PERMANENT POOL: 426,021	PERMANENT POOL: 450,170	*No change in IC from previously approved pond design
	WQV: 780,439	WQV: 780,928	
EXISTING WOLF LAKES VILLAGE SEC. 1 - PH. 2 - WET POND 1 (2021-16-CON)	PERMANENT POOL: 130,305	PERMANENT POOL: 226,297	
	WQV: 238,893	WQV: 335,946	
EXISTING WOLF RANCH TOWN CENTER - WET POND A	PERMANENT POOL: 144,449	PERMANENT POOL: 150,148	*No change in IC from previously approved pond design
	WQV: 288,898	WQV: 300,296	

INDEX KEY



1": 2000'

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STEVEN S. CRAUFORD
92677
LICENSED
PROFESSIONAL ENGINEER

09/12/2025

NO.	REVISION	DATE

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CITY OF GEORGETOWN, TEXAS
WOLF RANCH PKWY / MEMORIAL DR

WATER QUALITY TREATMENT SUMMARY 1 OF 11

CITY JOB No.
JOB NO. 51423-00
DATE 9/12/2025
DESIGNER AK
CHECKED SC DRAWN AK
1 11
SHEET 452

Date: Sep 12, 2025, 10:32am User ID: cashatz
File: I:\Projects\514\23\001\301 Construction Documents\Civil\WQ51423-00.dwg

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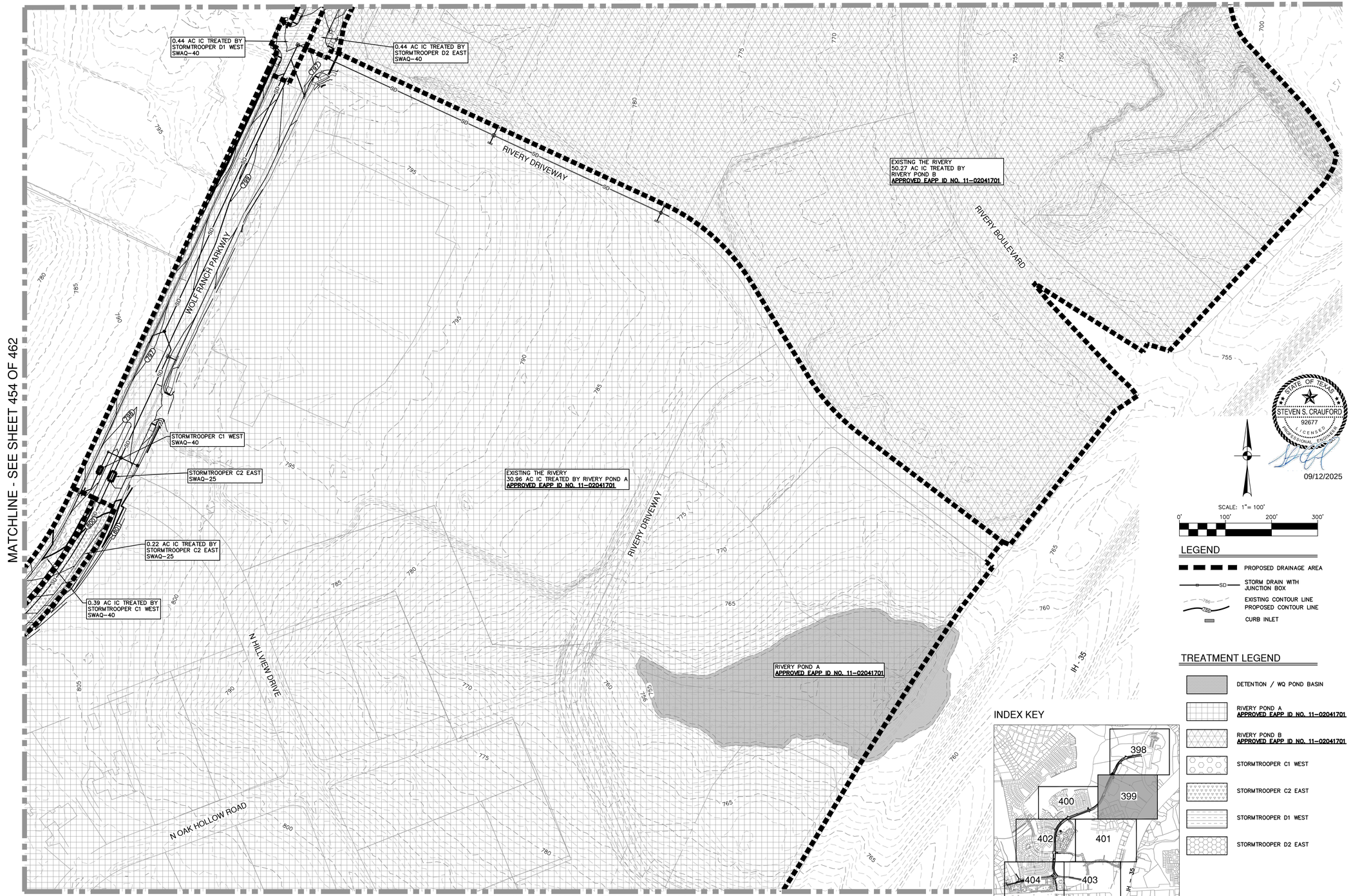
MATCHLINE - SEE SHEET 452 OF 462

MATCHLINE - SEE SHEET 454 OF 462



MATCHLINE - SEE SHEET 455 OF 462

09/12/2025

SCALE: 1"= 100'

0' 100' 200' 300'

LEGEND

- PROPOSED DRAINAGE AREA
- SD — STORM DRAIN WITH JUNCTION BOX
- EXISTING CONTOUR LINE
- PROPOSED CONTOUR LINE
- CURB INLET

TREATMENT LEGEND

- DETENTION / WQ POND BASIN
- RIVERY POND A APPROVED EAPP ID NO. 11-02041701
- RIVERY POND B APPROVED EAPP ID NO. 11-02041701
- STORMTROOPER C1 WEST
- STORMTROOPER C2 EAST
- STORMTROOPER D1 WEST
- STORMTROOPER D2 EAST

INDEX KEY

1": 2000'

NO.	REVISION	DATE

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STATE OF TEXAS
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CITY OF GEORGETOWN, TEXAS
WOLF RANCH PKWY / MEMORIAL DR
WATER QUALITY TREATMENT SUMMARY 2 OF 11

CITY JOB No.
JOB NO. 51423-00
DATE 9/12/2025
DESIGNER AK
CHECKED SC DRAWN AK

SHEET 2 11
453

Date: Sep 12, 2025, 11:14am User ID: cshatz
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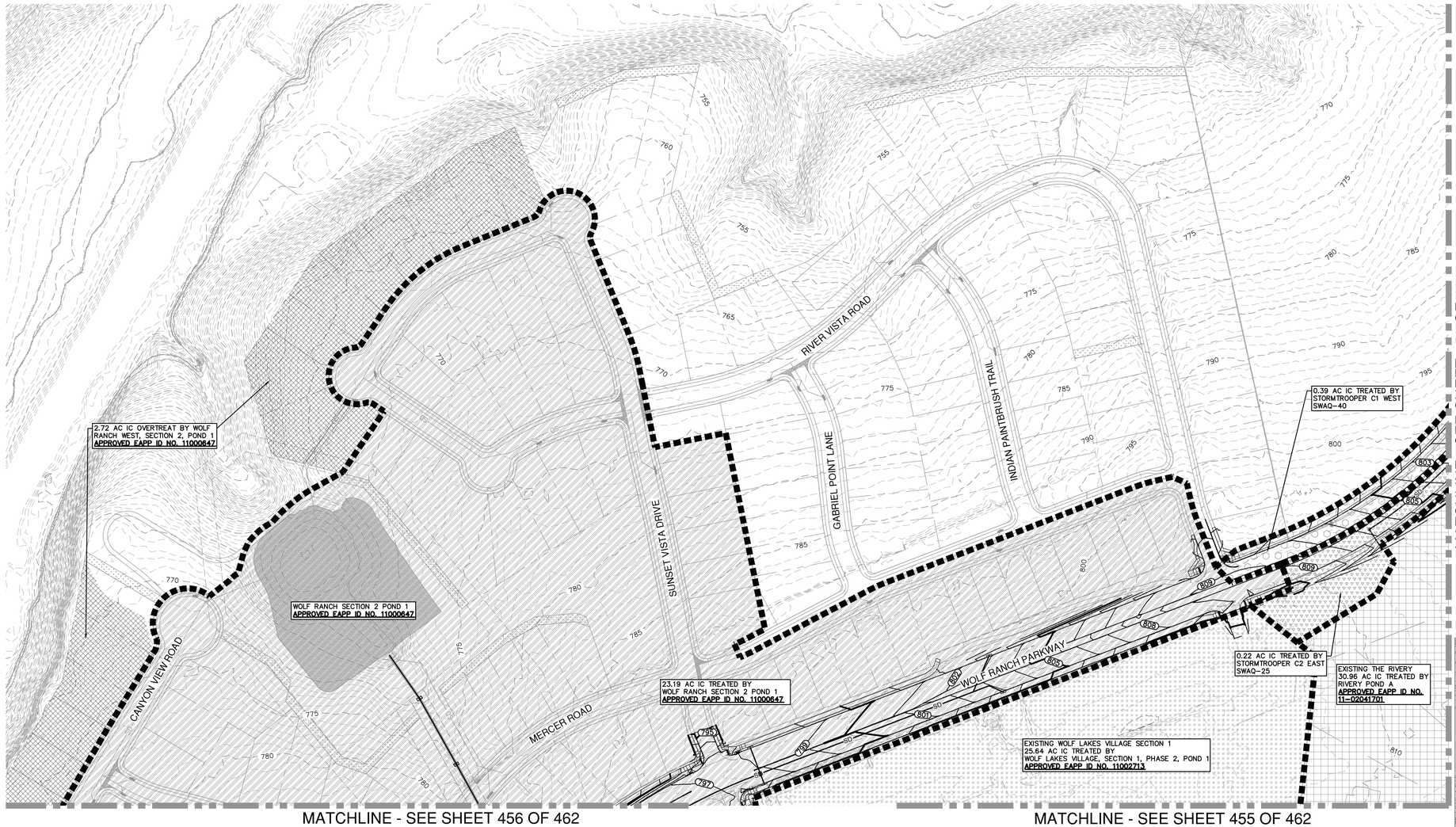

SCALE: 1"= 100'

0' 100' 200' 300'

LEGEND

- PROPOSED DRAINAGE AREA
- STORM DRAIN WITH JUNCTION BOX
- EXISTING CONTOUR LINE
- PROPOSED CONTOUR LINE
- CURB INLET

TREATMENT LEGEND

- DETENTION / WQ POND BASIN
- RIVERY POND A APPROVED EAPP ID NO. 11-02041701
- STORMTROOPER C1 WEST
- STORMTROOPER C2 EAST
- WOLF RANCH SECTION 2 POND 1 APPROVED EAPP ID NO. 11000647
- WOLF LAKES VILLAGE SECTION 1, PHASE 2, POND 1 APPROVED EAPP ID NO. 11002713
- AREAS OF OVERTREAT
- VEGETATIVE FILTER STRIP

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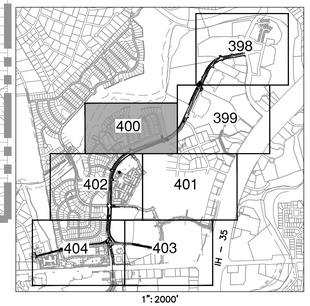
INDEX KEY 09/12/2025



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CITY OF GEORGETOWN, TEXAS
WOLF RANCH PKWY / MEMORIAL DR
WATER QUALITY TREATMENT SUMMARY 3 OF 11

CITY JOB No.
JOB NO. 51423-00
DATE 9/12/2025
DESIGNER AK
CHECKED SC DRAWN AK
SHEET 454 3 11

Date: Sep 12, 2025, 11:15am User ID: cashetz
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MATCHLINE - SEE SHEET 454 OF 462

MATCHLINE - SEE SHEET 453 OF 462

MATCHLINE - SEE SHEET 456 OF 462

EXISTING THE RIVERY
30.96 AC IC TREATED BY RIVERY POND A
APPROVED EAPP ID NO. 11-02041701

98.56 AC IC TREATED BY
WOLF LAKES VILLAGE SECTION 1,
PHASE 1 & SECTION 2 - POND 1
APPROVED EAPP ID NO. 11003027

WATER QUALITY DETENTION WET POND 1
APPROVED EAPP ID NO. 11003027

N OAK HOLLOW ROAD

N HILLVIEW DRIVE

RIVER HILLS DRIVE

LEGACY CROSSING

WOLF LAKES DRIVE

BELLA LAGO DRIVE

IH - 35

SCALE: 1" = 100'

0' 100' 200' 300'

LEGEND

- PROPOSED DRAINAGE AREA
- SD — STORM DRAIN WITH JUNCTION BOX
- EXISTING CONTOUR LINE
- PROPOSED CONTOUR LINE
- CURB INLET

TREATMENT LEGEND

- DETENTION / WQ POND BASIN
- RIVERY WET POND A
  APPROVED EAPP ID NO. 11-02041701
- WOLF LAKES VILLAGE SECTION 1,
  PHASE 2, POND 1
  APPROVED EAPP ID NO. 1102713
- WOLF LAKES VILLAGE SECTION 1,
  PHASE 1 & SECTION 2 - POND 1
  APPROVED EAPP ID NO. 11003027

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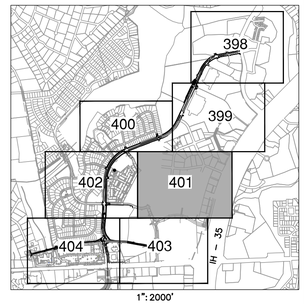

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CITY OF GEORGETOWN, TEXAS
WOLF RANCH PKWY / MEMORIAL DR
WATER QUALITY TREATMENT SUMMARY 4 OF 11

CITY JOB No.
JOB NO. 51423-00
DATE 9/12/2025
DESIGNER AK
CHECKED SC DRAWN AK
4 11
SHEET 455

Date: Sep 12, 2025, 11:16am User ID: cathatz
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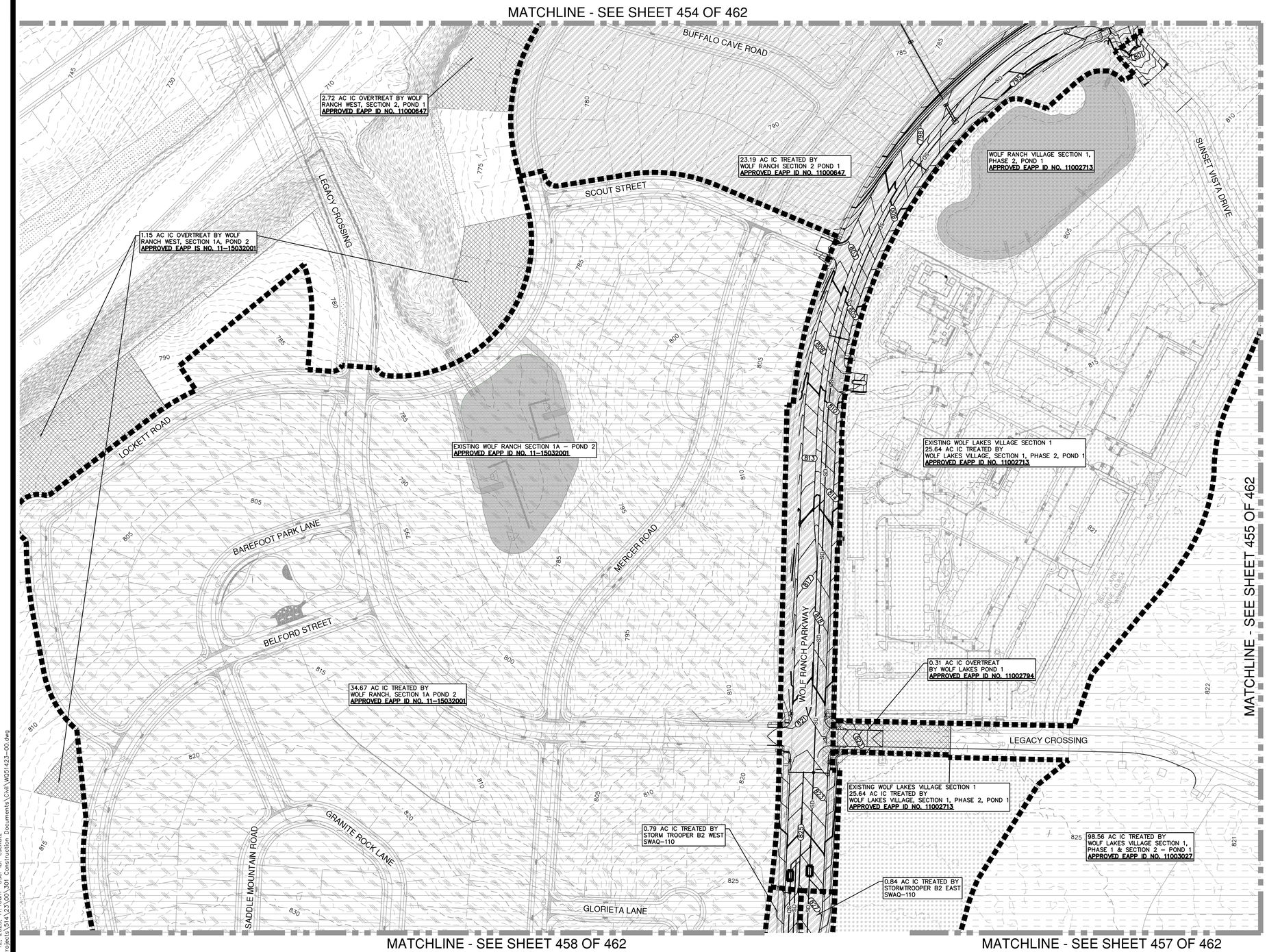

SCALE: 1"= 100'

0' 100' 200' 300'

LEGEND

- PROPOSED DRAINAGE AREA
- STORM DRAIN WITH JUNCTION BOX
- EXISTING CONTOUR LINE
- PROPOSED CONTOUR LINE
- CURB INLET

TREATMENT LEGEND

- DETENTION / WQ POND BASIN
- WOLF LAKES VILLAGE SECTION 1, PHASE 2, POND 1 APPROVED EAPP ID NO. 11002713
- WOLF RANCH SECTION 2 POND 1 APPROVED EAPP ID NO. 11000647
- WOLF LAKES VILLAGE SECTION 1, PHASE 1 & SECTION 2 – POND 1 APPROVED EAPP ID NO. 11003027
- WOLF RANCH SECTION 1A APPROVED EAPP ID NO. 11-15032001
- AREAS OF OVERTREAT

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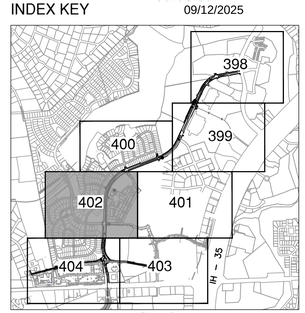
09/12/2025

INDEX KEY



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CITY OF GEORGETOWN, TEXAS
WOLF RANCH PKWY / MEMORIAL DR
WATER QUALITY TREATMENT SUMMARY 5 OF 11

CITY JOB No.
JOB NO. 51423-00
DATE 9/12/2025
DESIGNER AK
CHECKED SC DRAWN AK
5 11
SHEET 456

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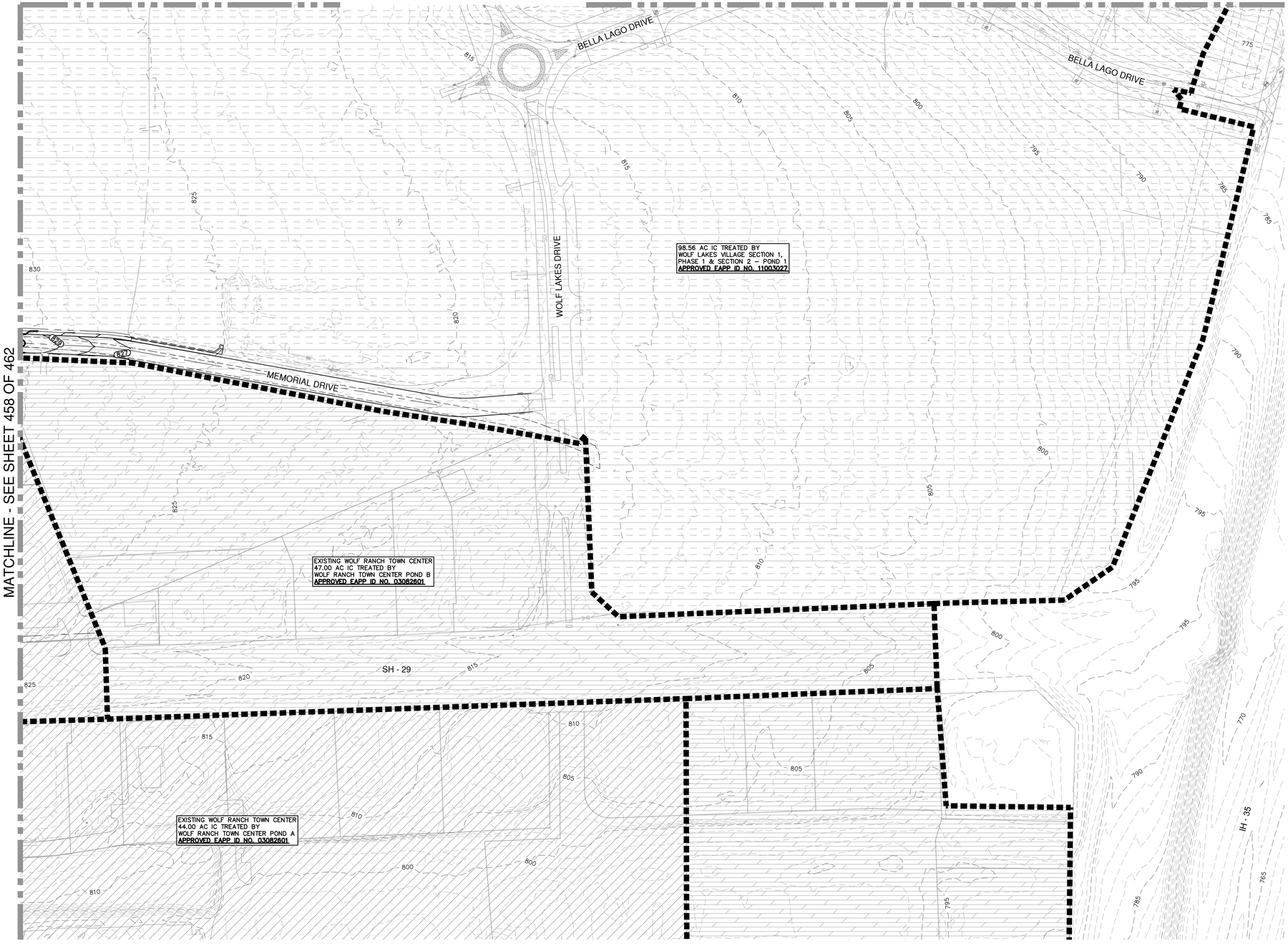
MATCHLINE - SEE SHEET 456 OF 462

MATCHLINE - SEE SHEET 455 OF 462

MATCHLINE - SEE SHEET 458 OF 462



SCALE: 1"= 100'

0' 100' 200' 300'

LEGEND

- PROPOSED DRAINAGE AREA
- SD — STORM DRAIN WITH JUNCTION BOX
- EXISTING CONTOUR LINE
- PROPOSED CONTOUR LINE
- CURB INLET

TREATMENT LEGEND

- WOLF LAKES VILLAGE SECTION 1, PHASE 1 & SECTION 2 – POND 1 APPROVED EAPP ID NO. 11003027
- WOLF RANCH TOWN CENTER POND B APPROVED EAPP ID NO. 03082801
- WOLF RANCH TOWN CENTER POND A APPROVED EAPP ID NO. 03082801

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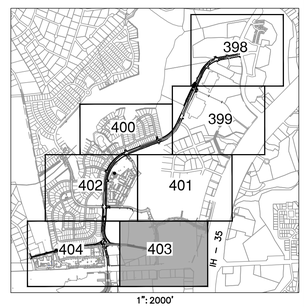

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CITY OF GEORGETOWN, TEXAS
WOLF RANCH PKWY / MEMORIAL DR
WATER QUALITY TREATMENT SUMMARY 6 OF 11

CITY JOB No.
JOB NO. 51423-00
DATE 9/12/2025
DESIGNER AK
CHECKED SC DRAWN AK
6 11
SHEET 457

Date: Sep 12, 2025, 11:17am User ID: cashatz
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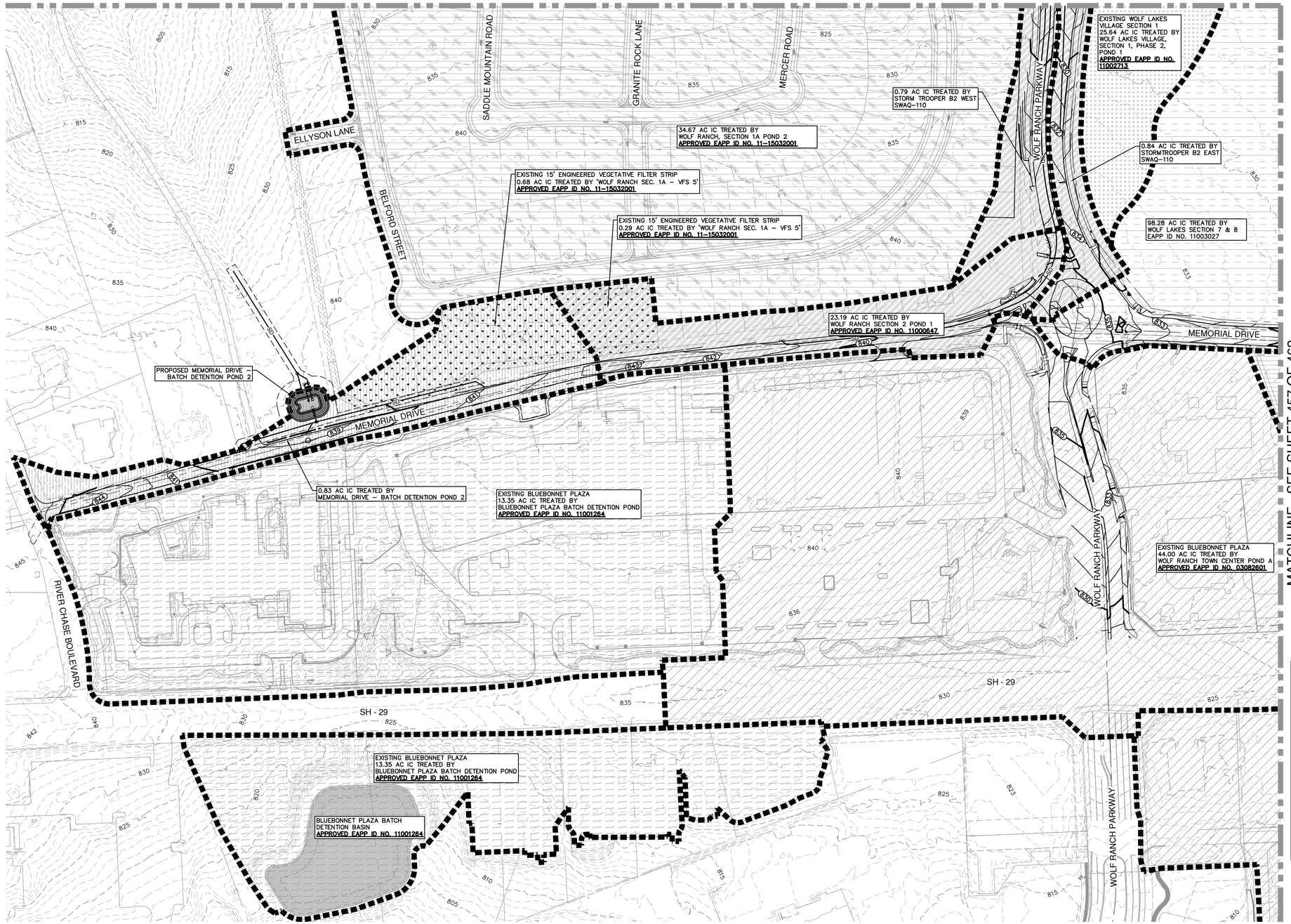
MATCHLINE - SEE SHEET 456 OF 462



MATCHLINE - SEE SHEET 457 OF 462

SCALE: 1"= 100'

0' 100' 200' 300'

LEGEND

- PROPOSED DRAINAGE AREA
- STORM DRAIN WITH JUNCTION BOX
- EXISTING CONTOUR LINE
- PROPOSED CONTOUR LINE
- CURB INLET

TREATMENT LEGEND

- WOLF LAKES SECTIONS 7 & 8 APPROVED EAPP ID NO. 11003027
- WOLF RANCH TOWN CENTER POND A APPROVED EAAP ID NO. 03082601
- WOLF RANCH TOWN CENTER POND B APPROVED EAAP ID NO. 03082601
- WOLF RANCH SECTION 1A POND 2 APPROVED EAPP ID NO. 11-15032001
- WOLF LAKES VILLAGE SECTION 1, PHASE 2, POND 1 APPROVED EAPP ID NO. 11002713
- WOLF RANCH SECTION 2 POND 1 APPROVED EAPP ID NO. 11000647
- BLUEBONNET PLAZA BATCH POND APPROVED EAPP ID NO. 11001264
- MEMORIAL DRIVE BATCH POND 2
- DETENTION / WQ POND BASIN
- LOT AREA TREATED BY VEGETATIVE FILTER STRIP

STATE OF TEXAS
STEVEN S. CRAUFORD
92677
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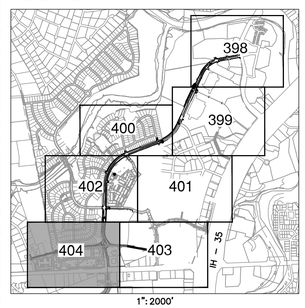
INDEX KEY 09/12/2025



1": 2000'

NO.	REVISION	DATE

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CITY OF GEORGETOWN, TEXAS
WOLF RANCH PKWY / MEMORIAL DR
WATER QUALITY TREATMENT SUMMARY 7 OF 11

CITY JOB No.
JOB NO. 51423-00
DATE 9/12/2025
DESIGNER AK
CHECKED SC DRAWN AK
7 11
SHEET 458

Date: Sep 12, 2025, 10:37am User ID: cschultz
File: H:\Projects\51423\00\301 Construction Documents\Civil\W051423-00.dwg

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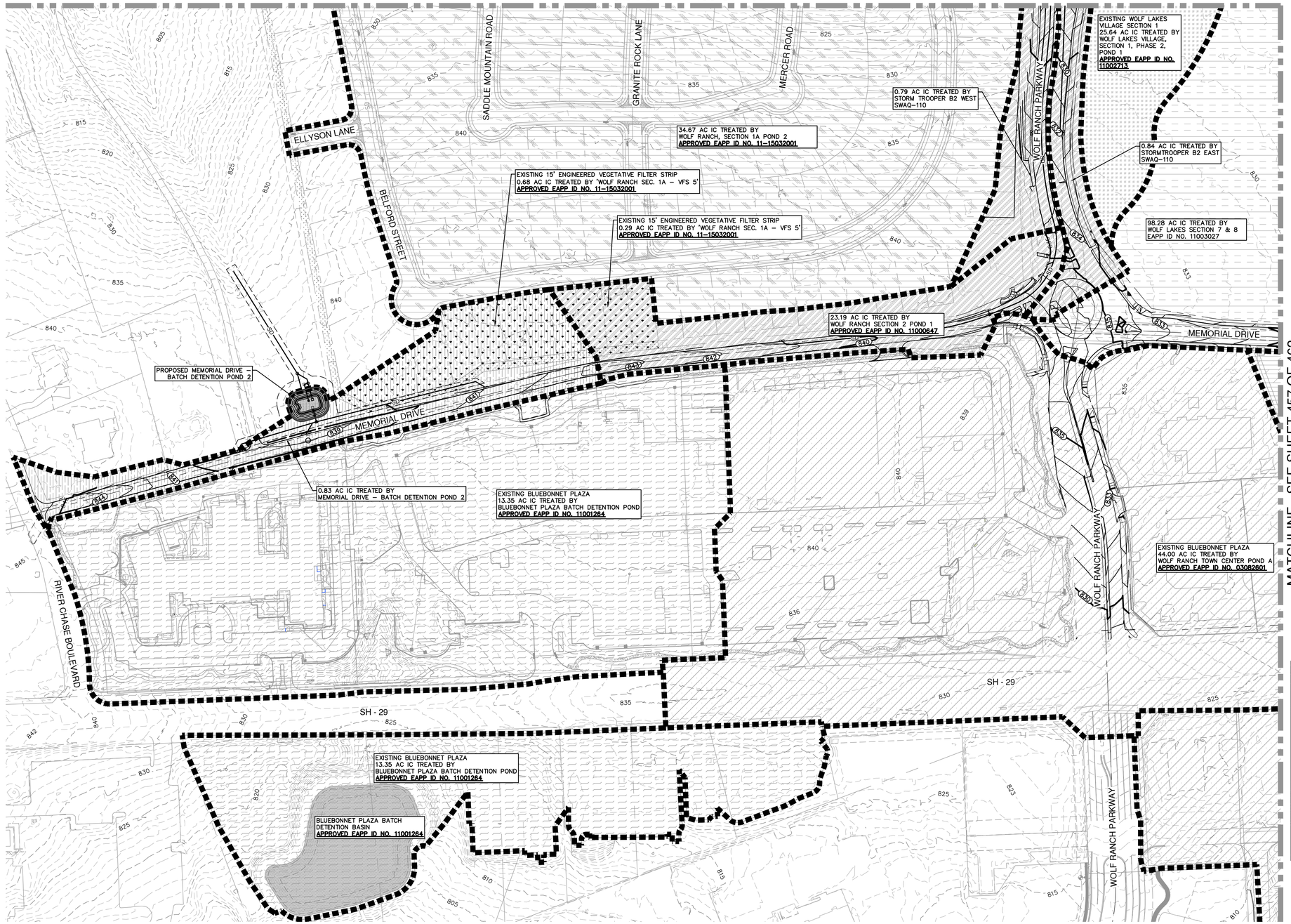
MEMORIAL DRIVE BASIN

MATCHLINE - SEE SHEET 456 OF 462



MATCHLINE - SEE SHEET 457 OF 462

SCALE: 1"= 100'

0' 100' 200' 300'

LEGEND

- PROPOSED DRAINAGE AREA
- STORM DRAIN WITH JUNCTION BOX
- EXISTING CONTOUR LINE
- PROPOSED CONTOUR LINE
- CURB INLET

TREATMENT LEGEND

- WOLF LAKES SECTIONS 7 & 8 APPROVED EAPP ID NO. 11003027
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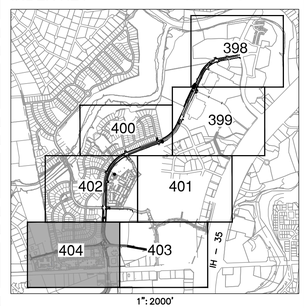
LICENSED PROFESSIONAL ENGINEER

INDEX KEY 09/12/2025



1": 2000'

NO.	REVISION	DATE

GEORGETOWN TEXAS more than welcome

PAPE-DAWSON ENGINEERS
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10801 N MOPAC EXPY, BLDG 3, STE 200 I AUSTIN, TX 78759 I 512.454.8711
TBPE FIRM REGISTRATION #470 I TBPLS FIRM REGISTRATION #10028801

CITY OF GEORGETOWN, TEXAS
WOLF RANCH PKWY / MEMORIAL DR
WATER QUALITY TREATMENT SUMMARY 7 OF 11

CITY JOB No.
JOB NO. 51423-00
DATE 9/12/2025
DESIGNER AK
CHECKED SC DRAWN AK
7 11
SHEET 458

Date: Sep 12, 2025, 10:37am User ID: cschultz
File: H:\Projects\51423\00\301 Construction Documents\Civil\W051423-00.dwg

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Water Quality - Memorial Drive Pond - Combined Elevation-Area-Storage Table							
Stage (ft. msl)	Pond Area (sf)	Pond Area (ac)	Incremental Height (ft)	Incremental Volume Avg. End Area (cf)	Cumulative Volume (cf)	Cumulative Volume (ac-ft)	Comments
833.5	130	0.0030	---	---	---	---	
834	944	0.0217	0.5	269	269	0.01	Sed Marker @ 0.5 ft Sed Depth
835	1,366	0.0314	1	1,155	1,424	0.03	
836	1,843	0.0423	1	1,605	3,028	0.07	
837	2,374	0.0545	1	2,109	5,137	0.12	
838	2,961	0.0680	1	2,668	7,804	0.18	Water Quality Volume
838.8	3,281	0.0753	0.8	2,497	10,301	0.24	25 YR WSEL
839	3,601	0.0827	0.2	688	10,989	0.25	100 YR WSEL
840	4,297	0.0986	1	3,949	14,938	0.34	Top of Berm

ORIFICE DRAWDOWN TIME FOR BATCH DETENTION

Contour Elevation (ft)	Contour Area (ft^2)	Average End Area Method $V_{1,2} = \left[\frac{A_1 + A_2}{2}\right] * d$ Incremental Volume (ft^3)	Total Volume (ft^3)	Orifice Discharge (cfs)	Incremental Drawdown Time (hr)	Total Drawdown Time (hr)
838	2,961	-	-	-	-	-
837	2,374	2,668	2,668	0.27	2.8	2.8
836	1,843	2,109	4,776	0.24	2.4	5.2
835	1,366	1,605	6,381	0.22	2.0	7.2
834	944	1,155	7,536	0.19	1.7	8.9
833.5	130	269	7,804	0.17	0.4	9.3

ORIFICE DIAMETER	2.00	in
ORIFICE FL ELEV	831.02	
ORIFICE CENTROID ELEV	**831.10**	
ORIFICE AREA (Ao)	**0.022**	sf
ORIFICE COEFFICIENT	**0.6**	

ORIFICE EQUATION

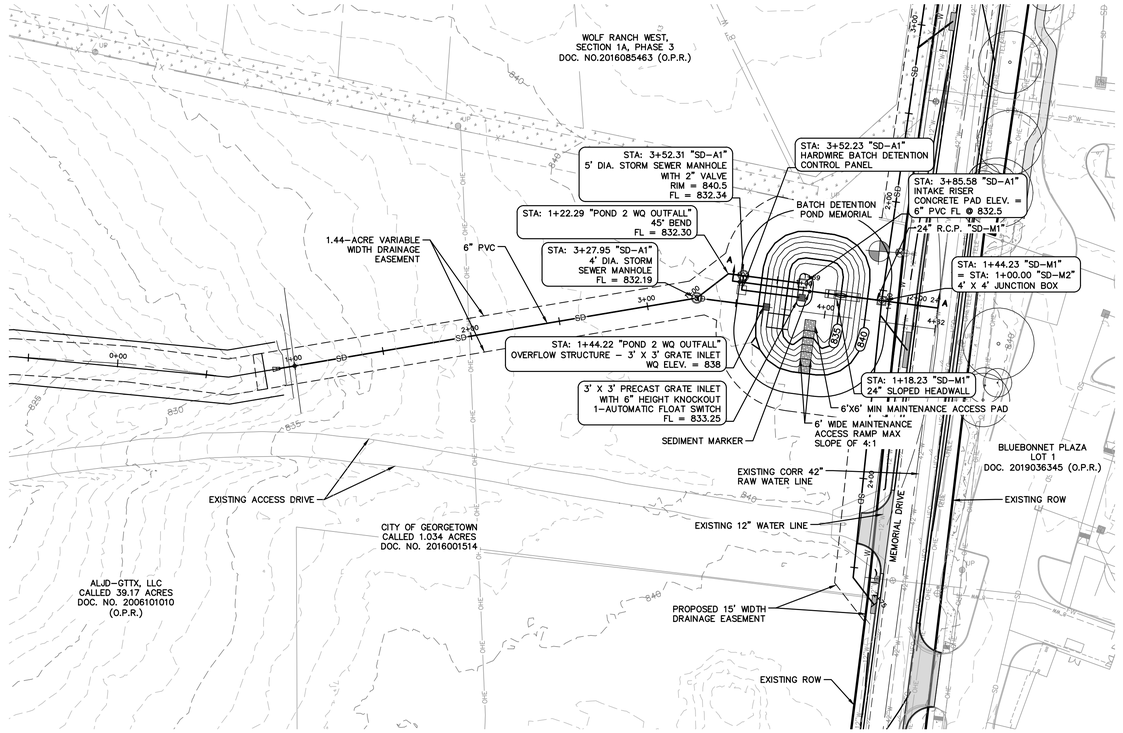
$$Q = CA_o\sqrt{2gH}$$

CALCULATE 24 HR DRAWDOWN ELEVATION FOR WATER QUALITY POND (USE IN DETENTION MODEL)

Total Drawdown Time	9.3	hours
Total Hold + Drawdown Time (Max. 48 Hours)	21.3	hours
Orifice Discharge Rate (Average)	0.23	cfs

POND UNDERDRAIN SIZING CALCULATIONS

DRAIN LINE ID	WATER QUALITY VOLUME **WQV** (cf)	AVERAGE DRAWDOWN FLOWRATE FROM ORIFICE (VALVE) **Q** (cfs)	PIPE DIAMETER **D** (in)	MANNINGS N **n**	PIPE SLOPE **S** (ft/ft)	FULL FLOW CAPACITY **Qcap**	**K**	FRICTION SLOPE **Sf** (ft/ft)
MEMORIAL DRIVE POND DRAIN	7,804	0.23	6	0.010	0.005	0.52	7.29	0.0010



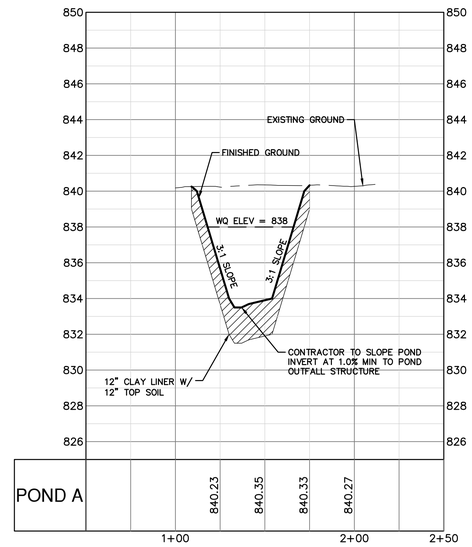
SCALE: 1"= 40'

0' 40' 80' 120'

LEGEND

- WATER LINE
- WASTEWATER LINE & MH
- STORM DRAIN LINE & MH
- CURB INLET
- FLOODPLAIN
- OVERHEAD ELECTRIC LINE
- GATE VALVE
- FIRE HYDRANT
- EXISTING GATE VALVE
- EXISTING FIRE HYDRANT
- EXISTING WATER LINE
- EXISTING WASTEWATER LINE
- EXISTING STORM DRAIN LINE
- EXISTING CONTOUR LINE
- PROPOSED CONTOUR LINE

EXISTING TREES



STATE OF TEXAS
STEVEN S. CRAUFORD
92677
LICENSED PROFESSIONAL ENGINEER

09/12/2025

PROFILE SCALES:

1" = 40' HORIZONTAL
1" = 4' VERTICAL

PROFILE LEGEND:

NATURAL GROUND

FINISHED GRADE

PROPOSED STORM DRAIN

NO.	REVISION	DATE

GEORGETOWN TEXAS *more than welcome*

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TBPE FIRM REGISTRATION #470 | TBPLS FIRM REGISTRATION #10028801

CITY OF GEORGETOWN, TEXAS
WOLF RANCH PKWY / MEMORIAL DR

BATCH DETENTION POND 2 PLAN

CITY JOB No.
JOB NO. 51423-00
DATE 9/12/2025
DESIGNER JB
CHECKED SC DRAWN JB

SHEET 466

Date: Sep 12, 2025, 10:40am User ID: cashatz
File: K:\Proj\514\23\001\301 Construction Documents\Civil\PD51423-00_POND 2.dwg

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Texas Commission on Environmental Quality

TSS Removal Calculations 04-20-2009

Project Name: **Memorial Drive - Batch Detention Pond 2**
Date Prepared: **8/8/2025**

Additional information is provided for cells with a red triangle in the upper right corner. Place the cursor over the cell.
Text shown in blue indicate location of instructions in the Technical Guidance Manual - RG-348.
Characters shown in red are data entry fields.
Characters shown in black (Bold) are calculated fields. Changes to these fields will remove the equations used in the spreadsheet.

1. The Required Load Reduction for the total project: Calculations from RG-348 Pages 3-27 to 3-30

Page 3-29 Equation 3.3: $L_M = 28.9(A_N \times P)$

where:
$L_{M\ TOTAL\ PROJECT}$ = Required TSS removal resulting from t
A_N = Net increase in impervious area for the project
P = Average annual precipitation, inches

Site Data: Determine Required Load Removal Based on the Entire Project

County =	**Williamson**	
Total project area included in plan * =	**453.42**	acres
Predevelopment impervious area within the limits of the plan * =	**12.31**	acres
Total post-development impervious area within the limits of the plan* =	**376.59**	acres
Total post-development impervious cover fraction * =	**0.83**	
P =	**32**	inches
$L_{M\ TOTAL\ PROJECT}$ =	**336886**	lbs.

* **The values entered in these fields should be for the total project area.**

Number of drainage basins / outfalls areas leaving the plan area = **1.00**

2. Drainage Basin Parameters (This information should be provided for each basin):

Drainage Basin/Outfall Area No. = Memorial Pond

Total drainage basin/outfall area =	**3.08**	acres	
Predevelopment impervious area within drainage basin/outfall area =	**0.60**	acres	
Post-development impervious area within drainage basin/outfall area =	**0.83**	acres	***Not including the IC that was already treated with VFS**
Post-development impervious fraction within drainage basin/outfall area =	**0.27**		
$L_{M\ THIS\ BASIN}$ =	**768**	lbs.	

3. Indicate the proposed BMP Code for this basin.

Proposed BMP =	**Batch Detention**	
Removal efficiency =	**91**	percent

4. Calculate Maximum TSS Load Removed (L_R) for this Drainage Basin by the selected BMP Type.

RG-348 Page 3-33 Equation 3.7: L_R = (BMP efficiency) x P x (A_C x 34.6 + A_P x 0.54)

where:
A_C = Total On-Site drainage area in the BMP catchment area
A_I = Impervious area proposed in the BMP catchment area
A_P = Pervious area remaining in the BMP catchment area
L_R = TSS Load removed from this catchment area by the proposed BMP

A_C =	**3.08**	acres	
A_I =	**0.83**	acres	***Not including the IC that was already treated with VFS**
A_P =	**2.25**	acres	
L_R =	**872**	lbs	

5. Calculate Fraction of Annual Runoff to Treat the drainage basin / outfall area

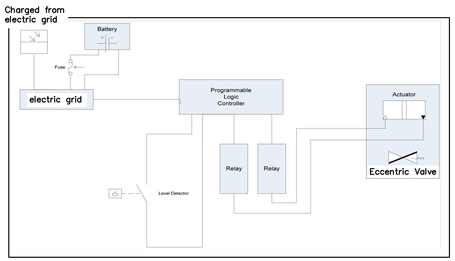
Desired $L_{M\ THIS\ BASIN}$ =	**768**	lbs.
F =	**0.88**	

6. Calculate Capture Volume required by the BMP Type for this drainage basin / outfall area. Calculations from RG-348 Pages 3-34 to 3-36

Rainfall Depth =	**1.50**	inches
Post Development Runoff Coefficient =	**0.24**	
On-site Water Quality Volume =	**4059**	cubic feet

Calculations from RG-348 Pages 3-36 to 3-37

Off-site area draining to BMP =	**0.00**	acres
Off-site Impervious cover draining to BMP =	**0.00**	acres
Impervious fraction of off-site area =	**0**	
Off-site Runoff Coefficient =	**0.00**	
Off-site Water Quality Volume =	**0**	cubic feet
Storage for Sediment =	**812**	
Total Capture Volume (required water quality volume(s) x 1.20) =	**4871**	cubic feet



CONTROLLER CIRCUIT DIAGRAM

CONTROLLER NOTES:
1. REFER TO THE WATER POLLUTION ABATEMENT PLAN FOR LOGIC CONTROLLER CYCLE OVERVIEW.
2. CLEARLY VISIBLE ALARM SYSTEM TO BE PROVIDED TO INDICATE SYSTEM MALFUNCTION.
3. SIGN TO BE POSTED WITH PHONE NUMBERS OF THE OWNER AND APPROPRIATE TCEQ REGIONAL OFFICE.

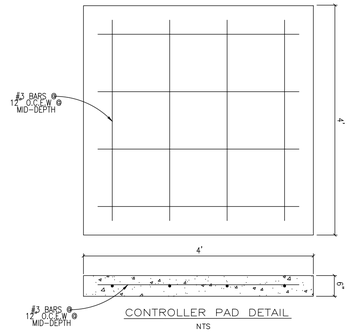
Batch Detention Pond Controller Information

Component	Description	Voltage
Power System	Charged from electric grid 12 VDC Battery (Model MK Powered 8GU1) (Or approved equal).	
Logic Controller	IDEC FL1C-H12RCE (Or approved equal)	12
Parts Enclosure	Southwest Photovoltaic Model BBG-1 (15.75" wide x 9.75" deep x 11.75" tall) (Or approved equal)	
Nature of Event Sensing	Anchor Scientific Float Switch (Or approved equal)	
Valve Type	2" Eccentric Plug Valve with over torque sensors and mechanical hand crank for physical override if necessary. Able to withstand 100 psi minimum. (Or approved equal)	
Actuator	EPI-6 12 VDC. Able to withstand 100 psi minimum. (Or approved equal)	12
Power Consumption (actuator, controller, relay, PLC)	242.58 W, 46.5 W-hours	



POND SIGN DETAIL

SIGN NOTING CONTACT INFORMATION FOR RESPONSIBLE PARTY IN CASE OF ALARM. SHALL HAVE MINIMUM DIMENSION OF 12" WIDE BY 18" HIGH AND SHALL HAVE BLACK LETTERS ON A WHITE REFLECTIVE BACKGROUND. SIGN MUST BE LOCATED NEAR SYSTEM ALARM.

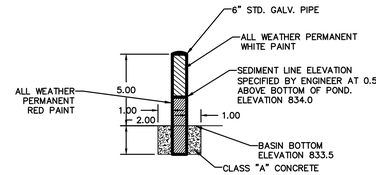


CONTROLLER PAD DETAIL
NTS

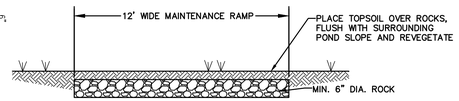
Material Property	Requirement	Testing Standard
Minimum Liquid Limit	> 50	ASTM D 4318
Minimum Plasticity Index	> 30	ASTM D 4318
Minimum Percent Passing # 200 Sieve	> 60 %	ASTM D 422
Maximum Particle Size	< 1 inch	ASTM D 422
Maximum Laboratory Permeability	$< 1 \times 10^{-7}$ cm/sec	ASTM D 5084

*REFER TO GEOTECHNICAL REPORT PREPARED BY MLA LABS, INC., DATED JULY 19, 2024 FOR CLAY LINER RECOMMENDATIONS.

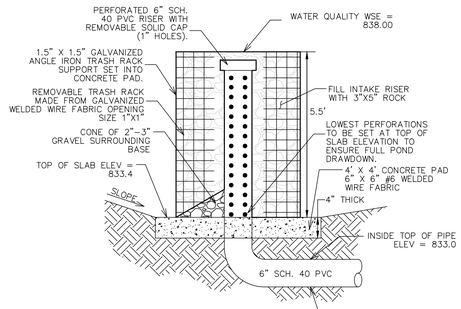
NOTE
1. THE CONSTRUCTED HEIGHT OF AN EARTHEN EMBANKMENT SHALL BE EQUAL TO THE DESIGN HEIGHT PLUS THE AMOUNT NECESSARY TO ENSURE THAT THE DESIGN HEIGHT WILL BE MAINTAINED ONCE ALL SETTLEMENT HAS TAKEN PLACE. THIS AMOUNT SHALL IN NO CASE BE LESS THAN 5% OF THE TOTAL FILL HEIGHT. ALL EARTHEN EMBANKMENTS SHALL BE COMPACTED TO 95% OF MAXIMUM DENSITY IN ACCORDANCE WITH CITY OF SAN MARCOS STANDARD SPECIFICATIONS.
2. UPON COMPLETION OF THE PROPOSED SITE IMPROVEMENT AND PRIOR TO THE RELEASE OF THE CERTIFICATE OF ACCEPTANCE OR OCCUPANCY BY THE PERMIT CENTER, THE DESIGN ENGINEER SHALL CERTIFY IN WRITING THAT THE PROPOSED DETENTION FACILITY, FILTRATION FACILITIES OR WATER QUALITY FACILITIES WERE CONSTRUCTED IN CONFORMANCE WITH THE APPROVED PLANS. ANY SUCH FACILITIES BUILT WITHIN THE CITY OF SAN MARCOS CITY LIMITS WILL NEED TO SHOW COMPLIANCE WITH THE CITY MUNICIPAL SEPARATE STORM SEWER SYSTEM ORDINANCES. PRIOR TO RELEASE OF THE CERTIFICATE OF ACCEPTANCE OR OCCUPANCY A CITY EASEMENT MUST BE SHOWN AROUND ALL SUCH FACILITIES WITH A MAINTENANCE COVENANT FOR EACH FACILITY.
3. STABILIZATION OF POND OR OTHER DISTURBED SLOPES 3:1 OR STEEPER WITH DEGRADABLE SOIL RETENTION BLANKETS, OR EQUIVALENT BMP IS REQUIRED. OR SOD.



SEDIMENT DEPTH MARKER DETAIL
NTS

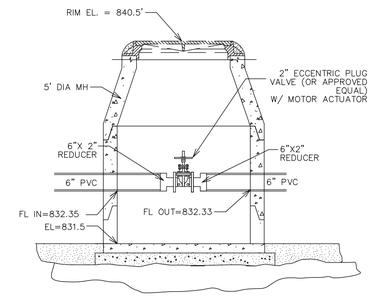


POND MAINTENANCE ACCESS SECTION
N.T.S.



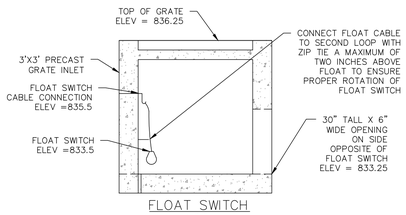
INTAKE RISER DETAIL
NTS

NOTE:
INTAKE RISER TO BE USED AS TEMPORARY SEDIMENT BASIN DEWATERING OUTLET DURING INTERIM CONSTRUCTION ACTIVITIES.

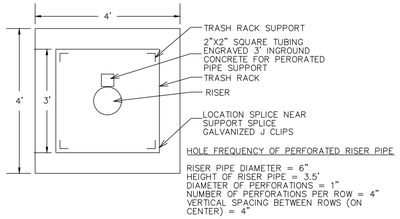


STORM SEWER MANHOLE DETAIL
NTS

NOTE:
CONTROL VALVE TO BE MOTOR ACTUATED VALVE. VALVE SHALL BE WIRED TO A CONTROLLER THAT OPENS VALVE 12 HOURS AFTER RAINFALL EVENT AND CLOSES VALVE ONCE POND HAS DRAINED DRY. CONTROLLER SHALL INCLUDE PROVISIONS FOR A MANUAL OVERRIDE SWITCH.



FLOAT SWITCH
N.T.S.



HOLE FREQUENCY OF PERFORATED RISER PIPE

RISER PIPE DIAMETER = 6"
HEIGHT OF RISER PIPE = 3.5'
DIAMETER OF PERFORATIONS = 1"
NUMBER OF PERFORATIONS PER ROW = 4"
VERTICAL SPACING BETWEEN ROWS (ON CENTER) = 4"

STATE OF TEXAS
STEVEN S. CRAUFORD
92677
LICENSED PROFESSIONAL ENGINEER
09/12/2025

NO.	REVISION	DATE

GEORGETOWN TEXAS more than welcome

PAPE-DAWSON ENGINEERS
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TBPE FIRM REGISTRATION #470 | TBPLS FIRM REGISTRATION #10028801

CITY OF GEORGETOWN, TEXAS
WOLF RANCH PKWY / MEMORIAL DR

POND 2 DETAILS (1 OF 1)

CITY JOB No.
JOB NO. 51423-00
DATE 9/12/2025
DESIGNER JB
CHECKED SC DRAWN JB

SHEET 467

Date: Sep 12, 2025, 10:40am User ID: cashcitz
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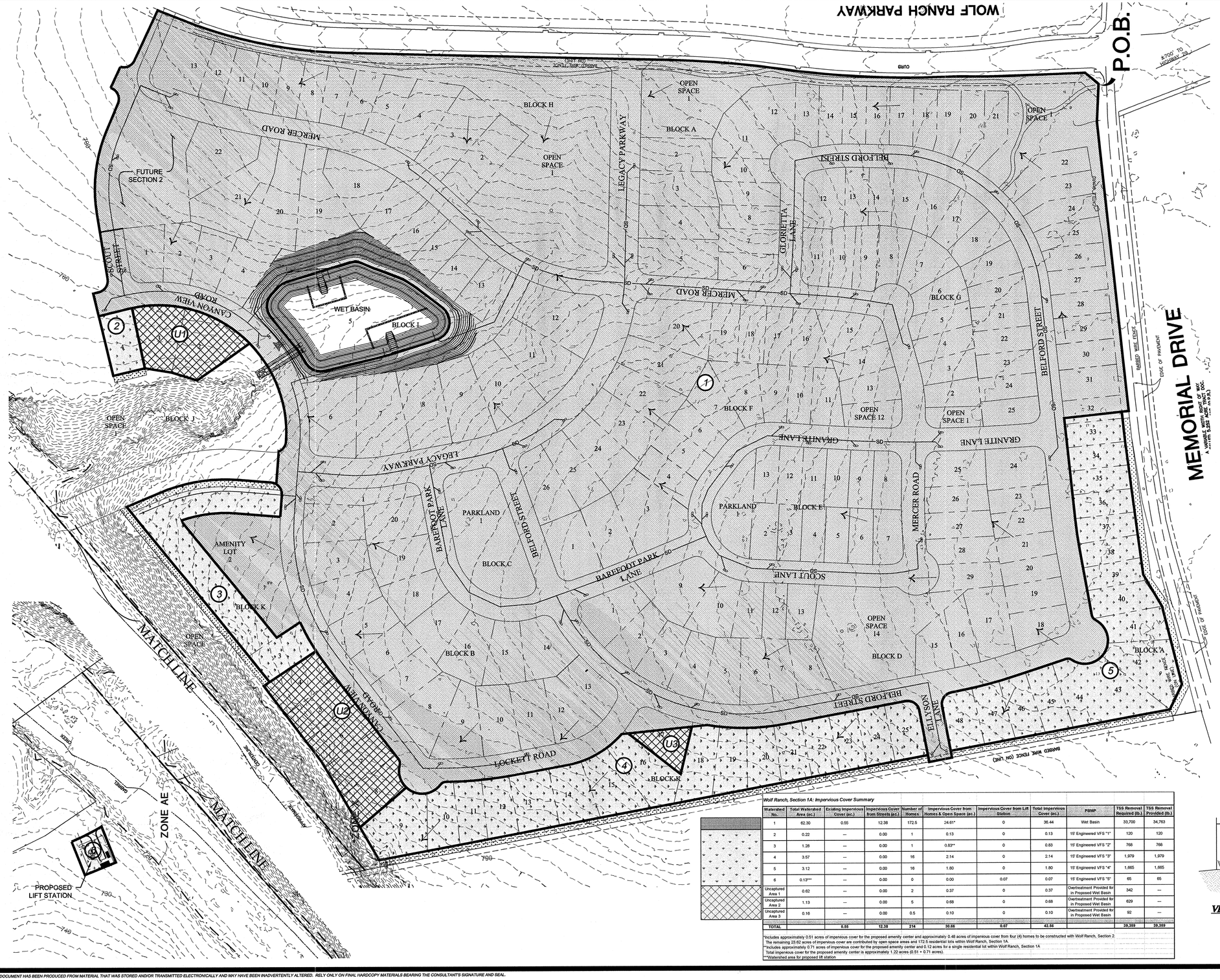
WOLF RANCH SECTION 1A WET POND BASIN (EAPP ID NO. 11-15032001)



SCALE: 1"= 100'

0' 100' 200' 300

LEGEND

- LIMITS OF CONSTRUCTION (33.80 ACRES)
- FLOW ARROW
- 100 YEAR FLOODPLAIN
- 786 PROPOSED CONTOUR LINE
- 786 EXISTING CONTOUR LINE
- VEGETATIVE FILTER STRIP
- WATERSHED BOUNDARY
- (1) WATERSHED AREA
- (U1) UNCAPTURED WATERSHED AREA

SUMMARY OF PERMANENT POLLUTION ABATEMENT MEASURES:

1. SILT FENCE WILL BE MAINTAINED UNTIL THE SITE IMPROVEMENTS ARE COMPLETED AND SUFFICIENT VEGETATION HAS BEEN ESTABLISHED IN ACCORDANCE WITH APPLICABLE PROJECT SPECIFICATIONS.

2. ONE (1) WET BASIN, FIVE (5) FIFTEEN-FOOT (15') WIDE ENGINEERED VEGETATIVE FILTER STRIP ARE PROPOSED TO SERVE AS THE PBMPs FOR THIS DEVELOPMENT.

3. ALL PERMANENT BEST MANAGEMENT PRACTICES PBMPs HAVE BEEN DESIGNED TO REMOVE AT LEAST 85% OF THE INCREASED TOTAL SUSPENDED SOLIDS (TSS) IN ACCORDANCE WITH TCEQ's TECHNICAL GUIDANCE MANUAL (TGM) RG-348 (2005) AND IN ACCORDANCE WITH THE CITY OF GEORGETOWN SALAMANDER ORDINANCE

4. DURING CONSTRUCTION, TO THE EXTENT PRACTICAL, CONTRACTOR SHALL MINIMIZE THE AREA OF SOIL DISTURBANCE. AREAS OF DISTURBED SOIL SHALL BE REVEGETATED. IRRIGATION MAY BE REQUIRED IN ORDER TO ESTABLISH SUFFICIENT VEGETATION.

5. FOR DISTURBED AREAS WHERE INSUFFICIENT SOIL EXISTS TO ESTABLISH VEGETATION, CONTRACTOR SHALL PLACE A MINIMUM OF 6" TOPSOIL PRIOR TO REVEGETATION.

6. SLOPES ON SITE VARY FROM APPROXIMATELY 0.5% TO 33% FOR EARTHEN SIDE SLOPES

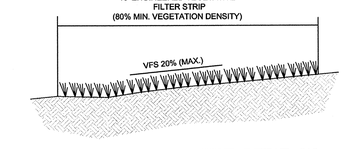
VEGETATIVE FILTER STRIP NOTE TO HOMEBUILDER:

- WHERE VEGETATIVE FILTER STRIP FOR TREATMENT PURPOSES IS SHOWN AT BACK OF LOT, HOMEBUILDER SHALL GRADE BACK OF LOT TO MAINTAIN SHEET FLOW PATTERN ACROSS THE VEGETATIVE FILTER STRIP.

Wolf Ranch, Section 1A: Impervious Cover Summary

Watershed No.	Total Watershed Area (ac.)	Existing Impervious Cover (ac.)	Impervious Cover from Streets (ac.)	Number of Homes	Impervious Cover from Homes & Open Space (ac.)	Impervious Cover from Lift Station	Total Impervious Cover (ac.)	PBMP	TSS Removal Required (lb.)	TSS Removal Provided (lb.)
1	62.30	0.55	12.38	172.5	24.61*	0	36.44	Wet Basin	33,700	34,763
2	0.22	---	0.00	1	0.13	0	0.13	15' Engineered VFS "1"	120	120
3	1.28	---	0.00	1	0.83**	0	0.83	15' Engineered VFS "2"	768	768
4	3.57	---	0.00	16	2.14	0	2.14	15' Engineered VFS "3"	1,979	1,979
5	3.12	---	0.00	16	1.80	0	1.80	15' Engineered VFS "4"	1,665	1,665
6	0.13***	---	0.00	0	0.00	0.07	0.07	15' Engineered VFS "5"	65	65
Uncaptured Area 1	0.62	---	0.00	2	0.37	0	0.37	Overtreatment Provided for in Proposed Wet Basin	342	---
Uncaptured Area 2	1.13	---	0.00	5	0.68	0	0.68	Overtreatment Provided for in Proposed Wet Basin	629	---
Uncaptured Area 3	0.16	---	0.00	0.5	0.10	0	0.10	Overtreatment Provided for in Proposed Wet Basin	92	---
TOTAL		0.55	12.38	214	30.66	0.07	42.56		39,359	39,359

*Includes approximately 0.51 acres of impervious cover for the proposed amenity center and approximately 0.48 acres of impervious cover from four (4) homes to be constructed with Wolf Ranch, Section 2.
The remaining 23.62 acres of impervious cover are contributed by open space areas and 172.5 residential lots within Wolf Ranch, Section 1A.
**Includes approximately 0.71 acres of impervious cover for the proposed amenity center and 0.12 acres for a single residential lot within Wolf Ranch, Section 1A
Total impervious cover for the proposed amenity center is approximately 1.22 acres (0.51 + 0.71 acres).
***Watershed area for proposed lift station



VEGETATIVE FILTER STRIP DETAIL "A"
N.T.S.

REVISIONS:

STATE OF TEXAS
MICHAEL S. FISHER
87704
LICENSED PROFESSIONAL ENGINEER
3/16/15

PAPE-DAWSON ENGINEERS
7800 SHOAL CREEK BLVD | SUITE 220 WEST | AUSTIN TEXAS 78757 | PHONE: 512.454.8711 FAX: 512.459.8867
TEXAS BOARD OF PROFESSIONAL ENGINEERS, FIRM REGISTRATION # 470

WOLF RANCH SECTION 1A TCEQ BMP DRAINAGE AREA MAP

JOB NO. 50790-02
DATE 3/16/2015
DESIGNER XXX
CHECKED ___ DRAWN XXX
SHEET 1 OF 1

DATE: Mar 19, 2015, 2:48PM, USER ID: DHART
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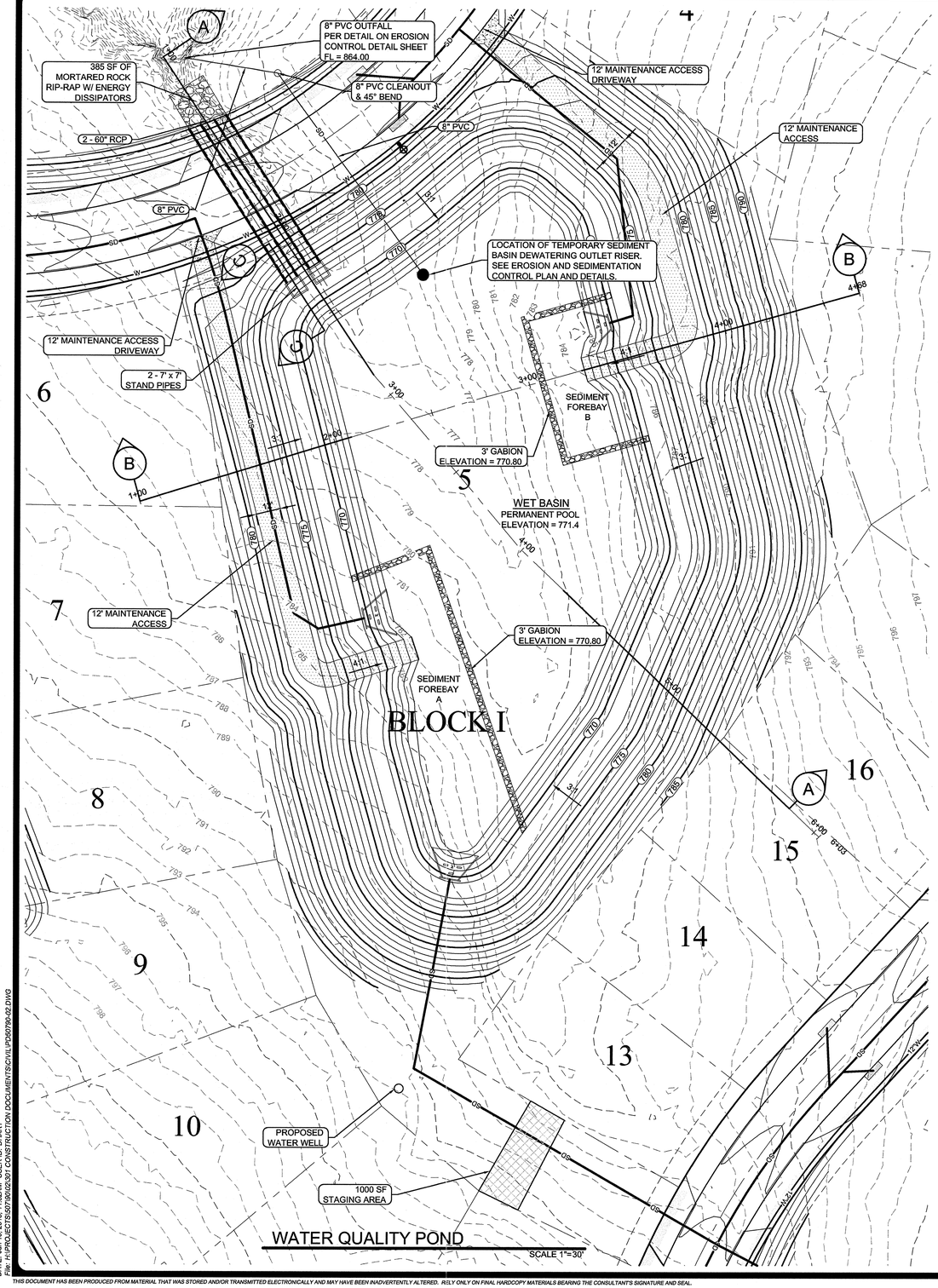
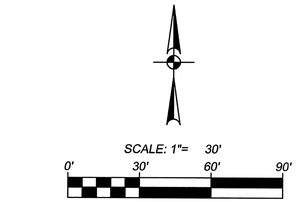




LEGEND

MAINTENANCE ACCESS

TEXAS COMMISSION ON ENVIRONMENTAL QUALITY
WATER POLLUTION ABATEMENT PLAN
GENERAL CONSTRUCTION NOTES

1. WRITTEN CONSTRUCTION NOTIFICATION MUST BE GIVEN TO THE APPROPRIATE TCEQ REGIONAL OFFICE NO LATER THAN 48 HOURS PRIOR TO COMMENCEMENT OF THE REGULATED ACTIVITY. INFORMATION MUST INCLUDE THE DATE ON WHICH THE REGULATED ACTIVITY WILL COMMENCE, THE NAME OF THE APPROVED PLAN FOR THE REGULATED ACTIVITY, AND THE NAME OF THE PRIME CONTRACTOR AND THE NAME AND TELEPHONE NUMBER OF THE CONTACT PERSON.

2. ALL CONTRACTORS CONDUCTING REGULATED ACTIVITIES ASSOCIATED WITH THIS PROJECT MUST BE PROVIDED WITH COMPLETE COPIES OF THE APPROVED WATER POLLUTION ABATEMENT PLAN AND THE TCEQ LETTER INDICATING THE SPECIFIC CONDITIONS OF ITS APPROVAL. DURING THE COURSE OF THESE REGULATED ACTIVITIES, THE CONTRACTORS ARE REQUIRED TO KEEP ON-SITE COPIES OF THE APPROVED PLAN AND APPROVAL LETTER.

3. IF ANY SENSITIVE FEATURE IS DISCOVERED DURING CONSTRUCTION, ALL REGULATED ACTIVITIES NEAR THE SENSITIVE FEATURE MUST BE SUSPENDED IMMEDIATELY. THE APPROPRIATE TCEQ REGIONAL OFFICE MUST BE IMMEDIATELY NOTIFIED OF ANY SENSITIVE FEATURES ENCOUNTERED DURING CONSTRUCTION. THE REGULATED ACTIVITIES NEAR THE SENSITIVE FEATURE MAY NOT PROCEED UNTIL THE TCEQ HAS REVIEWED AND APPROVED THE METHODS PROPOSED TO PROTECT THE SENSITIVE FEATURE AND THE EDWARDS AQUIFER FROM ANY POTENTIALLY ADVERSE IMPACTS TO WATER QUALITY.

4. NO TEMPORARY ABOVEGROUND HYDROCARBON AND HAZARDOUS SUBSTANCE STORAGE TANK SYSTEM MAY BE INSTALLED WITHIN 150 FEET OF A DOMESTIC, INDUSTRIAL, IRRIGATION, OR PUBLIC WATER SUPPLY WELL, OR OTHER SENSITIVE FEATURE.

