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: US 183A General Purpose Lanes						**2. Regulated Entity No.: 104348743**			
3. Customer Name: Texas Department of Transportation						**4. Customer No.: 600803456**			
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):**		180.2	
9. Application Fee:	N/A		**10. Permanent BMP(s):**			VFS, GS, SFs, ED, STUs			
11. SCS (Linear Ft.):	0		**12. AST/UST (No. Tanks):**			0			
13. County:	Williamson		**14. Watershed:**			Brushy creek			

Application Distribution

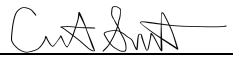
Instructions: Use the table below to determine the number of applications required. One original and one copy of the application, plus additional copies (as needed) for each affected incorporated city, county, and groundwater conservation district are required. Linear projects or large projects, which 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	_X_ Austin _X_ Cedar Park ___Florence ___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. Clint Smith
Print Name of Customer/Authorized Agent  1/21/2026
Signature of Customer/Authorized Agent Date

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):	

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: Clint Smith, P.E.

Date: 1/21/2026

Signature of Customer/Agent:

Project Information

1. Regulated Entity Name: US 183A General Purpose Lanes
2. County: Williamson
3. Stream Basin: Brushy Creek
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: Kyle Russell
   Entity: Texas Department of Transportation
   Mailing Address: 2727 S Austin Ave
   City, State: Georgetown, TX Zip: 78726
   Telephone: 512-930-5402 FAX: _____
   Email Address: kyle.russell@txdot.gov

8. Agent/Representative (If any):

   Contact Person: Clint Smith
   Entity: Halff Associates, Inc.
   Mailing Address: 5113 Southwest Pkwy, Suite 140
   City, State: Austin, TX Zip: 78735
   Telephone: 737-787-2704 FAX: _____
   Email Address: clint.smith@halff.com

9. Project Location:

   ☒ The project site is located inside the city limits of Austin and Cedar Park.
   ☐ 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.

    The project site is located in the ROW of US 183A between Avery Ranch Boulevard to Ranch to Market Road 1431 (RM 1431).

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: _____

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:

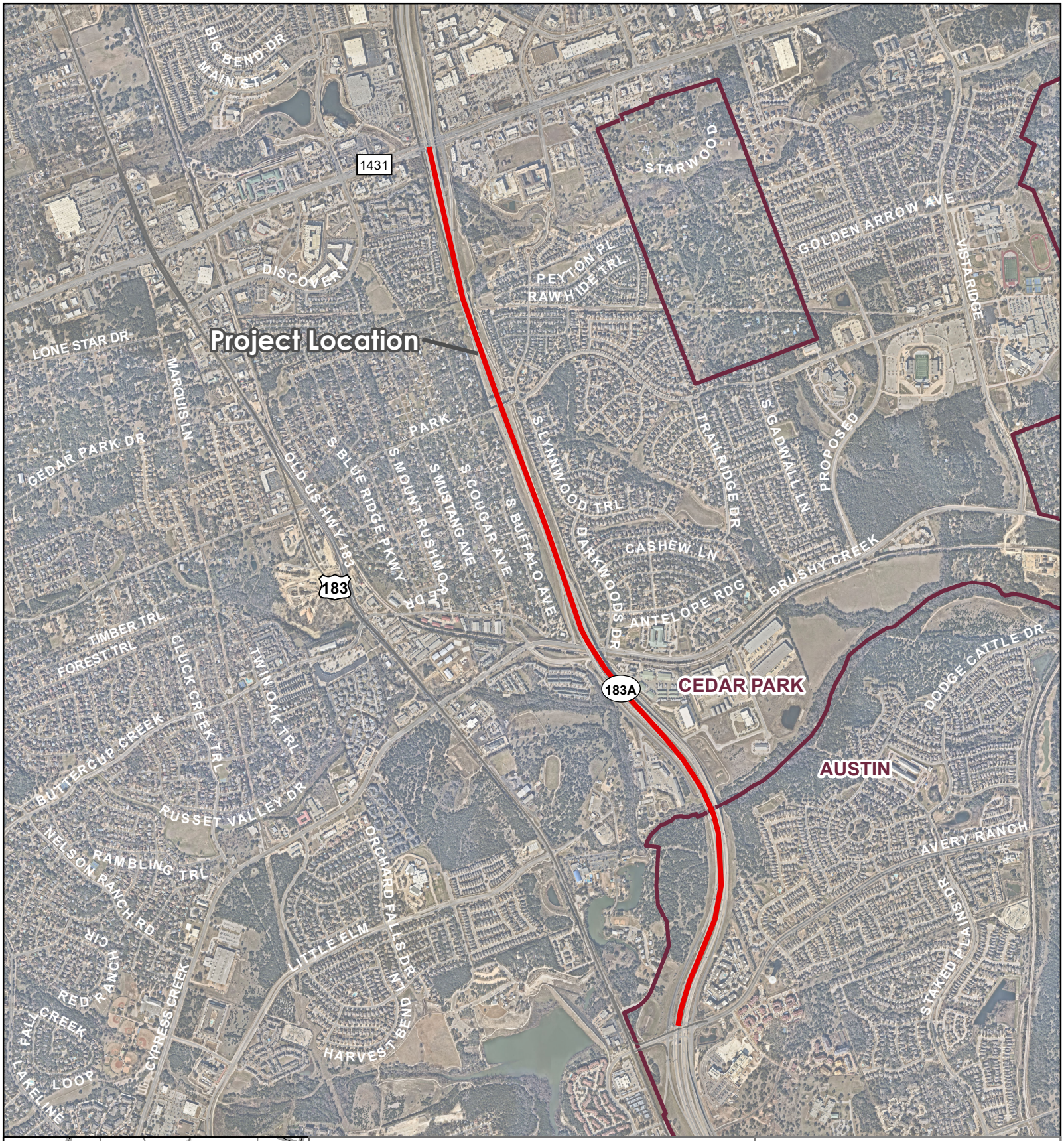
☒ For a Water Pollution Abatement Plan or Modification, the total acreage of the site where regulated activities will occur.
☐ For an Organized Sewage Collection System Plan or Modification, the total linear footage of all collection system lines.
☐ For a UST Facility Plan or Modification or an AST Facility 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.

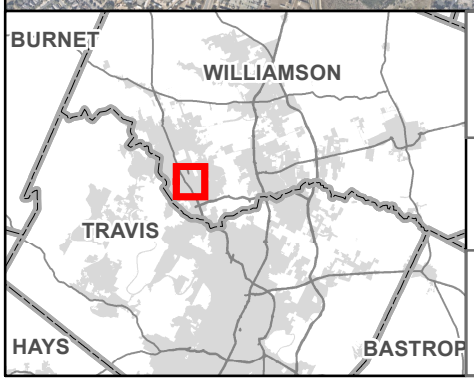
19. ☒ Application fees are due and payable at the time the application is filed. If the correct fee is not submitted, the TCEQ is not required to consider the application until the correct fee is submitted. Both the fee and the Edwards Aquifer Fee Form have been sent to the Commission's:

☐ 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.





Pape-Dawson
TXDOT-WA#1 183 Frontage WQ

Attachment A
Road Map

Directions:
Take IH 35 to US-183 Hwy N to Route 183A S in Williamson County.

Project Location

City Boundary

0 1,000 2,000 Feet

1:24,000

halff

Pape-Dawson
TXDOT-WA#1
183 Frontage WQ

Attachment B
USGS / Edwards Recharge Zone Map

Project Location

Roadway

City Boundary

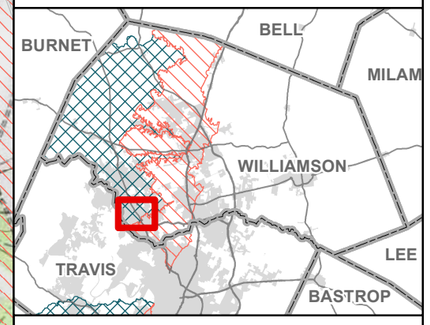
County Boundary

Edwards Aquifer

Recharge Zone

Contributing Zone

- Edwards Aquifer Regulatory Boundary TCEQ, 2023
- 7.5 Minute USGS Topographic Quads LEANDER and JOLLYVILLE



0 1,000 2,000 Feet

1:24,000

halff

Service Layer Credits: Copyright:© 2013 National Geographic Society, i-cubed

Attachment C:

Project Description:

US Highway 183A currently does not have frontage roads along the entirety from Avery Ranch Boulevard to Ranch to Market Road 1431 (RM 1431), approximately 2.8 miles along the centerline of US 183A. The portion of this project that is south of Brushy Creek is within the Edwards Aquifer Recharge Zone while the rest of the project is within the Edwards Aquifer Contributing Zone. Since a portion of this project lies within the Edwards Aquifer Recharge Zone, the entire project is to be treated as per the Recharge Zone rules. To comply with the Texas Commission on Environmental Quality (TCEQ) rules for Edwards Aquifer compliance, treatment must be provided for 80% of the increased sediment load. The existing Best Management Practices (BMPs) for the main lanes of US 183A are a combination of extended detention ponds, sand filter ponds, vegetated filter strips, and combination vegetated filter strip/grassy swales. To address the increase in sediment load from the new impervious cover added by the proposed frontage roads, existing water quality measures were evaluated for existing treatment capacity and treatment capacity remaining.

The existing Water Pollution Abatement Plan (WPAP) prepared in 2004, provides treatment for the existing mainlanes and future expansion of the roadway (more details below). This proposed WPAP supersedes the existing and took calculations back to a "Day 1" scenario starting from an impervious cover amount seen in aerial imagery from 1994 due to the extensive changes being made to the existing and proposed treatment options. The proposed treatments for the future conditions are extended detention, sand filtration, jellyfish filters, vegetated filter strips, and grassy swales. In most areas of the project, in-series treatment will be utilized to achieve the 80% treatment required.

- **Identifier: 04071601 (US 183A; East of the Existing US 183 from Avery Ranch Boulevard North to the Existing US 183 and the South Fork San Gabriel River; Austin ETJ, Cedar Park, and Leander, Texas)**
    - Held by CTRMA - **WPAP**
    - Approved September 30, 2004
        - The project limits are located within the proposed US 183A frontage road project limits. The existing mainlane geometry will be used, and ramps and frontage roads will be added. The existing water quality ponds (Warrior, Longhorn, Lobo, Aggie, and Elbow) will all remain in place. Some existing grassy swales and vegetated filter strips will remain however many of them will be removed for the addition of the frontage roads. The existing WPAP required a removal of 112,363 lbs/year and removed 112,437 lbs/year.
    - **Recommendation: Supersede WPAP** from Avery Ranch Blvd to RM 1431

Modification of a Previously Approved Plan

Texas Commission on Environmental Quality

for Regulated Activities on the Edwards Aquifer Recharge Zone and Transition Zone and Relating to 30 TAC 213.4(j), 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 request for a **Modification of a Previously Approved Plan** is hereby submitted for TCEQ review and executive director approval. The request was prepared by:

Print Name of Customer/Agent: Clint Smith, P.E.

Date: 1/21/2026

Signature of Customer/Agent:

Project Information

1. Current Regulated Entity Name: US 183A General Purpose Lanes
   Original Regulated Entity Name: US 183A General Purpose Lanes
   Regulated Entity Number(s) (RN): 104348743
   Edwards Aquifer Protection Program ID Number(s): 11004130
   ☒ The applicant has not changed and the Customer Number (CN) is: 600803456
   ☐ The applicant or Regulated Entity has changed. A new Core Data Form has been provided.

2. ☒ **Attachment A: Original Approval Letter and Approved Modification Letters**. A copy of the original approval letter and copies of any modification approval letters are attached.

3. A modification of a previously approved plan is requested for (check all that apply):
   - ☒ 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;
   - ☐ 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;
   - ☐ Development of land previously identified as undeveloped in the original water pollution abatement plan;
   - ☐ Physical modification of the approved organized sewage collection system;
   - ☐ Physical modification of the approved underground storage tank system;
   - ☐ Physical modification of the approved aboveground storage tank system.

4. ☒ Summary of Proposed Modifications (select plan type being modified). If the approved plan has been modified more than once, copy the appropriate table below, as necessary, and complete the information for each additional modification.

WPAP Modification Summary	***Approved Project***	***Proposed Modification***
Acres	180.2	180.2
Type of Development	Roadway	Roadway
Number of Residential Lots	0	0
Impervious Cover (acres)	110.7	110.7
Impervious Cover (%	61.4	61.4
Permanent BMPs	ED, SFS, VFS, GS, STUs	ED, SFS, VFS, GS, STUs
Other	_____	_____

SCS Modification Summary	***Approved Project***	***Proposed Modification***
Linear Feet	_____	_____
Pipe Diameter	_____	_____
Other	_____	_____

AST Modification Summary	***Approved Project***	***Proposed Modification***
Number of ASTs	_____	_____
Volume of ASTs	_____	_____
Other	_____	_____

UST Modification Summary	***Approved Project***	***Proposed Modification***
Number of USTs	_____	_____
Volume of USTs	_____	_____
Other	_____	_____

5. ☒ **Attachment B: Narrative of Proposed Modification**. A detailed narrative description of the nature of the proposed modification is attached. It discusses what was approved, including any previous modifications, and how this proposed modification will change the approved plan.

6. ☒ **Attachment C: Current Site Plan of the Approved Project**. A current site plan showing the existing site development (i.e., current site layout) at the time this application for modification is attached. A site plan detailing the changes proposed in the submitted modification is required elsewhere.
   - ☒ The approved construction has not commenced. The original approval letter and any subsequent modification approval letters are included as Attachment A to document that the approval has not expired.
   - ☐ The approved construction has commenced and has been completed. Attachment C illustrates that the site was constructed as approved.
   - ☐ The approved construction has commenced and has been completed. Attachment C illustrates that the site was **not** constructed as approved.
   - ☐ The approved construction has commenced and has **not** been completed. Attachment C illustrates that, thus far, the site was constructed as approved.
   - ☐ The approved construction has commenced and has **not** been completed. Attachment C illustrates that, thus far, the site was **not** constructed as approved.

7. ☐ The acreage of the approved plan has increased. A Geologic Assessment has been provided for the new acreage.
   ☒ Acreage has not been added to or removed from the approved plan.

8. ☒ 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.

Jon Niermann, *Chairman*
Bobby Janecka, *Commissioner*
Catarina R. Gonzales, *Commissioner*
Kelly Keel, *Executive Director*

TEXAS COMMISSION ON ENVIRONMENTAL QUALITY

Protecting Texas by Reducing and Preventing Pollution

December 13, 2024

Mr. Kyle Russell, P.E.
Georgetown Area Office
Texas Department of Transportation
2727 South Austin Avenue
Georgetown, Texas 78626

Re: Approval of a Modification of an approved Water Pollution Abatement Plan (WPAP-MOD)
US 183A Avery Ranch Blvd to E Whitestone Blvd; Cedar Park and Austin, Williamson County
Edwards Aquifer Protection Program ID: 11004130, RN104348743

Dear Mr. Russell:

The Texas Commission on Environmental Quality (TCEQ) has completed its review on the application for the above-referenced project submitted to the Edwards Aquifer Protection Program (EAPP) by Halff Associates, Inc. on behalf of the applicant, Texas Department of Transportation (TxDOT), on August 26, 2024. Final review of the application was completed after additional materials were received on October 29 and December 2, 2024.

As presented to the TCEQ, the application was prepared in general compliance with the requirements of 30 Texas Administrative Codes (TAC) Chapter §213. The permanent best management practices (BMPs) and measures represented in the application were prepared by a Texas licensed professional engineer (PE). All construction plans and design information were sealed, signed, and dated by a Texas licensed PE. Therefore, the application for the construction of the proposed project and methods to protect the Edwards Aquifer are **approved,** subject to applicable state rules and the conditions in this letter.

This approval expires two years from the date of this letter, unless, prior to the expiration date, more than 10 percent of the construction has commenced on the project or an extension of time has been officially requested. This approval or extension will expire, and no extension will be granted if more than 50 percent of the project has not been completed within ten years from the date of this letter.

The applicant or a person affected may file with the chief clerk a motion for reconsideration of the executive director's final action on this Edwards Aquifer protection plan. A motion for reconsideration must be filed in accordance with 30 TAC §50.139.

BACKGROUND

The project is a modification and final supersession of prior plan approval EAPP ID 11-04071601 “US 183A” and involves the southernmost section of the corridor.

Additionally, EAPP ID 11-04071601B “US 183A” which created Longhorn Pond and its storage volume, is being superseded by this modification. Where any sheets overlap, this plan set replaces prior plan sets.

Previous superseding plans within the original corridor which remain in effect include:

EAPP ID 11002291 "US 183A Phase III, Hero Way to CR 258", the northernmost section,
EAPP ID 11-04071601D "US 183A, CR 274 (San Gabriel Pkwy) S TO FM 1431", the middle section.

The following adjacent plan also remains in effect:

EAPP ID 11-99111201A "Foxworth Galbraith Lumber Yard" contains impervious cover which drains to Foxworth basin and Longhorn basin detention area herein.

PROJECT DESCRIPTION

The proposed roadway modifications are to occur within 180.2 acres of project area (out of the original 530.4 acres for the whole plan in 2004) and will extend south from RM 1431 to Avery Ranch Boulevard. The CTRMA previously constructed the main lanes, but not the frontage roads for this section of roadway. In addition, certain best management practices (BMPs) will be upgraded or altered. The impervious cover in this section will be increased from approximately 84.0 acres to 110.7 acres (61.4%) within the right-of-way (ROW).

The project is within the Recharge Zone (RZ) and Contributing Zone (CZ) and approves:

- Modifying approximately 2.8 miles of US 183A frontage roads and access ramps to serve the existing toll lanes, and necessary drainage improvements,
- Constructing bridges over Spanish Oak Creek, and Brushy Creek Road for directional traffic, and routing the stormwater via curb and gutter storm controls into water quality ponds,
- Improving the intersections and turn lanes at Avery Ranch Boulevard, Brushy Creek Road, Brushy Creek Loop, and E. Whitestone Boulevard,
- Adjusting permanent BMPs, including vegetated filter strips (VFS), and grassy swales (GS), and redirecting runoff to existing detention facilities,
- Adding retaining walls and removing the existing toll facility,
- Assigning staging areas and re-stabilizing the ROW after construction.

In addition to the described activities, temporary erosion and sedimentation controls will be installed prior to commencing site disturbance and maintained during construction. No wastewater will be generated by this roadway project.

PERMANENT POLLUTION ABATEMENT MEASURES

The proposed WPAP utilizes the existing sand filter systems (SFS), and extended detention basin (ED) with no modifications, while also adding inline storm treatment units (STU Jellyfish filters, JF) and constructing new VFS and GS and using existing VFS and GS when able. The proposed areas of the site that drain to specific BMPs are shown on the layouts.

To prevent pollution of stormwater runoff originating on-site or up-gradient of the site and potentially flowing across and off the site after construction, a combination of STUs, VFS, GS, four partial sedimentation filtration SFS, and one ED, designed using the TCEQ technical guidance, *RG-348, Complying with the Edwards Aquifer Rules: Technical Guidance on Best Management Practices,* will be implemented, modified, or installed to treat additional stormwater runoff. Existing VFS will be removed and replaced with the BMPs as described in the approved plan set for this project. Existing culverts will cross under US 183A and continue to carry and divert off-site runoff around the proposed BMPs.

The required total suspended solids (TSS) treatment for this project is 95,455 pounds of TSS generated from the net increase of 26.7 acres of IC, and existing IC, including basin adjustments. The approved permanent BMPs and measures meet the required 80 percent removal of the increased load in TSS caused by the project. Treatment design calculations were sealed by Clint Smith, P.E., on November 26, 2024.

An updated summary of the load removals by basins and other BMPs are included here in the following table*:

Watershed	Name of BMPs	Type of BMP	Basin Nos.	TSS req. removal (lbs.)	TSS reduction (lbs.)
Spanish Oak Creek	Warrior Pond / VFS, STU	ED	A & B	11071	10345
Spanish Oak Tributary 1	Lobo Pond / STUs, VFS, GS	SFS	C & D	22376	22963
Brushy Creek Tributary 1	STUs, GS		E	6379	7154
Cluck Creek	Elbow Pond / STUs	SFS	F & G	18755	24684
Brushy Creek	Longhorn Pond / STUs	SFS	H & I	29580	29549
Brushy Creek	Aggie Pond / STUs	SFS	J & K	7294	8382
	POND and BMP Summary	**TOTALS**		**95,455**	**103,075**

*reference Removal Table November 26, 2024

The permanent BMPs shall be operational prior to the use of the proposed project lanes. Inspection, maintenance, repair, and retrofit of the permanent BMPs shall be in accordance with the approved application. Maintenance will be performed by CTRMA for existing SFS and ED basins and TxDOT for newly installed STUs, VFS, and GS.

GEOLOGY

According to the Geologic Assessment (GA) included with the application, the surficial units of the site are the Edwards (Ked) and Comanche Peak (Kc) Limestone Formations. The site has been previously disturbed by construction of prior lane and drainage improvements and consists of pavement, non-native soil, and regrading within the existing ROW. The site assessment conducted on September 16, 2024, by TCEQ staff determined the site to be generally as described by the GA.

SPECIAL CONDITIONS

I. Since this is a roadway construction project, deed recordation of this approval letter is not required.

II. All construction activities, including staging, stockpiling, parking lots, and traffic shall be conducted inside the established ROW, and outside the 100-year floodplain, except in the case where proper BMPs are being installed or maintained.

STANDARD CONDITIONS

1. The plan holder (applicant) must comply with all provisions of 30 TAC Chapter §213 and all technical specifications in the approved plan. The plan holder should also acquire and comply with additional and separate approvals, permits, registrations or authorizations from other TCEQ Programs (i.e., Stormwater, Water Rights, Dam Safety, Underground Injection Control) as required based on the specifics of the plan.

2. In addition to the rules of the Commission, the plan holder must also comply with state and local ordinances and regulations providing for the protection of water quality as applicable.

Prior to Commencement of Construction:

3. The plan holder of any approved Edwards Aquifer protection plan must notify the EAPP and obtain approval from the executive director prior to initiating any modification to the activities described in the referenced application following the date of the approval.

4. The plan holder must provide written notification of intent to commence construction, replacement, or rehabilitation of the referenced project. Notification must be submitted to the EAPP no later than 48 hours prior to commencement of the regulated activity. Notification must include the date on which the regulated activity will commence, the name of the approved plan and program ID number for the regulated activity, and the name of the prime contractor with the name and telephone number of the contact person.

5. Temporary erosion and sedimentation (E&S) controls as described in the referenced application, must be installed prior to construction, and maintained during construction. Temporary E&S controls may be removed when vegetation is established, and the construction area is stabilized. The TCEQ may monitor stormwater discharges from the site to evaluate the adequacy of temporary E&S control measures. Additional controls may be necessary if excessive solids are being discharged from the site.

6. All borings with depths greater than or equal to 20 feet must be plugged with non-shrink grout from the bottom of the hole to within three (3) feet of the surface. The remainder of the hole must be backfilled with cuttings from the boring or gravel. All borings less than 20 feet must be backfilled with cuttings from the boring. All borings must be backfilled or plugged within four (4) days of completion of the drilling operation.

During Construction:

7. This approval does not authorize the installation of temporary or permanent aboveground storage tanks on this project that will have a total storage capacity of five hundred gallons or more of static hydrocarbons or hazardous substances without prior approval of an Aboveground Storage Tank facility application.

8. If any sensitive feature is encountered during construction, replacement, or rehabilitation on this project, all regulated activities must be **immediately** suspended near it and notification must be made to TCEQ EAPP staff. Temporary BMPs must be installed and maintained to protect the feature from pollution and contamination. Regulated activities near the feature may not proceed until the executive director has reviewed and approved the methods proposed to protect the feature and the aquifer from potentially adverse impacts to water quality.

9. All water wells, including injection, dewatering, and monitoring wells shall be identified in the geologic assessment and must be in compliance with the requirements of the Texas Department of Licensing and Regulation 16 TAC Chapter §76 and all other locally applicable rules, as appropriate.

10. If sediment escapes the construction site, the 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). Sediment must be removed from sediment traps or sedimentation ponds not later than when design capacity has been reduced by 50 percent. Litter, construction debris, and construction chemicals shall be prevented from becoming stormwater discharge pollutants.

11. Intentional discharges of sediment laden water are not allowed. If dewatering becomes necessary, the discharge must be filtered through appropriately selected BMPs and as necessary, the included dewatering plan shall be followed.

12. The following records shall be maintained and made available to the executive director 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.

13. Stabilization measures shall be initiated as soon as practicable in portions of the site where construction activities have temporarily or permanently ceased, and construction activities will not resume within 21 days. When the initiation of stabilization measures by the 14th day is precluded by weather conditions, stabilization measures shall be initiated as soon as practicable.

<u>After Completion of Construction:</u>

14. Owners of permanent BMPs and temporary measures must ensure that the BMPs and measures are constructed and function as designed. A Texas licensed PE must certify in writing that the **permanent** BMPs or measures were constructed as designed. The certification letter must be submitted to the EAPP within 30 days of site completion.

15. The applicant shall be responsible for maintaining the permanent BMPs after construction until such time as the maintenance obligation is either assumed in writing by another entity having ownership or control of the property or the ownership of the property is transferred to the entity. A copy of the transfer of responsibility must be filed with the executive director through the EAPP within 30 days of the transfer.

The holder of the approved Edwards Aquifer protection plan is responsible for compliance with Chapter §213 and any condition of the approved plan through all phases of plan implementation. Failure to comply with any condition within this approval letter is a violation of Chapter §213 and is subject to administrative rule or orders and penalties as provided under §213.10 of this title (relating to Enforcement). Such violations may also be subject to civil penalties and injunction. Upon legal transfer of this property, the new owner is required to comply with all terms of the approved Edwards Aquifer protection plan.

This action is taken as delegated by the executive director of the Texas Commission on Environmental Quality. If you have any questions or require additional information, please contact Mr. Kevin Lee Smith, P.E. of the Edwards Aquifer Protection Program of the Austin Regional Office at 512-339-2929.

Sincerely,

Monica Reyes

Monica Reyes, Section Manager
Edwards Aquifer Protection Program
Texas Commission on Environmental Quality

MMR/kls

Cc: Clint Smith, P.E., Halff Associates, Inc.

Attachment B: Narrative of Proposed Modification

US Highway 183A currently does not have frontage roads along the entirety from Avery Ranch Boulevard to Ranch to Market Road 1431 (RM 1431), approximately 2.8 miles along the centerline of US 183A. The portion of this project that is south of Brushy Creek is within the Edwards Aquifer Recharge Zone, so the entire project will be treated as per the Recharge Zone rules.

To achieve the 80% treatment requirement for the Edwards Aquifer Protection Program, the existing Water Pollution Abatement Plan (WPAP) (No. 04071601) is to be modified to accommodate for the increase in impervious cover and modifications/removal of existing best management practices (BMPs) (namely vegetated filter strips and grassy swales). The existing extended detention pond (Warrior) and sand filters (Lobo, Elbow, Aggie and Longhorn) are not being modified, however the loading and removal rate is being changed as part of this WPAP modification.

This proposed WPAP modifies a portion of the existing WPAP. The existing WPAP has been modified in other sections with WPAP Nos. 11-04071601B and 11-040701601D. WPAP No. 11-04071601B is modified only in amount of loading that Longhorn pond will remove. This WPAP will cover 180.2acres of the original 530.42 acres of the WPAP. The impervious cover from the existing WPAP will go from 84.03 acres to 110.72 acres (this is just within the portion of the project site that is being modified). This site will go from 51.2% impervious cover to 61.4% impervious cover due to the increase in impervious cover in this portion of the site (not the entire original WPAP site).

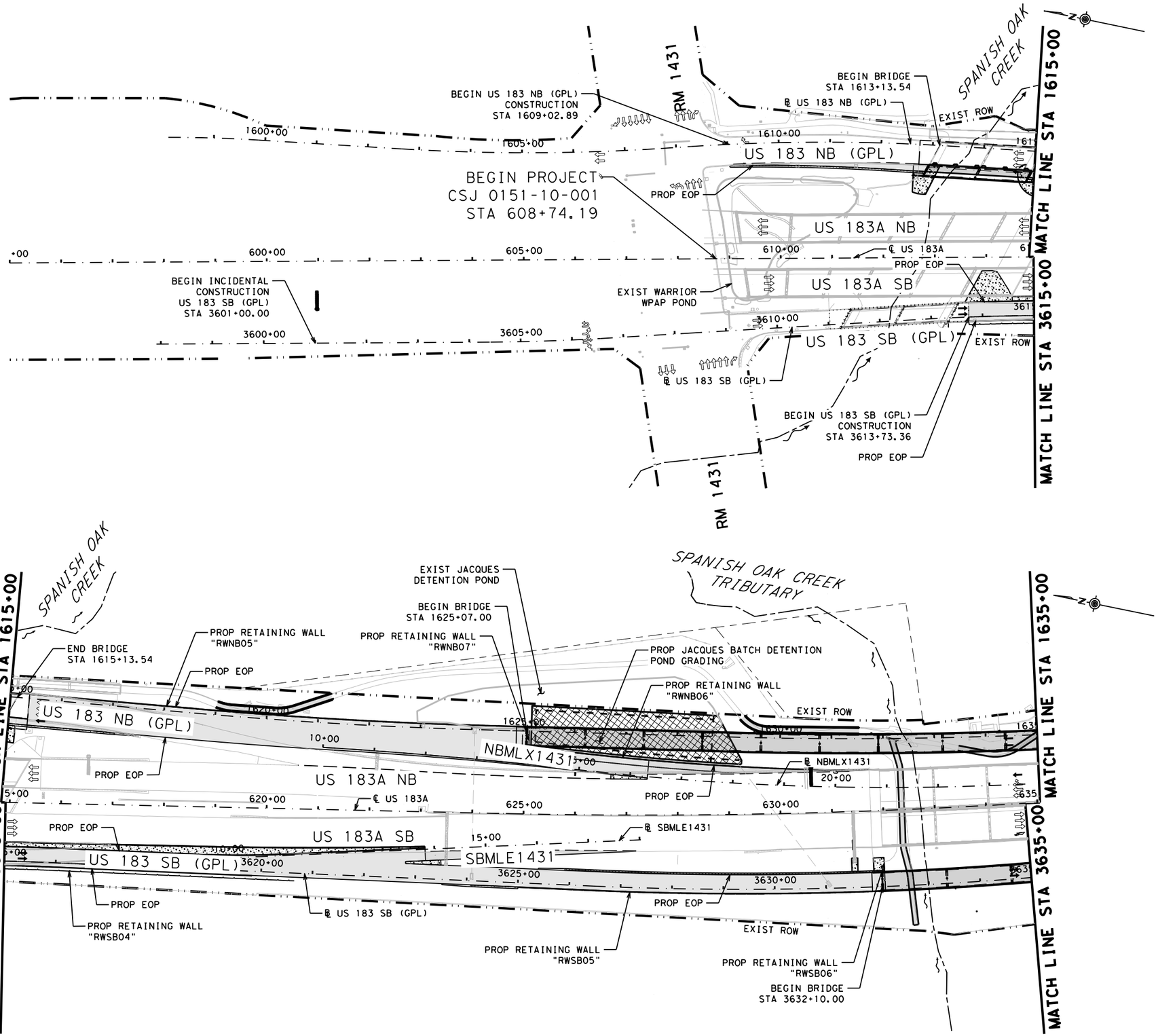
The existing WPAP has the following permanent BMPS:

- Sand Filters (Lobo, Elbow, Longhorn, and Aggie)
- Extended Detention (Warrior)
- Vegetated Filter Strips (VFS)
- Grassy Swales (GS)
- Combination Vegetated Filter Strips/Grassy Swales (VFS/GS)
- Jellyfish Stormwater Units (STUs)

For this modification, the sizing of Jellyfish Storm Units has been revised based on drainage areas and amount of impervious cover draining to each unit. The original calculations utilized full impervious cover and full drainage areas to the Jellyfish Units. There have been no previous modifications to the design.

After refinement of sizing based on the impervious cover and drrather than sizing based on a full impervious cover per unit, the sizes of the Jellyfish units was reduced to be sized appropriately for the drainage areas.

The only alterations this causes is the sizing of the Jellyfish Units themselves as the total removals were based on actual impervious cover amounts rather than a worst case scenario, which is shown on **Pages 208-240**.



DESIGN

STATE OF TEXAS · MARISSA GUZMAN · 130772 · LICENSED PROFESSIONAL ENGINEER

MARISSA GUZMAN, P.E.

11/8/2023

DATE

APPROVAL

STATE OF TEXAS · DAN THOMA · 98622 · LICENSED PROFESSIONAL ENGINEER

DAN THOMA, P.E.

11/8/2023

DATE

0 100 200 300

SCALE: 1" = 200'

PAPE-DAWSON ENGINEERS

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2000 NW LOOP 410 | SAN ANTONIO, TX 78213 | 210.375.9000

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PROJECT LAYOUT

SHEET 1 OF 5

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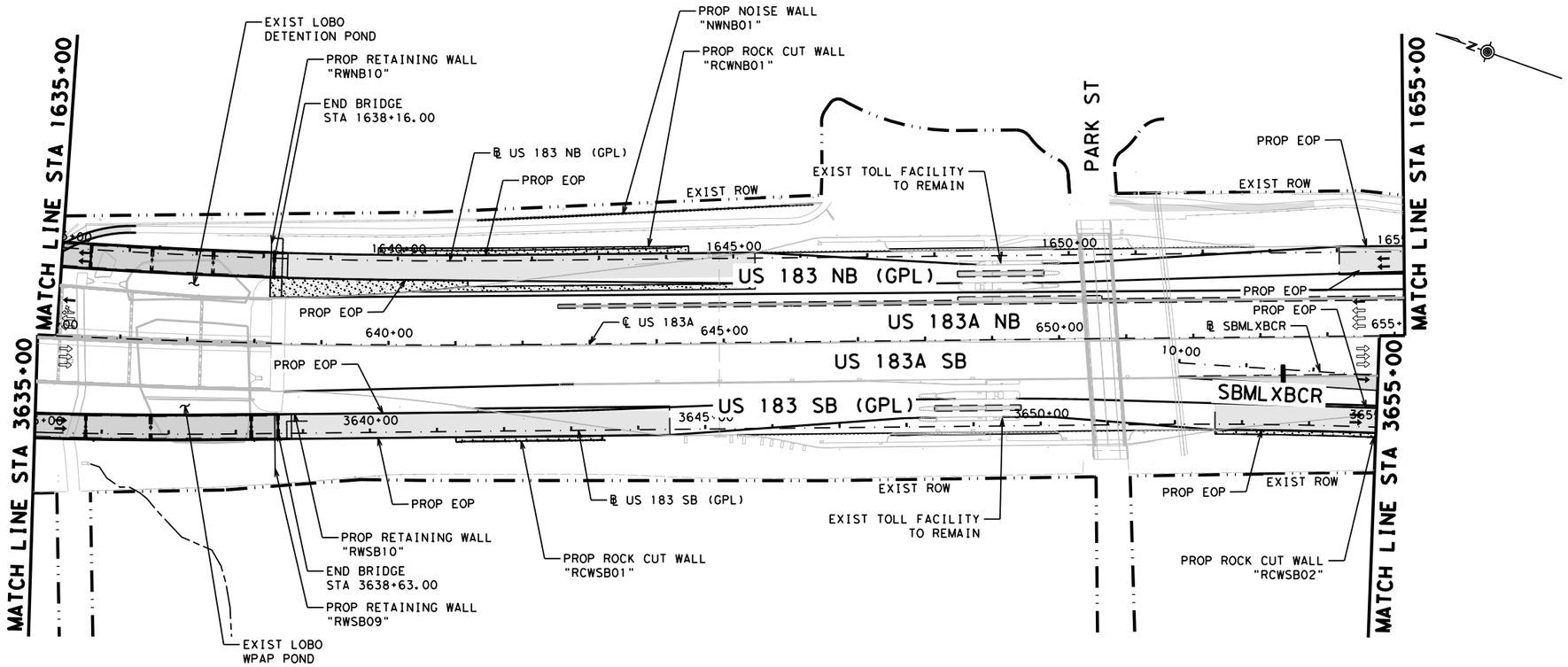

LEGEND

- EXIST EASEMENTS
- PROPOSED PAVEMENT/BRIDGE
- PROPOSED RIPRAP
- PROPOSED POND GRADING

DESIGN

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MARISSA GUZMAN, P.E.
3/4/2024
DATE

APPROVAL

STATE OF TEXAS · DAN THOMA · 98622 · LICENSED PROFESSIONAL ENGINEER

DAN THOMA, P.E.
3/4/2024
DATE

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SHEET 2 OF 5

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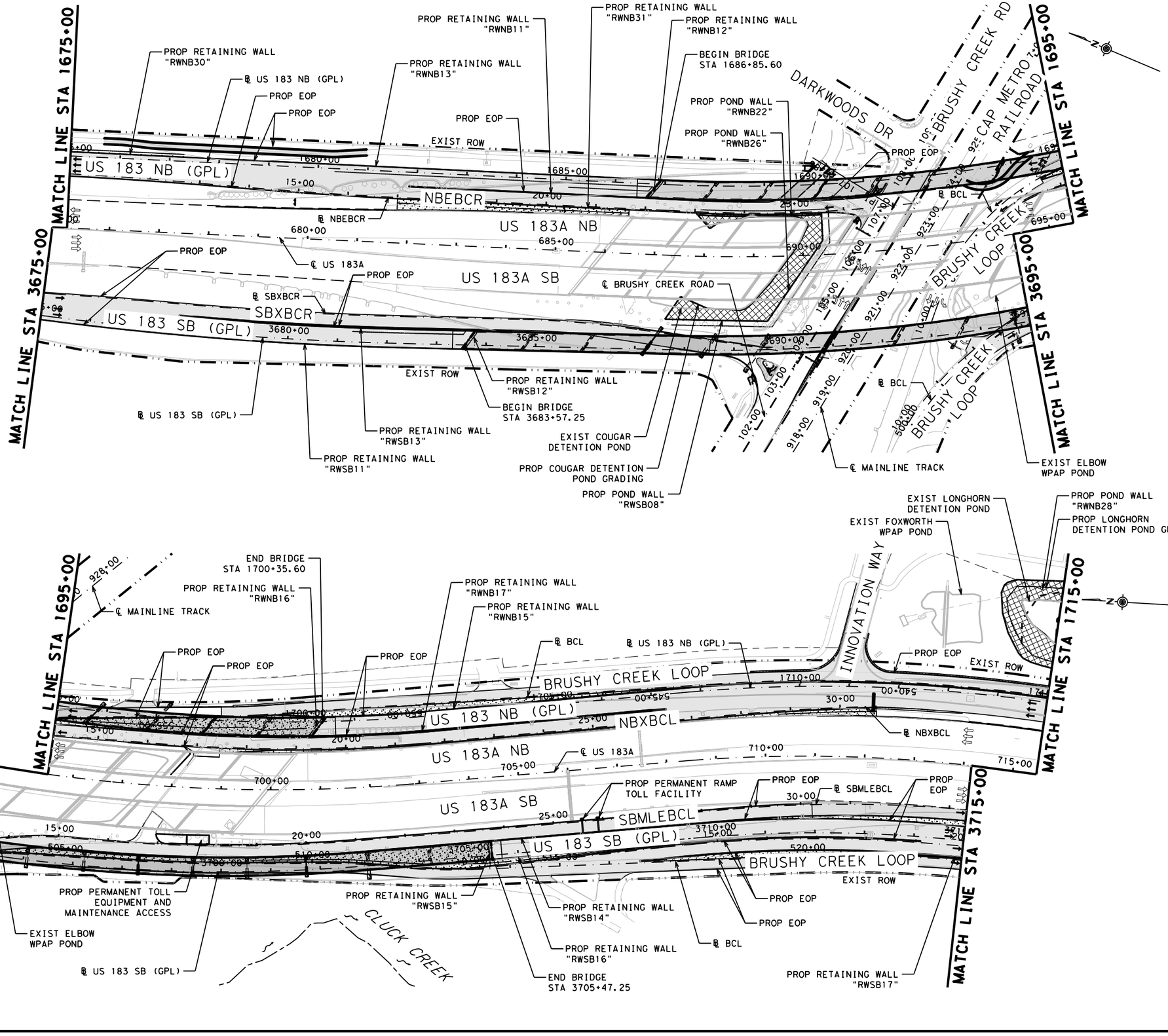

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MARISSA GUZMAN, P.E.
11/8/2023
DATE

APPROVAL

DAN THOMA, P.E.
11/8/2023
DATE

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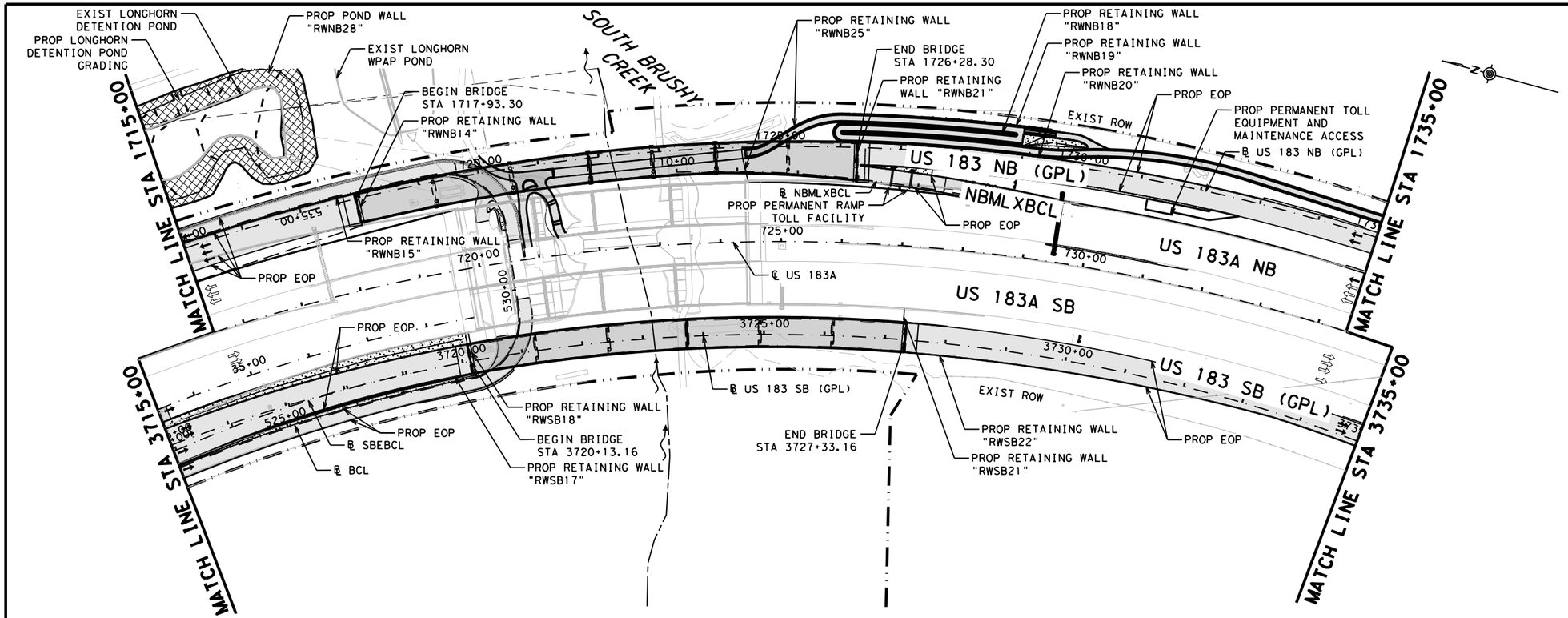

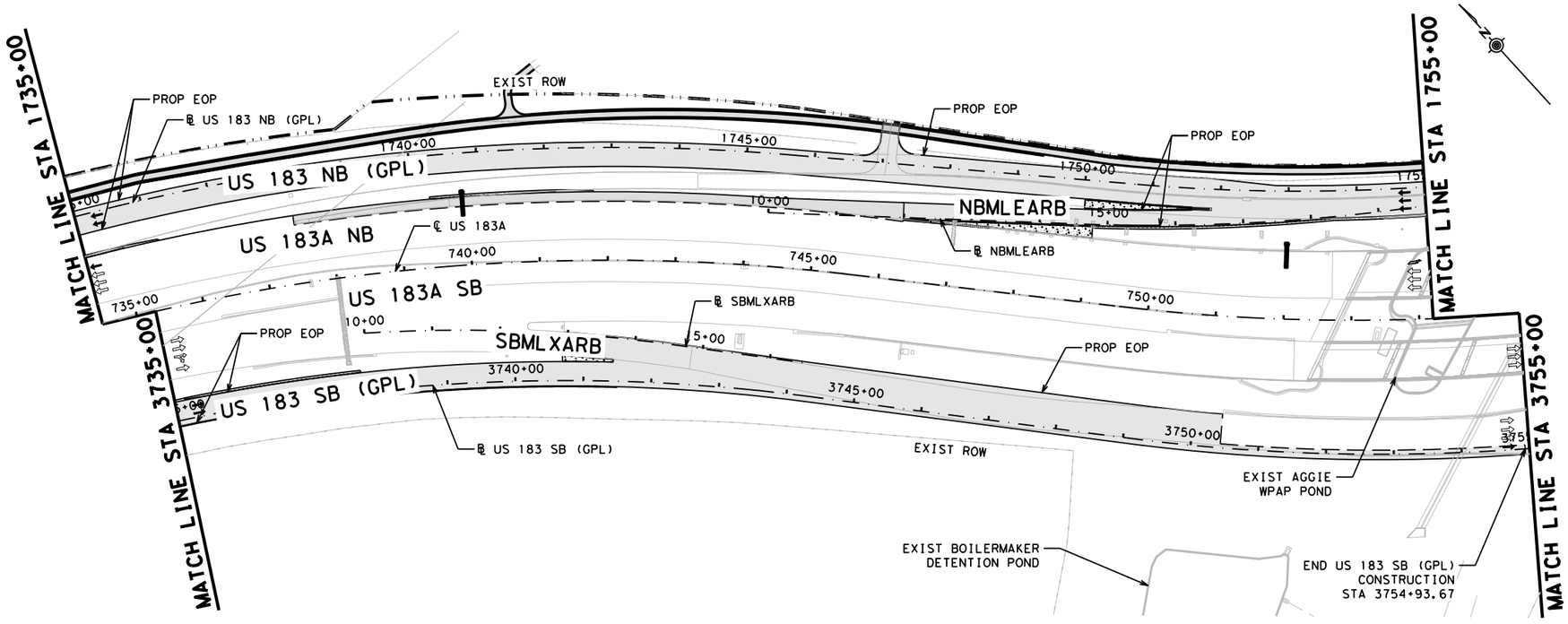

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MARISSA GUZMAN, P.E.
7/16/2024
DATE

APPROVAL

DAN THOMA, P.E.
7/16/2024
DATE

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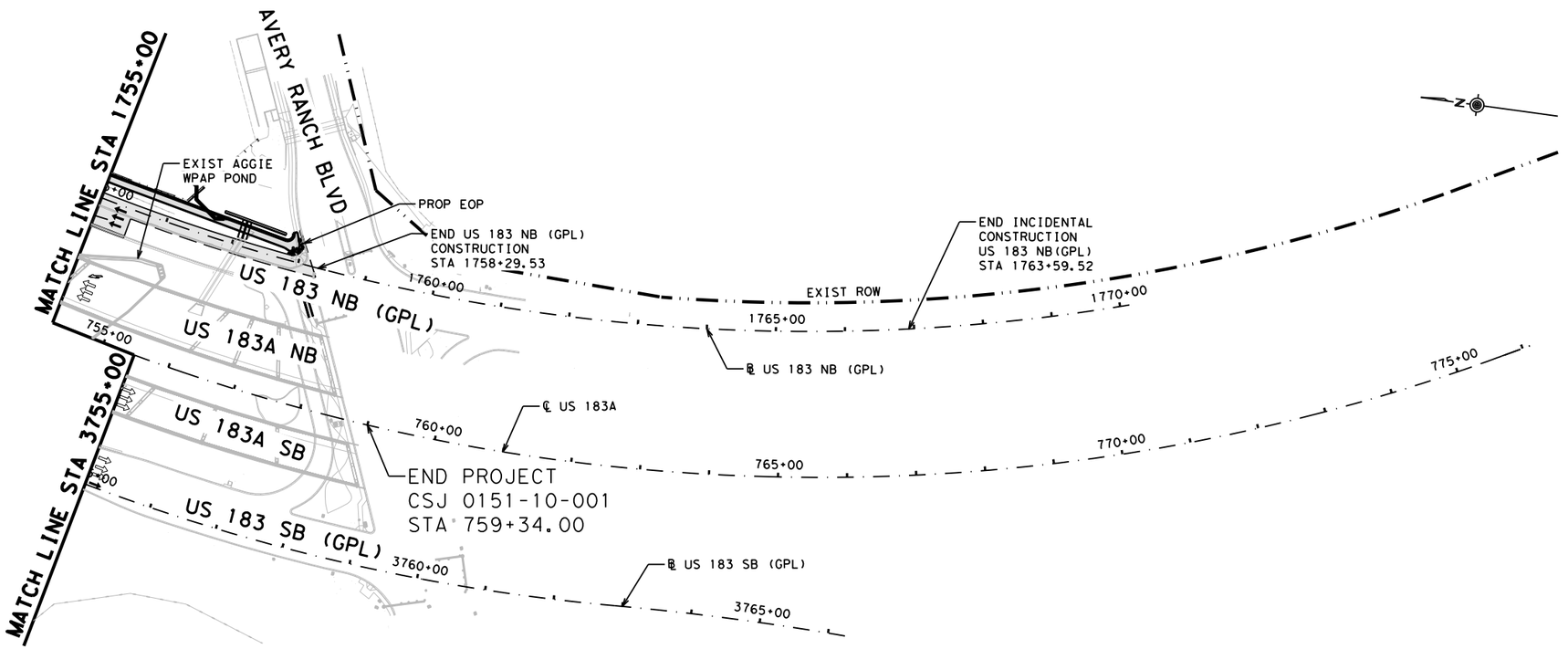

LEGEND

- EXIST EASEMENTS
- PROPOSED PAVEMENT/BRIDGE
- PROPOSED RIPRAP
- PROPOSED POND GRADING

DESIGN

STATE OF TEXAS · MARISSA GUZMAN · 130772 · LICENSED PROFESSIONAL ENGINEER

MARISSA GUZMAN, P.E.

11/8/2023
DATE

APPROVAL

STATE OF TEXAS · DAN THOMA · 98622 · LICENSED PROFESSIONAL ENGINEER

DAN THOMA, P.E.

11/8/2023
DATE

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SCALE: 1"= 200'

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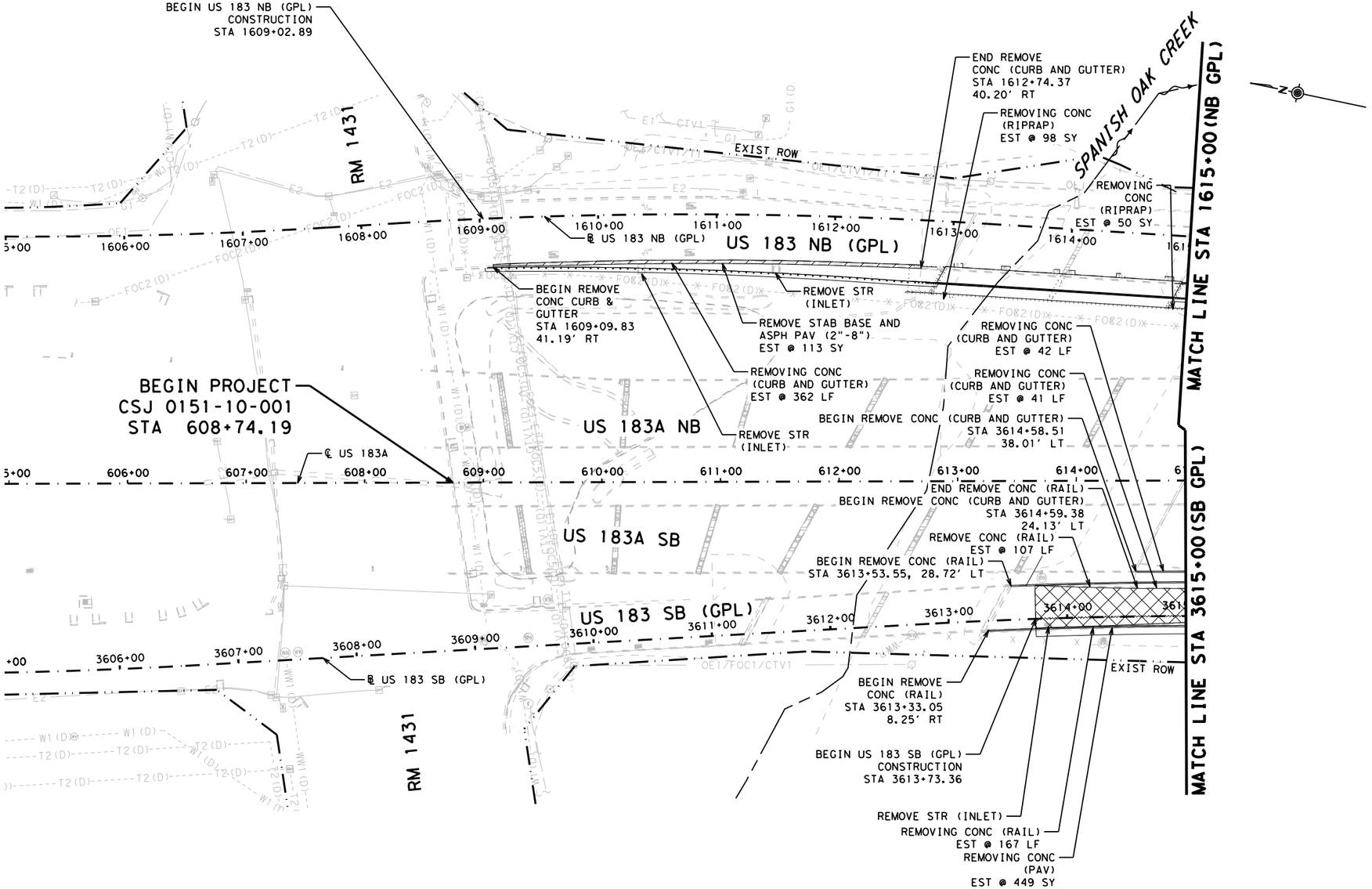

LEGEND

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- W 12" EXISTING UTILITY
- EXISTING FEATURES
- CONCRETE PAVEMENT REMOVAL
- ASPHALT PAVEMENT REMOVAL
- CONCRETE SIDEWALK REMOVAL
- CUT AND RESTORE

NOTES

1. SEE SW3P FOR TREE PROTECTION. ALL TREES WITHIN ROW NOT PROTECTED ARE IN CONFLICT WITH PROPOSED CONSTRUCTION AND WILL BE REMOVED SUBSIDIARY TO PREP ROW.

DESIGN

STATE OF TEXAS — MARISSA GUZMAN — 130772 — LICENSED PROFESSIONAL ENGINEER

MARISSA GUZMAN, P.E.

2/28/2024
DATE

APPROVAL

STATE OF TEXAS — DAN THOMA — 98622 — LICENSED PROFESSIONAL ENGINEER

DAN THOMA, P.E.

2/28/2024
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SHEET 1 OF 16

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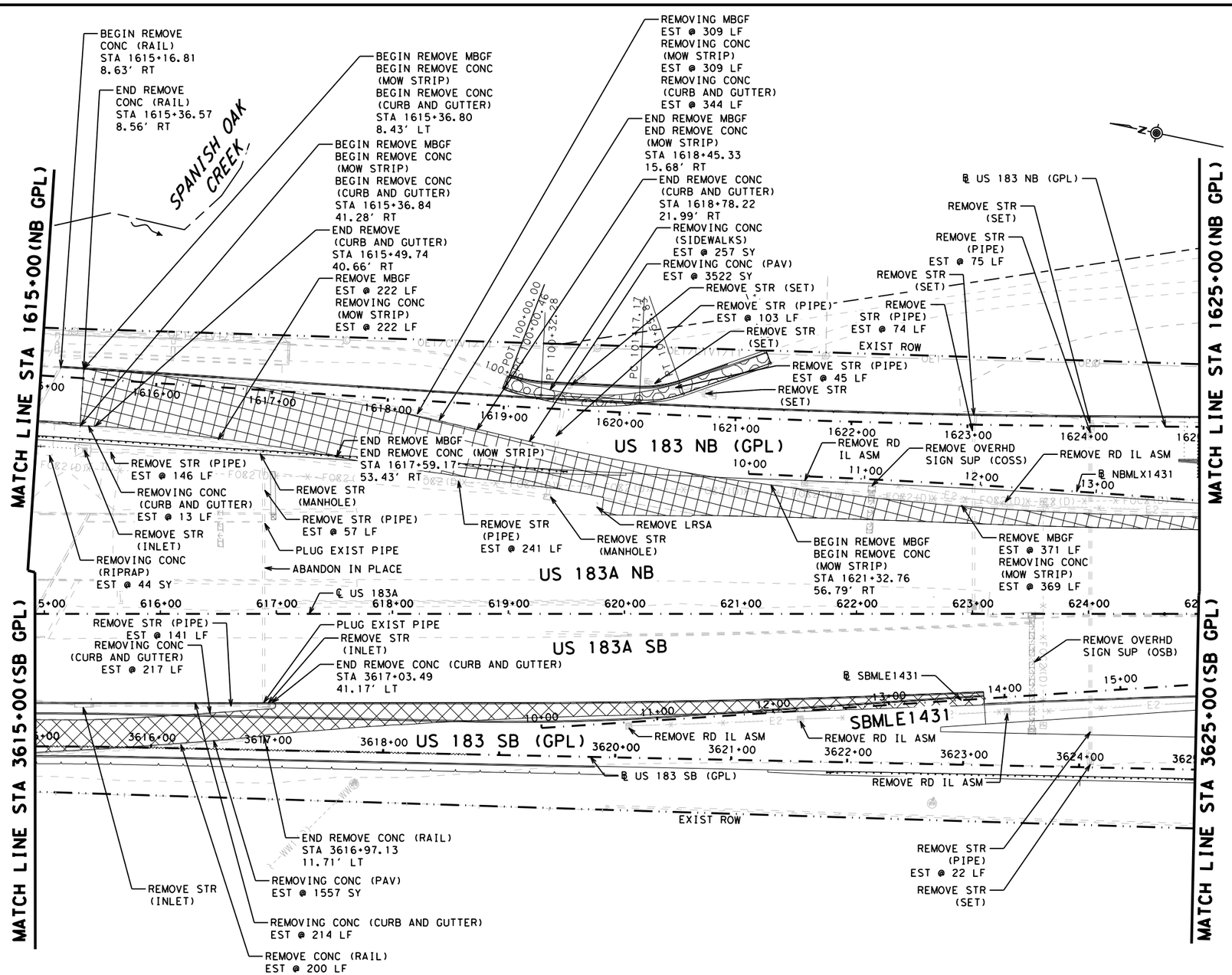

LEGEND

- R.O.W
- PROPERTY EASEMENT
- W 12" EXISTING UTILITY
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DESIGN

STATE OF TEXAS · MARISSA GUZMAN · 130772 · LICENSED PROFESSIONAL ENGINEER

MARISSA GUZMAN, P.E.
4/24/2024
DATE

APPROVAL

STATE OF TEXAS · DAN THOMA · 98622 · LICENSED PROFESSIONAL ENGINEER

DAN THOMA, P.E.
4/24/2024
DATE

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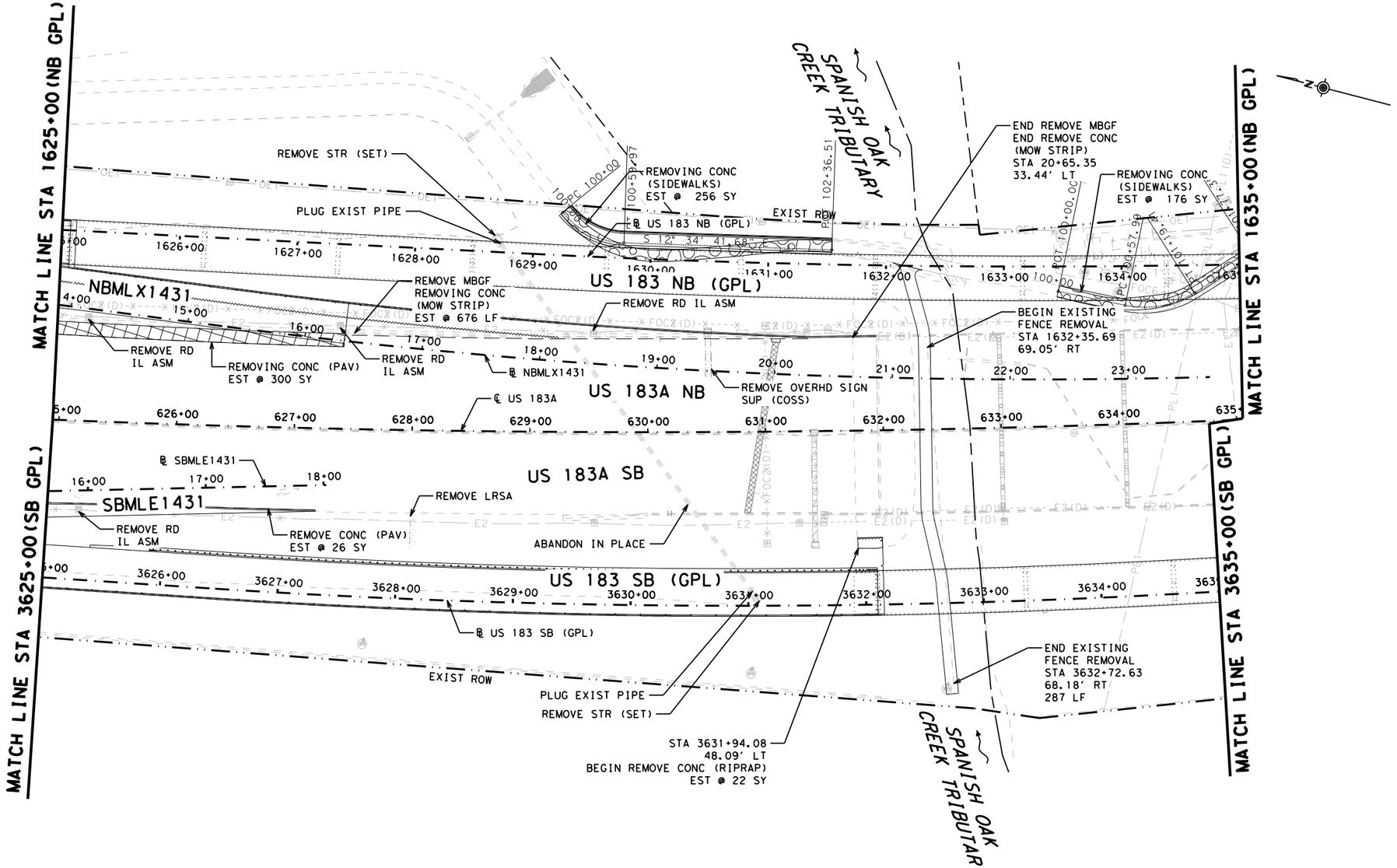

LEGEND

- R.O.W
- PROPERTY EASEMENT
- W 12" EXISTING UTILITY
- EXISTING FEATURES
- CONCRETE PAVEMENT REMOVAL
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NOTES

1. SEE SW3P FOR TREE PROTECTION. ALL TREES WITHIN ROW NOT PROTECTED ARE IN CONFLICT WITH PROPOSED CONSTRUCTION AND WILL BE REMOVED SUBSIDIARY TO PREP ROW.

DESIGN

MARISSA GUZMAN 130772 LICENSED PROFESSIONAL ENGINEER STATE OF TEXAS

MARISSA GUZMAN, P.E.

4/24/2024

DATE

APPROVAL

DAN THOMA 98622 LICENSED PROFESSIONAL ENGINEER STATE OF TEXAS

DAN THOMA, P.E.

4/24/2024

DATE

0 50 100 150

SCALE: 1"= 100'

PAPE-DAWSON ENGINEERS

SAN ANTONIO | AUSTIN | HOUSTON | FORT WORTH | DALLAS

2000 NW LOOP 410 | SAN ANTONIO, TX 78213 | 210.375.9000

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US 183 GPL

REMOVAL PLAN

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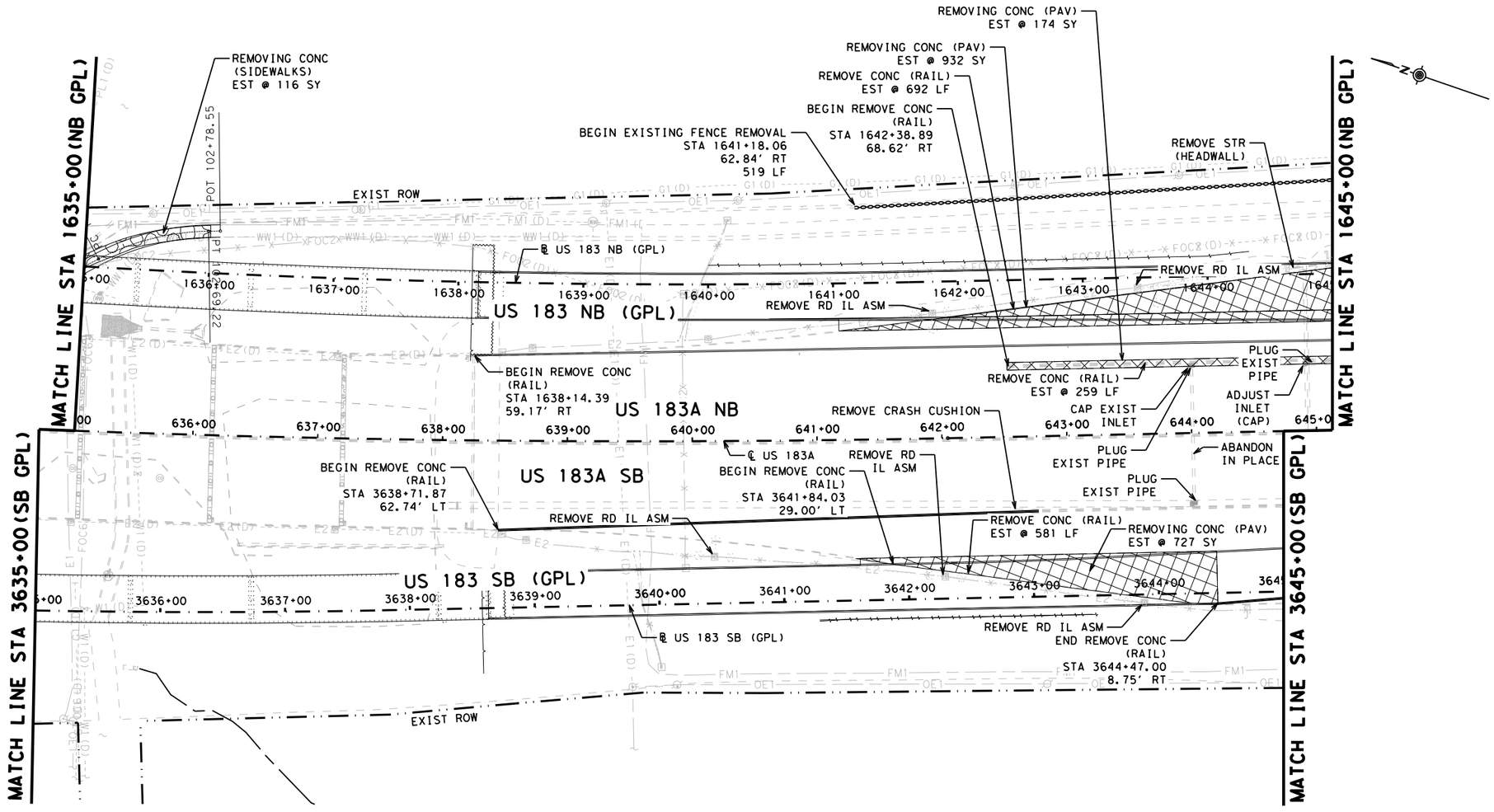

LEGEND

- R.O.W
- PROPERTY EASEMENT
- W 12" EXISTING UTILITY
- EXISTING FEATURES
- CONCRETE PAVEMENT REMOVAL
- ASPHALT PAVEMENT REMOVAL
- CONCRETE SIDEWALK REMOVAL
- CUT AND RESTORE

NOTES

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DESIGN

STATE OF TEXAS · MARISSA GUZMAN · 130772 · LICENSED PROFESSIONAL ENGINEER

MARISSA GUZMAN, P.E.

11/8/2023
DATE

APPROVAL

STATE OF TEXAS · DAN THOMA · 98622 · LICENSED PROFESSIONAL ENGINEER

DAN THOMA, P.E.

11/8/2023
DATE

0 50 100 150

SCALE: 1"= 100'

PAPE-DAWSON ENGINEERS
SAN ANTONIO | AUSTIN | HOUSTON | FORT WORTH | DALLAS
2000 NW LOOP 410 | SAN ANTONIO, TX 78213 | 210.375.9000
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US 183 GPL

REMOVAL PLAN

© 2023	CONT	SECT	JOB	HIGHWAY
DS: CK:	0151	10	001	US 183
DW: CK:	DIST	COUNTY		SHEET NO.
	AUS	WILLIAMSON		344

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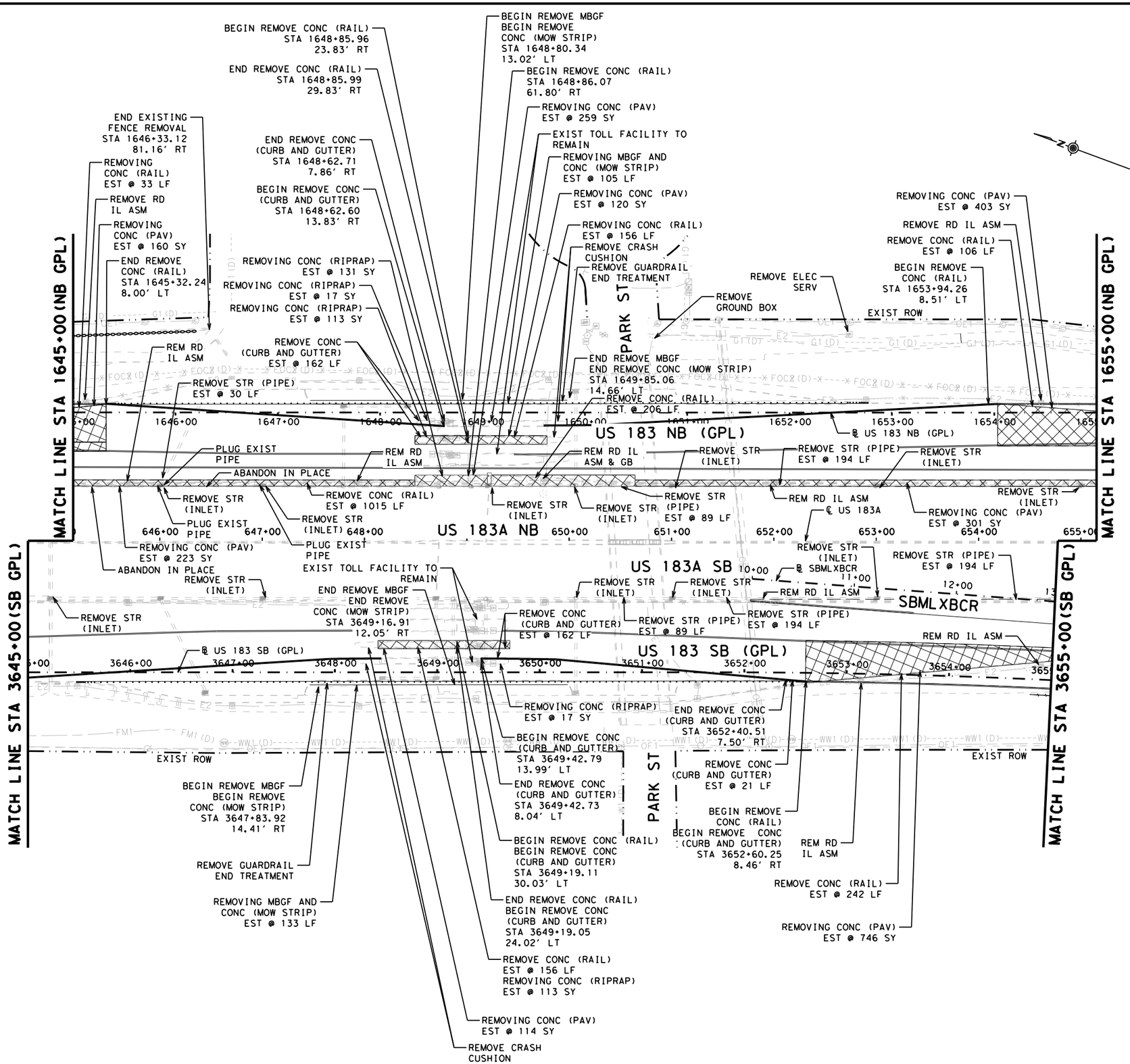

LEGEND

- R.O.W
- PROPERTY EASEMENT
- W 12" EXISTING UTILITY
- EXISTING FEATURES
- CONCRETE PAVEMENT REMOVAL
- ASPHALT PAVEMENT REMOVAL
- CONCRETE SIDEWALK REMOVAL
- CUT AND RESTORE

NOTES

1. SEE SW3P FOR TREE PROTECTION. ALL TREES WITHIN ROW NOT PROTECTED ARE IN CONFLICT WITH PROPOSED CONSTRUCTION AND WILL BE REMOVED SUBSIDIARY TO PREP ROW.

DESIGN

STATE OF TEXAS — MARISSA GUZMAN — 130772 — LICENSED PROFESSIONAL ENGINEER

MARISSA GUZMAN, P.E.
3/5/2024
DATE

APPROVAL

STATE OF TEXAS — DAN THOMA — 98622 — LICENSED PROFESSIONAL ENGINEER

DAN THOMA, P.E.
3/5/2024
DATE

0 50 100 150
SCALE: 1"= 100'

PAPE-DAWSON ENGINEERS
SAN ANTONIO | AUSTIN | HOUSTON | FORT WORTH | DALLAS
2000 NW LOOP 410 | SAN ANTONIO, TX 78213 | 210.375.9000
TEXAS ENGINEERING FIRM #470 | TEXAS SURVEYING FIRM #10028800

2024
Texas Department of Transportation

US 183 GPL

REMOVAL PLAN

SHEET 5 OF 16

© 2024		CONT	SECT	JOB	HIGHWAY
DS:	CK:	0151	10	001	US 183
		DIST	COUNTY		SHEET NO.
DW:	CK:	AUS	WILLIAMSON		345

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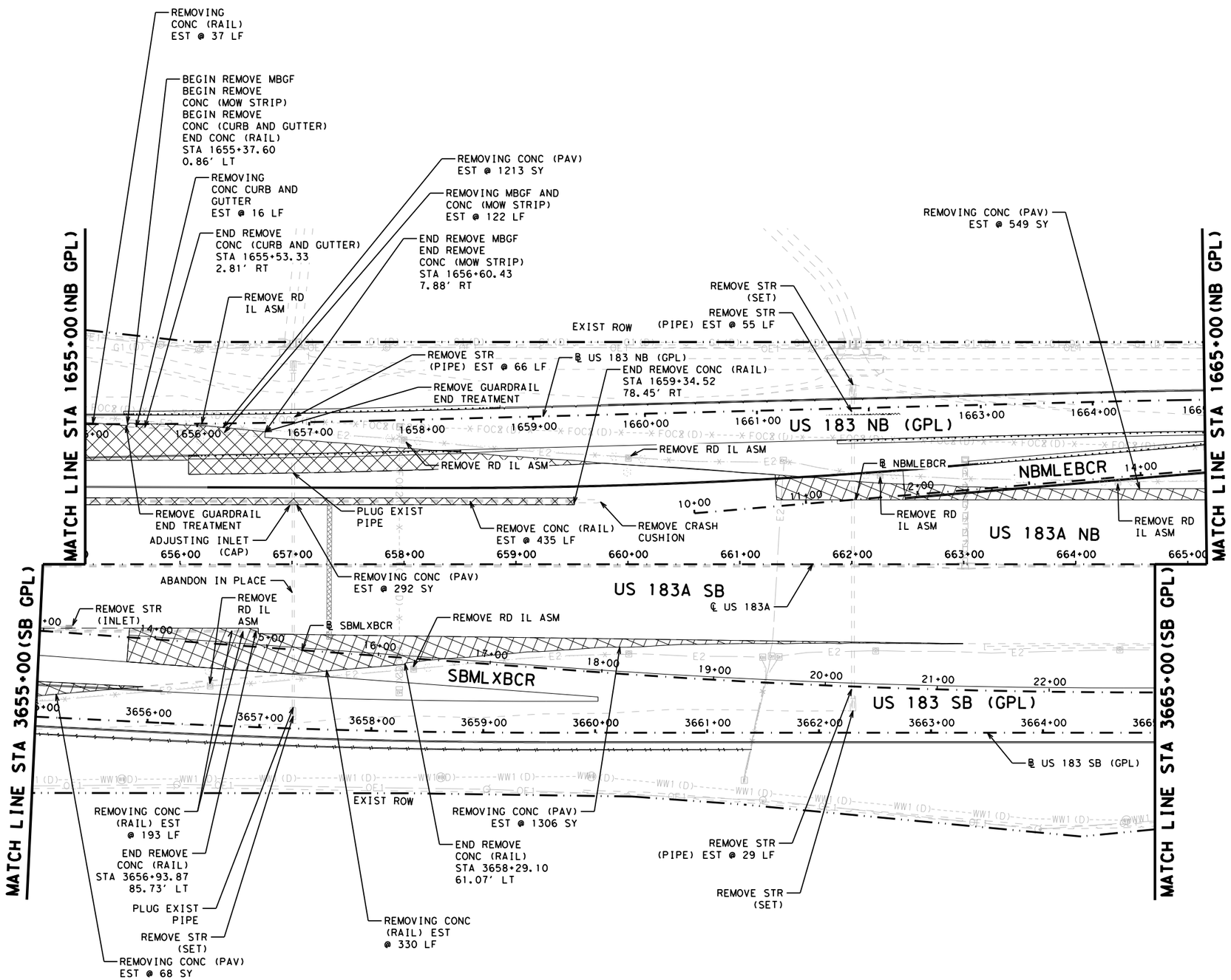

LEGEND

- R.O.W
- PROPERTY EASEMENT
- W 12" — EXISTING UTILITY
- EXISTING FEATURES
- CONCRETE PAVEMENT REMOVAL
- ASPHALT PAVEMENT REMOVAL
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NOTES

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DESIGN

STATE OF TEXAS — MARISSA GUZMAN — 130772 — LICENSED PROFESSIONAL ENGINEER

MARISSA GUZMAN, P.E.
4/24/2024
DATE

APPROVAL

STATE OF TEXAS — DAN THOMA — 98622 — LICENSED PROFESSIONAL ENGINEER

DAN THOMA, P.E.
4/24/2024
DATE

0 50 100 150
SCALE: 1"= 100'

PAPE-DAWSON ENGINEERS
SAN ANTONIO | AUSTIN | HOUSTON | FORT WORTH | DALLAS
2000 NW LOOP 410 | SAN ANTONIO, TX 78213 | 210.375.9000
TEXAS ENGINEERING FIRM #470 | TEXAS SURVEYING FIRM #10028800

2024
Texas Department of Transportation

US 183 GPL

REMOVAL PLAN

SHEET 6 OF 16

© 2024		CONT	SECT	JOB	HIGHWAY
DS:	CK:	0151	10	001	US 183
		DIST	COUNTY		SHEET NO.
DW:	CK:	AUS	WILLIAMSON		346

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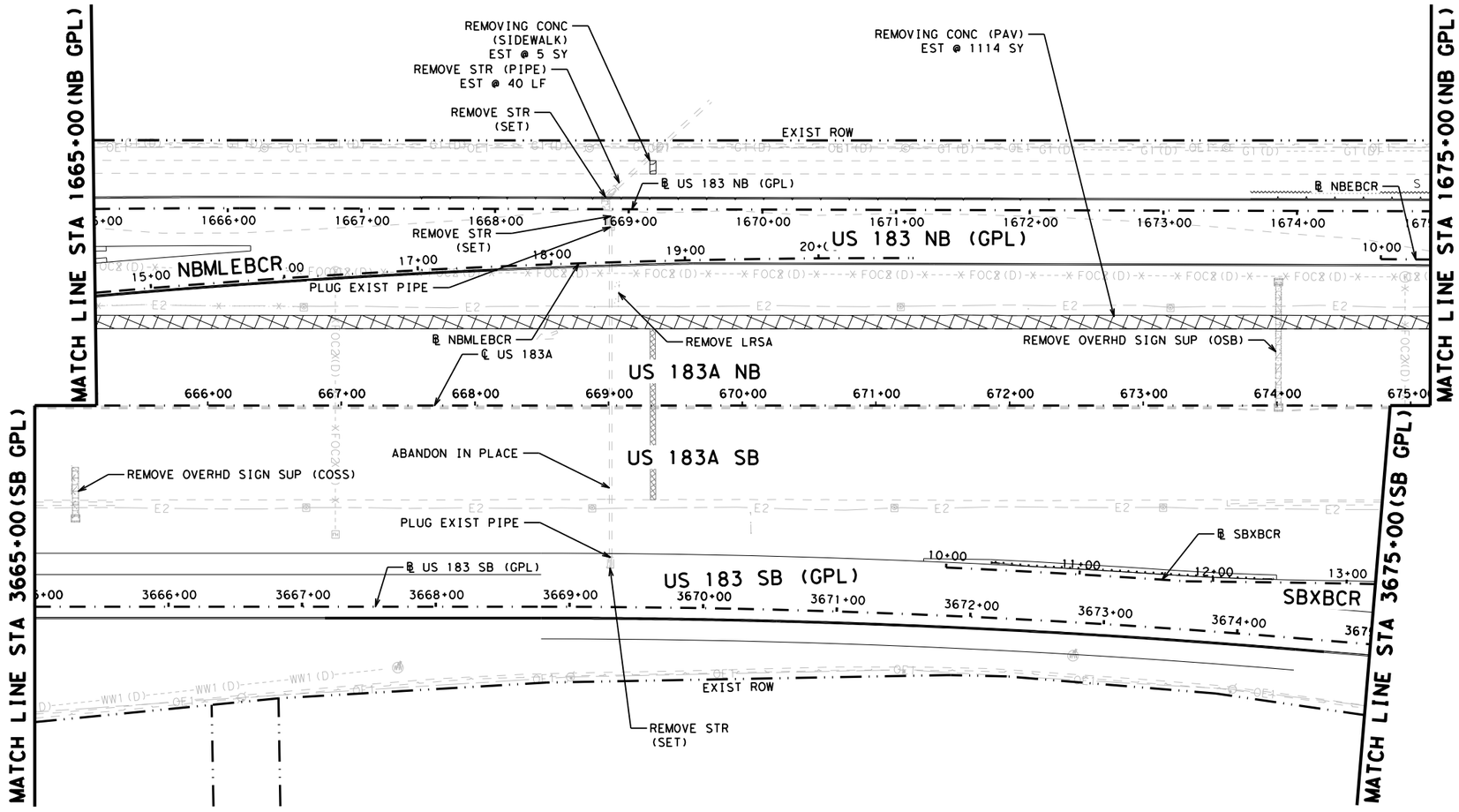

LEGEND

- R.O.W
- PROPERTY EASEMENT
- W 12" EXISTING UTILITY
- EXISTING FEATURES
- CONCRETE PAVEMENT REMOVAL
- ASPHALT PAVEMENT REMOVAL
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NOTES

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DESIGN

STATE OF TEXAS · MARISSA GUZMAN · 130772 · LICENSED PROFESSIONAL ENGINEER

MARISSA GUZMAN, P.E.
4/21/2023
DATE

APPROVAL

STATE OF TEXAS · DAN THOMA · 98622 · LICENSED PROFESSIONAL ENGINEER

DAN THOMA, P.E.
4/21/2023
DATE

0 50 100 150
SCALE: 1" = 100'

PAPE-DAWSON ENGINEERS
SAN ANTONIO | AUSTIN | HOUSTON | FORT WORTH | DALLAS
2000 NW LOOP 410 | SAN ANTONIO, TX 78213 | 210.375.9000
TEXAS ENGINEERING FIRM #470 | TEXAS SURVEYING FIRM #10028800

2023 Texas Department of Transportation

US 183 GPL

REMOVAL PLAN

SHEET 7 OF 16

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CONT	SECT	JOB	HIGHWAY
0151	10	001	US 183
DIST	COUNTY		SHEET NO.
AUS	WILLIAMSON		347

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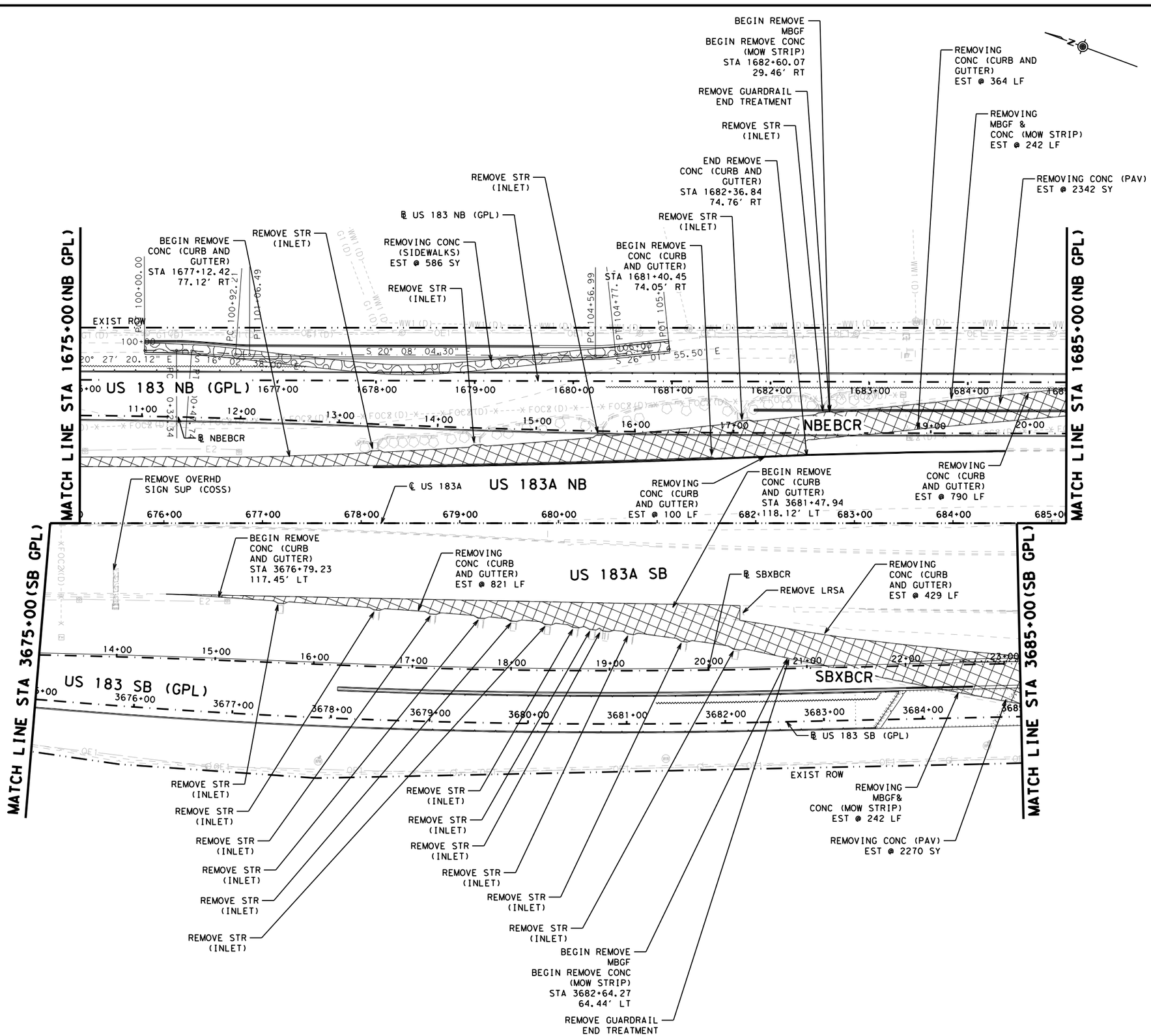

LEGEND

- R.O.W
- PROPERTY EASEMENT
- W 12" EXISTING UTILITY
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NOTES

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DESIGN

STATE OF TEXAS — MARISSA GUZMAN — 130772 — LICENSED PROFESSIONAL ENGINEER

MARISSA GUZMAN, P.E.
4/24/2024
DATE

APPROVAL

STATE OF TEXAS — DAN THOMA — 98622 — LICENSED PROFESSIONAL ENGINEER

DAN THOMA, P.E.
4/24/2024
DATE

0 50 100 150
SCALE: 1"= 100'

PAPE-DAWSON ENGINEERS
SAN ANTONIO | AUSTIN | HOUSTON | FORT WORTH | DALLAS
2000 NW LOOP 410 | SAN ANTONIO, TX 78213 | 210.375.9000
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2024 Texas Department of Transportation

US 183 GPL

REMOVAL PLAN

SHEET 8 OF 16

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DS:	CK:	CONT	SECT	JOB	HIGHWAY
		0151	10	001	US 183
DW:	CK:	DIST	COUNTY		SHEET NO.
		AUS	WILLIAMSON		348

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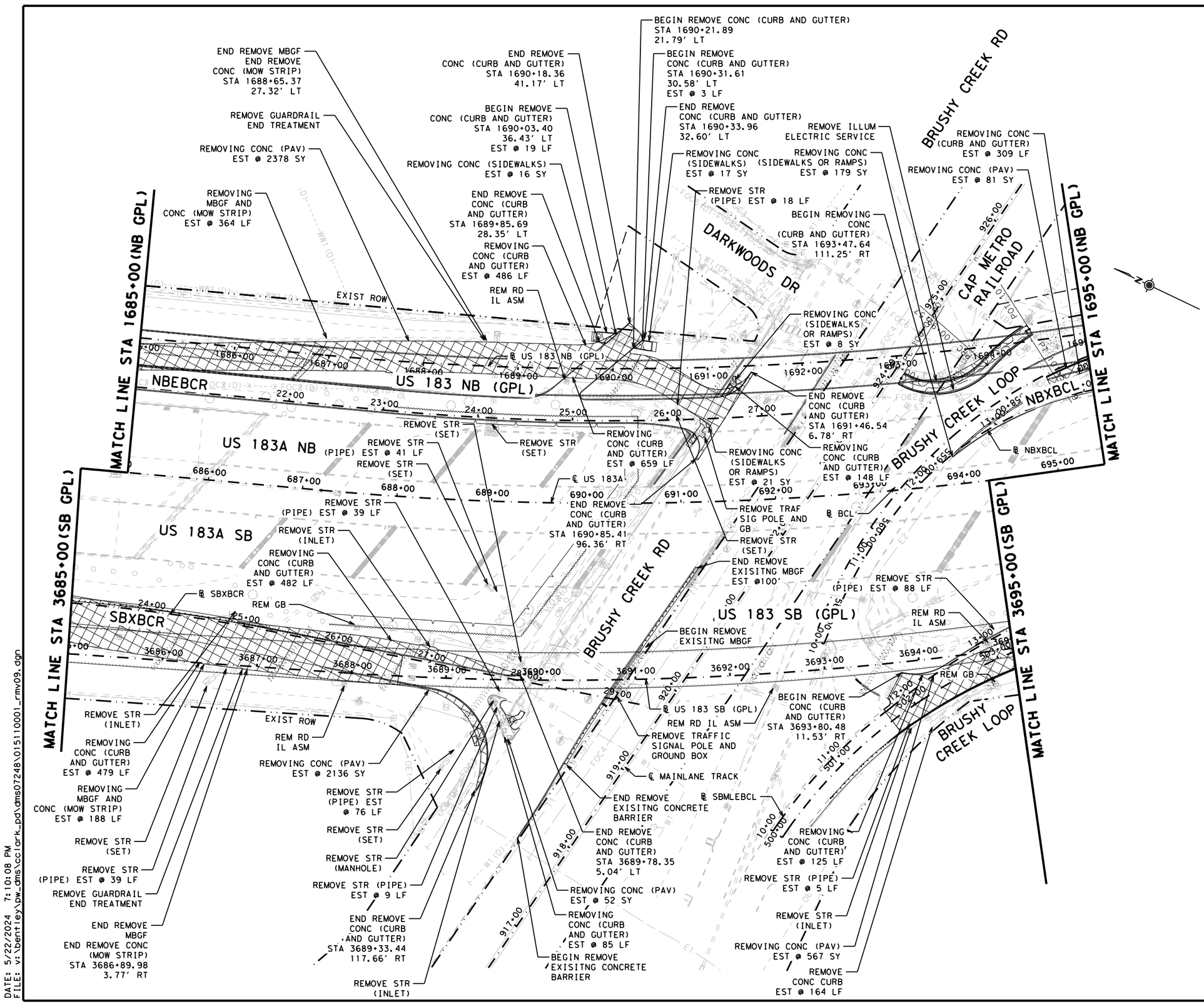

LEGEND

- R.O.W
- PROPERTY EASEMENT
- W 12" EXISTING UTILITY
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DESIGN

STATE OF TEXAS · MARISSA GUZMAN · 130772 · LICENSED PROFESSIONAL ENGINEER

MARISSA GUZMAN, P.E.

5/22/2024
DATE

APPROVAL

STATE OF TEXAS · DAN THOMA · 98622 · LICENSED PROFESSIONAL ENGINEER

DAN THOMA, P.E.

5/22/2024
DATE

0 50 100 150
SCALE: 1"= 100'

PAPE-DAWSON ENGINEERS
SAN ANTONIO | AUSTIN | HOUSTON | FORT WORTH | DALLAS
2000 NW LOOP 410 | SAN ANTONIO, TX 78213 | 210.375.9000
TEXAS ENGINEERING FIRM #470 | TEXAS SURVEYING FIRM #10028800

2024
Texas Department of Transportation

US 183 GPL

REMOVAL PLAN

SHEET 9 OF 16

© 2024

DS:	CK:	CONT	SECT	JOB	HIGHWAY
DW:	CK:	0151	10	001	US 183
		DIST	COUNTY		SHEET NO.
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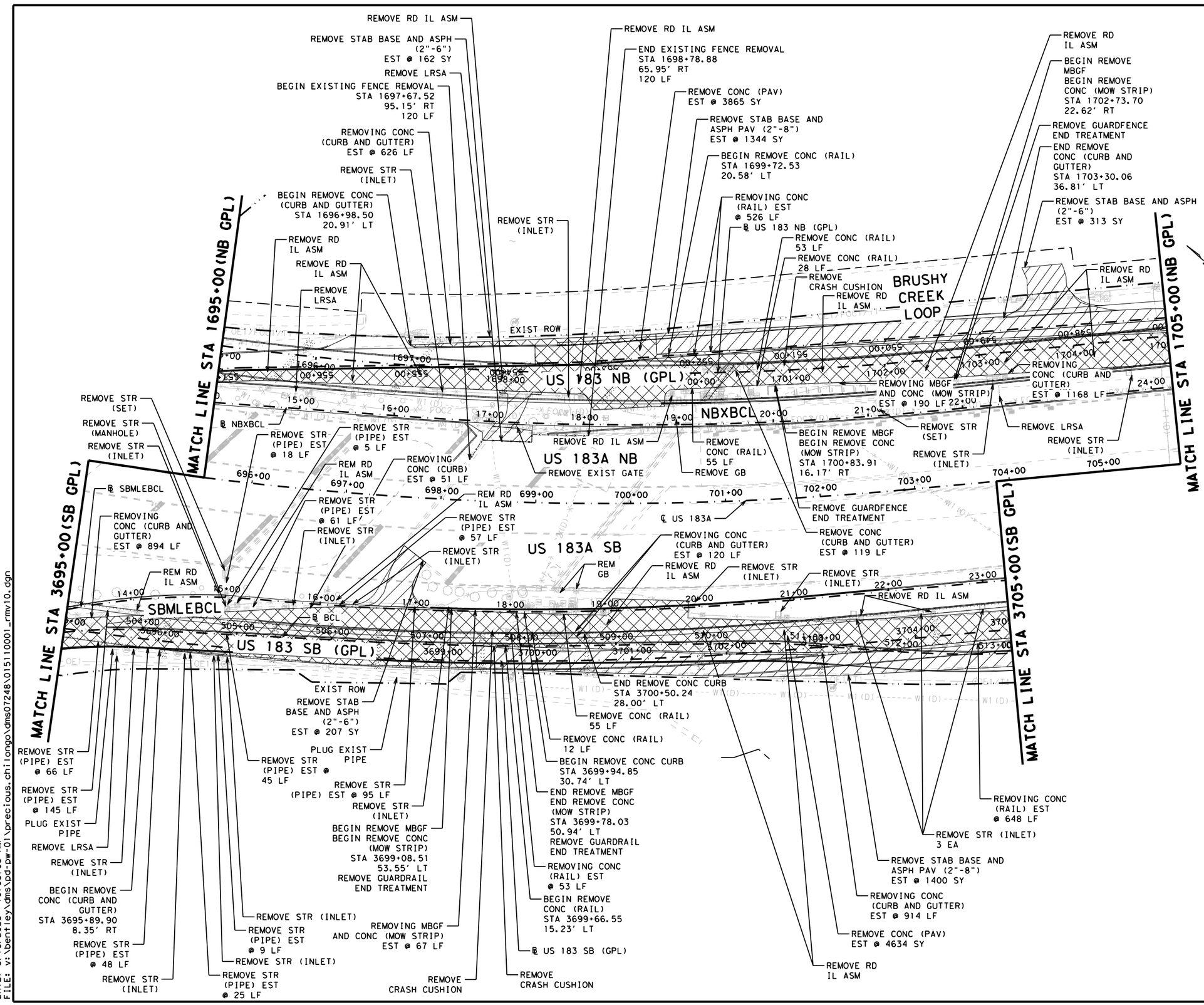
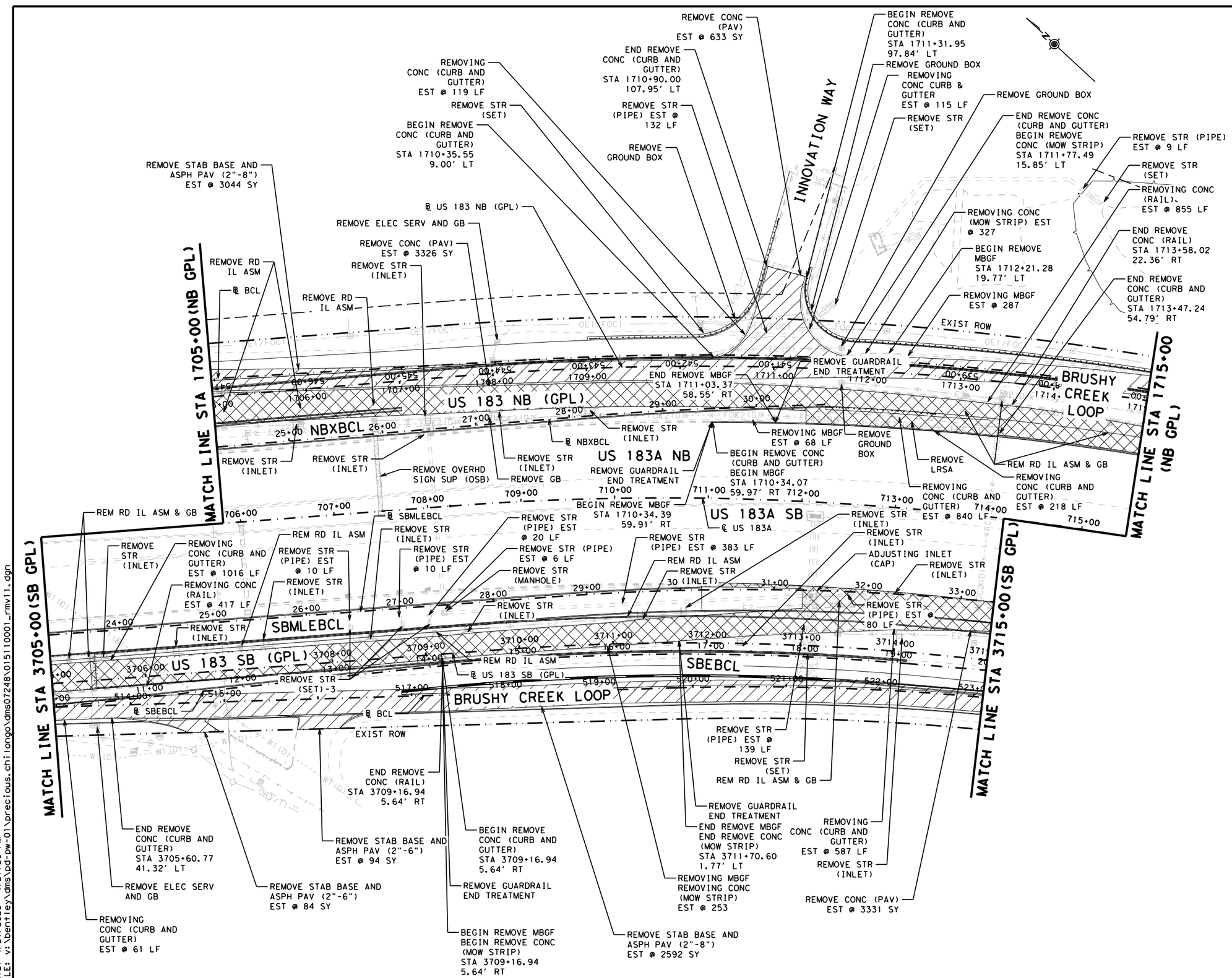

MATCH LINE STA 1695+00 (NB GPL)
MATCH LINE STA 1705+00 (NB GPL)
MATCH LINE STA 3695+00 (SB GPL)
MATCH LINE STA 3705+00 (SB GPL)
US 183 NB (GPL)
US 183A NB
US 183A SB
US 183 SB (GPL)
SBMLEBCL
NBXBCL
BRUSHY CREEK LOOP
EXIST ROW
REMOVE RD IL ASM
REMOVE STR (INLET)
REMOVE STAB BASE AND ASPH (2"-6") EST @ 162 SY
REMOVE LRSA
BEGIN EXISTING FENCE REMOVAL STA 1697+67.52 95.15' RT 120 LF
REMOVING CONC (CURB AND GUTTER) EST @ 626 LF
BEGIN REMOVE CONC (CURB AND GUTTER) STA 1696+98.50 20.91' LT
END EXISTING FENCE REMOVAL STA 1698+78.88 65.95' RT 120 LF
REMOVE CONC (PAV) EST @ 3865 SY
REMOVE STAB BASE AND ASPH PAV (2"-8") EST @ 1344 SY
BEGIN REMOVE CONC (RAIL) STA 1699+72.53 20.58' LT
REMOVING CONC (RAIL) EST @ 526 LF
REMOVE CONC (RAIL) 53 LF
REMOVE CONC (RAIL) 28 LF
REMOVE CRASH CUSHION
REMOVE GB
REMOVE EXIST GATE
REMOVE CONC (RAIL) 55 LF
BEGIN REMOVE MBGF BEGIN REMOVE CONC (MOW STRIP) STA 1700+83.91 16.17' RT
REMOVING MBGF AND CONC (MOW STRIP) EST @ 190 LF
REMOVE GUARDFENCE END TREATMENT
REMOVE CONC (CURB AND GUTTER) EST @ 119 LF
BEGIN REMOVE MBGF BEGIN REMOVE CONC (MOW STRIP) STA 1702+73.70 22.62' RT
REMOVE GUARDFENCE END TREATMENT
END REMOVE CONC (CURB AND GUTTER) STA 1703+30.06 36.81' LT
REMOVE STAB BASE AND ASPH (2"-6") EST @ 313 SY
REMOVING CONC (CURB AND GUTTER) EST @ 1168 LF
REMOVE LRSA
REMOVE STR (SET)
REMOVE STR (MANHOLE)
REMOVE STR (PIPE) EST @ 18 LF
REMOVE STR (PIPE) EST @ 5 LF
REMOVE RD IL ASM
REMOVING CONC (CURB) EST @ 51 LF
REMOVE STR (PIPE) EST @ 61 LF
REMOVE STR (PIPE) EST @ 57 LF
REMOVING CONC (CURB AND GUTTER) EST @ 894 LF
REMOVE STR (PIPE) EST @ 66 LF
REMOVE STR (PIPE) EST @ 145 LF
PLUG EXIST PIPE
REMOVE LRSA
REMOVE STR (INLET)
BEGIN REMOVE CONC (CURB AND GUTTER) STA 3695+89.90 8.35' RT
REMOVE STR (PIPE) EST @ 48 LF
REMOVE STR (PIPE) EST @ 25 LF
REMOVE STR (PIPE) EST @ 9 LF
REMOVE STR (PIPE) EST @ 45 LF
REMOVE STAB BASE AND ASPH (2"-6") EST @ 207 SY
REMOVE STR (PIPE) EST @ 95 LF
PLUG EXIST PIPE
BEGIN REMOVE MBGF BEGIN REMOVE CONC (MOW STRIP) STA 3699+08.51 53.55' LT REMOVE GUARDRAIL END TREATMENT
REMOVING MBGF AND CONC (MOW STRIP) EST @ 67 LF
REMOVE CRASH CUSHION
END REMOVE CONC CURB STA 3700+50.24 28.00' LT
REMOVE CONC (RAIL) 55 LF
REMOVE CONC (RAIL) 12 LF
BEGIN REMOVE CONC CURB STA 3699+94.85 30.74' LT
END REMOVE MBGF END REMOVE CONC (MOW STRIP) STA 3699+78.03 50.94' LT REMOVE GUARDRAIL END TREATMENT
REMOVING CONC (RAIL) EST @ 53 LF
BEGIN REMOVE CONC (RAIL) STA 3699+66.55 15.23' LT
REMOVE CONC (PAV) EST @ 4634 SY
REMOVING CONC (CURB AND GUTTER) EST @ 914 LF
REMOVE STAB BASE AND ASPH PAV (2"-8") EST @ 1400 SY
REMOVE STR (INLET) 3 EA
REMOVING CONC (RAIL) EST @ 648 LF
REMOVE RD IL ASM
REMOVE STR (INLET)
REMOVE STR (SET)
REMOVE LRSA
REMOVE STR (INLET)
REMOVING CONC (CURB AND GUTTER) EST @ 1168 LF
REMOVING MBGF AND CONC (MOW STRIP) EST @ 190 LF
REMOVE RD IL ASM
REMOVE STR (INLET)
REMOVE STR (INLET)
REMOVE RD IL ASM
REMOVE STR (INLET)
REMOVE RD IL ASM
REMOVE RD IL ASM
REMOVE RD IL ASM



LEGEND

- R.O.W
- PROPERTY EASEMENT
- W 12" EXISTING UTILITY
- EXISTING FEATURES
- CONCRETE PAVEMENT REMOVAL
- ASPHALT PAVEMENT REMOVAL
- CONCRETE SIDEWALK REMOVAL
- CUT AND RESTORE

NOTES

1. SEE SW3P FOR TREE PROTECTION. ALL TREES WITHIN ROW NOT PROTECTED ARE IN CONFLICT WITH PROPOSED CONSTRUCTION AND WILL BE REMOVED SUBSIDIARY TO PREP ROW.

DESIGN

MARISSA GUZMAN 130772 LICENSED PROFESSIONAL ENGINEER STATE OF TEXAS

MARISSA GUZMAN, P.E.

4/21/2023
DATE

APPROVAL

DAN THOMA 98622 LICENSED PROFESSIONAL ENGINEER STATE OF TEXAS

DAN THOMA, P.E.

4/21/2023
DATE

0 50 100 150

SCALE: 1" = 100'

PAPE-DAWSON ENGINEERS

SAN ANTONIO | AUSTIN | HOUSTON | FORT WORTH | DALLAS
2000 NW LOOP 410 | SAN ANTONIO, TX 78213 | 210.375.9000
TEXAS ENGINEERING FIRM #470 | TEXAS SURVEYING FIRM #10028800

2023 Texas Department of Transportation

US 183 GPL

REMOVAL PLAN

SHEET 11 OF 16

© 2023	CONT	SECT	JOB	HIGHWAY
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DW: CK:	DIST	COUNTY		SHEET NO.
	AUS	WILLIAMSON		351

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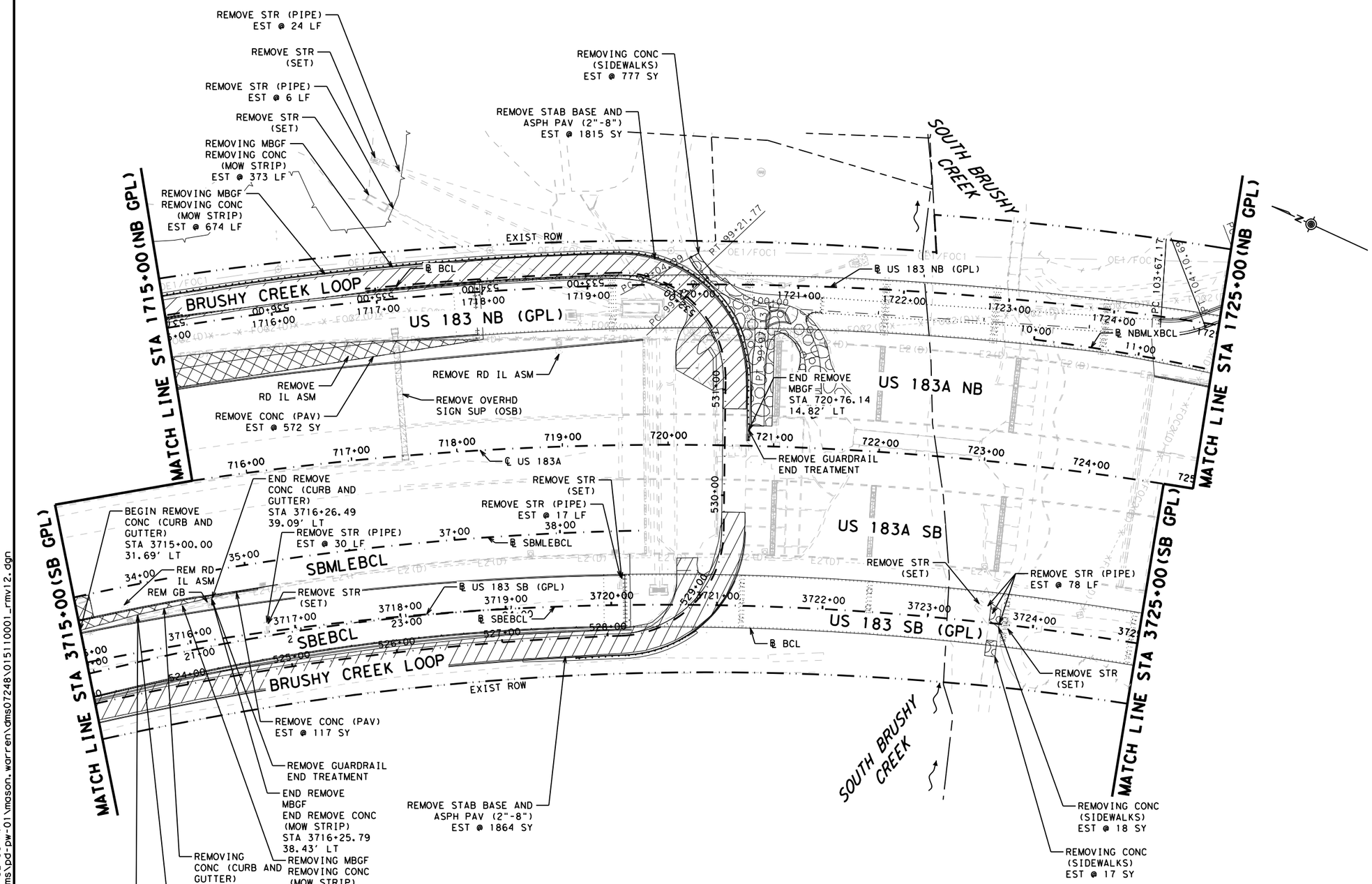

LEGEND

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- PROPERTY EASEMENT
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NOTES

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DESIGN

STATE OF TEXAS · MARISSA GUZMAN · 130772 · LICENSED PROFESSIONAL ENGINEER

MARISSA GUZMAN, P.E.

4/24/2024
DATE

APPROVAL

STATE OF TEXAS · DAN THOMA · 98622 · LICENSED PROFESSIONAL ENGINEER

DAN THOMA, P.E.

4/24/2024
DATE

0 50 100 150

SCALE: 1"= 100'

PAPE-DAWSON ENGINEERS

SAN ANTONIO | AUSTIN | HOUSTON | FORT WORTH | DALLAS
2000 NW LOOP 410 | SAN ANTONIO, TX 78213 | 210.375.9000
TEXAS ENGINEERING FIRM #470 | TEXAS SURVEYING FIRM #10028800

2024 Texas Department of Transportation

US 183 GPL

REMOVAL PLAN

SHEET 12 OF 16

© 2024	CONT	SECT	JOB	HIGHWAY
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DW: CK:	DIST	COUNTY		SHEET NO.
	AUS	WILLIAMSON		352

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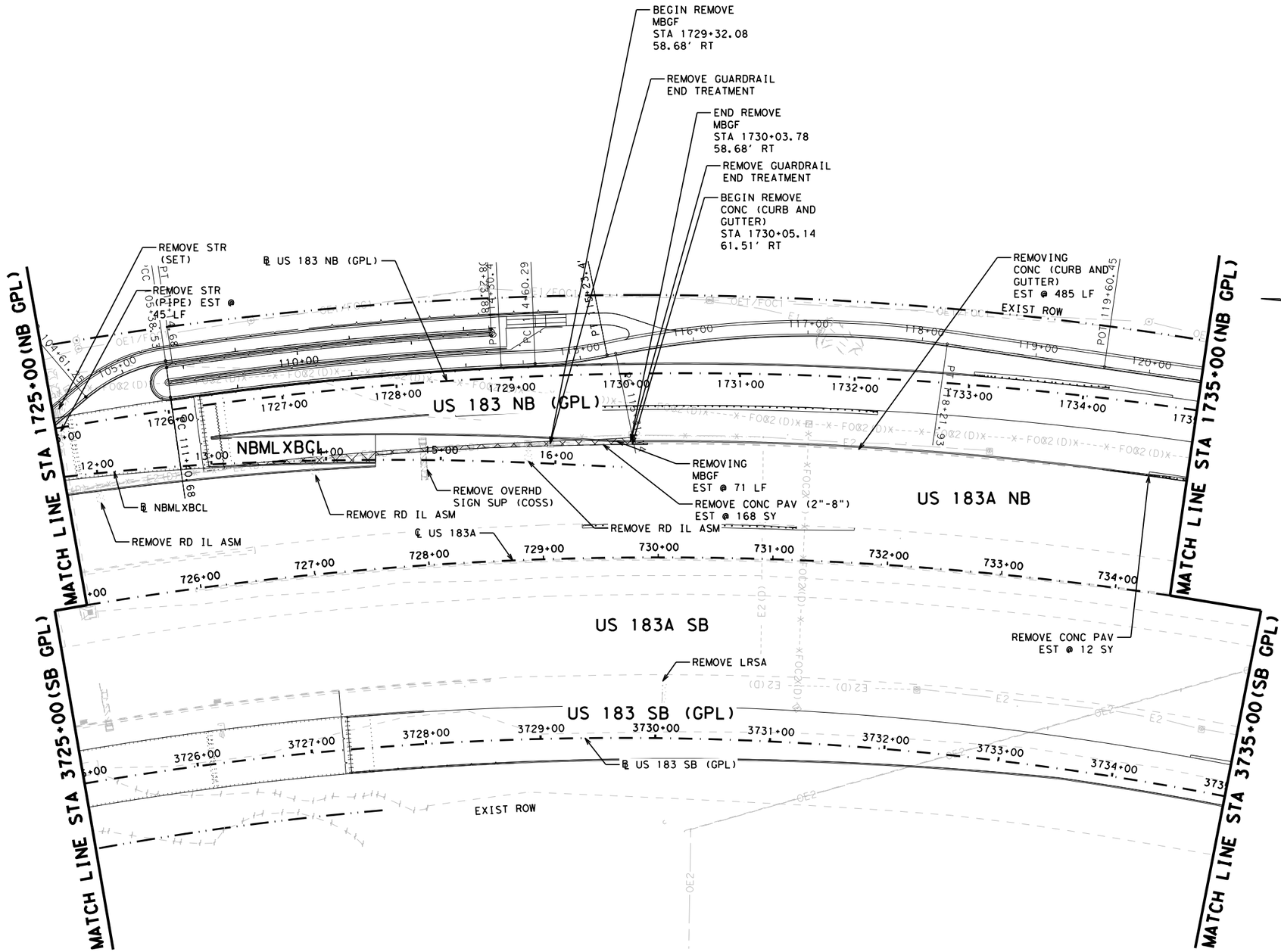

LEGEND

- R.O.W
- PROPERTY EASEMENT
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NOTES

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DESIGN

STATE OF TEXAS · MARISSA GUZMAN · 130772 · LICENSED PROFESSIONAL ENGINEER

MARISSA GUZMAN, P.E.
4/24/2024
DATE

APPROVAL

STATE OF TEXAS · DAN THOMA · 98622 · LICENSED PROFESSIONAL ENGINEER

DAN THOMA, P.E.
4/24/2024
DATE

0 50 100 150
SCALE: 1"= 100'

PAPE-DAWSON ENGINEERS
SAN ANTONIO | AUSTIN | HOUSTON | FORT WORTH | DALLAS
2000 NW LOOP 410 | SAN ANTONIO, TX 78213 | 210.375.9000
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2024 Texas Department of Transportation

US 183 GPL

REMOVAL PLAN

SHEET 13 OF 16

© 2024	CONT	SECT	JOB	HIGHWAY
DS: CK:	0151	10	001	US 183
DW: CK:	DIST	COUNTY		SHEET NO.
	AUS	WILLIAMSON		353

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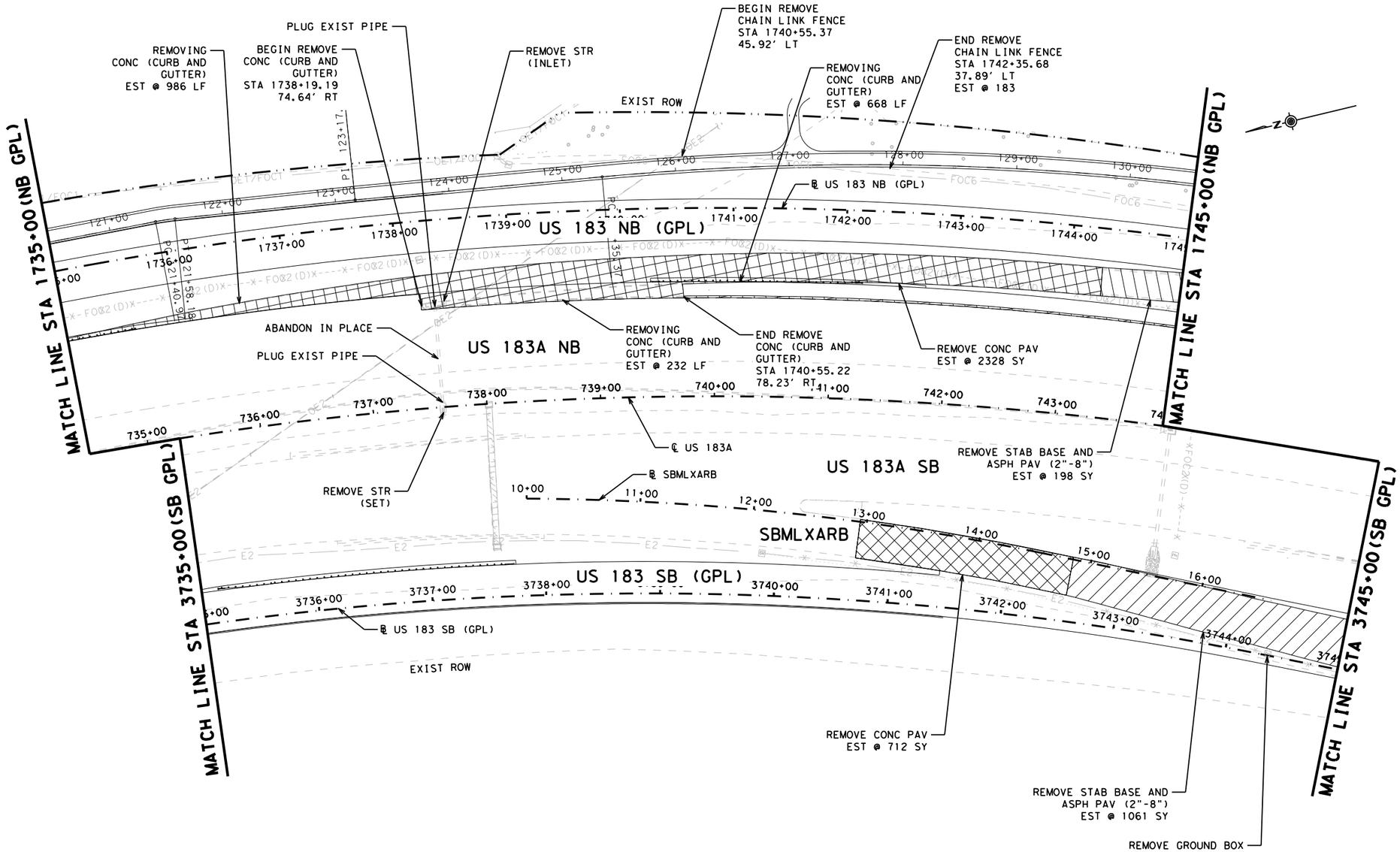

LEGEND

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DESIGN

STATE OF TEXAS — MARISSA GUZMAN — 130772 — LICENSED PROFESSIONAL ENGINEER

MARISSA GUZMAN, P.E.

2/28/2024
DATE

APPROVAL

STATE OF TEXAS — DAN THOMA — 98622 — LICENSED PROFESSIONAL ENGINEER

DAN THOMA, P.E.