5. PRIOR TO COMMENCEMENT OF CONSTRUCTION, ALL TEMPORARY EROSION AND SEDIMENTATION (E&S) CONTROL MEASURES MUST BE PROPERLY SELECTED, INSTALLED, AND MAINTAINED IN ACCORDANCE WITH THE MANUFACTURERS SPECIFICATIONS AND GOOD ENGINEERING PRACTICES. CONTROLS SPECIFIED IN THE TEMPORARY STORM WATER SECTION OF THE APPROVED EDWARDS AQUIFER PROTECTION PLAN ARE REQUIRED DURING CONSTRUCTION. IF INSPECTIONS INDICATE A CONTROL HAS BEEN USED INAPPROPRIATELY, OR INCORRECTLY, THE APPLICANT MUST REPLACE OR MODIFY THE CONTROL FOR SITE SITUATIONS. THE CONTROLS MUST REMAIN IN PLACE UNTIL DISTURBED AREAS ARE REVEGETATED AND THE AREAS HAVE BECOME PERMANENTLY STABILIZED.

6. IF SEDIMENT ESCAPES THE CONSTRUCTION SITE, OFF-SITE ACCUMULATIONS OF SEDIMENT MUST BE REMOVED AT A FREQUENCY SUFFICIENT TO MINIMIZE OFF-SITE IMPACTS TO WATER QUALITY (E.G., FUGITIVE SEDIMENT IN STREET BEING WASHED INTO SURFACE STREAMS OR SENSITIVE FEATURES BY THE NEXT RAIN).

7. SEDIMENT MUST BE REMOVED FROM SEDIMENT TRAPS OR SEDIMENTATION PONDS NOT LATER THAN WHEN DESIGN CAPACITY HAS BEEN REDUCED BY 50%. A PERMANENT STAKE MUST BE PROVIDED THAT CAN INDICATE WHEN THE SEDIMENT OCCUPIES 50% OF THE BASIN VOLUME.

8. LITTER, CONSTRUCTION DEBRIS, AND CONSTRUCTION CHEMICALS EXPOSED TO STORMWATER SHALL BE PREVENTED FROM BECOMING A POLLUTANT SOURCE FOR STORMWATER DISCHARGES (E.G., SCREENING OUTFALLS, PICKED UP DAILY).

9. ALL SPOILS (EXCAVATED MATERIAL) GENERATED FROM THE PROJECT SITE MUST BE STORED ON SITE WITH PROPER E&S CONTROLS. FOR STORAGE OR DISPOSAL OF SPOILS AT ANOTHER SITE ON THE EDWARDS AQUIFER RECHARGE ZONE, THE OWNER OF THE SITE MUST RECEIVE APPROVAL OF A WATER POLLUTION ABATEMENT PLAN FOR THE PLACEMENT OF FILL MATERIAL OR MASS GRADING PRIOR TO THE PLACEMENT OF SPOILS AT THE OTHER SITE.

10. STABILIZATION MEASURES SHALL BE INITIATED AS SOON AS PRACTICABLE IN PORTIONS OF THE SITE WHERE CONSTRUCTION ACTIVITIES HAVE TEMPORARILY OR PERMANENTLY CEASED, BUT IN NO CASE MORE THAN 14 DAYS AFTER THE CONSTRUCTION ACTIVITY IN THAT PORTION OF THE SITE HAS TEMPORARILY OR PERMANENTLY CEASED. WHERE THE INITIATION OF STABILIZATION MEASURES BY THE 14TH DAY AFTER CONSTRUCTION ACTIVITY TEMPORARY OR PERMANENTLY CEASE IS PRECLUDED BY WEATHER CONDITIONS, STABILIZATION MEASURES SHALL BE INITIATED AS SOON AS PRACTICABLE. WHERE CONSTRUCTION ACTIVITY ON A PORTION OF THE SITE IS TEMPORARILY CEASED, AND EARTH DISTURBING ACTIVITIES WILL BE RESUMED WITHIN 21 DAYS, TEMPORARY STABILIZATION MEASURES DO NOT HAVE TO BE INITIATED ON THAT PORTION OF SITE. IN AREAS EXPERIENCING DROUGHTS WHERE THE INITIATION OF STABILIZATION MEASURES BY THE 14TH DAY AFTER CONSTRUCTION ACTIVITY HAS TEMPORARILY OR PERMANENTLY CEASED IS PRECLUDED BY SEASONAL ARID CONDITIONS, STABILIZATION MEASURES SHALL BE INITIATED AS SOON AS PRACTICABLE.

11. THE FOLLOWING RECORDS SHALL BE MAINTAINED AND MADE AVAILABLE TO THE TCEQ UPON REQUEST: THE DATES WHEN MAJOR GRADING ACTIVITIES OCCUR; THE DATES WHEN CONSTRUCTION ACTIVITIES TEMPORARILY OR PERMANENTLY CEASE ON A PORTION OF THE SITE; AND THE DATES WHEN STABILIZATION MEASURES ARE INITIATED.

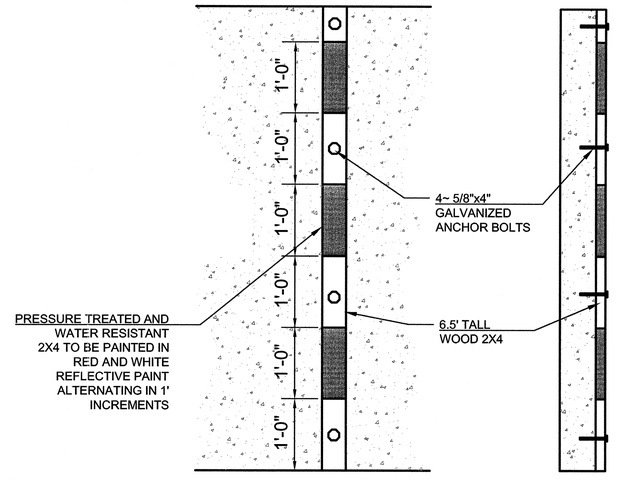
12. THE HOLDER OF ANY APPROVED EDWARDS AQUIFER PROTECTION PLAN MUST NOTIFY THE APPROPRIATE REGIONAL OFFICE IN WRITING AND OBTAIN APPROVAL FROM THE EXECUTIVE DIRECTOR PRIOR TO INITIATING ANY OF THE FOLLOWING:

A. ANY PHYSICAL OR OPERATIONAL MODIFICATION OF ANY WATER POLLUTION ABATEMENT STRUCTURE(S), INCLUDING BUT NOT LIMITED TO PONDS, DAMS, BERMS, SEWAGE TREATMENT PLANTS, AND DIVERSIONARY STRUCTURES;

B. ANY CHANGE IN THE NATURE OR CHARACTER OF THE REGULATED ACTIVITY FROM THAT WHICH WAS ORIGINALLY APPROVED OR A CHANGE WHICH WOULD SIGNIFICANTLY IMPACT THE ABILITY OF THE PLAN TO PREVENT POLLUTION OF THE EDWARDS AQUIFER;

C. ANY DEVELOPMENT OF LAND PREVIOUSLY IDENTIFIED AS UNDEVELOPED IN THE ORIGINAL WATER POLLUTION ABATEMENT PLAN.

TEXAS COMMISSION ON ENVIRONMENTAL QUALITY
12100 PARK 35 CIRCLE, BLDG. A, AUSTIN, TX 78753
PHONE: (512) 339-2929
FAX: (512) 339-3795



SEDIMENT DEPTH MARKER DETAIL
SCALE 1"=1'

REVISIONS:

STATE OF TEXAS
MICHAEL S. FISHER
87704
LICENSED
PROFESSIONAL ENGINEER
6/12/15

PAPE-DAWSON ENGINEERS
7800 SHOAL CREEK BLVD | SUITE 220N WEST
AUSTIN, TEXAS 78757
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TEXAS BOARD OF PROFESSIONAL ENGINEERS, FIRM REGISTRATION # 470

WOLF RANCH WEST
SECTION 1A

WATER QUALITY POND-PLAN VIEW

JOB NO. 50790-02
DATE June 15
DESIGNER DH
CHECKED ___ DRAWN WT
SHEET 108 OF 134

DATE: Jun 10, 2015, 11:32AM USER ID: DHART
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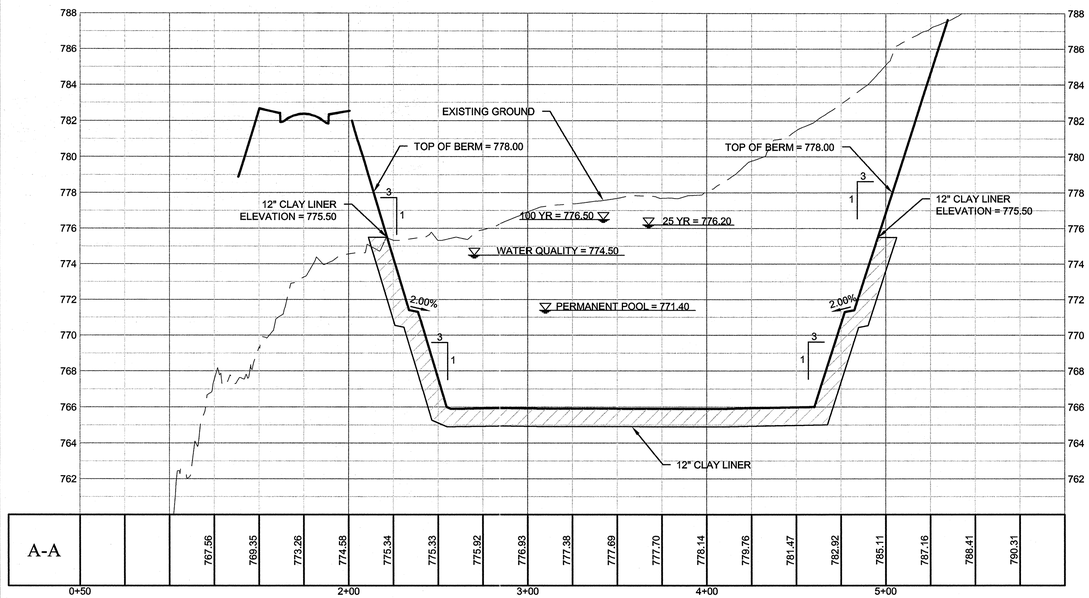
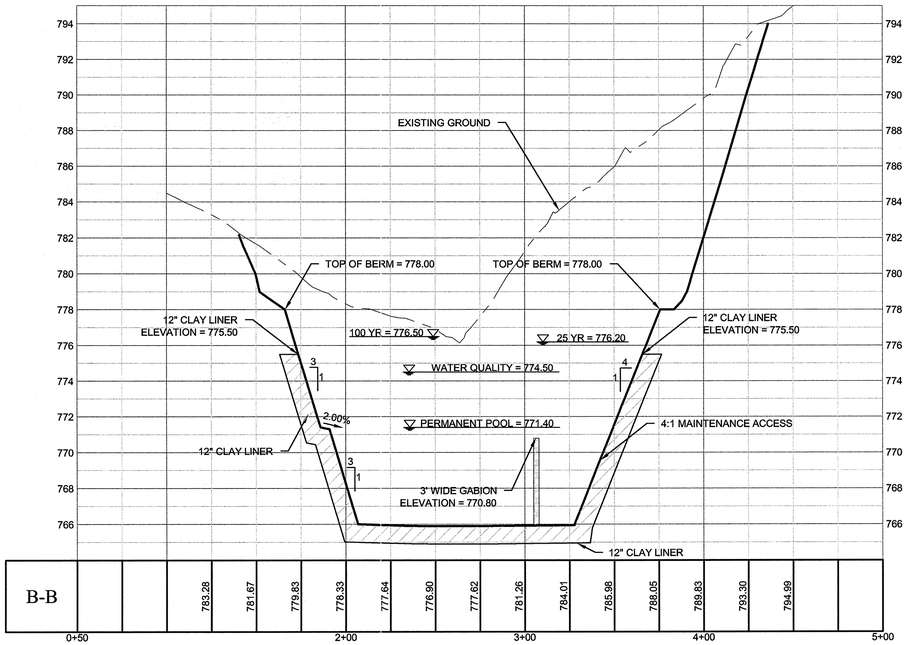


WATER QUALITY POND SECTION "A-A"

SCALE 1"=40' H
SCALE 1"=4' V



WATER QUALITY POND SECTION "B-B"

SCALE 1"=40' H
SCALE 1"=4' V

Table 3-6 Clay Liner Specifications (COA, 2004)

Property	Test Method	Unit	Specification
Permeability	ASTM D-2434	cm/sec	1 x 10^{-6}
Plasticity Index of Clay	ASTM D-423 & D-424	%	Not less than 15
Liquid Limit of Clay	ASTM D-2216	%	Not less than 30
Clay Particles Passing	ASTM D-422	%	Not less than 30
Clay Compaction	ASTM D-2216	%	95% of Standard Proctor Density

Wetland Plant List

Install Bulrush in clumps, with individual plants spaced approximately three to four feet on center: At least two of the following species should be used:

BULRUSH	WATER DEPTH	NOTES
Scirpus validus, Bulrush	1' — 3'	8' tall evergreen, resists cattail encroachment
Scirpus californicus, Bulrush	1' — 3'	8' tall evergreen, resists cattail encroachment
Scirpus americanus, Three-square bulrush	2" — 6"	2' to 4' tall, w/ 3 distinct edges

At least two species of the following marsh plants should be used (additional species are encouraged). Install in clumps in shallow water, with individual plants spaced at approximately three feet on center:

MARSH DIVERSITY	WATER DEPTH	NOTES
1. Cyperus ochraeus, Flatsedge	2"—6"	1' to 2' tall, clump-forming, common to central Texas
2. Dichromena colorata, White-topped Sedge	2" —6"	1' to 2' tall, white bracts during warm season
3. Echinodorus rostratus, Burhead	3' - 1'	1' to 2' tall, annual, heart-shaped leaves, flower similar to arrowhead
4. Eleocharis quadrangulata, Four-square Spikerush	6" — 1'	1' to 2' tall, colonizes, inhabits deeper water than other Spikerushes
5. Iris Pseudacorus, Yellow Flag Iris	1' — 2'	3' to 4' tall. can be invasive, dense growth, yellow flowers
6. Junctus effusus, Soft Rush	6" — 1'	3' to 4' tall, forms a tight clump, evergreen, very attractive
7. Justicia americana, Water willow	2" — 6"	2' to 3' tall, common, white flowers, herbaceous, colonizes
8. Marsilea macropoda, Water Clover	2" — 6"	Looks like floating four-leaf clover, endemic to Texas
9. Najas guadalupensis, Water-Naiad	1' —4'	Submergent, valuable to fish and wildlife
10. Pontederia cordata, Pickerelweed	2" — 1'	3' tall, colonizes, cosmopolitan, purple flowers
11. Rhynchospora corniculata, Horned-rush	2" — 6"	2' to 3' tall, brass-colored flowers in May

Install spikerush at or near the water's edge, with individual plants spaced approximately three to six feet on center. At least two of the following species should be used:

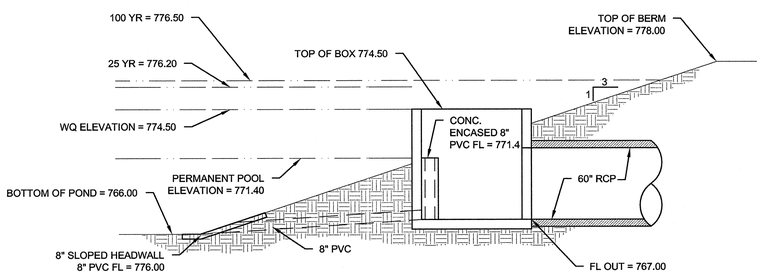
SPIKERUSH	WATER DEPTH	NOTES
Eleocharis montevidensis, Spikerush	0" — 6"	1' tall, rhizomatous, reduces erosion at the pond edge
Eleocharis macrostachys, Spikerush	0" — 6"	1' tall, rhizomatous, reduces erosion at the pond edge
Eleocharis quadrangulata, Spikerush	3" — 1'	2' to 2.5' tall, rhizomatous, can accommodate deeper water, 4-angled

Install Arrowhead in clumps in shallow water, with individual plants spaced approximately three feet on center.

ARROWHEAD	WATER DEPTH	NOTES
Saggitaria latifolia, Arrowhead	2" — 1'	2' height, wildlife value, white flowers, proven water quality performer

Floating-leafed aquatic plants are rooted in the sediment of the pond, and have leaves that float on the surface of the water. These leaves shade the water, which limits potential algae growth. At least two of the following species should be used and should be placed at random locations throughout the pond:

AQUATICS	WATER DEPTH	NOTES
1. Cabomba caroliniana, Fanwort	1' — 4'	Approximately 6' length underwater, submergent
2. Ceratophyllum spp., Coon-tail	1' —4'	Maximum 8' length, tolerant of turbidity and water fluctuation, wildlife food
3. Nymphaea odorata, Fanwort	6" —2'	A native, reliably hardy, floating- leaved aquatic, with white flowers
4. Potomageton pectinatus, Sago Pondweed	8" — 3'	Colonizes quickly, valuable to fish and wildlife; floating-leaved aquatic



STAND PIPE DETAIL SECTION "C-C"

SCALE 1"= 5'

REVISIONS:

STATE OF TEXAS
MICHAEL S. FISHER
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6/4/15

PAPE-DAWSON ENGINEERS
7800 SHOAL CREEK BLVD | AUSTIN TEXAS 78757 | PHONE: 512.454.8711
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TEXAS BOARD OF PROFESSIONAL ENGINEERS, FIRM REGISTRATION # 470

WOLF RANCH WEST

WATER QUALITY POND-SECTIONS

JOB NO. 50790-02
DATE June 2015
DESIGNER DH
CHECKED ____ DRAWN WT
SHEET 109 OF 134

DATE: Jun 10, 2015, 11:32AM USER ID: DHART
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Treatment Summary			
Required WQ Volume (ft^3) =	351,711		
Provided WQ Volume (ft^3) =	362,225		
Required Permanent Pool Volume (ft^3) =	191,842		
Provided Permanent Pool Volume (ft^3) =	200,634		
Required Sediment Forebay Volume (ft^3)=	30,095	to	50,159
Provided Sediment Forebay Volume (ft^3)=	38,148		

Section 1A Wet Basin					
Elevation (ft)	Area (ft^2)	Area (ac)	Incremental Volume (ft^3)	Cumulative Volume (ft^3)	Notes
766	30,546.06	0.701241	-	-	
767	32,935.12	0.756086	31,741	31,741	
768	35,344.13	0.811390	34,140	65,880	
769	37,798.62	0.867737	36,571	102,452	
770	40,300.21	0.925166	39,049	141,501	
771	42,858.35	0.983892	41,579	183,080	
771.3	43,628.03	1.001562	12,973	196,053	
771.4	47,997.04	1.101860	4,581	200,634	Permanent Pool
772	49,439.95	1.134985	29,231	229,866	
773	52,227.37	1.198975	50,834	280,699	
774	55,057.91	1.263956	53,643	334,342	
774.5	56,476.18	1.296515	27,884	362,225	Water Quality
775	57,932.71	1.329952	28,602	390,828	
776	60,855.49	1.397050	59,394	450,222	
777	63,844.84	1.465676	62,350	512,572	
778	66,899.07	1.535791	65,372	577,944	

Sediment Forebay A					
Elevation (ft)	Area (ft^2)	Area (ac)	Incremental Volume (ft^3)	Cumulative Volume (ft^3)	Notes
766	4,185.06	0.096076	-	-	
767	4,803.56	0.110275	4,494	4,494	
768	5,406.76	0.124122	5,105	9,599	
769	6,018.50	0.138166	5,713	15,312	
770	6,638.78	0.152405	6,329	21,641	
770.8	7,132.69	0.163744	5,509	27,149	Top of Gabion

Sediment Forebay B					
Elevation (ft)	Area (ft^2)	Area (ac)	Incremental Volume (ft^3)	Cumulative Volume (ft^3)	Notes
766	1,724.99	0.039600	-	-	
767	1,967.32	0.045163	1,846	1,846	
768	2,204.34	0.050605	2,086	3,932	
769	2,435.36	0.055908	2,320	6,252	
770	2,661.86	0.061108	2,549	8,800	
770.8	2,832.79	0.065032	2,198	10,998	Top oof Gabion

Low Flow Orifice Sizing	
Water Quality Volume less Permanent Pool Volume (ft^3) =	161,590.92
Average Head (ft) =	1.55
$Q_{24\ hour}$ (cfs) =	1.87
Area (ft^2) =	0.31
Diameter (ft) =	0.63
Diameter (in) =	7.56
Use 8" Diameter PVC	

Orifice	
Diameter (in) =	8.00
Diameter (ft) =	0.67
Flow Line (ft) =	771.40
Center Elevation (ft) =	771.73
Top Elevation (ft) =	772.07
Area (ft^2) =	0.35
Coefficient =	0.60

Spillway	
Elevation (ft) =	774.50
Length (ft) =	56.00
Coefficient =	3.00

Outlet Pipe Check	
100-Year WSEL (ft) =	776.50
Q (cfs) =	483.90
# of Pipes =	2.00
Outlet Size (in) =	60.00
Outlet Size (ft) =	5.00
Area (ft^2) =	39.27
Flow Line (ft) =	767.00
Coefficient =	0.60
H Required (ft) =	6.55
H Provided (ft) =	7.00

Texas Commission on Environmental Quality

TSS Removal Calculations 04-20-2009

Project Name: Wolf Ranch, Section 1A
Date Prepared: 3/16/2015

Additional information is provided for cells with a red triangle in the upper right corner. Place the cursor over the cell.
Text shown in blue indicate location of instructions in the Technical Guidance Manual - RG-348.
Characters shown in red are data entry fields.
Characters shown in black (Bold) are calculated fields. Changes to these fields will remove the equations used in the spreadsheet.

1. The Required Load Reduction for the total project: Calculations from RG-348 Pages 3-27 to 3-30

Page 3-29 Equation 3.3: $L_M = 27.2(A_N \times P)$

where:
$L_{M\ TOTAL\ PROJECT}$ = Required TSS removal resulting from the proposed development = 80% of increased load
A_N = Net increase in impervious area for the project
P = Average annual precipitation, inches

Site Data: Determine Required Load Removal Based on the Entire Project

County =	**Williamson**		
Total project area included in plan * =	**78.19**	acres	
Predevelopment impervious area within the limits of the plan * =	**0.55**	acres	
Total post-development impervious area within the limits of the plan* =	**43.11**	acres	
Total post-development impervious cover fraction * =	**0.55**		
P =	**32**	inches	
$L_{M\ TOTAL\ PROJECT}$ =	**39359**	lbs.	ADJUSTED FOR 85% TSS REMOVAL AND NOT 80%

* **The values entered in these fields should be for the total project area.**

Number of drainage basins / outfalls areas leaving the plan area = **1**

2. Drainage Basin Parameters (This information should be provided for each basin):

Drainage Basin/Outfall Area No. = **1**

Total drainage basin/outfall area =	**62.30**	acres	
Predevelopment impervious area within drainage basin/outfall area =	**0.55**	acres	
Post-development impervious area within drainage basin/outfall area =	**36.99**	acres	
Post-development impervious fraction within drainage basin/outfall area =	**0.59**		
$L_{M\ THIS\ BASIN}$ =	**33700**	lbs.	ADJUSTED FOR 85% TSS REMOVAL AND NOT 80%

3. Indicate the proposed BMP Code for this basin.

Proposed BMP = **Wet Basin**
Removal efficiency = **93** percent

Aqualogic Cartridge Filter
Bioretention
Contech StormFilter
Constructed Wetland
Extended Detention
Grassy Swale
Retention / Irrigation
Sand Filter
Stormceptor
Vegetated Filter Strips
Vortechs
Wet Basin
Wet Vault

4. Calculate Maximum TSS Load Removed (L_R) for this Drainage Basin by the selected BMP Type.

RG-348 Page 3-33 Equation 3.7: L_R = (BMP efficiency) x P x (A_I x 34.6 + A_P x 0.54)

where:
A_C = Total On-Site drainage area in the BMP catchment area
A_I = Impervious area proposed in the BMP catchment area
A_P = Pervious area remaining in the BMP catchment area
L_R = TSS Load removed from this catchment area by the proposed BMP

A_C =	**62.30**	acres
A_I =	**36.99**	acres
A_P =	**25.31**	acres
L_R =	**38495**	lbs

5. Calculate Fraction of Annual Runoff to Treat the drainage basin / outfall area

Desired $L_{M\ THIS\ BASIN}$ = **34763** lbs.

F = **0.90**

6. Calculate Capture Volume required by the BMP Type for this drainage basin / outfall area. Calculations from RG-348 Pages 3-34 to 3-36

Rainfall Depth =	**1.70**	inches
Post Development Runoff Coefficient =	**0.42**	
On-site Water Quality Volume =	**159869**	cubic feet

Calculations from RG-348 Pages 3-36 to 3-37

Off-site area draining to BMP =	**0.00**	acres
Off-site Impervious cover draining to BMP =	**0.00**	acres
Impervious fraction of off-site area =	**0**	
Off-site Runoff Coefficient =	**0.00**	
Off-site Water Quality Volume =	**0**	cubic feet
Storage for Sediment =	**31974**	
Total Capture Volume (required water quality volume(s) x 1.20) =	**191842**	cubic feet

The following sections are used to calculate the required water quality volume(s) for the selected BMP.
The values for BMP Types not selected in cell C45 will show NA.

11. Wet Basins Designed as Required in RG-348 Pages 3-66 to 3-71

Required capacity of Permanent Pool =	**191842**	cubic feet	**Permanent Pool Capacity is 1.20 times the WQV**
Required capacity at WQV Elevation =	**351711**	cubic feet	**Total Capacity should be the Permanent Pool Capacity plus a second WQV.**

REVISIONS:

STATE OF TEXAS
MICHAEL S. FISHER
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LICENSED
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3/16/15

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TEXAS BOARD OF PROFESSIONAL ENGINEERS, FIRM REGISTRATION # 470

WOLF RANCH SECTION 1A
WATER QUALITY POND - CALCULATIONS

JOB NO. 50790-02
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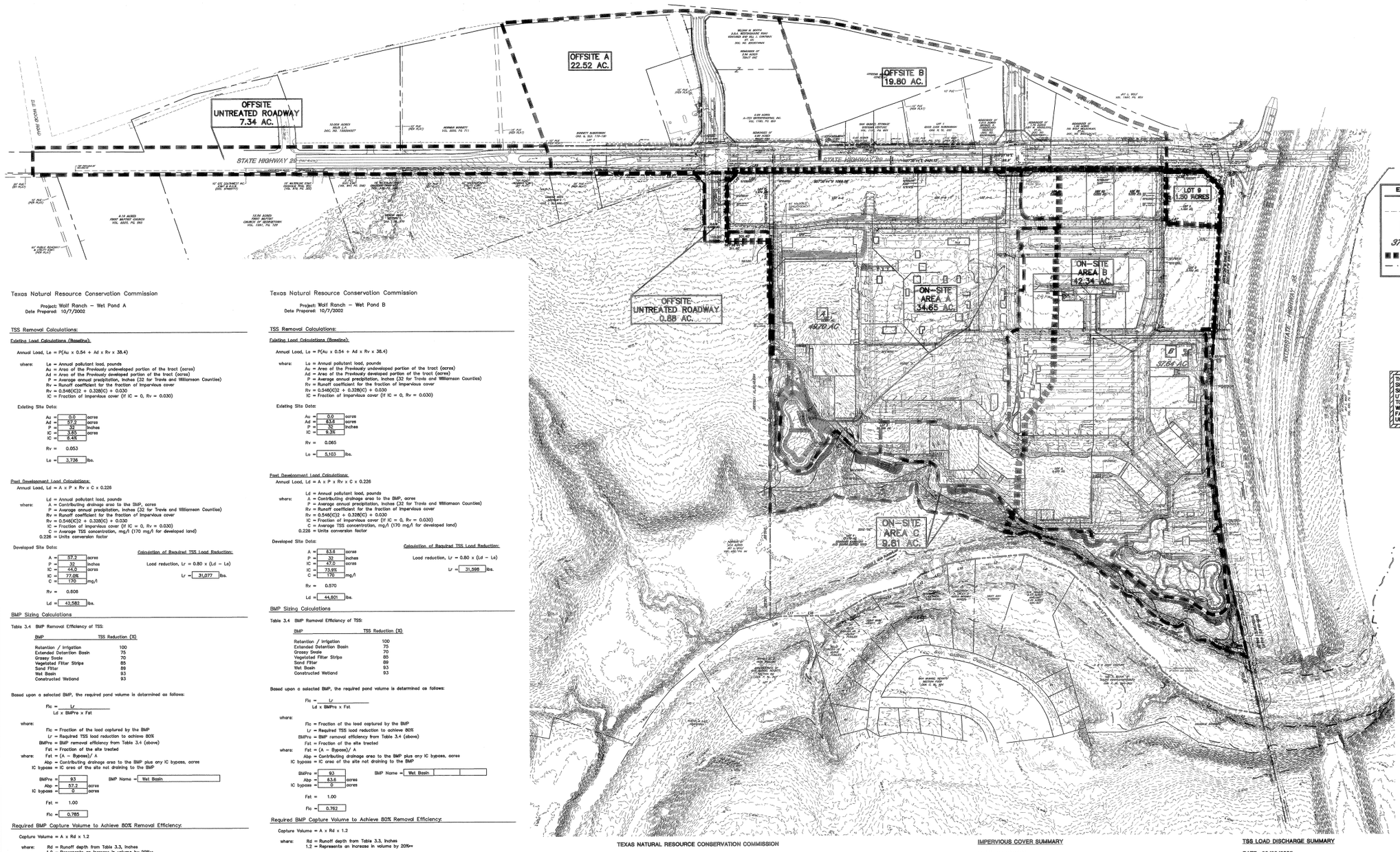
WOLF RANCH TOWN CENTER – WET POND A BASIN

(EAPP ID NO. 03082601)

DATE	NO.	REVISION	APPROVAL
12-20-05	AS-BUILT	-ADDED LOT 9 TO DRAINAGE MAP	



LEGEND

EXISTING	PROPOSED	
		PROPERTY (R.O.W.) LINE
678	678	DIRECTION OF FLOW / CONTOUR
B 37.64 AC	ON-SITE AREA A 34.65 AC.	DRAINAGE AREA NUMBER
		DRAINAGE DIVIDE
		FLOODPLAIN LINE

THE LOCATION OF EXISTING UNDERGROUND UTILITIES ARE SHOWN IN AN APPROXIMATE WAY ONLY. THE CONTRACTOR SHALL DETERMINE THE EXACT LOCATION OF ALL EXISTING UTILITIES BEFORE COMMENCING WORK. CONTRACTOR AGREES TO BE FULLY RESPONSIBLE FOR ANY AND ALL DAMAGES WHICH MIGHT BE OCCASIONED BY THE CONTRACTOR'S FAILURE TO EXACTLY LOCATE AND PRESERVE ANY AND ALL UNDERGROUND UTILITIES.

Texas Natural Resource Conservation Commission

Project: Wolf Ranch – Wet Pond A
Date Prepared: 10/7/2002

TSS Removal Calculations:

Existing Load Calculations (Baseline):

Annual Load, Le = P(Au x 0.54 + Ad x Rv x 38.4)

where:
- Le = Annual pollutant load, pounds
- Au = Area of the Previously undeveloped portion of the tract (acres)
- Ad = Area of the Previously developed portion of the tract (acres)
- P = Average annual precipitation, inches (32 for Travis and Williamson Counties)
- Rv = Runoff coefficient for the fraction of impervious cover
- Rv = 0.546(IC)2 + 0.328(IC) + 0.030
- IC = Fraction of impervious cover (if IC = 0, Rv = 0.030)

Existing Site Data:

Au =	0.0	acres
Ad =	57.2	acres
P =	32	inches
IC =	3.85	acres
IC =	6.4%	

Rv = 0.053

Le = 3,736 lbs.

Post Development Load Calculations:

Annual Load, Ld = A x P x Rv x C x 0.226

where:
- Ld = Annual pollutant load, pounds
- A = Contributing drainage area to the BMP, acres
- P = Average annual precipitation, inches (32 for Travis and Williamson Counties)
- Rv = Runoff coefficient for the fraction of impervious cover
- Rv = 0.546(IC)2 + 0.328(IC) + 0.030
- IC = Fraction of impervious cover (if IC = 0, Rv = 0.030)
- C = Average TSS concentration, mg/l (170 mg/l for developed land)
- 0.226 = Units conversion factor

Developed Site Data:

A =	57.2	acres
P =	32	inches
IC =	44.0	acres
IC =	77.0%	
C =	170	mg/l

Rv = 0.606

Ld = 42,582 lbs.

Calculation of Required TSS Load Reduction:

Load reduction, Lr = 0.80 x (Ld – Le)

Lr = 31,077 lbs.

BMP Sizing Calculations

Table 3.4 BMP Removal Efficiency of TSS:

BMP	TSS Reduction (%)
Retention / Irrigation	100
Extended Detention Basin	75
Grassy Swale	70
Vegetated Filter Strips	85
Sand Filter	89
Wet Basin	93
Constructed Wetland	93

Based upon a selected BMP, the required pond volume is determined as follows:

Flc = Lr / (Ld x BMPre x Fst)

where:
- Flc = Fraction of the load captured by the BMP
- Lr = Required TSS load reduction to achieve 80%
- BMPre = BMP removal efficiency from Table 3.4 (above)
- Fst = Fraction of the site treated
- where: Fst = (A – Bypass)/ A
- Abp = Contributing drainage area to the BMP plus any IC bypass, acres
- IC bypass = IC area of the site not draining to the BMP

BMPre =	93	BMP Name =	Wet Basin
Abp =	57.2	acres	
IC bypass =	0	acres	

Fst = 1.00

Flc = 0.785

Required BMP Capture Volume to Achieve 80% Removal Efficiency:

Capture Volume = A x Rd x 1.2

where:
- Rd = Runoff depth from Table 3.3, inches
- 1.2 = Represents an increase in volume by 20%**

** Capture volume shall be increased by 20% to accommodate reductions in available storage volume due to deposition of solids between full-scale maintenance activities.

Rd = 0.58 inches

Capture Volume = 144,449 cubic feet of volume in pond
24,075 = the increase in volume for deposition of solids

Required Water Quality Volume =	144,449 cu. Ft.
Required Permanent Pool Volume =	144,449 cu. Ft.
TOTAL VOLUME REQUIRED =	288,898 cu. Ft.

Provided BMP Capture Volume:

TOTAL VOLUME PROVIDED =	300,296 cu. Ft.
Required Water Quality Volume =	150,148 cu. Ft.
Required Permanent Pool Volume =	150,148 cu. Ft.

Capture Volume = 125,123 = cubic feet of volume in pond
25,025 = 20% increase in volume for deposition of solids
150,148 = total volume

Rd = V / A / 43560 * 12

Rd = 0.60 inches

where:
- V = Volume before 20% increase
- A = Pond drainage area

FIC 0.793 from Table 3.3

Lr = FIC xLd x BMPre x Fst

Lr = 31,404 lbs

Proposed Load Discharged = Ld – Lr =	11,178 lbs
Existing Load Discharged = Le =	3,736 lbs
Increase in Load Discharged =	7,442 lbs

Texas Natural Resource Conservation Commission

Project: Wolf Ranch – Wet Pond B
Date Prepared: 10/7/2002

TSS Removal Calculations:

Existing Load Calculations (Baseline):

Annual Load, Le = P(Au x 0.54 + Ad x Rv x 38.4)

where:
- Le = Annual pollutant load, pounds
- Au = Area of the Previously undeveloped portion of the tract (acres)
- Ad = Area of the Previously developed portion of the tract (acres)
- P = Average annual precipitation, inches (32 for Travis and Williamson Counties)
- Rv = Runoff coefficient for the fraction of impervious cover
- Rv = 0.546(IC)2 + 0.328(IC) + 0.030
- IC = Fraction of impervious cover (if IC = 0, Rv = 0.030)

Existing Site Data:

Au =	0.0	acres
Ad =	63.6	acres
P =	32	inches
IC =	9.3%	

Rv = 0.065

Le = 5,103 lbs.

Post Development Load Calculations:

Annual Load, Ld = A x P x Rv x C x 0.226

where:
- Ld = Annual pollutant load, pounds
- A = Contributing drainage area to the BMP, acres
- P = Average annual precipitation, inches (32 for Travis and Williamson Counties)
- Rv = Runoff coefficient for the fraction of impervious cover
- Rv = 0.546(IC)2 + 0.328(IC) + 0.030
- IC = Fraction of impervious cover (if IC = 0, Rv = 0.030)
- C = Average TSS concentration, mg/l (170 mg/l for developed land)
- 0.226 = Units conversion factor

Developed Site Data:

A =	63.6	acres
P =	32	inches
IC =	47.0	acres
IC =	73.9%	
C =	170	mg/l

Rv = 0.570

Ld = 44,601 lbs.

Calculation of Required TSS Load Reduction:

Load reduction, Lr = 0.80 x (Ld – Le)

Lr = 31,598 lbs.

BMP Sizing Calculations

Table 3.4 BMP Removal Efficiency of TSS:

BMP	TSS Reduction (%)
Retention / Irrigation	100
Extended Detention Basin	75
Grassy Swale	70
Vegetated Filter Strips	85
Sand Filter	89
Wet Basin	93
Constructed Wetland	93

Based upon a selected BMP, the required pond volume is determined as follows:

Flc = Lr / (Ld x BMPre x Fst)

where:
- Flc = Fraction of the load captured by the BMP
- Lr = Required TSS load reduction to achieve 80%
- BMPre = BMP removal efficiency from Table 3.4 (above)
- Fst = Fraction of the site treated
- where: Fst = (A – Bypass)/ A
- Abp = Contributing drainage area to the BMP plus any IC bypass, acres
- IC bypass = IC area of the site not draining to the BMP

BMPre =	93	BMP Name =	Wet Basin
Abp =	63.6	acres	
IC bypass =	0	acres	

Fst = 1.00

Flc = 0.762

Required BMP Capture Volume to Achieve 80% Removal Efficiency:

Capture Volume = A x Rd x 1.2

where:
- Rd = Runoff depth from Table 3.3, inches
- 1.2 = Represents an increase in volume by 20%**

** Capture volume shall be increased by 20% to accommodate reductions in available storage volume due to deposition of solids between full-scale maintenance activities.

Rd = 0.5 inches

Capture Volume = 138,608 cubic feet of volume in pond
23,101 = the increase in volume for deposition of solids

Required Water Quality Volume =	138,608 cu. Ft.
Required Permanent Pool Volume =	138,608 cu. Ft.
TOTAL VOLUME =	277,216 cu. Ft.

Provided BMP Capture Volume to Achieve 80% Removal Efficiency:

TOTAL VOLUME PROVIDED =	300,081 cu. Ft.
Required Water Quality Volume =	154,541 cu. Ft.
Required Permanent Pool Volume =	154,541 cu. Ft.

Capture Volume = 128,784 = cubic feet of volume in pond
25,757 = 20% increase in volume for deposition of solids
154,541 = total volume

Rd = V / A / 43560 * 12

Rd = 0.56 inches

where:
- V = Volume before 20% increase
- A = Pond drainage area

FIC 0.789 from Table 3.3

Lr = FIC xLd x BMPre x Fst

Lr = 32,727 lbs

Proposed Load Discharged = Ld – Lr =	11,874 lbs
Existing Load Discharged = Le =	5,103 lbs
Increase in Load Discharged =	6,771 lbs

TEXAS NATURAL RESOURCE CONSERVATION COMMISSION

PROJECT: WOLF RANCH - WEST OFFSITE ROADWAY
DATE : 10/9/2002

TSS REMOVAL CALCULATIONS:

EXISTING LOAD CALCULATIONS (BASELINE):

ANNUAL LOAD, LE = P(AU X 0.54 + AD X RV X 38.4)

WHERE:
- LE = ANNUAL POLLUTANT LOAD, POUNDS
- AU = AREA OF THE PREVIOUSLY UNDEVELOPED PORTION OF THE TRACT (ACRES)
- AD = AREA OF THE PREVIOUSLY DEVELOPED PORTION OF THE TRACT (ACRES)
- P = AVERAGE ANNUAL PRECIPITATION, INCHES (32 FOR TRAVIS AND WILLIAMSON COUNTIES)
- RV = RUNOFF COEFFICIENT FOR THE FRACTION OF IMPERVIOUS COVER
- RV = 0.546(IC)2 + 0.328(IC) + 0.030
- IC = FRACTION OF IMPERVIOUS COVER (IF IC = 0, RV = 0.030)

EXISTING SITE DATA:

AU =	0.0	ACRES
AD =	7.5	ACRES
P =	32	INCHES
IC =	46.8	%

RV = 0.303

LE = 2,788 LBS.

POST DEVELOPMENT LOAD CALCULATIONS:

ANNUAL LOAD, LD = A X P X RV X C X 0.226

WHERE:
- LD = ANNUAL POLLUTANT LOAD, POUNDS
- A = CONTRIBUTING DRAINAGE AREA TO THE BMP, ACRES
- P = AVERAGE ANNUAL PRECIPITATION, INCHES (32 FOR TRAVIS AND WILLIAMSON COUNTIES)
- RV = RUNOFF COEFFICIENT FOR THE FRACTION OF IMPERVIOUS COVER
- RV = 0.546(IC)2 + 0.328(IC) + 0.030
- IC = FRACTION OF IMPERVIOUS COVER (IF IC = 0, RV = 0.030)
- C = AVERAGE TSS CONCENTRATION, MG/L (170 MG/L FOR DEVELOPED LAND)
- 0.226 = UNITS CONVERSION FACTOR

DEVELOPED SITE DATA:

A =	7.5	ACRES
P =	32	INCHES
IC* =	51.6	%
C =	170	MG/L

*INCLUDES 6,500 S.F. OF DRIVEWAY TO THE OFFSITE LIFT STATION

RV = 0.345

LD = 3,176 LBS. = LOAD DISCHARGED

IMPERVIOUS COVER SUMMARY

DATE : 06/03/2005

	Existing Area (ac)	Existing Imp (ac)	Existing Imp (%)	Proposed Area (ac)	Proposed Imp (ac)	Proposed Imp (%)
West Offsite Roadway	7.49	3.50	46.8%	7.49	5.07	67.6%
NSJS LTD.	10.4	0.12	1.2%	10.4	6.74	65.0%
Lloyd Treiner	2.15	1.29	60.0%	2.15	1.40	65.0%
West. Rd Ventura	5.44	0.00	0%	5.44	3.53	65.0%
Lots 2&3 –Onsite Area "A"	26.8	0.28	1.0%	26.8	22.5	84.0%
Lot 7 – Onsite Area "A"	1.47	0.00	0.0%	1.47	1.18	80.0%
Lot 4 –Onsite Area "A"	6.39	0.00	0.0%	6.39	5.11	80.0%
Offsite Roadway A	4.57	1.97	43.0%	4.57	2.75	60.0%
Total Pond A	67.2	5.7	8.4%	67.2	49.3	73.6%
Texas Waterproof	0.28	0.23	81.9%	0.28	0.18	65.0%
San Gabriel Storage	1.08	0.99	91.7%	1.08	0.70	65.0%
Memorial Garden	6.65	0.00	0%	6.65	0.66	10.0%
Ben & Alicia Johnson	1.86	0.51	27.1%	1.86	1.21	65.0%
Georgetown Title	1.42	0.24	17.1%	1.42	0.92	65.0%
Phil Mockford	1.25	0.02	1.8%	1.25	0.81	65.0%
Bill Chapman	1.96	0.00	0%	1.96	1.27	65.0%
Lots 2&8 – Onsite Area "B"	35.9	0.38	1.1%	35.9	31.2	86.9%
Lot 3 – Onsite Area "B"	3.63	0.00	0.0%	3.63	2.91	80.0%
Lot 6 Onsite Area "B"	2.76	0.00	0.0%	2.76	2.21	80.0%
Offsite Roadway "B"	5.30	2.58	48.7%	5.30	2.93	55.3%
Ivo Wolf Lot 9	1.50	0.97	64.3%	1.50	1.20	80.0%
Total Pond B	83.8	6.82	8.3%	83.8	68.2	72.7%

TSS LOAD DISCHARGE SUMMARY

DATE : 06/03/2005

	West Roadway	Pond A	Pond B	Total
Existing Load (Le)	2,788	3,736	5,103	11,627
Developed Load (Ld)	3,176	42,582	44,601	90,360
Increase in Load (Ld – Le)	389	38,846	39,498	78,733
Required Load Reduction (Lr = 0.80 x (Ld – Le))	311	31,077	31,598	62,986
Load Discharge After Required Removal (Ld – Lr)	2,865	11,505	13,003	27,373
Proposed Load Discharge	3,176	11,178	11,874	26,229

Bury+Partners
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STATE OF TEXAS
Christopher Randazzo
87029
LICENSED
PROFESSIONAL ENGINEER
12/9/05

SIMON PROPERTY GROUP

WATER QUALITY DRAINAGE AREA MAP

WOLF RANCH
GEORGETOWN, TEXAS

SIMON PROPERTY GROUP

PLOTTING SCALE: 1" = 1'
DATE PLOTTED: 06/03/05
FILE: G:\1262\01\126201DAM03
DRAWN BY: LKC\ PSD
DESIGNED BY: JP
REVIEWED BY: CSS
PROJECT NO.: 1262-01.00

SHEET 24 OF 61

AS-BUILT

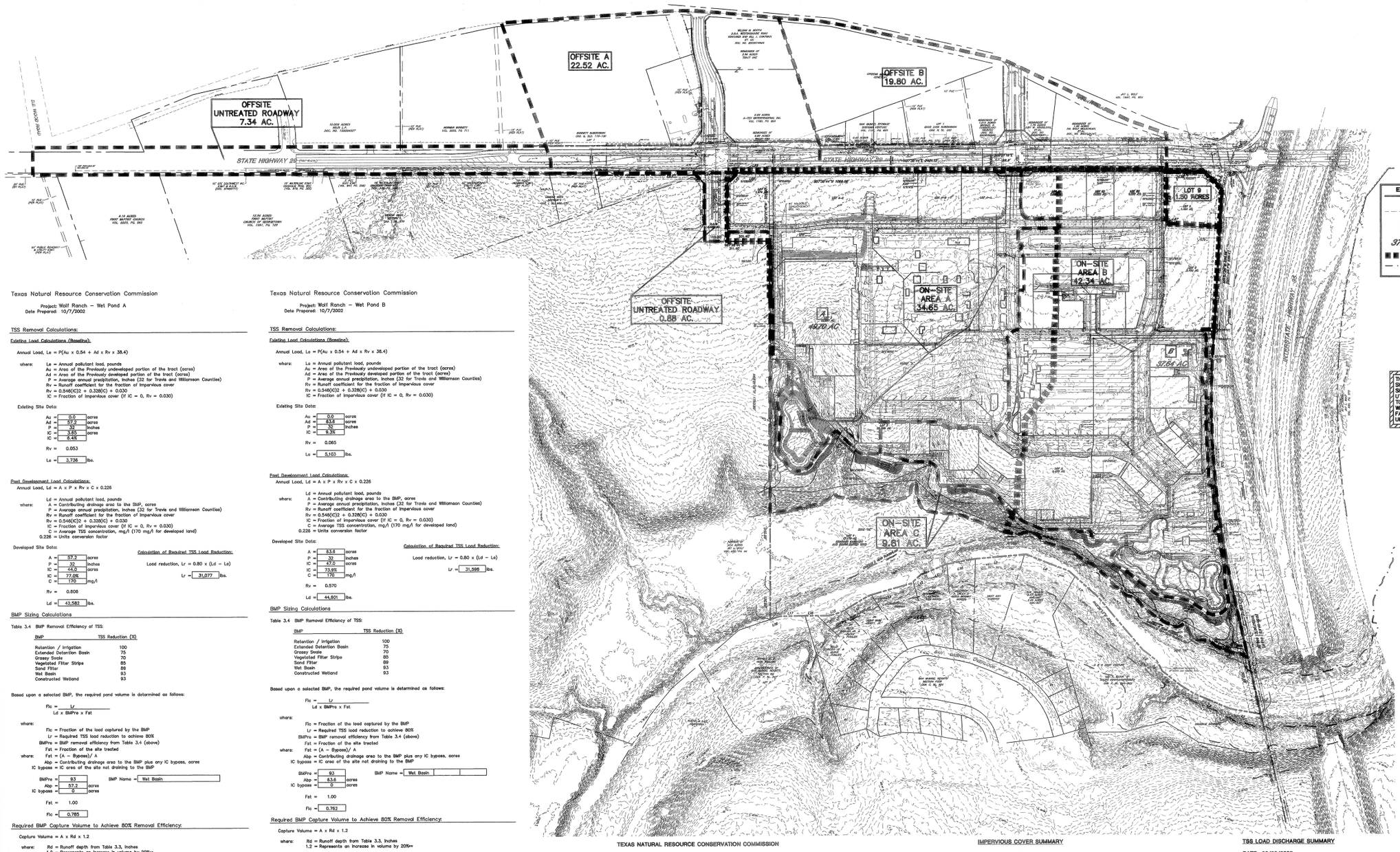
AS-BUILT

G:\1262\01\126201DAM03.dwg modified by ldoshier on Dec 22, 2005 – 10:30am

WOLF RANCH TOWN CENTER – WET POND B BASIN

(EAPP ID NO. 03082601)

DATE	NO.	REVISION	APPROVAL
12-20-05	AS-BUILT	-ADDED LOT 9 TO DRAINAGE MAP	



LEGEND

EXISTING	PROPOSED	
		PROPERTY (R.O.W.) LINE
678	678	DIRECTION OF FLOW / CONTOUR
B 37.64 AC	ON-SITE AREA A 34.65 AC.	DRAINAGE AREA NUMBER
		DRAINAGE DIVIDE
		FLOODPLAIN LINE

THE LOCATION OF EXISTING UNDERGROUND UTILITIES ARE SHOWN IN AN APPROXIMATE WAY ONLY. THE CONTRACTOR SHALL DETERMINE THE EXACT LOCATION OF ALL EXISTING UTILITIES BEFORE COMMENCING WORK. CONTRACTOR AGREES TO BE FULLY RESPONSIBLE FOR ANY AND ALL DAMAGES WHICH MIGHT BE OCCASIONED BY THE CONTRACTOR'S FAILURE TO EXACTLY LOCATE AND PRESERVE ANY AND ALL UNDERGROUND UTILITIES.

Texas Natural Resource Conservation Commission

Project: Wolf Ranch – Wet Pond A
Date Prepared: 10/7/2002

TSS Removal Calculations:

Existing Load Calculations (Baseline):

Annual Load, Le = P(Au x 0.54 + Ad x Rv x 38.4)

where:
- Le = Annual pollutant load, pounds
- Au = Area of the Previously undeveloped portion of the tract (acres)
- Ad = Area of the Previously developed portion of the tract (acres)
- P = Average annual precipitation, inches (32 for Travis and Williamson Counties)
- Rv = Runoff coefficient for the fraction of impervious cover
- Rv = 0.546(IC)2 + 0.328(IC) + 0.030
- IC = Fraction of impervious cover (If IC = 0, Rv = 0.030)

Existing Site Data:

Au =	0.0	acres
Ad =	57.2	acres
P =	32	inches
IC =	3.85	acres
IC =	6.4%	

Rv = 0.053

Le = 3,736 lbs.

Post Development Load Calculations:

Annual Load, Ld = A x P x Rv x C x 0.226

where:
- Ld = Annual pollutant load, pounds
- A = Contributing drainage area to the BMP, acres
- P = Average annual precipitation, inches (32 for Travis and Williamson Counties)
- Rv = Runoff coefficient for the fraction of impervious cover
- Rv = 0.546(IC)2 + 0.328(IC) + 0.030
- IC = Fraction of impervious cover (If IC = 0, Rv = 0.030)
- C = Average TSS concentration, mg/l (170 mg/l for developed land)
- 0.226 = Units conversion factor

Developed Site Data:

A =	57.2	acres
P =	32	inches
IC =	44.0	acres
IC =	77.0%	
C =	170	mg/l

Rv = 0.606

Ld = 42,582 lbs.

Calculation of Required TSS Load Reduction:

Load reduction, Lr = 0.80 x (Ld – Le)

Lr = 31,077 lbs.

BMP Sizing Calculations

Table 3.4 BMP Removal Efficiency of TSS:

BMP	TSS Reduction (%)
Retention / Irrigation	100
Extended Detention Basin	75
Grassy Swale	70
Vegetated Filter Strips	85
Sand Filter	89
Wet Basin	93
Constructed Wetland	93

Based upon a selected BMP, the required pond volume is determined as follows:

Flc = Lr / (Ld x BMPre x Fst)

where:
- Flc = Fraction of the load captured by the BMP
- Lr = Required TSS load reduction to achieve 80%
- BMPre = BMP removal efficiency from Table 3.4 (above)
- Fst = Fraction of the site treated
- where: Fst = (A – Bypass)/ A
- Abp = Contributing drainage area to the BMP plus any IC bypass, acres
- IC bypass = IC area of the site not draining to the BMP

BMPre =	93	BMP Name =	Wet Basin
Abp =	57.2	acres	
IC bypass =	0	acres	

Fst = 1.00

Flc = 0.785

Required BMP Capture Volume to Achieve 80% Removal Efficiency:

Capture Volume = A x Rd x 1.2

where:
- Rd = Runoff depth from Table 3.3, inches
- 1.2 = Represents an increase in volume by 20%**

** Capture volume shall be increased by 20% to accommodate reductions in available storage volume due to deposition of solids between full-scale maintenance activities.

Rd = 0.58 inches

Capture Volume = 144,449 cubic feet of volume in pond
24,075 = the increase in volume for deposition of solids

Required Water Quality Volume =	144,449	cu. Ft.
Required Permanent Pool Volume =	144,449	cu. Ft.
TOTAL VOLUME REQUIRED =	288,898	cu. Ft.

Provided BMP Capture Volume:

TOTAL VOLUME PROVIDED =	300,296	cu. Ft.
Required Water Quality Volume =	150,148	cu. Ft.
Required Permanent Pool Volume =	150,148	cu. Ft.

Capture Volume = 125,123 = cubic feet of volume in pond
25,025 = 20% increase in volume for deposition of solids
150,148 = total volume

Rd = V / A / 43560 * 12

Rd = 0.60 inches

where:
- V = Volume before 20% increase
- A = Pond drainage area

FlC 0.793 from Table 3.3

Lr = FlC xLd x BMPre x Fst

Lr = 31,404 lbs

Proposed Load Discharged = Ld – Lr =	11,178	lbs
Existing Load Discharged = Le =	3,736	lbs
Increase in Load Discharged =	7,442	lbs

Texas Natural Resource Conservation Commission

Project: Wolf Ranch – Wet Pond B
Date Prepared: 10/7/2002

TSS Removal Calculations:

Existing Load Calculations (Baseline):

Annual Load, Le = P(Au x 0.54 + Ad x Rv x 38.4)

where:
- Le = Annual pollutant load, pounds
- Au = Area of the Previously undeveloped portion of the tract (acres)
- Ad = Area of the Previously developed portion of the tract (acres)
- P = Average annual precipitation, inches (32 for Travis and Williamson Counties)
- Rv = Runoff coefficient for the fraction of impervious cover
- Rv = 0.546(IC)2 + 0.328(IC) + 0.030
- IC = Fraction of impervious cover (If IC = 0, Rv = 0.030)

Existing Site Data:

Au =	0.0	acres
Ad =	63.6	acres
P =	32	inches
IC =	9.3%	

Rv = 0.065

Le = 5,103 lbs.

Post Development Load Calculations:

Annual Load, Ld = A x P x Rv x C x 0.226

where:
- Ld = Annual pollutant load, pounds
- A = Contributing drainage area to the BMP, acres
- P = Average annual precipitation, inches (32 for Travis and Williamson Counties)
- Rv = Runoff coefficient for the fraction of impervious cover
- Rv = 0.546(IC)2 + 0.328(IC) + 0.030
- IC = Fraction of impervious cover (If IC = 0, Rv = 0.030)
- C = Average TSS concentration, mg/l (170 mg/l for developed land)
- 0.226 = Units conversion factor

Developed Site Data:

A =	63.6	acres
P =	32	inches
IC =	47.0	acres
IC =	73.9%	
C =	170	mg/l

Rv = 0.570

Ld = 44,601 lbs.

Calculation of Required TSS Load Reduction:

Load reduction, Lr = 0.80 x (Ld – Le)

Lr = 31,598 lbs.

BMP Sizing Calculations

Table 3.4 BMP Removal Efficiency of TSS:

BMP	TSS Reduction (%)
Retention / Irrigation	100
Extended Detention Basin	75
Grassy Swale	70
Vegetated Filter Strips	85
Sand Filter	89
Wet Basin	93
Constructed Wetland	93

Based upon a selected BMP, the required pond volume is determined as follows:

Flc = Lr / (Ld x BMPre x Fst)

where:
- Flc = Fraction of the load captured by the BMP
- Lr = Required TSS load reduction to achieve 80%
- BMPre = BMP removal efficiency from Table 3.4 (above)
- Fst = Fraction of the site treated
- where: Fst = (A – Bypass)/ A
- Abp = Contributing drainage area to the BMP plus any IC bypass, acres
- IC bypass = IC area of the site not draining to the BMP

BMPre =	93	BMP Name =	Wet Basin
Abp =	63.6	acres	
IC bypass =	0	acres	

Fst = 1.00

Flc = 0.762

Required BMP Capture Volume to Achieve 80% Removal Efficiency:

Capture Volume = A x Rd x 1.2

where:
- Rd = Runoff depth from Table 3.3, inches
- 1.2 = Represents an increase in volume by 20%**

** Capture volume shall be increased by 20% to accommodate reductions in available storage volume due to deposition of solids between full-scale maintenance activities.

Rd = 0.5 inches

Capture Volume = 138,608 cubic feet of volume in pond
23,101 = the increase in volume for deposition of solids

Required Water Quality Volume =	138,608	cu. Ft.
Required Permanent Pool Volume =	138,608	cu. Ft.
TOTAL VOLUME =	277,216	cu. Ft.

Provided BMP Capture Volume to Achieve 80% Removal Efficiency:

TOTAL VOLUME PROVIDED =	300,081	cu. Ft.
Required Water Quality Volume =	154,541	cu. Ft.
Required Permanent Pool Volume =	154,541	cu. Ft.

Capture Volume = 128,784 = cubic feet of volume in pond
25,757 = 20% increase in volume for deposition of solids
154,541 = total volume

Rd = V / A / 43560 * 12

Rd = 0.56 inches

where:
- V = Volume before 20% increase
- A = Pond drainage area

FlC 0.789 from Table 3.3

Lr = FlC xLd x BMPre x Fst

Lr = 32,727 lbs

Proposed Load Discharged = Ld – Lr =	11,874	lbs
Existing Load Discharged = Le =	5,103	lbs
Increase in Load Discharged =	6,771	lbs

TEXAS NATURAL RESOURCE CONSERVATION COMMISSION

PROJECT: WOLF RANCH - WEST OFFSITE ROADWAY
DATE : 10/9/2002

TSS REMOVAL CALCULATIONS:

EXISTING LOAD CALCULATIONS (BASELINE):

ANNUAL LOAD, LE = P(AU X 0.54 + AD X RV X 38.4)

WHERE:
- LE = ANNUAL POLLUTANT LOAD, POUNDS
- AU = AREA OF THE PREVIOUSLY UNDEVELOPED PORTION OF THE TRACT (ACRES)
- AD = AREA OF THE PREVIOUSLY DEVELOPED PORTION OF THE TRACT (ACRES)
- P = AVERAGE ANNUAL PRECIPITATION, INCHES (32 FOR TRAVIS AND WILLIAMSON COUNTIES)
- RV = RUNOFF COEFFICIENT FOR THE FRACTION OF IMPERVIOUS COVER
- RV = 0.546(IC)2 + 0.328(IC) + 0.030
- IC = FRACTION OF IMPERVIOUS COVER (IF IC = 0, RV = 0.030)

EXISTING SITE DATA:

AU =	0.0	ACRES
AD =	7.5	ACRES
P =	32	INCHES
IC =	46.8	%

RV = 0.303

LE = 2,788 LBS.

POST DEVELOPMENT LOAD CALCULATIONS:

ANNUAL LOAD, LD = A X P X RV X C X 0.226

WHERE:
- LD = ANNUAL POLLUTANT LOAD, POUNDS
- A = CONTRIBUTING DRAINAGE AREA TO THE BMP, ACRES
- P = AVERAGE ANNUAL PRECIPITATION, INCHES (32 FOR TRAVIS AND WILLIAMSON COUNTIES)
- RV = RUNOFF COEFFICIENT FOR THE FRACTION OF IMPERVIOUS COVER
- RV = 0.546(IC)2 + 0.328(IC) + 0.030
- IC = FRACTION OF IMPERVIOUS COVER (IF IC = 0, RV = 0.030)
- C = AVERAGE TSS CONCENTRATION, MG/L (170 MG/L FOR DEVELOPED LAND)
- 0.226 = UNITS CONVERSION FACTOR

DEVELOPED SITE DATA:

A =	7.5	ACRES
P =	32	INCHES
IC* =	51.6	%
C =	170	MG/L

*INCLUDES 6,500 S.F. OF DRIVEWAY TO THE OFFSITE LIFT STATION

RV = 0.345

LD = 3,176 LBS. = LOAD DISCHARGED

IMPERVIOUS COVER SUMMARY

DATE : 06/03/2005

	Existing Area (ac)	Existing Imp (ac)	Existing Imp (%)	Proposed Area (ac)	Proposed Imp (ac)	Proposed Imp (%)
West Offsite Roadway	7.49	3.50	46.8%	7.49	5.07	67.6%
NSJS LTD.	10.4	0.12	1.2%	10.4	6.74	65.0%
Lloyd Treiner	2.15	1.29	60.0%	2.15	1.40	65.0%
West. Rd Ventura	5.44	0.00	0%	5.44	3.53	65.0%
Lots 2&3 –Onsite Area "A"	26.8	0.28	1.0%	26.8	22.5	84.0%
Lot 7 – Onsite Area "A"	1.47	0.00	0.0%	1.47	1.18	80.0%
Lot 4 –Onsite Area "A"	6.39	0.00	0.0%	6.39	5.11	80.0%
Offsite Roadway A	4.57	1.97	43.0%	4.57	2.75	60.0%
Total Pond A	67.2	5.7	8.4%	67.2	49.3	73.6%
Texas Waterproof	0.28	0.23	81.9%	0.28	0.18	65.0%
San Gabriel Storage	1.08	0.99	91.7%	1.08	0.70	65.0%
Memorial Garden	6.65	0.00	0%	6.65	0.66	10.0%
Ben & Alicia Johnson	1.86	0.51	27.1%	1.86	1.21	65.0%
Georgetown Title	1.42	0.24	17.1%	1.42	0.92	65.0%
Phil Mockford	1.25	0.02	1.8%	1.25	0.81	65.0%
Bill Chapman	1.96	0.00	0%	1.96	1.27	65.0%
Lots 2&8 – Onsite Area "B"	35.9	0.38	1.1%	35.9	31.2	86.9%
Lot 3 – Onsite Area "B"	3.63	0.00	0.0%	3.63	2.91	80.0%
Lot 6 Onsite Area "B"	2.76	0.00	0.0%	2.76	2.21	80.0%
Offsite Roadway "B"	5.30	2.58	48.7%	5.30	2.93	55.3%
Ivo Wolf Lot 9	1.50	0.97	64.3%	1.50	1.20	80.0%
Total Pond B	83.8	6.82	8.3%	83.8	48.2	72.7%

TSS LOAD DISCHARGE SUMMARY

DATE : 06/03/2005

	West Roadway	Pond A	Pond B	Total
Existing Load (Le)	2,788	3,736	5,103	11,627
Developed Load (Ld)	3,176	42,582	44,601	90,360
Increase in Load (Ld – Le)	389	38,846	39,498	78,733
Required Load Reduction (Lr = 0.80 x (Ld – Le))	311	31,077	31,598	62,986
Load Discharge After Required Removal (Ld – Lr)	2,865	11,505	13,003	27,373
Proposed Load Discharge	3,176	11,178	11,874	26,229

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ENGINEERING SOLUTIONS
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STATE OF TEXAS
Christopher Randazzo
87029
LICENSED
PROFESSIONAL ENGINEER
12/19/05

SIMON PROPERTY GROUP

WATER QUALITY DRAINAGE AREA MAP

WOLF RANCH
GEORGETOWN, TEXAS

SIMON PROPERTY GROUP

PLOTTING SCALE: 1" = 1'
DATE PLOTTED: 06/03/05
FILE: G:\1262\01\126201DAM03
DRAWN BY: LKC\ PSD
DESIGNED BY: JP
REVIEWED BY: CSS
PROJECT NO.: 1262-01.00

SHEET 24 OF 61

AS-BUILT

AS-BUILT

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WOLF LAKES SECTION 1, PHASE 1 & SECTION 2 – POND 1 BASIN

(EAPP ID NO. 11003027)



SCALE: 1"= 200'

0' 200' 400' 600'

LEGEND

- DRAINAGE FLOW ARROW
- PROPOSED DRAINAGE AREA
- XX DRAINAGE AREA
- 786 EXISTING CONTOUR LINE
- 786 PROPOSED CONTOUR LINE
- PROJECT AREA FROM APPROVED EAPP11002794
- WOLF LAKES VILLAGE SECTIONS 7 & 8 PROJECT AREA

Wolf Lakes Village - Impervious Cover Summary
Drainage Area P1

BMP Watershed	Total Watershed Area (ac.)	Existing Impervious Cover (ac.)	Projected Impervious Cover (ac.)	PBMP	TSS Removal Required (lb.)	TSS Removal Provided (lb.)	Notes
Pond 1	129.83	0.00	98.56	Wet Basin	85,787	86,056	
Overtreat	0.35	0.00	0.31	Overtreat	270		
TOTAL	129.83	0.00	98.87		86,056	86,056	

NO.	REVISION	DATE

STATE OF TEXAS
MICHAEL S FISHER
87704
LICENSED
PROFESSIONAL ENGINEER
3/29/22

PAPE-DAWSON ENGINEERS
SAN ANTONIO | AUSTIN | HOUSTON | FORT WORTH | DALLAS
2000 NW LOOP 410 | SAN ANTONIO, TX 78213 | 210.375.9000
TBPE FIRM REGISTRATION #470 | TBPLS FIRM REGISTRATION #10028800

WOLF LAKES VILLAGE SECTION 8
CITY OF GEORGETOWN, TEXAS
WATER QUALITY DRAINAGE AREA MAP

CITY JOB NO. 2022-1-CON
JOB NO. 51321-00
DATE March 25, 2022
DESIGNER ARC
CHECKED MF DRAWN ARC
SHEET 1 OF 1

Date: Mar 25, 2022, 2:29pm User ID: aconner
File: H:\Projects\513\21\00\307_WPAP\Exhibits\WQDA51321-00.dwg

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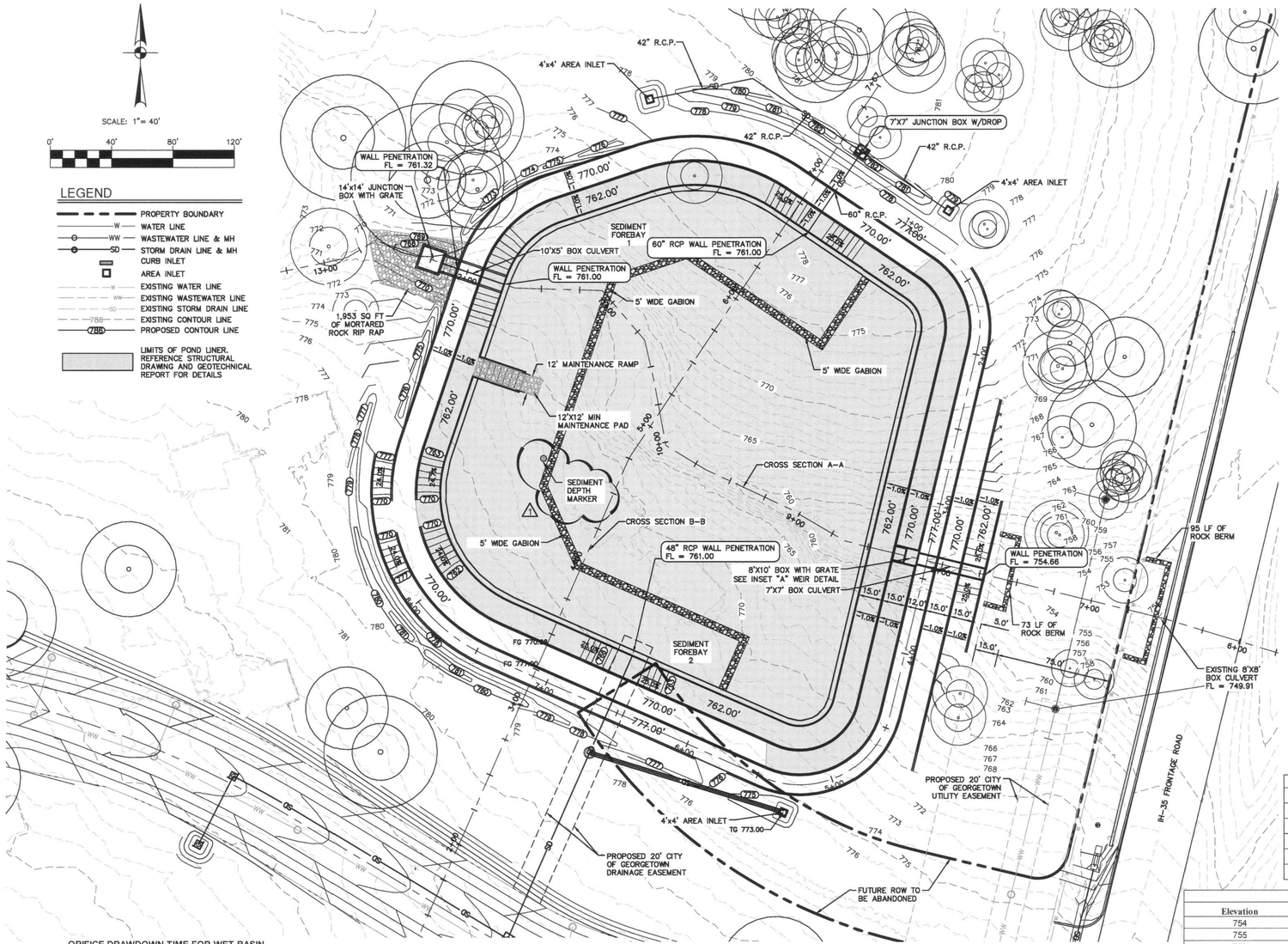
2022-1-CON



Texas Commission on Environmental Quality

TSS Removal Calculations 04-20-2009

Project Name: Wolf Lakes Village
Date Prepared: 3/25/2022

Additional information is provided for cells with a red triangle in the upper right corner. Place the cursor over the cell.
Text shown in blue indicate location of instructions in the Technical Guidance Manual - RG-348.
Characters shown in red are data entry fields.
Characters shown in black (Bold) are calculated fields. Changes to these fields will remove the equations used in the

1. The Required Load Reduction for the total project: Calculations from RG-348 Pages 3-27 to 3-30

Page 3-29 Equation 3.3: $L_M = 27.2(A_N \times P)$

where:
$L_{M\ TOTAL\ PROJECT}$ = Required TSS removal resulting from the proposed development = 80% of inc
A_N = Net increase in impervious area for the project
P = Average annual precipitation, inches

Site Data: Determine Required Load Removal Based on the Entire Project

County =	Williamson	
Total project area included in plan * =	164.51	acres
Predevelopment impervious area within the limits of the plan * =	0.00	acres
Total post-development impervious area within the limits of the plan * =	98.56	acres
Total post-development impervious cover fraction * =	0.60	
P =	32	inches
$L_{M\ TOTAL\ PROJECT}$ =	85787	lbs.

*** The values entered in these fields should be for the total project area.**

Number of drainage basins / outfalls areas leaving the plan area = 1

2. Drainage Basin Parameters (This information should be provided for each basin):

Drainage Basin/Outfall Area No. = 1

Total drainage basin/outfall area =	129.83	acres
Predevelopment impervious area within drainage basin/outfall area =	0.00	acres
Post-development impervious area within drainage basin/outfall area =	98.56	acres
Post-development impervious fraction within drainage basin/outfall area =	0.76	
$L_{M\ THIS\ BASIN}$ =	85787	lbs.

3. Indicate the proposed BMP Code for this basin.

Proposed BMP = **Wet Basin**
Removal efficiency = 93 percent

4. Calculate Maximum TSS Load Removed (L_R) for this Drainage Basin by the selected BMP Type.

RG-348 Page 3-33 Equation 3.7: $L_R = (\text{BMP efficiency}) \times P \times (A_I \times 34.6 + A_P \times 0.54)$

where:
A_C = Total On-Site drainage area in the BMP catchment area
A_I = Impervious area proposed in the BMP catchment area
A_P = Pervious area remaining in the BMP catchment area
L_R = TSS Load removed from this catchment area by the proposed BMP

A_C =	123.28	acres
A_I =	98.56	acres
A_P =	24.72	acres
L_R =	101884	lbs

5. Calculate Fraction of Annual Runoff to Treat the drainage basin / outfall area

Desired $L_{M\ THIS\ BASIN}$ = 86056 lbs.

F = 0.84

6. Calculate Capture Volume required by the BMP Type for this drainage basin / outfall area. Calculations from RG-348 Pages 3-

Rainfall Depth =	1.26	inches
Post Development Runoff Coefficient =	0.62	
On-site Water Quality Volume =	351383	cubic feet

Calculations from RG-348 Pages 3-36 to 3-37

Off-site area draining to BMP =	6.55	acres
Off-site Impervious cover draining to BMP =	0.00	acres
Impervious fraction of off-site area =	0.00	
Off-site Runoff Coefficient =	0.62	
Off-site Water Quality Volume =	599	cubic feet
Storage for Sediment =	70391	
Total Capture Volume (required water quality volume(s) x 1.20) =	422343	cubic feet

11. Wet Basins Designed as Required in RG-348 Pages 3-66 to 3-71

Required capacity of Permanent Pool =	422343	cubic feet	**Permanent Pool Capacity is 1.20 times the V**
Required capacity at WQV Elevation =	773697	cubic feet	**Total Capacity should be the Permanent Poo plus a second WQV.**

Wolf Lakes Village, Pond 1, Wet Basin			
Required Capacity at WQ Volume (ft^3) =	773,697		
Provided Capacity at WQ Volume (ft^3) =	780,928		
Required Capacity at Permanent Pool Volume (ft^3) =	422,343		
Provided Capacity at Permanent Pool Volume (ft^3) =	450,170		
Required Sediment Forebay Volume (ft^3)=	67,526	to	112,543
Provided Sediment Forebay Volume (ft^3)=	107,104		

ORIFICE DRAWDOWN TIME FOR WET BASIN

Contour Elevation (ft)	Contour Area (ft^2)	Average End Area Method: Incremental Volume (ft^3)	Average End Area Method: Total Volume (ft^3)	Orifice Discharge (cfs)	Incremental Drawdown Time (hr)	Total Drawdown Time (hr)
764	90,909	-	-	-	-	-
763	90,180	90,545	90,545	5.94	4.2	4.2
762	78,190	84,185	174,730	5.02	4.7	8.9
761	78,014	78,102	252,832	3.89	5.6	14.5
760	77,837	77,925	330,757	2.25	9.6	24.1

ORIFICE DIAMETER	11.000	in
ORIFICE FL ELEV	760.00	
ORIFICE CENTROID ELEV	760.00	
NUMBER OF ORIFICE	1.00	
ORIFICE AREA (Ao)	0.660	sf
ORIFICE COEFFICIENT	0.6	

ORIFICE EQUATION

$$Q = CA_o\sqrt{2gH}$$

Drawdown Time	24.1	hours
Drawdown Time Exceeding 24 Hours	0.1	hours
Orifice Discharge Rate	2.25	cfs
Volume Released During Duration Exceeding 24 Hours	753	ft^3
Depth of Remaining Water Quality Volume @ 24 Hours	0.01	ft

Sediment Forebay					
	Area (ft^2)	Area (ac)	Incremental Volume (ft^3)	Cumulative Volume (ft^3)	Notes
754	26,776.00	0.614692	-	-	
755	26,776.00	0.614692	26,776	26,776	
756	26,776.00	0.614692	26,776	53,552	
757	26,776.00	0.614692	26,776	80,328	
758	26,776.00	0.614692	26,776	107,104	

Wolf Lakes Village, Pond 1, Wet Basin					
Elevation	Area (ft^2)	Area (ac)	Incremental Volume (ft^3)	Cumulative Volume (ft^3)	Notes
754	73,739.63	1.692829	-	-	
755	73,924.79	1.697080	73,832	73,832	
756	74,101.09	1.701127	74,013	147,845	
757	74,268.54	1.704971	74,185	222,030	
758	74,430.23	1.708683	74,349	296,379	
759	77,657.70	1.782775	76,044	372,423	
760	77,836.55	1.786881	77,747	450,170	Permanent Pool
761	78,013.98	1.790955	77,925	528,096	
762	78,189.98	1.794995	78,102	606,198	
763	90,180.43	2.070258	84,185	690,383	
764	90,909.16	2.086987	90,545	780,928	Water Quality Volume
764.5	91,268.99	2.095248	45,545	826,472	
765	91,657.78	2.104173	45,732	872,204	
766	92,422.48	2.121728	92,040	964,244	
767	93,200.66	2.139593	92,812	1,057,056	
768	93,993.29	2.157789	93,597	1,150,653	
769	95,773.87	2.198666	94,884	1,245,536	
770	98,793.33	2.267983	97,284	1,342,820	
771	119,325.70	2.739341	109,060	1,451,879	
772	123,192.38	2.828108	121,259	1,573,138	
773	127,888.06	2.935906	125,540	1,698,679	
774	134,268.34	3.082377	131,078	1,829,757	
775	142,206.78	3.264618	138,238	1,967,994	
775.5	146,752.15	3.368966	72,240	2,040,234	100 Year WSEL
776	151,481.21	3.477530	74,558	2,114,792	
777	162,348.56	3.727010	156,915	2,271,707	

NO.	REVISION	DATE
1	ADD SEDIMENT DEPTH MARKER	08/31/21

STATE OF TEXAS
MICHAEL S FISHER
87704
LICENSED PROFESSIONAL ENGINEER
5/19/22

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WOLF LAKES VILLAGE, SECTION 1, PHASE 1 & SECTION 2
CITY OF GEORGETOWN, TEXAS

POND PLAN VIEW

CITY JOB No. 2021-4-CON
JOB NO. 51119-02
DATE DECEMBER 2021
DESIGNER
CHECKED MF DRAWN ARC
SHEET 46 OF 75

Date: Mar 25, 2022, 2:45pm User ID: oconner
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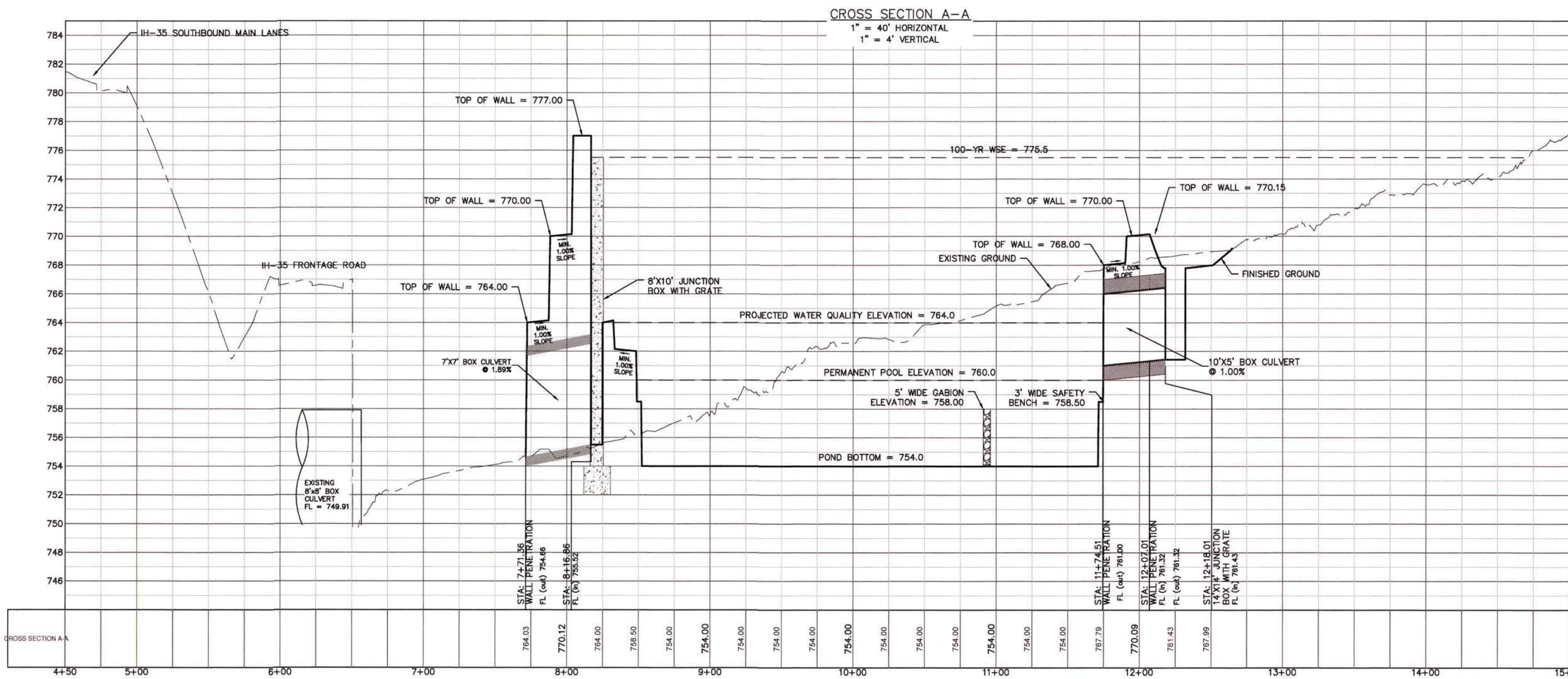

TENCATE

Mirafi

Mirafi® S800

Drainage Separation

Mirafi® S800 is a needle-punched nonwoven geotextile composed of polypropylene fibers, which are formed into a stable network such that the fibers retain their relative position. Mirafi® S800 is inert to biological degradation and resistant to naturally encountered chemicals, alkalis, and acids.

Mechanical Properties	Test Method	Unit	Minimum Average Roll Value
Weight	ASTM D 5261	g/m² (oz/yd²)	271 (8.0)
Thickness	ASTM D 5199	mm (mils)	2.3 (90)
Grab Tensile Strength	ASTM D 4632	N (lbs)	1024 (230)
Grab Tensile Elongation	ASTM D 4632	%	50
Trapezoid Tear Strength	ASTM D 4533	N (lbs)	378 (85)
Mullen Burst Strength	ASTM D 3786	kPa (psi)	2756 (400)
Puncture Strength[1]	ASTM D 4833	N (lbs)	579 (130)
CBR Puncture Strength	ASTM D 6241	N (lbs)	2670 (600)
Apparent Opening Size (AOS)[2]	ASTM D 4751	mm (U.S. Sieve)	0.15 (100)
Permittivity	ASTM D 4491	sec⁻¹	1.36
Permeability	ASTM D 4491	cm/sec	0.31
Flow Rate	ASTM D 4491	l/min/m² (gal/min/ft²)	4074 (100)
UV Resistance (at 500 hours)	ASTM D 4355	% strength retained	80

[1] ASTM D 4833 has been replaced with ASTM D 6241
[2] ASTM D 4751: AOS is a Maximum Opening diameter value

Physical Properties	Unit	Typical Value
Roll Dimensions (width x length)	m (ft)	4.5 x 91 (15 x 300)
Roll Area	m² (yd²)	418 (500)
Estimated Roll Weight	kg (lb)	130 (286)

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TerraTex® N08

TerraTex® N08 is a nonwoven geotextile made up of polypropylene fibers. These fibers are needled to form a stable and durable network such that the fibers retain their relative position. It is non-biodegradable and resistant to most soil chemicals, acids, and alkali with a pH range of 3 to 12. TerraTex® N08 is manufactured to meet or exceed the following minimum average roll values:

Unless noted otherwise, all values are minimum average roll values (MARV).

PROPERTY	TEST METHOD	ENGLISH	METRIC
Weight (Typical) [1]	ASTM D5261	8.0 oz/yd²	271 g/m²
Grab Tensile	ASTM D4632	205 lbs	0.911 kN
Grab Elongation	ASTM D4632	50 %	50 %
Trapezoid Tear	ASTM D4533	85 lbs	0.378 kN
CBR Puncture	ASTM D6241	535 lbs	2.38 kN
Permittivity [1]	ASTM D4491	1.35 sec⁻¹	1.35 sec⁻¹
Water Flow Rate [1]	ASTM D4491	90 gpm/ft²	3,657 Lpm/m²
AOS [1, 2]	ASTM D4751	80 US Std. Sieve	0.180 mm
UV Resistance	ASTM D4355	70 % @ 500 hrs	70 % @ 500 hrs

1 At the time of manufacturing. Handling, storage, and shipping may change these properties.
2 Value represents maximum average roll value.

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11/20/2018

EXPERIENCE THE CARLISLE DIFFERENCE — CARLISLE SYNTEC SYSTEMS

GeoTough EPDM
Geosynthetic Membrane



Overview

Carlisle's GeoTough EPDM Geosynthetic Membrane is a nominal 45-mil and 60-mil thick non-reinforced Ethylene Propylene Diene Terpolymer (EPDM) based elastomeric waterproofing liner for use in recreational, commercial aquaculture and industrial water containment applications. The membrane is specifically formulated for long-term use in buried or exposed geomembrane applications. GeoTough EPDM has been formulated to be compatible with aquatic life. It is recommended that customers test GeoTough EPDM before use to ensure it is compatible with the specific aquatic species for the proposed application. GeoTough EPDM has a wide variety of applications including the lining of agricultural waste water containment, commercial and industrial reservoirs, catch basins, stormwater retention ponds, canals and aquaculture, including fish hatcheries.

Features and Benefits

- Superb elongation and lay flat characteristics
- Excellent low temperature impact resistance
- Exceptional resistance to solar UV, ozone, and oxidation
- Low water vapor permeance and water absorption
- Quick seaming process - no specialized or expensive tools required
- 20-year material warranty available
- Large prefabricated panels available in custom sizing
- Unmatched J-Tear protection

Installation

Installation procedures vary as to the type of application employed and the specific job requirements. When installed correctly, it is difficult to find a more efficient water barrier. Surfaces on or against where GeoTough EPDM membrane is to be applied must be smooth, free of fins, sharp edges, loose and foreign materials, oil and grease. GeoTough EPDM can be easily repaired in the field by the owner without specialized tools or training. Consult current specifications and details for complete installation information.

J-Tear Protection:

Amongst top competitors, Carlisle's GeoTough EPDM membranes are the only brand that will give you the added benefit of consistent J-Tear protection. When the J-Tear test is successful the sheet will tear in the direction of the cut for a short distance and then it will change direction and attempt to curve back on itself --- as it does with Carlisle's GeoTough EPDM membrane.

This direction change is important during the membrane installation process. As the installer works around protrusions, the J-tear stops the membrane from tearing as they install the sheet.

Review Carlisle specifications and details for complete installation information.

Sizes Available

	45-mil	60-mil
Width	5–50 feet (1.5 - 15.2 meters)	5–50 feet (1.5 - 15.2 meters)
Length	50–200 feet (15.2 – 61 meters)	50, 100, 150 feet (15.2, 30.5, 45.7 meters)
Weight	0.28 lbs/ft² (1.37 kg/m²)	0.37 lbs/ft² (1.81 kg/m²)
Specific Gravity	1.19 g/cc	1.19 g/cc

SCAN HERE TO WATCH THE J-TEAR TEST COMPARISON VIDEO

800-479-6832 | P.O. Box 7000 | Carlisle, PA 17013 | Fax: 717-245-7053 | www.carlislesyntec.com

EXPERIENCE THE CARLISLE DIFFERENCE — CARLISLE SYNTEC SYSTEMS

GeoTough EPDM
Geosynthetic Membrane

Typical Properties and Characteristics

Physical Property	Test Method	Minimum Properties English		Minimum Properties Metric	
		45 mil	60 mil	1.14 mm	1.52 mm
Thickness Tolerance	ASTM D412	45 mils ± 10%	60 mils ± 10%	1.14 mm ± 10%	1.52 mm ± 10%
Break Strength	ASTM D412	1305 PSI	1305 PSI	9.0 MPA	9.0 MPA
Break Elongation	ASTM D412	300%	300%	300%	300%
Tear Strength min.	ASTM D624	150 lbf/in	150 lbf/in	26.3 kN/m	26.3 kN/m
Puncture Resistance	ASTM D4833	30 lbs.	35 lbs.	125 N	155 N
J-Tear	ASTM D-624 Die T	Pass	Pass	Pass	Pass
Brittleness Temperature max.	ASTM D2137	-49 °F	-49 °F	-45 °C	-45 °C
Water Vapor Permeance max.	ASTM E96 (Proc. B or BW)	0.03 (Typ.) 0.045 (Max.)	0.03 (Typ.) 0.045 (Max.)	0.03 (Typ.) 0.045 (Max.)	0.03 (Typ.) 0.045 (Max.)
Resistance to Water Absorption after 7 d immersion @ 158 °F (°C), max.	ASTM D471	+8.0 % -2.0 %	+8.0 % -2.0 %	+8.0 % -2.0 %	+8.0 % -2.0 %
Resistance to Heat Aging (Properties after 670 hours @ 240° F (116° C)) 1. Tensile Break Strength 2. Elongation, ultimate min. 3. Tear Strength	ASTM D573 ASTM D412 ASTM D624	1205 PSI 200% 125 lbf/in	1205 PSI 200% 125 lbf/in	8.3 mPa 200% 21.9 kN/m	8.3 mPa 200% 21.9 kN/m
Multiaxial Elongation	ASTM D5617	100%	100%	100%	100%
Dimensional Stability 168 hrs, 212 °F (100 °C)	ASTM D1204	0.75% ±1.0%	0.75% ±1.0%	0.75% ±1.0%	0.75% ±1.0%
Ozone Resistance Condition after exposure to 100 pphm ozone in air for 168 hrs @ 140°F (40°C) sample under 50% strain)	ASTM D1149	No Cracks	No Cracks	No Cracks	No Cracks
Resistance To Outdoor (Ultraviolet) Weathering[1], Xenon-Arc, 10,080 kJ/m² exposure @ 80°C (176°F) Black panel temperature, visual examination 7X magnification	ASTM G155	No Cracks	No Cracks	No Cracks	No Cracks
Toxicity to Fish	ASTM E729(96) (modified)	Passes	Passes	Passes	Passes
Whole Effluent Toxicity Testing	EPA 600/4-89/001 Method 1000	Tested	Tested	Tested	Tested
Shore A Durometer	ASTM D2240	60±10	60±10	60±10	60±10
Factory Seam Strength	ASTM D-816	Sheet Failure	Sheet Failure	Sheet Failure	Sheet Failure

Typical properties and characteristics are based on samples tested and are not guaranteed for all samples of this product. This data and information is intended as a guide and does not reflect the specification range for any particular property of this product.

[1]Approximately equal to 8,000 hours at 0.35W/m² irradiance.

A two week minimum lead time will be necessary when ordering Carlisle GeoEPDM that is certified to meet the ASTM D-7465 requirements for Type I sheeting.

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NO.	REVISION	DATE
2	ADD PRODUCT DATA SHEETS	10/21/21

STATE OF TEXAS
MICHAEL S FISHER
87704
LICENSED PROFESSIONAL ENGINEER
[illegible] 1/12/22

PAPE-DAWSON ENGINEERS
AUSTIN | SAN ANTONIO | HOUSTON | FORT WORTH | DALLAS
10801 N MOPAC EXPY, BLDG 3, STE 200 | AUSTIN, TX 78759 | 512.454.8711
TBPE FIRM REGISTRATION #470 | TBPLS FIRM REGISTRATION #10028801

WOLF LAKES VILLAGE, SECTION 1, PHASE 1 & SECTION 2
CITY OF GEORGETOWN, TEXAS

POND DETAIL SHT 1 OF 4

CITY JOB No. 2021-4-CON
JOB NO. 51119-02
DATE DECEMBER 2021
DESIGNER
CHECKED MF DRAWN ARC
SHEET 47 OF 75

Date: Dec 15, 2021, 10:56am User ID: aconner
File: H:\Projects\511\19\02\301 Construction Documents\Civil\PD51119-02.dwg

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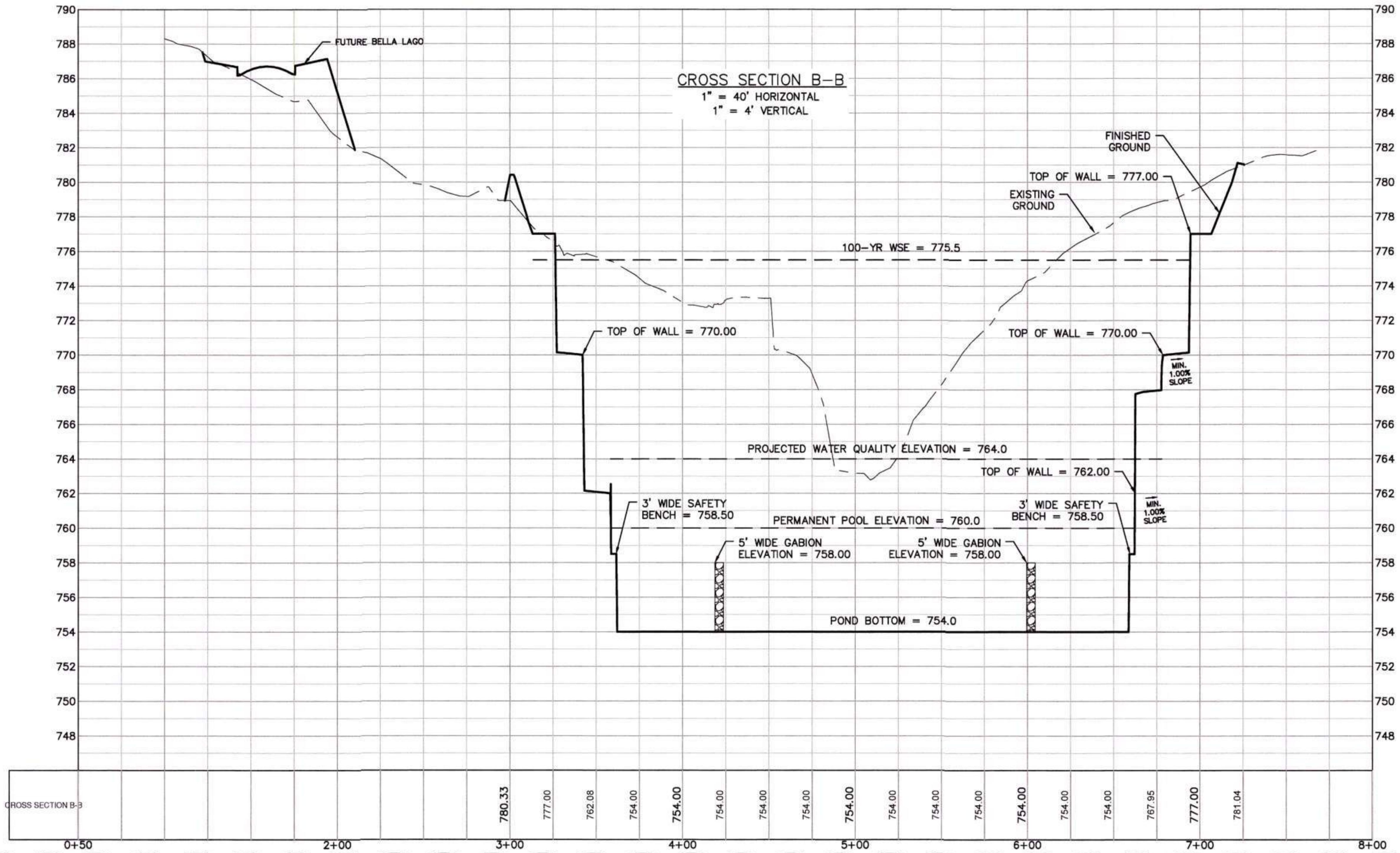

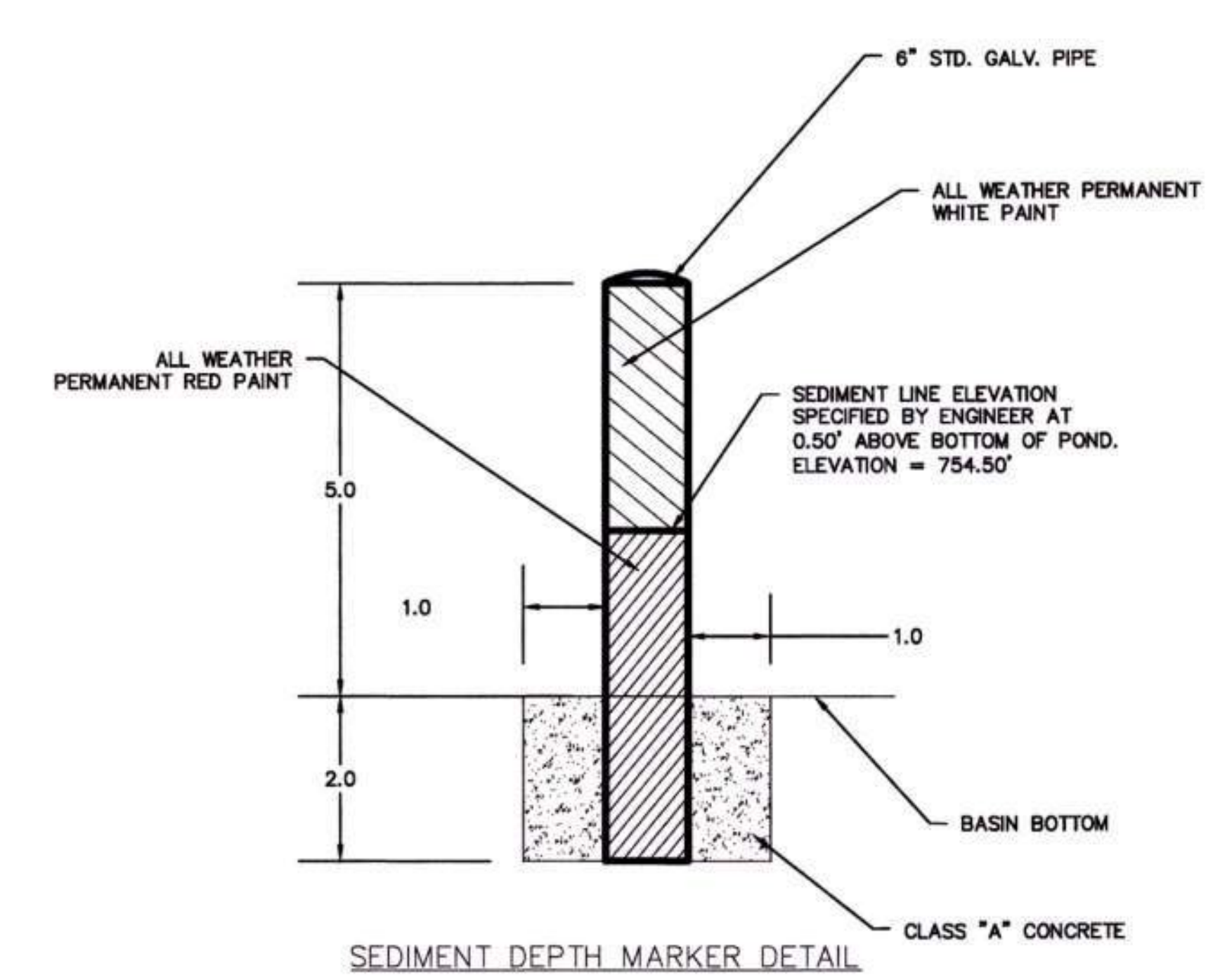

SEDIMENT DEPTH MARKER DETAIL

EXPERIENCE THE CARLISLE DIFFERENCE

CARLISLE SYNTEC SYSTEMS

GeoTough EPDM
Pressure-Sensitive Cured Cover Strip



Overview

GeoTough EPDM Pressure-Sensitive (PS) Cured Cover Strip is a nominal 60-mil-thick, cured EPDM membrane with a nominal 26-mil-thick, fully cured, synthetic rubber pressure-sensitive adhesive.

PS Cured Cover Strip is ideal for stripping in seams and simply making repairs to cut membrane. PS Cured Cover Strip must be used in conjunction with Carlisle HP-250 or Low-VOC Primer.

Features and Benefits

- Available in 6" x 100', 9" x 100' and 12" x 50' rolls
- As tough as the field membrane
- Fully cured state enables it to handle expansion and contraction loads without weakening
- Resists tearing, flex cracking and abrasion caused by temperature extremes, sunlight, precipitation and all forms of normal weathering

Installation

1. The entire surface where the PS Cured Cover Strip will be applied must be clean. The adhesive on the back of the PS Cured Cover Strip will not adhere to dusted or dirty surfaces. Any residual contamination will be detrimental to the bond strength of the adhesive.
2. Remove all foreign material.
   a. Remove excess mica dust by brooming or wiping with a clean, dry rag or Carlisle HP Splice Wipe.
   b. The use of Weathered Membrane Cleaner may be necessary. This process is essential on membrane that has been exposed for a number of weeks.
   Note: Permeation-resistant gloves (that meet ANSI/ISEA 105-2005) are required for hand protection when cleaners or primers are being used.
   c. Allow the membrane to dry thoroughly before proceeding.
3. Application of HP-250 or Low-VOC Primer
   a. Standard GeoTough EPDM Membrane - Apply the primer with a clean HP Splice Wipe (or equivalent). Scrub the area of the membrane (where the PS Cured Cover Strip is to be applied) in a circular motion to achieve a thin, even coating on the membrane. The properly cleaned/primed area will be uniform in color without streaks and free of globs or puddles.
   b. Pre-Kleened™ GeoTough EPDM Membrane - Roller-apply the primer to the membrane with a short nap-length paint roller. The coated area will be free of globs or puddles.
   Note: The use of excessive amounts of primer will not significantly enhance the adhesion of the pressure-sensitive product to the EPDM membrane. Use only the amount necessary to obtain 100% coverage of the area where the PS Cured Cover Strip will be applied.
4. Allow the primer to flash-off until it does not transfer to a dry finger touch yet remains tacky. Install the pressure-sensitive product immediately after the primer has flashed-off to promote adhesion and avoid contamination.
5. Peel off 10–12" (250–305 mm) of the protective release liner from the PS Cured Cover Strip. Position the cured cover strip over the area to be covered and press down the exposed tape adhesive using firm, even hand pressure across the entire area. Continue this process until the full area to be flashed is completed.
6. Immediately roll the PS Cured Cover Strip with a 2"-wide (50 mm) hand roller. Roll across the cover strip edge, not parallel to it.
7. To achieve proper adhesion of the PS Cured Cover Strip when jobsite temperatures fall below 40°F (4°C), heat the primed area of the membrane with a hot-air gun as the flashing is applied and pressed into place.

Review Carlisle specifications and details for complete installation information.

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EXPERIENCE THE CARLISLE DIFFERENCE

CARLISLE SYNTEC SYSTEMS

GeoTough EPDM
Pressure-Sensitive Cured Cover Strip

Precautions

- Avoid prolonged contact with skin. In case of contact with skin, thoroughly wash affected area with soap and water.
- Prolonged jobsite storage temperatures in excess of 90°F (32°C) will shorten product shelf life.
- In warm, sunny weather, keep PS Cured Cover Strip rolls in their box in a shaded area until ready to use.
- PS Cured Cover Strip must be stored in a dry area.
- Storage and use of PS Cured Cover Strip at temperatures below 40°F (4°C) will result in a loss of adhesive tack and, in extreme cases, will result in no bond to the substrate. Overnight storage must be available to keep the temperature of the PS Cured Cover Strip at a minimum of 60°F (15°C). Hot boxes for jobsite storage must be provided to maintain a minimum product temperature of 40°F (4°C).
- Due to solvent flash-off, condensation may form on applied primer when the ambient temperature is near the dew point. If condensation develops, the application of primer and PS Cured Cover Strip must be discontinued as proper adhesion will not be achieved. Allow the surface to dry before applying a thin coat of primer and PS Cured Cover Strip to the previously coated surface.
- PS Cured Cover Strip is cured and cannot be used for flashing corners, pipes or T-Joint Covers.
- Do not allow waste products (petroleum, grease, oil, solvents, vegetable or mineral oils, animal fats, etc.) or direct steam venting to come in contact with the PS Cured Cover Strip.
- Let primer flash-off for 24 hours before introducing water.
- KEEP OUT OF THE REACH OF CHILDREN.

Typical Properties and Characteristics	
Color	Black
Base Membrane Adhesive	 EPDM Synthetic rubber
Solids	100%
Tensile Strength	1650 psi (11.3 Mpa) minimum
Elongation	1480% minimum
Tear Resistance	150 lbs/in (36 kN/m)
Ozone Resistance Condition after exposure to 100 pphm Ozone in air for 168 hrs. @ 104°F (40°C) (Specimen under 50% strain)	No cracks
Brittleness Temp	-67°F (-55°C)
Nominal Thickness	88 mils (2.24 mm)
Nominal Width Membrane Adhesive	 6" (150 mm); 9" (225 mm); 12" (300 mm) 6⅛" (155 mm); 9⅛" (230 mm); 12⅛" (305 mm)
Net Weight Per Roll	6" = 30 lbs (14 kg) 9" = 45 lbs (21 kg) 12" = 30 lbs (14 kg)
Packaging	6" = 2 rolls/carton (100 linear ft each) 9" = 1 rolls/carton (100 linear ft) 12" = 1 rolls/carton (50 linear ft)
Shelf Life	1 year

Typical properties and characteristics are based on samples tested and are not guaranteed for all samples of this product. This data and information is intended as a guide and does not reflect the specification range for any particular property of this product.

LEED® Information	
Pre-consumer Recycled Content	2%
Post-consumer Recycled Content	0%
Manufacturing Location	Greenville, IL
Solar Reflectance Index (SRI)	N/A

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EXPERIENCE THE CARLISLE DIFFERENCE

CARLISLE SYNTEC SYSTEMS

Sure-Seal EPDM
Pressure-Sensitive Pipe Seals



Overview

Let Carlisle simplify your next EPDM installation with their Sure-Seal Pressure-Sensitive (PS) Pipe Seals. PS Pipe Seals are cured, pre-molded EPDM flashing that are available in two sizes.

Features and Benefits

- Available in two sizes to flash pipes from ½" to 3" (12 mm – 75 mm) and from 1" to 6" (25 mm – 150 mm) in diameter
- PS Pipe Seals have pre-applied SecurTAPE™ on the bottom of the deck flange which affords easy installation and strong membrane bonding
- Designed to be used with Carlisle's Sure-Seal and Sure-Tough™ EPDM membranes

Installation

1. Remove all lead and other flashing material.
2. The entire surface where the PS Pipe Seal will be applied must be clean. The adhesive on the back of the PS Pipe Seal will not adhere to dusted or dirty surfaces. Any residual contamination will be detrimental to the bond strength of the adhesive.
3. Remove all foreign material.
   a. Remove excess mica dust by brooming or wiping with a clean, dry rag or Carlisle HP Splice Wipe.
   b. The use of Weathered Membrane Cleaner may be necessary. This process is essential on membrane that has been exposed for a number of weeks.
   Note: Permeation-resistant gloves (that meet ANSI/ISEA 105-2005) are required for hand protection when cleaners or primers are being used.
   c. Allow the membrane to dry thoroughly before proceeding.
4. Cut the PS Pipe Seal above the raised "ring" that is one size smaller than pipe diameter.
5. Pull PS Pipe Seal over pipe until base flange is in contact with the membrane.
6. Mark pipe around the top of the PS Pipe Seal.
7. Pull PS Pipe Seal upwards on pipe until mark on the pipe is visible.
8. Install Water Cut-Off Mastic below the mark, which indicates the top of the installed PS Pipe Seal.
9. Application of HP-250 or Low-VOC Primer
   a. Standard Membrane - Apply the primer with a clean HP Splice Wipe (or equivalent). Scrub the area of the membrane (where the PS Pipe Seal is to be applied) in a circular motion to achieve a thin, even coating on the membrane. The properly cleaned/primed area will be uniform in color without streaks and free of globs or puddles.
   b. Pre-Kleened™ Membrane - Roller-apply the primer to the membrane with a short naplength paint roller. The coated area will be free of globs or puddles.
   Note: The use of excessive amounts of primer will not significantly enhance the adhesion of the PS Pipe Seal to the EPDM membrane. Use only the amount necessary to obtain 100% coverage of the area where the PS Pipe Seal will be applied.
10. Allow the primer to properly flash off until it does not transfer to a dry finger touch. Install the PS Pipe Seal as soon as the primer flashes off to minimize potential dust contamination and promote adhesion in colder weather.
11. Pull PS Pipe Seal back down over pipe and into position.
12. Remove release liner from the tape and with hand pressure press tape to the primed area. Roll splice area with a 2" roller.
13. Install a stainless steel universal clamping ring to the top of the PS Pipe Seal to provide constant compression of the Water Cut-Off Mastic.
14. When a field splice intersects a PS Pipe Seal, install a T-Joint Cover.

Review Carlisle specifications and details for complete installation information.

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EXPERIENCE THE CARLISLE DIFFERENCE

CARLISLE SYNTEC SYSTEMS

Sure-Seal EPDM
Pressure-Sensitive Pipe Seals

Precautions

- Remove all lead and other flashing.
- Temperature of pipe must not exceed 180°F (82°C).
- Deck flanges of the PS Pipe Seal should not be overlapped, cut or applied over any angle change.
- Additional membrane securement is required on mechanically fastened roofing systems.
- When clamping ring is to be used with a 1" diameter pipe, the following method must be utilized to provide proper clamping.
  a. Lift the tightening screw and slip the loose end of the clamping ring under this tightening apparatus. A complete circle will now be formed with the metal band.
  b. Pull the loose end of the clamping ring until a circle with a diameter of approximately 1½" is formed.
  c. Insert the loose end of the clamping ring under the tightening screw for the second time so a double layer of the metal bands result.
  d. Flip the tightening apparatus into position and turn the tightening screw until the appropriate clamping pressure is achieved against the sealant and pipe penetration.

Physical Property	½" to 3"	1" to 6"
Material	Molded EPDM	Molded EPDM
Color	Black	Black
Size	½" to 3" (12 mm–75 mm) pipe	1" to 6" (25 mm–150 mm) pipe
Packaging	10/carton	10/carton
Weight	7 lbs/carton (3.2 kg)	11 lbs/carton (5 kg)
Shelf Life	1 year	1 year

Typical properties and characteristics are based on samples tested and are not guaranteed for all samples of this product. This data and information is intended as a guide and does not reflect the specification range for any particular property of this product.

LEED® Information	
Pre-consumer Recycled Content	2%
Post-consumer Recycled Content	0%
Manufacturing Location	Greenville, IL
Solar Reflectance Index (SRI)	N/A

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Jon Niermann, Chairman
Emily Lindley, Commissioner
Bobby Janecka, Commissioner
Toby Baker, Executive Director

TEXAS COMMISSION ON ENVIRONMENTAL QUALITY

Protecting Texas by Reducing and Preventing Pollution

December 10, 2021

Michael Fisher, P.E.
Senior Vice President
Pape-Dawson Engineers, Inc.
10801 North Mopac Expressway, Bldg. 3 – Ste. 200
Austin, TX 78759

Re: Wolf Lakes Village Section 1 – Phase 1 & Section 2 Pond Dam
Construction Plan Review
Williamson County

Dear Mr. Fisher:

TCEQ Dam Safety received a submittal package for the proposed subject dam, which was actually comprised of three separate submittal packages that were received on July 27th & 28th, and August 24, 2021. In correspondence dated September 17, 2021, TCEQ Dam Safety requested additional information, and a revised submittal was received on October 13, 2021. A second comment letter dated November 1, 2021, from TCEQ Dam Safety requested further information/clarifications, and a revised submittal was received on November 12, 2021.

According to the provisions of the Texas Administrative Code (TAC) Chapter 299, the final construction plans and specifications for the referenced project are hereby approved on behalf of the Executive Director.

We are retaining the approved construction plans and specifications for our records.

You are reminded of the following sections pertaining to construction:

§ 299.23	Requires the continuous maintenance of construction records.
§ 299.24	Requires this office to be notified promptly of the date construction actually begins and for high and significant hazard dams, to be sent monthly progress reports.
§ 299.25	Requires continuous daily inspections by owner's engineer or by a qualified inspector under supervision of the owner's engineer.
§ 299.25	Requires construction to be according to the approved plans and specifications.
§ 299.26	Requires significant changes to the approved plans and specifications be approved by this office.

P.O. Box 13087 • Austin, Texas 78711-3087 • 512-239-1000 • tceq.texas.gov
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Mr. Michael Fisher, P.E.
December 10, 2021
Page 2

§ 299.29	Requires the submission of the engineer's notification of completion within 45 calendar days after the work is substantially complete.
§ 299.30	Provides for the submission of record drawings with permanent reference mark(s) within six months after final completion of construction.

With regard to the submitted Hydrologic and Hydraulic (H&H) Analysis and Breach Analysis that accompanied the submitted construction plans and specifications, they are currently under review and any related comments will be sent under separate cover. It should be understood that if the H&H review results in any needed changes to the proposed spillway(s) design(s), then the construction plans will need to be revised at that time.

Additionally, it should be noted that § 299.61 (c) requires that "The owner of a proposed high- or significant-hazard dam shall submit the emergency action plan to the executive director before either requesting closure of the dam or upon completion of construction of the dam, if the dam does not require a closure section."

Guidance on items to be included in an emergency action plan can be found in our *Guidelines for Developing Emergency Action Plans for Dams in Texas (GI-394).*

https://www.tceq.texas.gov/compliance/investigation/damsafetyprog.html/#guide_eaps

Such a plan should be provided to the TCEQ Dam Safety office for our review.

If you have any comments or questions, please feel free to contact me at (512) 239-4307.

Sincerely,

Johnny Cosgrove, PE
Dam Safety Section
Critical Infrastructure Division MC-177

Cc: Iva Wolf McLachlan
President
Wolf Lake, LP
4229 Mercer Rd.
Georgetown, TX 78628

NO.	REVISION	DATE
1	ADD SEDIMENT DEPTH MARKER	08/31/21
2	ADD PRODUCT DATA SHEETS	10/21/21

STATE OF TEXAS
MICHAEL S FISHER
87704
LICENSED PROFESSIONAL ENGINEER
1/19/22

PAPE-DAWSON ENGINEERS
AUSTIN | SAN ANTONIO | HOUSTON | FORT WORTH | DALLAS
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TBPE FIRM REGISTRATION #470 | TBPLS FIRM REGISTRATION #10028801

WOLF LAKES VILLAGE, SECTION 1, PHASE 1 & SECTION 2
CITY OF GEORGETOWN, TEXAS

POND DETAIL SHT 2 OF 4

CITY JOB No. 2021-4-CON
JOB NO. 51119-02
DATE DECEMBER 2021
DESIGNER
CHECKED MF DRAWN ARC
SHEET 48 OF 75

Date: Dec 15, 2021, 10:56am User ID: aconner
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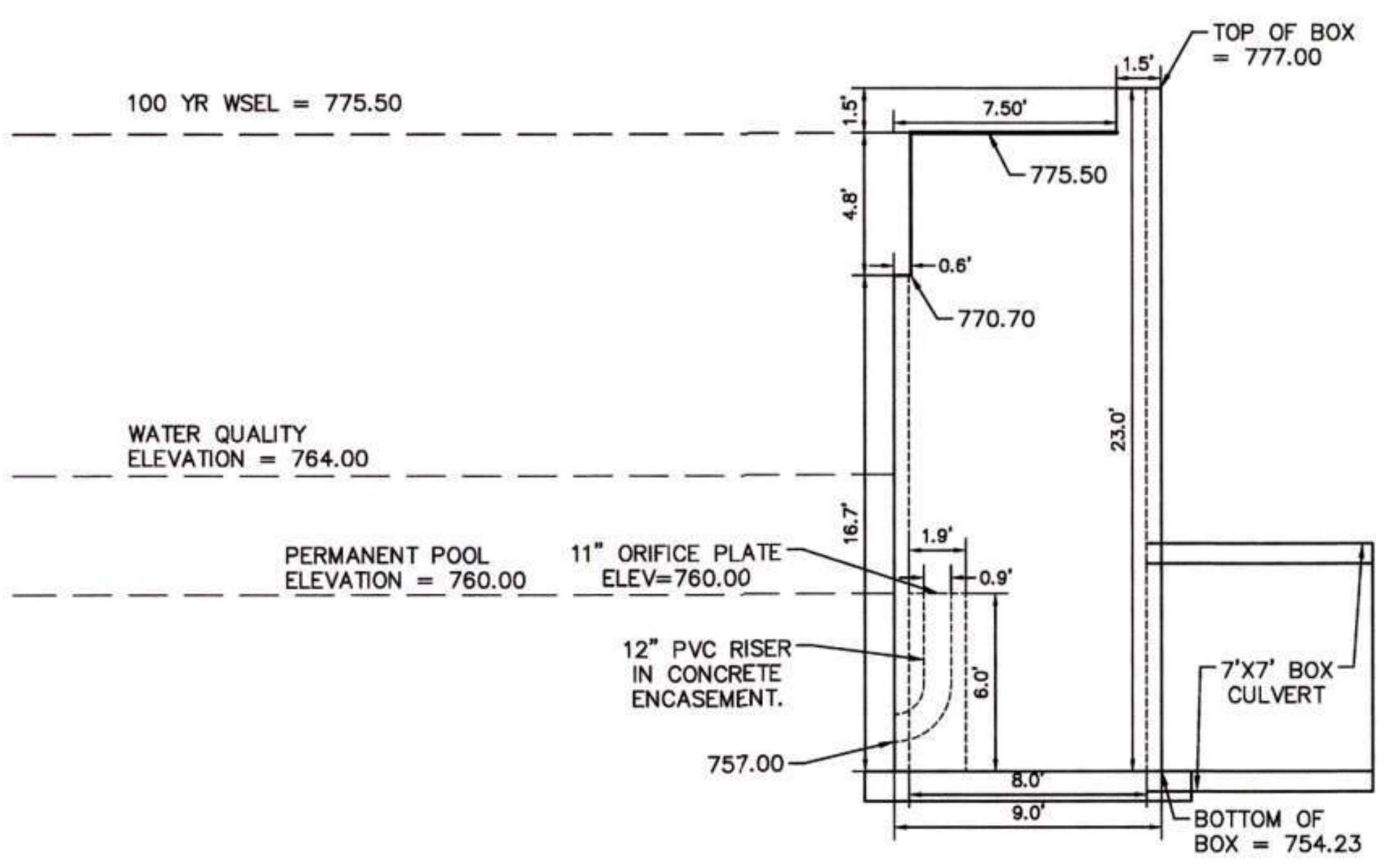
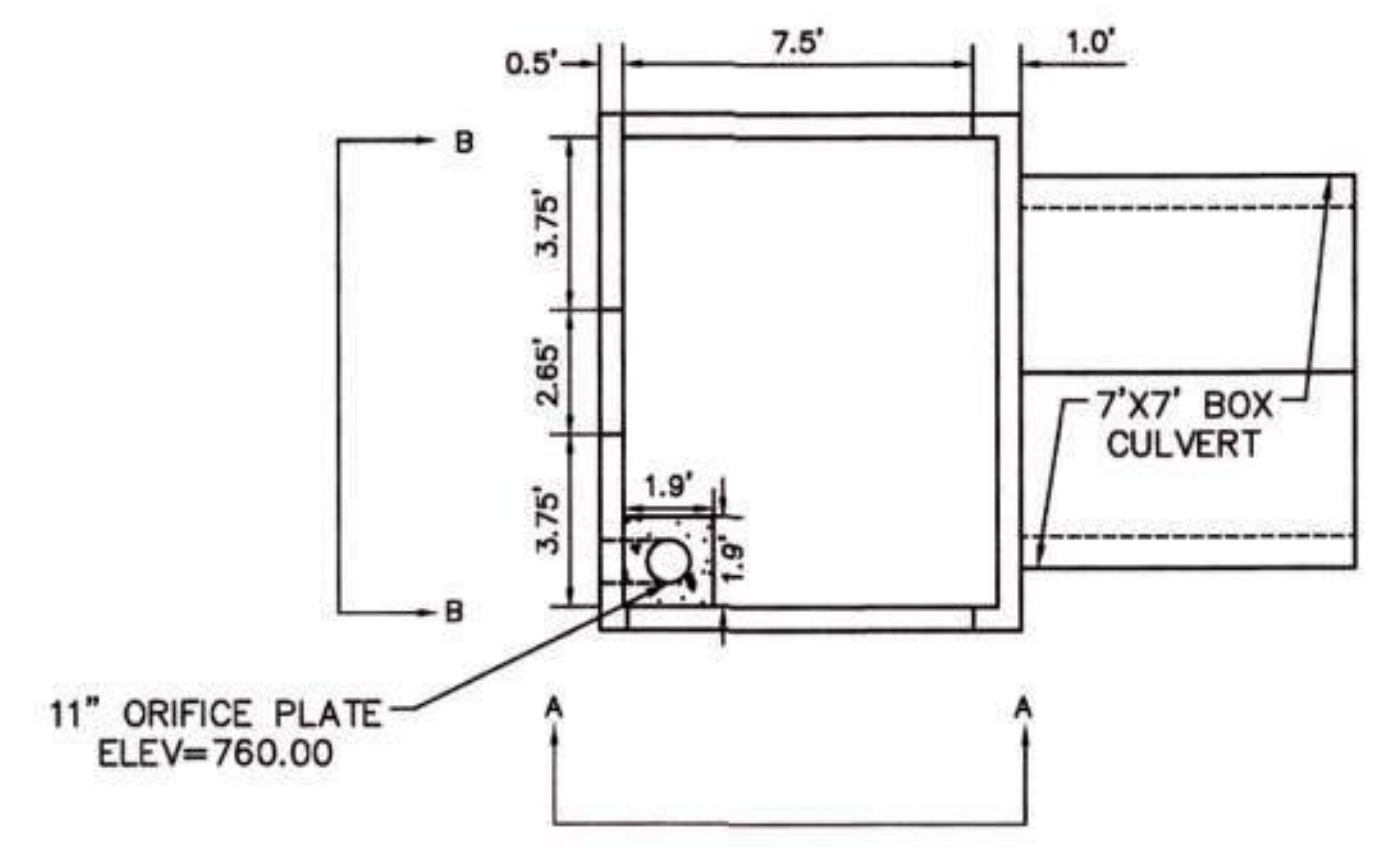
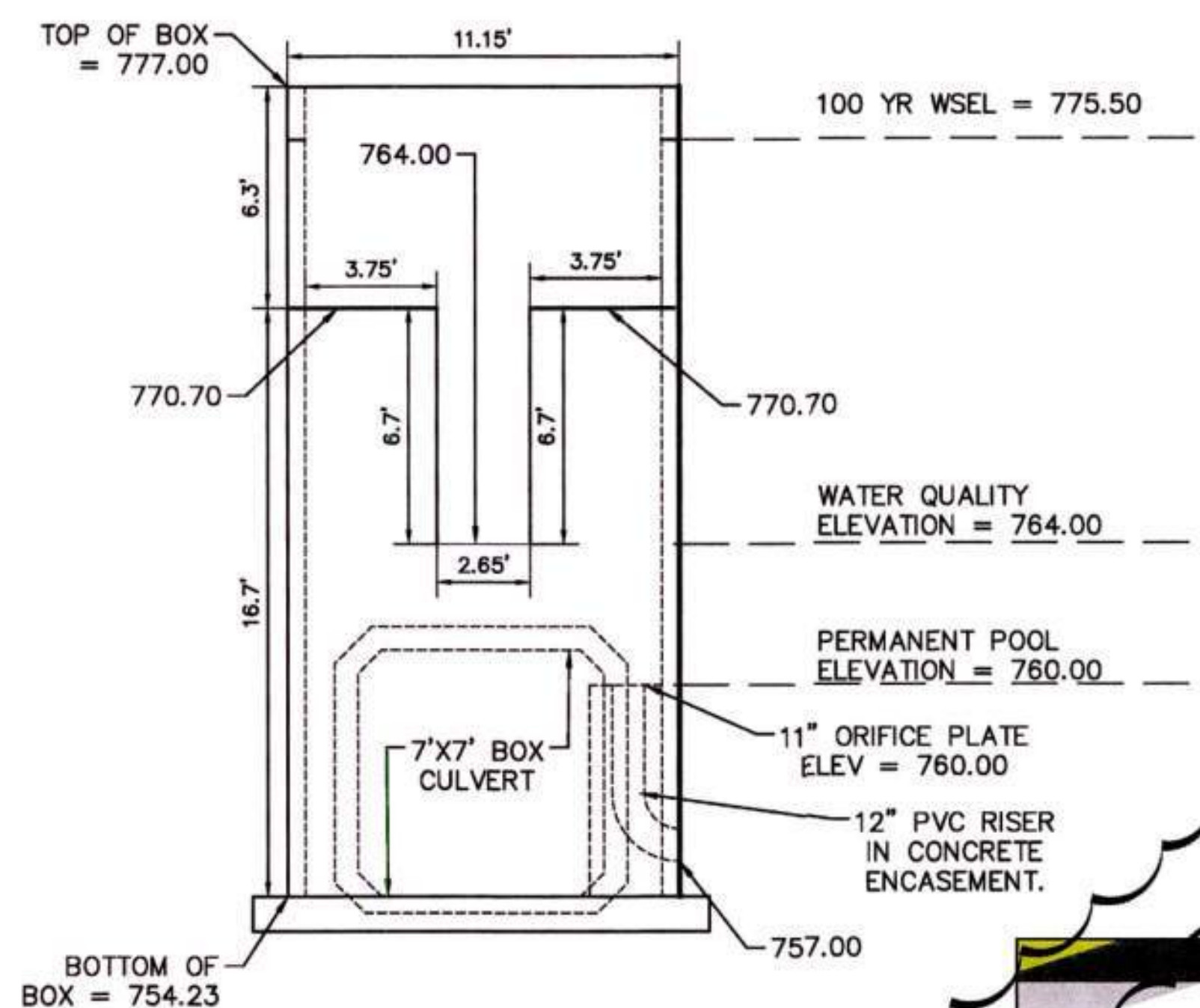
2021-4-CON



CROSS SECTION A–A
SCALE 1" = 5'



INSET 'A'
8'X10' WEIR STRUCTURE
SCALE 1" = 5'



CROSS SECTION B–B
SCALE 1" = 5'

EXPERIENCE THE CARLISLE DIFFERENCE

CARLISLE SYNTEC SYSTEMS

Fastening and Termination Bars



Polymer Fastening Bar

The Polymer Fastening Bar is an engineered polymer bar that's used to mechanically fasten EPDM membranes per Carlisle Specifications. The bar is packaged in a 1" x 250' coil that has pre-punched holes every 3" on center. The bar can be easily cut to any desired length. When installing, make sure that all corners of cut bar are rounded. Install the bar using HP or HP-X Fasteners.

Typical Properties and Characteristics

Material	Engineered Polymer
Dimensions	1" (25 mm) wide x 250' (76 m) long
Packaging	250 lf (76 m) per carton
Weight	10 lbs. (5 kg) carton
Recycled Content	0% pre-consumer recycled content
Manufacturing Location	Addison, IL

Metal Fastening Bar

The Metal Fastening Bar is a Galvalume™ coated metal that's used to mechanically fasten EPDM membranes per Carlisle Specifications. The bar is packaged in 1" x 10' lengths, 500 linear feet per package and has pre-punched holes every 6" on center. The bar can be easily cut to any desired length. When installing, make sure that all corners of cut bar are rounded. Install the bar using HP-X Fasteners.

Typical Properties and Characteristics

Material	Galvalume Coated Metal
Dimensions	1" (102 mm) wide x 10' (3 m) long
Packaging	50 pcs; 500 lf (152 m) per carton
Weight	85 lbs. (39 kg) carton
Recycled Content	49% pre-consumer recycled content
Manufacturing Location	Cleveland, OH



Termination Bar

The Termination Bar is an extruded aluminum bar that's designed for securing and sealing compression type flashing terminations per Carlisle Specifications. The bar is packaged in 1" x 10' lengths, 500 linear feet per package and has pre-punched holes every 6" on center. This bar features a top edge for ease of applying Carlisle's Lap Sealant for EPDM installations or Universal Single Ply Sealant for TPO, PVC, and KEE HP installations. The bar can be easily cut to any desired length. When installing, make sure that all corners of cut bar are rounded. Install the bar using HP-X Fasteners, or Term-Bar Nail In Fasteners.

Typical Properties and Characteristics

Material	6063-T6 Extruded Aluminum
Dimensions	1" (25 mm) wide x 10' (3 m) long
Packaging	50 pcs; 500 lf (152 m) per carton
Weight	69 lbs. (31 kg) carton
Recycled Content	0% pre-consumer recycled content 15% post-consumer recycled content
Manufacturing Location	Cleveland, OH

Sure-Seal Ballast Retaining Bar

The Ballast Retaining Bar is an extruded aluminum bar that's designed as a ballast retaining perimeter securement system, which comes packaged in 4" x 10' lengths, 250 linear feet per package. The ballast retaining bar has pre-punched holes every 6" on center for installation, and also has pre-punched drainage holes every 4" on center.

Typical Properties and Characteristics

Material	6063-T6 Extruded Aluminum
Dimensions	4" (102 mm) wide x 10' (3 m) long
Packaging	25 pcs; 250 lf (76 m) per carton
Weight	123 lbs. (56 kg) carton

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WEB ONLY EPDM-1090 - "Fastening and Term Bars Product Data Sheet"

WeatherBond
Water Cut-Off Mastic



Overview

Water Cut-Off Mastic is a one-component, low-viscosity, self-wetting, butyl-blend mastic designed to be used in conjunction with roofing and waterproofing systems. It is primarily used as a sealing agent between various membranes and applicable when membrane is being terminated using a compression-type seal.

Water Cut-Off Mastic is an extremely tacky material and will remain as such when used with compression-type terminations.

Features and Benefits

- Extremely tacky
- Provides a durable compression-type seal between various membranes and parapet wall constructions

Coverage Rate

10 linear feet per tube at the recommended application rate of a ½" bead.

Application

1. All surfaces to be sealed with Water Cut-Off Mastic must be free of moisture, oil, dirt and other foreign materials. Water Cut-Off Mastic cannot be used on insulation.
2. Apply a ½" (13 mm) bead of Water Cut-Off Mastic between the substrate and the edge of the membrane.
3. Apply appropriate termination material and secure to provide constant compression for the Water Cut-Off Mastic.

REVIEW CURRENT WEATHERBOND INSTALLATION INSTRUCTIONS FOR SPECIFIC APPLICATION REQUIREMENTS.

Precautions

1. Review the applicable Material Safety Data Sheet for complete safety information prior to use.
2. Water Cut-Off Mastic is FLAMMABLE – It contains solvents that are dangerous fire and explosion hazards when exposed to heat, flame or sparks. Store and use away from all sources of heat, flame or sparks. Do not smoke while applying. Do not use in a confined or unventilated area. Vapors are heavier than air and may travel along ground to a distant ignition source and flash back.
3. Avoid breathing vapors. Keep container closed when not in use. Use with adequate ventilation. If inhaled, remove to fresh air. If not breathing, perform artificial respiration. If breathing is difficult, give oxygen. Call a physician immediately.
4. If swallowed, DO NOT INDUCE VOMITING. Call a physician immediately.
5. Avoid contact with eyes. Safety glasses or goggles are recommended. If splashed in eyes, immediately flush eyes with plenty of clean water for at least 15 minutes. Contact a physician immediately.
6. Avoid contact with skin. Wash hands thoroughly after handling. In case of contact with skin, thoroughly wash affected area with soap and water.

Note: Permeation-resistant gloves (that meet ANSI/ISEA 105-2005) are recommended to be worn when using this product to protect hands from irritating ingredients.

WEATHERBOND ROOFING SYSTEMS
Single-Ply Simplified

LEED® Information

Pre-consumer Recycled Content	0%
Post-consumer Recycled Content	0%
Manufacturing Location	Carlisle, PA
VOC Content	250 g/L

Typical Properties and Characteristics

Property	Results
Color	Gray
Solids	80%
Flash Point	40°F (4°C) Closed Cup
Service Temperature	-40°F to 200°F (-40°C to 93°C)
Specific Gravity	1.29
Cold Weather Flexibility	Excellent
Average Brookfield Viscosity	1,320,000 cps
Packaging	25 tubes/carton
Clean up	Weathered Membrane Cleaner
Average net weight/gallon	28 lbs (13 kg)
Shelf Life	1 year, unopened container

Typical properties and characteristics are based on samples tested and are not guaranteed for all samples of this product. This data and information is intended as a guide and does not reflect the specification range for any particular property of this product.

WEATHERBOND ROOFING SYSTEMS
Single-Ply Simplified

P.O. Box 251 | Plainfield, PA 17081 | 866.471.5125 | FAX: 717.960.4034 | www.weatherbondroofing.com

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WeatherBond EPDM
Multi-Purpose Primer



Overview

WeatherBond's Multi-Purpose Primer is a solvent-based product designed for one-step cleaning and priming of EPDM surfaces prior to the application of Peel and Stick (P&S) products.

Features and Benefits

- One-step cleaner and primer used in conjunction with all P&S accessories on EPDM membranes
- Coverage rates of up to 450 ft²/gallon (42 m²) with no-dust membrane

Mixing

Stir thoroughly until all settled pigments are dispersed and the primer is uniform in color. Minimum five (5) minutes of stirring is recommended.

Coverage Rates

Approximately 250 sq ft/gallon (23 m²) can be expected when properly applied to dusted membrane. Coverage rates as high as 450 sq ft/gallon (42 m²) can be expected with No-Dust membrane.

Application

1. Remove all foreign material.
   a. Excessive mica dust may be removed by brooming or wiping with a dry, clean rag.
   b. The use of Weathered Membrane Cleaner may be necessary. This process is essential on membrane that has been exposed for a number of weeks or dusted membrane.

   Note: -resistant gloves (that meet ANSI/ISEA 105- 2005) are required for hand protection when cleaners or primers are being used.
2. Use care in removing and replacing the lid to keep the lid from being distorted. Wipe out excess primer from the rim to promote a positive seal and keep the lid on the pail when not in use. Once resealed, turn the pail upside down and back again to create an air tight seal under the rim.
3. Thoroughly stir primer by hand or with an air operated mixing paddle until all settled materials are blended into the solution.
4. Application of Multi-Purpose Primer
   a. Dusted EPDM Membrane- Clean the splice area with Weathered Membrane Cleaner. Change dry, clean rags often to ensure mica dust is removed. Roller-apply the primer to the membrane with a short nap-length paint roller. The coated area will be free of globs or puddles.
   b. Pre-Cleaned Membrane- Roller-apply the primer to the membrane with a short nap-length paint roller. The coated area will be free of globs or puddles.

   Note: The use of excessive amounts of primer will not significantly enhance the adhesion of the P&S product to the EPDM membrane. Use only the amount necessary to obtain 100% coverage of the area where the tape or adhesive will be applied.
5. Allow the primer to properly flash off until it does not transfer to a dry finger touch. Install the P&S product as soon as the primer flashes off to minimize potential dust contamination and promote adhesion in colder weather.
6. Complete the splice as specified in WeatherBond's installation Instructions.

REVIEW CURRENT WEATHERBOND INSTALLATION INSTRUCTIONS FOR SPECIFIC APPLICATION REQUIREMENTS.

WEATHERBOND ROOFING SYSTEMS
Single-Ply Simplified

Precautions

1. This product is FLAMMABLE. Precautions must be taken to keep the primer away from heat, flame and sparks during storage and use.
2. Keep container closed when not in use. Use with adequate ventilation. Avoid breathing vapors. Avoid contact with eyes and skin.
3. If inhaled, remove to fresh air. If not breathing, perform artificial respiration. If breathing is difficult, give oxygen. Call a physician immediately. During application, efforts must be made to prevent fumes from entering the building via air ventilation ducts. Do not place open containers or mix adhesive near fresh-air intake units. When possible, shut down or seal off the closest units.
4. If swallowed, DO NOT INDUCE VOMITING. Call a physician immediately.
5. Chemical-resistant gloves must be worn with Multi-Purpose Primer to protect hands from staining and irritating ingredients.
6. Thoroughly stir this product until all settled pigment is blended into the solution. Solids suspended in Multi-Purpose Primer tend to settle; stir the solution frequently during use (every 15–20 minutes). Use primer full strength. Do not thin. Thinning will affect performance.
7. WeatherBond Multi-Purpose Primer may cause staining of WeatherBond EPDM White membrane and other non-black surfaces.
8. Jobsite storage temperatures in excess of 90°F (32°C) may affect product shelf life. Should the primer be stored at temperatures lower than 60°F (15°C), restore to room temperature prior to use.
9. Keep can tightly closed when not in use and protect from moisture contamination. Once exposed to moisture in the air, Multi-Purpose Primer begins to cure and may gel within a few days. A gasket of membrane or sealant can be used to create a positive seal.
10. Due to solvent flash-off, condensation may form on freshly applied primer when the ambient temperature is near the dew point. If condensation develops, the application of primer must be discontinued (proper adhesion will not be obtained). Allow the surface to dry and apply a thin freshener coat of primer to the previously coated surface when conditions allow.
11. Review the Multi-Purpose Primer Safety Data Sheet for complete safety information prior to use.
12. KEEP OUT OF THE REACH OF CHILDREN.

LEED® Information

Pre-consumer Recycled Content	0%
Post-consumer Recycled Content	0%
Manufacturing Location	Carlisle, PA
VOC Content	727 g/L
Solar Reflectance Index (SRI)	N/A

Typical Properties and Characteristics

Property	Results
Base	Synthetic Rubber
Color	Olive drab to dark grey
Solids	18%
Flash Point	40°F (4.4°C)
Packaging	(6) 1-gallon (3.8-liter) cans
Shelf Life	9 months
Average Weight	7.3 lbs/gallon (0.9 kg/liter)

Typical properties and characteristics are based on samples tested and are not guaranteed for all samples of this product. This data and information is intended as a guide and does not reflect the specification range for any particular property of this product.

WEATHERBOND ROOFING SYSTEMS
Single-Ply Simplified

P.O. Box 251 | Plainfield, PA 17081 | 866.471.5125 | FAX: 717.960.4034 | www.weatherbondroofing.com

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WeatherBond
Black Lap Sealant and White Lap Sealant



Overview

WeatherBond's Lap Sealants are heavy-bodied trowel- or gun-consistency materials used in conjunction with roofing system materials. Its primary use is to seal the exposed edges of EPDM membrane splices. Lap Sealants are extremely durable. The cured rubber consistency enables them to expand and contract with the membrane.

WeatherBond Black Lap Sealant is to be used to seal splice edges of cured black EPDM and uncured EPDM Flashing. White Lap Sealant seals the splice edges of cured White EPDM and uncured White EPDM Flashing.

Features and Benefits

- Various application methods - trowel, caulk gun, etc.
- Cured rubber consistency
- Able to expand and contract with EPDM membrane
- Seals exposed edges of EPDM and provides a durable barrier to weather extremes

Coverage Rates

22' (6.7 m) per tube using a ¼" (8 mm) bead.

Application

1. All surfaces to be sealed with Lap Sealant must be firm, dry and free of oil, talc dust and other foreign materials.
2. After seams are cemented together with the proper splicing materials, clean the rubber to remove all foreign materials by wiping with a Splice Wipe (or equivalent) dampened with Weathered Membrane Cleaner. **(Note: Protective gloves MUST be worn while using cleaner.)**
3. Apply a ¼" (8 mm) bead of Lap Sealant (22' [6.7 m] per cartridge) along the exposed edge of the membrane.
4. Using the feathering tool supplied with the sealant, feather the sealant bead so the high point is above the offset of the splice and the edges are feathered onto the deck.
5. Lap Sealant must be applied and feathered on all splice edges by the end of the working day. Cured-to-cured membrane field splices must be allowed to age at least two hours before Lap Sealant is applied. Uncured EPDM Flashing field seams and splices between cured membrane and Uncured EPDM Flashing may be sealed immediately.

REVIEW CURRENT WEATHERBOND INSTALLATION INSTRUCTIONS FOR SPECIFIC APPLICATION REQUIREMENTS.

Precautions

1. Review the applicable Safety Data Sheet for complete safety information prior to use.
2. Lap Sealant is EXTREMELY FLAMMABLE. It contains solvents that are dangerous fire and explosion hazards when exposed to heat, flame or sparks. Store and use away from all sources of heat, flame or sparks. Do not smoke while applying. Do not use in a confined or unventilated area. Vapors are heavier than air and may travel along ground to a distant ignition source and flash back. A red caution label is required when shipping.
3. Avoid breathing vapors. Keep container closed when not in use. Use with adequate ventilation. If inhaled, remove to fresh air. If not breathing, perform artificial respiration. If breathing is difficult, give oxygen. Call a physician immediately.
4. If swallowed, DO NOT INDUCE VOMITING. Call a physician immediately.
5. Avoid contact with eyes. Safety glasses or goggles are recommended. If splashed in eyes, immediately flush eyes with plenty of clean water for at least 15 minutes. Contact a physician immediately.
6. Avoid contact with skin. Wash hands thoroughly after handling. In case of contact with skin, thoroughly wash affected area with soap and water.

   NOTE: Permeation-resistant gloves (that meet ANSI/ISEA 105-2005) are to be worn when using this product to protect hands from irritating ingredients.
7. Follow WeatherBond's recommended splice instructions.DO NOT USE as Splice Adhesive between rubber membranes.

WEATHERBOND ROOFING SYSTEMS
Single-Ply Simplified

8. Jobsite storage temperatures in excess of 90°F (32°C) may affect product shelf life. Should the Lap Sealant be stored at temperatures below 60°F (15°C), restore to room temperature prior to use.
9. By using an excessively wet solvent cloth while cleaning the splice edge, solvent may be left in the offset of the membrane sheets. To avoid causing this problem, use a damp rag and make sure the Weathered Membrane Cleaner is completely flashed off the area before Lap Sealant application.
10. If applied during periods of cold, dampness or high humidity, it is possible that evaporation of solvents will be substantially reduced, resulting in some slight membrane swelling. This would be further aggravated should the sealant be applied in an unusually heavy coat.
11. Coverage rates are average and may vary due to conditions on the jobsite.
12. KEEP OUT OF THE REACH OF CHILDREN.

Typical Properties and Characteristics

Property	Results
Color	Black White
Solids	Black – 61% White – 55%
Flash Point	Black 40°F (4°C) Tag Open Cup White 52°F (11°C) Closed Cup
Service Temperature	-60°F to 180°F (-51°C to 82°C)
Specific Gravity	Black – 1.03 White – 1.16
Cold Weather Flex	Excellent
Resistance to: Staining General Weathering Ozone Ultraviolet Radiation Slump Water Acid Alkali	 Excellent Excellent Excellent Excellent Very Good Excellent Good Good
VOC	Black – 395 grams/liter White – 449 grams/liter
Average Net Weight/gallon	Black – 8.58 lbs (1.03 Kg/l) White – 9.94 lbs (1.19 Kg/l)
Packaging	25 Tubes/Carton
Shelf Life	1 year

Typical properties and characteristics are based on samples tested and are not guaranteed for all samples of this product. This data and information is intended as a guide and does not reflect the specification range for any particular property of this product.

WEATHERBOND ROOFING SYSTEMS
Single-Ply Simplified

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NO.	REVISION	DATE
1	REVISE POND OUTFALL STRUCTURE	08/31/21
2	ADD PRODUCT DATA SHEETS	10/21/21

STATE OF TEXAS
MICHAEL S FISHER
87704
LICENSED PROFESSIONAL ENGINEER
1/19/22

PAPE-DAWSON ENGINEERS
AUSTIN | SAN ANTONIO | HOUSTON | FORT WORTH | DALLAS
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TBPE FIRM REGISTRATION #470 | TBPLS FIRM REGISTRATION #10028801

WOLF LAKES VILLAGE, SECTION 1, PHASE 1 & SECTION 2
CITY OF GEORGETOWN, TEXAS

POND DETAIL SHT 3 OF 4

CITY JOB No. 2021–4–CON
JOB NO. 51119–02
DATE DECEMBER 2021
DESIGNER
CHECKED MF DRAWN ARC
SHEET 49 OF 75

Date: Dec 15, 2021, 10:56am User ID: aconner
File: H:\Projects\511\19\02\301 Construction Documents\Civil\PD51119-02.dwg

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3.4.2 Basin Lining Requirements

Impermeable liners should be used for water quality basins (retention, extended detention, sand filters, wet ponds and constructed wetlands) located over the recharge zone and in areas with the potential for groundwater contamination. Impermeable liners may be clay, concrete or geomembrane. If geomembrane is used, suitable geotextile fabric should be placed on the top and bottom of the membrane for puncture protection and the liners covered with a minimum of 6 inches of compacted topsoil. The topsoil should be stabilized with appropriate vegetation. Clay liners should meet the specifications in Table 3-6 and have a minimum thickness of 12 inches.

Table 3-6 Clay Liner Specifications (COA, 2004)

Property	Test Method	Unit	Specification
Permeability	ASTM D-2434	cm/sec	1×10^{-6}
Plasticity Index of Clay	ASTM D-423 & D-424	%	Not less than 15
Liquid Limit of Clay	ASTM D-2216	%	Not less than 30
Clay Particles Passing	ASTM D-422	%	Not less than 30
Clay Compaction	ASTM D-2216	%	95% of Standard Proctor Density

If a geomembrane liner is used it should have a minimum thickness of 30 mils and be ultraviolet resistant. The geotextile fabric (for protection of geomembrane) should be nonwoven geotextile fabric and meet the specifications in Table 3-7.