2/28/2024
DATE

0 50 100 150
SCALE: 1"= 100'

PAPE-DAWSON ENGINEERS
SAN ANTONIO | AUSTIN | HOUSTON | FORT WORTH | DALLAS
2000 NW LOOP 410 | SAN ANTONIO, TX 78213 | 210.375.9000
TEXAS ENGINEERING FIRM #470 | TEXAS SURVEYING FIRM #10028800

2024
Texas Department of Transportation

US 183 GPL

REMOVAL PLAN

SHEET 14 OF 16

© 2024

CONT	SECT	JOB	HIGHWAY
0151	10	001	US 183
DIST	COUNTY		SHEET NO.
AUS	WILLIAMSON		354

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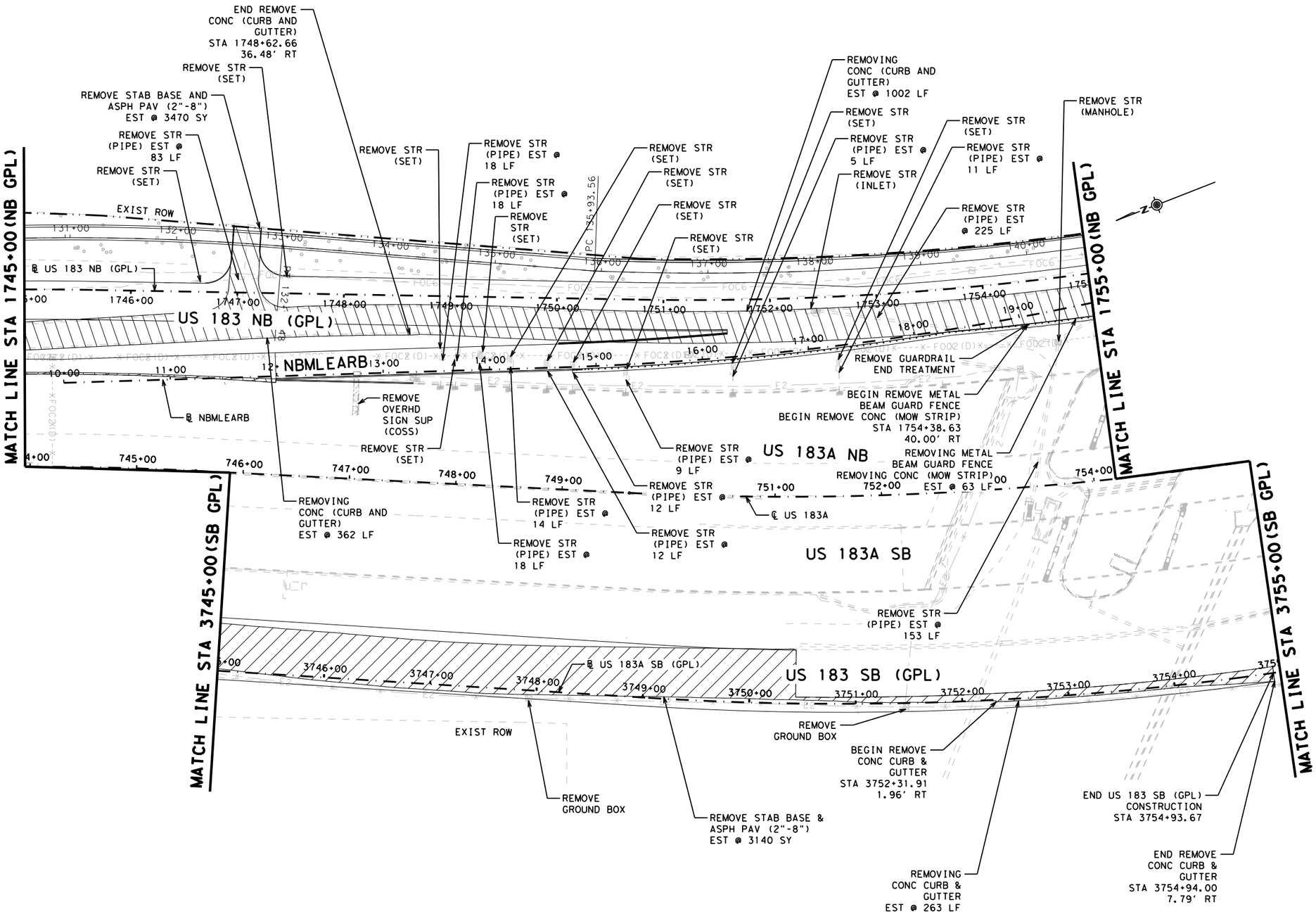

LEGEND

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DESIGN

STATE OF TEXAS — MARISSA GUZMAN — 130772 — LICENSED PROFESSIONAL ENGINEER

MARISSA GUZMAN, P.E.
11/8/2023
DATE

APPROVAL

STATE OF TEXAS — DAN THOMA — 98622 — LICENSED PROFESSIONAL ENGINEER

DAN THOMA, P.E.
11/8/2023
DATE

0 50 100 150
SCALE: 1"= 100'

PAPE-DAWSON ENGINEERS
SAN ANTONIO | AUSTIN | HOUSTON | FORT WORTH | DALLAS
2000 NW LOOP 410 | SAN ANTONIO, TX 78213 | 210.375.9000
TEXAS ENGINEERING FIRM #470 | TEXAS SURVEYING FIRM #10028800

2023
Texas Department of Transportation

US 183 GPL

REMOVAL PLAN

SHEET 15 OF 16

© 2023		CONT	SECT	JOB	HIGHWAY
DS:	CK:	0151	10	001	US 183
		DIST	COUNTY		SHEET NO.
DW:	CK:	AUS	WILLIAMSON		355

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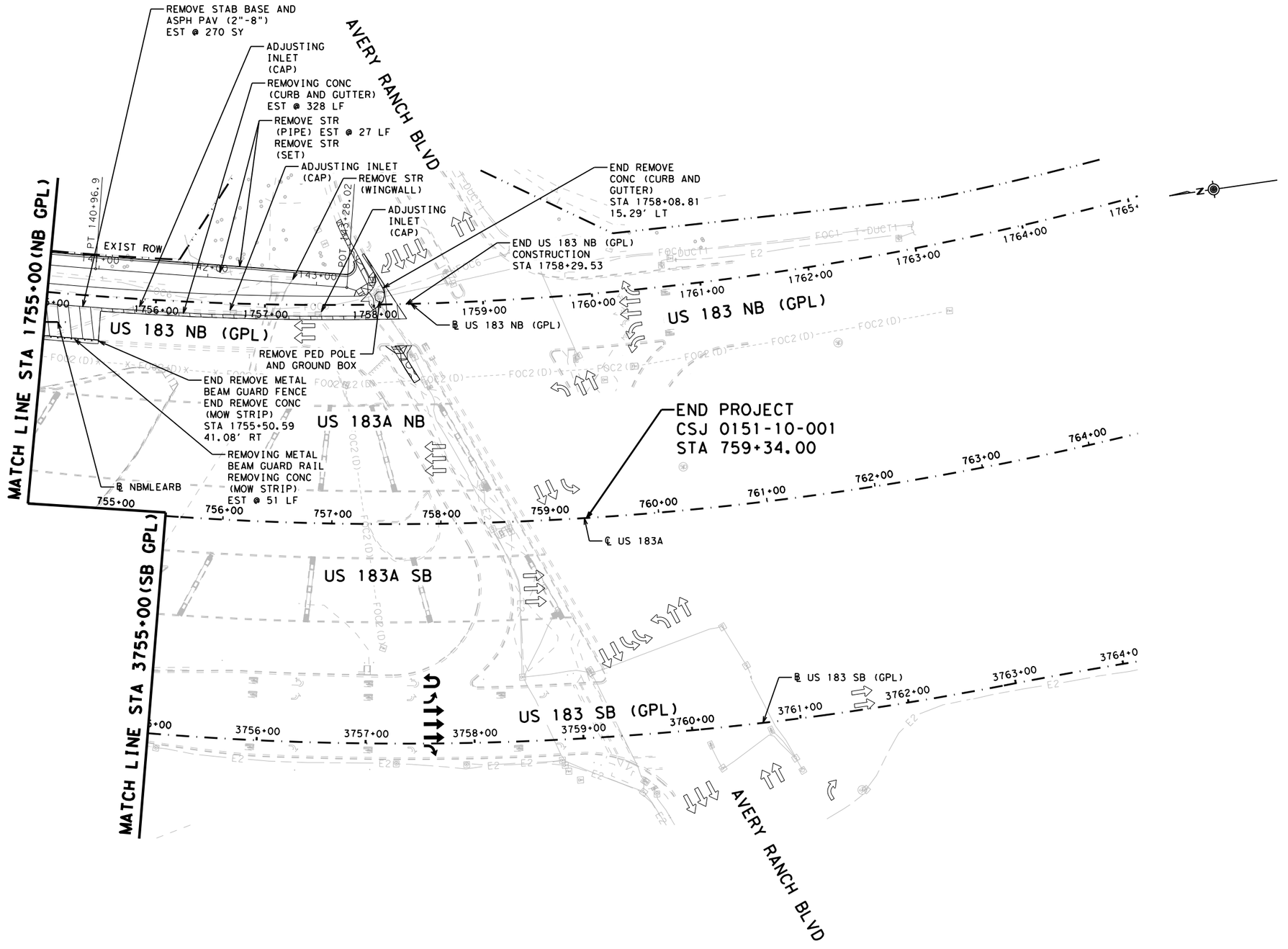

LEGEND

- R.O.W
- PROPERTY EASEMENT
- W 12" — EXISTING UTILITY
- EXISTING FEATURES
- CONCRETE PAVEMENT REMOVAL
- ASPHALT PAVEMENT REMOVAL
- CONCRETE SIDEWALK REMOVAL
- CUT AND RESTORE

NOTES

1. SEE SW3P FOR TREE PROTECTION. ALL TREES WITHIN ROW NOT PROTECTED ARE IN CONFLICT WITH PROPOSED CONSTRUCTION AND WILL BE REMOVED SUBSIDIARY TO PREP ROW.

DESIGN

STATE OF TEXAS — MARISSA GUZMAN — 130772 — LICENSED PROFESSIONAL ENGINEER

MARISSA GUZMAN, P.E.
11/8/2023
DATE

APPROVAL

STATE OF TEXAS — DAN THOMA — 98622 — LICENSED PROFESSIONAL ENGINEER

DAN THOMA, P.E.
11/8/2023
DATE

0 50 100 150
SCALE: 1" = 100'

PAPE-DAWSON ENGINEERS
SAN ANTONIO | AUSTIN | HOUSTON | FORT WORTH | DALLAS
2000 NW LOOP 410 | SAN ANTONIO, TX 78213 | 210.375.9000
TEXAS ENGINEERING FIRM #470 | TEXAS SURVEYING FIRM #10028800

2023
Texas Department of Transportation

US 183 GPL

REMOVAL PLAN

SHEET 16 OF 16

© 2023		CONT	SECT	JOB	HIGHWAY
DS:	CK:	0151	10	001	US 183
		DIST	COUNTY		SHEET NO.
DW:	CK:	AUS	WILLIAMSON		356

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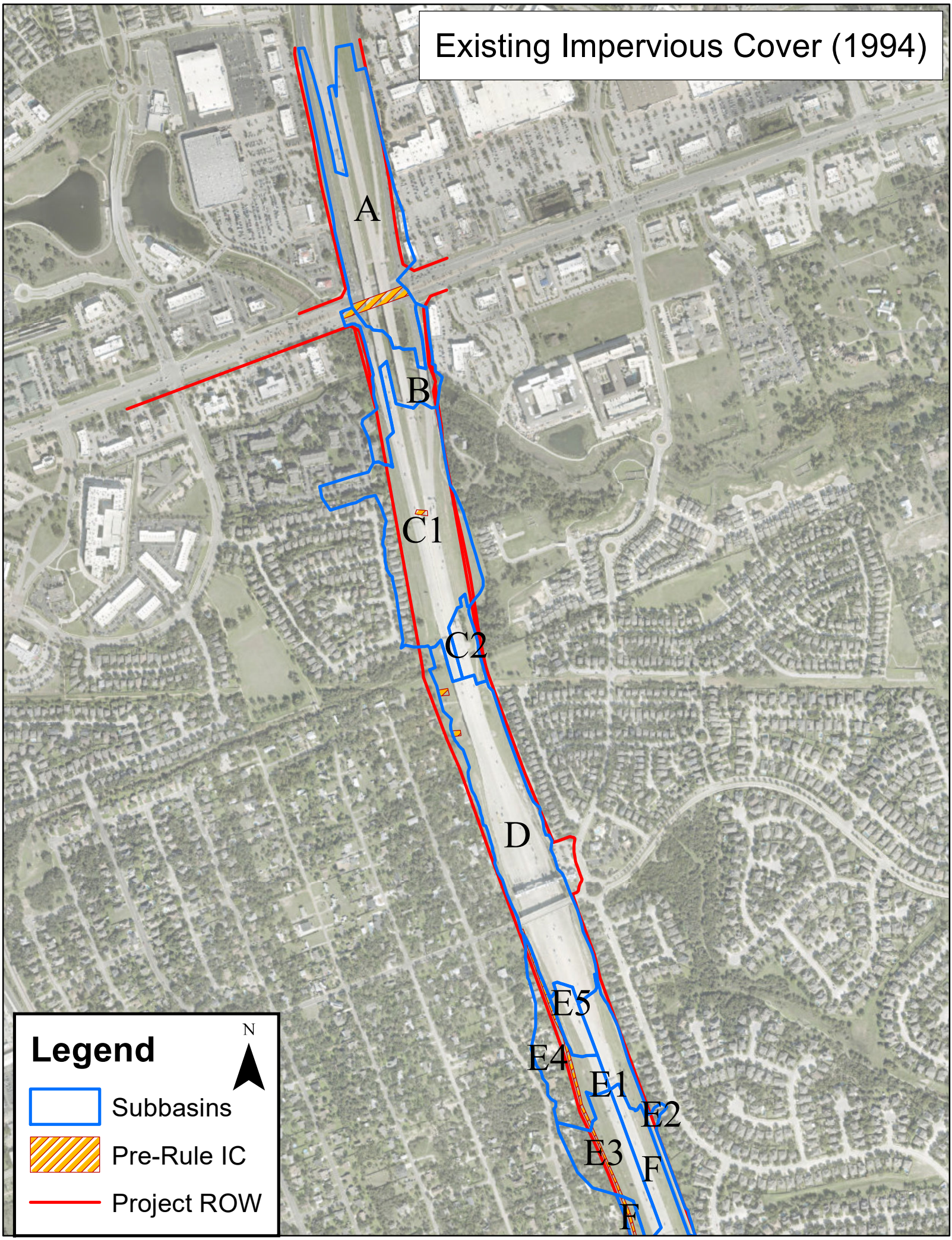
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C1
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E5
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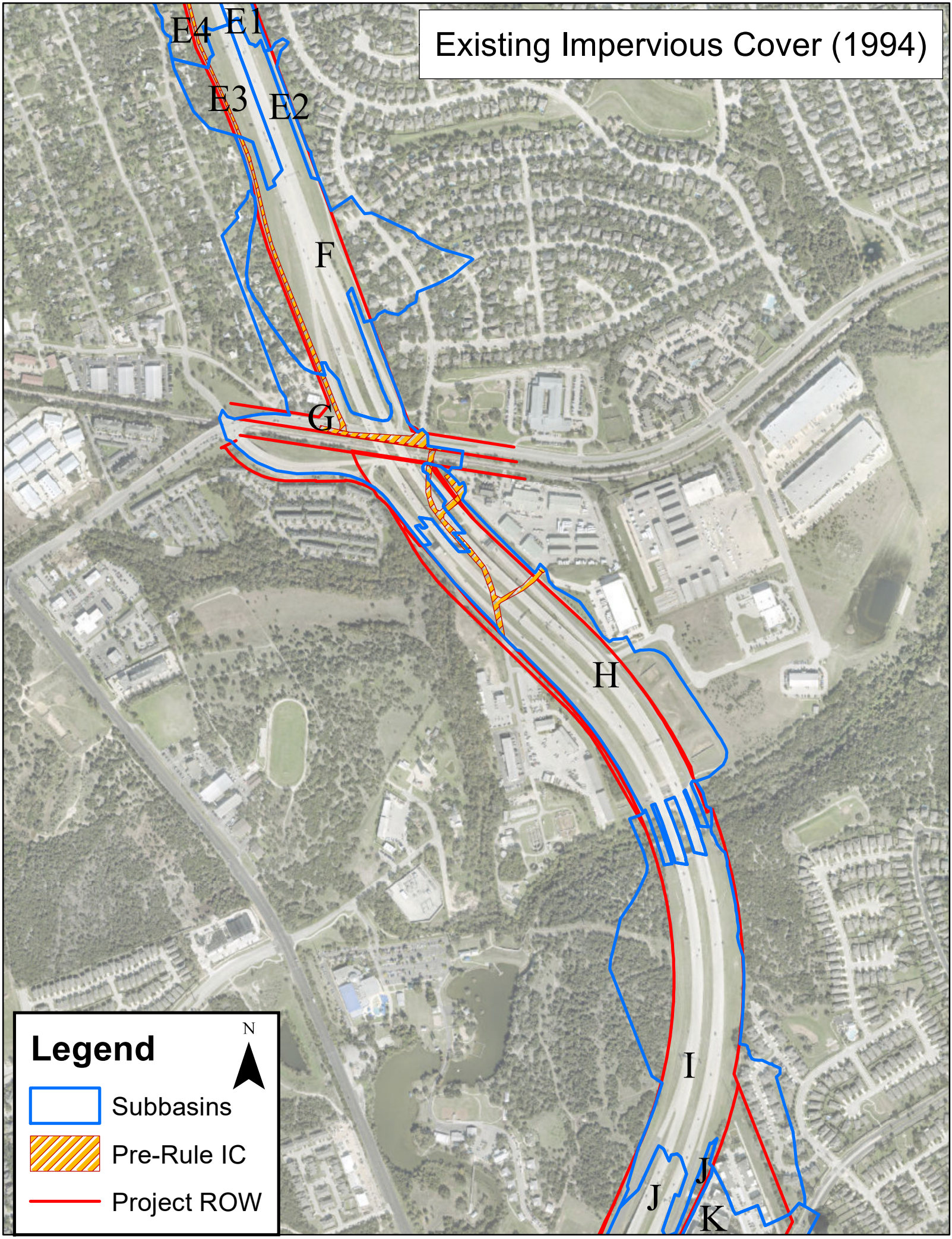
Legend
N
Subbasins
Pre-Rule IC
Project ROW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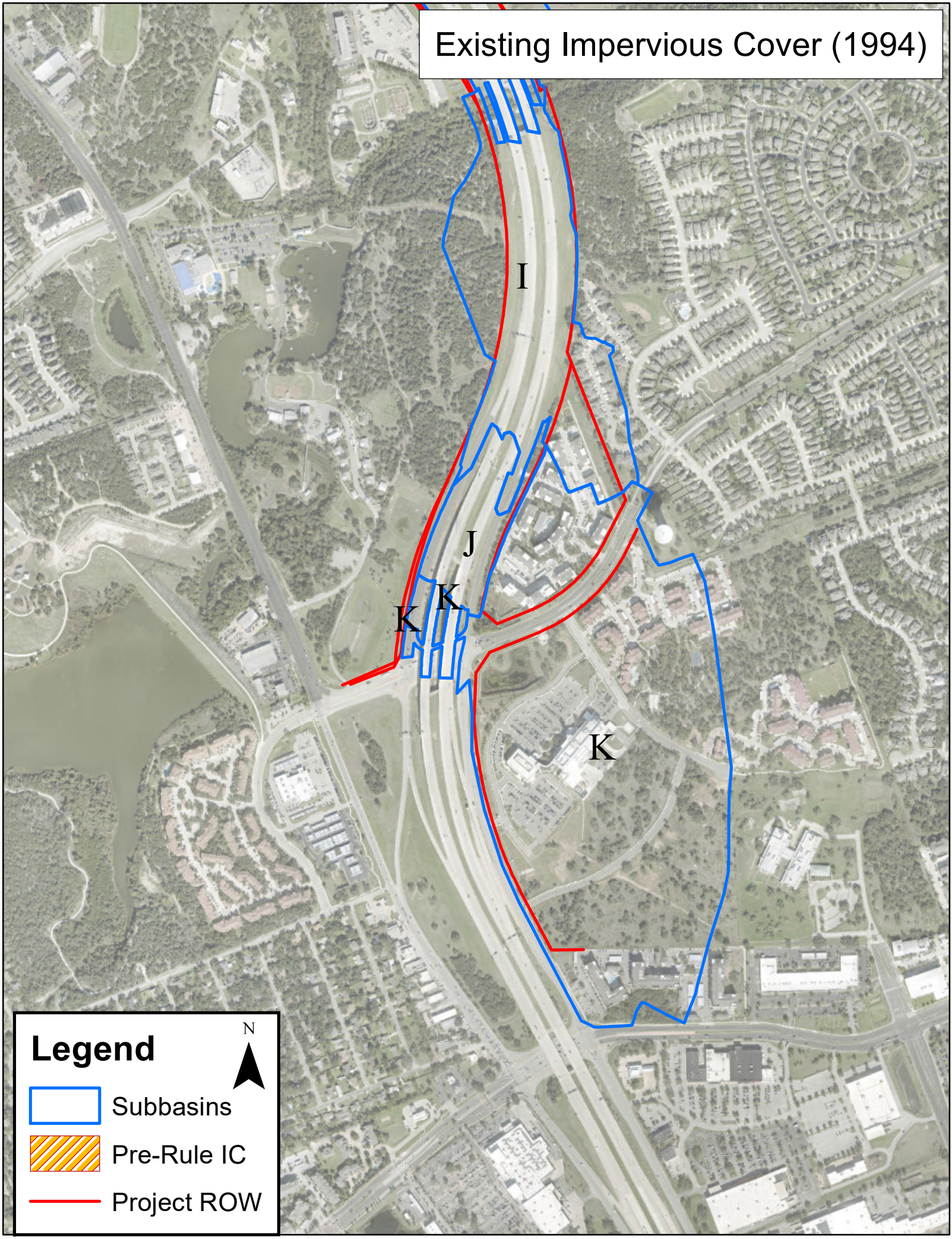
K
Legend
N
Subbasins
Pre-Rule IC
Project ROW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Subbasins
Pre-Rule IC
Project ROW

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: Clint Smith, P.E.

Date: 12/12/2025

Signature of Customer/Agent:

Project Information

1. Regulated Entity (Project) Name: US 183A General Purpose Lanes
2. County: Williamson
3. Stream Basin(s): Brushy Creek
4. Groundwater Conservation District (if applicable): N/A
5. Customer (Applicant):

   Contact Person: Kyle Russell
   Entity: Texas Department of Transportation
   Mailing Address: 2727 S Austin Ave
   City, State: Georgetown, TX Zip: 78626
   Telephone: 512-930-5402
   Email Address: kyle.russell@txdot.gov

6. Agent (Representative):

Contact Person: Clint Smith, P.E.
Entity: Halff Associates, Inc.
Mailing Address: 5113 Southwest Pkwy, Suite 140
City, State: Austin, TX Zip: 78735
Telephone: 737-787-2704
Email Address: clint.smith@halff.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: Oscar Solis
Entity: Central Texas Regional Mobility Authority
Mailing Address: 13640 Briarwick Drive, Suite 200
City, State: Austin, TX Zip: 78729
Telephone: 512-450-6290
Email Address: osolis@ctrma.org

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: _____

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: 164.1 (ac.)
    Length: 14,784 ft.
    Width: varies from 390 ft. to 410 ft.
    Impervious cover (IC): 121.23 (ac.)
    Total of Pavement area 121.23 (ac.) ÷ R.O.W. area 164.1 (ac.) x 100 = 73.9% IC.

    ☒ CAD program was used to determine areas.
    ☒ Number of travel lanes: proposed: 8, existing: 6
    ☒ Typical widths of lanes: 12 (ft.)
    ☒ Are intersections also being improved? (Y/N) Y

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):FEMA Effective Firm Panels dates 12/20/2019.

    ☐ 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.

    ☒ Name all stream crossings: South Brushy Creek, Cluck Creek, South Brushy creek Trib. I, Spanish Oak Creek,Spanish Oak Creek Trib. 1

    ☒ 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. ☒ 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 ☒ Shared-use paths

    ☐ Related turn lanes ☐ Off-site improvements and staging areas

☒ Demolition plans ☐ Utility relocations
☐ Other improved areas: _____

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.

    ☒ 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.

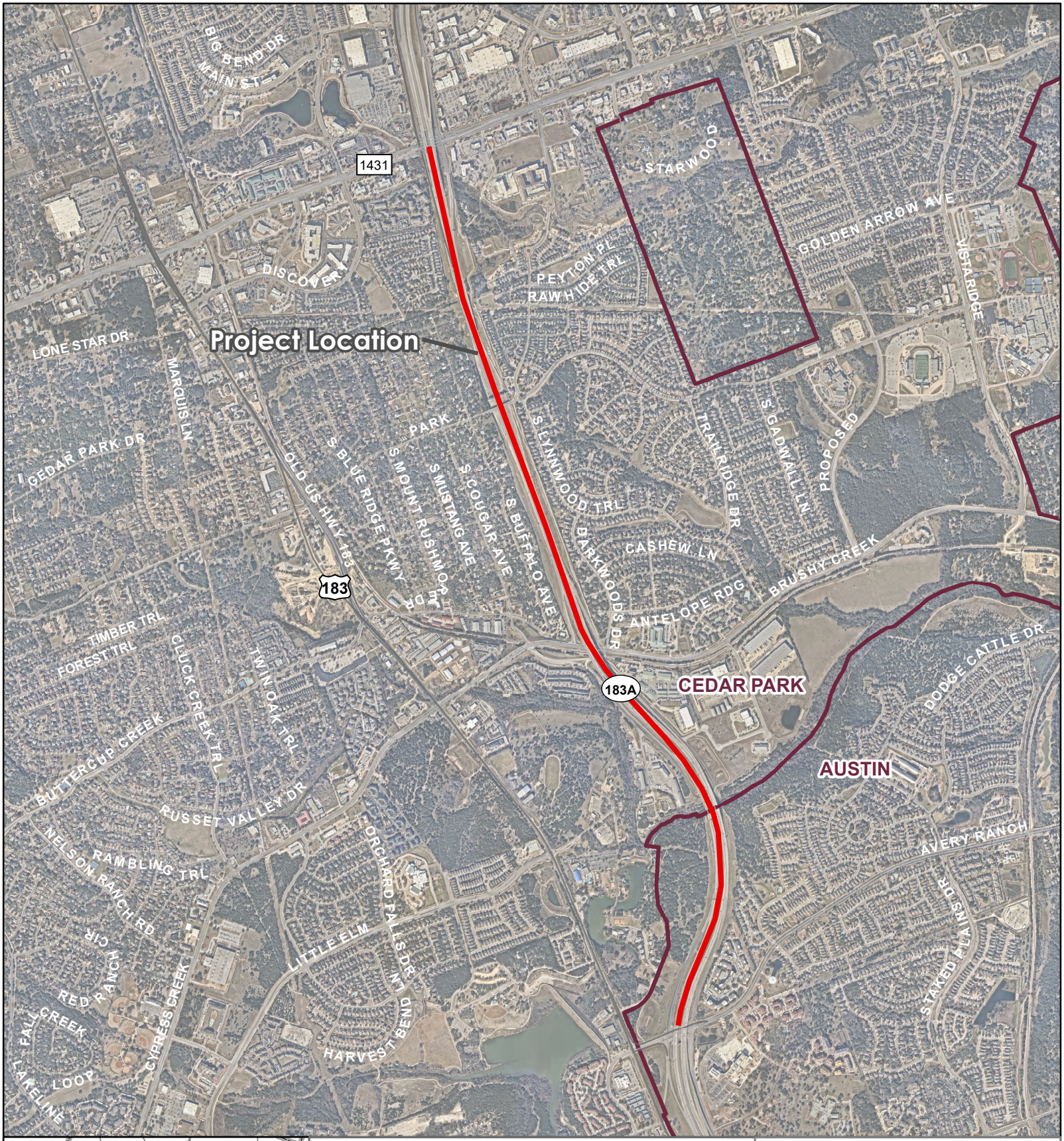
Administrative Information

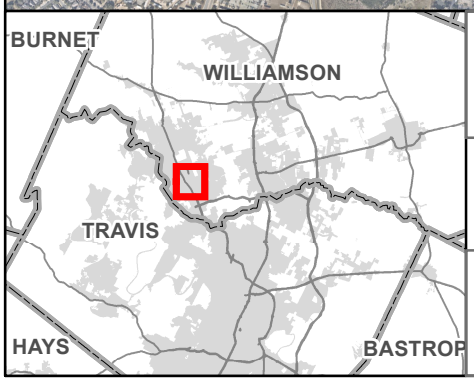
39. ☒ Submit one (1) original and one (1) copy of the application, plus one electronic copy as needed, for each affected incorporated city, groundwater conservation district, and county in which the project will be located. The TCEQ is required to distribute the additional copies to these jurisdictions.

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

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

    ☒ TxDOT roadway project.





Pape-Dawson
TXDOT-WA#1 183 Frontage WQ

Attachment A
Road Map

Directions:
Take IH 35 to US-183 Hwy N to Route 183A S in Williamson County.

Project Location

City Boundary

0 1,000 2,000 Feet

1:24,000

halff

Pape-Dawson
TXDOT-WA#1
183 Frontage WQ

Attachment B
USGS / Edwards Recharge Zone Map

Project Location

Roadway

City Boundary

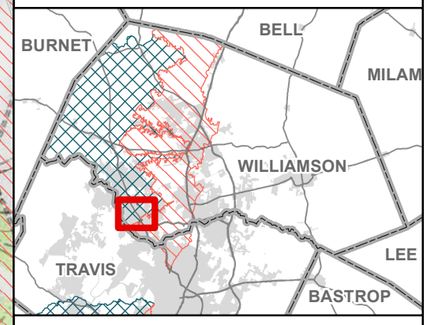
County Boundary

Edwards Aquifer

Recharge Zone

Contributing Zone

- Edwards Aquifer Regulatory Boundary TCEQ, 2023
- 7.5 Minute USGS Topographic Quads LEANDER and JOLLYVILLE



0 1,000 2,000 Feet

1:24,000

halff

Service Layer Credits: Copyright:© 2013 National Geographic Society, i-cubed

Attachment C:

Project Description:

US Highway 183A currently does not have frontage roads along the entirety from Avery Ranch Boulevard to Ranch to Market Road 1431 (RM 1431), approximately 2.8 miles along the centerline of US 183A. The portion of this project that is south of Brushy Creek is within the Edwards Aquifer Recharge Zone while the rest of the project is within the Edwards Aquifer Contributing Zone. Since a portion of this project lies within the Edwards Aquifer Recharge Zone, the entire project is to be treated as per the Recharge Zone rules. To comply with the Texas Commission on Environmental Quality (TCEQ) rules for Edwards Aquifer compliance, treatment must be provided for 80% of the increased sediment load. The existing Best Management Practices (BMPs) for the main lanes of US 183A are a combination of extended detention ponds, sand filter ponds, vegetated filter strips, and combination vegetated filter strip/grassy swales. To address the increase in sediment load from the new impervious cover added by the proposed frontage roads, existing water quality measures were evaluated for existing treatment capacity and treatment capacity remaining.

The existing Water Pollution Abatement Plan (WPAP) prepared in 2004, provides treatment for the existing mainlanes and future expansion of the roadway (more details below). This proposed WPAP supersedes the existing and took calculations back to a "Day 1" scenario starting from an impervious cover amount seen in aerial imagery from 1994 due to the extensive changes being made to the existing and proposed treatment options. The proposed treatments for the future conditions are extended detention, sand filtration, jellyfish filters, vegetated filter strips, and grassy swales. In most areas of the project, in-series treatment will be utilized to achieve the 80% treatment required.

- **Identifier: 04071601 (US 183A; East of the Existing US 183 from Avery Ranch Boulevard North to the Existing US 183 and the South Fork San Gabriel River; Austin ETJ, Cedar Park, and Leander, Texas)**
    - Held by CTRMA - **WPAP**
    - Approved September 30, 2004
        - The project limits are located within the proposed US 183A frontage road project limits. The existing mainlane geometry will be used, and ramps and frontage roads will be added. The existing water quality ponds (Warrior, Longhorn, Lobo, Aggie, and Elbow) will all remain in place. Some existing grassy swales and vegetated filter strips will remain however many of them will be removed for the addition of the frontage roads. The existing WPAP required a removal of 112,363 lbs/year and removed 112,437 lbs/year.
    - **Recommendation: Supersede WPAP** from Avery Ranch Blvd to RM 1431

ATTACHMENT D – Factors Affecting Water Quality

The utility improvements associated with the proposed drainage, and roadway improvements has some potential to affect the water quality in a number of ways.

During construction, exposed and disturbed soil will be a source of sediment for storm water runoff. Material storage and application (concrete and asphalt) may be a potential source of water pollution. Sanitary portable toilets also have a possibility of affecting water quality. Additionally, any spill of hazardous material, during or after construction, will affect water quality.

The proposed improvements will increase impervious cover greatly compared to the existing roadway configuration.

The proposed TCEQ certified BMPs (Jellyfish Filters, Grassy Swales, Sand Filters, Vegetated Filter Strips, and Extended Detention) will be utilized to treat the increase in impervious cover.

Attachment E: BMPs for Upgradient (Offsite) Stormwater

Any offsite flows will be routed to the same BMPs that are used for the onsite flows.

Vegetative Filter Strips:

Filter strips, also known as vegetated buffer strips, are vegetated sections of land similar to grassy swales, except they are essentially flat with low slopes, and are designed only to accept runoff as overland sheet flow.

Jellyfish Filter:

The Jellyfish® Filter is an engineered stormwater quality treatment technology featuring unique membrane filtration in a compact stand-alone treatment system that removes a wide variety of stormwater pollutants. The Jellyfish® Filter integrates pre-treatment and filtration with passive self-cleaning mechanisms. The system utilizes membrane filtration cartridges with very high filtration surface area and flow capacity, which provide the advantages of high sediment capacity and low filtration flux rate (flow per unit surface area) at relatively low driving head compared to conventional filter systems. Each lightweight Jellyfish® Filter cartridge consists of multiple detachable membrane encased filter elements (“filtration tentacles”) attached to a cartridge head plate.

Grassy Swales:

Grassy swales are vegetated channels that convey stormwater and remove pollutants by sedimentation and infiltration through soil. They require shallow slopes and soils that drain well. Pollutant removal capability is related to channel dimensions, longitudinal slope, and amount of vegetation. Optimum design of these components will increase contact time of runoff through the swale and improve pollutant removal rates.

Extended Detention:

Extended detention basins are normally used to remove particulate pollutants and to reduce maximum runoff rates associated with development to their pre-development levels. The water quality benefits are the removal of sediment and buoyant materials. Furthermore, nutrients, heavy metals, toxic materials, and oxygen-demanding materials associated with the particles also are removed. The control of the maximum runoff rates serves to protect drainage channels below the device from erosion and to reduce downstream flooding. Although detention facilities designed for flood control have different design requirements than those used for water quality enhancement, it is possible to achieve these two objectives in a single facility.

Sand Filters:

Sand filters consist of basins that capture stormwater runoff and then filter the runoff through a bed of sand in the floor of the facility. These BMPs can be configured as either a single basin or as separate sedimentation and filtration basins. These facilities should be installed at grade to facilitate drying out of the sand between storm events.

Attachment F: BMPs for On-site Stormwater

Vegetative Filter Strips:

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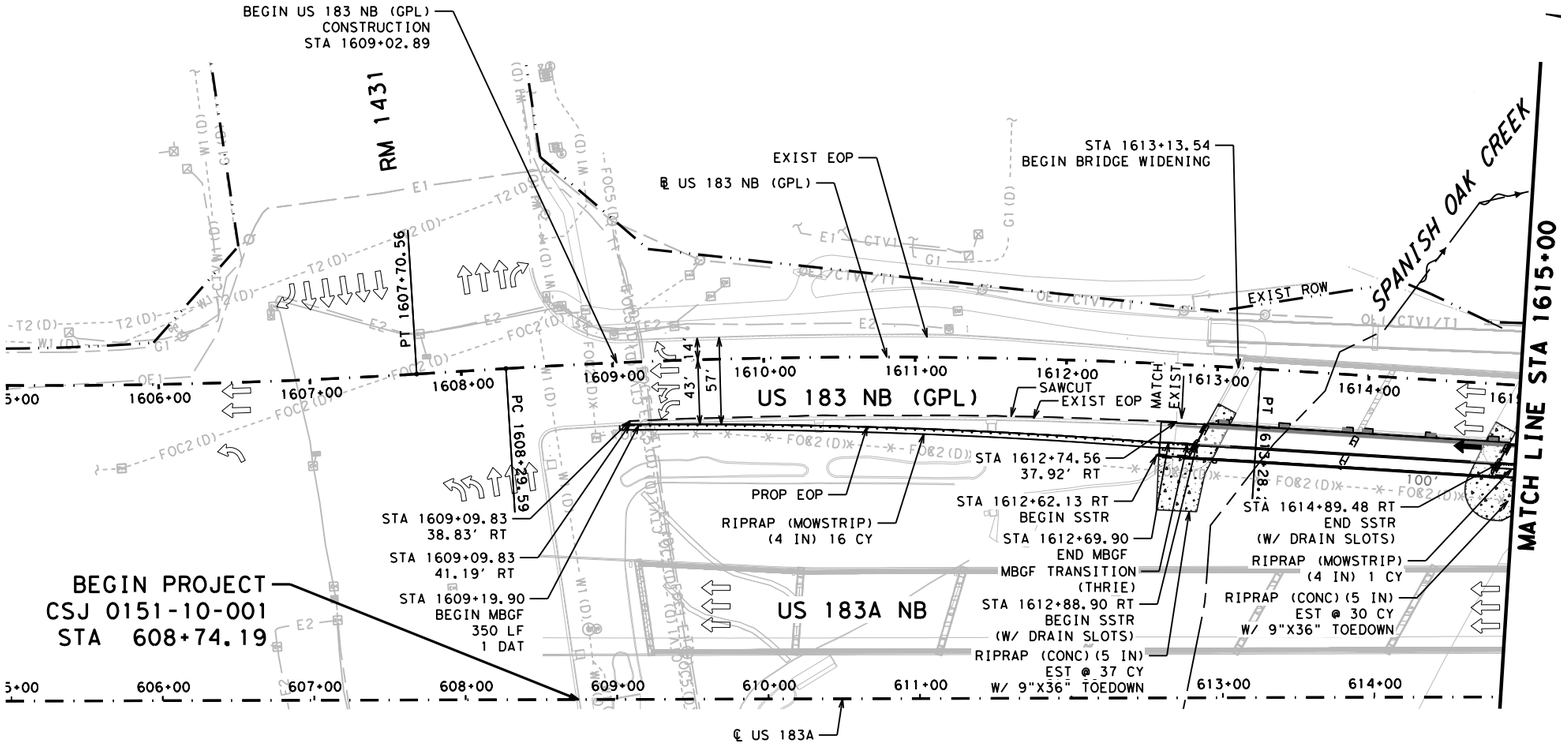
Attachment G: Construction Plans

- Roadway Plan and Profiles
- BMP plans and details (WQ Layouts)
- Erosion Control & SW3P
- Design Calculations
- EPIC

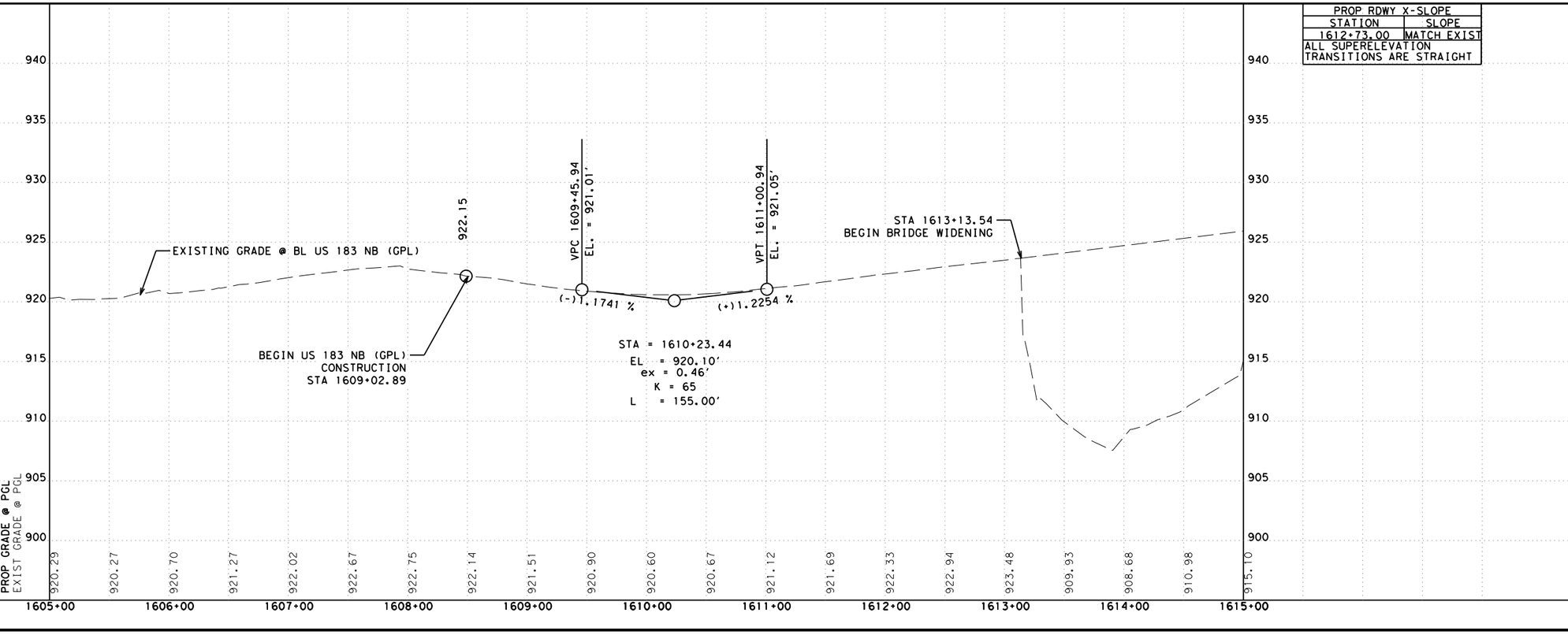


LEGEND

- EXIST TRAFFIC FLOW ARROW
- PROP TRAFFIC FLOW ARROW
- RETAINING WALL
- NOISE WALL
- TEMPORARY SPECIAL SHORING WALL
- ROCK CUT WALL
- PROP CRCP
- CONCRETE RIPRAP
- PROPERTY EASEMENT
- [X] DRIVEWAY ID
- W T2" EXISTING UTILITY

NOTES

1. EXISTING FEATURES AND PROPOSED FEATURES NOT DETAILED ON THIS SHEET ARE SHOWN SCREENED BACK; i.e. FADED.
2. SEE HORIZONTAL ALIGNMENT DATA SHEETS FOR HORIZONTAL ALIGNMENT DATA.
3. SEE INTERSECTION DETAIL SHEETS FOR INTERSECTION INFORMATION.
4. SEE PAVEMENT MARKING SHEETS FOR STRIPING AND TRAFFIC FLOW DETAILS.
5. SEE NB SUP PLAN AND PROFILE SHEETS FOR SHARED-USE PATH INFORMATION.
6. SEE RAMP PLAN AND PROFILE SHEETS FOR RAMP INFORMATION.
7. SEE BRUSHY CREEK LOOP PLAN AND PROFILE SHEETS FOR BRUSHY CREEK LOOP INFORMATION.
8. SEE NB PLAN AND PROFILE SHEETS FOR FOR US 183 NB GPL INFORMATION AND SB PLAN AND PROFILE SHEETS FOR US 183 SB GPL INFORMATION.
9. THE PROFILE DATA IS A GUIDE AND FOR DESIGN VERIFICATION PURPOSES ONLY. CONSTRUCT THE PAVEMENT IN ACCORDANCE WITH THE TYPICAL SECTION.
10. THE HORIZONTAL DATA IS A GUIDE AND FOR DESIGN VERIFICATION PURPOSES ONLY. CONSTRUCT THE PAVEMENT IN ACCORDANCE WITH THE TYPICAL SECTION.



PROP RDWY X-SLOPE	
STATION	SLOPE
1612+73.00	MATCH EXIST
ALL SUPERELEVATION TRANSITIONS ARE STRAIGHT	

DESIGN

STATE OF TEXAS — MARISSA GUZMAN — 130772 — LICENSED PROFESSIONAL ENGINEER

MARISSA GUZMAN, P.E.
2/28/2024
DATE

APPROVAL

STATE OF TEXAS — DAN THOMA — 98622 — LICENSED PROFESSIONAL ENGINEER

DAN THOMA, P.E.
2/28/2024
DATE

0 50 100
SCALE: PLAN 1" = 100'
PROFILE: 1" = 10'

PAPE-DAWSON ENGINEERS
SAN ANTONIO | AUSTIN | HOUSTON | FORT WORTH | DALLAS
2000 NW LOOP 410 | SAN ANTONIO, TX 78213 | 210.375.9000
TEXAS ENGINEERING FIRM #470 | TEXAS SURVEYING FIRM #10028800

2024 Texas Department of Transportation

US 183 GPL
NB
PLAN & PROFILE

SHEET 1 OF 16

© 2024		CONT	SECT	JOB	HIGHWAY
DS:	CK:	0151	10	001	US 183
DW:	CK:	DIST	COUNTY		SHEET NO.
		AUS	WILLIAMSON		266

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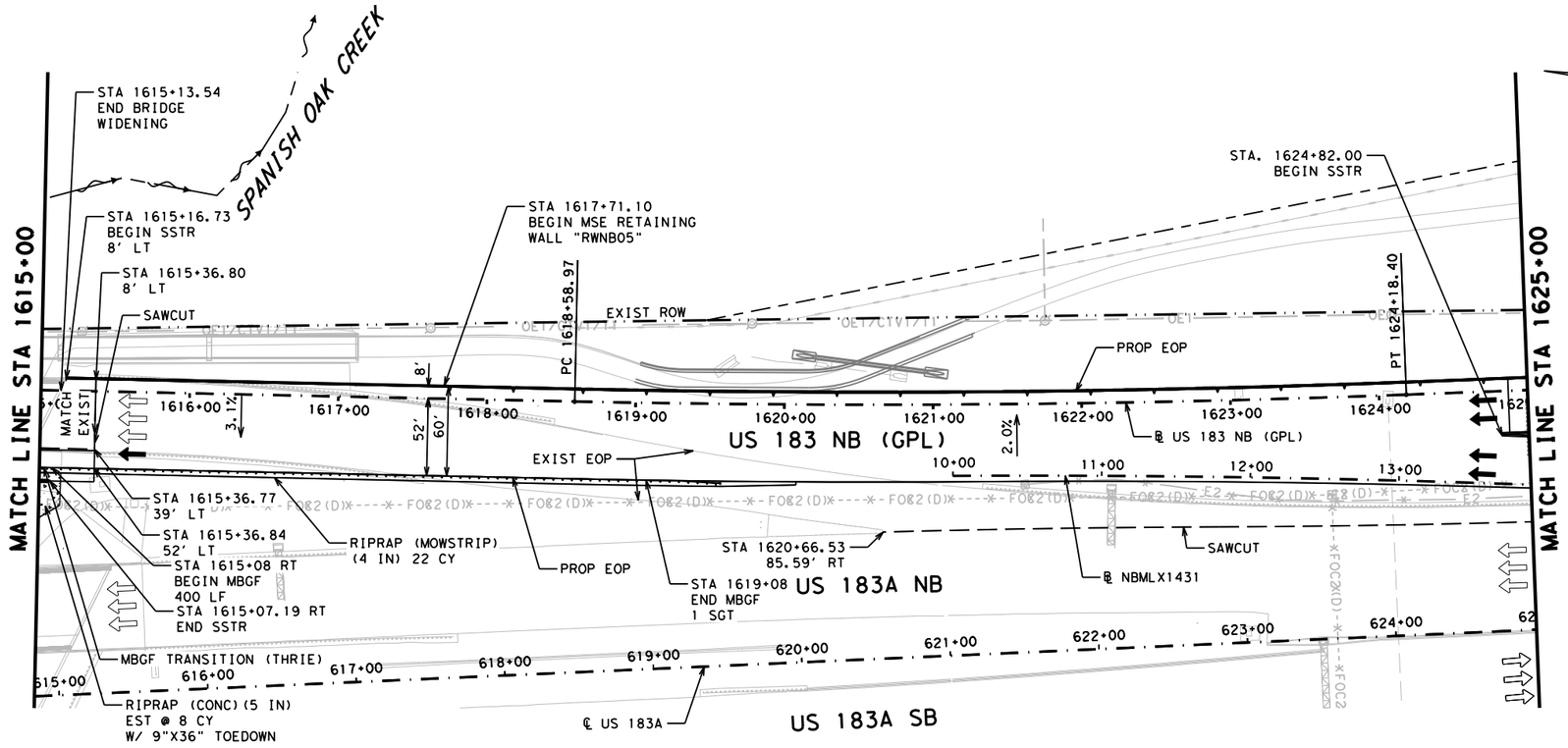

LEGEND

- EXIST TRAFFIC FLOW ARROW
- PROP TRAFFIC FLOW ARROW
- RETAINING WALL
- NOISE WALL
- TEMPORARY SPECIAL SHORING WALL
- ROCK CUT WALL
- PROP CRCP
- CONCRETE RIPRAP
- PROPERTY EASEMENT
- [X] DRIVEWAY ID
- W 12" EXISTING UTILITY

NOTES

1. EXISTING FEATURES AND PROPOSED FEATURES NOT DETAILED ON THIS SHEET ARE SHOWN SCREENED BACK; i.e. FADED.
2. SEE HORIZONTAL ALIGNMENT DATA SHEETS FOR HORIZONTAL ALIGNMENT DATA.
3. SEE INTERSECTION DETAIL SHEETS FOR INTERSECTION INFORMATION.
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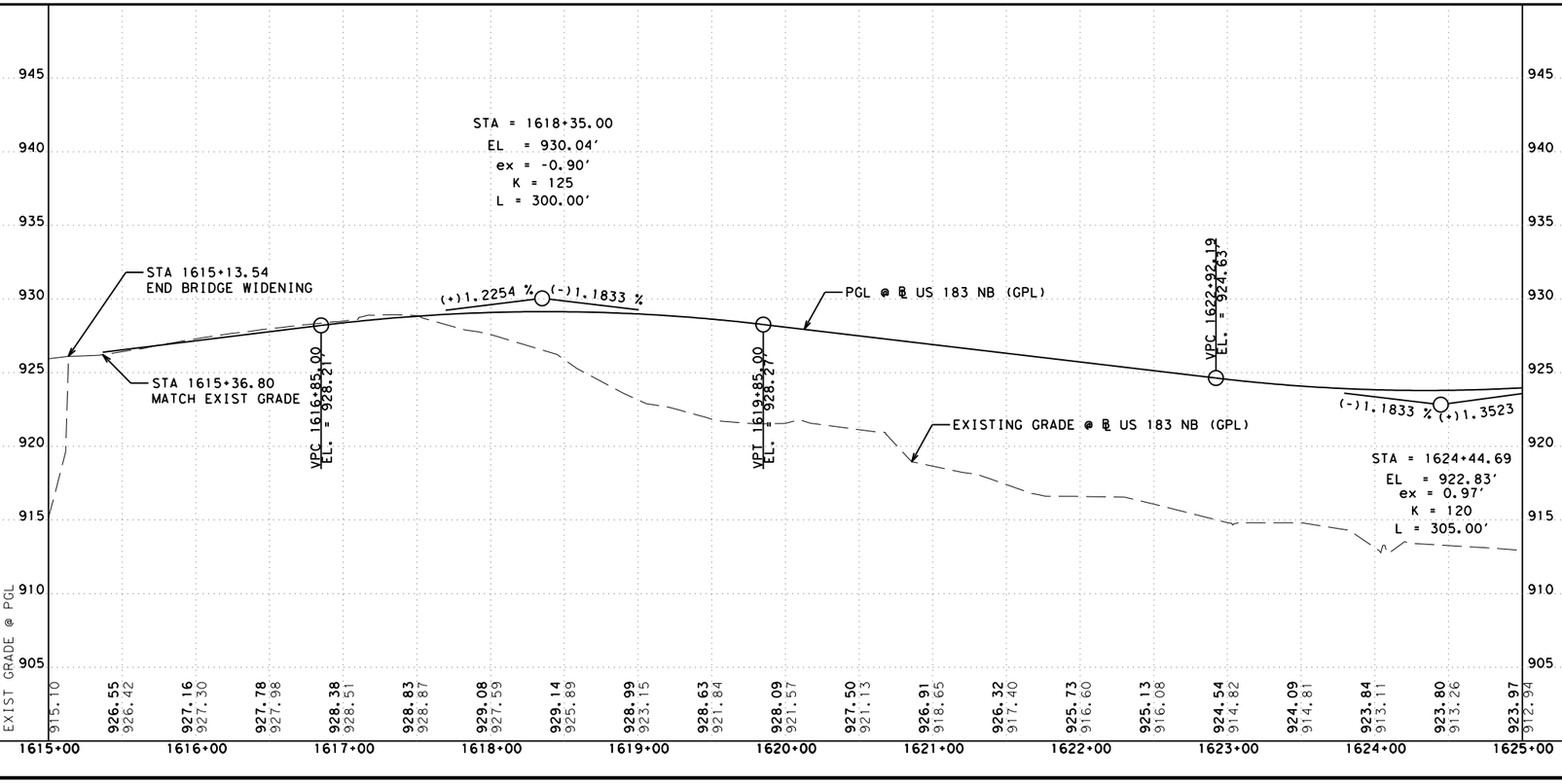
7. SEE BRUSHY CREEK LOOP PLAN AND PROFILE SHEETS FOR BRUSHY CREEK LOOP INFORMATION.
8. SEE NB PLAN AND PROFILE SHEETS FOR FOR US 183 NB GPL INFORMATION AND SB PLAN AND PROFILE SHEETS FOR US 183 SB GPL INFORMATION.



PROP RDWY X-SLOPE	
STATION	SLOPE
1615+36.80	MATCH EXIST
1616+35.00	-3.10%
1621+56.00	2.00%
ALL SUPERELEVATION TRANSITIONS ARE STRAIGHT	

DESIGN

STATE OF TEXAS · MARISSA GUZMAN · 130772 · LICENSED PROFESSIONAL ENGINEER

MARISSA GUZMAN, P.E.
4/17/2024
DATE

APPROVAL

STATE OF TEXAS · DAN THOMA · 98622 · LICENSED PROFESSIONAL ENGINEER

DAN THOMA, P.E.
4/17/2024
DATE

0 50 100
SCALE: PLAN 1" = 100'
PROFILE: 1" = 10'

PAPE-DAWSON ENGINEERS
SAN ANTONIO | AUSTIN | HOUSTON | FORT WORTH | DALLAS
2000 NW LOOP 410 | SAN ANTONIO, TX 78213 | 210.375.9000
TEXAS ENGINEERING FIRM #470 | TEXAS SURVEYING FIRM #10028800

2024
Texas Department of Transportation

US 183 GPL
NB
PLAN & PROFILE

SHEET 2 OF 16

© 2024		CONT	SECT	JOB	HIGHWAY
DS:	CK:	0151	10	001	US 183
DW:	CK:	DIST	COUNTY		SHEET NO.
		AUS	WILLIAMSON		267

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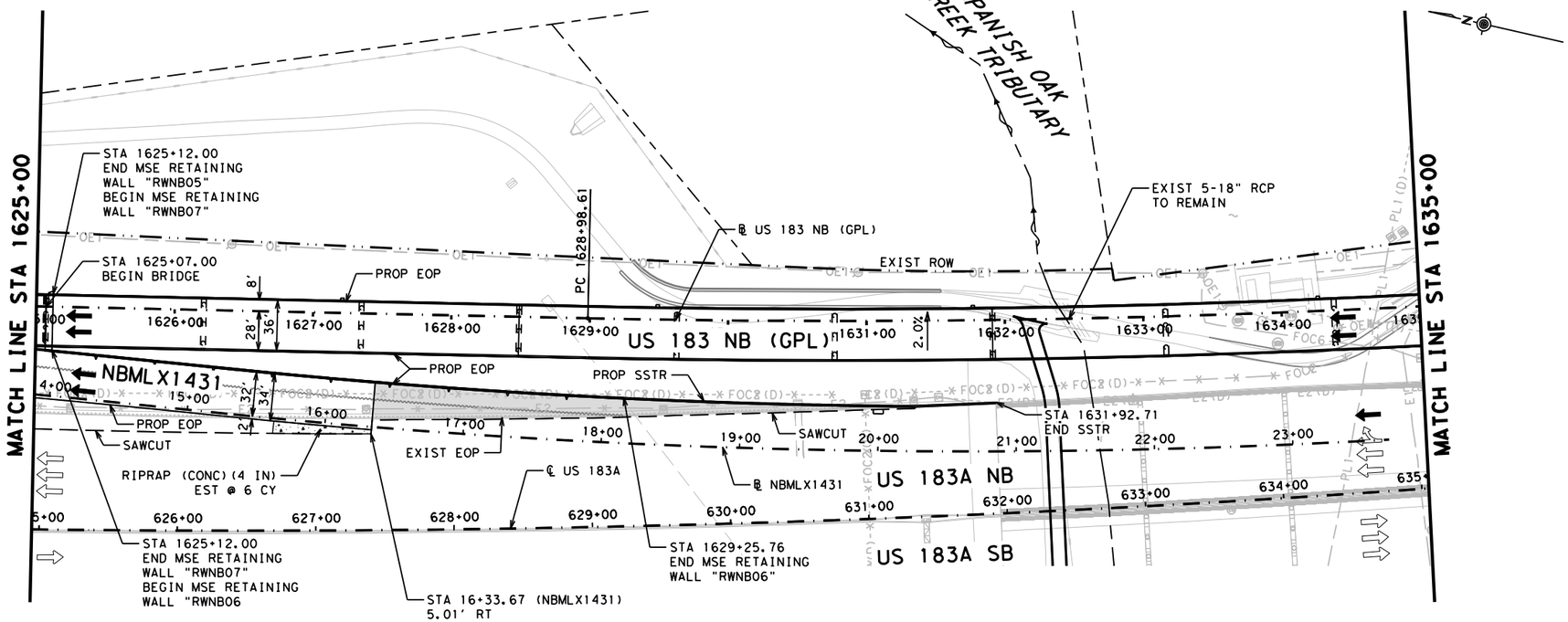

LEGEND

- EXIST TRAFFIC FLOW ARROW
- PROP TRAFFIC FLOW ARROW
- RETAINING WALL
- NOISE WALL
- TEMPORARY SPECIAL SHORING WALL
- ROCK CUT WALL
- PROP CRCP
- CONCRETE RIPRAP
- PROPERTY EASEMENT
- [X] DRIVEWAY ID
- W 12" EXISTING UTILITY

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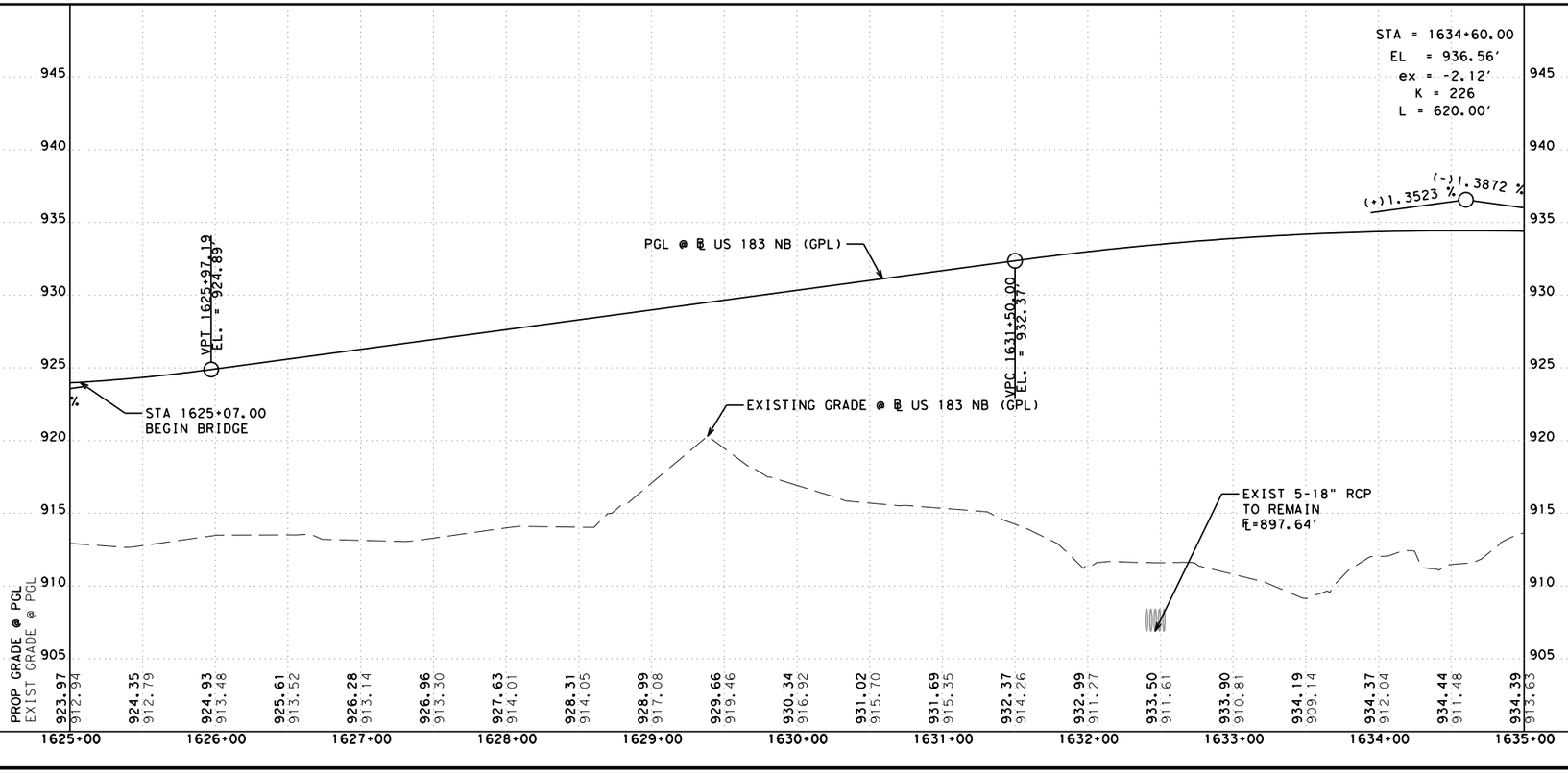

PROP RDWY X-SLOPE	
STATION	SLOPE
ALL SUPERELEVATION TRANSITIONS ARE STRAIGHT	

DESIGN

STATE OF TEXAS — MARISSA GUZMAN — 130772 — LICENSED PROFESSIONAL ENGINEER

MARISSA GUZMAN, P.E.

11/8/2023
DATE

APPROVAL

STATE OF TEXAS — DAN THOMA — 98622 — LICENSED PROFESSIONAL ENGINEER

DAN THOMA, P.E.

11/8/2023
DATE

0 50 100

SCALE: PLAN 1" = 100'
PROFILE: 1" = 10'

PAPE-DAWSON ENGINEERS
SAN ANTONIO | AUSTIN | HOUSTON | FORT WORTH | DALLAS
2000 NW LOOP 410 | SAN ANTONIO, TX 78213 | 210.375.9000
TEXAS ENGINEERING FIRM #470 | TEXAS SURVEYING FIRM #10028800

2023 Texas Department of Transportation

US 183 GPL
NB
PLAN & PROFILE

SHEET 3 OF 16

© 2023		CONT	SECT	JOB	HIGHWAY
DS:	CK:	0151	10	001	US 183
DW:	CK:	DIST	COUNTY		SHEET NO.
		AUS	WILLIAMSON		268

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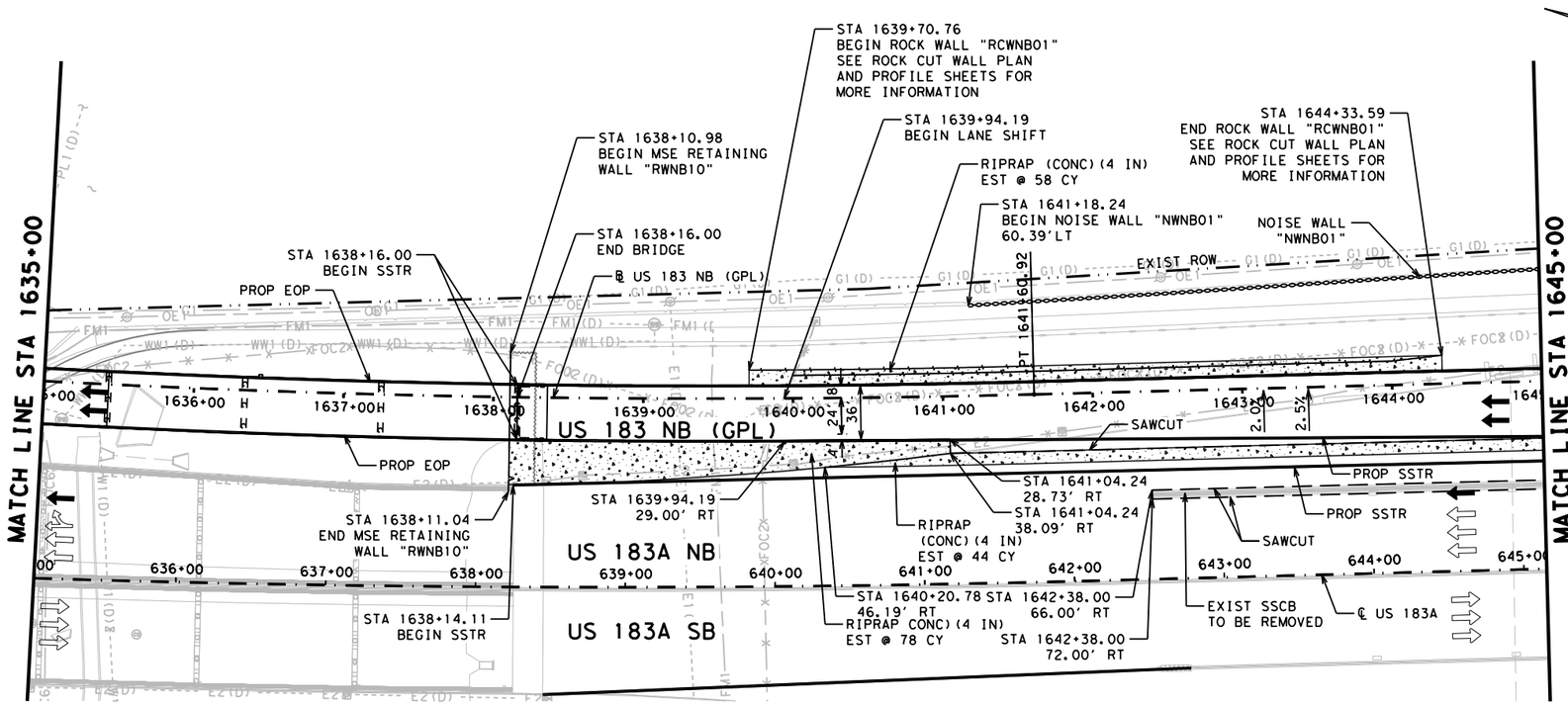

LEGEND

- EXIST TRAFFIC FLOW ARROW
- PROP TRAFFIC FLOW ARROW
- RETAINING WALL
- NOISE WALL
- TEMPORARY SPECIAL SHORING WALL
- ROCK CUT WALL
- PROP CRCP
- CONCRETE RIPRAP
- PROPERTY EASEMENT
- DRIVEWAY ID
- EXISTING UTILITY

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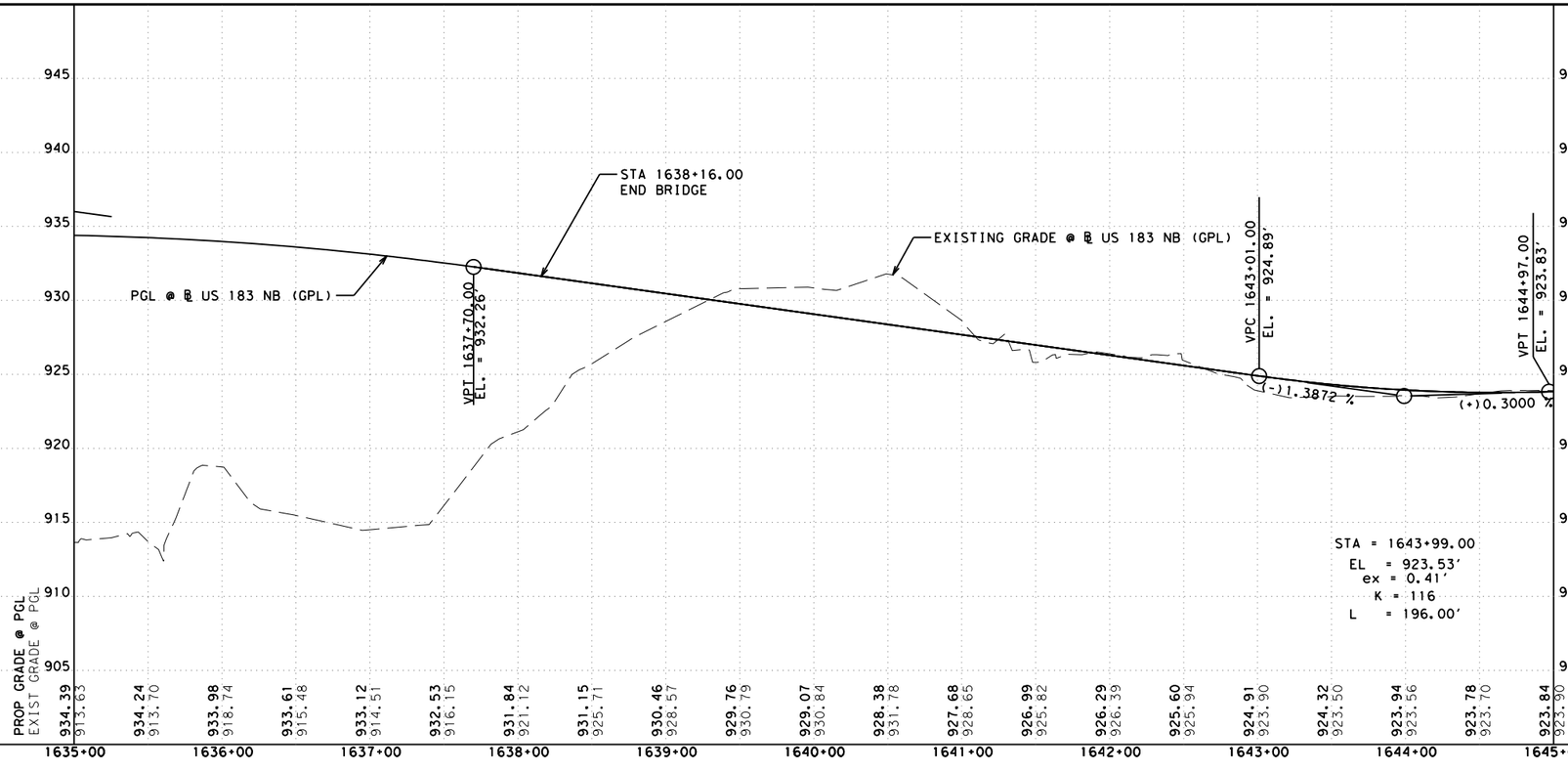

PROP RDWY X-SLOPE	
STATION	SLOPE
1643+14.00	2.00%
1643+44.00	2.50%
ALL SUPERELEVATION TRANSITIONS ARE STRAIGHT	

DESIGN

STATE OF TEXAS — MARISSA GUZMAN — 130772 — LICENSED PROFESSIONAL ENGINEER

MARISSA GUZMAN, P.E.

11/8/2023
DATE

APPROVAL

STATE OF TEXAS — DAN THOMA — 98622 — LICENSED PROFESSIONAL ENGINEER

DAN THOMA, P.E.

11/8/2023
DATE

0 50 100

SCALE: PLAN 1" = 100'
PROFILE: 1" = 10'

PAPE-DAWSON ENGINEERS
SAN ANTONIO | AUSTIN | HOUSTON | FORT WORTH | DALLAS
2000 NW LOOP 410 | SAN ANTONIO, TX 78213 | 210.375.9000
TEXAS ENGINEERING FIRM #470 | TEXAS SURVEYING FIRM #10028800

2023
Texas Department of Transportation

US 183 GPL
NB
PLAN & PROFILE

SHEET 4 OF 16

© 2023		CONT	SECT	JOB	HIGHWAY
DS:	CK:	0151	10	001	US 183
DW:	CK:	DIST	COUNTY		SHEET NO.
		AUS	WILLIAMSON		269

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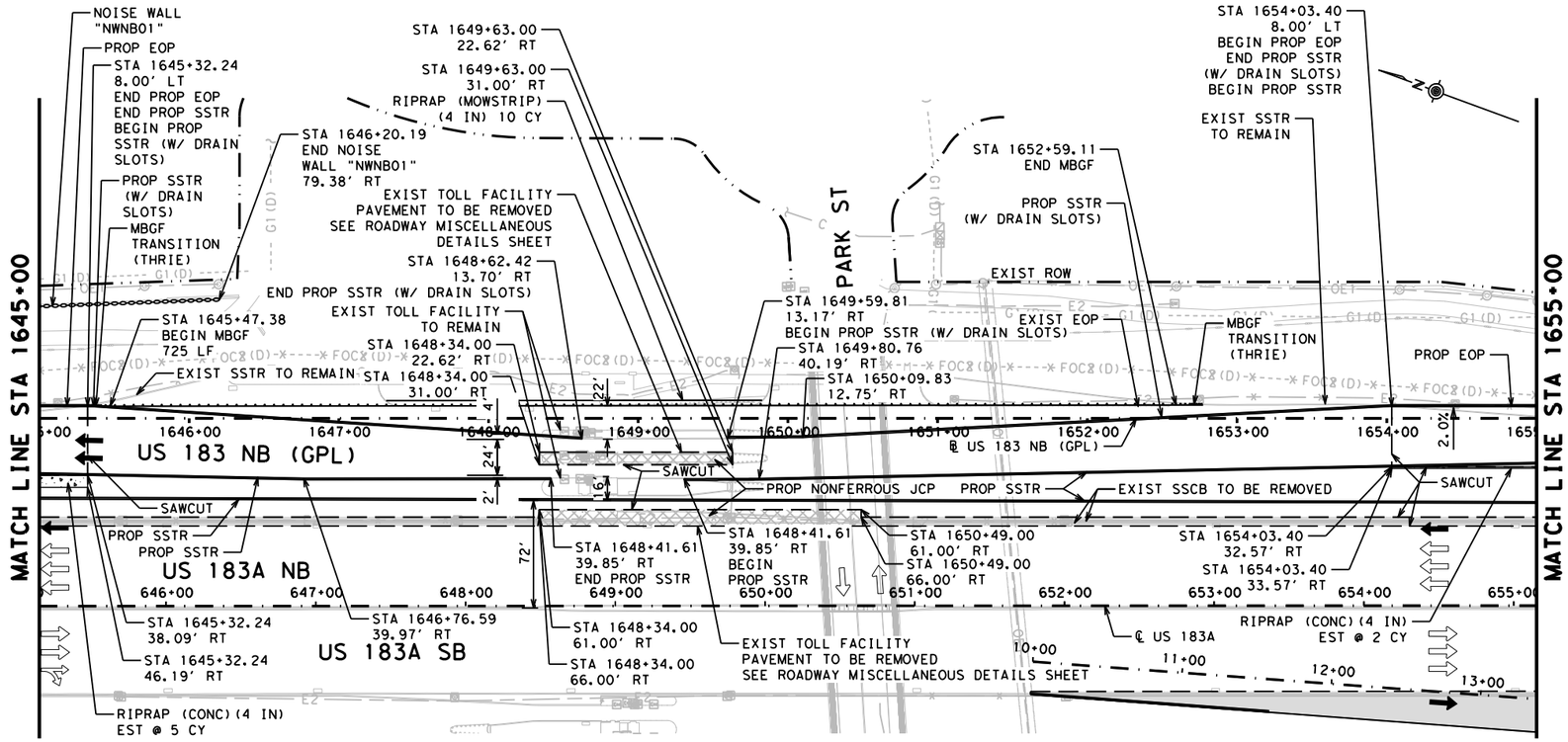

LEGEND

- EXIST TRAFFIC FLOW ARROW
- PROP TRAFFIC FLOW ARROW
- RETAINING WALL
- NOISE WALL
- TEMPORARY SPECIAL SHORING WALL
- ROCK CUT WALL
- PROP CRCP
- CONCRETE RIPRAP
- PROPERTY EASEMENT
- [X] DRIVEWAY ID
- W 12" EXISTING UTILITY

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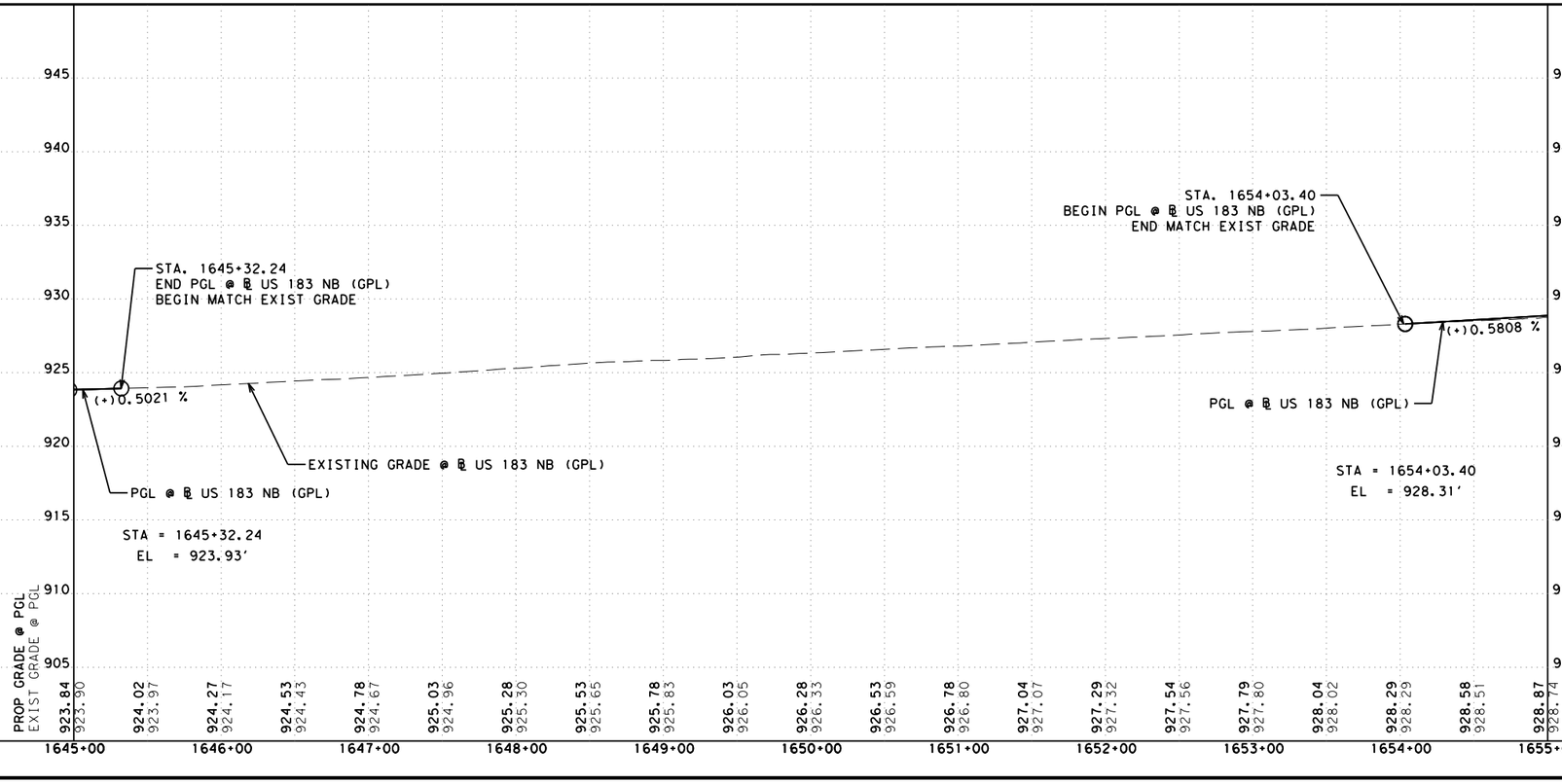

PROP RDWY X-SLOPE	
STATION	SLOPE
1645+32.24	MATCH EXIST
1654+03.00	MATCH EXIST
1654+30.00	2.00%
ALL SUPERELEVATION TRANSITIONS ARE STRAIGHT	

*NOTE EXIST CONC PAVEMENT TO REMAIN STA 1645+32.24 TO STA 1654+03.40

DESIGN

STATE OF TEXAS · MARISSA GUZMAN · 130772 · LICENSED PROFESSIONAL ENGINEER

MARISSA GUZMAN, P.E.
4/11/2024
DATE

APPROVAL

STATE OF TEXAS · DAN THOMA · 98622 · LICENSED PROFESSIONAL ENGINEER

DAN THOMA, P.E.
4/11/2024
DATE

0 50 100
SCALE: PLAN 1" = 100'
PROFILE: 1" = 10'

PAPE-DAWSON ENGINEERS
SAN ANTONIO | AUSTIN | HOUSTON | FORT WORTH | DALLAS
2000 NW LOOP 410 | SAN ANTONIO, TX 78213 | 210.375.9000
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2024 Texas Department of Transportation

US 183 GPL
NB
PLAN & PROFILE

SHEET 5 OF 16

© 2024		CONT	SECT	JOB	HIGHWAY
DS:	CK:	0151	10	001	US 183
DW:	CK:	DIST	COUNTY		SHEET NO.
		AUS	WILLIAMSON		270

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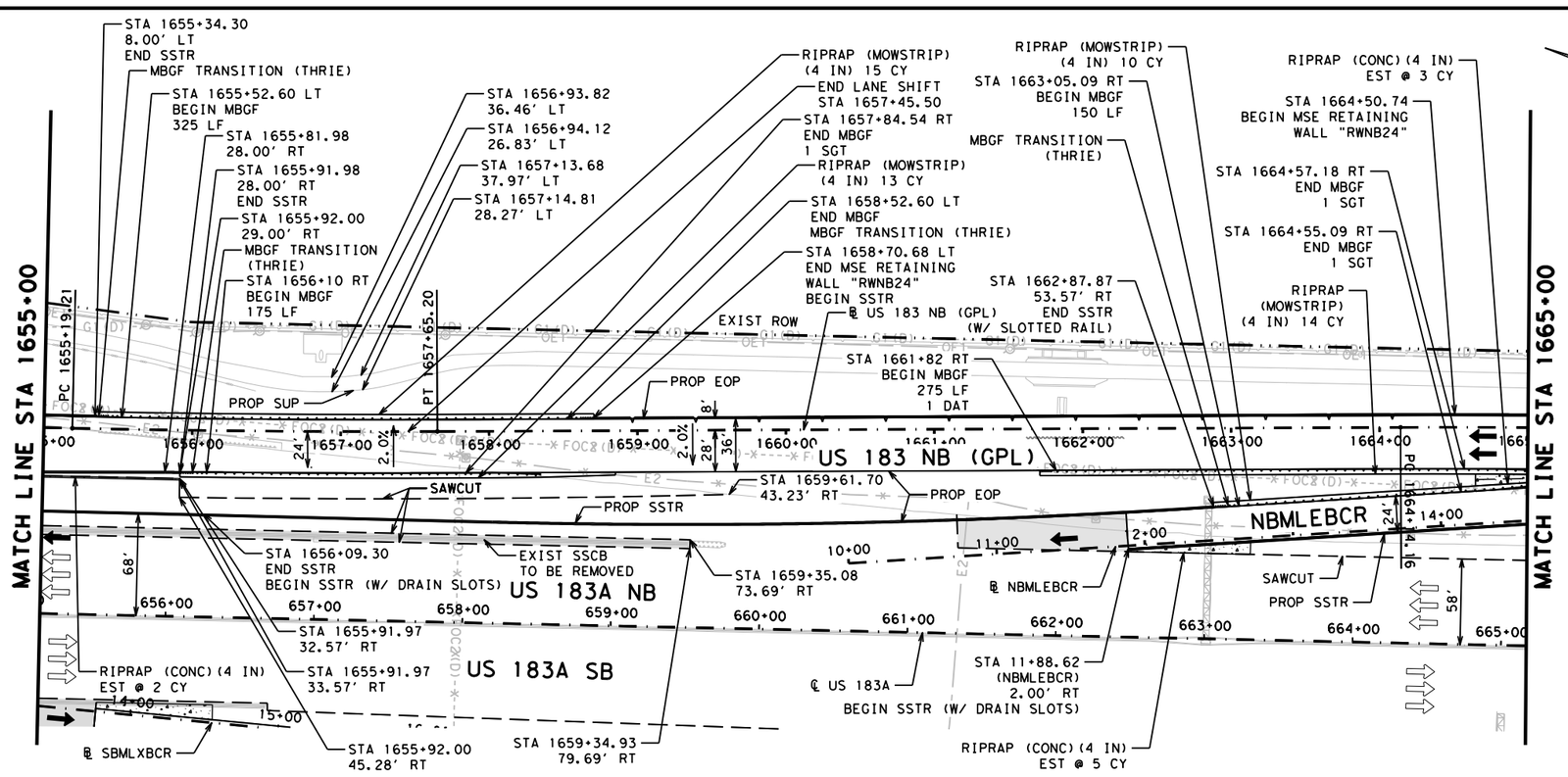

LEGEND

- EXIST TRAFFIC FLOW ARROW
- PROP TRAFFIC FLOW ARROW
- RETAINING WALL
- NOISE WALL
- TEMPORARY SPECIAL SHORING WALL
- ROCK CUT WALL
- PROP CRCP
- CONCRETE RIPRAP
- PROPERTY EASEMENT
- [X] DRIVEWAY ID
- W 12" EXISTING UTILITY

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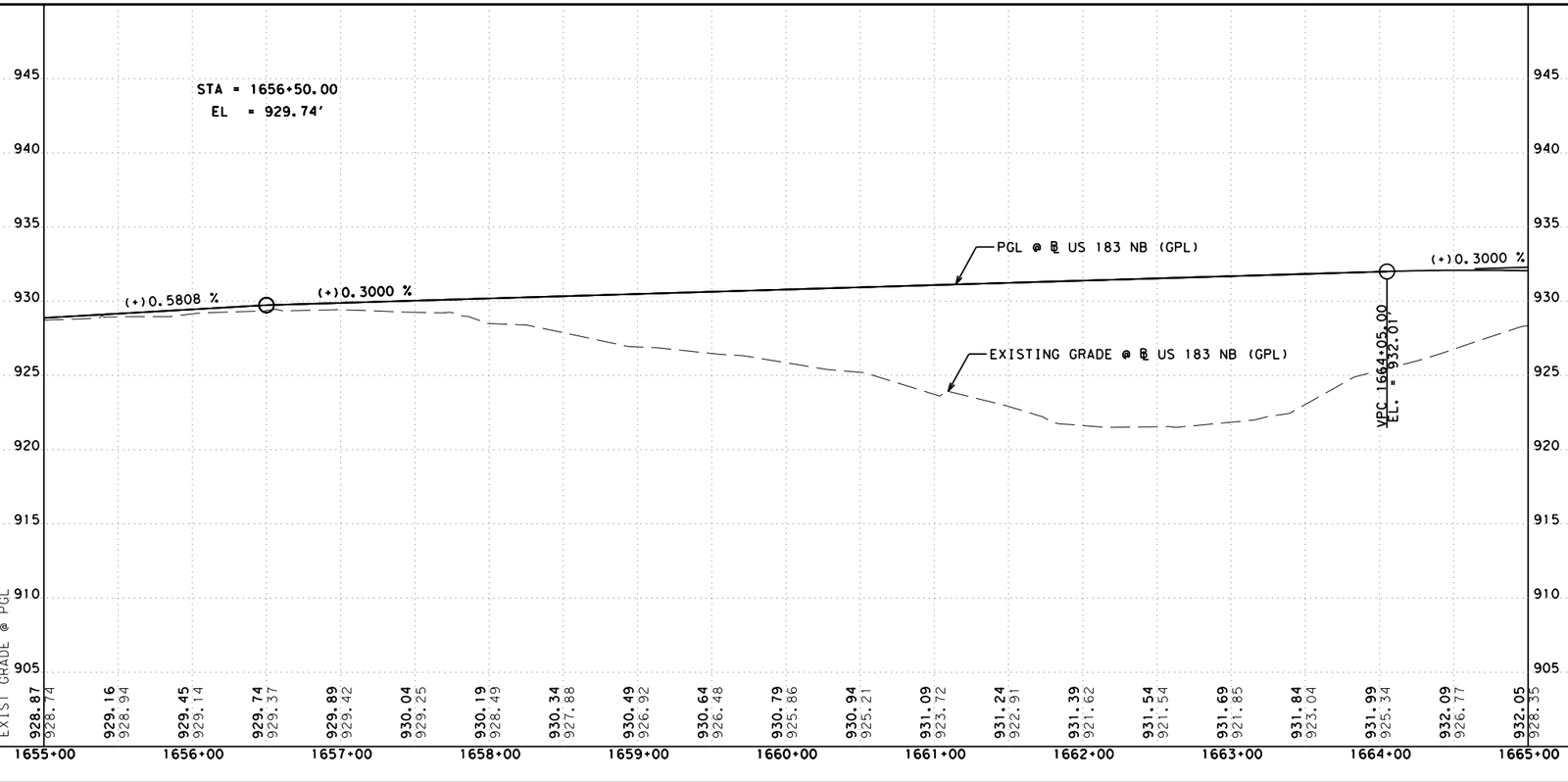
8. SEE NB PLAN AND PROFILE SHEETS FOR FOR US 183 NB GPL INFORMATION AND SB PLAN AND PROFILE SHEETS FOR US 183 SB GPL INFORMATION.



PROP RDWY X-SLOPE	
STATION	SLOPE
1657+24.00	2.00%
1659+29.00	-2.00%
ALL SUPERELEVATION TRANSITIONS ARE STRAIGHT	

DESIGN

STATE OF TEXAS · MARISSA GUZMAN · 130772 · LICENSED PROFESSIONAL ENGINEER

MARISSA GUZMAN, P.E.
4/17/2024
DATE

APPROVAL

STATE OF TEXAS · DAN THOMA · 98622 · LICENSED PROFESSIONAL ENGINEER

DAN THOMA, P.E.
4/17/2024
DATE

0 50 100
SCALE: PLAN 1" = 100'
PROFILE: 1" = 10'

PAPE-DAWSON ENGINEERS
SAN ANTONIO | AUSTIN | HOUSTON | FORT WORTH | DALLAS
2000 NW LOOP 410 | SAN ANTONIO, TX 78213 | 210.375.9000
TEXAS ENGINEERING FIRM #470 | TEXAS SURVEYING FIRM #10028800

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US 183 GPL
NB
PLAN & PROFILE

SHEET 6 OF 16

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DS:	CK:	0151	10	001	US 183
DW:	CK:	DIST	COUNTY		SHEET NO.
		AUS	WILLIAMSON		271

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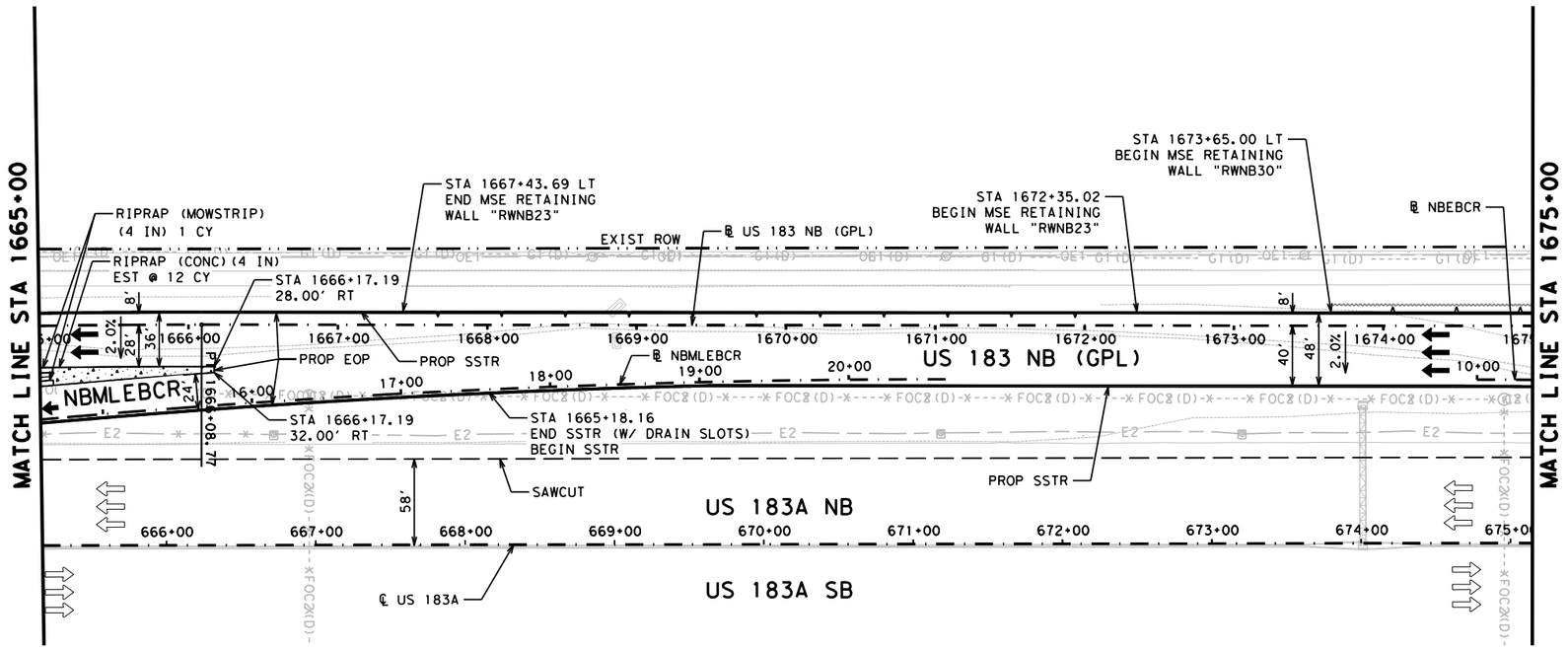

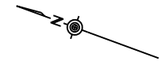

LEGEND

- EXIST TRAFFIC FLOW ARROW
- PROP TRAFFIC FLOW ARROW
- RETAINING WALL
- NOISE WALL
- TEMPORARY SPECIAL SHORING WALL
- ROCK CUT WALL
- PROP CRCP
- CONCRETE RIPRAP
- PROPERTY EASEMENT
- [X] DRIVEWAY ID
- W T2" EXISTING UTILITY

NOTES

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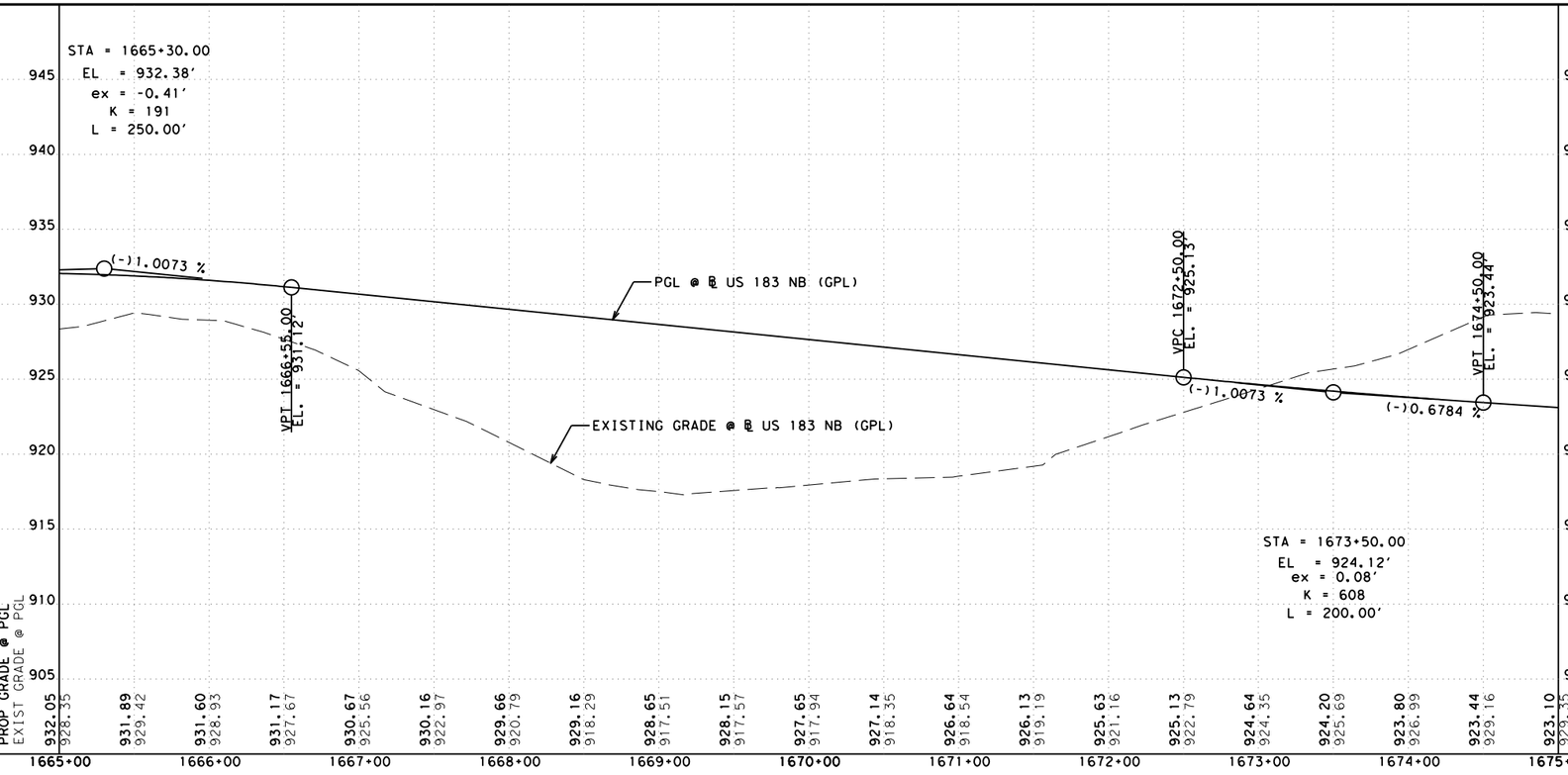

PROP RDWY X-SLOPE	
STATION	SLOPE
ALL SUPERELEVATION TRANSITIONS ARE STRAIGHT	

DESIGN

STATE OF TEXAS — MARISSA GUZMAN — 130772 — LICENSED PROFESSIONAL ENGINEER

MARISSA GUZMAN, P.E.

4/21/2023

DATE

APPROVAL

STATE OF TEXAS — DAN THOMA — 98622 — LICENSED PROFESSIONAL ENGINEER

DAN THOMA, P.E.

4/21/2023

DATE

0 50 100

SCALE: PLAN 1" = 100'
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PAPE-DAWSON ENGINEERS

SAN ANTONIO | AUSTIN | HOUSTON | FORT WORTH | DALLAS
2000 NW LOOP 410 | SAN ANTONIO, TX 78213 | 210.375.9000
TEXAS ENGINEERING FIRM #470 | TEXAS SURVEYING FIRM #10028800

2023 Texas Department of Transportation

US 183 GPL
NB
PLAN & PROFILE

SHEET 7 OF 16

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DS:	CK:	0151	10	001	US 183
DW:	CK:	DIST	COUNTY		SHEET NO.
		AUS	WILLIAMSON		272

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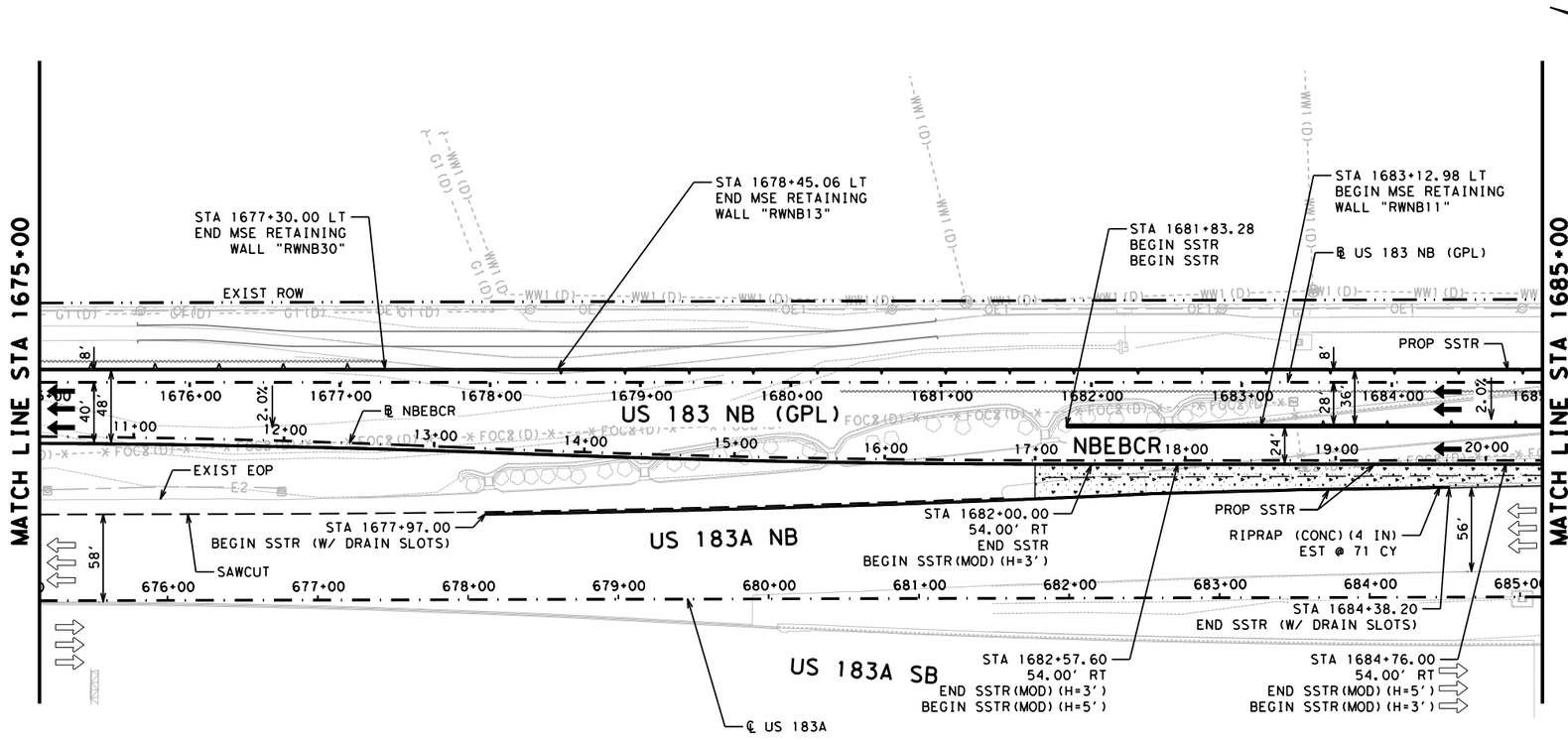

LEGEND

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- PROP TRAFFIC FLOW ARROW
- RETAINING WALL
- NOISE WALL
- TEMPORARY SPECIAL SHORING WALL
- ROCK CUT WALL
- PROP CRCP
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- PROPERTY EASEMENT
- [X] DRIVEWAY ID
- W 12" EXISTING UTILITY

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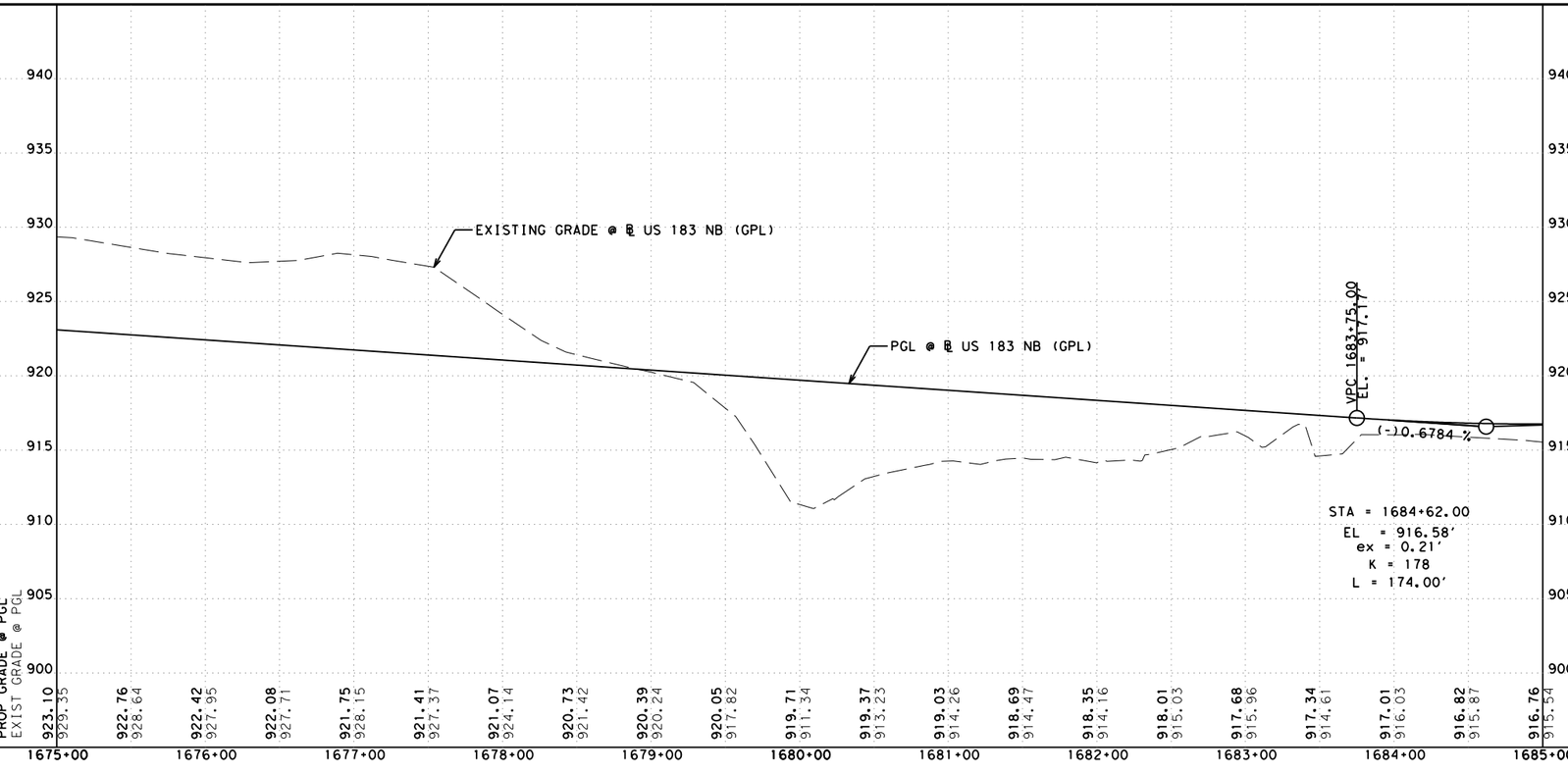

PROP RDWY X-SLOPE	
STATION	SLOPE
1684+66.00	-2.00%
ALL SUPERELEVATION TRANSITIONS ARE STRAIGHT	

DESIGN

STATE OF TEXAS — MARISSA GUZMAN — 130772 — LICENSED PROFESSIONAL ENGINEER

MARISSA GUZMAN, P.E.

4/21/2023

DATE

APPROVAL

STATE OF TEXAS — DAN THOMA — 98622 — LICENSED PROFESSIONAL ENGINEER

DAN THOMA, P.E.

4/21/2023

DATE

0 50 100

SCALE: PLAN 1" = 100'
PROFILE: 1" = 10'

PAPE-DAWSON ENGINEERS

SAN ANTONIO | AUSTIN | HOUSTON | FORT WORTH | DALLAS
2000 NW LOOP 410 | SAN ANTONIO, TX 78213 | 210.375.9000
TEXAS ENGINEERING FIRM #470 | TEXAS SURVEYING FIRM #10028800

2023 Texas Department of Transportation

US 183 GPL

NB PLAN & PROFILE

SHEET 8 OF 16

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DS:	CK:	0151	10	001	US 183
DW:	CK:	DIST	COUNTY		SHEET NO.
		AUS	WILLIAMSON		273

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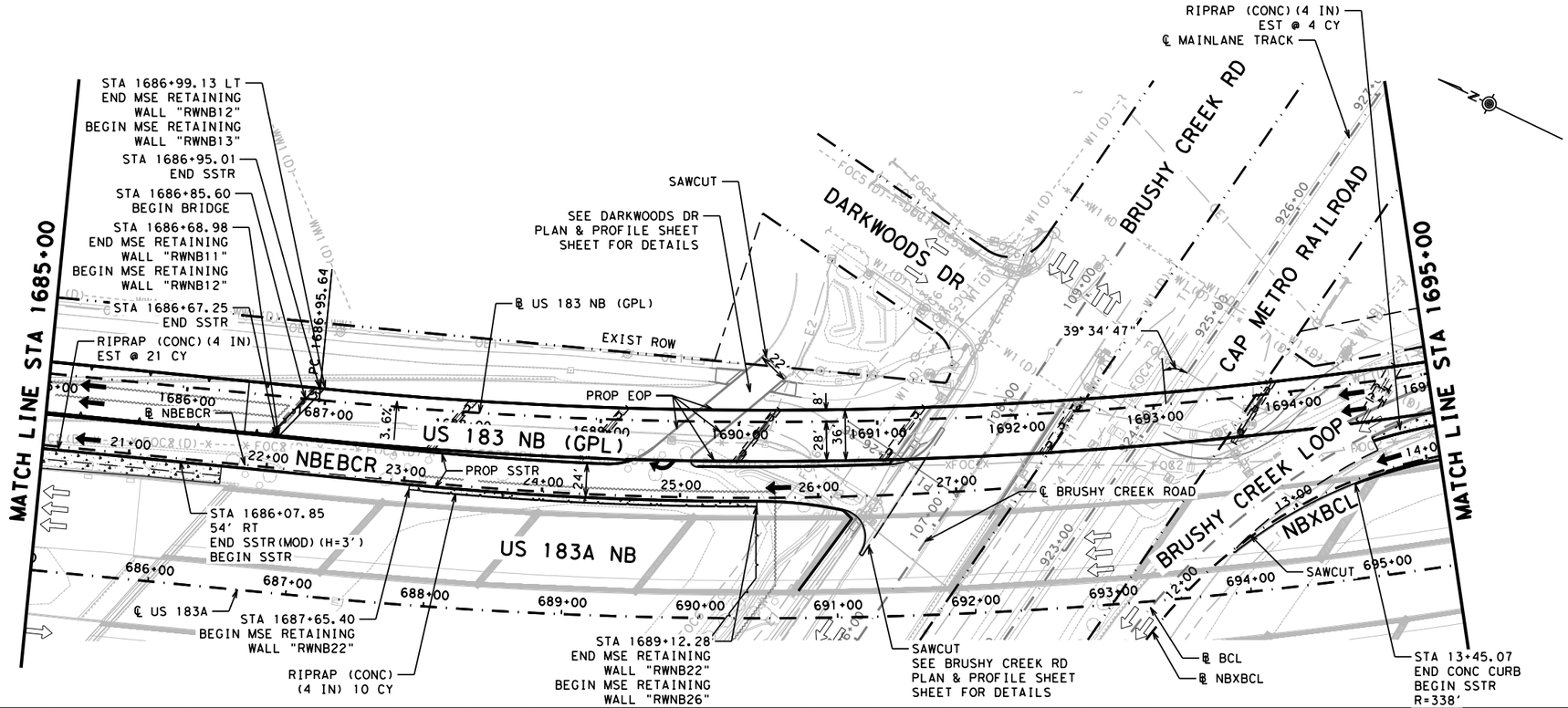

LEGEND

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- W T2" EXISTING UTILITY

NOTES

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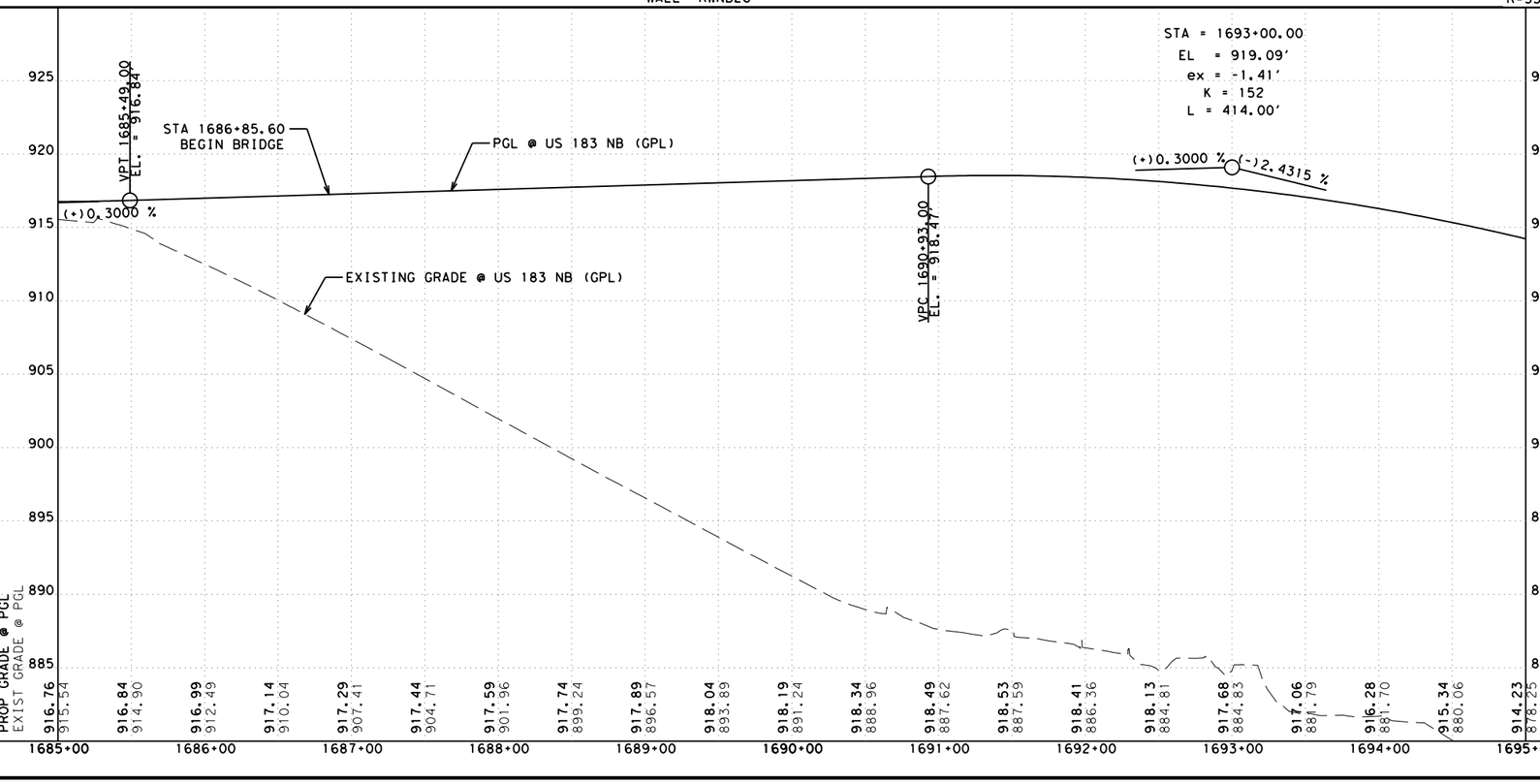
5. SEE NB SUP PLAN AND PROFILE SHEETS FOR SHARED-USE PATH INFORMATION.
6. SEE RAMP PLAN AND PROFILE SHEETS FOR RAMP INFORMATION.
7. SEE BRUSHY CREEK LOOP PLAN AND PROFILE SHEETS FOR BRUSHY CREEK LOOP INFORMATION.
8. SEE NB PLAN AND PROFILE SHEETS FOR FOR US 183 NB GPL INFORMATION AND SB PLAN AND PROFILE SHEETS FOR US 183 SB GPL INFORMATION.



PROP RDWY X-SLOPE	
STATION	SLOPE
1687+52.00	3.60%
ALL SUPERELEVATION TRANSITIONS ARE STRAIGHT	

DESIGN

STATE OF TEXAS — MARISSA GUZMAN — 130772 — LICENSED PROFESSIONAL ENGINEER

MARISSA GUZMAN, P.E.
4/21/2023
DATE

APPROVAL

STATE OF TEXAS — DAN THOMA — 98622 — LICENSED PROFESSIONAL ENGINEER

DAN THOMA, P.E.
4/21/2023
DATE

0 50 100
SCALE: PLAN 1" = 100'
PROFILE: 1" = 10'

PAPE-DAWSON ENGINEERS
SAN ANTONIO | AUSTIN | HOUSTON | FORT WORTH | DALLAS
2000 NW LOOP 410 | SAN ANTONIO, TX 78213 | 210.375.9000
TEXAS ENGINEERING FIRM #470 | TEXAS SURVEYING FIRM #10028800

2023 Texas Department of Transportation

US 183 GPL
NB
PLAN & PROFILE

SHEET 9 OF 16

© 2023		CONT	SECT	JOB	HIGHWAY
DS:	CK:	0151	10	001	US 183
DW:	CK:	DIST	COUNTY		SHEET NO.
		AUS	WILLIAMSON		274

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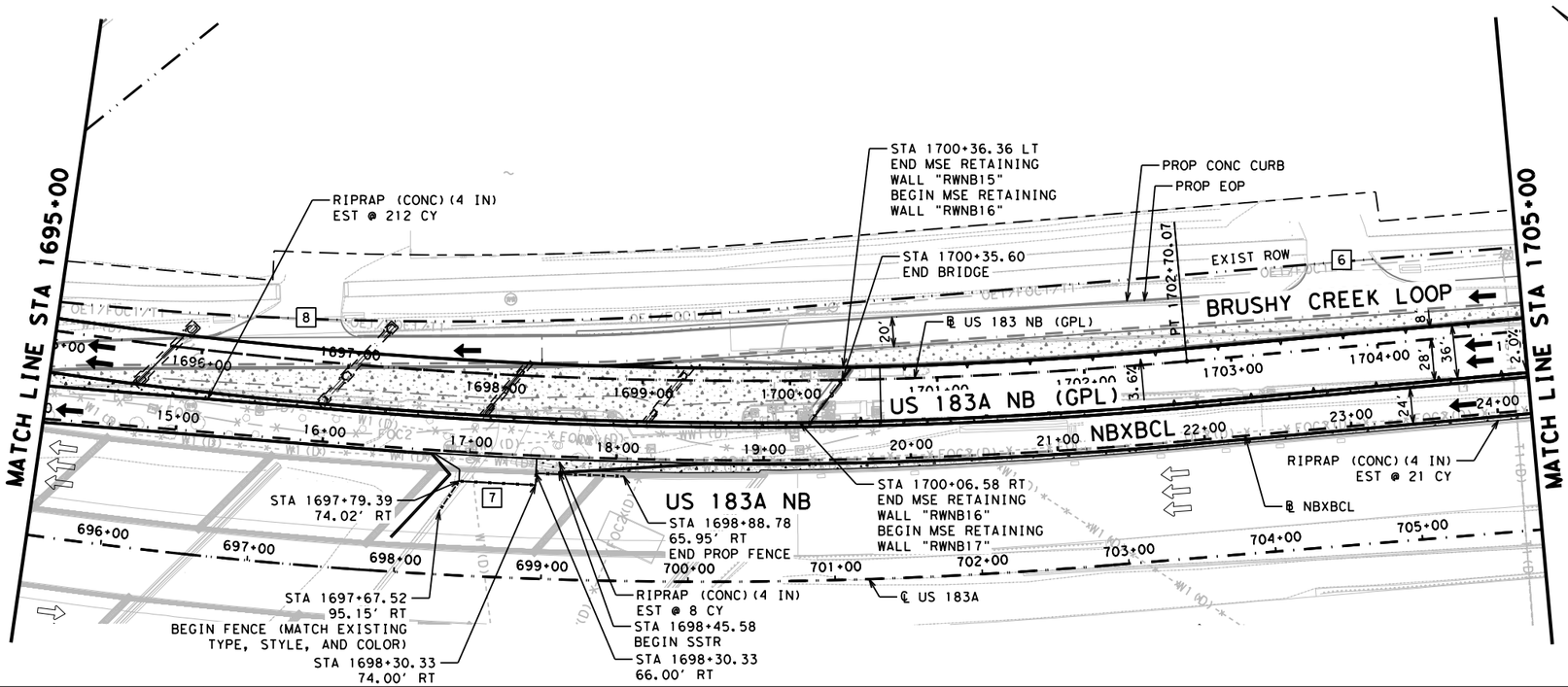

LEGEND

- EXIST TRAFFIC FLOW ARROW
- PROP TRAFFIC FLOW ARROW
- RETAINING WALL
- NOISE WALL
- TEMPORARY SPECIAL SHORING WALL
- ROCK CUT WALL
- PROP CRCP
- CONCRETE RIPRAP
- PROPERTY EASEMENT
- [X] DRIVEWAY ID
- W T2" EXISTING UTILITY

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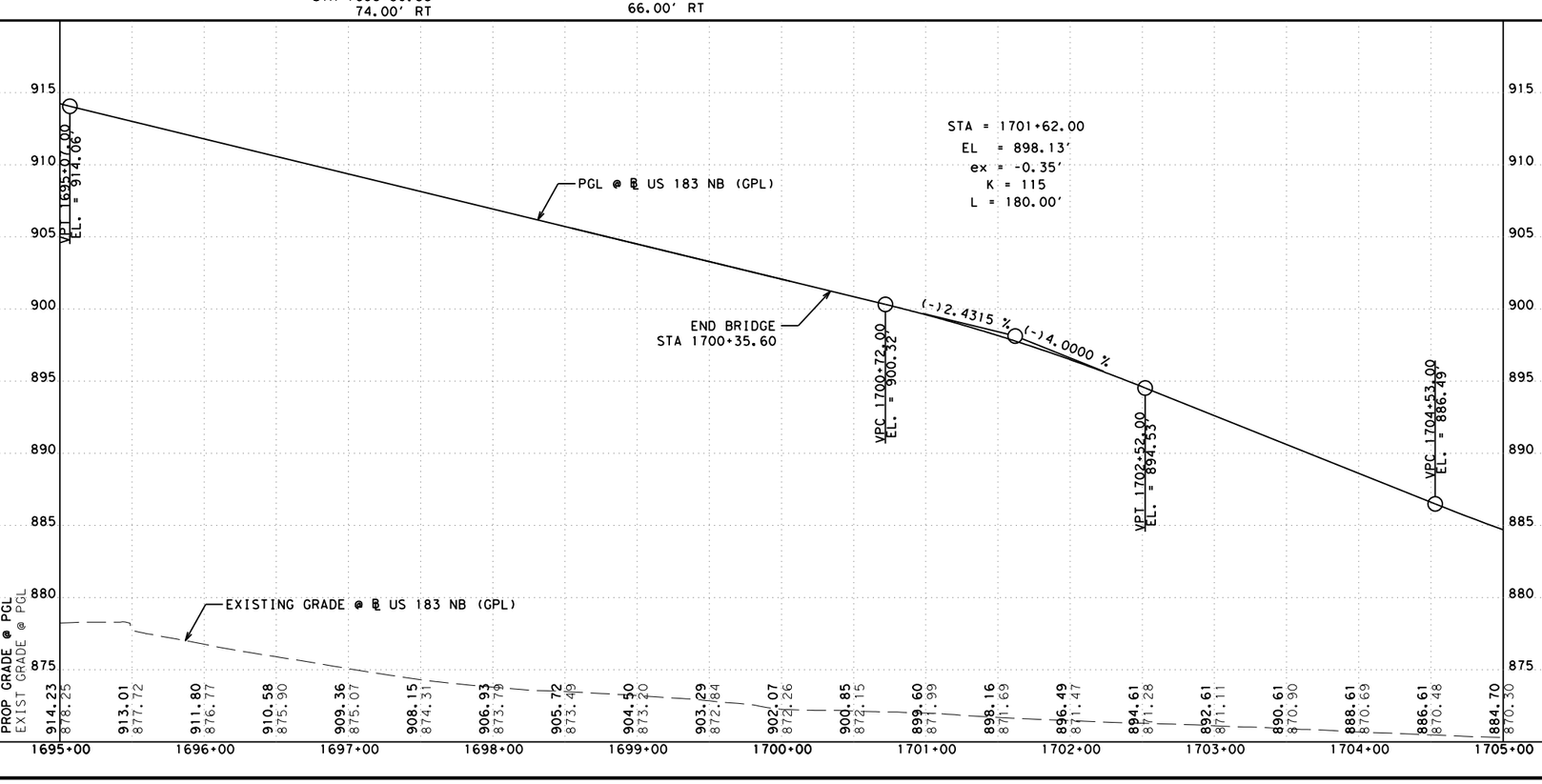
8. SEE NB PLAN AND PROFILE SHEETS FOR FOR US 183 NB GPL INFORMATION AND SB PLAN AND PROFILE SHEETS FOR US 183 SB GPL INFORMATION.