Table 3-7 Geotextile Fabric Specifications (COA, 2004)

Property	Test Method	Unit	Specification (min)
Unit Weight		oz/yd^2	8
Filtration Rate		in/sec	0.08
Puncture Strength	ASTM D-751*	lb	125
Mullen Burst Strength	ASTM D-751	psi	400
Tensile Strength	ASTM D 1682	lb	200
Equiv. Opening Size	US Standard Sieve	No.	80

*modified

Installation methods for geomembrane liners vary according to the site requirements. Figure 3-13 shows a typical installation on an earthen slope with the top of the liner keyed in above the maximum water level of the basin. Figure 3-14 presents an example of geomembrane liner attached to the exterior of a concrete or rock wall. The "liquid membrane" shown in the figure is a hot fluid-applied, rubberized asphalt typically used for waterproofing and roofing applications, such as Hydrotech 6125 or equivalent.

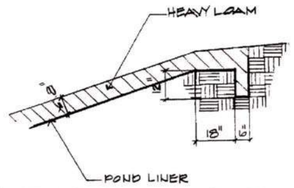


Figure 3-13 Example of Liner Installation on Earthen Slope (Courtesy COA)

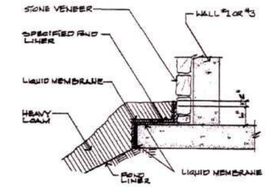


Figure 3-14 Pond Liner Attached to Exterior of Rock Wall (Courtesy COA)

Figure 3-15 presents an installation where the liner is installed prior to concrete forming. The liner is installed and keyed in above the maximum water level. The excavation is backfilled before forming and pouring the concrete.

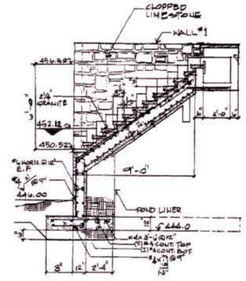


Figure 3-15 Example of Liner Installed Prior to Concrete Pour (Courtesy COA)

Water quality basins constructed on the contributing zone need not have impermeable liners, but should be built with appropriate materials to achieve desired residence times and to maintain structural integrity.

Wetland Plant List

Install Bulrush in clumps, with individual plants spaced approximately three to four feet on center: At least two of the following species should be used:

BULRUSH	WATER DEPTH	NOTES
Scirpus validus, Bulrush	1" — 3"	8' tall evergreen, resists cattail encroachment
Scirpus californicus, Bulrush	1" — 3"	8' tall evergreen, resists cattail encroachment
Scirpus americanus, Three-square bulrush	2"— 6"	2' to 4' tall, w/ 3 distinct edges

At least two species of the following marsh plants should be used (additional species are encouraged). Install in clumps in shallow water, with individual plants spaced at approximately three feet on center:

MARSH DIVERSITY	WATER DEPTH	NOTES
1. Cyperus ochraeus, Flatsedge	2"—6"	1' to 2' tall, clump-forming, common to central Texas
2. Dichromena colorata, White-topped Sedge	2"—6"	1' to 2' tall, white bracts during warm season
3. Echinodorus rostratus, Burhead	3' - 1'	1' to 2' tall, ensual, heart-shaped leaves, flower similar to arrowhead
4. Eleocharis quadrangulata, Four-square Spikerush	6" — 1'	1' to 2' tall, colonizes, inhabits deeper water than other Spikerushes
5. Iris Pseudacorus, Yellow Flag Iris	1" — 2'	3' to 4' tall. can be invasive, dense growth, yellow flowers
6. Juncus effusus, Soft Rush	6"— 1'	3' to 4' tall, forms a tight clump, evergreen, very attractive
7. Justicia americana, Water willow	2" — 6"	2' to 3' tall, common, white flowers, herbaceous, colonizes
8. Marsilea macropoda, Water Clover	2" — 6"	Looks like floating four-leaf clover, endemic to Texas
9. Najas guadalupensis, Water-Naiad	1'—4'	Submergent, valuable to fish and wildlife
10. Pontederia cordata, Pickerelweed	2"— 1'	3' tall, colonizes, cosmopolitan, purple flowers
11. Rhynchospora corniculata, Horned-rush	2"— 6"	2' to 3' tall, brass-colored flowers in May

Install spikerush at or near the water's edge, with individual plants spaced approximately three to six feet on center. At least two of the following species should be used:

SPIKERUSH	WATER DEPTH	NOTES
Eleocharis montevidensis, Spikerush	0" — 6"	1' tall, rhizomatous, reduces erosion at the pond edge
Eleocharis macrostachys, Spikerush	0" — 6"	1' tall, rhizomatous, reduces erosion at the pond edge
Eleocharis quadrangulata, Spikerush	3" — 1'	2' to 2.5' tall, rhizomatous, can accommodate deeper water, 4-angled

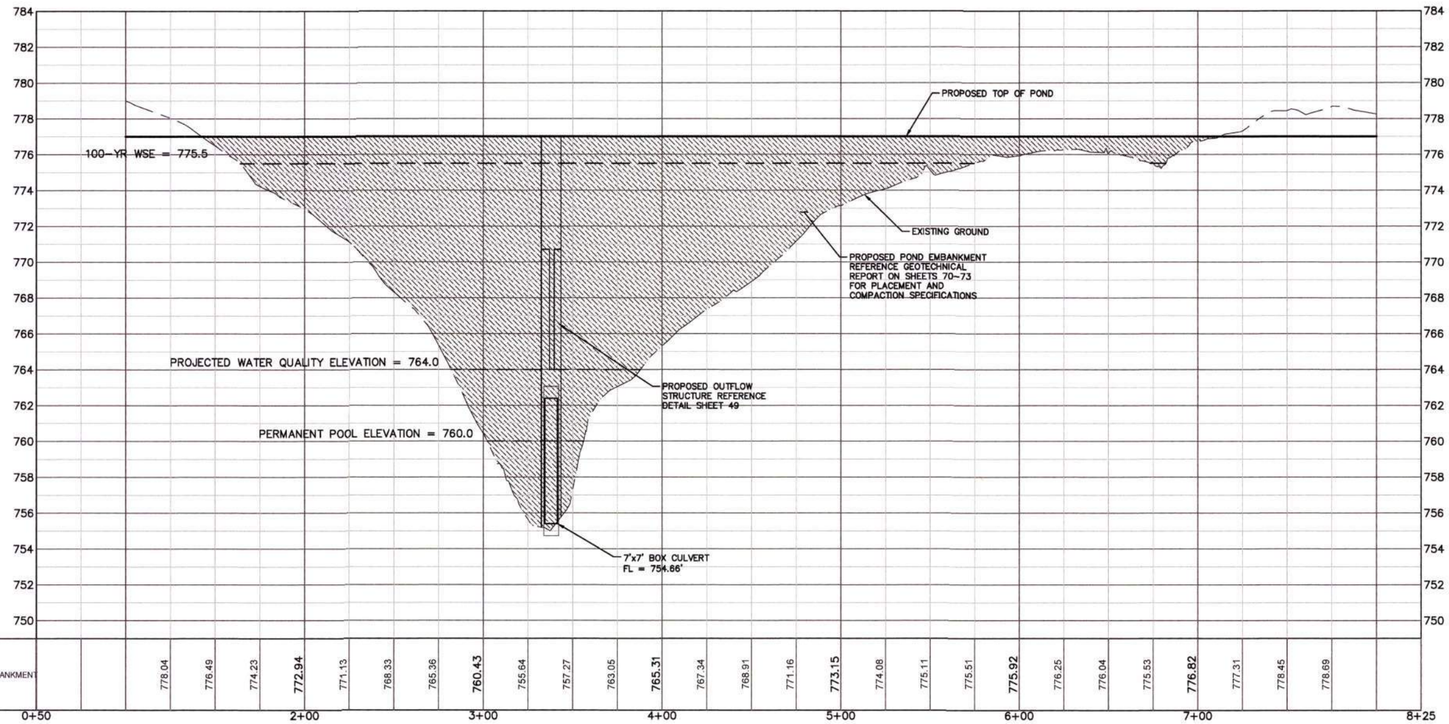
Install Arrowhead in clumps in shallow water, with individual plants spaced approximately three feet on center.

ARROWHEAD	WATER DEPTH	NOTES
Sagittaria latifolia, Arrowhead	2" — 1'	2' height, wildlife value, white flowers, proven water quality performer

Floating-leafed aquatic plants are rooted in the sediment of the pond, and have leaves that float on the surface of the water. These leaves shade the water, which limits potential algae growth. At least two of the following species should be used and should be placed at random locations throughout the pond:

AQUATICS	WATER DEPTH	NOTES
1. Cabomba caroliniana, Fanwort	1' — 4'	Approximately 6' length underwater, submergent
2. Ceratophyllum spp., Coon-tail	1' —4'	Maximum 8' length, tolerant of turbidity and water fluctuation, wildlife food
3. Nymphaea odorata, Fanwort	6" — 2'	A native, reliably hardy, floating - leaved aquatic, with white flowers
4. Potomageton pectinatus, Sago Pondweed	8" — 3'	Colonizes quickly, valuable to fish and wildlife; floating-leaved aquatic

(8) *Erosion Protection at the Outfall* – For online facilities, special consideration should be given to the facility's outfall location. Flared pipe end sections that discharge at or near the stream invert are preferred. The channel immediately below the pond outfall should be modified to conform to natural dimensions, and lined with large riprap placed over filter cloth. Energy dissipation should be used to reduce flow velocities from the primary spillway to non-erosive velocities.



2021-4-CON

NO.	REVISION	DATE
2	ADD TCEQ DETAILS	10/21/21



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WOLF LAKES VILLAGE, SECTION 1,
PHASE 1 & SECTION 2
CITY OF GEORGETOWN, TEXAS

POND DETAIL SHT 4 OF 4

CITY JOB No. 2021-4-CON
JOB NO. 51119-02
DATE DECEMBER 2021
DESIGNER
CHECKED MF DRAWN ARC
SHEET 50 OF 75

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WOLF LAKES SECTION 1, & PHASE 2 - POND 1 BASIN

(EAPP ID NO. 11002713)

Sediment Forebay 1 - (3-foot Tall Gabion)			
Elevation	Area (ft^2)	Incremental Volume (ft^3)	Cumulative Volume (ft^3)
788	9,765	-	-
789	12,777	11,271	11,271
790	14,168	13,473	24,744
791	15,580	14,874	39,618

Sediment Forebay 2 - (3-foot Tall Gabion)			
Elevation	Area (ft^2)	Incremental Volume (ft^3)	Cumulative Volume (ft^3)
789	2,324	-	-
790	2,638	2,481	2,481
791	2,947	2,793	5,274
792	3,249	3,098	8,372

ORIFICE DRAWDOWN TIME FOR WET BASIN

Contour Elevation (ft)	Contour Area (ft^2)	Average End Area Method: Incremental Volume (ft^3)	Average End Area Method: Total Volume (ft^3)	Orifice Discharge (cfs)	Incremental Drawdown Time (hr)	Total Drawdown Time (hr)
794.2	63,104	-	-	-	-	-
794	63,015	23,560	38,106	1.86	3.5	3.5
793	58,727	38,577	76,683	1.58	6.8	10.3
792	54,517	46,788	123,471	0.91	14.3	24.6

ORIFICE DIAMETER	7.000	in
ORIFICE FL ELEV	792.00	
ORIFICE CENTROID ELEV	792.00	
ORIFICE AREA (Ao)	0.267	sf
ORIFICE COEFFICIENT	0.6	

ORIFICE EQUATION

$$Q = CA_o\sqrt{2gH}$$

CALCULATE 24 HR DRAWDOWN ELEVATION FOR WATER QUALITY POND (USE IN DETENTION MODEL)

Drawdown Time	24.6	hours
Drawdown Time Exceeding 24 Hours	0.6	hours
Orifice Discharge Rate	1.58	cfs
Volume Released During Duration Exceeding 24 Hours	3359	ft^3
Depth of Remaining Water Quality Volume @ 24 Hours	0.25	ft

Pond 1			
Required WQ Volume (ft^3) =	126,476		
Provided WQ Volume (ft^3) =	130,105		
Required Permanent Pool Volume (ft^3) =	130,305		
Provided Permanent Pool Volume (ft^3) =	226,297		
Required Sediment Forebay Volume (ft^3)=	33,944	to	56,574
Provided Sediment Forebay Volume (ft^3)=	47,989		

Pond 1					
Elevation	Area (ft^2)	Area (ac)	Incremental Volume (ft^3)	Cumulative Volume (ft^3)	Notes
786	13,874	0.318503	-	-	
787	15,218	0.349357	14,546	14,546	
788	31,902	0.732369	23,560	38,106	
789	45,251	1.038820	38,577	76,683	
790	48,325	1.109389	46,788	123,471	
791	51,405	1.180096	49,865	173,336	
792	54,517	1.251538	52,961	226,297	Permanent Pool
793	58,727	1.348186	56,622	282,919	
794	63,015	1.446625	60,871	343,790	
794.2	63,104	1.448658	12,612	356,401	Water Quality Volume
795	67,442	1.548246	52,218	408,619	
796	71,872	1.649954	69,657	478,276	Spillway Elevation
797	76,376	1.753352	74,124	552,400	
797.2	76,468	1.755455	15,284	567,685	25-YR WSE
798	80,957	1.858517	62,970	630,654	100-YR WSE
799	85,630	1.965794	83,294	713,948	Top of Pond

Texas Commission on Environmental Quality

TSS Removal Calculations 04-20-2009

Project Name: **Wolf Lakes Village, Section 1 Phase 2**
Date Prepared: **7/12/2021**

Additional information is provided for cells with a red triangle in the upper right corner. Place the cursor over the cell.
Text shown in blue indicate location of instructions in the Technical Guidance Manual - RG-348.
Characters shown in red are data entry fields.
Characters shown in black (Bold) are calculated fields. Changes to these fields will remove the equations used in the spreadsheet.

1. The Required Load Reduction for the total project: Calculations from RG-348 Pages 3-27 to 3-30

Page 3-29 Equation 3.3: $L_M = 28.93(A_N \times P)$

where:
$L_{M\,TOTAL\,PROJECT}$ = Required TSS removal resulting from the proposed development = 80% of increased load
A_N = Net increase in impervious area for the project
P = Average annual precipitation, inches

Site Data: Determine Required Load Removal Based on the Entire Project

County =	**Williamson**	
Total project area included in plan * =	**163.46**	acres
Predevelopment impervious area within the limits of the plan * =	**0.00**	acres
Total post-development impervious area within the limits of the plan* =	**25.64**	acres
Total post-development impervious cover fraction * =	**0.16**	
P =	**32**	inches
$L_{M\,TOTAL\,PROJECT}$ =	**23712**	lbs. **ADJUSTED FOR 85% TSS REMOVAL**

*** The values entered in these fields should be for the total project area.**

Number of drainage basins / outfalls areas leaving the plan area = **1**

2. Drainage Basin Parameters (This information should be provided for each basin):

Drainage Basin/Outfall Area No. = 1

Total drainage basin/outfall area =	**38.38**	acres
Predevelopment impervious area within drainage basin/outfall area =	**0.00**	acres
Post-development impervious area within drainage basin/outfall area =	**24.69**	acres
Post-development impervious fraction within drainage basin/outfall area =	**0.64**	
$L_{M\,THIS\,BASIN}$ =	**22833**	lbs. **ADJUSTED FOR 85% TSS REMOVAL**

3. Indicate the proposed BMP Code for this basin.

Proposed BMP = **Wet Basin**
Removal efficiency = **93** percent

4. Calculate Maximum TSS Load Removed (L_M) for this Drainage Basin by the selected BMP Type.

RG-348 Page 3-33 Equation 3.7: L_M = (BMP efficiency) x P x (A_C x 34.6 + A_P x 0.54)

where:
A_C = Total On-Site drainage area in the BMP catchment area
A_I = Impervious area proposed in the BMP catchment area
A_P = Pervious area remaining in the BMP catchment area
L_M = TSS Load removed from this catchment area by the proposed BMP

A_C =	**38.38**	acres
A_I =	**24.69**	acres
A_P =	**13.69**	acres
L_M =	**25643**	lbs

5. Calculate Fraction of Annual Runoff to Treat the drainage basin / outfall area

Desired $L_{M\,THIS\,BASIN}$ = **23712** lbs.

F = **0.92**

6. Calculate Capture Volume required by the BMP Type for this drainage basin / outfall area. Calculations from RG-348

Rainfall Depth = **2.00** inches
Post Development Runoff Coefficient = **0.45**
On-site Water Quality Volume = **125476** cubic feet

Calculations from RG-348 Pages 3-36 to 3-37

Off-site area draining to BMP =	**0.00**	acres
Off-site impervious cover draining to BMP =	**0.00**	acres
Impervious fraction of off-site area =	**0**	
Off-site Runoff Coefficient =	**0.00**	
Off-site Water Quality Volume =	**0**	cubic feet
Storage for Sediment =	**25295**	
Total Capture Volume (required water quality volume(s) x 1.20) =	**151771**	cubic feet

11. Wet Basins Designed as Required in RG-348 Pages 3-66 to 3-71

Required capacity of Permanent Pool =	**151771**	cubic feet **Permanent Pool Capacity is 1.20 times the WQV**
Required capacity at WQV Elevation =	**275247**	cubic feet **Total Capacity should be the Permanent Pool Capacity plus a second WQV.**

RECORD DRAWING
THIS RECORD DRAWING IS A COMPILATION OF A COPY OF THE SEALED ENGINEERING DRAWING FOR THIS PROJECT, MODIFIED BY ADDENDA, CHANGE ORDERS AND INFORMATION FURNISHED BY THE CONTRACTOR.
APRIL 19, 2022
THE INFORMATION SHOWN ON THE RECORD DRAWINGS THAT WAS PROVIDED BY THE CONTRACTOR OR OTHERS NOT ASSOCIATED WITH THE DESIGN ENGINEER CANNOT BE VERIFIED FOR ACCURACY OR COMPLETENESS.

SCALE: 1"= 40'
0' 40' 80' 120'

LEGEND
PERMANENT POOL
WALL
MAINTENANCE RAMP

NOTES
1. CONTRACTOR SHALL PROVIDE FULLY FUNCTIONAL POND INCLUDING WATER
2. CONTRACTOR SHALL INSTALL INTERNAL WATER-TIGHT GASKET CONNECTIONS ON ALL PIPES TO AN ELEVATION ONE-FOOT ABOVE THE INDICATED PERMANENT POOL ELEVATION
3. CONTRACTOR SHALL INSTALL GEOMEMBRANE AND BENTONITE PER LINER PENETRATION DETAIL AROUND ALL HEADWALLS AND WALLS
4. RETAINING WALL SHALL BE WATER TIGHT. REFERENCE STRUCTURAL PLANS FOR WALL DETAILS
5. REFERENCE LANDSCAPE PLANS FOR MAKE-UP WELL LOCATION

NO.	REVISION	DATE
1	REVISE POND STRUCTURES & CALCULATIONS	07/13/21
3	REVISE POND STRUCTURES & CALCULATIONS	12/08/21

STATE OF TEXAS
MICHAEL S. FISHER
87704
LICENSED PROFESSIONAL ENGINEER
1/19/2022

PAPE-DAWSON ENGINEERS
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TBPE FIRM REGISTRATION #470 | TBPLS FIRM REGISTRATION #10028800

WOLF LAKES VILLAGE, SECTION 1, PHASE 2
CITY OF GEORGETOWN, TEXAS
POND PLAN VIEW

CITY JOB NO. 2021-16-CON
JOB NO. 51119-01
DATE SEPT 2021
DESIGNER
CHECKED DRAWN ARC
SHEET 23 OF 37

Date: Dec 08, 2021, 3:41pm User ID: oconner
File: H:\Projects\51119\01_301 Construction Documents\Civil\P051119-01.dwg

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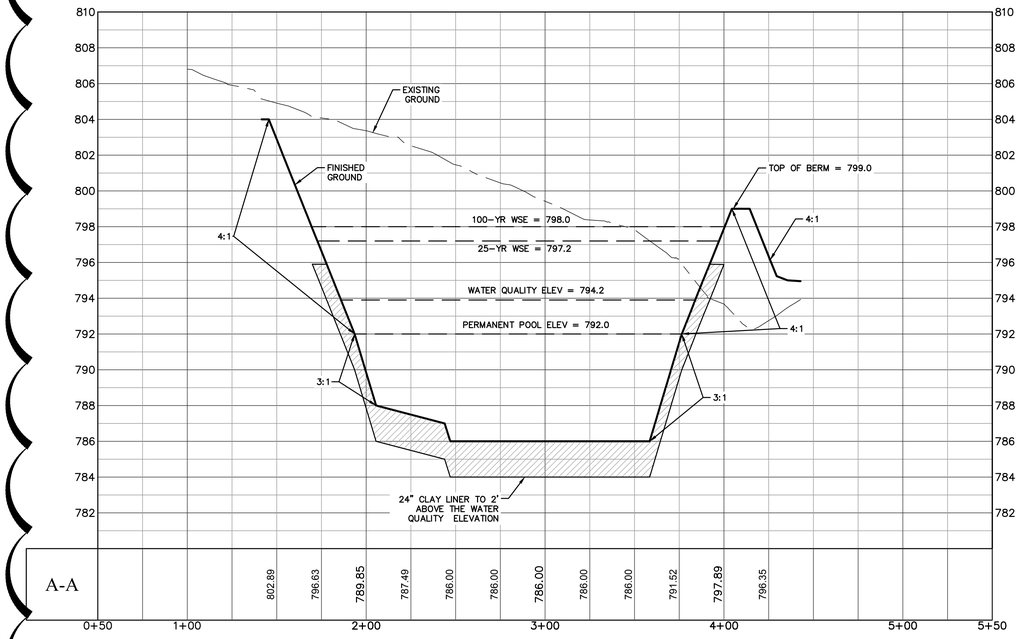
2021-16-CON

CROSS SECTION A–A

1" = 40' HORIZONTAL
1" = 4' VERTICAL



CROSS SECTION B–B

1" = 40' HORIZONTAL
1" = 4' VERTICAL

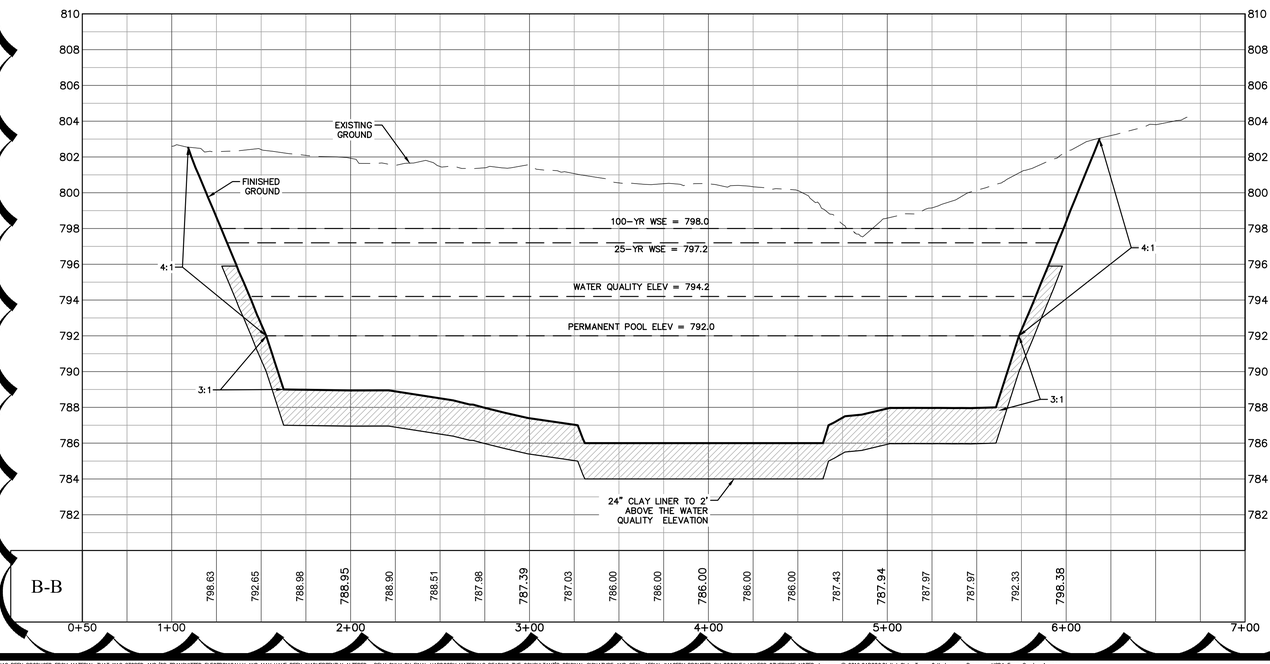


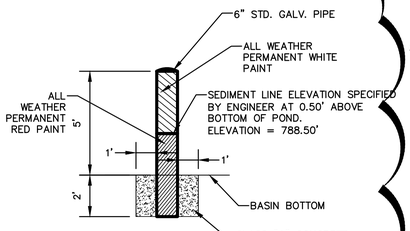
Table 3-6 Clay Liner Specifications (COA, 2004)

Property	Test Method	Unit	Specification
Permeability	ASTM D-2434	cm/sec	1×10^{-6}
Plasticity Index of Clay	ASTM D-423 & D-424	%	Not less than 15
Liquid Limit of Clay	ASTM D-2216	%	Not less than 30
Clay Particles Passing	ASTM D-422	%	Not less than 30
Clay Compaction	ASTM D-2216	%	95% of Standard Proctor Density

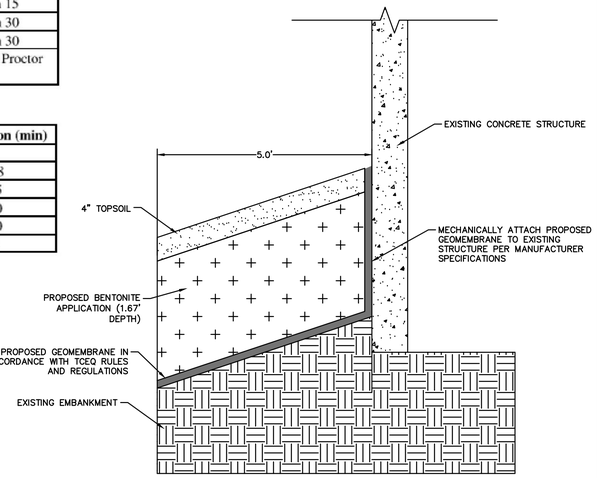
Table 3-7 Geotextile Fabric Specifications (COA, 2004)

Property	Test Method	Unit	Specification (min)
Unit Weight		oz/yd^2	8
Filtration Rate		in/sec	0.08
Puncture Strength	ASTM D-751*	lb	125
Mullen Burst Strength	ASTM D-751	psi	400
Tensile Strength	ASTM D-1682	lb	200
Equiv. Opening Size	US Standard Sieve	No.	80

*modified

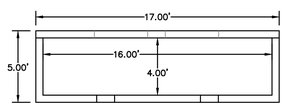


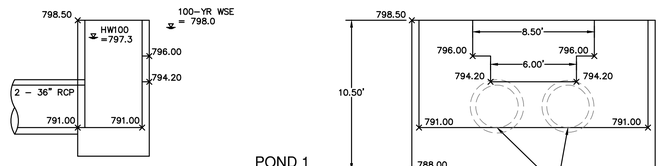
SEDIMENT DEPTH MARKER DETAIL



CLAY LINER PENETRATION DETAIL

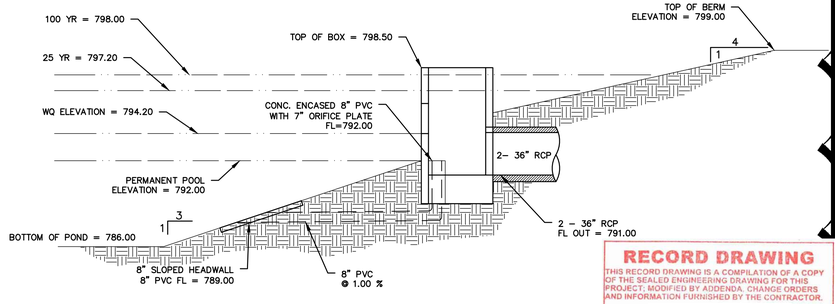
NOT–TO–SCALE





POND 1
CAST-IN-PLACE OUTFALL STRUCTURE DETAIL

SCALE: 1" = 5'



POND 1
STAND PIPE DETAIL

NOT-TO-SCALE

RECORD DRAWING

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APRIL 19, 2022

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NO.	REVISION	DATE
1	REVISE POND STRUCTURES & CALCULATIONS	07/13/21
3	REVISE POND STRUCTURES & CALCULATIONS	12/08/21

STATE OF TEXAS
MICHAEL S. FISHER
87704
LICENSED
PROFESSIONAL ENGINEER
1/19/2022

PAPE-DAWSON ENGINEERS
SAN ANTONIO I AUSTIN I HOUSTON I FORT WORTH I DALLAS
2000 NW LOOP 410 I SAN ANTONIO, TX 78213 I 210.375.9000
TBPE FIRM REGISTRATION #470 I TBPLS FIRM REGISTRATION #10028800

WOLF LAKES VILLAGE, SECTION 1, PHASE 2
CITY OF GEORGETOWN, TEXAS
POND CROSS SECTIONS

CITY JOB NO. 2021–16–CON
JOB NO. 51119–01
DATE SEPT 2021
DESIGNER
CHECKED DRAWN ARC
SHEET 24 OF 37

2021-16-CON

Date: Dec 08, 2021, 3:42pm User ID: cscanner
File: H:\Projects\51119.101_301 Construction Documents\Civil\P051119-01.dwg

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WOLF RANCH SECTION 2 - POND 1 BASIN

(EAPP ID NO. 11000647)

SPRING BUFFER

POND 1 DRAINAGE AREA

POND 2 DRAINAGE AREA

POND 2

TCEQ BUFFER

POND 2

APPROXIMATE LOCATION OF FUTURE WOLF RANCH PARKWAY EXPANSION (DESIGN BY OTHERS)

OFFSITE DRAINAGE AREA

WOLF LAKES

SCALE: 1" = 200'

0' 200' 400' 600'

NOTES:

1. THE LOCATIONS OF EXISTING UNDERGROUND UTILITIES ARE SHOWN IN AN APPROXIMATE WAY ONLY AND HAVE NOT BEEN INDEPENDENTLY VERIFIED BY THE OWNER OR ITS REPRESENTATIVE. THE CONTRACTOR SHALL DETERMINE THE EXACT LOCATION OF ALL EXISTING UTILITIES BEFORE COMMENCING WORK, AND AGREES TO BE FULLY RESPONSIBLE FOR ANY AND ALL DAMAGES WHICH MIGHT BE ASSOCIATED BY THE CONTRACTOR'S FAILURE TO EXACTLY LOCATE AND PRESERVE ANY AND ALL UN
2. EXISTING CONTOUR INFORMATION SHOWN HERE ON THIS PLAN SHEET ARE SHOWN AT ONE (1) FOOT INTERVALS, THEY ARE COMPUTER GENERATED USING WILLIAMSON COUNTY DATA.

LEGEND

- W — WATER LINE
- WW — WASTEWATER LINE & MH
- SD — STORM DRAIN LINE & MH
- CURB INLET
- SINGLE WATER SERVICE
- DOUBLE WATER SERVICE
- SINGLE WW SERVICE
- DOUBLE WW SERVICE
- GATE VALVE
- FIRE HYDRANT
- EXISTING GATE VALVE
- EXISTING FIRE HYDRANT
- EXISTING WATER LINE
- EXISTING WASTEWATER LINE
- EXISTING STORM DRAIN LINE
- EXISTING CONTOUR LINE
- EXISTING CONTOUR LINE
- PROPERTY BOUNDARY
- DRAINAGE AREA BOUNDARY
- OFFSITE DRAINAGE AREA
- TOTAL PROJECT AREA INCLUDED IN THE PLAN
- APPROXIMATE LOCATION OF FUTURE WOLF RANCH PARKWAY EXPANSION (DESIGN BY OTHERS)

NO.	REVISION	DATE

STATE OF TEXAS
MARK A. RAMSEUR
88748
LICENSED
PROFESSIONAL ENGINEER
7/19/17

PAPE-DAWSON ENGINEERS
AUSTIN | SAN ANTONIO | HOUSTON | FORT WORTH | DALLAS
7800 SHOAL CREEK BLVD, STE 220 W | AUSTIN, TX 78757 | 512.454.8711
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WOLF RANCH WEST, SECTION 2
CITY OF GEORGETOWN, TEXAS

OFFSITE WATER QUALITY DRAINAGE AREA MAP

CITY JOB NO. CON-2017-XXX
JOB NO. 50790-20
DATE JULY 2017
DESIGNER
CHECKED DH DRAWN
SHEET 85 OF 104

Date: Jul 19, 2017, 11:10am User ID: DHart
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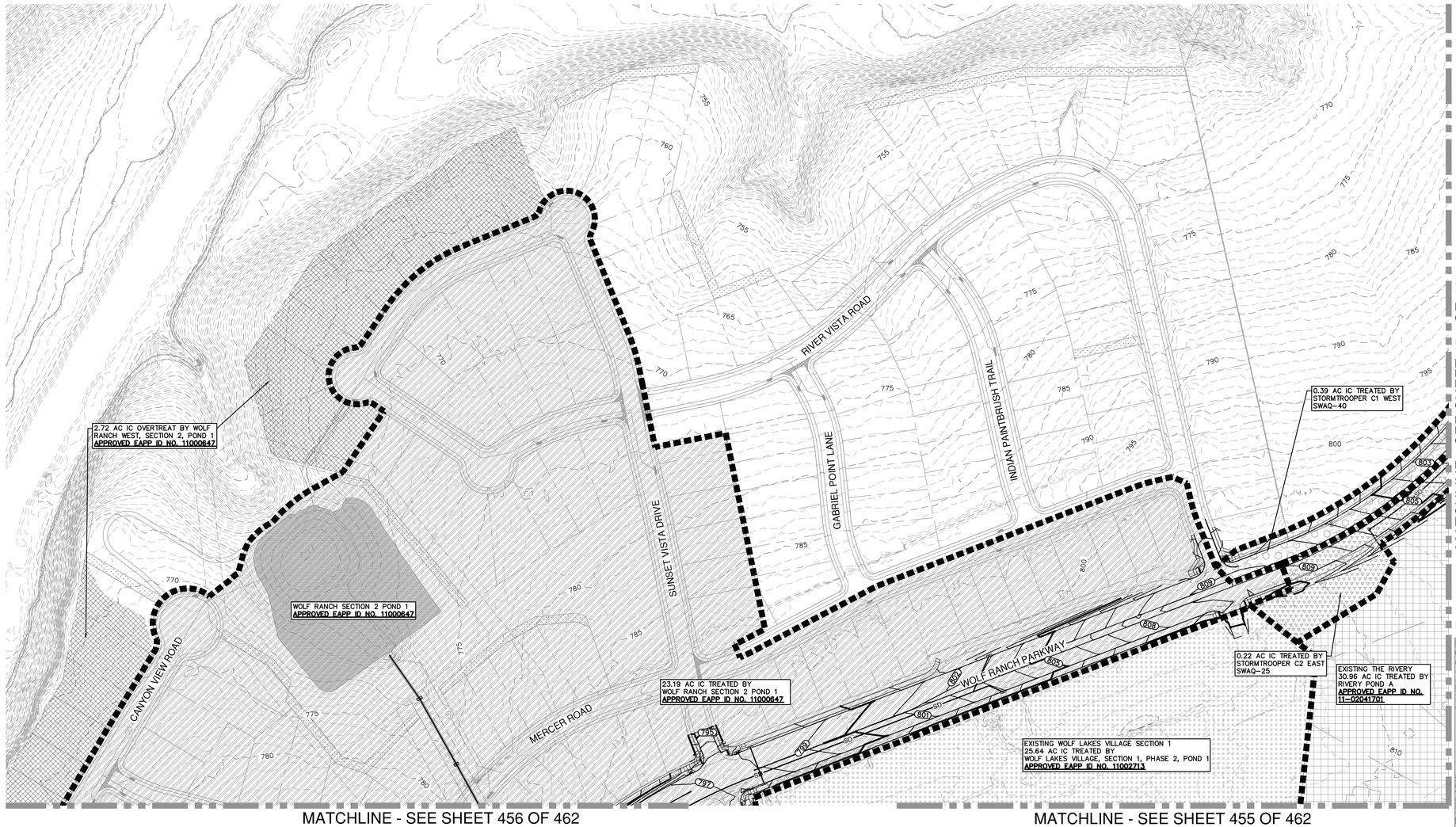


SCALE: 1"= 100'

0' 100' 200' 300'

LEGEND

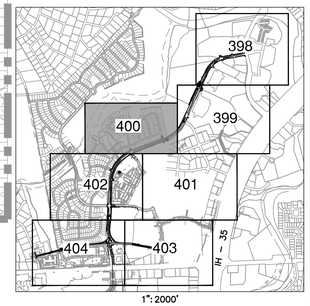
- PROPOSED DRAINAGE AREA
- STORM DRAIN WITH JUNCTION BOX (SD)
- EXISTING CONTOUR LINE (780)
- PROPOSED CONTOUR LINE
- CURB INLET

TREATMENT LEGEND

- DETENTION / WQ POND BASIN
- RIVERY POND A APPROVED EAPP ID NO. 11-02041701
- STORMTROOPER C1 WEST
- STORMTROOPER C2 EAST
- WOLF RANCH SECTION 2 POND 1 APPROVED EAPP ID NO. 11000647
- WOLF LAKES VILLAGE SECTION 1, PHASE 2, POND 1 APPROVED EAPP ID NO. 11002713
- AREAS OF OVERTREAT
- VEGETATIVE FILTER STRIP

STATE OF TEXAS
STEVEN S. CRAUFORD
92677
LICENSED
PROFESSIONAL ENGINEER

INDEX KEY 09/12/2025



1": 2000'

NO.	REVISION	DATE

GEORGETOWN TEXAS *more than welcome*

PAPE-DAWSON ENGINEERS

AUSTIN | SAN ANTONIO | HOUSTON | FORT WORTH | DALLAS
10801 N MOPAC EXPY, BLDG 3, STE 200 | AUSTIN, TX 78759 | 512.454.8711
TBPE FIRM REGISTRATION #470 | TBPLS FIRM REGISTRATION #10028801

CITY OF GEORGETOWN, TEXAS
WOLF RANCH PKWY / MEMORIAL DR
WATER QUALITY TREATMENT SUMMARY 3 OF 11

CITY JOB No.
JOB NO. 51423-00
DATE 9/12/2025
DESIGNER AK
CHECKED SC DRAWN AK
SHEET 454 3 11

Date: Sep 12, 2025, 11:15am User ID: cashetz
File: H:\Projects\514\23\00\30\Construction Documents\Civil\W051423-00.dwg

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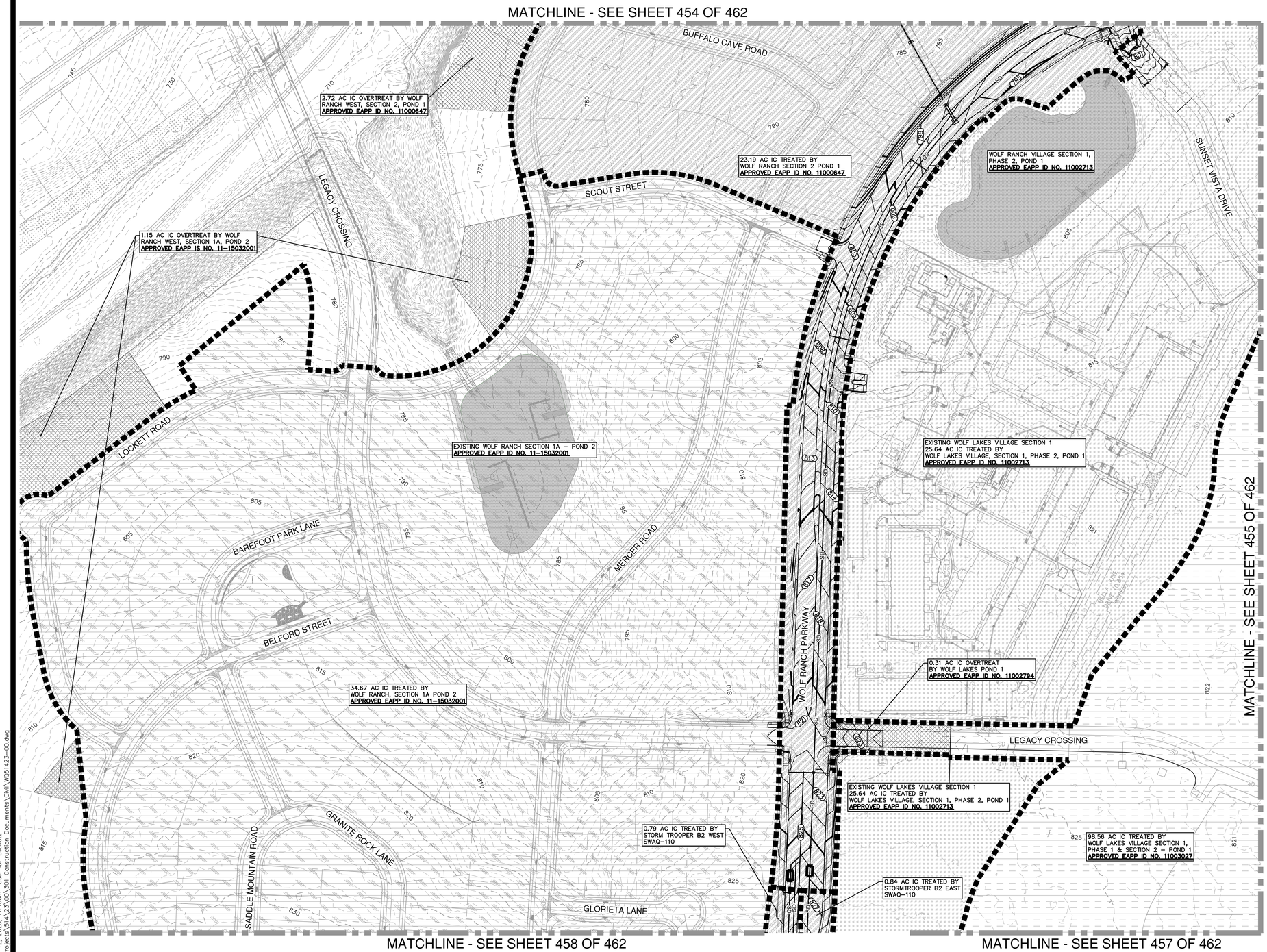


SCALE: 1"= 100'

0' 100' 200' 300'

LEGEND

- PROPOSED DRAINAGE AREA
- STORM DRAIN WITH JUNCTION BOX
- EXISTING CONTOUR LINE
- PROPOSED CONTOUR LINE
- CURB INLET

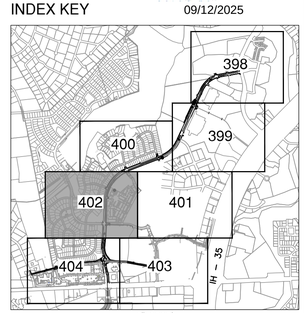
TREATMENT LEGEND

- DETENTION / WQ POND BASIN
- WOLF LAKES VILLAGE SECTION 1, PHASE 2, POND 1 APPROVED EAPP ID NO. 11002713
- WOLF RANCH SECTION 2 POND 1 APPROVED EAPP ID NO. 11000647
- WOLF LAKES VILLAGE SECTION 1, PHASE 1 & SECTION 2 – POND 1 APPROVED EAPP ID NO. 11003027
- WOLF RANCH SECTION 1A APPROVED EAPP ID NO. 11-15032001
- AREAS OF OVERTREAT

STATE OF TEXAS
STEVEN S. CRAUFORD
92677
LICENSED
PROFESSIONAL ENGINEER

09/12/2025

INDEX KEY



1": 2000'

NO.	REVISION	DATE

GEORGETOWN TEXAS
more than welcome

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TBPE FIRM REGISTRATION #470 I TBPLS FIRM REGISTRATION #10028801

CITY OF GEORGETOWN, TEXAS
WOLF RANCH PKWY / MEMORIAL DR
WATER QUALITY TREATMENT SUMMARY 5 OF 11

CITY JOB No.
JOB NO. 51423-00
DATE 9/12/2025
DESIGNER AK
CHECKED SC DRAWN AK
5 11
SHEET 456

Date: Sep 12, 2025, 11:16am User ID: cschatz
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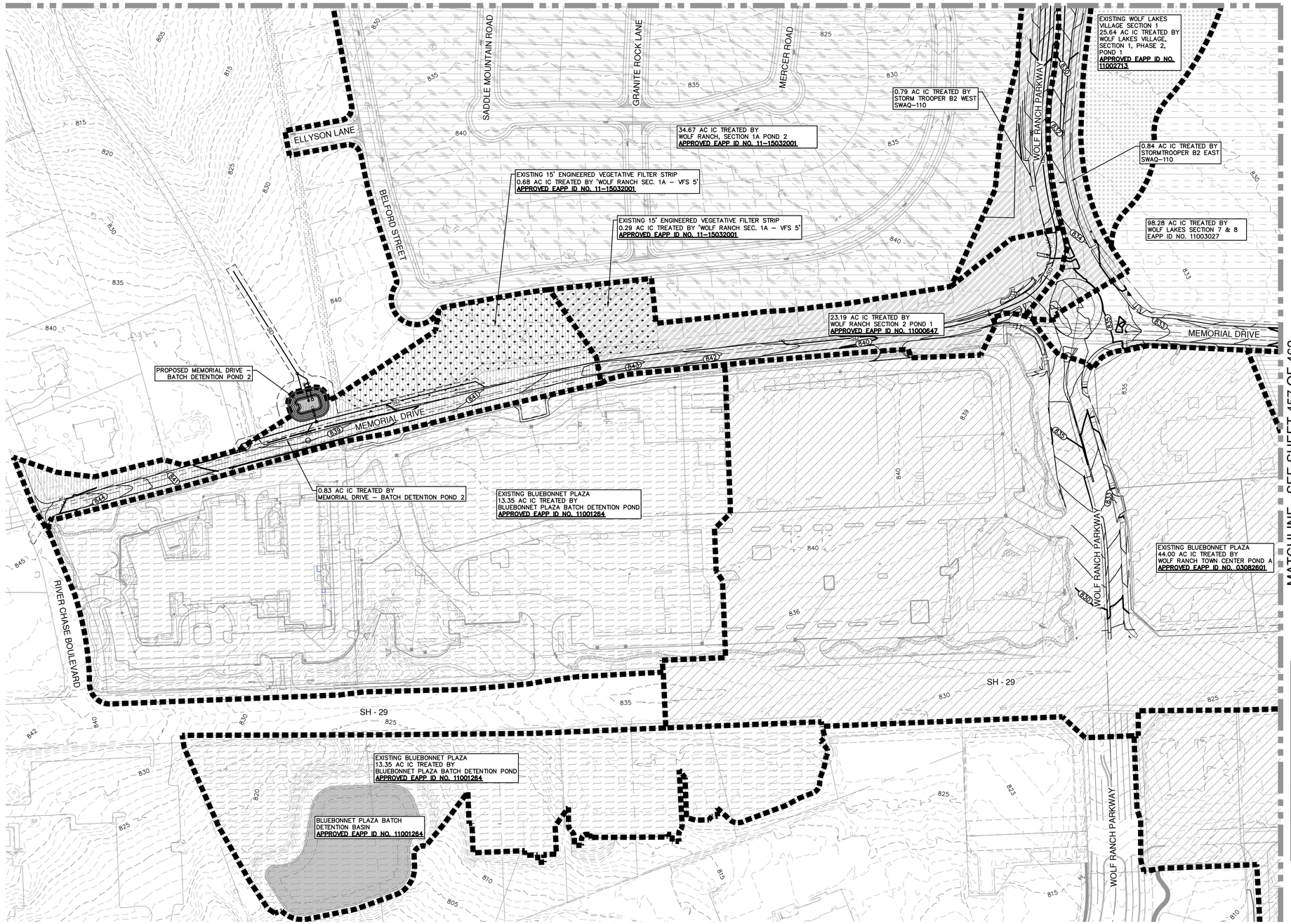
MATCHLINE - SEE SHEET 456 OF 462



MATCHLINE - SEE SHEET 457 OF 462

SCALE: 1"= 100'

0' 100' 200' 300'

LEGEND

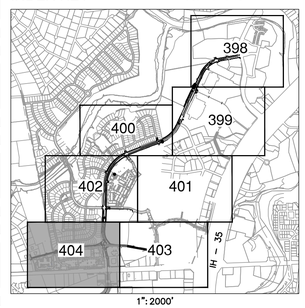
- PROPOSED DRAINAGE AREA
- STORM DRAIN WITH JUNCTION BOX
- EXISTING CONTOUR LINE
- PROPOSED CONTOUR LINE
- CURB INLET

TREATMENT LEGEND

- WOLF LAKES SECTIONS 7 & 8 APPROVED EAPP ID NO. 11003027
- WOLF RANCH TOWN CENTER POND A APPROVED EAAP ID NO. 03082601
- WOLF RANCH TOWN CENTER POND B APPROVED EAAP ID NO. 03082601
- WOLF RANCH SECTION 1A POND 2 APPROVED EAPP ID NO. 11-15032001
- WOLF LAKES VILLAGE SECTION 1, PHASE 2, POND 1 APPROVED EAPP ID NO. 11002713
- WOLF RANCH SECTION 2 POND 1 APPROVED EAPP ID NO. 11000647
- BLUEBONNET PLAZA BATCH POND APPROVED EAPP ID NO. 11001264
- MEMORIAL DRIVE BATCH POND 2
- DETENTION / WQ POND BASIN
- LOT AREA TREATED BY VEGETATIVE FILTER STRIP

STATE OF TEXAS
STEVEN S. CRAUFORD
92677
LICENSED PROFESSIONAL ENGINEER

INDEX KEY 09/12/2025



1": 2000'

NO.	REVISION	DATE

GEORGETOWN TEXAS more than welcome

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10801 N MOPAC EXPY, BLDG 3, STE 200 I AUSTIN, TX 78759 I 512.454.8711
TBPE FIRM REGISTRATION #470 I TBPLS FIRM REGISTRATION #10028801

CITY OF GEORGETOWN, TEXAS
WOLF RANCH PKWY / MEMORIAL DR
WATER QUALITY TREATMENT SUMMARY 7 OF 11

CITY JOB No.
JOB NO. 51423-00
DATE 9/12/2025
DESIGNER AK
CHECKED SC DRAWN AK
7 11
SHEET 458

Date: Sep 12, 2025, 10:37am User ID: cschultz
File: H:\Projects\51423\00\301 Construction Documents\Civil\W051423-00.dwg

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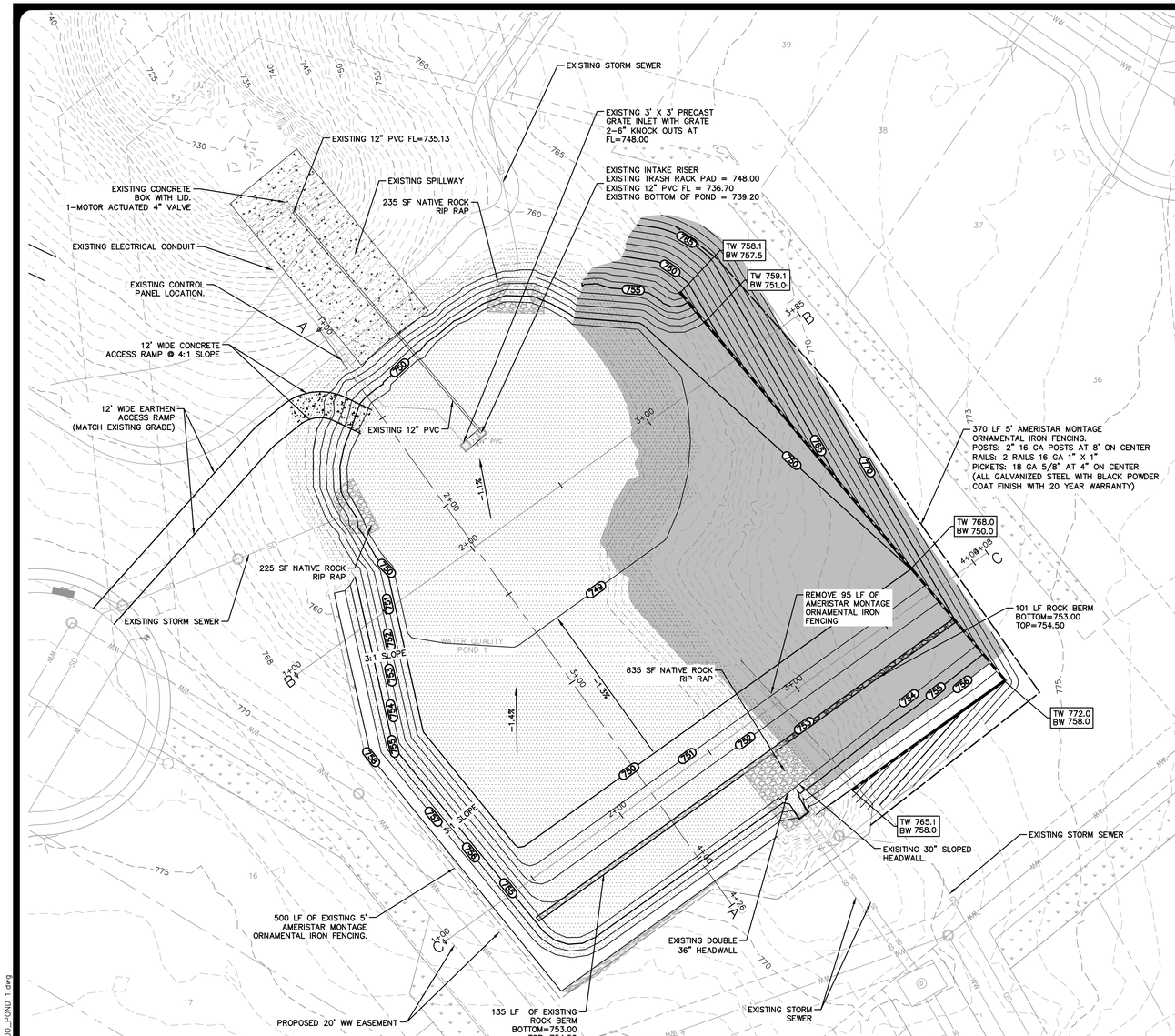


LEGEND

- STORM DRAIN LINE & MH
- CURB INLET
- EXISTING CONTOUR LINE
- EXISTING CONTOUR LINE
- PROPERTY BOUNDARY
- WALL
- TW — TOP OF WALL
- BW — BOTTOM OF WALL
- EG — EXISTING GROUND
- LIMITS OF PROPOSED POND EXPANSION

Texas Commission on Environmental Quality

TSS Removal Calculations 04-20-2009

Project Name: Wolf Ranch Section 2-Pond 1
Date Prepared: 7/19/2017

Additional information is provided for cells with a red triangle in the upper right corner. Place the cursor over the cell.
Text shown in blue indicate location of instructions in the Technical Guidance Manual - RG-348.
Characters shown in red are data entry fields.
Characters shown in black (Bold) are calculated fields. Changes to these fields will remove the equations used in the spreadsheet.

1. The Required Load Reduction for the total project: Calculations from RG-348 Pages 3-27 to 3-30

Page 3-29 Equation 3.3: $L_M = 28.9(A_N \times P)$

where:
$L_{M\,TOTAL\ PROJECT}$ = Required TSS removal resulting from the proposed development = 80% of increased load
A_N = Net increase in impervious area for the project
P = Average annual precipitation, inches

Site Data: Determine Required Load Removal Based on the Entire Project

County =	**Williamson**	
Total project area included in plan * =	**69.61**	acres
Predevelopment impervious area within the limits of the plan * =	**0.66**	acres
Total post-development impervious area within the limits of the plan* =	**38.13**	acres
Total post-development impervious cover fraction * =	**0.64**	
P =	**32**	inches
$L_{M\,TOTAL\ PROJECT}$ =	**34652**	lbs. ADJUSTED FOR 80% TSS REMOVAL AND NOT 80%!!!!!!!!!!!!!!!!!!

* **The values entered in these fields should be for the total project area.**

Number of drainage basins / outfalls areas leaving the plan area = **1**

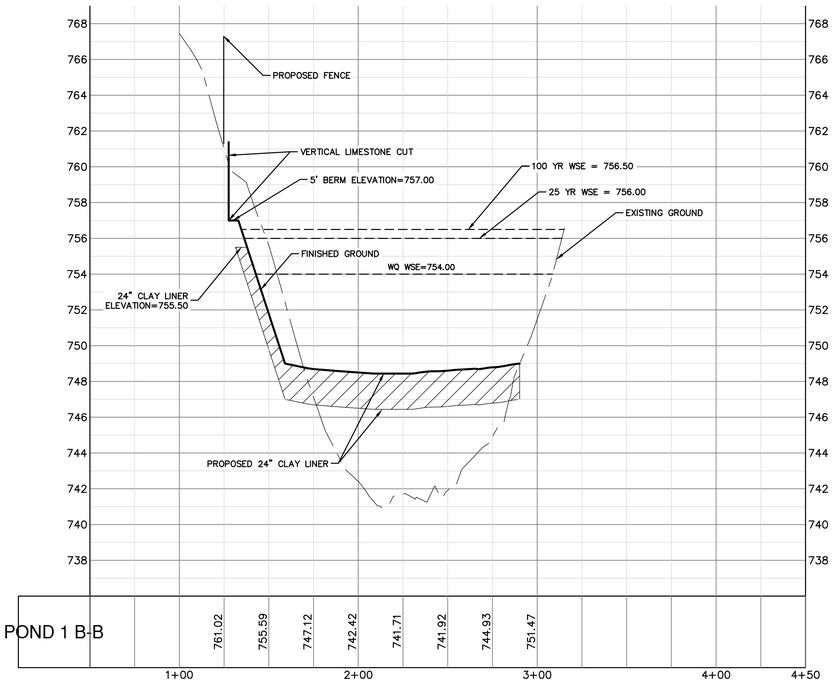
2. Drainage Basin Parameters (This information should be provided for each basin):

Drainage Basin/Outfall Area No. = **1**

Total drainage basin/outfall area =	**36.18**	acres
Predevelopment impervious area within drainage basin/outfall area =	**0.66**	acres
Post-development impervious area within drainage basin/outfall area =	**22.94**	acres
Post-development impervious fraction within drainage basin/outfall area =	**0.63**	
$L_{M\,THIS\ BASIN}$ =	**20605**	lbs. ADJUSTED FOR 80% TSS REMOVAL AND NOT 80%!!!!!!!!!!!!!!!!!!

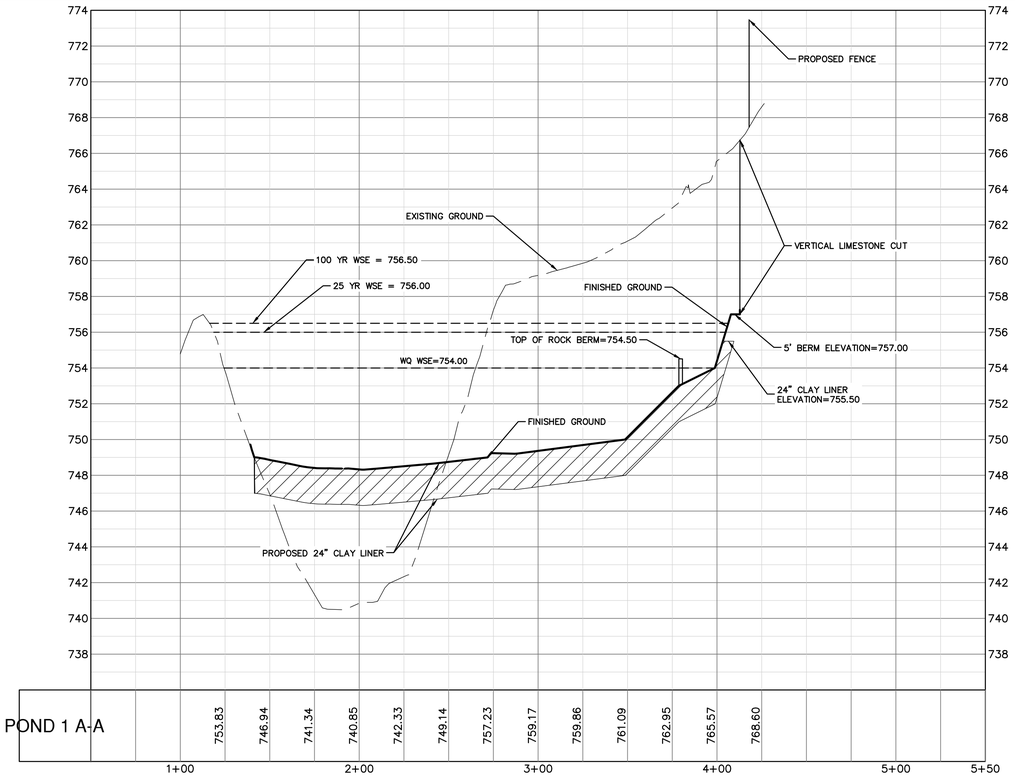
3. Indicate the proposed BMP Code for this basin.

Proposed BMP =	**Batch Detention**	
Removal efficiency =	**91**	percent ADJUST MANUALLY!!!!!!!!!!!!!!!!!



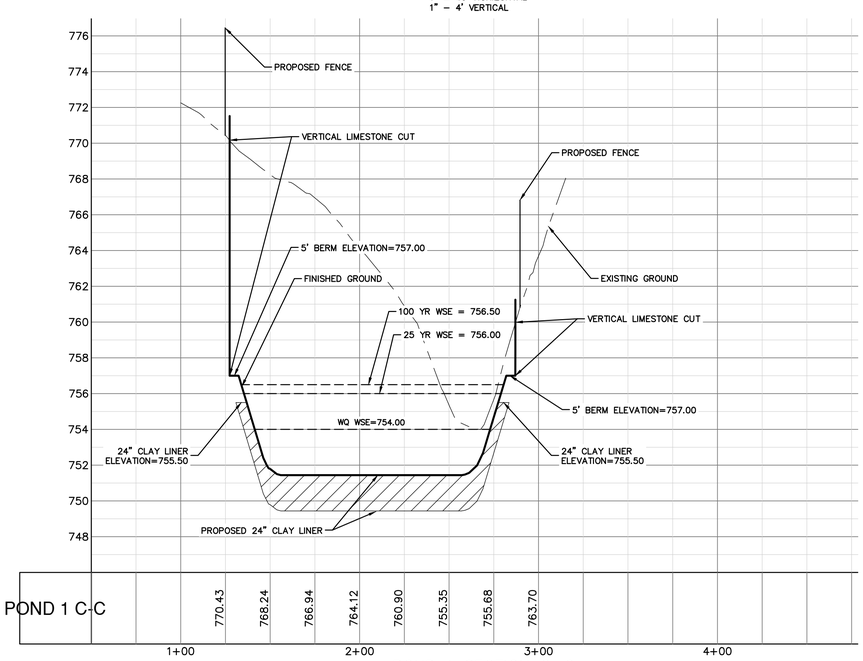
POND 1 SECTION B–B

1" = 40' HORIZONTAL
1" = 4' VERTICAL



POND 1 SECTION A–A

1" = 40' HORIZONTAL
1" = 4' VERTICAL



POND 1 SECTION C–C

1" = 40' HORIZONTAL
1" = 4' VERTICAL

NO.	REVISION	DATE

GEORGETOWN TEXAS
more than welcome

PAPE-DAWSON ENGINEERS
AUSTIN | SAN ANTONIO | HOUSTON | FORT WORTH | DALLAS
10801 N MOPAC EXPY, BLDG 3, STE 200 | AUSTIN, TX 78759 | 512.454.8711
TBPE FIRM REGISTRATION #470 | TBPLS FIRM REGISTRATION #10028801

STATE OF TEXAS
STEVEN S. CRAUFORD
92677
LICENSED
PROFESSIONAL ENGINEER

09/12/2025

CITY OF GEORGETOWN, TEXAS
WOLF RANCH PKWY / MEMORIAL DR

POND 1 DETAILS (2 OF 2)

CITY JOB No.
JOB NO. 51423-00
DATE 9/12/2025
DESIGNER JB
CHECKED SC DRAWN JB

SHEET 465

Date: Sep 12, 2025, 10:38am User ID: csabatr
File: H:\Projects\514\23\00\30 Construction Documents\Civil\PD51423-00_POND 1.dwg

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BLUEBONNET PLAZA BATCH DETENTION POND BASIN

(EAPP ID NO. 11001264)



SCALE: 1"= 100'

0' 100' 200' 300'

LEGEND

- PROPOSED PROPERTY LINE
- EXISTING DRAINAGE AREA
- EXISTING TC – SHEET FLOW
- EXISTING TC – SHALLOW FLOW
- EXISTING TC – CHANNEL FLOW
- EXISTING STORM DRAIN
- EXISTING DRAINAGE AREA

EXISTING CONDITIONS

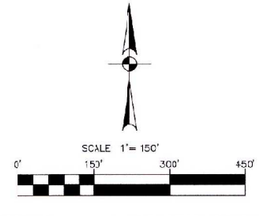
Drainage Area	Area (ac)	Area (mi^2)	Soil Type	IC (ac)	PC (ac)	I.C. %	PC CN	PC (ac)	IC CN	IC (ac)	Weighted CN
A	9.796	0.015307	D	1.27	8.52	13.0 %	81	690.26	98	124.91	85.21
B	3.712	0.005800	D	0.23	3.49	6.07%	81	282.41	98	22.10	82.03
C	13.876	0.021681	D	0.38	13.49	2.75%	81	1093.03	98	37.41	81.47
D	5.825	0.009101	D	0.35	5.48	5.97%	81	443.66	98	34.07	82.01
E	17.578	0.027465	D	0.00	17.58	0.00%	81	1423.81	98	0.00	81.00
F	4.331	0.006767	D	0.00	4.33	0.00%	81	350.80	98	0.00	81.00
G	1.916	0.002993	D	0.00	1.92	0.00%	81	155.16	98	0.00	81.00
H	2.798	0.004372	D	0.00	2.80	0.00%	81	226.64	98	0.00	81.00
R1	1.766	0.002759	D	1.21	0.53	69.77%	81	43.24	98	120.76	92.86
R2	0.801	0.001252	D	0.55	0.25	68.74%	81	20.24	98	53.96	92.69
R3	0.830	0.001297	D	0.77	0.05	92.48%	81	3.11	98	75.16	96.71
R4	0.522	0.000816	D	0.22	0.31	41.09%	81	24.91	98	21.03	87.99

Existing Conditions

Drainage Area	Sheet Flow				Shallow Concentrated Flow			Channel / Pipe Flow			Cumulative
	Length (ft)	Manning's (n)	Slope ft/ft	Tc (min)	Length (ft)	Slope ft/ft	Tc (min)	Length (ft)	Velocity ft/s	Tc (min)	Tc (min)
A	100	0.24	8.442	7.2	1021	0.014	9.0				10.21
B	100	0.24	0.012	16.9	1123	0.012	10.6				27.58
C	100	0.24	0.009	18.9	580	0.026	3.7	172	4.76	0.6	23.24
D	100	0.24	0.015	15.4	850	0.014	7.5				22.76
E	100	0.24	0.020	13.8	1562	0.031	9.1	372	3.34	1.6	24.45
F	100	0.24	0.058	9.0	397	0.056	1.6	193	2.64	1.2	11.79
G	100	0.24	0.056	9.1	674	0.051	3.1				12.20
H	Negligible OffSite Flow										
R1	100	0.011	0.015	1.3	1372	0.015	11.7				12.98
R2	100	0.011	0.010	1.5	499.5	0.013	2.5				5.00
R3	100	0.011	0.015	1.3	1629.5	0.020	11.9				13.17
R4	100	0.011	0.012	1.4	485	0.021	3.5				5.00

Existing Conditions

Drainage Area	Area(ac)	Area(mi^2)	Curve Number	I.C. %	Cumulative Tc (min)	Lag Time (min)	Q_2 (cfs)	Q_{10} (cfs)	Q_{25} (cfs)	Q_{100} (cfs)
A	9.80	0.015307	85.21	15.0%	10.2	6.1	24.38	46.04	57.93	76.77
B	3.71	0.005800	82.03	6.1%	27.6	16.5	5.64	11.30	14.80	19.90
TOTAL OFF-SITE DRAINAGE							**27.50**	**52.59**	**57.55**	**89.83**
C	13.88	0.021681	81.47	2.8%	23.2	13.9	22.32	45.14	59.03	79.54
D	5.82	0.009101	82.01	6.0%	22.8	13.7	9.71	17.95	25.34	34.01
R1	1.77	0.002759	92.86	69.8%	13.0	7.8	5.56	9.98	12.09	14.87
R2	0.80	0.001252	92.69	68.7%	5.3	3.0	3.69	5.49	6.72	8.08
SH-29 CULVERT							**37.95**	**74.34**	**96.40**	**129.45**
E	17.58	0.027465	81.00	0.0%	24.4	14.7	26.95	54.90	71.97	97.27
F	4.33	0.006767	81.00	0.0%	1.8	7.1	9.21	17.93	23.30	31.06
G	1.92	0.002993	81.00	0.0%	2.2	7.3	4.02	7.88	10.27	13.53
R3	0.83	0.001297	96.71	92.4%	3.2	7.9	3.49	4.98	5.94	7.18
R4	0.52	0.000815	87.99	41.1%	5.0	3.0	1.96	3.21	3.58	4.94
OVERALL DESIGN POINT							**76.40**	**152.73**	**198.92**	**266.91**



DATE | NO. | REVISION

STATE OF TEXAS
MARK A. RAMSEUR
88148
LICENSED
PROFESSIONAL ENGINEER
10/15/18

PAPE-DAWSON ENGINEERS

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TBPE FIRM REGISTRATION #470 | TBPLS FIRM REGISTRATION #100288-01

BLUEBONNET PLAZA
CITY OF GEORGETOWN, TEXAS

TCEQ CONSTRUCTION PLANS
EXISTING DRAINAGE PLAN

JOB NO. 51002-00
DATE October 2018
DESIGNER MB
CHECKED DRAWN KHT

SHEET 12 OF 19

Date: Oct 15, 2018, 6:30pm User ID: MBurciaga
Files: H:\projects\510\02\00\392 TCEQ\civil\DR- 51002-00.dwg

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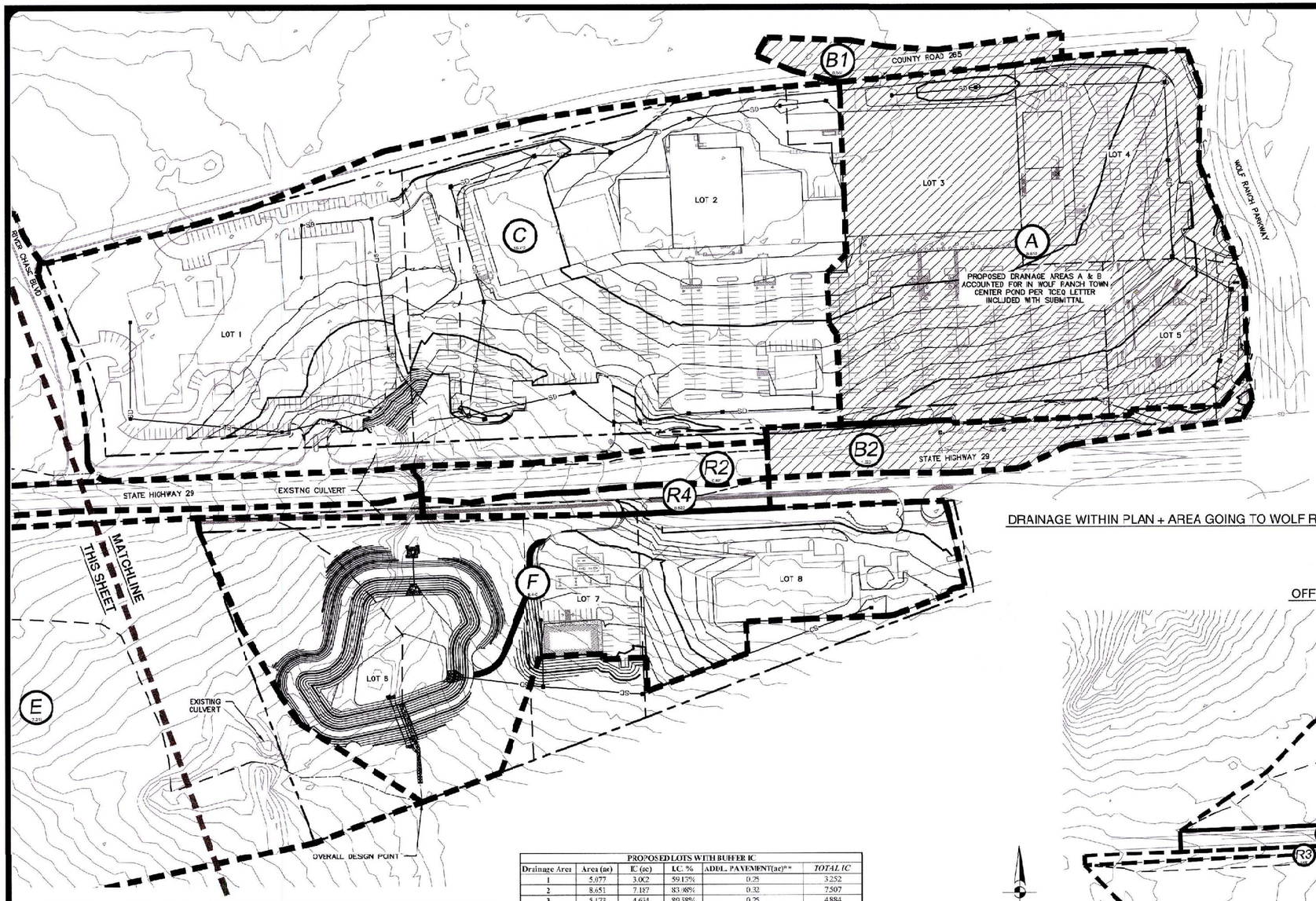
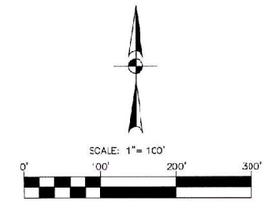


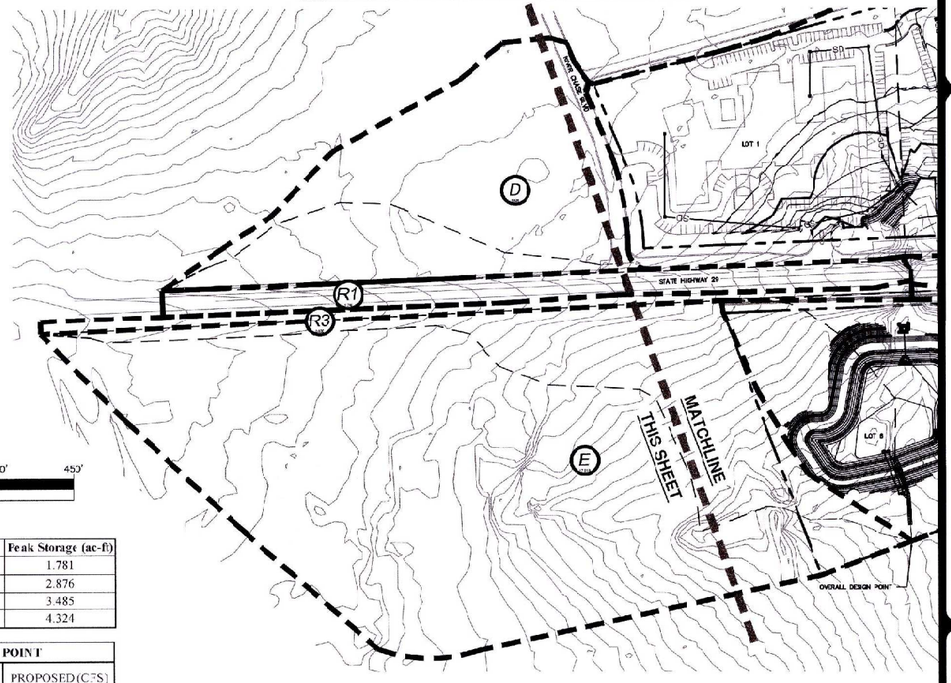


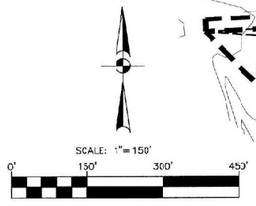
LEGEND

- PROPOSED PROPERTY LINE
- PROPOSED DRAINAGE AREA
- PROPOSED TC - SHEET FLOW
- PROPOSED TC - SHALLOW FLOW
- PROPOSED TC - CHANNEL FLOW
- EXISTING STORM DRAIN WITH MANHOLE
- PROPOSED STORM DRAIN
- PROPOSED CURB INLET
- PROPOSED AREA INLET
- PROPOSED TRENCH DRAIN
- PROPOSED JUNCTION BOX
- (Z) PROPOSED DRAINAGE AREA
- DRAINAGE AREAS ACCOUNTED FOR IN WOLF RANCH TOWN CENTER POND

DRAINAGE WITHIN PLAN + AREA GOING TO WOLF RANCH

OFF-SITE DRAINAGE TO OVERALL DESIGN POINT





PROPOSED CONDITIONS

Drainage Area	Area (ac)	Area (mi^2)	Soil Type	IC (ac)	PC (ac)	I.C. %	PC CN	PC (ac)	IC CN	IC (ac)	Weighted CN
A	8.818	0.013778	D	7.738	1.08	87.76%	81	47.44	98	758.35	95.92
B	1.790	0.002797	D	0.913	0.88	51.01%	81	71.02	98	89.47	89.67
C	15.772	0.024644	D	10.755	5.02	68.19%	81	406.44	98	1053.96	92.59
D	5.825	0.009101	D	0.348	5.48	5.97%	81	443.66	98	34.07	82.01
E	17.218	0.027665	D	0.000	17.58	0.00%	81	1423.81	98	0.00	81.00
F	8.440	0.013188	D	2.509	5.93	29.72%	81	480.48	98	245.83	86.05
R1	1.766	0.002759	D	1.232	0.53	69.77%	81	43.24	98	120.76	92.86
R2	0.801	0.001252	D	0.551	0.25	68.74%	81	20.28	98	53.96	92.69
R3	0.830	0.001297	D	0.767	0.06	92.40%	81	5.11	98	75.16	96.71
R4	0.522	0.000816	D	0.215	0.31	41.09%	81	24.91	98	21.08	87.99

**PROPOSED IC INCLUDES ADDITIONAL PAVEMENT (SEE LOT TABLE)

Proposed Conditions

Drainage Area	Sheet Flow Length (ft)	Sheet Flow Manning's (n)	Sheet Flow Slope ft/ft	Sheet Flow Tc (min)	Shallow Concentrated Flow Length (ft)	Shallow Concentrated Flow Slope ft/ft	Shallow Concentrated Flow Tc (min)	Channel / Pipe Flow Length (ft)	Channel / Pipe Flow Velocity ft/s	Channel / Pipe Flow Tc (min)	Cumulative Tc (min)
A	Accounted For Per TCEQ Letter										
B											
C	100	0.15	0.009	12.8	765.6	0.021	5.0	134	6.90	0.3	18.08
D	100	0.24	0.015	15.4	854.4	0.014	7.3	38.8	2.11	0.3	22.76
E	100	0.24	0.02	13.8	1390	0.031	9.1	298.2	3.34	1.6	24.45
F	100	0.15	0.041	8.2	624	0.055	2.7				10.93
R1	100	0.011	0.015	1.3	1372	0.215	11.7				12.98
R2	100	0.011	0.010	1.5	459.5	0.043	2.5				5.00
R3	100	0.011	0.015	1.3	1629.5	0.020	11.5				13.17
R4	100	0.011	0.012	1.4	485	0.021	3.5				5.00

PROPOSED LOTS WITH BUFFER IC

Drainage Area	Area (ac)	IC (ac)	I.C. %	ADDL. PAVEMENT(ac)**	*TOTAL IC*
1	5.077	3.002	59.15%	0.25	3.252
2	8.651	7.187	83.08%	0.32	7.507
3	5.173	4.634	89.58%	0.25	4.884
4	2.314	1.957	79.44%	0.10	2.057
5	1.321	1.044	79.00%	0.08	1.124
6	5.938	0.000	0.00%	0.01	0.010
7	1.852	0.806	48.79%	0.05	0.856
8	3.153	1.627	51.60%	0.10	1.727
TOTAL	32.579	20.297	62.30%	1.16	21.457

**ADD.. PAVEMENT = PROPOSED DRIVEWAYS, DECELERATION LANE, & PUBLIC SIDEWALKS

Proposed Conditions

Drainage Area	Area (ac)	Area (mi^2)	Curve Number	I.C. %	Cumulative Tc (min)	Lag Time (min)	Q_2 (cfs)	Q_{10} (cfs)	Q_{25} (cfs)	Q_{100} (cfs)
A	8.82	0.013778	95.92	87.76%	Accounted For Per TCEQ Letter					
B	1.79	0.002797	89.67	51.01%						
C	15.77	0.024644	92.59	68.19%	8.1	10.8	50.72	79.04	95.44	119.46
D	5.82	0.009101	82.01	5.97%	22.8	13.7	9.74	19.5	25.34	36.04
R1	1.77	0.002759	92.86	69.77%	3.0	7.8	6.56	9.98	12.09	14.87
R2	0.80	0.001252	92.69	68.74%	5.0	3.0	3.69	5.49	6.72	8.08
SH-29 CULVERT							67.24	109.37	134.26	170.25
E	17.22	0.026901	81.00	0.00%	24.4	14.7	26.40	53.77	70.49	95.28
F	8.44	0.013188	86.05	29.72%	0.9	6.6	23.98	42.6	52.97	68.63
R3	0.83	0.001297	96.71	92.40%	3.2	7.9	3.49	4.98	5.54	7.18
R4	0.52	0.000815	87.99	41.09%	5.0	3.0	1.96	3.21	3.58	4.94
OVERALL DESIGN POINT							76.15	151.27	196.67	262.67

Storm Event	Peak Elevation (ft)	Peak Storage (ac-ft)
2-Year	802.48	1.781
10-Year	803.56	2.876
25-Year	804.13	3.485
100-Year	804.87	4.324

OVERALL DESIGN POINT		
EVENT	EXISTING (CFS)	PROPOSED (CFS)
2-YR	76.40	76.15
10-YR	152.73	151.27
25-YR	198.92	196.67
100-YR	266.91	262.67

NO.	REVISION	DATE

STATE OF TEXAS
MARK A. RAMSEUR
88743
LICENSED PROFESSIONAL ENGINEER
10/24/18

PAPE-DAWSON ENGINEERS
AUSTIN | SAN ANTONIO | HOUSTON | FORT WORTH | DALLAS
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TBPE FIRM REGISTRATION #470 | TBPLS FIRM REGISTRATION #10028801

BLUEBONNET PLAZA
CITY OF GEORGETOWN, TEXAS

TCEQ CONSTRUCTION PLANS
PROPOSED DRAINAGE PLAN

JOB NO. 51002-00
DATE October 2018
DESIGNER ME
CHECKED DRAWN KHT
SHEET 13 OF 19

Date: Oct 15, 2018, 6:31pm User ID: MBurridge
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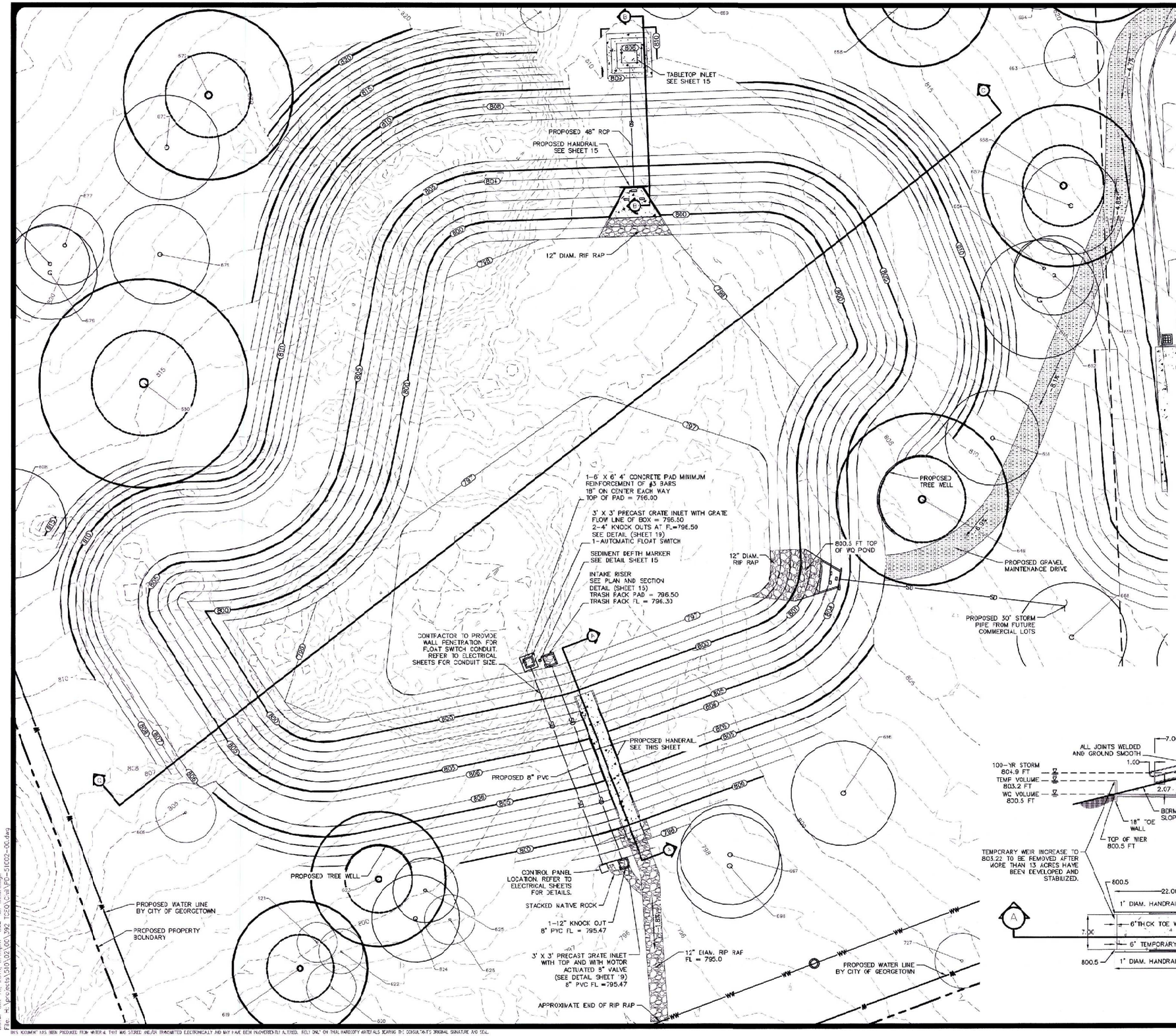


SCALE: 1" = 20'

0' 20' 40' 60'

LEGEND

- PROPOSED PROPERTY BOUNDARY
- 800 EXISTING CONTOUR
- 800 PROPOSED CONTOUR
- PROPOSED COG WATER LINE
- SD PROPOSED STORM DRAIN
- WW PROPOSED WASTEWATER LINE W/ MH
- PROPOSED INLET
- CONCRETE FLATWORK
- RIP RAP
- GRAVEL DRIVE

HERITAGE TREE TO REMAIN

PROTECTED TREE TO REMAIN

WATER QUALITY SUMMARY TABLE	
Required WQ Volume (ft^3) =	73,047
Provided WQ Volume (ft^3) =	100,658

WATER QUALITY (BATCH) POND

Elev. (ft)	Pr. Area (ft^2)	Area (ac)	Incremental Volume (ft^3)	Cumulative Volume (ft^3)	Notes
797	12,506	*0.287096*	0	0	BOTTOM OF POND
798	28,299	*0.649656*	20,403	20,403	
799	31,473	*0.722521*	29,886	50,289	
799.76	33,735	*0.774438*	24,818	75,106	REQUIRED VOL. ELEV.
800.0	34,444	*0.790725*	32,959	83,247	
800.5	36,000	*0.826446*	17,611	100,858	PROVIDED VOL. ELEV.

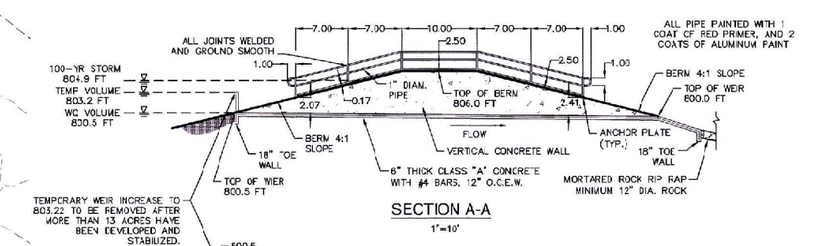
WATER QUALITY DRAW DOWN TIME = 14.4 HOURS

DETENTION POND

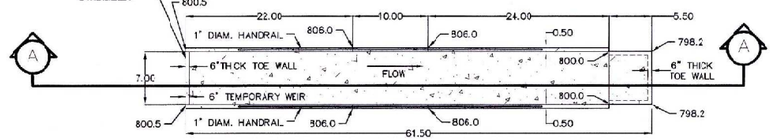
Elev. (ft)	Pr. Area (ft^2)	Area (ac)	Incremental Volume (ft^3)	Cumulative Volume (ft^3)	Notes
800.5	36,000	*0.826446*	0	0	WQ WIER ELEV.
801	37,556	*0.662167*	18,389	18,389	
802	40,798	*0.936593*	39,177	57,566	
803	44,161	*1.013797*	42,480	100,046	
804	47,655	*1.094006*	45,908	145,954	
805	51,249	*1.176515*	49,452	195,406	
806	54,944	*1.261341*	53,097	248,502	TOP OF POND

REQUIRED TEMPORARY SEDIMENT BASIN VOLUME = 4.32 AC-FT (209960 FT^3)
REQUIRED TEMPORARY SEDIMENT BASIN ELEVATION = 803.22 FT

NOTE:
INTAKE RISER TO BE USED AS TEMPORARY SEDIMENT BASIN DEWATERING OUTLET DURING INTERIM CONSTRUCTION ACTIVITIES. SEE SHEET 15



SECTION A-A
1"=10'



OUTLET PLAN VIEW
1"=10'

NOTE: ALL ELEVATIONS SHOWN REPRESENT TOP OF FINISHED CONCRETE.

NO.	REVISION	DATE

STATE OF TEXAS
MARK A. RAMSEUR
88748
LICENSED
PROFESSIONAL ENGINEER
10/16/18

PAPE-DAWSON ENGINEERS
AUSTIN | SAN ANTONIO | HOUSTON | FORT WORTH | DALLAS
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TBPE FIRM REGISTRATION #470 | TBPLS FIRM REGISTRATION #10009601

BLUEBONNET PLAZA
CITY OF GEORGETOWN, TEXAS
TCEQ CONSTRUCTION PLANS
TEMP. SEDIMENT BASIN & BATCH POND PLAN

JOB NO. 51002-00
DATE October 2018
DESIGNER ME
CHECKED DRAWN KHT
SHEET 14 OF 19

Date: Oct 15, 2018, 6:04pm User ID: Mburciaga
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Texas Commission on Environmental Quality

TSS Removal Calculations 04-20-2009

Project Name: **Bluebonnet Plaza**
Date Prepared: **10/9/2018**

Additional information is provided for cells with a red triangle in the upper right corner. Place the cursor over the cell.
Text shown in blue indicate location of instructions in the Technical Guidance Manual - RG-348.
Characters shown in red are data entry fields.
Characters shown in black (Bold) are calculated fields. Changes to these fields will remove the equations used in the spreadsheet.

. The Required Load Reduction for the total project: Calculations from RG-348 Pages 3-27 to 3-30

Page 3-29 Equation 3.3: $L_M = 27.2(A_N \times P)$

where $L_{M\ TOTAL\ PROJECT}$ = Required TSS removal resulting from the proposed development = 85% of increased load
A_N = Net increase in impervious area for the project
P = Average annual precipitation, inches

Site Data Determine Required Load Removal Based on the Entire Project

County =	Williamson	
Total drainage area included in plan * =	44.55	acres
Predevelopment impervious area within the limits of the plan * =	0.00	acres
Total post-development impervious area within the limits of the plan* =	25.026	acres
Total post-development impervious cover fraction * =	0.56	
P =	32	inches
$L_{M\ TOTAL\ PROJECT}$ =	23169	lbs. TSS CALCS FOR 85% REMOVAL
The values entered in these fields should be for the total project area. (All Basi	1	
Number of drainage basins / outfalls areas leaving the plan area =	1	

. Drainage Basin Parameters (This information should be provided for each basin):

Drainage Basin/Outfall Area No. =	A	
Total drainage basin/outfall area =	33.957	acres
Predevelopment impervious area within drainage basin/outfall area =	0.00	acres
Post-development impervious area within drainage basin/outfall area =	13.352	acres
Post-development impervious fraction within drainage basin/outfall area =	0.39	
$L_{M\ THIS\ BASIN}$ =	12361	lbs.

. Indicate the proposed BMP Code for this basin.

Proposed BMP =	Batch Detention	
Removal efficiency =	91	percent

. Calculate Maximum TSS Load Removed (L_R) for this Drainage Basin by the selected BMP Type.

RG-348 Page 3-33 Equation 3.7: $L_R = (\text{BMP efficiency}) \times P \times (A_I \times 34.6 + A_P \times 0.54)$ P = RAINFALL (IN.)

where:
A_C = Total *On-Site* drainage area in the BMP catchment area
A_I = Total *On-Site* impervious area proposed in the BMP catchment area
A_P = Pervious area remaining in the BMP catchment area
L_R = TSS Load removed from this catchment area by the proposed BMP

A_C =	23.571	acres
A_I =	13.352	acres
A_P =	10.219	acres
L_R =	13614	lbs

. Calculate Fraction of Annual Runoff to Treat the drainage basin / outfall area

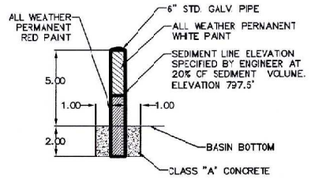
Desired $L_{M\ THIS\ BASIN}$ =	12361	lbs.
F =	0.91	F = L_M/L_R Must be <1.0

. Calculate Capture Volume required by the BMP Type for this drainage basin / outfall area. Calculations from RG-348 Pages 3-34 to 3-36

Rainfall Depth =	1.80	inches
Post Development Runoff Coefficient =	0.40	
On-site Water Quality Volume =	61182	cubic feet

Calculations from RG-348 Pages 3-36 to 3-37

Off-site area draining to BMP =	10.39	acres
Off-site Impervious cover draining to BMP =	0.00	acres
Impervious fraction of off-site area =	0.00	
Off-site Runoff Coefficient =	0.02	
Off-site Water Quality Volume =	1357	cubic feet
Storage for Sediment =	12508	cubic feet
Total Capture Volume (required water quality volume(s) x 1.20) =	75047	cubic feet



DETENTION POND SECTION C-C

1"=30'

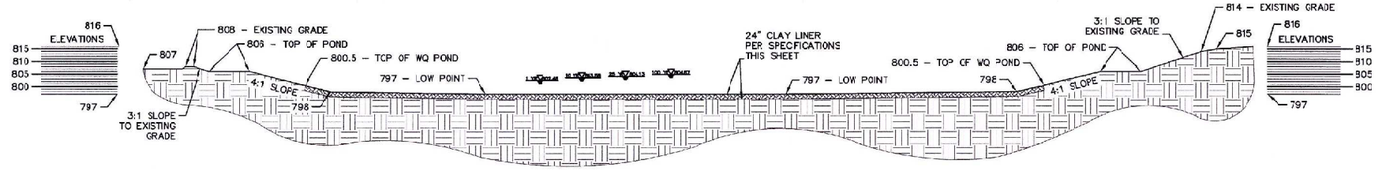


Table 3-6 Clay Liner Specifications (COA, 2004)

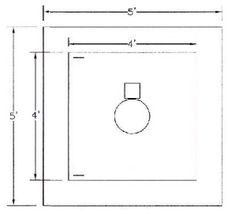
Property	Test Method	Unit	Specification
Permeability	ASTM D-2434	cm/sec	1×10^{-6}
Plasticity Index of Clay	ASTM D-423 & D-424	%	Not less than 15
Liquid Limit of Clay	ASTM D-2216	%	Not less than 30
Clay Particles Passing	ASTM D-422	%	Not less than 30
Clay Compaction	ASTM D-2216	%	95% of Standard Proctor Density

TSS CALCS FOR DRAINAGE TO WOLF RANCH POND

County =	Williamson	
Total drainage area included in plan * =	12.55	acres
Predevelopment impervious area within the limits of the plan * =	0.00	acres
Total post-development impervious area within the limits of the plan* =	8.15	acres
Total post-development impervious cover fraction * =	0.65	
P =	32.00	inches
$L_{M\ TOTAL\ PROJECT}$ =	7552	lbs.
The values entered in these fields should be for the total project area. (All Basi	1	
Number of drainage basins / outfalls areas leaving the plan area =	1	

2. Drainage Basin Parameters (This information should be provided for each basin):

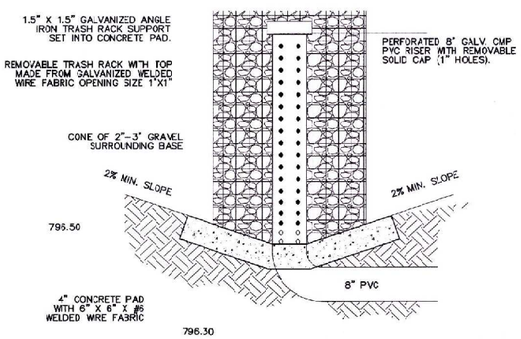
Drainage Basin/Outfall Area No. =	B	*GOING TO WOLF RANCH POND*
Total drainage basin/outfall area =	10.638	acres
Predevelopment impervious area within drainage basin/outfall area =	0.00	acres
Post-development impervious area within drainage basin/outfall area =	8.165	acres
Post-development impervious fraction within drainage basin/outfall area =	0.73	
$L_{M\ THIS\ BASIN}$ =	7503	lbs.



INTAKE RISER PLAN VIEW DETAIL

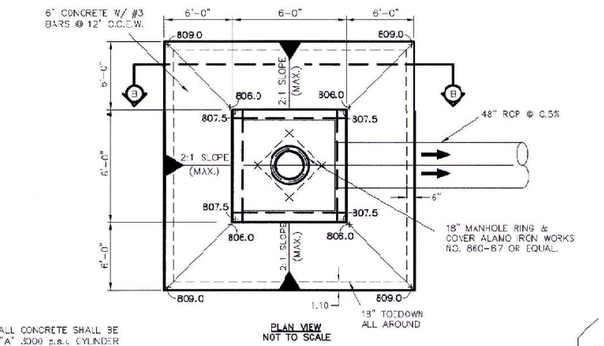
NTS

NOTE:
INTAKE RISER TO BE USED AS TEMPORARY SEDIMENT BASIN DEWATERING OUTLET DURING INTERIM CONSTRUCTION ACTIVITIES.



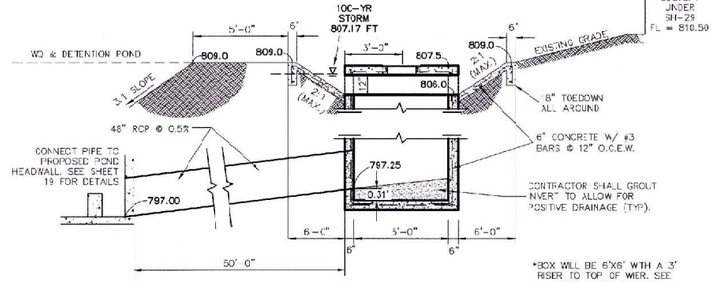
INTAKE RISER SECTION VIEW DETAIL

NTS

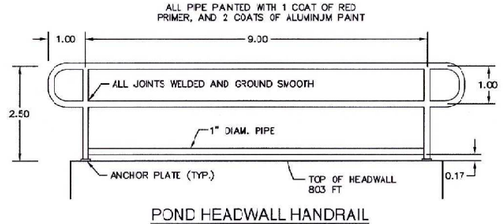


PLAN VIEW
NOT TO SCALE

NOTE: ALL CONCRETE SHALL BE CLASS "A" 3000 p.s.i. CYLINDER STRENGTH IN 28 DAYS.



SECTION B-B
NOT TO SCALE



POND HEADWALL HANDRAIL
1"=2' (EXCEPT PIPE = 1" DIAM.)

DATE | NO. | REVISION

STATE OF TEXAS
MARK A. RAMSEUR
88748
LICENSED PROFESSIONAL ENGINEER
10/15/18

PAPE-DAWSON ENGINEERS
AUSTIN | SAN ANTONIO | HOUSTON | FORT WORTH | DALLAS
10801 N MOPAC EXPY, BLDG 3, STE 200 | AUSTIN, TX 78759 | 512.454.8711
TBPE FIRM REGISTRATION #470 | TBPLS FIRM REGISTRATION #10028801

BLUEBONNET PLAZA
CITY OF GEORGETOWN, TEXAS
TCEQ CONSTRUCTION PLANS
POND DETAILS

JOB NO. 51002-00
DATE October 2018
DESIGNER MB
CHECKED ____ DRAWN MHT
SHEET 15 OF 19

Date: Oct 15, 2018, 5:48pm User ID: MBurciaga
File: H:\projects\51002\00\392 CEQ\CIVIL\PD-51002-00.dwg

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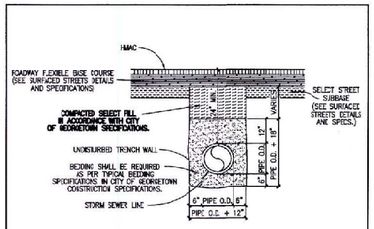


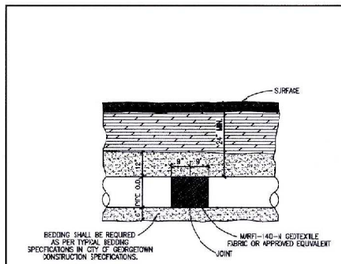
NOTES:

1. DENSITY TESTS SHALL BE TAKEN IN ACCORDANCE WITH THE CITY OF GEORGETOWN CONSTRUCTION SPECIFICATIONS AND STANDARDS.
2. CONTRACTOR OR ENGINEER MAY USE FLOWABLE BACKFILL AS AN ALTERNATE BACKFILL MATERIAL (SEE C9 FLOWABLE BACKFILL FOR THE SPECIFICATION).

TRENCH WIDTHS
*PIPE LESS THAN 20" DIAMETER
1'-0" + PIPE O.D.
*20" DIAMETER PIPE AND LARGER
2'-0" + PIPE O.D.

The Architect/Engineer assumes responsibility for appropriate use of this standard.

ADOPTED 8/21/2006		
CITY OF GEORGETOWN CONSTRUCTION STANDARDS AND DETAILS	SD41	
TRENCH AND EMBEDMENT DETAIL UNDER PROPOSED ROADWAY FOR STORM SEWER	DATE 1/2006	

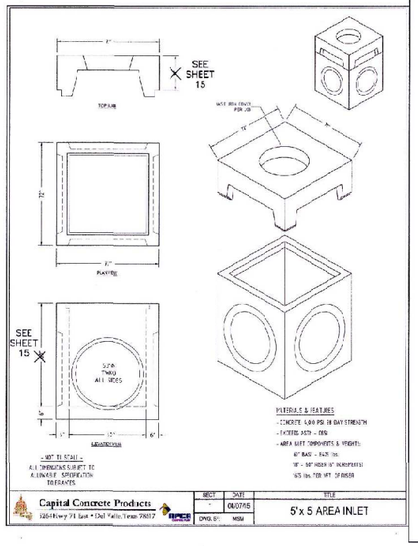


NOTES

1. PIPE SHALL BE REINFORCED CONCRETE RIPE CLASS III UNLESS THE DEPTH OF PIPE REQUIRES A STRONGER CLASS.
2. ALL FITTINGS AND WYES SHALL BE MANUFACTURED AND NOT CONSTRUCTED ON THE PROJECT WITHOUT PRIOR APPROVAL FROM THE CITY.
3. ALL JOINTS SHALL BE WRAPPED WITH MARFI-140-N GEOTEXTILE FABRIC OR APPROVED EQUIVALENT. EACH JOINT SHALL BE WRAPPED WITH 18" WIDE FABRIC CENTERED ON THE JOINT.

The Architect/Engineer assumes responsibility for appropriate use of this standard.

ADOPTED 8/21/2006		
CITY OF GEORGETOWN CONSTRUCTION STANDARDS AND DETAILS	SD42	
TRENCH AND EMBEDMENT DETAIL (PROFILE) FOR STORM SEWER	DATE 1/2006	

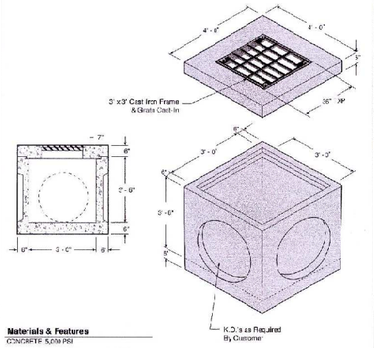


Capital Concrete Products
12544 Hwy 71 East • Del Valle, Texas 78617

DRCT	DATE
DWG. BY	08/2015
MSM	

5'x 5 AREA INLET

Precast Drainage Structures



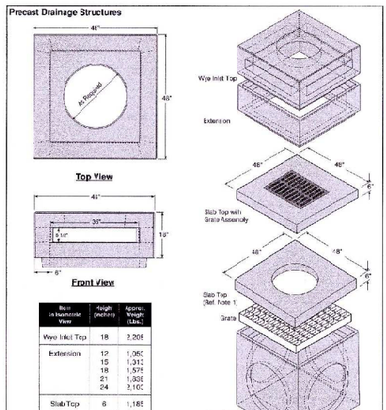
Materials & Features
CONCRETE 5,000 PSI
REINFORCING per ASTM A615 or A-185
H20 LOADING
MAXIMUM PIPE SIZE 57" I.D. R.C.P.
TOP SLAB WEIGHT: 1,80 Lbs.
JUNCTION BOX WEIGHT: 4,310 Lbs.
EXTENSION SECTION S AVAILABLE

-No Scale-
All dimensions subject to allowable specification tolerances.

TITLE	PLANT	STATE	SECTION PART	DATE
3' x 3' Standard Catch Basin	Quad Parts	TX	6.0	11-12-15

FORTERRA

Precast Drainage Structures



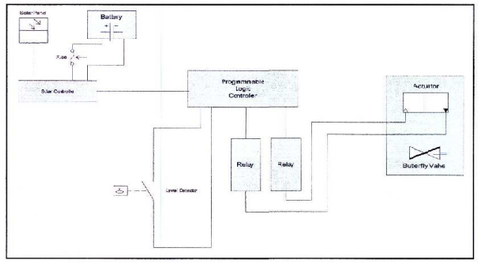
Item in Isometric View	Height (inches)	Approx. Weight (Lbs.)
Wye Inlet Top	18	3,200
Extension	12	1,060
	15	1,310
	18	1,575
	21	1,800
	24	2,100
Slab Top	6	1,185
Grate	3 1/4	270
Box	Varies	

Note:
1.) Customer to specify opening size or cast iron ring and cover

-No Scale-
All dimensions subject to allowable specification tolerances.

TITLE	PLANT	STATE	SECTION NO.	DATE
Top Options for 3' x 3' Precast Box	Sand Plant Houston	TX	S1	11-12-15

FORTERRA

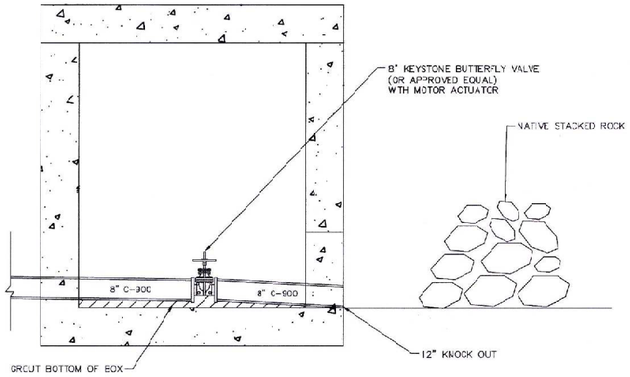


CONTROLLER CIRCUIT DIAGRAM

CONTROLLER NOTES:
1. REFER TO THE WATER POLLUTION ABATEMENT PLAN FOR LOGIC CONTROLLER CYCLE OVERVIEW.
2. CLEARLY VISIBLE ALARM SYSTEM TO BE PROVIDED TO INDICATE SYSTEM MALFUNCTION.
3. SIGN TO BE POSTED WITH PHONE NUMBERS OF THE OWNER AND APPROPRIATE TCEQ REGIONAL OFFICE.

LOGIC CONTROLLER CYCLE OVERVIEW
1. CASE 1: A SINGLE RAIN EVENT FILLS THE BATCH DETENTION BASIN. THE BASIN HOLDS THE DIVERTED STORM WATER FOR THE DETENTION TIME (12 HOURS) AND THE RELEASES THE WATER. ONCE THE BATCH DETENTION BASIN IS EMPTY, A DELAY OF 2 HOURS IS STARTED TO ALLOW THE BASIN TO COMPLETELY DRAIN, AND THEN A CLOSE SIGNAL IS SENT TO THE ACTUATOR TO CLOSE THE VALVE.
2. CASE 2: A SINGLE RAIN EVENT OCCURS, BUT DOES NOT COMPLETELY FILL THE BATCH DETENTION BASIN. THE BASIN HOLDS THE WATER FOR THE DETENTION PERIOD (12 HOURS), AND THEN RELEASES IT. ONCE THE BATCH DETENTION BASIN IS EMPTY, A DELAY OF 2 HOURS IS STARTED TO ALLOW THE BASIN TO COMPLETELY DRAIN, AND THEN A CLOSE SIGNAL IS SENT TO THE ACTUATOR TO CLOSE THE VALVE.
3. CASE 3: A SINGLE RAIN EVENT FILLS THE BATCH DETENTION BASIN UNDER THE "TRIP POINT OF THE LEVEL SENSOR. THE LEVEL SENSOR DOES NOT TRIP. THE CAPTURED WATER IS HELD UNTIL IT INFILTRATES / EVAPORATES OR S JOINED BY STORM WATER FROM A SUBSEQUENT STORM.
4. CASE 4: BEGINS THE SAME AS CASE 1. DURING THE DRAWDOWN PERIOD, ONE OR MORE ADDITIONAL RAIN EVENTS OCCUR CAUSING ADDITIONAL WATER TO ENTER THE BATCH DETENTION BASIN. THE VALVE REMAINS OPEN AND THE ADDITIONAL WATER VOLUME IS DRAINED. ONCE THE BATCH DETENTION BASIN IS EMPTY, A DELAY OF 2 HOURS IS STARTED TO ALLOW THE BASIN TO COMPLETELY DRAIN, AND THEN A CLOSE SIGNAL IS SENT TO THE ACTUATOR TO CLOSE THE VALVE.
5. CASE 5: BEGINS THE SAME AS CASE 2. DURING THE DRAWDOWN PERIOD, ONE OR MORE ADDITIONAL RAIN EVENTS CAN OCCUR CAUSING ADDITIONAL WATER TO ENTER THE BASIN. THE VALVE REMAINS OPEN AND THE ADDITIONAL WATER VOLUME IS DRAINED. ONCE THE BATCH DETENTION BASIN IS EMPTY, A DELAY OF 2 HOURS IS STARTED TO ALLOW THE BASIN TO COMPLETELY DRAIN, AND THEN A CLOSE SIGNAL IS SENT TO THE ACTUATOR TO CLOSE THE VALVE.
6. CASE 6: INTERMITTENT NUISANCE WATER LESS THAN THE FLOAT ON ELEVATION. TO ALLEVIATE SMALL FLOWS DUE TO IRRIGATION OUTSIDE OF STORM EVENTS, THE CONTROLLER WILL OPEN THE VALVE ONCE A WEEK FOR TWO HOURS TO DRAIN ANY NUISANCE WATER.

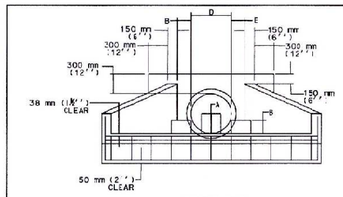
Batch Detention Pond Controller Information		
Component	**Description**	**Voltage**
Power System	Solar Charged 12 VDC Battery (Model MK Powered 8GL1) (Or approved equal)	
Logic Controller	IDEC FL1C-H12RCE (Or approved equal)	:2
Parts Enclosure	Southwest Photovoltaic Model B8G-L (15.75" wide x 9.75" deep x 11.75" tall) (Or approved equal)	
Nature of Event Sensing	Anchor Scientific Float Switch (Or approved equal)	
Valve Type	Keystone 4" Butterfly Valve with over torque sensors and mechanical hand crank for physical override if necessary. Able to withstand 100 psi minimum. (Or approved equal)	
Actuator	EPI-6 12 VDC. Able to withstand 100 psi minimum (Or approved equal)	:2
Power Consumption (actuator, controller, relay, PLC)	242.58 W, 46.5 W-hours	



3' X 3' PRECAST GRATE INLET SECTION

NTS

NOTE:
CONTROL VALVE TO BE MOTOR ACTUATED VALVE. VALVE SHALL BE WIRED TO A CONTROLLER THAT OPENS VALVE 12 HOURS AFTER RAINFALL EVENT AND CLOSES VALVE ONCE POND HAS DRAINED DRY. CONTROLLER SHALL INCLUDE PROVISIONS FOR A MANUAL OVERRIDE SWITCH.



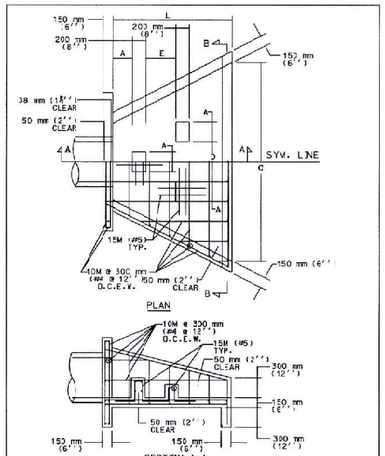
SECTION B-E

NOTES:
1. ALL CONCRETE SHALL BE TYPE "C" AS PER SPEC. 4035. CONCRETE FOR STRUCTURES.
2. CHAMFER ALL EXTERNAL VISIBLE CORNERS.
3. DISSIPATOR BLOCKS REQUIRED ON DISCHARGE HEADWALLS ONLY.

D	457 mm (18")	533 mm (21")	610 mm (24")	685 mm (27")	765 mm (30")	838 mm (33")	914 mm (36")	1,067 mm (42")	1,219 mm (48")	1,372 mm (54")	1,524 mm (60")	
A	225 mm (9")	250 mm (10")	300 mm (12")	350 mm (14")	375 mm (15")	400 mm (16")	450 mm (18")	525 mm (21")	600 mm (24")	675 mm (27")	750 mm (30")	
B	150 mm (6")	175 mm (7")	200 mm (8")	225 mm (9")	250 mm (10")	275 mm (11")	300 mm (12")	350 mm (14")	400 mm (16")	450 mm (18")	500 mm (20")	
C	2.29 m (90")	2.67 m (105")	3.05 m (120")	3.43 m (135")	3.81 m (150")	4.19 m (165")	4.57 m (180")	5.33 m (210")	6.10 m (240")	6.86 m (270")	7.62 m (300")	
L	1.37 m (54")	1.50 m (63")	1.83 m (72")	2.06 m (81")	2.29 m (90")	2.51 m (99")	2.74 m (108")	3.20 m (126")	3.66 m (144")	4.11 m (162")	4.57 m (180")	
E	300 mm (12")	350 mm (14")	400 mm (16")	450 mm (18")	500 mm (20")	550 mm (22")	600 mm (24")	700 mm (28")	800m (32")	900 mm (36")	1000 mm (40")	

DIMENSIONS IN MILLIMETERS, METERS AND (INCHES).
DISCHARGE VELOCITIES GREATER THAN 3 METERS/SECOND (10 fps) REQUIRE ROCK OUTLET PROTECTION.

CITY OF AUSTIN DEPARTMENT OF WATERSHED PROTECTION AND DEVELOPMENT REVIEW		STANDARD HEADWALL AND ENERGY DISSIPATORS	
RECORD COPY SIGNED BY BILL GARDNER	08/30/07 ADOPTED	THE ARCHITECT/ENGINEER ASSUMES RESPONSIBILITY FOR APPROPRIATE USE OF THIS STANDARD.	STANDARD NO. 508S-13 2 OF 2



CITY OF AUSTIN DEPARTMENT OF WATERSHED PROTECTION AND DEVELOPMENT REVIEW		STANDARD HEADWALL AND ENERGY DISSIPATORS	
RECORD COPY SIGNED BY BILL GARDNER	08/30/07 ADOPTED	THE ARCHITECT/ENGINEER ASSUMES RESPONSIBILITY FOR APPROPRIATE USE OF THIS STANDARD.	STANDARD NO. 508S-13 1 OF 2

NO.	REVISION	DATE

STATE OF TEXAS
MARK A. RAMSEUR
88746
LICENSED
PROFESSIONAL ENGINEER

PAPE-DAWSON ENGINEERS
AUSTIN | SAN ANTONIO | HOUSTON | FORT WORTH | DALLAS
10801 N MOPAC EXPY, BLDG 3, STE 200 | AUSTIN, TX 78759 | 512.454.8711
TBPE FIRM REGISTRATION #470 | TBPLS FIRM REGISTRATION #10028801

BLUEBONNET PLAZA
CITY OF GEORGETOWN, TEXAS

TCEQ CONSTRUCTION PLANS
DRAINAGE DETAILS

JOB NO. 51002-00
DATE October 2018
DESIGNER MB
CHECKED ____ DRAWN KHT
SHEET 19 OF 19

Date: Oct 15, 2018, 5:49pm User ID: MBurciaga
File: H:\projects\510\02\00\392 TCEQ\Civil\DT-51002-00.dwg

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RIVERY POND A BASIN (EAPP ID NO. 11-02041701)

EXISTING (UNDEVELOPED) DRAINAGE AREA CALCULATIONS

25YR

Subcatchment UD-1: Undeveloped DA UD-1

Runoff = 282.66 cfs @ 2.01 hrs, Volume= 22.864 af

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-5.00 hrs, dt= 0.01 hrs
Austin 3-hr 25-yr Rainfall=5.40"

Area (ac)	CN	Description
10.760	98	River Hills Subdiv. IC
68.980	80	>75% Grass cover, Good, HSG D
79.740	82	Weighted Average

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
35.4	2,200	0.0250	1.0		Lag/CN Method,

Subcatchment UD-2: Undeveloped DA UD-2

Runoff = 97.43 cfs @ 1.97 hrs, Volume= 7.406 af

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-5.00 hrs, dt= 0.01 hrs
Austin 3-hr 25-yr Rainfall=5.40"

Area (ac)	CN	Description
27.390	80	>75% Grass cover, Good, HSG D

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
31.3	2,160	0.0350	1.1		Lag/CN Method,

Subcatchment UD-3: Undeveloped DA UD-3

Runoff = 57.34 cfs @ 1.94 hrs, Volume= 4.067 af

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-5.00 hrs, dt= 0.01 hrs
Austin 3-hr 25-yr Rainfall=5.40"

Area (ac)	CN	Description
18.370	80	>75% Grass cover, Good, HSG D

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
29.6	2,000	0.0350	1.1		Lag/CN Method,

Subcatchment UD-4: Undeveloped DA UD-4

Runoff = 76.05 cfs @ 1.98 hrs, Volume= 5.802 af

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-5.00 hrs, dt= 0.01 hrs
Austin 3-hr 25-yr Rainfall=5.40"

Area (ac)	CN	Description
21.460	80	>75% Grass cover, Good, HSG D

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
32.5	2,200	0.0350	1.2		Lag/CN Method,

100YR

Subcatchment UD-1: Undeveloped DA UD-1

Runoff = 381.58 cfs @ 2.01 hrs, Volume= 31.797 af

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-5.00 hrs, dt= 0.01 hrs
Austin 3-hr 100-yr Rainfall=6.88"

Area (ac)	CN	Description
10.760	98	River Hills Subdiv. IC
68.980	80	>75% Grass cover, Good, HSG D
79.740	82	Weighted Average

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
35.4	2,200	0.0250	1.0		Lag/CN Method,

Subcatchment UD-2: Undeveloped DA UD-2

Runoff = 132.98 cfs @ 1.97 hrs, Volume= 10.421 af

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-5.00 hrs, dt= 0.01 hrs
Austin 3-hr 100-yr Rainfall=6.88"

Area (ac)	CN	Description
27.390	80	>75% Grass cover, Good, HSG D

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
31.3	2,160	0.0350	1.1		Lag/CN Method,

Subcatchment UD-3: Undeveloped DA UD-3

Runoff = 91.60 cfs @ 1.94 hrs, Volume= 6.869 af

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-5.00 hrs, dt= 0.01 hrs
Austin 3-hr 100-yr Rainfall=6.88"

Area (ac)	CN	Description
18.370	80	>75% Grass cover, Good, HSG D

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
29.6	2,000	0.0350	1.1		Lag/CN Method,

Subcatchment UD-4: Undeveloped DA UD-4

Runoff = 102.48 cfs @ 1.98 hrs, Volume= 8.104 af

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-5.00 hrs, dt= 0.01 hrs
Austin 3-hr 100-yr Rainfall=6.88"

Area (ac)	CN	Description
21.460	80	>75% Grass cover, Good, HSG D

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
32.5	2,200	0.0350	1.2		Lag/CN Method,

MIDDLE FORK SAN GABRIEL RIVER

NORTH FORK SAN GABRIEL RIVER

OAK HOLLOW ROAD

HILLVIEW DRIVE

RIVER HILLS DRIVE

IH 35 FRONTAGE ROAD

UD-1

UD-2

UD-3

UD-4

EXISTING
FLOW TO CULVERT:
Q25=282.96cfs
Q100=381.58cfs

LEGEND

MH	PROPOSED STORM SEWER MANHOLE
CI	PROPOSED CURB INLET
RCP	PROPOSED REINFORCED CONCRETE PIPE
CMP	PROPOSED CORRUGATED METAL PIPE (ALUMINIZED)
B5	DRAINAGE AREA DESIGNATION
	DRAINAGE AREA BOUNDARY

THE RIVERY - PHASE ONE

SUBDIVISION CONSTRUCTION PLANS

UNDEVELOPED DRAINAGE AREA MAP

RIVERY - CONSTRUCTION DRAWINGS - UDG JOB NO. 99-075.010

REVISIONS

3660 STONERIDGE ROAD
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AUSTIN, TEXAS 78746
PHONE: (512) 347-0040
FAX: (512) 347-1311
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WWW: WWW.UDG.COM

Urban Design Group

BRIANZ. RUNYEN
85076
LICENSED PROFESSIONAL ENGINEER
5/23/02

SCALE:
1" = 150'
0 1/2 1
IF THIS BAR DOES NOT MEASURE 1" THEN DRAWING IS NOT TO SCALE

05/23/2002

DRAWING
GD00c

SHEET 9 470 SETS

JOB NO. 99-075.010

RECORD DRAWINGS

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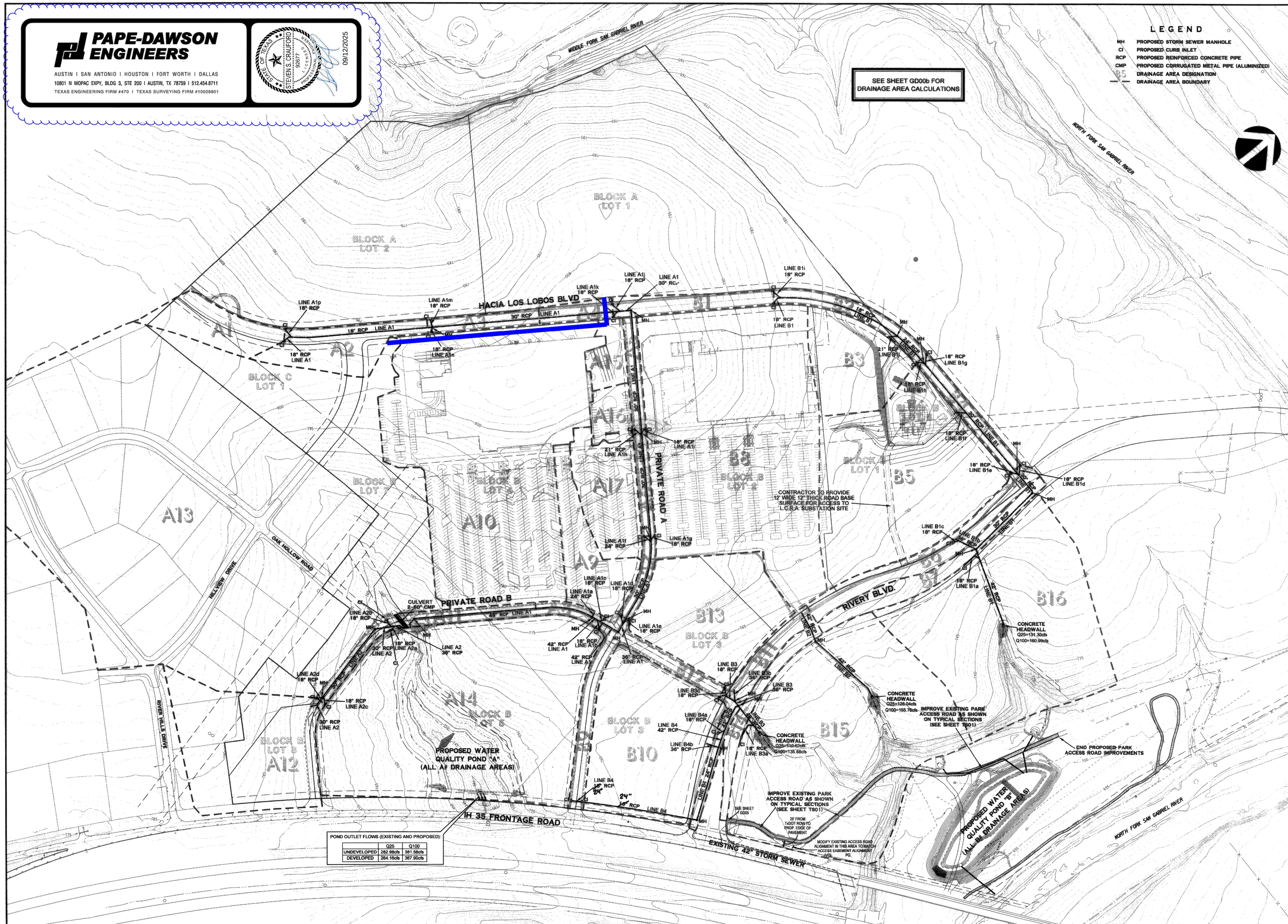
PAPE-DAWSON ENGINEERS
AUSTIN | SAN ANTONIO | HOUSTON | FORT WORTH | DALLAS
10801 N MOPAC EXPY, BLDG 3, STE 200 | AUSTIN, TX 78759 | 512.454.8711
TEXAS ENGINEERING FIRM #470 | TEXAS SURVEYING FIRM #10028801

STATE OF TEXAS
STEVEN S. CRAUFORD
92677
LICENSED PROFESSIONAL ENGINEER
09/12/2025



POND OUTLET FLOWS (EXISTING AND PROPOSED):

	Q25	Q100
UNDEVELOPED	282.96cfs	381.58cfs
DEVELOPED	264.16cfs	367.90cfs

LEGEND

MH	PROPOSED STORM SEWER MANHOLE
CI	PROPOSED CURB INLET
RCP	PROPOSED REINFORCED CONCRETE PIPE
CMP	PROPOSED CORRUGATED METAL PIPE (ALUMINIZED)
B5	DRAINAGE AREA DESIGNATION
	DRAINAGE AREA BOUNDARY

THE RIVERY - PHASE ONE
SUBDIVISION CONSTRUCTION PLANS
OVERALL DRAINAGE PLAN AND PARK ACCESS ROAD IMPROVEMENTS

RIVERY - CONSTRUCTION DRAWINGS - UDG JOB NO. 99-075.010

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UDG Urban Design Group

STATE OF TEXAS
BRIAN E. RUNYEN
85573
LICENSED PROFESSIONAL ENGINEER
1/23/02

SCALE:
1" = 150'
0 1/2 1
IF THIS BAR DOES NOT MEASURE 1" THEN DRAWING IS NOT TO SCALE

DRAWING
GD00
SHEET 7 468 ITS

JOB NO. 99-075.010

05/23/2002

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RECORD DRAWINGS

POND A DRAINAGE AREAS

25 YR

100 YR

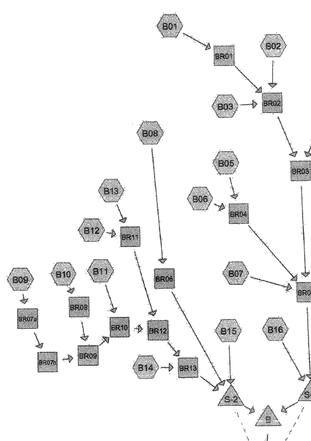
POND B DRAINAGE AREAS

25 YR

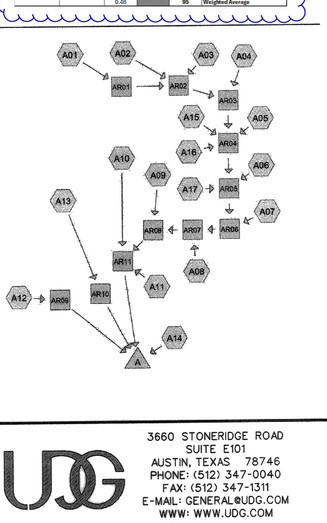
100 YR

25 YR

100 YR

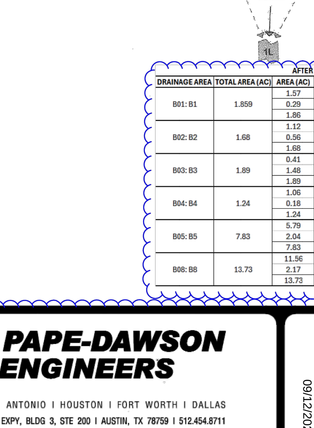


AFTER WRP EXPANSION				
DRAINAGE AREA	TOTAL AREA (AC)	AREA (AC)	CN	DESCRIPTION
B01: B1	1.859	1.57	98	Paved roads w/ curbs & sewers
		0.29	80	> 75% Grass cover, Good, HSG D
		1.86	95	Weighted Average
B02: B2	1.68	1.12	98	Paved roads w/ curbs & sewers
		0.56	80	> 75% Grass cover, Good, HSG D
		1.68	92	Weighted Average
B03: B3	1.89	0.41	98	Paved roads w/ curbs & sewers
		1.48	80	> 75% Grass cover, Good, HSG D
		1.89	84	Weighted Average
B04: B4	1.24	1.06	98	Paved roads w/ curbs & sewers
		0.18	80	> 75% Grass cover, Good, HSG D
		1.24	95	Weighted Average
B05: B5	7.83	5.79	98	Paved roads w/ curbs & sewers
		2.04	80	> 75% Grass cover, Good, HSG D
		7.83	93	Weighted Average
B08: B8	13.73	11.56	98	Paved roads w/ curbs & sewers
		2.17	80	> 75% Grass cover, Good, HSG D
		13.73	95	Weighted Average

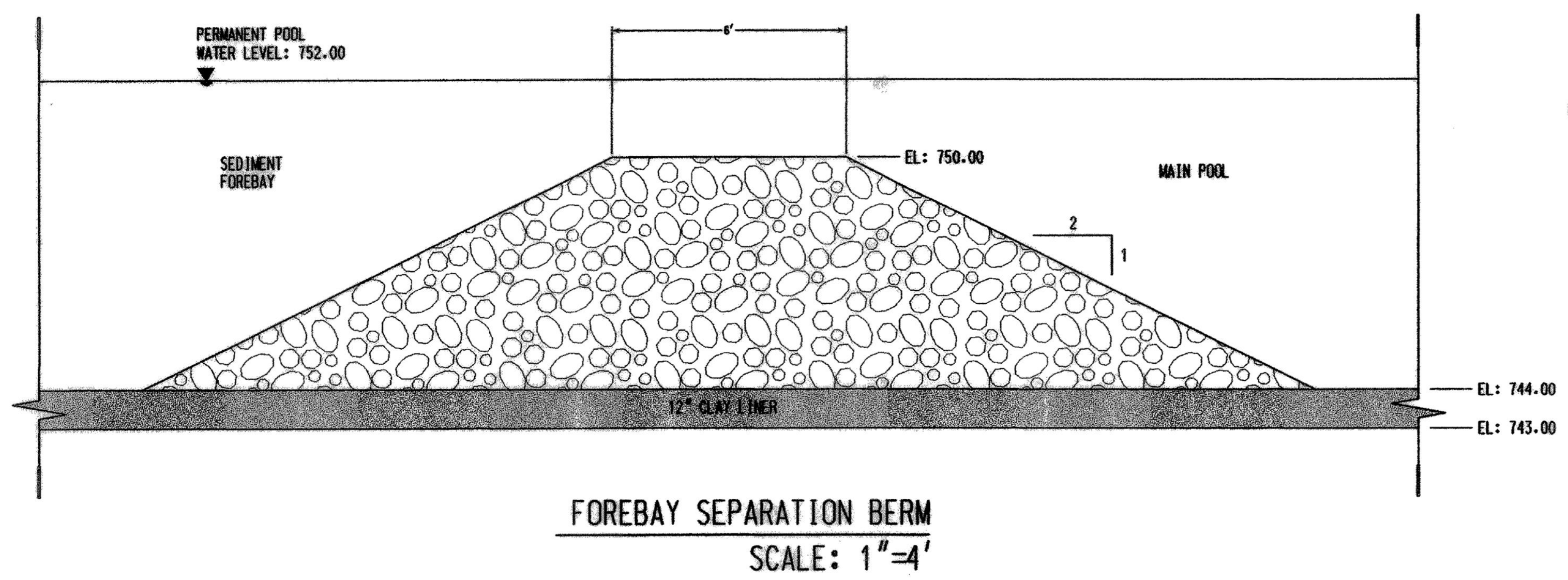


AFTER WRP EXPANSION				
DRAINAGE AREA	TOTAL AREA (AC)	AREA (AC)	FRACTION	CN	DESCRIPTION
A1	2.40	0.86	35.8	98	Paved roads w/ curbs & sewers
		1.54	64.2	73	Brush, Good, HSG D
		2.40		82	Weighted Average
A2	2.435	1.07	44.1	98	Paved roads w/ curbs & sewers
		1.36	55.8	73	Brush, Good, HSG D
		2.43		84	Weighted Average
A3	1.142	0.91	79.8	98	Paved roads w/ curbs & sewers
		0.23	20.2	80	> 75% Grass cover, Good, HSG D
		1.14		94	Weighted Average
A4	0.48	0.41	85.1	98	Paved roads w/ curbs & sewers
		0.07	14.9	80	> 75% Grass cover, Good, HSG D
		0.48		95	Weighted Average

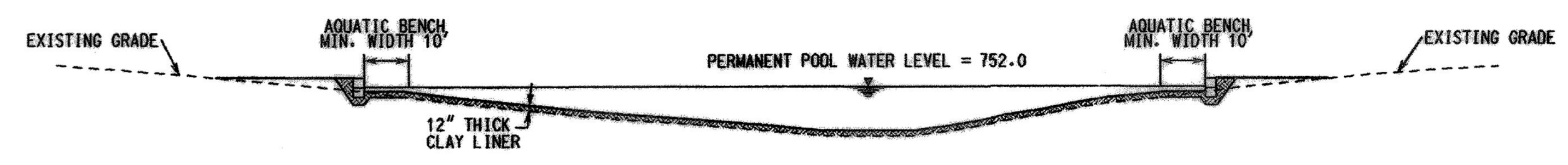




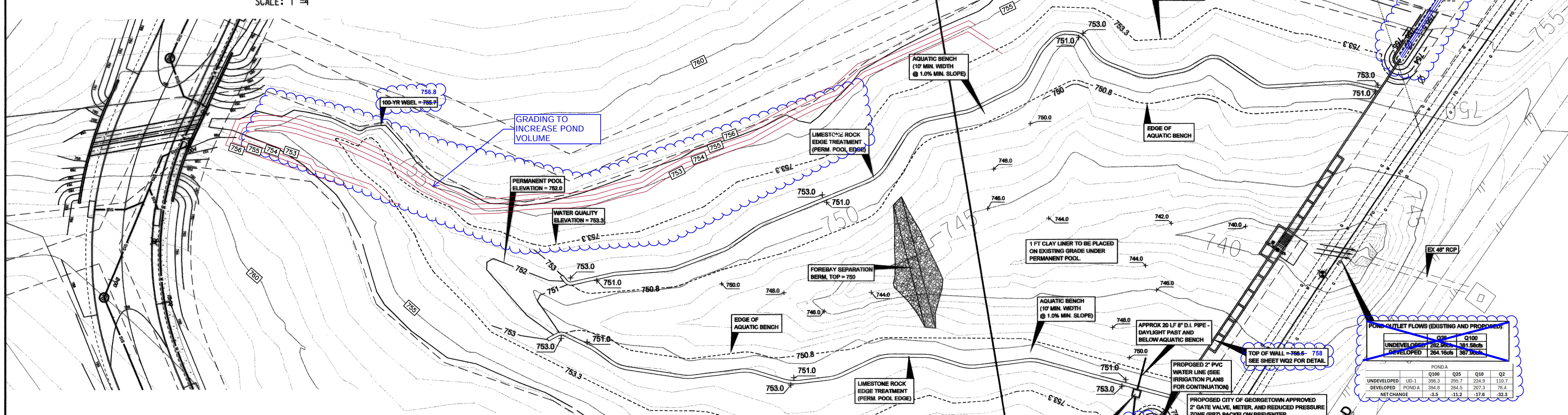
AFTER WRP EXPANSION				
DRAINAGE AREA	TOTAL AREA (AC)	AREA (AC)	CN	DESCRIPTION
B01: B1	1.859	1.57	98	Paved roads w/ curbs & sewers
		0.29	80	> 75% Grass cover, Good, HSG D
		1.86	95	Weighted Average
B02: B2	1.68	1.12	98	Paved roads w/ curbs & sewers
		0.56	80	> 75% Grass cover, Good, HSG D
		1.68	92	Weighted Average
B03: B3	1.89	0.41	98	Paved roads w/ curbs & sewers
		1.48	80	> 75% Grass cover, Good, HSG D
		1.89	84	Weighted Average
B04: B4	1.24	1.06	98	Paved roads w/ curbs & sewers
		0.18	80	> 75% Grass cover, Good, HSG D
		1.24	95	Weighted Average
B05: B5	7.83	5.79	98	Paved roads w/ curbs & sewers
		2.04	80	> 75% Grass cover, Good, HSG D
		7.83	93	Weighted Average
B08: B8	13.73	11.56	98	Paved roads w/ curbs & sewers
		2.17	80	> 75% Grass cover, Good, HSG D
		13.73	95	Weighted Average



FOREBAY SEPARATION BERM
SCALE: 1"=4'



WATER QUALITY POND "A" (SECTION B)
SCALE: 1"=30'



POND OUTLET FLOWS (EXISTING AND PROPOSED):

	Q25	Q100
UNDEVELOPED	282.96cfs	381.58cfs
DEVELOPED	264.16cfs	367.90cfs

POND A		Q100	Q25	Q10	Q2
UNDEVELOPED	UD-1	398.3	295.7	224.9	110.7
DEVELOPED	POND A	394.8	284.5	207.3	78.4
NET CHANGE		-3.5	-11.2	-17.6	-32.3

POND A WATER QUALITY VOLUME (TNRCC EDWARDS AQUIFER REQUIREMENTS):

A = Drainage Area (ac): 86.33 ac
30.73 acres existing development at assumed 35% impervious (River Hills Subdivision)
55.60 acres onsite area
P = Average Annual Precipitation, Williamson County (in) = 32

OFFSITE LOAD:

Rv = Runoff Coefficient for the fraction of impervious cover
= 0.546 (IC)^2 + 0.328 (IC) + 0.030 = 0.212 (35% IC)
C = Average TSS Concentration (mg/L) = 170 (developed)

Offsite L = A x P x Rv x C x 0.226
= 30.73 x 32 x 0.212 x 170 x 0.226
= 8,010 lbs

ONSITE PRE-DEVELOPMENT (BACKGROUND) LOAD:

Rv = Runoff Coefficient for the fraction of impervious cover
= 0.546 (IC)^2 + 0.328 (IC) + 0.030 = 0.030 (0% IC)
C = Average TSS Concentration (mg/L) = 80 (undeveloped)

Onsite Predevelopment L = A x P x Rv x C x 0.226
= 55.60 x 32 x 0.030 x 80 x 0.226
= 965 lbs

ONSITE POST-DEVELOPMENT LOAD:

Total Impervious Cover (ac): 30.96
IC = Impervious Cover = 55.7%

Rv = Runoff Coefficient for the fraction of impervious cover
= 0.546 (IC)^2 + 0.328 (IC) + 0.030 = 0.382
C = Average TSS Concentration (mg/L) = 170 (developed)

Onsite Postdevelopment L = A x P x Rv x C x 0.226
= 55.60 x 32 x 0.382 x 170 x 0.226
= 26,112 lbs

TOTAL PREDEVELOPMENT LOAD:

Onsite Predevelopment Load + Offsite Load = 8,975 lbs

TOTAL POSTDEVELOPMENT LOAD:

Onsite Postdevelopment Load + Offsite Load = 34,122 lbs

TSS LOAD REDUCTION:

Lr = 0.8 x (postdevelopment load - predevelopment load)
= 20,118 lbs

Lr = (total postdevelopment load) x F x (fraction of site treated) x (TSS removal eff.)
20,118 = 34,122 x F x 1 x 0.93

F = fraction of load captured by BMP
F = 0.634

Runoff capture depth = 0.25 in
(48.3% weighted impervious cover over drainage area, 63.4% load captured by pond)

PERMANENT POOL ELEVATION = 752.0
WATER QUALITY ELEVATION = 753.3

REQUIRED WATER QUALITY VOLUME = 0.25 in x 86.33 ac
= 78,345 cf (1.80 AC-FT)
PROVIDED WATER QUALITY VOLUME = 85,001 cf (1.86 AC-FT)

REQUIRED PERMANENT POOL VOLUME = 1.2 x WQV (20% increase to allow for sediment accumulation)
= 94,013 cf (2.16 AC-FT)
PROVIDED PERMANENT POOL VOLUME = 242,630 cf (5.57 AC-FT)

REQUIRED FOREBAY VOLUME = 15 to 25% of permanent pool volume
PROVIDED FOREBAY VOLUME = 44,901 CF (18.2%)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
739.00	0	0	0
740.00	248	124	124
741.00	817	533	657
742.00	1,877	1,347	2,004
743.00	3,841	2,859	4,863
744.00	7,371	5,606	10,469
745.00	11,751	9,561	20,030
746.00	16,051	13,901	33,931
747.00	20,477	18,264	52,195
748.00	25,585	23,031	75,226
749.00	31,617	28,601	103,827
750.00	39,463	35,540	139,367
750.80	45,986	34,180	173,546
751.00	58,244	10,423	183,969
752.00	59,077	58,661	242,630
[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]

Primary OutFlow (Free Discharge)
1=Culvert
3=Broad-Crested Rectangular Weir
2=Broad-Crested Rectangular Weir

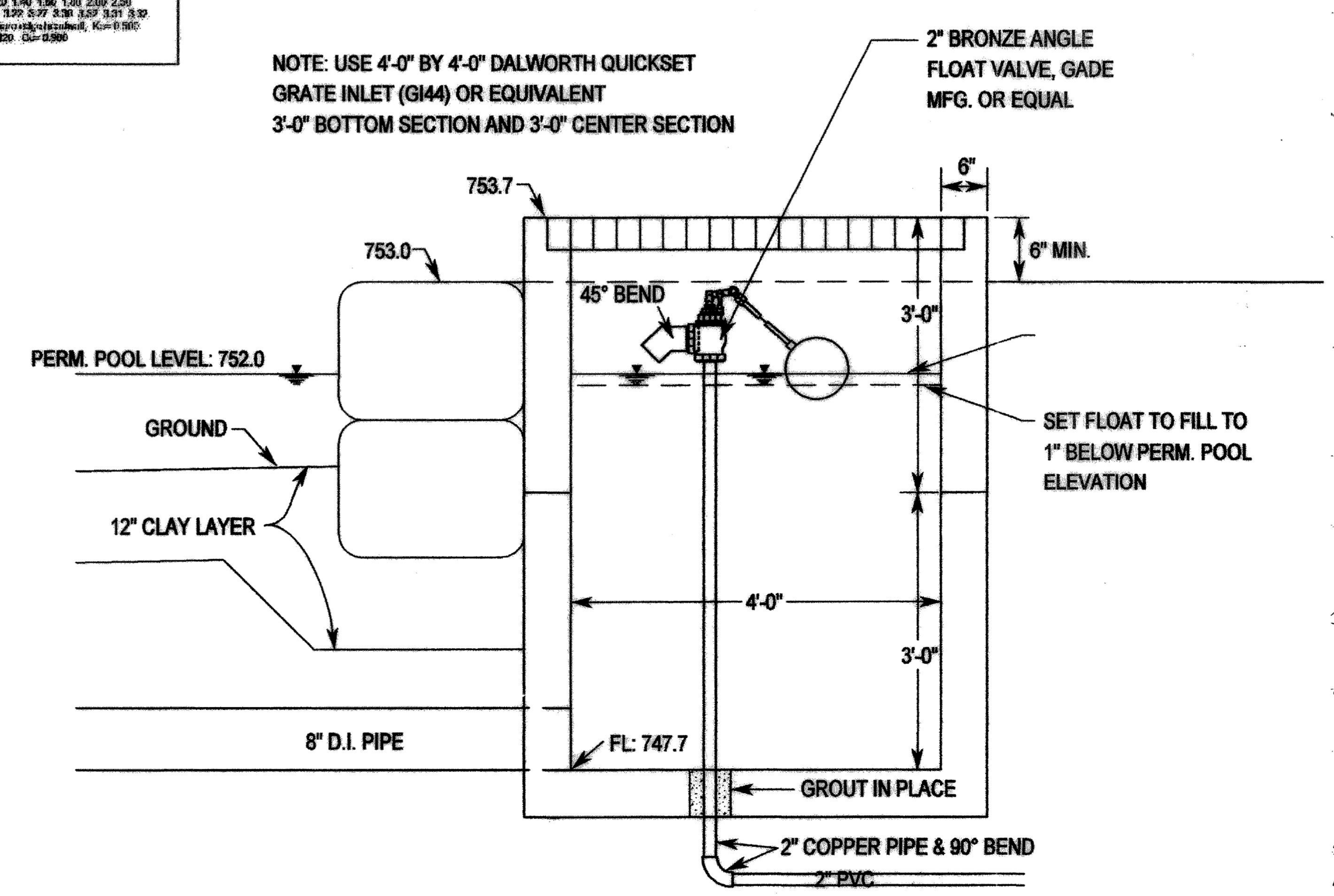
#	Routing	Invert	Outlet Devices
1	Device 3	752.00'	1.0' long x 0.7' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 Coef. (English) 2.76 2.82 2.93 3.00 3.10 3.22 3.27 3.30 3.22 3.31 3.32
2	Device 3	753.30'	28.5' long x 0.7' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 Coef. (English) 2.76 2.82 2.93 3.00 3.10 3.22 3.27 3.30 3.32 3.31 3.32
3	Primary	738.10'	42.0" x 80' long Culvert X 2.00 CMP, [illegible] headwall, Ke=0.500 Outlet Invert= 738.03' S=0.0187'/' n=0.020 Cc=0.900