PROP RDWY X-SLOPE	
STATION	SLOPE
1702+13.00	3.60%
1704+99.00	-2.00%
ALL SUPERELEVATION TRANSITIONS ARE STRAIGHT	

DESIGN

STATE OF TEXAS · MARISSA GUZMAN · 130772 · LICENSED PROFESSIONAL ENGINEER

MARISSA GUZMAN, P.E.
3/16/2023
DATE

APPROVAL

STATE OF TEXAS · DAN THOMA · 98622 · LICENSED PROFESSIONAL ENGINEER

DAN THOMA, P.E.
3/16/2023
DATE

0 50 100
SCALE: PLAN 1" = 100'
PROFILE: 1" = 10'

PAPE-DAWSON ENGINEERS
SAN ANTONIO | AUSTIN | HOUSTON | FORT WORTH | DALLAS
2000 NW LOOP 410 | SAN ANTONIO, TX 78213 | 210.375.9000
TEXAS ENGINEERING FIRM #470 | TEXAS SURVEYING FIRM #10028800

2023 Texas Department of Transportation

US 183 GPL
NB
PLAN & PROFILE

SHEET 10 OF 16

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DS:	CK:	0151	10	001	US 183
DW:	CK:	DIST	COUNTY		SHEET NO.
		AUS	WILLIAMSON		275

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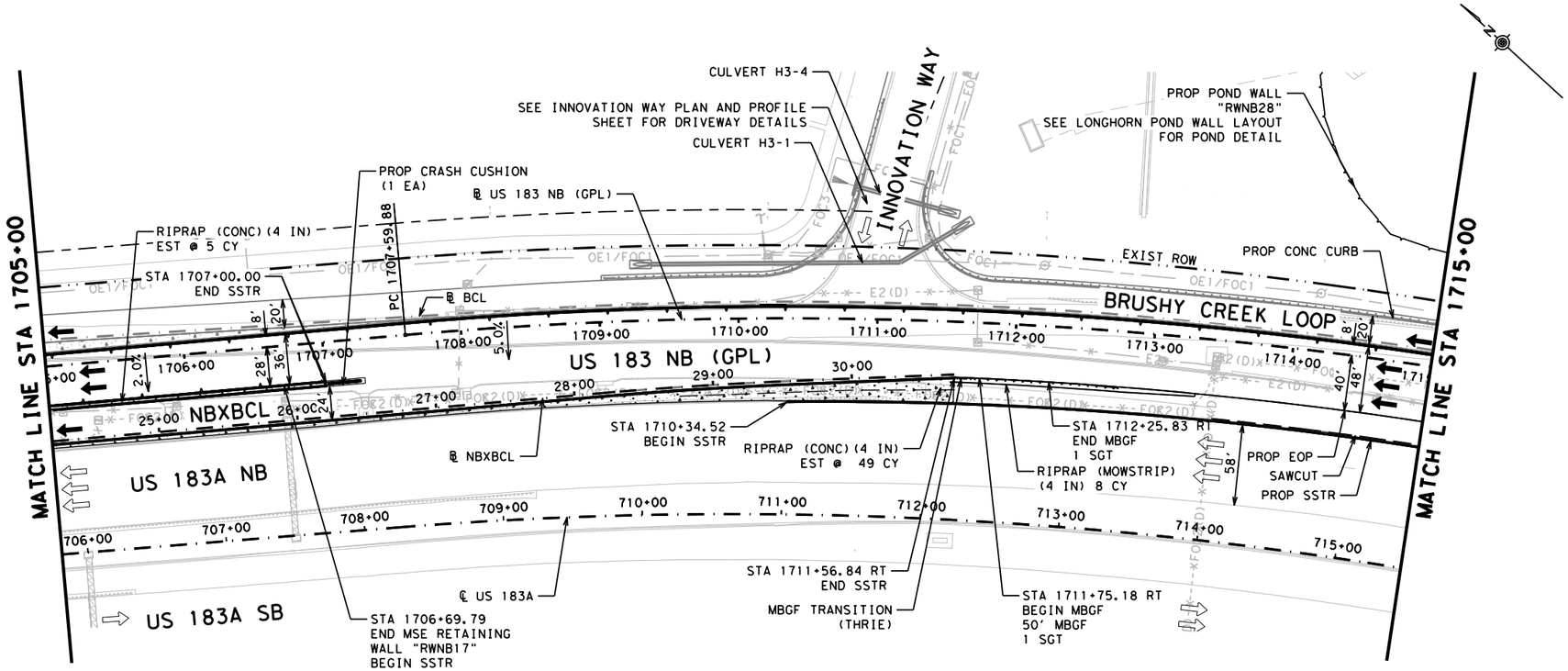

LEGEND

- EXIST TRAFFIC FLOW ARROW
- PROP TRAFFIC FLOW ARROW
- RETAINING WALL
- NOISE WALL
- TEMPORARY SPECIAL SHORING WALL
- ROCK CUT WALL
- PROP CRCP
- CONCRETE RIPRAP
- PROPERTY EASEMENT
- [X] DRIVEWAY ID
- W T2" EXISTING UTILITY

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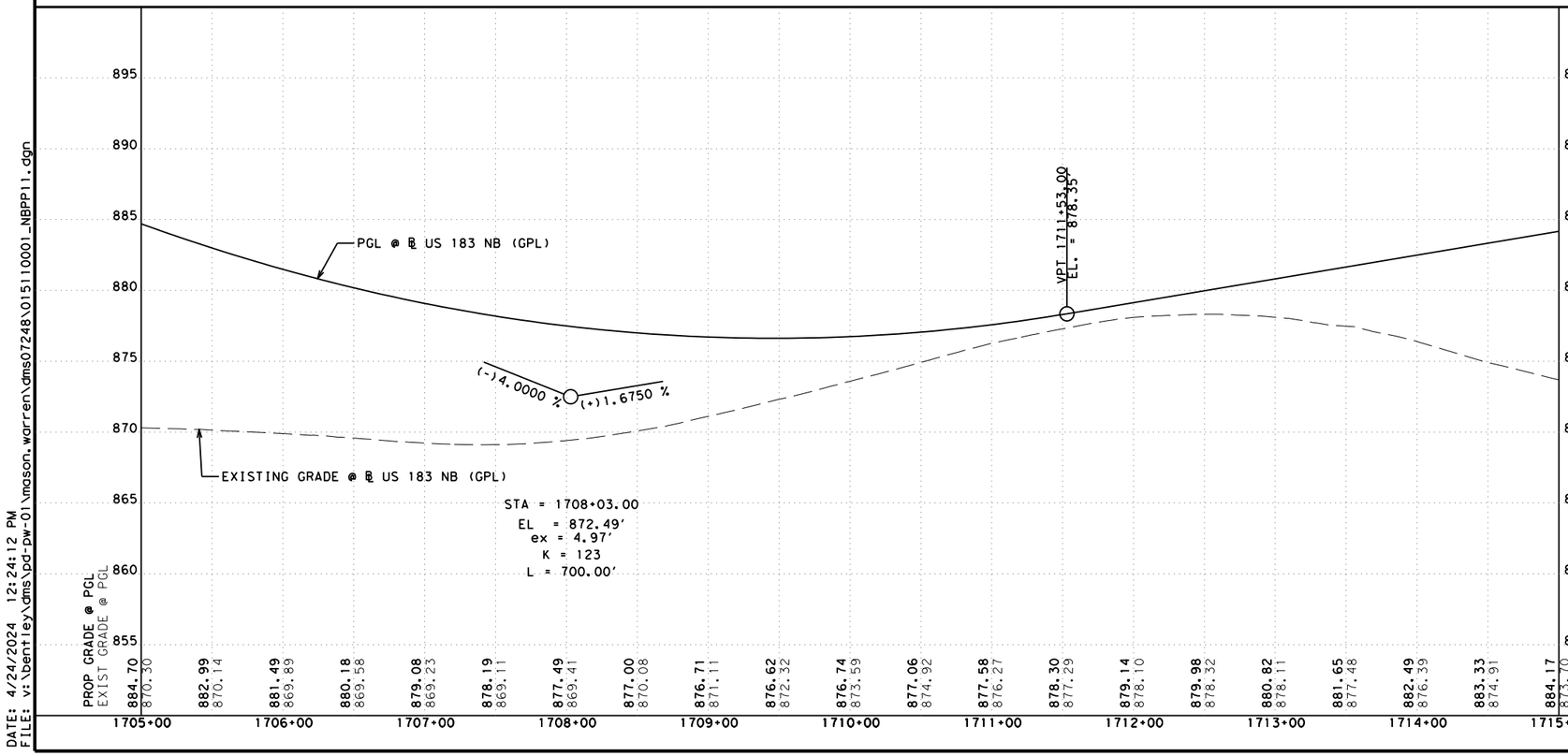

PROP RDWY X-SLOPE	
STATION	SLOPE
1706+36.00	-2.00%
1707+90.00	-5.00%

ALL SUPERELEVATION TRANSITIONS ARE STRAIGHT

DESIGN

STATE OF TEXAS — MARISSA GUZMAN — 130772 — LICENSED PROFESSIONAL ENGINEER

MARISSA GUZMAN, P.E.
4/24/2024
DATE

APPROVAL

STATE OF TEXAS — DAN THOMA — 98622 — LICENSED PROFESSIONAL ENGINEER

DAN THOMA, P.E.
4/24/2024
DATE

0 50 100
SCALE: PLAN 1" = 100'
PROFILE: 1" = 10'

PAPE-DAWSON ENGINEERS
SAN ANTONIO | AUSTIN | HOUSTON | FORT WORTH | DALLAS
2000 NW LOOP 410 | SAN ANTONIO, TX 78213 | 210.375.9000
TEXAS ENGINEERING FIRM #470 | TEXAS SURVEYING FIRM #10028800

2024 Texas Department of Transportation

US 183 GPL
NB
PLAN & PROFILE

SHEET 11 OF 16

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DS:	CK:	CONT	SECT	JOB	HIGHWAY
		0151	10	001	US 183
DW:	CK:	DIST	COUNTY		SHEET NO.
		AUS	WILLIAMSON		276

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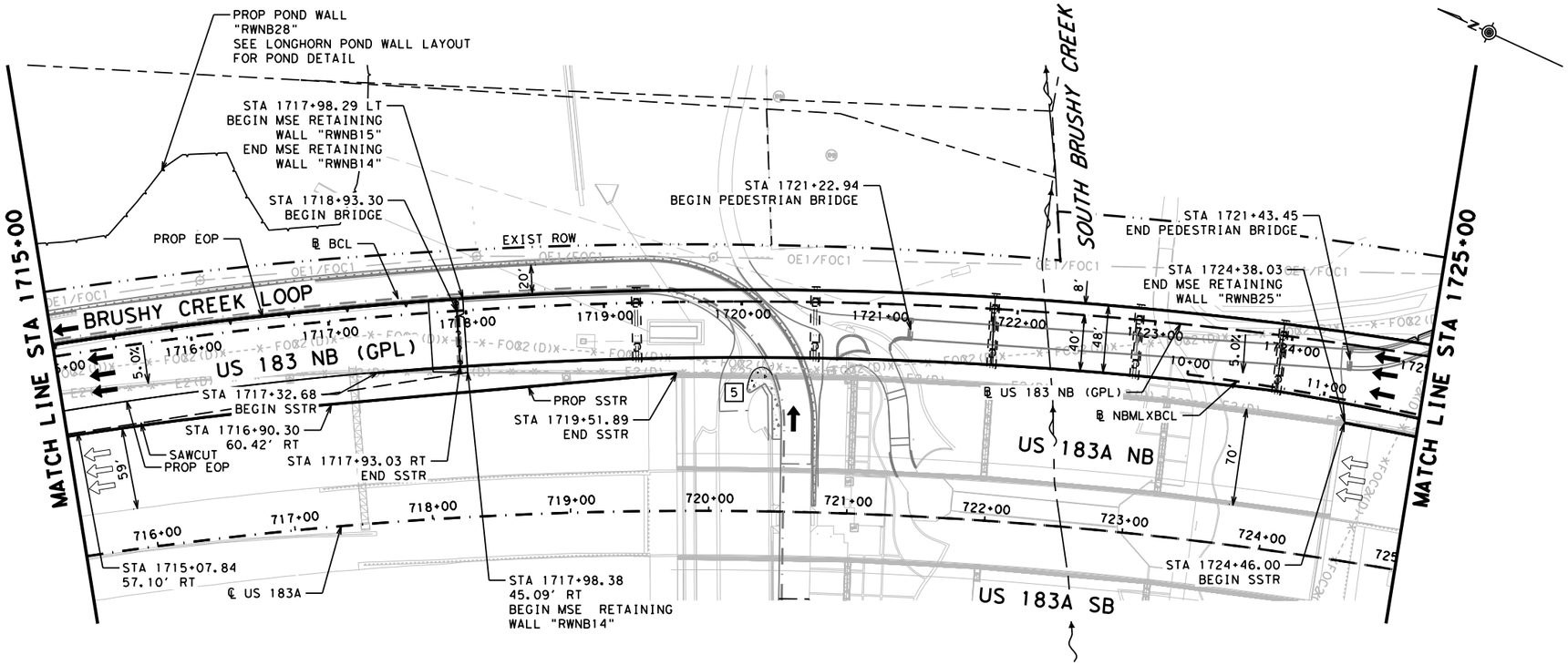

LEGEND

- EXIST TRAFFIC FLOW ARROW
- PROP TRAFFIC FLOW ARROW
- RETAINING WALL
- NOISE WALL
- TEMPORARY SPECIAL SHORING WALL
- ROCK CUT WALL
- PROP CRCP
- CONCRETE RIPRAP
- PROPERTY EASEMENT
- [X] DRIVEWAY ID
- W 12" EXISTING UTILITY

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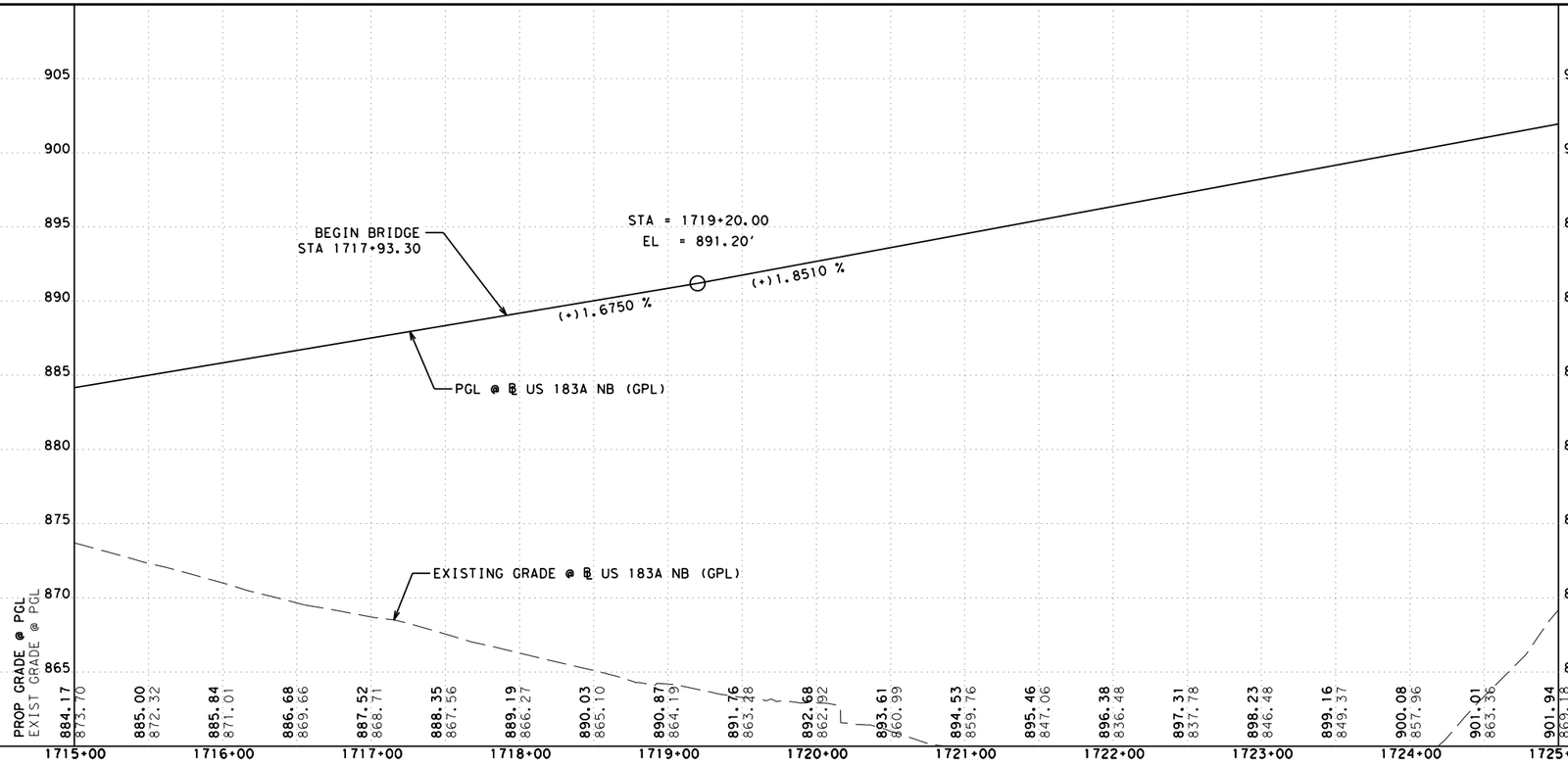

PROP RDWY X-SLOPE	
STATION	SLOPE
ALL SUPERELEVATION TRANSITIONS ARE STRAIGHT	

DESIGN

STATE OF TEXAS — MARISSA GUZMAN — 130772 — LICENSED PROFESSIONAL ENGINEER

MARISSA GUZMAN, P.E.

4/11/2024

DATE

APPROVAL

STATE OF TEXAS — DAN THOMA — 98622 — LICENSED PROFESSIONAL ENGINEER

DAN THOMA, P.E.

4/11/2024

DATE

0 50 100

SCALE: PLAN 1" = 100'
PROFILE: 1" = 10'

PAPE-DAWSON ENGINEERS

SAN ANTONIO | AUSTIN | HOUSTON | FORT WORTH | DALLAS
2000 NW LOOP 410 | SAN ANTONIO, TX 78213 | 210.375.9000
TEXAS ENGINEERING FIRM #470 | TEXAS SURVEYING FIRM #10028800

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US 183 GPL

NB PLAN & PROFILE

SHEET 12 OF 16

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DS:	CK:	0151	10	001	US 183
		DIST	COUNTY		SHEET NO.
DW:	CK:	AUS	WILLIAMSON		277

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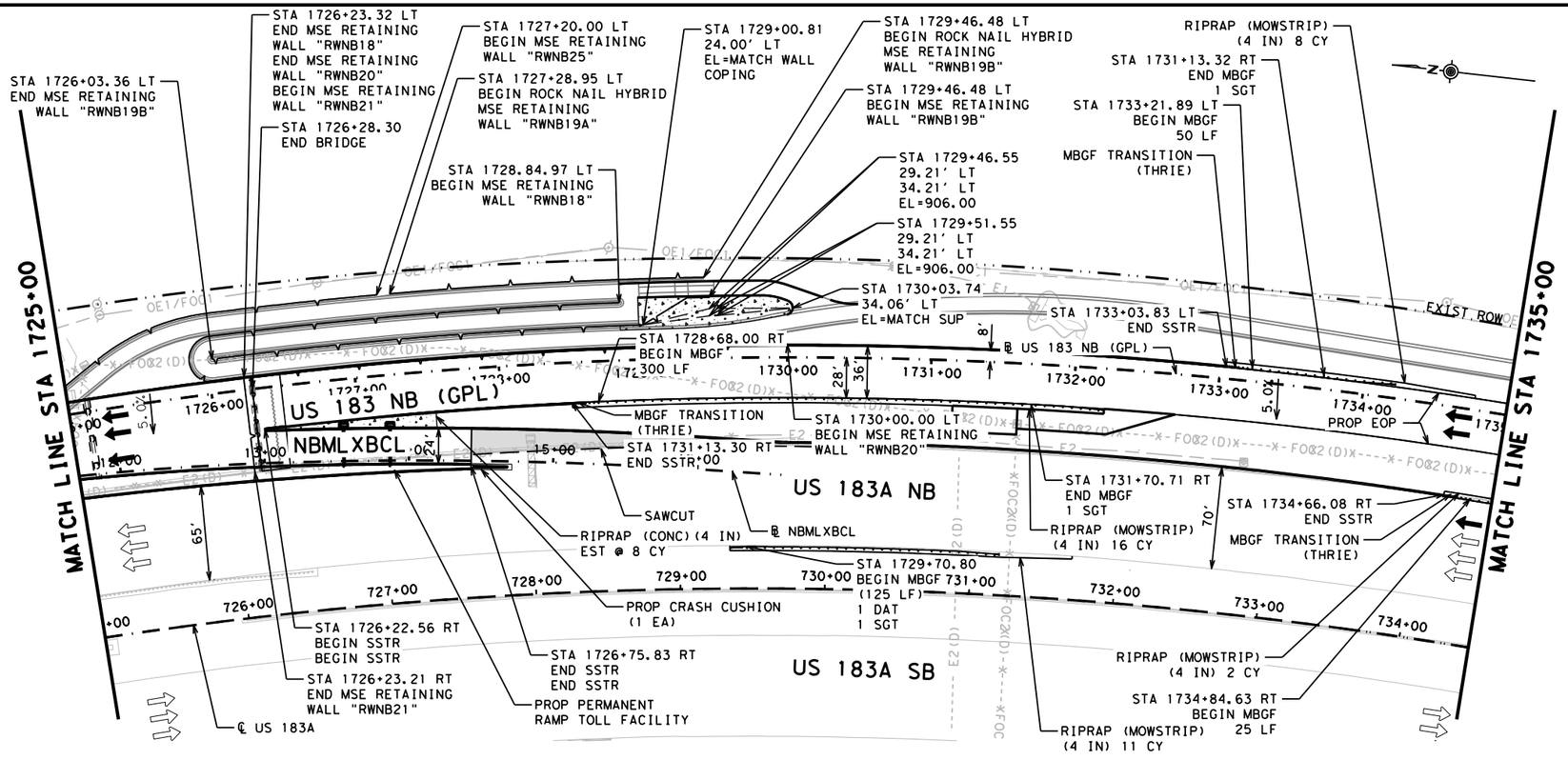

LEGEND

- EXIST TRAFFIC FLOW ARROW
- PROP TRAFFIC FLOW ARROW
- RETAINING WALL
- NOISE WALL
- TEMPORARY SPECIAL SHORING WALL
- ROCK CUT WALL
- PROP CRCP
- CONCRETE RIPRAP
- PROPERTY EASEMENT
- [X] DRIVEWAY ID
- W 12" EXISTING UTILITY

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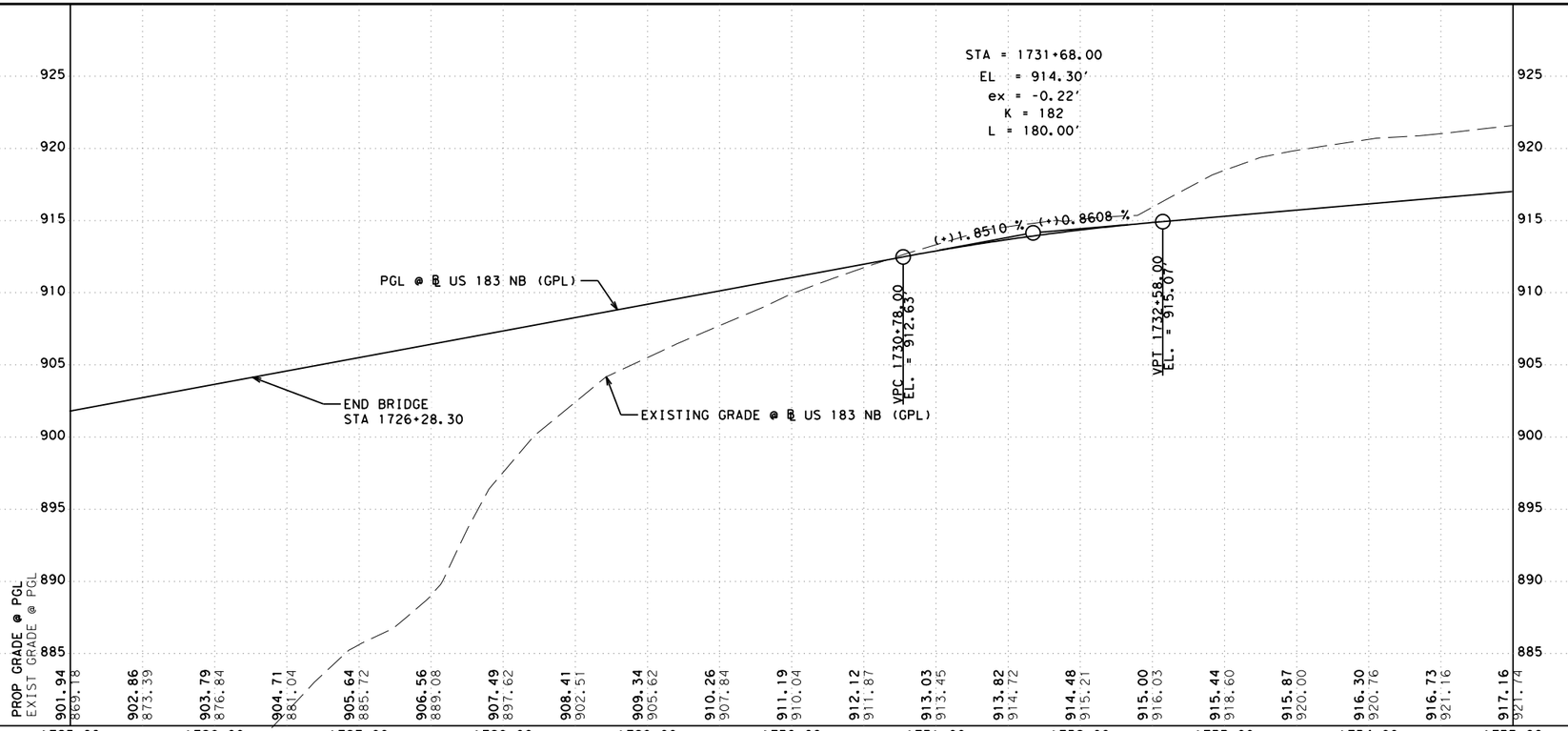

PROP RDWY X-SLOPE	
STATION	SLOPE
ALL SUPERELEVATION TRANSITIONS ARE STRAIGHT	

DESIGN

STATE OF TEXAS · MARISSA GUZMAN · 130772 · LICENSED PROFESSIONAL ENGINEER

MARISSA GUZMAN, P.E.
4/24/2024
DATE

APPROVAL

STATE OF TEXAS · DAN THOMA · 98622 · LICENSED PROFESSIONAL ENGINEER

DAN THOMA, P.E.
4/24/2024
DATE

0 50 100
SCALE: PLAN 1" = 100'
PROFILE: 1" = 10'

PAPE-DAWSON ENGINEERS
SAN ANTONIO | AUSTIN | HOUSTON | FORT WORTH | DALLAS
2000 NW LOOP 410 | SAN ANTONIO, TX 78213 | 210.375.9000
TEXAS ENGINEERING FIRM #470 | TEXAS SURVEYING FIRM #10028800

2024
Texas Department of Transportation

US 183 GPL
NB
PLAN & PROFILE

SHEET 13 OF 16

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DS: CK:	0151	10	001	US 183
DW: CK:	DIST	COUNTY		SHEET NO.
	AUS	WILLIAMSON		278

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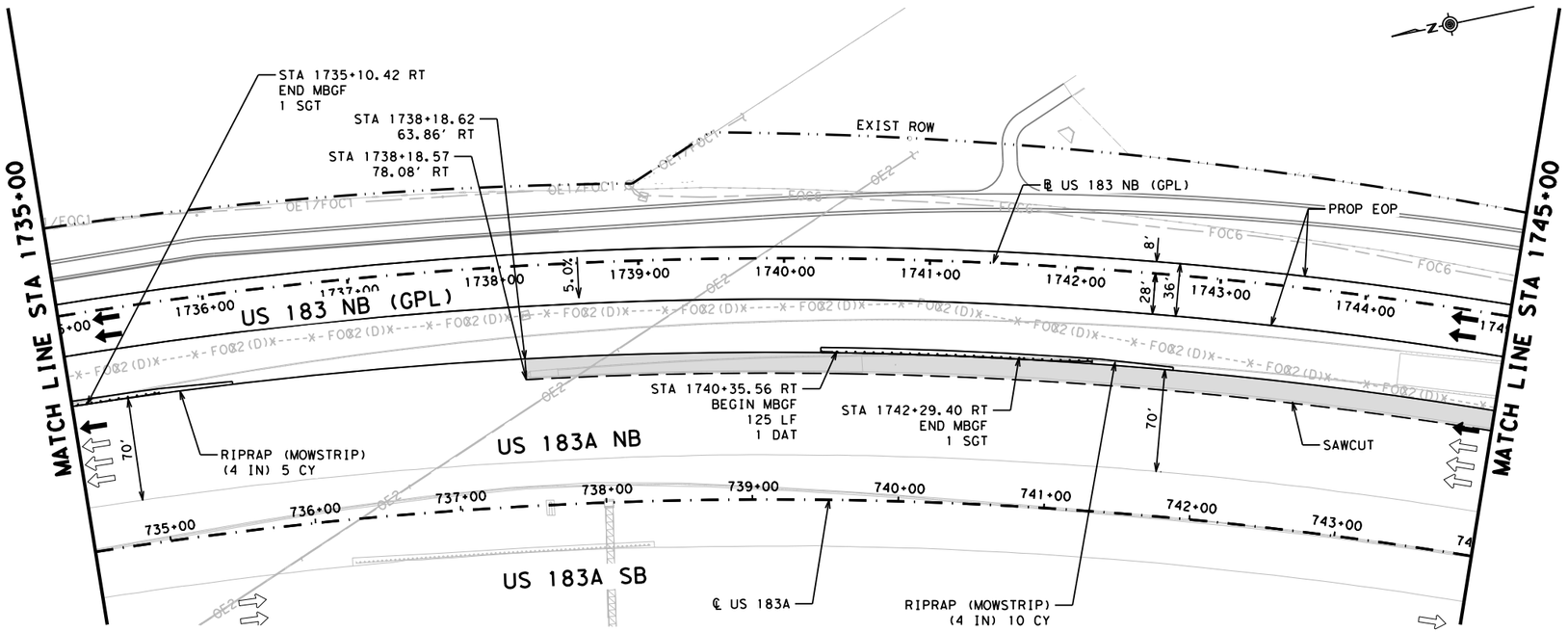

LEGEND

- EXIST TRAFFIC FLOW ARROW
- PROP TRAFFIC FLOW ARROW
- RETAINING WALL
- NOISE WALL
- TEMPORARY SPECIAL SHORING WALL
- ROCK CUT WALL
- PROP CRCP
- CONCRETE RIPRAP
- PROPERTY EASEMENT
- [X] DRIVEWAY ID
- W 12" EXISTING UTILITY

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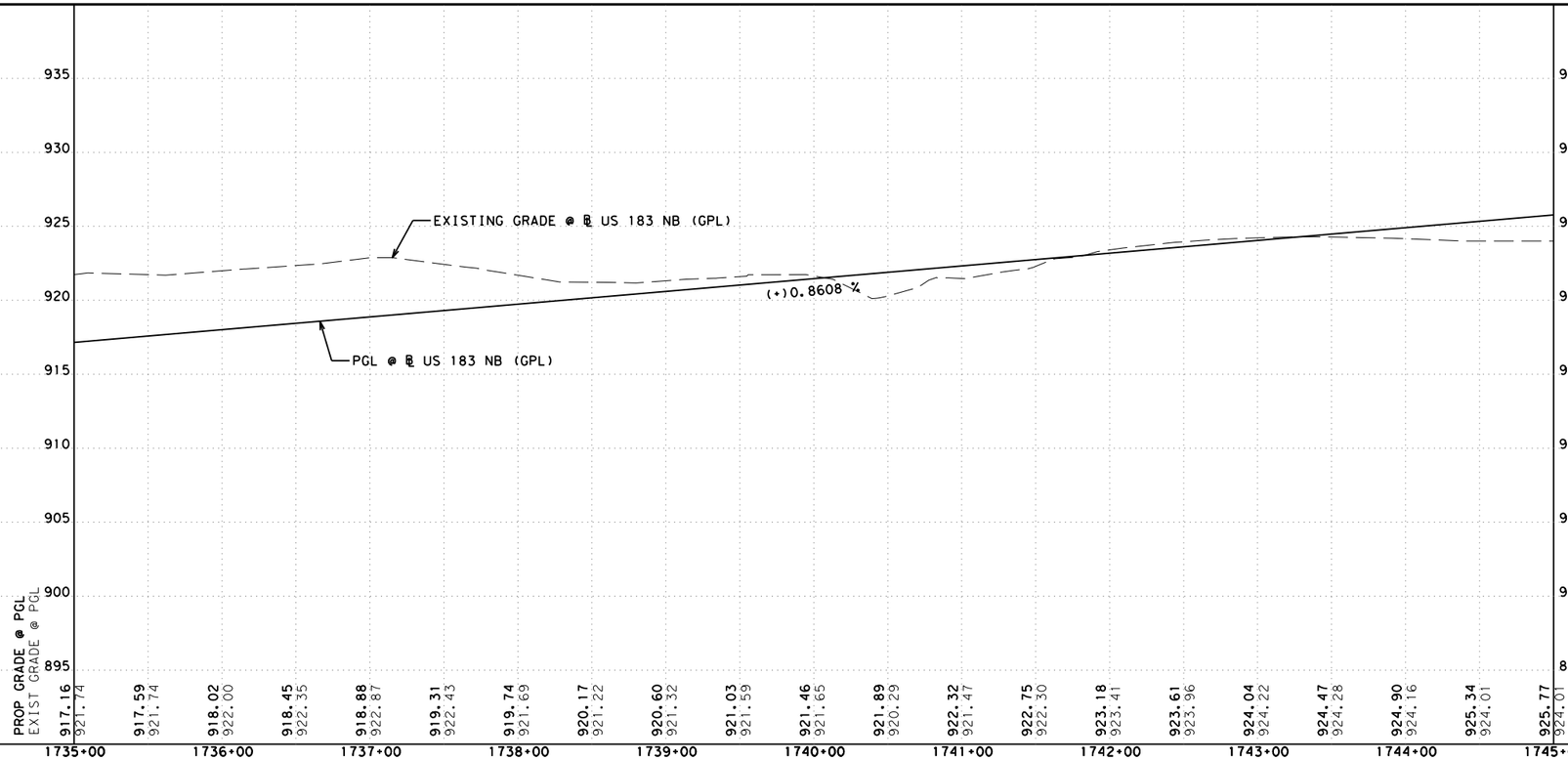

PROP RDWY X-SLOPE	
STATION	SLOPE
ALL SUPERELEVATION TRANSITIONS ARE STRAIGHT	

DESIGN

STATE OF TEXAS · MARISSA GUZMAN · 130772 · LICENSED PROFESSIONAL ENGINEER

MARISSA GUZMAN, P.E.
2/28/2024
DATE

APPROVAL

STATE OF TEXAS · DAN THOMA · 98622 · LICENSED PROFESSIONAL ENGINEER

DAN THOMA, P.E.
2/28/2024
DATE

0 50 100
SCALE: PLAN 1" = 100'
PROFILE: 1" = 10'

PAPE-DAWSON ENGINEERS
SAN ANTONIO | AUSTIN | HOUSTON | FORT WORTH | DALLAS
2000 NW LOOP 410 | SAN ANTONIO, TX 78213 | 210.375.9000
TEXAS ENGINEERING FIRM #470 | TEXAS SURVEYING FIRM #10028800

2024 Texas Department of Transportation

US 183 GPL
NB
PLAN & PROFILE

SHEET 14 OF 16

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DS:	CK:	0151	10	001	US 183
DW:	CK:	DIST	COUNTY		SHEET NO.
		AUS	WILLIAMSON		279

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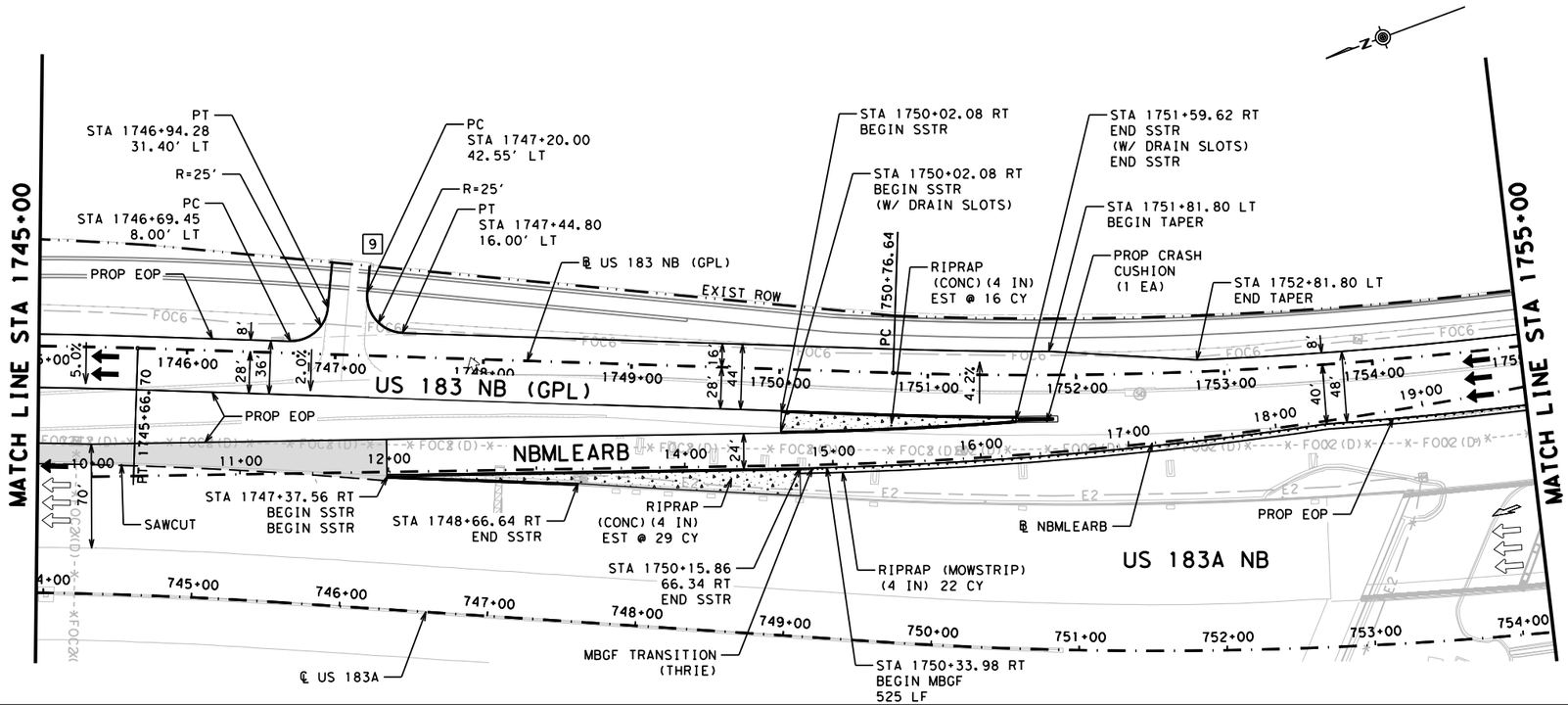

LEGEND

- EXIST TRAFFIC FLOW ARROW
- PROP TRAFFIC FLOW ARROW
- RETAINING WALL
- NOISE WALL
- TEMPORARY SPECIAL SHORING WALL
- ROCK CUT WALL
- PROP CRCP
- CONCRETE RIPRAP
- PROPERTY EASEMENT
- [X] DRIVEWAY ID
- W 12" EXISTING UTILITY

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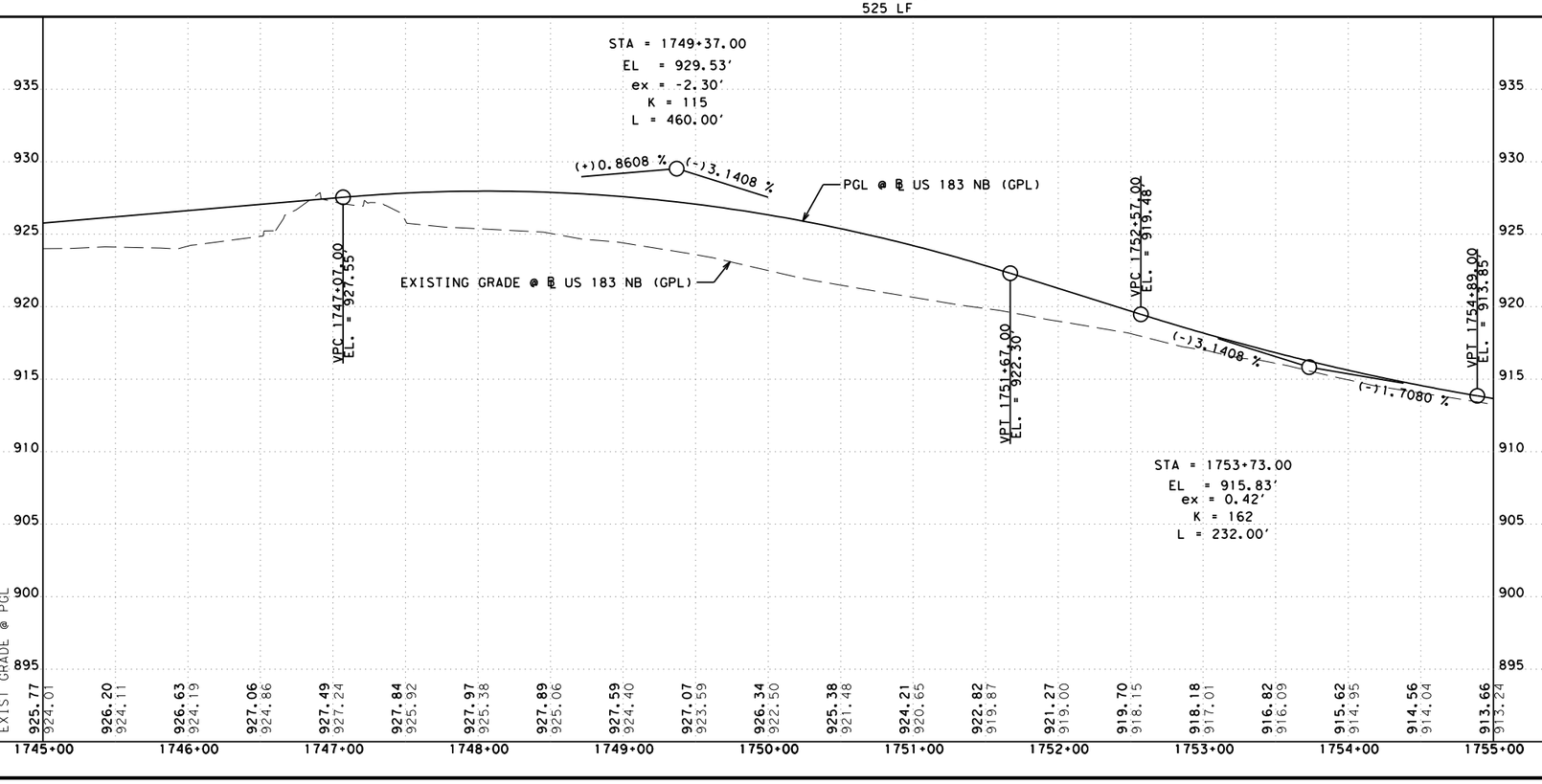

PROP RDWY X-SLOPE	
STATION	SLOPE
1745+30.00	-5.00%
1746+84.00	-2.00%
1748+18.00	-2.00%
1751+35.00	4.20%
1754+46.00	4.20%

ALL SUPERELEVATION TRANSITIONS ARE STRAIGHT

DESIGN

STATE OF TEXAS · MARISSA GUZMAN · 130772 · LICENSED PROFESSIONAL ENGINEER

MARISSA GUZMAN, P.E.
4/11/2024
DATE

APPROVAL

STATE OF TEXAS · DAN THOMA · 98622 · LICENSED PROFESSIONAL ENGINEER

DAN THOMA, P.E.
4/11/2024
DATE

0 50 100
SCALE: PLAN 1" = 100'
PROFILE: 1" = 10'

PAPE-DAWSON ENGINEERS
SAN ANTONIO | AUSTIN | HOUSTON | FORT WORTH | DALLAS
2000 NW LOOP 410 | SAN ANTONIO, TX 78213 | 210.375.9000
TEXAS ENGINEERING FIRM #470 | TEXAS SURVEYING FIRM #10028800

2024 Texas Department of Transportation

US 183 GPL
NB
PLAN & PROFILE

SHEET 15 OF 16

© 2024		CONT	SECT	JOB	HIGHWAY
DS:	CK:	0151	10	001	US 183
DW:	CK:	DIST	COUNTY		SHEET NO.
		AUS	WILLIAMSON		280

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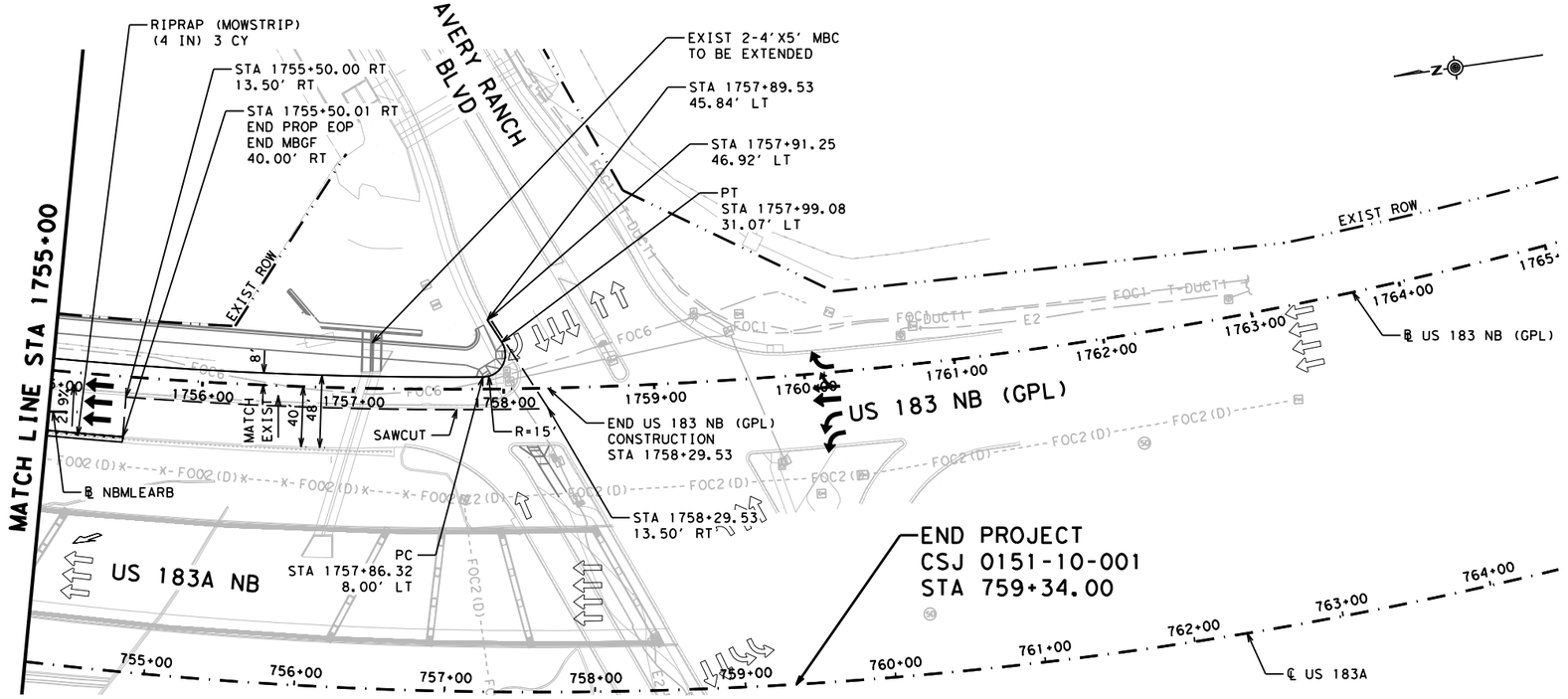

LEGEND

- EXIST TRAFFIC FLOW ARROW
- PROP TRAFFIC FLOW ARROW
- RETAINING WALL
- NOISE WALL
- TEMPORARY SPECIAL SHORING WALL
- ROCK CUT WALL
- PROP CRCP
- CONCRETE RIPRAP
- PROPERTY EASEMENT
- X — DRIVEWAY ID
- W 12" — EXISTING UTILITY

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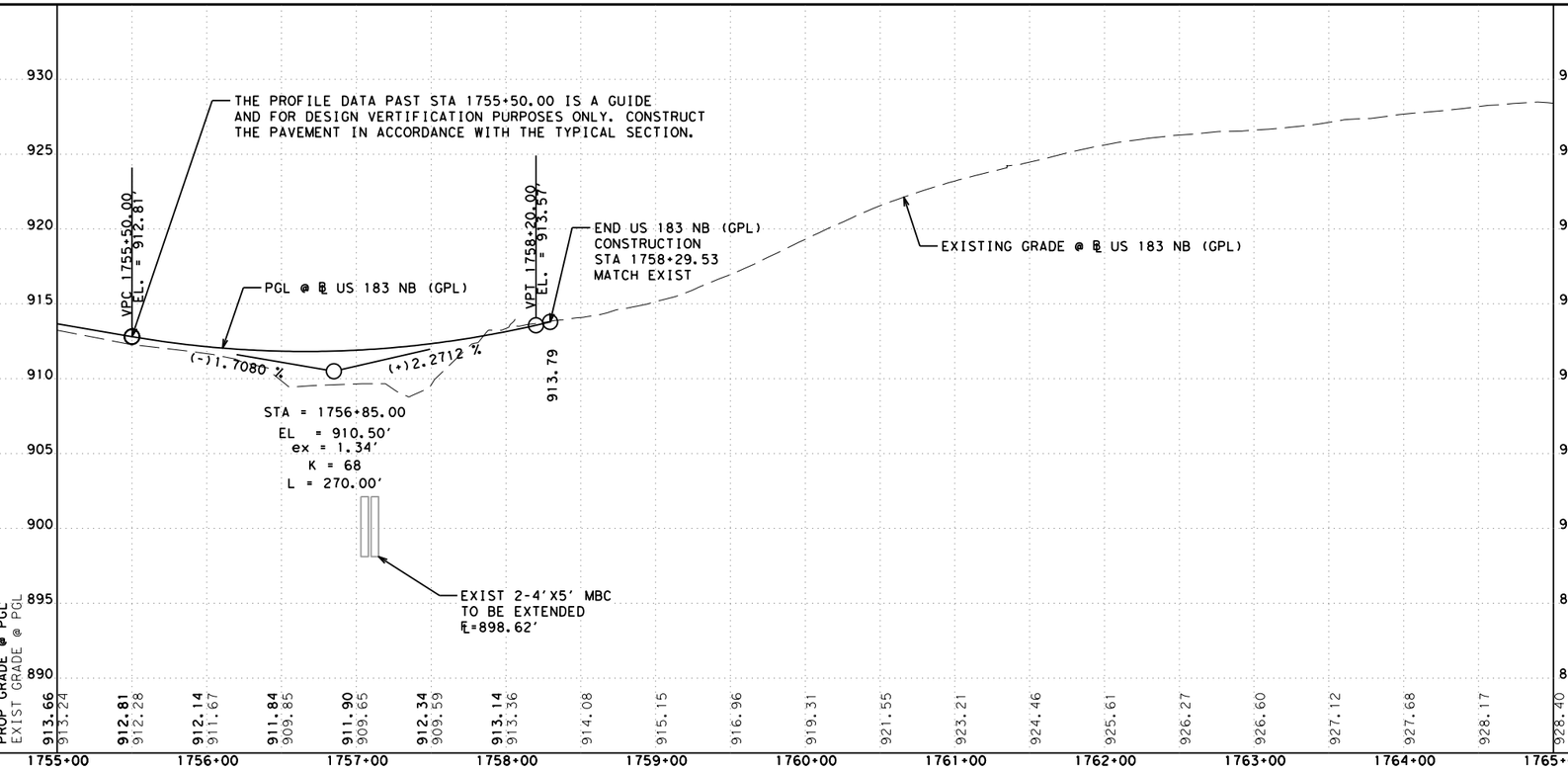

PROP RDWY X-SLOPE	
STATION	SLOPE
1755+46.00	MATCH EXIST

ALL SUPERELEVATION TRANSITIONS ARE STRAIGHT

DESIGN

STATE OF TEXAS — MARISSA GUZMAN — 130772 — LICENSED PROFESSIONAL ENGINEER

MARISSA GUZMAN, P.E.

11/28/2023
DATE

APPROVAL

STATE OF TEXAS — DAN THOMA — 98622 — LICENSED PROFESSIONAL ENGINEER

DAN THOMA, P.E.

11/28/2023
DATE

0 50 100

SCALE: PLAN 1" = 100'
PROFILE: 1" = 10'

PAPE-DAWSON ENGINEERS
SAN ANTONIO | AUSTIN | HOUSTON | FORT WORTH | DALLAS
2000 NW LOOP 410 | SAN ANTONIO, TX 78213 | 210.375.9000
TEXAS ENGINEERING FIRM #470 | TEXAS SURVEYING FIRM #10028800

2023 Texas Department of Transportation

US 183 GPL

NB
PLAN & PROFILE

SHEET 16 OF 16

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DS:	CK:	0151	10	001	US 183
DW:	CK:	DIST	COUNTY		SHEET NO.
		AUS	WILLIAMSON		281

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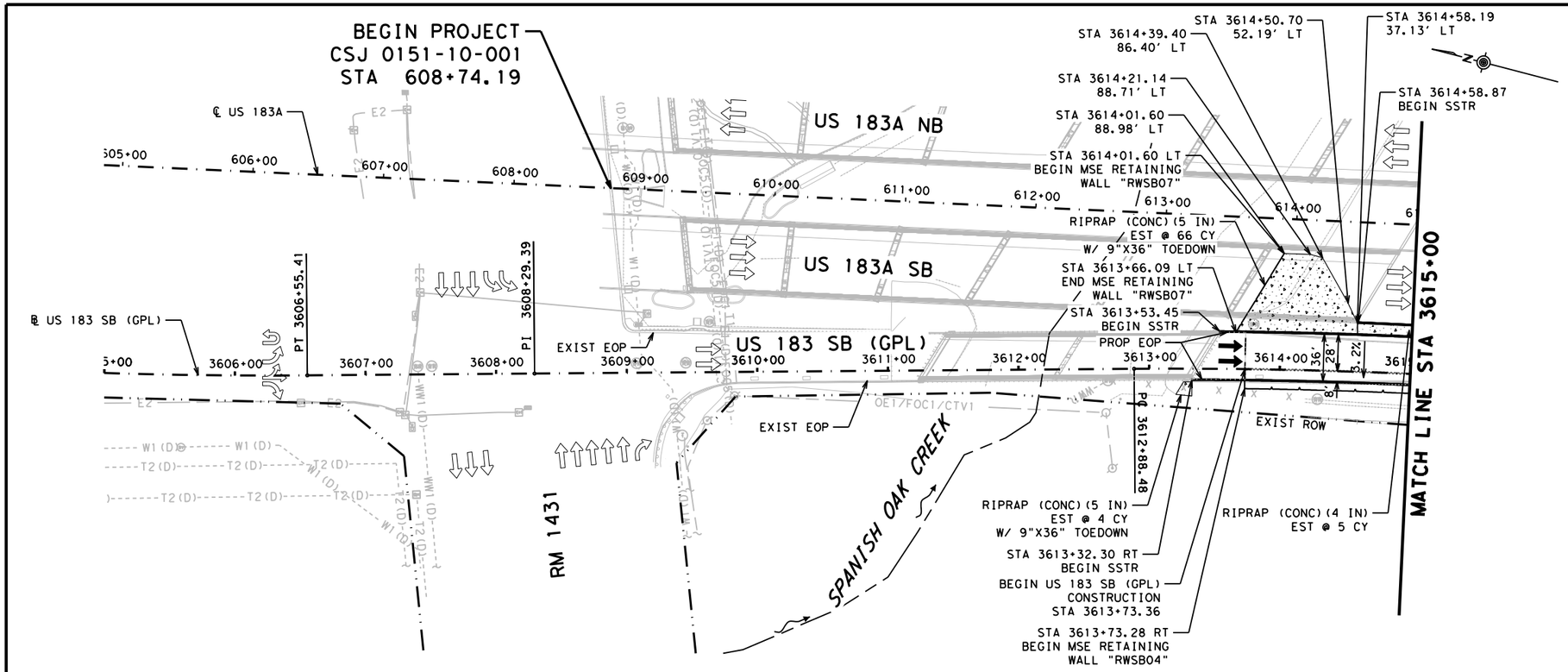
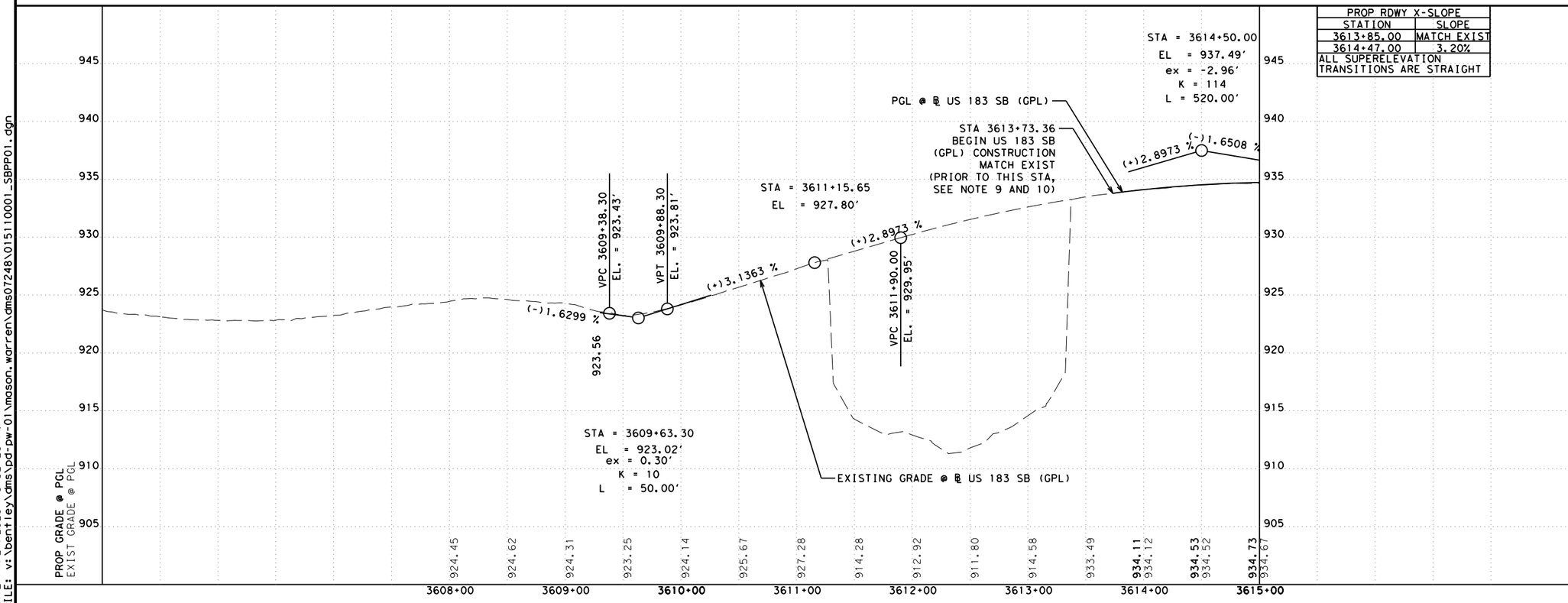


LEGEND

- EXIST TRAFFIC FLOW ARROW
- PROP TRAFFIC FLOW ARROW
- RETAINING WALL
- NOISE WALL
- TEMPORARY SPECIAL SHORING WALL
- ROCK CUT WALL
- PROP CRCP
- CONCRETE RIPRAP
- PROPERTY EASEMENT
- DRIVEWAY ID
- EXISTING UTILITY

NOTES

1. EXISTING FEATURES AND PROPOSED FEATURES NOT DETAILED ON THIS SHEET ARE SHOWN SCREENED BACK; i.e. FADED.
2. SEE HORIZONTAL ALIGNMENT DATA SHEETS FOR HORIZONTAL ALIGNMENT DATA.
3. SEE INTERSECTION DETAIL SHEETS FOR INTERSECTION INFORMATION.
4. SEE PAVEMENT MARKING SHEETS FOR STRIPING AND TRAFFIC FLOW DETAILS.
5. SEE NB SUP PLAN AND PROFILE SHEETS FOR SHARED-USE PATH INFORMATION.
6. SEE RAMP PLAN AND PROFILE SHEETS FOR RAMP INFORMATION.
7. SEE BRUSHY CREEK LOOP PLAN AND PROFILE SHEETS FOR BRUSHY CREEK LOOP INFORMATION.
8. SEE NB PLAN AND PROFILE SHEETS FOR FOR US 183 NB GPL INFORMATION AND SB PLAN AND PROFILE SHEETS FOR US 183 SB GPL INFORMATION.
9. THE PROFILE DATA IS A GUIDE AND FOR DESIGN VERIFICATION PURPOSES ONLY. CONSTRUCT THE PAVEMENT IN ACCORDANCE WITH THE TYPICAL SECTION.
10. THE HORIZONTAL DATA IS A GUIDE AND FOR DESIGN VERIFICATION PURPOSES ONLY. CONSTRUCT THE PAVEMENT IN ACCORDANCE WITH THE TYPICAL SECTION.



PROP RDWY X-SLOPE	
STATION	SLOPE
3613+85.00	MATCH EXIST
3614+47.00	3.20%
ALL SUPERELEVATION TRANSITIONS ARE STRAIGHT	

DESIGN

STATE OF TEXAS — MARISSA GUZMAN — 130772 — LICENSED PROFESSIONAL ENGINEER

MARISSA GUZMAN, P.E.
4/21/2023
DATE

APPROVAL

STATE OF TEXAS — DAN THOMA — 98622 — LICENSED PROFESSIONAL ENGINEER

DAN THOMA, P.E.
4/21/2023
DATE

0 50 100
SCALE: PLAN 1" = 100'
PROFILE: 1" = 10'

PAPE-DAWSON ENGINEERS
SAN ANTONIO | AUSTIN | HOUSTON | FORT WORTH | DALLAS
2000 NW LOOP 410 | SAN ANTONIO, TX 78213 | 210.375.9000
TEXAS ENGINEERING FIRM #470 | TEXAS SURVEYING FIRM #10028800

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US 183 GPL
SB
PLAN & PROFILE

SHEET 1 OF 16

© 2023		CONT	SECT	JOB	HIGHWAY
DS:	CK:	0151	10	001	US 183
DW:	CK:	DIST	COUNTY		SHEET NO.
		AUS	WILLIAMSON		282

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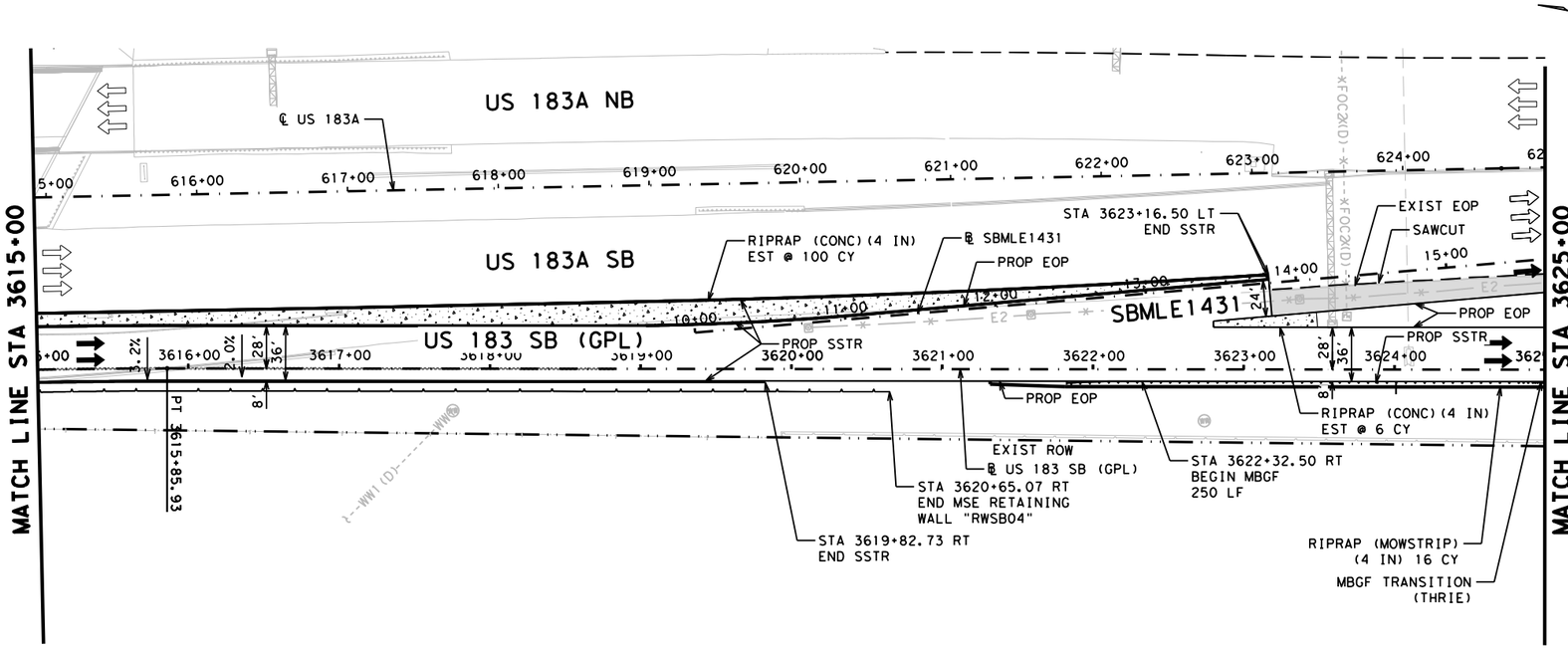

LEGEND

- EXIST TRAFFIC FLOW ARROW
- PROP TRAFFIC FLOW ARROW
- RETAINING WALL
- NOISE WALL
- TEMPORARY SPECIAL SHORING WALL
- ROCK CUT WALL
- PROP CRCP
- CONCRETE RIPRAP
- PROPERTY EASEMENT
- [X] DRIVEWAY ID
- W T2" EXISTING UTILITY

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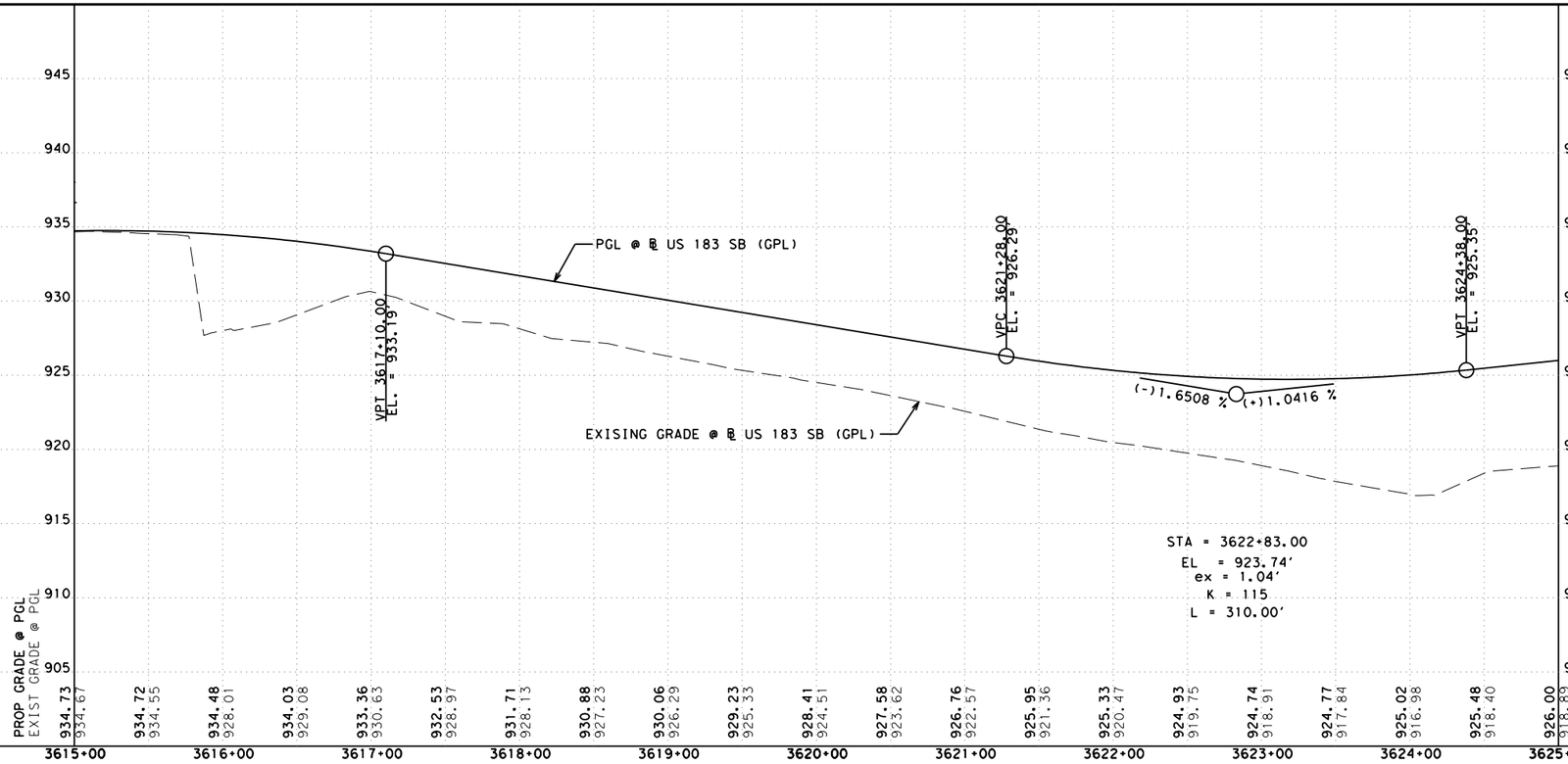

PROP RDWY X-SLOPE	
STATION	SLOPE
3615+73.00	3.20%
3616+35.00	2.00%
3624+82.00	2.00%
ALL SUPERELEVATION TRANSITIONS ARE STRAIGHT	

DESIGN

STATE OF TEXAS — MARISSA GUZMAN — 130772 — LICENSED PROFESSIONAL ENGINEER

MARISSA GUZMAN, P.E.
4/17/2024
DATE

APPROVAL

STATE OF TEXAS — DAN THOMA — 98622 — LICENSED PROFESSIONAL ENGINEER

DAN THOMA, P.E.
4/17/2024
DATE

0 50 100
SCALE: PLAN 1" = 100'
PROFILE: 1" = 10'

PAPE-DAWSON ENGINEERS
SAN ANTONIO | AUSTIN | HOUSTON | FORT WORTH | DALLAS
2000 NW LOOP 410 | SAN ANTONIO, TX 78213 | 210.375.9000
TEXAS ENGINEERING FIRM #470 | TEXAS SURVEYING FIRM #10028800

2024 Texas Department of Transportation

US 183 GPL
SB
PLAN & PROFILE

SHEET 2 OF 16

© 2024		CONT	SECT	JOB	HIGHWAY
DS:	CK:	0151	10	001	US 183
DW:	CK:	DIST	COUNTY		SHEET NO.
		AUS	WILLIAMSON		283

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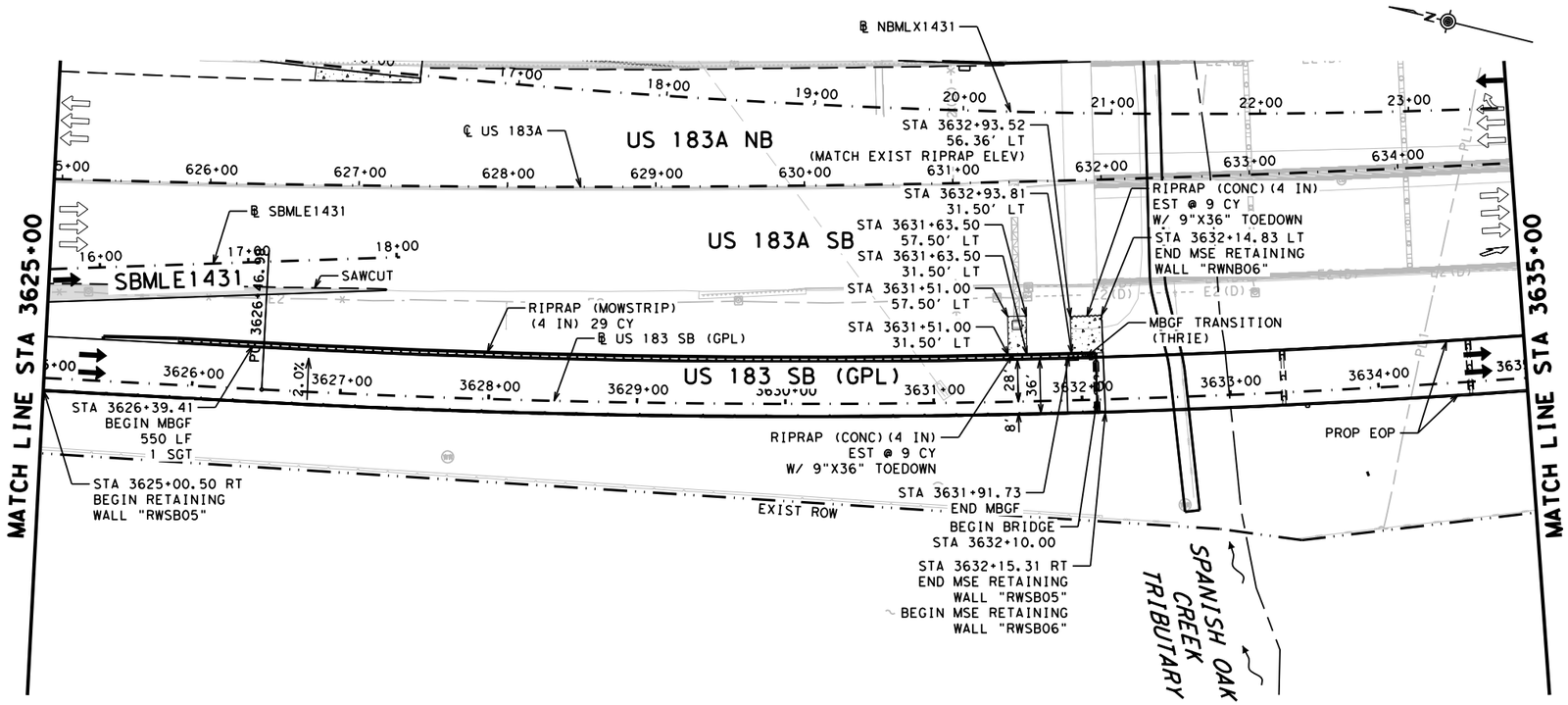

LEGEND

- EXIST TRAFFIC FLOW ARROW
- PROP TRAFFIC FLOW ARROW
- RETAINING WALL
- NOISE WALL
- TEMPORARY SPECIAL SHORING WALL
- ROCK CUT WALL
- PROP CRCP
- CONCRETE RIPRAP
- PROPERTY EASEMENT
- [X] DRIVEWAY ID
- W 12" EXISTING UTILITY

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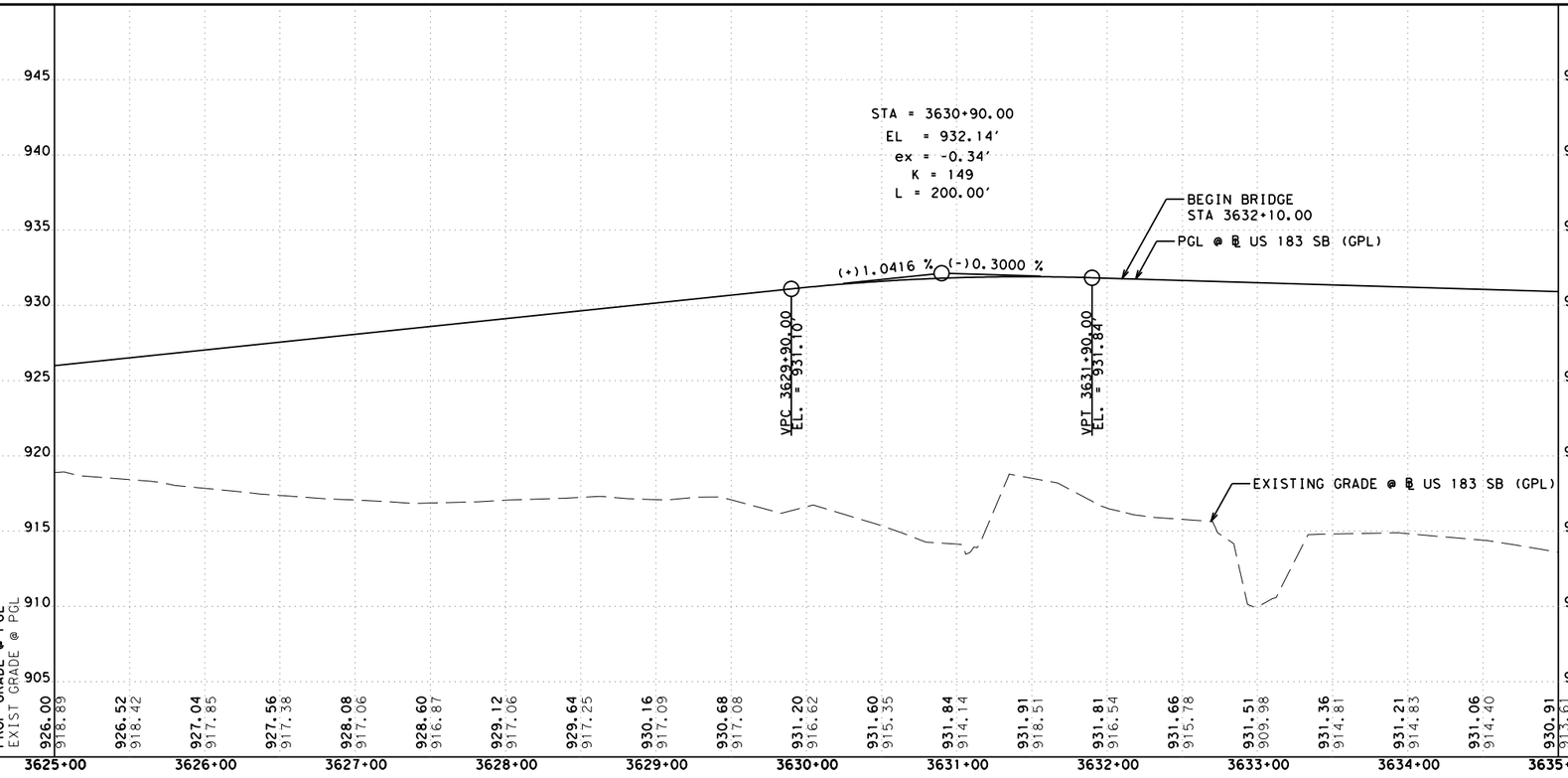

PROP RDWY X-SLOPE	
STATION	SLOPE
3626+87.00	-2.00%
ALL SUPERELEVATION TRANSITIONS ARE STRAIGHT	

DESIGN

STATE OF TEXAS · MARISSA GUZMAN · 130772 · LICENSED PROFESSIONAL ENGINEER

MARISSA GUZMAN, P.E.

11/8/2023
DATE

APPROVAL

STATE OF TEXAS · DAN THOMA · 98622 · LICENSED PROFESSIONAL ENGINEER

DAN THOMA, P.E.

11/8/2023
DATE

0 50 100

SCALE: PLAN 1" = 100'
PROFILE: 1" = 10'

PAPE-DAWSON ENGINEERS

SAN ANTONIO | AUSTIN | HOUSTON | FORT WORTH | DALLAS
2000 NW LOOP 410 | SAN ANTONIO, TX 78213 | 210.375.9000
TEXAS ENGINEERING FIRM #470 | TEXAS SURVEYING FIRM #10028800

2023 Texas Department of Transportation

US 183 GPL

SB
PLAN & PROFILE

SHEET 3 OF 16

© 2023		CONT	SECT	JOB	HIGHWAY
DS:	CK:	0151	10	001	US 183
DW:	CK:	DIST	COUNTY		SHEET NO.
		AUS	WILLIAMSON		284

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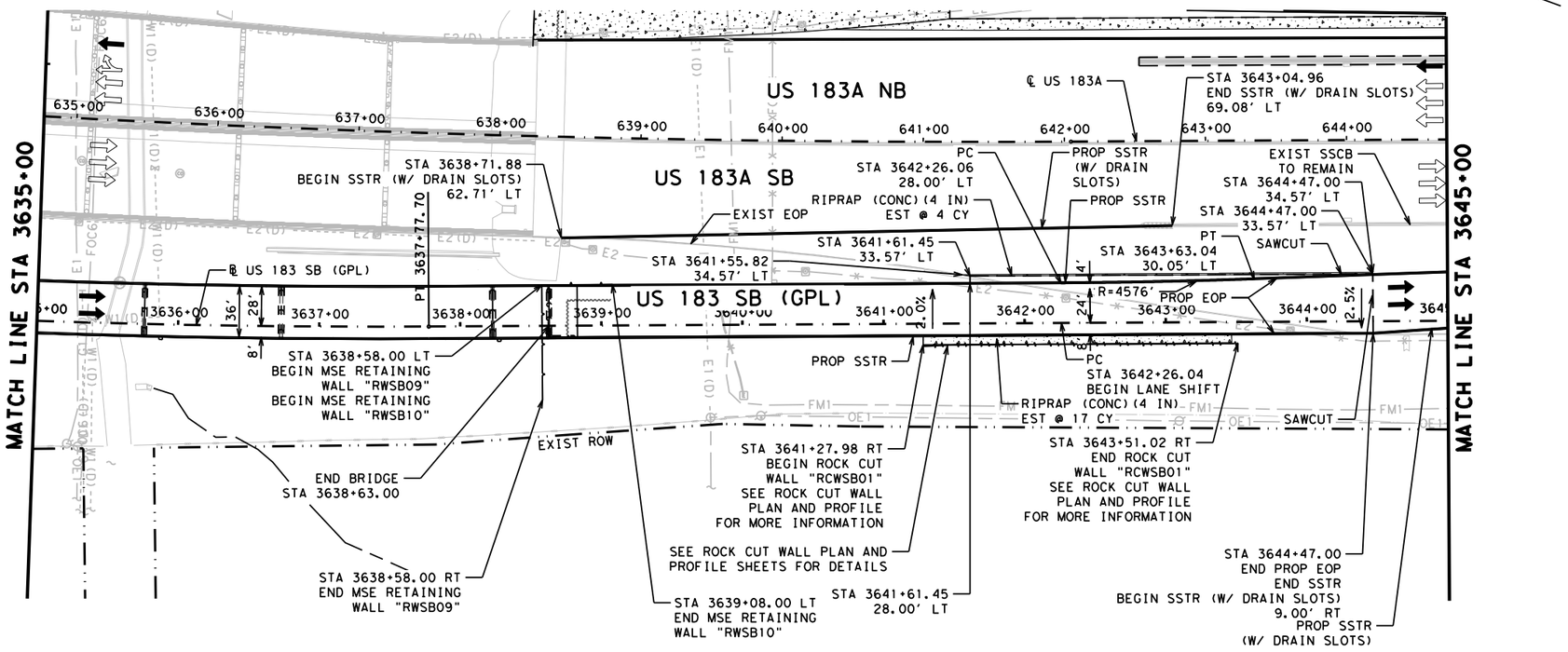

LEGEND

- EXIST TRAFFIC FLOW ARROW
- PROP TRAFFIC FLOW ARROW
- RETAINING WALL
- NOISE WALL
- TEMPORARY SPECIAL SHORING WALL
- ROCK CUT WALL
- PROP CRCP
- CONCRETE RIPRAP
- PROPERTY EASEMENT
- [X] DRIVEWAY ID
- W 12" EXISTING UTILITY

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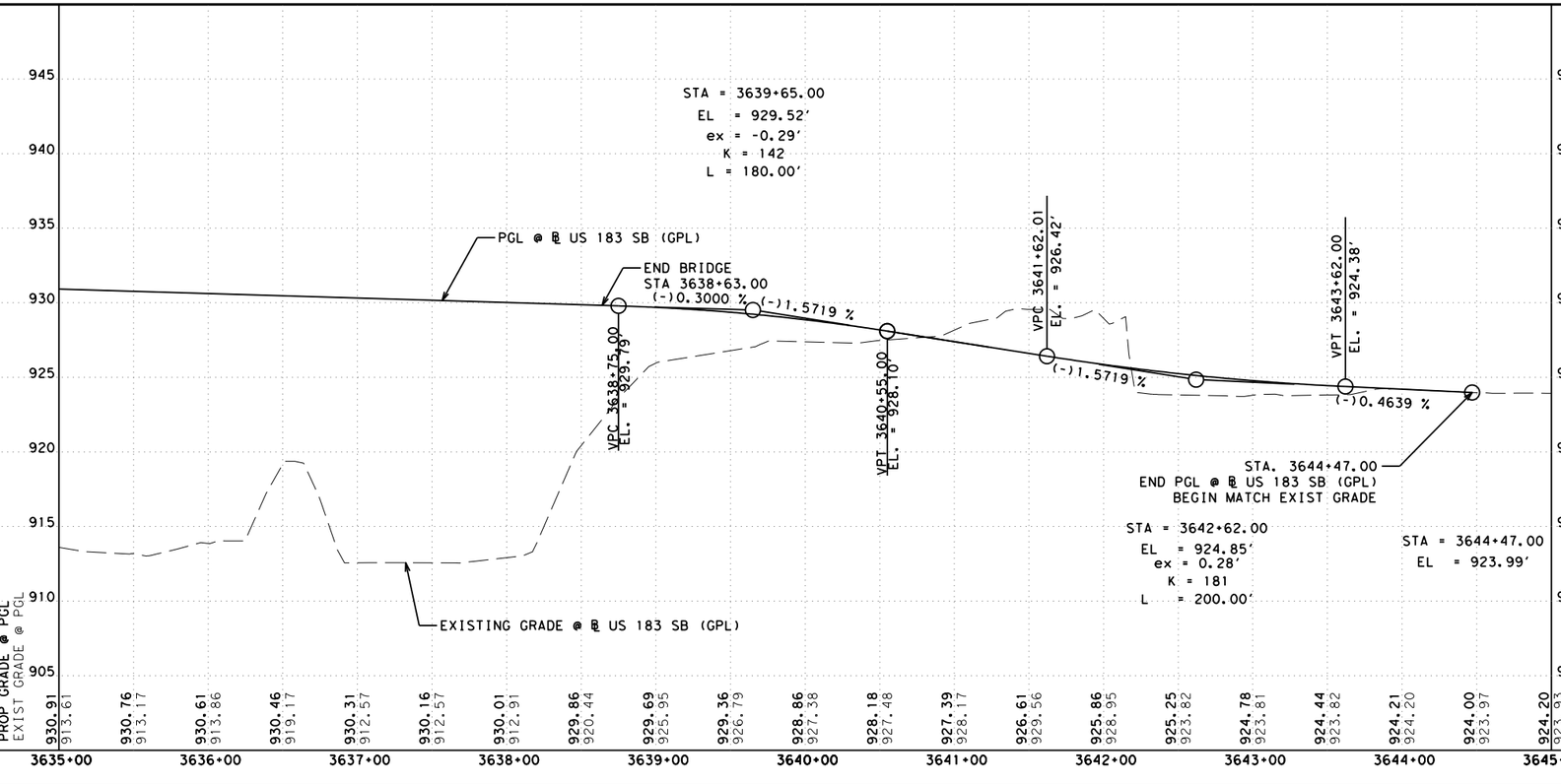

PROP RDWY X-SLOPE	
STATION	SLOPE
3641+50.00	-2.00%
3643+80.00	2.50%
3644+47.00	MATCH EXIST
ALL SUPERELEVATION TRANSITIONS ARE STRAIGHT	

DESIGN

STATE OF TEXAS — MARISSA GUZMAN — 130772 — LICENSED PROFESSIONAL ENGINEER

MARISSA GUZMAN, P.E.

11/10/2023
DATE

APPROVAL

STATE OF TEXAS — DAN THOMA — 98622 — LICENSED PROFESSIONAL ENGINEER

DAN THOMA, P.E.

11/10/2023
DATE

0 50 100

SCALE: PLAN 1" = 100'
PROFILE: 1" = 10'

PAPE-DAWSON ENGINEERS

SAN ANTONIO | AUSTIN | HOUSTON | FORT WORTH | DALLAS
2000 NW LOOP 410 | SAN ANTONIO, TX 78213 | 210.375.9000
TEXAS ENGINEERING FIRM #470 | TEXAS SURVEYING FIRM #10028800

2023 Texas Department of Transportation

US 183 GPL
SB
PLAN & PROFILE

SHEET 4 OF 16

© 2023		CONT	SECT	JOB	HIGHWAY
DS:	CK:	0151	10	001	US 183
DW:	CK:	DIST	COUNTY		SHEET NO.
		AUS	WILLIAMSON		285

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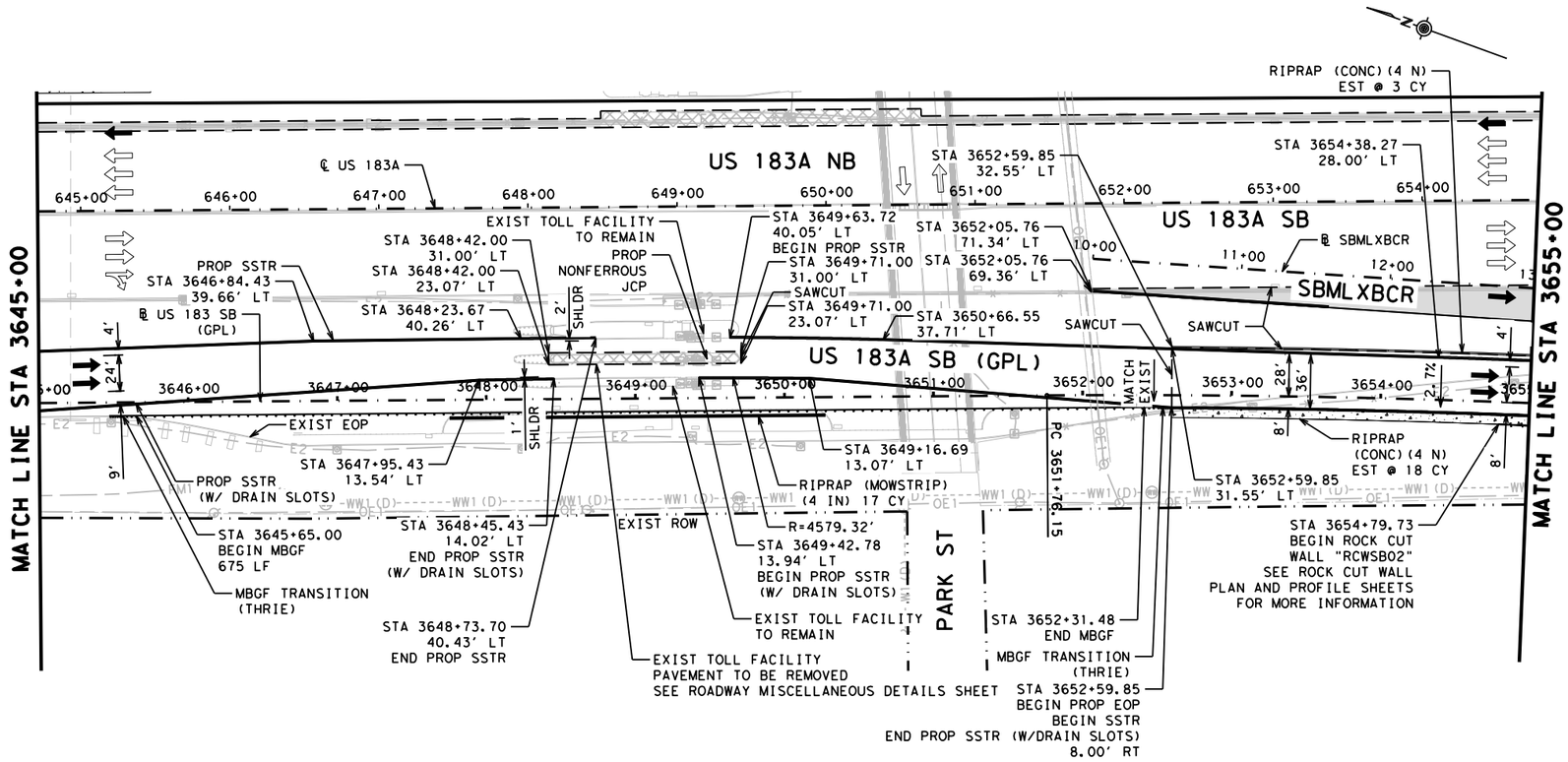

LEGEND

- EXIST TRAFFIC FLOW ARROW
- PROP TRAFFIC FLOW ARROW
- RETAINING WALL
- NOISE WALL
- TEMPORARY SPECIAL SHORING WALL
- ROCK CUT WALL
- PROP CRCP
- CONCRETE RIPRAP
- PROPERTY EASEMENT
- [X] DRIVEWAY ID
- W 12" EXISTING UTILITY

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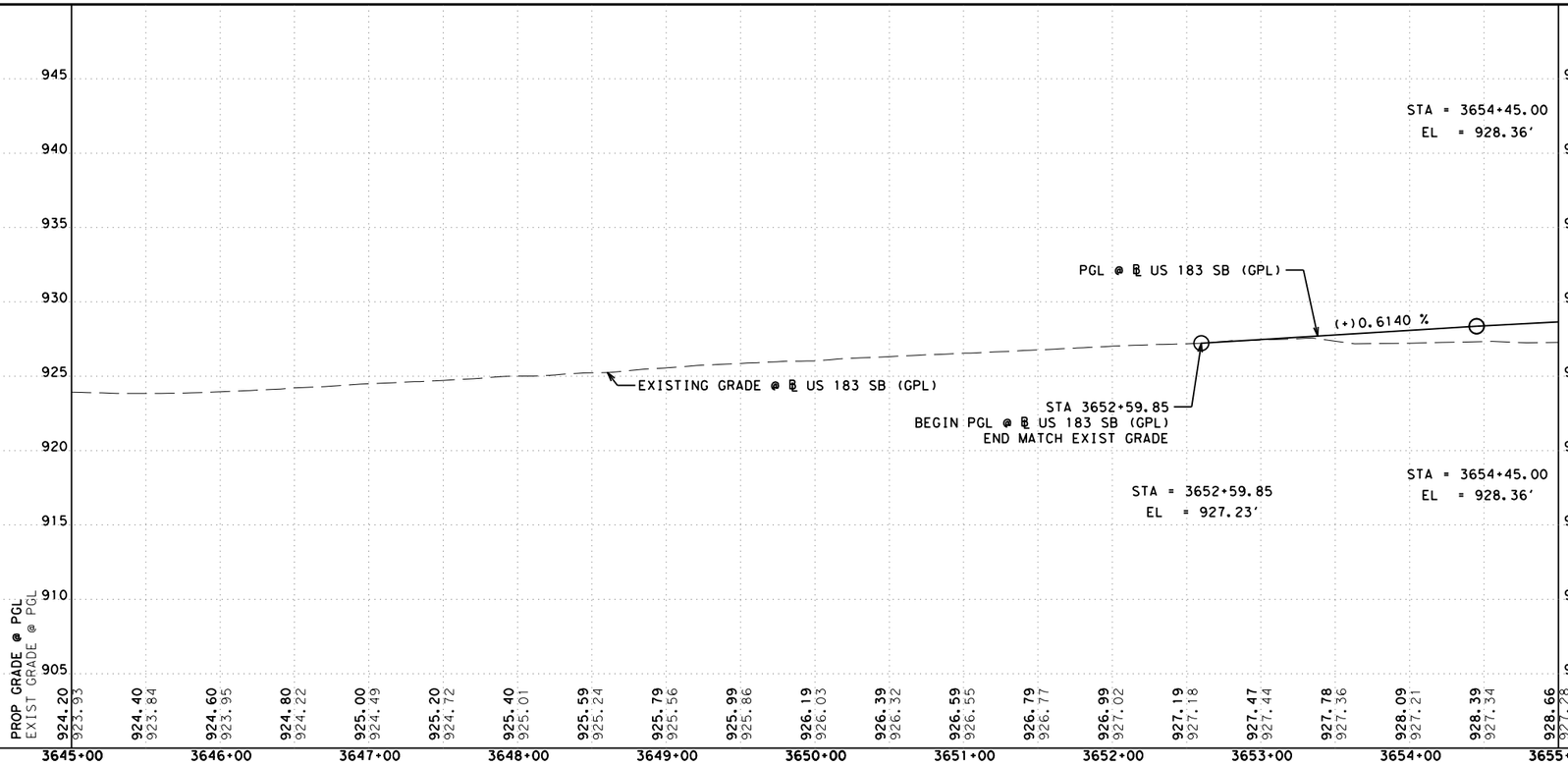
8. SEE NB PLAN AND PROFILE SHEETS FOR FOR US 183 NB GPL INFORMATION AND SB PLAN AND PROFILE SHEETS FOR US 183 SB GPL INFORMATION.



PROP RDWY X-SLOPE	
STATION	SLOPE
3652+59.85	MATCH EXIST
3654+20.00	2.70%
ALL SUPERELEVATION TRANSITIONS ARE STRAIGHT	

DESIGN

STATE OF TEXAS — MARISSA GUZMAN — 130772 — LICENSED PROFESSIONAL ENGINEER

MARISSA GUZMAN, P.E.

4/16/2024
DATE

APPROVAL

STATE OF TEXAS — DAN THOMA — 98622 — LICENSED PROFESSIONAL ENGINEER

DAN THOMA, P.E.

4/16/2024
DATE

0 50 100

SCALE: PLAN 1" = 100'
PROFILE: 1" = 10'

PAPE-DAWSON ENGINEERS

SAN ANTONIO | AUSTIN | HOUSTON | FORT WORTH | DALLAS
2000 NW LOOP 410 | SAN ANTONIO, TX 78213 | 210.375.9000
TEXAS ENGINEERING FIRM #470 | TEXAS SURVEYING FIRM #10028800

2024 Texas Department of Transportation

US 183 GPL

SB
PLAN & PROFILE

SHEET 5 OF 16

© 2024		CONT	SECT	JOB	HIGHWAY
DS:	CK:	0151	10	001	US 183
DW:	CK:	DIST	COUNTY		SHEET NO.
		AUS	WILLIAMSON		286

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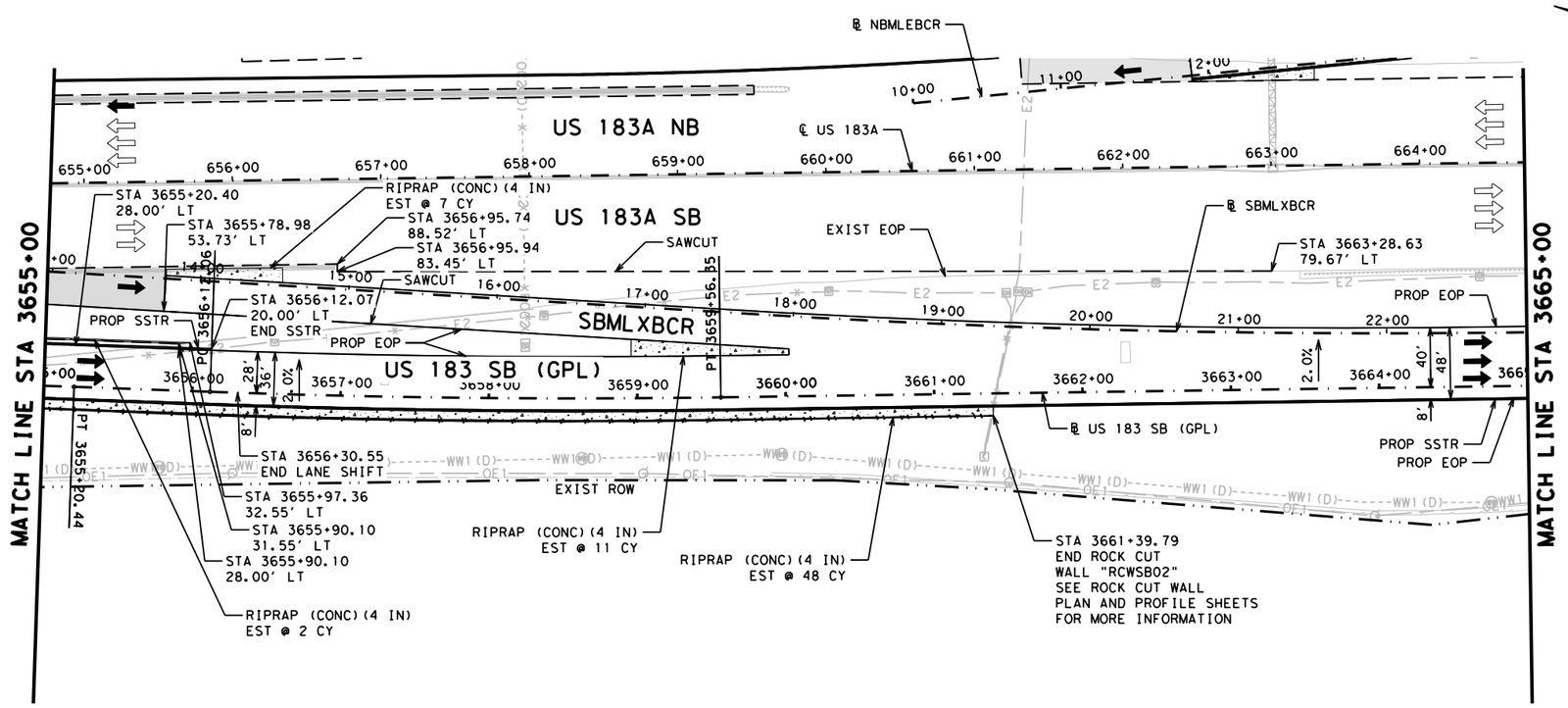

LEGEND

- EXIST TRAFFIC FLOW ARROW
- PROP TRAFFIC FLOW ARROW
- RETAINING WALL
- NOISE WALL
- TEMPORARY SPECIAL SHORING WALL
- ROCK CUT WALL
- PROP CRCP
- CONCRETE RIPRAP
- PROPERTY EASEMENT
- [X] DRIVEWAY ID
- W 12" EXISTING UTILITY

NOTES

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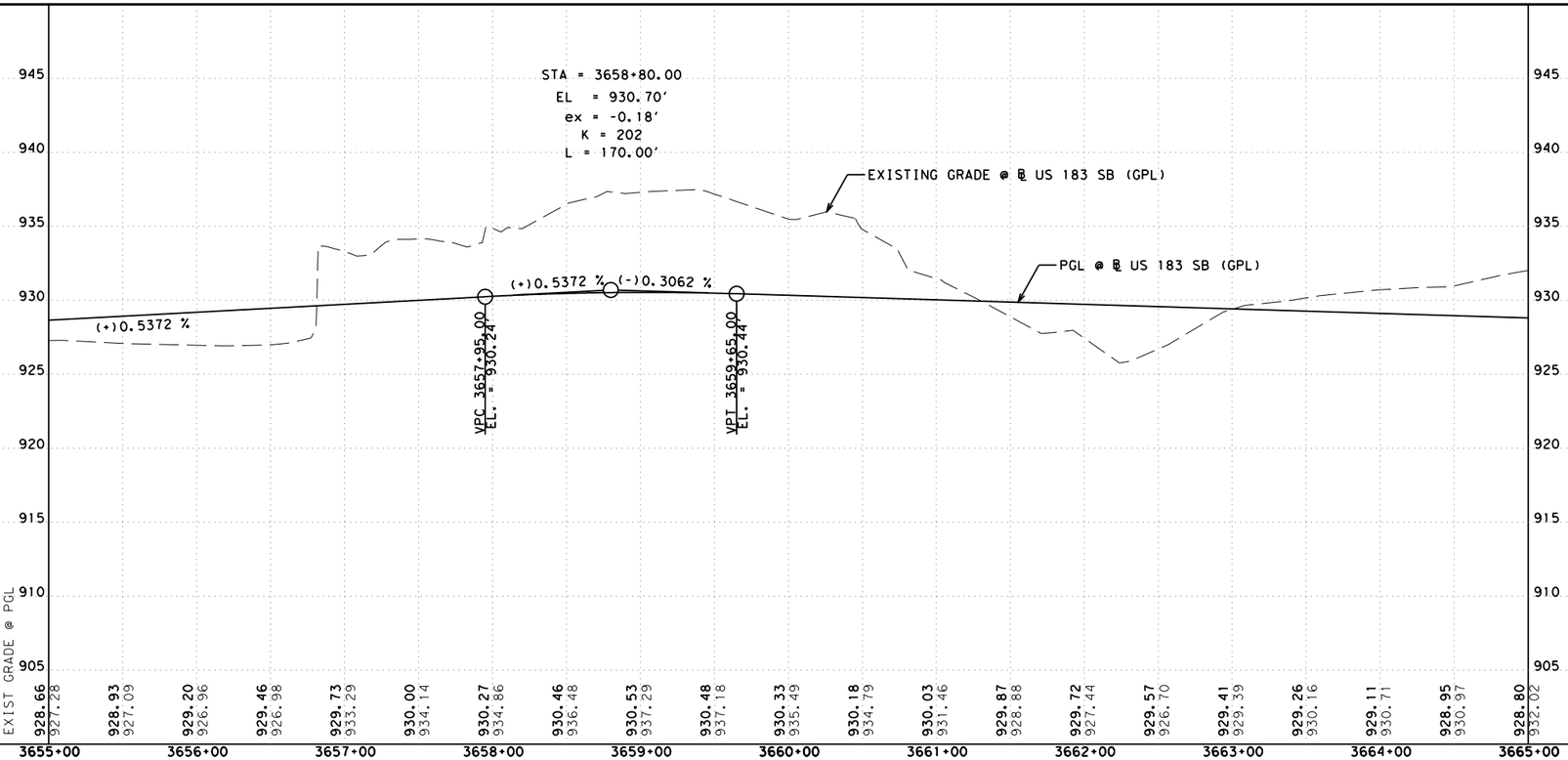

PROP RDWY X-SLOPE	
STATION	SLOPE
3656+60.00	-2.00%
ALL SUPERELEVATION TRANSITIONS ARE STRAIGHT	

DESIGN

STATE OF TEXAS · MARISSA GUZMAN · 130772 · LICENSED PROFESSIONAL ENGINEER

MARISSA GUZMAN, P.E.

11/10/2023
DATE

APPROVAL

STATE OF TEXAS · DAN THOMA · 98622 · LICENSED PROFESSIONAL ENGINEER

DAN THOMA, P.E.

11/10/2023
DATE

0 50 100

SCALE: PLAN 1" = 100'
PROFILE: 1" = 10'

PAPE-DAWSON ENGINEERS

SAN ANTONIO | AUSTIN | HOUSTON | FORT WORTH | DALLAS
2000 NW LOOP 410 | SAN ANTONIO, TX 78213 | 210.375.9000
TEXAS ENGINEERING FIRM #470 | TEXAS SURVEYING FIRM #10028800

2023 Texas Department of Transportation

US 183 GPL

SB PLAN & PROFILE

SHEET 6 OF 16

© 2023		CONT	SECT	JOB	HIGHWAY
DS:	CK:	0151	10	001	US 183
DW:	CK:	DIST	COUNTY		SHEET NO.
		AUS	WILLIAMSON		287

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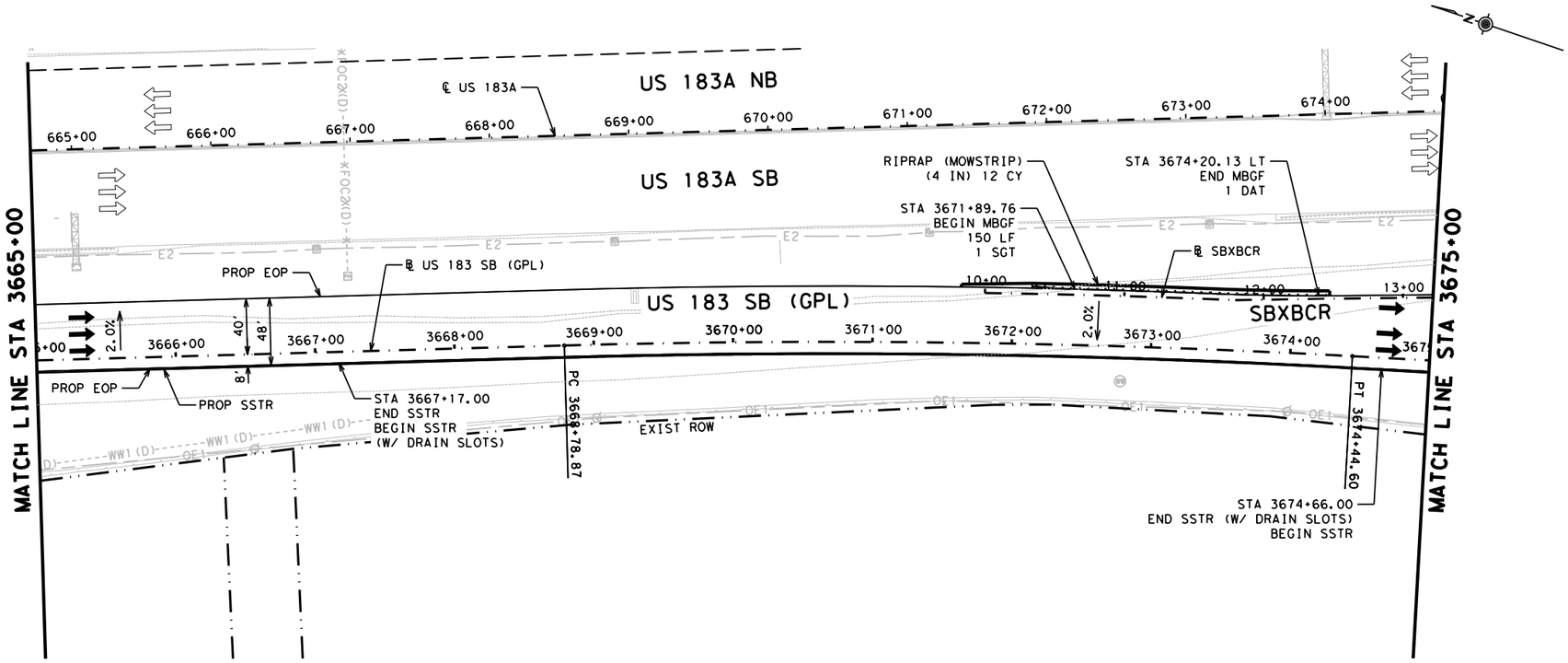

LEGEND

- EXIST TRAFFIC FLOW ARROW
- PROP TRAFFIC FLOW ARROW
- RETAINING WALL
- NOISE WALL
- TEMPORARY SPECIAL SHORING WALL
- ROCK CUT WALL
- PROP CRCP
- CONCRETE RIPRAP
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- [X] DRIVEWAY ID
- W 12" EXISTING UTILITY

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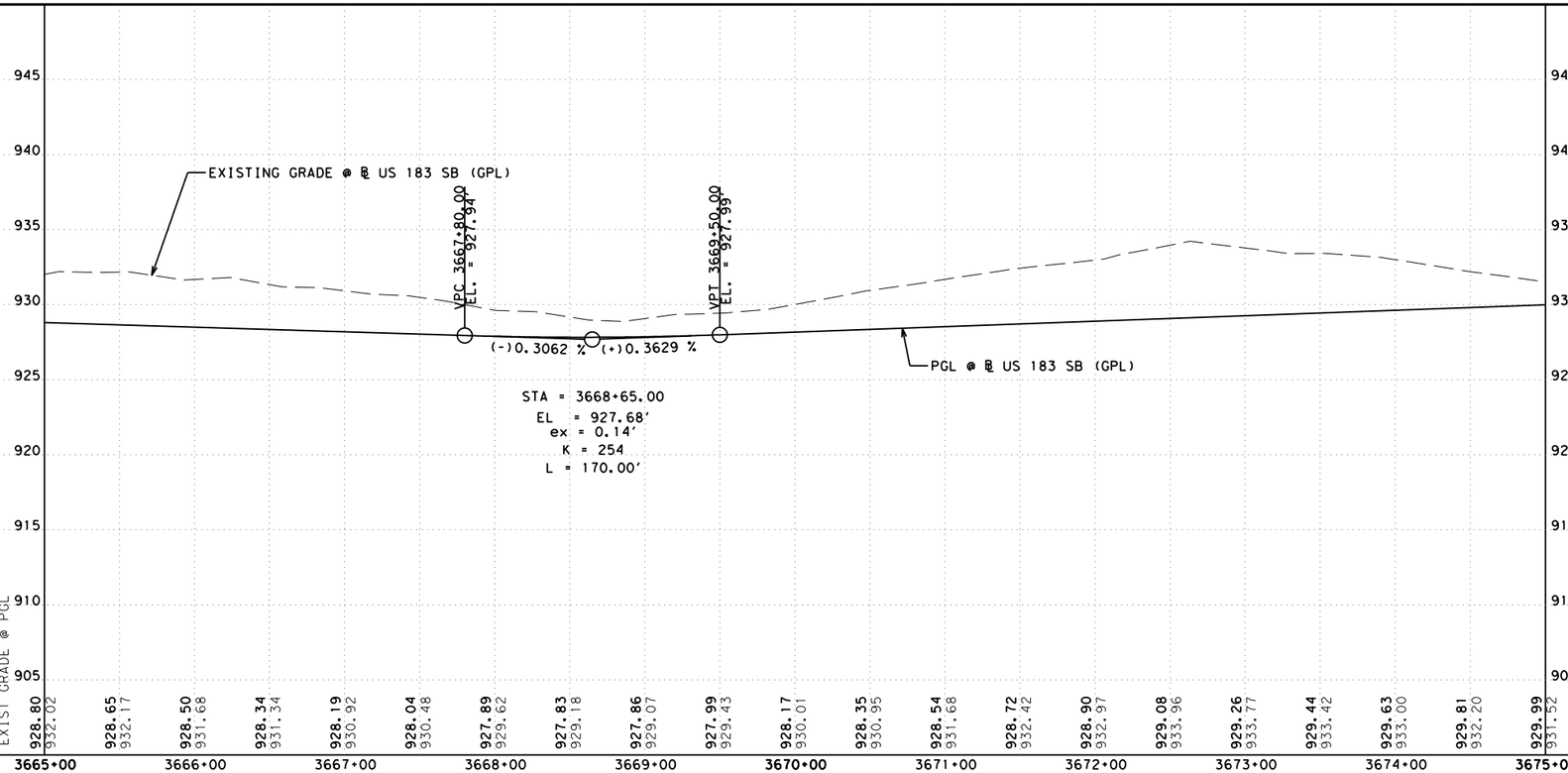

PROP RDWY X-SLOPE	
STATION	SLOPE
3666+02.00	-2.00%
3669+09.00	2.00%
3673+28.00	2.00%
ALL SUPERELEVATION TRANSITIONS ARE STRAIGHT	

DESIGN

STATE OF TEXAS · MARISSA GUZMAN · 130772 · LICENSED PROFESSIONAL ENGINEER

MARISSA GUZMAN, P.E.

3/16/2023

DATE

APPROVAL

STATE OF TEXAS · DAN THOMA · 98622 · LICENSED PROFESSIONAL ENGINEER

DAN THOMA, P.E.

3/16/2023

DATE

0 50 100

SCALE: PLAN 1" = 100'
PROFILE: 1" = 10'

PAPE-DAWSON ENGINEERS

SAN ANTONIO | AUSTIN | HOUSTON | FORT WORTH | DALLAS
2000 NW LOOP 410 | SAN ANTONIO, TX 78213 | 210.375.9000
TEXAS ENGINEERING FIRM #470 | TEXAS SURVEYING FIRM #10028800

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US 183 GPL

SB

PLAN & PROFILE

SHEET 7 OF 16

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DS:	CK:	0151	10	001	US 183
		DIST	COUNTY		SHEET NO.
DW:	CK:	AUS	WILLIAMSON		288

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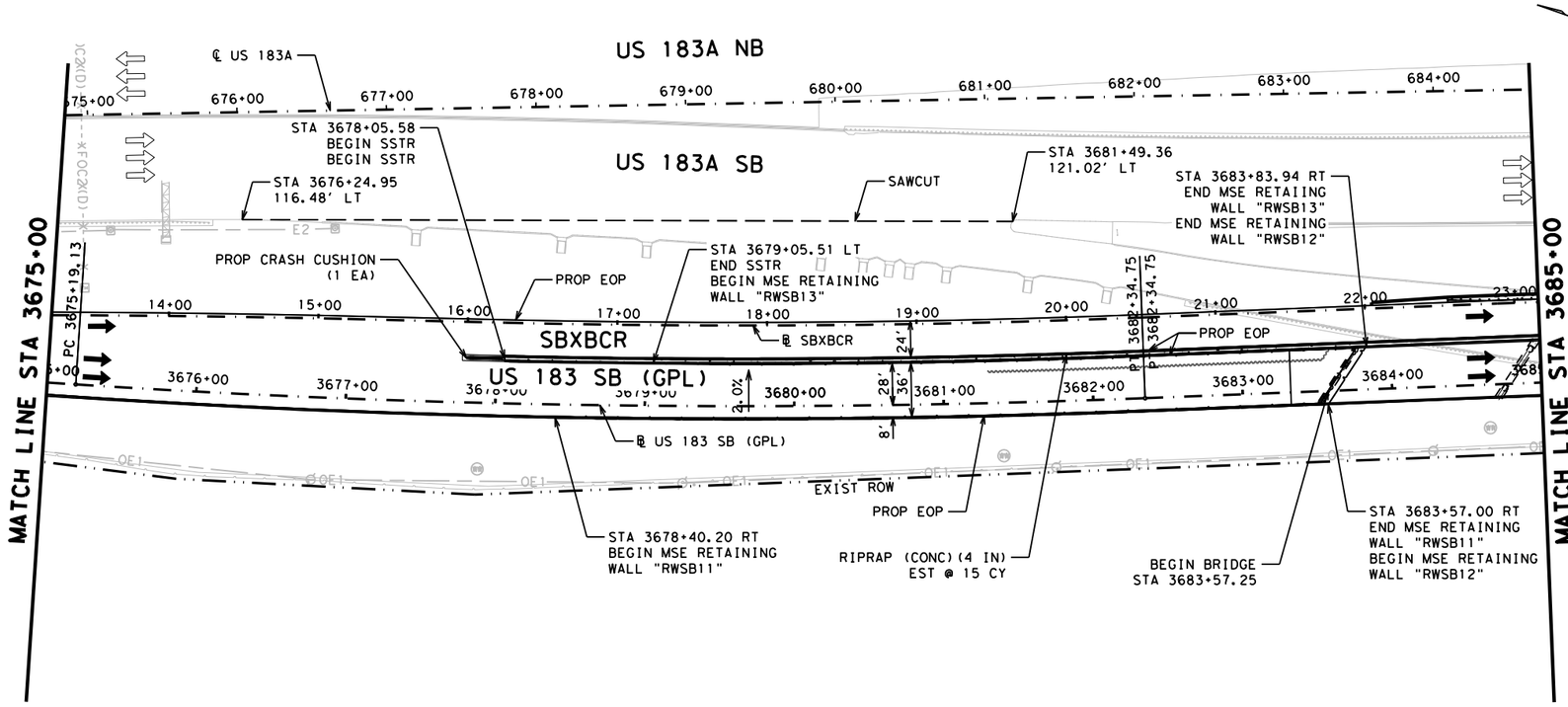

LEGEND

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- PROP TRAFFIC FLOW ARROW
- RETAINING WALL
- NOISE WALL
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- [X] DRIVEWAY ID
- W T2" EXISTING UTILITY

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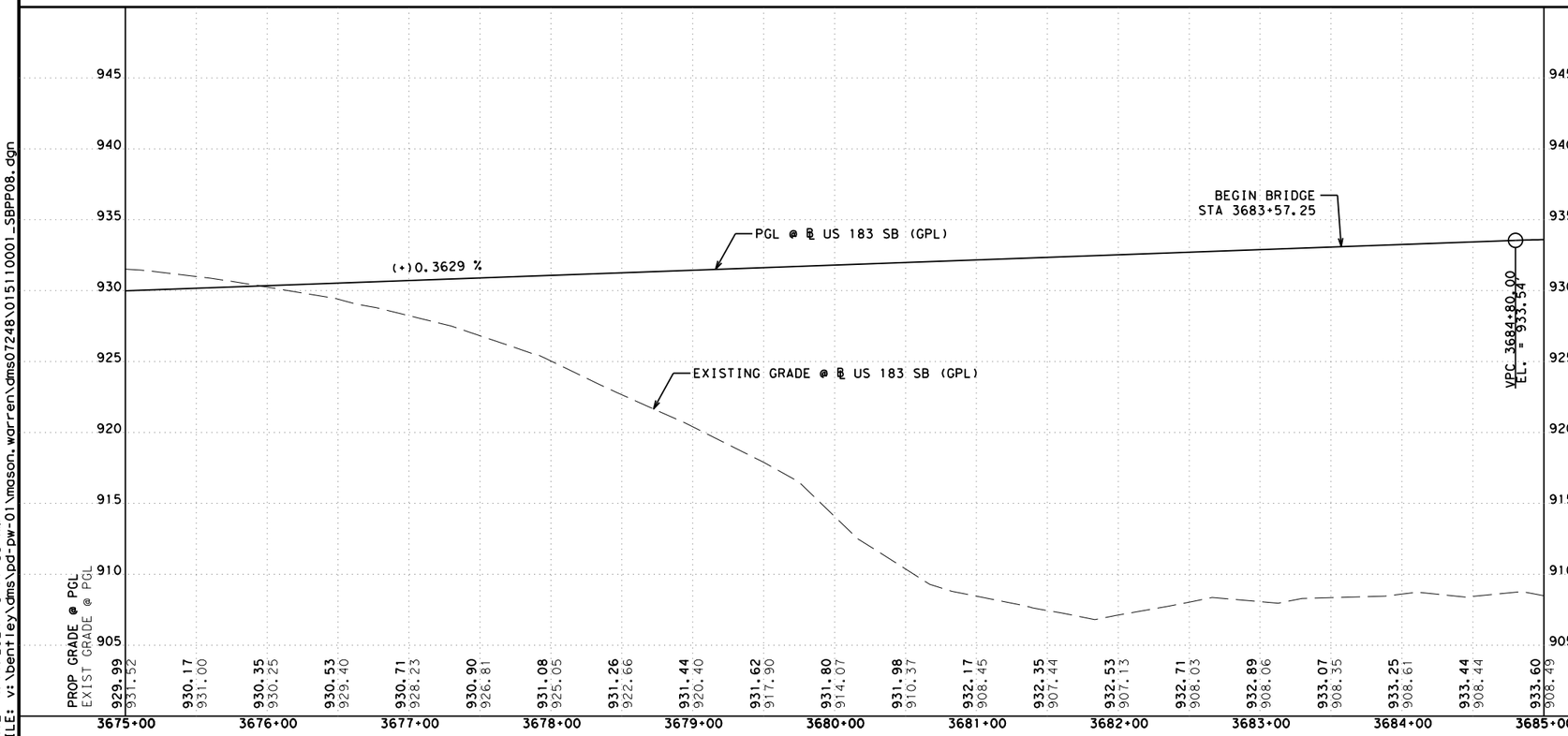

PROP RDWY X-SLOPE	
STATION	SLOPE
3676+35.00	-2.00%
ALL SUPERELEVATION TRANSITIONS ARE STRAIGHT	

DESIGN

STATE OF TEXAS — MARISSA GUZMAN — 130772 — LICENSED PROFESSIONAL ENGINEER

MARISSA GUZMAN, P.E.

4/17/2024

DATE

APPROVAL

STATE OF TEXAS — DAN THOMA — 98622 — LICENSED PROFESSIONAL ENGINEER

DAN THOMA, P.E.