Pond A

AREA DELTA (FT²)	Elevation	Area (ft²)	Area (ac)	Incremental Volume (ft³)	Cumulative Volume (ft³)	Notes
	739	0	0.000	-	-	
	740	248	0.006	124	124	
	741	817	0.019	533	657	
	742	1,877	0.043	1,347	2,004	
	743	3,841	0.088	2,859	4,863	
	744	7,371	0.169	5,606	10,469	
	745	11,751	0.270	9,561	20,030	
	746	16,051	0.368	13,901	33,931	
	747	20,477	0.470	18,264	52,195	
	748	25,585	0.587	23,031	75,226	
	749	31,617	0.726	28,601	103,827	
	750	39,463	0.906	35,540	139,367	
	750.8	45,986	1.056	34,180	173,546	
	751	58,244	1.337	10,423	183,969	
	752	59,077	1.356	58,661	242,630	PERMANENT POOL
16346	753	78,931	1.812	69,004	311,634	
	753.2	84,899	1.949	16,383	328,017	WATER QUALITY ELEV.
10222	754	108,769	2.497	93,850	405,484	
7019	755	121,750	2.795	115,260	520,744	
2623	756	134,354	3.084	128,052	648,796	
	756.8	145,432	3.339	111,914	760,710	100 YR WSEL
	757	148,201	3.402	29,363	790,073	

Elevation (feet)	Discharge (cfs)	Elevation (feet)	Discharge (cfs)
739.00	0.00	754.00	64.48
.	.	754.04	69.56
.	.	754.08	75.25
752.00	0.00	754.12	80.92
752.04	0.03	754.16	86.63
752.08	0.09	754.20	92.51
752.12	0.17	754.24	98.57
752.16	0.28	754.28	104.80
752.20	0.37	754.32	111.06
752.24	0.49	754.36	117.32
752.28	0.62	754.40	123.72
752.32	0.76	754.44	130.26
752.36	0.91	754.48	136.93
752.40	1.07	754.52	143.78
752.44	1.24	754.56	150.80
752.48	1.43	754.60	157.96
752.52	1.62	754.64	165.26
752.56	1.83	754.68	172.70
752.60	2.04	754.72	180.18
752.64	2.27	754.76	187.69
752.68	2.52	754.80	195.33
752.72	2.77	754.84	203.08
752.76	3.04	754.88	210.96
752.80	3.32	754.92	218.89
752.84	3.59	754.96	226.88
752.88	3.87	755.00	234.97
752.92	4.16	755.04	243.18
752.96	4.46	755.08	251.49
753.00	4.77	755.12	259.70
753.04	5.07	755.16	267.78
753.08	5.38	755.20	275.94
753.12	5.70	755.24	284.18
753.16	6.02	755.28	292.49
753.20	6.35	755.32	300.99
753.24	6.69	755.36	309.69
753.28	7.04	755.40	318.47
753.32	7.82	755.44	327.34
753.36	8.91	755.48	336.30
753.40	10.61	755.52	345.34
753.44	12.61	755.56	354.46
753.48	14.87	755.60	363.66
753.52	17.38	755.64	368.16
753.56	20.12	755.68	368.63
753.60	23.08	755.72	369.10
753.64	26.24	755.76	369.56
753.68	29.59	755.80	370.02
753.72	33.17	755.84	370.49
753.76	36.98	755.88	370.95
753.80	41.00	755.92	371.41
753.84	45.19	755.96	371.88
753.88	49.67	756.00	372.34
753.92	54.21		
753.96	59.14		

NOTE: USE 4'-0" BY 4'-0" DALWORTH QUICKSET GRATE INLET (GI44) OR EQUIVALENT
3'-0" BOTTOM SECTION AND 3'-0" CENTER SECTION



FLOAT SWITCH BOX DETAIL
SCALE: 1" = 1'

ELEVATION (FT)	OUTFLOW (CFS)	ELEVATION (FT)	OUTFLOW (CFS)	ELEVATION (FT)	OUTFLOW (CFS)
752	0	752.997	4.5	755.615	159.9
752	0	753.039	4.8	755.639	163.8
752	0	753.082	5.1	755.664	167.8
752	0	753.127	5.4	755.69	172
752	0	753.174	5.7	755.709	175.2
752	0	753.224	6.1	755.716	176.3
752	0	753.276	6.5	755.743	180.8
752	0	753.331	6.9	755.771	185.5
752	0	753.388	7.4	755.799	190.3
752	0	753.449	7.8	755.829	195.4
752	0	753.512	8.4	755.859	200.6
752	0	753.579	8.9	755.866	201.7
752	0	753.65	9.5	755.891	206.1
752.001	0	753.724	10.2	755.923	211.7
752.002	0	753.802	10.9	755.956	217.6
752.003	0	753.885	11.6	755.99	223.7
752.006	0	753.973	12.5	756.011	227.5
752.009	0	754.054	13.2	756.023	229.6
752.012	0	754.134	14	756.055	235.5
752.016	0	754.22	14.9	756.088	241.6
752.021	0	754.312	15.9	756.121	247.8
752.027	0	754.409	19.9	756.132	249.7
752.033	0	754.512	26.3	756.155	254.1
752.039	0	754.621	34.6	756.19	260.7
752.046	0	754.735	44.9	756.225	267.3
752.054	0.1	754.855	57.1	756.241	270.4
752.063	0.1	754.982	71.4	756.26	274.1
752.072	0.1	755.107	86.7	756.296	281.1
752.083	0.1	755.175	95.5	756.332	288.2
752.093	0.1	755.187	97	756.339	289.6
752.105	0.2	755.199	98.7	756.368	295.3
752.117	0.2	755.212	100.4	756.404	302.5
752.13	0.2	755.225	102.1	756.427	307.1
752.144	0.2	755.238	103.9	756.44	309.7
752.158	0.3	755.241	104.3	756.475	316.9
752.174	0.3	755.252	105.8	756.504	322.8
752.19	0.4	755.266	107.7	756.511	324.1
752.207	0.4	755.28	109.7	756.545	331.3
752.225	0.5	755.294	111.7	756.57	336.4
752.243	0.5	755.309	113.8	756.579	338.3
752.263	0.6	755.325	116	756.612	345.2
752.284	0.7	755.341	118.2	756.625	347.9
752.306	0.8	755.357	120.6	756.644	351.9
752.329	0.8	755.374	123	756.672	357.8
752.353	0.9	755.388	125.1	756.675	358.4
752.378	1	755.391	125.5	756.704	364.6
752.405	1.2	755.408	128.1	756.713	366.5
752.433	1.3	755.427	130.8	756.731	370.4
752.462	1.4	755.445	133.6	756.748	373.9
752.493	1.6	755.465	136.5	756.756	375.7
752.525	1.7	755.484	139.5	756.776	380.1
752.559	1.9	755.505	142.6	756.778	380.6
752.594	2.1	755.526	145.8	756.798	384.9
752.631	2.3	755.547	149.2	756.799	385.1
752.669	2.5	755.547	149.1	756.815	388.5
752.71	2.7	755.569	152.6	756.817	389.1
752.753	2.9	755.592	156.2	756.828	391.5
752.797	3.2	756.844	395	756.831	392.1
752.844	3.5	756.846	395.4	756.838	393.6
752.893	3.8	756.847	395.6	756.841	394.2
752.944	4.1				

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STATE OF TEXAS
STEVEN S. CRAUFORD
92677
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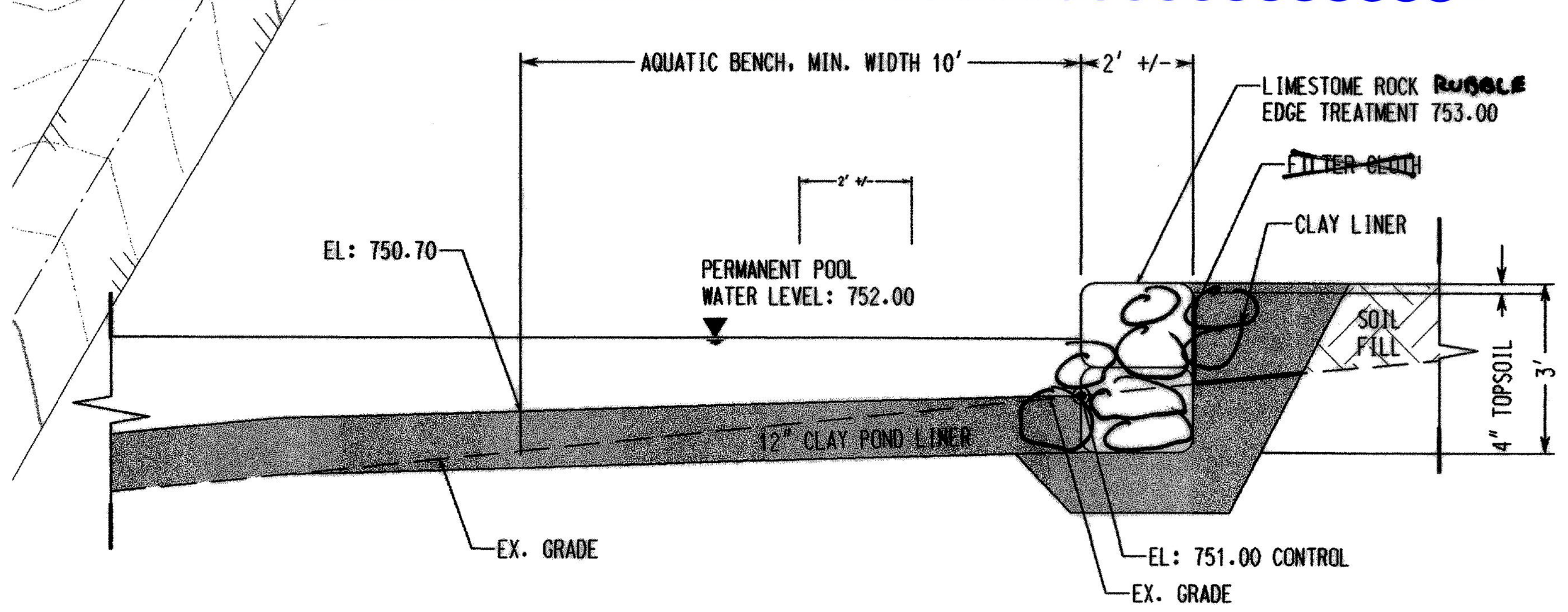

AQUATIC BENCH. SECTION
SCALE: 1"=2'

THE RIVERY - PHASE ONE
SUBDIVISION CONSTRUCTION PLANS
WATER QUALITY POND "A"
PLAN VIEW LAYOUT

RIVERY - CONSTRUCTION DRAWINGS - UDG JOB NO. 99-075.010

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5/24/02

SCALE:
1" = 30'
0 1/2 1
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05/24/2002

DRAWING
WQ1
SHEET 471
JOB NO. 99-075.010

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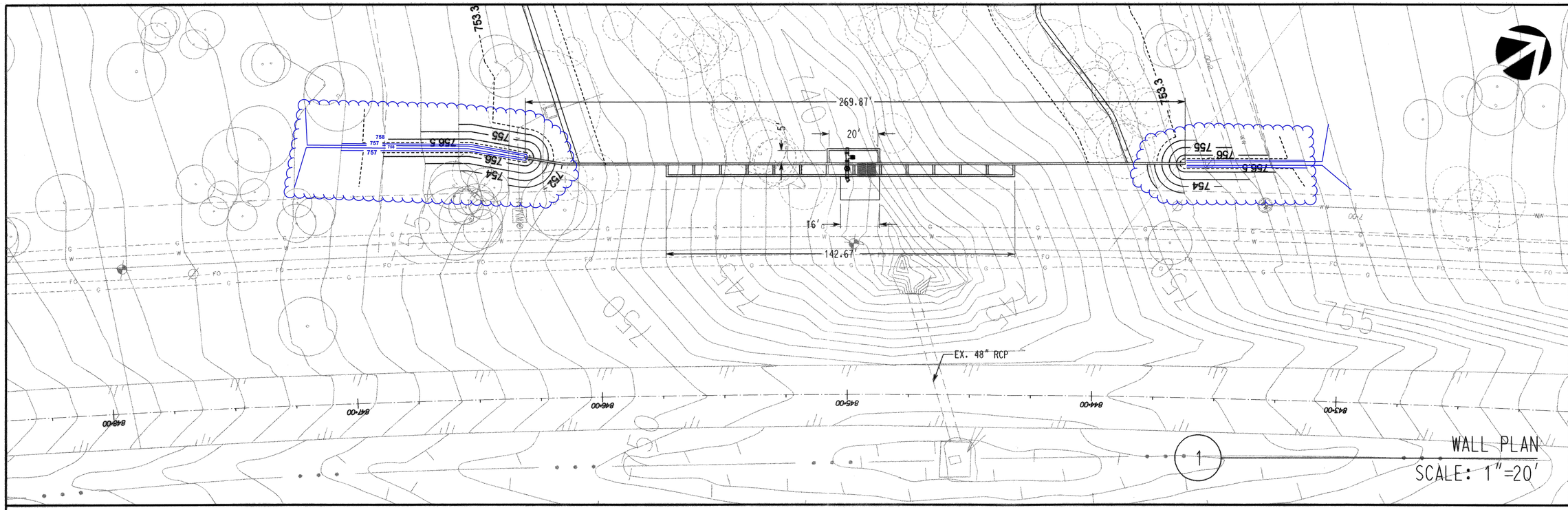
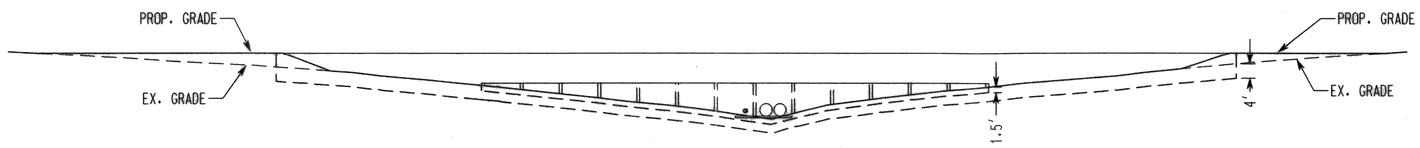
RECORD DRAWINGS



1 WALL PLAN
SCALE: 1"=20'



2 WALL ELEVATION
SCALE: 1"=20'

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STATE OF TEXAS
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92677
LICENSED
PROFESSIONAL ENGINEER
09/12/2025

THE RIVERY - PHASE ONE
SUBDIVISION CONSTRUCTION PLANS
WATER QUALITY POND "A"
RETENTION STRUCTURE LAYOUT
RIVERY - CONSTRUCTION DRAWINGS - UDG JOB NO. 99-075.010

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SCALE:
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0 1/2 1
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DRAWING
WQ2
SHEET 8C 472 SETS

JOB NO. 99-075.010

RECORD DRAWINGS

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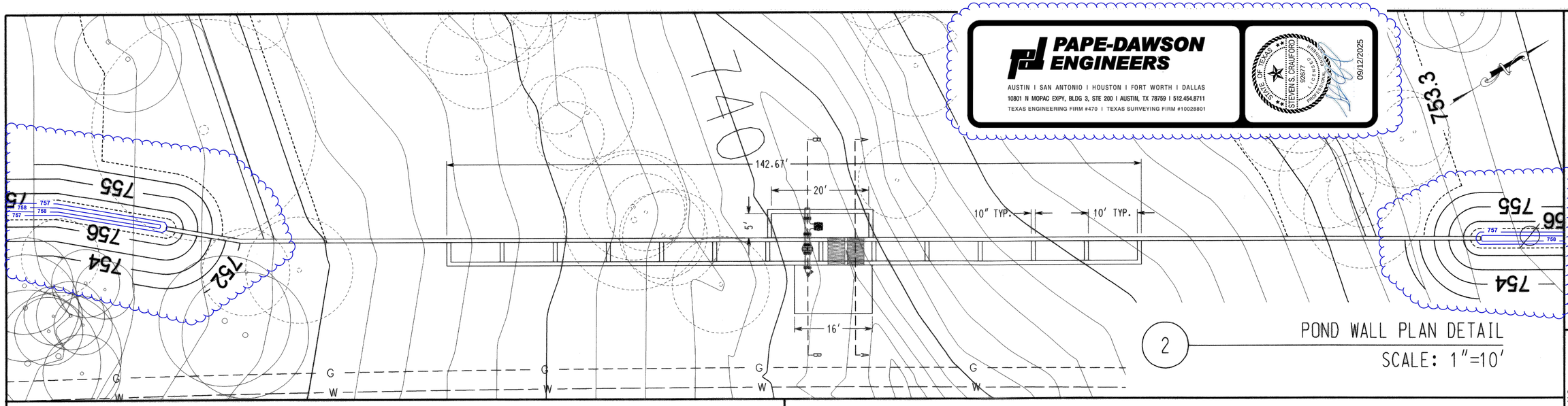
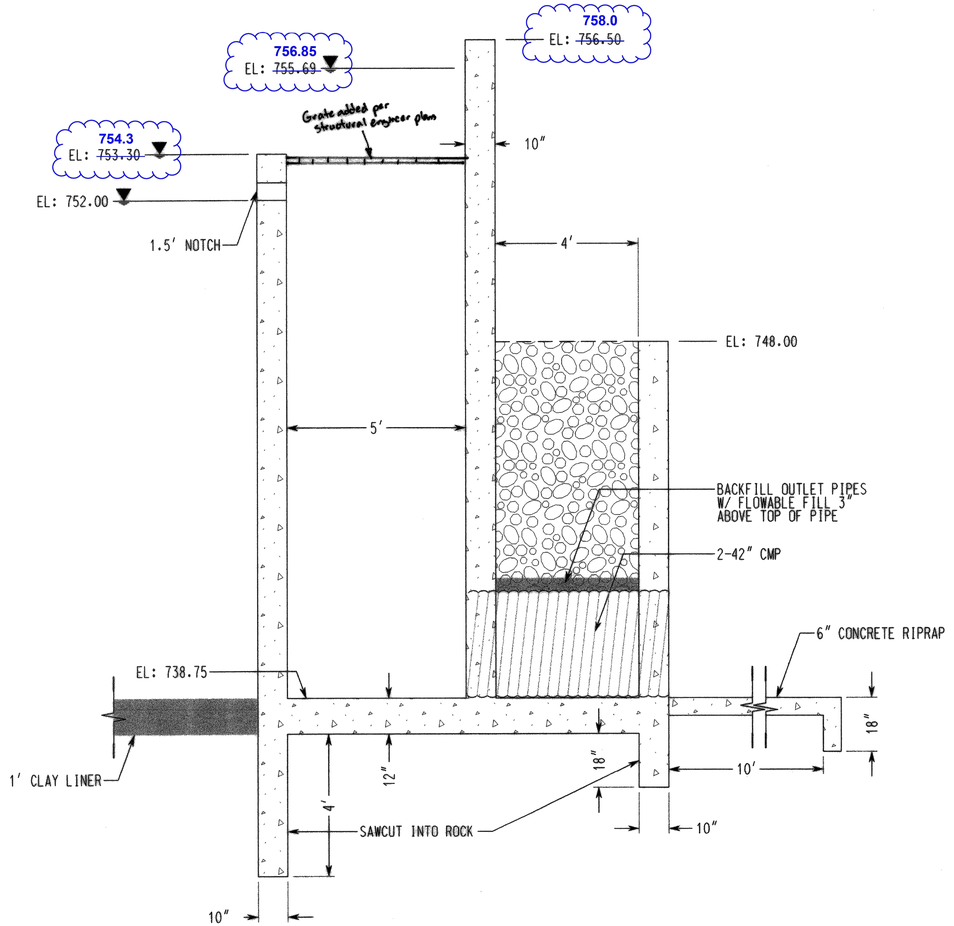
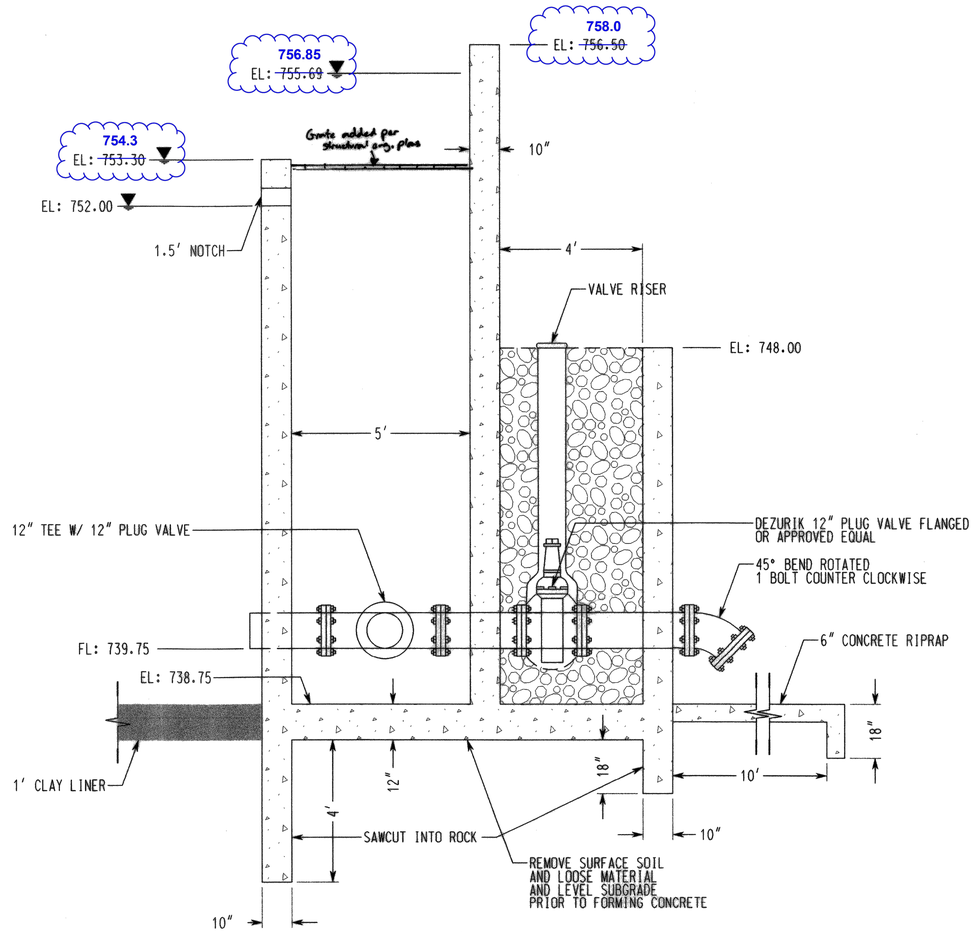


2 POND WALL PLAN DETAIL
SCALE: 1"=10'



3 POND WALL. SECTION A-A
SCALE: 1"=2'



4 POND WALL. SECTION B-B
SCALE: 1"=2'

REVISIONS

THE RIVERY - PHASE ONE
SUBDIVISION CONSTRUCTION PLANS
WATER QUALITY POND "A"
RETENTION STRUCTURE DETAILS

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SCALE:
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DRAWING
WQ3
SHEET 8 473 SHEETS

JOB NO. 99-075.010

RECORD DRAWINGS

RIVERY CONSTRUCTION DRAWINGS_UDG JOB NO. 99-075.010

RIVERY POND B BASIN (EAPP ID NO. 11-02041701)

EXISTING (UNDEVELOPED) DRAINAGE AREA CALCULATIONS

25YR

Subcatchment UD-1: Undeveloped DA UD-1

Runoff = 282.66 cfs @ 2.01 hrs, Volume= 22.864 af

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-5.00 hrs, dt= 0.01 hrs
Austin 3-hr 25-yr Rainfall=5.40"

Area (ac)	CN	Description
10.760	98	River Hills Subdiv. IC
68.980	80	>75% Grass cover, Good, HSG D
79.740	82	Weighted Average

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
35.4	2,200	0.0250	1.0		Lag/CN Method,

Subcatchment UD-2: Undeveloped DA UD-2

Runoff = 97.43 cfs @ 1.97 hrs, Volume= 7.406 af

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-5.00 hrs, dt= 0.01 hrs
Austin 3-hr 25-yr Rainfall=5.40"

Area (ac)	CN	Description
27.390	80	>75% Grass cover, Good, HSG D

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
31.3	2,150	0.0350	1.1		Lag/CN Method,

Subcatchment UD-3: Undeveloped DA UD-3

Runoff = 57.34 cfs @ 1.94 hrs, Volume= 4.067 af

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-5.00 hrs, dt= 0.01 hrs
Austin 3-hr 25-yr Rainfall=5.40"

Area (ac)	CN	Description
18.370	80	>75% Grass cover, Good, HSG D

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
29.6	2,000	0.0350	1.1		Lag/CN Method,

Subcatchment UD-4: Undeveloped DA UD-4

Runoff = 76.05 cfs @ 1.98 hrs, Volume= 5.802 af

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-5.00 hrs, dt= 0.01 hrs
Austin 3-hr 25-yr Rainfall=5.40"

Area (ac)	CN	Description
21.460	80	>75% Grass cover, Good, HSG D

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
32.5	2,200	0.0350	1.2		Lag/CN Method,

100YR

Subcatchment UD-1: Undeveloped DA UD-1

Runoff = 381.58 cfs @ 2.01 hrs, Volume= 31.797 af

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-5.00 hrs, dt= 0.01 hrs
Austin 3-hr 100-yr Rainfall=6.88"

Area (ac)	CN	Description
10.760	98	River Hills Subdiv. IC
68.980	80	>75% Grass cover, Good, HSG D
79.740	82	Weighted Average

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
35.4	2,200	0.0250	1.0		Lag/CN Method,

Subcatchment UD-2: Undeveloped DA UD-2

Runoff = 132.98 cfs @ 1.97 hrs, Volume= 10.421 af

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-5.00 hrs, dt= 0.01 hrs
Austin 3-hr 100-yr Rainfall=6.88"

Area (ac)	CN	Description
27.390	80	>75% Grass cover, Good, HSG D

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
31.3	2,150	0.0350	1.1		Lag/CN Method,

Subcatchment UD-3: Undeveloped DA UD-3

Runoff = 91.65 cfs @ 1.94 hrs, Volume= 6.569 af

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-5.00 hrs, dt= 0.01 hrs
Austin 3-hr 100-yr Rainfall=6.88"

Area (ac)	CN	Description
18.370	80	>75% Grass cover, Good, HSG D

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
29.6	2,000	0.0350	1.1		Lag/CN Method,

Subcatchment UD-4: Undeveloped DA UD-4

Runoff = 102.48 cfs @ 1.98 hrs, Volume= 8.104 af

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-5.00 hrs, dt= 0.01 hrs
Austin 3-hr 100-yr Rainfall=6.88"

Area (ac)	CN	Description
21.460	80	>75% Grass cover, Good, HSG D

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
32.5	2,200	0.0350	1.2		Lag/CN Method,

LEGEND

MH	PROPOSED STORM SEWER MANHOLE
CI	PROPOSED CURB INLET
RCP	PROPOSED REINFORCED CONCRETE PIPE
CMP	PROPOSED CORRUGATED METAL PIPE (ALUMINIZED)
85	DRAINAGE AREA DESIGNATION
	DRAINAGE AREA BOUNDARY

MIDDLE FORK SAN GABRIEL RIVER

NORTH FORK SAN GABRIEL RIVER

OAK HOLLOW ROAD

HILLVIEW DRIVE

RIVER HILLS DRIVE

IH 35 FRONTAGE ROAD

UD-1

UD-2

UD-3

UD-4

EXISTING
FLOW TO CULVERT:
Q25=282.96cfs
Q100=381.58cfs

THE RIVERY - PHASE ONE

SUBDIVISION CONSTRUCTION PLANS

UNDEVELOPED DRAINAGE AREA MAP

RIVERY - CONSTRUCTION DRAWINGS - UDG JOB NO. 99-075.010

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Urban Design Group

STATE OF TEXAS
BRIANCE RUNYEN
85073
LICENSED PROFESSIONAL ENGINEER
5/23/02

SCALE:
1" = 150'
0 1/2 1
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05/23/2002

DRAWING
GD00c

SHEET 467

JOB NO. 99-075.010

RECORD DRAWINGS

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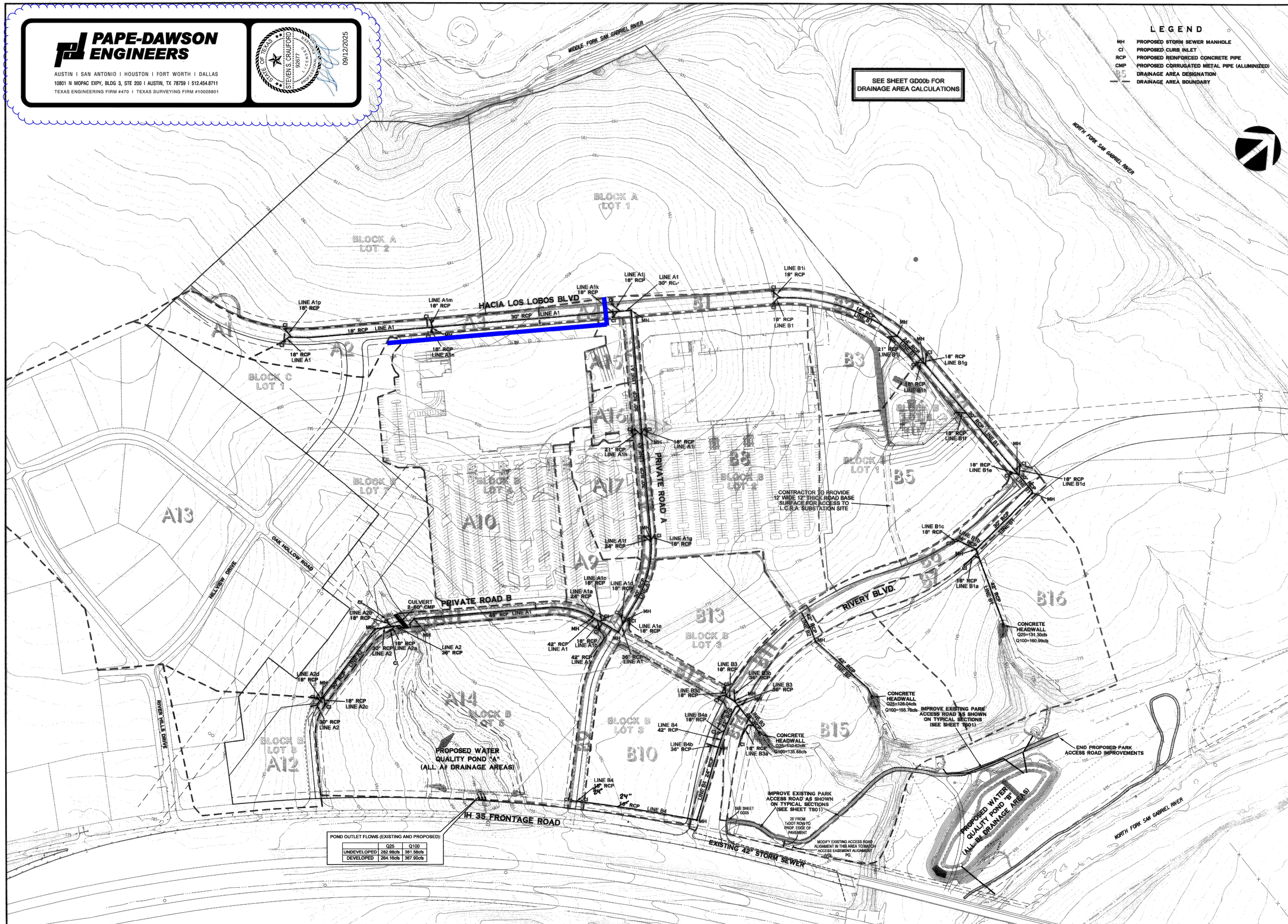
STATE OF TEXAS
STEVEN S. CRAUFORD
92677
LICENSED PROFESSIONAL ENGINEER
09/12/2025



POND OUTLET FLOWS (EXISTING AND PROPOSED):

	Q25	Q100
UNDEVELOPED	282.96cfs	381.58cfs
DEVELOPED	264.16cfs	367.90cfs

LEGEND

MH	PROPOSED STORM SEWER MANHOLE
CI	PROPOSED CURB INLET
RCP	PROPOSED REINFORCED CONCRETE PIPE
CMP	PROPOSED CORRUGATED METAL PIPE (ALUMINIZED)
B5	DRAINAGE AREA DESIGNATION
	DRAINAGE AREA BOUNDARY

THE RIVERY - PHASE ONE
SUBDIVISION CONSTRUCTION PLANS
OVERALL DRAINAGE PLAN AND PARK ACCESS ROAD IMPROVEMENTS

RIVERY - CONSTRUCTION DRAWINGS - UDG JOB NO. 99-075.010

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85573
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1/23/02

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0 1/2 1
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DRAWING
GD00
SHEET 7 468 ITS

JOB NO. 99-075.010

05/23/2002

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RECORD DRAWINGS

POND A DRAINAGE AREAS

25 YR

100 YR

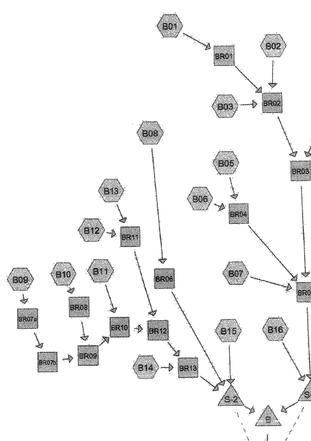
POND B DRAINAGE AREAS

25 YR

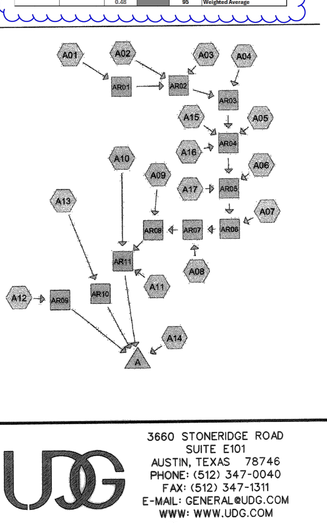
100 YR

25 YR

100 YR

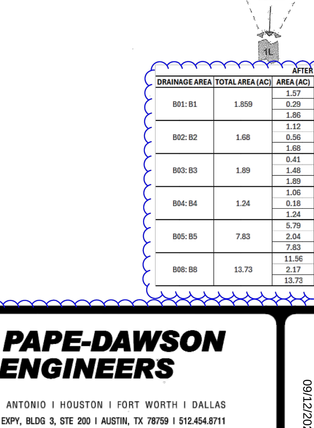


AFTER WRP EXPANSION				
DRAINAGE AREA	TOTAL AREA (AC)	AREA (AC)	CN	DESCRIPTION
B01: B1	1.859	1.57	98	Paved roads w/ curbs & sewers
		0.29	80	> 75% Grass cover, Good, HSG D
		1.86	95	Weighted Average
B02: B2	1.68	1.12	98	Paved roads w/ curbs & sewers
		0.56	80	> 75% Grass cover, Good, HSG D
		1.68	92	Weighted Average
B03: B3	1.89	0.41	98	Paved roads w/ curbs & sewers
		1.48	80	> 75% Grass cover, Good, HSG D
		1.89	84	Weighted Average
B04: B4	1.24	1.06	98	Paved roads w/ curbs & sewers
		0.18	80	> 75% Grass cover, Good, HSG D
		1.24	95	Weighted Average
B05: B5	7.83	5.79	98	Paved roads w/ curbs & sewers
		2.04	80	> 75% Grass cover, Good, HSG D
		7.83	93	Weighted Average
B08: B8	13.73	11.56	98	Paved roads w/ curbs & sewers
		2.17	80	> 75% Grass cover, Good, HSG D
		13.73	95	Weighted Average



AFTER WRP EXPANSION				
DRAINAGE AREA	TOTAL AREA (AC)	AREA (AC)	FRACTION	CN	DESCRIPTION
A1	2.40	0.86	35.8	98	Paved roads w/ curbs & sewers
		1.54	64.2	73	Brush, Good, HSG D
		2.40		82	Weighted Average
A2	2.435	1.07	44.1	98	Paved roads w/ curbs & sewers
		1.36	55.8	73	Brush, Good, HSG D
		2.43		84	Weighted Average
A3	1.142	0.91	79.8	98	Paved roads w/ curbs & sewers
		0.23	20.2	80	> 75% Grass cover, Good, HSG D
		1.14		94	Weighted Average
A4	0.48	0.41	85.1	98	Paved roads w/ curbs & sewers
		0.07	14.9	80	> 75% Grass cover, Good, HSG D
		0.48		95	Weighted Average





AFTER WRP EXPANSION				
DRAINAGE AREA	TOTAL AREA (AC)	AREA (AC)	CN	DESCRIPTION
B01: B1	1.859	1.57	98	Paved roads w/ curbs & sewers
		0.29	80	> 75% Grass cover, Good, HSG D
		1.86	95	Weighted Average
B02: B2	1.68	1.12	98	Paved roads w/ curbs & sewers
		0.56	80	> 75% Grass cover, Good, HSG D
		1.68	92	Weighted Average
B03: B3	1.89	0.41	98	Paved roads w/ curbs & sewers
		1.48	80	> 75% Grass cover, Good, HSG D
		1.89	84	Weighted Average
B04: B4	1.24	1.06	98	Paved roads w/ curbs & sewers
		0.18	80	> 75% Grass cover, Good, HSG D
		1.24	95	Weighted Average
B05: B5	7.83	5.79	98	Paved roads w/ curbs & sewers
		2.04	80	> 75% Grass cover, Good, HSG D
		7.83	93	Weighted Average
B08: B8	13.73	11.56	98	Paved roads w/ curbs & sewers
		2.17	80	> 75% Grass cover, Good, HSG D
		13.73	95	Weighted Average

POND B WATER QUALITY VOLUME (TNRCC EDWARDS AQUIFER REQUIREMENTS):

A = Drainage Area (ac): 66.28 ac
P = Average Annual Precipitation, Williamson County (in) = 32

PRE-DEVELOPMENT (BACKGROUND) LOAD:

Rv = Runoff Coefficient for the fraction of impervious cover
= 0.546 (IC)^2 + 0.328 (IC) + 0.030 = 0.030 (0% IC)
C = Average TSS Concentration (mg/L) = 80 (undeveloped)

Onsite Predevelopment L = A x P x Rv x C x 0.226
= 66.28 x 32 x 0.030 x 80 x 0.226
= 1,150 lbs

POST-DEVELOPMENT LOAD:

Total Impervious Cover (ac): 50.27
IC = Impervious Cover = 75.8%

Rv = Runoff Coefficient for the fraction of impervious cover
= 0.546 (IC)^2 + 0.328 (IC) + 0.030 = 0.592
C = Average TSS Concentration (mg/L) = 170 (developed)

Onsite Postdevelopment L = A x P x Rv x C x 0.226
= 66.28 x 32 x 0.592 x 170 x 0.226
= 48,240 lbs

TSS LOAD REDUCTION:

Lr = 0.8 x (postdevelopment load - predevelopment load)
= 37,672 lbs

Lr = (total postdevelopment load) x F x (fraction of site treated) x (TSS removal eff.)
37672 = 48,240 x F x 1 x 0.93

F = fraction of load captured by BMP
F = 0.840

Runoff capture depth = 0.73 in
(75.8% impervious cover, 84.0% load captured by pond)

PERMANENT POOL ELEVATION = 697.0
WATER QUALITY ELEVATION = 699.4

REQUIRED WATER QUALITY VOLUME = 0.73 in x 66.28 ac
= 175,635 cf (4.03 AC-FT)
PROVIDED WATER QUALITY VOLUME = 177,314 cf (4.07 AC-FT)

REQUIRED PERMANENT POOL VOLUME = 1.2 x WQV (20% increase to allow for sediment accumulation)
= 210,762 cf (4.84 AC-FT)
PROVIDED PERMANENT POOL VOLUME = 263,615 cf (6.05 AC-FT)

REQUIRED FOREBAY VOLUME = 15 to 25% of permanent pool volume
PROVIDED FOREBAY VOLUME = 57,690 CF (21.9%)

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STATE OF TEXAS · STEPHEN S. CRAUFORD · 126277 · LICENSED PROFESSIONAL ENGINEER · 09/12/2025

8 x 5' BOX INLET
TOP = 697.5
36" FL = 695.0

TOP OF 10' SPILLWAY = 699.4

TOP OF WALL = 700

SEE SHEET WQ5 FOR SECTION A

REMOVE EXISTING 18" RCP AND 20' ALUM CULVERTS, GRADE DEPRESSION TO DRAIN ACROSS DRIVEWAY

338.9 LF 36" RCP @ 0.69%

189 LF 27" RCP @ 2.0%

FLOAT SWITCH BOX (SEE DETAIL SHEET WQ5)

APPROX 20 LF 8" D.I. PIPE - DAYLIGHT PAST AND BELOW AQUATIC BENCH

AQUATIC BENCH (10' MIN. WIDTH @ 1.0% MIN. SLOPE)

27" FL: 692.0

36" FL: 692.0

TOP OF ROCK BERM = 695

SEE SHEET WQ6 FOR CROSS SECTION A

PROPOSED 2" PVC WATER

PROPOSED 2"X2" TEE FOR IRRIGATION SYSTEM (SEE IRRIGATION PLANS)

PROPOSED CITY OF GEORGETOWN APPROVED 2" GATE VALVE, METER, AND REDUCED PRESSURE ZONE (RPZ) BACKFLOW PREVENTER.

PROPOSED 2" PVC WATER LINE TO PROPOSED DRINKING FOUNTAIN (SEE LANDSCAPE PLANS)

EXISTING 16" PVC WATER

I-35 BRIDGES

AQUATIC BENCH (10' MIN. WIDTH @ 1.0% MIN. SLOPE)

PROPOSED SPILLWAY (SEE DETAIL SHEET 475A)

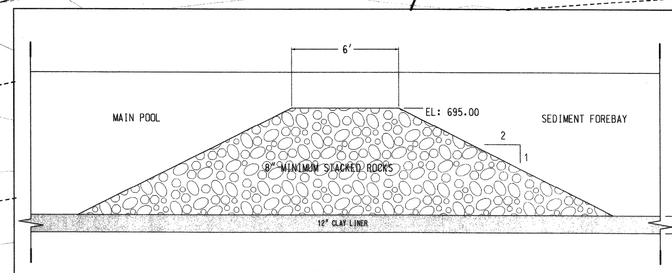
465.5 LF 30" RCP @ 3.30%

30" FL: 686.0

10' x 10' BOX
6" NOTCH FL: 697.0
TOP OF BOX: 699.4
36" FL OUT: 691.5

NOTE: SEE SHEET WQ6 FOR DISC GOLF RELOCATION PLAN.

FOREBAY SEPARATION BERM (SECTION D)
SCALE: 1"=4'



LEGEND

EXISTING DISC GOLF TEE, FAIRWAY & HOLE #

RELOCATED DISC GOLF TEE, FAIRWAY & HOLE #

THE RIVERY - PHASE ONE
SUBDIVISION CONSTRUCTION PLANS
WATER QUALITY POND "B"
PLAN VIEW LAYOUT

RIVERY - CONSTRUCTION DRAWINGS - UDG JOB NO. 99-075.010

REVISIONS

3660 STONERIDGE ROAD
SUITE E101
AUSTIN, TEXAS 78746
PHONE: (512) 347-0040
FAX: (512) 347-1311
E-MAIL: GENERAL@UDG.COM
WWW: WWW.UDG.COM
Urban Design Group

SCALE:
1"=30'
0 1/2 1
IF THIS BAR DOES NOT MEASURE 1" THEN DRAWING IS NOT TO SCALE

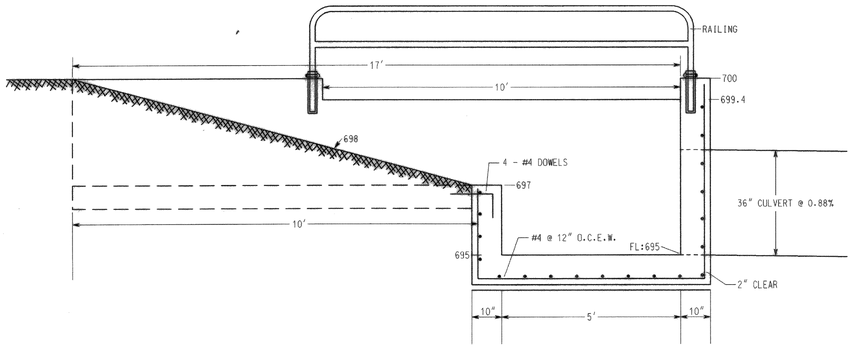
05/08/2003

DRAWING
WQ4
SHEET 82 474 ETS

JOB NO. 99-075.010

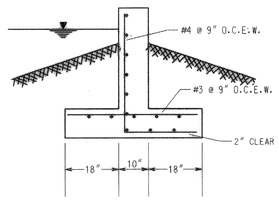
RECORD DRAWINGS

c:\Jobfiles\Rivery\Cnst-s-wq4.dgn



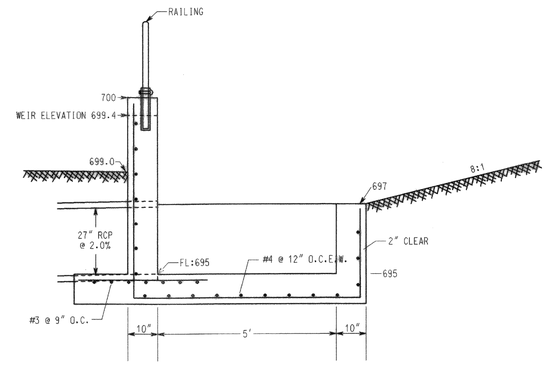
FLOW SPLITTER STRUCTURE 2 (SECTION A)

SCALE: 1"=2'



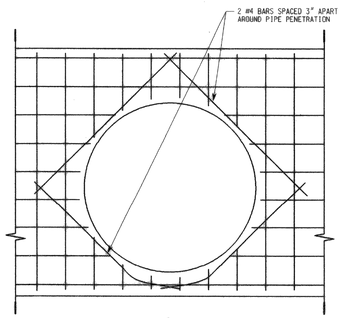
WALL SECTION

SCALE: 1"=2'



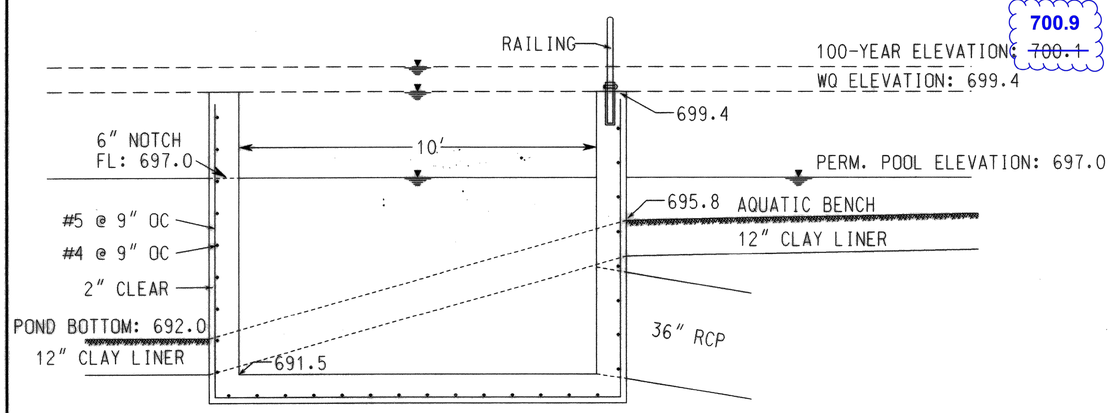
FLOW SPLITTER STRUCTURE (SECTION B)

SCALE: 1"=2'



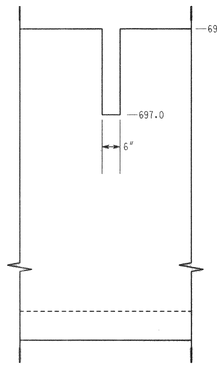
PIPE PENETRATION WALL REINFORCEMENT DETAIL

SCALE: NTS



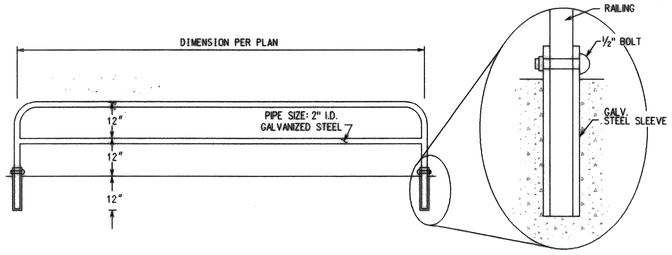
POND B OUTLET STRUCTURE (SECTION C)

SCALE: 1"=2'



POND B NOTCH DETAIL

SCALE: 1"=2'



OUTLET BOX RAILING DETAIL (POND B)

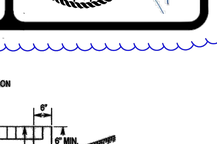
N.T.S.

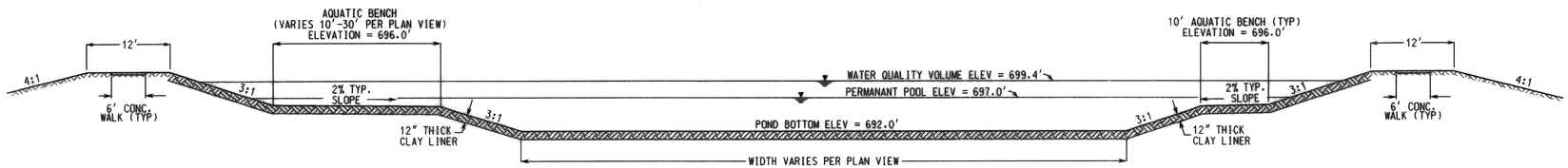
PAPE-DAWSON ENGINEERS

AUSTIN I SAN ANTONIO I HOUSTON I FORT WORTH I DALLAS

10801 N MOPAC EXPY, BLDG 3, STE 200 I AUSTIN, TX 78759 I 512.454.8711

TEXAS ENGINEERING FIRM #470 I TEXAS SURVEYING FIRM #10028801

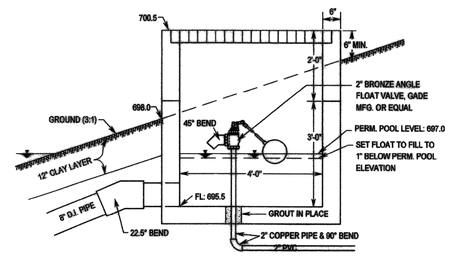




WATER QUALITY POND "B" (SECTION A)

SCALE: 1"=10'

NOTE: USE 4'-0" BY 4'-0" DALWORTH QUICKSET GRATE INLET (G44) OR EQUIVALENT 3'-0" BOTTOM SECTION AND 2'-0" CENTER SECTION



FLOAT SWITCH BOX DETAIL

SCALE: 1" = 1'

THE RIVERY - PHASE ONE

SUBDIVISION CONSTRUCTION PLANS

WATER QUALITY POND "B"

DETAILS

RIVERY - CONSTRUCTION DRAWINGS - UDG JOB NO. 99-075.010

REVISIONS

3660 STONERIDGE ROAD
SUITE E101
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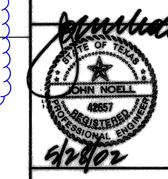
Urban Design Group



SCALE:

AS SHOWN

0 ½ 1

IF THIS BAR DOES NOT MEASURE 1" THEN DRAWING IS NOT TO SCALE

05/24/2002

DRAWING

WQ5

SHEET 83 475 STS

JOB NO. 99-075.010

RECORD DRAWINGS

c:\pw\Rivery\dm-rivery05.dgn

ATTACHMENT H

MEMORIAL DRIVE – BATCH DETENTION POND 2

Texas Commission on Environmental Quality

TSS Removal Calculations 04-20-2009

Project Name: Memorial Drive - Batch Detention Pond 2
Date Prepared: 8/8/2025

Additional information is provided for cells with a red triangle in the upper right corner. Place the cursor over the cell.
Text shown in blue indicate location of instructions in the Technical Guidance Manual - RG-348.
Characters shown in red are data entry fields.
Characters shown in black (Bold) are calculated fields. Changes to these fields will remove the equations used in the spreadsheet.

1. The Required Load Reduction for the total project: Calculations from RG-348 Pages 3-27 to 3-30

Page 3-29 Equation 3.3: $L_M = 28.9(A_N \times P)$

where: $L_{M\,TOTAL\,PROJECT}$ = Required TSS removal resulting from t
A_N = Net increase in impervious area for the project
P = Average annual precipitation, inches

Site Data: Determine Required Load Removal Based on the Entire Project

County =	**Williamson**	
Total project area included in plan * =	**460.96**	acres
Predevelopment impervious area within the limits of the plan * =	**12.31**	acres
Total post-development impervious area within the limits of the plan* =	**376.59**	acres
Total post-development impervious cover fraction * =	**0.82**	
P =	**32**	inches
$L_{M\,TOTAL\,PROJECT}$ =	**336886**	lbs.

*** The values entered in these fields should be for the total project area.**

Number of drainage basins / outfalls areas leaving the plan area = **1.00**

2. Drainage Basin Parameters (This information should be provided for each basin):

Drainage Basin/Outfall Area No. = Memorial Pond

Total drainage basin/outfall area =	**3.08**	acres	
Predevelopment impervious area within drainage basin/outfall area =	**0.60**	acres	
Post-development impervious area within drainage basin/outfall area =	**0.83**	acres	***Not including the IC that was already treated with VFS**
Post-development impervious fraction within drainage basin/outfall area =	**0.27**		
$L_{M\,THIS\,BASIN}$ =	**768**	lbs.	

3. Indicate the proposed BMP Code for this basin.

Proposed BMP =	**Batch Detention**	
Removal efficiency =	**91**	percent

4. Calculate Maximum TSS Load Removed (L_R) for this Drainage Basin by the selected BMP Type.

RG-348 Page 3-33 Equation 3.7: $L_R = (\text{BMP efficiency}) \times P \times (A_C \times 34.6 + A_P \times 0.54)$

where: A_C = Total On-Site drainage area in the BMP catchment area
A_I = Impervious area proposed in the BMP catchment area
A_P = Pervious area remaining in the BMP catchment area
L_R = TSS Load removed from this catchment area by the proposed BMP

A_C =	**3.08**	acres	
A_I =	**0.83**	acres	***Not including the IC that was already treated with VFS**
A_P =	**2.25**	acres	
L_R =	**872**	lbs	

5. Calculate Fraction of Annual Runoff to Treat the drainage basin / outfall area

Desired $L_{M\,THIS\,BASIN}$ = **768** lbs.

F = **0.88**

6. Calculate Capture Volume required by the BMP Type for this drainage basin / outfall area. Calculations from RG-348 Pages 3-34 to 3-36

Rainfall Depth =	**1.50**	inches
Post Development Runoff Coefficient =	**0.24**	
On-site Water Quality Volume =	**4059**	cubic feet

Calculations from RG-348 Pages 3-36 to 3-37

Off-site area draining to BMP =	**0.00**	acres
Off-site Impervious cover draining to BMP =	**0.00**	acres
Impervious fraction of off-site area =	**0**	
Off-site Runoff Coefficient =	**0.00**	
Off-site Water Quality Volume =	**0**	cubic feet
Storage for Sediment =	**812**	
Total Capture Volume (required water quality volume(s) x 1.20) =	**4871**	cubic feet

EXISTING WOLF RANCH SEC. 1A – VFS 5 WITHIN THE PROPOSED MEMORIAL DRIVE BATCH POND BASIN

Texas Commission on Environmental Quality

TSS Removal Calculations 04-20-2009

Project Name: Wolf Ranch Sec. 1A - VFS 5
Date Prepared: 8/8/2025

Additional information is provided for cells with a red triangle in the upper right corner. Place the cursor over the cell.
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Characters shown in red are data entry fields.
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1. The Required Load Reduction for the total project: Calculations from RG-348 Pages 3-27 to 3-30

Page 3-29 Equation 3.3: $L_M = 28.9(A_N \times P)$

where: $L_{M\,TOTAL\,PROJECT}$ = Required TSS removal resulting from t
A_N = Net increase in impervious area for the project
P = Average annual precipitation, inches

Site Data: Determine Required Load Removal Based on the Entire Project

County =	**Williamson**	
Total project area included in plan * =	**460.96**	acres
Predevelopment impervious area within the limits of the plan * =	**12.31**	acres
Total post-development impervious area within the limits of the plan* =	**376.59**	acres
Total post-development impervious cover fraction * =	**0.82**	
P =	**32**	inches
$L_{M\,TOTAL\,PROJECT}$ =	**336886**	lbs.

*** The values entered in these fields should be for the total project area.**

Number of drainage basins / outfalls areas leaving the plan area = **1.00**

2. Drainage Basin Parameters (This information should be provided for each basin):

Drainage Basin/Outfall Area No. = EX VFS 5

Total drainage basin/outfall area =	**1.31**	acres	
Predevelopment impervious area within drainage basin/outfall area =	**0.00**	acres	
Post-development impervious area within drainage basin/outfall area =	**0.68**	acres	
Post-development impervious fraction within drainage basin/outfall area =	**0.52**		
$L_{M\,THIS\,BASIN}$ =	**592**	lbs.	

3. Indicate the proposed BMP Code for this basin.

Proposed BMP =	**Vegetated Filter Strips**	
Removal efficiency =	**89**	percent

4. Calculate Maximum TSS Load Removed (L_R) for this Drainage Basin by the selected BMP Type.

RG-348 Page 3-33 Equation 3.7: $L_R = (\text{BMP efficiency}) \times P \times (A_C \times 34.6 + A_P \times 0.54)$

where: A_C = Total On-Site drainage area in the BMP catchment area
A_I = Impervious area proposed in the BMP catchment area
A_P = Pervious area remaining in the BMP catchment area
L_R = TSS Load removed from this catchment area by the proposed BMP

A_C =	**1.31**	acres	
A_I =	**0.68**	acres	
A_P =	**0.63**	acres	
L_R =	**680**	lbs	

5. Calculate Fraction of Annual Runoff to Treat the drainage basin / outfall area

Desired $L_{M\,THIS\,BASIN}$ = **629** lbs.

F = **0.93**

EXISTING WOLF RANCH TOWN CENTER – WET POND A

Texas Natural Resource Conservation Commission

Project: Wolf Ranch – Wet Pond A
Date Prepared: 10/7/2002

TSS Removal Calculations:

Existing Load Calculations (Baseline):

Annual Load, $L_E = P(Au \times 0.54 + Ad \times Rv \times 38.4)$

where: L_E = Annual pollutant load, pounds
Au = Area of the Previously undeveloped portion of the tract (acres)
Ad = Area of the Previously developed portion of the tract (acres)
P = Average annual precipitation, inches (32 for Travis and Williamson Counties)
Rv = Runoff coefficient for the fraction of impervious cover
$Rv = 0.546(IC)2 + 0.328(IC) + 0.030$
IC = Fraction of impervious cover (if IC = 0, Rv = 0.030)

Existing Site Data:

Au =	0.0	acres
Ad =	57.2	acres
P =	32	inches
IC =	3.65	acres
IC =	6.4%	

Rv = 0.053

L_E = 3,736 lbs.

Post Development Load Calculations:

Annual Load, $Ld = A \times P \times Rv \times C \times 0.226$

where: Ld = Annual pollutant load, pounds
A = Contributing drainage area to the BMP, acres
P = Average annual precipitation, inches (32 for Travis and Williamson Counties)
Rv = Runoff coefficient for the fraction of impervious cover
$Rv = 0.546(IC)2 + 0.328(IC) + 0.030$
IC = Fraction of impervious cover (if IC = 0, Rv = 0.030)
C = Average TSS concentration, mg/l (170 mg/l for developed land)
0.226 = Units conversion factor

Developed Site Data:

A =	57.2	acres
P =	32	inches
IC =	44.0	acres
IC =	77.0%	
C =	170	mg/l

Rv = 0.606

Ld = 42,582 lbs.

Calculation of Required TSS Load Reduction:

Load reduction, Lr = 0.80 x (Ld – Le)

Lr = 31,077 lbs.

BMP Sizing Calculations

Table 3.4 BMP Removal Efficiency of TSS:

BMP	TSS Reduction (%)
Retention / Irrigation	100
Extended Detention Basin	75
Grassy Swale	70
Vegetated Filter Strips	85
Sand Filter	89
Wet Basin	93
Constructed Wetland	93

Based upon a selected BMP, the required pond volume is determined as follows:

$$Flc = \frac{Lr}{Ld \times BMPre \times Fst}$$

where: Flc = Fraction of the load captured by the BMP
Lr = Required TSS load reduction to achieve 80%
BMPre = BMP removal efficiency from Table 3.4 (above)
Fst = Fraction of the site treated
where: Fst = (A – Bypass)/ A
Abp = Contributing drainage area to the BMP plus any IC bypass, acres
IC bypass = IC area of the site not draining to the BMP

BMPre = 93 BMP Name = Wet Basin
Abp = 57.2 acres
IC bypass = 0 acres

Fst = 1.00

Flc = 0.785

Required BMP Capture Volume to Achieve 80% Removal Efficiency:

Capture Volume = A x Rd x 1.2

where: Rd = Runoff depth from Table 3.3, inches
1.2 = Represents an increase in volume by 20%**

** Capture volume shall be increased by 20% to accommodate reductions in available storage volume due to deposition of solids between full-scale maintenance activities.

Rd = 0.58 inches

Capture Volume = 144,449 cubic feet of volume in pond
24,075 = the increase in volume for deposition of solids

Required Water Quality Volume = 144,449 cu. Ft.
Required Permanent Pool Volume = 144,449 cu. Ft.

TOTAL VOLUME REQUIRED = 288,898 cu. Ft.

Provided BMP Capture Volume:

TOTAL VOLUME PROVIDED = 300,296 cu. Ft.

Required Water Quality Volume = 150,148 cu. Ft.
Required Permanent Pool Volume = 150,148 cu. Ft.

Capture Volume = 125,123 = cubic feet of volume in pond
25,025 = 20% increase in volume for deposition of solids
150,148 = total volume

Rd = V / A / 43560 * 12

Rd = 0.60 inches

where: V = Volume before 20% increase
A = Pond drainage area

FIC 0.793 from Table 3.3

Lr = FIC xLd x BMPre x Fst

Lr = 31,404 lbs

Proposed Load Discharged = Ld – Lr = 11,178 lbs
Existing Load Discharged = Le = 3,736 lbs
Increase in Load Discharged = 7,442 lbs

EXISTING WOLF RANCH TOWN CENTER – WET POND B

Texas Natural Resource Conservation Commission

Project: Wolf Ranch – Wet Pond B
Date Prepared: 10/7/2002

TSS Removal Calculations:

Existing Load Calculations (Baseline):

Annual Load, $L_E = P(Au \times 0.54 + Ad \times Rv \times 38.4)$

where: L_E = Annual pollutant load, pounds
Au = Area of the Previously undeveloped portion of the tract (acres)
Ad = Area of the Previously developed portion of the tract (acres)
P = Average annual precipitation, inches (32 for Travis and Williamson Counties)
Rv = Runoff coefficient for the fraction of impervious cover
$Rv = 0.546(IC)2 + 0.328(IC) + 0.030$
IC = Fraction of impervious cover (if IC = 0, Rv = 0.030)

Existing Site Data:

Au =	0.0	acres
Ad =	63.6	acres
P =	32	inches
IC =	9.3%	

Rv = 0.085

L_E = 5,103 lbs.

Post Development Load Calculations:

Annual Load, $Ld = A \times P \times Rv \times C \times 0.226$

where: Ld = Annual pollutant load, pounds
A = Contributing drainage area to the BMP, acres
P = Average annual precipitation, inches (32 for Travis and Williamson Counties)
Rv = Runoff coefficient for the fraction of impervious cover
$Rv = 0.546(IC)2 + 0.328(IC) + 0.030$
IC = Fraction of impervious cover (if IC = 0, Rv = 0.030)
C = Average TSS concentration, mg/l (170 mg/l for developed land)
0.226 = Units conversion factor

Developed Site Data:

A =	63.6	acres
P =	32	inches
IC =	47.0	acres
IC =	73.9%	
C =	170	mg/l

Rv = 0.570

Ld = 44,601 lbs.

Calculation of Required TSS Load Reduction:

Load reduction, Lr = 0.80 x (Ld – Le)

Lr = 31,598 lbs.

BMP Sizing Calculations

Table 3.4 BMP Removal Efficiency of TSS:

BMP	TSS Reduction (%)
Retention / Irrigation	100
Extended Detention Basin	75
Grassy Swale	70
Vegetated Filter Strips	85
Sand Filter	89
Wet Basin	93
Constructed Wetland	93

Based upon a selected BMP, the required pond volume is determined as follows:

$$Flc = \frac{Lr}{Ld \times BMPre \times Fst}$$

where: Flc = Fraction of the load captured by the BMP
Lr = Required TSS load reduction to achieve 80%
BMPre = BMP removal efficiency from Table 3.4 (above)
Fst = Fraction of the site treated
where: Fst = (A – Bypass)/ A
Abp = Contributing drainage area to the BMP plus any IC bypass, acres
IC bypass = IC area of the site not draining to the BMP

BMPre = 93 BMP Name = Wet Basin
Abp = 63.6 acres
IC bypass = 0 acres

Fst = 1.00

Flc = 0.762

Required BMP Capture Volume to Achieve 80% Removal Efficiency:

Capture Volume = A x Rd x 1.2

where: Rd = Runoff depth from Table 3.3, inches
1.2 = Represents an increase in volume by 20%**

** Capture volume shall be increased by 20% to accommodate reductions in available storage volume due to deposition of solids between full-scale maintenance activities.

Rd = 0.5 inches

Capture Volume = 138,608 cubic feet of volume in pond
23,101 = the increase in volume for deposition of solids

Required Water Quality Volume = 138,608 cu. Ft.
Required Permanent Pool Volume = 138,608 cu. Ft.

TOTAL VOLUME = 277,216 cu. Ft.

Provided BMP Capture Volume to Achieve 80% Removal Efficiency:

TOTAL VOLUME PROVIDED = 309,081 cu. Ft.

Required Water Quality Volume = 154,541 cu. Ft.
Required Permanent Pool Volume = 154,541 cu. Ft.

Capture Volume = 128,784 = cubic feet of volume in pond
25,757 = 20% increase in volume for deposition of solids
154,541 = total volume

Rd = V / A / 43560 * 12

Rd = 0.56 inches

where: V = Volume before 20% increase
A = Pond drainage area

FIC 0.789 from Table 3.3

Lr = FIC xLd x BMPre x Fst

Lr = 32,727 lbs

Proposed Load Discharged = Ld – Lr = 11,874 lbs
Existing Load Discharged = Le = 5,103 lbs
Increase in Load Discharged = 6,771 lbs

NOTES

1. TSS CALCULATIONS FOR MEMORIAL DRIVE POND & RETROFITTED WOLF RANCH SECTION 2 POND ARE SHOWN ON THE POND SHEETS

EXISTING WOLF LAKES SEC. 1, PH. 1 & SEC. 2 – WET POND

Texas Commission on Environmental Quality

TSS Removal Calculations 04-20-2009

Project Name: Wolf Lakes Village Sec 1, Ph 1 & Sec 2 - Pond 1 - Ultimate Conditions
Date Prepared: 8/8/2025

Additional information is provided for cells with a red triangle in the upper right corner. Place the cursor over the cell.
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1. The Required Load Reduction for the total project: Calculations from RG-348 Pages 3-27 to 3-30

Page 3-29 Equation 3.3: $L_M = 28.9(A_N \times P)$

where: $L_{M\,TOTAL\,PROJECT}$ = Required TSS removal resulting from the proposed development = 80% of increased load
A_N = Net increase in impervious area for the project
P = Average annual precipitation, inches

Site Data: Determine Required Load Removal Based on the Entire Project

County =	**Williamson**	
Total project area included in plan * =	**460.96**	acres
Predevelopment impervious area within the limits of the plan * =	**12.31**	acres
Total post-development impervious area within the limits of the plan* =	**376.59**	acres
Total post-development impervious cover fraction * =	**0.82**	
P =	**32**	inches
$L_{M\,TOTAL\,PROJECT}$ =	**336886**	lbs.

*** The values entered in these fields should be for the total project area.**

Number of drainage basins / outfalls areas leaving the plan area = **1**

2. Drainage Basin Parameters (This information should be provided for each basin):

Drainage Basin/Outfall Area No. = **1**

Total drainage basin/outfall area =	**129.83**	acres
Predevelopment impervious area within drainage basin/outfall area =	**0.00**	acres
Post-development impervious area within drainage basin/outfall area =	**98.56**	acres
Post-development impervious fraction within drainage basin/outfall area =	**0.76**	
$L_{M\,THIS\,BASIN}$ =	**85787**	lbs.

3. Indicate the proposed BMP Code for this basin.

Proposed BMP =	**Wet Basin**	
Removal efficiency =	**93**	percent

Aqualogic Cartridge Filter

4. Calculate Maximum TSS Load Removed (L_R) for this Drainage Basin by the selected BMP Type.

RG-348 Page 3-33 Equation 3.7: $L_R = (\text{BMP efficiency}) \times P \times (A_C \times 34.6 + A_P \times 0.54)$

where: A_C = Total On-Site drainage area in the BMP catchment area
A_I = Impervious area proposed in the BMP catchment area
A_P = Pervious area remaining in the BMP catchment area
L_R = TSS Load removed from this catchment area by the proposed BMP

A_C =	**123.28**	acres	
A_I =	**98.56**	acres	
A_P =	**24.72**	acres	
L_R =	**101884**	lbs	

5. Calculate Fraction of Annual Runoff to Treat the drainage basin / outfall area

Desired $L_{M\,THIS\,BASIN}$ = **86056** lbs.

F = **0.84**

6. Calculate Capture Volume required by the BMP Type for this drainage basin / outfall area. Calculations from RG-348 Pages 3-34 to 3-3

Rainfall Depth =	**1.26**	inches
Post Development Runoff Coefficient =	**0.62**	
On-site Water Quality Volume =	**351353**	cubic feet

Calculations from RG-348 Pages 3-36 to 3-37

Off-site area draining to BMP =	**6.55**	acres
Off-site Impervious cover draining to BMP =	**0.00**	acres
Impervious fraction of off-site area =	**0.00**	
Off-site Runoff Coefficient =	**0.02**	
Off-site Water Quality Volume =	**599**	cubic feet
Storage for Sediment =	**70391**	
Total Capture Volume (required water quality volume(s) x 1.20) =	**422343**	cubic feet

The following sections are used to calculate the required water quality volume(s) for the selected BMP.

11. Wet Basins Designed as Required in RG-348 Pages 3-66 to 3-71

Required capacity of Permanent Pool =	**422343**	cubic **Permanent Pool Capacity is 1.20 times the WQV**
Required capacity at WQV Elevation =	**773697**	cubic **Total Capacity should be the Permanent Pool Capacity plus a second WQV.**

STATE OF TEXAS
STEVEN S. CRAUFORD
92677
LICENSED
PROFESSIONAL ENGINEER

09/12/2025

NO.	REVISION	DATE

GEORGETOWN TEXAS *more than welcome*

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CITY OF GEORGETOWN, TEXAS
WOLF RANCH PKWY / MEMORIAL DR
WATER QUALITY TREATMENT SUMMARY 8 OF 11

CITY JOB No.
JOB NO. 51423-00
DATE 9/12/2025
DESIGNER AK
CHECKED SC DRAWN AK
8 11
SHEET 459

Date: Sep 12, 2025, 10:37am User ID: cashcraft
File: H:\Projects\514\23\00\301 Construction Documents\Civil\W051423-00.dwg

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EXISTING WOLF LAKES VILLAGE SEC. 1, PH. 2 – POND 1

Texas Commission on Environmental Quality

TSS Removal Calculations 04-20-2009

Project Name: Wolf Lakes Village, Section 1, Phase 2, Pond 1
Date Prepared: 8/8/2025

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Characters shown in red are data entry fields.
Characters shown in black (Bold) are calculated fields. Changes to these fields will remove the equations used in the spreadsheet.

1. The Required Load Reduction for the total project: Calculations from RG-348 Pages 3-27 to 3-30

Page 3-29 Equation 3.3: $L_M = 28.9(A_N \times P)$

where:
$L_{M\ TOTAL\ PROJECT}$ = Required TSS removal resulting from the proposed development = 80% of increased load
A_N = Net increase in impervious area for the project
P = Average annual precipitation, inches

Site Data: Determine Required Load Removal Based on the Entire Project

County =	**Williamson**	
Total project area included in plan * =	**460.96**	acres
Predevelopment impervious area within the limits of the plan* =	**12.31**	acres
Total post-development impervious area within the limits of the plan* =	**376.59**	acres
Total post-development impervious cover fraction * =	**0.82**	
P =	**32**	inches
$L_{M\ TOTAL\ PROJECT}$ =	**336886**	lbs.

* **The values entered in these fields should be for the total project area.**

Number of drainage basins / outfalls areas leaving the plan area = **1**

2. Drainage Basin Parameters (This information should be provided for each basin):

Drainage Basin/Outfall Area No. = **1**

Total drainage basin/outfall area =	**35.81**	acres
Predevelopment impervious area within drainage basin/outfall area =	**0.00**	acres
Post-development impervious area within drainage basin/outfall area =	**25.64**	acres
Post-development impervious fraction within drainage basin/outfall area =	**0.72**	
$L_{M\ THIS\ BASIN}$ =	**22317**	lbs.

3. Indicate the proposed BMP Code for this basin.

Proposed BMP =	**Wet Basin**	
Removal efficiency =	**93**	percent

4. Calculate Maximum TSS Load Removed (L_M) for this Drainage Basin by the selected BMP Type.

RG-348 Page 3-33 Equation 3.7: $L_R = (\text{BMP efficiency}) \times P \times (A_I \times 34.6 + A_P \times 0.54)$

where:
A_C = Total On-Site drainage area in the BMP catchment area
A_I = Impervious area proposed in the BMP catchment area
A_P = Pervious area remaining in the BMP catchment area
L_R = TSS Load removed from this catchment area by the proposed BMP

A_C =	**35.81**	acres
A_I =	**25.64**	acres
A_P =	**10.17**	acres
L_R =	**26565**	lbs

5. Calculate Fraction of Annual Runoff to Treat the drainage basin / outfall area

Desired $L_{M\ THIS\ BASIN}$ =	**23712**	lbs.
F =	**0.89**	

6. Calculate Capture Volume required by the BMP Type for this drainage basin / outfall area. Calculations from RG-348 Pages 3-34 to 3-36

Rainfall Depth =	**1.60**	inches
Post Development Runoff Coefficient =	**0.52**	
On-site Water Quality Volume =	**108588**	cubic feet

Calculations from RG-348 Pages 3-36 to 3-37

Off-site area draining to BMP =	**0.00**	acres
Off-site Impervious cover draining to BMP =	**0.00**	acres
Impervious fraction of off-site area =	**0**	
Off-site Runoff Coefficient =	**0.00**	
Off-site Water Quality Volume =	**0**	cubic feet
Storage for Sediment =	**21718**	
Total Capture Volume (required water quality volume(s) x 1.20) =	**130305**	cubic feet

The following sections are used to calculate the required water quality volume(s) for the selected BMP.
The values for BMP Types not selected in cell C45 will show N/A.

11. Wet Basins Designed as Required in RG-348 Pages 3-66 to 3-71

Required capacity of Permanent Pool =	**130305**	cubic **Permanent Pool Capacity is 1.20 times the WQV**
Required capacity at WQV Elevation =	**238893**	cubic **Total Capacity should be the Permanent Pool Capacity plus a second WQV.**

EXISTING WOLF RANCH SECTION 2 – POND 1

Texas Commission on Environmental Quality

TSS Removal Calculations 04-20-2009

Project Name: Wolf Ranch Expansion - Wolf Ranch Section 2 - Pond 1
Date Prepared: 8/8/2025

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1. The Required Load Reduction for the total project: Calculations from RG-348 Pages 3-27 to 3-30

Page 3-29 Equation 3.3: $L_M = 28.9(A_N \times P)$

where:
$L_{M\ TOTAL\ PROJECT}$ = Required TSS removal resulting from the proposed development = 85% of increased load
A_N = Net increase in impervious area for the project
P = Average annual precipitation, inches

Site Data: Determine Required Load Removal Based on the Entire Project

County =	**Williamson**	
Total project area included in plan * =	**460.96**	acres
Predevelopment impervious area within the limits of the plan * =	**12.31**	acres
Total post-development impervious area within the limits of the plan* =	**376.59**	acres
Total post-development impervious cover fraction * =	**0.82**	
P =	**32**	inches
$L_{M\ TOTAL\ PROJECT}$ =	**336886**	lbs. **ADJUSTED FOR 85% TSS REMOVAL**

* **The values entered in these fields should be for the total project area.**

Number of drainage basins / outfalls areas leaving the plan area = **1**

2. Drainage Basin Parameters (This information should be provided for each basin):

Drainage Basin/Outfall Area No. = **S2P1**

Total drainage basin/outfall area =	**40.93**	acres
Predevelopment impervious area within drainage basin/outfall area =	**1.00**	acres
Post-development impervious area within drainage basin/outfall area =	**24.19**	acres
Post-development impervious fraction within drainage basin/outfall area =	**0.59**	
$L_{M\ THIS\ BASIN}$ =	**21446**	lbs. **ADJUSTED FOR 85% TSS REMOVAL**

3. Indicate the proposed BMP Code for this basin.

Proposed BMP =	**Batch Detention**	
Removal efficiency =	**91**	percent

4. Calculate Maximum TSS Load Removed (L_M) for this Drainage Basin by the selected BMP Type.

RG-348 Page 3-33 Equation 3.7: $L_R = (\text{BMP efficiency}) \times P \times (A_I \times 34.6 + A_P \times 0.54)$

where:
A_C = Total On-Site drainage area in the BMP catchment area
A_I = Impervious area proposed in the BMP catchment area
A_P = Pervious area remaining in the BMP catchment area
L_R = TSS Load removed from this catchment area by the proposed BMP

A_C =	**40.93**	acres
A_I =	**24.19**	acres
A_P =	**16.74**	acres
L_R =	**24636**	lbs

5. Calculate Fraction of Annual Runoff to Treat the drainage basin / outfall area

Desired $L_{M\ THIS\ BASIN}$ =	**23961**	lbs.
F =	**0.97**	

6. Calculate Capture Volume required by the BMP Type for this drainage basin / outfall area. Calculations from RG-348 Pages 3-34 to 3-36

Rainfall Depth =	**3.00**	inches
Post Development Runoff Coefficient =	**0.41**	
On-site Water Quality Volume =	**184488**	cubic feet

Calculations from RG-348 Pages 3-36 to 3-37

Off-site area draining to BMP =	**0.00**	acres
Off-site Impervious cover draining to BMP =	**0.00**	acres
Impervious fraction of off-site area =	**0**	
Off-site Runoff Coefficient =	**0.00**	
Off-site Water Quality Volume =	**0**	cubic feet
Storage for Sediment =	**36898**	
Total Capture Volume (required water quality volume(s) x 1.20) =	**221386**	cubic feet

EXISTING WOLF RANCH SEC. 1A – VFS 5 WITHIN THE WOLF RANCH SECTION 2, POND 1 RETROFIT BASIN

Texas Commission on Environmental Quality

TSS Removal Calculations 04-20-2009

Project Name: Wolf Ranch Sec. 1A - VFS 5
Date Prepared: 8/8/2025

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1. The Required Load Reduction for the total project: Calculations from RG-348 Pages 3-27 to 3-30

Page 3-29 Equation 3.3: $L_M = 28.9(A_N \times P)$

where:
$L_{M\ TOTAL\ PROJECT}$ = Required TSS removal resulting from t
A_N = Net increase in impervious area for the project
P = Average annual precipitation, inches

Site Data: Determine Required Load Removal Based on the Entire Project

County =	**Williamson**	
Total project area included in plan * =	**460.96**	acres
Predevelopment impervious area within the limits of the plan * =	**12.31**	acres
Total post-development impervious area within the limits of the plan* =	**376.59**	acres
Total post-development impervious cover fraction * =	**0.82**	
P =	**32**	inches
$L_{M\ TOTAL\ PROJECT}$ =	**336886**	lbs.

* **The values entered in these fields should be for the total project area.**

Number of drainage basins / outfalls areas leaving the plan area = **1.00**

2. Drainage Basin Parameters (This information should be provided for each basin):

Drainage Basin/Outfall Area No. = **EX VFS 5**

Total drainage basin/outfall area =	**0.49**	acres
Predevelopment impervious area within drainage basin/outfall area =	**0.00**	acres
Post-development impervious area within drainage basin/outfall area =	**0.29**	acres
Post-development impervious fraction within drainage basin/outfall area =	**0.59**	
$L_{M\ THIS\ BASIN}$ =	**252**	lbs.

3. Indicate the proposed BMP Code for this basin.

Proposed BMP =	**Vegetated Filter Strips**	
Removal efficiency =	**80**	percent

4. Calculate Maximum TSS Load Removed (L_M) for this Drainage Basin by the selected BMP Type.

RG-348 Page 3-33 Equation 3.7: $L_R = (\text{BMP efficiency}) \times P \times (A_I \times 34.6 + A_P \times 0.54)$

where:
A_C = Total On-Site drainage area in the BMP catchment area
A_I = Impervious area proposed in the BMP catchment area
A_P = Pervious area remaining in the BMP catchment area
L_R = TSS Load removed from this catchment area by the proposed BMP

A_C =	**0.49**	acres
A_I =	**0.30**	acres
A_P =	**0.19**	acres
L_R =	**299**	lbs

5. Calculate Fraction of Annual Runoff to Treat the drainage basin / outfall area

Desired $L_{M\ THIS\ BASIN}$ =	**268**	lbs.
F =	**0.90**	

STATE OF TEXAS
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09/12/2025

WOLF RANCH PARKWAY STORMTROOPERS WITHIN WOLF RANCH SECTION 2, POND 1 RETROFIT BASIN

Texas Commission on Environmental Quality

TSS Removal Calculations 04-20-2009

Project Name: Wolf Ranch Expansion - StormTrooper B2 East
Date Prepared: 8/8/2025

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1. StormTrooper Model Sizing based on Individual Catchment Areas to the BMP. Pages 3-27 to 3-30

Page 3-27 Equation 3.3: Effective Area (EA) = (0.9 x Ai) + (0.03 x Ar) Page 3-27 "RG-348" (C=0.90 Imp. Area, C=0.03 for Perv. Area)

Where:

County =	**Williamson**	
Effective Area =	**0.766**	
Total Impervious Area =	**0.84**	
Total Pervious Area =	**0.35**	
Drainage Area	**B2 East**	
From Table 2 choose an initial Model:	**SWAQ-110**	
Surface Area of Model:	**913**	
P =	**32**	
L_{AR} = 27.2 x An x P =	**731**	Lm1 = 27.2 x An x P Equation 3.3 "RG-348"

2. Overflow Rate

$V_{OR} = Q/S.A.$ Equation 3.4 & 3.5 "RG-348"
Page 3-30 "RG-348" (i = 1.1 in./HR., 90% Volume Treated)

Where:

Q =	**i x (EA)**	
Q =	**0.84**	**cfs**
V_{OR} =	**(i x EA)/Model Surface Area**	
V_{OR} =	**0.00092**	**fps**

3. BMP efficiency (Table 3). If the overflow rate is between two percent efficiencies, use the smaller.

V_{OR} =	**0.00092**
BMP Eff (%) =	**85%**

4. Maximum TSS Removal of BMP: L_{BR}

Lr = (BMP Effieniency) x P x (Ai x 34.6 + Ap x 0.54) Equation 3.8 "RG-348"

Where:
Lr = Load Removed by BMP
BMP Efficiency = TSS Removal Efficiency (expressed as a decimal fraction from Table 3)

L_{BR} = **795.65** **#TSS**

TSS removal exceeding required L_M to be counted towards untreated area = L_C

L_C = **L_{AR} - L_{BR}**
L_C = **64.65** **#TSS**

Required TSS removal for untreated area:
L_{AC} = **8.98** < 64.65 #TSS

UNIT IS SUFFICIENTLY SIZED TO REMOVE REQUIRED TSS FROM BOTH CAPTURED AND UNCAPTURED AREAS

Texas Commission on Environmental Quality

TSS Removal Calculations 04-20-2009

Project Name: Wolf Ranch Expansion - StormTrooper B2 West
Date Prepared: 8/8/2025

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1. StormTrooper Model Sizing based on Individual Catchment Areas to the BMP. Pages 3-27 to 3-30

Page 3-27 Equation 3.3: Effective Area (EA) = (0.9 x Ai) + (0.03 x Ar) Page 3-27 "RG-348" (C=0.90 Imp. Area, C=0.03 for Perv. Area)

Where:

County =	**Williamson**	
Effective Area =	**0.725**	
Total Impervious Area =	**0.79**	
Total Pervious Area =	**0.48**	
Drainage Area	**B2 West**	
From Table 2 choose an initial Model:	**SWAQ-110**	
Surface Area of Model:	**913**	
P =	**32**	
L_{AR} = 27.2 x An x P =	**688**	Lm1 = 27.2 x An x P Equation 3.3 "RG-348"

2. Overflow Rate

$V_{OR} = Q/S.A.$ Equation 3.4 & 3.5 "RG-348"
Page 3-30 "RG-348" (i = 1.1 in./HR., 90% Volume Treated)

Where:

Q =	**i x (EA)**	
Q =	**0.8**	**cfs**
V_{OR} =	**(i x EA)/Model Surface Area**	
V_{OR} =	**0.00087**	**fps**

3. BMP efficiency (Table 3). If the overflow rate is between two percent efficiencies, use the smaller.

V_{OR} =	**0.00087**
BMP Eff (%) =	**85%**

4. Maximum TSS Removal of BMP: L_{BR}

Lr = (BMP Effieniency) x P x (Ai x 34.6 + Ap x 0.54) Equation 3.8 "RG-348"

Where:
Lr = Load Removed by BMP
BMP Efficiency = TSS Removal Efficiency (expressed as a decimal fraction from Table 3)

L_{BR} = **750.49** **#TSS**

TSS removal exceeding required L_M to be counted towards untreated area = L_C

L_C = **L_{AR} - L_{BR}**
L_C = **62.49** **#TSS**

Required TSS removal for untreated area:
L_{AC} = **8.98** < 62.49 #TSS

UNIT IS SUFFICIENTLY SIZED TO REMOVE REQUIRED TSS FROM BOTH CAPTURED AND UNCAPTURED AREAS

NO.	REVISION	DATE

GEORGETOWN TEXAS *more than welcome*

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CITY OF GEORGETOWN, TEXAS
WOLF RANCH PKWY / MEMORIAL DR
WATER QUALITY TREATMENT SUMMARY 9 OF 11

CITY JOB No.
JOB NO. 51423-00
DATE 9/12/2025
DESIGNER AK
CHECKED SC DRAWN AK
9 11
SHEET 460

Date: Sep 12, 2025, 10:37am User ID: casholtz
File: H:\Projects\514\23\00\301 Construction Documents\Civil\W051423-00.dwg

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EXISTING BLUEBONNET PLAZA – BATCH DETENTION POND

Texas Commission on Environmental Quality

TSS Removal Calculations 04-20-2009

Project Name: **Bluebonnet Plaza**
Date Prepared: **8/8/2025**

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1. The Required Load Reduction for the total project: Calculations from RG-348 Pages 3-27 to 3-30

Page 3-29 Equation 3.3: $L_M = 28.9(A_N \times P)$

where:
$L_{M\,TOTAL\,PROJECT}$ = Required TSS removal resulting from t
A_N = Net increase in impervious area for the project
P = Average annual precipitation, inches

Site Data: Determine Required Load Removal Based on the Entire Project

County =	Williamson	
Total project area included in plan * =	460.96	acres
Predevelopment impervious area within the limits of the plan* =	12.31	acres
Total post-development impervious area within the limits of the plan* =	376.59	acres
Total post-development impervious cover fraction * =	0.82	
P =	32	inches
$L_{M\,TOTAL\,PROJECT}$ =	336886	lbs.

* **The values entered in these fields should be for the total project area.**

Number of drainage basins / outfalls areas leaving the plan area = 1

2. Drainage Basin Parameters (This information should be provided for each basin):

Drainage Basin/Outfall Area No. = Bluebonnet Plaza Pond

Total drainage basin/outfall area =	33.96	acres
Predevelopment impervious area within drainage basin/outfall area =	0.00	acres
Post-development impervious area within drainage basin/outfall area =	13.35	acres
Post-development impervious fraction within drainage basin/outfall area =	0.39	
$L_{M\,THIS\,BASIN}$ =	12346	lbs.

3. Indicate the proposed BMP Code for this basin.

Proposed BMP =	Batch Detention	
Removal efficiency =	91	percent

4. Calculate Maximum TSS Load Removed (L_R) for this Drainage Basin by the selected BMP Type.

RG-348 Page 3-33 Equation 3.7: L_R = (BMP efficiency) x P x (A_I x 34.6 + A_P x 0.54)

where:
A_C = Total On-Site drainage area in the BMP catchment area
A_I = Impervious area proposed in the BMP catchment area
A_P = Pervious area remaining in the BMP catchment area
L_R = TSS Load removed from this catchment area by the proposed BMP

A_C =	33.96	acres
A_I =	13.35	acres
A_P =	20.61	acres
L_R =	13777	lbs

5. Calculate Fraction of Annual Runoff to Treat the drainage basin / outfall area

Desired $L_{M\,THIS\,BASIN}$ =	12346	lbs.
F =	0.90	

6. Calculate Capture Volume required by the BMP Type for this drainage basin / outfall area. Calculations from RG-348 Pages 3-34 to 3-36

Rainfall Depth =	1.70	inches
Post Development Runoff Coefficient =	0.30	
On-site Water Quality Volume =	63626	cubic feet

Calculations from RG-348 Pages 3-36 to 3-37

Off-site area draining to BMP =	10.39	acres
Off-site Impervious cover draining to BMP =	0.00	acres
Impervious fraction of off-site area =	0.00	
Off-site Runoff Coefficient =	0.02	
Off-site Water Quality Volume =	1282	cubic feet
Storage for Sediment =	12982	
Total Capture Volume (required water quality volume(s) x 1.20) =	77890	cubic feet

RIVERY POND A

```
POND A WATER QUALITY VOLUME (TNRCC EDWARDS AQUIFER REQUIREMENTS):

        A = Drainage Area (ac):  86.33 ac
            30.73 acres existing development at assumed 35% impervious (River Hills Subdivision)
            55.60 acres onsite area
        P = Average Annual Precipitation, Williamson County (in) = 32

   OFFSITE LOAD:

        Rv = Runoff Coefficient for the fraction of impervious cover
           = 0.546 (IC)^2 + 0.328 (IC) + 0.030 = 0.212  (35% IC)
        C = Average TSS Concentration (mg/L) = 170 (developed)

     Offsite L = A x P x Rv x C x 0.226
               = 30.73 x 32 x 0.212 x 170 x 0.226
               = 8,010 lbs

   ONSITE PRE-DEVELOPMENT (BACKGROUND) LOAD:

        Rv = Runoff Coefficient for the fraction of impervious cover
           = 0.546 (IC)^2 + 0.328 (IC) + 0.030 = 0.030 (0% IC)
        C = Average TSS Concentration (mg/L) = 80 (undeveloped)

     Onsite Predevelopment L = A x P x Rv x C x 0.226
                             = 55.60 x 32 x 0.030 x 80 x 0.226
                             = 965 lbs

   ONSITE POST-DEVELOPMENT LOAD:

        Total Impervious Cover (ac):  30.96
        IC = Impervious Cover = 55.7%

        Rv = Runoff Coefficient for the fraction of impervious cover
           = 0.546 (IC)^2 + 0.328 (IC) + 0.030 = 0.382
        C = Average TSS Concentration (mg/L) = 170 (developed)

     Onsite Postdevelopment L = A x P x Rv x C x 0.226
                              = 55.60 x 32 x 0.382 x 170 x 0.226
                              = 26,112 lbs

   TOTAL PREDEVELOPMENT LOAD:

      Onsite Predevelopment Load + Offsite Load = 8,975 lbs

   TOTAL POSTDEVELOPMENT LOAD:

      Onsite Postdevelopment Load + Offsite Load = 34,122 lbs

   TSS LOAD REDUCTION:

     Lr = 0.8 x (postdevelopment load - predevelopment load)
        = 20,118 lbs

        Lr = (total postdevelopment load) x F x (fraction of site treated) x (TSS removal eff.)
        20,118 = 34,122 x F x 1 x 0.93

   F = fraction of load captured by BMP
   F = 0.634

    Runoff capture depth = 0.25 in
         (48.3% weighted impervious cover over drainage area. 63.4% load captured by pond)

PERMANENT POOL ELEVATION = 752.0
WATER QUALITY ELEVATION = 753.3

REQUIRED WATER QUALITY VOLUME  = 0.25 in x 86.33 ac
                               = 78,345 cf (1.80 AC-FT)
PROVIDED WATER QUALITY VOLUME = 85,001 cf (1.86 AC-FT)

REQUIRED PERMANENT POOL VOLUME = 1.2 x WQV  (20% increase to allow for sediment accumulation)
                               = 94,013 cf (2.16 AC-FT)
PROVIDED PERMANENT POOL VOLUME = 242,630 cf (5.57 AC-FT)

REQUIRED FOREBAY VOLUME = 15 to 25% of permanent pool volume
PROVIDED FOREBAY VOLUME = 44,901 CF (18.2%)
```

STATE OF TEXAS
STEVEN S. CRAUFORD
92677
LICENSED PROFESSIONAL ENGINEER
09/12/2025

WOLF RANCH PARKWAY STORMTROOPERS WITHIN RIVERY POND A BASIN

Texas Commission on Environmental Quality

TSS Removal Calculations 04-20-2009

Project Name: **Wolf Ranch Expansion - StormTrooper C2 East**
Date Prepared: **8/8/2025**

Additional information is provided for cells with a red triangle in the upper right corner. Place the cursor over the cell.
Text shown in blue indicate location of instructions in the Technical Guidance Manual - RG-348.
Characters shown in red are data entry fields.
Characters shown in black (Bold) are calculated fields. Changes to these fields will remove the equations used in the spreadsheet.

1. StormTrooper Model Sizing based on Individual Catchment Areas to the BMP. Pages 3-27 to 3-30

Page 3-27 Equation 3.3: Effective Area (EA) = (0.9 x Ai) + (0.03 x Ar) Page 3-27 "RG-348" (C=0.90 Imp. Area, C=0.03 for Perv. Area)

Where:

County =	Williamson	
Effective Area =	0.212	
Total Impervious Area =	0.22	
Total Pervious Area =	0.48	
Drainage Area	C2 East	
From Table 2 choose an initial Model:	SWAQ-25	
Surface Area of Model:	369	
P =	32	
L_{MT} = 27.2 x An x P =	191	Lmt = 27.2 x An x P Equation 3.3 "RG-348"

2. Overflow Rate

V_{OR} = Q/S.A. Equation 3.4 & 3.5 "RG-348"
Page 3-30 "RG-348" (i = 1.1 in./HR., 90% Volume Treated)

Where:

Q =	i x (EA)	
Q =	0.23	cfs
V_{OR} =	(i x EA)/Model Surface Area	
V_{OR} =	0.00063	fps

3. BMP efficiency (Table 3). If the overflow rate is between two percent efficiencies, use the smaller.

V_{OR} =	0.00063
BMP Eff (%) =	88%

4. Maximum TSS Removal of BMP: L_{MR}

Lr = (BMP Effiencieny) x P x (Ai x 34.6 + Ap x 0.54) Equation 3.8 "RG-348"

Where:
Lr = Load Removed by BMP
BMP Efficiency = TSS Removal Efficiency (expressed as a decimal fraction from Table 3)

L_{MR} =	221.65	#TSS

TSS removal exceeding required L_M to be counted towards untreated area = L_C

L_C =	L_{MR} - L_{MT}	
L_C =	30.65	#TSS

Required TSS removal for untreated area:

L_{MC} =	8.98	<	30.65	#TSS

UNIT IS SUFFICIENTLY SIZED TO REMOVE REQUIRED TSS FROM BOTH CAPTURED AND UNCAPTURED AREAS

Texas Commission on Environmental Quality

TSS Removal Calculations 04-20-2009

Project Name: **Wolf Ranch Expansion - StormTrooper C1 West**
Date Prepared: **8/8/2025**

Additional information is provided for cells with a red triangle in the upper right corner. Place the cursor over the cell.
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1. StormTrooper Model Sizing based on Individual Catchment Areas to the BMP. Pages 3-27 to 3-30

Page 3-27 Equation 3.3: Effective Area (EA) = (0.9 x Ai) + (0.03 x Ar) Page 3-27 "RG-348" (C=0.90 Imp. Area, C=0.03 for Perv. Area)

Where:

County =	Williamson	
Effective Area =	0.355	
Total Impervious Area =	0.39	
Total Pervious Area =	0.14	
Drainage Area	C1 West	
From Table 2 choose an initial Model:	SWAQ-40	
Surface Area of Model:	588	
P =	32	
L_{MT} = 27.2 x An x P =	339	Lmt = 27.2 x An x P Equation 3.3 "RG-348"

2. Overflow Rate

V_{OR} = Q/S.A. Equation 3.4 & 3.5 "RG-348"
Page 3-30 "RG-348" (i = 1.1 in./HR., 90% Volume Treated)

Where:

Q =	i x (EA)	
Q =	0.39	cfs
V_{OR} =	(i x EA)/Model Surface Area	
V_{OR} =	0.00066	fps

3. BMP efficiency (Table 3). If the overflow rate is between two percent efficiencies, use the smaller.

V_{OR} =	0.00066
BMP Eff (%) =	88%

4. Maximum TSS Removal of BMP: L_{MR}

Lr = (BMP Effiencieny) x P x (Ai x 34.6 + Ap x 0.54) Equation 3.8 "RG-348"

Where:
Lr = Load Removed by BMP
BMP Efficiency = TSS Removal Efficiency (expressed as a decimal fraction from Table 3)

L_{MR} =	382.12	#TSS

TSS removal exceeding required L_M to be counted towards untreated area = L_C

L_C =	L_{MR} - L_{MT}	
L_C =	43.12	#TSS

Required TSS removal for untreated area:

L_{MC} =	8.98	<	43.12	#TSS

UNIT IS SUFFICIENTLY SIZED TO REMOVE REQUIRED TSS FROM BOTH CAPTURED AND UNCAPTURED AREAS

NO.	REVISION	DATE

GEORGETOWN TEXAS *more than welcome*

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TBPE FIRM REGISTRATION #470 | TBPLS FIRM REGISTRATION #10028801

CITY OF GEORGETOWN, TEXAS
WOLF RANCH PKWY / MEMORIAL DR
WATER QUALITY TREATMENT SUMMARY 10 OF 11

CITY JOB No.
JOB NO. 51423-00
DATE 9/12/2025
DESIGNER AK
CHECKED SC DRAWN AK
10 11
SHEET 461

Date: Sep 12, 2025, 10:37am User ID: cschatz
File: H:\Projects\51423\00\301 Construction Documents\Civil\W51423-00.dwg
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RIVERY POND B

POND B WATER QUALITY VOLUME (TNRCC EDWARDS AQUIFER REQUIREMENTS):

A = Drainage Area (ac): 66.28 ac
P = Average Annual Precipitation, Williamson County (in) = 32

PRE-DEVELOPMENT (BACKGROUND) LOAD:

Rv = Runoff Coefficient for the fraction of impervious cover
= 0.546 (IC^2 + 0.328 (IC) + 0.030 = 0.030 (0% IC)
C = Average TSS Concentration (mg/L) = 80 (undeveloped)

Onsite Predevelopment L = A x P x Rv x C x 0.226
= 66.28 x 32 x 0.030 x 80 x 0.226
= 1,150 lbs

POST-DEVELOPMENT LOAD:

Total Impervious Cover (ac): 50.27
IC = Impervious Cover = 75.8%

Rv = Runoff Coefficient for the fraction of impervious cover
= 0.546 (IC^2 + 0.328 (IC) + 0.030 = 0.592
C = Average TSS Concentration (mg/L) = 170 (developed)

Onsite Postdevelopment L = A x P x Rv x C x 0.226
= 66.28 x 32 x 0.592 x 170 x 0.226
= 48,240 lbs

TSS LOAD REDUCTION:

Lr = 0.8 x (postdevelopment load - predevelopment load)
= 37,672 lbs

Lr = (total postdevelopment load) x F x (fraction of site treated) x (TSS removal eff.)
37672 = 48,240 x F x 1 x 0.93

F = fraction of load captured by BMP
F = 0.840

Runoff capture depth = 0.73 in
(75.8% impervious cover, 84.0% load captured by pond)

PERMANENT POOL ELEVATION = 697.0
WATER QUALITY ELEVATION = 699.4

REQUIRED WATER QUALITY VOLUME = 0.73 in x 66.28 ac
= 175,635 cf (4.03 AC-FT)
PROVIDED WATER QUALITY VOLUME = 177,314 cf (4.07 AC-FT)

REQUIRED PERMANENT POOL VOLUME = 1.2 x WQV (20% increase to allow for sediment accumulation)
= 210,762 cf (4.84 AC-FT)
PROVIDED PERMANENT POOL VOLUME = 263,515 cf (6.05 AC-FT)

REQUIRED FOREBAY VOLUME = 15 to 25% of permanent pool volume
PROVIDED FOREBAY VOLUME = 57,690 CF (21.9%)

WOLF RANCH PARKWAY
STORMTROOPERS WITHIN RIVERY
POND B BASIN

Texas Commission on Environmental Quality
TSS Removal Calculations 04-20-2009

Project Name: Wolf Ranch Expansion - StormTrooper D2 East
Date Prepared: 8/8/2025

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1. StormTrooper Model Sizing based on Individual Catchment Areas to the BMP. Pages 3-27 to 3-30

Page 3-27 Equation 3.3: Effective Area (EA) = (0.9 x Ai) + (0.03 x Ar) — Page 3-27 "RG-348" (C=0.90 Imp. Area, C=0.03 for Perv. Area)

	County =	Williamson	
Where:	Effective Area =	0.418	
	Total Impervious Area =	0.44	
	Total Pervious Area =	0.73	
	Drainage Area	D2 East	
	From Table 2 choose an initial Model:	SWAQ-40	
	Surface Area of Model:	588	
	P =	32	
	L_M = 27.2 x An x P =	383	Lm1 = 27.2 x An x P Equation 3.3 "RG-348"

2. Overflow Rate

$V_{OR} = Q/S.A.$ — Equation 3.4 & 3.5 "RG-348"
Page 3-30 "RG-348" (i = 1.1 in./HR., 90% Volume Treated)

Where:	Q =	i x (EA)	
	Q =	0.46	cfs
	V_{OR} =	(i x EA)/Model Surface Area	
	V_{OR} =	0.00078	fps

3. BMP efficiency (Table 3). If the overflow rate is between two percent efficiencies, use the smaller.

V_{OR} =	0.00078	
BMP Eff (%) =	86%	

4. Maximum TSS Removal of BMP: L_M

STORMTROOPER D2 EAST (SWAQ-25)

Lr = (BMP Effiencienc) x P x (Ai x 34.6 + Ap x 0.54) — Equation 3.8 "RG-348"

Where:
Lr = Load Removed by BMP
BMP Efficiency = TSS Removal Efficiency (expressed as a decimal fraction from Table 3)

L_M =	429.81	#TSS		
TSS removal exceeding required L_M to be counted towards untreated area = L_C				
L_C =	L_M - L_{M1}			
L_C =	46.81	#TSS		
Required TSS removal for untreated area:				
L_{MC} =	8.98	<	46.81	#TSS

UNIT IS SUFFICIENTLY SIZED TO REMOVE REQUIRED TSS FROM BOTH CAPTURED AND UNCAPTURED AREAS

Texas Commission on Environmental Quality
TSS Removal Calculations 04-20-2009

Project Name: Wolf Ranch Expansion - StormTrooper D1 West
Date Prepared: 8/8/2025

Additional information is provided for cells with a red triangle in the upper right corner. Place the cursor over the cell.
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1. StormTrooper Model Sizing based on Individual Catchment Areas to the BMP. Pages 3-27 to 3-30

Page 3-27 Equation 3.3: Effective Area (EA) = (0.9 x Ai) + (0.03 x Ar) — Page 3-27 "RG-348" (C=0.90 Imp. Area, C=0.03 for Perv. Area)

	County =	Williamson	
Where:	Effective Area =	0.398	
	Total Impervious Area =	0.44	
	Total Pervious Area =	0.08	
	Drainage Area	D1 West	
	From Table 2 choose an initial Model:	SWAQ-40	
	Surface Area of Model:	588	
	P =	32	
	L_M = 27.2 x An x P =	383	Lm1 = 27.2 x An x P Equation 3.3 "RG-348"

2. Overflow Rate

$V_{OR} = Q/S.A.$ — Equation 3.4 & 3.5 "RG-348"
Page 3-30 "RG-348" (i = 1.1 in./HR., 90% Volume Treated)

Where:	Q =	i x (EA)	
	Q =	0.44	cfs
	V_{OR} =	(i x EA)/Model Surface Area	
	V_{OR} =	0.00075	fps

3. BMP efficiency (Table 3). If the overflow rate is between two percent efficiencies, use the smaller.

V_{OR} =	0.00075	
BMP Eff (%) =	86%	

4. Maximum TSS Removal of BMP: L_M

Lr = (BMP Effiencienc) x P x (Ai x 34.6 + Ap x 0.54) — Equation 3.8 "RG-348"

Where:
Lr = Load Removed by BMP
BMP Efficiency = TSS Removal Efficiency (expressed as a decimal fraction from Table 3)

L_M =	420.15	#TSS		
TSS removal exceeding required L_M to be counted towards untreated area = L_C				
L_C =	L_M - L_{M1}			
L_C =	37.15	#TSS		
Required TSS removal for untreated area:				
L_{MC} =	8.98	<	37.15	#TSS

UNIT IS SUFFICIENTLY SIZED TO REMOVE REQUIRED TSS FROM BOTH CAPTURED AND UNCAPTURED AREAS

WOLF RANCH SECTION 1A
WET POND BASIN

Texas Commission on Environmental Quality
TSS Removal Calculations 04-20-2009

Project Name: Wolf Ranch, Section 1A
Date Prepared: 8/8/2025

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1. The Required Load Reduction for the total project: Calculations from RG-348 — Pages 3-27 to 3-30

Page 3-29 Equation 3.3: $L_M = 28.9(A_N \times P)$

where:
$L_{M\,TOTAL\,PROJECT}$ = Required TSS removal resulting from the proposed development = 80% of increased load
A_N = Net increase in impervious area for the project
P = Average annual precipitation, inches

Site Data: Determine Required Load Removal Based on the Entire Project

County =	Williamson	
Total project area included in plan * =	460.96	acres
Predevelopment impervious area within the limits of the plan * =	12.31	acres
Total post-development impervious area within the limits of the plan* =	376.59	acres
Total post-development impervious cover fraction,* =	0.82	
P =	32	inches
$L_{M\,TOTAL\,PROJECT}$ =	336886	lbs. ADJUSTED FOR 85% TSS REMOVAL AND NOT 80%

* **The values entered in these fields should be for the total project area.**

Number of drainage basins / outfalls areas leaving the plan area = 1

2. Drainage Basin Parameters (This information should be provided for each basin):

Drainage Basin/Outfall Area No. = 1

Total drainage basin/outfall area =	61.23	acres
Predevelopment impervious area within drainage basin/outfall area =	0.55	acres
Post-development impervious area within drainage basin/outfall area =	34.67	acres
Post-development impervious fraction within drainage basin/outfall area =	0.57	
$L_{M\,THIS\,BASIN}$ =	31554	lbs. ADJUSTED FOR 85% TSS REMOVAL AND NOT 80%

3. Indicate the proposed BMP Code for this basin.

Proposed BMP = Wet Basin
Removal efficiency = 93 percent

4. Calculate Maximum TSS Load Removed (L_M) for this Drainage Basin by the selected BMP Type.

RG-348 Page 3-33 Equation 3.7: L_M = (BMP efficiency) x P x (A x 34.6 + A_P x 0.54)

where:
A_C = Total On-Site drainage area in the BMP catchment area
A_I = Impervious area proposed in the BMP catchment area
A_P = Pervious area remaining in the BMP catchment area
L_M = TSS Load removed from this catchment area by the proposed BMP

A_C =	61.23	acres
A_I =	34.67	acres
A_P =	26.56	acres
L_M =	36126	lbs

5. Calculate Fraction of Annual Runoff to Treat the drainage basin / outfall area

Desired $L_{M\,THIS\,BASIN}$ = 32618 lbs. DOUBLE CHECK

F = 0.90

6. Calculate Capture Volume required by the BMP Type for this drainage basin / outfall area. Calculations from RG-348 Pages 3-34 to 3-36

Rainfall Depth =	1.70	inches
Post Development Runoff Coefficient =	0.40	
On-site Water Quality Volume =	150044	cubic feet

Calculations from RG-348 — Pages 3-36 to 3-37

Off-site area draining to BMP =	0.00	acres
Off-site Impervious cover draining to BMP =	0.00	acres
Impervious fraction of off-site area =	0	
Off-site Runoff Coefficient =	0.00	
Off-site Water Quality Volume =	0	cubic feet
Storage for Sediment =	30009	
Total Capture Volume (required water quality volume(s) x 1.20) =	180053	cubic feet

The following sections are used to calculate the required water quality volume(s) for the selected BMP.
The values for BMP Types not selected in cell C45 will show NA.

11. Wet Basins Designed as Required in RG-348 — Pages 3-66 to 3-71

Required capacity of Permanent Pool =	180053	cubic **Permanent Pool Capacity is 1.20 times the WQV**
Required capacity at WQV Elevation =	330097	cubic **Total Capacity should be the Permanent Pool Capacity plus a second WQV.**

STATE OF TEXAS
STEVEN S. CRAUFORD
92677
LICENSED
PROFESSIONAL ENGINEER

09/12/2025

NO. REVISION DATE

PAPE-DAWSON ENGINEERS
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GEORGETOWN TEXAS
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CITY OF GEORGETOWN, TEXAS
WOLF RANCH PKWY / MEMORIAL DR
WATER QUALITY TREATMENT SUMMARY 11 OF 11

CITY JOB No.
JOB NO. 51423-00
DATE 9/12/2025
DESIGNER AK
CHECKED SC DRAWN AK
11 11
SHEET 462

Date: Sep 12, 2025, 10:37am User ID: cashatt
File: H:\Projects\514\23\00\30 Construction Documents\Civil\W051423-00.dwg

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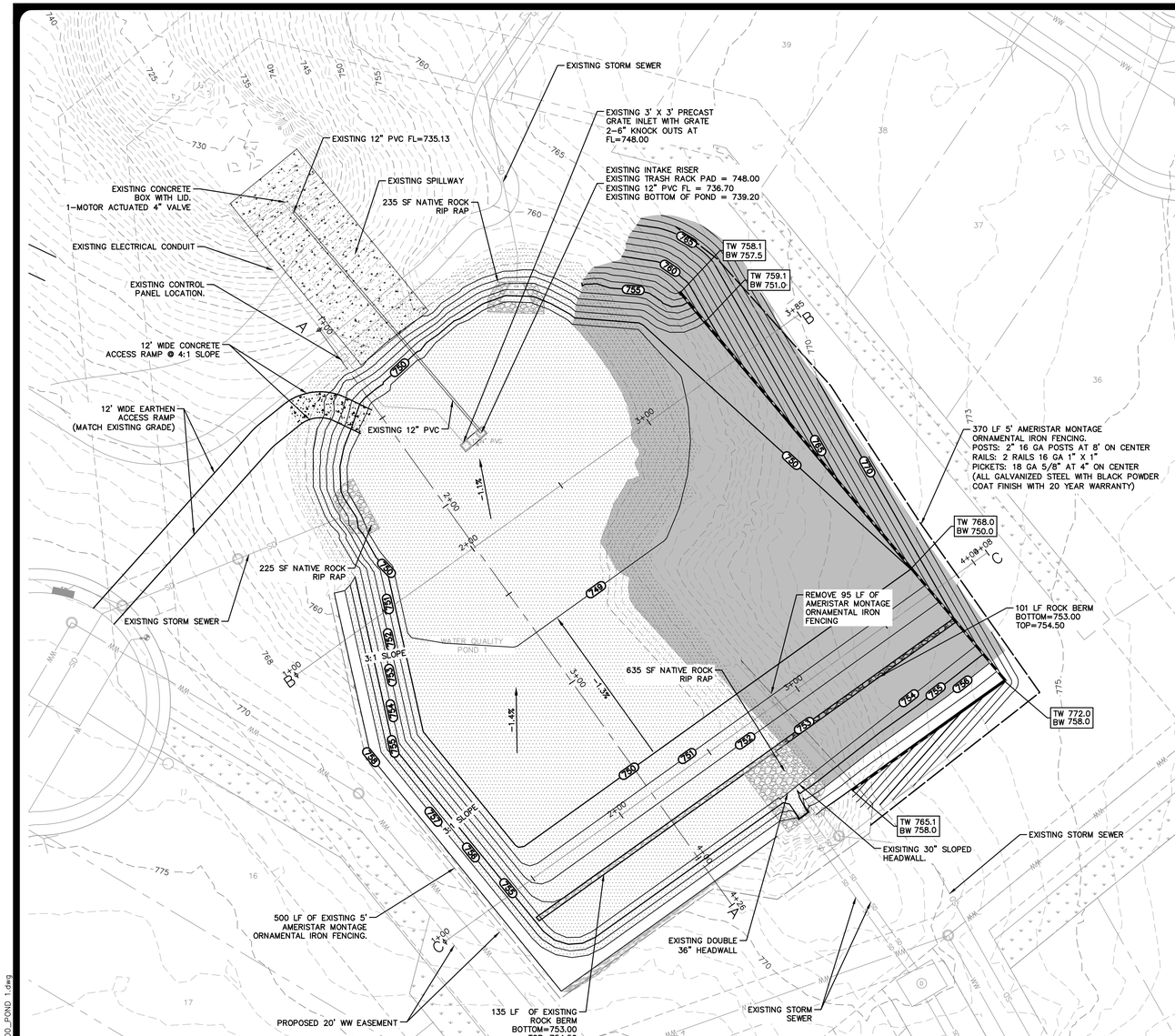

LEGEND

- STORM DRAIN LINE & MH
- CURB INLET
- EXISTING CONTOUR LINE
- EXISTING CONTOUR LINE
- PROPERTY BOUNDARY
- WALL
- TW — TOP OF WALL
- BW — BOTTOM OF WALL
- EG — EXISTING GROUND
- LIMITS OF PROPOSED POND EXPANSION

Texas Commission on Environmental Quality

TSS Removal Calculations 04-20-2009

Project Name: Wolf Ranch Section 2-Pond 1
Date Prepared: 7/19/2017

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1. The Required Load Reduction for the total project: Calculations from RG-348 Pages 3-27 to 3-30

Page 3-29 Equation 3.3: $L_M = 28.9(A_N \times P)$

where:
$L_{M\,TOTAL\ PROJECT}$ = Required TSS removal resulting from the proposed development = 80% of increased load
A_N = Net increase in impervious area for the project
P = Average annual precipitation, inches

Site Data: Determine Required Load Removal Based on the Entire Project

County =	**Williamson**	
Total project area included in plan * =	**69.61**	acres
Predevelopment impervious area within the limits of the plan * =	**0.66**	acres
Total post-development impervious area within the limits of the plan* =	**38.13**	acres
Total post-development impervious cover fraction * =	**0.64**	
P =	**32**	inches
$L_{M\,TOTAL\ PROJECT}$ =	**34652**	lbs. ADJUSTED FOR 80% TSS REMOVAL AND NOT 80%!!!!!!!!!!!!!!!!!!

* **The values entered in these fields should be for the total project area.**

Number of drainage basins / outfalls areas leaving the plan area = **1**

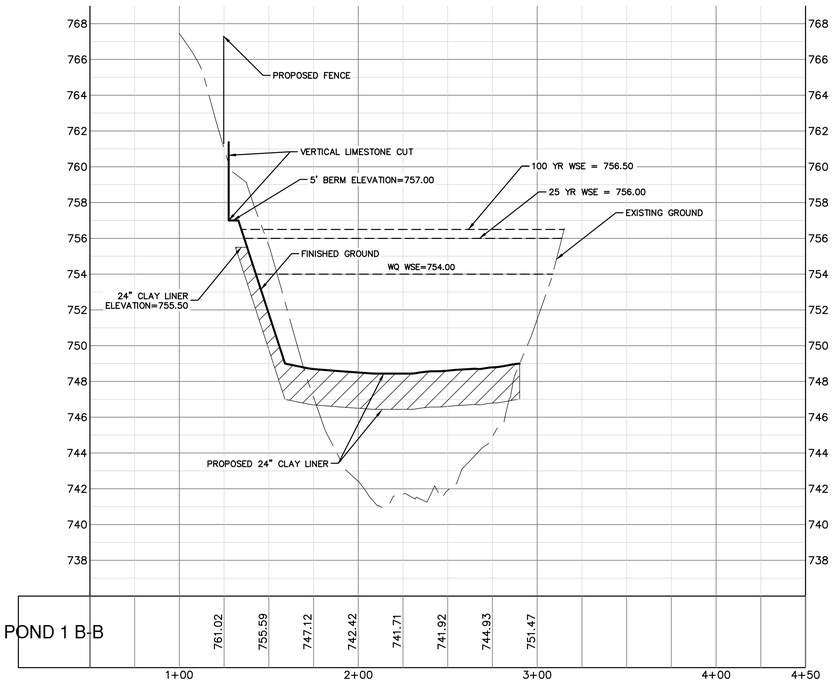
2. Drainage Basin Parameters (This information should be provided for each basin):

Drainage Basin/Outfall Area No. = **1**

Total drainage basin/outfall area =	**36.18**	acres
Predevelopment impervious area within drainage basin/outfall area =	**0.66**	acres
Post-development impervious area within drainage basin/outfall area =	**22.94**	acres
Post-development impervious fraction within drainage basin/outfall area =	**0.63**	
$L_{M\,THIS\ BASIN}$ =	**20605**	lbs. ADJUSTED FOR 80% TSS REMOVAL AND NOT 80%!!!!!!!!!!!!!!!!!!

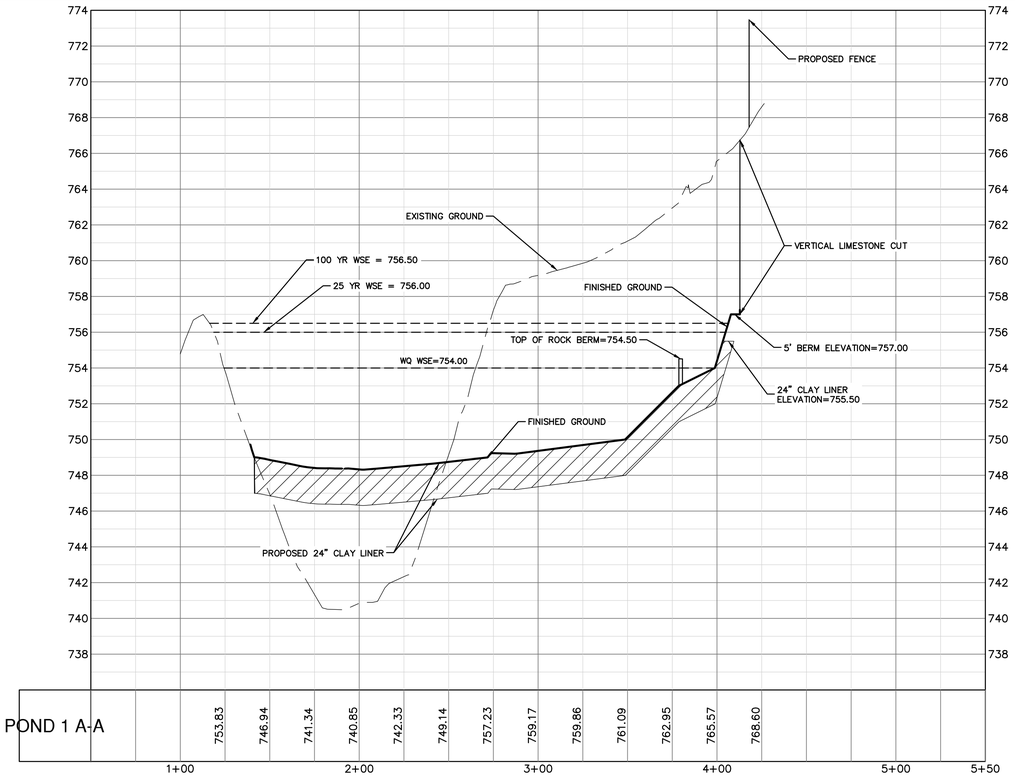
3. Indicate the proposed BMP Code for this basin.

Proposed BMP =	**Batch Detention**	
Removal efficiency =	**91**	percent ADJUST MANUALLY!!!!!!!!!!!!!!!!!



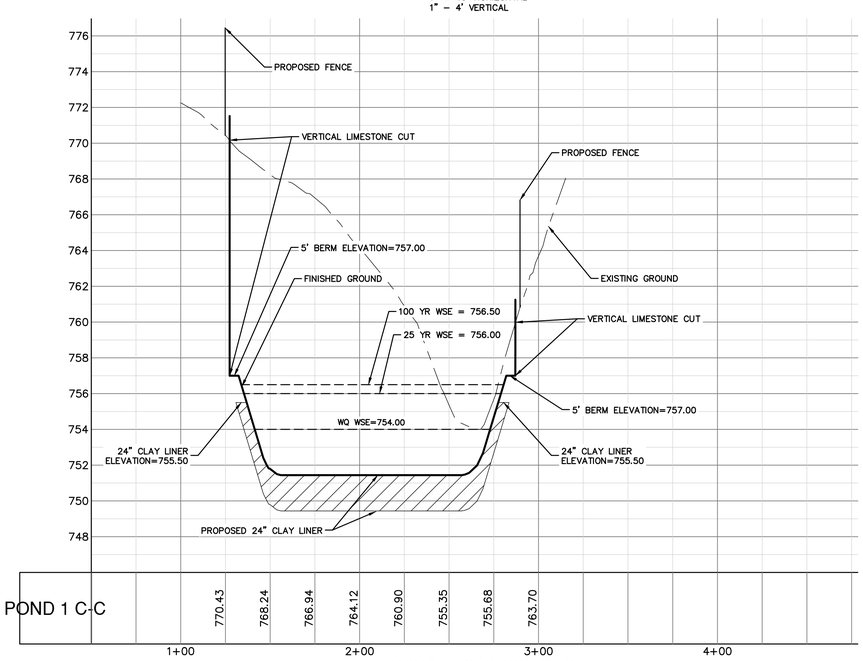
POND 1 SECTION B–B

1" = 40' HORIZONTAL
1" = 4' VERTICAL



POND 1 SECTION A–A

1" = 40' HORIZONTAL
1" = 4' VERTICAL



POND 1 SECTION C–C

1" = 40' HORIZONTAL
1" = 4' VERTICAL

NO.	REVISION	DATE

GEORGETOWN TEXAS
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STATE OF TEXAS
STEVEN S. CRAUFORD
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PROFESSIONAL ENGINEER

09/12/2025

CITY OF GEORGETOWN, TEXAS
WOLF RANCH PKWY / MEMORIAL DR

POND 1 DETAILS (2 OF 2)

CITY JOB No.
JOB NO. 51423-00
DATE 9/12/2025
DESIGNER JB
CHECKED SC DRAWN JB

SHEET 465

Date: Sep 12, 2025, 10:38am User ID: csabatr
File: H:\Projects\514\23\00\30 Construction Documents\Civil\PD51423-00_POND 1.dwg

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Water Quality - Memorial Drive Pond - Combined Elevation-Area-Storage Table							
Stage (ft. msl)	Pond Area (sf)	Pond Area (ac)	Incremental Height (ft)	Incremental Volume Avg. End Area (cf)	Cumulative Volume (cf)	Cumulative Volume (ac-ft)	Comments
833.5	130	0.0030	---	---	---	---	
834	944	0.0217	0.5	269	269	0.01	Sed Marker @ 0.5 ft Sed Depth
835	1,366	0.0314	1	1,155	1,424	0.03	
836	1,843	0.0423	1	1,605	3,028	0.07	
837	2,374	0.0545	1	2,109	5,137	0.12	
838	2,961	0.0680	1	2,668	7,804	0.18	Water Quality Volume
838.8	3,281	0.0753	0.8	2,497	10,301	0.24	25 YR WSEL
839	3,601	0.0827	0.2	688	10,989	0.25	100 YR WSEL
840	4,297	0.0986	1	3,949	14,938	0.34	Top of Berm

ORIFICE DRAWDOWN TIME FOR BATCH DETENTION

Contour Elevation (ft)	Contour Area (ft^2)	Average End Area Method $V_{1,2} = \left[\frac{A_1 + A_2}{2}\right] * d$ Incremental Volume (ft^3)	Total Volume (ft^3)	Orifice Discharge (cfs)	Incremental Drawdown Time (hr)	Total Drawdown Time (hr)
838	2,961	-	-	-	-	-
837	2,374	2,668	2,668	0.27	2.8	2.8
836	1,843	2,109	4,776	0.24	2.4	5.2
835	1,366	1,605	6,381	0.22	2.0	7.2
834	944	1,155	7,536	0.19	1.7	8.9
833.5	130	269	7,804	0.17	0.4	9.3

ORIFICE DIAMETER	2.00	in
ORIFICE FL ELEV	831.02	
ORIFICE CENTROID ELEV	**831.10**	
ORIFICE AREA (Ao)	**0.022**	sf
ORIFICE COEFFICIENT	**0.6**	

ORIFICE EQUATION

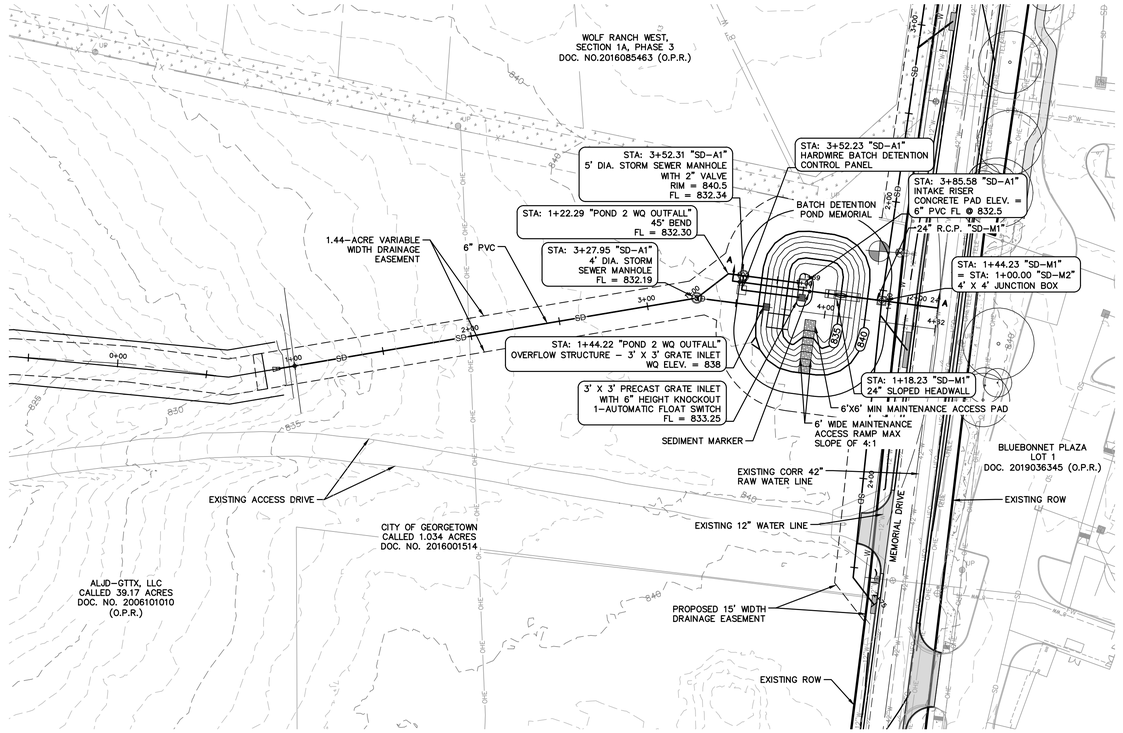
$$Q = CA_o\sqrt{2gH}$$

CALCULATE 24 HR DRAWDOWN ELEVATION FOR WATER QUALITY POND (USE IN DETENTION MODEL)

Total Drawdown Time	9.3	hours
Total Hold + Drawdown Time (Max. 48 Hours)	21.3	hours
Orifice Discharge Rate (Average)	0.23	cfs

POND UNDERDRAIN SIZING CALCULATIONS

DRAIN LINE ID	WATER QUALITY VOLUME **WQV** (cf)	AVERAGE DRAWDOWN FLOWRATE FROM ORIFICE (VALVE) **Q** (cfs)	PIPE DIAMETER **D** (in)	MANNINGS N **n**	PIPE SLOPE **S** (ft/ft)	FULL FLOW CAPACITY **Qcap**	**K**	FRICTION SLOPE **Sf** (ft/ft)
MEMORIAL DRIVE POND DRAIN	7,804	0.23	6	0.010	0.005	0.52	7.29	0.0010



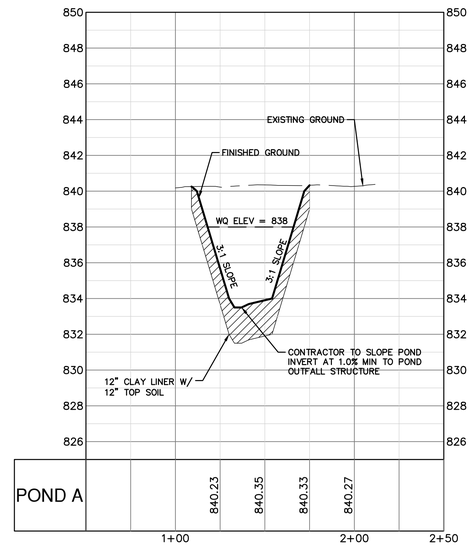
SCALE: 1"= 40'

0' 40' 80' 120'

LEGEND

- WATER LINE
- WASTEWATER LINE & MH
- STORM DRAIN LINE & MH
- CURB INLET
- FLOODPLAIN
- OVERHEAD ELECTRIC LINE
- GATE VALVE
- FIRE HYDRANT
- EXISTING GATE VALVE
- EXISTING FIRE HYDRANT
- EXISTING WATER LINE
- EXISTING WASTEWATER LINE
- EXISTING STORM DRAIN LINE
- EXISTING CONTOUR LINE
- PROPOSED CONTOUR LINE

EXISTING TREES



STATE OF TEXAS
STEVEN S. CRAUFORD
92677
LICENSED PROFESSIONAL ENGINEER

09/12/2025

PROFILE SCALES:

1" = 40' HORIZONTAL
1" = 4' VERTICAL

PROFILE LEGEND:

NATURAL GROUND

FINISHED GRADE

PROPOSED STORM DRAIN

NO.	REVISION	DATE

GEORGETOWN TEXAS *more than welcome*

PAPE-DAWSON ENGINEERS

AUSTIN | SAN ANTONIO | HOUSTON | FORT WORTH | DALLAS
10801 N MOPAC EXPY, BLDG 3, STE 200 | AUSTIN, TX 78759 | 512.454.8711
TBPE FIRM REGISTRATION #470 | TBPLS FIRM REGISTRATION #10028801

CITY OF GEORGETOWN, TEXAS
WOLF RANCH PKWY / MEMORIAL DR

BATCH DETENTION POND 2 PLAN

CITY JOB No.
JOB NO. 51423-00
DATE 9/12/2025
DESIGNER JB
CHECKED SC DRAWN JB

SHEET 466

Date: Sep 12, 2025, 10:40am User ID: cashatz
File: K:\Proj\514\23\001\301 Construction Documents\Civil\PD51423-00_POND 2.dwg

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Texas Commission on Environmental Quality

TSS Removal Calculations 04-20-2009

Project Name: **Memorial Drive - Batch Detention Pond 2**
Date Prepared: **8/8/2025**

Additional information is provided for cells with a red triangle in the upper right corner. Place the cursor over the cell.
Text shown in blue indicate location of instructions in the Technical Guidance Manual - RG-348.
Characters shown in red are data entry fields.
Characters shown in black (Bold) are calculated fields. Changes to these fields will remove the equations used in the spreadsheet.

1. The Required Load Reduction for the total project: Calculations from RG-348 Pages 3-27 to 3-30

Page 3-29 Equation 3.3: $L_M = 28.9(A_N \times P)$

where:
$L_{M\ TOTAL\ PROJECT}$ = Required TSS removal resulting from t
A_N = Net increase in impervious area for the project
P = Average annual precipitation, inches

Site Data: Determine Required Load Removal Based on the Entire Project

County =	**Williamson**	
Total project area included in plan * =	**453.42**	acres
Predevelopment impervious area within the limits of the plan * =	**12.31**	acres
Total post-development impervious area within the limits of the plan* =	**376.59**	acres
Total post-development impervious cover fraction * =	**0.83**	
P =	**32**	inches
$L_{M\ TOTAL\ PROJECT}$ =	**336886**	lbs.

* **The values entered in these fields should be for the total project area.**

Number of drainage basins / outfalls areas leaving the plan area = **1.00**

2. Drainage Basin Parameters (This information should be provided for each basin):

Drainage Basin/Outfall Area No. = Memorial Pond

Total drainage basin/outfall area =	**3.08**	acres	
Predevelopment impervious area within drainage basin/outfall area =	**0.60**	acres	
Post-development impervious area within drainage basin/outfall area =	**0.83**	acres	***Not including the IC that was already treated with VFS**
Post-development impervious fraction within drainage basin/outfall area =	**0.27**		
$L_{M\ THIS\ BASIN}$ =	**768**	lbs.	

3. Indicate the proposed BMP Code for this basin.

Proposed BMP =	**Batch Detention**	
Removal efficiency =	**91**	percent

4. Calculate Maximum TSS Load Removed (L_R) for this Drainage Basin by the selected BMP Type.

RG-348 Page 3-33 Equation 3.7: L_R = (BMP efficiency) x P x (A_C x 34.6 + A_P x 0.54)

where:
A_C = Total On-Site drainage area in the BMP catchment area
A_I = Impervious area proposed in the BMP catchment area
A_P = Pervious area remaining in the BMP catchment area
L_R = TSS Load removed from this catchment area by the proposed BMP

A_C =	**3.08**	acres	
A_I =	**0.83**	acres	***Not including the IC that was already treated with VFS**
A_P =	**2.25**	acres	
L_R =	**872**	lbs	

5. Calculate Fraction of Annual Runoff to Treat the drainage basin / outfall area

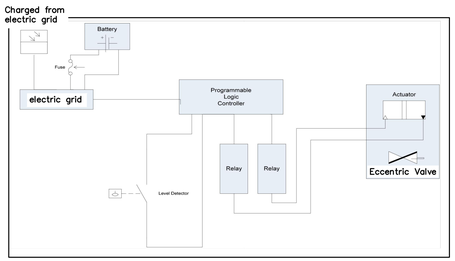
Desired $L_{M\ THIS\ BASIN}$ =	**768**	lbs.
F =	**0.88**	

6. Calculate Capture Volume required by the BMP Type for this drainage basin / outfall area. Calculations from RG-348 Pages 3-34 to 3-36

Rainfall Depth =	**1.50**	inches
Post Development Runoff Coefficient =	**0.24**	
On-site Water Quality Volume =	**4059**	cubic feet

Calculations from RG-348 Pages 3-36 to 3-37

Off-site area draining to BMP =	**0.00**	acres
Off-site Impervious cover draining to BMP =	**0.00**	acres
Impervious fraction of off-site area =	**0**	
Off-site Runoff Coefficient =	**0.00**	
Off-site Water Quality Volume =	**0**	cubic feet
Storage for Sediment =	**812**	
Total Capture Volume (required water quality volume(s) x 1.20) =	**4871**	cubic feet



CONTROLLER CIRCUIT DIAGRAM

CONTROLLER NOTES:
1. REFER TO THE WATER POLLUTION ABATEMENT PLAN FOR LOGIC CONTROLLER CYCLE OVERVIEW.
2. CLEARLY VISIBLE ALARM SYSTEM TO BE PROVIDED TO INDICATE SYSTEM MALFUNCTION.
3. SIGN TO BE POSTED WITH PHONE NUMBERS OF THE OWNER AND APPROPRIATE TCEQ REGIONAL OFFICE.

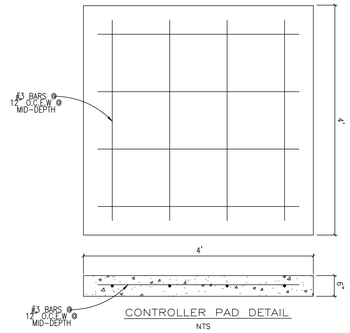
Batch Detention Pond Controller Information

Component	Description	Voltage
Power System	Charged from electric grid 12 VDC Battery (Model MK Powered 8GU1) (Or approved equal).	
Logic Controller	IDEC FL1C-H12RCE (Or approved equal)	12
Parts Enclosure	Southwest Photovoltaic Model BBG-1 (15.75" wide x 9.75" deep x 11.75" tall) (Or approved equal)	
Nature of Event Sensing	Anchor Scientific Float Switch (Or approved equal)	
Valve Type	2" Eccentric Plug Valve with over torque sensors and mechanical hand crank for physical override if necessary. Able to withstand 100 psi minimum. (Or approved equal)	
Actuator	EPI-6 12 VDC. Able to withstand 100 psi minimum. (Or approved equal)	12
Power Consumption (actuator, controller, relay, PLC)	242.58 W, 46.5 W-hours	



POND SIGN DETAIL

SIGN NOTING CONTACT INFORMATION FOR RESPONSIBLE PARTY IN CASE OF ALARM. SHALL HAVE MINIMUM DIMENSION OF 12" WIDE BY 18" HIGH AND SHALL HAVE BLACK LETTERS ON A WHITE REFLECTIVE BACKGROUND. SIGN MUST BE LOCATED NEAR SYSTEM ALARM.

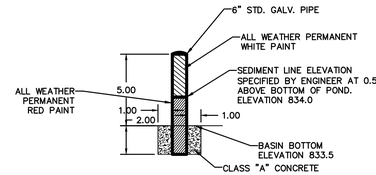


CONTROLLER PAD DETAIL
NTS

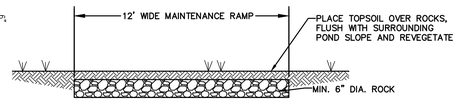
Material Property	Requirement	Testing Standard
Minimum Liquid Limit	> 50	ASTM D 4318
Minimum Plasticity Index	> 30	ASTM D 4318
Minimum Percent Passing # 200 Sieve	> 60 %	ASTM D 422
Maximum Particle Size	< 1 inch	ASTM D 422
Maximum Laboratory Permeability	$< 1 \times 10^{-7}$ cm/sec	ASTM D 5084

*REFER TO GEOTECHNICAL REPORT PREPARED BY MLA LABS, INC., DATED JULY 19, 2024 FOR CLAY LINER RECOMMENDATIONS.

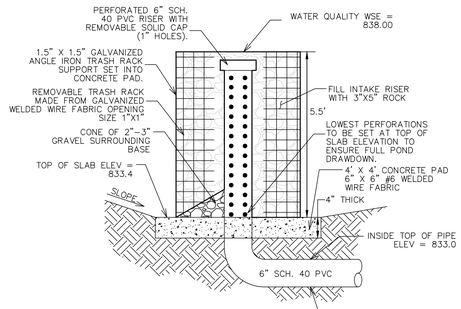
NOTE
1. THE CONSTRUCTED HEIGHT OF AN EARTHEN EMBANKMENT SHALL BE EQUAL TO THE DESIGN HEIGHT PLUS THE AMOUNT NECESSARY TO ENSURE THAT THE DESIGN HEIGHT WILL BE MAINTAINED ONCE ALL SETTLEMENT HAS TAKEN PLACE. THIS AMOUNT SHALL IN NO CASE BE LESS THAN 5% OF THE TOTAL FILL HEIGHT. ALL EARTHEN EMBANKMENTS SHALL BE COMPACTED TO 95% OF MAXIMUM DENSITY IN ACCORDANCE WITH CITY OF SAN MARCOS STANDARD SPECIFICATIONS.
2. UPON COMPLETION OF THE PROPOSED SITE IMPROVEMENT AND PRIOR TO THE RELEASE OF THE CERTIFICATE OF ACCEPTANCE OR OCCUPANCY BY THE PERMIT CENTER, THE DESIGN ENGINEER SHALL CERTIFY IN WRITING THAT THE PROPOSED DETENTION FACILITY, FILTRATION FACILITIES OR WATER QUALITY FACILITIES WERE CONSTRUCTED IN CONFORMANCE WITH THE APPROVED PLANS. ANY SUCH FACILITIES BUILT WITHIN THE CITY OF SAN MARCOS CITY LIMITS WILL NEED TO SHOW COMPLIANCE WITH THE CITY MUNICIPAL SEPARATE STORM SEWER SYSTEM ORDINANCES. PRIOR TO RELEASE OF THE CERTIFICATE OF ACCEPTANCE OR OCCUPANCY A CITY EASEMENT MUST BE SHOWN AROUND ALL SUCH FACILITIES WITH A MAINTENANCE COVENANT FOR EACH FACILITY.
3. STABILIZATION OF POND OR OTHER DISTURBED SLOPES 3:1 OR STEEPER WITH DEGRADABLE SOIL RETENTION BLANKETS, OR EQUIVALENT BMP IS REQUIRED. OR SOD.



SEDIMENT DEPTH MARKER DETAIL
NTS

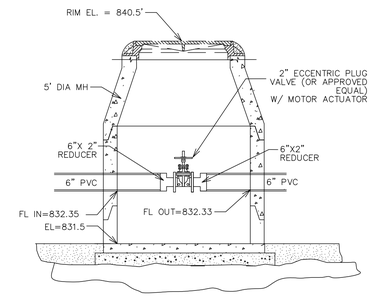


POND MAINTENANCE ACCESS SECTION
N.T.S.



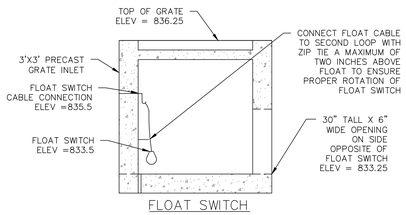
INTAKE RISER DETAIL
NTS

NOTE:
INTAKE RISER TO BE USED AS TEMPORARY SEDIMENT BASIN DEWATERING OUTLET DURING INTERIM CONSTRUCTION ACTIVITIES.

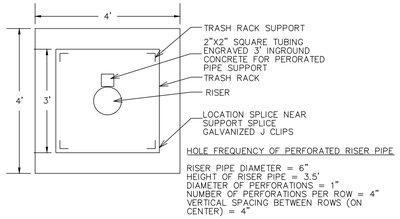


STORM SEWER MANHOLE DETAIL
NTS

NOTE:
CONTROL VALVE TO BE MOTOR ACTUATED VALVE. VALVE SHALL BE WIRED TO A CONTROLLER THAT OPENS VALVE 12 HOURS AFTER RAINFALL EVENT AND CLOSES VALVE ONCE POND HAS DRAINED DRY. CONTROLLER SHALL INCLUDE PROVISIONS FOR A MANUAL OVERRIDE SWITCH.



FLOAT SWITCH
N.T.S.