4/17/2024

DATE

0 50 100

SCALE: PLAN 1" = 100'
PROFILE: 1" = 10'

PAPE-DAWSON ENGINEERS

SAN ANTONIO | AUSTIN | HOUSTON | FORT WORTH | DALLAS
2000 NW LOOP 410 | SAN ANTONIO, TX 78213 | 210.375.9000
TEXAS ENGINEERING FIRM #470 | TEXAS SURVEYING FIRM #10028800

2024 Texas Department of Transportation

US 183 GPL

SB PLAN & PROFILE

SHEET 8 OF 16

© 2024	CONT	SECT	JOB	HIGHWAY
DS: CK:	0151	10	001	US 183
DW: CK:	DIST	COUNTY		SHEET NO.
	AUS	WILLIAMSON		289

DATE: 4/17/2024 8:17:55 AM
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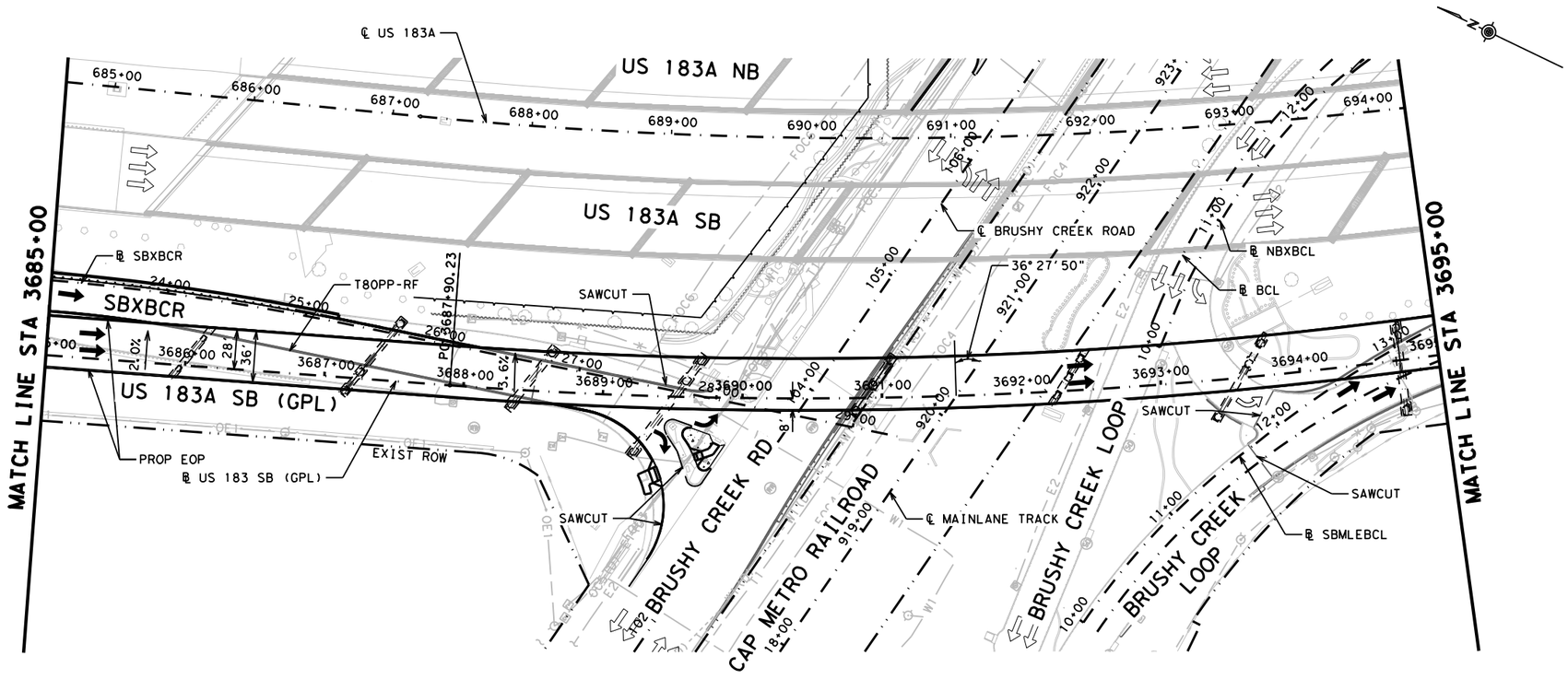

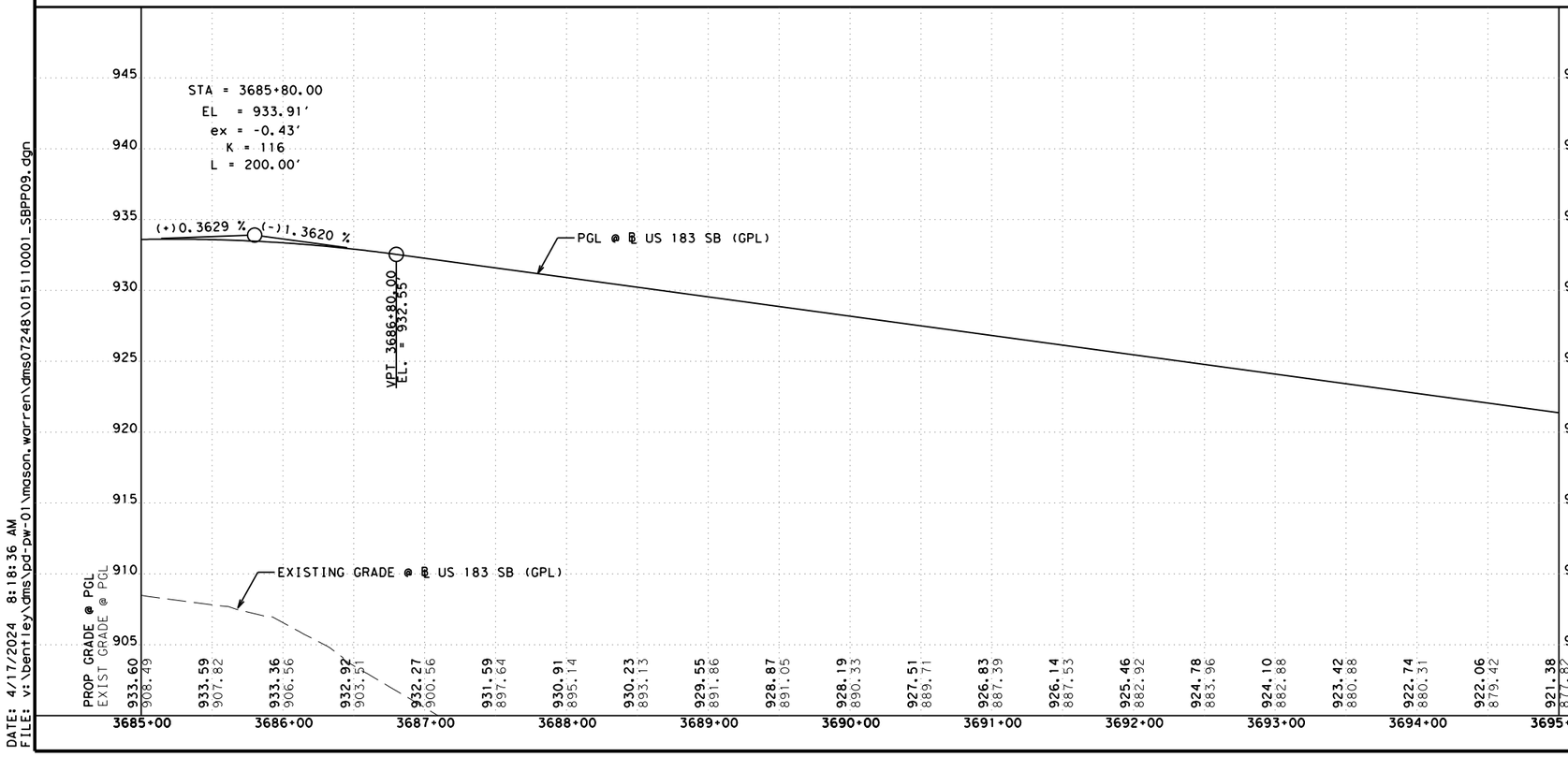

PROP RDWY X-SLOPE	
STATION	SLOPE
3686+22.25	-2.00%
3688+42.25	-3.60%
ALL SUPERELEVATION TRANSITIONS ARE STRAIGHT	

LEGEND

- EXIST TRAFFIC FLOW ARROW
- PROP TRAFFIC FLOW ARROW
- RETAINING WALL
- NOISE WALL
- TEMPORARY SPECIAL SHORING WALL
- ROCK CUT WALL
- PROP CRCP
- CONCRETE RIPRAP
- PROPERTY EASEMENT
- [X] DRIVEWAY ID
- W T2" EXISTING UTILITY

NOTES

1. EXISTING FEATURES AND PROPOSED FEATURES NOT DETAILED ON THIS SHEET ARE SHOWN SCREENED BACK; i.e. FADED.
2. SEE HORIZONTAL ALIGNMENT DATA SHEETS FOR HORIZONTAL ALIGNMENT DATA.
3. SEE INTERSECTION DETAIL SHEETS FOR INTERSECTION INFORMATION.
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8. SEE NB PLAN AND PROFILE SHEETS FOR FOR US 183 NB GPL INFORMATION AND SB PLAN AND PROFILE SHEETS FOR US 183 SB GPL INFORMATION.

DESIGN

STATE OF TEXAS — MARISSA GUZMAN — 130772 — LICENSED PROFESSIONAL ENGINEER

MARISSA GUZMAN, P.E.
4/17/2024
DATE

APPROVAL

STATE OF TEXAS — DAN THOMA — 98622 — LICENSED PROFESSIONAL ENGINEER

DAN THOMA, P.E.
4/17/2024
DATE

0 50 100
SCALE: PLAN 1" = 100'
PROFILE: 1" = 10'

PAPE-DAWSON ENGINEERS
SAN ANTONIO | AUSTIN | HOUSTON | FORT WORTH | DALLAS
2000 NW LOOP 410 | SAN ANTONIO, TX 78213 | 210.375.9000
TEXAS ENGINEERING FIRM #470 | TEXAS SURVEYING FIRM #10028800

2024 Texas Department of Transportation

US 183 GPL
SB
PLAN & PROFILE

SHEET 9 OF 16

© 2024		CONT	SECT	JOB	HIGHWAY
DS:	CK:	0151	10	001	US 183
DW:	CK:	DIST	COUNTY		SHEET NO.
		AUS	WILLIAMSON		290

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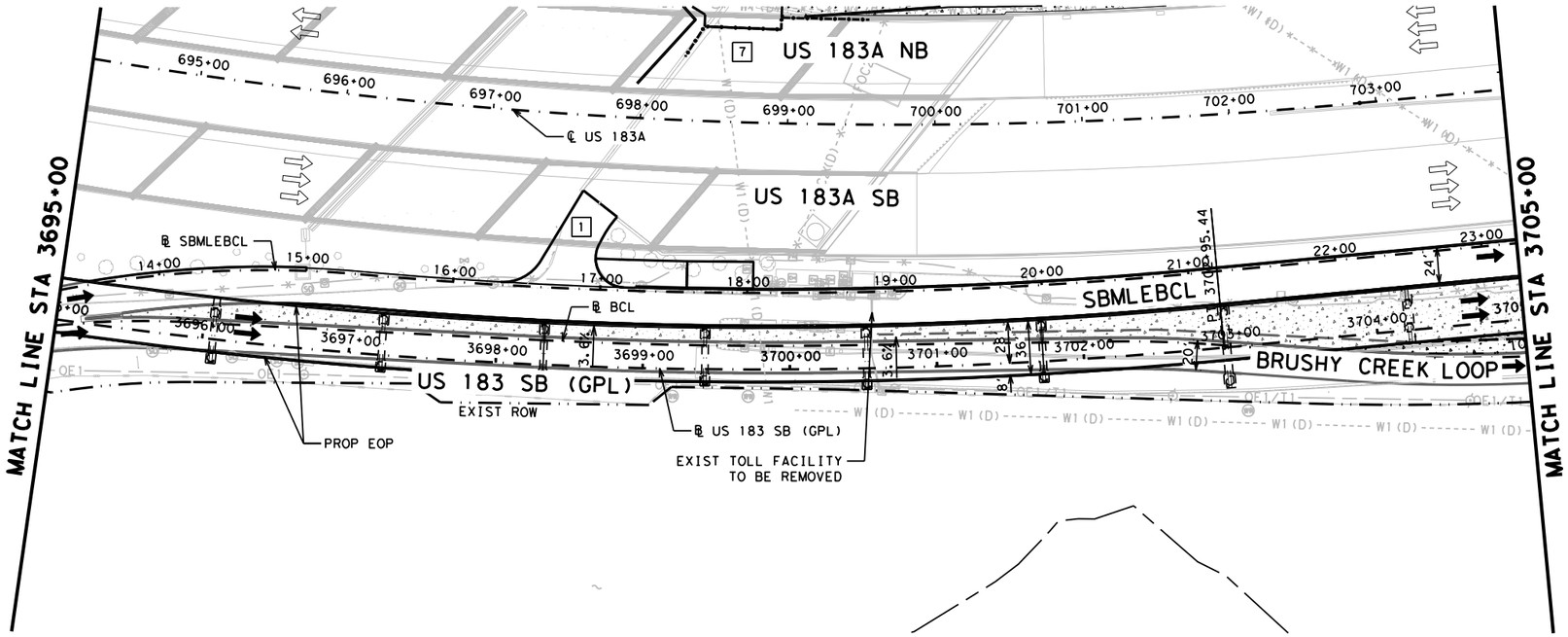

LEGEND

- EXIST TRAFFIC FLOW ARROW
- PROP TRAFFIC FLOW ARROW
- RETAINING WALL
- NOISE WALL
- TEMPORARY SPECIAL SHORING WALL
- ROCK CUT WALL
- PROP CRCP
- CONCRETE RIPRAP
- PROPERTY EASEMENT
- [X] DRIVEWAY ID
- W 12" EXISTING UTILITY

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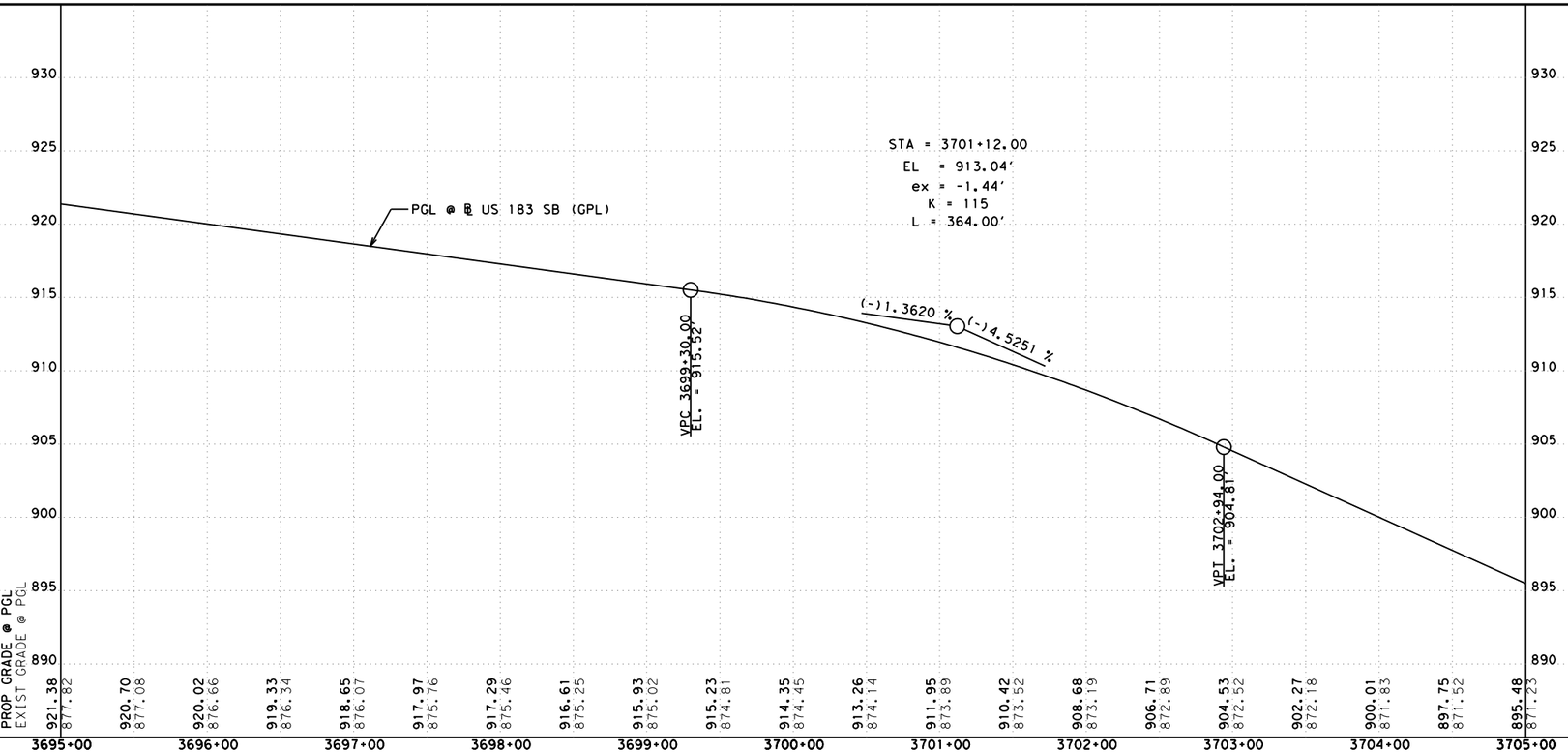

PROP RDWY X-SLOPE	
STATION	SLOPE
3701+72.25	-3.60%
ALL SUPERELEVATION TRANSITIONS ARE STRAIGHT	

DESIGN

STATE OF TEXAS — MARISSA GUZMAN — 130772 — LICENSED PROFESSIONAL ENGINEER

MARISSA GUZMAN, P.E.

4/23/2024

DATE

APPROVAL

STATE OF TEXAS — DAN THOMA — 98622 — LICENSED PROFESSIONAL ENGINEER

DAN THOMA, P.E.

4/23/2024

DATE

0 50 100

SCALE: PLAN 1" = 100'
PROFILE: 1" = 10'

PAPE-DAWSON ENGINEERS

SAN ANTONIO | AUSTIN | HOUSTON | FORT WORTH | DALLAS
2000 NW LOOP 410 | SAN ANTONIO, TX 78213 | 210.375.9000
TEXAS ENGINEERING FIRM #470 | TEXAS SURVEYING FIRM #10028800

2024 Texas Department of Transportation

US 183 GPL

SB PLAN & PROFILE

SHEET 10 OF 16

© 2024		CONT	SECT	JOB	HIGHWAY
DS:	CK:	0151	10	001	US 183
		DIST	COUNTY		SHEET NO.
DW:	CK:	AUS	WILLIAMSON		291

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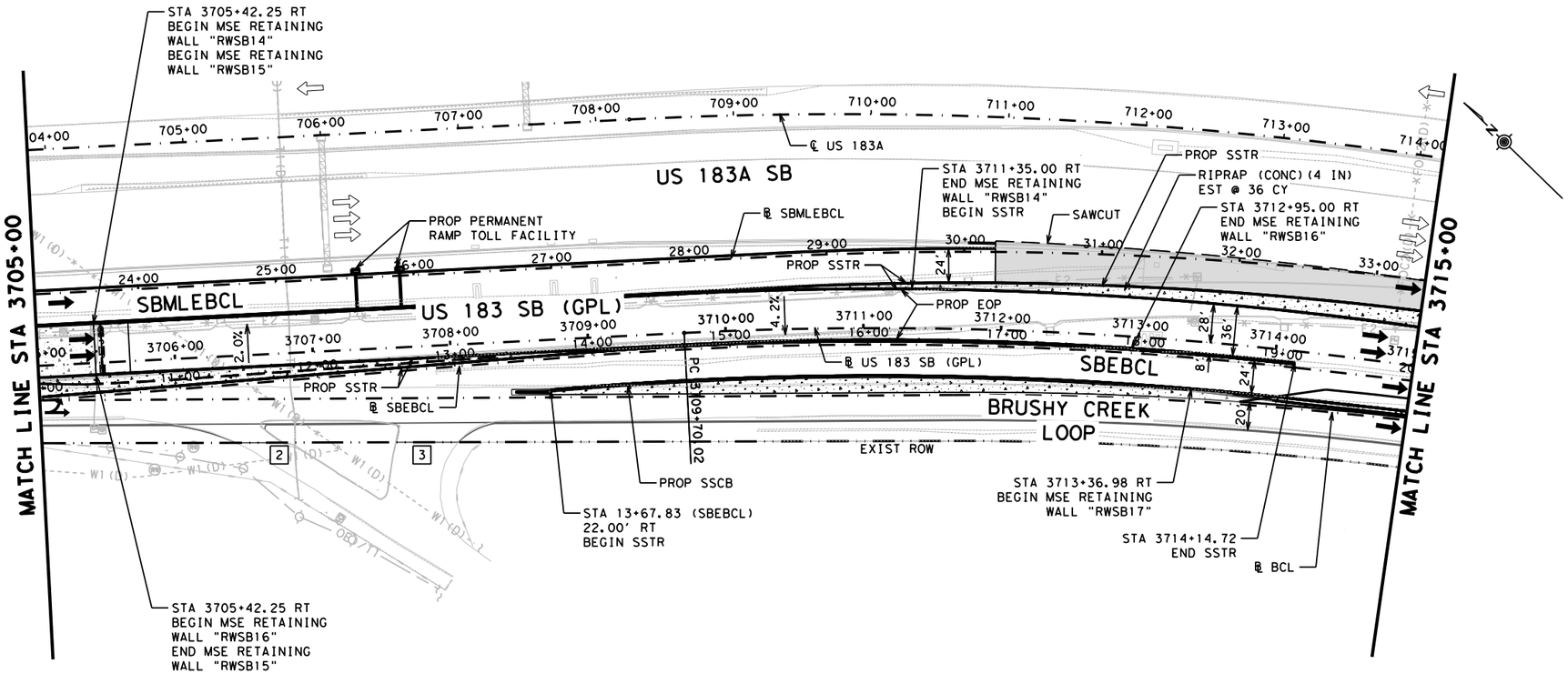

LEGEND

- EXIST TRAFFIC FLOW ARROW
- PROP TRAFFIC FLOW ARROW
- RETAINING WALL
- NOISE WALL
- TEMPORARY SPECIAL SHORING WALL
- ROCK CUT WALL
- PROP CRCP
- CONCRETE RIPRAP
- PROPERTY EASEMENT
- [X] DRIVEWAY ID
- W T2" EXISTING UTILITY

NOTES

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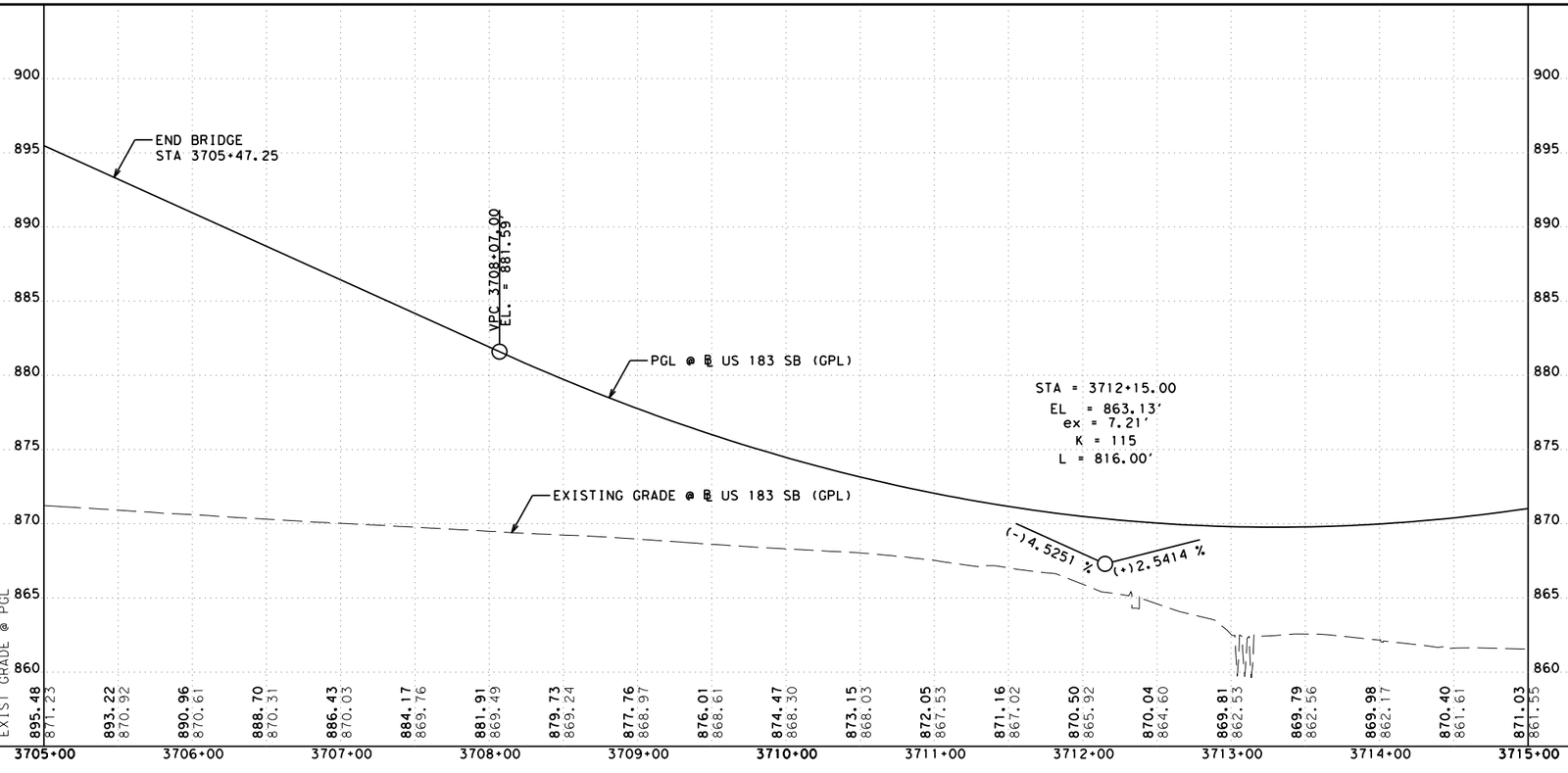

PROP RDWY X-SLOPE	
STATION	SLOPE
3705+47.25	-2.00%
3707+16.00	-2.00%
3710+33.00	4.20%
ALL SUPERELEVATION TRANSITIONS ARE STRAIGHT	

DESIGN

STATE OF TEXAS · MARISSA GUZMAN · 130772 · LICENSED PROFESSIONAL ENGINEER

MARISSA GUZMAN, P.E.
4/21/2023
DATE

APPROVAL

STATE OF TEXAS · DAN THOMA · 98622 · LICENSED PROFESSIONAL ENGINEER

DAN THOMA, P.E.
4/21/2023
DATE

0 50 100
SCALE: PLAN 1" = 100'
PROFILE: 1" = 10'

PAPE-DAWSON ENGINEERS
SAN ANTONIO | AUSTIN | HOUSTON | FORT WORTH | DALLAS
2000 NW LOOP 410 | SAN ANTONIO, TX 78213 | 210.375.9000
TEXAS ENGINEERING FIRM #470 | TEXAS SURVEYING FIRM #10028800

2023
Texas Department of Transportation

US 183 GPL
SB
PLAN & PROFILE

SHEET 11 OF 16

© 2023		CONT	SECT	JOB	HIGHWAY
DS:	CK:	0151	10	001	US 183
DW:	CK:	DIST	COUNTY		SHEET NO.
		AUS	WILLIAMSON		292

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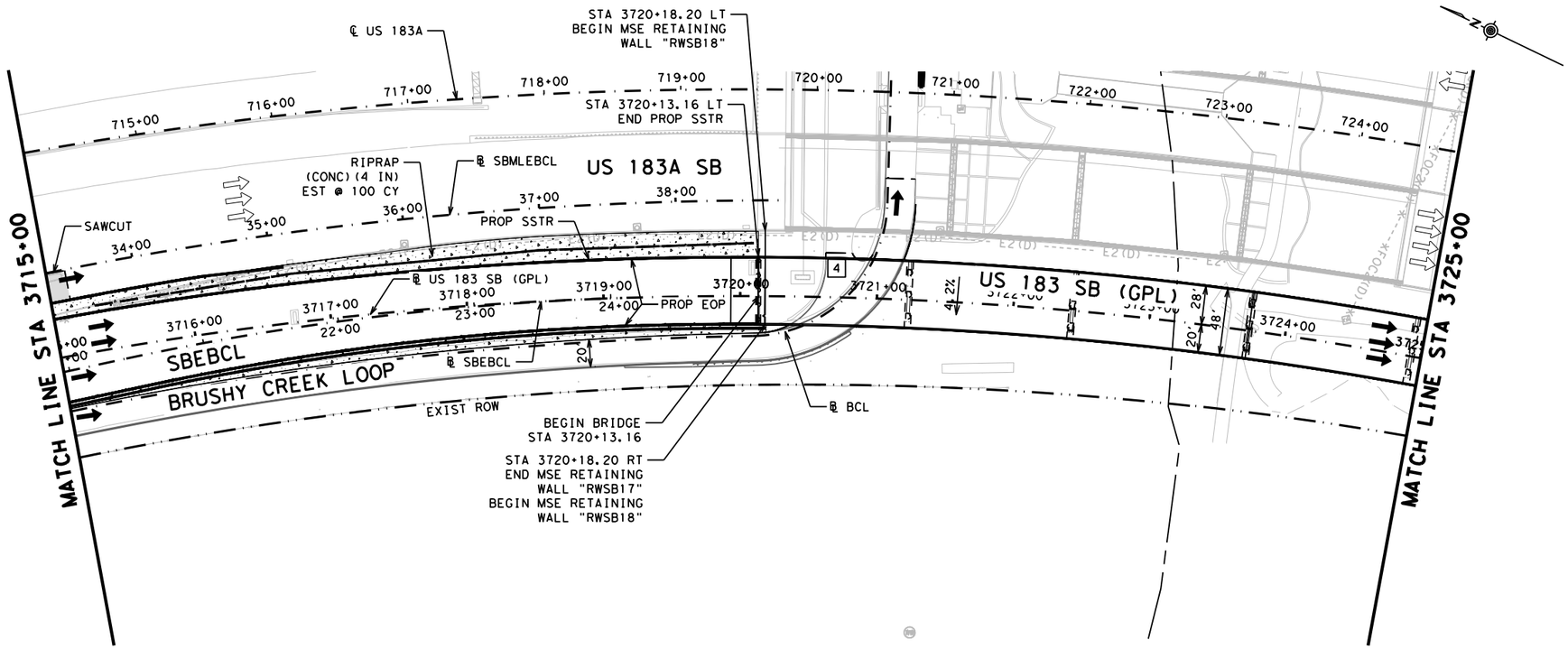

LEGEND

- EXIST TRAFFIC FLOW ARROW
- PROP TRAFFIC FLOW ARROW
- RETAINING WALL
- NOISE WALL
- TEMPORARY SPECIAL SHORING WALL
- ROCK CUT WALL
- PROP CRCP
- CONCRETE RIPRAP
- PROPERTY EASEMENT
- [X] DRIVEWAY ID
- W 12" EXISTING UTILITY

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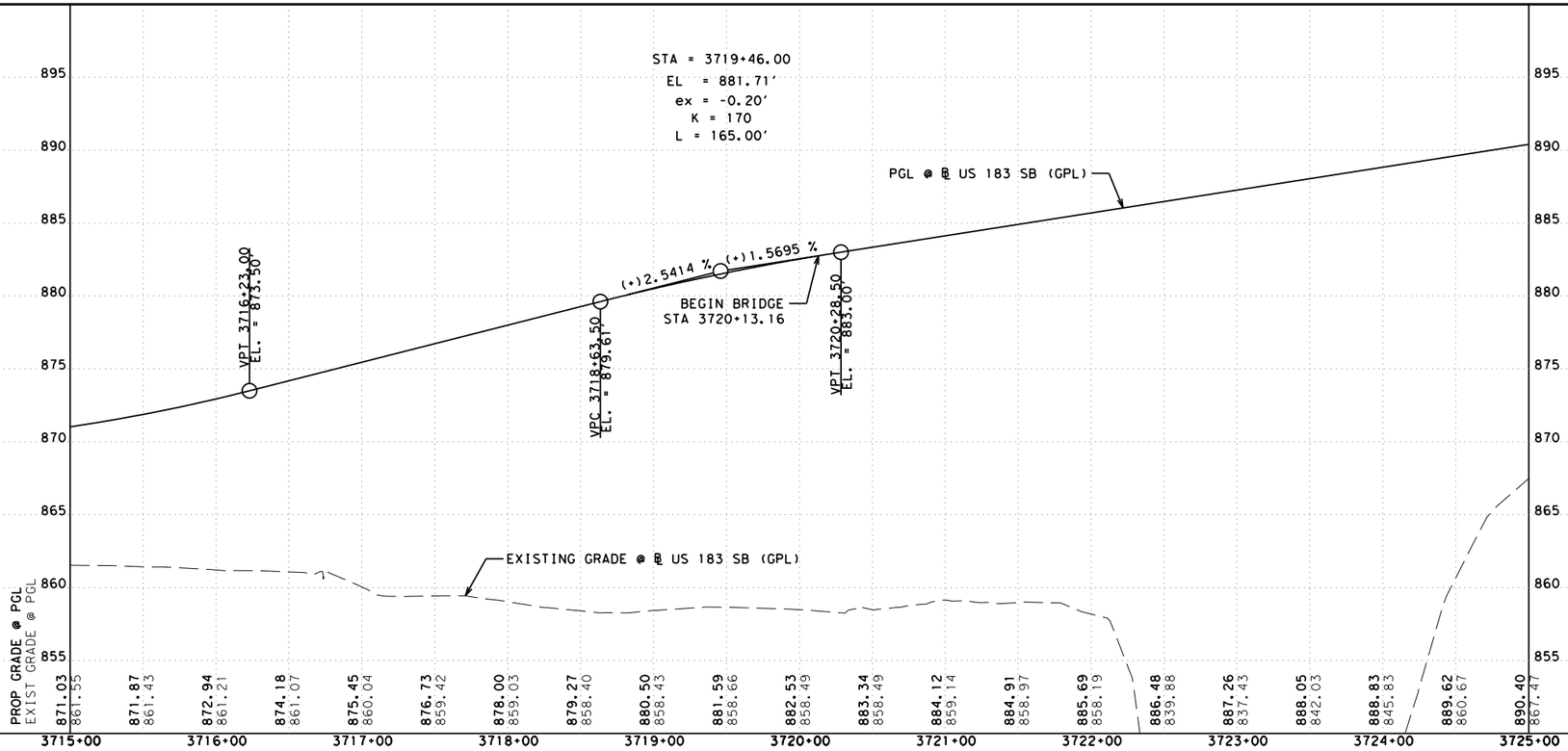

PROP RDWY X-SLOPE	
STATION	SLOPE
ALL SUPERELEVATION TRANSITIONS ARE STRAIGHT	

DESIGN

STATE OF TEXAS — MARISSA GUZMAN — 130772 — LICENSED PROFESSIONAL ENGINEER

MARISSA GUZMAN, P.E.

4/11/2024

DATE

APPROVAL

STATE OF TEXAS — DAN THOMA — 98622 — LICENSED PROFESSIONAL ENGINEER

DAN THOMA, P.E.

4/11/2024

DATE

0 50 100

SCALE: PLAN 1" = 100'
PROFILE: 1" = 10'

PAPE-DAWSON ENGINEERS

SAN ANTONIO | AUSTIN | HOUSTON | FORT WORTH | DALLAS
2000 NW LOOP 410 | SAN ANTONIO, TX 78213 | 210.375.9000
TEXAS ENGINEERING FIRM #470 | TEXAS SURVEYING FIRM #10028800

2024 Texas Department of Transportation

US 183 GPL
SB
PLAN & PROFILE

SHEET 12 OF 16

© 2024		CONT	SECT	JOB	HIGHWAY
DS:	CK:	0151	10	001	US 183
DW:	CK:	DIST	COUNTY		SHEET NO.
		AUS	WILLIAMSON		293

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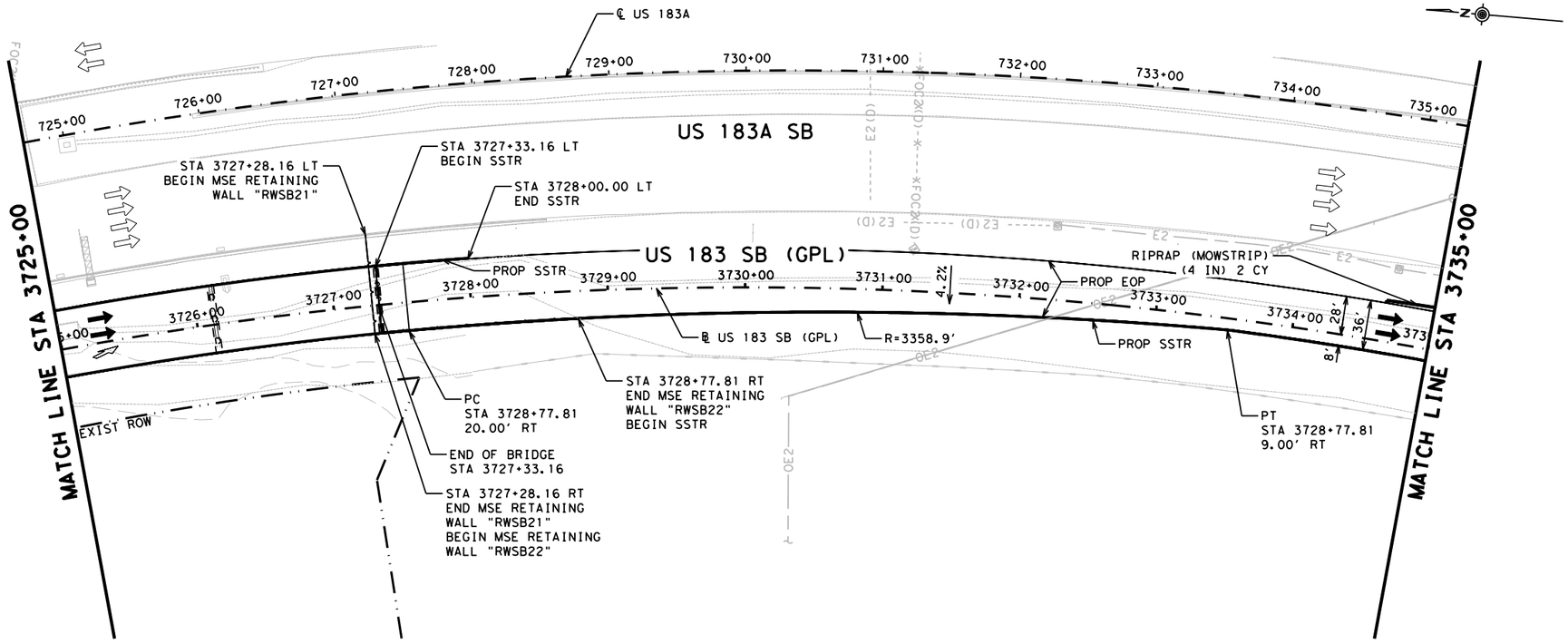

LEGEND

- EXIST TRAFFIC FLOW ARROW
- PROP TRAFFIC FLOW ARROW
- RETAINING WALL
- NOISE WALL
- TEMPORARY SPECIAL SHORING WALL
- ROCK CUT WALL
- PROP CRCP
- CONCRETE RIPRAP
- PROPERTY EASEMENT
- DRIVEWAY ID
- EXISTING UTILITY

NOTES

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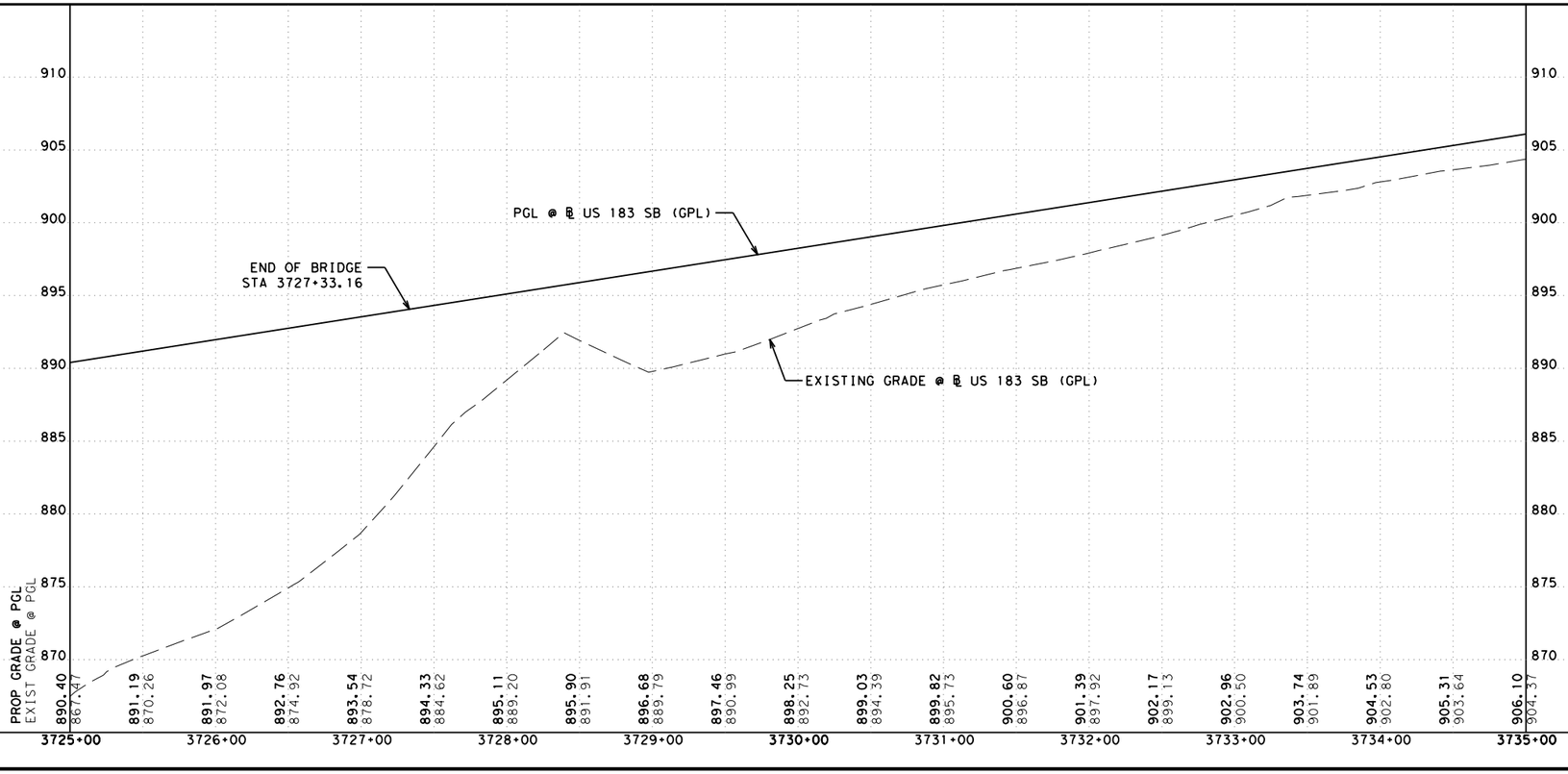

PROP RDWY X-SLOPE	
STATION	SLOPE
ALL SUPERELEVATION TRANSITIONS ARE STRAIGHT	

DESIGN

STATE OF TEXAS · MARISSA GUZMAN · 130772 · LICENSED PROFESSIONAL ENGINEER

MARISSA GUZMAN, P.E.

3/16/2023

DATE

APPROVAL

STATE OF TEXAS · DAN THOMA · 98622 · LICENSED PROFESSIONAL ENGINEER

DAN THOMA, P.E.

3/16/2023

DATE

0 50 100

SCALE: PLAN 1" = 100'
PROFILE: 1" = 10'

PAPE-DAWSON ENGINEERS

SAN ANTONIO | AUSTIN | HOUSTON | FORT WORTH | DALLAS
2000 NW LOOP 410 | SAN ANTONIO, TX 78213 | 210.375.9000
TEXAS ENGINEERING FIRM #470 | TEXAS SURVEYING FIRM #10028800

2023 Texas Department of Transportation

US 183 GPL

SB PLAN & PROFILE

SHEET 13 OF 16

© 2023		CONT	SECT	JOB	HIGHWAY
DS:	CK:	0151	10	001	US 183
		DIST	COUNTY		SHEET NO.
DW:	CK:	AUS	WILLIAMSON		294

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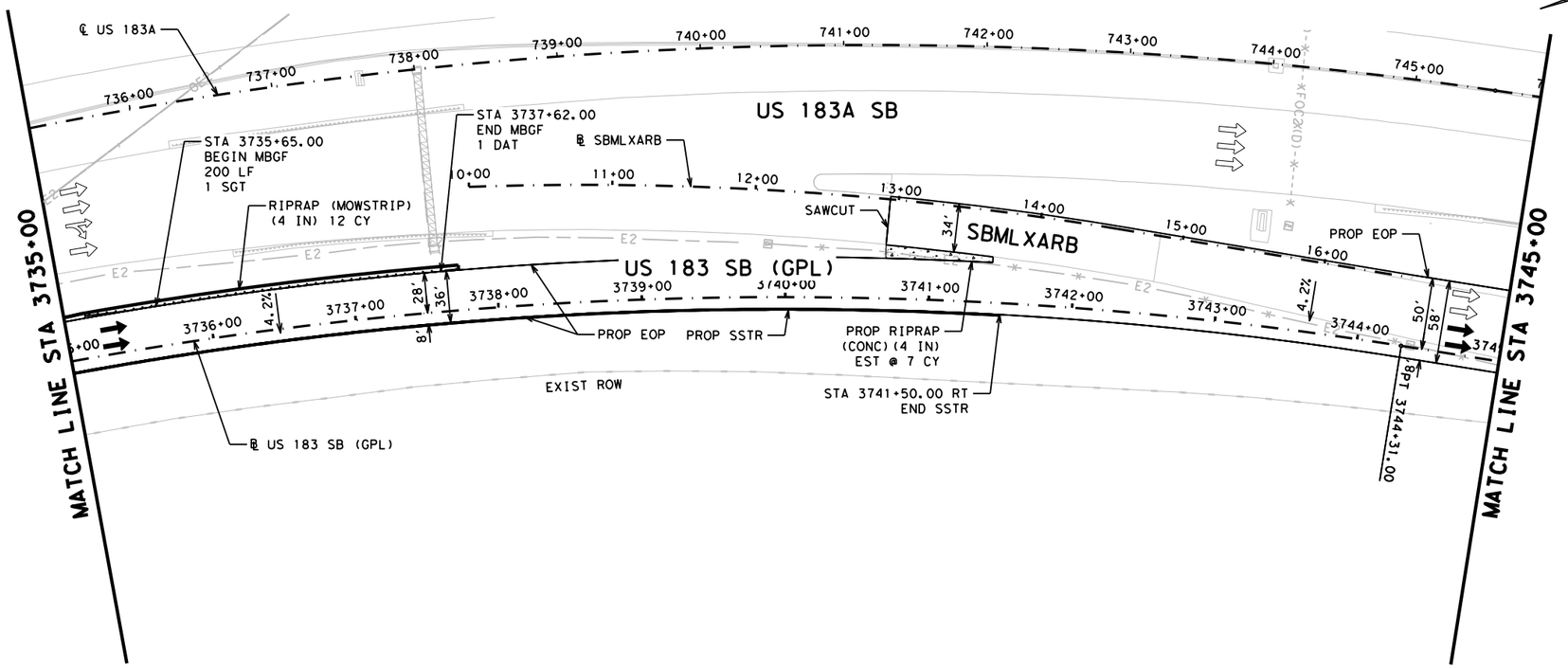

LEGEND

- EXIST TRAFFIC FLOW ARROW
- PROP TRAFFIC FLOW ARROW
- RETAINING WALL
- NOISE WALL
- TEMPORARY SPECIAL SHORING WALL
- ROCK CUT WALL
- PROP CRCP
- CONCRETE RIPRAP
- PROPERTY EASEMENT
- [X] DRIVEWAY ID
- W T2" EXISTING UTILITY

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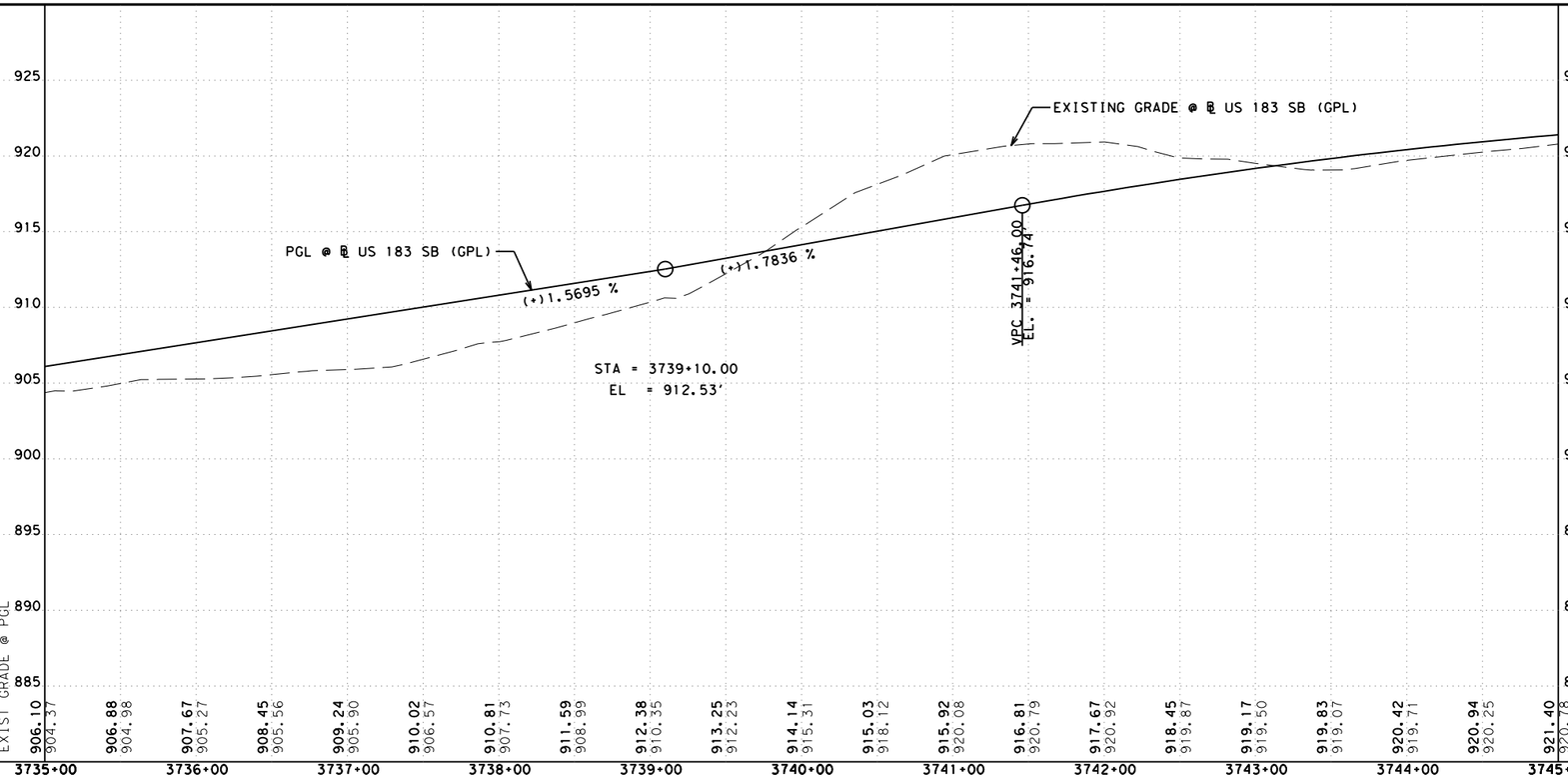

PROP RDWY X-SLOPE	
STATION	SLOPE
3743+68.00	4.20%
ALL SUPERELEVATION TRANSITIONS ARE STRAIGHT	

DESIGN

STATE OF TEXAS · MARISSA GUZMAN · 130772 · LICENSED PROFESSIONAL ENGINEER

MARISSA GUZMAN, P.E.

4/11/2024
DATE

APPROVAL

STATE OF TEXAS · DAN THOMA · 98622 · LICENSED PROFESSIONAL ENGINEER

DAN THOMA, P.E.

4/11/2024
DATE

0 50 100

SCALE: PLAN 1" = 100'
PROFILE: 1" = 10'

PAPE-DAWSON ENGINEERS

SAN ANTONIO | AUSTIN | HOUSTON | FORT WORTH | DALLAS
2000 NW LOOP 410 | SAN ANTONIO, TX 78213 | 210.375.9000
TEXAS ENGINEERING FIRM #470 | TEXAS SURVEYING FIRM #10028800

2024 Texas Department of Transportation

US 183 GPL

SB
PLAN & PROFILE

SHEET 14 OF 16

© 2024		CONT	SECT	JOB	HIGHWAY
DS:	CK:	0151	10	001	US 183
		DIST	COUNTY		SHEET NO.
DW:	CK:	AUS	WILLIAMSON		295

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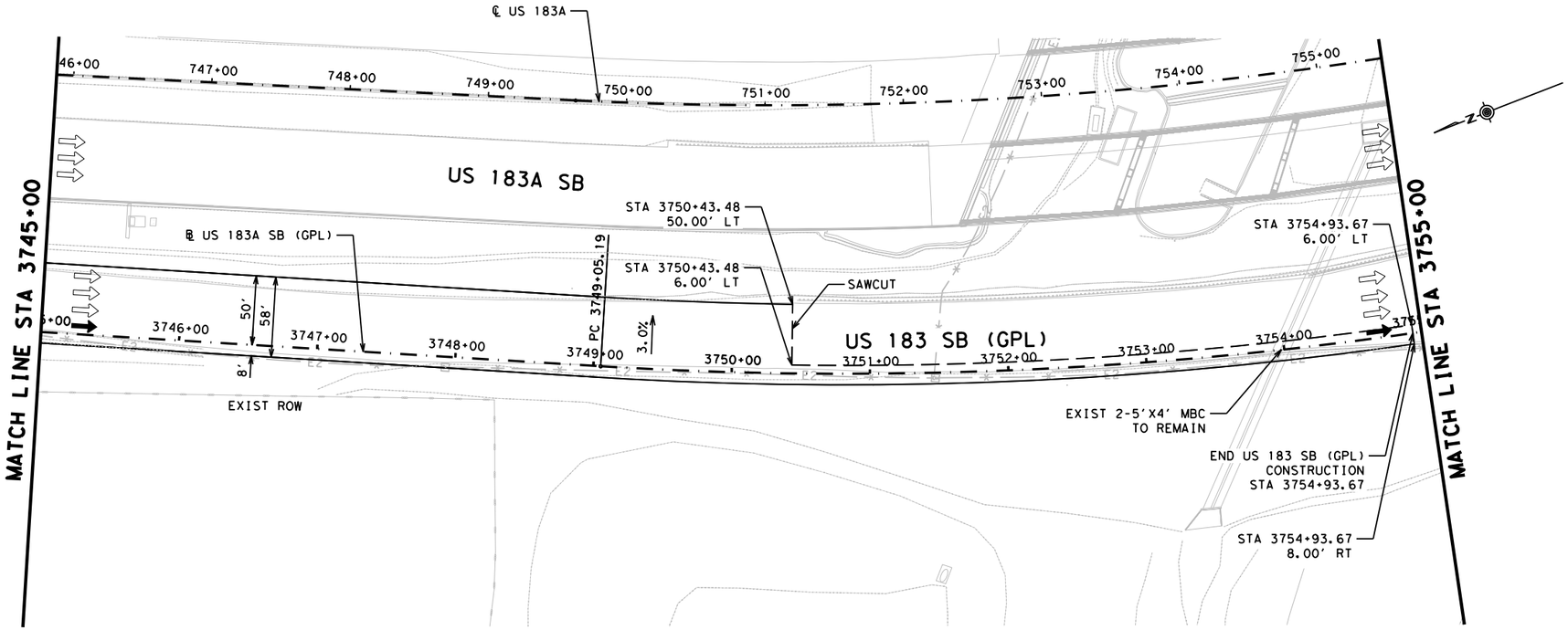

LEGEND

- EXIST TRAFFIC FLOW ARROW
- PROP TRAFFIC FLOW ARROW
- RETAINING WALL
- NOISE WALL
- TEMPORARY SPECIAL SHORING WALL
- ROCK CUT WALL
- PROP CRCP
- CONCRETE RIPRAP
- PROPERTY EASEMENT
- [X] DRIVEWAY ID
- W T2" EXISTING UTILITY

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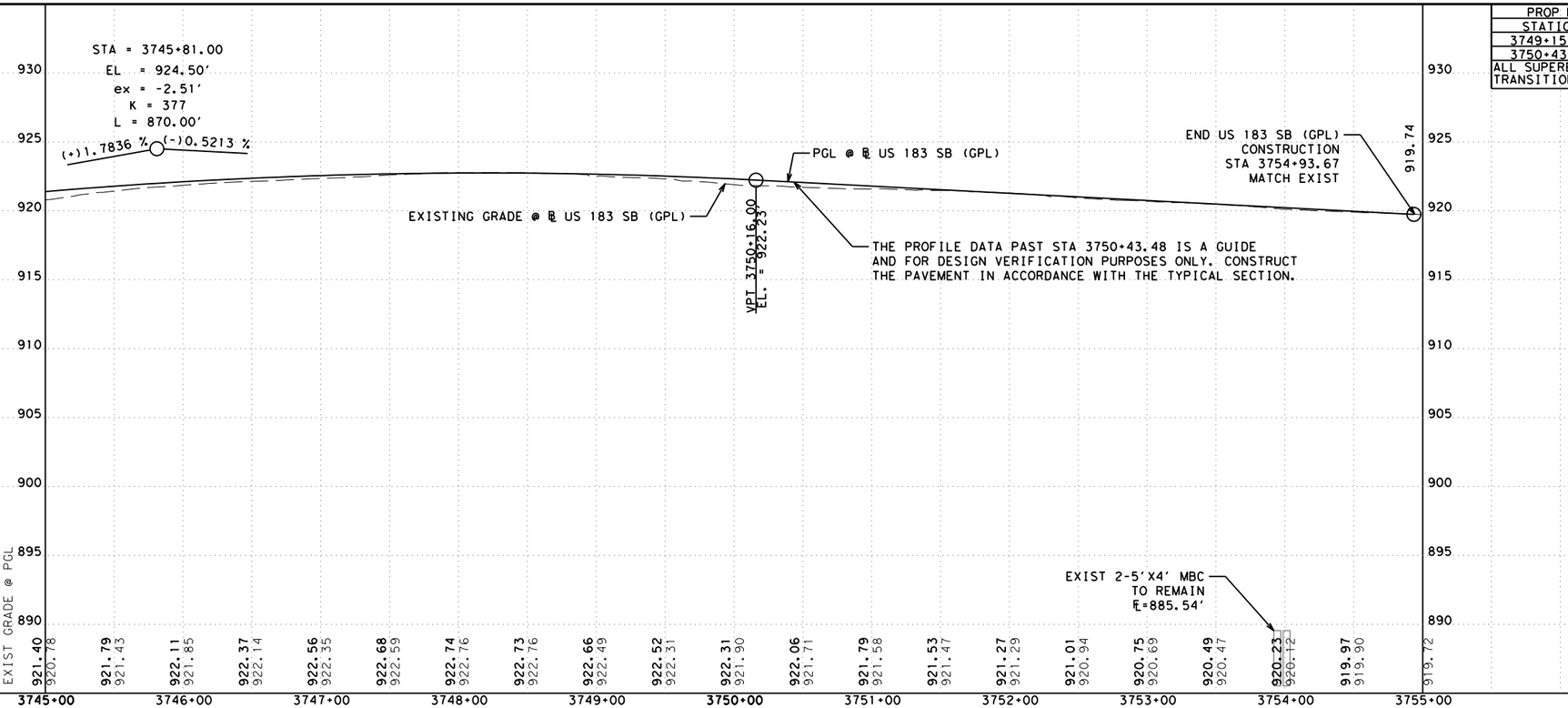

PROP RDWY X-SLOPE	
STATION	SLOPE
3749+15.00	-3.00%
3750+43.48	MATCH EXIST
ALL SUPERELEVATION TRANSITIONS ARE STRAIGHT	

DESIGN

STATE OF TEXAS · MARISSA GUZMAN · 130772 · LICENSED PROFESSIONAL ENGINEER

MARISSA GUZMAN, P.E.
3/16/2023
DATE

APPROVAL

STATE OF TEXAS · DAN THOMA · 98622 · LICENSED PROFESSIONAL ENGINEER

DAN THOMA, P.E.
3/16/2023
DATE

0 50 100
SCALE: PLAN 1" = 100'
PROFILE: 1" = 10'

PAPE-DAWSON ENGINEERS
SAN ANTONIO | AUSTIN | HOUSTON | FORT WORTH | DALLAS
2000 NW LOOP 410 | SAN ANTONIO, TX 78213 | 210.375.9000
TEXAS ENGINEERING FIRM #470 | TEXAS SURVEYING FIRM #10028800

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US 183 GPL
SB
PLAN & PROFILE

SHEET 15 OF 16

© 2023		CONT	SECT	JOB	HIGHWAY
DS:	CK:	0151	10	001	US 183
DW:	CK:	DIST	COUNTY		SHEET NO.
		AUS	WILLIAMSON		296

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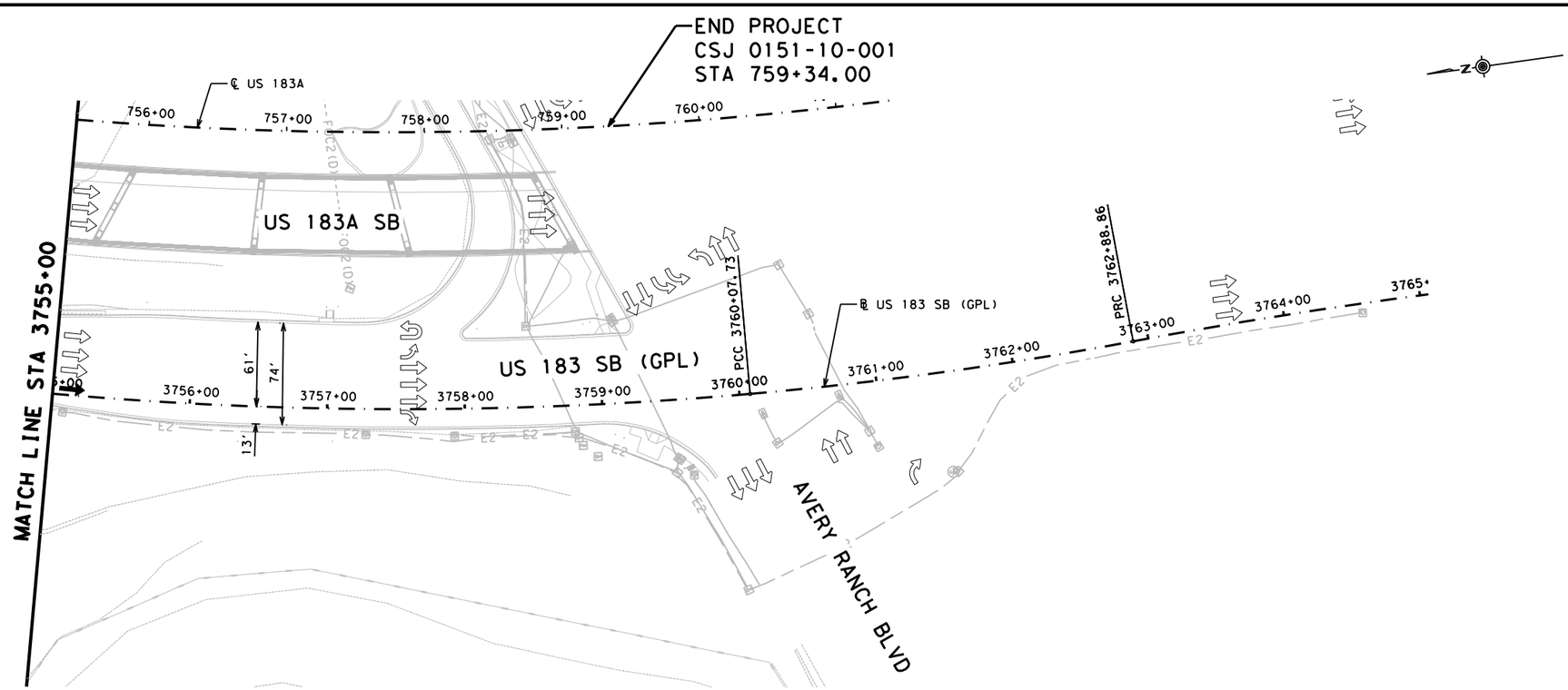

LEGEND

- EXIST TRAFFIC FLOW ARROW
- PROP TRAFFIC FLOW ARROW
- RETAINING WALL
- NOISE WALL
- TEMPORARY SPECIAL SHORING WALL
- ROCK CUT WALL
- PROP CRCP
- CONCRETE RIPRAP
- PROPERTY EASEMENT
- [X] DRIVEWAY ID
- W T2" EXISTING UTILITY

NOTES

1. EXISTING FEATURES AND PROPOSED FEATURES NOT DETAILED ON THIS SHEET ARE SHOWN SCREENED BACK; i.e. FADED.
2. SEE HORIZONTAL ALIGNMENT DATA SHEETS FOR HORIZONTAL ALIGNMENT DATA.
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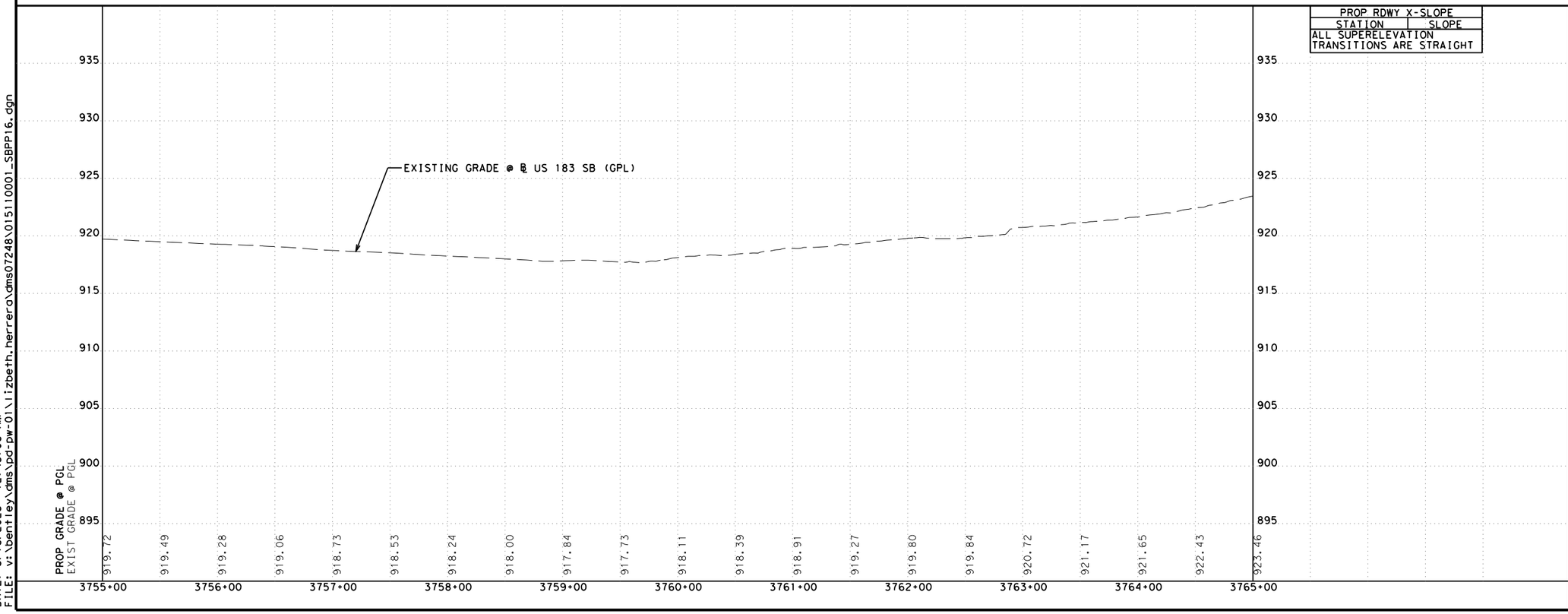
6. SEE RAMP PLAN AND PROFILE SHEETS FOR RAMP INFORMATION.
7. SEE BRUSHY CREEK LOOP PLAN AND PROFILE SHEETS FOR BRUSHY CREEK LOOP INFORMATION.
8. SEE NB PLAN AND PROFILE SHEETS FOR FOR US 183 NB GPL INFORMATION AND SB PLAN AND PROFILE SHEETS FOR US 183 SB GPL INFORMATION.
9. THE PROFILE DATA IS A GUIDE AND FOR DESIGN VERIFICATION PURPOSES ONLY. CONSTRUCT THE PAVEMENT IN ACCORDANCE WITH THE TYPICAL SECTION.
10. THE HORIZONTAL DATA IS A GUIDE AND FOR DESIGN VERIFICATION PURPOSES ONLY. CONSTRUCT THE PAVEMENT IN ACCORDANCE WITH THE TYPICAL SECTION.



PROP RDWY X-SLOPE	
STATION	SLOPE
ALL SUPERELEVATION TRANSITIONS ARE STRAIGHT	

DESIGN

STATE OF TEXAS — MARISSA GUZMAN — 130772 — LICENSED PROFESSIONAL ENGINEER

MARISSA GUZMAN, P.E.
3/16/2023
DATE

APPROVAL

STATE OF TEXAS — DAN THOMA — 98622 — LICENSED PROFESSIONAL ENGINEER

DAN THOMA, P.E.
3/16/2023
DATE

0 50 100

SCALE: PLAN 1" = 100'
PROFILE: 1" = 10'

PAPE-DAWSON ENGINEERS
SAN ANTONIO | AUSTIN | HOUSTON | FORT WORTH | DALLAS
2000 NW LOOP 410 | SAN ANTONIO, TX 78213 | 210.375.9000
TEXAS ENGINEERING FIRM #470 | TEXAS SURVEYING FIRM #10028800

2023 Texas Department of Transportation

US 183 GPL
SB
PLAN & PROFILE

SHEET 16 OF 16

© 2023		CONT	SECT	JOB	HIGHWAY
DS:	CK:	0151	10	001	US 183
DW:	CK:	DIST	COUNTY		SHEET NO.
		AUS	WILLIAMSON		297

DATE: 3/16/2023 12:45:06 AM
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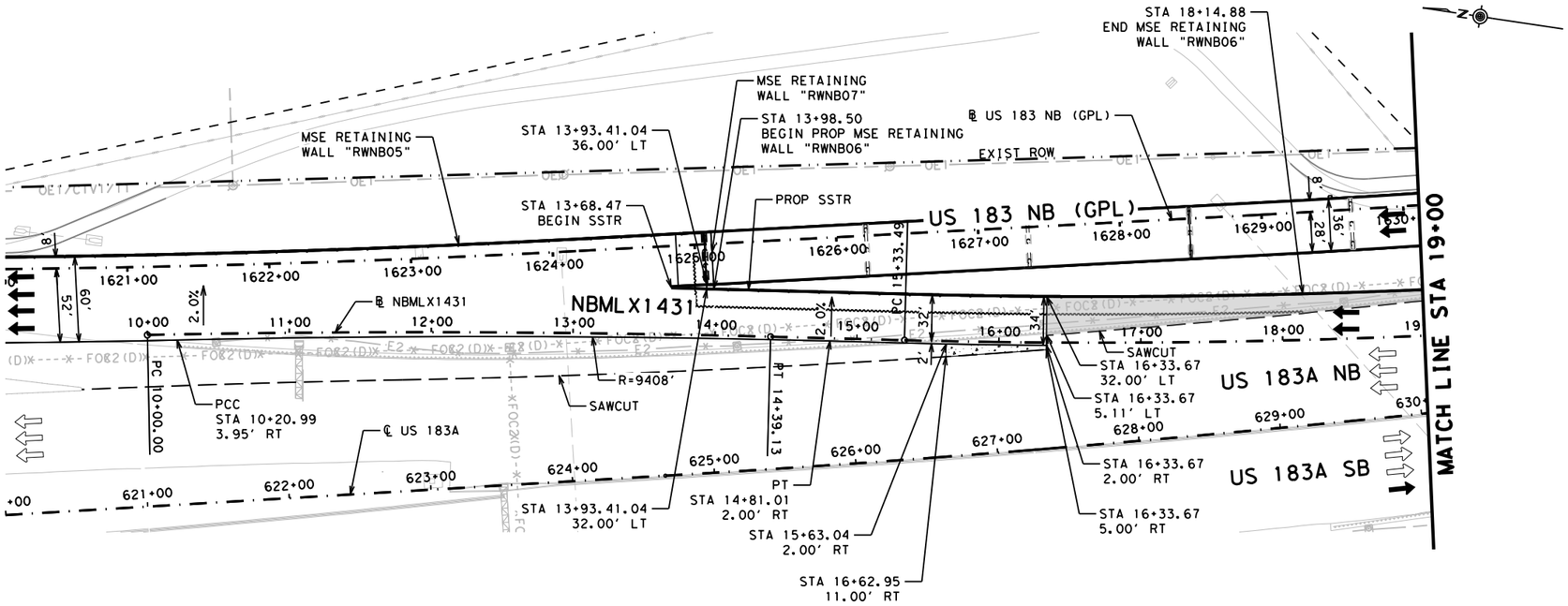

LEGEND

- EXIST TRAFFIC FLOW ARROW
- PROP TRAFFIC FLOW ARROW
- RETAINING WALL
- NOISE WALL
- TEMPORARY SPECIAL SHORING WALL
- ROCK CUT WALL
- PROP CRCP
- CONCRETE RIPRAP
- PROPERTY EASEMENT
- [X] DRIVEWAY ID
- W 12" EXISTING UTILITY

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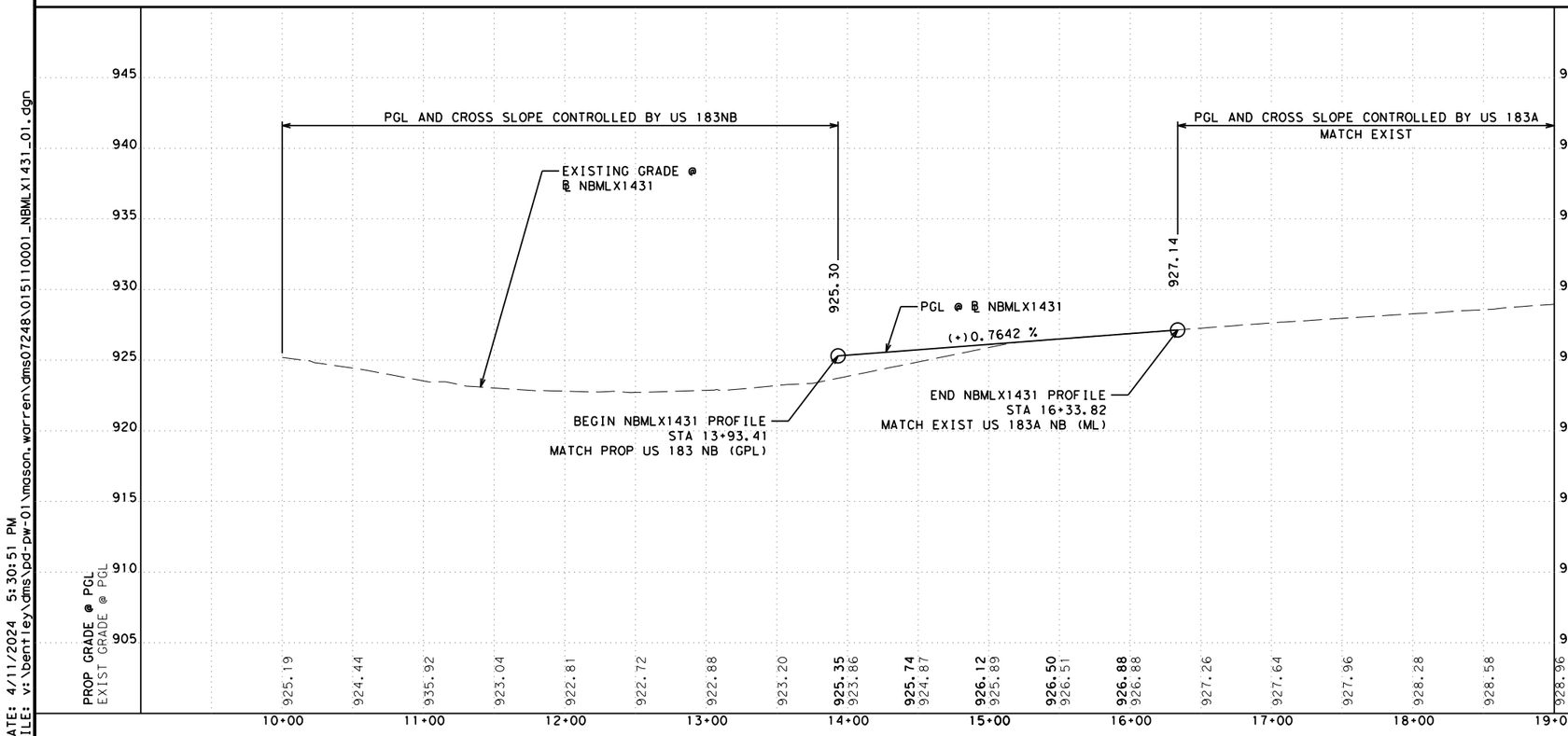

PROP RDWY X-SLOPE	
STATION	SLOPE
13+93.41	MATCH US 183 NB (GPL)
16+00.00	-2.00%
16+33.67	MATCH EXIST
ALL SUPERELEVATION TRANSITIONS ARE STRAIGHT LINE	

DESIGN

STATE OF TEXAS · MARISSA GUZMAN · 130772 · LICENSED PROFESSIONAL ENGINEER

MARISSA GUZMAN, P.E.
4/11/2024
DATE

APPROVAL

STATE OF TEXAS · DAN THOMA · 98622 · LICENSED PROFESSIONAL ENGINEER

DAN THOMA, P.E.
4/11/2024
DATE

0 50 100
SCALE: PLAN 1" = 100'
PROFILE: 1" = 10'

PAPE-DAWSON ENGINEERS
SAN ANTONIO | AUSTIN | HOUSTON | FORT WORTH | DALLAS
2000 NW LOOP 410 | SAN ANTONIO, TX 78213 | 210.375.9000
TEXAS ENGINEERING FIRM #470 | TEXAS SURVEYING FIRM #10028800

2024 Texas Department of Transportation

US 183 GPL
RAMP PLAN & PROFILE
NB EXIT FROM NB 183A (ML) TO RM 1431

SHEET 1 OF 2

© 2024		CONT	SECT	JOB	HIGHWAY
DS:	CK:	0151	10	001	US 183
DW:	CK:	DIST	COUNTY		SHEET NO.
		AUS	WILLIAMSON		298

DATE: 4/11/2024 5:30:51 PM
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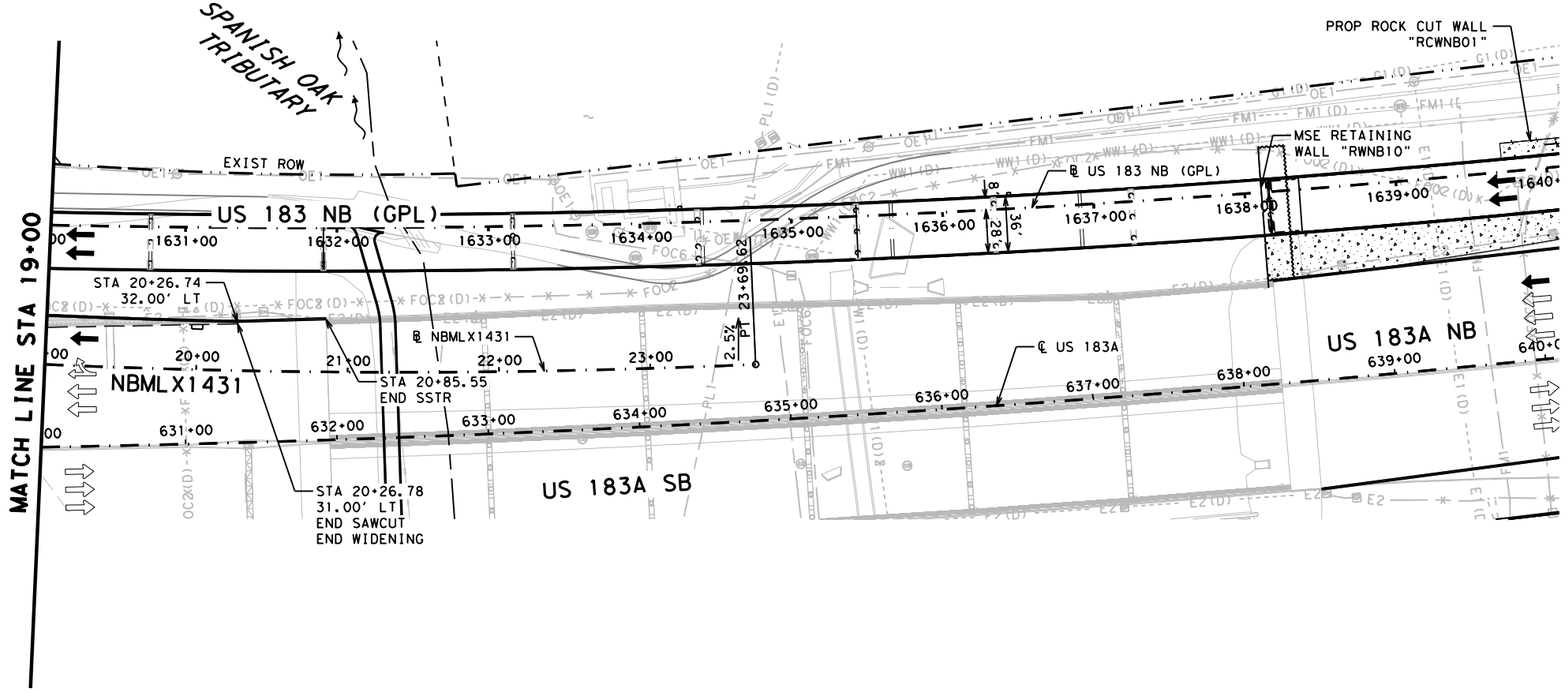

LEGEND

- EXIST TRAFFIC FLOW ARROW
- PROP TRAFFIC FLOW ARROW
- RETAINING WALL
- NOISE WALL
- TEMPORARY SPECIAL SHORING WALL
- ROCK CUT WALL
- PROP CRCP
- CONCRETE RIPRAP
- PROPERTY EASEMENT
- [X] DRIVEWAY ID
- W 12" EXISTING UTILITY

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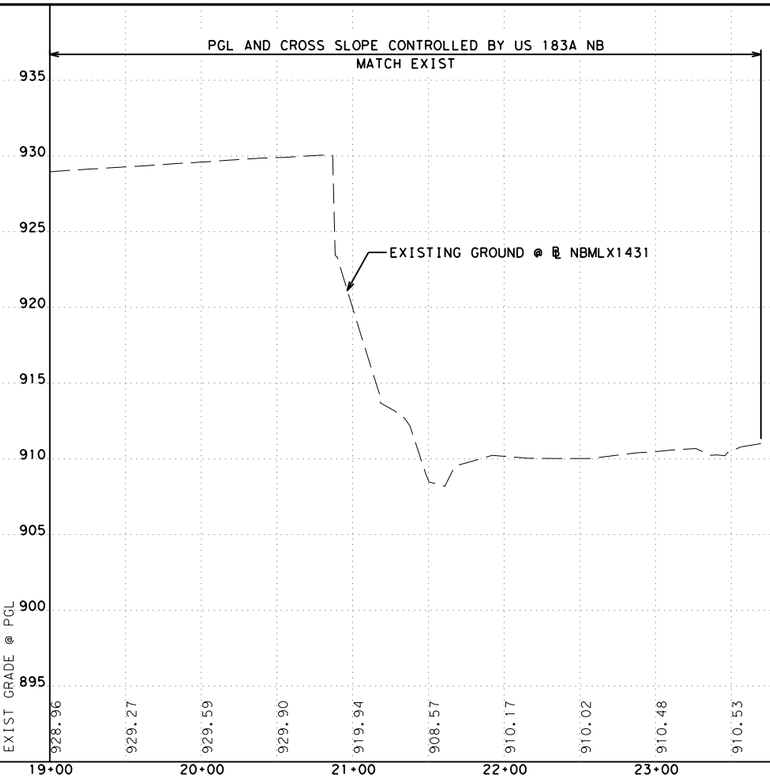

PROP RDWY X-SLOPE	
STATION	SLOPE
ALL SUPERELEVATION TRANSITIONS ARE STRAIGHT LINE	

DESIGN

STATE OF TEXAS — MARISSA GUZMAN — 130772 — LICENSED PROFESSIONAL ENGINEER

MARISSA GUZMAN, P.E.

11/8/2023
DATE

APPROVAL

STATE OF TEXAS — DAN THOMA — 98622 — LICENSED PROFESSIONAL ENGINEER

DAN THOMA, P.E.

11/8/2023
DATE

0 50 100

SCALE: PLAN 1" = 100'
PROFILE: 1" = 10'

PAPE-DAWSON ENGINEERS
SAN ANTONIO | AUSTIN | HOUSTON | FORT WORTH | DALLAS
2000 NW LOOP 410 | SAN ANTONIO, TX 78213 | 210.375.9000
TEXAS ENGINEERING FIRM #470 | TEXAS SURVEYING FIRM #10028800

2023 Texas Department of Transportation

US 183 GPL
RAMP PLAN & PROFILE
NB EXIT FROM NB 183A (ML) TO RM 1431

SHEET 2 OF 2

© 2023	CONT	SECT	JOB	HIGHWAY
DS: CK:	0151	10	001	US 183
	DIST	COUNTY		SHEET NO.
DW: CK:	AUS	WILLIAMSON		299

DATE: 11/8/2023 5:10:29 PM
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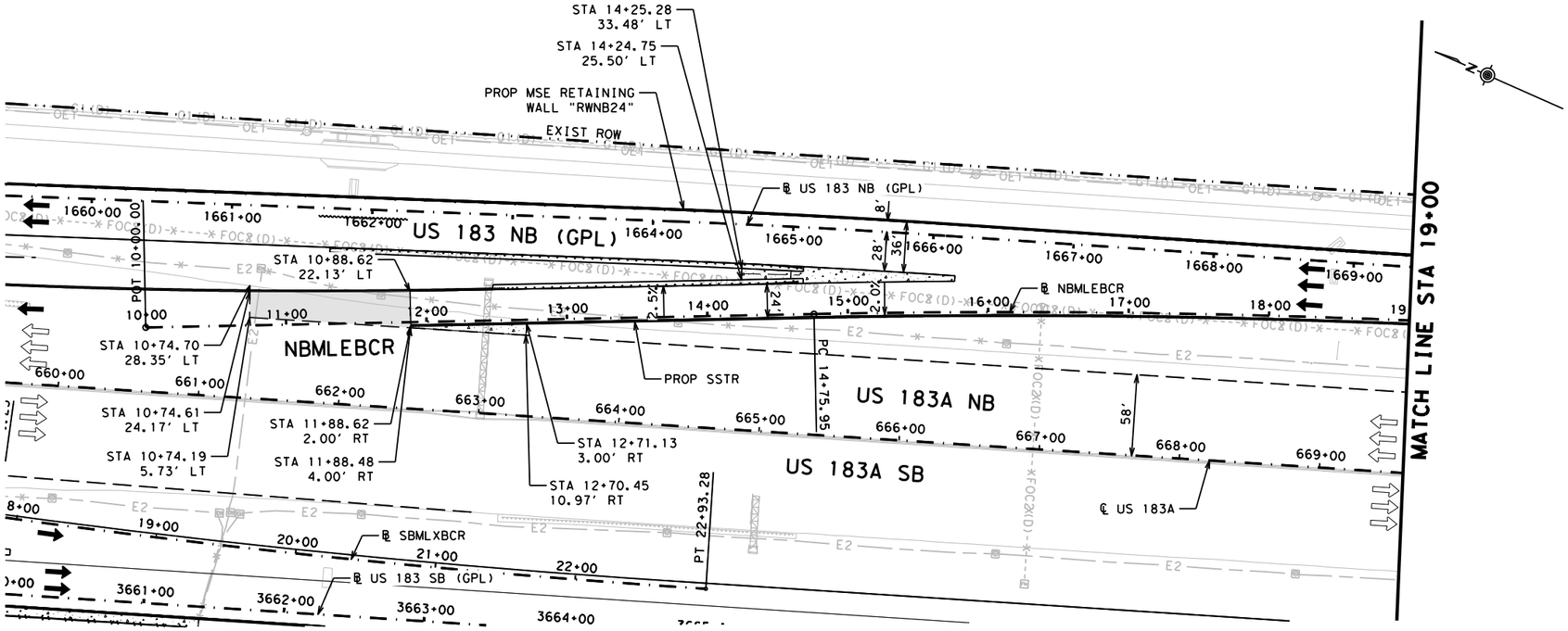

LEGEND

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- RETAINING WALL
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- TEMPORARY SPECIAL SHORING WALL
- ROCK CUT WALL
- PROP CRCP
- CONCRETE RIPRAP
- PROPERTY EASEMENT
- [X] DRIVEWAY ID
- W 12" EXISTING UTILITY

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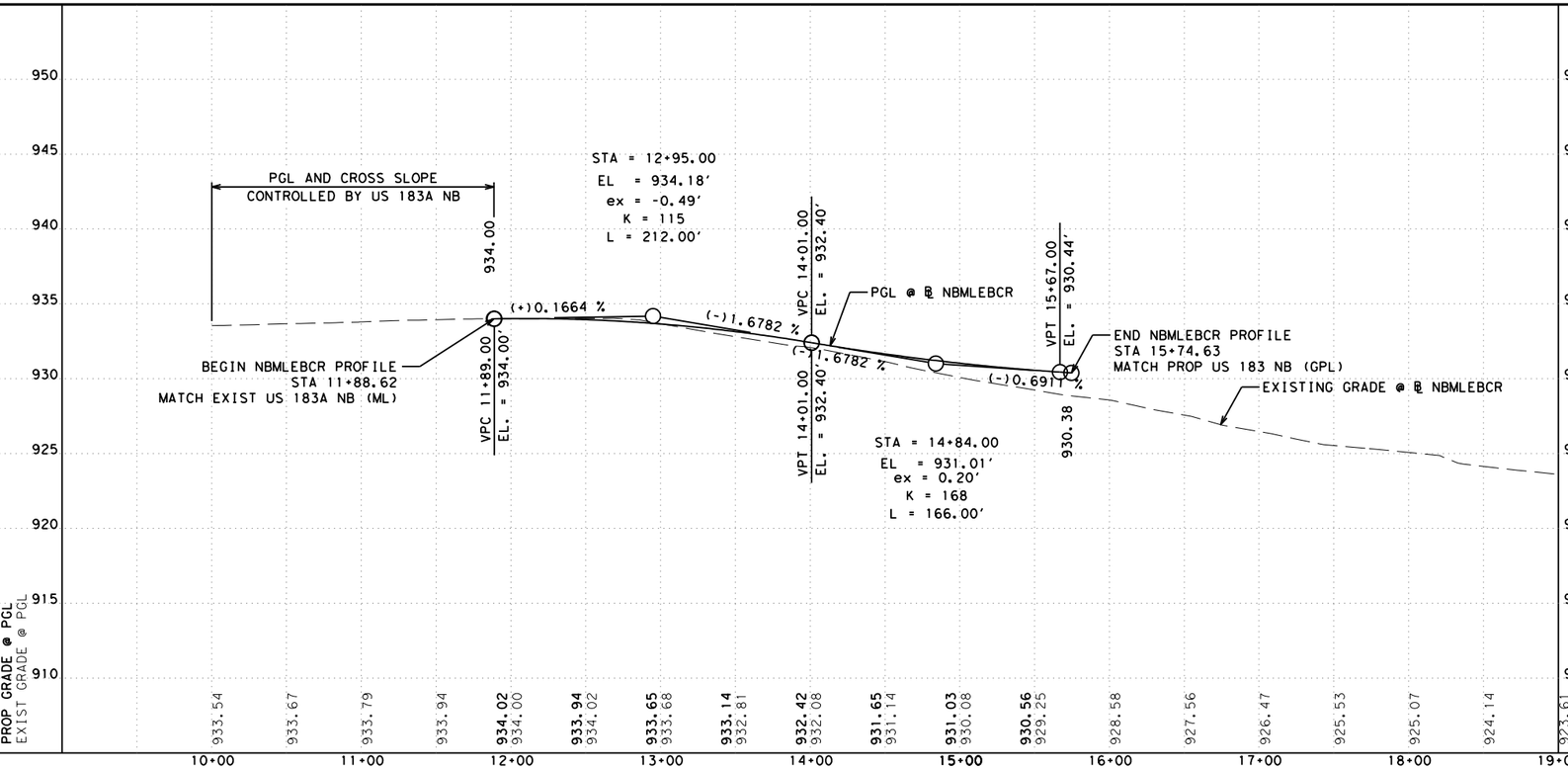

PROP RDWY X-SLOPE	
STATION	SLOPE
11+88.62	MATCH EXIST
13+82.00	-2.50%
15+17.00	2.00%
15+67.00	MATCH US 183 NB (GPL)
ALL SUPERELEVATION TRANSITIONS ARE STRAIGHT LINE	

DESIGN

STATE OF TEXAS · MARISSA GUZMAN · 130772 · LICENSED PROFESSIONAL ENGINEER

MARISSA GUZMAN, P.E.
4/17/2024
DATE

APPROVAL

STATE OF TEXAS · DAN THOMA · 98622 · LICENSED PROFESSIONAL ENGINEER

DAN THOMA, P.E.
4/17/2024
DATE

0 50 100
SCALE: PLAN 1" = 100'
PROFILE: 1" = 10'

PAPE-DAWSON ENGINEERS
SAN ANTONIO | AUSTIN | HOUSTON | FORT WORTH | DALLAS
2000 NW LOOP 410 | SAN ANTONIO, TX 78213 | 210.375.9000
TEXAS ENGINEERING FIRM #470 | TEXAS SURVEYING FIRM #10028800

2024 Texas Department of Transportation

US 183 GPL
RAMP PLAN & PROFILE
NB ENTRANCE FROM NB 183 (GPL) TO 183A (ML)

SHEET 1 OF 2

© 2024		CONT	SECT	JOB	HIGHWAY
DS:	CK:	0151	10	001	US 183
DW:	CK:	DIST	COUNTY		SHEET NO.
		AUS	WILLIAMSON		300

DATE: 4/17/2024 8:02:48 AM
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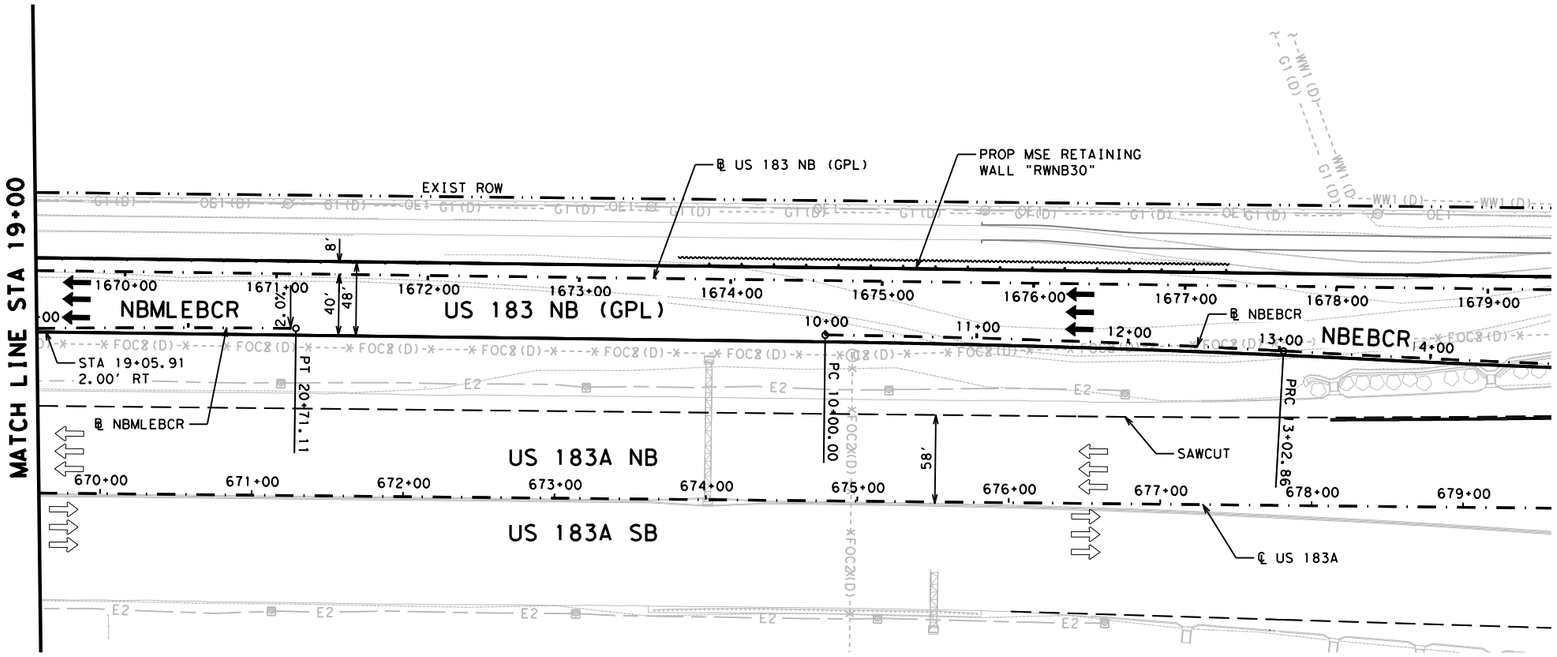

LEGEND

- EXIST TRAFFIC FLOW ARROW
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- RETAINING WALL
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- [X] DRIVEWAY ID
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8. SEE NB PLAN AND PROFILE SHEETS FOR FOR US 183 NB GPL INFORMATION AND SB PLAN AND PROFILE SHEETS FOR US 183 SB GPL INFORMATION.

PROP RDWY X-SLOPE	
STATION	SLOPE
ALL SUPERELEVATION TRANSITIONS ARE STRAIGHT LINE	

DESIGN

STATE OF TEXAS — MARISSA GUZMAN — 130772 — LICENSED PROFESSIONAL ENGINEER

MARISSA GUZMAN, P.E.
4/21/2023
DATE

APPROVAL

STATE OF TEXAS — DAN THOMA — 98622 — LICENSED PROFESSIONAL ENGINEER

DAN THOMA, P.E.
4/21/2023
DATE

0 50 100
SCALE: PLAN 1" = 100'
PROFILE: 1" = 10'

PAPE-DAWSON ENGINEERS
SAN ANTONIO | AUSTIN | HOUSTON | FORT WORTH | DALLAS
2000 NW LOOP 410 | SAN ANTONIO, TX 78213 | 210.375.9000
TEXAS ENGINEERING FIRM #470 | TEXAS SURVEYING FIRM #10028800

2023 Texas Department of Transportation

US 183 GPL
RAMP PLAN & PROFILE
NB ENTRANCE FROM NB 183 (GPL) TO 183A (ML)

SHEET 2 OF 2

© 2023		CONT	SECT	JOB	HIGHWAY
DS:	CK:	0151	10	001	US 183
		DIST	COUNTY		SHEET NO.
DW:	CK:	AUS	WILLIAMSON		301

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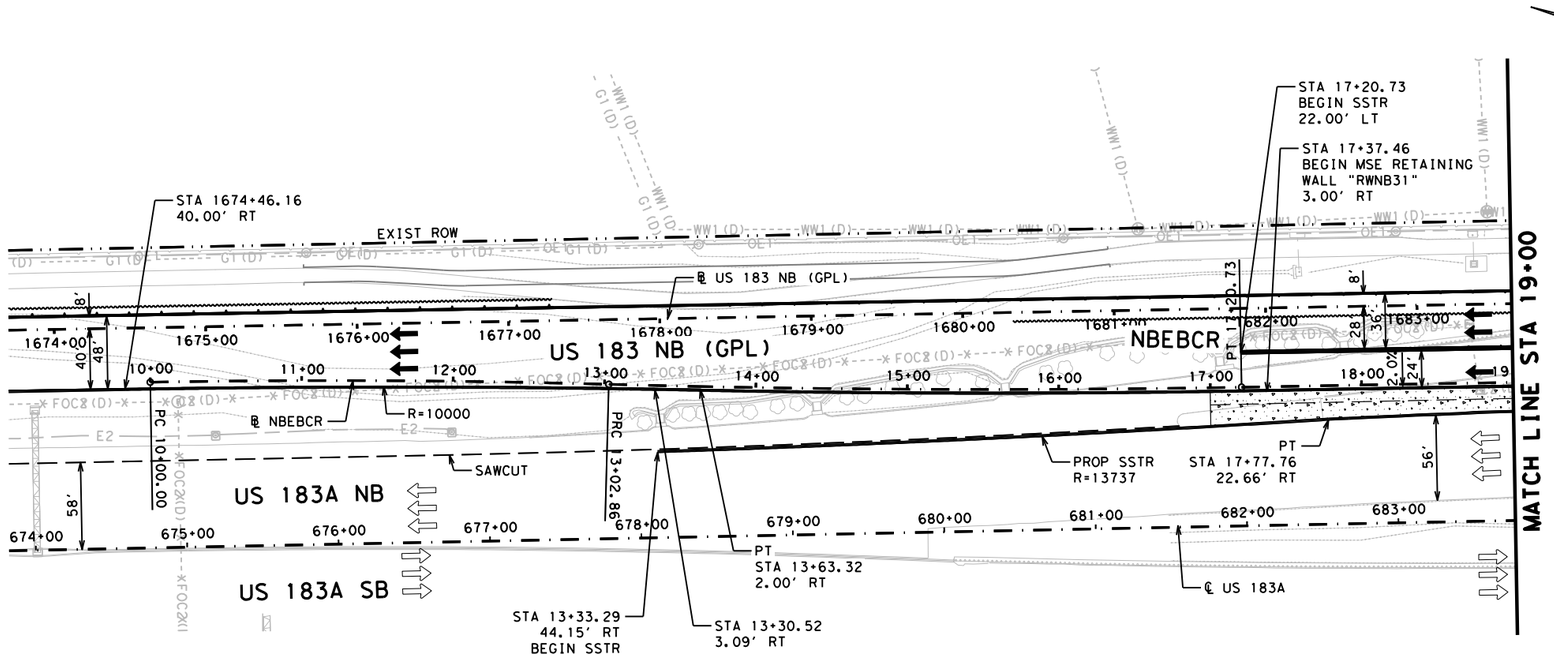

LEGEND

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- RETAINING WALL
- NOISE WALL
- TEMPORARY SPECIAL SHORING WALL
- ROCK CUT WALL
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- [X] DRIVEWAY ID
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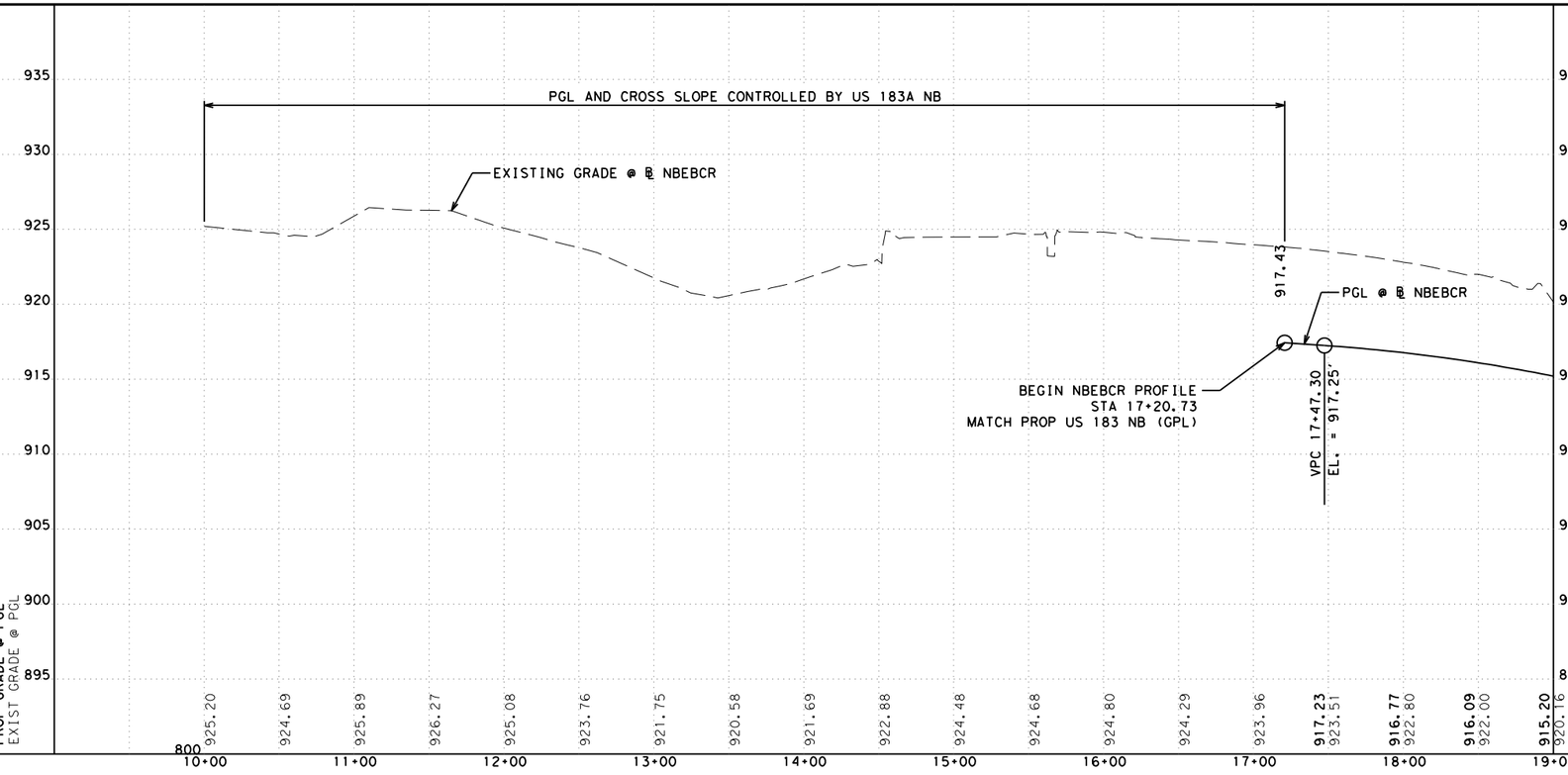

PROP RDWY X-SLOPE	
STATION	SLOPE
17+20.73	2.00%
ALL SUPERELEVATION TRANSITIONS ARE STRAIGHT LINE	

DESIGN

STATE OF TEXAS — MARISSA GUZMAN — 130772 — LICENSED PROFESSIONAL ENGINEER

MARISSA GUZMAN, P.E.
4/21/2023
DATE

APPROVAL

STATE OF TEXAS — DAN THOMA — 98622 — LICENSED PROFESSIONAL ENGINEER

DAN THOMA, P.E.
4/21/2023
DATE

0 50 100
SCALE: PLAN 1" = 100'
PROFILE: 1" = 10'

PAPE-DAWSON ENGINEERS
SAN ANTONIO | AUSTIN | HOUSTON | FORT WORTH | DALLAS
2000 NW LOOP 410 | SAN ANTONIO, TX 78213 | 210.375.9000
TEXAS ENGINEERING FIRM #470 | TEXAS SURVEYING FIRM #10028800

2023 Texas Department of Transportation

US 183 GPL
RAMP PLAN & PROFILE
NB ENTRANCE FROM BRUSHY CREEK RD TO 183 (GPL)

SHEET 1 OF 2

© 2023		CONT	SECT	JOB	HIGHWAY
DS:	CK:	0151	10	001	US 183
DW:	CK:	DIST	COUNTY		SHEET NO.
		AUS	WILLIAMSON		302

DATE: 4/21/2023 7:22:24 PM
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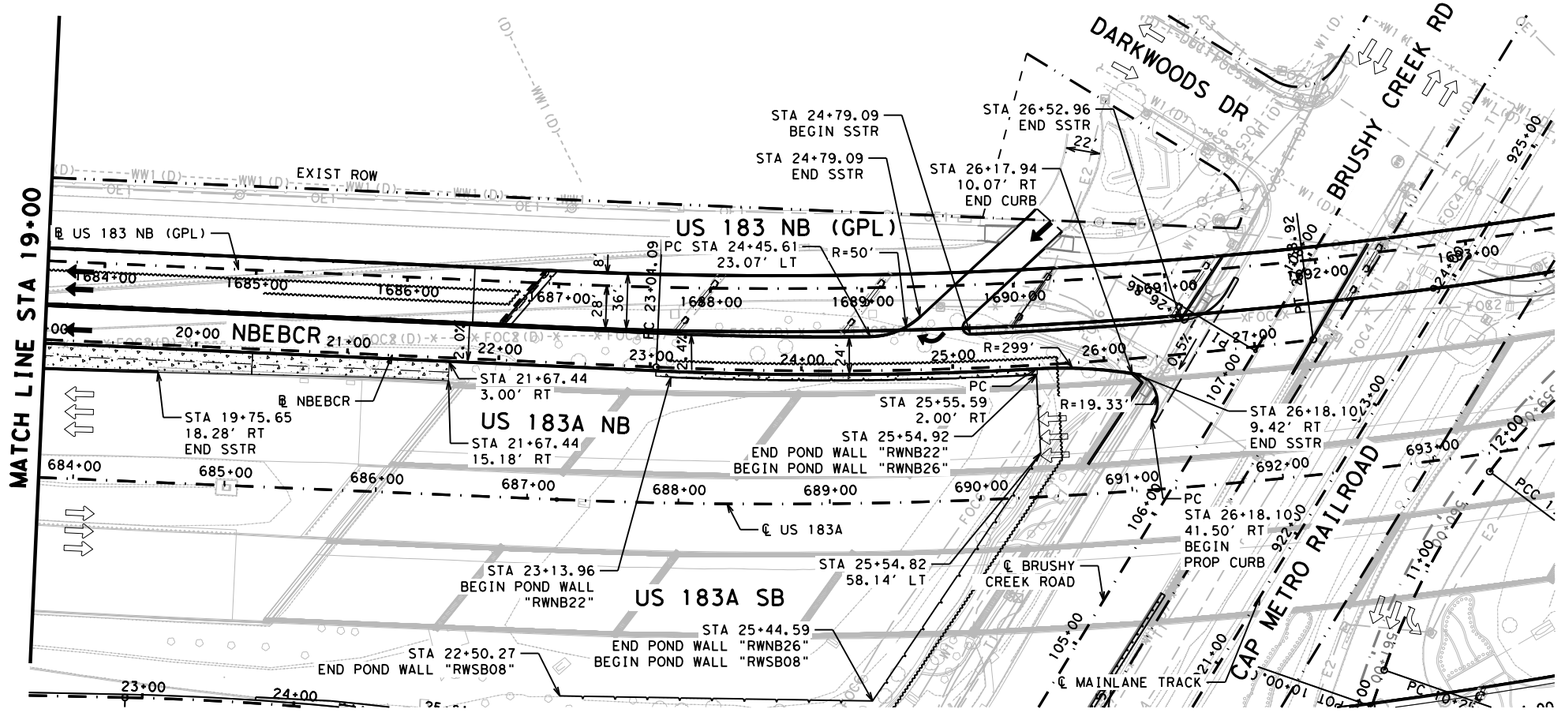

LEGEND

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- CONCRETE RIPRAP
- PROPERTY EASEMENT
- [X] DRIVEWAY ID
- W T2" EXISTING UTILITY

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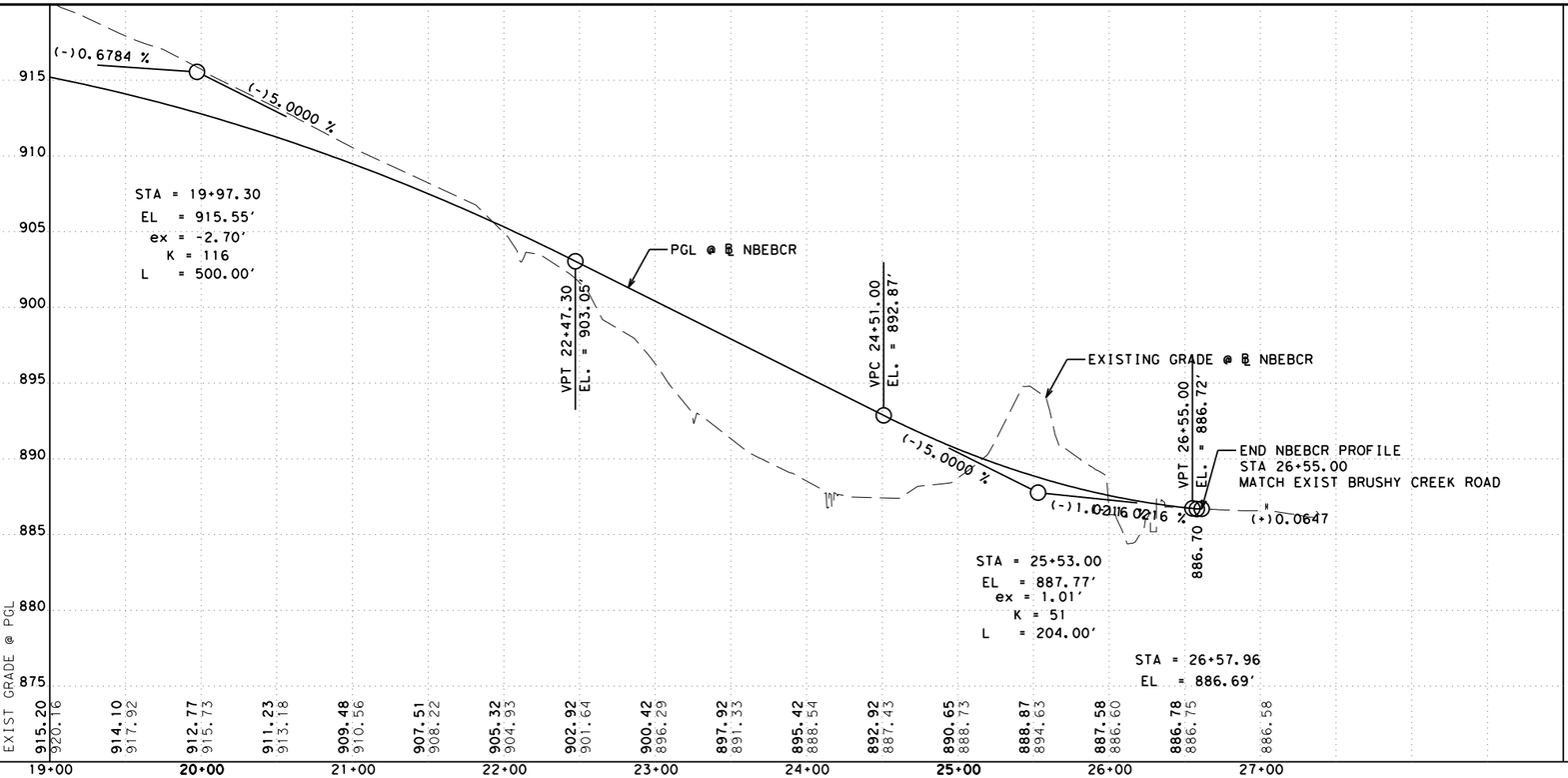

PROP RDWY X-SLOPE	
STATION	SLOPE
22+24.00	2.00%
23+24.00	-2.40%
25+89.00	-2.40%
26+55.00	MATCH EXIST
ALL SUPERELEVATION TRANSITIONS ARE STRAIGHT LINE	

DESIGN

STATE OF TEXAS · MARISSA GUZMAN · 130772 · LICENSED PROFESSIONAL ENGINEER

MARISSA GUZMAN, P.E.
4/21/2023
DATE

APPROVAL

STATE OF TEXAS · DAN THOMA · 98622 · LICENSED PROFESSIONAL ENGINEER

DAN THOMA, P.E.
4/21/2023
DATE

0 50 100
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PROFILE: 1" = 10'

PAPE-DAWSON ENGINEERS
SAN ANTONIO | AUSTIN | HOUSTON | FORT WORTH | DALLAS
2000 NW LOOP 410 | SAN ANTONIO, TX 78213 | 210.375.9000
TEXAS ENGINEERING FIRM #470 | TEXAS SURVEYING FIRM #10028800

2023 Texas Department of Transportation

US 183 GPL
RAMP PLAN & PROFILE
NB ENTRANCE FROM BRUSHY CREEK RD TO 183 (GPL)

SHEET 2 OF 2

© 2023		CONT	SECT	JOB	HIGHWAY
DS:	CK:	0151	10	001	US 183
		DIST	COUNTY		SHEET NO.
DW:	CK:	AUS	WILLIAMSON		303

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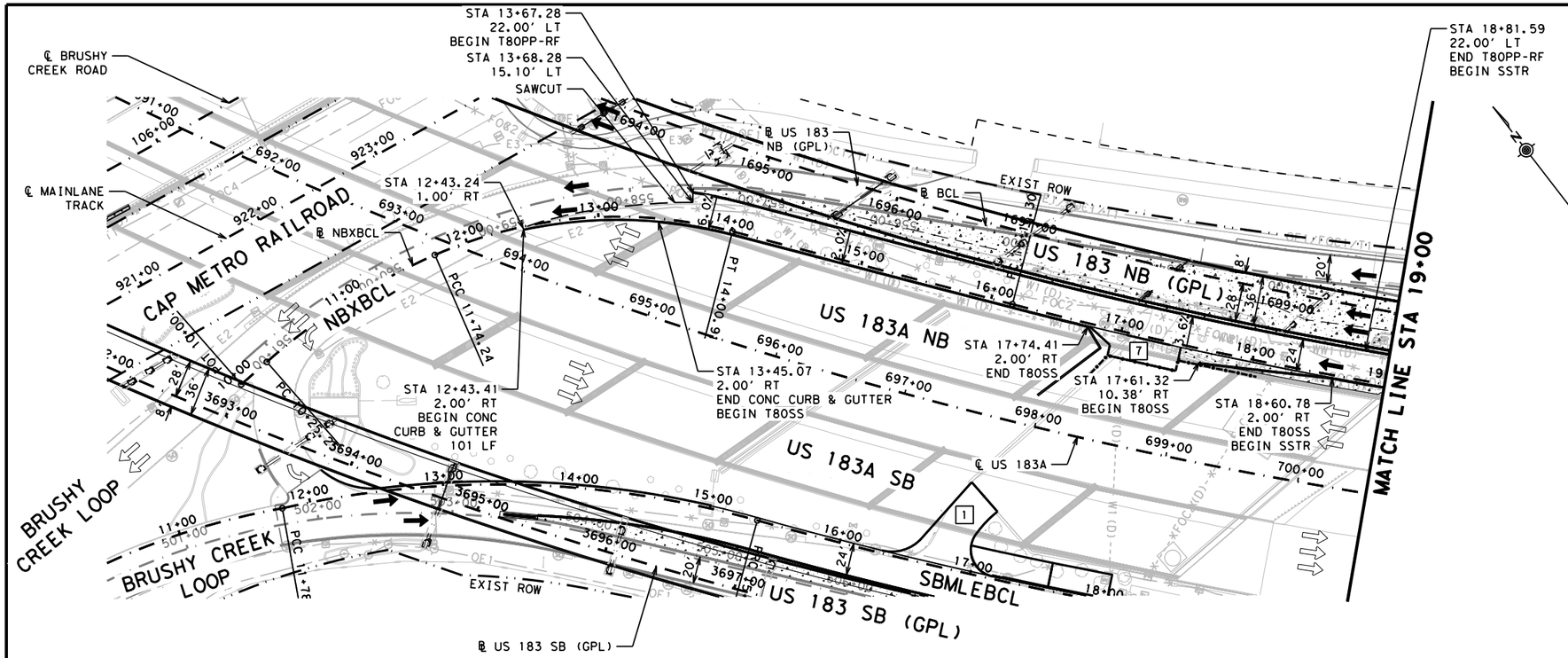

LEGEND

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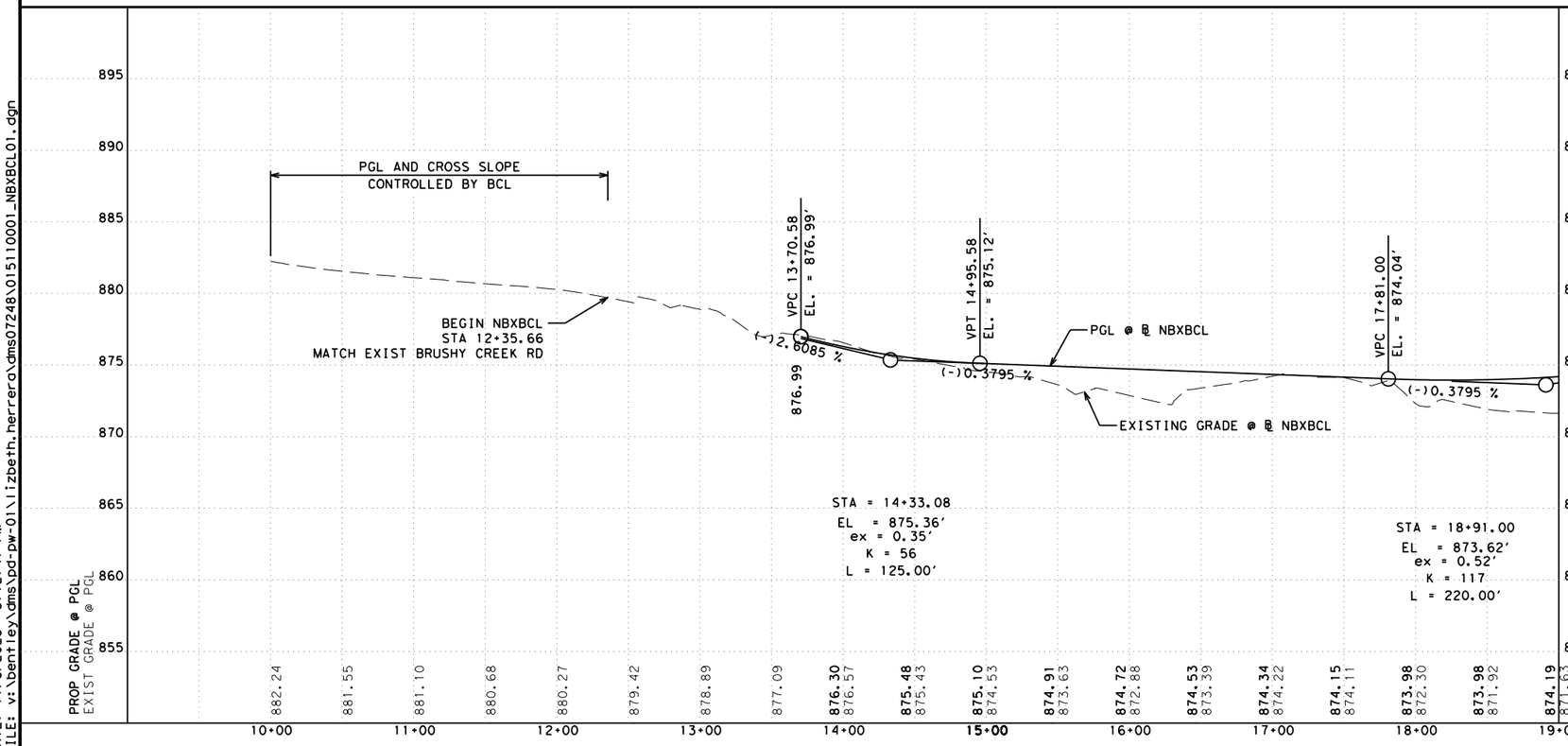

PROP RDWY X-SLOPE	
STATION	SLOPE
12+33.66	MATCH EXIST
13+67.28	6.00%
13+82.00	6.00%
14+73.00	2.00%
15+14.00	2.00%
16+41.00	-3.60%

ALL SUPERELEVATION TRANSITIONS ARE STRAIGHT LINE

DESIGN

STATE OF TEXAS — MARISSA GUZMAN — 130772 — LICENSED PROFESSIONAL ENGINEER

MARISSA GUZMAN, P.E.
11/8/2023
DATE

APPROVAL

STATE OF TEXAS — DAN THOMA — 98622 — LICENSED PROFESSIONAL ENGINEER

DAN THOMA, P.E.
11/8/2023
DATE

0 50 100
SCALE: PLAN 1" = 100'
PROFILE: 1" = 10'

PAPE-DAWSON ENGINEERS
SAN ANTONIO | AUSTIN | HOUSTON | FORT WORTH | DALLAS
2000 NW LOOP 410 | SAN ANTONIO, TX 78213 | 210.375.9000
TEXAS ENGINEERING FIRM #470 | TEXAS SURVEYING FIRM #10028800

2023
Texas Department of Transportation

US 183 GPL
RAMP PLAN & PROFILE
NB EXIT FROM NB 183 (GPL) TO BRUSHY CREEK LOOP

SHEET 1 OF 3

© 2023		CONT	SECT	JOB	HIGHWAY
DS:	CK:	0151	10	001	US 183
		DIST	COUNTY		SHEET NO.
DW:	CK:	AUS	WILLIAMSON		304

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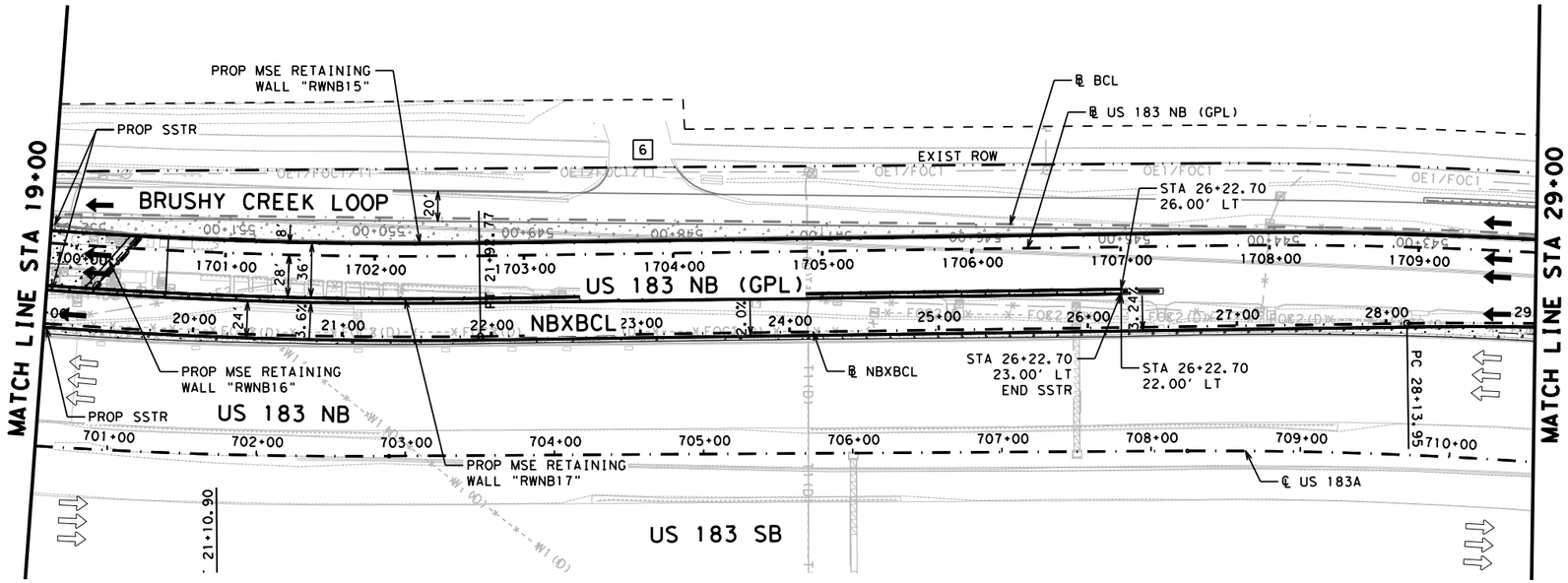
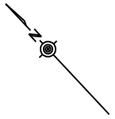


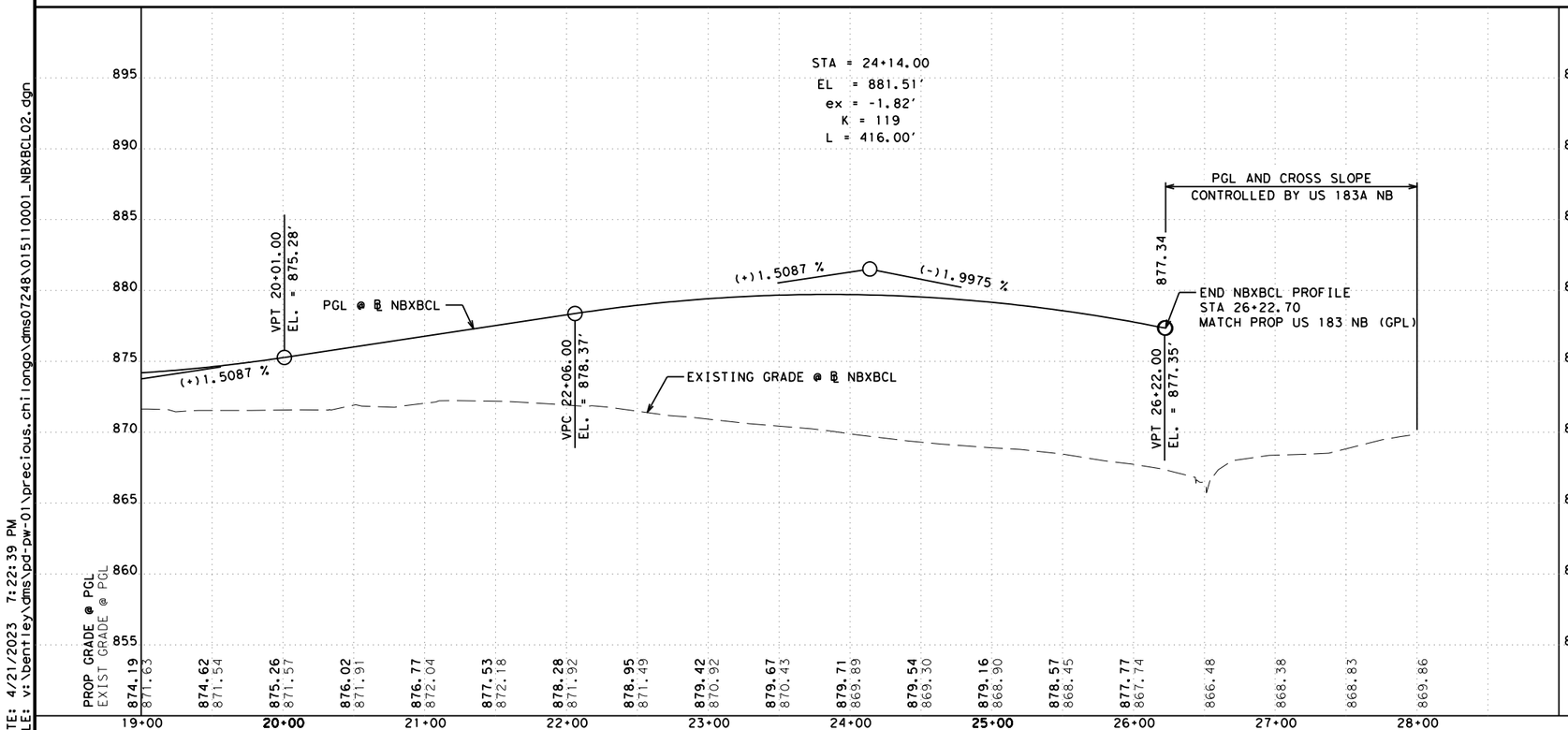


LEGEND

- EXIST TRAFFIC FLOW ARROW
- PROP TRAFFIC FLOW ARROW
- RETAINING WALL
- NOISE WALL
- TEMPORARY SPECIAL SHORING WALL
- ROCK CUT WALL
- PROP CRCP
- CONCRETE RIPRAP
- PROPERTY EASEMENT
- [X] DRIVEWAY ID
- W T2" EXISTING UTILITY

NOTES

1. EXISTING FEATURES AND PROPOSED FEATURES NOT DETAILED ON THIS SHEET ARE SHOWN SCREENED BACK; i.e. FADED.
2. SEE HORIZONTAL ALIGNMENT DATA SHEETS FOR HORIZONTAL ALIGNMENT DATA.
3. SEE INTERSECTION DETAIL SHEETS FOR INTERSECTION INFORMATION.
4. SEE PAVEMENT MARKING SHEETS FOR STRIPING AND TRAFFIC FLOW DETAILS.
5. SEE NB SUP PLAN AND PROFILE SHEETS FOR SHARED-USE PATH INFORMATION.
6. SEE RAMP PLAN AND PROFILE SHEETS FOR RAMP INFORMATION.
7. SEE BRUSHY CREEK LOOP PLAN AND PROFILE SHEETS FOR BRUSHY CREEK LOOP INFORMATION.
8. SEE NB PLAN AND PROFILE SHEETS FOR FOR US 183 NB GPL INFORMATION AND SB PLAN AND PROFILE SHEETS FOR US 183 SB GPL INFORMATION.



PROP RDWY X-SLOPE	
STATION	SLOPE
21+58.00	-3.60%
23+25.00	2.00%
25+62.53	2.00%
26+22.70	3.24%
ALL SUPERELEVATION TRANSITIONS ARE STRAIGHT LINE	

DESIGN

STATE OF TEXAS · MARISSA GUZMAN · 130772 · LICENSED PROFESSIONAL ENGINEER

MARISSA GUZMAN, P.E.
4/21/2023
DATE

APPROVAL

STATE OF TEXAS · DAN THOMA · 98622 · LICENSED PROFESSIONAL ENGINEER

DAN THOMA, P.E.
4/21/2023
DATE

0 50 100
SCALE: PLAN 1" = 100'
PROFILE: 1" = 10'

PAPE-DAWSON ENGINEERS
SAN ANTONIO | AUSTIN | HOUSTON | FORT WORTH | DALLAS
2000 NW LOOP 410 | SAN ANTONIO, TX 78213 | 210.375.9000
TEXAS ENGINEERING FIRM #470 | TEXAS SURVEYING FIRM #10028800

2023 Texas Department of Transportation

US 183 GPL
RAMP PLAN & PROFILE
NB EXIT FROM NB 183 (GPL) TO BRUSHY CREEK LOOP

SHEET 2 OF 3

© 2023		CONT	SECT	JOB	HIGHWAY
DS:	CK:	0151	10	001	US 183
		DIST	COUNTY		SHEET NO.
DW:	CK:	AUS	WILLIAMSON		305

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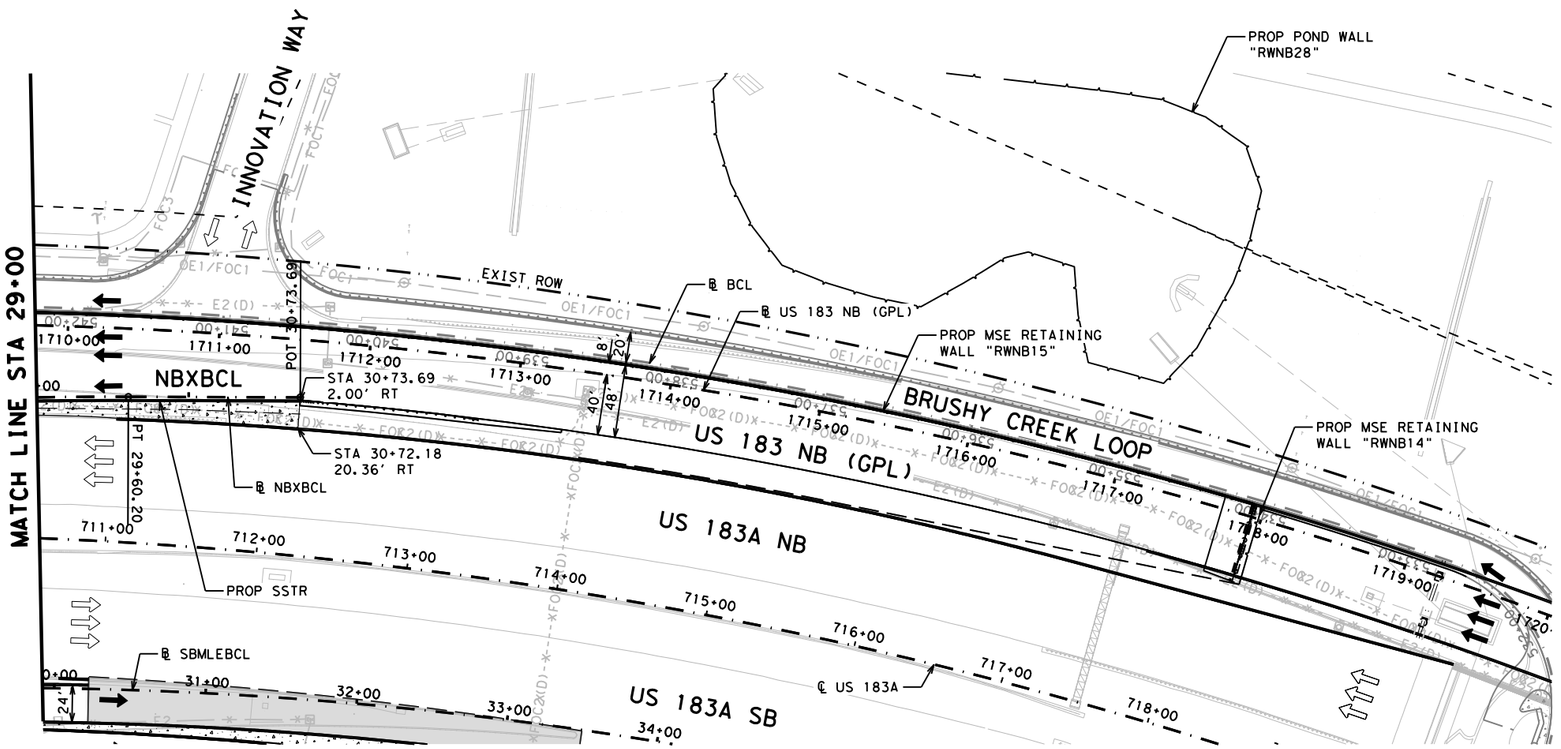

LEGEND

- EXIST TRAFFIC FLOW ARROW
- PROP TRAFFIC FLOW ARROW
- RETAINING WALL
- NOISE WALL
- TEMPORARY SPECIAL SHORING WALL
- ROCK CUT WALL
- PROP CRCP
- CONCRETE RIPRAP
- PROPERTY EASEMENT
- [X] DRIVEWAY ID
- W 12" EXISTING UTILITY

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7. SEE BRUSHY CREEK LOOP PLAN AND PROFILE SHEETS FOR BRUSHY CREEK LOOP INFORMATION.
8. SEE NB PLAN AND PROFILE SHEETS FOR FOR US 183 NB GPL INFORMATION AND SB PLAN AND PROFILE SHEETS FOR US 183 SB GPL INFORMATION.

PROP RDWY X-SLOPE	
STATION	SLOPE
ALL SUPERELEVATION TRANSITIONS ARE STRAIGHT LINE	

DESIGN

STATE OF TEXAS — MARISSA GUZMAN — 130772 — LICENSED PROFESSIONAL ENGINEER

MARISSA GUZMAN, P.E.

4/24/2024

DATE

APPROVAL

STATE OF TEXAS — DAN THOMA — 98622 — LICENSED PROFESSIONAL ENGINEER

DAN THOMA, P.E.

4/24/2024

DATE

0 50 100

SCALE: PLAN 1" = 100'
PROFILE: 1" = 10'

PAPE-DAWSON ENGINEERS

SAN ANTONIO | AUSTIN | HOUSTON | FORT WORTH | DALLAS
2000 NW LOOP 410 | SAN ANTONIO, TX 78213 | 210.375.9000
TEXAS ENGINEERING FIRM #470 | TEXAS SURVEYING FIRM #10028800

2024 Texas Department of Transportation

US 183 GPL
RAMP PLAN & PROFILE
NB EXIT FROM NB 183 (GPL) TO BRUSHY CREEK LOOP

SHEET 3 OF 3

© 2024

CONT	SECT	JOB	HIGHWAY
0151	10	001	US 183

DIST	COUNTY	SHEET NO.
AUS	WILLIAMSON	306

DS: CK: DW: CK:

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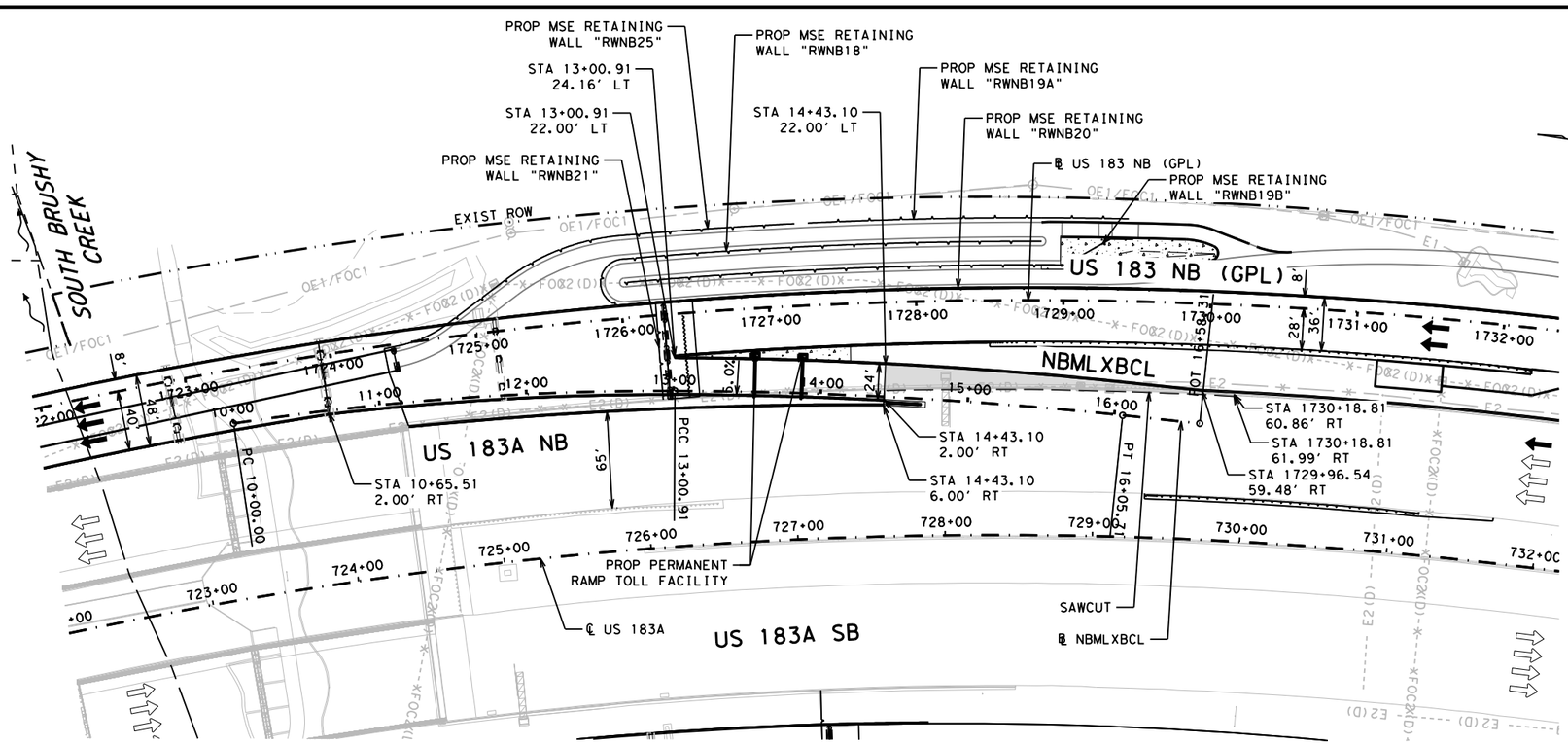

LEGEND

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- PROP TRAFFIC FLOW ARROW
- RETAINING WALL
- NOISE WALL
- TEMPORARY SPECIAL SHORING WALL
- ROCK CUT WALL
- PROP CRCP
- CONCRETE RIPRAP
- PROPERTY EASEMENT
- [X] DRIVEWAY ID
- W T2" EXISTING UTILITY

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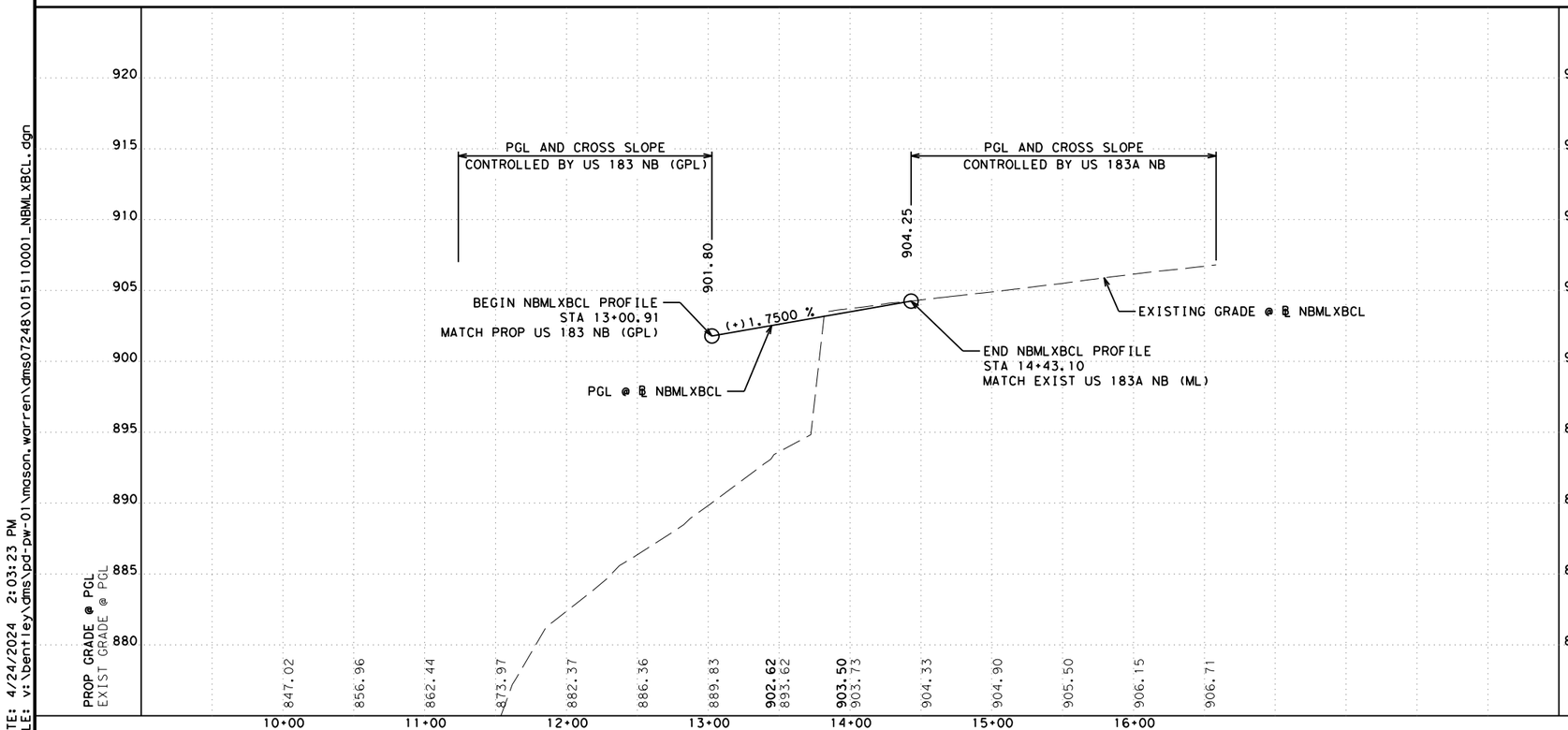

PROP RDWY X-SLOPE	
STATION	SLOPE
13+02.66	5.00%
14+30.00	5.00%
14+43.10	MATCH EXIST
ALL SUPERELEVATION TRANSITIONS ARE STRAIGHT LINE	

DESIGN

STATE OF TEXAS — MARISSA GUZMAN — 130772 — LICENSED PROFESSIONAL ENGINEER

MARISSA GUZMAN, P.E.
4/24/2024
DATE

APPROVAL

STATE OF TEXAS — DAN THOMA — 98622 — LICENSED PROFESSIONAL ENGINEER

DAN THOMA, P.E.
4/24/2024
DATE

0 50 100

SCALE: PLAN 1" = 100'
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PAPE-DAWSON ENGINEERS
SAN ANTONIO | AUSTIN | HOUSTON | FORT WORTH | DALLAS
2000 NW LOOP 410 | SAN ANTONIO, TX 78213 | 210.375.9000
TEXAS ENGINEERING FIRM #470 | TEXAS SURVEYING FIRM #10028800

2024 Texas Department of Transportation

US 183 GPL
RAMP PLAN & PROFILE
NB EXIT FROM NB 183A (ML) TO 183 (GPL)

SHEET 1 OF 1

© 2024	CONT	SECT	JOB	HIGHWAY
DS: CK:	0151	10	001	US 183
	DIST	COUNTY		SHEET NO.
DW: CK:	AUS	WILLIAMSON		307

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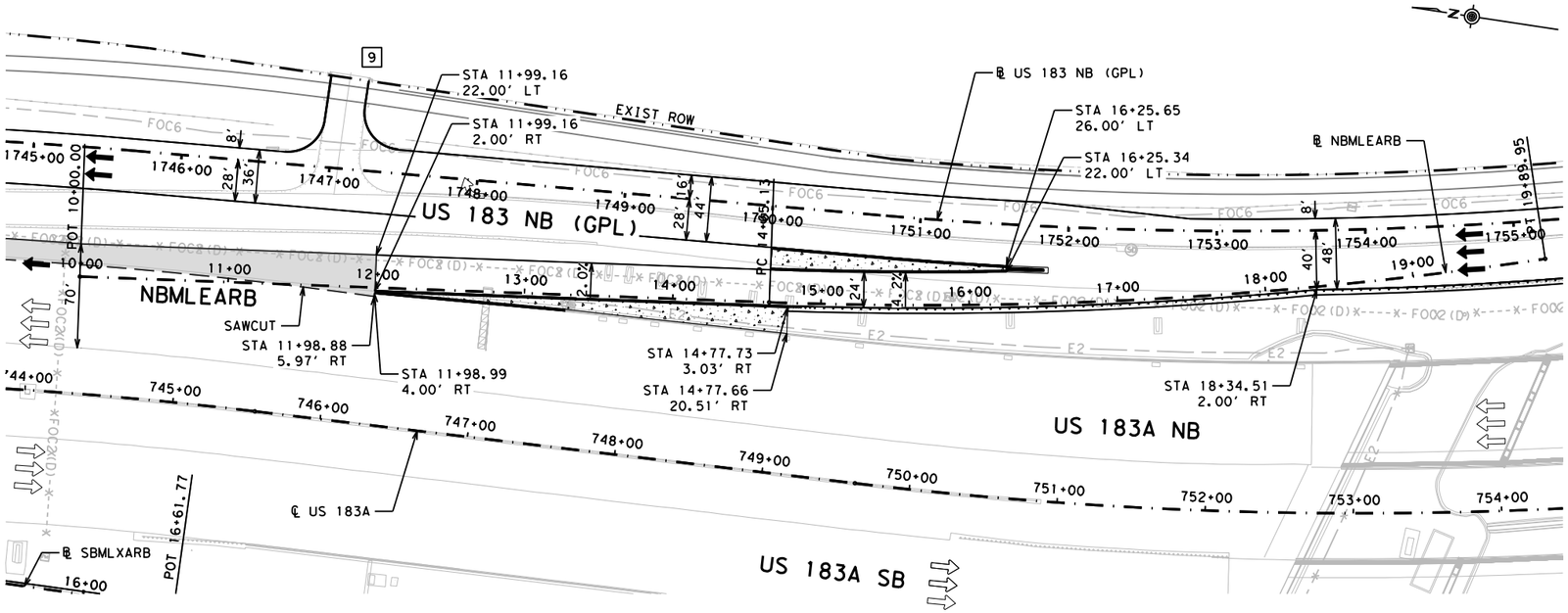

LEGEND

- EXIST TRAFFIC FLOW ARROW
- PROP TRAFFIC FLOW ARROW
- RETAINING WALL
- NOISE WALL
- TEMPORARY SPECIAL SHORING WALL
- ROCK CUT WALL
- PROP CRCP
- CONCRETE RIPRAP
- PROPERTY EASEMENT
- [X] DRIVEWAY ID
- W 12" EXISTING UTILITY

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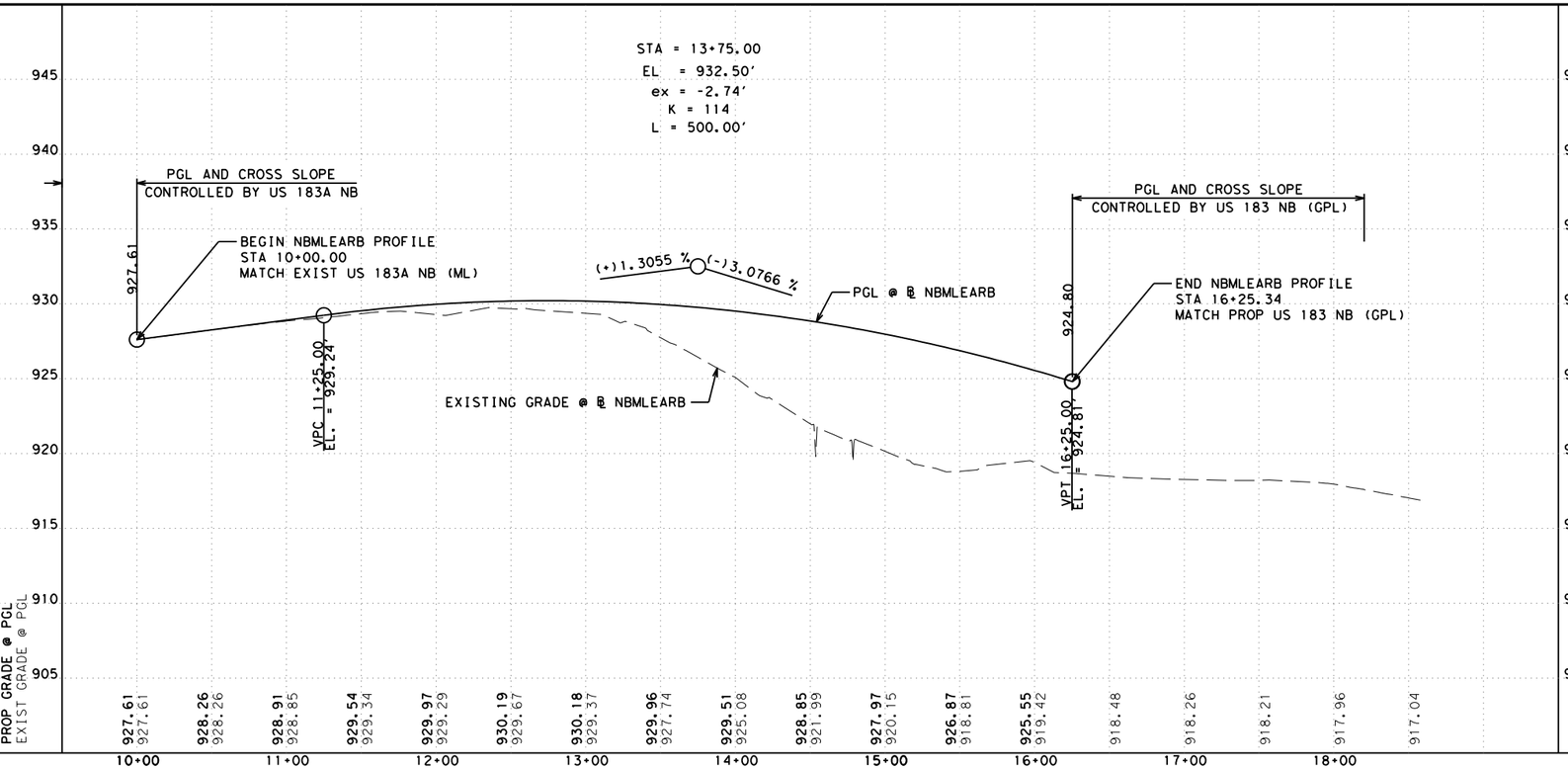

PROP RDWY X-SLOPE	
STATION	SLOPE
11+98.99	MATCH EXIST
12+72.00	-2.00%
14+12.00	-2.00%
14+78.00	-4.20%
16+25.00	MATCH US 183 NB (GPL)
ALL SUPERELEVATION TRANSITIONS ARE STRAIGHT LINE	

DESIGN

STATE OF TEXAS · MARISSA GUZMAN · 130772 · LICENSED PROFESSIONAL ENGINEER

MARISSA GUZMAN, P.E.
11/8/2023
DATE

APPROVAL

STATE OF TEXAS · DAN THOMA · 98622 · LICENSED PROFESSIONAL ENGINEER

DAN THOMA, P.E.
11/8/2023
DATE

0 50 100
SCALE: PLAN 1" = 100'
PROFILE: 1" = 10'

PAPE-DAWSON ENGINEERS
SAN ANTONIO | AUSTIN | HOUSTON | FORT WORTH | DALLAS
2000 NW LOOP 410 | SAN ANTONIO, TX 78213 | 210.375.9000
TEXAS ENGINEERING FIRM #470 | TEXAS SURVEYING FIRM #10028800

2023 Texas Department of Transportation

US 183 GPL
RAMP PLAN & PROFILE
NB ENTRANCE FROM AVERY RANCH BLVD TO 183A (ML)

SHEET 1 OF 1

© 2023

DS:	CK:	CONT	SECT	JOB	HIGHWAY
		0151	10	001	US 183
DW:	CK:	DIST	COUNTY		SHEET NO.
		AUS	WILLIAMSON		308

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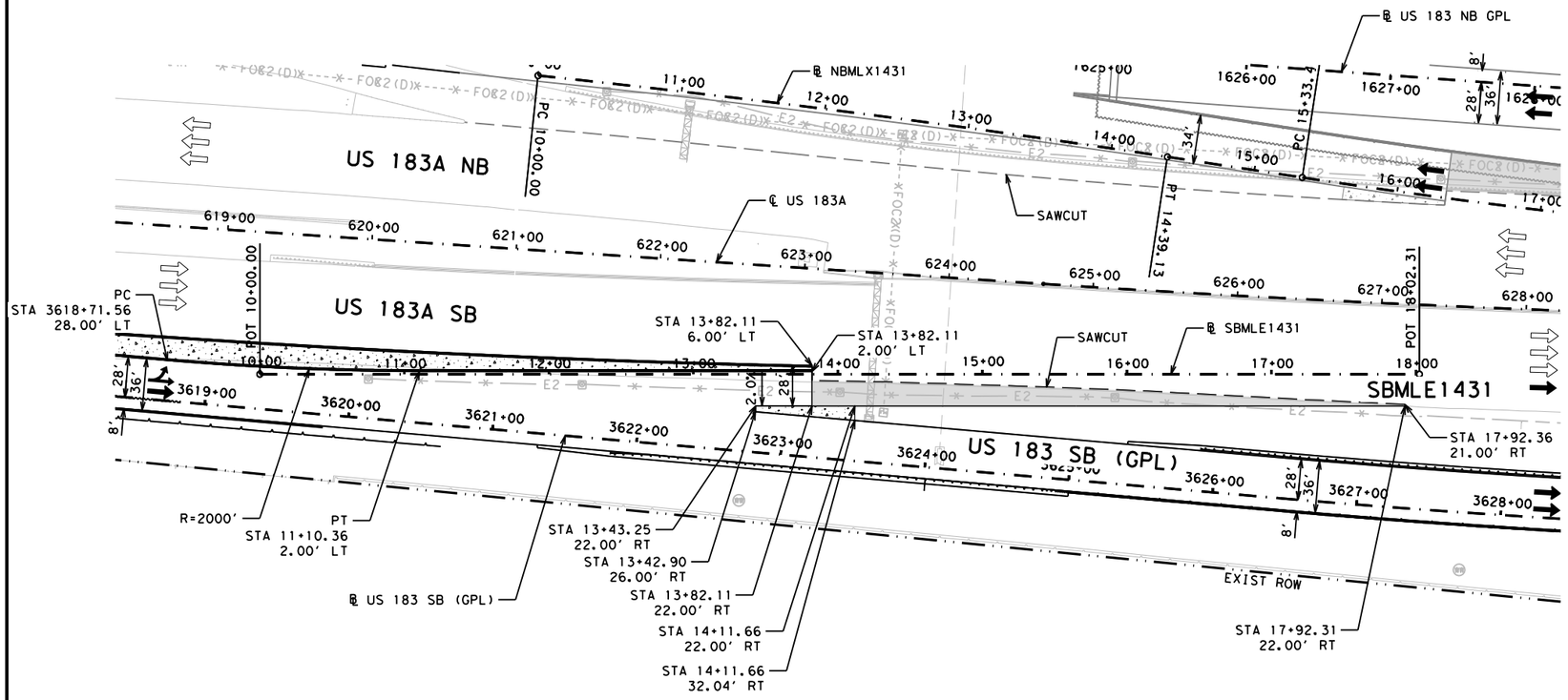

LEGEND

- EXIST TRAFFIC FLOW ARROW
- PROP TRAFFIC FLOW ARROW
- RETAINING WALL
- NOISE WALL
- TEMPORARY SPECIAL SHORING WALL
- ROCK CUT WALL
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- [X] DRIVEWAY ID
- W 12" EXISTING UTILITY

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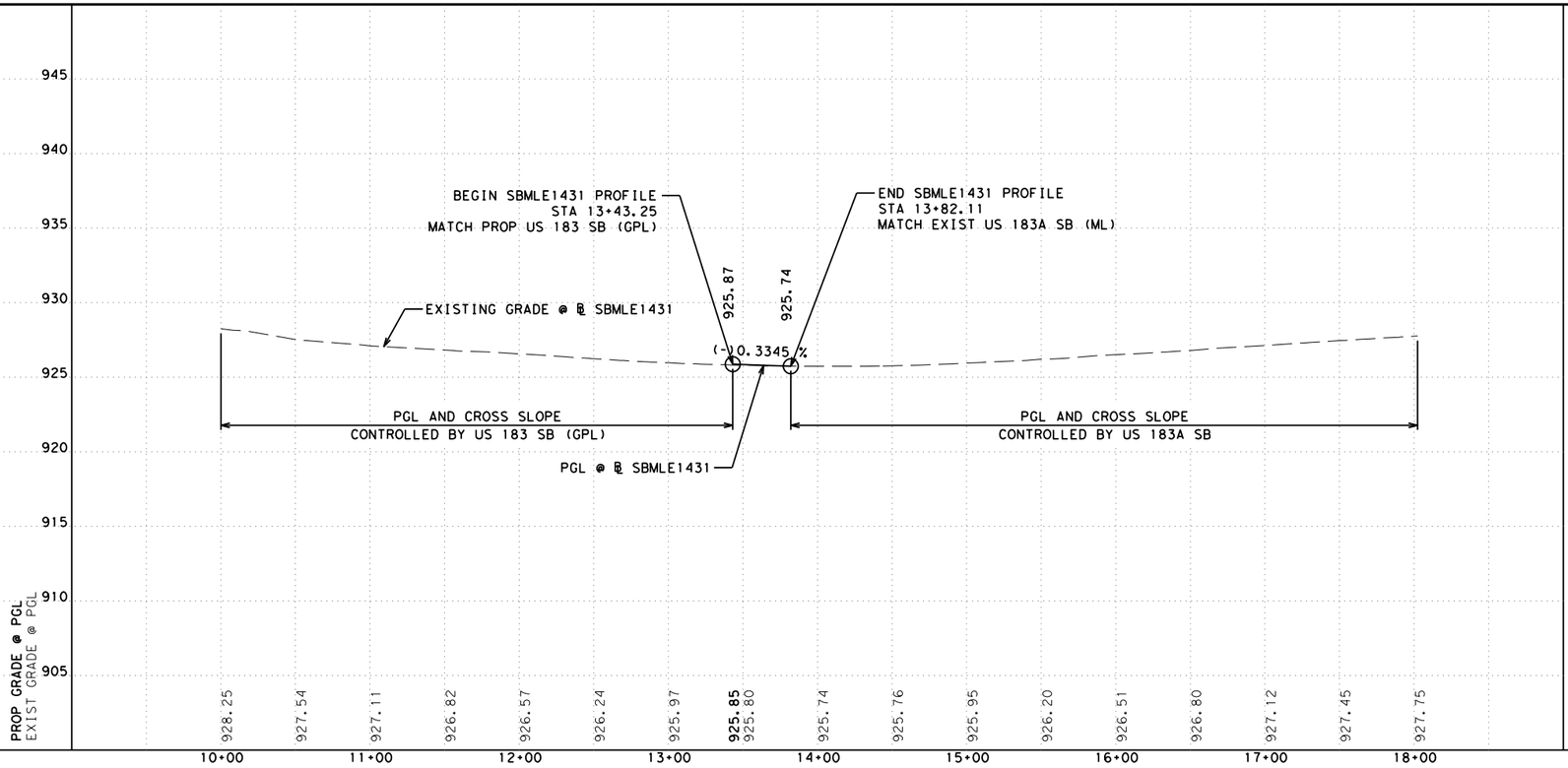

PROP RDWY X-SLOPE	
STATION	SLOPE
13+43.00	-2.00%
13+80.00	MATCH EXIST
ALL SUPERELEVATION TRANSITIONS ARE STRAIGHT	

DESIGN

STATE OF TEXAS — MARISSA GUZMAN — 130772 — LICENSED PROFESSIONAL ENGINEER

MARISSA GUZMAN, P.E.

4/17/2024

DATE

APPROVAL

STATE OF TEXAS — DAN THOMA — 98622 — LICENSED PROFESSIONAL ENGINEER

DAN THOMA, P.E.

4/17/2024

DATE

0 50 100

SCALE: PLAN 1" = 100'
PROFILE: 1" = 10'

PAPE-DAWSON ENGINEERS
SAN ANTONIO | AUSTIN | HOUSTON | FORT WORTH | DALLAS
2000 NW LOOP 410 | SAN ANTONIO, TX 78213 | 210.375.9000
TEXAS ENGINEERING FIRM #470 | TEXAS SURVEYING FIRM #10028800

2024 Texas Department of Transportation

US 183 GPL
RAMP PLAN & PROFILE
SB ENTRANCE FROM RM 1431 TO 183A (ML)

SHEET 1 OF 1

© 2024		CONT	SECT	JOB	HIGHWAY
DS:	CK:	0151	10	001	US 183
		DIST	COUNTY		SHEET NO.
DW:	CK:	AUS	WILLIAMSON		309

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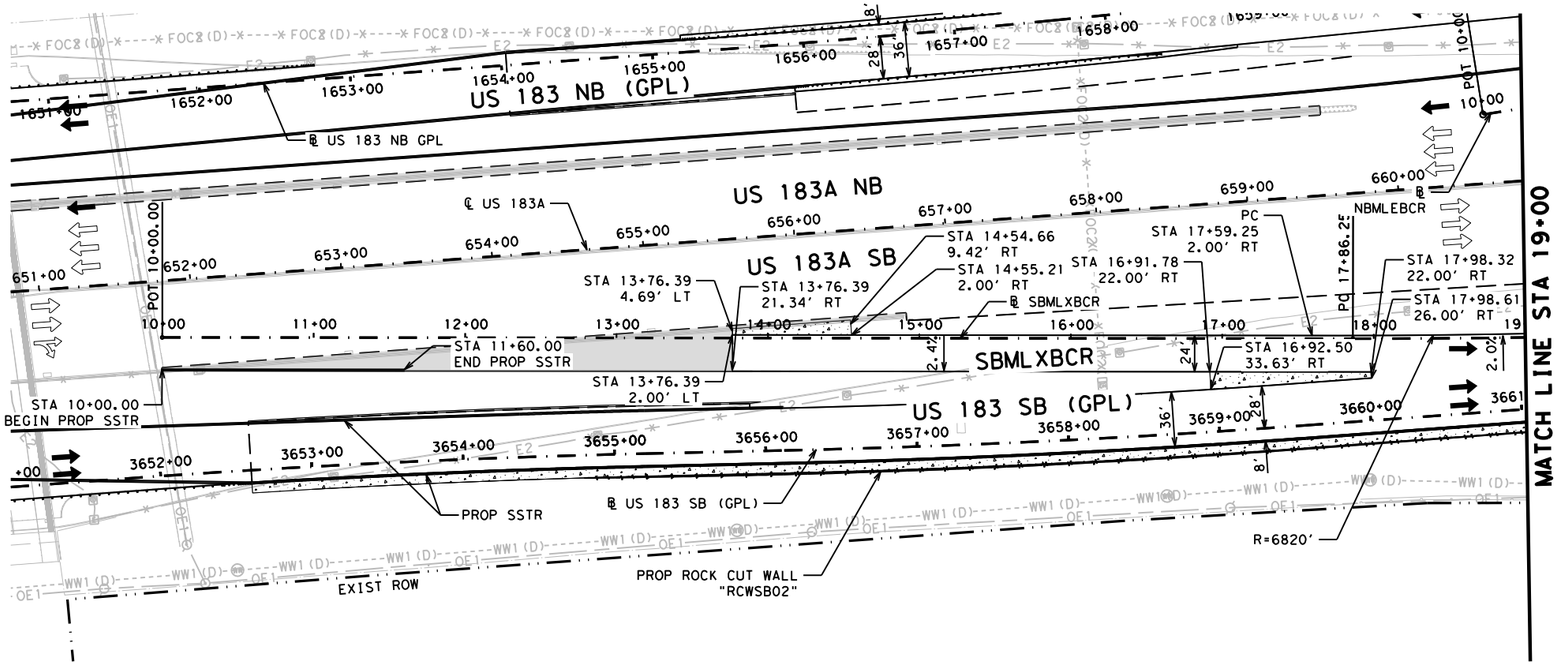

LEGEND

- EXIST TRAFFIC FLOW ARROW
- PROP TRAFFIC FLOW ARROW
- RETAINING WALL
- NOISE WALL
- TEMPORARY SPECIAL SHORING WALL
- ROCK CUT WALL
- PROP CRCP
- CONCRETE RIPRAP
- PROPERTY EASEMENT
- [X] DRIVEWAY ID
- W 12" EXISTING UTILITY

NOTES

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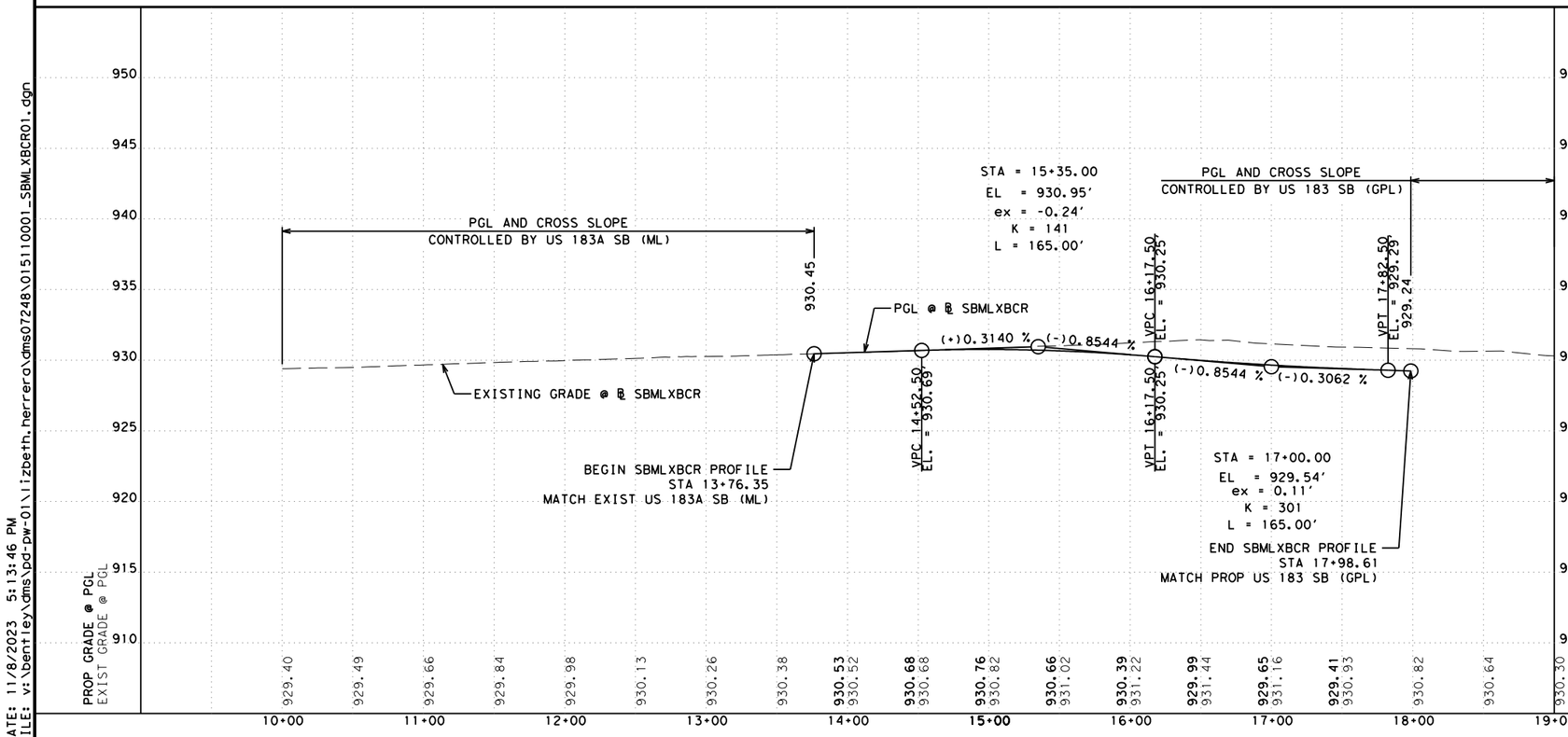

PROP RDWY X-SLOPE	
STATION	SLOPE
13+76.00	MATCH EXIST
16+66.00	-2.40%
17+98.00	2.00%
ALL SUPERELEVATION TRANSITIONS ARE STRAIGHT	

DESIGN

STATE OF TEXAS · MARISSA GUZMAN · 130772 · LICENSED PROFESSIONAL ENGINEER

MARISSA GUZMAN, P.E.
11/8/2023
DATE

APPROVAL

STATE OF TEXAS · DAN THOMA · 98622 · LICENSED PROFESSIONAL ENGINEER

DAN THOMA, P.E.
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0 50 100
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2000 NW LOOP 410 | SAN ANTONIO, TX 78213 | 210.375.9000
TEXAS ENGINEERING FIRM #470 | TEXAS SURVEYING FIRM #10028800

2023 Texas Department of Transportation

US 183 GPL
RAMP PLAN & PROFILE
SB EXIT FROM SB 183A (ML) TO 183 (GPL)

SHEET 1 OF 2

© 2023		CONT	SECT	JOB	HIGHWAY
DS:	CK:	0151	10	001	US 183
		DIST	COUNTY		SHEET NO.
DW:	CK:	AUS	WILLIAMSON		310

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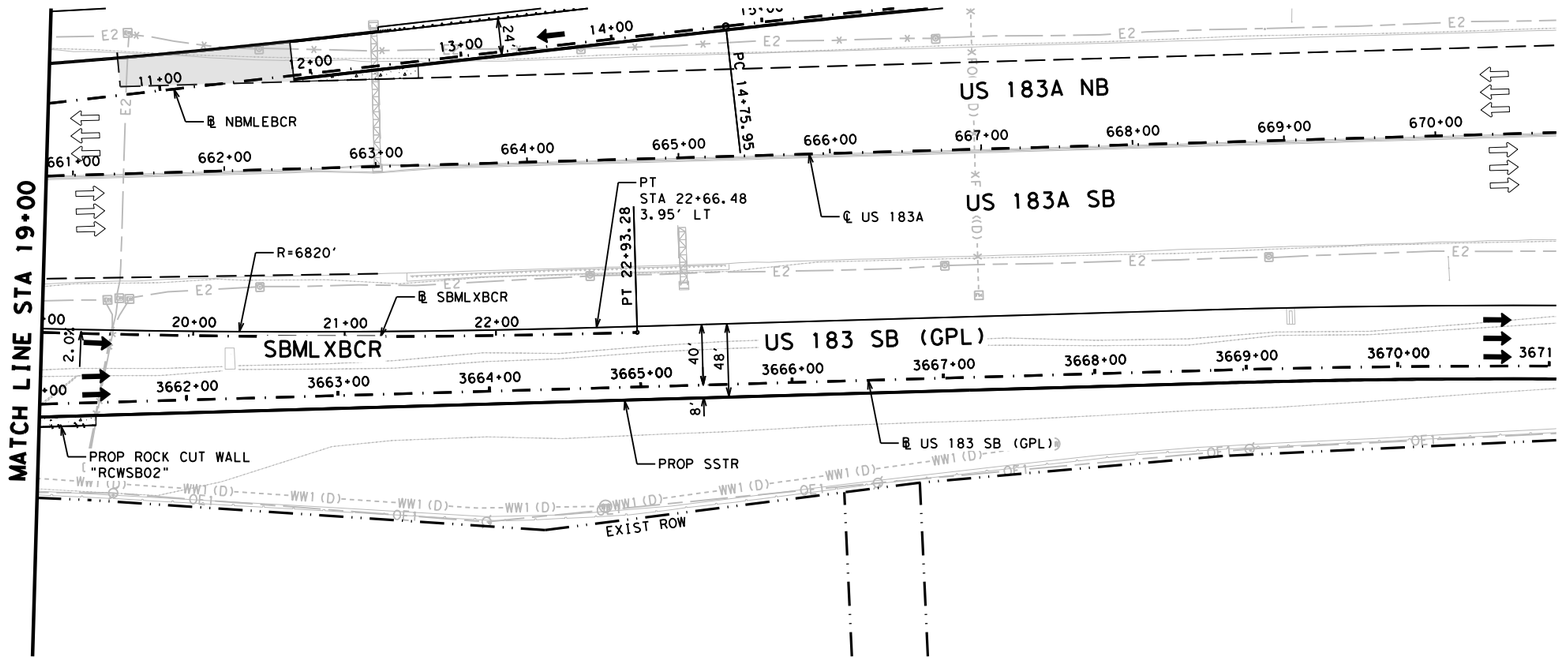

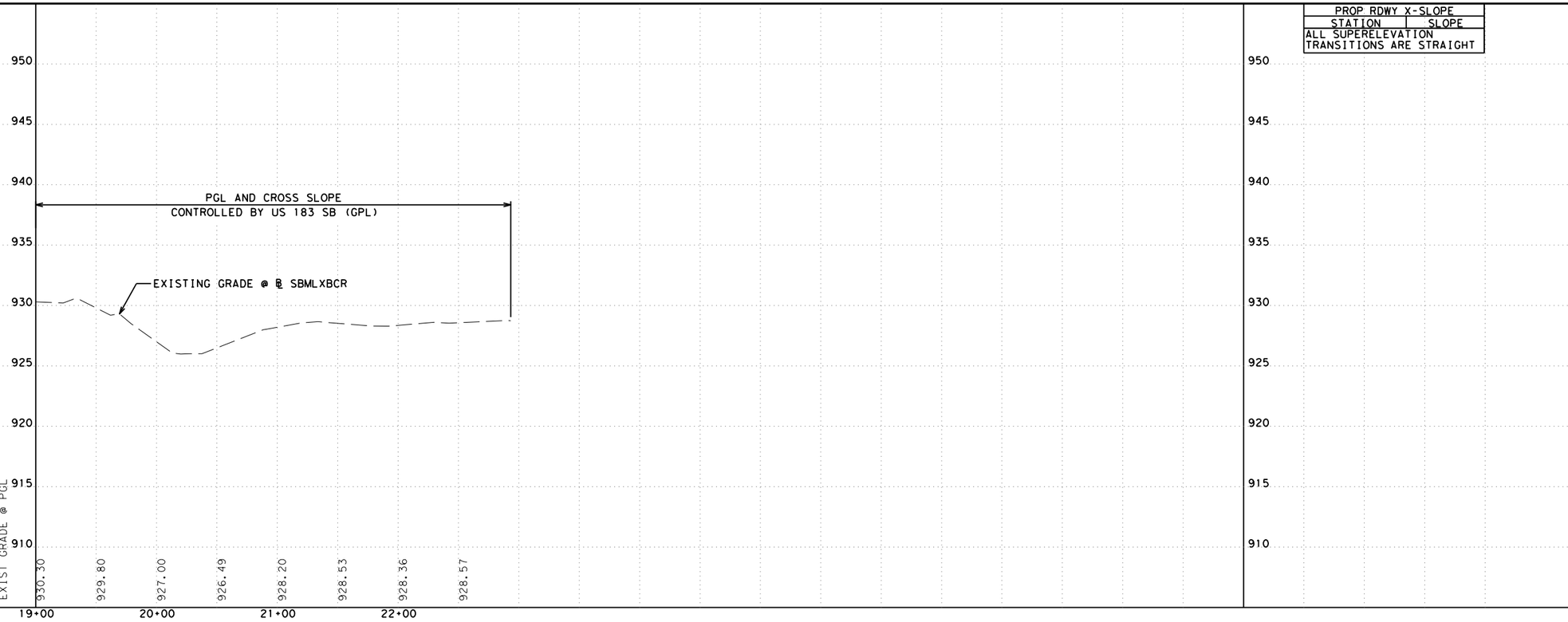

PROP RDWY X-SLOPE	
STATION	SLOPE
ALL SUPERELEVATION TRANSITIONS ARE STRAIGHT	

LEGEND

- EXIST TRAFFIC FLOW ARROW
- PROP TRAFFIC FLOW ARROW
- RETAINING WALL
- NOISE WALL
- TEMPORARY SPECIAL SHORING WALL
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- PROP CRCP
- CONCRETE RIPRAP
- PROPERTY EASEMENT
- X — DRIVEWAY ID
- W T2" — EXISTING UTILITY

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DESIGN

STATE OF TEXAS — MARISSA GUZMAN — 130772 — LICENSED PROFESSIONAL ENGINEER

MARISSA GUZMAN, P.E.
4/21/2023
DATE

APPROVAL

STATE OF TEXAS — DAN THOMA — 98622 — LICENSED PROFESSIONAL ENGINEER

DAN THOMA, P.E.
4/21/2023
DATE

0 50 100
SCALE: PLAN 1" = 100'
PROFILE: 1" = 10'

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SAN ANTONIO | AUSTIN | HOUSTON | FORT WORTH | DALLAS
2000 NW LOOP 410 | SAN ANTONIO, TX 78213 | 210.375.9000
TEXAS ENGINEERING FIRM #470 | TEXAS SURVEYING FIRM #10028800

2023 Texas Department of Transportation

US 183 GPL
RAMP PLAN & PROFILE
SB EXIT FROM SB 183A (ML) TO 183 (GPL)

SHEET 2 OF 2

© 2023		CONT	SECT	JOB	HIGHWAY
DS:	CK:	0151	10	001	US 183
		DIST	COUNTY		SHEET NO.
DW:	CK:	AUS	WILLIAMSON		311

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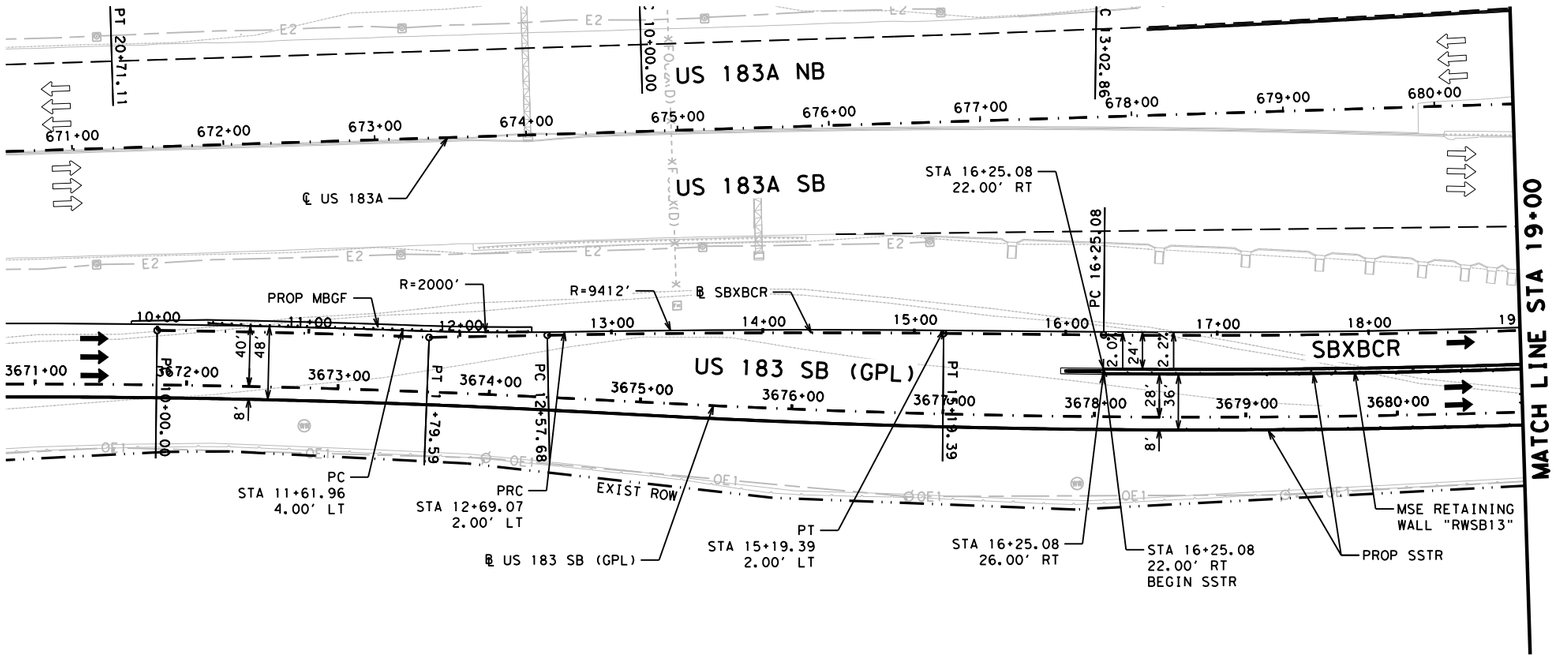

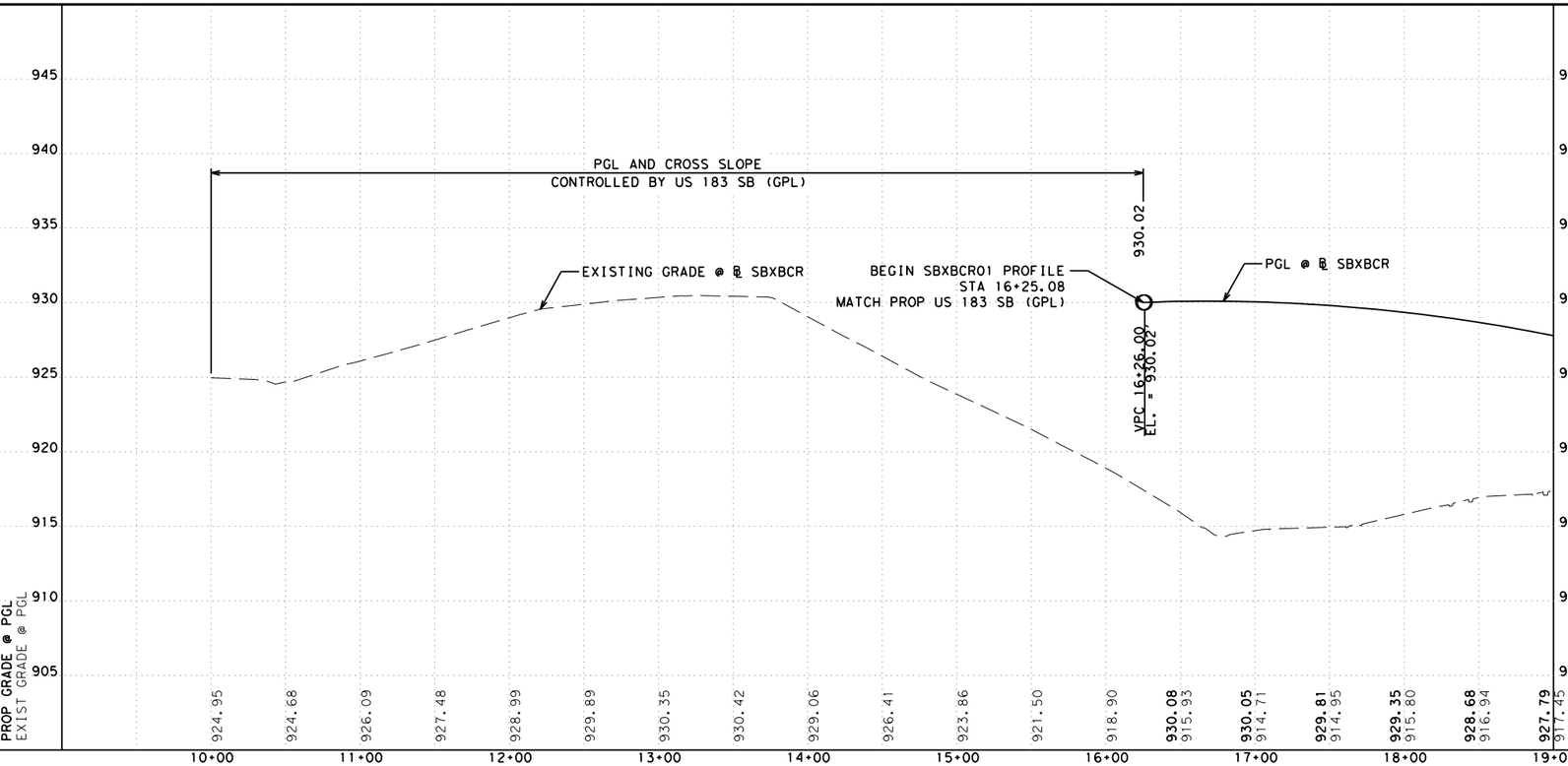

LEGEND

- EXIST TRAFFIC FLOW ARROW
- PROP TRAFFIC FLOW ARROW
- RETAINING WALL
- NOISE WALL
- TEMPORARY SPECIAL SHORING WALL
- ROCK CUT WALL
- PROP CRCP
- CONCRETE RIPRAP
- PROPERTY EASEMENT
- X — DRIVEWAY ID
- W T2" — EXISTING UTILITY

NOTES

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5. SEE NB SUP PLAN AND PROFILE SHEETS FOR SHARED-USE PATH INFORMATION.
6. SEE RAMP PLAN AND PROFILE SHEETS FOR RAMP INFORMATION.
7. SEE BRUSHY CREEK LOOP PLAN AND PROFILE SHEETS FOR BRUSHY CREEK LOOP INFORMATION.
8. SEE NB PLAN AND PROFILE SHEETS FOR FOR US 183 NB GPL INFORMATION AND SB PLAN AND PROFILE SHEETS FOR US 183 SB GPL INFORMATION.

PROP RDWY X-SLOPE	
STATION	SLOPE
16+25.08	2.00%
16+32.00	2.20%
ALL SUPERELEVATION TRANSITIONS ARE STRAIGHT	

DESIGN

STATE OF TEXAS — MARISSA GUZMAN — 130772 — LICENSED PROFESSIONAL ENGINEER

MARISSA GUZMAN, P.E.

4/21/2023

DATE

APPROVAL

STATE OF TEXAS — DAN THOMA — 98622 — LICENSED PROFESSIONAL ENGINEER

DAN THOMA, P.E.

4/21/2023

DATE

0 50 100

SCALE: PLAN 1" = 100'
PROFILE: 1" = 10'

PAPE-DAWSON ENGINEERS

SAN ANTONIO | AUSTIN | HOUSTON | FORT WORTH | DALLAS
2000 NW LOOP 410 | SAN ANTONIO, TX 78213 | 210.375.9000
TEXAS ENGINEERING FIRM #470 | TEXAS SURVEYING FIRM #10028800

2023 Texas Department of Transportation

US 183 GPL
RAMP PLAN & PROFILE
SB EXIT FROM SB 183 (GPL) TO BRUSHY CREEK RD

SHEET 1 OF 2

© 2023		CONT	SECT	JOB	HIGHWAY
DS:	CK:	0151	10	001	US 183
		DIST	COUNTY		SHEET NO.
DW:	CK:	AUS	WILLIAMSON		312

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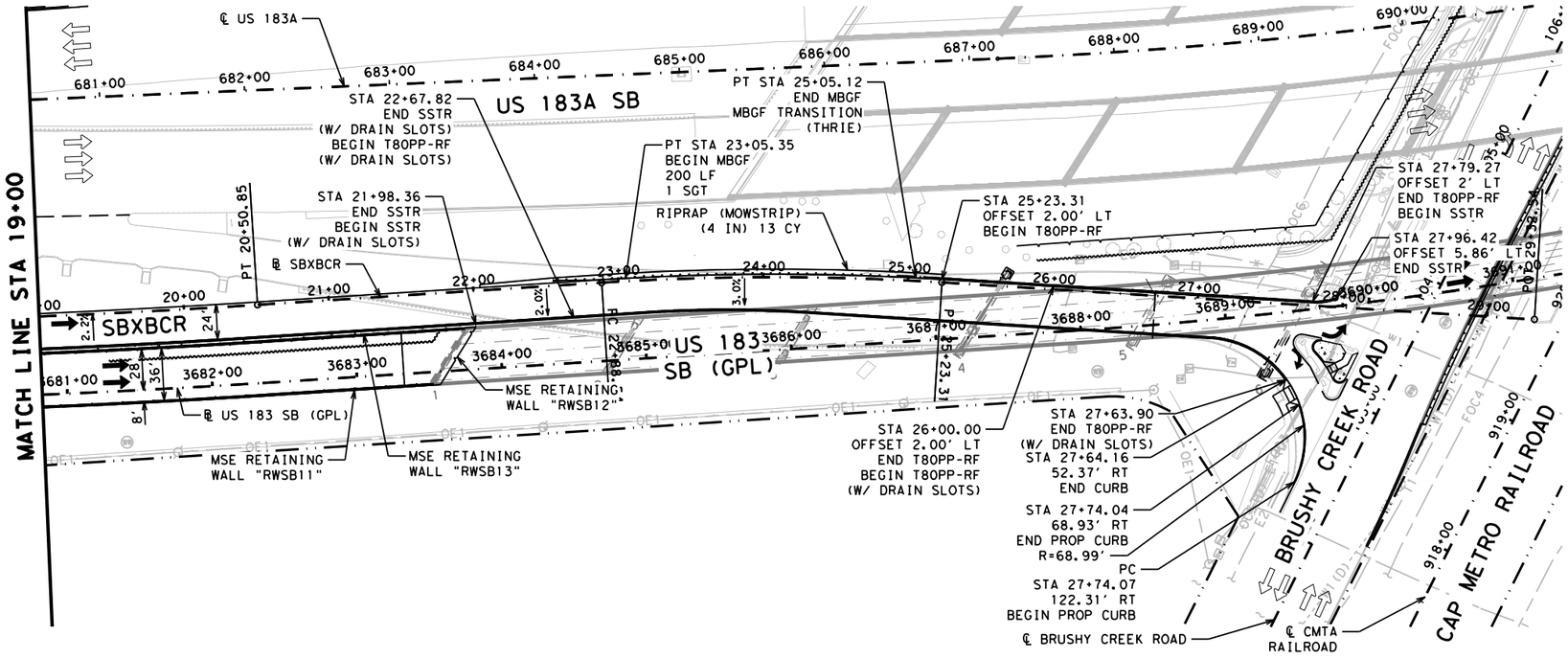

LEGEND

- EXIST TRAFFIC FLOW ARROW
- PROP TRAFFIC FLOW ARROW
- RETAINING WALL
- NOISE WALL
- TEMPORARY SPECIAL SHORING WALL
- ROCK CUT WALL
- PROP CRCP
- CONCRETE RIPRAP
- PROPERTY EASEMENT
- [X] DRIVEWAY ID
- W T2" EXISTING UTILITY

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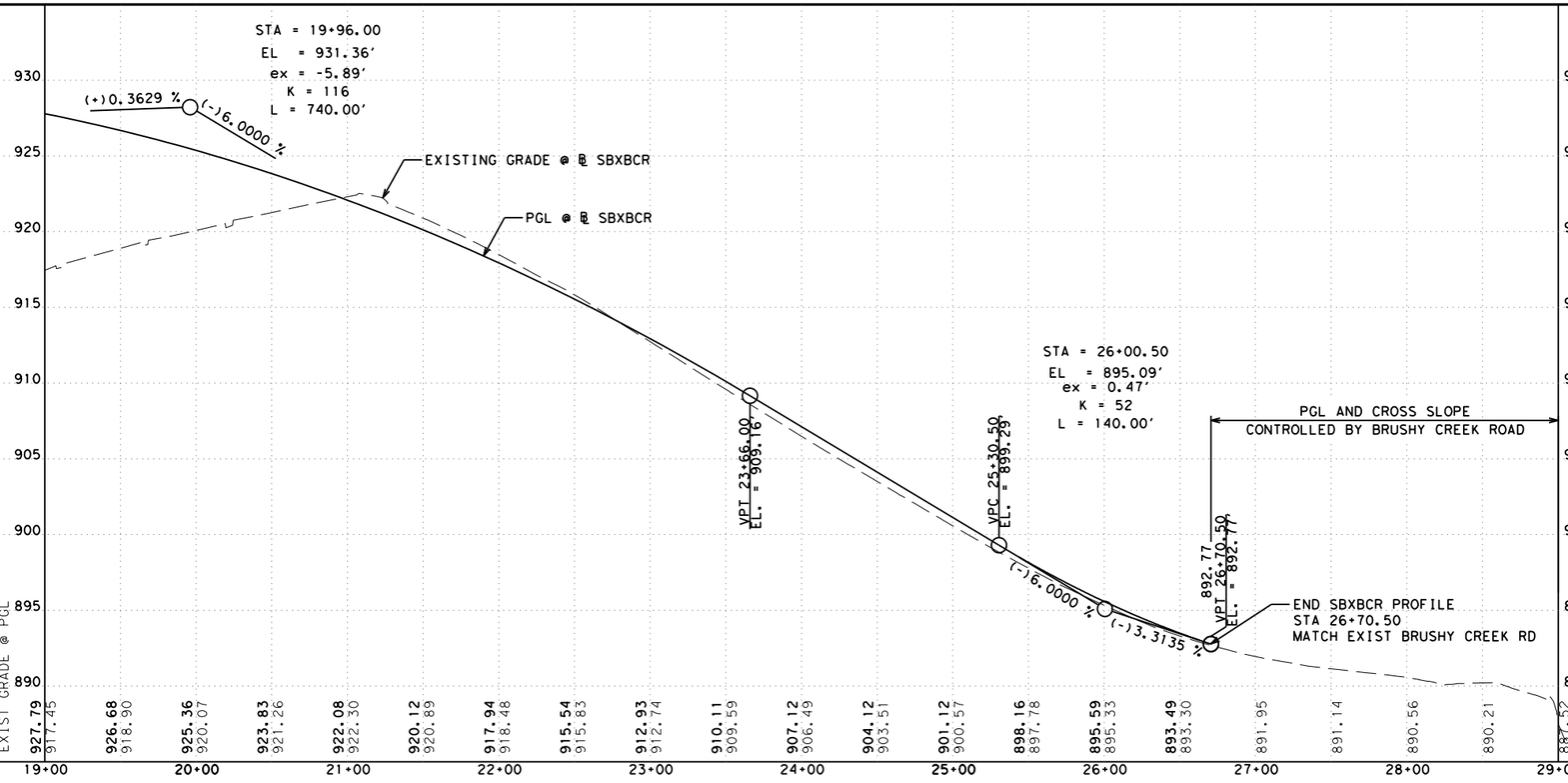

PROP RDWY X-SLOPE	
STATION	SLOPE
20+13.00	2.20%
21+39.00	-2.00%
22+83.00	-2.00%
23+06.00	-3.00%
24+76.00	-3.00%
26+70.58	MATCH EXIST

ALL SUPERELEVATION TRANSITIONS ARE STRAIGHT

DESIGN

STATE OF TEXAS · MARISSA GUZMAN · 130772 · LICENSED PROFESSIONAL ENGINEER

MARISSA GUZMAN, P.E.
4/17/2024
DATE

APPROVAL

STATE OF TEXAS · DAN THOMA · 98622 · LICENSED PROFESSIONAL ENGINEER

DAN THOMA, P.E.
4/17/2024
DATE

0 50 100
SCALE: PLAN 1" = 100'
PROFILE: 1" = 10'

PAPE-DAWSON ENGINEERS
SAN ANTONIO | AUSTIN | HOUSTON | FORT WORTH | DALLAS
2000 NW LOOP 410 | SAN ANTONIO, TX 78213 | 210.375.9000
TEXAS ENGINEERING FIRM #470 | TEXAS SURVEYING FIRM #10028800

2024 Texas Department of Transportation

US 183 GPL
RAMP PLAN & PROFILE
SB EXIT FROM SB 183 (GPL) TO BRUSHY CREEK RD

SHEET 2 OF 2

© 2024

CONT	SECT	JOB	HIGHWAY
0151	10	001	US 183

DIST	COUNTY	SHEET NO.
AUS	WILLIAMSON	313

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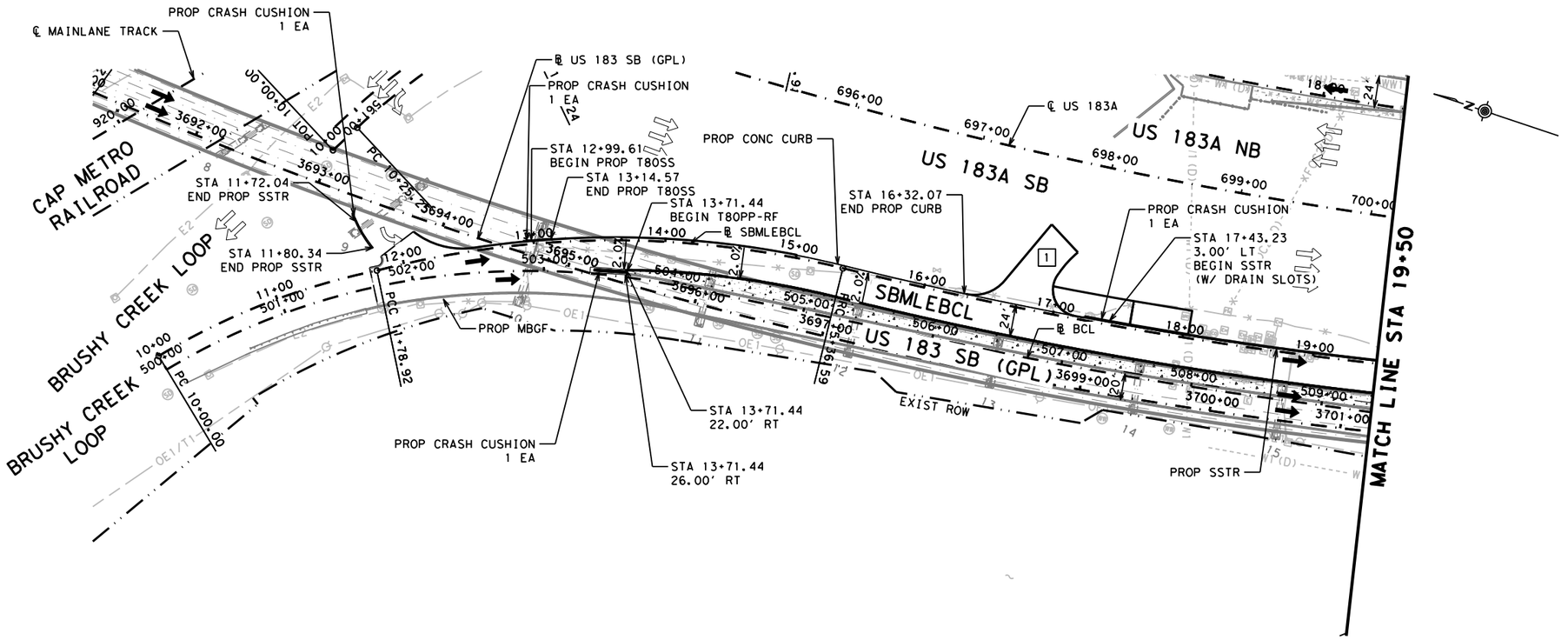

LEGEND

- EXIST TRAFFIC FLOW ARROW
- PROP TRAFFIC FLOW ARROW
- RETAINING WALL
- NOISE WALL
- TEMPORARY SPECIAL SHORING WALL
- ROCK CUT WALL
- PROP CRCP
- CONCRETE RIPRAP
- PROPERTY EASEMENT
- [X] DRIVEWAY ID
- W 12" EXISTING UTILITY

NOTES

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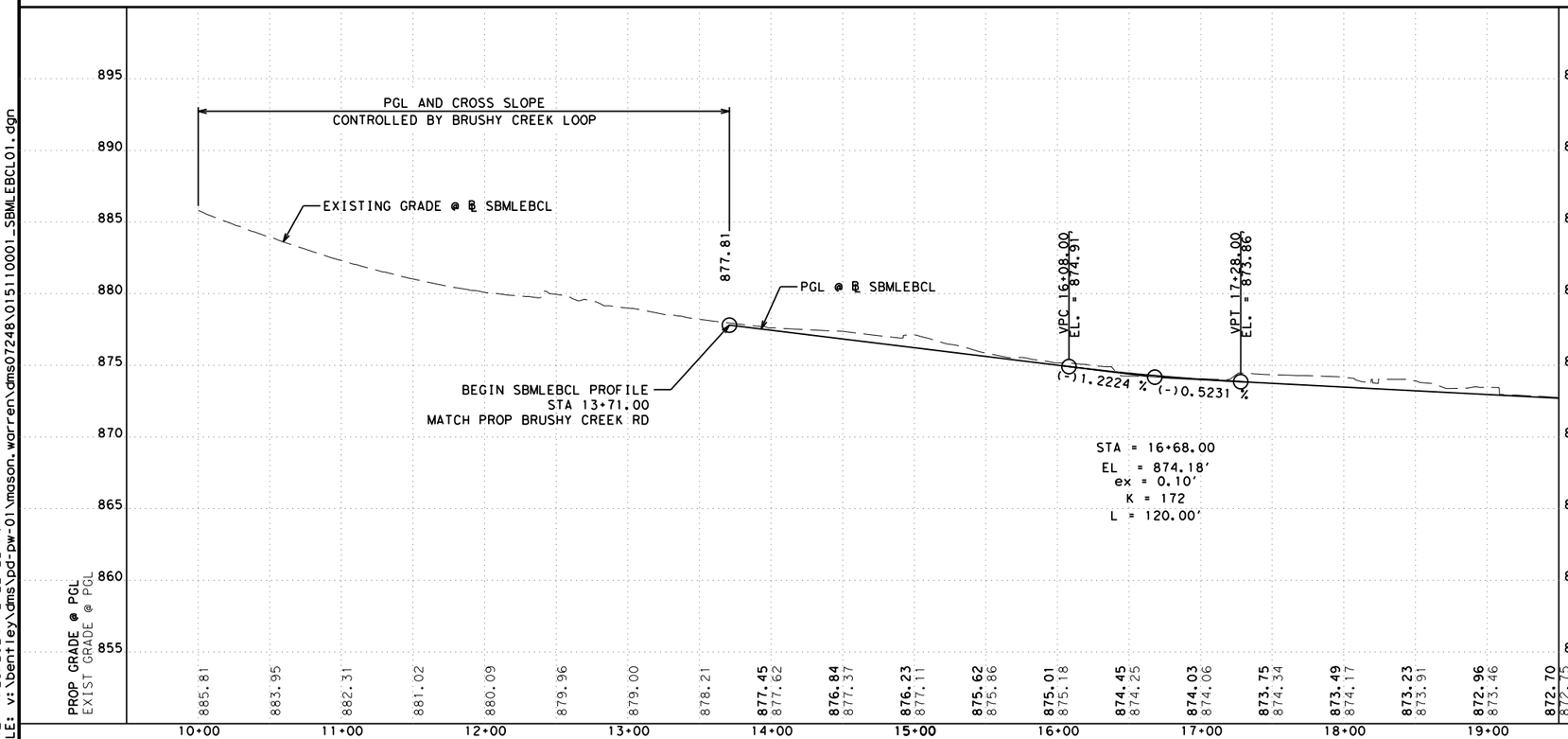

PROP RDWY X-SLOPE	
STATION	SLOPE
13+71.00	-2.00%
14+60.00	-2.00%
15+55.00	2.00%
ALL SUPERELEVATION TRANSITIONS ARE STRAIGHT	

DESIGN

STATE OF TEXAS · MARISSA GUZMAN · 130772 · LICENSED PROFESSIONAL ENGINEER

MARISSA GUZMAN, P.E.

4/23/2024
DATE

APPROVAL

STATE OF TEXAS · DAN THOMA · 98622 · LICENSED PROFESSIONAL ENGINEER

DAN THOMA, P.E.

4/23/2024
DATE

0 50 100

SCALE: PLAN 1" = 100'
PROFILE: 1" = 10'

PAPE-DAWSON ENGINEERS

SAN ANTONIO | AUSTIN | HOUSTON | FORT WORTH | DALLAS
2000 NW LOOP 410 | SAN ANTONIO, TX 78213 | 210.375.9000
TEXAS ENGINEERING FIRM #470 | TEXAS SURVEYING FIRM #10028800

2024 Texas Department of Transportation

US 183 GPL
RAMP PLAN & PROFILE
SB 183A (ML) ENTRANCE FROM BRUSHY CREEK LOOP TO 183A (ML)

SHEET 1 OF 3

© 2024		CONT	SECT	JOB	HIGHWAY
DS:	CK:	0151	10	001	US 183
		DIST	COUNTY		SHEET NO.
DW:	CK:	AUS	WILLIAMSON		314

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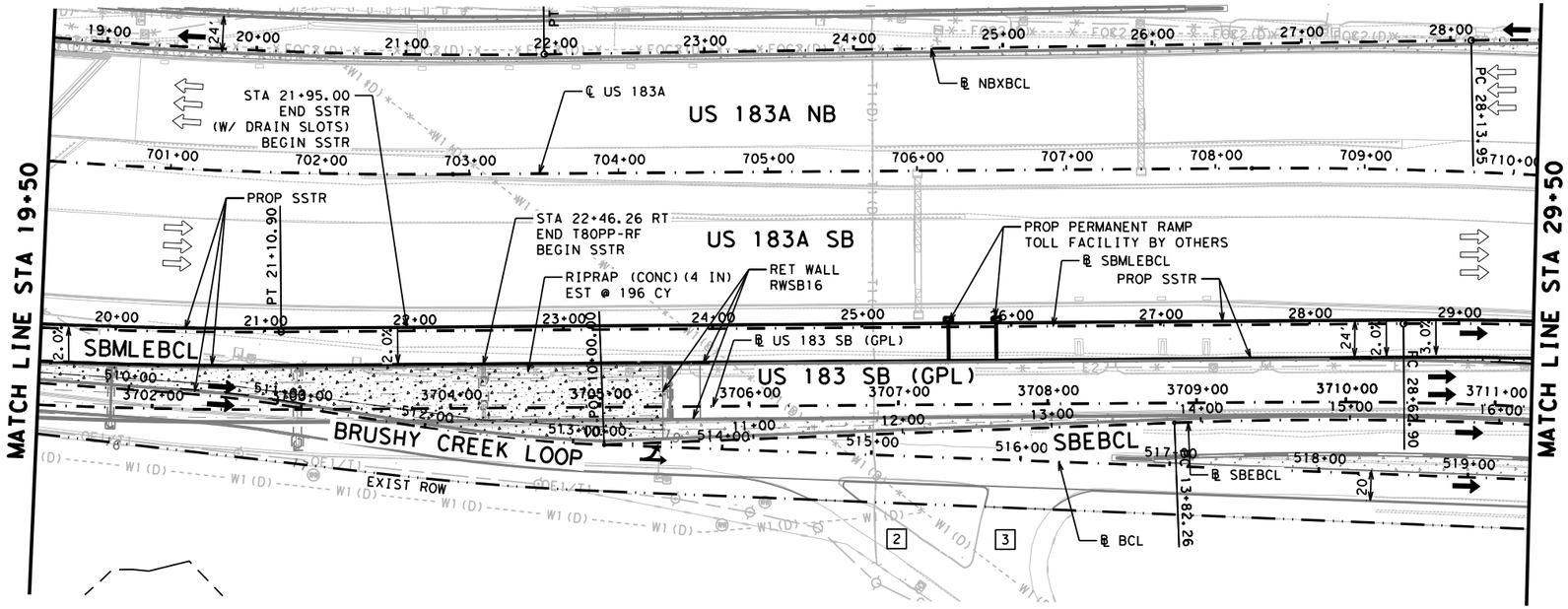

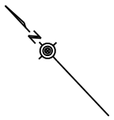

LEGEND

- EXIST TRAFFIC FLOW ARROW
- PROP TRAFFIC FLOW ARROW
- RETAINING WALL
- NOISE WALL
- TEMPORARY SPECIAL SHORING WALL
- ROCK CUT WALL
- PROP CRCP
- CONCRETE RIPRAP
- PROPERTY EASEMENT
- [X] DRIVEWAY ID
- W 12" EXISTING UTILITY

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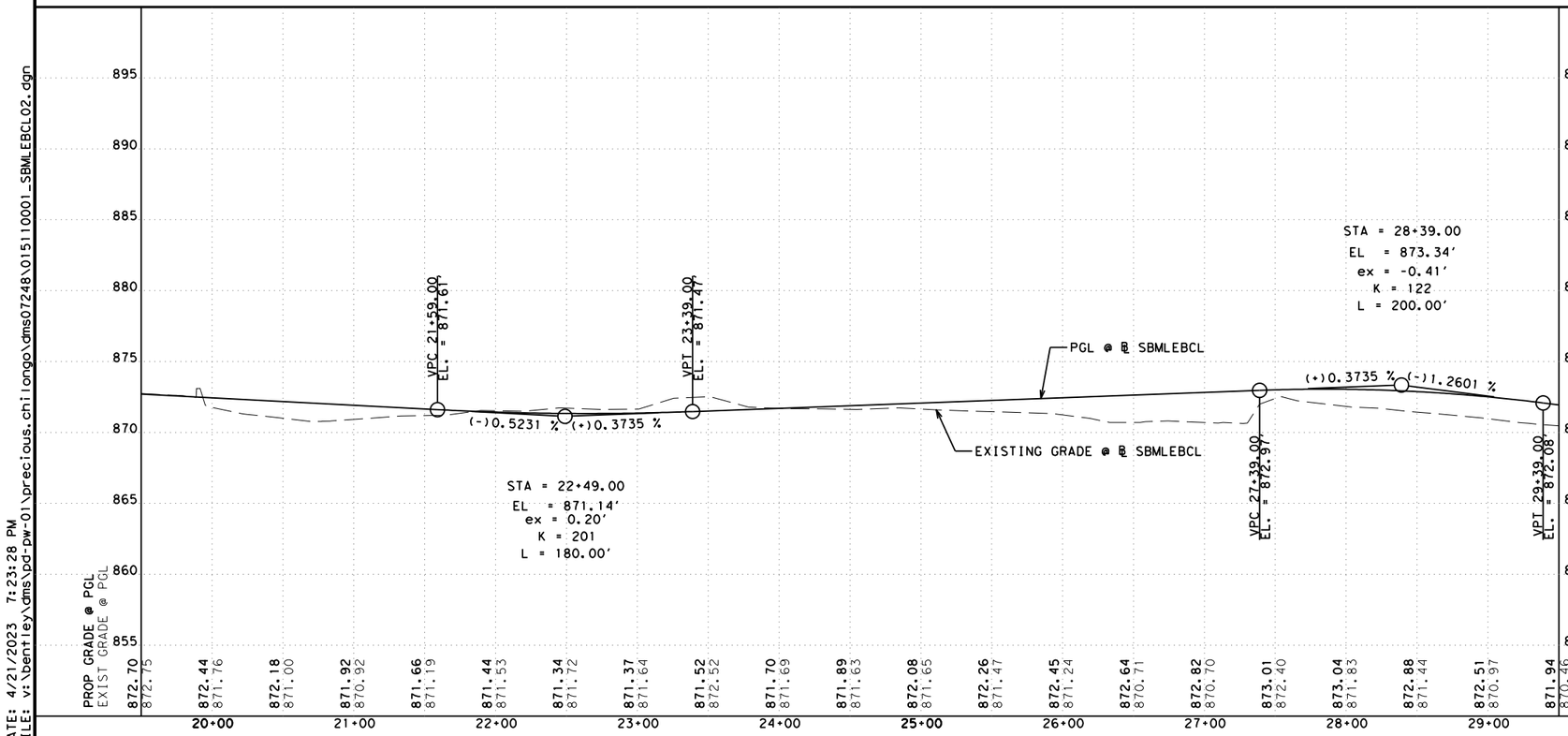

PROP RDWY X-SLOPE	
STATION	SLOPE
20+75.00	2.00%
21+95.00	-2.00%
28+41.00	-2.00%
28+71.00	-3.00%
ALL SUPERELEVATION TRANSITIONS ARE STRAIGHT	

DESIGN

STATE OF TEXAS · MARISSA GUZMAN · 130772 · LICENSED PROFESSIONAL ENGINEER

MARISSA GUZMAN, P.E.
4/21/2023
DATE

APPROVAL

STATE OF TEXAS · DAN THOMA · 98622 · LICENSED PROFESSIONAL ENGINEER

DAN THOMA, P.E.
4/21/2023
DATE

0 50 100
SCALE: PLAN 1" = 100'
PROFILE: 1" = 10'

PAPE-DAWSON ENGINEERS
SAN ANTONIO | AUSTIN | HOUSTON | FORT WORTH | DALLAS
2000 NW LOOP 410 | SAN ANTONIO, TX 78213 | 210.375.9000
TEXAS ENGINEERING FIRM #470 | TEXAS SURVEYING FIRM #10028800

2023
Texas Department of Transportation

US 183 GPL
RAMP PLAN & PROFILE
SB 183A (ML) ENTRANCE FROM BRUSHY CREEK LOOP TO 183A (ML)

SHEET 2 OF 3

© 2023		CONT	SECT	JOB	HIGHWAY
DS:	CK:	0151	10	001	US 183
		DIST	COUNTY		SHEET NO.
DW:	CK:	AUS	WILLIAMSON		315

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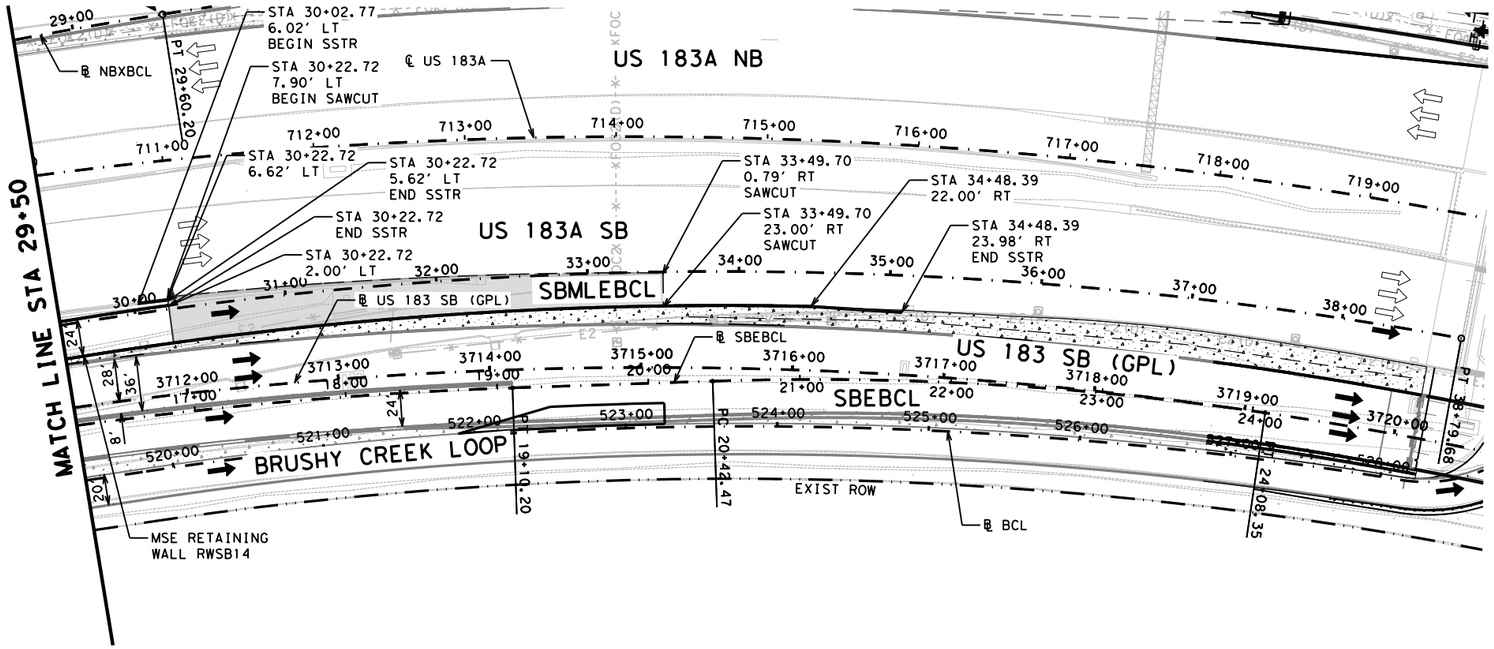

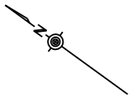

LEGEND

- EXIST TRAFFIC FLOW ARROW
- PROP TRAFFIC FLOW ARROW
- RETAINING WALL
- NOISE WALL
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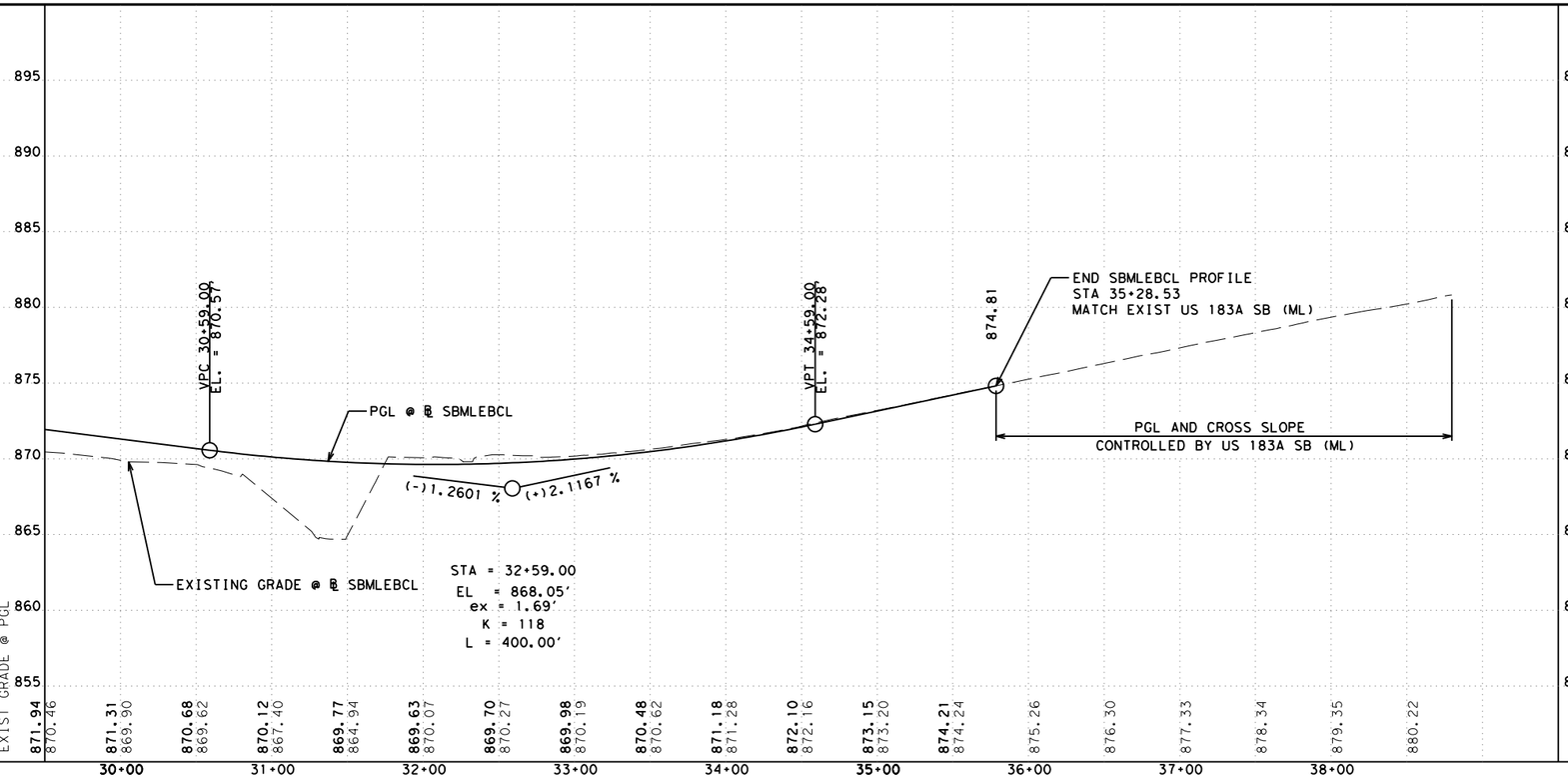

PROP RDWY X-SLOPE	
STATION	SLOPE
30+22.72	MATCH EXIST
ALL SUPERELEVATION TRANSITIONS ARE STRAIGHT	

DESIGN

STATE OF TEXAS — MARISSA GUZMAN — 130772 — LICENSED PROFESSIONAL ENGINEER

MARISSA GUZMAN, P.E.

4/21/2023

DATE

APPROVAL

STATE OF TEXAS — DAN THOMA — 98622 — LICENSED PROFESSIONAL ENGINEER

DAN THOMA, P.E.

4/21/2023

DATE

0 50 100

SCALE: PLAN 1" = 100'
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PAPE-DAWSON ENGINEERS

SAN ANTONIO | AUSTIN | HOUSTON | FORT WORTH | DALLAS
2000 NW LOOP 410 | SAN ANTONIO, TX 78213 | 210.375.9000
TEXAS ENGINEERING FIRM #470 | TEXAS SURVEYING FIRM #10028800

2023 Texas Department of Transportation

US 183 GPL
RAMP PLAN & PROFILE
SB 183A (ML) ENTRANCE FROM BRUSHY CREEK LOOP TO 183A (ML)

SHEET 3 OF 3

© 2023		CONT	SECT	JOB	HIGHWAY
DS:	CK:	0151	10	001	US 183
		DIST	COUNTY		SHEET NO.
DW:	CK:	AUS	WILLIAMSON		316

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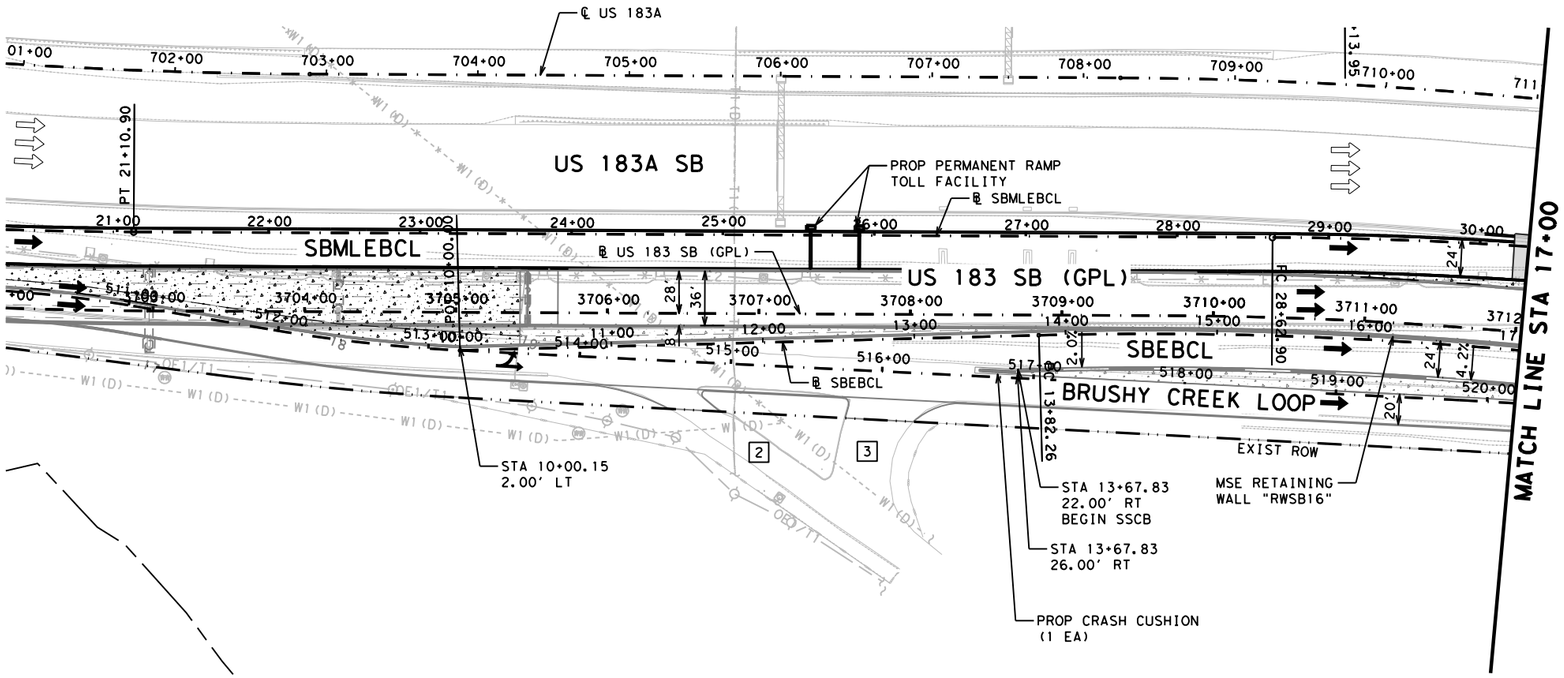

LEGEND

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- [X] DRIVEWAY ID
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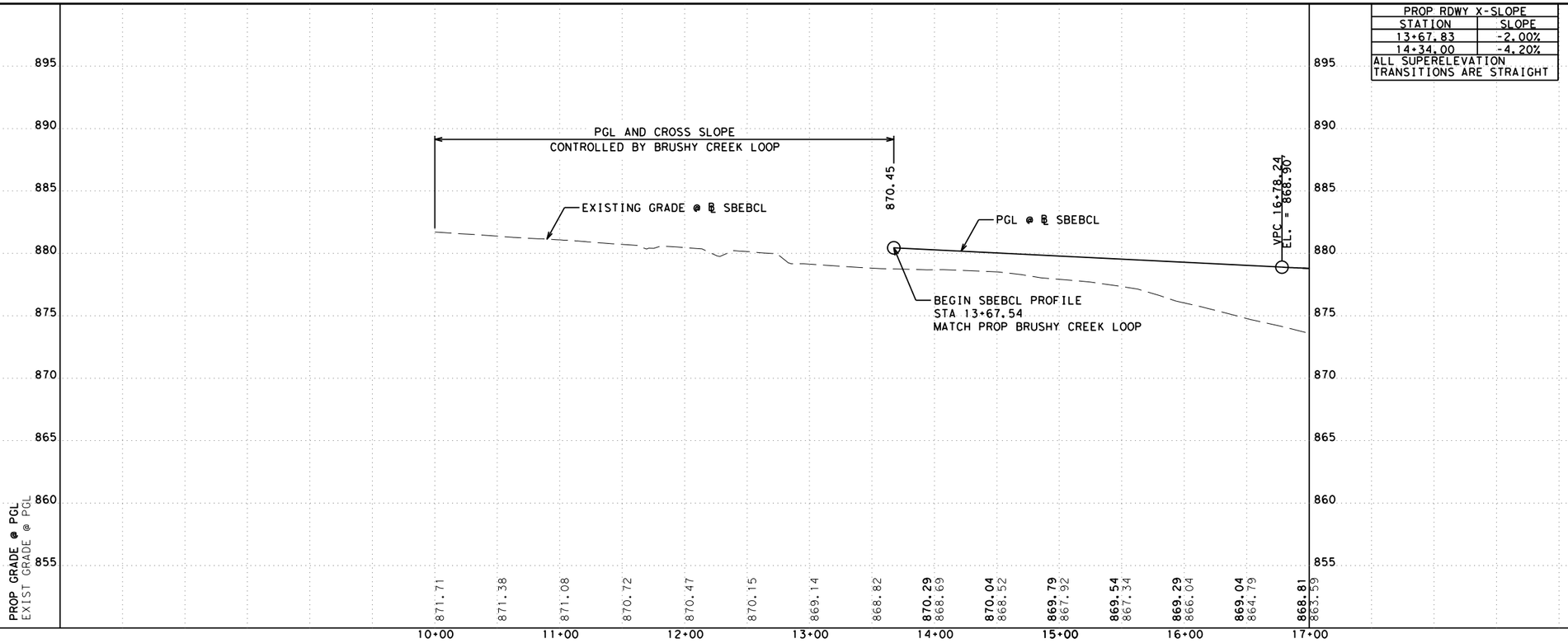

PROP RDWY X-SLOPE	
STATION	SLOPE
13+67.83	-2.00%
14+34.00	-4.20%
ALL SUPERELEVATION TRANSITIONS ARE STRAIGHT	

DESIGN

STATE OF TEXAS — MARISSA GUZMAN — 130772 — LICENSED PROFESSIONAL ENGINEER

MARISSA GUZMAN, P.E.

4/21/2023

DATE

APPROVAL

STATE OF TEXAS — DAN THOMA — 98622 — LICENSED PROFESSIONAL ENGINEER

DAN THOMA, P.E.

4/21/2023

DATE

0 50 100

SCALE: PLAN 1" = 100'
PROFILE: 1" = 10'

PAPE-DAWSON ENGINEERS

SAN ANTONIO | AUSTIN | HOUSTON | FORT WORTH | DALLAS
2000 NW LOOP 410 | SAN ANTONIO, TX 78213 | 210.375.9000
TEXAS ENGINEERING FIRM #470 | TEXAS SURVEYING FIRM #10028800

2023 Texas Department of Transportation

US 183 GPL
RAMP PLAN & PROFILE
SB 183 (GPL) ENTRANCE FROM BRUSHY CREEK LOOP TO 183 (GPL)

SHEET 1 OF 2

© 2023		CONT	SECT	JOB	HIGHWAY
DS:	CK:	0151	10	001	US 183
DW:	CK:	DIST	COUNTY		SHEET NO.
		AUS	WILLIAMSON		317

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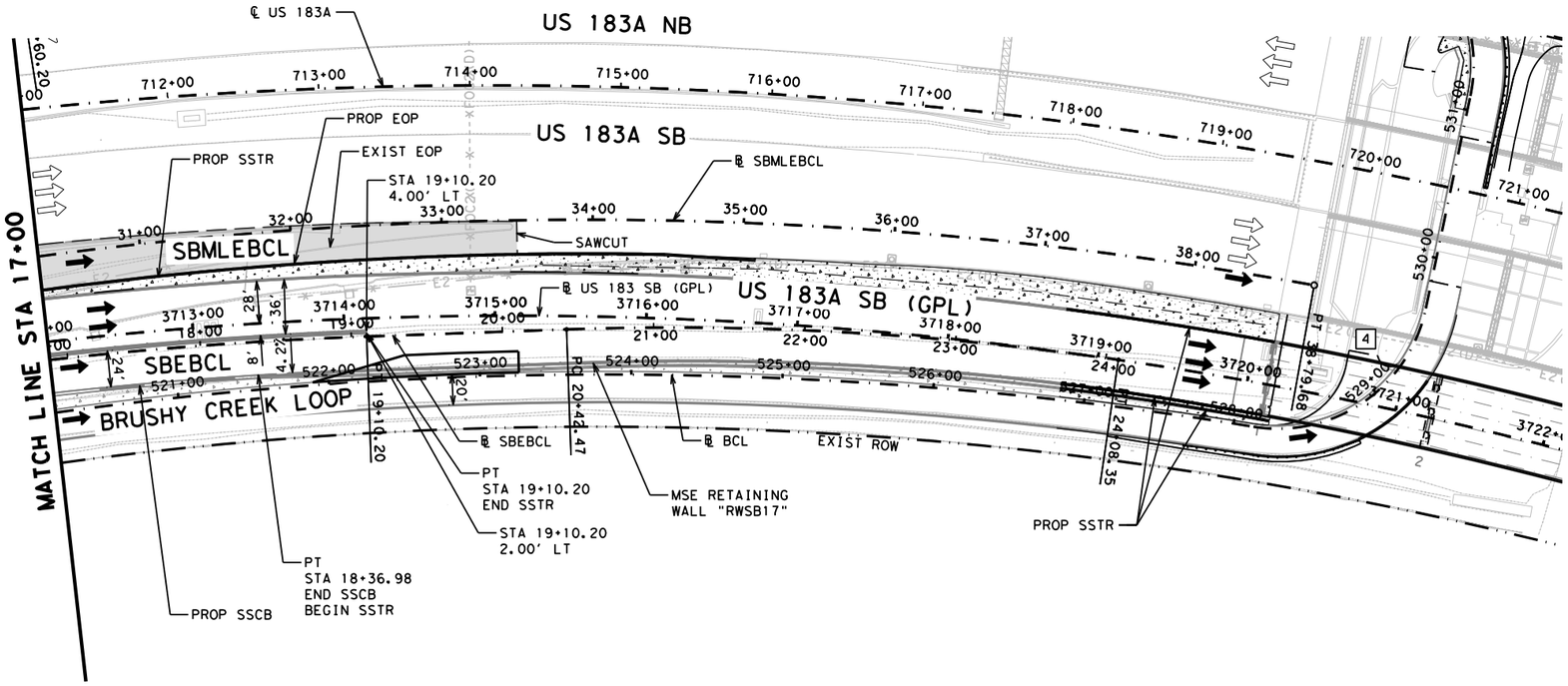

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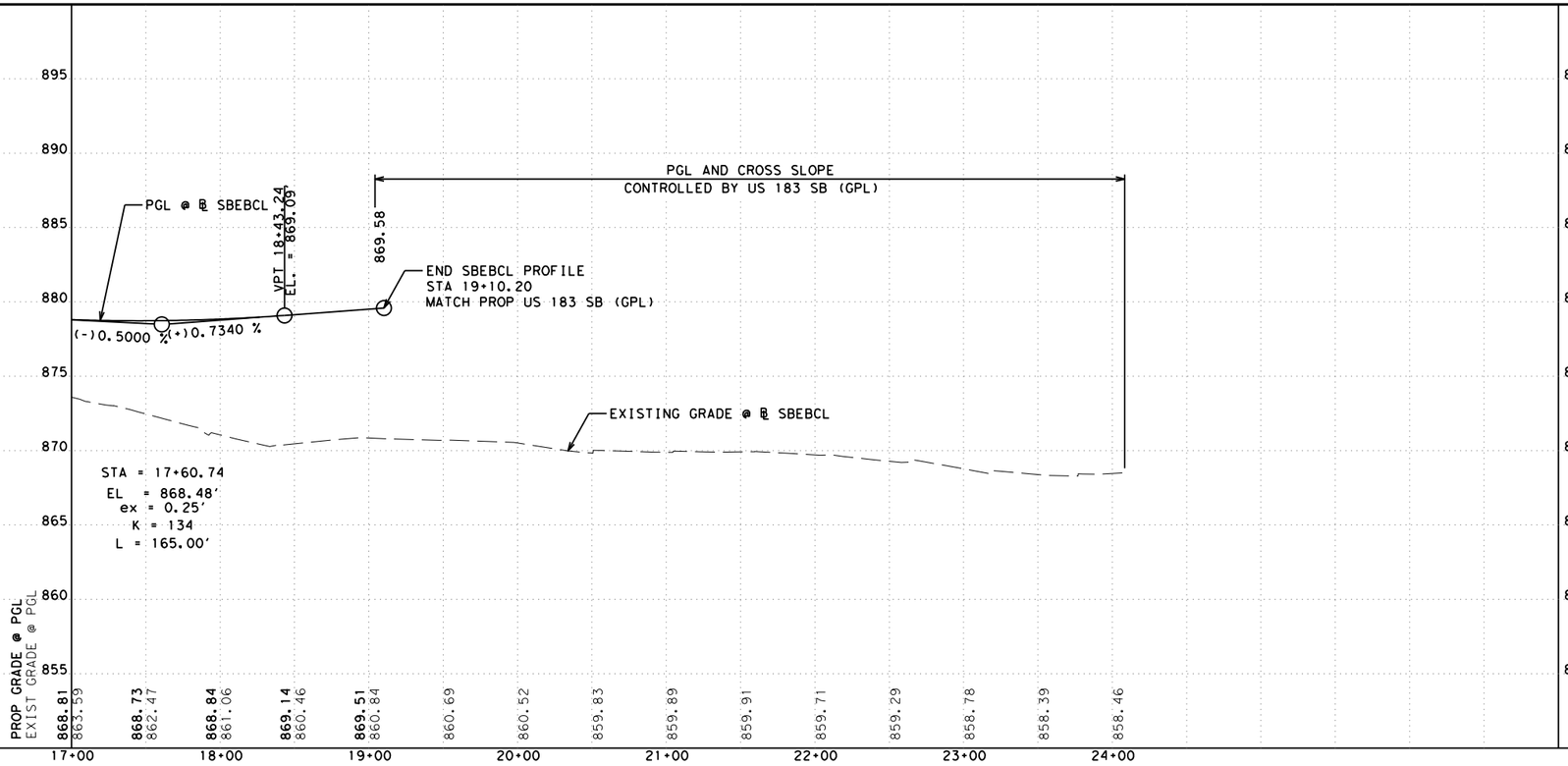

PROP RDWY X-SLOPE	
STATION	SLOPE
19+10.20	-4.20%
ALL SUPERELEVATION TRANSITIONS ARE STRAIGHT	

DESIGN

STATE OF TEXAS — MARISSA GUZMAN — 130772 — LICENSED PROFESSIONAL ENGINEER

MARISSA GUZMAN, P.E.

4/21/2023

DATE

APPROVAL

STATE OF TEXAS — DAN THOMA — 98622 — LICENSED PROFESSIONAL ENGINEER

DAN THOMA, P.E.

4/21/2023

DATE

0 50 100

SCALE: PLAN 1" = 100'
PROFILE: 1" = 10'

PAPE-DAWSON ENGINEERS

SAN ANTONIO | AUSTIN | HOUSTON | FORT WORTH | DALLAS
2000 NW LOOP 410 | SAN ANTONIO, TX 78213 | 210.375.9000
TEXAS ENGINEERING FIRM #470 | TEXAS SURVEYING FIRM #10028800

2023 Texas Department of Transportation

US 183 GPL
RAMP PLAN & PROFILE
SB 183 (GPL) ENTRANCE FROM BRUSHY CREEK LOOP TO 183 (GPL)

SHEET 2 OF 2

© 2023		CONT	SECT	JOB	HIGHWAY
DS:	CK:	0151	10	001	US 183
DW:	CK:	DIST	COUNTY		SHEET NO.
		AUS	WILLIAMSON		318

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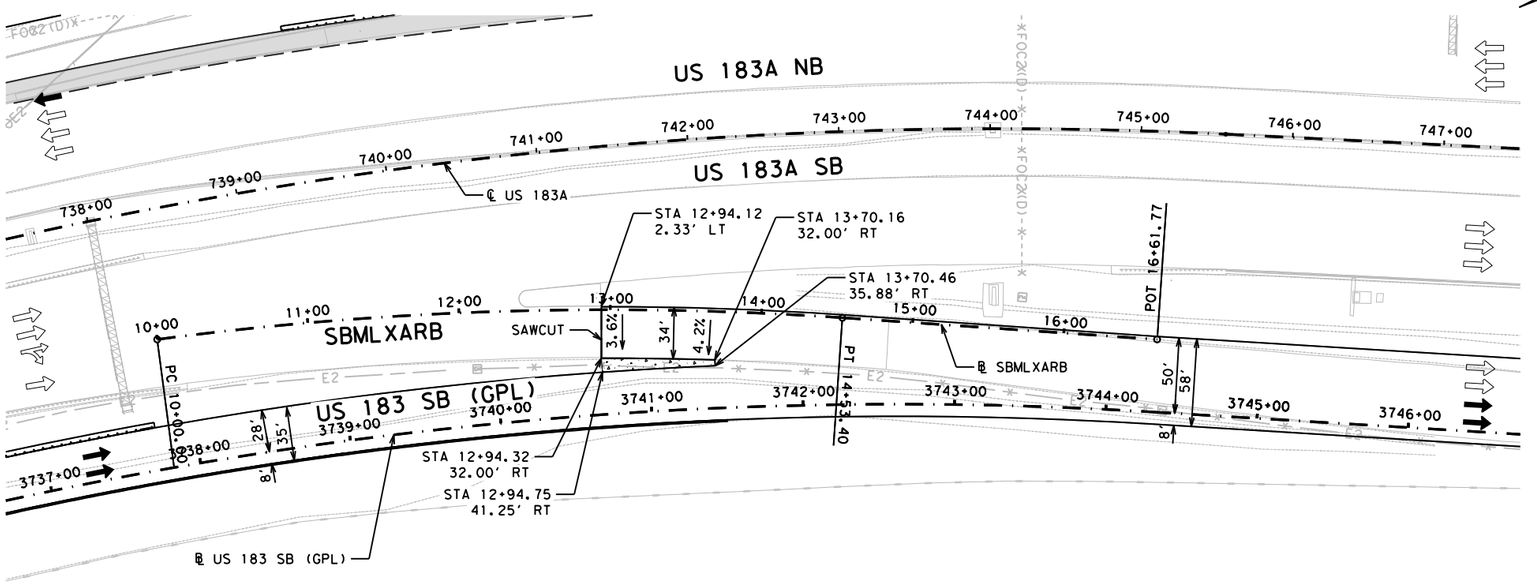

LEGEND

- EXIST TRAFFIC FLOW ARROW
- PROP TRAFFIC FLOW ARROW
- RETAINING WALL
- NOISE WALL
- TEMPORARY SPECIAL SHORING WALL
- ROCK CUT WALL
- PROP CRCP
- CONCRETE RIPRAP
- PROPERTY EASEMENT
- DRIVEWAY ID (X)
- EXISTING UTILITY (W T2")

NOTES

1. EXISTING FEATURES AND PROPOSED FEATURES NOT DETAILED ON THIS SHEET ARE SHOWN SCREENED BACK; i.e. FADED.
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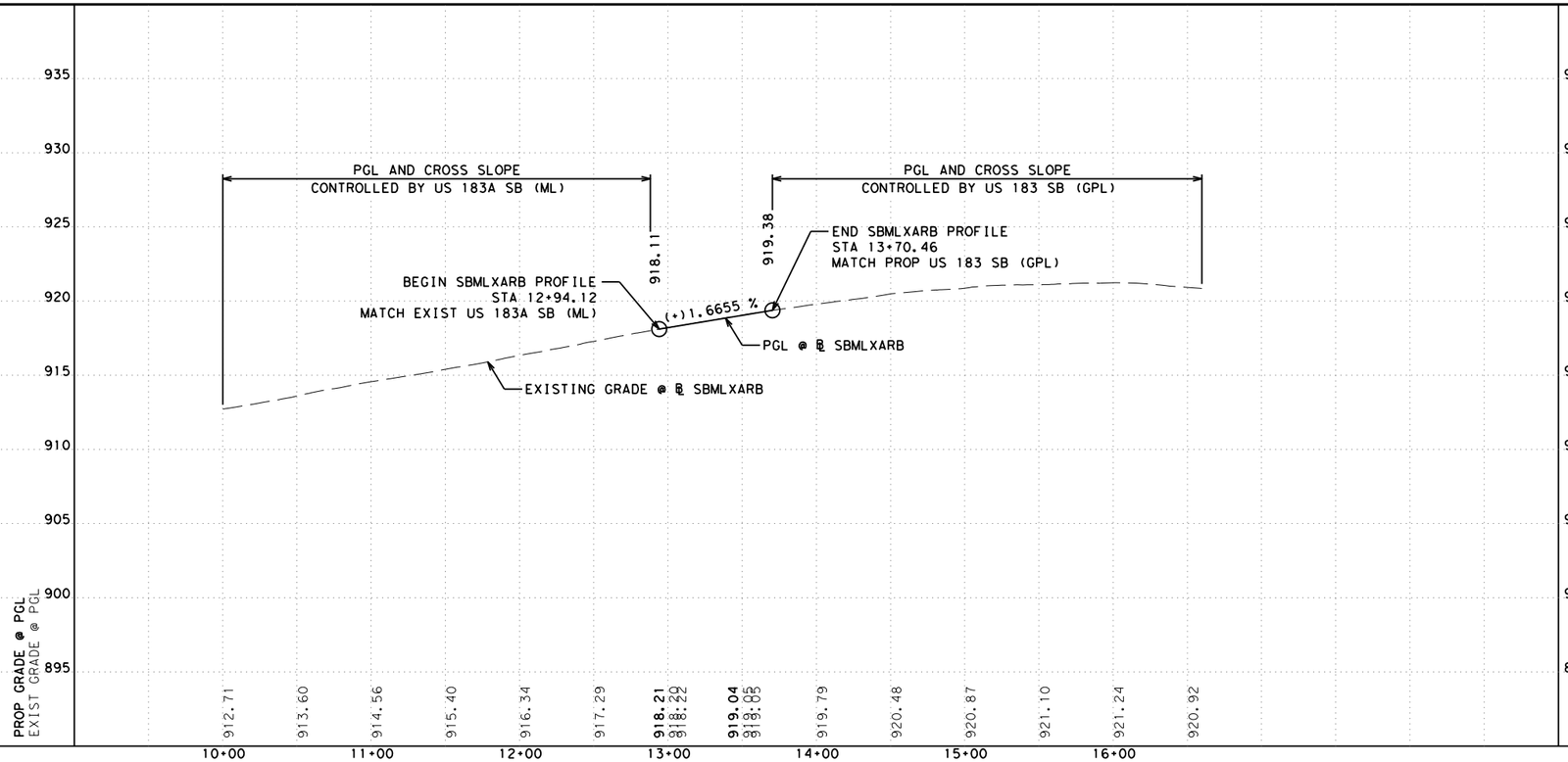
7. SEE BRUSHY CREEK LOOP PLAN AND PROFILE SHEETS FOR BRUSHY CREEK LOOP INFORMATION.
8. SEE NB PLAN AND PROFILE SHEETS FOR FOR US 183 NB GPL INFORMATION AND SB PLAN AND PROFILE SHEETS FOR US 183 SB GPL INFORMATION.



PROP RDWY X-SLOPE	
STATION	SLOPE
12+94.12	-3.60%
13+70.46	-4.20%
ALL SUPERELEVATION TRANSITIONS ARE STRAIGHT	

DESIGN

STATE OF TEXAS — MARISSA GUZMAN — 130772 — LICENSED PROFESSIONAL ENGINEER

MARISSA GUZMAN, P.E.

4/21/2023

DATE

APPROVAL

STATE OF TEXAS — DAN THOMA — 98622 — LICENSED PROFESSIONAL ENGINEER

DAN THOMA, P.E.