HOLE FREQUENCY OF PERFORATED RISER PIPE

RISER PIPE DIAMETER = 6"
HEIGHT OF RISER PIPE = 3.5'
DIAMETER OF PERFORATIONS = 1"
NUMBER OF PERFORATIONS PER ROW = 4"
VERTICAL SPACING BETWEEN ROWS (ON CENTER) = 4"

STATE OF TEXAS
STEVEN S. CRAUFORD
92677
LICENSED PROFESSIONAL ENGINEER
09/12/2025

NO.	REVISION	DATE

GEORGETOWN TEXAS more than welcome

PAPE-DAWSON ENGINEERS
AUSTIN | SAN ANTONIO | HOUSTON | FORT WORTH | DALLAS
10801 N MOPAC EXPY, BLDG 3, STE 200 | AUSTIN, TX 78759 | 512.454.8711
TBPE FIRM REGISTRATION #470 | TBPLS FIRM REGISTRATION #10028801

CITY OF GEORGETOWN, TEXAS
WOLF RANCH PKWY / MEMORIAL DR

POND 2 DETAILS (1 OF 1)

CITY JOB No.
JOB NO. 51423-00
DATE 9/12/2025
DESIGNER JB
CHECKED SC DRAWN JB

SHEET 467

Date: Sep 12, 2025, 10:40am User ID: cashcitz
File: H:\Projects\514\23\00\301 Construction Documents\Civil\P051423-00__POND 2.dwg

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80% TCEQ IMPERVIOUS COVER CALCULATION SPREADSHEETS

Texas Commission on Environmental Quality

TSS Removal Calculations 04-20-2009

Project Name: **Wolf Ranch Sec. 1A - VFS 5**
Date Prepared: **8/8/2025**

Additional information is provided for cells with a red triangle in the upper right corner. Place the cursor over the cell.
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Characters shown in red are data entry fields.
Characters shown in black (Bold) are calculated fields. Changes to these fields will remove the equations used in the spreadsheet.

1. The Required Load Reduction for the total project: Calculations from RG-348 Pages 3-27 to 3-30

Page 3-29 Equation 3.3: $L_M = 27.2(A_N \times P)$

where:

$L_{M\ TOTAL\ PROJECT}$ = Required TSS removal resulting from t
A_N = Net increase in impervious area for the project
P = Average annual precipitation, inches

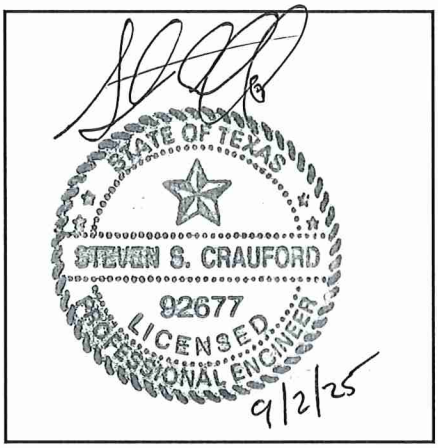
80% TSS REMOVAL CALCULATIONS PER TCEQ REQUIREMENTS

Site Data: Determine Required Load Removal Based on the Entire Project

County =	Williamson	
Total project area included in plan * =	460.96	acres
Predevelopment impervious area within the limits of the plan * =	12.31	acres
Total post-development impervious area within the limits of the plan* =	376.59	acres
Total post-development impervious cover fraction * =	0.82	
P =	32	inches
$L_{M\ TOTAL\ PROJECT}$ =	317069	lbs.

* The values entered in these fields should be for the total project area.

Number of drainage basins / outfalls areas leaving the plan area = 1.00



PAPE-DAWSON CONSULTING ENGINEERS, LLC.
TEXAS ENGINEERING FIRM #470

2. Drainage Basin Parameters (This information should be provided for each basin):

Drainage Basin/Outfall Area No. =	EX VFS 5	
Total drainage basin/outfall area =	1.31	acres
Predevelopment impervious area within drainage basin/outfall area =	0.00	acres
Post-development impervious area within drainage basin/outfall area =	0.68	acres
Post-development impervious fraction within drainage basin/outfall area =	0.52	
$L_{M\ THIS\ BASIN}$ =	592	lbs.

3. Indicate the proposed BMP Code for this basin.

Proposed BMP =	Vegetated Filter Strips	
Removal efficiency =	89	percent

4. Calculate Maximum TSS Load Removed (L_R) for this Drainage Basin by the selected BMP Type.

RG-348 Page 3-33 Equation 3.7: $L_R = (\text{BMP efficiency}) \times P \times (A_I \times 34.6 + A_P \times 0.54)$

where:

A_C = Total On-Site drainage area in the BMP catchment area
A_I = Impervious area proposed in the BMP catchment area
A_P = Pervious area remaining in the BMP catchment area
L_R = TSS Load removed from this catchment area by the proposed BMP

A_C =	1.31	acres
A_I =	0.68	acres
A_P =	0.63	acres
L_R =	680	lbs

5. Calculate Fraction of Annual Runoff to Treat the drainage basin / outfall area

Desired $L_{M\ THIS\ BASIN}$ =	629	lbs.
F =	0.93	

Texas Commission on Environmental Quality

TSS Removal Calculations 04-20-2009

Project Name: **Memorial Drive - Batch Detention Pond 2**
Date Prepared: **8/8/2025**

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80% TSS REMOVAL CALCULATIONS PER TCEQ REQUIREMENTS

1. The Required Load Reduction for the total project: Calculations from RG-348 Pages 3-27 to 3-30

Page 3-29 Equation 3.3: $L_M = 27.2(A_N \times P)$

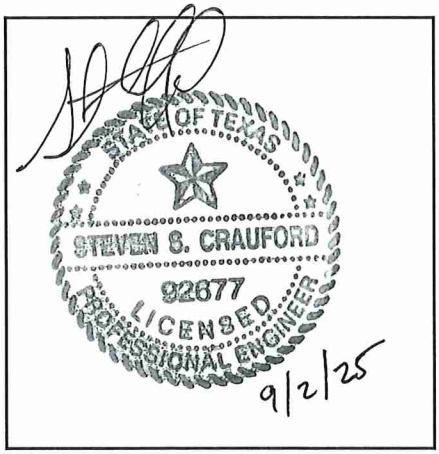
where:
$L_{M\ TOTAL\ PROJECT}$ = Required TSS removal resulting from t
A_N = Net increase in impervious area for the project
P = Average annual precipitation, inches

Site Data: Determine Required Load Removal Based on the Entire Project

County =	Williamson	
Total project area included in plan * =	460.96	acres
Predevelopment impervious area within the limits of the plan * =	12.31	acres
Total post-development impervious area within the limits of the plan* =	376.59	acres
Total post-development impervious cover fraction * =	0.82	
P =	32	inches
$L_{M\ TOTAL\ PROJECT}$ =	317069	lbs.

* The values entered in these fields should be for the total project area.

Number of drainage basins / outfalls areas leaving the plan area = 1.00



PAPE-DAWSON CONSULTING ENGINEERS, LLC.
TEXAS ENGINEERING FIRM #470

2. Drainage Basin Parameters (This information should be provided for each basin):

Drainage Basin/Outfall Area No. = Memorial Pond

Total drainage basin/outfall area =	3.08	acres
Predevelopment impervious area within drainage basin/outfall area =	0.60	acres
Post-development impervious area within drainage basin/outfall area =	0.83	acres
Post-development impervious fraction within drainage basin/outfall area =	0.27	
$L_{M\ THIS\ BASIN}$ =	722	lbs.

*Not including the IC that was already treated with VFS

3. Indicate the proposed BMP Code for this basin.

Proposed BMP = Batch Detention
Removal efficiency = 91 percent

4. Calculate Maximum TSS Load Removed (L_R) for this Drainage Basin by the selected BMP Type.

RG-348 Page 3-33 Equation 3.7: $L_R = (\text{BMP efficiency}) \times P \times (A_I \times 34.6 + A_P \times 0.54)$

where:
A_C = Total On-Site drainage area in the BMP catchment area
A_I = Impervious area proposed in the BMP catchment area
A_P = Pervious area remaining in the BMP catchment area
L_R = TSS Load removed from this catchment area by the proposed BMP

A_C =	3.08	acres
A_I =	0.83	acres
A_P =	2.25	acres
L_R =	872	lbs

*Not including the IC that was already treated with VFS

5. Calculate Fraction of Annual Runoff to Treat the drainage basin / outfall area

Desired $L_{M\ THIS\ BASIN}$ = 722 lbs.

F = 0.83

6. Calculate Capture Volume required by the BMP Type for this drainage basin / outfall area. Calculations from RG-348 Pages 3-34 to 3-36

Rainfall Depth =	1.20	inches
Post Development Runoff Coefficient =	0.24	
On-site Water Quality Volume =	3248	cubic feet

Calculations from RG-348 Pages 3-36 to 3-37

Off-site area draining to BMP =	0.00	acres
Off-site Impervious cover draining to BMP =	0.00	acres
Impervious fraction of off-site area =	0	
Off-site Runoff Coefficient =	0.00	
Off-site Water Quality Volume =	0	cubic feet
Storage for Sediment =	650	
Total Capture Volume (required water quality volume(s) x 1.20) =	3897	cubic feet

Texas Commission on Environmental Quality

TSS Removal Calculations 04-20-2009

Project Name: Wolf Ranch, Section 1A
Date Prepared: 8/8/2025

Additional information is provided for cells with a red triangle in the upper right corner. Place the cursor over the cell.
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1. The Required Load Reduction for the total project: Calculations from RG-348 Pages 3-27 to 3-30

Page 3-29 Equation 3.3: $L_M = 27.2(A_N \times P)$

where:
$L_{M\ TOTAL\ PROJECT}$ = Required TSS removal resulting from the proposed development = 80% of increased load
A_N = Net increase in impervious area for the project
P = Average annual precipitation, inches

Site Data: Determine Required Load Removal Based on the Entire Project

County =	Williamson	
Total project area included in plan * =	460.96	acres
Predevelopment impervious area within the limits of the plan * =	12.31	acres
Total post-development impervious area within the limits of the plan* =	376.59	acres
Total post-development impervious cover fraction * =	0.82	
P =	32	inches
$L_{M\ TOTAL\ PROJECT}$ =	317069	lbs. ADJUSTED FOR 85% TSS REMOVAL AND NOT 80%

* The values entered in these fields should be for the total project area.

Number of drainage basins / outfalls areas leaving the plan area = 1

2. Drainage Basin Parameters (This information should be provided for each basin):

Drainage Basin/Outfall Area No. = 1

Total drainage basin/outfall area =	61.23	acres
Predevelopment impervious area within drainage basin/outfall area =	0.55	acres
Post-development impervious area within drainage basin/outfall area =	34.67	acres
Post-development impervious fraction within drainage basin/outfall area =	0.57	
$L_{M\ THIS\ BASIN}$ =	29698	lbs. ADJUSTED FOR 85% TSS REMOVAL AND NOT 80%

3. Indicate the proposed BMP Code for this basin.

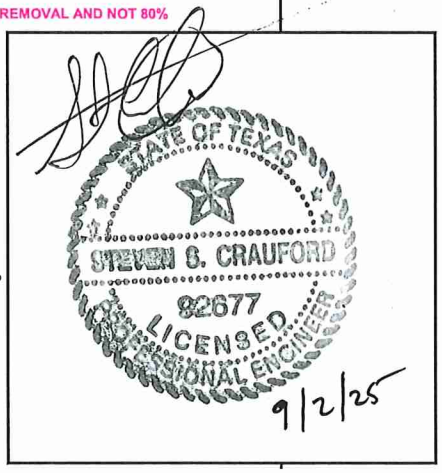
Proposed BMP = Wet Basin
Removal efficiency = 93 percent

4. Calculate Maximum TSS Load Removed (L_R) for this Drainage Basin by the selected BMP Type.

RG-348 Page 3-33 Equation 3.7: $L_R = (\text{BMP efficiency}) \times P \times (A_I \times 34.6 + A_P \times 0.54)$

where:
A_C = Total On-Site drainage area in the BMP catchment area
A_I = Impervious area proposed in the BMP catchment area
A_P = Pervious area remaining in the BMP catchment area
L_R = TSS Load removed from this catchment area by the proposed BMP

A_C =	61.23	acres
A_I =	34.67	acres
A_P =	26.56	acres
L_R =	36126	lbs



5. Calculate Fraction of Annual Runoff to Treat the drainage basin / outfall area

Desired $L_{M\ THIS\ BASIN}$ = 30699 lbs. DOUBLE CHECK

F = 0.85

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6. Calculate Capture Volume required by the BMP Type for this drainage basin / outfall area. Calculations from RG-348 Pages 3-34 to 3-36

Rainfall Depth =	1.32	inches
Post Development Runoff Coefficient =	0.40	
On-site Water Quality Volume =	116505	cubic feet

80% TSS REMOVAL CALCULATIONS PER TCEQ REQUIREMENTS

Calculations from RG-348 Pages 3-36 to 3-37

Off-site area draining to BMP =	0.00	acres
Off-site Impervious cover draining to BMP =	0.00	acres
Impervious fraction of off-site area =	0	
Off-site Runoff Coefficient =	0.00	
Off-site Water Quality Volume =	0	cubic feet
Storage for Sediment =	23301	
Total Capture Volume (required water quality volume(s) x 1.20) =	139806	cubic feet

The following sections are used to calculate the required water quality volume(s) for the selected BMP.
The values for BMP Types not selected in cell C45 will show NA.

11. Wet Basins Designed as Required in RG-348 Pages 3-66 to 3-71

Required capacity of Permanent Pool =	139806	cubic f Permanent Pool Capacity is 1.20 times the WQV
Required capacity at WQV Elevation =	256310	cubic f Total Capacity should be the Permanent Pool Capacity plus a second WQV.

Texas Commission on Environmental Quality

TSS Removal Calculations 04-20-2009

Project Name: Wolf Lakes Village Sec 1, Ph 1 & Sec 2 - Pond 1 - Ultimate Conditions
Date Prepared: 8/8/2025

Additional information is provided for cells with a red triangle in the upper right corner. Place the cursor over the cell.
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Characters shown in black (Bold) are calculated fields. Changes to these fields will remove the equations used in the spreadsheet.

1. The Required Load Reduction for the total project: Calculations from RG-348 Pages 3-27 to 3-30

Page 3-29 Equation 3.3: $L_M = 27.2(A_N \times P)$

where:
$L_{M\ TOTAL\ PROJECT}$ = Required TSS removal resulting from the proposed development = 80% of increased load
A_N = Net increase in impervious area for the project
P = Average annual precipitation, inches

Site Data: Determine Required Load Removal Based on the Entire Project

County =	Williamson	
Total project area included in plan * =	460.96	acres
Predevelopment impervious area within the limits of the plan * =	12.31	acres
Total post-development impervious area within the limits of the plan* =	376.59	acres
Total post-development impervious cover fraction * =	0.82	
P =	32	inches
$L_{M\ TOTAL\ PROJECT}$ =	317069	lbs.

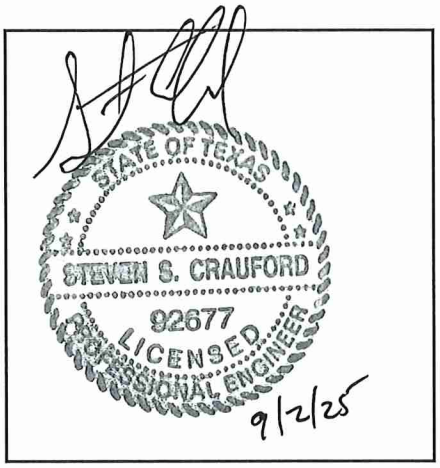
* The values entered in these fields should be for the total project area.

Number of drainage basins / outfalls areas leaving the plan area = 1

2. Drainage Basin Parameters (This information should be provided for each basin):

Drainage Basin/Outfall Area No. = 1

Total drainage basin/outfall area =	129.83	acres
Predevelopment impervious area within drainage basin/outfall area =	0.00	acres
Post-development impervious area within drainage basin/outfall area =	98.56	acres
Post-development impervious fraction within drainage basin/outfall area =	0.76	
$L_{M\ THIS\ BASIN}$ =	85787	lbs.



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TEXAS ENGINEERING FIRM #470

3. Indicate the proposed BMP Code for this basin.

Proposed BMP = Wet Basin
Removal efficiency = 93 percent

Aqualogic Cartridge Filter

80% TSS REMOVAL CALCULATIONS PER TCEQ REQUIREMENTS

4. Calculate Maximum TSS Load Removed (L_R) for this Drainage Basin by the selected BMP Type.

RG-348 Page 3-33 Equation 3.7: $L_R = (\text{BMP efficiency}) \times P \times (A_I \times 34.6 + A_P \times 0.54)$

where:
A_C = Total On-Site drainage area in the BMP catchment area
A_I = Impervious area proposed in the BMP catchment area
A_P = Pervious area remaining in the BMP catchment area
L_R = TSS Load removed from this catchment area by the proposed BMP

A_C =	123.28	acres
A_I =	98.56	acres
A_P =	24.72	acres
L_R =	101884	lbs

5. Calculate Fraction of Annual Runoff to Treat the drainage basin / outfall area

Desired $L_{M\ THIS\ BASIN}$ = 86056 lbs.

F = 0.84

6. Calculate Capture Volume required by the BMP Type for this drainage basin / outfall area. Calculations from RG-348 Pages 3-34 to 3-3

Rainfall Depth =	1.26	inches
Post Development Runoff Coefficient =	0.62	
On-site Water Quality Volume =	351353	cubic feet

Calculations from RG-348 Pages 3-36 to 3-37

Off-site area draining to BMP =	6.55	acres
Off-site Impervious cover draining to BMP =	0.00	acres
Impervious fraction of off-site area =	0.00	
Off-site Runoff Coefficient =	0.02	
Off-site Water Quality Volume =	599	cubic feet
Storage for Sediment =	70391	
Total Capture Volume (required water quality volume(s) x 1.20) =	422343	cubic feet

The following sections are used to calculate the required water quality volume(s) for the selected BMP.

11. Wet Basins Designed as Required in RG-348 Pages 3-66 to 3-71

Required capacity of Permanent Pool =	422343	cubic f	Permanent Pool Capacity is 1.20 times the WQV
Required capacity at WQV Elevation =	773697	cubic f	Total Capacity should be the Permanent Pool Capacity plus a second WQV.

Texas Commission on Environmental Quality

TSS Removal Calculations 04-20-2009

Project Name: Wolf Lakes Village, Section 1, Phase 2, Pond 1
Date Prepared: 8/8/2025

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1. The Required Load Reduction for the total project: Calculations from RG-348 Pages 3-27 to 3-30

Page 3-29 Equation 3.3: $L_M = 27.2(A_N \times P)$

where:
$L_{M\ TOTAL\ PROJECT}$ = Required TSS removal resulting from the proposed development = 80% of increased load
A_N = Net increase in impervious area for the project
P = Average annual precipitation, inches

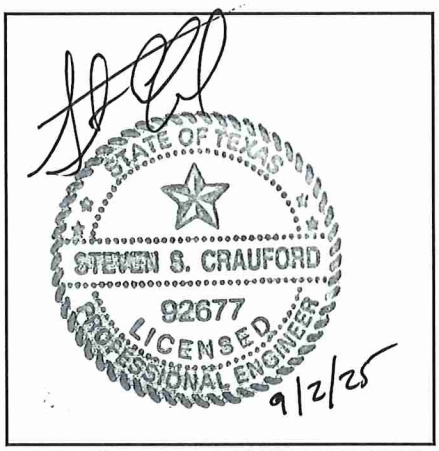
80% TSS REMOVAL CALCULATIONS PER TCEQ REQUIREMENTS

Site Data: Determine Required Load Removal Based on the Entire Project

County =	Williamson	
Total project area included in plan * =	460.96	acres
Predevelopment impervious area within the limits of the plan * =	12.31	acres
Total post-development impervious area within the limits of the plan* =	376.59	acres
Total post-development impervious cover fraction * =	0.82	
P =	32	inches
$L_{M\ TOTAL\ PROJECT}$ =	317069	lbs.

* The values entered in these fields should be for the total project area.

Number of drainage basins / outfalls areas leaving the plan area = 1



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2. Drainage Basin Parameters (This information should be provided for each basin):

Drainage Basin/Outfall Area No. = 1

Total drainage basin/outfall area =	35.81	acres
Predevelopment impervious area within drainage basin/outfall area =	0.00	acres
Post-development impervious area within drainage basin/outfall area =	25.64	acres
Post-development impervious fraction within drainage basin/outfall area =	0.72	
$L_{M\ THIS\ BASIN}$ =	22317	lbs.

3. Indicate the proposed BMP Code for this basin.

Proposed BMP =	Wet Basin	
Removal efficiency =	93	percent

4. Calculate Maximum TSS Load Removed (L_R) for this Drainage Basin by the selected BMP Type.

RG-348 Page 3-33 Equation 3.7: $L_R = (\text{BMP efficiency}) \times P \times (A_I \times 34.6 + A_P \times 0.54)$

where:
A_C = Total On-Site drainage area in the BMP catchment area
A_I = Impervious area proposed in the BMP catchment area
A_P = Pervious area remaining in the BMP catchment area
L_R = TSS Load removed from this catchment area by the proposed BMP

A_C =	35.81	acres
A_I =	25.64	acres
A_P =	10.17	acres
L_R =	26565	lbs

5. Calculate Fraction of Annual Runoff to Treat the drainage basin / outfall area

Desired $L_{M\ THIS\ BASIN}$ =	23712	lbs.
F =	0.89	

6. Calculate Capture Volume required by the BMP Type for this drainage basin / outfall area. Calculations from RG-348 Pages 3-34 to 3-36

Rainfall Depth =	1.60	inches
Post Development Runoff Coefficient =	0.52	
On-site Water Quality Volume =	108588	cubic feet

Calculations from RG-348 Pages 3-36 to 3-37

Off-site area draining to BMP =	0.00	acres
Off-site impervious cover draining to BMP =	0.00	acres
Impervious fraction of off-site area =	0	
Off-site Runoff Coefficient =	0.00	
Off-site Water Quality Volume =	0	cubic feet
Storage for Sediment =	21718	
Total Capture Volume (required water quality volume(s) x 1.20) =	130305	cubic feet

The following sections are used to calculate the required water quality volume(s) for the selected BMP.
The values for BMP Types not selected in cell C45 will show NA.

11. Wet Basins Designed as Required in RG-348 Pages 3-66 to 3-71

Required capacity of Permanent Pool =	130305	cubic f Permanent Pool Capacity is 1.20 times the WQV
Required capacity at WQV Elevation =	238893	cubic f Total Capacity should be the Permanent Pool Capacity plus a second WQV.

Texas Commission on Environmental Quality
TSS Removal Calculations 04-20-2009

Project Name: **Wolf Ranch Expansion - StormTrooper B2 West**
Date Prepared: **8/8/2025**

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1. StormTrooper Model Sizing based on Individual Catchment Areas to the BMP. Pages 3-27 to 3-30

Page 3-27 Equation 3.3: Effective Area (EA) = (0.9 x Ai) + (0.03 x A_P) — Page 3-27 "RG-348" (C=0.90 Imp. Area, C=0.03 for Perv. Area)

	County =	**Williamson**
Where:	Effective Area =	**0.725**
	Total Impervious Area =	**0.79**
	Total Pervious Area =	**0.48**
	Drainage Area	**B2 West**
	From Table 2 choose an initial Model:	**SWAQ-40**
	Surface Area of Model:	**588**
	P =	**32**
	L_{M1} = 27.2 x An x P =	**688**

Lm1 = 27.2 x An x P
Equation 3.3 "RG-348"

2. Overflow Rate

V_{OR} = Q/S.A. — Equation 3.4 & 3.5 "RG-348"
Page 3-30 "RG-348" (i = 1.1 in./HR., 90% Volume Treated)

Where:	Q =	**I x (EA)**	
	Q =	**0.8**	**cfs**
	V_{OR} =	**(I x EA)/Model Surface Area**	
	V_{OR} =	**0.00136**	**fps**

3. BMP efficiency (Table 3). If the overflow rate is between two percent efficiencies, use the smaller.

V_{OR} =	**0.00136**
BMP Eff (%) =	**80%**

4. Maximum TSS Removal of BMP: L_{R1}

Lr = (BMP Effiencicency) x P x (Ai x 34.6 + Ap x 0.54) — Equation 3.8 "RG-348"

Where:
Lr = Load Removed by BMP
BMP Efficiency = TSS Removal Efficiency (expressed as a decimal fraction from Table 3)

L_{R1} = **706.34** **#TSS**

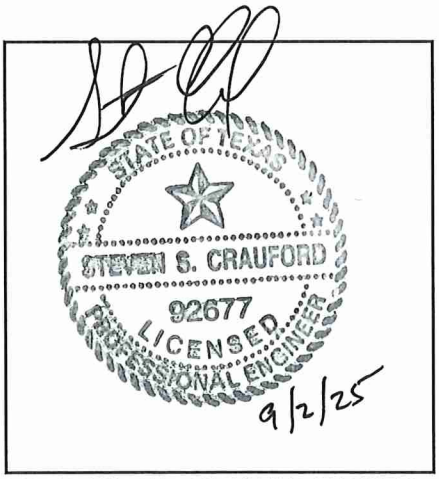
TSS removal exceeding required L_M to be counted towards untreated area = L_C

L_C = L_{R1} - L_{M1}
L_C = **18.34** **#TSS**

Required TSS removal for untreated area:
L_{M2} = **8.98** **<** 18.34 #TSS

UNIT IS SUFFICIENTLY SIZED TO REMOVE REQUIRED TSS FROM BOTH CAPTURED AND UNCAPTURED AREAS

80% TSS REMOVAL CALCULATIONS PER TCEQ REQUIREMENTS



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Texas Commission on Environmental Quality
TSS Removal Calculations 04-20-2009

Project Name: **Wolf Ranch Expansion - StormTrooper B2 East**
Date Prepared: **8/8/2025**

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1. StormTrooper Model Sizing based on Individual Catchment Areas to the BMP. Pages 3-27 to 3-30

Page 3-27 Equation 3.3: Effective Area (EA) = (0.9 x Ai) + (0.03 x A_P) — Page 3-27 "RG-348" (C=0.90 Imp. Area, C=0.03 for Perv. Area)

	County =	**Williamson**
Where:	Effective Area =	**0.766**
	Total Impervious Area =	**0.84**
	Total Pervious Area =	**0.35**
	Drainage Area	**B2 East**
	From Table 2 choose an initial Model:	**SWAQ-70**
	Surface Area of Model:	**730**
	P =	**32**
	L_{M1} = 27.2 x An x P =	**731**

Lm1 = 27.2 x An x P
Equation 3.3 "RG-348"

2. Overflow Rate

V_{OR} = Q/S.A. — Equation 3.4 & 3.5 "RG-348"
Page 3-30 "RG-348" (i = 1.1 in./HR., 90% Volume Treated)

Where:	Q =	**I x (EA)**	
	Q =	**0.84**	**cfs**
	V_{OR} =	**(I x EA)/Model Surface Area**	
	V_{OR} =	**0.00115**	**fps**

3. BMP efficiency (Table 3). If the overflow rate is between two percent efficiencies, use the smaller.

V_{OR} =	**0.00115**
BMP Eff (%) =	**82%**

4. Maximum TSS Removal of BMP: L_{R1}

Lr = (BMP Effienciency) x P x (Ai x 34.6 + Ap x 0.54) — Equation 3.8 "RG-348"

Where:
Lr = Load Removed by BMP
BMP Efficiency = TSS Removal Efficiency (expressed as a decimal fraction from Table 3)

L_{R1} = **767.57** **#TSS**

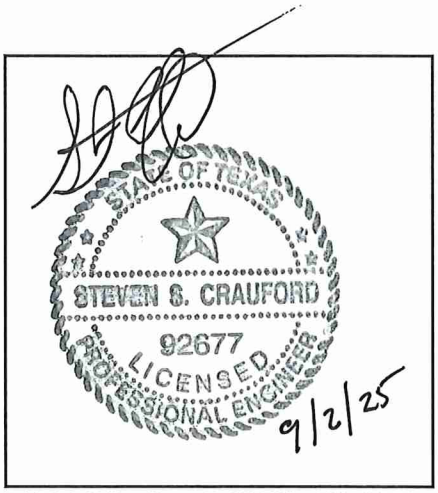
TSS removal exceeding required L_M to be counted towards untreated area = L_C

L_C = L_{R1} - L_{M1}
L_C = **36.57** **#TSS**

Required TSS removal for untreated area:
L_{M2} = **8.98** **<** 36.57 #TSS

UNIT IS SUFFICIENTLY SIZED TO REMOVE REQUIRED TSS FROM BOTH CAPTURED AND UNCAPTURED AREAS

80% TSS REMOVAL CALCULATIONS PER TCEQ REQUIREMENTS



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TEXAS ENGINEERING FIRM #470

Texas Commission on Environmental Quality

TSS Removal Calculations 04-20-2009

Project Name: **Wolf Ranch Sec. 1A - VFS 5**
Date Prepared: **8/8/2025**

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1. The Required Load Reduction for the total project: Calculations from RG-348 Pages 3-27 to 3-30

Page 3-29 Equation 3.3: $L_M = 27.2(A_N \times P)$

where:
$L_{M\ TOTAL\ PROJECT}$ = Required TSS removal resulting from t
A_N = Net increase in impervious area for the project
P = Average annual precipitation, inches

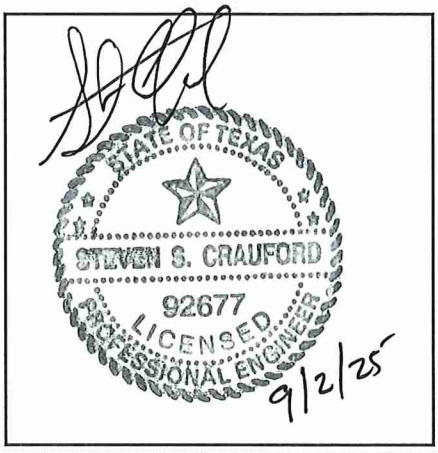
80% TSS REMOVAL CALCULATIONS PER TCEQ REQUIREMENTS

Site Data: Determine Required Load Removal Based on the Entire Project

County =	Williamson	
Total project area included in plan * =	460.96	acres
Predevelopment impervious area within the limits of the plan * =	12.31	acres
Total post-development impervious area within the limits of the plan* =	376.59	acres
Total post-development impervious cover fraction * =	0.82	
P =	32	inches
$L_{M\ TOTAL\ PROJECT}$ =	317069	lbs.

* The values entered in these fields should be for the total project area.

Number of drainage basins / outfalls areas leaving the plan area = 1.00



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2. Drainage Basin Parameters (This information should be provided for each basin):

Drainage Basin/Outfall Area No. = EX VFS 5

Total drainage basin/outfall area =	0.49	acres
Predevelopment impervious area within drainage basin/outfall area =	0.00	acres
Post-development impervious area within drainage basin/outfall area =	0.29	acres
Post-development impervious fraction within drainage basin/outfall area =	0.59	
$L_{M\ THIS\ BASIN}$ =	252	lbs.

3. Indicate the proposed BMP Code for this basin.

Proposed BMP = Vegetated Filter Strips
Removal efficiency = 89 percent

4. Calculate Maximum TSS Load Removed (L_R) for this Drainage Basin by the selected BMP Type.

RG-348 Page 3-33 Equation 3.7: $L_R = (\text{BMP efficiency}) \times P \times (A_I \times 34.6 + A_P \times 0.54)$

where:
A_C = Total On-Site drainage area in the BMP catchment area
A_I = Impervious area proposed in the BMP catchment area
A_P = Pervious area remaining in the BMP catchment area
L_R = TSS Load removed from this catchment area by the proposed BMP

A_C =	0.49	acres
A_I =	0.30	acres
A_P =	0.19	acres
L_R =	299	lbs

5. Calculate Fraction of Annual Runoff to Treat the drainage basin / outfall area

Desired $L_{M\ THIS\ BASIN}$ = 268 lbs.

F = 0.90

Texas Commission on Environmental Quality

TSS Removal Calculations 04-20-2009

Project Name: Wolf Ranch Expansion - Wolf Ranch Section 2 - Pond 1

Date Prepared: 8/8/2025

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1. The Required Load Reduction for the total project: Calculations from RG-348 Pages 3-27 to 3-30

Page 3-29 Equation 3.3: $L_M = 27.2(A_N \times P)$

where:

$L_{M\ TOTAL\ PROJECT}$ = Required TSS removal resulting from the proposed development = 85% of increased load
A_N = Net increase in impervious area for the project
P = Average annual precipitation, inches

Site Data: Determine Required Load Removal Based on the Entire Project

County =	Williamson	
Total project area included in plan * =	460.96	acres
Predevelopment impervious area within the limits of the plan * =	12.31	acres
Total post-development impervious area within the limits of the plan* =	376.59	acres
Total post-development impervious cover fraction * =	0.82	
P =	32	inches
$L_{M\ TOTAL\ PROJECT}$ =	317069	lbs. ADJUSTED FOR 85% TSS REMOVAL

* The values entered in these fields should be for the total project area.

Number of drainage basins / outfalls areas leaving the plan area = 1

2. Drainage Basin Parameters (This information should be provided for each basin):

Drainage Basin/Outfall Area No. = S2P1

Total drainage basin/outfall area =	40.93	acres
Predevelopment impervious area within drainage basin/outfall area =	1.00	acres
Post-development impervious area within drainage basin/outfall area =	24.19	acres
Post-development impervious fraction within drainage basin/outfall area =	0.59	
$L_{M\ THIS\ BASIN}$ =	20185	lbs. ADJUSTED FOR 85% TSS REMOVAL

3. Indicate the proposed BMP Code for this basin.

Proposed BMP =	Batch Detention	
Removal efficiency =	91	percent

4. Calculate Maximum TSS Load Removed (L_R) for this Drainage Basin by the selected BMP Type.

RG-348 Page 3-33 Equation 3.7: $L_R = (\text{BMP efficiency}) \times P \times (A_I \times 34.6 + A_P \times 0.54)$

where:

A_C = Total On-Site drainage area in the BMP catchment area
A_I = Impervious area proposed in the BMP catchment area
A_P = Pervious area remaining in the BMP catchment area
L_R = TSS Load removed from this catchment area by the proposed BMP

A_C =	40.93	acres
A_I =	24.19	acres
A_P =	16.74	acres
L_R =	24636	lbs

5. Calculate Fraction of Annual Runoff to Treat the drainage basin / outfall area

80% TSS REMOVAL CALCULATIONS PER TCEQ REQUIREMENTS

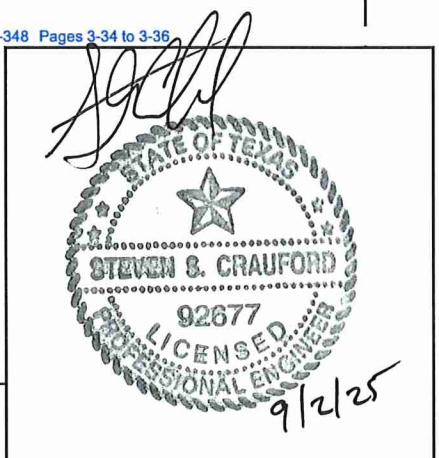
Desired $L_{M\ THIS\ BASIN}$ =	22552	lbs.
F =	0.92	

6. Calculate Capture Volume required by the BMP Type for this drainage basin / outfall area. Calculations from RG-348 Pages 3-34 to 3-36

Rainfall Depth =	2.00	inches
Post Development Runoff Coefficient =	0.41	
On-site Water Quality Volume =	122992	cubic feet

Calculations from RG-348 Pages 3-36 to 3-37

Off-site area draining to BMP =	0.00	acres
Off-site Impervious cover draining to BMP =	0.00	acres
Impervious fraction of off-site area =	0	
Off-site Runoff Coefficient =	0.00	
Off-site Water Quality Volume =	0	cubic feet
Storage for Sediment =	24598	
Total Capture Volume (required water quality volume(s) x 1.20) =	147591	cubic feet



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Texas Commission on Environmental Quality

TSS Removal Calculations 04-20-2009

Project Name: **Bluebonnet Plaza**
Date Prepared: **8/8/2025**

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1. The Required Load Reduction for the total project: Calculations from RG-348 Pages 3-27 to 3-30

Page 3-29 Equation 3.3: $L_M = 27.2(A_N \times P)$

where:

$L_{M\ TOTAL\ PROJECT}$ = Required TSS removal resulting from th
A_N = Net increase in impervious area for the project
P = Average annual precipitation, inches

80% TSS REMOVAL CALCULATIONS PER TCEQ REQUIREMENTS

Site Data: Determine Required Load Removal Based on the Entire Project

County =	Williamson	
Total project area included in plan * =	460.96	acres
Predevelopment impervious area within the limits of the plan * =	12.31	acres
Total post-development impervious area within the limits of the plan* =	376.59	acres
Total post-development impervious cover fraction * =	0.82	
P =	32	inches
$L_{M\ TOTAL\ PROJECT}$ =	317069	lbs.

* The values entered in these fields should be for the total project area.

Number of drainage basins / outfalls areas leaving the plan area = 1

2. Drainage Basin Parameters (This information should be provided for each basin):

Drainage Basin/Outfall Area No. = Bluebonnet Plaza Pond

Total drainage basin/outfall area =	33.96	acres
Predevelopment impervious area within drainage basin/outfall area =	0.00	acres
Post-development impervious area within drainage basin/outfall area =	13.35	acres
Post-development impervious fraction within drainage basin/outfall area =	0.39	
$L_{M\ THIS\ BASIN}$ =	11620	lbs.

3. Indicate the proposed BMP Code for this basin.

Proposed BMP = Batch Detention
Removal efficiency = 91 percent

STATE OF TEXAS
STEVEN S. CRAUFORD
92677
LICENSED
PROFESSIONAL ENGINEER
9/2/25

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4. Calculate Maximum TSS Load Removed (L_R) for this Drainage Basin by the selected BMP Type.

RG-348 Page 3-33 Equation 3.7: $L_R = (\text{BMP efficiency}) \times P \times (A_I \times 34.6 + A_P \times 0.54)$

where:

A_C = Total On-Site drainage area in the BMP catchment area
A_I = Impervious area proposed in the BMP catchment area
A_P = Pervious area remaining in the BMP catchment area
L_R = TSS Load removed from this catchment area by the proposed BMP

A_C =	33.96	acres
A_I =	13.35	acres
A_P =	20.61	acres
L_R =	13777	lbs

5. Calculate Fraction of Annual Runoff to Treat the drainage basin / outfall area

Desired $L_{M\ THIS\ BASIN}$ = 11620 lbs.

F = 0.84

6. Calculate Capture Volume required by the BMP Type for this drainage basin / outfall area. Calculations from RG-348 Pages 3-34 to 3-36

Rainfall Depth =	1.26	inches
Post Development Runoff Coefficient =	0.30	
On-site Water Quality Volume =	47158	cubic feet

Calculations from RG-348 Pages 3-36 to 3-37

Off-site area draining to BMP =	10.39	acres
Off-site Impervious cover draining to BMP =	0.00	acres
Impervious fraction of off-site area =	0.00	
Off-site Runoff Coefficient =	0.02	
Off-site Water Quality Volume =	950	cubic feet
Storage for Sediment =	9622	
Total Capture Volume (required water quality volume(s) x 1.20) =	57730	cubic feet

Texas Commission on Environmental Quality
TSS Removal Calculations 04-20-2009

Project Name: Wolf Ranch Expansion - StormTrooper C1 West
Date Prepared: 8/8/2025

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1. StormTrooper Model Sizing based on Individual Catchment Areas to the BMP. Pages 3-27 to 3-30

Page 3-27 Equation 3.3: Effective Area (EA) = (0.9 x Ai) + (0.03 x Ap) — Page 3-27 "RG-348" (C=0.90 Imp. Area, C=0.03 for Perv. Area)

	County =	Williamson
Where:	Effective Area =	0.355
	Total Impervious Area =	0.39
	Total Pervious Area =	0.14
	Drainage Area	C1 West
	From Table 2 choose an initial Model:	SWAQ-25
	Surface Area of Model:	369
	P =	32
	L_{M1} = 27.2 x An x P =	339

Lm1 = 27.2 x An x P
Equation 3.3 "RG-348"

2. Overflow Rate

V_{OR} = Q/S.A. — Equation 3.4 & 3.5 "RG-348"
Page 3-30 "RG-348" (i = 1.1 in./HR., 90% Volume Treated)

Where:	Q =	i x (EA)	
	Q =	0.39	cfs
	V_{OR} =	(i x EA)/Model Surface Area	
	V_{OR} =	0.00106	fps

3. BMP efficiency (Table 3). If the overflow rate is between two percent efficiencies, use the smaller.

V_{OR} =	0.00106
BMP Eff (%) =	83%

4. Maximum TSS Removal of BMP: L_{R1}

Lr = (BMP Effiencency) x P x (Ai x 34.6 + Ap x 0.54) — Equation 3.8 "RG-348"

Where:
Lr = Load Removed by BMP
BMP Efficiency = TSS Removal Efficiency (expressed as a decimal fraction from Table 3)

L_{R1} = 360.41 #TSS

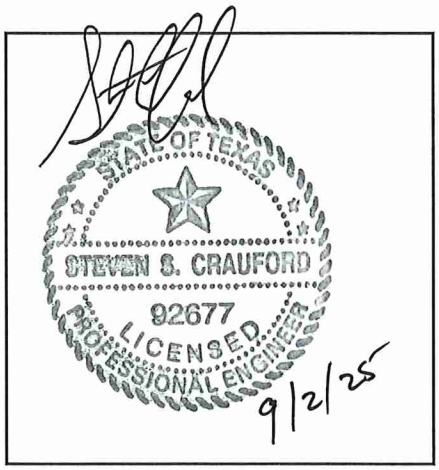
TSS removal exceeding required L_M to be counted towards untreated area = L_C

L_C = L_{R1} - L_{M1}
L_C = 21.41 #TSS

Required TSS removal for untreated area:
L_{M2} = 8.98 < 21.41 #TSS

UNIT IS SUFFICIENTLY SIZED TO REMOVE REQUIRED TSS FROM BOTH CAPTURED AND UNCAPTURED AREAS

80% TSS REMOVAL CALCULATIONS PER TCEQ REQUIREMENTS



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TEXAS ENGINEERING FIRM #470

Texas Commission on Environmental Quality
TSS Removal Calculations 04-20-2009

Project Name: Wolf Ranch Expansion - StormTrooper C2 East
Date Prepared: 8/8/2025

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1. StormTrooper Model Sizing based on Individual Catchment Areas to the BMP. Pages 3-27 to 3-30

Page 3-27 Equation 3.3: Effective Area (EA) = (0.9 x Ai) + (0.03 x Ap) — Page 3-27 "RG-348" (C=0.90 Imp. Area, C=0.03 for Perv. Area)

	County =	Williamson	
Where:	Effective Area =	0.212	
	Total Impervious Area =	0.22	
	Total Pervious Area =	0.48	
	Drainage Area	C2 East	
	From Table 2 choose an initial Model:	SWAQ-20	
	Surface Area of Model:	248	
	P =	32	
	L_{M1} = 27.2 x An x P =	191	Lm1 = 27.2 x An x P Equation 3.3 "RG-348"

2. Overflow Rate

V_{OR} = Q/S.A. — Equation 3.4 & 3.5 "RG-348"
Page 3-30 "RG-348" (i = 1.1 in./HR., 90% Volume Treated)

Where:	Q =	i x (EA)	
	Q =	0.23	cfs
	V_{OR} =	(i x EA)/Model Surface Area	
	V_{OR} =	0.00094	fps

3. BMP efficiency (Table 3). If the overflow rate is between two percent efficiencies, use the smaller.

V_{OR} =	0.00094
BMP Eff (%) =	83%

4. Maximum TSS Removal of BMP: L_{R1}

Lr = (BMP Effienciency) x P x (Ai x 34.6 + Ap x 0.54) — Equation 3.8 "RG-348"

Where:
Lr = Load Removed by BMP
BMP Efficiency = TSS Removal Efficiency (expressed as a decimal fraction from Table 3)

L_{R1} =	209.06	#TSS

TSS removal exceeding required L_M to be counted towards untreated area = L_C

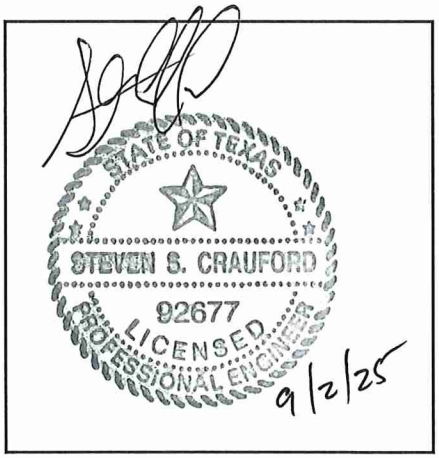
L_C =	L_{R1} - L_{M1}	
L_C =	18.06	#TSS

Required TSS removal for untreated area:

L_{M2} =	8.98	<	18.06	#TSS

UNIT IS SUFFICIENTLY SIZED TO REMOVE REQUIRED TSS FROM BOTH CAPTURED AND UNCAPTURED AREAS

80% TSS REMOVAL CALCULATIONS PER TCEQ REQUIREMENTS



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TEXAS ENGINEERING FIRM #470

Texas Commission on Environmental Quality
TSS Removal Calculations 04-20-2009

Project Name: Wolf Ranch Expansion - StormTrooper D1 West
Date Prepared: 8/8/2025

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1. StormTrooper Model Sizing based on Individual Catchment Areas to the BMP. Pages 3-27 to 3-30

Page 3-27 Equation 3.3: Effective Area (EA) = (0.9 x Ai) + (0.03 x Ap) — Page 3-27 "RG-348" (C=0.90 Imp. Area, C=0.03 for Perv. Area)

	County =	Williamson
Where:	Effective Area =	0.398
	Total Impervious Area =	0.44
	Total Pervious Area =	0.08
	Drainage Area	D1 West
	From Table 2 choose an initial Model:	SWAQ-25
	Surface Area of Model:	369
	P =	32
	L_{M1} = 27.2 x An x P =	383

Lm1 = 27.2 x An x P
Equation 3.3 "RG-348"

2. Overflow Rate

V_{OR} = Q/S.A. — Equation 3.4 & 3.5 "RG-348"
Page 3-30 "RG-348" (i = 1.1 in./HR., 90% Volume Treated)

Where:	Q =	i x (EA)	
	Q =	0.44	cfs
	V_{OR} =	(i x EA)/Model Surface Area	
	V_{OR} =	0.00119	fps

3. BMP efficiency (Table 3). If the overflow rate is between two percent efficiencies, use the smaller.

V_{OR} =	0.00119
BMP Eff (%) =	81%

4. Maximum TSS Removal of BMP: L_{R1}

Lr = (BMP Effiencieny) x P x (Ai x 34.6 + Ap x 0.54) — Equation 3.8 "RG-348"

Where:
Lr = Load Removed by BMP
BMP Efficiency = TSS Removal Efficiency (expressed as a decimal fraction from Table 3)

L_{R1} = 395.73 #TSS

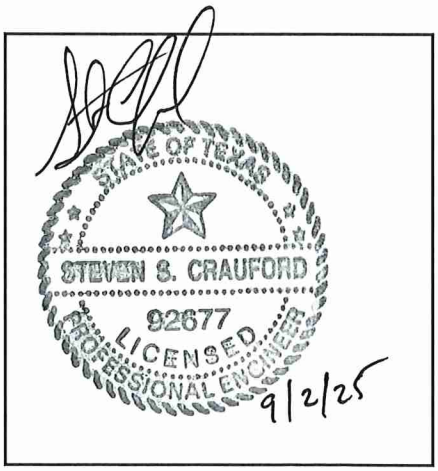
TSS removal exceeding required L_M to be counted towards untreated area = L_C

L_C = L_{R1} - L_{M1}
L_C = 12.73 #TSS

Required TSS removal for untreated area:
L_{M2} = 8.98 < 12.73 #TSS

UNIT IS SUFFICIENTLY SIZED TO REMOVE REQUIRED TSS FROM BOTH CAPTURED AND UNCAPTURED AREAS

80% TSS REMOVAL CALCULATIONS PER TCEQ REQUIREMENTS



PAPE-DAWSON CONSULTING ENGINEERS, LLC.
TEXAS ENGINEERING FIRM #470

Texas Commission on Environmental Quality
TSS Removal Calculations 04-20-2009

Project Name: Wolf Ranch Expansion - StormTrooper D2 East
Date Prepared: 8/8/2025

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1. StormTrooper Model Sizing based on Individual Catchment Areas to the BMP. Pages 3-27 to 3-30

Page 3-27 Equation 3.3: Effective Area (EA) = (0.9 x Ai) + (0.03 x A_P) — Page 3-27 "RG-348" (C=0.90 Imp. Area, C=0.03 for Perv. Area)

	County =	Williamson	
Where:	Effective Area =	0.418	
	Total Impervious Area =	0.44	
	Total Pervious Area =	0.73	
	Drainage Area	D2 East	
	From Table 2 choose an initial Model:	SWAQ-25	
	Surface Area of Model:	369	
	P =	32	
	L_{M1} = 27.2 x An x P =	383	Lm1 = 27.2 x An x P Equation 3.3 "RG-348"

2. Overflow Rate

V_{OR} = Q/S.A. — Equation 3.4 & 3.5 "RG-348"
Page 3-30 "RG-348" (i = 1.1 in./HR., 90% Volume Treated)

Where:	Q =	i x (EA)	
	Q =	0.46	cfs
	V_{OR} =	(i x EA)/Model Surface Area	
	V_{OR} =	0.00125	fps

3. BMP efficiency (Table 3). If the overflow rate is between two percent efficiencies, use the smaller.

V_{OR} =	0.00125
BMP Eff (%) =	81%

4. Maximum TSS Removal of BMP: L_{R1}

STORMTROOPER D2 EAST (SWAQ-25)

Lr = (BMP Effiencicency) x P x (Ai x 34.6 + Ap x 0.54) — Equation 3.8 "RG-348"

Where:
Lr = Load Removed by BMP
BMP Efficiency = TSS Removal Efficiency (expressed as a decimal fraction from Table 3)

L_{R1} =	404.82	#TSS

TSS removal exceeding required L_M to be counted towards untreated area = L_C

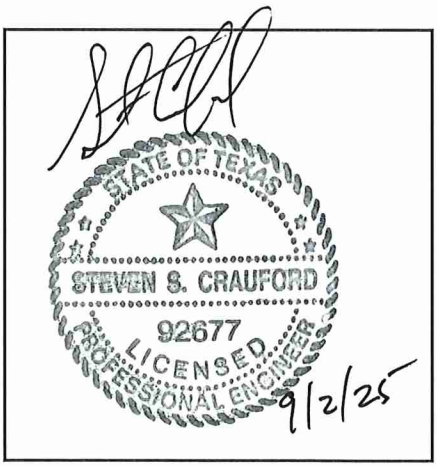
L_C =	L_{R1} - L_{M1}	
L_C =	21.82	#TSS

Required TSS removal for untreated area:

L_{M2} =	8.98	<	21.82	#TSS

UNIT IS SUFFICIENTLY SIZED TO REMOVE REQUIRED TSS FROM BOTH CAPTURED AND UNCAPTURED AREAS

80% TSS REMOVAL CALCULATIONS PER TCEQ REQUIREMENTS



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TEXAS ENGINEERING FIRM #470

ATTACHMENT I

INSPECTIONS & MAINTENANCE

Designated and qualified person(s) shall inspect Pollution Control Measures weekly and within 24 hours after a storm event. An inspection report that summarizes the scope of the inspection, names and qualifications of personnel conducting the inspection, date of the inspection, major observations, and actions taken as a result of the inspection will be recorded and maintained as part of Storm Water TPDES data for a period of three years after the Notice of Termination (NOT) has been filed. A copy of the Inspection Report Form is provided in this Storm Water Pollution Prevention Plan.

As a minimum, the inspector shall observe: (1) significant disturbed areas for evidence of erosion, (2) storage areas for evidence of leakage from the exposed stored materials, (3) structural controls (rock berm outlets, silt fences, drainage swales, etc.) for evidence of failure or excess siltation (over 6 inches deep), (4) vehicle exit point for evidence of off-site sediment tracking, (5) vehicle storage areas for signs of leaking equipment or spills, (6) concrete truck rinse-out pit for signs of potential failure, (7) embankment, spillways, and outlet of sediment basin (where applicable) for erosion damage, and (8) sediment basins (where applicable) for evidence that basin has accumulated 50% of its volume in silt. Deficiencies noted during the inspection will be corrected and documented within seven calendar days following the inspection or before the next anticipated storm event if practicable. Temporary sediment basins and permanent basins will be inspected until final stabilization of 70% within the basin watershed is achieved.

BMP inspection and maintenance requirements from sections 1.3 and 1.4 of TCEQ's Technical Guidance Manual are detailed below.

Temporary Construction Entrance/Exit

- The entrance should be maintained in a condition, which will prevent tracking or flowing of sediment onto public rights-of-way. This may require periodic top dressing with additional stone as conditions demand and repair and/or cleanout of any measures used to trap sediment.
- All sediment spilled, dropped, washed or tracked onto public rights-of-way should be removed immediately by contractor.
- When necessary, wheels should be cleaned to remove sediment prior to entrance onto public right-of-way.
- When washing is required, it should be done on an area stabilized with crushed stone that drains into an approved sediment trap or sediment basin.
- All sediment should be prevented from entering any storm drain, ditch or water course by using approved methods.

Silt Fence

- Inspect all fencing weekly, and after any rainfall.
- Remove sediment when buildup reaches 6 inches.
- Replace any torn fabric or install a second line of fencing parallel to the torn section.
- Replace or repair any sections crushed or collapsed in the course of construction activity. If a section of fence is obstructing vehicular access, consider relocating it to a spot where it will provide equal protection, but will not obstruct vehicles. A triangular filter dike may be preferable to a silt fence at common vehicle access points.

- When construction is complete, the sediment should be disposed of in a manner that will not cause additional siltation and the prior location of the silt fence should be revegetated. The fence itself should be disposed of in an approved landfill.

Rock Berms

- Inspection should be made weekly and after each rainfall by the responsible party. For installations in streambeds, additional daily inspections should be made.
- Remove sediment and other debris when buildup reaches 6 inches and dispose of the accumulated silt in an approved manner that will not cause any additional siltation.
- Repair any loose wire sheathing.
- The berm should be reshaped as needed during inspection.
- The berm should be replaced when the structure ceases to function as intended due to silt accumulation among the rocks, washout, construction traffic damage, etc.
- The rock berm should be left in place until all upstream areas are stabilized and accumulated silt removed.

Inlet Protection

- Inspection should be made weekly and after each rainfall. Repair or replacement should be made promptly as needed by the contractor.

- Remove sediment when buildup reaches a depth of 3 inches. Removed sediment should be deposited in a suitable area and in such a manner that it will not erode.
- Check placement of device to prevent gaps between device and curb.
- Inspect filter fabric and patch or replace if torn or missing. 1-100
- Structures should be removed and the area stabilized only after the remaining drainage area has been properly stabilized.

Concrete Washout Areas

- Incorporate requirements for concrete waste management into material supplier and subcontractor agreements.
- Avoid mixing excess amounts of fresh concrete.
- Perform washout of concrete trucks in designated areas only.
- Do not wash out concrete trucks into storm drains, open ditches, streets, or streams.
- Do not allow excess concrete to be dumped onsite, except in designated areas.
- Locate washout area at least 50 feet from sensitive features, storm drains, open ditches, or water bodies. Do not allow runoff from this area by constructing a temporary pit or bermed area large enough for liquid and solid waste.
- Wash out wastes into the temporary pit where the concrete can set, be broken up, and then disposed properly.

Pollution Prevention Measure	**Inspected in Compliance**	**Corrective Action Required**	
		Description (use additional sheet if necessary)	**Date Completed**
Best Management Practices			
Natural vegetation buffer strips			
Temporary vegetation			
Permanent vegetation			
Sediment control basin			
Silt fences			
Rock berms			
Gravel filter bags			
Drain inlet protection			
Other structural controls			
Vehicle exits (off-site tracking)			
Material storage areas (leakage)			
Equipment areas (leaks, spills)			
Concrete washout pit (leaks, failure)			
General site cleanliness			
Trash receptacles			
Evidence of Erosion			
Site preparation			
Roadway or parking lot construction			
Utility construction			
Drainage construction			
Building construction			
Major Observations			
Sediment discharges from site			
BMPs requiring maintenance			
BMPs requiring modification			
Additional BMPs required			

_____ **A brief statement describing the qualifications of the inspector is included in this SWP3.**

"I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations."

"I further certify I am an authorized signatory in accordance with the provisions of 30 TAC §305.128."

Inspector's Name _____ Inspector's Signature _____ Date _____

PROJECT MILESTONE DATES

Date when major site grading activities begin:

Construction Activity	*Date*
Installation of BMPs	

Dates when construction activities temporarily or permanently cease on all or a portion of the project:

Construction Activity	Date

Dates when stabilization measures are initiated:

Stabilization Activity	Date
Removal of BMPs	

ATTACHMENT J

SCHEDULE OF INTERIM AND PERMANENT SOIL STABILIZATION PRACTICES

Interim on-site stabilization measures, which are continuous, will include minimizing soil disturbances by exposing the smallest practical area of land required for the shortest period of time and maximizing use of natural vegetation. As soon as practical, all disturbed soil will be stabilized via permanent revegetation. Details, such as installation, irrigation, and maintenance are provided below.

Installation:

- Final grading must be completed prior to seeding, minimizing all steep slopes. In addition, all necessary erosion structures such as dikes, swales, diversions, should also be installed.
- Seedbed should be well pulverized, loose, and uniform.
- Fertilizer should be applied at the rate of 40 pounds of nitrogen and 40 pounds of phosphorus per acre, which is equivalent to about 1.0 pounds of nitrogen and phosphorus per 1000 square feet. Compost can be used instead of fertilizer and applied at the same time as the seed.

Irrigation:

- Temporary irrigation should be provided according to the schedule described below, or to replace moisture loss to evapotranspiration (ET), whichever is greater. Significant rainfall (on-site rainfall of ½" or greater) may allow watering to be postponed until the next scheduled irrigation.

Time Period	Irrigation Amount and Frequency
Within 2 hours of installation	Irrigate entire root depth, or to germinate seed
During the next 10 business days	Irrigate entire root depth every Monday, Wednesday, and Friday
During the next 30 business days or until Substantial Completion	Irrigate entire root depth a minimum of once per week, or as necessary to ensure vigorous growth
During the next 4 months or until Final Acceptance of the Project	Irrigate entire root depth once every two weeks, or as necessary to ensure vigorous growth

Inspection and Maintenance Guidelines:

- Permanent vegetation should be inspected weekly and after each rain event to locate and repair any erosion.
- Erosion from storms or other damage should be repaired as soon as practical by regrading the area and applying new seed.
- If the vegetated cover is less than 80%, the area should be reseeded.

Stabilization measures will be initiated as soon as practicable in portions of the site where construction activities have temporarily or permanently ceased, and except as provided below, will be initiated no more than fourteen (14) days after the construction activity in that portion of the site has temporarily or permanently ceased. Where construction activity on a portion of the site is temporarily ceased, and earth disturbing activities will be resumed within twenty-one (21) days, temporary stabilization measures do not have to be initiated on that portion of site. In areas experiencing droughts where the initiation of stabilization measures by the 14th day after construction activity has temporarily or permanently ceased is precluded by seasonably arid conditions, stabilization measures must be initiated as soon as practicable.

AGENT AUTHORIZATION

Agent Authorization Form
For Required Signature
Edwards Aquifer Protection Program
Relating to 30 TAC Chapter 213
Effective June 1, 1999

I **Hunter Anderson**,
Print Name

Utility Project Manager,
Title - Owner/President/Other

of **City of Georgetown**,
Corporation/Partnership/Entity Name

have authorized **Steven Crauford, P.E.**
Print Name of Agent/Engineer

of **Pape-Dawson Engineers, Inc.**
Print Name of Firm

to represent and act on the behalf of the above named Corporation, Partnership, or Entity for the purpose of preparing and submitting this plan application to the Texas Commission on Environmental Quality (TCEQ) for the review and approval consideration of regulated activities.

I also understand that:

1. The applicant is responsible for compliance with 30 Texas Administrative Code Chapter 213 and any condition of the TCEQ's approval letter. The TCEQ is authorized to assess administrative penalties of up to $10,000 per day per violation.

2. For those submitting an application who are not the property owner, but who have the right to control and possess the property, additional authorization is required from the owner.

3. Application fees are due and payable at the time the application is submitted. The application fee must be sent to the TCEQ cashier or to the appropriate regional office. The application will not be considered until the correct fee is received by the commission.

4. A notarized copy of the Agent Authorization Form must be provided for the person preparing the application, and this form must accompany the completed application.

5. No person shall commence any regulated activity on the Edwards Aquifer Recharge Zone, Contributing Zone or Transition Zone until the appropriate application for the activity has been filed with and approved by the Executive Director.

SIGNATURE PAGE:

Applicant's Signature

7-17-2025
Date

THE STATE OF Texas §

County of Williamson §

BEFORE ME, the undersigned authority, on this day personally appeared Hunter Anderson known to me to be the person whose name is subscribed to the foregoing instrument, and acknowledged to me that (s)he executed same for the purpose and consideration therein expressed.

GIVEN under my hand and seal of office on this 17 day of July, 2025.

NOTARY PUBLIC

DANIEL HAVINS
Notary Public, State of Texas
Comm. Expires 08-07-2028
Notary ID 135028707

Daniel Havins
Typed or Printed Name of Notary

MY COMMISSION EXPIRES: 8-7-2028

Owner Authorization Form

Edwards Aquifer Protection Program

Instructions

Complete the following form by adding the requested information in the fields below. The form must be notarized for it to be considered complete. Attach it to other programmatic submittals required by 30 Texas Administrative Code (30 TAC), Chapter 213, and provide it to TCEQ's Edwards Aquifer Protection Program (EAPP) as part of your application.

If you have questions on how to fill out this form or about EAPP, please contact us by phone at 512-339-2929 or by e-mail at eapp@tceq.texas.gov.

Landowner Authorization

I, Rebecca Ida Broudy Collins of Williamson County MUD #28

am the owner of the property located at:

416 Canyon View Rd, Georgetown, TX 78628

and am duly authorized in accordance with 30 TAC 213.4(c)(2) and 213.4(d)(1), or 30 TAC 213.23(c)(2) and 213.23(d), relating to the right to submit an application, signatory authority, and proof of authorized signatory.

I do hereby authorize City of Georgetown
To conduct the construction of Memorial Drive, Wolf Ranch Parkway, and related infrastructure
At Intersection of Memorial Drive and Wolf Ranch Parkway

Landowner Acknowledgement

I understand that Williamson County MUD #28

Is ultimately responsible for the compliance with the approved or conditionally approved Edwards Aquifer protection plan and any special conditions of the approved plan through all phases of plan implementation even if the responsibility for compliance and the right to possess and control the property referenced in the application has been contractually assumed by another legal entity. I further understand that any failure to comply with any condition of the executive director's approval is a violation and subject to administrative rule or orders and penalties as provided under 30 TAC 213.10, relating to enforcement. Such violations may also be subject to civil penalties.

Landowner Signature

Rebecca Ida Broudy Collins

Landowner Signature

Date 8/18/25

THE STATE § OF Texas

County § of Travis

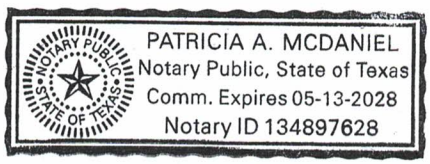
BEFORE ME, the undersigned authority, on this day personally appeared

Rebecca Ida Broudy Collins

known to me to be the person whose name is subscribed to the foregoing instrument and acknowledged to me that (s)he executed same for the purpose and consideration therein expressed.

GIVEN under my hand and seal of office on this 18th day of August

NOTARY PUBLIC Patricia A McDaniel



MY COMMISSION EXPIRES: 5/13/28

Optional Attachments

Select All that apply:

☐ Lease Agreement

☐ Signed Contract

☐ Deed Restricted Easement

☐ Other legally binding documents

APPLICATION FEE FORM

Application Fee Form

Texas Commission on Environmental Quality

Name of Proposed Regulated Entity: Wolf Ranch Parkway / Memorial Drive
Regulated Entity Location: SE of the intersection of Wolf Ranch Pkwy & Memorial Drive.
Name of Customer: City of Georgetown
Contact Person: Hunter Anderson Phone: (512) 930-6527
Customer Reference Number (if issued):CN _____
Regulated Entity Reference Number (if issued):RN N/A

Austin Regional Office (3373)

☐ Hays ☐ Travis ☒ Williamson

San Antonio Regional Office (3362)

☐ Bexar ☐ Medina ☐ Uvalde
☐ Comal ☐ Kinney

Application fees must be paid by check, certified check, or money order, payable to the **Texas Commission on Environmental Quality**. Your canceled check will serve as your receipt. **This form must be submitted with your fee payment**. This payment is being submitted to:

☒ Austin Regional Office
☐ Mailed to: TCEQ - Cashier
Revenues Section
Mail Code 214
P.O. Box 13088
Austin, TX 78711-3088

☐ San Antonio Regional Office
☐ Overnight Delivery to: TCEQ - Cashier
12100 Park 35 Circle
Building A, 3rd Floor
Austin, TX 78753
(512)239-0357

Site Location (Check All That Apply):

☒ Recharge Zone ☐ Contributing Zone ☐ Transition Zone

Type of Plan	*Size*	*Fee Due*
Water Pollution Abatement Plan, Contributing Zone Plan: One Single Family Residential Dwelling	Acres	$
Water Pollution Abatement Plan, Contributing Zone Plan: Multiple Single Family Residential and Parks	Acres	$
Water Pollution Abatement Plan, Contributing Zone Plan: Non-residential	34.97 Acres	$ 6,500.00
Sewage Collection System	L.F.	$
Lift Stations without sewer lines	Acres	$
Underground or Aboveground Storage Tank Facility	Tanks	$
Piping System(s)(only)	Each	$
Exception	Each	$
Extension of Time	Each	$

Signature: _____ Date: 9/2/25

Application Fee Schedule

Texas Commission on Environmental Quality
Edwards Aquifer Protection Program 30 TAC Chapter 213 (effective 05/01/2008)

Water Pollution Abatement Plans and Modifications

Contributing Zone Plans and Modifications

Project	*Project Area in Acres*	*Fee*
One Single Family Residential Dwelling	< 5	$650
Multiple Single Family Residential and Parks	< 5 5 < 10 10 < 40 40 < 100 100 < 500 ≥ 500	$1,500 $3,000 $4,000 $6,500 $8,000 $10,000
Non-residential (Commercial, industrial, institutional, multi-family residential, schools, and other sites where regulated activities will occur)	< 1 1 < 5 5 < 10 10 < 40 40 < 100 ≥ 100	$3,000 $4,000 $5,000 $6,500 $8,000 $10,000

Organized Sewage Collection Systems and Modifications

Project	*Cost per Linear Foot*	*Minimum Fee-Maximum Fee*
Sewage Collection Systems	$0.50	$650 - $6,500

Underground and Aboveground Storage Tank System Facility Plans and Modifications

Project	*Cost per Tank or Piping System*	*Minimum Fee-Maximum Fee*
Underground and Aboveground Storage Tank Facility	$650	$650 - $6,500

Exception Requests

Project	*Fee*
Exception Request	$500

Extension of Time Requests

Project	*Fee*
Extension of Time Request	$150

CORE DATA FORM

TCEQ Use Only

TCEQ Core Data Form

For detailed instructions on completing this form, please read the Core Data Form Instructions or call 512-239-5175.

SECTION I: General Information

1. Reason for Submission (*If other is checked please describe in space provided.*)

☒ New Permit, Registration or Authorization (*Core Data Form should be submitted with the program application.*)

☐ Renewal *(Core Data Form should be submitted with the renewal form)*

☐ Other

2. Customer Reference Number *(if issued)*	Follow this link to search for CN or RN numbers in Central Registry**	**3. Regulated Entity Reference Number** *(if issued)*
CN 600412043		**RN**

SECTION II: Customer Information

4. General Customer Information	**5. Effective Date for Customer Information Updates** (mm/dd/yyyy)	

☐ New Customer ☐ Update to Customer Information ☐ Change in Regulated Entity Ownership
☐ Change in Legal Name (Verifiable with the Texas Secretary of State or Texas Comptroller of Public Accounts)

The Customer Name submitted here may be updated automatically based on what is current and active with the Texas Secretary of State (SOS) or Texas Comptroller of Public Accounts (CPA).

6. Customer Legal Name *(If an individual, print last name first: eg: Doe, John)*	*If new Customer, enter previous Customer below:*
City of Georgetown, Texas	

7. TX SOS/CPA Filing Number	**8. TX State Tax ID** (11 digits)	**9. Federal Tax ID** (9 digits)	**10. DUNS Number** *(if applicable)*
N/A	N/A	746000974	N/A

11. Type of Customer:	☐ Corporation	☐ Individual	Partnership: ☐ General ☐ Limited
Government: ☒ City ☐ County ☐ Federal ☐ Local ☐ State ☐ Other		☐ Sole Proprietorship	☐ Other:

12. Number of Employees	**13. Independently Owned and Operated?**
☐ 0-20 ☐ 21-100 ☐ 101-250 ☒ 251-500 ☐ 501 and higher	☒ **Yes** ☐ **No**

14. Customer Role (Proposed or Actual) – *as it relates to the Regulated Entity listed on this form. Please check one of the following*

☒ Owner ☐ Operator ☐ Owner & Operator
☐ Occupational Licensee ☐ Responsible Party ☐ VCP/BSA Applicant ☐ Other:

15. Mailing Address:							
300 Industrial Avenue							
PO Box 409							
City	Georgetown	**State**	TX	**ZIP**	78626	**ZIP + 4**	

16. Country Mailing Information *(if outside USA)*	**17. E-Mail Address** *(if applicable)*
	Hunter.Anderson@georgetown.org

18. Telephone Number	19. Extension or Code	20. Fax Number *(if applicable)*
(512) 930-6527		( ) -

SECTION III: Regulated Entity Information

21. General Regulated Entity Information *(If 'New Regulated Entity" is selected, a new permit application is also required.)*

☒ New Regulated Entity ☐ Update to Regulated Entity Name ☐ Update to Regulated Entity Information

The Regulated Entity Name submitted may be updated, in order to meet TCEQ Core Data Standards (removal of organizational endings such as Inc, LP, or LLC).

22. Regulated Entity Name *(Enter name of the site where the regulated action is taking place.)*

Wolf Ranch Parkway / Memorial Drive

23. Street Address of the Regulated Entity: ***(No PO Boxes)***								
	City		**State**		**ZIP**		**ZIP + 4**	
24. County	WIlliamson							

If no Street Address is provided, fields 25-28 are required.

25. Description to Physical Location:	Wolf Ranch Parkway between SH-29 and Rivery Drive. Memorial Drive between River Chase Boulevard and Wolf Lakes Drive.				
26. Nearest City			**State**	**Nearest ZIP Code**	
Georgetown			TX	78626	

Latitude/Longitude are required and may be added/updated to meet TCEQ Core Data Standards. (Geocoding of the Physical Address may be used to supply coordinates where none have been provided or to gain accuracy).

27. Latitude (N) In Decimal:			**28. Longitude (W) In Decimal:**		
Degrees	Minutes	Seconds	Degrees	Minutes	Seconds
30	38	5.6	97	42	2.3

29. Primary SIC Code (4 digits)	**30. Secondary SIC Code** (4 digits)	**31. Primary NAICS Code** (5 or 6 digits)	**32. Secondary NAICS Code** (5 or 6 digits)

33. What is the Primary Business of this entity? *(Do not repeat the SIC or NAICS description.)*

Public Roadway

34. Mailing Address:	**300 Industrial Avenue**							
	PO Box 409							
	City	**Georgetown**	**State**	**TX**	**ZIP**	**78626**	**ZIP + 4**	
35. E-Mail Address:	**Hunter.Anderson@georgetown.org**							

36. Telephone Number	**37. Extension or Code**	**38. Fax Number** *(if applicable)*
(512) 930-6527		( ) -

39. TCEQ Programs and ID Numbers Check all Programs and write in the permits/registration numbers that will be affected by the updates submitted on this form. See the Core Data Form instructions for additional guidance.

☐ Dam Safety	☐ Districts	☒ Edwards Aquifer	☐ Emissions Inventory Air	☐ Industrial Hazardous Waste
☐ Municipal Solid Waste	☐ New Source Review Air	☐ OSSF	☐ Petroleum Storage Tank	☐ PWS
☐ Sludge	☐ Storm Water	☐ Title V Air	☐ Tires	☐ Used Oil
☐ Voluntary Cleanup	☐ Wastewater	☐ Wastewater Agriculture	☐ Water Rights	☐ Other:

SECTION IV: Preparer Information

40. Name:	Austin Conner, PE	**41. Title:**	Project Manager

42. Telephone Number	**43. Ext./Code**	**44. Fax Number**	**45. E-Mail Address**
(512) 454-8711		( ) -	AConner@pape-dawson.com

SECTION V: Authorized Signature

46. By my signature below, I certify, to the best of my knowledge, that the information provided in this form is true and complete, and that I have signature authority to submit this form on behalf of the entity specified in Section II, Field 6 and/or as required for the updates to the ID numbers identified in field 39.

Company:	Pape-Dawson Engineers, LLC.	**Job Title:**	Vice President
Name *(In Print):*	Steve Crauford, P.E.	**Phone:**	(512) 454- **8711**
Signature:		**Date:**	9/2/2025