4/21/2023

DATE

0 50 100

SCALE: PLAN 1" = 100'
PROFILE: 1" = 10'

PAPE-DAWSON ENGINEERS

SAN ANTONIO | AUSTIN | HOUSTON | FORT WORTH | DALLAS
2000 NW LOOP 410 | SAN ANTONIO, TX 78213 | 210.375.9000
TEXAS ENGINEERING FIRM #470 | TEXAS SURVEYING FIRM #10028800

2023 Texas Department of Transportation

US 183 GPL
RAMP PLAN & PROFILE
SB EXIT FROM 183A (ML) TO AVERY RANCH BLVD

SHEET 1 OF 1

© 2023		CONT	SECT	JOB	HIGHWAY
DS:	CK:	0151	10	001	US 183
		DIST	COUNTY		SHEET NO.
DW:	CK:	AUS	WILLIAMSON		319

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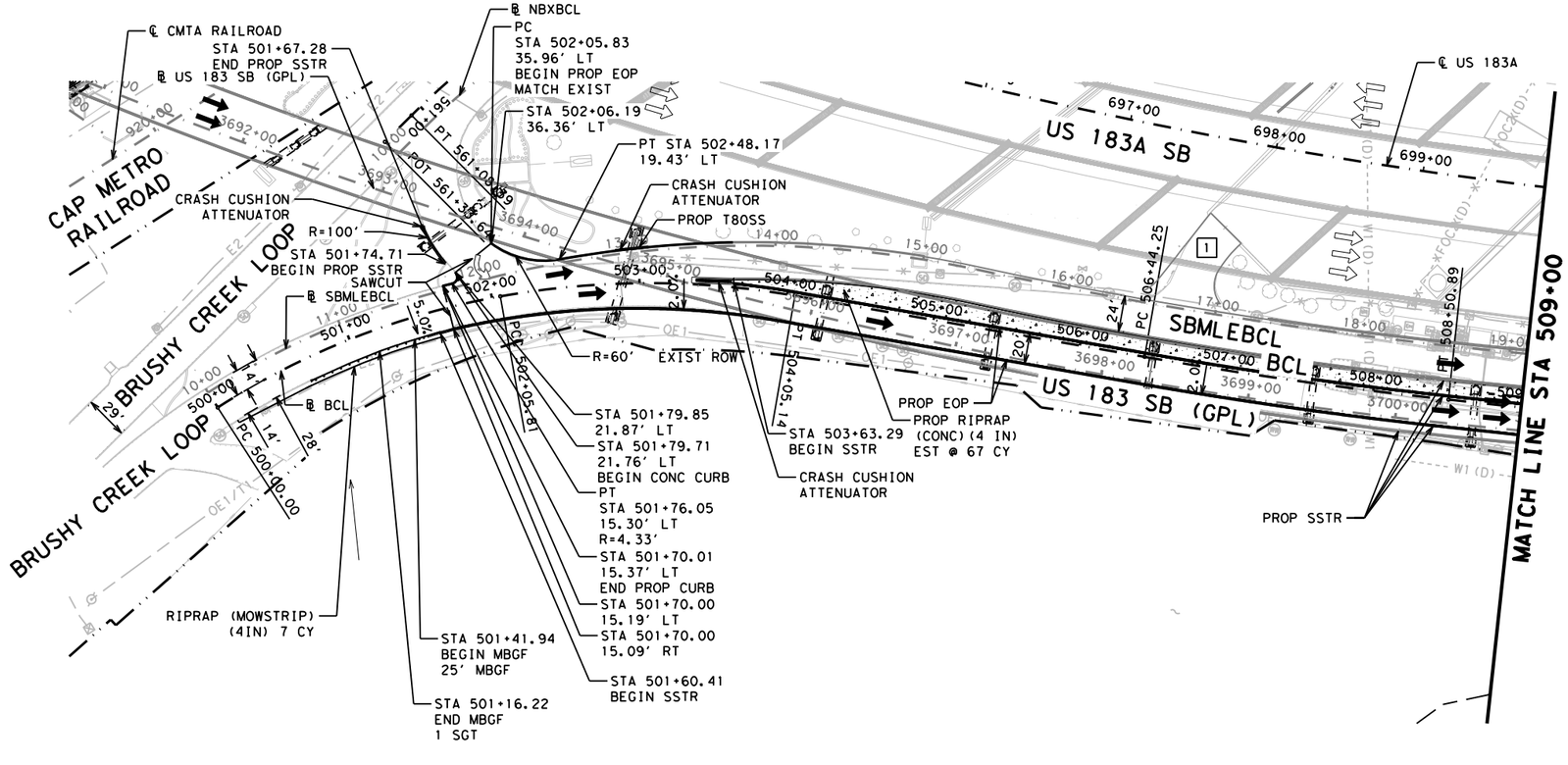

LEGEND

- EXIST TRAFFIC FLOW ARROW
- PROP TRAFFIC FLOW ARROW
- RETAINING WALL
- NOISE WALL
- TEMPORARY SPECIAL SHORING WALL
- ROCK CUT WALL
- PROP CRCP
- CONCRETE RIPRAP
- PROPERTY EASEMENT
- [X] DRIVEWAY ID
- W 12" EXISTING UTILITY

NOTES

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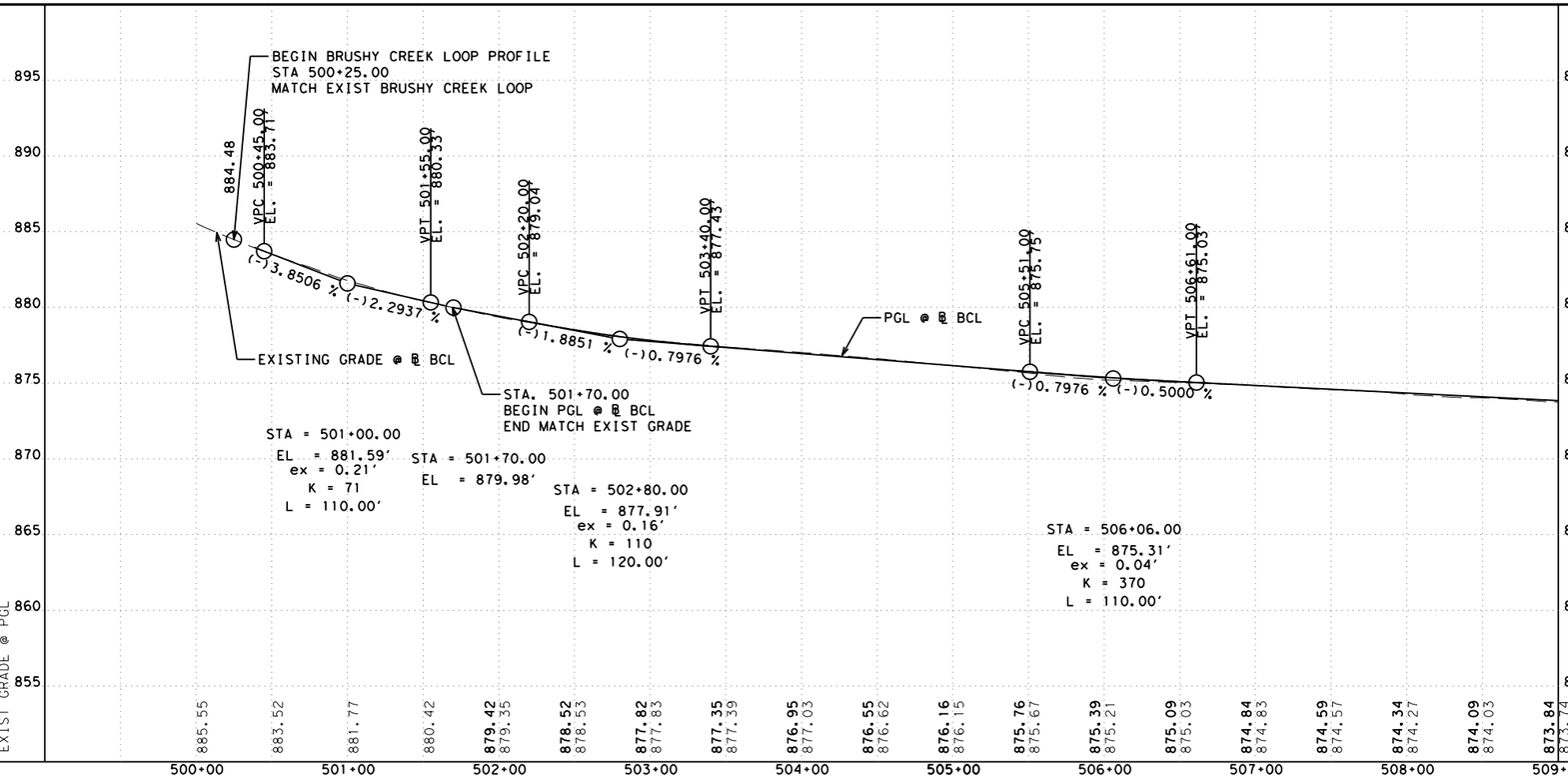

PROP RDWY X-SLOPE	
STATION	SLOPE
501+70.00	MATCH EXIST
502+70.00	-5.00%
503+38.00	-2.00%
ALL SUPERELEVATION TRANSITIONS ARE STRAIGHT	

DESIGN

STATE OF TEXAS — MARISSA GUZMAN — 130772 — LICENSED PROFESSIONAL ENGINEER

MARISSA GUZMAN, P.E.
4/23/2024
DATE

APPROVAL

STATE OF TEXAS — DAN THOMA — 98622 — LICENSED PROFESSIONAL ENGINEER

DAN THOMA, P.E.
4/23/2024
DATE

0 50 100
SCALE: PLAN 1" = 100'
PROFILE: 1" = 10'

PAPE-DAWSON ENGINEERS
SAN ANTONIO | AUSTIN | HOUSTON | FORT WORTH | DALLAS
2000 NW LOOP 410 | SAN ANTONIO, TX 78213 | 210.375.9000
TEXAS ENGINEERING FIRM #470 | TEXAS SURVEYING FIRM #10028800

2024 Texas Department of Transportation

US 183 GPL

BRUSHY CREEK LOOP PLAN & PROFILE

SHEET 1 OF 7

© 2024		CONT	SECT	JOB	HIGHWAY
DS:	CK:	0151	10	001	US 183
DW:	CK:	DIST	COUNTY		SHEET NO.
		AUS	WILLIAMSON		320

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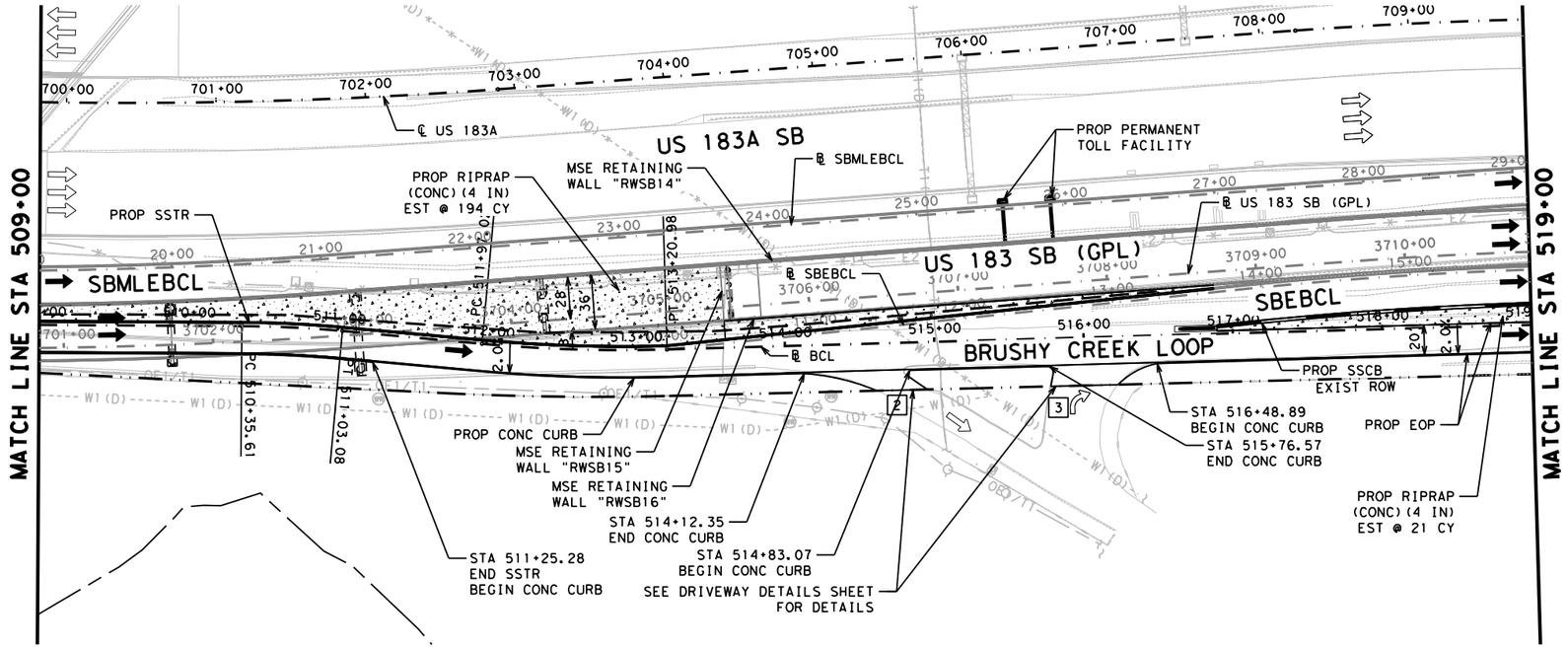

LEGEND

- EXIST TRAFFIC FLOW ARROW
- PROP TRAFFIC FLOW ARROW
- RETAINING WALL
- NOISE WALL
- TEMPORARY SPECIAL SHORING WALL
- ROCK CUT WALL
- PROP CRCP
- CONCRETE RIPRAP
- PROPERTY EASEMENT
- [X] DRIVEWAY ID
- W 12" EXISTING UTILITY

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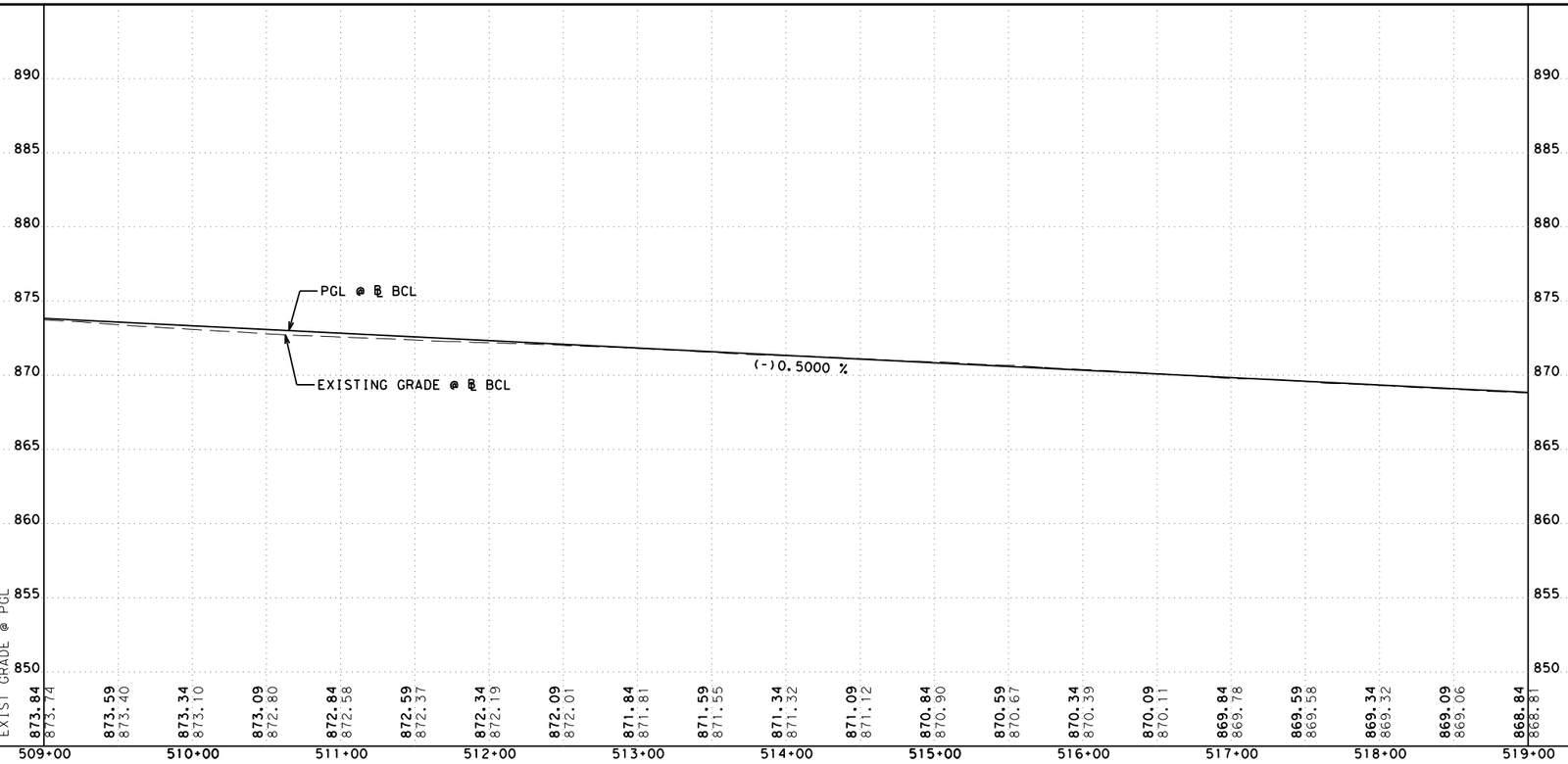

PROP RDWY X-SLOPE	
STATION	SLOPE
ALL SUPERELEVATION TRANSITIONS ARE STRAIGHT	

DESIGN

STATE OF TEXAS — MARISSA GUZMAN — 130772 — LICENSED PROFESSIONAL ENGINEER

MARISSA GUZMAN, P.E.
4/21/2023
DATE

APPROVAL

STATE OF TEXAS — DAN THOMA — 98622 — LICENSED PROFESSIONAL ENGINEER

DAN THOMA, P.E.
4/21/2023
DATE

0 50 100
SCALE: PLAN 1" = 100'
PROFILE: 1" = 10'

PAPE-DAWSON ENGINEERS
SAN ANTONIO | AUSTIN | HOUSTON | FORT WORTH | DALLAS
2000 NW LOOP 410 | SAN ANTONIO, TX 78213 | 210.375.9000
TEXAS ENGINEERING FIRM #470 | TEXAS SURVEYING FIRM #10028800

2023 Texas Department of Transportation

US 183 GPL

BRUSHY CREEK LOOP PLAN & PROFILE

SHEET 2 OF 7

© 2023		CONT	SECT	JOB	HIGHWAY
DS:	CK:	0151	10	001	US 183
		DIST	COUNTY		SHEET NO.
DW:	CK:	AUS	WILLIAMSON		321

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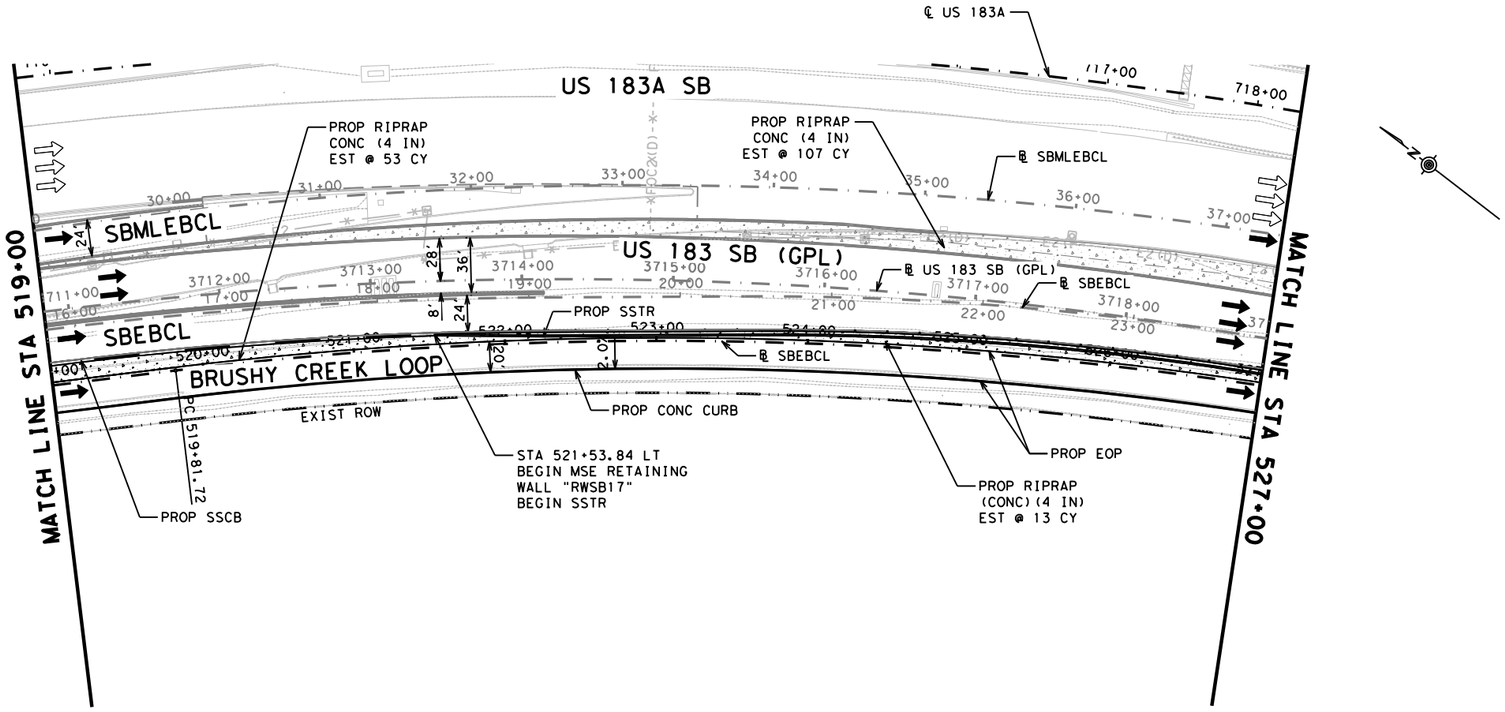

LEGEND

- EXIST TRAFFIC FLOW ARROW
- PROP TRAFFIC FLOW ARROW
- RETAINING WALL
- NOISE WALL
- TEMPORARY SPECIAL SHORING WALL
- ROCK CUT WALL
- PROP CRCP
- CONCRETE RIPRAP
- PROPERTY EASEMENT
- [X] DRIVEWAY ID
- W 12" EXISTING UTILITY

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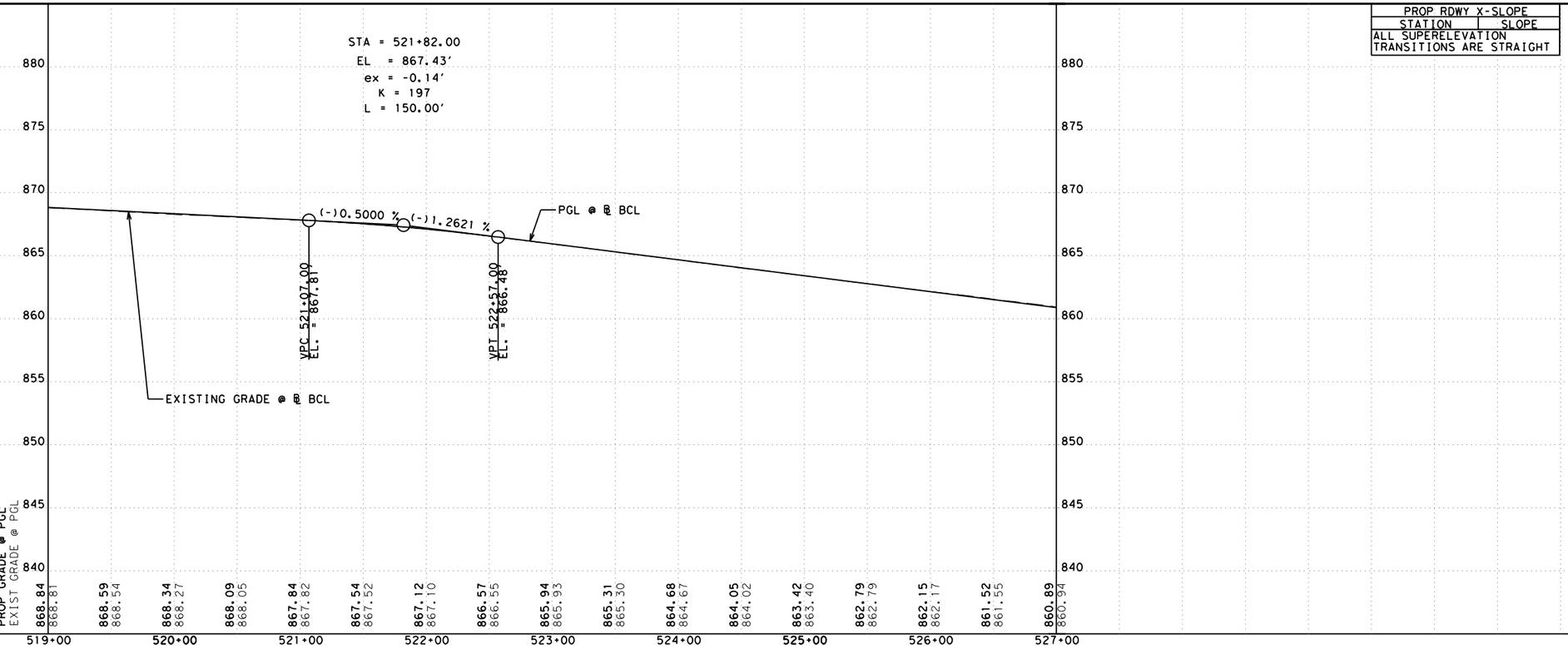

PROP RDWY X-SLOPE	
STATION	SLOPE
ALL SUPERELEVATION TRANSITIONS ARE STRAIGHT	

DESIGN

STATE OF TEXAS — MARISSA GUZMAN — 130772 — LICENSED PROFESSIONAL ENGINEER

MARISSA GUZMAN, P.E.

3/16/2023

DATE

APPROVAL

STATE OF TEXAS — DAN THOMA — 98622 — LICENSED PROFESSIONAL ENGINEER

DAN THOMA, P.E.

3/16/2023

DATE

0 50 100

SCALE: PLAN 1" = 100'
PROFILE: 1" = 10'

PAPE-DAWSON ENGINEERS

SAN ANTONIO | AUSTIN | HOUSTON | FORT WORTH | DALLAS
2000 NW LOOP 410 | SAN ANTONIO, TX 78213 | 210.375.9000
TEXAS ENGINEERING FIRM #470 | TEXAS SURVEYING FIRM #10028800

2023 Texas Department of Transportation

US 183 GPL

BRUSHY CREEK LOOP PLAN & PROFILE

SHEET 3 OF 7

© 2023		CONT	SECT	JOB	HIGHWAY
DS:	CK:	0151	10	001	US 183
DW:	CK:	DIST	COUNTY		SHEET NO.
		AUS	WILLIAMSON		322

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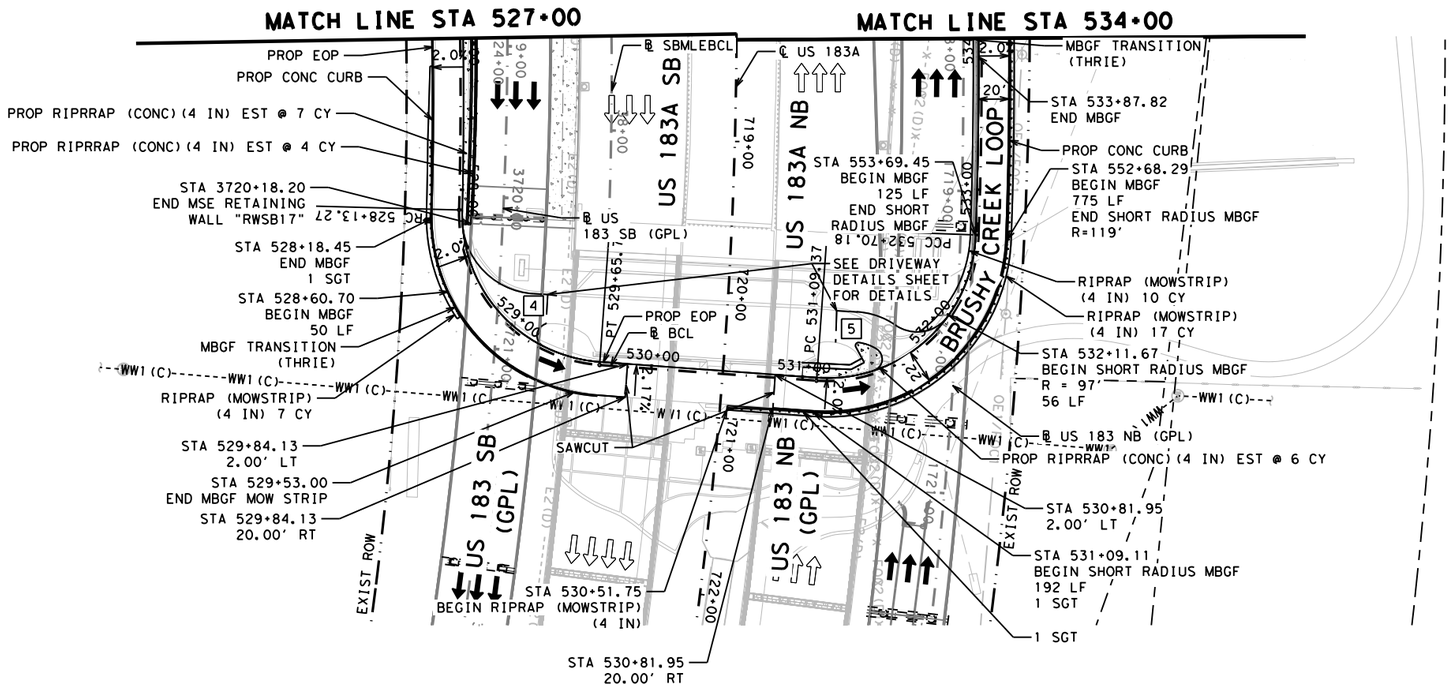

LEGEND

- EXIST TRAFFIC FLOW ARROW
- PROP TRAFFIC FLOW ARROW
- RETAINING WALL
- NOISE WALL
- TEMPORARY SPECIAL SHORING WALL
- ROCK CUT WALL
- PROP CRCP
- CONCRETE RIPRAP
- PROPERTY EASEMENT
- [X] DRIVEWAY ID
- W T2" EXISTING UTILITY

NOTES

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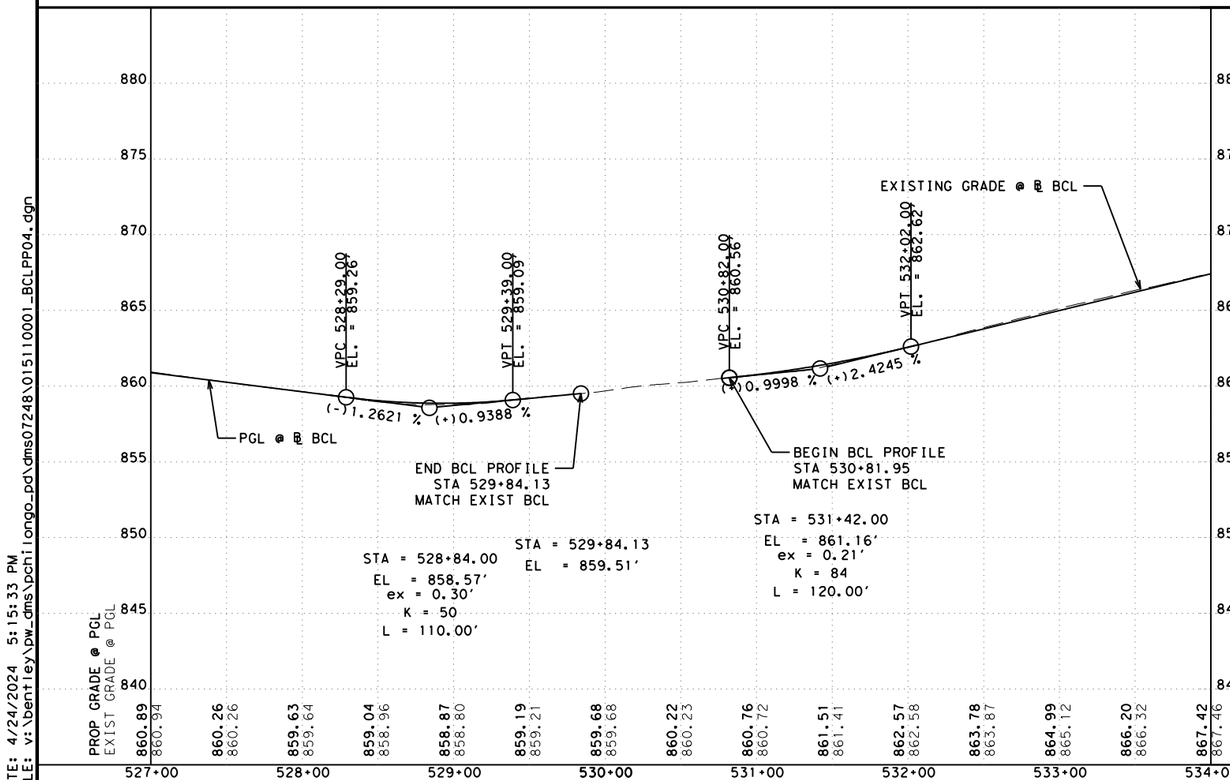

PROP RDWY X-SLOPE	
STATION	SLOPE
527+51.00	-2.00%
528+29.00	2.00%
529+60.00	2.00%
529+84.00	2.17%
530+79.13	MATCH EXIST
530+89.00	MATCH EXIST
531+13.00	2.00%
533+15.00	2.00%
533+93.00	-2.00%

ALL SUPERELEVATION TRANSITIONS ARE STRAIGHT

DESIGN

STATE OF TEXAS · MARISSA GUZMAN · 130772 · LICENSED PROFESSIONAL ENGINEER

MARISSA GUZMAN, P.E.
4/24/2024
DATE

APPROVAL

STATE OF TEXAS · DAN THOMA · 98622 · LICENSED PROFESSIONAL ENGINEER

DAN THOMA, P.E.
4/24/2024
DATE

0 50 100
SCALE: PLAN 1" = 100'
PROFILE: 1" = 10'

PAPE-DAWSON ENGINEERS
SAN ANTONIO | AUSTIN | HOUSTON | FORT WORTH | DALLAS
2000 NW LOOP 410 | SAN ANTONIO, TX 78213 | 210.375.9000
TEXAS ENGINEERING FIRM #470 | TEXAS SURVEYING FIRM #10028800

2024 Texas Department of Transportation

US 183 GPL

BRUSHY CREEK LOOP PLAN & PROFILE

SHEET 4 OF 7

© 2024	CONT	SECT	JOB	HIGHWAY
DS: CK:	0151	10	001	US 183
DW: CK:	DIST	COUNTY		SHEET NO.
	AUS	WILLIAMSON		323

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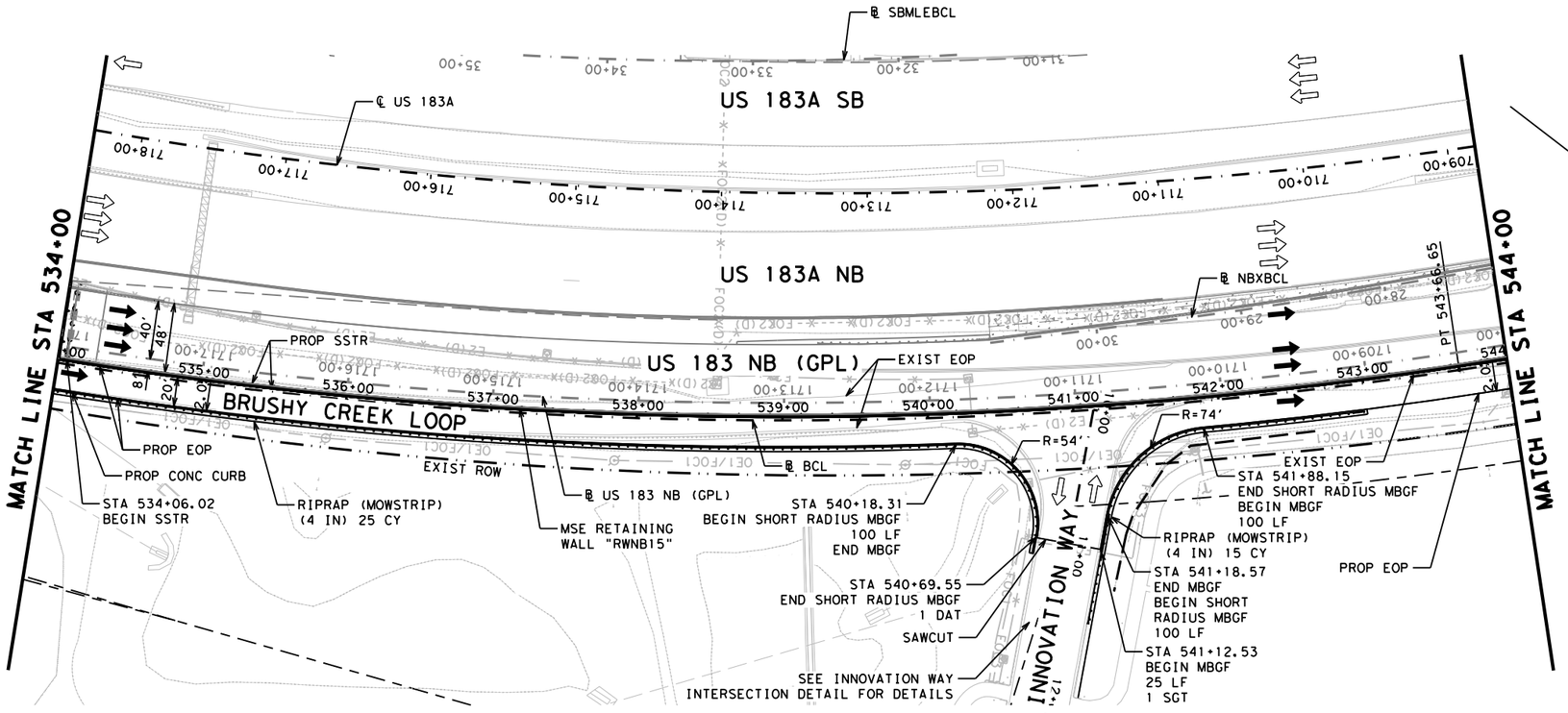

LEGEND

- EXIST TRAFFIC FLOW ARROW
- PROP TRAFFIC FLOW ARROW
- RETAINING WALL
- NOISE WALL
- TEMPORARY SPECIAL SHORING WALL
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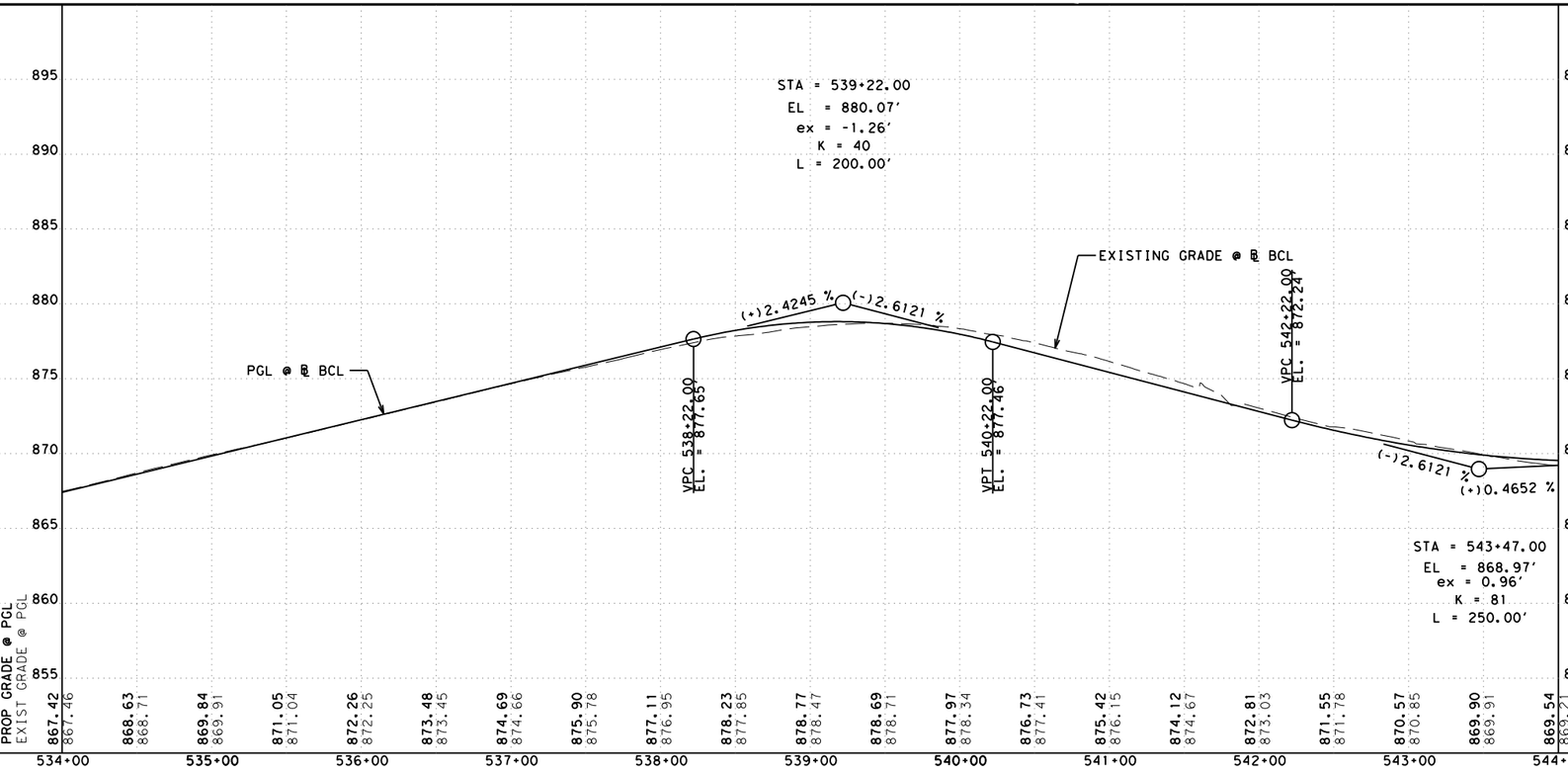

PROP RDWY X-SLOPE	
STATION	SLOPE
ALL SUPERELEVATION TRANSITIONS ARE STRAIGHT	

DESIGN

STATE OF TEXAS · MARISSA GUZMAN · 130772 · LICENSED PROFESSIONAL ENGINEER

MARISSA GUZMAN, P.E.
4/21/2023
DATE

APPROVAL

STATE OF TEXAS · DAN THOMA · 98622 · LICENSED PROFESSIONAL ENGINEER

DAN THOMA, P.E.
4/21/2023
DATE

0 50 100
SCALE: PLAN 1" = 100'
PROFILE: 1" = 10'

PAPE-DAWSON ENGINEERS
SAN ANTONIO | AUSTIN | HOUSTON | FORT WORTH | DALLAS
2000 NW LOOP 410 | SAN ANTONIO, TX 78213 | 210.375.9000
TEXAS ENGINEERING FIRM #470 | TEXAS SURVEYING FIRM #10028800

2023 Texas Department of Transportation

US 183 GPL

BRUSHY CREEK LOOP PLAN & PROFILE

SHEET 5 OF 7

© 2023		CONT	SECT	JOB	HIGHWAY
DS:	CK:	0151	10	001	US 183
DW:	CK:	DIST	COUNTY		SHEET NO.
		AUS	WILLIAMSON		324

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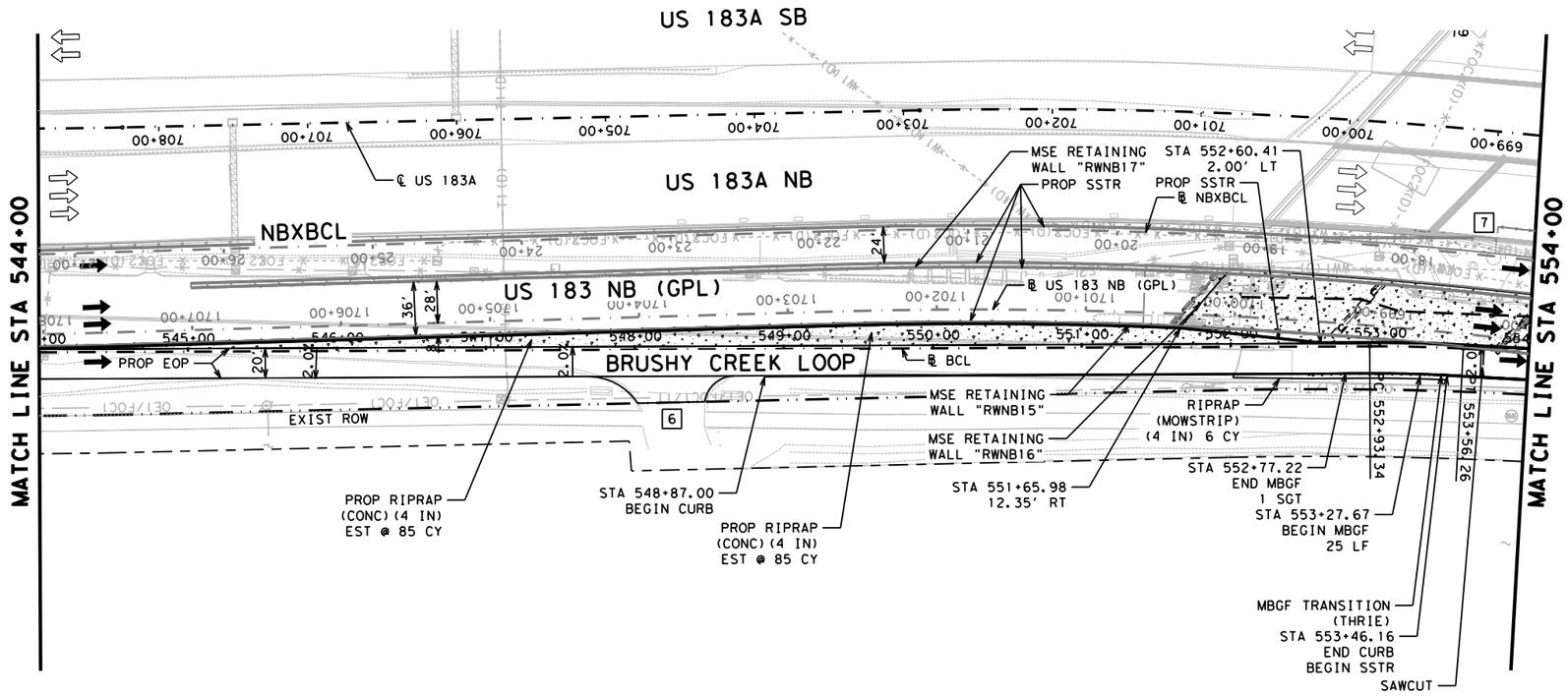

LEGEND

- EXIST TRAFFIC FLOW ARROW
- PROP TRAFFIC FLOW ARROW
- RETAINING WALL
- NOISE WALL
- TEMPORARY SPECIAL SHORING WALL
- ROCK CUT WALL
- PROP CRCP
- CONCRETE RIPRAP
- PROPERTY EASEMENT
- [X] DRIVEWAY ID
- W T2" EXISTING UTILITY

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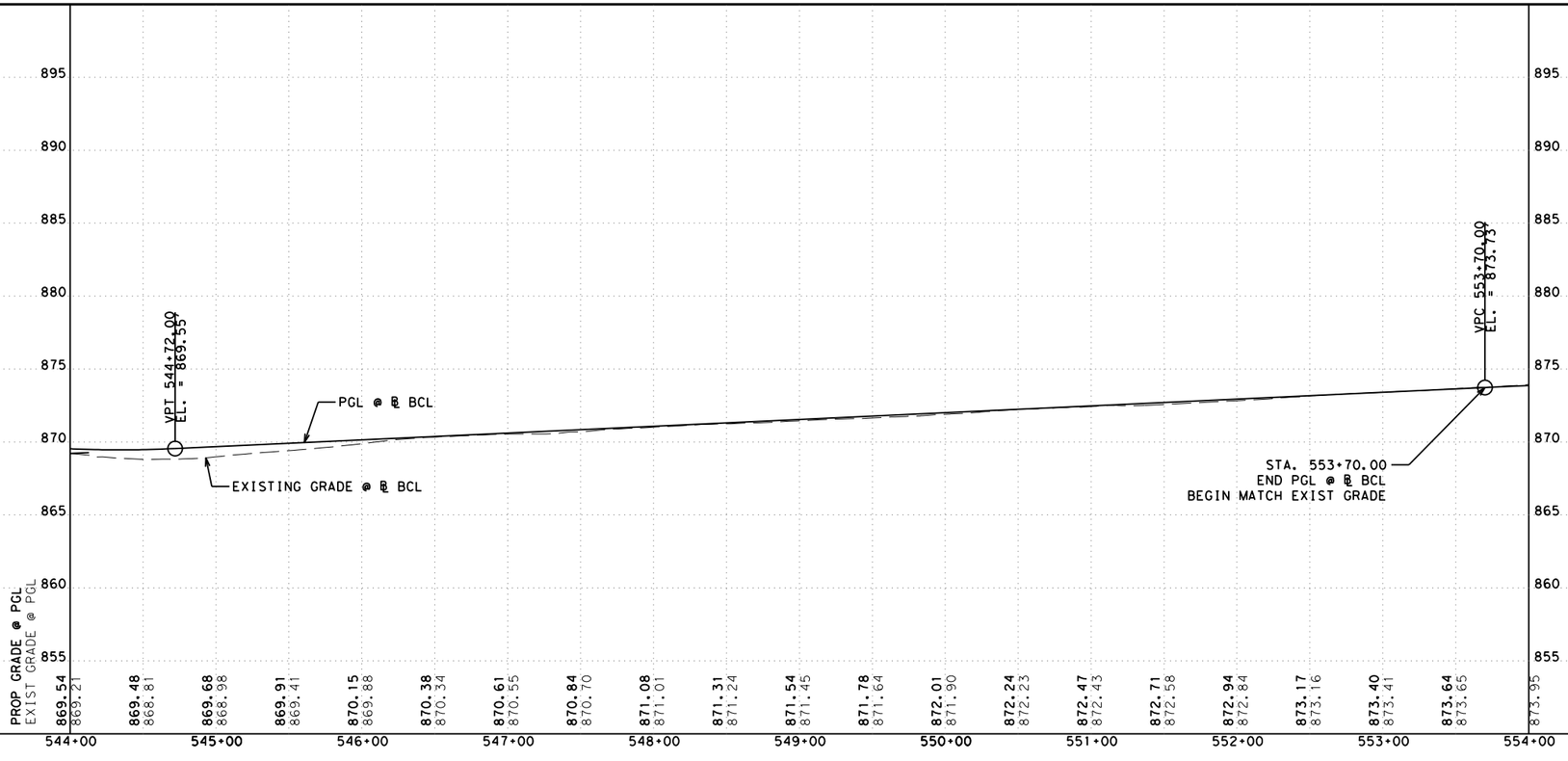

PROP RDWY X-SLOPE	
STATION	SLOPE
546+34.00	-2.00%
547+12.00	2.00%
553+70.00	MATCH EXIST

ALL SUPERELEVATION TRANSITIONS ARE STRAIGHT

DESIGN

STATE OF TEXAS — MARISSA GUZMAN — 130772 — LICENSED PROFESSIONAL ENGINEER

MARISSA GUZMAN, P.E.
4/21/2023
DATE

APPROVAL

STATE OF TEXAS — DAN THOMA — 98622 — LICENSED PROFESSIONAL ENGINEER

DAN THOMA, P.E.
4/21/2023
DATE

0 50 100
SCALE: PLAN 1" = 100'
PROFILE: 1" = 10'

PAPE-DAWSON ENGINEERS
SAN ANTONIO | AUSTIN | HOUSTON | FORT WORTH | DALLAS
2000 NW LOOP 410 | SAN ANTONIO, TX 78213 | 210.375.9000
TEXAS ENGINEERING FIRM #470 | TEXAS SURVEYING FIRM #10028800

2023 Texas Department of Transportation

US 183 GPL

BRUSHY CREEK LOOP PLAN & PROFILE

SHEET 6 OF 7

© 2023		CONT	SECT	JOB	HIGHWAY
DS:	CK:	0151	10	001	US 183
DW:	CK:	DIST	COUNTY		SHEET NO.
		AUS	WILLIAMSON		325

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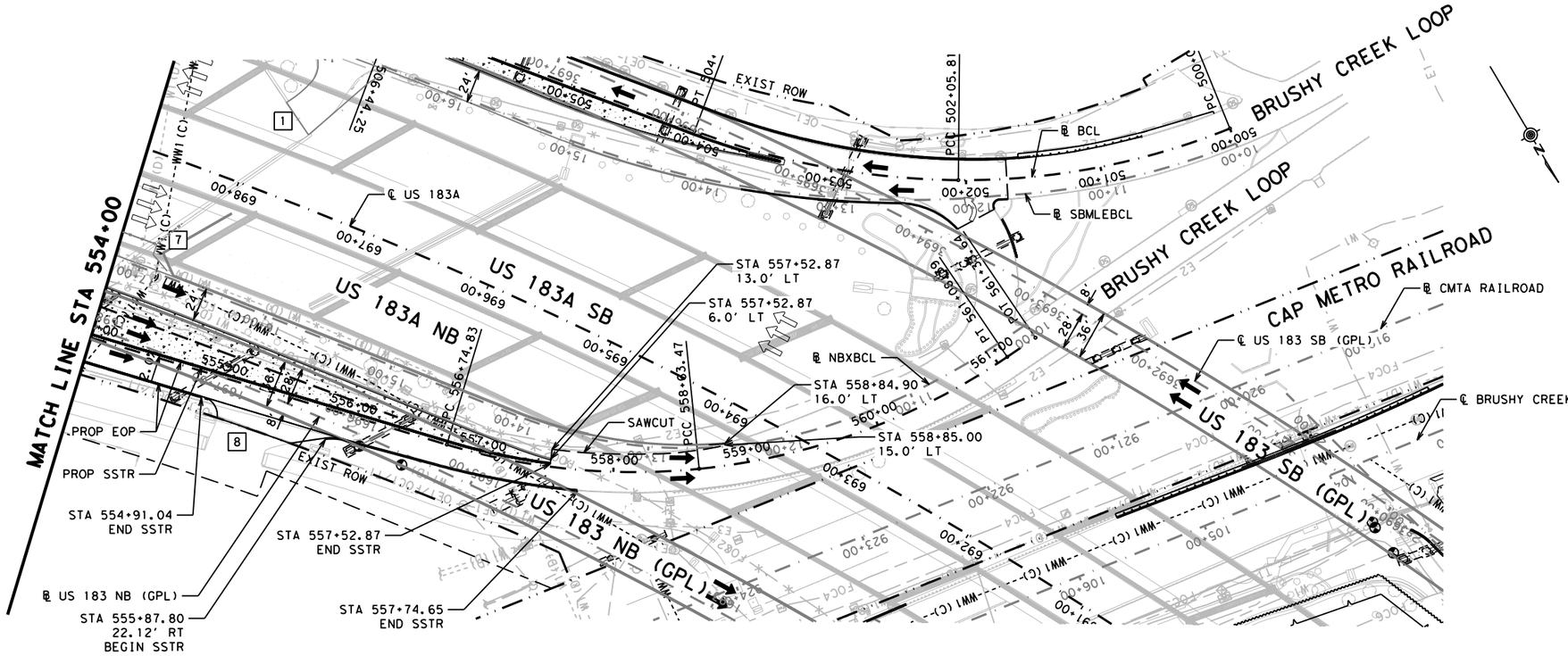

LEGEND

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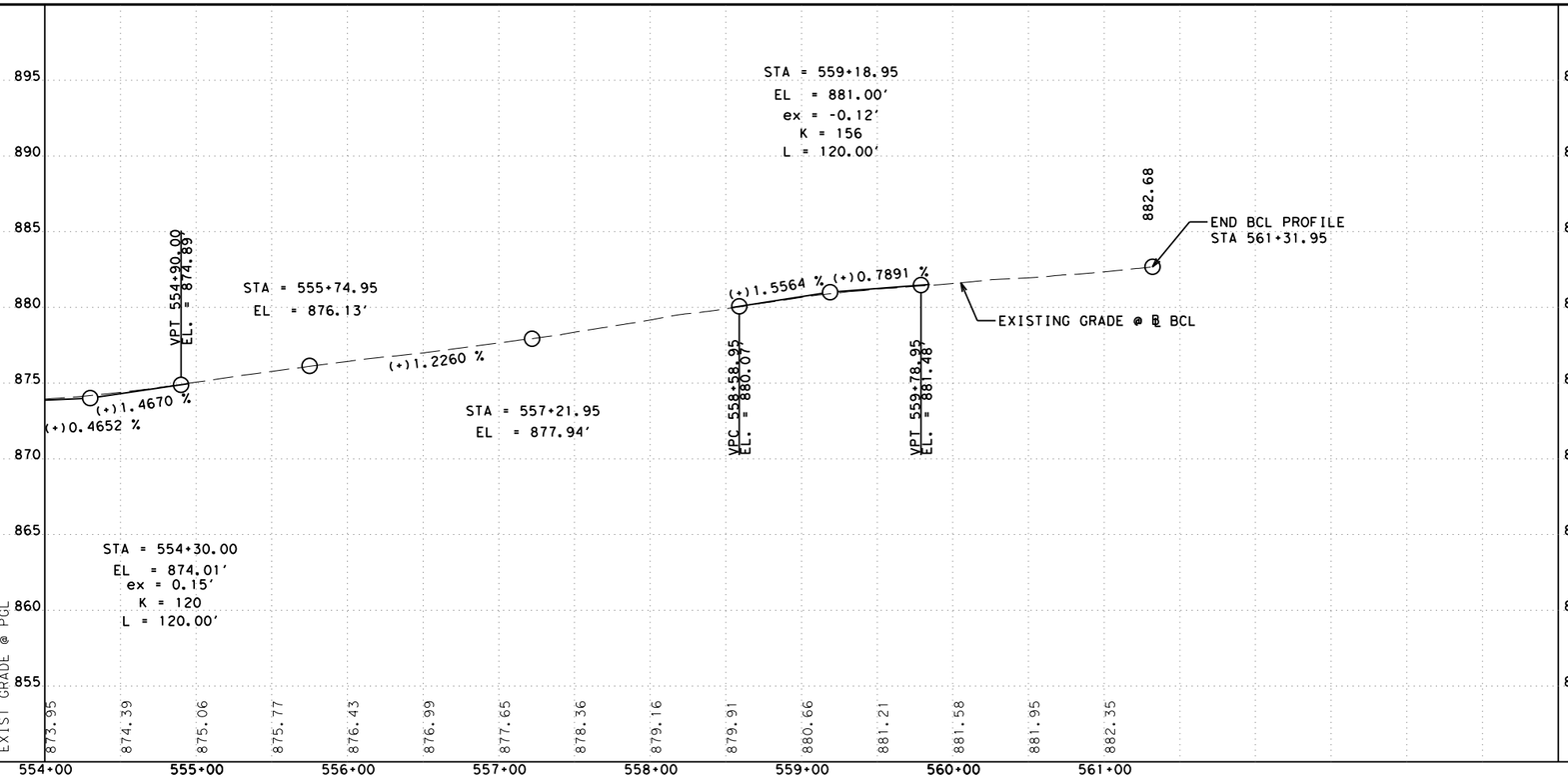

PROP RDWY X-SLOPE	
STATION	SLOPE
ALL SUPERELEVATION TRANSITIONS ARE STRAIGHT	

DESIGN

STATE OF TEXAS — MARISSA GUZMAN — 130772 — LICENSED PROFESSIONAL ENGINEER

MARISSA GUZMAN, P.E.

4/24/2024

DATE

APPROVAL

STATE OF TEXAS — DAN THOMA — 98622 — LICENSED PROFESSIONAL ENGINEER

DAN THOMA, P.E.

4/24/2024

DATE

0 50 100

SCALE: PLAN 1" = 100'
PROFILE: 1" = 10'

PAPE-DAWSON ENGINEERS

SAN ANTONIO | AUSTIN | HOUSTON | FORT WORTH | DALLAS
2000 NW LOOP 410 | SAN ANTONIO, TX 78213 | 210.375.9000
TEXAS ENGINEERING FIRM #470 | TEXAS SURVEYING FIRM #10028800

2024 Texas Department of Transportation

US 183 GPL

BRUSHY CREEK LOOP PLAN & PROFILE

SHEET 7 OF 7

© 2024		CONT	SECT	JOB	HIGHWAY
DS:	CK:	0151	10	001	US 183
DW:	CK:	DIST	COUNTY		SHEET NO.
		AUS	WILLIAMSON		326

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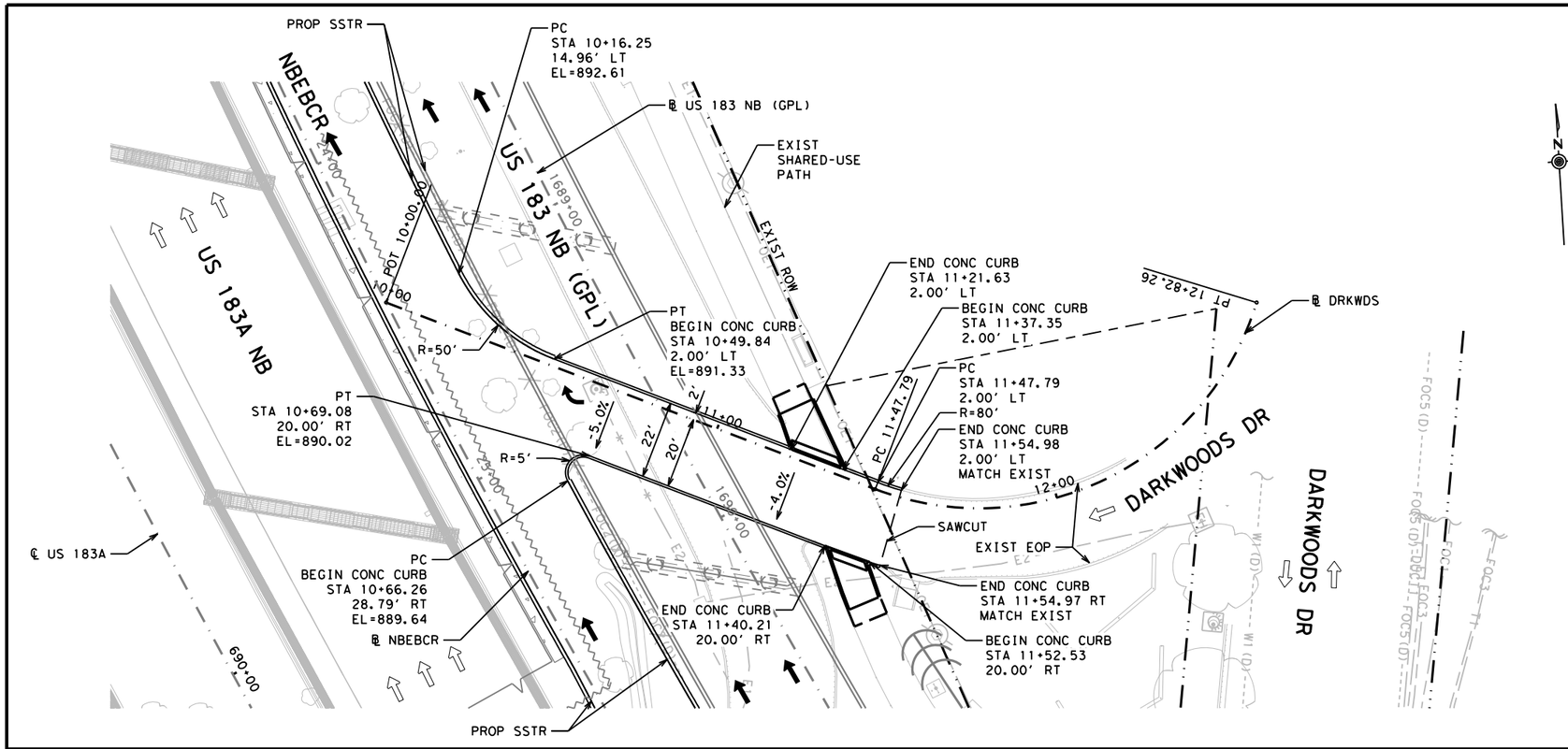
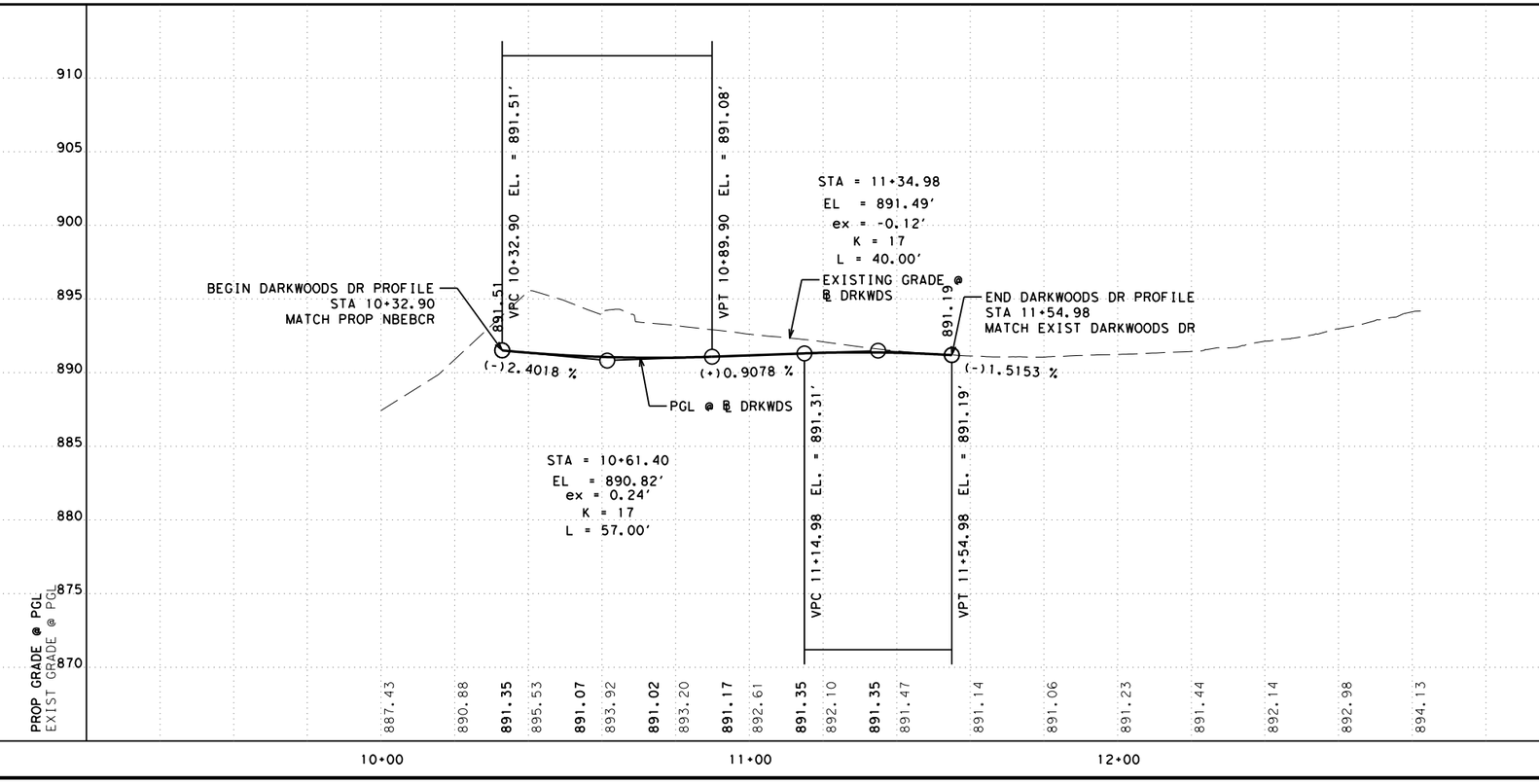


LEGEND

- EXIST TRAFFIC FLOW ARROW
- PROP TRAFFIC FLOW ARROW
- RETAINING WALL
- TEMPORARY SPECIAL SHORING WALL
- CONCRETE RIPRAP
- PROPERTY EASEMENT
- X — DRIVEWAY ID
- W 12" — EXISTING UTILITY

NOTES

1. EXISTING FEATURES ARE SHOWN SCREENED BACK; i.e. FADED.
2. SEE HORIZONTAL ALIGNMENT DATA SHEETS FOR HORIZONTAL ALIGNMENT DATA.
3. SEE INTERSECTION DETAIL SHEETS FOR INTERSECTION INFORMATION.
4. SEE PAVEMENT MARKING SHEETS FOR STRIPING AND TRAFFIC FLOW DETAILS.
5. SEE NB SUP PLAN AND PROFILE SHEETS FOR SHARED-USE PATH INFORMATION.
6. SEE RAMP PLAN AND PROFILE SHEETS FOR RAMP INFORMATION.
7. SEE BRUSHY CREEK LOOP PLAN AND PROFILE SHEETS FOR BRUSHY CREEK LOOP INFORMATION.



PROP RDWY X-SLOPE	
STATION	SLOPE
10+70.00	-5.00%
11+22.00	-4.00%
11+54.98	MATCH EXIST
ALL SUPERELEVATION TRANSITIONS ARE STRAIGHT LINE	

DESIGN

STATE OF TEXAS — MARISSA GUZMAN — 130772 — LICENSED PROFESSIONAL ENGINEER

MARISSA GUZMAN, P.E.
4/24/2024
DATE

APPROVAL

STATE OF TEXAS — DAN THOMA — 98622 — LICENSED PROFESSIONAL ENGINEER

DAN THOMA, P.E.
4/24/2024
DATE

0 20 40
SCALE: PLAN 1"= 40'
PROFILE 1"= 10'

PAPE-DAWSON ENGINEERS
SAN ANTONIO | AUSTIN | HOUSTON | FORT WORTH | DALLAS
2000 NW LOOP 410 | SAN ANTONIO, TX 78213 | 210.375.9000
TEXAS ENGINEERING FIRM #470 | TEXAS SURVEYING FIRM #10028800

2024 Texas Department of Transportation

US 183 GPL

DARKWOODS DR PLAN & PROFILE

SHEET 1 OF 1

© 2024		CONT	SECT	JOB	HIGHWAY
DS:	CK:	0151	10	001	US 183
DW:	CK:	DIST	COUNTY		SHEET NO.
		AUS	WILLIAMSON		327

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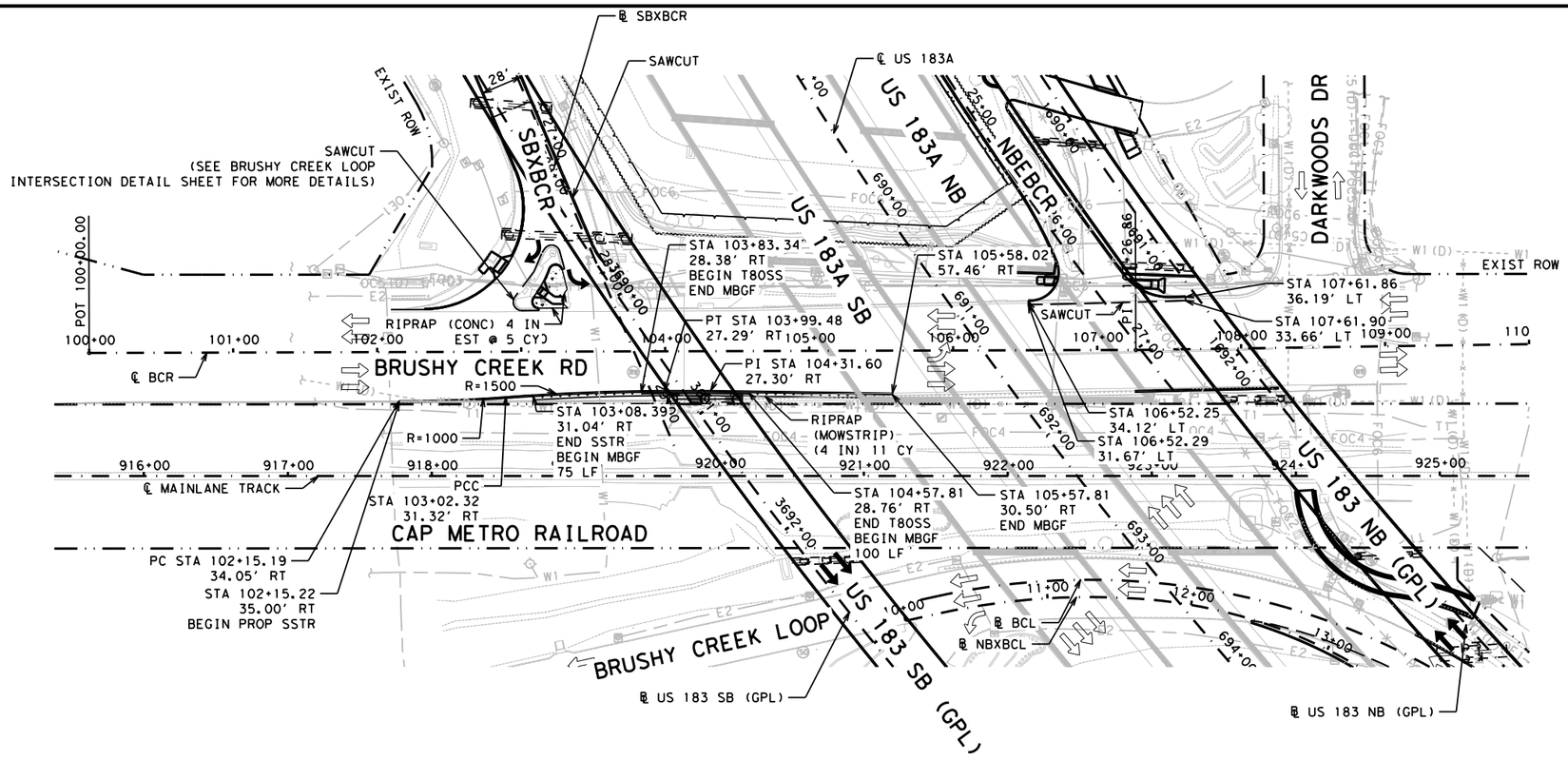

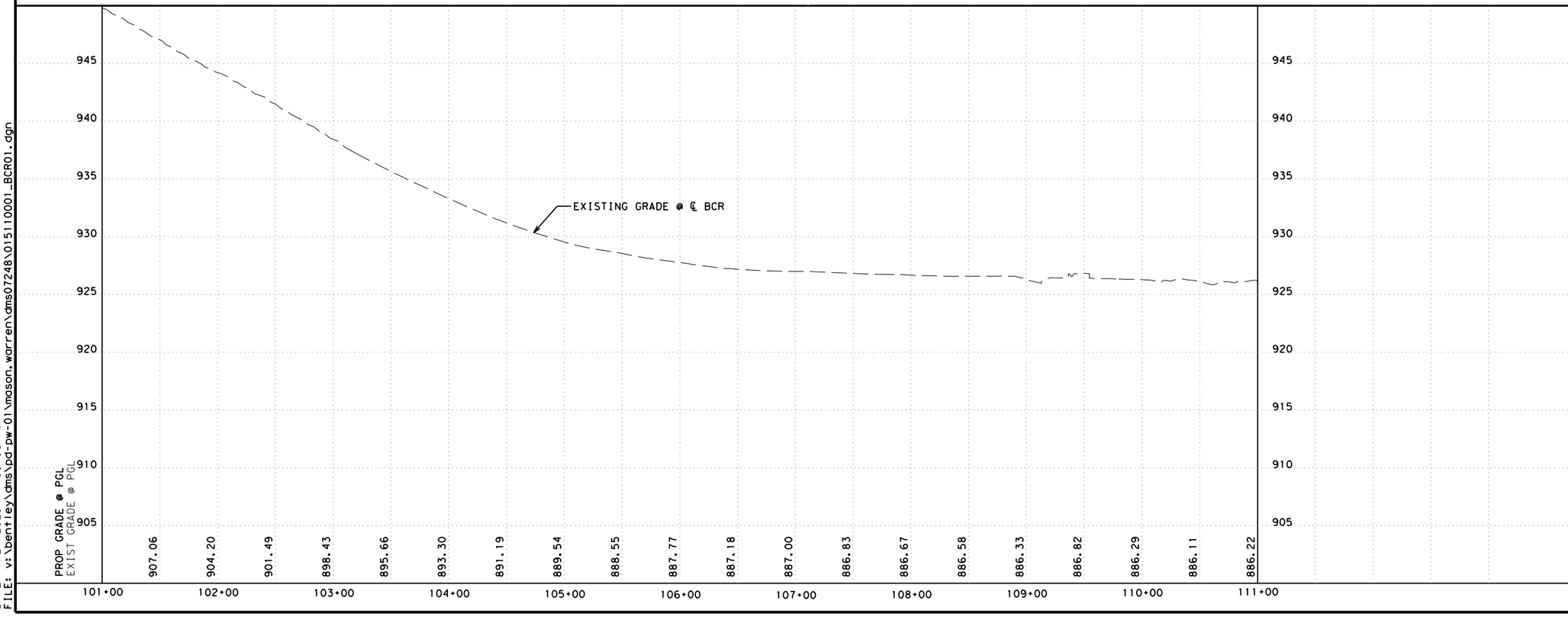

LEGEND

- EXIST TRAFFIC FLOW ARROW
- PROP TRAFFIC FLOW ARROW
- RETAINING WALL
- NOISE WALL
- TEMPORARY SPECIAL SHORING WALL
- ROCK CUT WALL
- PROP CRCP
- CONCRETE RIPRAP
- PROPERTY EASEMENT
- [X] DRIVEWAY ID
- W 12" EXISTING UTILITY

NOTES

1. EXISTING FEATURES AND PROPOSED FEATURES NOT DETAILED ON THIS SHEET ARE SHOWN SCREENED BACK; i.e. FADED.
2. SEE HORIZONTAL ALIGNMENT DATA SHEETS FOR HORIZONTAL ALIGNMENT DATA.
3. SEE INTERSECTION DETAIL SHEETS FOR INTERSECTION INFORMATION.
4. SEE PAVEMENT MARKING SHEETS FOR STRIPING AND TRAFFIC FLOW DETAILS.
5. SEE NB SUP PLAN AND PROFILE SHEETS FOR SHARED-USE PATH INFORMATION.
6. SEE RAMP PLAN AND PROFILE SHEETS FOR RAMP INFORMATION.
7. SEE BRUSHY CREEK LOOP PLAN AND PROFILE SHEETS FOR BRUSHY CREEK LOOP INFORMATION.
8. SEE NB PLAN AND PROFILE SHEETS FOR FOR US 183 NB GPL INFORMATION AND SB PLAN AND PROFILE SHEETS FOR US 183 SB GPL INFORMATION.

DESIGN

STATE OF TEXAS · MARISSA GUZMAN · 130772 · LICENSED PROFESSIONAL ENGINEER

MARISSA GUZMAN, P.E.
4/21/2023
DATE

APPROVAL

STATE OF TEXAS · DAN THOMA · 98622 · LICENSED PROFESSIONAL ENGINEER

DAN THOMA, P.E.
4/21/2023
DATE

0 50 100
SCALE: PLAN 1" = 100'
PROFILE: 1" = 10'

PAPE-DAWSON ENGINEERS
SAN ANTONIO | AUSTIN | HOUSTON | FORT WORTH | DALLAS
2000 NW LOOP 410 | SAN ANTONIO, TX 78213 | 210.375.9000
TEXAS ENGINEERING FIRM #470 | TEXAS SURVEYING FIRM #10028800

2023 Texas Department of Transportation

US 183 GPL

BRUSHY CREEK RD PLAN & PROFILE

SHEET 1 OF 1

© 2023		CONT	SECT	JOB	HIGHWAY
DS:	CK:	0151	10	001	US 183
DW:	CK:	DIST	COUNTY		SHEET NO.
		AUS	WILLIAMSON		328

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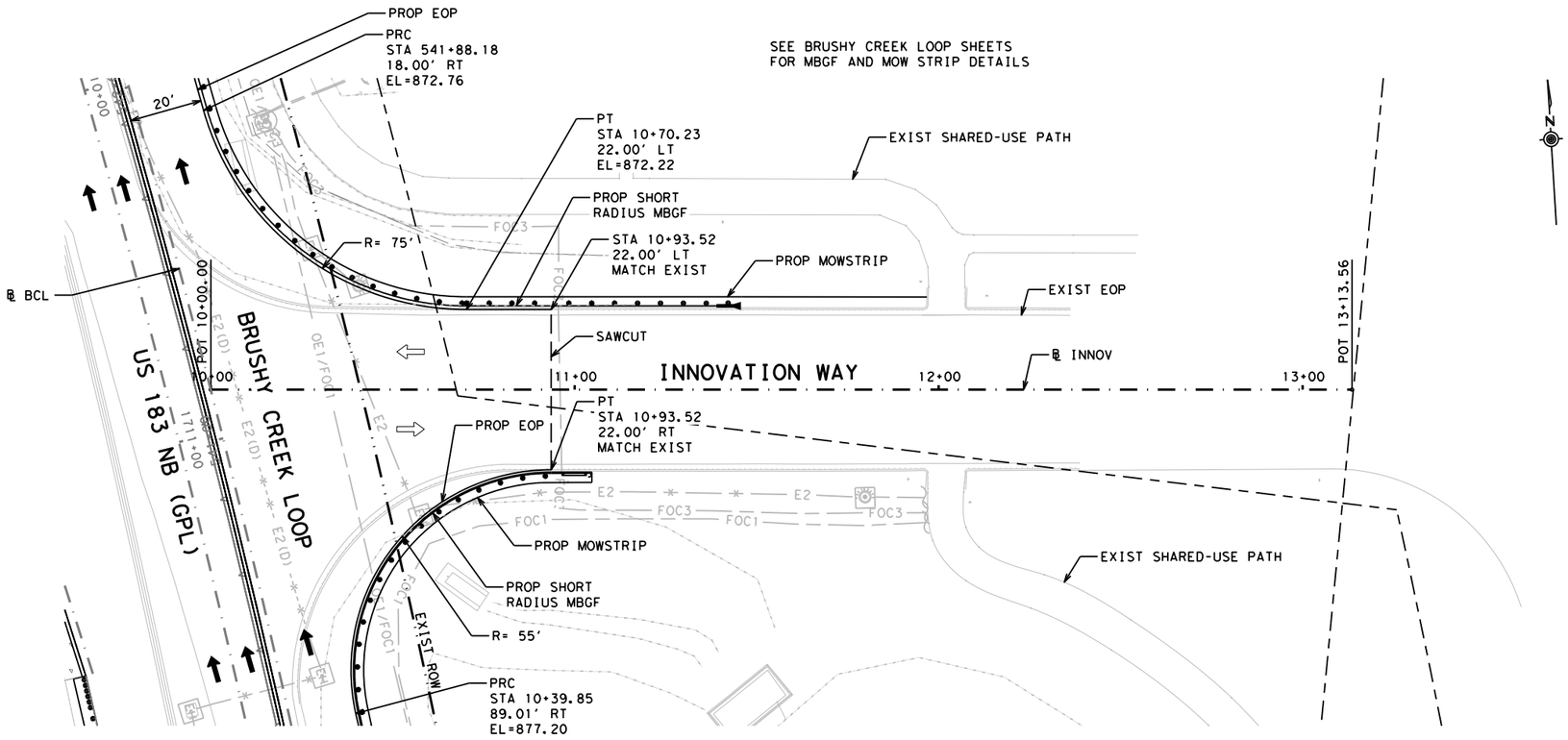
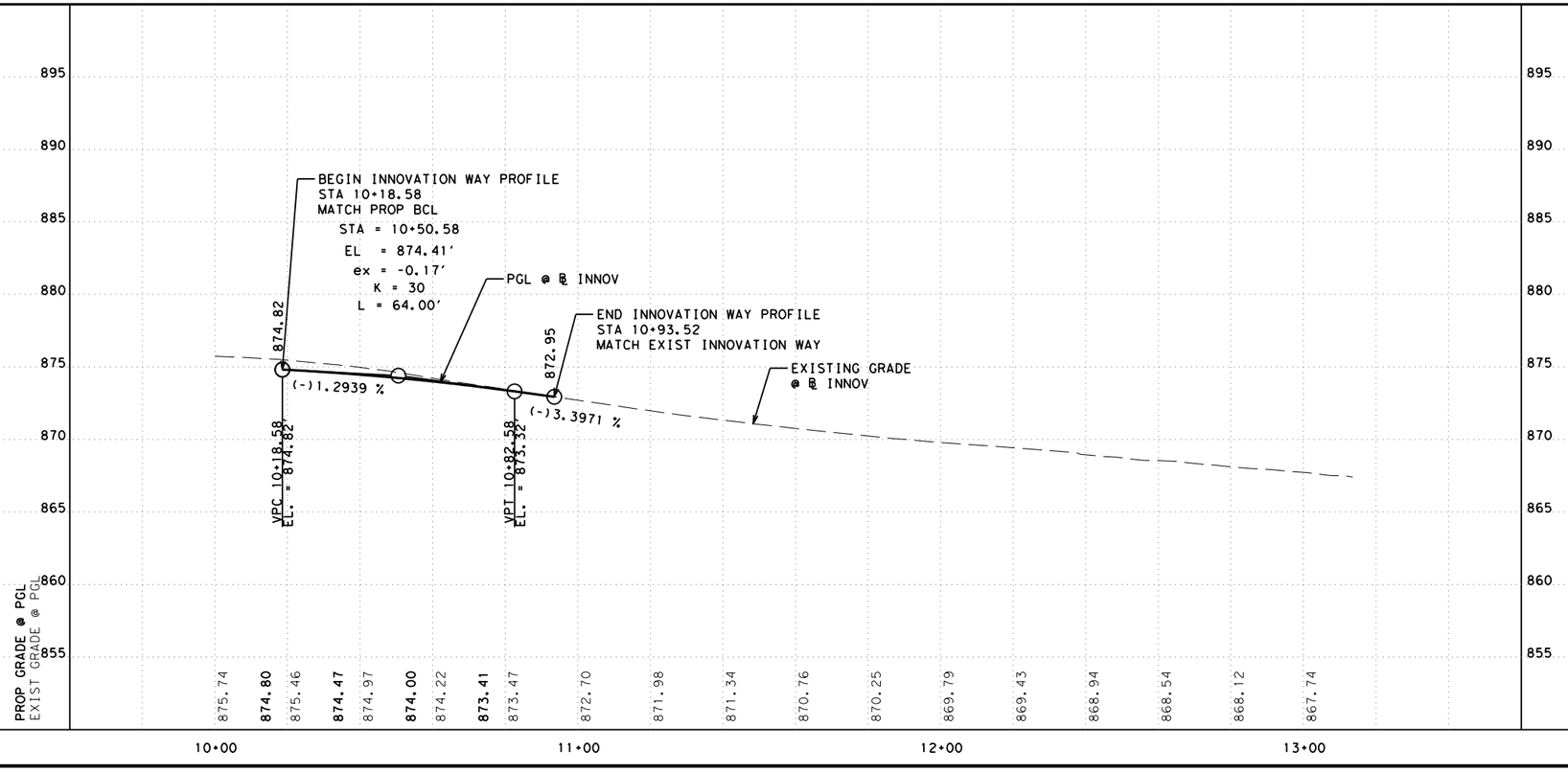


LEGEND

- EXIST TRAFFIC FLOW ARROW
- PROP TRAFFIC FLOW ARROW
- RETAINING WALL
- TEMPORARY SPECIAL SHORING WALL
- CONCRETE RIPRAP
- PROPERTY EASEMENT
- [X] DRIVEWAY ID
- W 12" EXISTING UTILITY

NOTES

1. EXISTING FEATURES ARE SHOWN SCREENED BACK; i.e. FADED.
2. SEE HORIZONTAL ALIGNMENT DATA SHEETS FOR HORIZONTAL ALIGNMENT DATA.
3. SEE INTERSECTION DETAIL SHEETS FOR INTERSECTION INFORMATION.
4. SEE PAVEMENT MARKING SHEETS FOR STRIPING AND TRAFFIC FLOW DETAILS.
5. SEE NB SUP PLAN AND PROFILE SHEETS FOR SHARED-USE PATH INFORMATION.
6. SEE RAMP PLAN AND PROFILE SHEETS FOR RAMP INFORMATION.
7. SEE BRUSHY CREEK LOOP PLAN AND PROFILE SHEETS FOR BRUSHY CREEK LOOP INFORMATION.



DESIGN

STATE OF TEXAS — MARISSA GUZMAN — 130772 — LICENSED PROFESSIONAL ENGINEER

MARISSA GUZMAN, P.E.
4/21/2023
DATE

APPROVAL

STATE OF TEXAS — DAN THOMA — 98622 — LICENSED PROFESSIONAL ENGINEER

DAN THOMA, P.E.
4/21/2023
DATE

0 20 40
SCALE: PLAN 1"= 40'
PROFILE 1"= 10'

PAPE-DAWSON ENGINEERS
SAN ANTONIO | AUSTIN | HOUSTON | FORT WORTH | DALLAS
2000 NW LOOP 410 | SAN ANTONIO, TX 78213 | 210.375.9000
TEXAS ENGINEERING FIRM #470 | TEXAS SURVEYING FIRM #10028800

2023
Texas Department of Transportation

US 183 GPL

INNOVATION WAY PLAN & PROFILE

SHEET 1 OF 1

© 2023		CONT	SECT	JOB	HIGHWAY
DS:	CK:	0151	10	001	US 183
DW:	CK:	DIST	COUNTY		SHEET NO.
		AUS	WILLIAMSON		329

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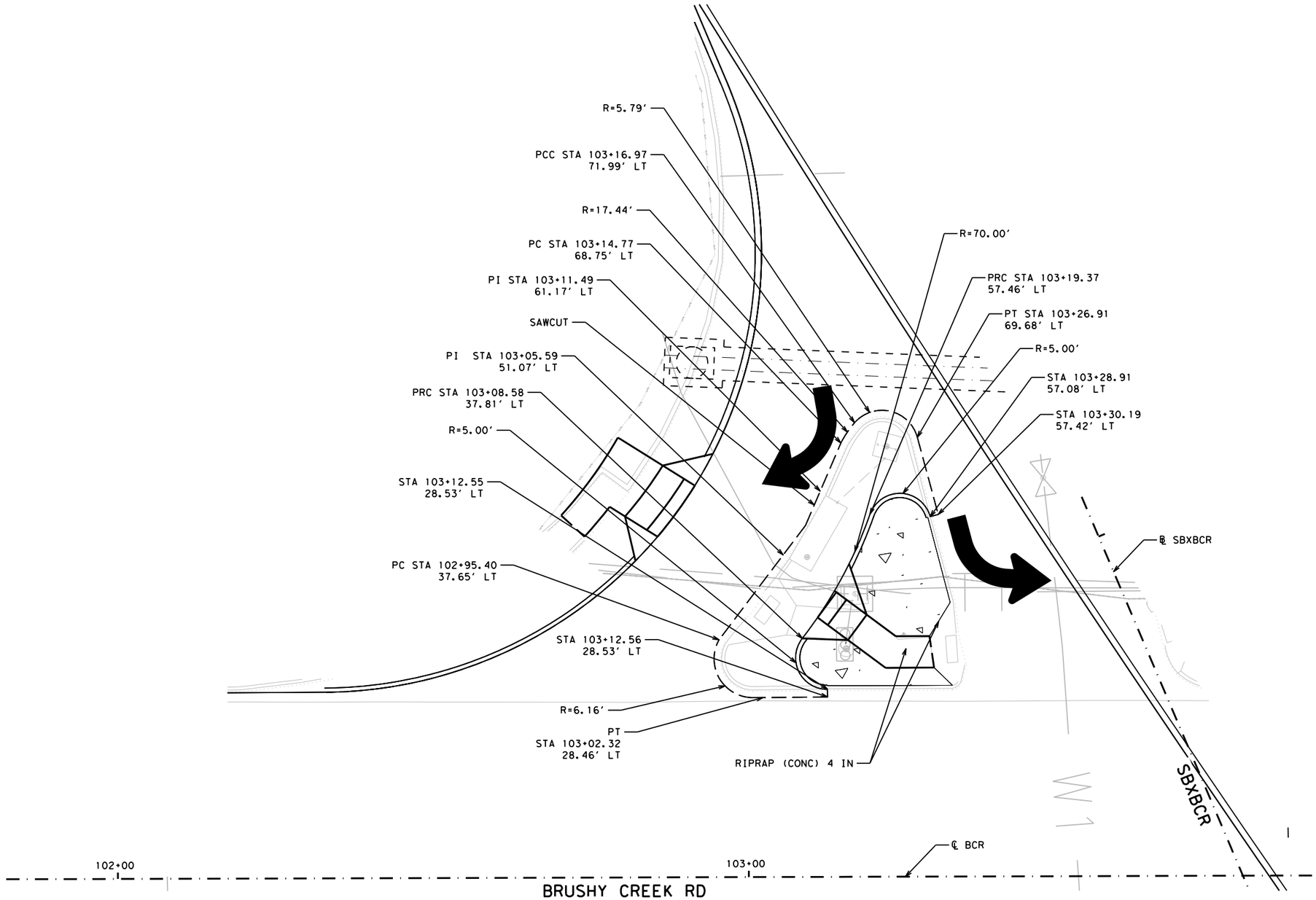

DESIGN

STATE OF TEXAS · MARISSA GUZMAN · 130772 · LICENSED PROFESSIONAL ENGINEER

MARISSA GUZMAN, P.E.

5/2/2023
DATE

APPROVAL

STATE OF TEXAS · DAN THOMA · 98622 · LICENSED PROFESSIONAL ENGINEER

DAN THOMA, P.E.

5/2/2023
DATE

PAPE-DAWSON ENGINEERS

SAN ANTONIO | AUSTIN | HOUSTON | FORT WORTH | DALLAS
2000 NW LOOP 410 | SAN ANTONIO, TX 78213 | 210.375.9000
TEXAS ENGINEERING FIRM #470 | TEXAS SURVEYING FIRM #10028800

2023
Texas Department of Transportation

US 183 GPL

BRUSHY CREEK RD INTERSECTION DETAIL

SHEET 1 OF 1

© 2023		CONT	SECT	JOB	HIGHWAY
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		DIST	COUNTY		SHEET NO.
DW:	CK:	AUS	WILLIAMSON		338 A

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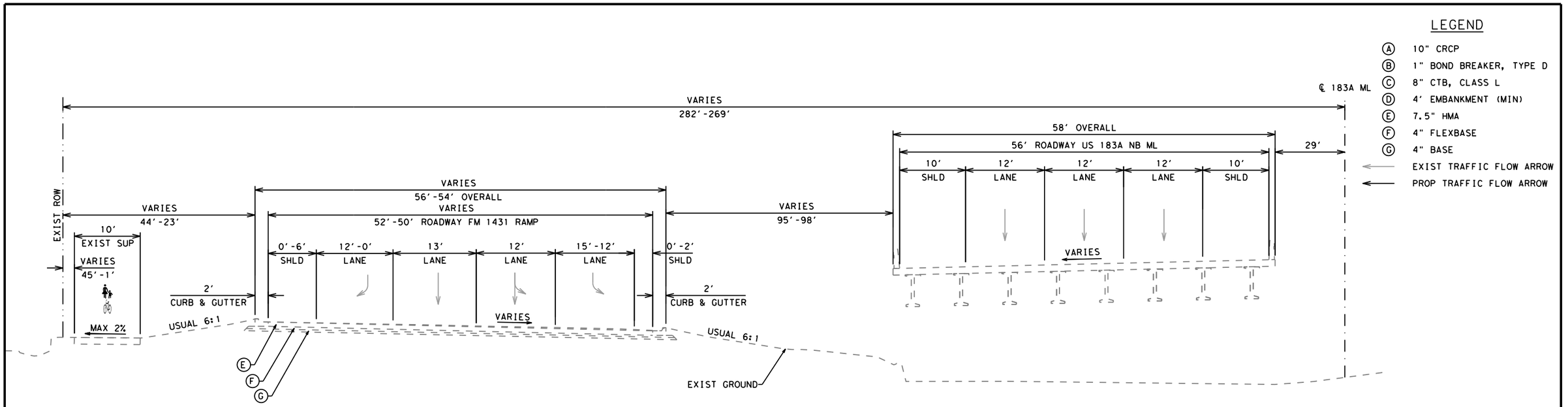

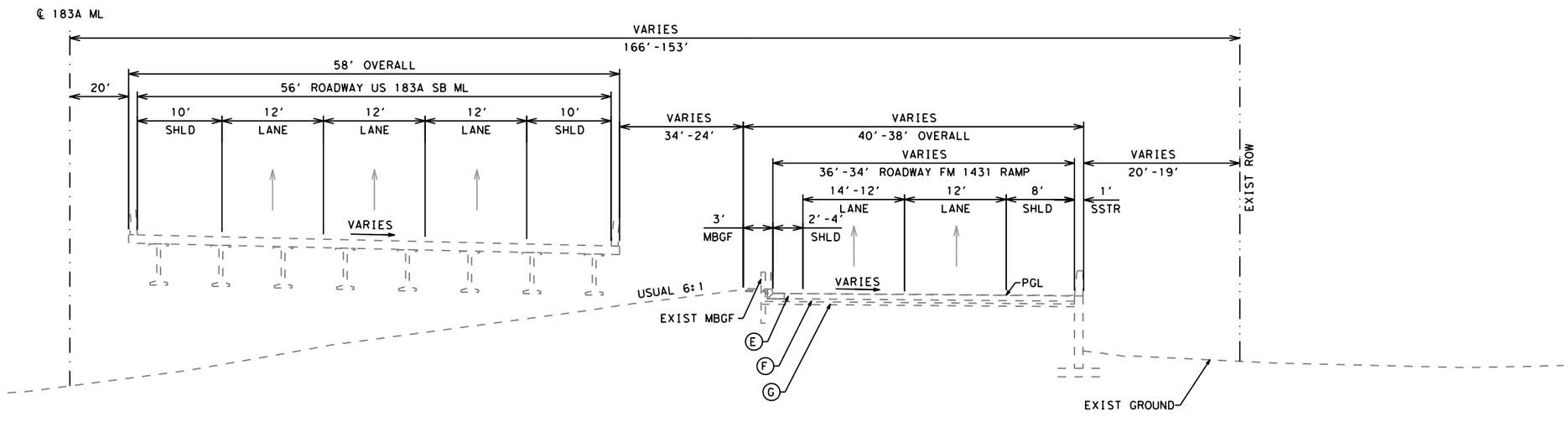

EXISTING TYPICAL SECTION
STA 608+75 TO STA 611+90

DESIGN

STATE OF TEXAS · MARISSA GUZMAN · 130772 · LICENSED PROFESSIONAL ENGINEER

MARISSA GUZMAN, P.E.
3/15/2023
DATE

APPROVAL

STATE OF TEXAS · DAN THOMA · 98622 · LICENSED PROFESSIONAL ENGINEER

DAN THOMA, P.E.
3/15/2023
DATE

0 100 200 300
SCALE: 1"=100'

PAPE-DAWSON ENGINEERS
SAN ANTONIO | AUSTIN | HOUSTON | FORT WORTH | DALLAS
2000 NW LOOP 410 | SAN ANTONIO, TX 78213 | 210.375.9000
TEXAS ENGINEERING FIRM #470 | TEXAS SURVEYING FIRM #10028800

2023 Texas Department of Transportation

US 183 GPL

EXISTING TYPICAL SECTIONS

SHEET 1 OF 10

© 2023	CONT	SECT	JOB	HIGHWAY
DS: CK:	0151	10	001	US 183
DW: CK:	DIST	COUNTY		SHEET NO.
	AUS	WILLIAMSON		11

DATE: 3/15/2023 8:23:13 PM
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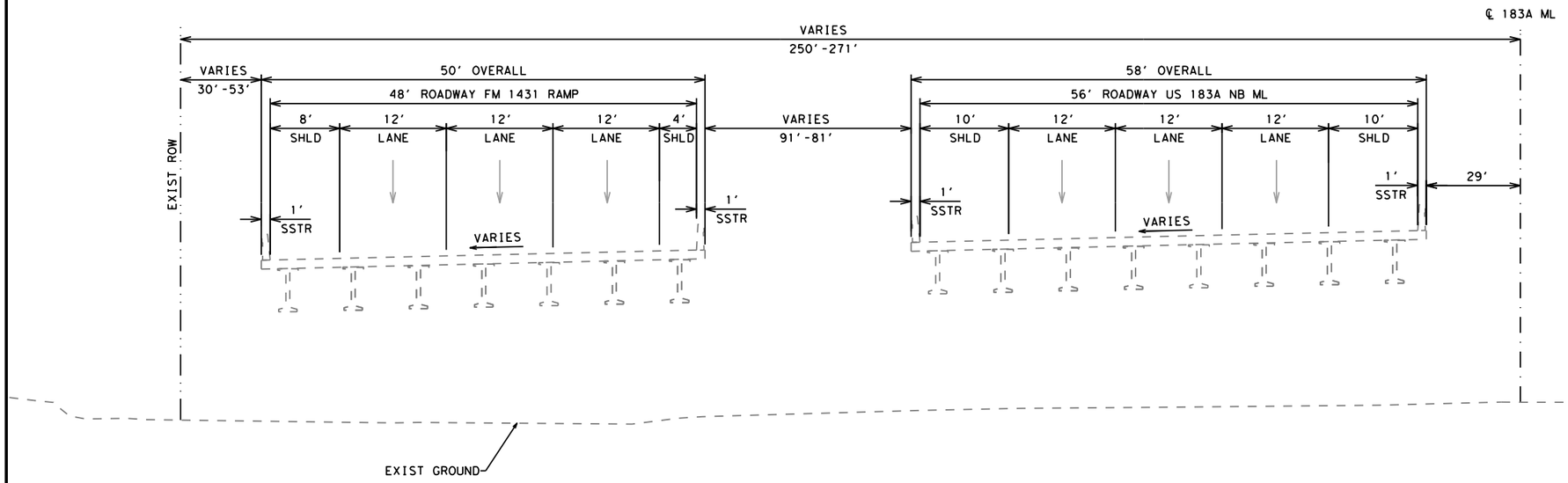
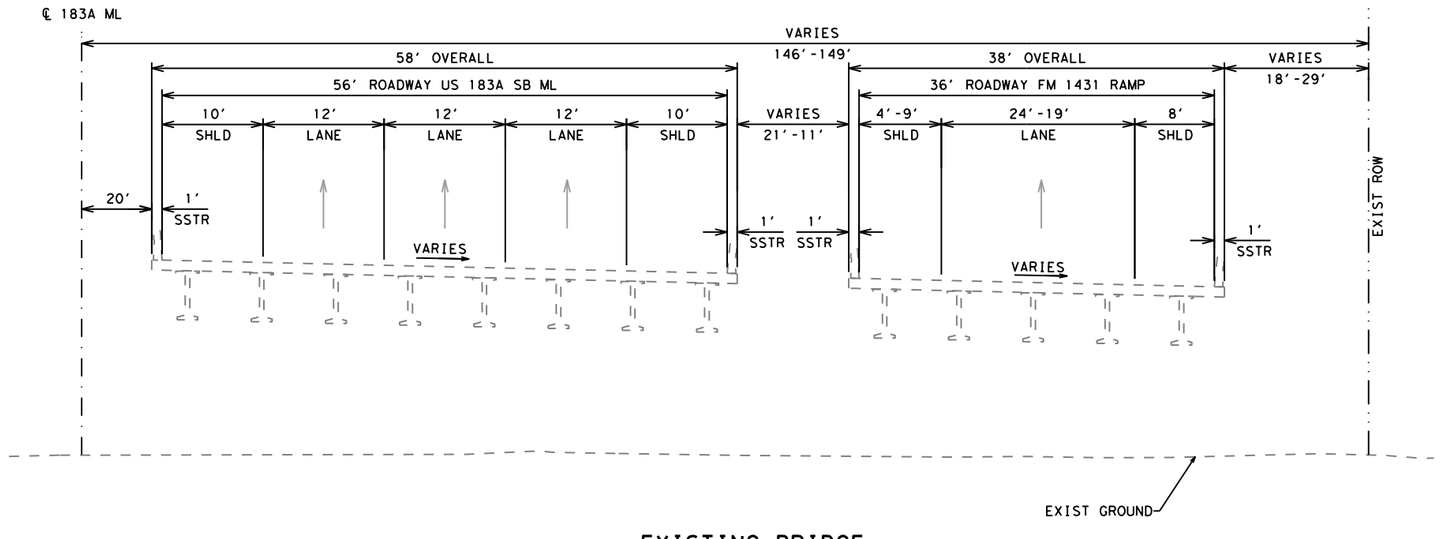
LEGEND

- (A) 10" CRCP
- (B) 1" BOND BREAKER, TYPE D
- (C) 8" CTB, CLASS L
- (D) 4' EMBANKMENT (MIN)
- (E) 7.5" HMA
- (F) 4" FLEXBASE
- (G) 4" BASE
- EXIST TRAFFIC FLOW ARROW
- PROP TRAFFIC FLOW ARROW





EXISTING BRIDGE TYPICAL SECTION

STA 611+90 TO STA 614+95

DESIGN

STATE OF TEXAS — MARISSA GUZMAN — 130772 — LICENSED PROFESSIONAL ENGINEER

MARISSA GUZMAN, P.E.

3/15/2023

DATE

APPROVAL

STATE OF TEXAS — DAN THOMA — 98622 — LICENSED PROFESSIONAL ENGINEER

DAN THOMA, P.E.

3/15/2023

DATE

0 100 200 300

SCALE: 1" = 100'

PAPE-DAWSON ENGINEERS

SAN ANTONIO | AUSTIN | HOUSTON | FORT WORTH | DALLAS

2000 NW LOOP 410 | SAN ANTONIO, TX 78213 | 210.375.9000

TEXAS ENGINEERING FIRM #470 | TEXAS SURVEYING FIRM #10028800

2023 Texas Department of Transportation

US 183 GPL

EXISTING TYPICAL SECTIONS

SHEET 2 OF 10

© 2023	CONT	SECT	JOB	HIGHWAY
DS: CK:	0151	10	001	US 183
DW: CK:	DIST	COUNTY		SHEET NO.
	AUS	WILLIAMSON		12

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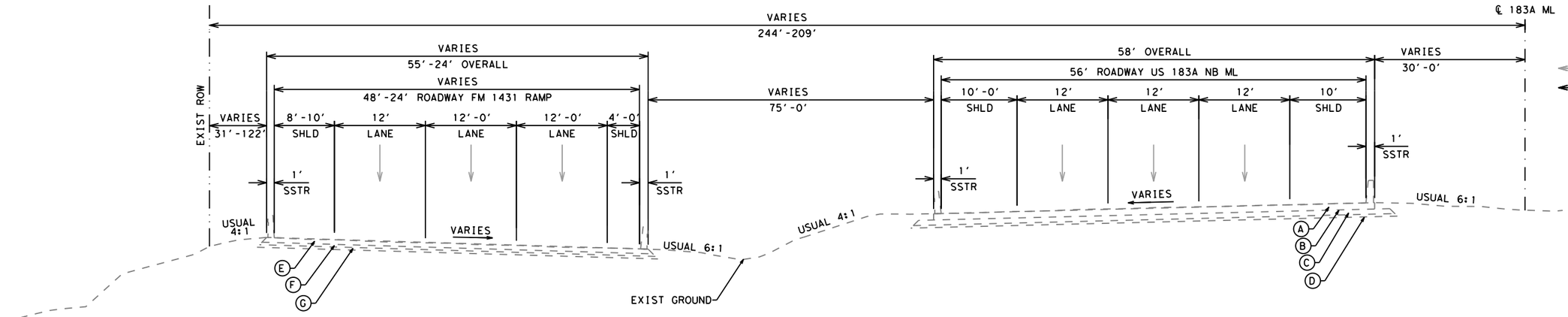

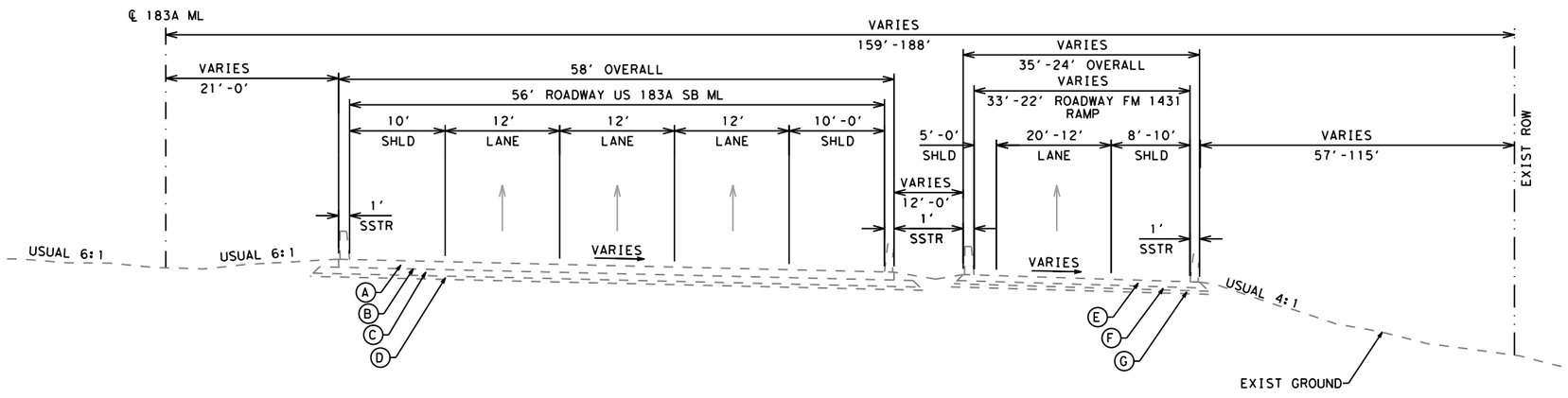

EXISTING TYPICAL SECTION

STA 614+95 TO STA 624+65

LEGEND

- (A) 10" CRCP
- (B) 1" BOND BREAKER, TYPE D
- (C) 8" CTB, CLASS L
- (D) 4' EMBANKMENT (MIN)
- (E) 7.5" HMA
- (F) 4" FLEXBASE
- (G) 4" BASE
- EXIST TRAFFIC FLOW ARROW
- PROP TRAFFIC FLOW ARROW

DESIGN

STATE OF TEXAS · MARISSA GUZMAN · 130772 · LICENSED PROFESSIONAL ENGINEER

MARISSA GUZMAN, P.E.

3/15/2023

DATE

APPROVAL

STATE OF TEXAS · DAN THOMA · 98622 · LICENSED PROFESSIONAL ENGINEER

DAN THOMA, P.E.

3/15/2023

DATE

0 100 200 300

SCALE: 1" = 100'

PAPE-DAWSON ENGINEERS

SAN ANTONIO | AUSTIN | HOUSTON | FORT WORTH | DALLAS

2000 NW LOOP 410 | SAN ANTONIO, TX 78213 | 210.375.9000

TEXAS ENGINEERING FIRM #470 | TEXAS SURVEYING FIRM #10028800

2023 Texas Department of Transportation

US 183 GPL

EXISTING TYPICAL SECTIONS

SHEET 3 OF 10

© 2023		CONT	SECT	JOB	HIGHWAY
DS:	CK:	0151	10	001	US 183
DW:	CK:	DIST	COUNTY		SHEET NO.
		AUS	WILLIAMSON		13

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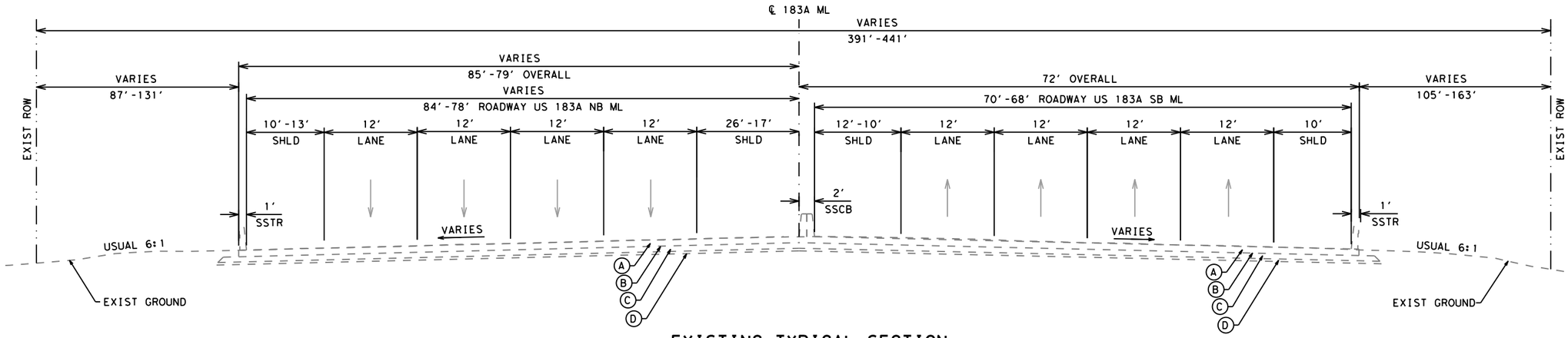
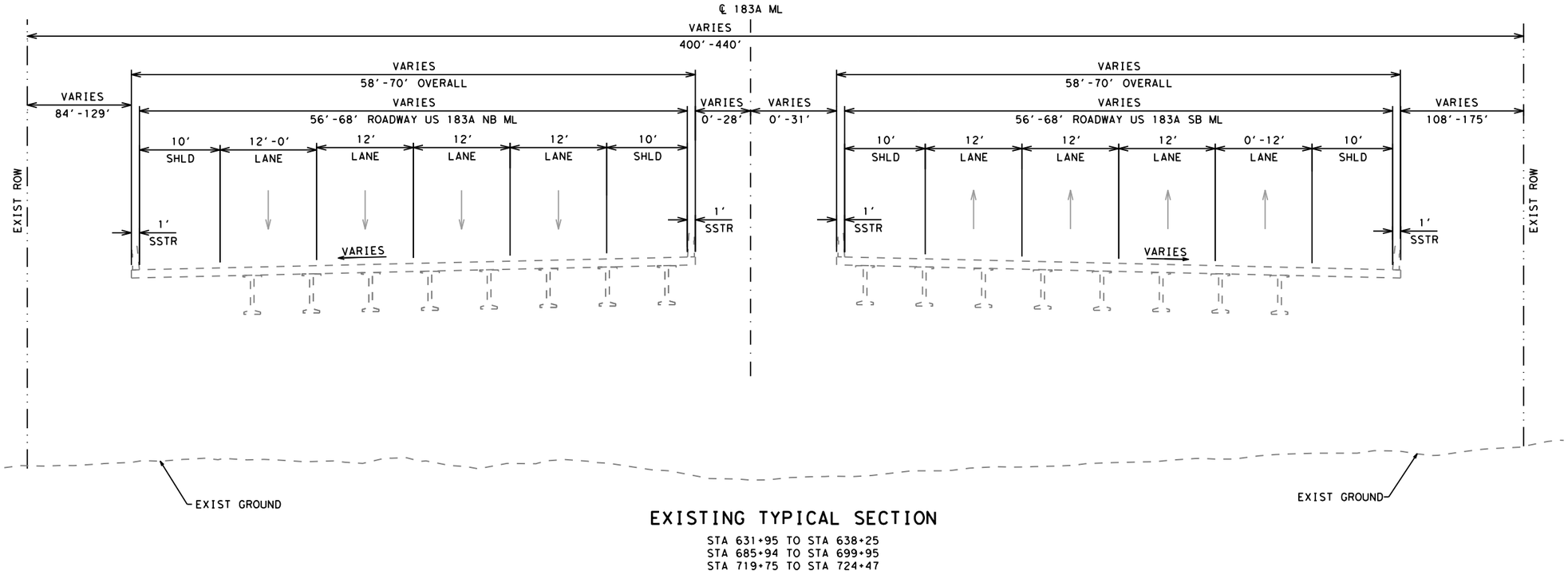


EXISTING TYPICAL SECTION

STA 624+65 TO STA 631+95
STA 664+98 TO STA 675+40



EXISTING TYPICAL SECTION

STA 631+95 TO STA 638+25
STA 685+94 TO STA 699+95
STA 719+75 TO STA 724+47

LEGEND

- (A) 10" CRCP
- (B) 1" BOND BREAKER, TYPE D
- (C) 8" CTB, CLASS L
- (D) 4' EMBANKMENT (MIN)
- (E) 7.5" HMA
- (F) 4" FLEXBASE
- (G) 4" BASE
- EXIST TRAFFIC FLOW ARROW
- PROP TRAFFIC FLOW ARROW

DESIGN

STATE OF TEXAS · MARISSA GUZMAN · 130772 · LICENSED PROFESSIONAL ENGINEER

MARISSA GUZMAN, P.E.
3/15/2023
DATE

APPROVAL

STATE OF TEXAS · DAN THOMA · 98622 · LICENSED PROFESSIONAL ENGINEER

DAN THOMA, P.E.
3/15/2023
DATE

0 100 200 300
SCALE: 1" = 200'

PAPE-DAWSON ENGINEERS
SAN ANTONIO | AUSTIN | HOUSTON | FORT WORTH | DALLAS
2000 NW LOOP 410 | SAN ANTONIO, TX 78213 | 210.375.9000
TEXAS ENGINEERING FIRM #470 | TEXAS SURVEYING FIRM #10028800

2023 Texas Department of Transportation

US 183 GPL

EXISTING TYPICAL SECTIONS

SHEET 4 OF 10

© 2023

DS:	CK:	CONT	SECT	JOB	HIGHWAY
		0151	10	001	US 183
DW:	CK:	DIST	COUNTY		SHEET NO.
		AUS	WILLIAMSON		14

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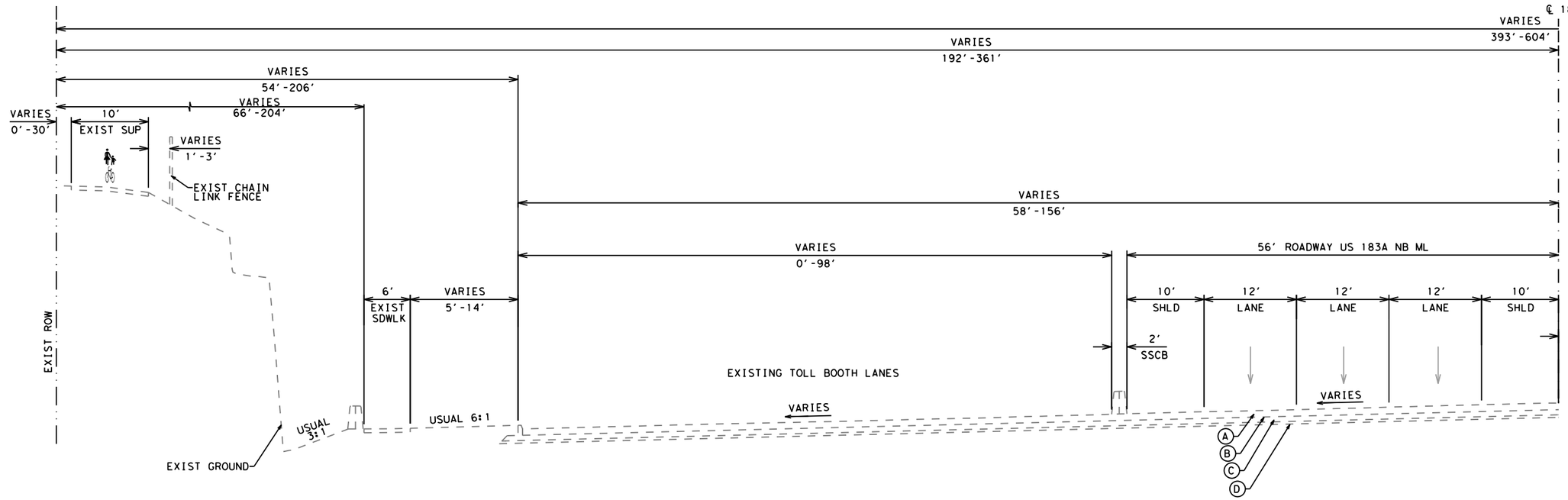
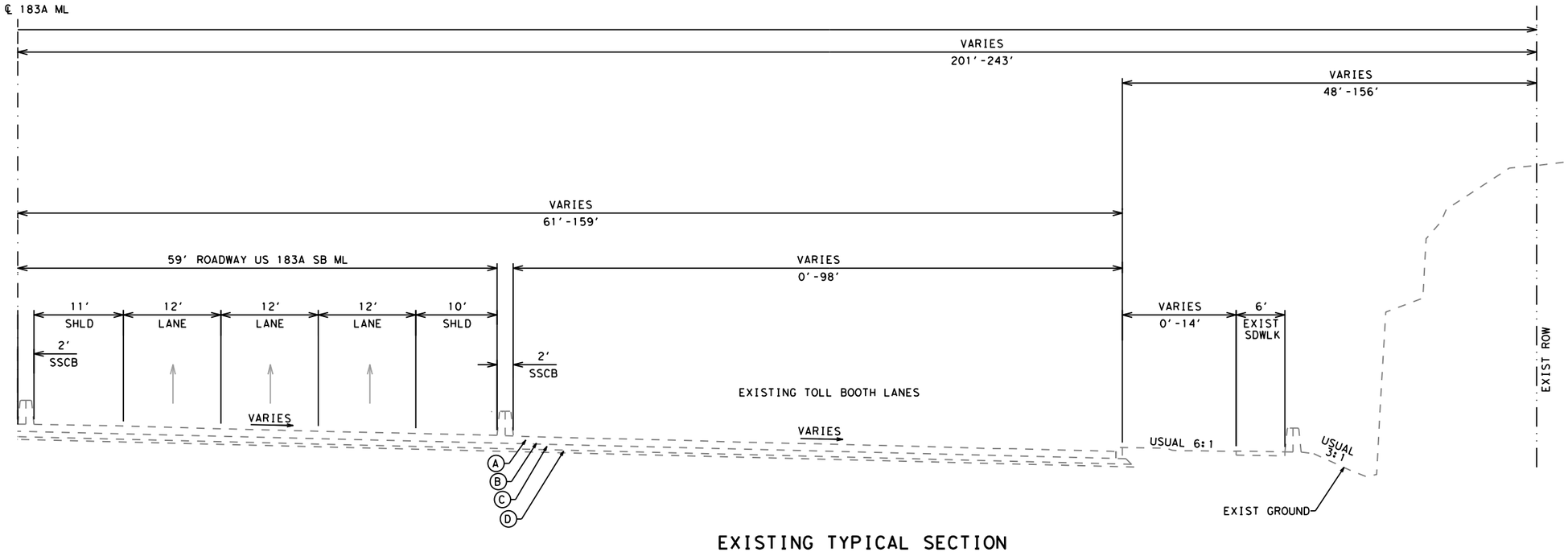


LEGEND

- (A) 10" CRCP
- (B) 1" BOND BREAKER, TYPE D
- (C) 8" CTB, CLASS L
- (D) 4' EMBANKMENT (MIN)
- (E) 7.5" HMA
- (F) 4" FLEXBASE
- (G) 4" BASE
- EXIST TRAFFIC FLOW ARROW
- PROP TRAFFIC FLOW ARROW



EXISTING TYPICAL SECTION

STA 638+25 TO STA 664+98

DESIGN

STATE OF TEXAS
MARISSA GUZMAN
130772
LICENSED PROFESSIONAL ENGINEER

MARISSA GUZMAN, P.E.
3/15/2023
DATE

APPROVAL

STATE OF TEXAS
DAN THOMA
98622
LICENSED PROFESSIONAL ENGINEER

DAN THOMA, P.E.
3/15/2023
DATE

0 100 200 300
SCALE: 1" = 100'

PAPE-DAWSON ENGINEERS
SAN ANTONIO | AUSTIN | HOUSTON | FORT WORTH | DALLAS
2000 NW LOOP 410 | SAN ANTONIO, TX 78213 | 210.375.9000
TEXAS ENGINEERING FIRM #470 | TEXAS SURVEYING FIRM #10028800

2023 Texas Department of Transportation

US 183 GPL

EXISTING TYPICAL SECTIONS

SHEET 5 OF 10

© 2023	CONT	SECT	JOB	HIGHWAY
DS: CK:	0151	10	001	US 183
DW: CK:	DIST	COUNTY		SHEET NO.
	AUS	WILLIAMSON		15

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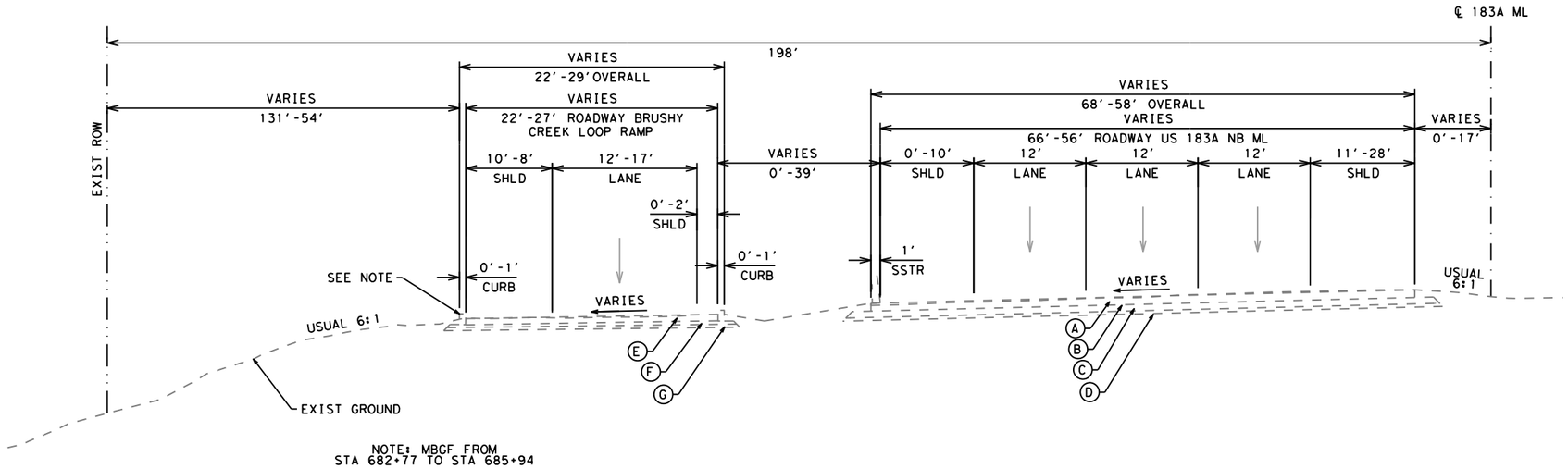
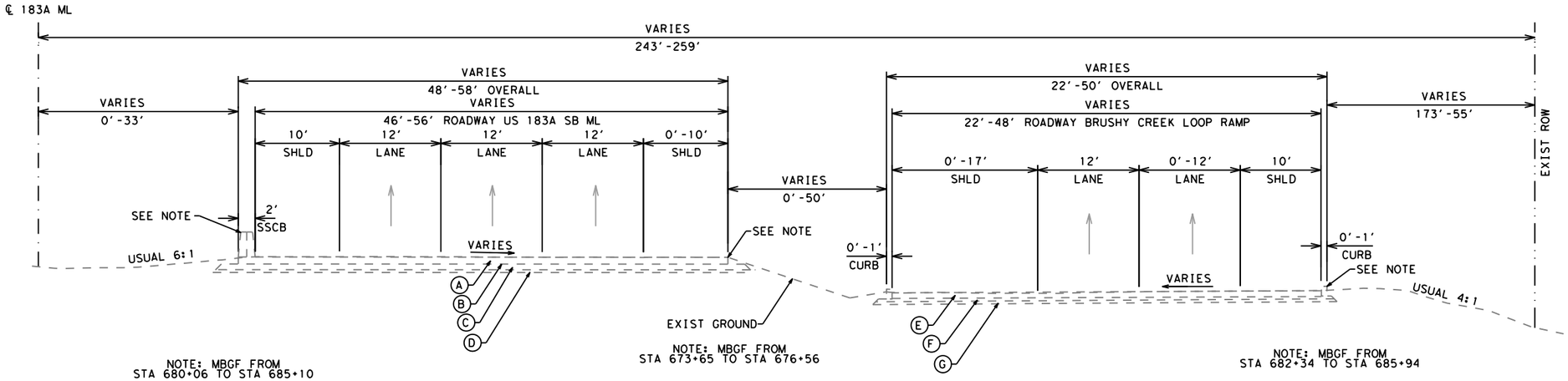


NOTE: MBGF FROM
STA 682+77 TO STA 685+94



NOTE: MBGF FROM
STA 680+06 TO STA 685+10

NOTE: MBGF FROM
STA 673+65 TO STA 676+56

NOTE: MBGF FROM
STA 682+34 TO STA 685+94

EXISTING TYPICAL SECTION
STA 675+40 TO STA 685+94

LEGEND

- (A) 10" CRCP
- (B) 1" BOND BREAKER, TYPE D
- (C) 8" CTB, CLASS L
- (D) 4' EMBANKMENT (MIN)
- (E) 7.5" HMA
- (F) 4" FLEXBASE
- (G) 4" BASE
- EXIST TRAFFIC FLOW ARROW
- PROP TRAFFIC FLOW ARROW

DESIGN

STATE OF TEXAS · MARISSA GUZMAN · 130772 · LICENSED PROFESSIONAL ENGINEER

MARISSA GUZMAN, P.E.
3/15/2023
DATE

APPROVAL

STATE OF TEXAS · DAN THOMA · 98622 · LICENSED PROFESSIONAL ENGINEER

DAN THOMA, P.E.
3/15/2023
DATE

0 100 200 300
SCALE: 1" = 100'

PAPE-DAWSON ENGINEERS
SAN ANTONIO | AUSTIN | HOUSTON | FORT WORTH | DALLAS
2000 NW LOOP 410 | SAN ANTONIO, TX 78213 | 210.375.9000
TEXAS ENGINEERING FIRM #470 | TEXAS SURVEYING FIRM #10028800

2023
Texas Department of Transportation

US 183 GPL

EXISTING TYPICAL SECTIONS

SHEET 6 OF 10

© 2023	CONT	SECT	JOB	HIGHWAY
DS: CK:	0151	10	001	US 183
DW: CK:	DIST	COUNTY		SHEET NO.
	AUS	WILLIAMSON		16

DATE: 3/15/2023 8:23:52 PM
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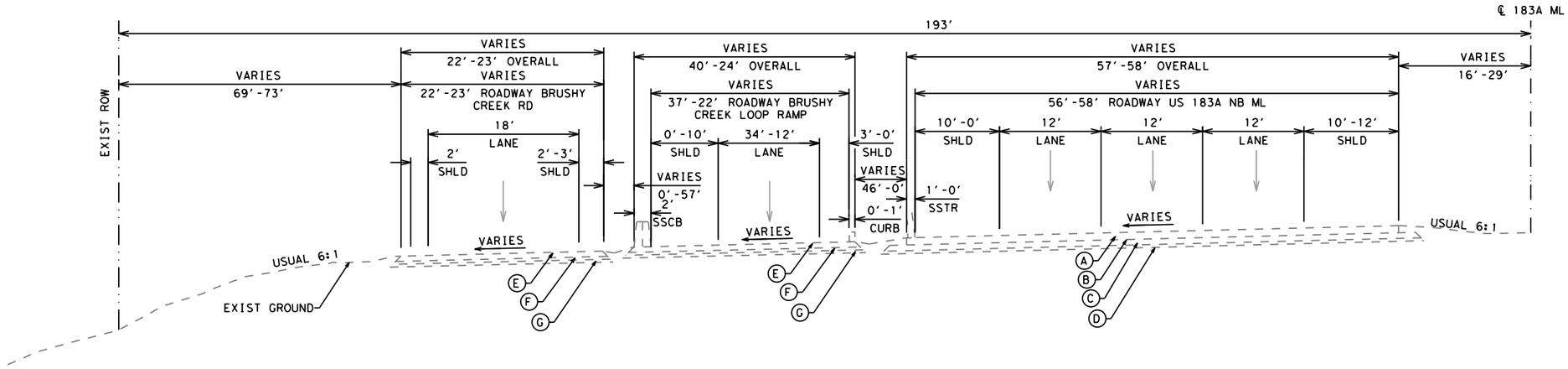
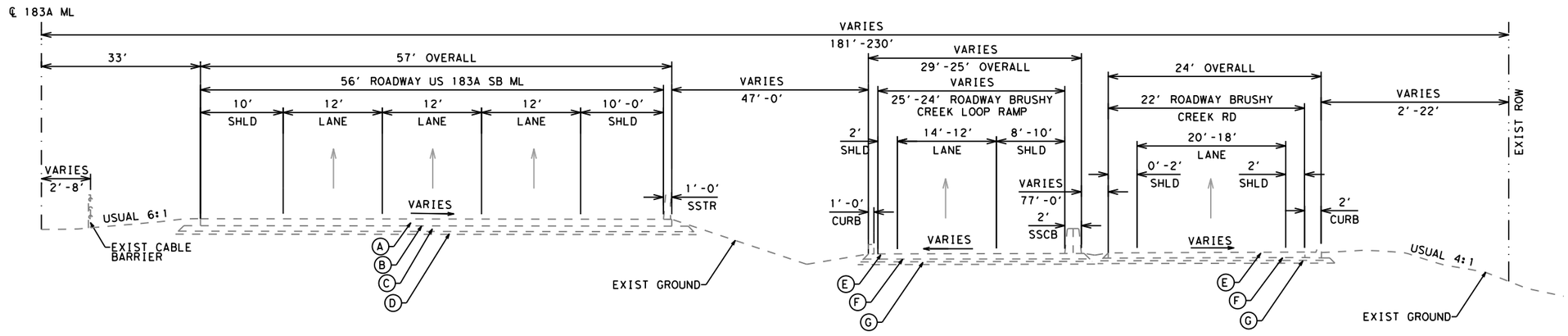
LEGEND

- (A) 10" CRCP
- (B) 1" BOND BREAKER, TYPE D
- (C) 8" CTB, CLASS L
- (D) 4' EMBANKMENT (MIN)
- (E) 7.5" HMA
- (F) 4" FLEXBASE
- (G) 4" BASE
- EXIST TRAFFIC FLOW ARROW
- PROP TRAFFIC FLOW ARROW





EXISTING TYPICAL SECTION

STA 699+95 TO STA 719+75

DESIGN

STATE OF TEXAS — MARISSA GUZMAN — 130772 — LICENSED PROFESSIONAL ENGINEER

MARISSA GUZMAN, P.E.

3/15/2023

DATE

APPROVAL

STATE OF TEXAS — DAN THOMA — 98622 — LICENSED PROFESSIONAL ENGINEER

DAN THOMA, P.E.

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US 183 GPL

EXISTING TYPICAL SECTIONS

SHEET 7 OF 10

© 2023	CONT	SECT	JOB	HIGHWAY
DS: CK:	0151	10	001	US 183
DW: CK:	DIST	COUNTY		SHEET NO.
	AUS	WILLIAMSON		17

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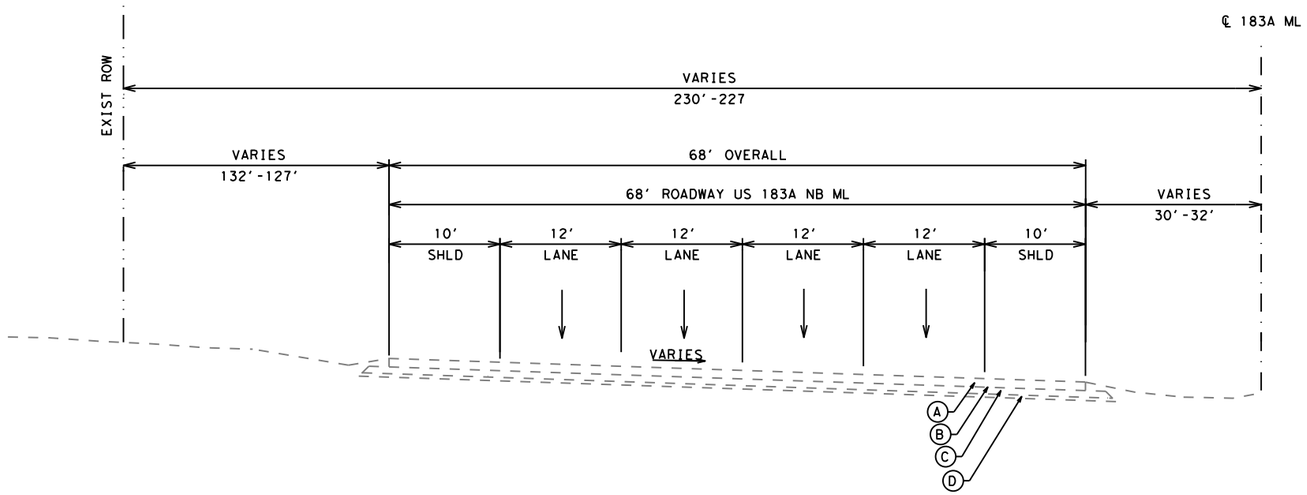

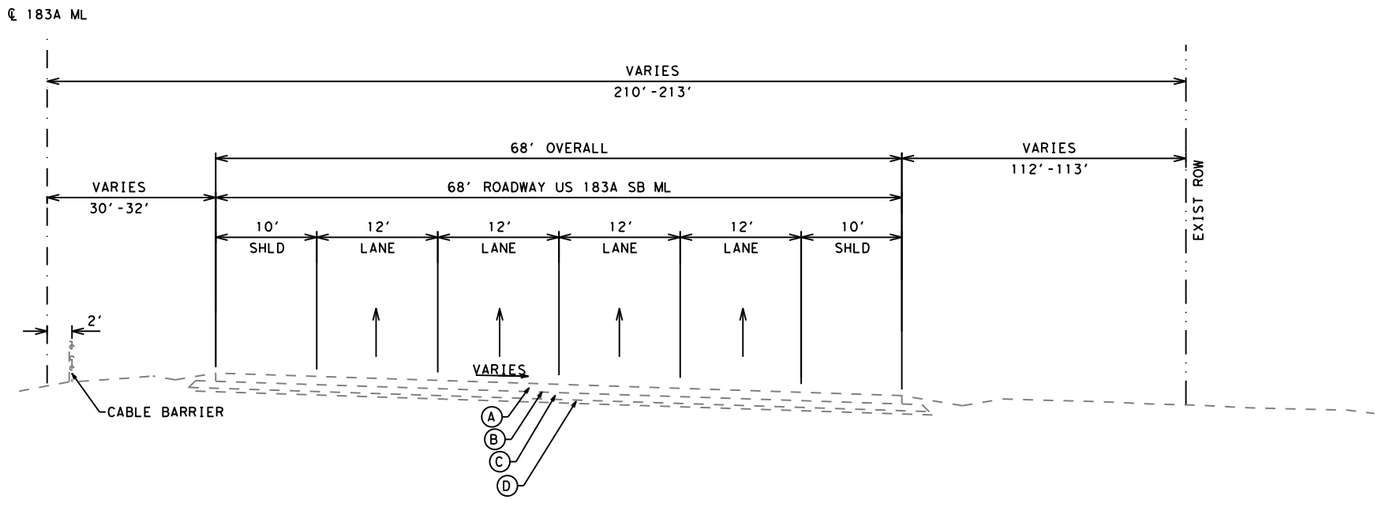

EXISTING TYPICAL SECTION

STA 724+47 TO STA 732+29

LEGEND

- (A) 10" CRCP
- (B) 1" BOND BREAKER, TYPE D
- (C) 8" CTB, CLASS L
- (D) 4' EMBANKMENT (MIN)
- (E) 7.5" HMA
- (F) 4" FLEXBASE
- (G) 4" BASE
- EXIST TRAFFIC FLOW ARROW
- PROP TRAFFIC FLOW ARROW

DESIGN

STATE OF TEXAS · MARISSA GUZMAN · 130772 · LICENSED PROFESSIONAL ENGINEER

MARISSA GUZMAN, P.E.

3/15/2023

DATE

APPROVAL

STATE OF TEXAS · DAN THOMA · 98622 · LICENSED PROFESSIONAL ENGINEER

DAN THOMA, P.E.

3/15/2023

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SCALE: 1" = 100'

PAPE-DAWSON ENGINEERS

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US 183 GPL

EXISTING TYPICAL SECTIONS

SHEET 8 OF 10

© 2023	CONT	SECT	JOB	HIGHWAY
DS: CK:	0151	10	001	US 183
DW: CK:	DIST	COUNTY		SHEET NO.
	AUS	WILLIAMSON		18

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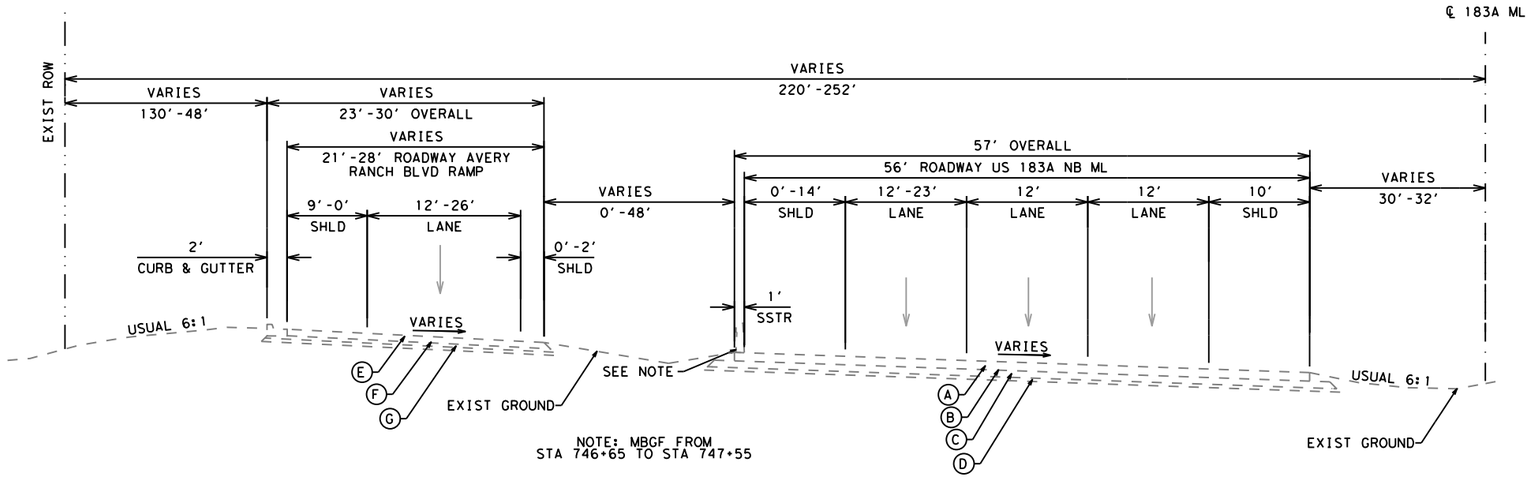
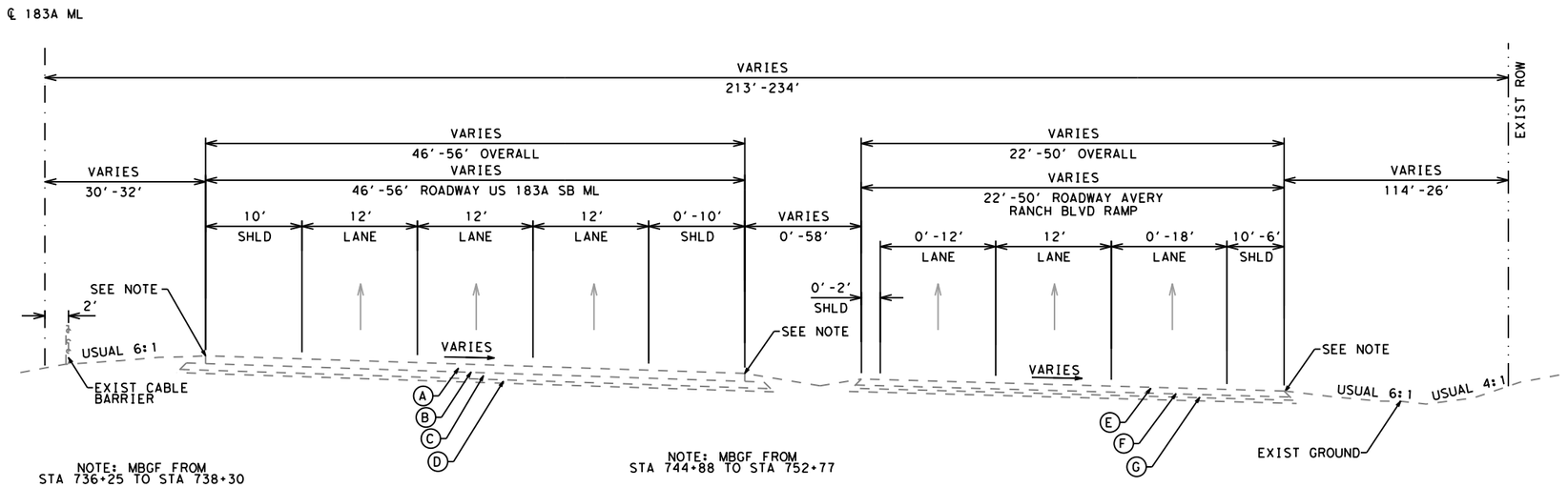


LEGEND

- (A) 10" CRCP
- (B) 1" BOND BREAKER, TYPE D
- (C) 8" CTB, CLASS L
- (D) 4' EMBANKMENT (MIN)
- (E) 7.5" HMA
- (F) 4" FLEXBASE
- (G) 4" BASE
- EXIST TRAFFIC FLOW ARROW
- PROP TRAFFIC FLOW ARROW



EXISTING TYPICAL SECTION

STA 732+29 TO STA 752+77

DESIGN

STATE OF TEXAS — MARISSA GUZMAN — 130772 — LICENSED PROFESSIONAL ENGINEER

MARISSA GUZMAN, P.E.

3/15/2023

DATE

APPROVAL

STATE OF TEXAS — DAN THOMA — 98622 — LICENSED PROFESSIONAL ENGINEER

DAN THOMA, P.E.

3/15/2023

DATE

0 100 200 300

SCALE: 1" = 200'

PAPE-DAWSON ENGINEERS

SAN ANTONIO | AUSTIN | HOUSTON | FORT WORTH | DALLAS

2000 NW LOOP 410 | SAN ANTONIO, TX 78213 | 210.375.9000

TEXAS ENGINEERING FIRM #470 | TEXAS SURVEYING FIRM #10028800

2023 Texas Department of Transportation

US 183 GPL

EXISTING TYPICAL SECTIONS

SHEET 9 OF 10

© 2023	CONT	SECT	JOB	HIGHWAY
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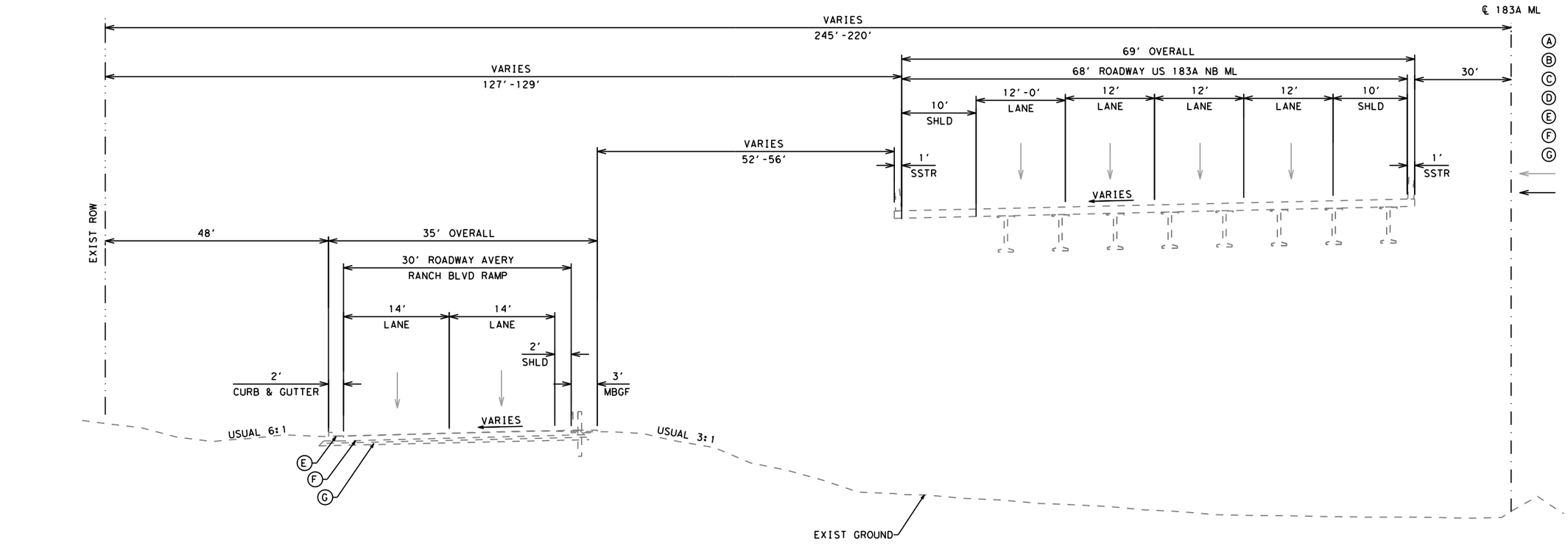

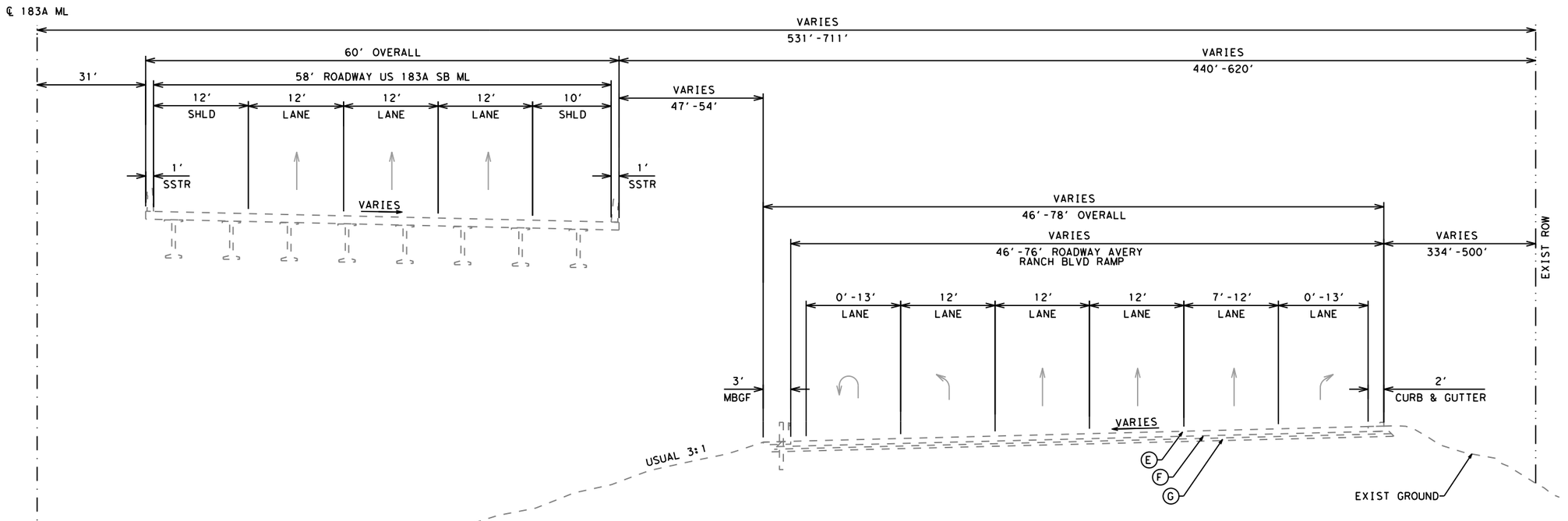

EXISTING TYPICAL SECTION
STA 752+77 TO STA 758+72

DESIGN

STATE OF TEXAS · MARISSA GUZMAN · 130772 · LICENSED PROFESSIONAL ENGINEER

MARISSA GUZMAN, P.E.
3/15/2023
DATE

APPROVAL

STATE OF TEXAS · DAN THOMA · 98622 · LICENSED PROFESSIONAL ENGINEER

DAN THOMA, P.E.
3/15/2023
DATE

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SCALE: 1" = 100'

PAPE-DAWSON ENGINEERS
SAN ANTONIO | AUSTIN | HOUSTON | FORT WORTH | DALLAS
2000 NW LOOP 410 | SAN ANTONIO, TX 78213 | 210.375.9000
TEXAS ENGINEERING FIRM #470 | TEXAS SURVEYING FIRM #10028800

2023 Texas Department of Transportation

US 183 GPL

EXISTING TYPICAL SECTIONS

SHEET 10 OF 10

© 2023		CONT	SECT	JOB	HIGHWAY
DS:	CK:	0151	10	001	US 183
DW:	CK:	DIST	COUNTY		SHEET NO.
		AUS	WILLIAMSON		20

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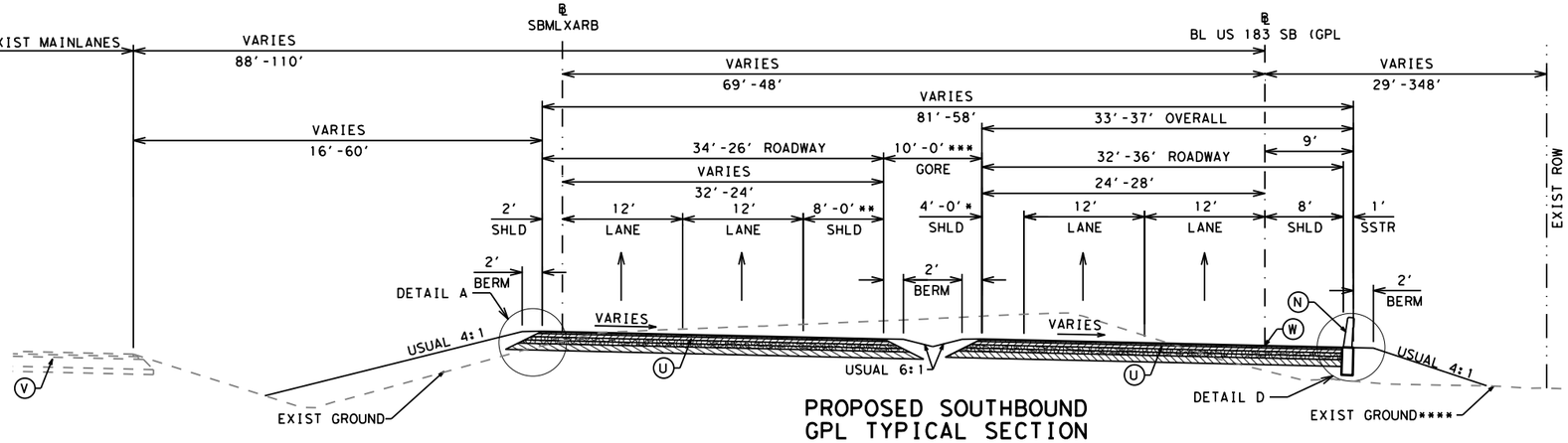
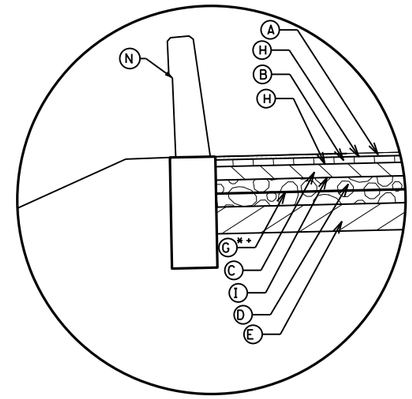


PROPOSED SOUTHBOUND GPL TYPICAL SECTION

STA 3740+69 TO STA 3750+43

*SHLD TRANSITIONS FROM 4' TO 0' BETWEEN STA 3740+69 AND STA 3744+30
**SHLD TRANSITIONS FROM 8' TO 0' BETWEEN STAD 3740+69 AND STA 3744+30
***GORE TRANSITIONS FROM 10'-0' BETWEEN STA 3740+69 AND STA 3744+31
****EXIST BOILERMAKER DETENTION POND AND SPARTAN WATER QUALITY POND STA 3749+58 TO STA 3759+58

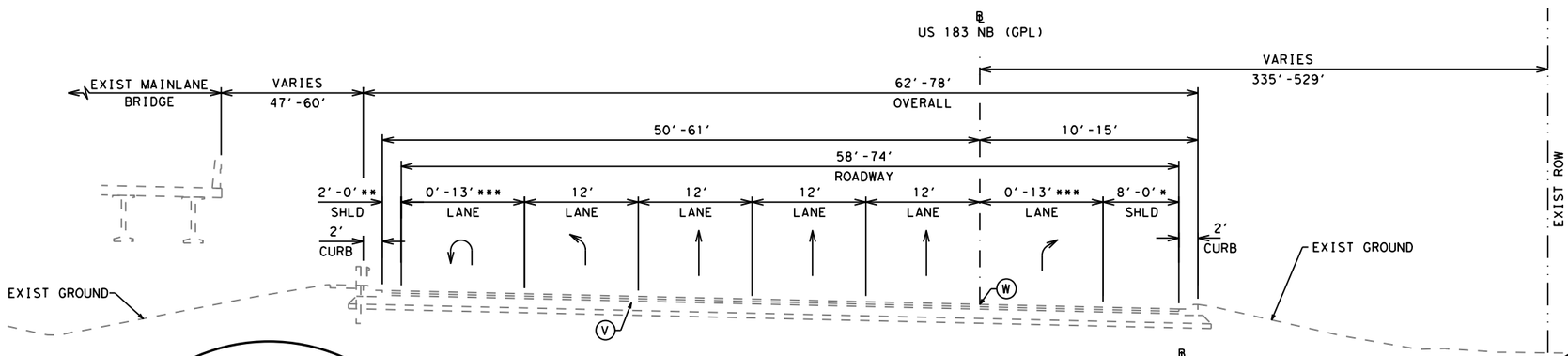


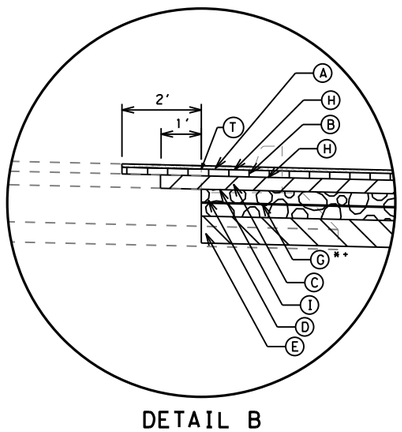
DETAIL D

LEGEND

- (A) 1" TOM-C (PG 76-22) SAC B
- (B) 1.5" D-GR TY D (PG 76-22)
- (C) 4" D-GR TY B (PG 64-22)
- (D) 8" FLEXBASE (TY A GR 5)*+
- (E) 8" TY C1 SELECT FILL
- (G) GEOGRID BASE REINFORCEMENT (TY II)
- (H) BONDING COURSE
- (I) PRIME COAT
- (J) CONC PVMT (CONT REINF - CRCP)(10.5")
- (K) 5" CONC SUP/SIDEWALKS
- (L) RIPRAP (CONC)(4 IN)
- (M) RIPRAP (MOW STRIP)(4 IN)
- (N) RAIL (TY SSTR) W/ TRF ****
- (O) RAIL (TY T80SS) W/ TRF80
- (P) RAIL (TY T80PP-RF)
- (Q) MTL W-BEAM GD FEN (TIM POST)
- (R) TY II CONC CURB & GUTTER
- (S) RETAINING WALL
- (T) SAWCUT LINE
- (U) PROP ASPHALT PAVEMENT
- (V) EXIST ASPHALT PAVEMENT
- (W) PGL
- (X) ROCK CUT WALL
- (Y) NOISE WALL

EXIST TRAFFIC FLOW ARROW
PROP TRAFFIC FLOW ARROW
*+INSTALL GEOGRID BEFORE THE LAST LIFT OF BASE IS PLACED
****TRF ONLY WHERE SHOWN IN TYP



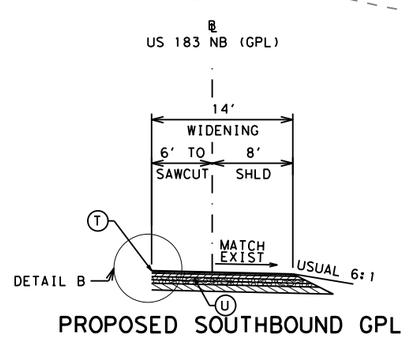


DETAIL B

PROPOSED SOUTHBOUND GPL TYPICAL SECTION

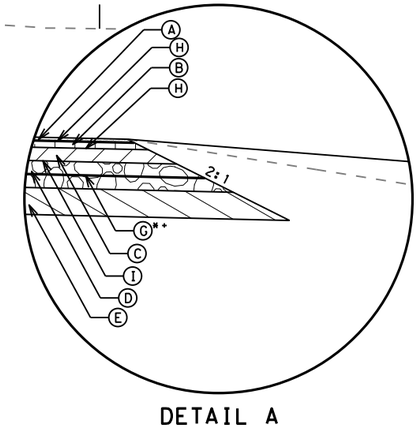
STA 3750+43 TO STA 3759+16

*SHLD TRANSITIONS FROM 2' TO 0' BETWEEN STA 3754+25 AND STA 3755+75
**SHLD TRANSITIONS FROM 8' TO 0' BETWEEN STA 3755+25 AND STA 3756+75
***LANE TRANSITIONS FROM 0' TO 13' BETWEENS STA 3754+25 AND STA 3755+75



PROPOSED SOUTHBOUND GPL WIDENING DETAIL

STA 3750+43 TO STA 3754+93



DETAIL A

DESIGN

STATE OF TEXAS
MARISSA GUZMAN
130772
LICENSED PROFESSIONAL ENGINEER

MARISSA GUZMAN, P.E.
2/28/2024
DATE

APPROVAL

STATE OF TEXAS
DAN THOMA
98622
LICENSED PROFESSIONAL ENGINEER

DAN THOMA, P.E.
2/28/2024
DATE

NOT TO SCALE

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2024 Texas Department of Transportation

US 183 GPL

PROPOSED TYPICAL SECTIONS

SHEET 16 OF 16

© 2024		CONT	SECT	JOB	HIGHWAY
DS:	CK:	0151	10	001	US 183
		DIST	COUNTY		SHEET NO.
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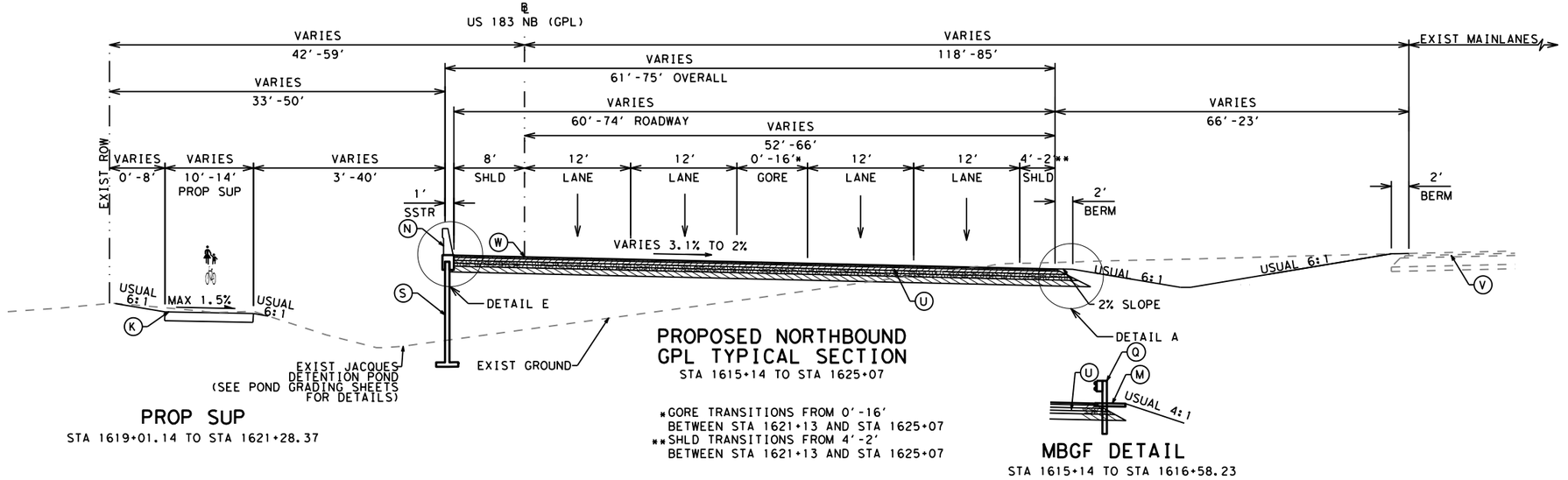


PROP SUP

STA 1619+01.14 TO STA 1621+28.37

PROPOSED NORTHBOUND GPL TYPICAL SECTION

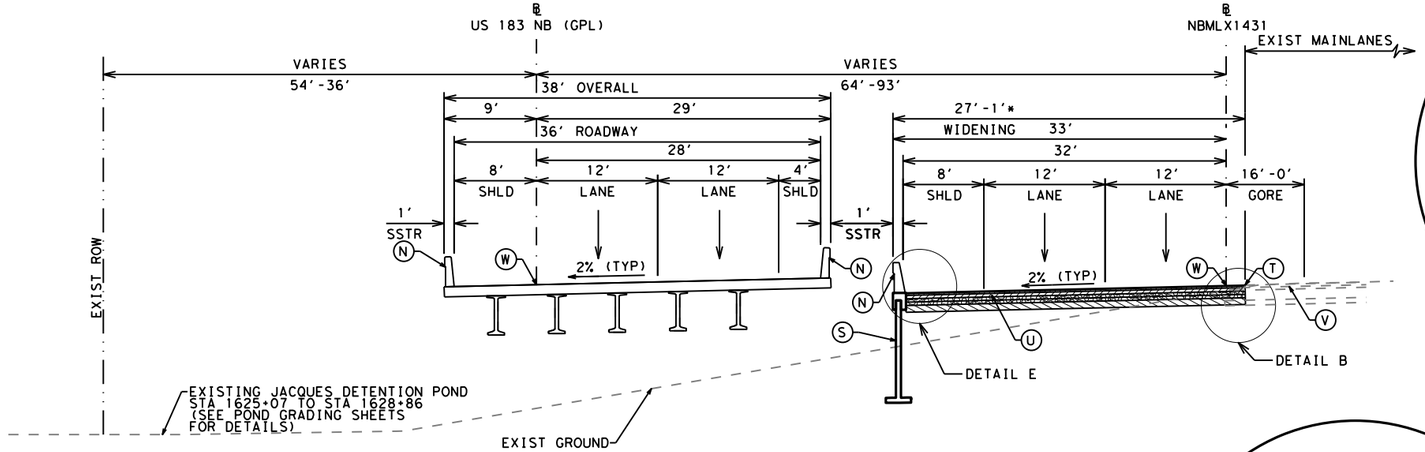
STA 1615+14 TO STA 1625+07

*GORE TRANSITIONS FROM 0'-16' BETWEEN STA 1621+13 AND STA 1625+07

**SHLD TRANSITIONS FROM 4'-2' BETWEEN STA 1621+13 AND STA 1625+07

MBGF DETAIL

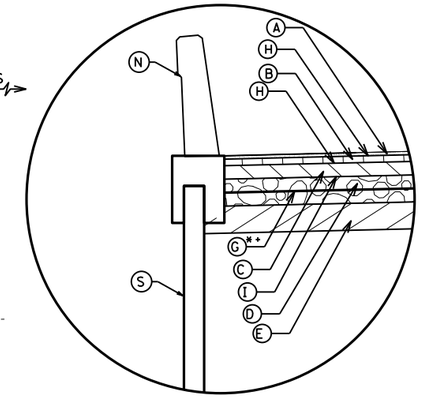
STA 1615+14 TO STA 1616+58.23

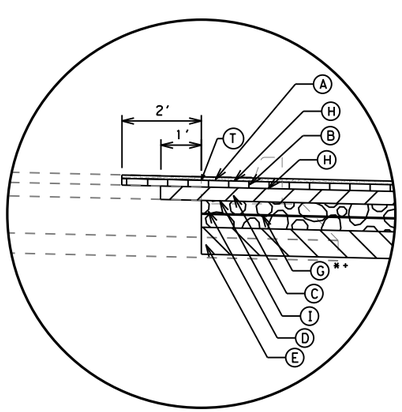


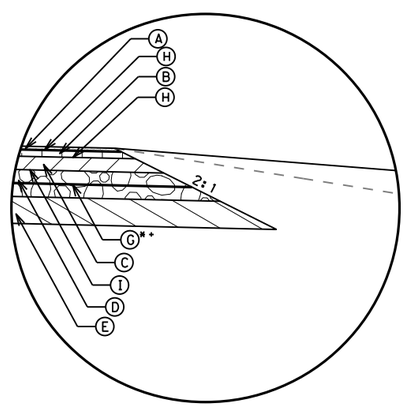
PROPOSED NORTHBOUND GPL TYPICAL SECTION

STA 1625+07 TO STA 1631+40

*PAVEMENT WIDENING TRANSITIONS FROM 27' TO 1' BETWEEN STA 1627+44 AND STA 1631+40







LEGEND

- (A) 1" TOM-C (PG 76-22) SAC B
- (B) 1.5" D-GR TY D (PG 76-22)
- (C) 4" D-GR TY B (PG 64-22)
- (D) 8" FLEXBASE (TY A GR 5)**
- (E) 8" TY C1 SELECT FILL
- (G) GEOGRID BASE REINFORCEMENT (TY II)
- (H) BONDING COURSE
- (I) PRIME COAT
- (J) CONC PVMT (CONT REINF - CRCP)(10.5")
- (K) 5" CONC SUP/SIDEWALKS
- (L) RIPRAP (CONC)(4 IN)
- (M) RIPRAP (MOW STRIP)(4 IN)
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- (P) RAIL (TY T80PP-RF)
- (Q) MTL W-BEAM GD FEN (TIM POST)
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- (V) EXIST ASPHALT PAVEMENT
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EXIST TRAFFIC FLOW ARROW

PROP TRAFFIC FLOW ARROW

**INSTALL GEOGRID BEFORE THE LAST LIFT OF BASE IS PLACED

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DESIGN

STATE OF TEXAS — MARISSA GUZMAN — 130772 — LICENSED PROFESSIONAL ENGINEER

MARISSA GUZMAN, P.E.

2/28/2024 DATE

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2024 Texas Department of Transportation

US 183 GPL

PROPOSED TYPICAL SECTIONS

SHEET 2 OF 16

© 2024		CONT	SECT	JOB	HIGHWAY
DS:	CK:	0151	10	001	US 183
		DIST	COUNTY		SHEET NO.
DW:	CK:	AUS	WILLIAMSON		22

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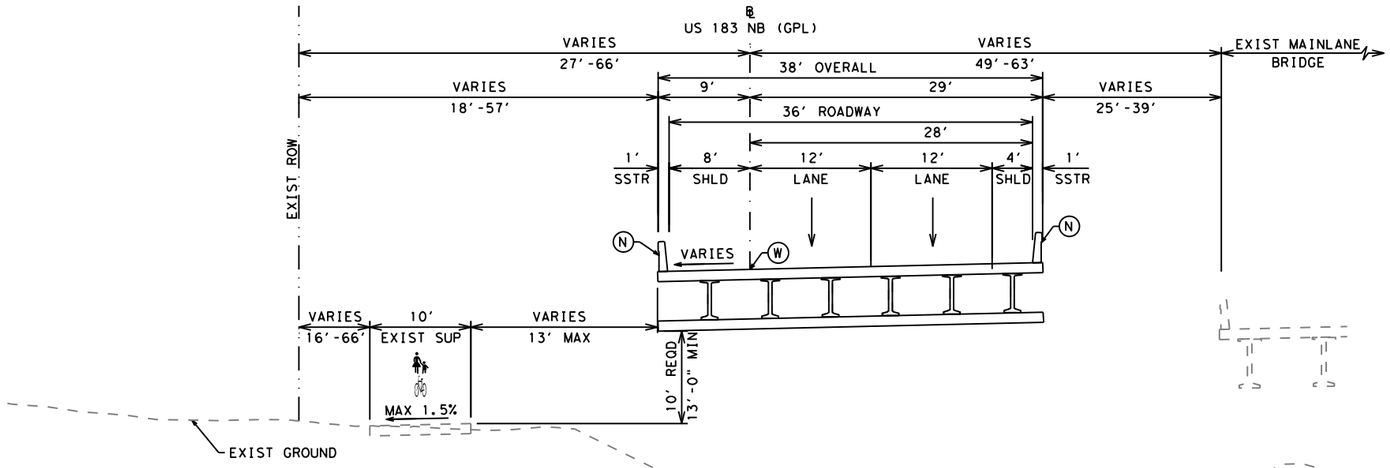
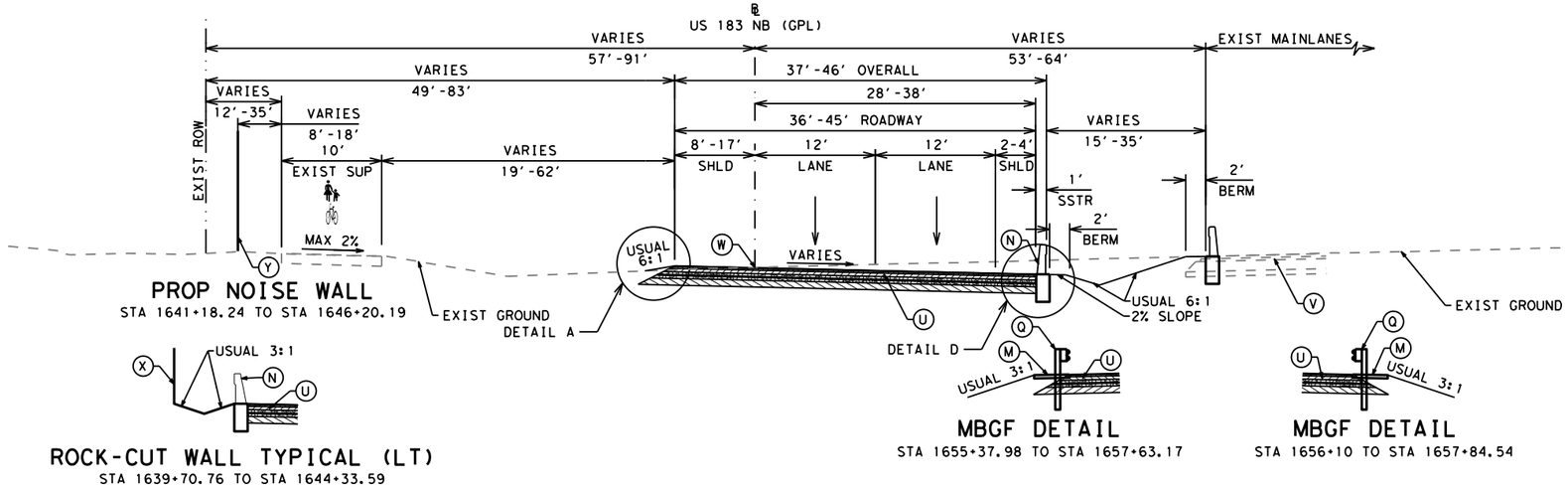


PROPOSED NORTHBOUND GPL TYPICAL SECTION

STA 1631+40 TO STA 1638+16
STA 1691+13 TO STA 1693+87

*EXIST LOBO DETENTION POND
STA 1635+80 TO STA 1638+16



PROP NOISE WALL
STA 1641+18.24 TO STA 1646+20.19

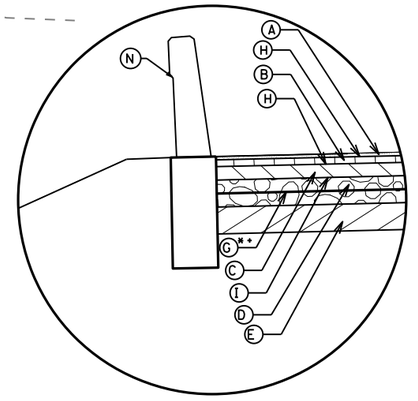
ROCK-CUT WALL TYPICAL (LT)
STA 1639+70.76 TO STA 1644+33.59

MBGF DETAIL
STA 1655+37.98 TO STA 1657+63.17

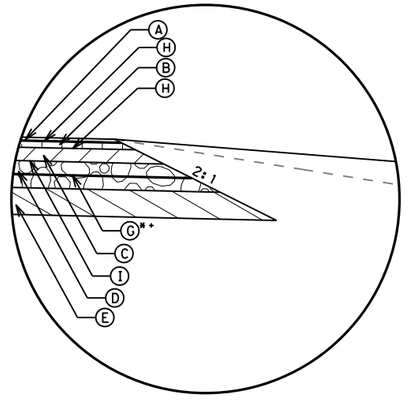
MBGF DETAIL
STA 1656+10 TO STA 1657+84.54

PROPOSED NORTHBOUND GPL TYPICAL SECTION

STA 1638+16 TO STA 1646+32.24
STA 1654+04 TO STA 1662+17



DETAIL D



DETAIL A

LEGEND

- (A) 1" TOM-C (PG 76-22) SAC B
- (B) 1.5" D-GR TY D (PG 76-22)
- (C) 4" D-GR TY B (PG 64-22)
- (D) 8" FLEXBASE (TY A GR 5)**
- (E) 8" TY C1 SELECT FILL
- (G) GEOGRID BASE REINFORCEMENT (TY II)
- (H) BONDING COURSE
- (I) PRIME COAT
- (J) CONC PVMT (CONT REINF - CRCP)(10.5")
- (K) 5" CONC SUP/SIDEWALKS
- (L) RIPRAP (CONC)(4 IN)
- (M) RIPRAP (MOW STRIP)(4 IN)
- (N) RAIL (TY SSTR) W/ TRF ****
- (O) RAIL (TY T80SS) W/ TRF80
- (P) RAIL (TY T80PP-RF)
- (Q) MTL W-BEAM GD FEN (TIM POST)
- (R) TY II CONC CURB & GUTTER
- (S) RETAINING WALL
- (T) SAWCUT LINE
- (U) PROP ASPHALT PAVEMENT
- (V) EXIST ASPHALT PAVEMENT
- (W) PGL
- (X) ROCK CUT WALL
- (Y) NOISE WALL

EXIST TRAFFIC FLOW ARROW
PROP TRAFFIC FLOW ARROW
**INSTALL GEOGRID BEFORE THE LAST LIFT OF BASE IS PLACED
****TRF ONLY WHERE SHOWN IN TYP

DESIGN

STATE OF TEXAS · MARISSA GUZMAN · 130772 · LICENSED PROFESSIONAL ENGINEER

MARISSA GUZMAN, P.E.
2/28/2024
DATE

APPROVAL

STATE OF TEXAS · DAN THOMA · 98622 · LICENSED PROFESSIONAL ENGINEER

DAN THOMA, P.E.
2/28/2024
DATE

NOT TO SCALE

PAPE-DAWSON ENGINEERS
SAN ANTONIO | AUSTIN | HOUSTON | FORT WORTH | DALLAS
2000 NW LOOP 410 | SAN ANTONIO, TX 78213 | 210.375.9000
TEXAS ENGINEERING FIRM #470 | TEXAS SURVEYING FIRM #10028800

2024
Texas Department of Transportation

US 183 GPL

PROPOSED TYPICAL SECTIONS

SHEET 3 OF 16

© 2024	CONT	SECT	JOB	HIGHWAY
DS: CK:	0151	10	001	US 183
DW: CK:	DIST	COUNTY		SHEET NO.
	AUS	WILLIAMSON		23

DATE: 2/28/2024 5:32:28 PM
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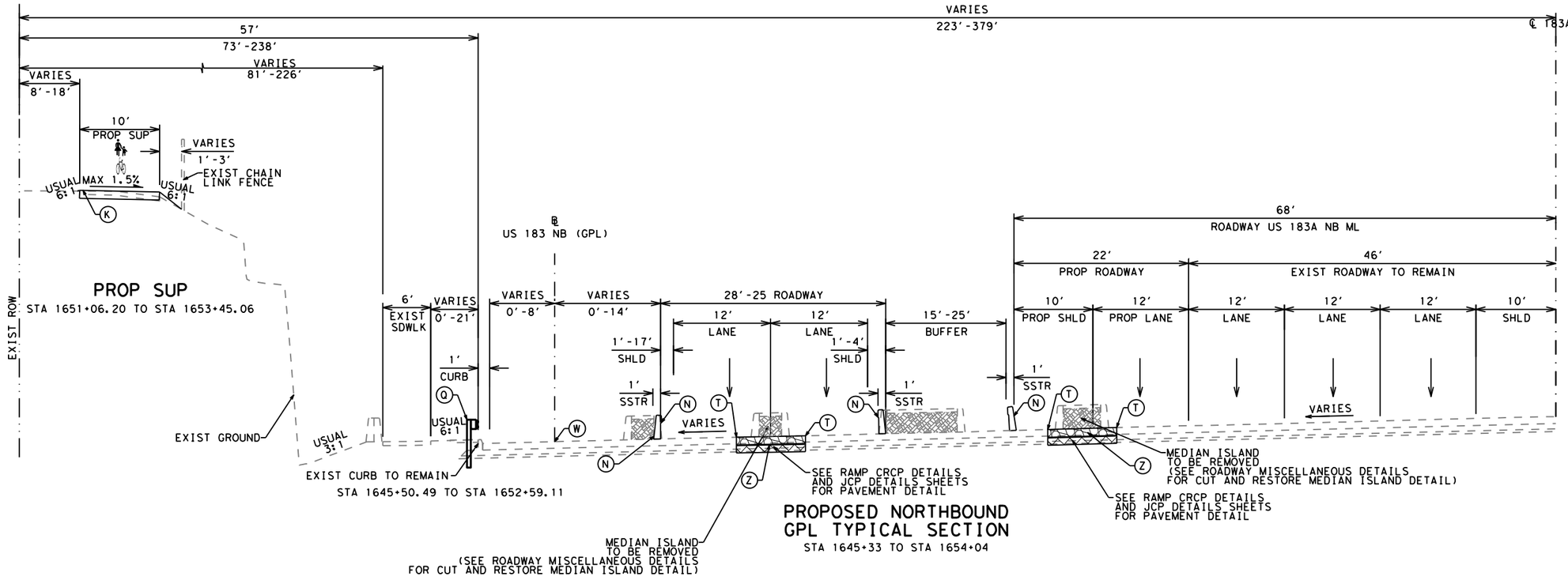


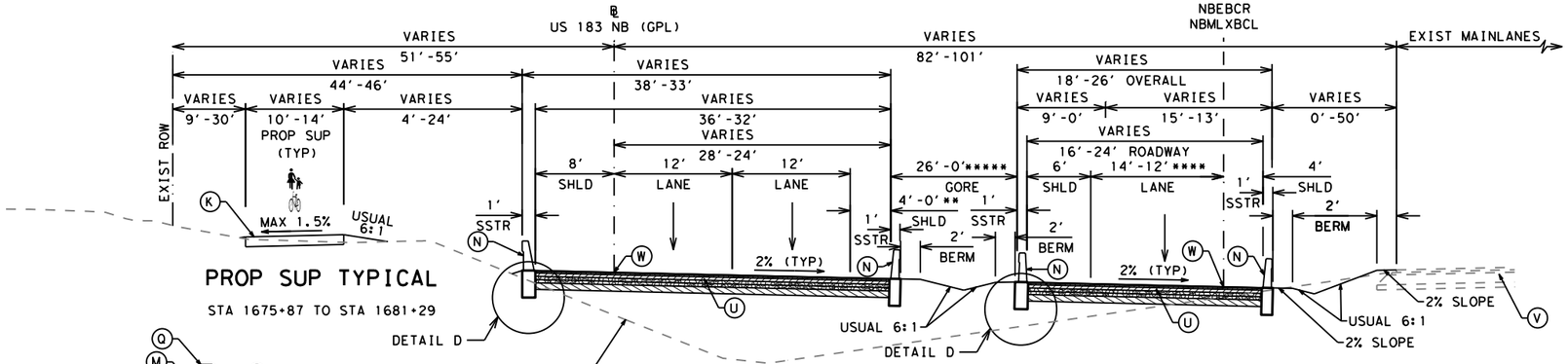
LEGEND

- (A) 1" TOM-C (PG 76-22) SAC B
- (B) 1.5" D-GR TY D (PG 76-22)
- (C) 4" D-GR TY B (PG 64-22)
- (D) 8" FLEXBASE (TY A GR 5)**
- (E) 8" TY C1 SELECT FILL
- (G) GEOGRID BASE REINFORCEMENT (TY II)
- (H) BONDING COURSE
- (I) PRIME COAT
- (J) CONC PVMT (CONT REINF - CRCP)(10.5")
- (K) 5" CONC SUP/SIDEWALKS
- (L) RIPRAP (CONC)(4 IN)
- (M) RIPRAP (MOW STRIP)(4 IN)
- (N) RAIL (TY SSTR) W/ TRF ****
- (O) RAIL (TY T80SS) W/ TRF80
- (P) RAIL (TY T80PP-RF)
- (Q) MTL W-BEAM GD FEN (TIM POST)
- (R) TY II CONC CURB & GUTTER
- (S) RETAINING WALL
- (T) SAWCUT LINE
- (U) PROP ASPHALT PAVEMENT
- (V) EXIST ASPHALT PAVEMENT
- (W) PGL
- (X) ROCK CUT WALL
- (Y) NOISE WALL
- (Z) JOINTED CONC PVMT(JCP)(11")

EXIST TRAFFIC FLOW ARROW
PROP TRAFFIC FLOW ARROW

**INSTALL GEOGRID BEFORE THE LAST LIFT OF BASE IS PLACED

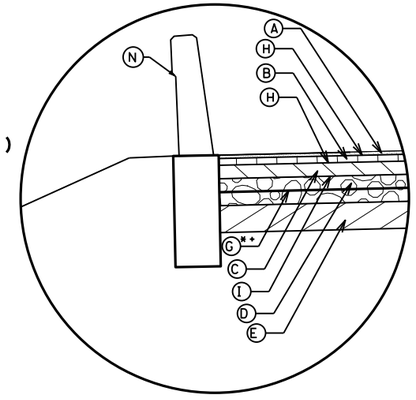
****TRF ONLY WHERE SHOWN IN TYP



**SHLD TRANSITIONS FROM 4' TO 0' BETWEEN STA 1666+09 AND STA 1667+92
SHLD TRANSITIONS FROM 0' TO 4' BETWEEN STA 1676+71 AND STA 1681+83

****LANE TRANSITIONS FROM 14' TO 12' BETWEEN STA 1665+19 AND STA 1671+13
LANE TRANSITIONS FROM 14' TO 12' BETWEEN STA 1674+63 AND STA 1677+67

*****GORE TRANSITIONS FROM 29' TO 0' BETWEEN STA 1662+17 AND STA 1667+92
GORE TRANSITIONS FROM 15' TO 0' BETWEEN STA 1736+30 AND STA 1731+11



DETAIL D

DESIGN

STATE OF TEXAS · MARISSA GUZMAN · 130772 · LICENSED PROFESSIONAL ENGINEER

MARISSA GUZMAN, P.E.
4/16/2024
DATE

APPROVAL

STATE OF TEXAS · DAN THOMA · 98622 · LICENSED PROFESSIONAL ENGINEER

DAN THOMA, P.E.
4/16/2024
DATE

NOT TO SCALE

PAPE-DAWSON ENGINEERS
SAN ANTONIO | AUSTIN | HOUSTON | FORT WORTH | DALLAS
2000 NW LOOP 410 | SAN ANTONIO, TX 78213 | 210.375.9000
TEXAS ENGINEERING FIRM #470 | TEXAS SURVEYING FIRM #10028800

2024 Texas Department of Transportation

US 183 GPL

PROPOSED TYPICAL SECTIONS

SHEET 4 OF 16

© 2024		CONT	SECT	JOB	HIGHWAY
DS:	CK:	0151	10	001	US 183
DW:	CK:	DIST	COUNTY		SHEET NO.
		AUS	WILLIAMSON		24

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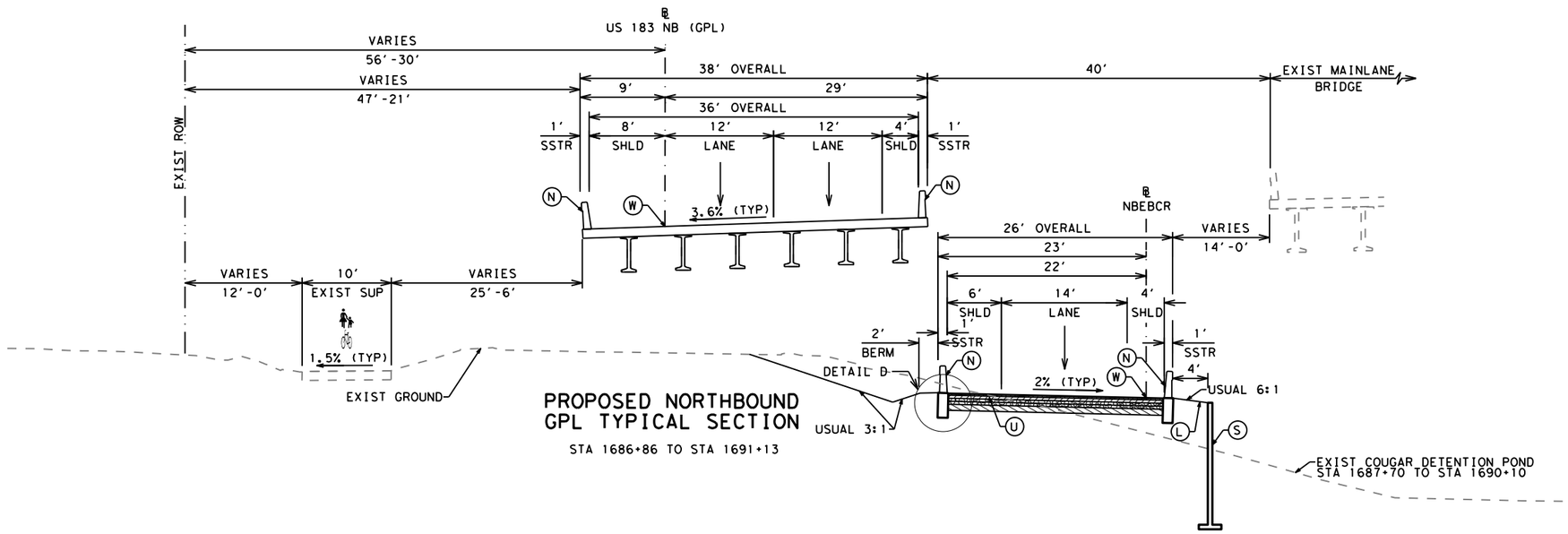
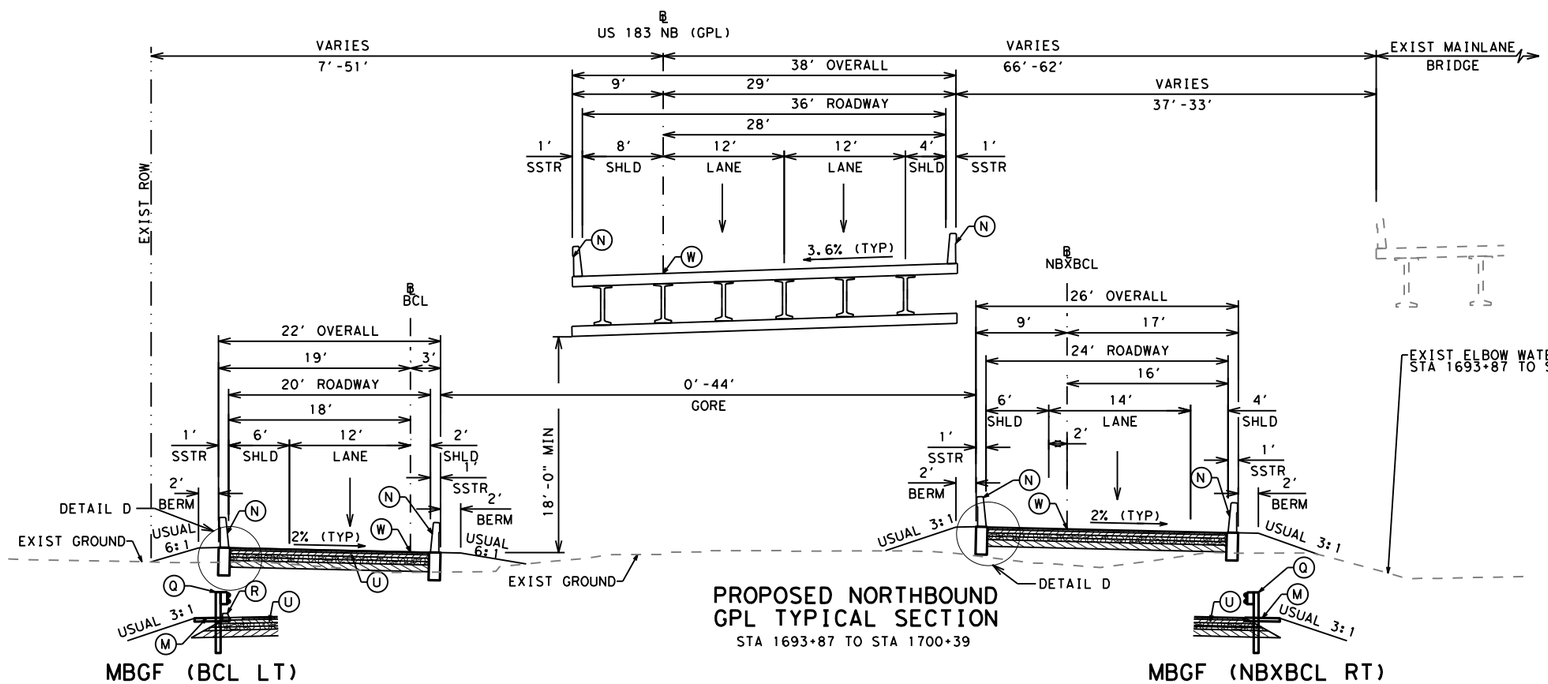


PROPOSED NORTHBOUND GPL TYPICAL SECTION

STA 1686+86 TO STA 1691+13



MBGF (BCL LT)

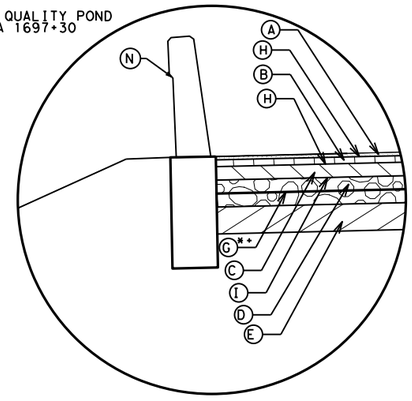
STA 1698+72.43 TO STA 1698+97.59

PROPOSED NORTHBOUND GPL TYPICAL SECTION

STA 1693+87 TO STA 1700+39

MBGF (NBXBCL RT)

STA 1694+42 TO STA 1697+40



DETAIL D

LEGEND

- (A) 1" TOM-C (PG 76-22) SAC B
- (B) 1.5" D-GR TY D (PG 76-22)
- (C) 4" D-GR TY B (PG 64-22)
- (D) 8" FLEXBASE (TY A GR 5)**
- (E) 8" TY C1 SELECT FILL
- (G) GEOGRID BASE REINFORCEMENT (TY II)
- (H) BONDING COURSE
- (I) PRIME COAT
- (J) CONC PVMT (CONT REINF - CRCP)(10.5")
- (K) 5" CONC SUP/SIDEWALKS
- (L) RIPRAP (CONC)(4 IN)
- (M) RIPRAP (MOW STRIP)(4 IN)
- (N) RAIL (TY SSTR) W/ TRF ****
- (O) RAIL (TY T80SS) W/ TRF80
- (P) RAIL (TY T80PP-RF)
- (Q) MTL W-BEAM GD FEN (TIM POST)
- (R) TY II CONC CURB & GUTTER
- (S) RETAINING WALL
- (T) SAWCUT LINE
- (U) PROP ASPHALT PAVEMENT
- (V) EXIST ASPHALT PAVEMENT
- (W) PGL
- (X) ROCK CUT WALL
- (Y) NOISE WALL

EXIST TRAFFIC FLOW ARROW
PROP TRAFFIC FLOW ARROW
**INSTALL GEOGRID BEFORE THE LAST LIFT OF BASE IS PLACED
****TRF ONLY WHERE SHOWN IN TYP

DESIGN

STATE OF TEXAS · MARISSA GUZMAN · 130772 · LICENSED PROFESSIONAL ENGINEER

MARISSA GUZMAN, P.E.
2/28/2024
DATE

APPROVAL

STATE OF TEXAS · DAN THOMA · 98622 · LICENSED PROFESSIONAL ENGINEER

DAN THOMA, P.E.
2/28/2024
DATE

NOT TO SCALE

PAPE-DAWSON ENGINEERS
SAN ANTONIO | AUSTIN | HOUSTON | FORT WORTH | DALLAS
2000 NW LOOP 410 | SAN ANTONIO, TX 78213 | 210.375.9000
TEXAS ENGINEERING FIRM #470 | TEXAS SURVEYING FIRM #10028800

2024 Texas Department of Transportation

US 183 GPL

PROPOSED TYPICAL SECTIONS

SHEET 5 OF 16

© 2024	CONT	SECT	JOB	HIGHWAY
DS: CK:	0151	10	001	US 183
	DIST	COUNTY		SHEET NO.
DW: CK:	AUS	WILLIAMSON		25

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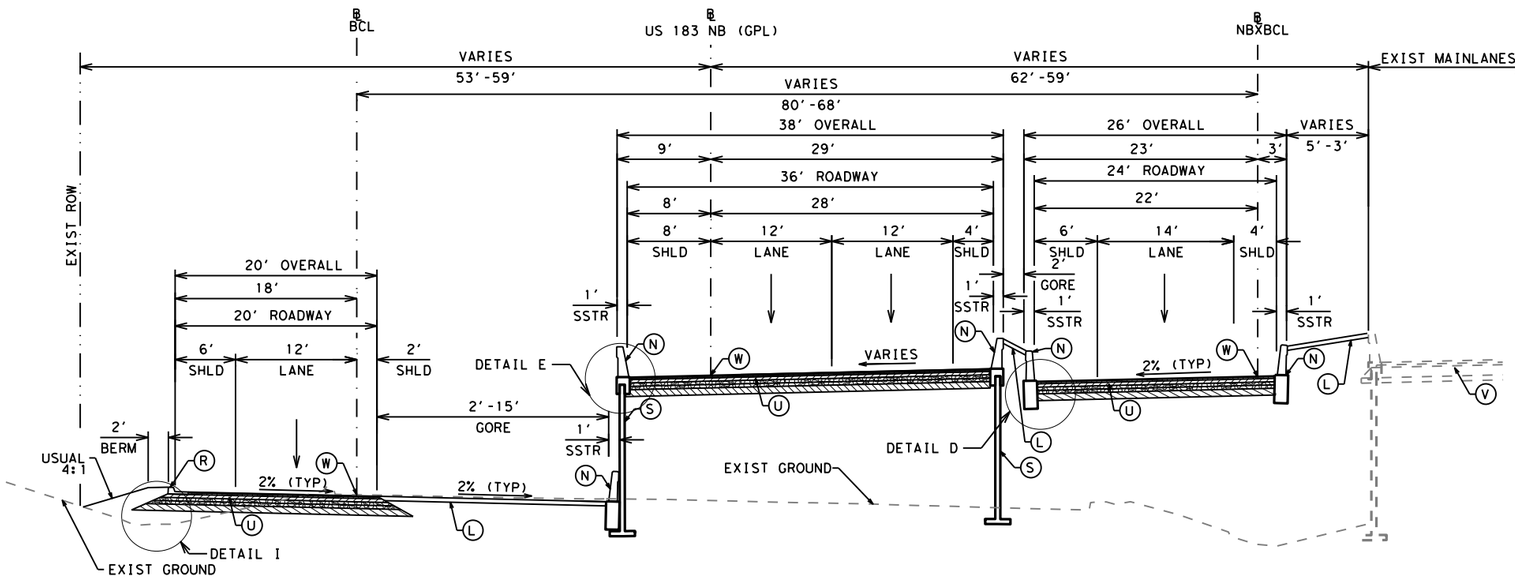
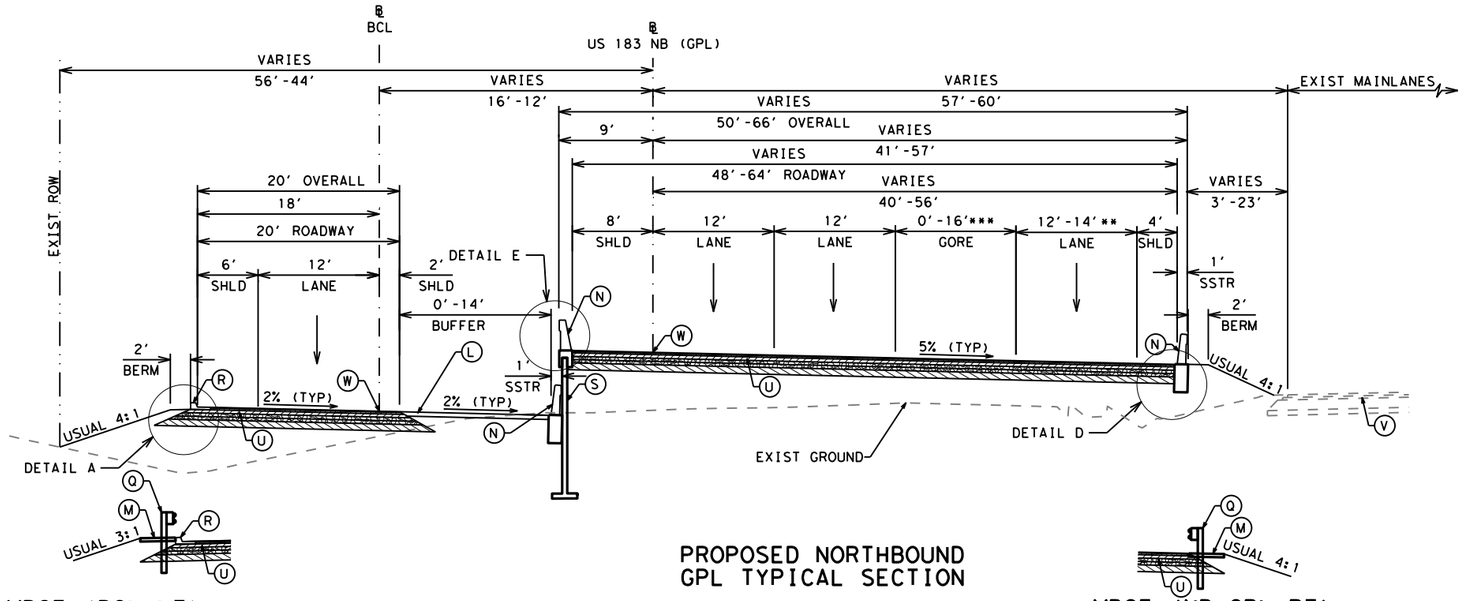


PROPOSED NORTHBOUND GPL TYPICAL SECTION

STA 1700+39 TO STA 1707+02



PROPOSED NORTHBOUND GPL TYPICAL SECTION

STA 1707+02 TO STA 1717+91

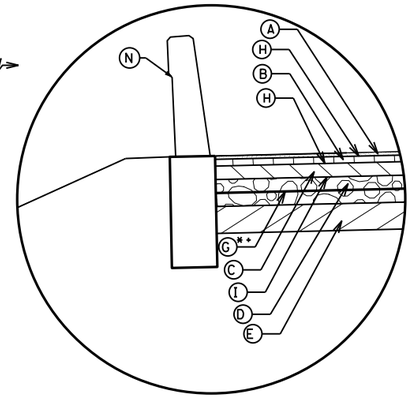
**LANE TRANSITIONS FROM 14' TO 12' BETWEEN STA 1711+56 AND STA 1711+81
***GORE TRANSITIONS FROM 16' TO 0' BETWEEN STA 1707+60 AND STA 1711+56

MBGF (BCL LT)

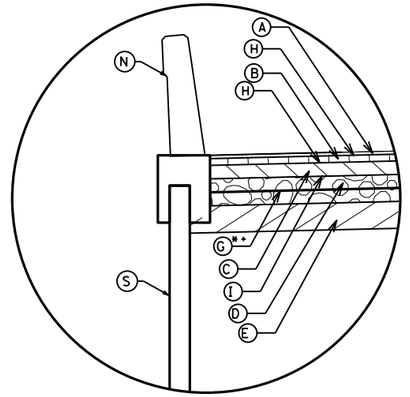
STA 1709+15.12 TO STA 1717+91

MBGF (NB GPL RT)

STA 1711+75.18 TO STA 1712+25.83



DETAIL D



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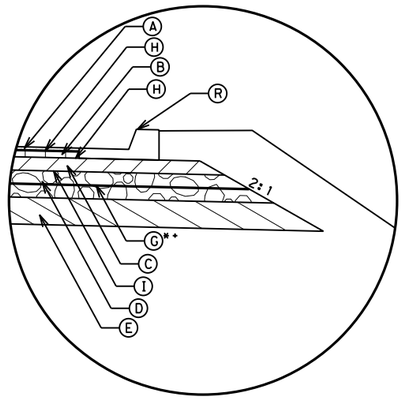

DETAIL I

LEGEND

- (A) 1" TOM-C (PG 76-22) SAC B
- (B) 1.5" D-GR TY D (PG 76-22)
- (C) 4" D-GR TY B (PG 64-22)
- (D) 8" FLEXBASE (TY A GR 5)**
- (E) 8" TY C1 SELECT FILL
- (G) GEOGRID BASE REINFORCEMENT (TY II)
- (H) BONDING COURSE
- (I) PRIME COAT
- (J) CONC PVMT (CONT REINF - CRCP)(10.5")
- (K) 5" CONC SUP/SIDEWALKS
- (L) RIPRAP (CONC)(4 IN)
- (M) RIPRAP (MOW STRIP)(4 IN)
- (N) RAIL (TY SSTR) W/ TRF ****
- (O) RAIL (TY T80SS) W/ TRF80
- (P) RAIL (TY T80PP-RF)
- (Q) MTL W-BEAM GD FEN (TIM POST)
- (R) TY II CONC CURB & GUTTER
- (S) RETAINING WALL
- (T) SAWCUT LINE
- (U) PROP ASPHALT PAVEMENT
- (V) EXIST ASPHALT PAVEMENT
- (W) PGL
- (X) ROCK CUT WALL
- (Y) NOISE WALL

EXIST TRAFFIC FLOW ARROW
PROP TRAFFIC FLOW ARROW
**INSTALL GEOGRID BEFORE THE LAST LIFT OF BASE IS PLACED
****TRF ONLY WHERE SHOWN IN TYP

DESIGN

STATE OF TEXAS — MARISSA GUZMAN — 130772 — LICENSED PROFESSIONAL ENGINEER

MARISSA GUZMAN, P.E.
2/28/2024
DATE

APPROVAL

STATE OF TEXAS — DAN THOMA — 98622 — LICENSED PROFESSIONAL ENGINEER

DAN THOMA, P.E.
2/28/2024
DATE

NOT TO SCALE

PAPE-DAWSON ENGINEERS
SAN ANTONIO | AUSTIN | HOUSTON | FORT WORTH | DALLAS
2000 NW LOOP 410 | SAN ANTONIO, TX 78213 | 210.375.9000
TEXAS ENGINEERING FIRM #470 | TEXAS SURVEYING FIRM #10028800

2024 Texas Department of Transportation

US 183 GPL

PROPOSED TYPICAL SECTIONS

SHEET 6 OF 16

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DS:	CK:	CONT	SECT	JOB	HIGHWAY
		0151	10	001	US 183
DW:	CK:	DIST	COUNTY		SHEET NO.
		AUS	WILLIAMSON		26

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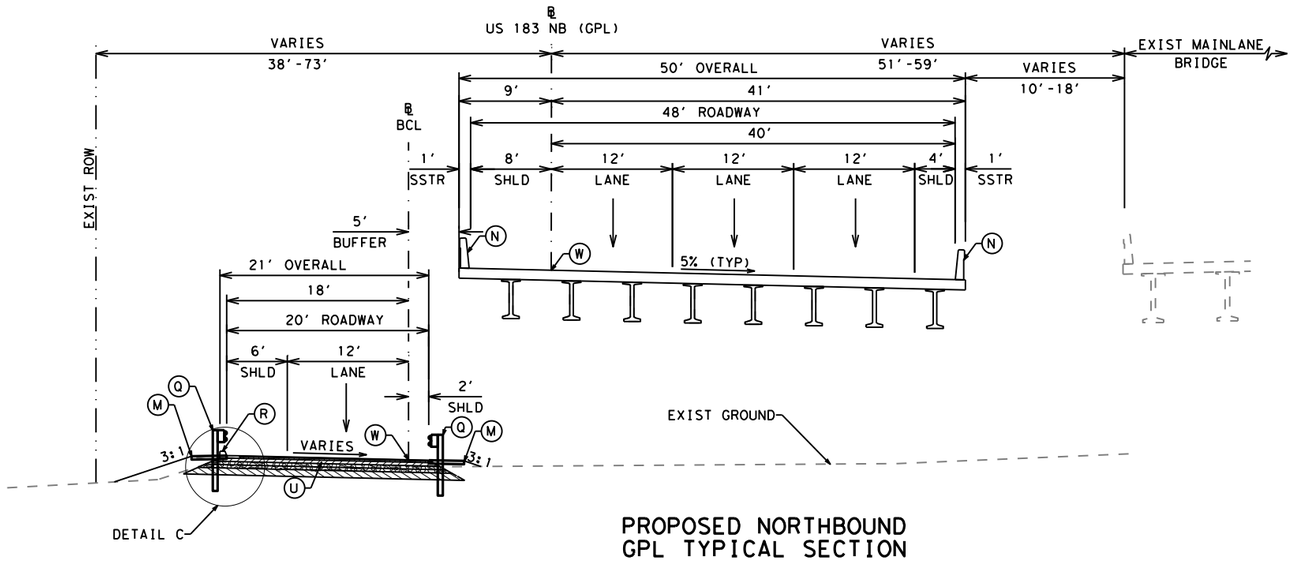
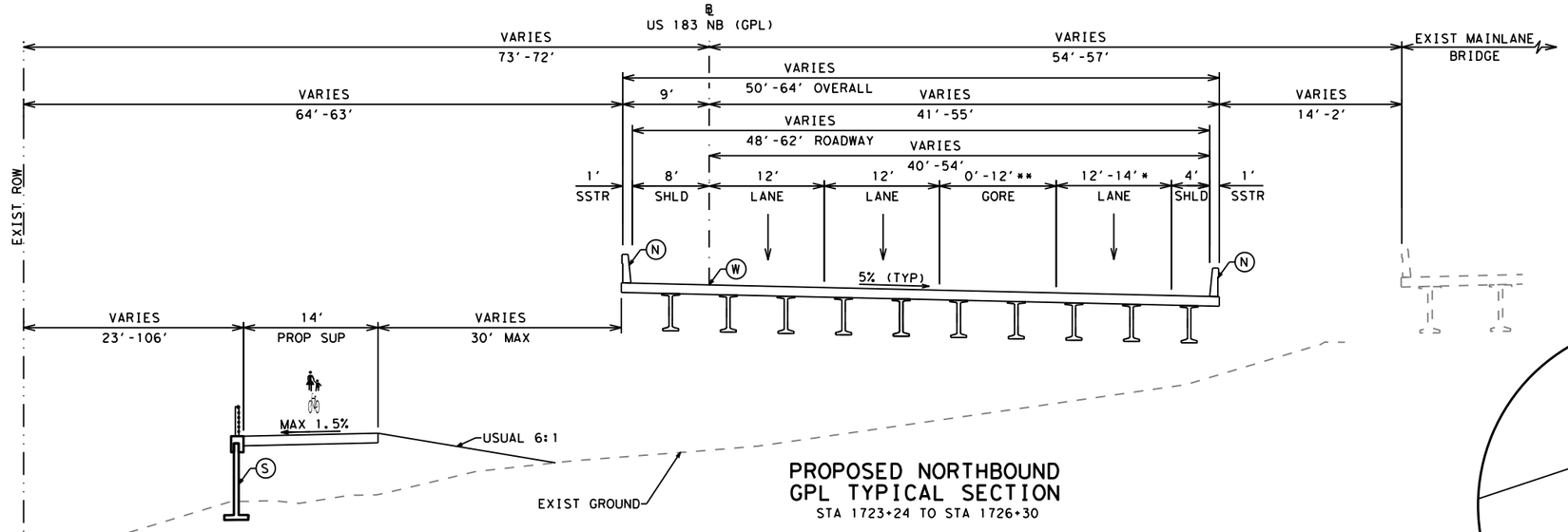


PROPOSED NORTHBOUND GPL TYPICAL SECTION

STA 1717+91 TO STA 1723+24

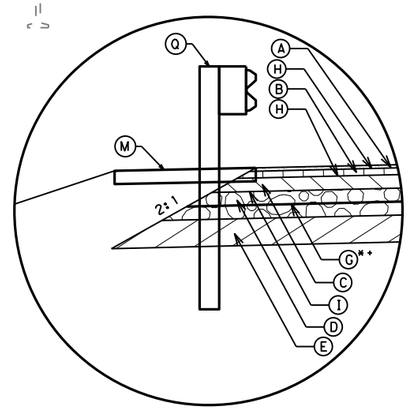


PROPOSED NORTHBOUND GPL TYPICAL SECTION

STA 1723+24 TO STA 1726+30

*LANE TRANSITIONS FROM 12' TO 14' BETWEEN STA 1723+93 AND STA 1724+42

**GORE TRANSITIONS FROM 0' TO 12' BETWEEN STA 1724+42 TO STA 1726+30



DETAIL C

LEGEND

- (A) 1" TOM-C (PG 76-22) SAC B
- (B) 1.5" D-GR TY D (PG 76-22)
- (C) 4" D-GR TY B (PG 64-22)
- (D) 8" FLEXBASE (TY A GR 5)**
- (E) 8" TY C1 SELECT FILL
- (G) GEOGRID BASE REINFORCEMENT (TY II)
- (H) BONDING COURSE
- (I) PRIME COAT
- (J) CONC PVMT (CONT REINF - CRCP)(10.5")
- (K) 5" CONC SUP/SIDEWALKS
- (L) RIPRAP (CONC)(4 IN)
- (M) RIPRAP (MOW STRIP)(4 IN)
- (N) RAIL (TY SSTR) W/ TRF ****
- (O) RAIL (TY T80SS) W/ TRF80
- (P) RAIL (TY T80PP-RF)
- (Q) MTL W-BEAM GD FEN (TIM POST)
- (R) TY II CONC CURB & GUTTER
- (S) RETAINING WALL
- (T) SAWCUT LINE
- (U) PROP ASPHALT PAVEMENT
- (V) EXIST ASPHALT PAVEMENT
- (W) PGL
- (X) ROCK CUT WALL
- (Y) NOISE WALL

EXIST TRAFFIC FLOW ARROW

PROP TRAFFIC FLOW ARROW

**INSTALL GEOGRID BEFORE THE LAST LIFT OF BASE IS PLACED

****TRF ONLY WHERE SHOWN IN TYP

DESIGN

STATE OF TEXAS · MARISSA GUZMAN · 130772 · LICENSED PROFESSIONAL ENGINEER

MARISSA GUZMAN, P.E.

2/28/2024

DATE

APPROVAL

STATE OF TEXAS · DAN THOMA · 98622 · LICENSED PROFESSIONAL ENGINEER

DAN THOMA, P.E.

2/28/2024

DATE

NOT TO SCALE

PAPE-DAWSON ENGINEERS

SAN ANTONIO | AUSTIN | HOUSTON | FORT WORTH | DALLAS

2000 NW LOOP 410 | SAN ANTONIO, TX 78213 | 210.375.9000

TEXAS ENGINEERING FIRM #470 | TEXAS SURVEYING FIRM #10028800

2024 Texas Department of Transportation

US 183 GPL

PROPOSED TYPICAL SECTIONS

SHEET 7 OF 16

© 2024		CONT	SECT	JOB	HIGHWAY
DS:	CK:	0151	10	001	US 183
		DIST	COUNTY		SHEET NO.
DW:	CK:	AUS	WILLIAMSON		27

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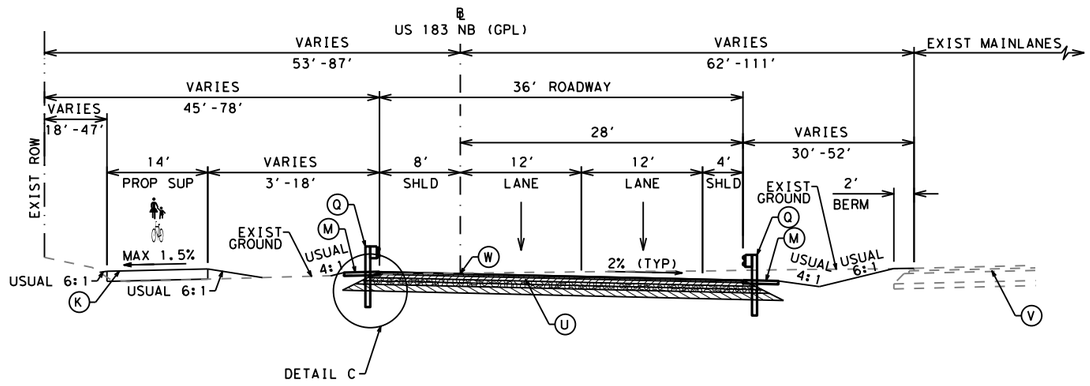
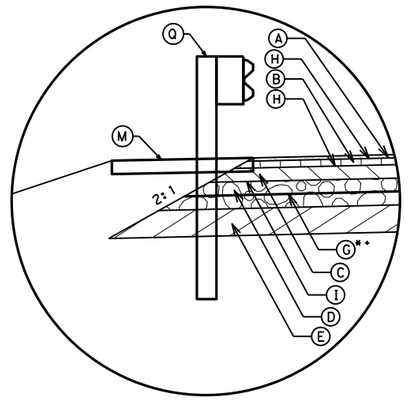


PROPOSED NORTHBOUND GPL TYPICAL SECTION

STA 1731+11 TO STA 1746+80
STA 1753+91 TO STA 1755+50

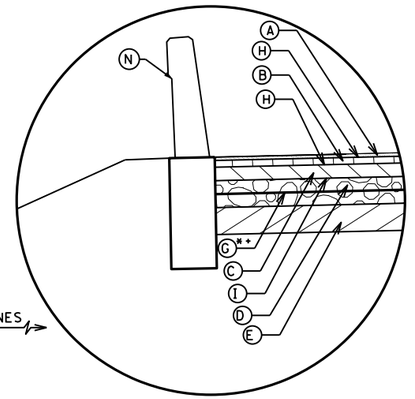


DETAIL C

LEGEND

- (A) 1" TOM-C (PG 76-22) SAC B
- (B) 1.5" D-GR TY D (PG 76-22)
- (C) 4" D-GR TY B (PG 64-22)
- (D) 8" FLEXBASE (TY A GR 5)**
- (E) 8" TY C1 SELECT FILL
- (G) GEOGRID BASE REINFORCEMENT (TY II)
- (H) BONDING COURSE
- (I) PRIME COAT
- (J) CONC PVMT (CONT REINF - CRCP)(10.5")
- (K) 5" CONC SUP/SIDEWALKS
- (L) RIPRAP (CONC)(4 IN)
- (M) RIPRAP (MOW STRIP)(4 IN)
- (N) RAIL (TY SSTR) W/ TRF ****
- (O) RAIL (TY T80SS) W/ TRF80
- (P) RAIL (TY T80PP-RF)
- (Q) MTL W-BEAM GD FEN (TIM POST)
- (R) TY II CONC CURB & GUTTER
- (S) RETAINING WALL
- (T) SAWCUT LINE
- (U) PROP ASPHALT PAVEMENT
- (V) EXIST ASPHALT PAVEMENT
- (W) PGL
- (X) ROCK CUT WALL
- (Y) NOISE WALL

EXIST TRAFFIC FLOW ARROW
PROP TRAFFIC FLOW ARROW
**INSTALL GEOGRID BEFORE THE LAST LIFT OF BASE IS PLACED
****TRF ONLY WHERE SHOWN IN TYP



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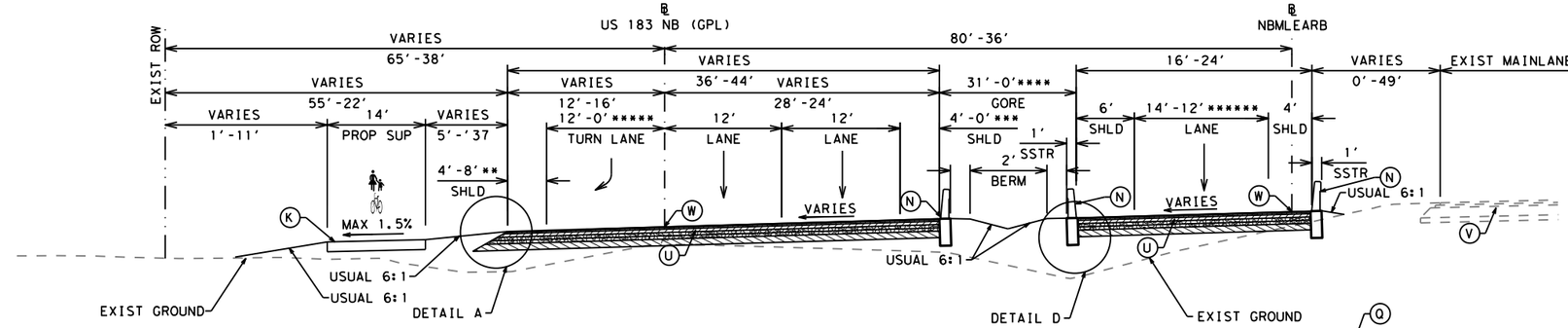
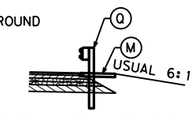


PROPOSED NORTHBOUND GPL TYPICAL SECTION

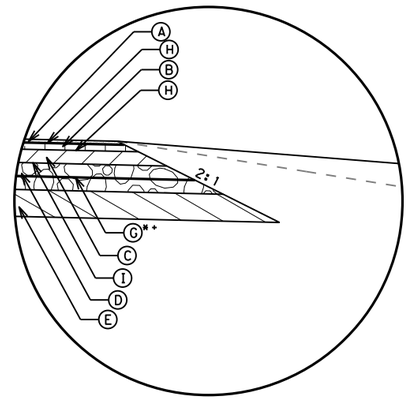
STA 1746+80 TO STA 1753+91



MBGF (NBMLEARB RT)
STA 1750+33.98 1755+50.01

***SHLD TRANSITIONS TO 0' BETWEEN STA 1751+59 AND STA 1753+71

****GORE TRANSITIONS FROM 31' TO 0' BETWEEN STA 1746+80 AND STA 1753+71
*****TURN LANE TRANSITIONS FROM 12' TO 0' BETWEEN STA 1751+81.80 AND STA 1752+81.80
******LANE TRANSITIONS FROM 14'-0' BETWEEN STA 1752+10 AND STA 1753+91



DETAIL A

DESIGN

MARISSA GUZMAN, P.E.
2/28/2024
DATE

APPROVAL

DAN THOMA, P.E.
2/28/2024
DATE

NOT TO SCALE

PAPE-DAWSON ENGINEERS
SAN ANTONIO | AUSTIN | HOUSTON | FORT WORTH | DALLAS
2000 NW LOOP 410 | SAN ANTONIO, TX 78213 | 210.375.9000
TEXAS ENGINEERING FIRM #470 | TEXAS SURVEYING FIRM #10028800

2024 Texas Department of Transportation

US 183 GPL

PROPOSED TYPICAL SECTIONS

SHEET 8 OF 16

© 2024		CONT	SECT	JOB	HIGHWAY
DS:	CK:	0151	10	001	US 183
		DIST	COUNTY		SHEET NO.
DW:	CK:	AUS	WILLIAMSON		28

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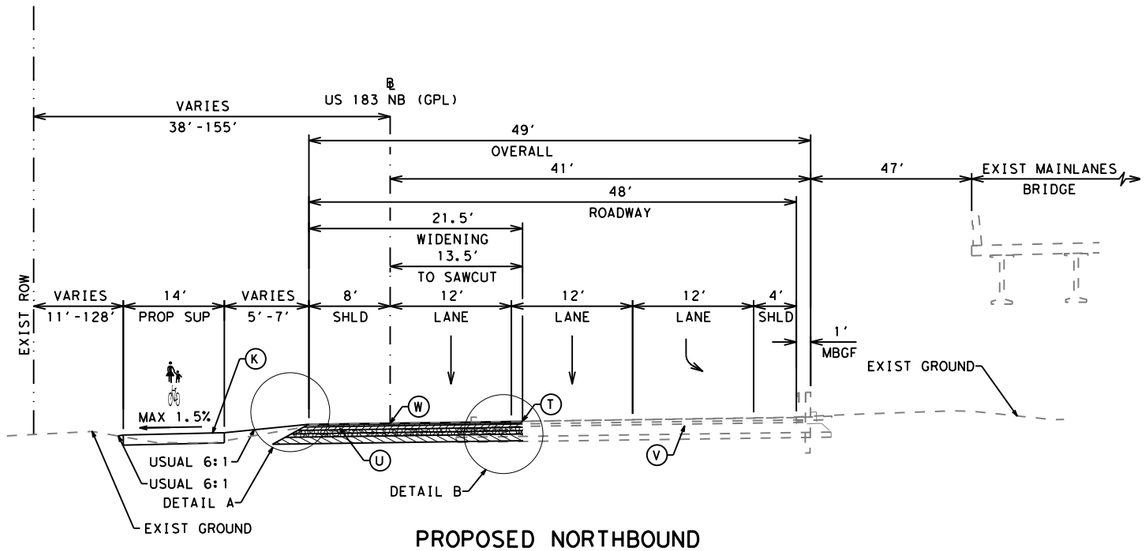


PROPOSED NORTHBOUND GPL TYPICAL SECTION

STA 1755+50 TO STA 1758+29.53

LEGEND

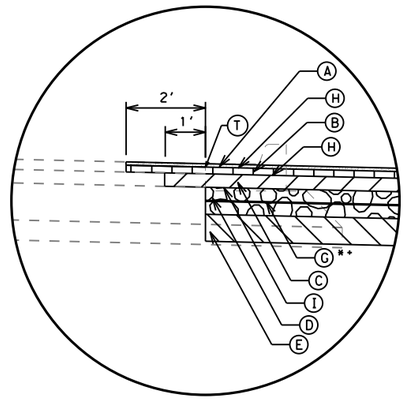
- (A) 1" TOM-C (PG 76-22) SAC B
- (B) 1.5" D-GR TY D (PG 76-22)
- (C) 4" D-GR TY B (PG 64-22)
- (D) 8" FLEXBASE (TY A GR 5)**
- (E) 8" TY C1 SELECT FILL
- (G) GEOGRID BASE REINFORCEMENT (TY II)
- (H) BONDING COURSE
- (I) PRIME COAT
- (J) CONC PVMT (CONT REINF - CRCP)(10.5")
- (K) 5" CONC SUP/SIDEWALKS
- (L) RIPRAP (CONC)(4 IN)
- (M) RIPRAP (MOW STRIP)(4 IN)
- (N) RAIL (TY SSTR) W/ TRF ****
- (O) RAIL (TY T80SS) W/ TRF80
- (P) RAIL (TY T80PP-RF)
- (Q) MTL W-BEAM GD FEN (TIM POST)
- (R) TY II CONC CURB & GUTTER
- (S) RETAINING WALL
- (T) SAWCUT LINE
- (U) PROP ASPHALT PAVEMENT
- (V) EXIST ASPHALT PAVEMENT
- (W) PGL
- (X) ROCK CUT WALL
- (Y) NOISE WALL

EXIST TRAFFIC FLOW ARROW

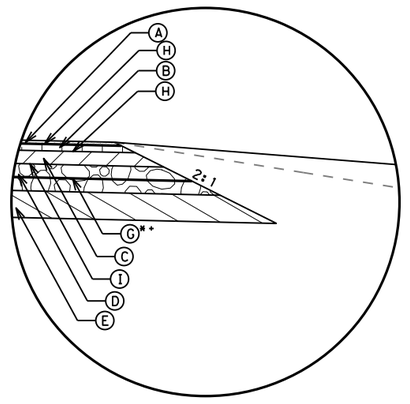
PROP TRAFFIC FLOW ARROW

**INSTALL GEOGRID BEFORE THE LAST LIFT OF BASE IS PLACED

****TRF ONLY WHERE SHOWN IN TYP



DETAIL B



DETAIL A

DESIGN

STATE OF TEXAS
MARISSA GUZMAN
130772
LICENSED
PROFESSIONAL ENGINEER

MARISSA GUZMAN, P.E.

2/28/2024
DATE

APPROVAL

STATE OF TEXAS
DAN THOMA
98622
LICENSED
PROFESSIONAL ENGINEER

DAN THOMA, P.E.

2/28/2024
DATE

NOT TO SCALE

PAPE-DAWSON ENGINEERS
SAN ANTONIO | AUSTIN | HOUSTON | FORT WORTH | DALLAS
2000 NW LOOP 410 | SAN ANTONIO, TX 78213 | 210.375.9000
TEXAS ENGINEERING FIRM #470 | TEXAS SURVEYING FIRM #10028800

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US 183 GPL

PROPOSED TYPICAL SECTIONS

SHEET 9 OF 16

DS:	CK:	CONT	SECT	JOB	HIGHWAY
DW:	CK:	0151	10	001	US 183
		DIST	COUNTY		SHEET NO.
		AUS	WILLIAMSON		29

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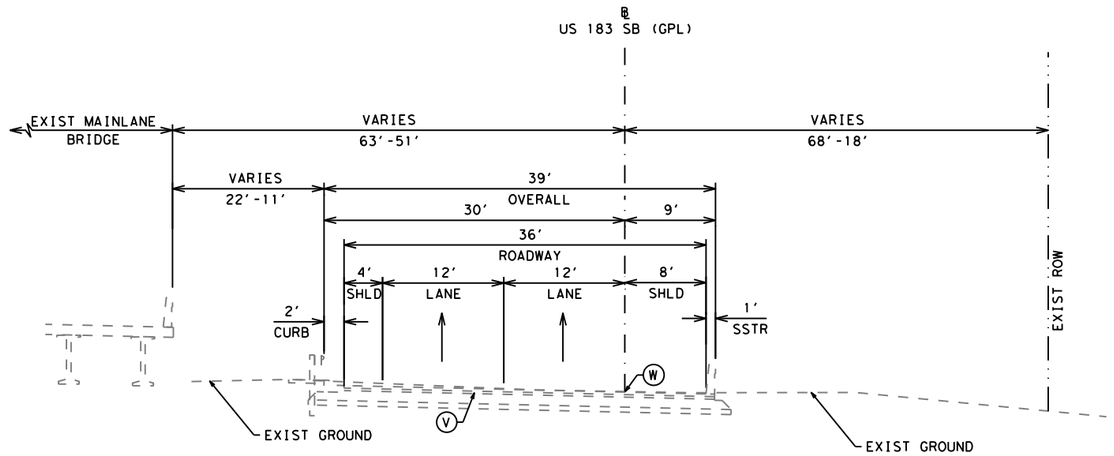
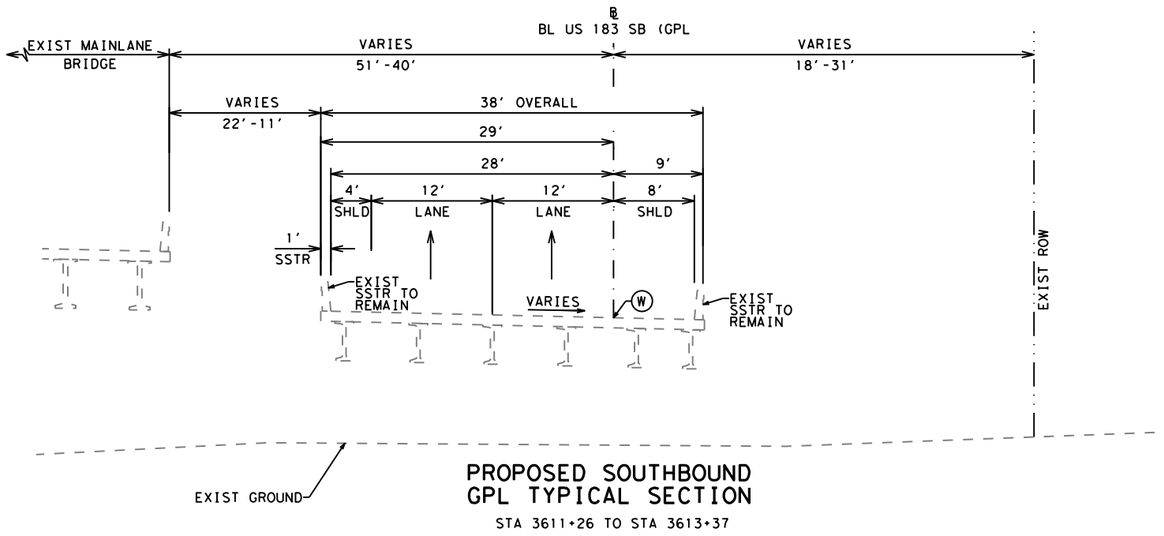


PROPOSED SOUTHBOUND GPL TYPICAL SECTION

STA 3609+14 TO STA 3611+26



PROPOSED SOUTHBOUND GPL TYPICAL SECTION

STA 3611+26 TO STA 3613+37

LEGEND

- (A) 1" TOM-C (PG 76-22) SAC B
- (B) 1.5" D-GR TY D (PG 76-22)
- (C) 4" D-GR TY B (PG 64-22)
- (D) 8" FLEXBASE (TY A GR 5)**
- (E) 8" TY C1 SELECT FILL
- (G) GEOGRID BASE REINFORCEMENT (TY II)
- (H) BONDING COURSE
- (I) PRIME COAT
- (J) CONC PVMT (CONT REINF - CRCP)(10.5")
- (K) 5" CONC SUP/SIDEWALKS
- (L) RIPRAP (CONC)(4 IN)
- (M) RIPRAP (MOW STRIP)(4 IN)
- (N) RAIL (TY SSTR) W/ TRF ****
- (O) RAIL (TY T80SS) W/ TRF80
- (P) RAIL (TY T80PP-RF)
- (Q) MTL W-BEAM GD FEN (TIM POST)
- (R) TY II CONC CURB & GUTTER
- (S) RETAINING WALL
- (T) SAWCUT LINE
- (U) PROP ASPHALT PAVEMENT
- (V) EXIST ASPHALT PAVEMENT
- (W) PGL
- (X) ROCK CUT WALL
- (Y) NOISE WALL

EXIST TRAFFIC FLOW ARROW
PROP TRAFFIC FLOW ARROW

**INSTALL GEOGRID BEFORE THE LAST LIFT OF BASE IS PLACED

****TRF ONLY WHERE SHOWN IN TYP

DESIGN

STATE OF TEXAS
MARISSA GUZMAN
130772
LICENSED
PROFESSIONAL ENGINEER

MARISSA GUZMAN, P.E.
2/28/2024
DATE

APPROVAL

STATE OF TEXAS
DAN THOMA
98622
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TEXAS ENGINEERING FIRM #470 | TEXAS SURVEYING FIRM #10028800

2024
Texas Department of Transportation

US 183 GPL

PROPOSED TYPICAL SECTIONS

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DS:	CK:	CONT	SECT	JOB	HIGHWAY
DW:	CK:	0151	10	001	US 183
		DIST	COUNTY		SHEET NO.
		AUS	WILLIAMSON		30

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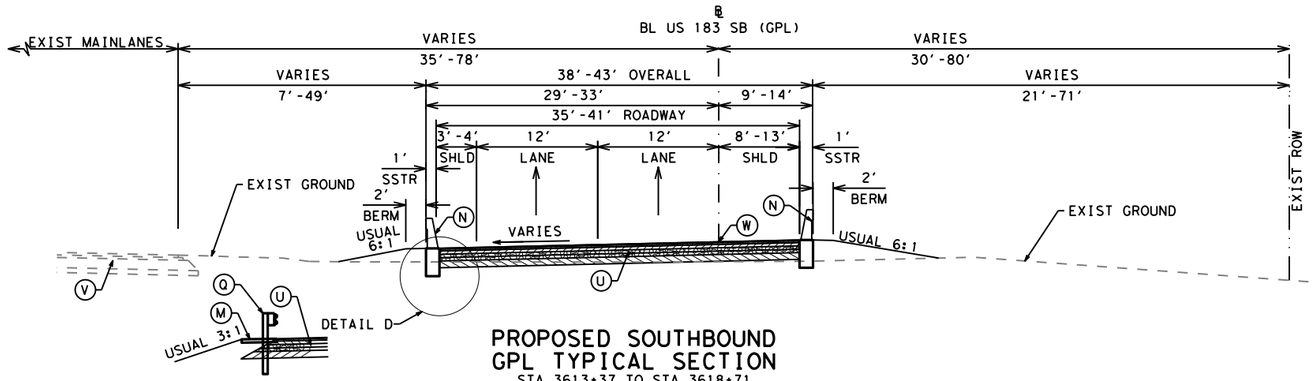


MBGF DETAIL

STA 3736+53 TO STA 3738+00
STA 3627+27 TO STA 3631+91.73

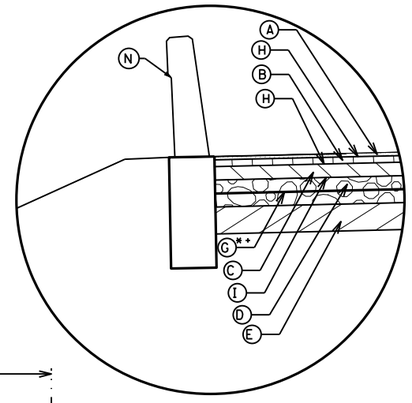
PROPOSED SOUTHBOUND GPL TYPICAL SECTION

STA 3613+37 TO STA 3618+71
STA 3627+27 TO STA 3632+10
STA 3638+63 TO STA 3644+47
STA 3652+60 TO STA 3655+80
STA 3733+53 TO STA 3740+69

LEGEND

- (A) 1" TOM-C (PG 76-22) SAC B
- (B) 1.5" D-GR TY D (PG 76-22)
- (C) 4" D-GR TY B (PG 64-22)
- (D) 8" FLEXBASE (TY A GR 5)**
- (E) 8" TY C1 SELECT FILL
- (G) GEOGRID BASE REINFORCEMENT (TY II)
- (H) BONDING COURSE
- (I) PRIME COAT
- (J) CONC PVMT (CONT REINF - CRCP)(10.5")
- (K) 5" CONC SUP/SIDEWALKS
- (L) RIPRAP (CONC)(4 IN)
- (M) RIPRAP (MOW STRIP)(4 IN)
- (N) RAIL (TY SSTR) W/ TRF ****
- (O) RAIL (TY T80SS) W/ TRF80
- (P) RAIL (TY T80PP-RF)
- (Q) MTL W-BEAM GD FEN (TIM POST)
- (R) TY II CONC CURB & GUTTER
- (S) RETAINING WALL
- (T) SAWCUT LINE
- (U) PROP ASPHALT PAVEMENT
- (V) EXIST ASPHALT PAVEMENT
- (W) PGL
- (X) ROCK CUT WALL
- (Y) NOISE WALL

EXIST TRAFFIC FLOW ARROW
PROP TRAFFIC FLOW ARROW
**INSTALL GEOGRID BEFORE THE LAST LIFT OF BASE IS PLACED
****TRF ONLY WHERE SHOWN IN TYP



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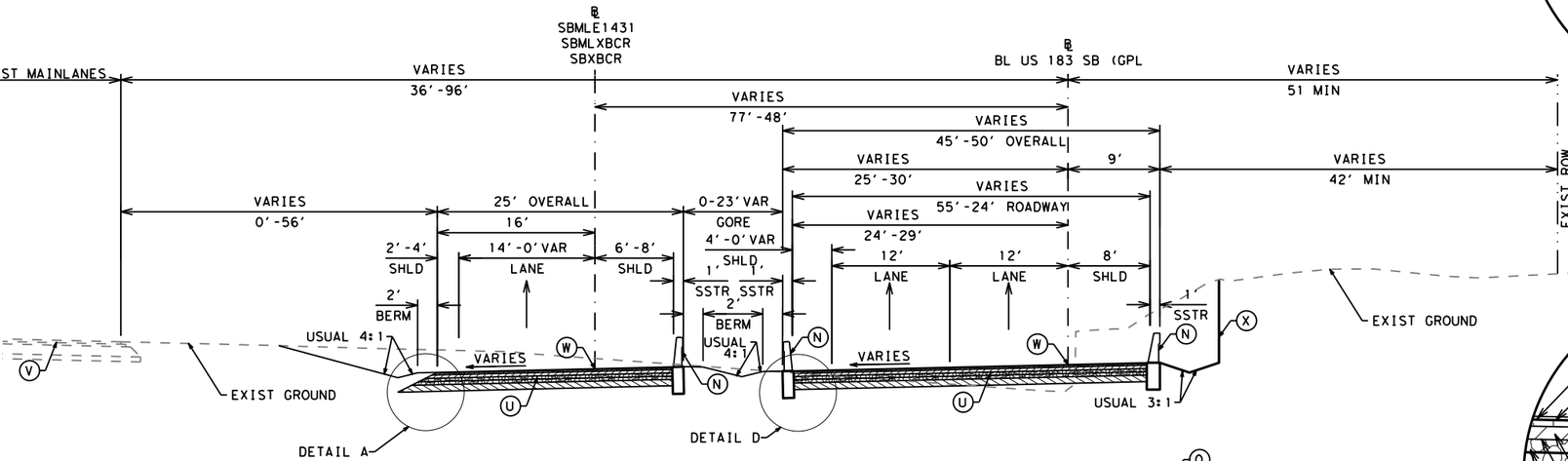
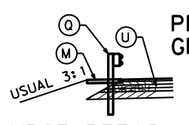


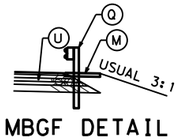


PROPOSED SOUTHBOUND GPL TYPICAL SECTION

STA 3618+71 TO STA 3627+27
STA 3655+80 TO STA 3678+05

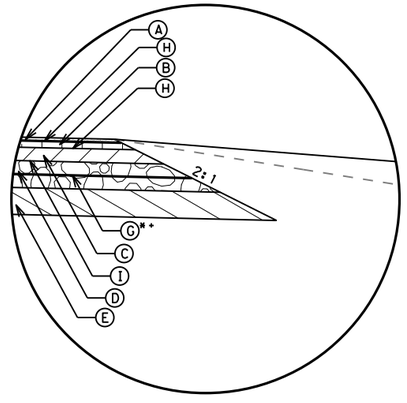
MBGF DETAIL

STA 3626+39.41 TO STA 3627+27
STA 3672+63.42 TO STA 3674+13.13



MBGF DETAIL

STA 3624+57.50 TO STA 3624+82.50



DETAIL A

DESIGN

STATE OF TEXAS
MARISSA GUZMAN
130772
LICENSED
PROFESSIONAL ENGINEER

MARISSA GUZMAN, P.E.
2/28/2024
DATE

APPROVAL

STATE OF TEXAS
DAN THOMA
98622
LICENSED
PROFESSIONAL ENGINEER

DAN THOMA, P.E.
2/28/2024
DATE

NOT TO SCALE

PAPE-DAWSON ENGINEERS
SAN ANTONIO | AUSTIN | HOUSTON | FORT WORTH | DALLAS
2000 NW LOOP 410 | SAN ANTONIO, TX 78213 | 210.375.9000
TEXAS ENGINEERING FIRM #470 | TEXAS SURVEYING FIRM #10028800

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US 183 GPL

PROPOSED TYPICAL SECTIONS

SHEET 11 OF 16

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DS:	CK:	0151	10	001	US 183
		DIST	COUNTY		SHEET NO.
DW:	CK:	AUS	WILLIAMSON		31

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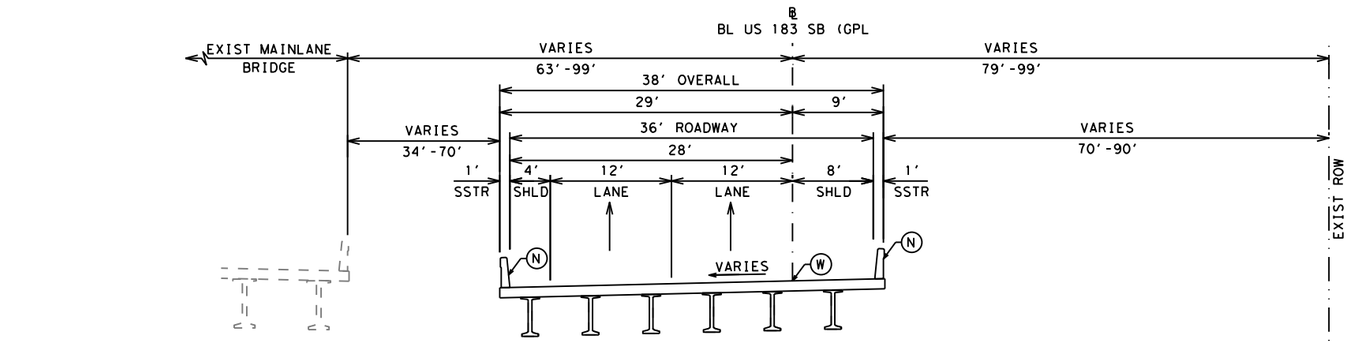
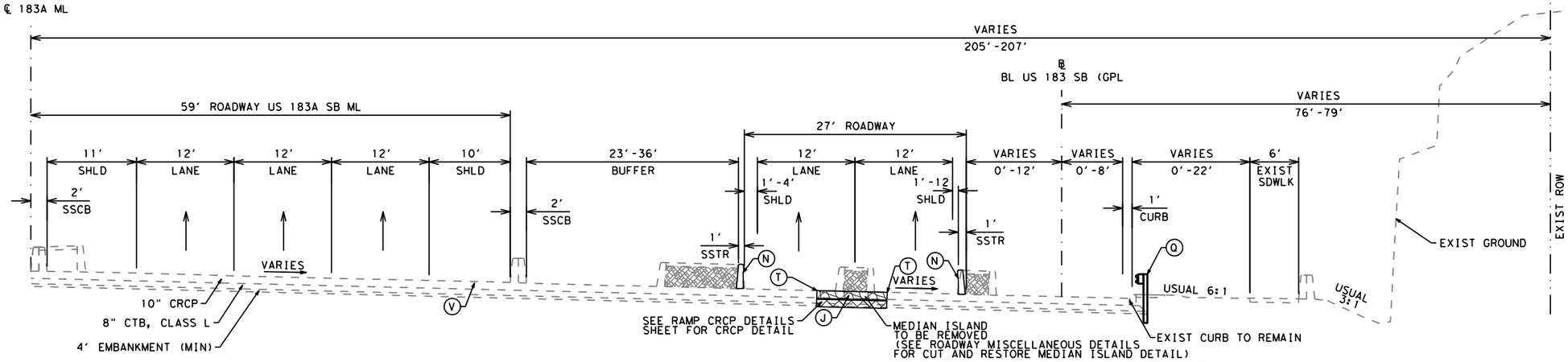


EXIST LOBO WATER QUALITY POND
STA 3636+50 TO STA 3638+50

EXIST GROUND

PROPOSED SOUTHBOUND GPL TYPICAL SECTION

STA 3632+10 TO STA 3638+63
STA 3690+10 TO STA 3694+18



PROP MBGF (RT)

STA 3644+65.25 TO STA 3652+41.58

PROPOSED SOUTHBOUND GPL TYPICAL SECTION

STA 3644+47 TO STA 3652+60

LEGEND

- (A) 1" TOM-C (PG 76-22) SAC B
- (B) 1.5" D-GR TY D (PG 76-22)
- (C) 4" D-GR TY B (PG 64-22)
- (D) 8" FLEXBASE (TY A GR 5)**
- (E) 8" TY C1 SELECT FILL
- (G) GEOGRID BASE REINFORCEMENT (TY II)
- (H) BONDING COURSE
- (I) PRIME COAT
- (J) CONC PVMT (CONT REINF - CRCP)(10.5")
- (K) 5" CONC SUP/SIDEWALKS
- (L) RIPRAP (CONC)(4 IN)
- (M) RIPRAP (MOW STRIP)(4 IN)
- (N) RAIL (TY SSTR) W/ TRF ****
- (O) RAIL (TY T80SS) W/ TRF80
- (P) RAIL (TY T80PP-RF)
- (Q) MTL W-BEAM GD FEN (TIM POST)
- (R) TY II CONC CURB & GUTTER
- (S) RETAINING WALL
- (T) SAWCUT LINE
- (U) PROP ASPHALT PAVEMENT
- (V) EXIST ASPHALT PAVEMENT
- (W) PGL
- (X) ROCK CUT WALL
- (Y) NOISE WALL

EXIST TRAFFIC FLOW ARROW
PROP TRAFFIC FLOW ARROW
**INSTALL GEOGRID BEFORE THE LAST LIFT OF BASE IS PLACED
****TRF ONLY WHERE SHOWN IN TYP

DESIGN

MARISSA GUZMAN
130772
LICENSED PROFESSIONAL ENGINEER
STATE OF TEXAS

MARISSA GUZMAN, P.E.
2/28/2024
DATE

APPROVAL

DAN THOMA
98622
LICENSED PROFESSIONAL ENGINEER
STATE OF TEXAS

DAN THOMA, P.E.
2/28/2024
DATE

NOT TO SCALE

PAPE-DAWSON ENGINEERS
SAN ANTONIO | AUSTIN | HOUSTON | FORT WORTH | DALLAS
2000 NW LOOP 410 | SAN ANTONIO, TX 78213 | 210.375.9000
TEXAS ENGINEERING FIRM #470 | TEXAS SURVEYING FIRM #10028800

2024
Texas Department of Transportation

US 183 GPL

PROPOSED TYPICAL SECTIONS

SHEET 12 OF 16

© 2024		CONT	SECT	JOB	HIGHWAY
DS:	CK:	0151	10	001	US 183
		DIST	COUNTY		SHEET NO.
DW:	CK:	AUS	WILLIAMSON		32

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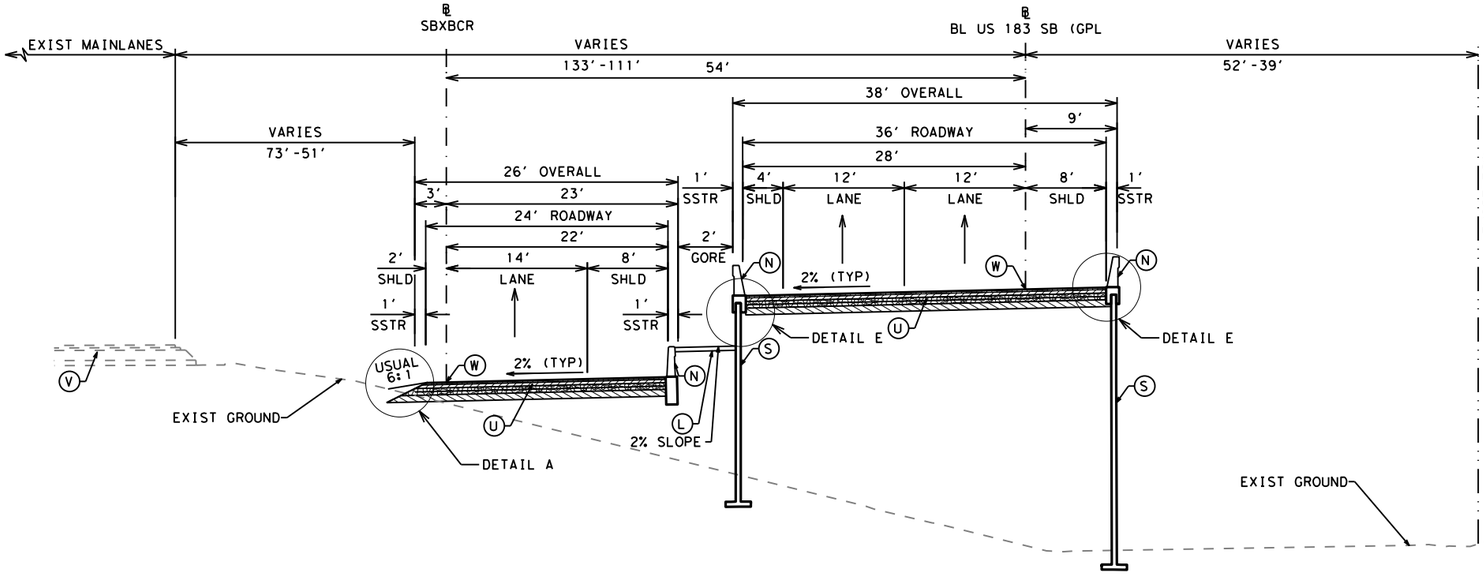
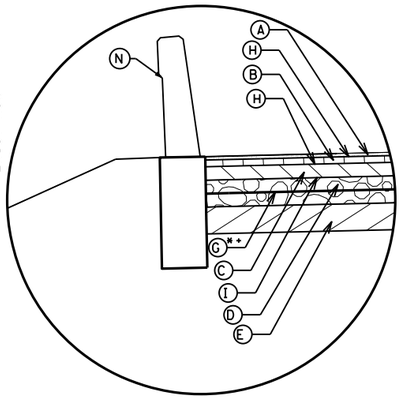


PROPOSED SOUTHBOUND GPL TYPICAL SECTION

STA 3678+05 TO STA 3683+58

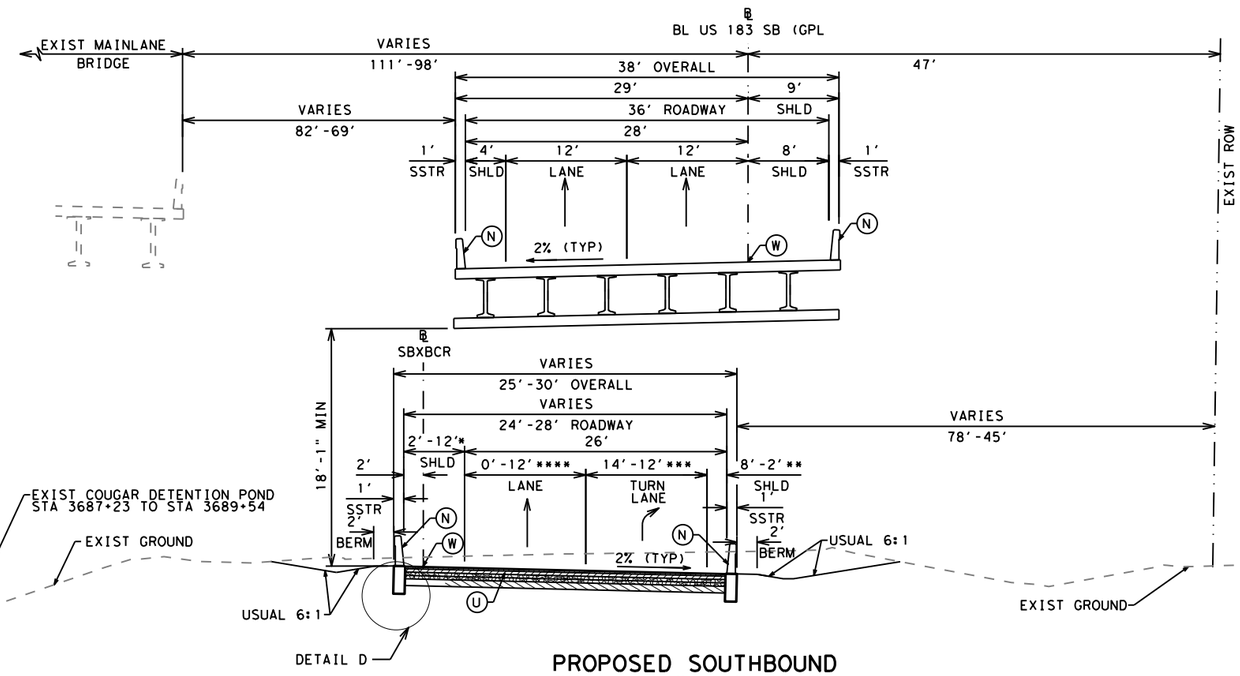


DETAIL D

LEGEND

- (A) 1" TOM-C (PG 76-22) SAC B
- (B) 1.5" D-GR TY D (PG 76-22)
- (C) 4" D-GR TY B (PG 64-22)
- (D) 8" FLEXBASE (TY A GR 5)**
- (E) 8" TY C1 SELECT FILL
- (G) GEOGRID BASE REINFORCEMENT (TY II)
- (H) BONDING COURSE
- (I) PRIME COAT
- (J) CONC PVMT (CONT REINF - CRCP)(10.5")
- (K) 5" CONC SUP/SIDEWALKS
- (L) RIPRAP (CONC)(4 IN)
- (M) RIPRAP (MOW STRIP)(4 IN)
- (N) RAIL (TY SSTR) W/ TRF ****
- (O) RAIL (TY T80SS) W/ TRF80
- (P) RAIL (TY T80PP-RF)
- (Q) MTL W-BEAM GD FEN (TIM POST)
- (R) TY II CONC CURB & GUTTER
- (S) RETAINING WALL
- (T) SAWCUT LINE
- (U) PROP ASPHALT PAVEMENT
- (V) EXIST ASPHALT PAVEMENT
- (W) PGL
- (X) ROCK CUT WALL
- (Y) NOISE WALL

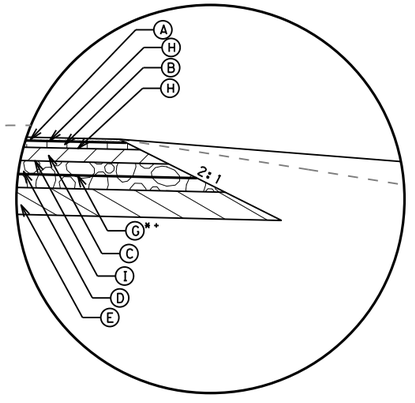
EXIST TRAFFIC FLOW ARROW
PROP TRAFFIC FLOW ARROW
**INSTALL GEOGRID BEFORE THE LAST LIFT OF BASE IS PLACED
****TRF ONLY WHERE SHOWN IN TYP



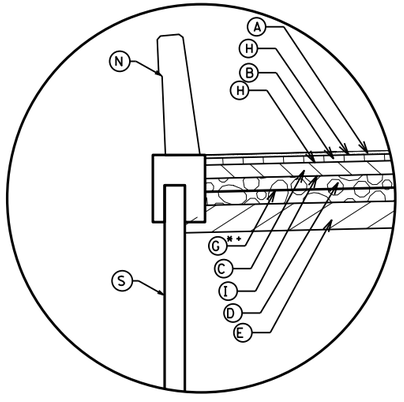
PROPOSED SOUTHBOUND GPL TYPICAL SECTION

STA 3683+58 TO STA 3690+10

*SHLD TRANSITIONS FROM 2' TO 12' BETWEEN STA 3688+59 TO STA 3689+94
**SHLD TRANSITIONS FROM 8' TO 2' BETWEEN STA 3683+53 AND STA 3686+27
***LANE TRANSITIONS FROM 14' TO 12' BETWEEN STA 3684+93 AND STA 3686+69
****LANE TRANSITIONS FROM 0' TO 12' BETWEEN STA 3684+93 AND STA 3686+69



DETAIL A



DETAIL E

DESIGN

STATE OF TEXAS
MARISSA GUZMAN
130772
LICENSED
PROFESSIONAL ENGINEER

MARISSA GUZMAN, P.E.
2/28/2024
DATE

APPROVAL

STATE OF TEXAS
DAN THOMA
98622
LICENSED
PROFESSIONAL ENGINEER

DAN THOMA, P.E.
2/28/2024
DATE

NOT TO SCALE

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SAN ANTONIO | AUSTIN | HOUSTON | FORT WORTH | DALLAS
2000 NW LOOP 410 | SAN ANTONIO, TX 78213 | 210.375.9000
TEXAS ENGINEERING FIRM #470 | TEXAS SURVEYING FIRM #10028800

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US 183 GPL

PROPOSED TYPICAL SECTIONS

SHEET 13 OF 16

© 2024		CONT	SECT	JOB	HIGHWAY
DS:	CK:	0151	10	001	US 183
DW:	CK:	DIST	COUNTY		SHEET NO.
		AUS	WILLIAMSON		33

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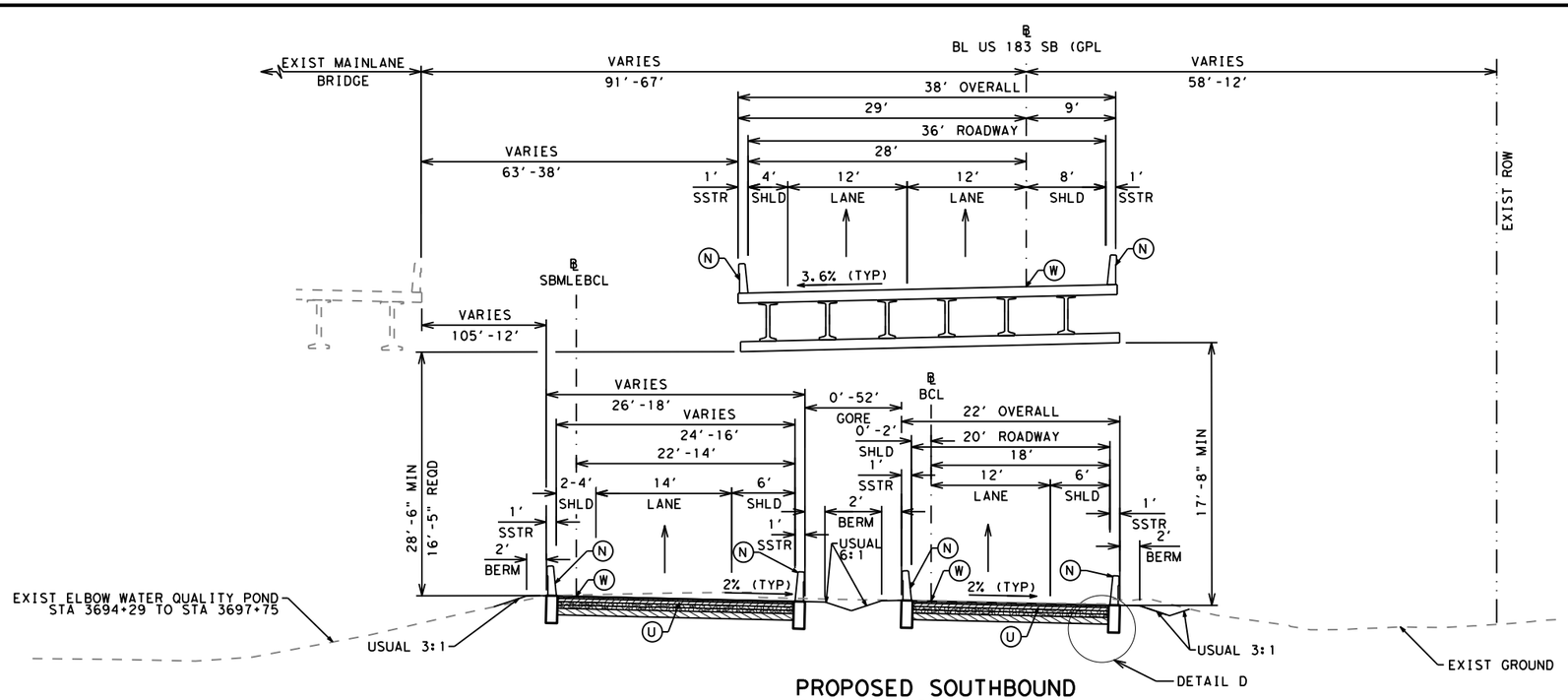
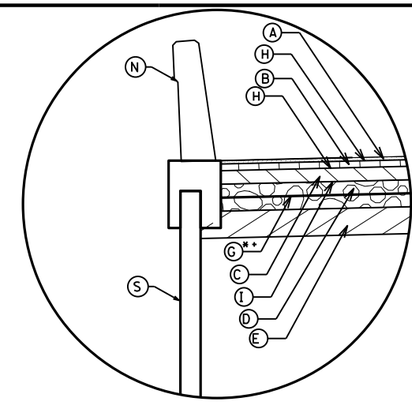


PROPOSED SOUTHBOUND GPL TYPICAL SECTION

STA 3694+18 TO STA 3705+47



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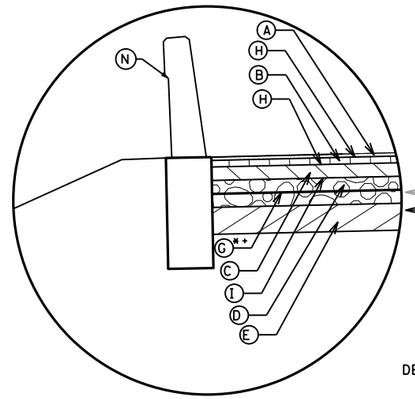


DETAIL D

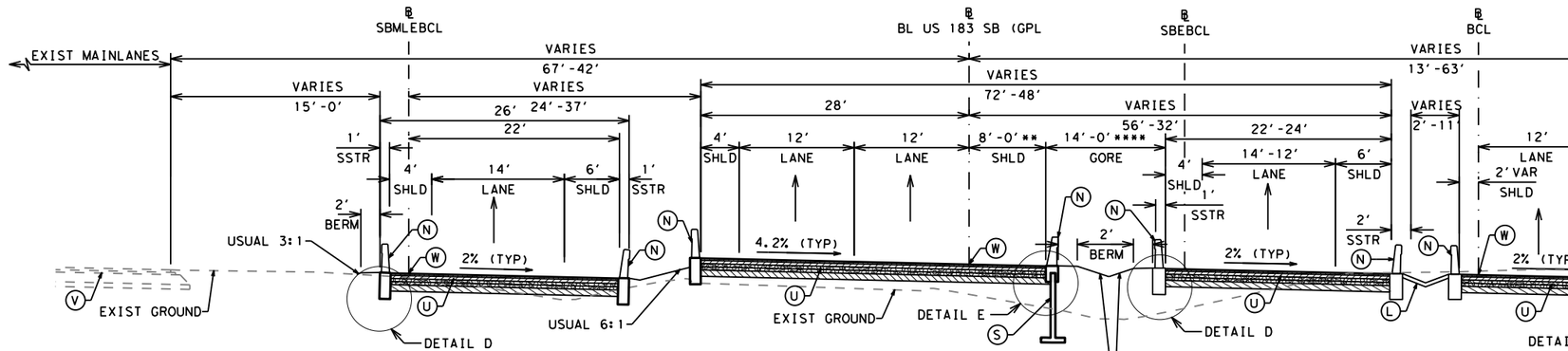
LEGEND

(A)	1" TOM-C (PG 76-22) SAC B
(B)	1.5" D-GR TY D (PG 76-22)
(C)	4" D-GR TY B (PG 64-22)
(D)	8" FLEXBASE (TY A GR 5)**
(E)	8" TY C1 SELECT FILL
(G)	GEOGRID BASE REINFORCEMENT (TY II)
(H)	BONDING COURSE
(I)	PRIME COAT
(J)	CONC PVMT (CONT REINF - CRCP) (10.5")
(K)	5" CONC SUP/SIDEWALKS
(L)	RIPRAP (CONC) (4 IN)
(M)	RIPRAP (MOW STRIP) (4 IN)
(N)	RAIL (TY SSTR) W/ TRF ****
(O)	RAIL (TY T80SS) W/ TRF80
(P)	RAIL (TY T80PP-RF)
(Q)	MTL W-BEAM GD FEN (TIM POST)
(R)	TY II CONC CURB & GUTTER
(S)	RETAINING WALL
(T)	SAWCUT LINE
(U)	PROP ASPHALT PAVEMENT
(V)	EXIST ASPHALT PAVEMENT
(W)	PGL
(X)	ROCK CUT WALL
(Y)	NOISE WALL
(Z)	JOINTED CONC PVMT (JCP) (11")

EXIST TRAFFIC FLOW ARROW
PROP TRAFFIC FLOW ARROW

**INSTALL GEOGRID BEFORE THE LAST LIFT OF BASE IS PLACED

****TRF ONLY WHERE SHOWN IN TYP

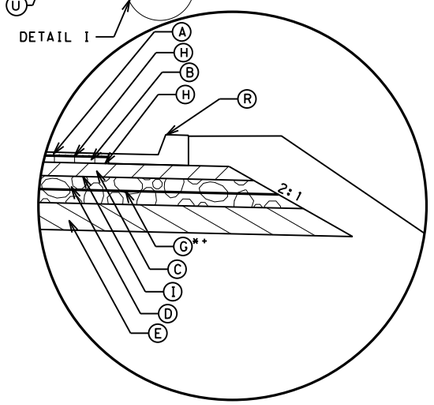


PROPOSED SOUTHBOUND GPL TYPICAL SECTION

STA 3705+47 TO STA 3720+13

**SHLD TRANSITIONS FROM 8' TO 0' BETWEEN STA 3714+15 AND STA 3718+87

****GORE TRANSITIONS FROM 14' TO 0' BETWEEN STA 3714+15 AND STA 3718+87



DETAIL I

DESIGN

STATE OF TEXAS
MARISSA GUZMAN
130772
LICENSED PROFESSIONAL ENGINEER

MARISSA GUZMAN, P.E.
4/16/2024
DATE

APPROVAL

STATE OF TEXAS
DAN THOMA
98622
LICENSED PROFESSIONAL ENGINEER

DAN THOMA, P.E.
4/16/2024
DATE

NOT TO SCALE

PAPE-DAWSON ENGINEERS
SAN ANTONIO | AUSTIN | HOUSTON | FORT WORTH | DALLAS
2000 NW LOOP 410 | SAN ANTONIO, TX 78213 | 210.375.9000
TEXAS ENGINEERING FIRM #470 | TEXAS SURVEYING FIRM #10028800

2024
Texas Department of Transportation

US 183 GPL

PROPOSED TYPICAL SECTIONS

SHEET 14 OF 16

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DS:	CK:	CONT	SECT	JOB	HIGHWAY
		0151	10	001	US 183
DW:	CK:	DIST	COUNTY		SHEET NO.
		AUS	WILLIAMSON		34

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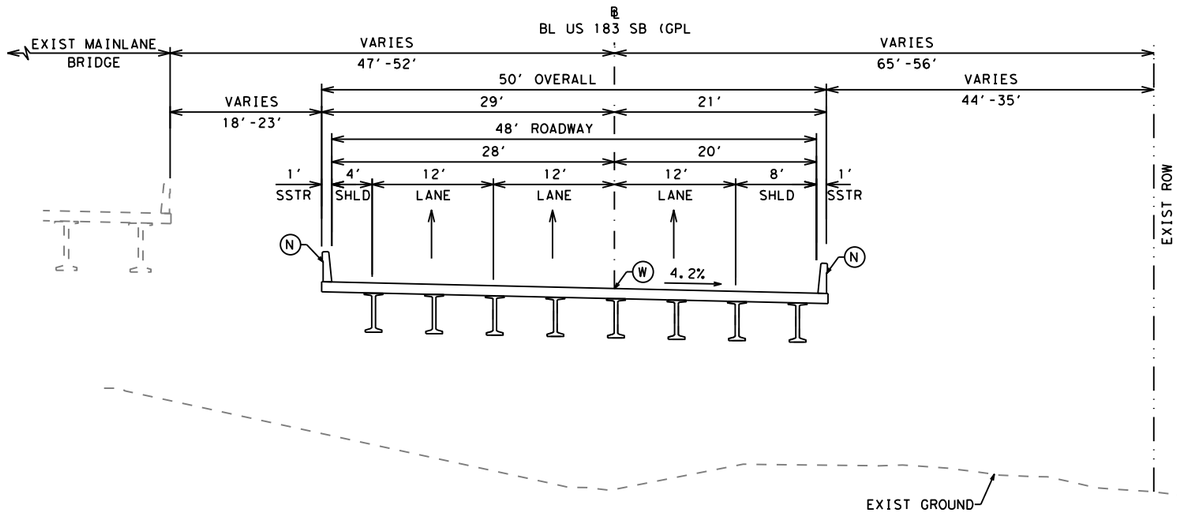
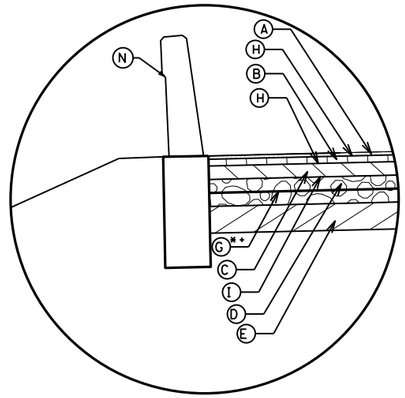


PROPOSED SOUTHBOUND GPL TYPICAL SECTION

STA 3720+13 TO STA 3727+33

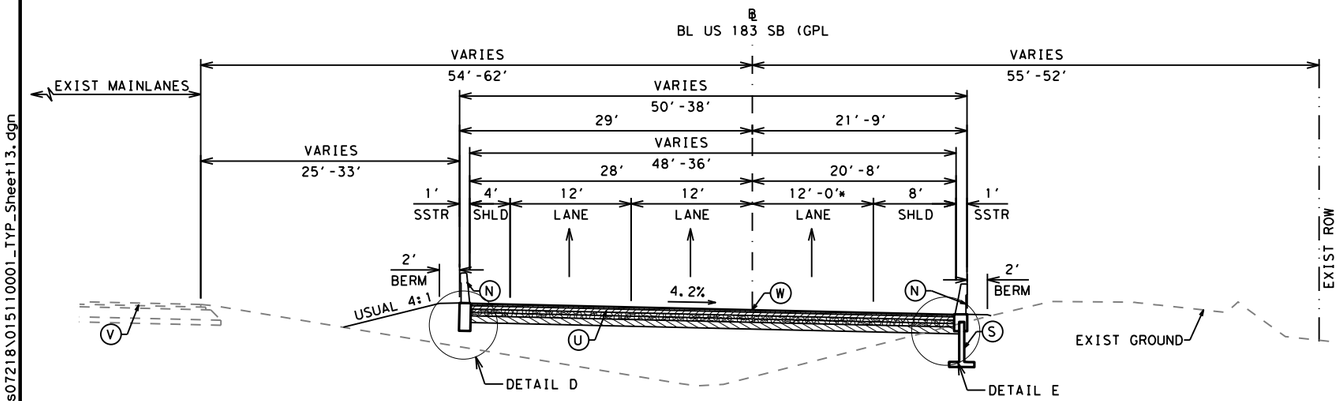


DETAIL D

LEGEND

- (A) 1" TOM-C (PG 76-22) SAC B
- (B) 1.5" D-GR TY D (PG 76-22)
- (C) 4" D-GR TY B (PG 64-22)
- (D) 8" FLEXBASE (TY A GR 5)**
- (E) 8" TY C1 SELECT FILL
- (G) GEOGRID BASE REINFORCEMENT (TY II)
- (H) BONDING COURSE
- (I) PRIME COAT
- (J) CONC PVMT (CONT REINF - CRCP)(10.5")
- (K) 5" CONC SUP/SIDEWALKS
- (L) RIPRAP (CONC)(4 IN)
- (M) RIPRAP (MOW STRIP)(4 IN)
- (N) RAIL (TY SSTR) W/ TRF ****
- (O) RAIL (TY T80SS) W/ TRF80
- (P) RAIL (TY T80PP-RF)
- (Q) MTL W-BEAM GD FEN (TIM POST)
- (R) TY II CONC CURB & GUTTER
- (S) RETAINING WALL
- (T) SAWCUT LINE
- (U) PROP ASPHALT PAVEMENT
- (V) EXIST ASPHALT PAVEMENT
- (W) PGL
- (X) ROCK CUT WALL
- (Y) NOISE WALL

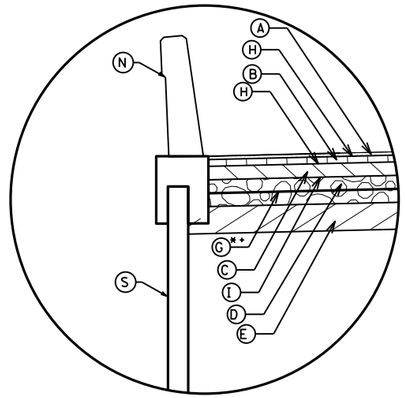
EXIST TRAFFIC FLOW ARROW
PROP TRAFFIC FLOW ARROW
**INSTALL GEOGRID BEFORE THE LAST LIFT OF BASE IS PLACED
****TRF ONLY WHERE SHOWN IN TYP



PROPOSED SOUTHBOUND GPL TYPICAL SECTION

STA 3727+33 TO STA 3733+53

*LANE TRANSITIONS FROM 12' TO 0' BETWEEN STA 3727+90 AND STA 3733+53



DETAIL E

DESIGN

STATE OF TEXAS
MARISSA GUZMAN
130772
LICENSED
PROFESSIONAL ENGINEER

MARISSA GUZMAN, P.E.
2/28/2024
DATE

APPROVAL

STATE OF TEXAS
DAN THOMA
98622
LICENSED
PROFESSIONAL ENGINEER

DAN THOMA, P.E.
2/28/2024
DATE

NOT TO SCALE

PAPE-DAWSON ENGINEERS
SAN ANTONIO | AUSTIN | HOUSTON | FORT WORTH | DALLAS
2000 NW LOOP 410 | SAN ANTONIO, TX 78213 | 210.375.9000
TEXAS ENGINEERING FIRM #470 | TEXAS SURVEYING FIRM #10028800

2024 Texas Department of Transportation

US 183 GPL

PROPOSED TYPICAL SECTIONS

SHEET 15 OF 16

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CONT	SECT	JOB	HIGHWAY
0151	10	001	US 183
DIST	COUNTY		SHEET NO.
AUS	WILLIAMSON		35

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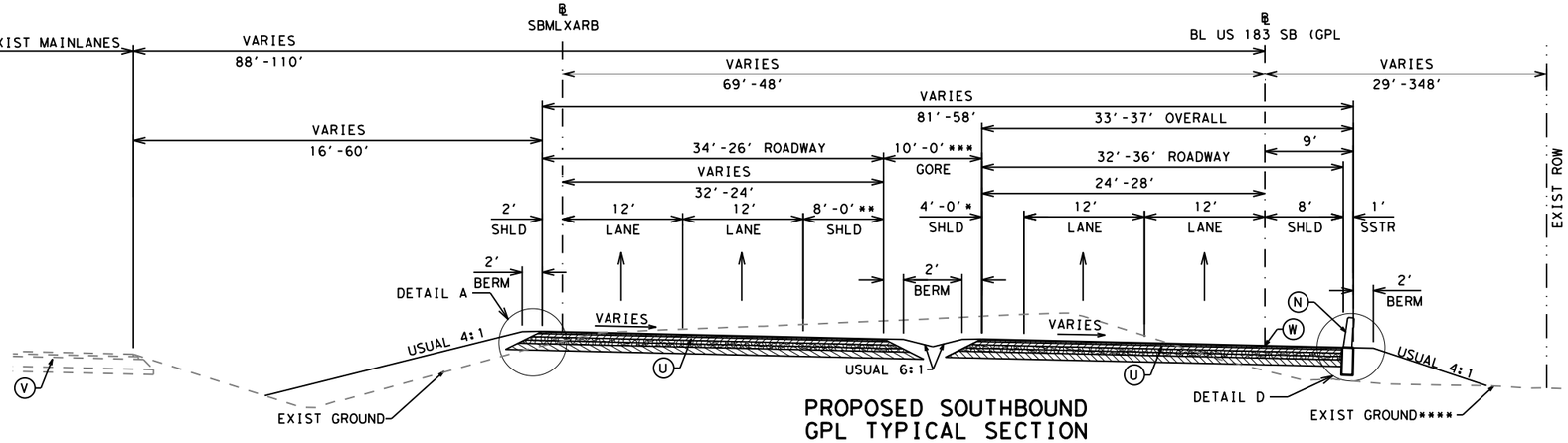
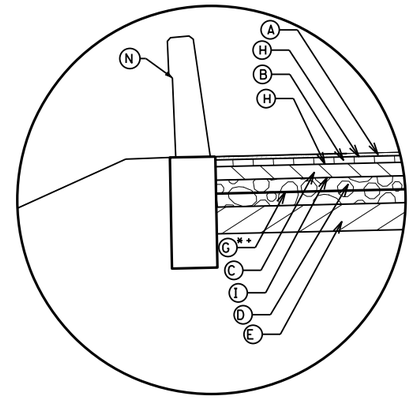


PROPOSED SOUTHBOUND GPL TYPICAL SECTION

STA 3740+69 TO STA 3750+43

*SHLD TRANSITIONS FROM 4' TO 0' BETWEEN STA 3740+69 AND STA 3744+30
**SHLD TRANSITIONS FROM 8' TO 0' BETWEEN STAD 3740+69 AND STA 3744+30
***GORE TRANSITIONS FROM 10'-0' BETWEEN STA 3740+69 AND STA 3744+31
****EXIST BOILERMAKER DETENTION POND AND SPARTAN WATER QUALITY POND STA 3749+58 TO STA 3759+58

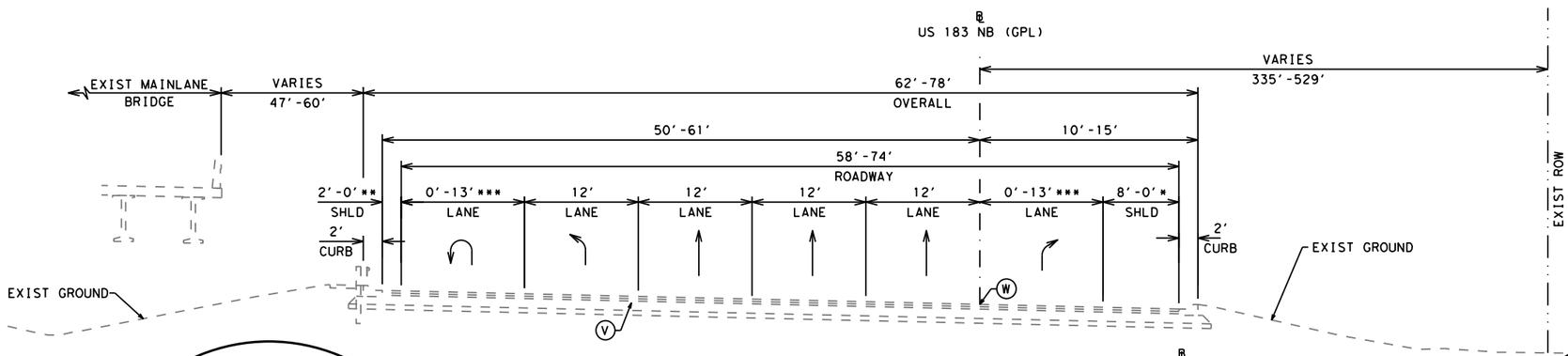


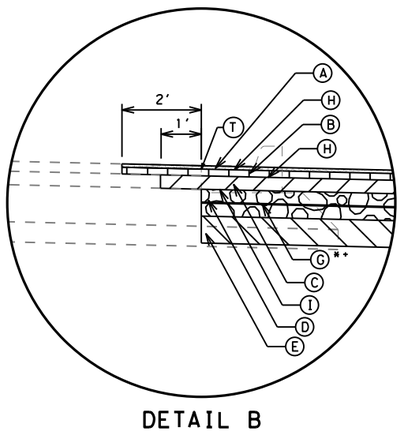
DETAIL D

LEGEND

- (A) 1" TOM-C (PG 76-22) SAC B
- (B) 1.5" D-GR TY D (PG 76-22)
- (C) 4" D-GR TY B (PG 64-22)
- (D) 8" FLEXBASE (TY A GR 5)*+
- (E) 8" TY C1 SELECT FILL
- (G) GEOGRID BASE REINFORCEMENT (TY II)
- (H) BONDING COURSE
- (I) PRIME COAT
- (J) CONC PVMT (CONT REINF - CRCP)(10.5")
- (K) 5" CONC SUP/SIDEWALKS
- (L) RIPRAP (CONC)(4 IN)
- (M) RIPRAP (MOW STRIP)(4 IN)
- (N) RAIL (TY SSTR) W/ TRF ****
- (O) RAIL (TY T80SS) W/ TRF80
- (P) RAIL (TY T80PP-RF)
- (Q) MTL W-BEAM GD FEN (TIM POST)
- (R) TY II CONC CURB & GUTTER
- (S) RETAINING WALL
- (T) SAWCUT LINE
- (U) PROP ASPHALT PAVEMENT
- (V) EXIST ASPHALT PAVEMENT
- (W) PGL
- (X) ROCK CUT WALL
- (Y) NOISE WALL

EXIST TRAFFIC FLOW ARROW
PROP TRAFFIC FLOW ARROW
*+INSTALL GEOGRID BEFORE THE LAST LIFT OF BASE IS PLACED
****TRF ONLY WHERE SHOWN IN TYP



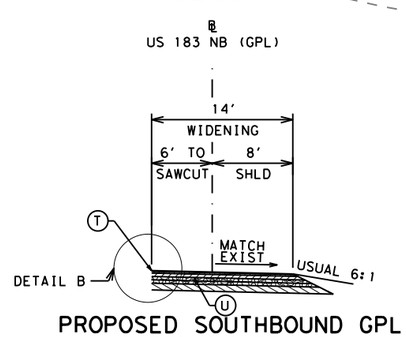


DETAIL B

PROPOSED SOUTHBOUND GPL TYPICAL SECTION

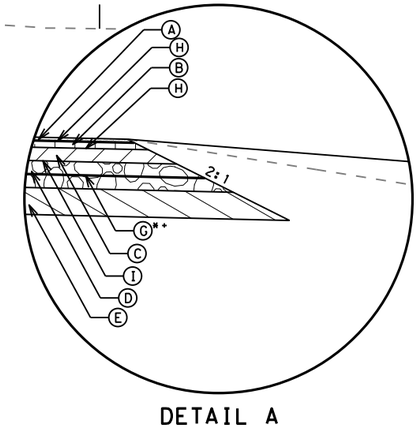
STA 3750+43 TO STA 3759+16

*SHLD TRANSITIONS FROM 2' TO 0' BETWEEN STA 3754+25 AND STA 3755+75
**SHLD TRANSITIONS FROM 8' TO 0' BETWEEN STA 3755+25 AND STA 3756+75
***LANE TRANSITIONS FROM 0' TO 13' BETWEENS STA 3754+25 AND STA 3755+75



PROPOSED SOUTHBOUND GPL WIDENING DETAIL

STA 3750+43 TO STA 3754+93



DETAIL A

DESIGN

STATE OF TEXAS
MARISSA GUZMAN
130772
LICENSED PROFESSIONAL ENGINEER

MARISSA GUZMAN, P.E.
2/28/2024
DATE

APPROVAL

STATE OF TEXAS
DAN THOMA
98622
LICENSED PROFESSIONAL ENGINEER

DAN THOMA, P.E.
2/28/2024
DATE

NOT TO SCALE

PAPE-DAWSON ENGINEERS
SAN ANTONIO | AUSTIN | HOUSTON | FORT WORTH | DALLAS
2000 NW LOOP 410 | SAN ANTONIO, TX 78213 | 210.375.9000
TEXAS ENGINEERING FIRM #470 | TEXAS SURVEYING FIRM #10028800

2024 Texas Department of Transportation

US 183 GPL

PROPOSED TYPICAL SECTIONS

SHEET 16 OF 16

© 2024		CONT	SECT	JOB	HIGHWAY
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		DIST	COUNTY		SHEET NO.
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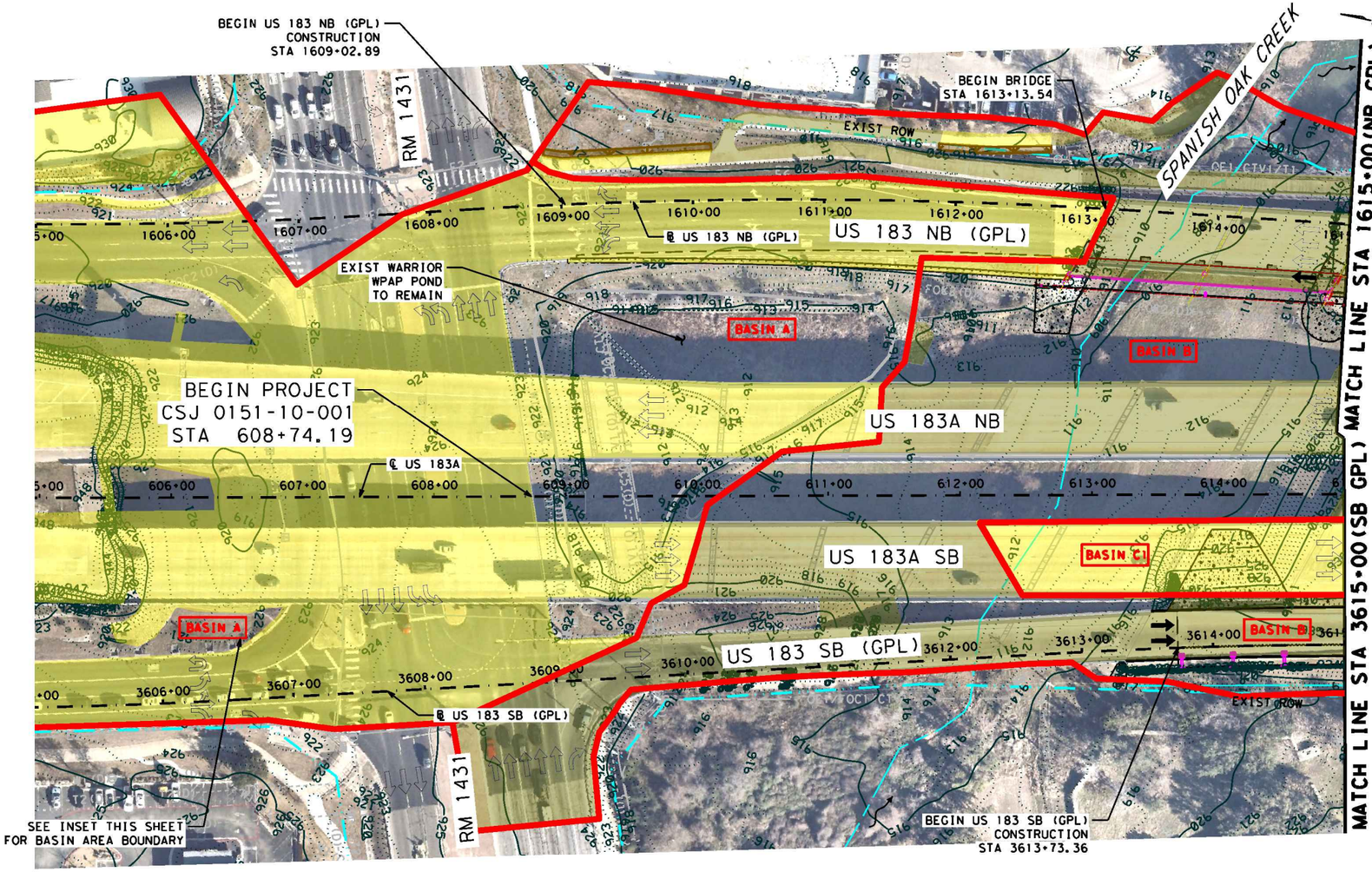

INSET A SCALE: 1"=500'

LEGEND

- 1' CONTOUR INTERVAL
- 5' CONTOUR INTERVAL
- RETAINING WALL
- BMP TREATED AREA
- STREAM FLOW ARROW
- STREAM CENTERLINE
- AREA DRAINING TO POND
- BASIN AREA BOUNDARY
- NON-TREATED OFFSITE IMPERVIOUS COVER
- NON-TREATED ONSITE IMPERVIOUS COVER
- TREATED IMPERVIOUS COVER (ONSITE AND OFFSITE)
- OFFSITE AREA PERMITTED PRIOR TO JUNE 1, 1999.
- PROP VEGETATIVE FILTER STRIP
- EXIST VEGETATIVE FILTER STRIP TO REMAIN
- PROP GRASSY SWALE
- PROP DETENTION POND EXPANSION
- PROPOSED DITCH ℄
- EXISTING DITCH ℄ TO REMAIN

NOTES

GENERAL NOTES:
1. EXISTING FEATURES ARE SHOWN SCREENED BACK; i.e. FADED.
2. SEE DITCH DATA SHEETS FOR DITCH INFORMATION.
3. SEE POND GRADING SHEETS AND POND LAYOUT SHEETS FOR ADDITIONAL POND INFORMATION.

DESIGN

STATE OF TEXAS — BRYAN SIERSMA — 147188 — LICENSED PROFESSIONAL ENGINEER

BRYAN SIERSMA, P.E.
7/2/2024
DATE

APPROVAL

STATE OF TEXAS — DAN THOMA — 98622 — LICENSED PROFESSIONAL ENGINEER

DAN THOMA, P.E.
7/2/2024
DATE

0 50 100 150
SCALE: 1" = 100'

PAPE-DAWSON ENGINEERS
SAN ANTONIO | AUSTIN | HOUSTON | FORT WORTH | DALLAS
2000 NW LOOP 410 | SAN ANTONIO, TX 78213 | 210.375.9000
TEXAS ENGINEERING FIRM #470 | TEXAS SURVEYING FIRM #10028800

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US 183 GPL

WATER QUALITY LAYOUT

SHEET 1 OF 16

© 2024		CONT	SECT	JOB	HIGHWAY
DS:	CK:	0151	10	001	US 183
		DIST	COUNTY		SHEET NO.
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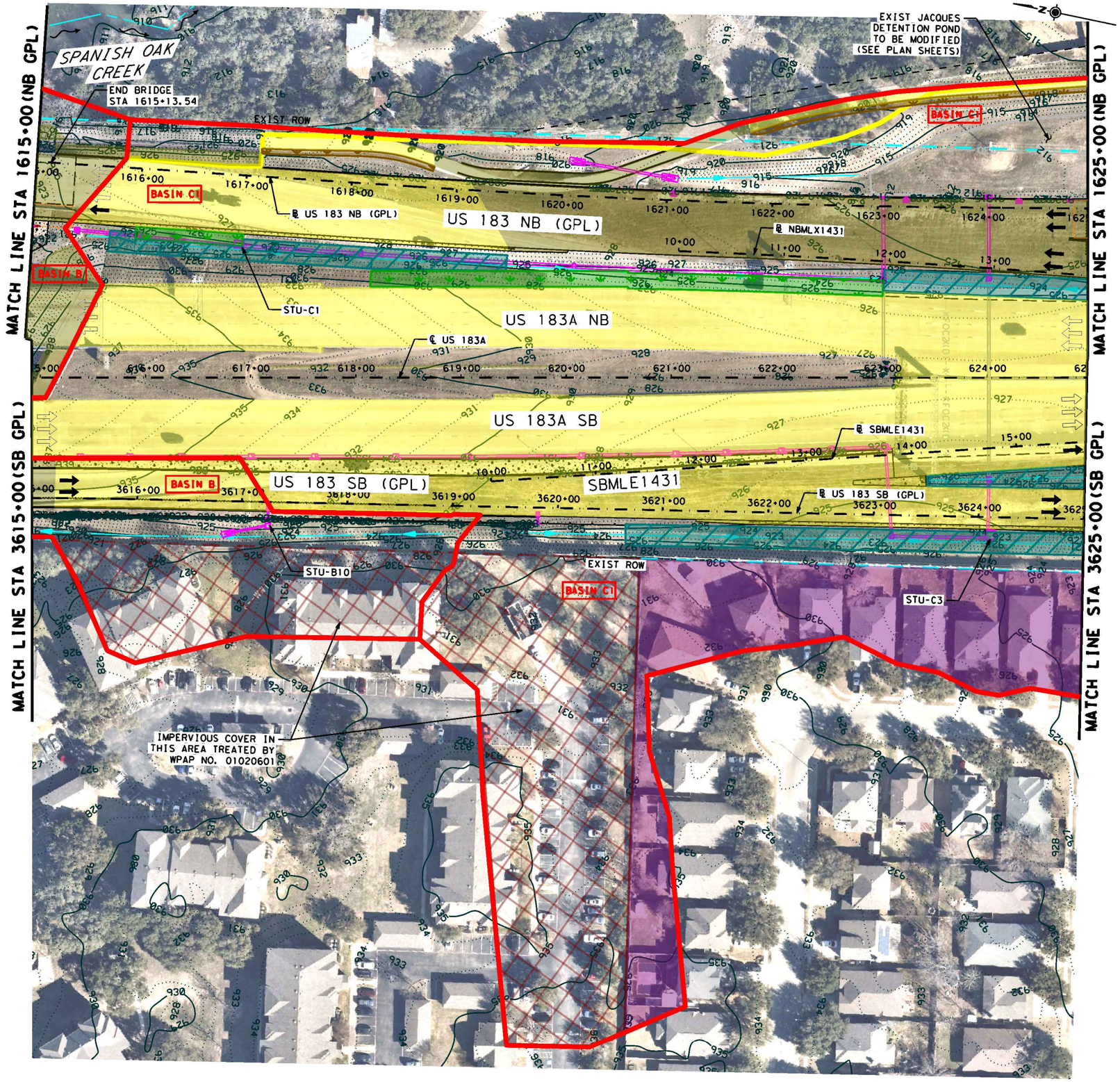

LEGEND

- 1' CONTOUR INTERVAL
- 5' CONTOUR INTERVAL
- RETAINING WALL
- BMP TREATED AREA
- STREAM FLOW ARROW
- STREAM CENTERLINE
- AREA DRAINING TO POND
- BASIN AREA BOUNDARY
- NON-TREATED OFFSITE IMPERVIOUS COVER
- NON-TREATED ONSITE IMPERVIOUS COVER
- TREATED IMPERVIOUS COVER (ONSITE AND OFFSITE)
- OFFSITE AREA PERMITTED PRIOR TO JUNE 1, 1999.
- PROP VEGETATIVE FILTER STRIP
- EXIST VEGETATIVE FILTER STRIP TO REMAIN
- PROP GRASSY SWALE
- PROP DETENTION POND EXPANSION
- PROPOSED DITCH ℄
- EXISTING DITCH ℄ TO REMAIN

NOTES

GENERAL NOTES:
1. EXISTING FEATURES ARE SHOWN SCREENED BACK; i.e. FADED.
2. SEE DITCH DATA SHEETS FOR DITCH INFORMATION.
3. SEE POND GRADING SHEETS AND POND LAYOUT SHEETS FOR ADDITIONAL POND INFORMATION.

DESIGN

BRYAN SIERSMA 147188 LICENSED PROFESSIONAL ENGINEER
BRYAN SIERSMA, P.E.
7/2/2024
DATE

APPROVAL

DAN THOMA 98622 LICENSED PROFESSIONAL ENGINEER
DAN THOMA, P.E.
7/2/2024
DATE

0 50 100 150
SCALE: 1" = 100'

PAPE-DAWSON ENGINEERS
SAN ANTONIO | AUSTIN | HOUSTON | FORT WORTH | DALLAS
2000 NW LOOP 410 | SAN ANTONIO, TX 78213 | 210.375.9000
TEXAS ENGINEERING FIRM #470 | TEXAS SURVEYING FIRM #10028800

2024 Texas Department of Transportation

US 183 GPL

WATER QUALITY LAYOUT

SHEET 2 OF 16

© 2024	CONT	SECT	JOB	HIGHWAY
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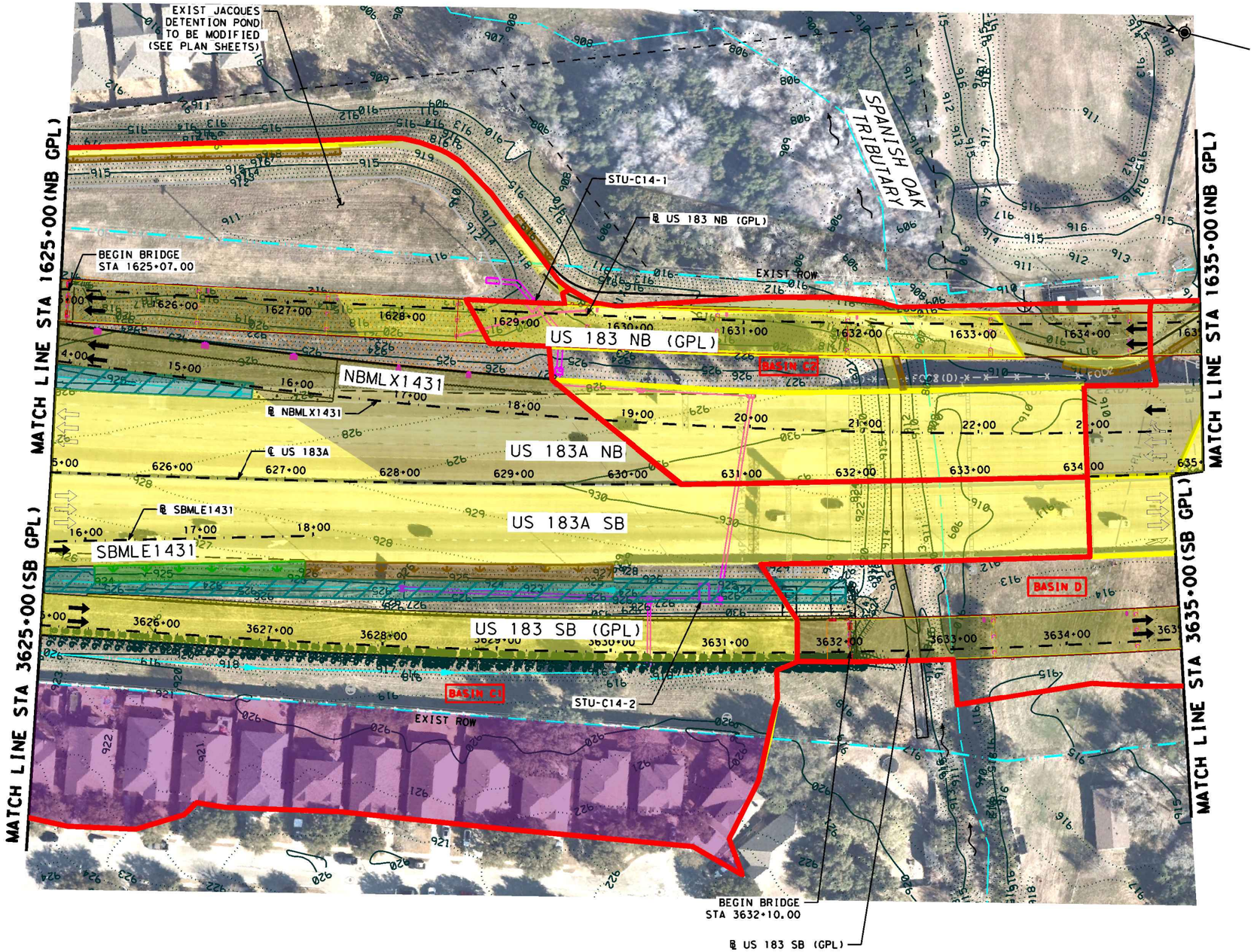

LEGEND

- 1' CONTOUR INTERVAL
- 5' CONTOUR INTERVAL
- RETAINING WALL
- BMP TREATED AREA
- STREAM FLOW ARROW
- STREAM CENTERLINE
- AREA DRAINING TO POND
- BASIN AREA BOUNDARY
- NON-TREATED OFFSITE IMPERVIOUS COVER
- NON-TREATED ONSITE IMPERVIOUS COVER
- TREATED IMPERVIOUS COVER (ONSITE AND OFFSITE)
- OFFSITE AREA PERMITTED PRIOR TO JUNE 1, 1999.
- PROP VEGETATIVE FILTER STRIP
- EXIST VEGETATIVE FILTER STRIP TO REMAIN
- PROP GRASSY SWALE
- PROP DETENTION POND EXPANSION
- PROPOSED DITCH ℄
- EXISTING DITCH ℄ TO REMAIN

NOTES

GENERAL NOTES:
1. EXISTING FEATURES ARE SHOWN SCREENED BACK; i.e. FADED.
2. SEE DITCH DATA SHEETS FOR DITCH INFORMATION.
3. SEE POND GRADING SHEETS AND POND LAYOUT SHEETS FOR ADDITIONAL POND INFORMATION.

DESIGN

STATE OF TEXAS · BRYAN SIERSMA · 147188 · LICENSED PROFESSIONAL ENGINEER

BRYAN SIERSMA, P.E.
7/2/2024
DATE

APPROVAL

STATE OF TEXAS · DAN THOMA · 98622 · LICENSED PROFESSIONAL ENGINEER

DAN THOMA, P.E.
7/2/2024
DATE

0 50 100 150
SCALE: 1" = 100'

PAPE-DAWSON ENGINEERS
SAN ANTONIO | AUSTIN | HOUSTON | FORT WORTH | DALLAS
2000 NW LOOP 410 | SAN ANTONIO, TX 78213 | 210.375.9000
TEXAS ENGINEERING FIRM #470 | TEXAS SURVEYING FIRM #10028800

2024 Texas Department of Transportation

US 183 GPL

WATER QUALITY LAYOUT

SHEET 3 OF 16

© 2024	CONT	SECT	JOB	HIGHWAY
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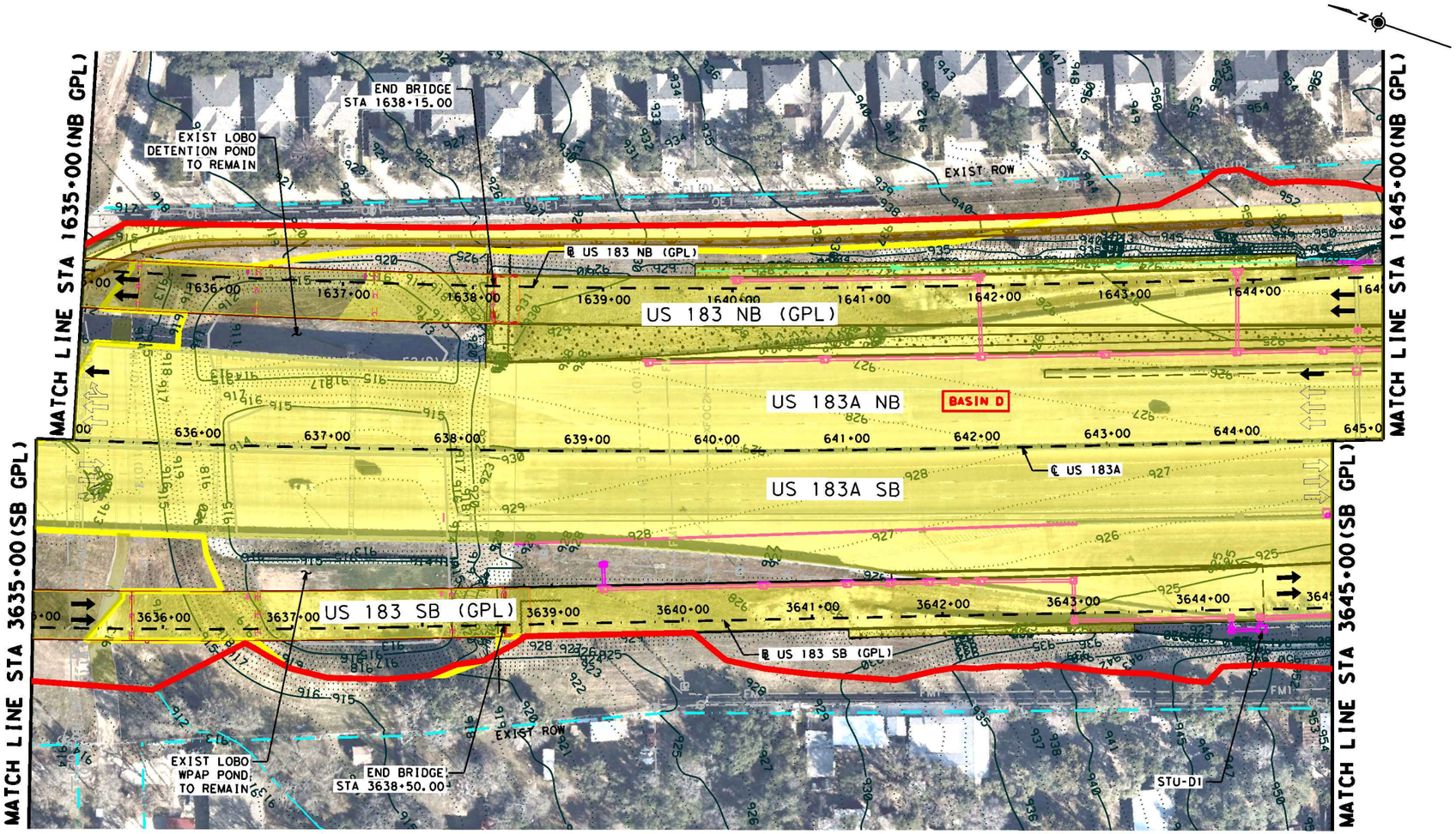

LEGEND

- 1' CONTOUR INTERVAL
- 5' CONTOUR INTERVAL
- RETAINING WALL
- BMP TREATED AREA
- STREAM FLOW ARROW
- STREAM CENTERLINE
- AREA DRAINING TO POND
- BASIN AREA BOUNDARY
- NON-TREATED OFFSITE IMPERVIOUS COVER
- NON-TREATED ONSITE IMPERVIOUS COVER
- TREATED IMPERVIOUS COVER (ONSITE AND OFFSITE)
- OFFSITE AREA PERMITTED PRIOR TO JUNE 1, 1999.
- PROP VEGETATIVE FILTER STRIP
- EXIST VEGETATIVE FILTER STRIP TO REMAIN
- PROP GRASSY SWALE
- PROP DETENTION POND EXPANSION
- PROPOSED DITCH ℄
- EXISTING DITCH ℄ TO REMAIN

NOTES

GENERAL NOTES:
1. EXISTING FEATURES ARE SHOWN SCREENED BACK; i.e. FADED.
2. SEE DITCH DATA SHEETS FOR DITCH INFORMATION.
3. SEE POND GRADING SHEETS AND POND LAYOUT SHEETS FOR ADDITIONAL POND INFORMATION.

DESIGN

STATE OF TEXAS · BRYAN SIERSMA · 147188 · LICENSED PROFESSIONAL ENGINEER

BRYAN SIERSMA, P.E.
7/2/2024
DATE

APPROVAL

STATE OF TEXAS · DAN THOMA · 98622 · LICENSED PROFESSIONAL ENGINEER

DAN THOMA, P.E.
7/2/2024
DATE

0 50 100 150
SCALE: 1"= 100'

PAPE-DAWSON ENGINEERS
SAN ANTONIO | AUSTIN | HOUSTON | FORT WORTH | DALLAS
2000 NW LOOP 410 | SAN ANTONIO, TX 78213 | 210.375.9000
TEXAS ENGINEERING FIRM #470 | TEXAS SURVEYING FIRM #10028800

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2024 Texas Department of Transportation

US 183 GPL

WATER QUALITY LAYOUT

SHEET 4 OF 16

© 2024	CONT	SECT	JOB	HIGHWAY
DS: CK:	0151	10	001	US 183
DW: CK:	DIST	COUNTY		SHEET NO.
	AUS	WILLIAMSON		1388

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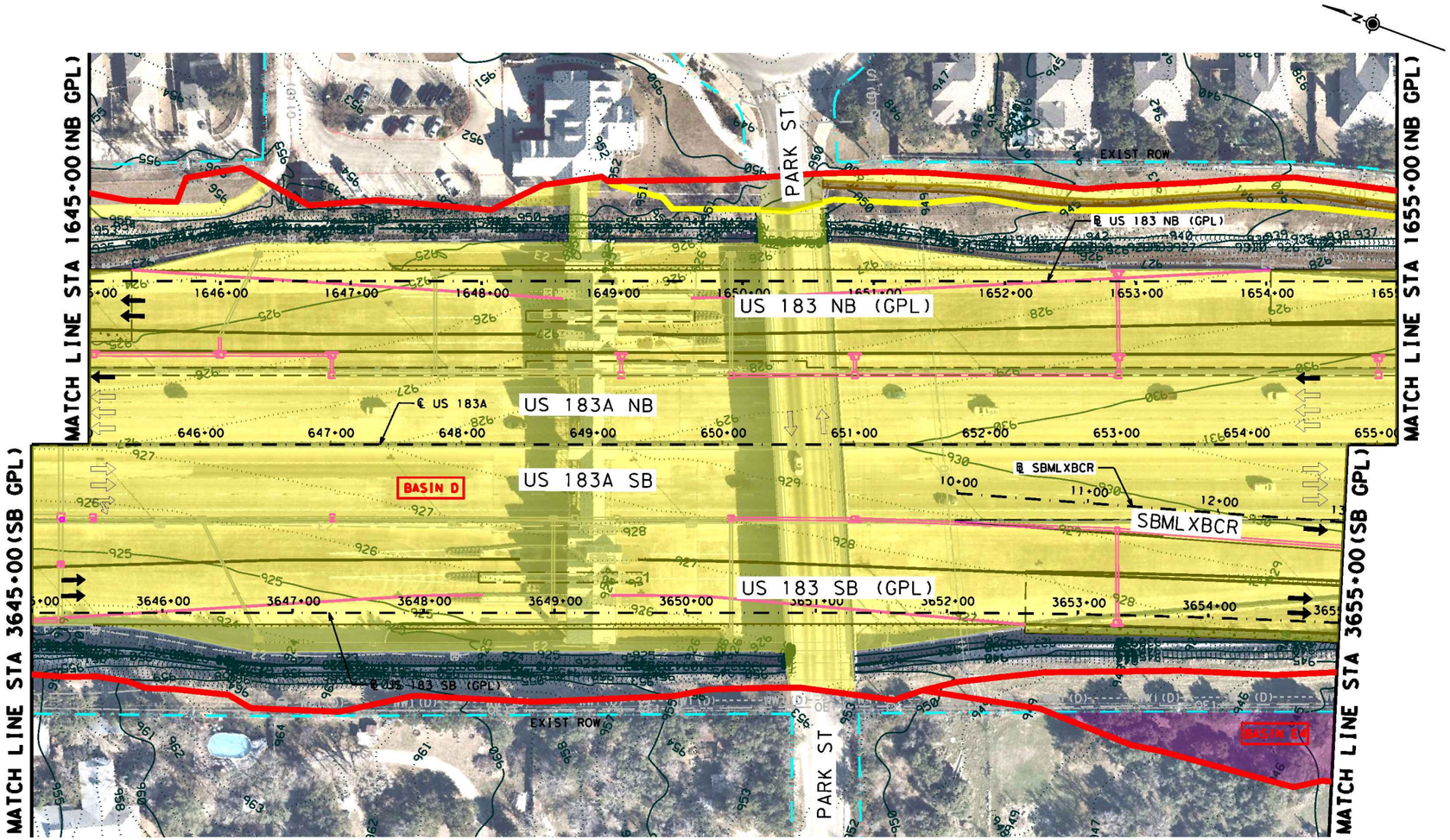

LEGEND

- 1' CONTOUR INTERVAL
- 5' CONTOUR INTERVAL
- RETAINING WALL
- BMP TREATED AREA
- STREAM FLOW ARROW
- STREAM CENTERLINE
- AREA DRAINING TO POND
- BASIN AREA BOUNDARY
- NON-TREATED OFFSITE IMPERVIOUS COVER
- NON-TREATED ONSITE IMPERVIOUS COVER
- TREATED IMPERVIOUS COVER (ONSITE AND OFFSITE)
- OFFSITE AREA PERMITTED PRIOR TO JUNE 1, 1999.
- PROP VEGETATIVE FILTER STRIP
- EXIST VEGETATIVE FILTER STRIP TO REMAIN
- PROP GRASSY SWALE
- PROP DETENTION POND EXPANSION
- PROPOSED DITCH ℄
- EXISTING DITCH ℄ TO REMAIN

NOTES

GENERAL NOTES:
1. EXISTING FEATURES ARE SHOWN SCREENED BACK; i.e. FADED.
2. SEE DITCH DATA SHEETS FOR DITCH INFORMATION.
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DESIGN

STATE OF TEXAS · BRYAN SIERSMA · 147188 · LICENSED PROFESSIONAL ENGINEER

BRYAN SIERSMA, P.E.

7/2/2024
DATE

APPROVAL

STATE OF TEXAS · DAN THOMA · 98622 · LICENSED PROFESSIONAL ENGINEER

DAN THOMA, P.E.

7/2/2024
DATE

0 50 100 150
SCALE: 1" = 100'

PAPE-DAWSON ENGINEERS
SAN ANTONIO | AUSTIN | HOUSTON | FORT WORTH | DALLAS
2000 NW LOOP 410 | SAN ANTONIO, TX 78213 | 210.375.9000
TEXAS ENGINEERING FIRM #470 | TEXAS SURVEYING FIRM #10028800

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US 183 GPL

WATER QUALITY LAYOUT

SHEET 5 OF 16

© 2024	CONT	SECT	JOB	HIGHWAY
DS: CK:	0151	10	001	US 183
DW: CK:	DIST	COUNTY		SHEET NO.
	AUS	WILLIAMSON		1389

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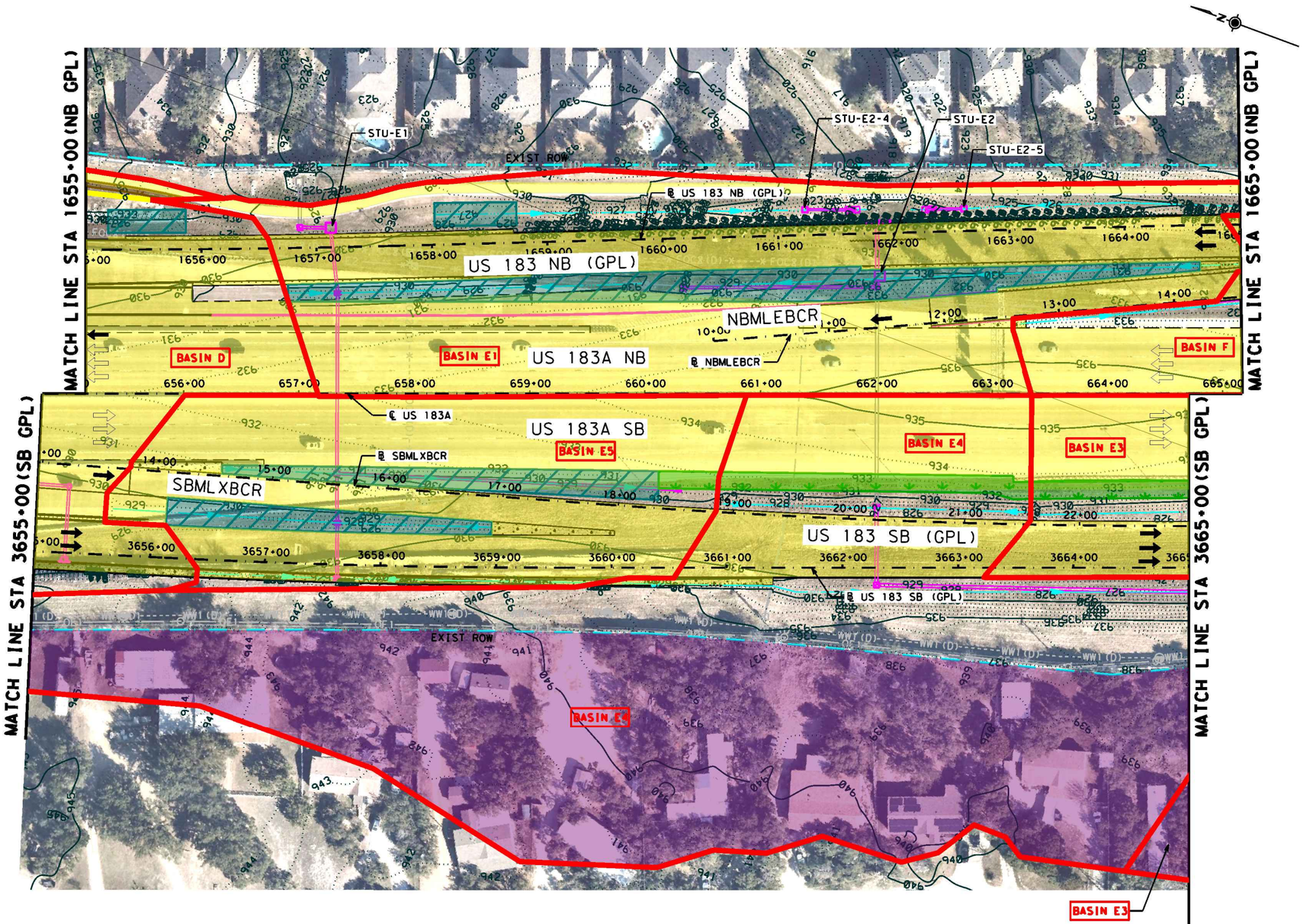

LEGEND

- 1' CONTOUR INTERVAL
- 5' CONTOUR INTERVAL
- RETAINING WALL
- BMP TREATED AREA
- STREAM FLOW ARROW
- STREAM CENTERLINE
- AREA DRAINING TO POND
- BASIN AREA BOUNDARY
- NON-TREATED OFFSITE IMPERVIOUS COVER
- NON-TREATED ONSITE IMPERVIOUS COVER
- TREATED IMPERVIOUS COVER (ONSITE AND OFFSITE)
- OFFSITE AREA PERMITTED PRIOR TO JUNE 1, 1999.
- PROP VEGETATIVE FILTER STRIP
- EXIST VEGETATIVE FILTER STRIP TO REMAIN
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WATER QUALITY LAYOUT

SHEET 6 OF 16

© 2024	CONT	SECT	JOB	HIGHWAY
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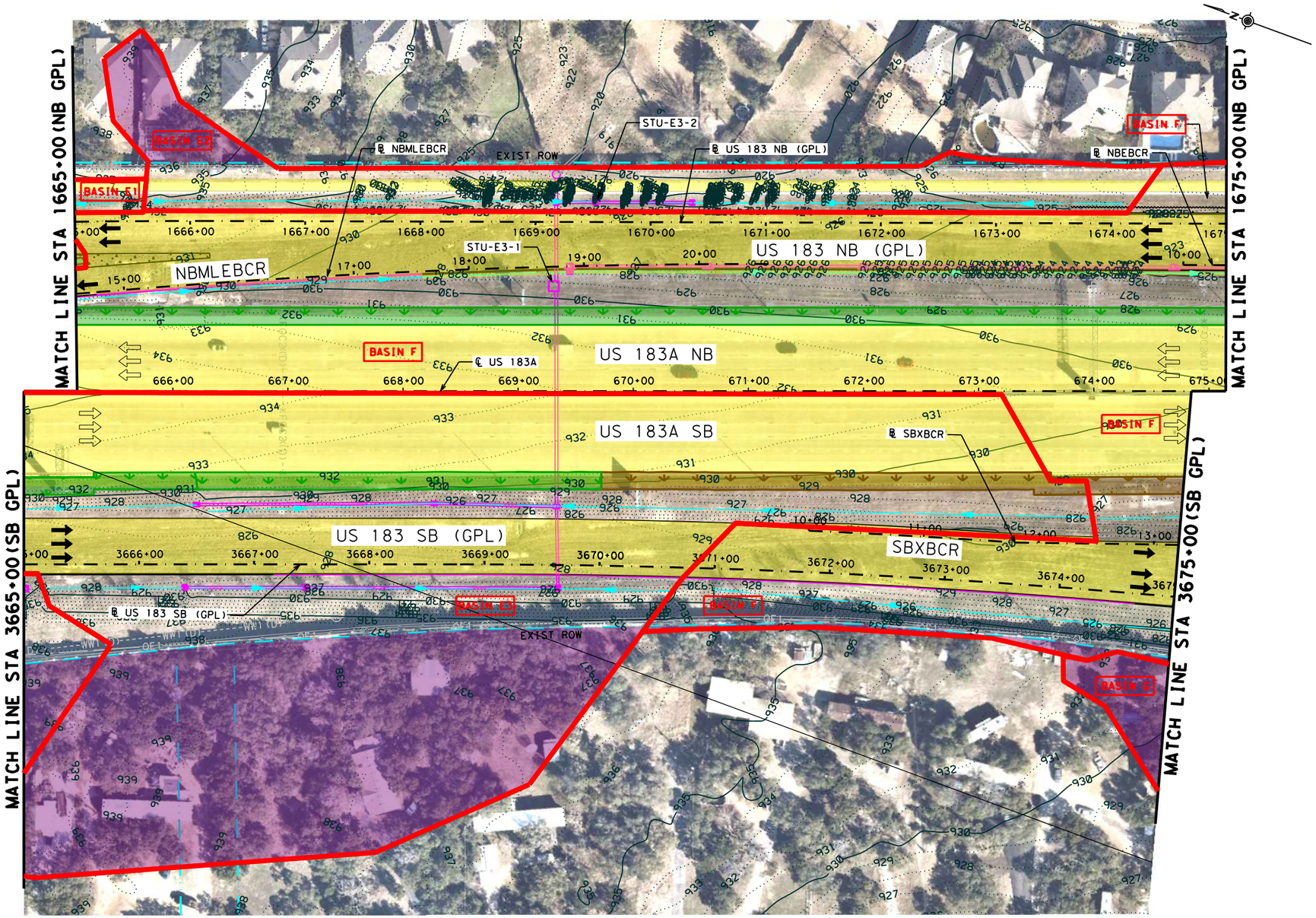

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WATER QUALITY LAYOUT

SHEET 7 OF 16

© 2024		CONT	SECT	JOB	HIGHWAY
DS:	CK:	0151	10	001	US 183
		DIST	COUNTY		SHEET NO.
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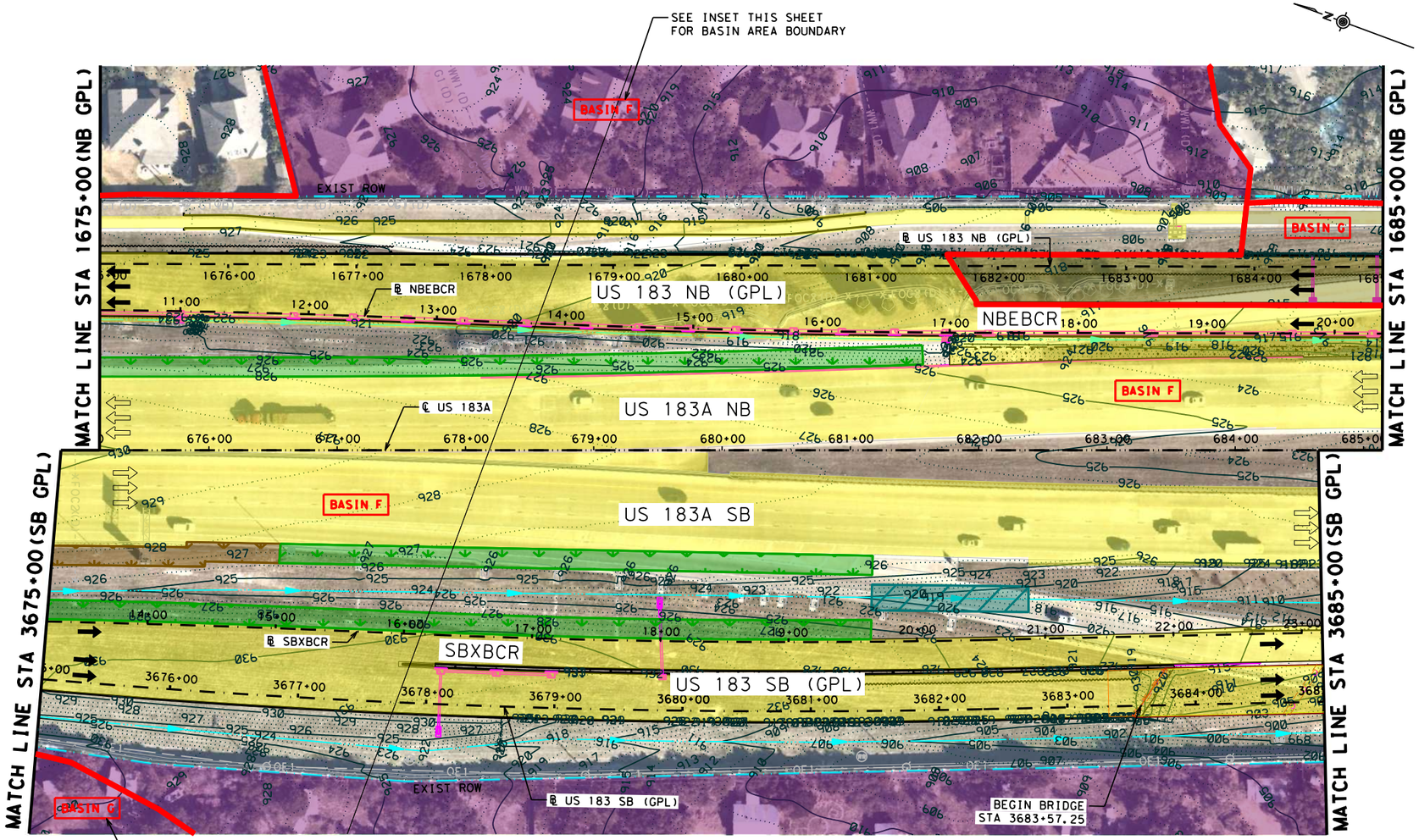

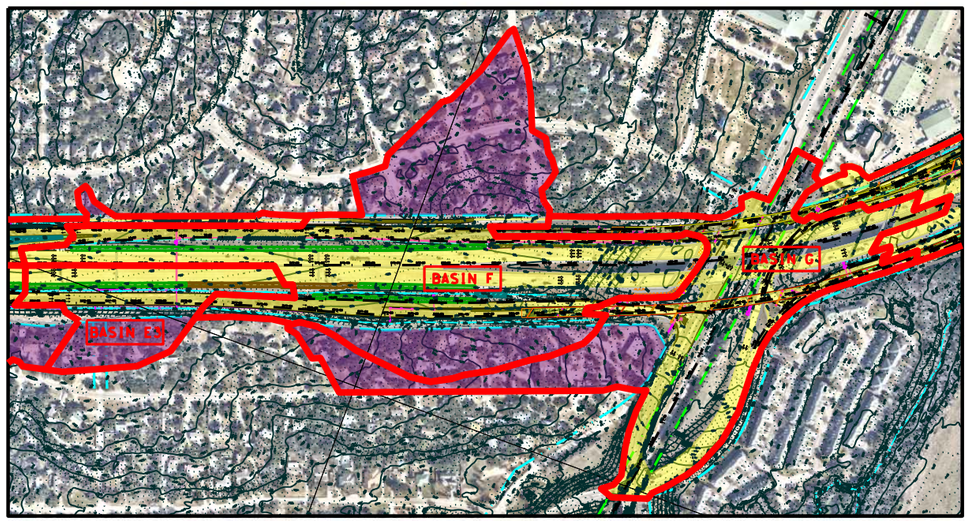

INSET A

SCALE: 1"=600'

LEGEND

- 1' CONTOUR INTERVAL
- 5' CONTOUR INTERVAL
- RETAINING WALL
- BMP TREATED AREA
- STREAM FLOW ARROW
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BRYAN SIERSMA, P.E.

7/2/2024
DATE

APPROVAL

STATE OF TEXAS · DAN THOMA · 98622 · LICENSED PROFESSIONAL ENGINEER

DAN THOMA, P.E.

7/2/2024
DATE

0 50 100 150

SCALE: 1"= 100'

PAPE-DAWSON ENGINEERS

SAN ANTONIO | AUSTIN | HOUSTON | FORT WORTH | DALLAS
2000 NW LOOP 410 | SAN ANTONIO, TX 78213 | 210.375.9000
TEXAS ENGINEERING FIRM #470 | TEXAS SURVEYING FIRM #10028800

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US 183 GPL

WATER QUALITY LAYOUT

SHEET 8 OF 16

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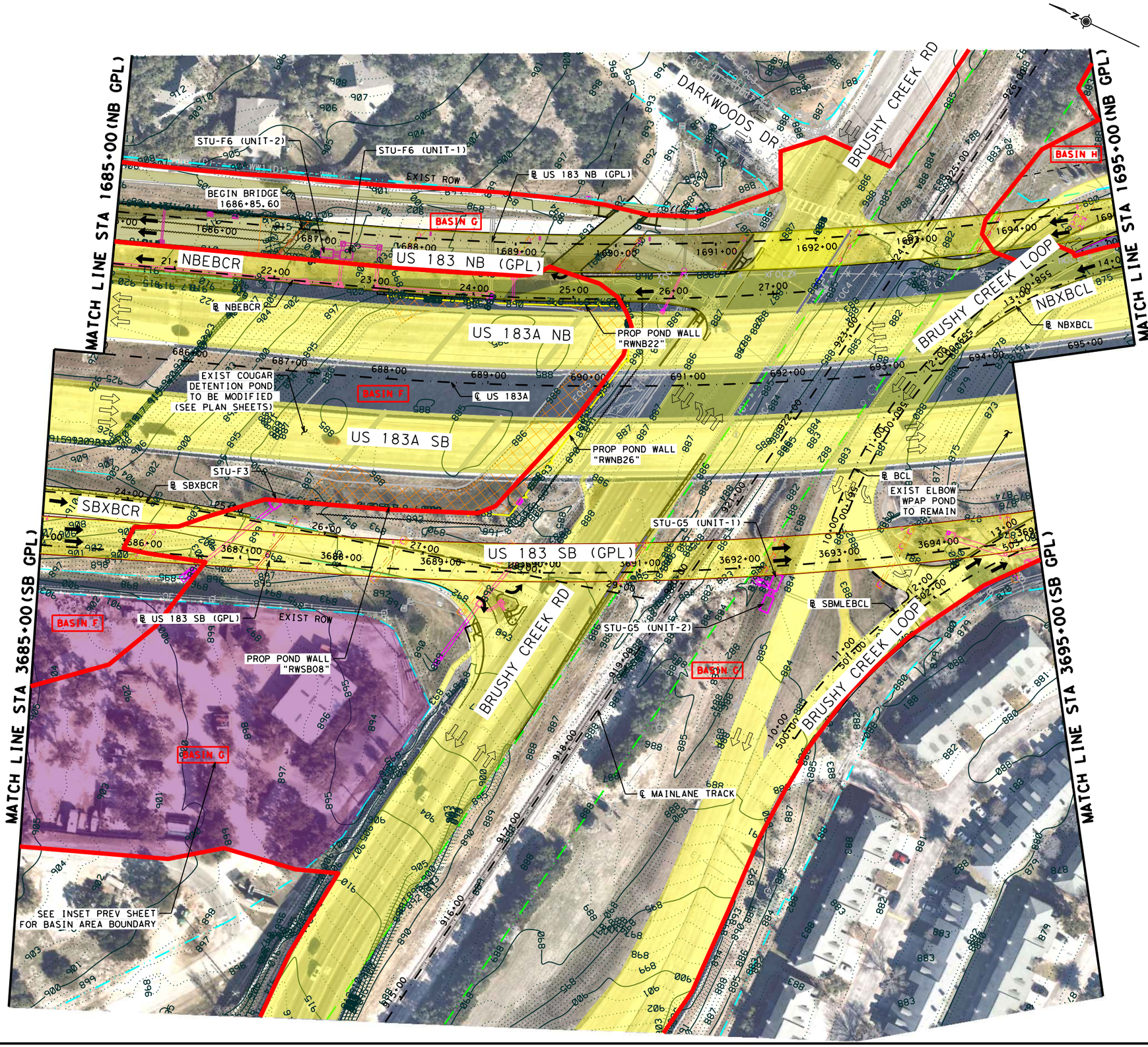

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WATER QUALITY LAYOUT

SHEET 9 OF 16

© 2024	CONT	SECT	JOB	HIGHWAY
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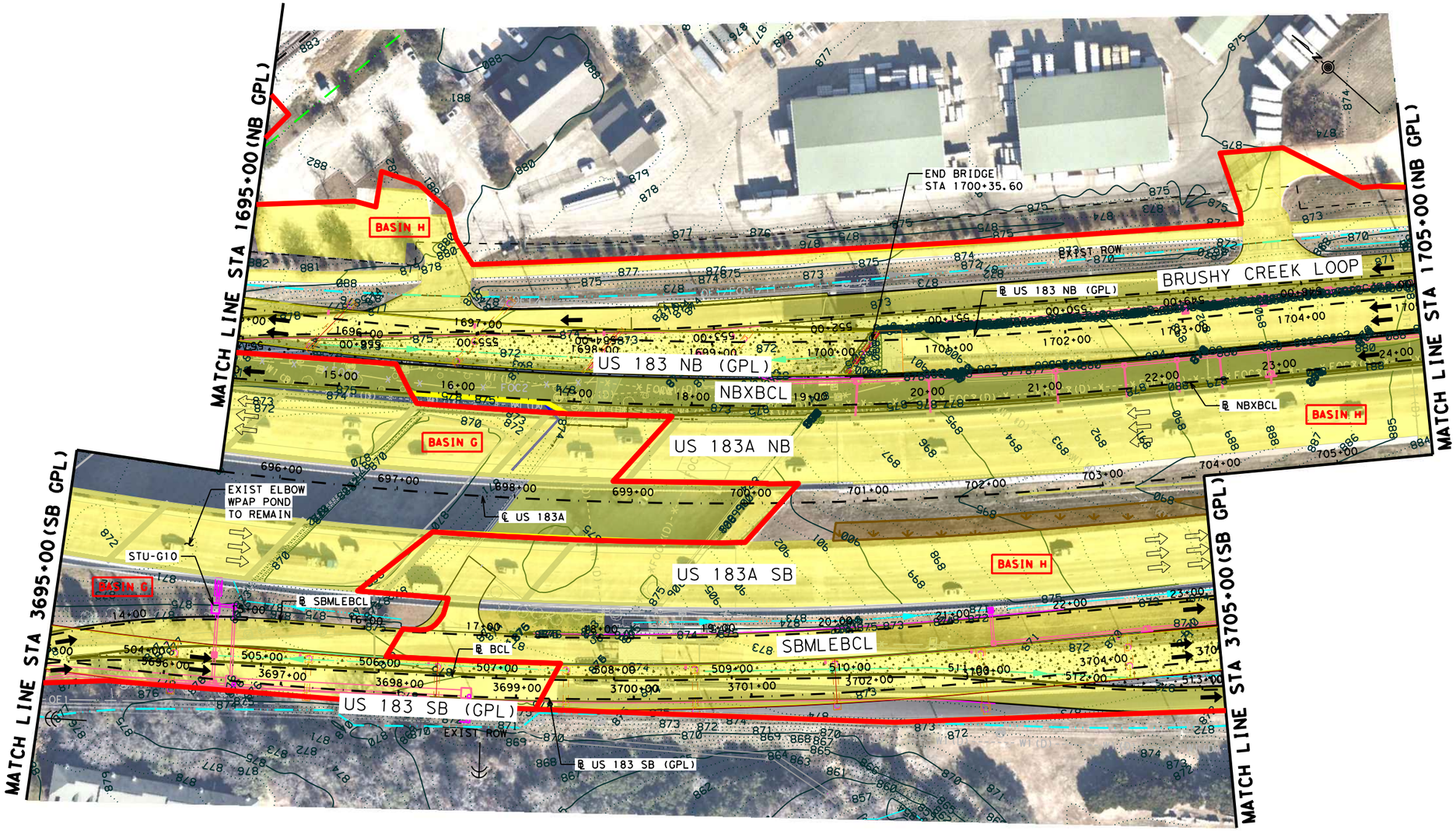

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DAN THOMA, P.E.
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2000 NW LOOP 410 | SAN ANTONIO, TX 78213 | 210.375.9000
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Texas Department of Transportation

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WATER QUALITY LAYOUT

SHEET 10 OF 16

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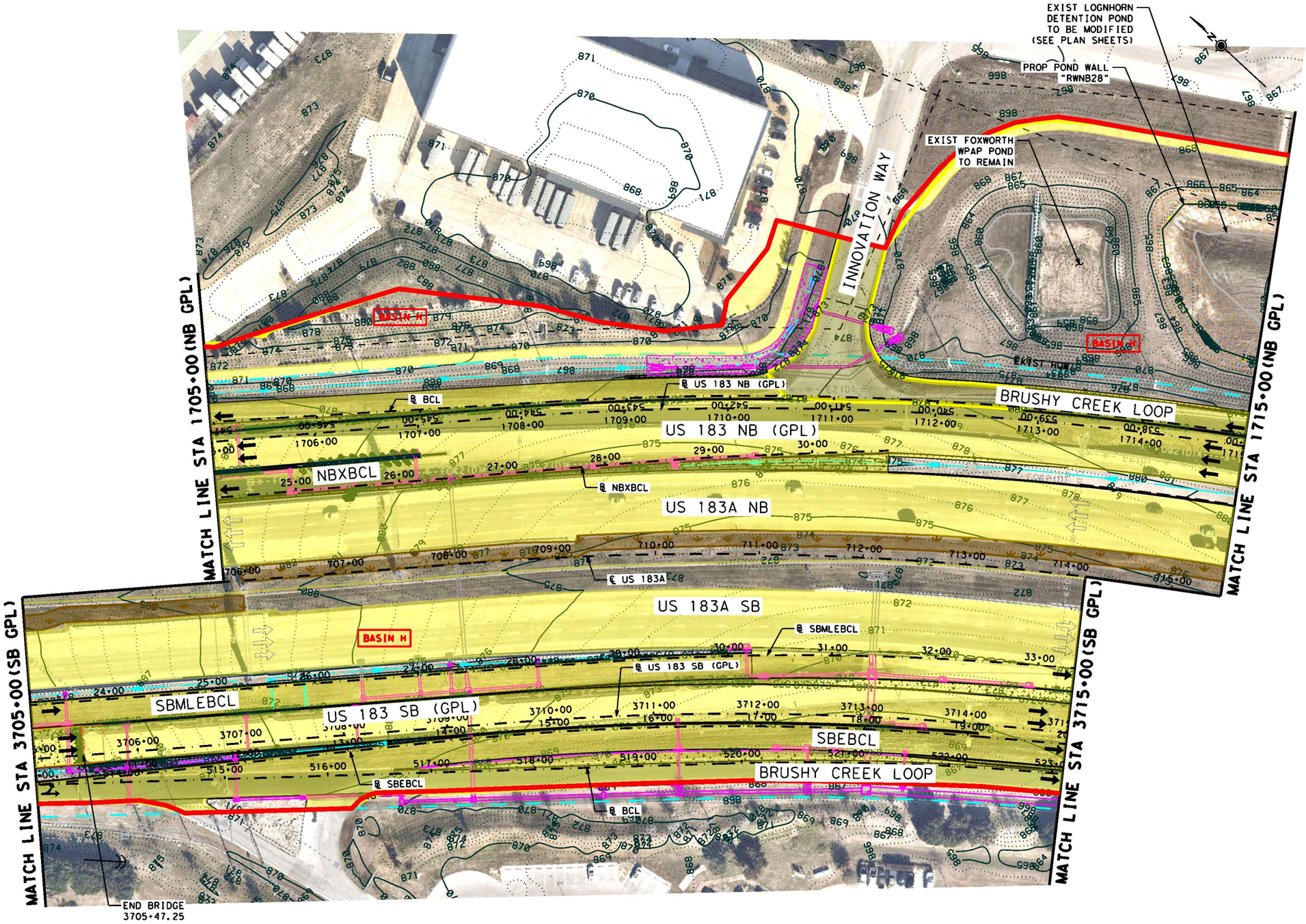

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WATER QUALITY LAYOUT

SHEET 11 OF 16

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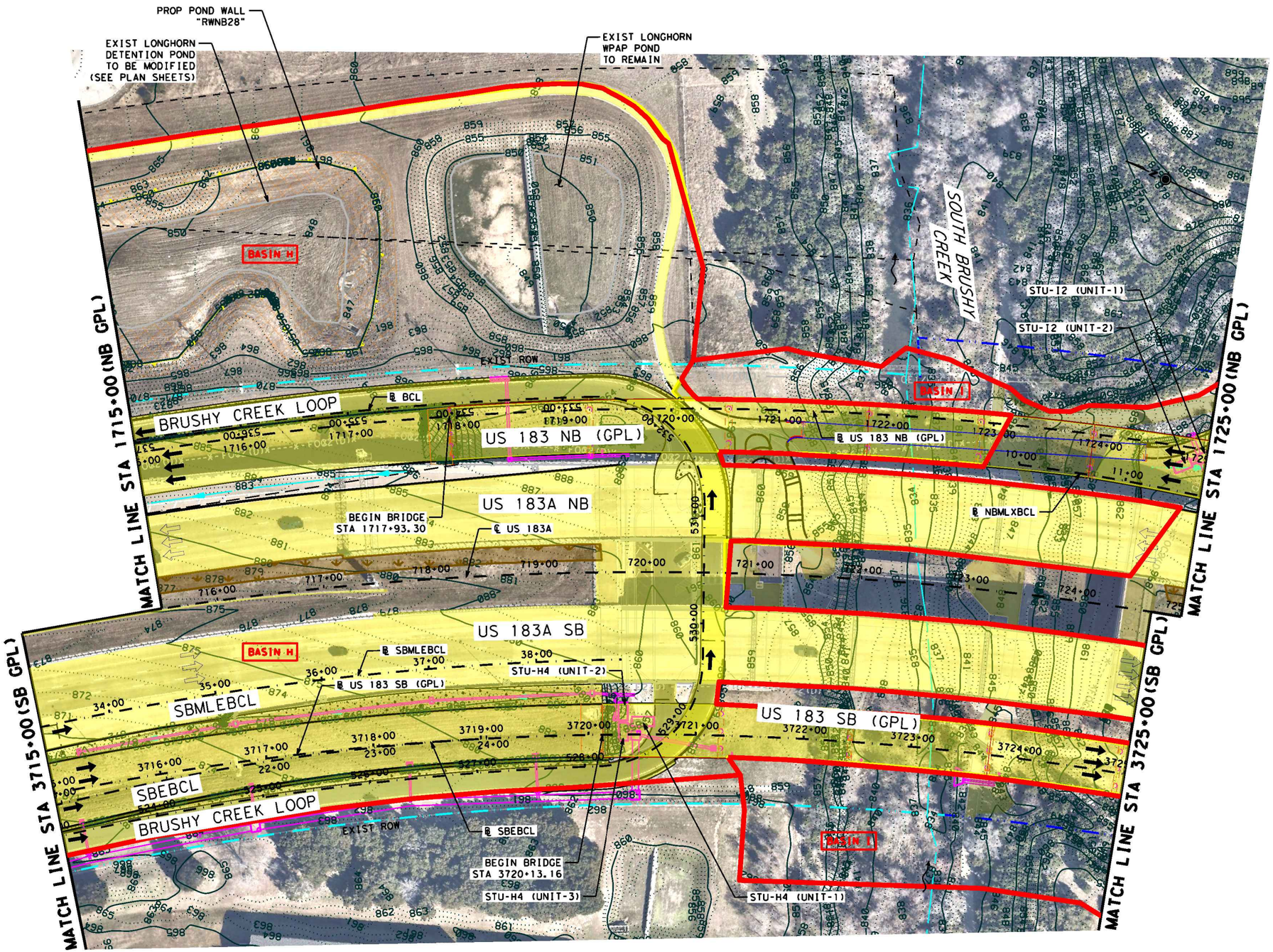

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SAN ANTONIO | AUSTIN | HOUSTON | FORT WORTH | DALLAS
2000 NW LOOP 410 | SAN ANTONIO, TX 78213 | 210.375.9000
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WATER QUALITY LAYOUT

SHEET 12 OF 16

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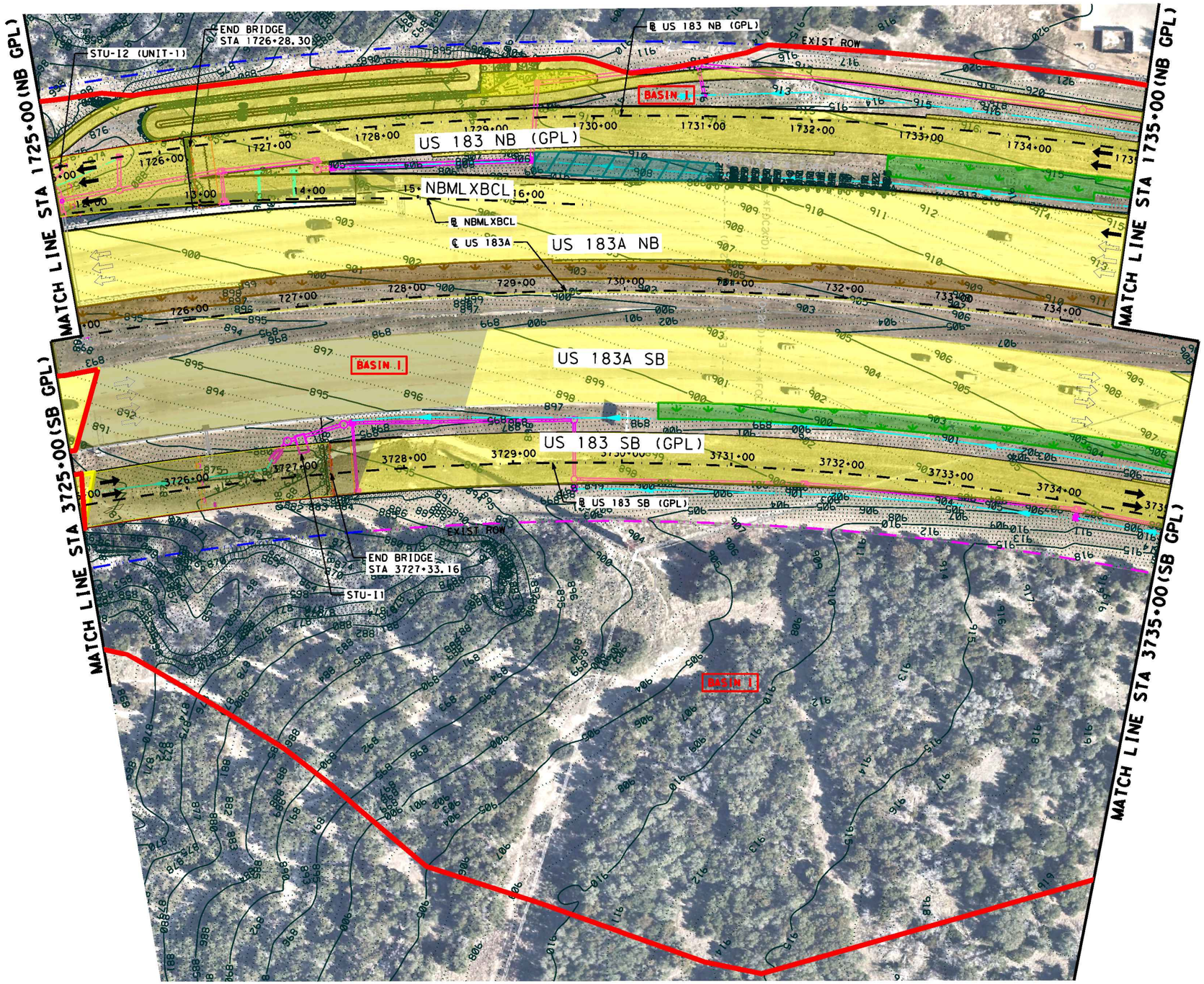

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TEXAS ENGINEERING FIRM #470 | TEXAS SURVEYING FIRM #10028800

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WATER QUALITY LAYOUT

SHEET 13 OF 16

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DW: CK:	DIST	COUNTY		SHEET NO.
	AUS	WILLIAMSON		1397

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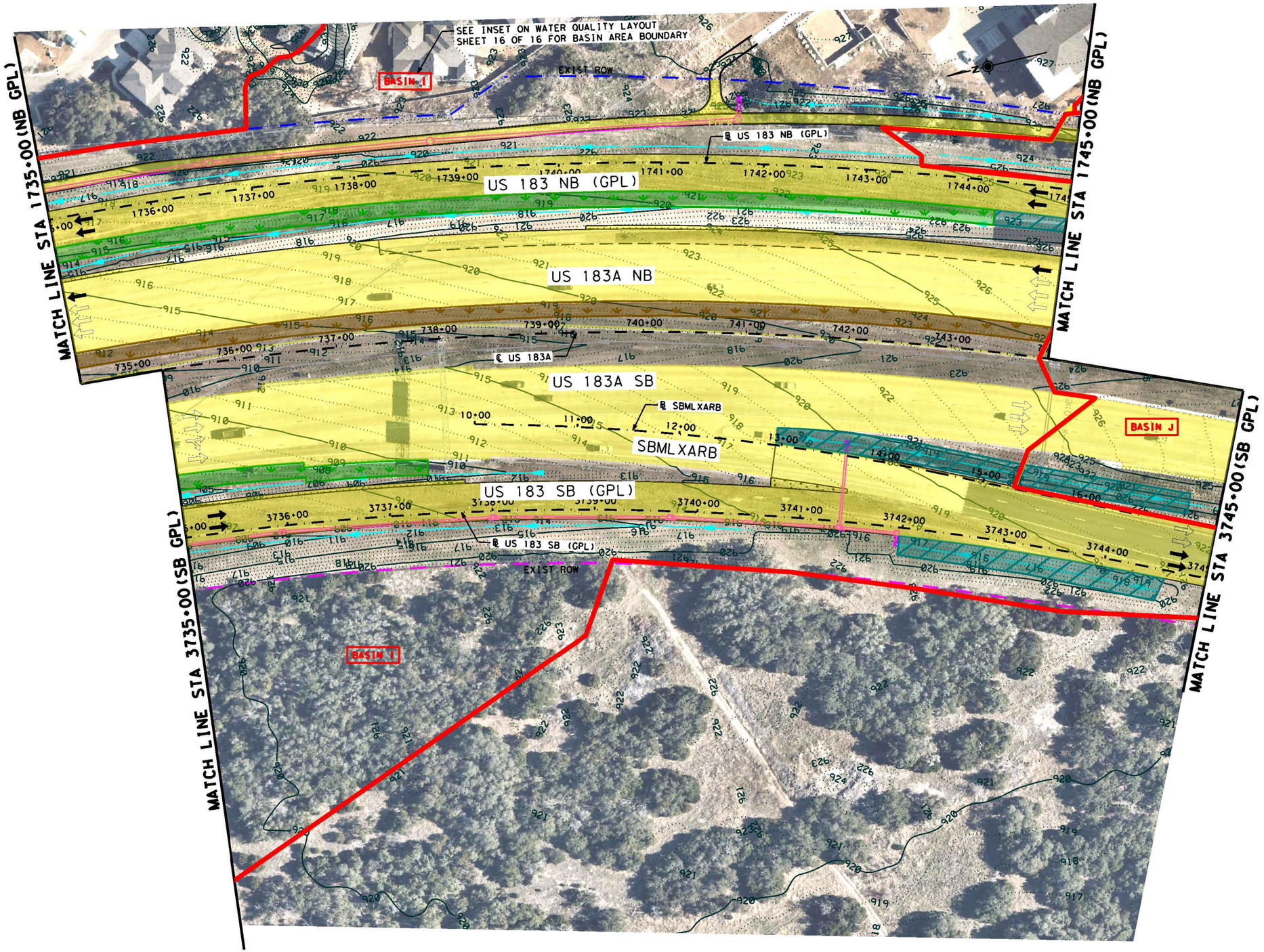

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TEXAS ENGINEERING FIRM #470 | TEXAS SURVEYING FIRM #10028800

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WATER QUALITY LAYOUT

SHEET 14 OF 16

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CONT	SECT	JOB	HIGHWAY
0151	10	001	US 183
DIST	COUNTY		SHEET NO.
AUS	WILLIAMSON		1398

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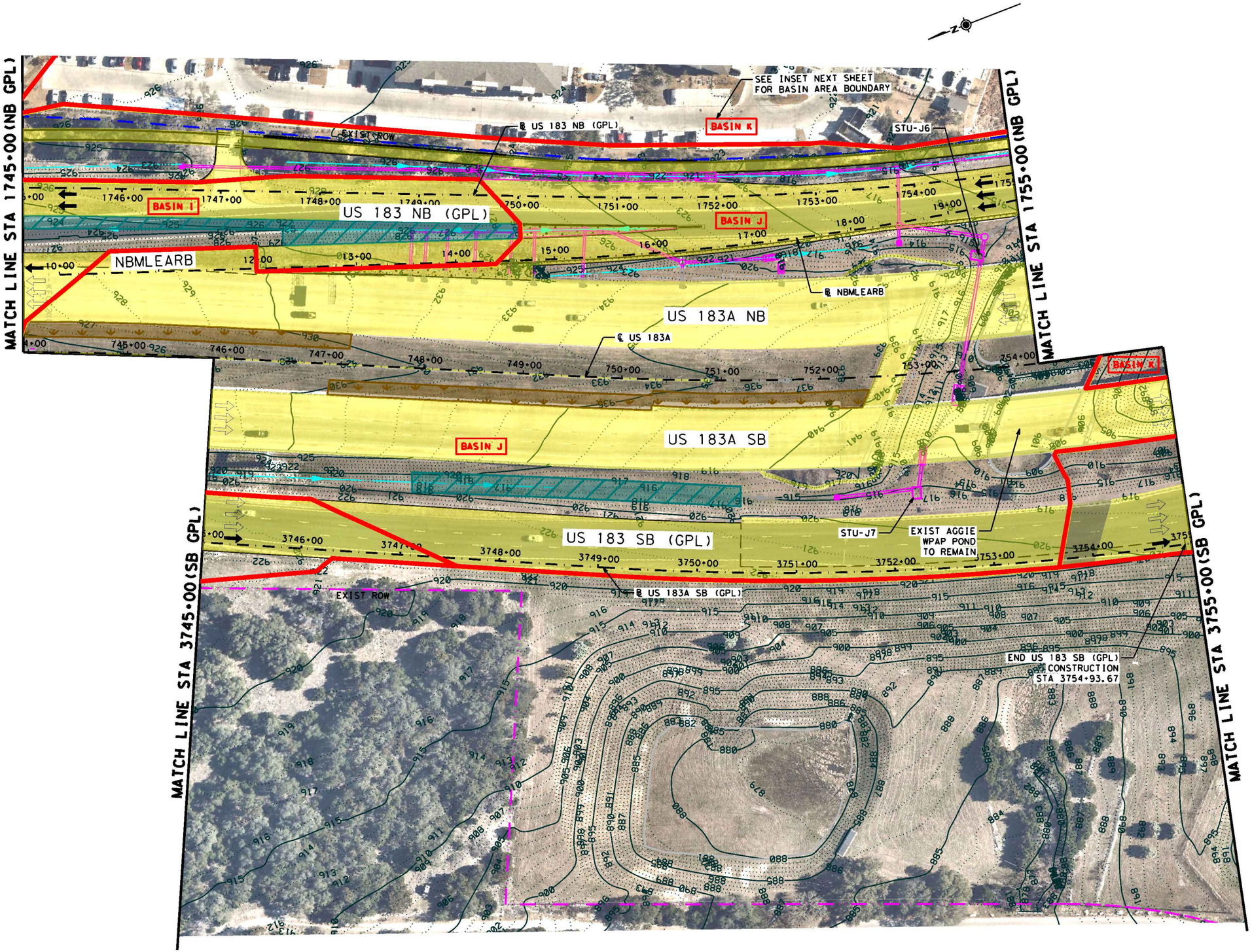

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- TREATED IMPERVIOUS COVER (ONSITE AND OFFSITE)
- OFFSITE AREA PERMITTED PRIOR TO JUNE 1, 1999.
- PROP VEGETATIVE FILTER STRIP
- EXIST VEGETATIVE FILTER STRIP TO REMAIN
- PROP GRASSY SWALE
- PROP DETENTION POND EXPANSION
- PROPOSED DITCH ℄
- EXISTING DITCH ℄ TO REMAIN

NOTES

GENERAL NOTES:
1. EXISTING FEATURES ARE SHOWN SCREENED BACK; i.e. FADED.
2. SEE DITCH DATA SHEETS FOR DITCH INFORMATION.
3. SEE POND GRADING SHEETS AND POND LAYOUT SHEETS FOR ADDITIONAL POND INFORMATION.

DESIGN

STATE OF TEXAS · BRYAN SIERSMA · 147188 · LICENSED PROFESSIONAL ENGINEER

BRYAN SIERSMA, P.E.
7/2/2024
DATE

APPROVAL

STATE OF TEXAS · DAN THOMA · 98622 · LICENSED PROFESSIONAL ENGINEER

DAN THOMA, P.E.
7/2/2024
DATE

0 50 100 150
SCALE: 1"= 100'

PAPE-DAWSON ENGINEERS
SAN ANTONIO | AUSTIN | HOUSTON | FORT WORTH | DALLAS
2000 NW LOOP 410 | SAN ANTONIO, TX 78213 | 210.375.9000
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US 183 GPL
WATER QUALITY LAYOUT

SHEET 15 OF 16

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DW: CK:	DIST	COUNTY		SHEET NO.
	AUS	WILLIAMSON		1399

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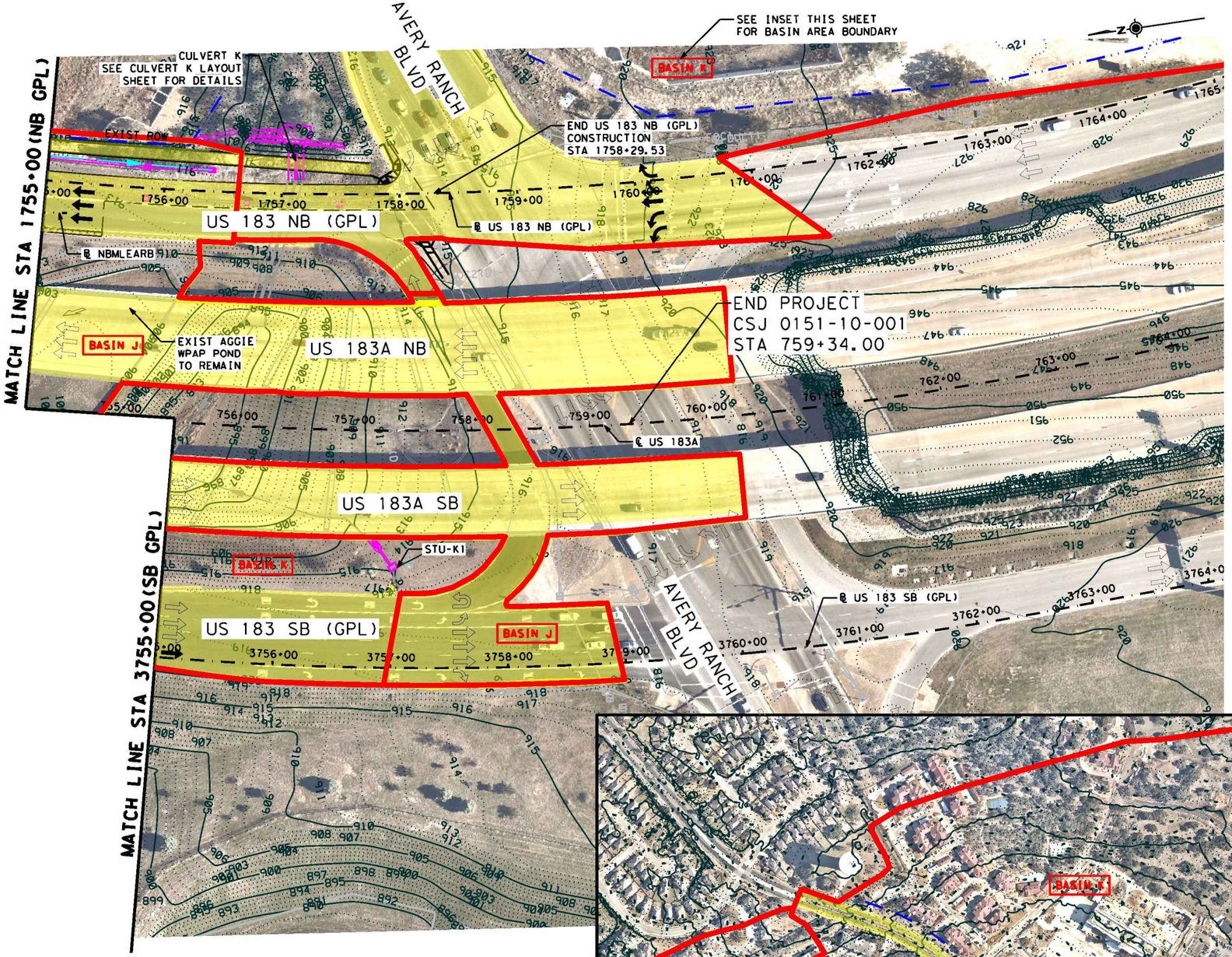

INSET A

SCALE: 1"=600'

LEGEND

- 1' CONTOUR INTERVAL
- 5' CONTOUR INTERVAL
- RETAINING WALL
- BMP TREATED AREA
- STREAM FLOW ARROW
- STREAM CENTERLINE
- AREA DRAINING TO POND
- BASIN AREA BOUNDARY
- NON-TREATED OFFSITE IMPERVIOUS COVER
- NON-TREATED ONSITE IMPERVIOUS COVER
- TREATED IMPERVIOUS COVER (ONSITE AND OFFSITE)
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BRYAN SIERSMA, P.E.

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SCALE: 1"= 100'

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WATER QUALITY LAYOUT

SHEET 16 OF 16

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		DIST	COUNTY		SHEET NO.
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STORMWATER POLLUTION PREVENTION PLAN (SWP3):

This SWP3 has been developed in accordance with the TPDES Construction General Permit TXR150000 (CGP). The Texas Department of Transportation (TxDOT) ensures that project specifications include adequate best management practices (BMPs) for this project.

For all projects with any soil disturbing activities, TxDOT will maintain a SWP3 with all pertinent records, correspondence, environmental documents, etc. at the project field office. If no field office is available, then this SWP3 shall be kept in the appropriate TxDOT Area Office.

This SWP3 is consistent with requirements specified in applicable stormwater plans and the projects environmental permits, issues, and commitments (EPICs). A copy of the CGP is included in Attachment 2.12 of the SWP3 binder.

1.0 SITE/PROJECT DESCRIPTION

1.1 PROJECT CONTROL SECTION JOB (CSJ):
0151-10-001, Federal Aid Project NO. STP()

1.2 PROJECT LIMITS:
From: RM 1431

To: AVERY RANCH BLVD

1.3 PROJECT COORDINATES:
BEGIN: (Lat) 30°31'30.02"N ,(Long) -97°48'58.42"W

END: (Lat) 30°29'12.03"N ,(Long) 97°48'17.28"W

1.4 TOTAL PROJECT AREA (Acres): 180.20

1.5 TOTAL AREA TO BE DISTURBED (Acres): 89.60

1.6 NATURE OF CONSTRUCTION ACTIVITY:
Construction of 2-lane grade separated NB & SB general purpose lanes, consisting of grading base, structures, asphalt, and pavement markings

1.7 MAJOR SOIL TYPES:

Soil Type	Description
Eckrant cobbly clay, 1 to 8 % slopes	85% Eckrant, stony and silar soils, well drained, medium runoff
Eckrant stony clay, 0 to 3 % slopes, stony	85% Eckrant and similar soils, well drained, medium runoff
Sunev silty clay loam, 1 to 3 % slopes	100% Sunev and smilar soils, well drained, low runoff

1.8 PROJECT SPECIFIC LOCATIONS (PSLs):
PSLs must be depicted on the Environmental Layout Sheets in Attachment 1.2 of this SWP3. PSLs may be identified during preconstruction meetings or during the construction process. Please choose from the options below:

☐ PSLs determined during preconstruction meeting
X PSLs determined during construction
☐ No PSLs planned for construction

Type	Sheet #s

All off-ROW PSLs required by the Contractor are the Contractor's responsibility. The Contractor shall secure all permits required by local, state, federal laws for off-ROW PSLs. The contractor shall provide diagrams, areas of disturbance, acreage, and BMPs for all off-ROW PSLs within one mile of the project.

1.9 CONSTRUCTION ACTIVITIES:
(Use the following list as a starting point when developing the Construction Activity Schedule and Ceasing Record in Attachment 2.5.)

X Mobilization
X Install sediment and erosion controls
X Blade existing topsoil into windrows, prep ROW, clear and grub
X Remove existing pavement
X Grading operations, excavation, and embankment
X Excavate and prepare subgrade for proposed pavement widening
X Remove existing culverts, safety end treatments (SETs)
X Remove existing metal beam guard fence (MBGF), bridge rail
X Install proposed pavement per plans
X Install culverts, culvert extensions, SETs
X Install mow strip, MBGF, bridge rail
X Place flex base
X Rework slopes, grade ditches
☐ Blade windrowed material back across slopes
X Revegetation of unpaved areas
X Achieve site stabilization and remove sediment and erosion control measures
☐ Other: _____
☐ Other: _____
☐ Other: _____

1.10 POTENTIAL POLLUTANTS AND SOURCES:

X Sediment laden stormwater from stormwater conveyance over disturbed area
X Fuels, oils, and lubricants from construction vehicles, equipment, and storage
X Solvents, paints, adhesives, etc. from various construction activities
X Transported soils from offsite vehicle tracking
X Construction debris and waste from various construction activities
X Contaminated water from excavation or dewatering pump-out water
X Sanitary waste from onsite restroom facilities
X Trash from various construction activities/receptacles
X Long-term stockpiles of material and waste
☐ Other: _____
☐ Other: _____
☐ Other: _____

1.11 RECEIVING WATERS:
Receiving waters must be depicted on the Environmental Layout Sheets in Attachment 1.2 of this SWP3. Include Segment # for receiving waters.

Tributaries	Classified Waterbody
Storm water will be channeled along grass ditch and storm system then to outfalls and detention ponds.	

* Add (*) for impaired waterbodies with pollutant in ().

1.12 ROLES AND RESPONSIBILITIES: TxDOT

X Development of plans and specifications
X Submit Notice of Intent (NOI) to TCEQ (≥5 acres)
X Post Construction Site Notice
X Submit NOI/CSN to local MS4
X Perform SWP3 inspections
X Maintain SWP3 records and update to reflect daily operations
X Complete and submit Notice of Termination to TCEQ
X Maintain SWP3 records for 3 years
☐ Other: _____
☐ Other: _____
☐ Other: _____

1.13 ROLES AND RESPONSIBILITIES: CONTRACTOR

X Day To Day Operational Control
X Submit Notice of Intent (NOI) to TCEQ (≥5 acres)
X Post Construction Site Notice
X Submit NOI/CSN to local MS4
X Maintain schedule of major construction activities
X Install, maintain and modify BMPs
X Complete and submit Notice of Termination to TCEQ
X Maintain SWP3 records for 3 years
☐ Other: _____
☐ Other: _____
☐ Other: _____

1.14 LOCAL MUNICIPAL SEPARATE STORM SEWER SYSTEM (MS4) OPERATOR COORDINATION:

MS4 Entity

DESIGN

STATE OF TEXAS — MARISSA GUZMAN — 130772 — LICENSED PROFESSIONAL ENGINEER

MARISSA GUZMAN, P.E.
10/22/2024
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APPROVAL

STATE OF TEXAS — DAN THOMA — 98622 — LICENSED PROFESSIONAL ENGINEER

DAN THOMA, P.E.
10/22/2024
DATE

STORMWATER POLLUTION PREVENTION PLAN (SWP3)

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Sheet 1 of 2

Texas Department of Transportation

FED. RD. DIV. NO.	PROJECT NO.		SHEET NO.
			1366
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0151	10	001	US 183

STORMWATER POLLUTION PREVENTION PLAN (SWP3):

2.0 BEST MANAGEMENT PRACTICES (BMPs) AND CONTROLS, INSPECTION, AND MAINTENANCE

The Contractor shall be the responsible party for implementing the BMPs described herein and for complying with the SWP3 for control of erosion and sedimentation during day-to-day operations. The Contractor shall implement changes to this SWP3 approved by TxDOT within the times specified in this SWP3 or the CGP.

2.1 EROSION CONTROL AND SOIL STABILIZATION BMPs:

T / P

- [X] [ ] Protection of Existing Vegetation
- [ ] [ ] Vegetated Buffer Zones
- [ ] [X] Soil Retention Blankets
- [ ] [ ] Geotextiles
- [ ] [ ] Mulching/ Hydromulching
- [ ] [ ] Soil Surface Treatments
- [X] [ ] Temporary Seeding
- [ ] [X] Permanent Planting, Sodding or Seeding
- [ ] [ ] Biodegradable Erosion Control Logs
- [X] [ ] Rock Filter Dams/ Rock Check Dams
- [ ] [ ] Vertical Tracking
- [ ] [X] Interceptor Swale
- [ ] [ ] Riprap
- [ ] [ ] Diversion Dike
- [ ] [ ] Temporary Pipe Slope Drain
- [ ] [ ] Embankment for Erosion Control
- [ ] [X] Paved Flumes
- [ ] [ ] Other: _____
- [ ] [ ] Other: _____
- [ ] [ ] Other: _____
- [ ] [ ] Other: _____

2.2 SEDIMENT CONTROL BMPs:

T / P

- [X] [ ] Biodegradable Erosion Control Logs
- [ ] [ ] Dewatering Controls
- [X] [ ] Inlet Protection
- [X] [ ] Rock Filter Dams/ Rock Check Dams
- [ ] [ ] Sandbag Berms
- [X] [ ] Sediment Control Fence
- [X] [ ] Stabilized Construction Exit
- [ ] [ ] Floating Turbidity Barrier
- [ ] [ ] Vegetated Buffer Zones
- [ ] [X] Vegetated Filter Strips
- [ ] [ ] Other: _____
- [ ] [ ] Other: _____
- [ ] [ ] Other: _____
- [ ] [ ] Other: _____

Refer to the Environmental Layout Sheets/ SWP3 Layout Sheets located in Attachment 1.2 of this SWP3

Sediment control BMPs requiring design capacity calculations (See SWP3 Attachment 1.3.):

T / P

- [ ] [ ] Sediment Trap
  - [ ] Calculated volume runoff from 2-year, 24-hour storm for each acre of disturbed area
  - [ ] 3,600 cubic feet of storage per acre drained
- [ ] [ ] Sedimentation Basin
  - [ ] Not required (<10 acres disturbed)
  - [ ] Required (>10 acres) and implemented.
    - [ ] Calculated volume runoff from 2-year, 24-hour storm for each acre of disturbed area
    - [ ] 3,600 cubic feet of storage per acre drained
  - [X] Required (>10 acres), but not feasible due to:
    - [ ] Available area/Site geometry
    - [X] Site slope/Drainage patterns
    - [ ] Site soils/Geotechnical factors
    - [ ] Public safety
    - [ ] Other: _____

2.3 PERMANENT CONTROLS:

(Coordinate post-construction BMPs with appropriate TxDOT maintenance sections.)

BMPs To Be Left In Place Post Construction:

Type	Stationing	
	From	To
See Water Quality Layout sheets included in plan for permanent BMPs.		

Refer to the Environmental Layout Sheets/ SWP3 Layout Sheets located in Attachment 1.2 of this SWP3

2.4 OFFSITE VEHICLE TRACKING CONTROLS:

- [X] Excess dirt/mud on road removed daily
- [X] Haul roads dampened for dust control
- [X] Loaded haul trucks to be covered with tarpaulin
- [X] Stabilized construction exit
- [X] Other: Provide for a motorized broom or a vacuum type sweeper to be available on a weekly basis/as directed by the engineer
- [X] Other: To remove sediment from paved roadways abutting or or traversing the project site.
- [ ] Other: _____
- [ ] Other: _____

2.5 POLLUTION PREVENTION MEASURES:

- [X] Chemical Management
- [X] Concrete and Materials Waste Management
- [X] Debris and Trash Management
- [X] Dust Control
- [X] Sanitary Facilities
- [ ] Other: _____
- [ ] Other: _____
- [ ] Other: _____
- [ ] Other: _____
- [ ] Other: _____

2.6 VEGETATED BUFFER ZONES:

Natural vegetated buffers shall be maintained as feasible to protect adjacent surface waters. If vegetated natural buffer zones are not feasible due to site geometry, the appropriate additional sediment control measures have been incorporated into this SWP3.

Type	Stationing	
	From	To

Refer to the Environmental Layout Sheets/ SWP3 Layout Sheets located in Attachment 1.2 of this SWP3

2.7 ALLOWABLE NON-STORMWATER DISCHARGES:

- [X] Fire hydrant flushings
- [X] Irrigation drainage
- [X] Pavement washwater (where spills or leaks have not occurred, and detergents are not used)
- [X] Potable water sources
- [X] Springs
- [X] Uncontaminated groundwater
- [X] Water used to wash vehicles or control dust
- [X] Other allowable non-stormwater discharges as allowed by TPDES GP TXR150000.

2.8 INSPECTIONS:

All disturbed areas and erosion and sediment control devices shall be inspected at least once every seven (7) days. Inspections shall be performed by TxDOT as indicated on the Field Inspection and Maintenance Report Form 2118 and retained in Attachment 2.5 of this SWP3 .

2.9 MAINTENANCE:

Control measures shall be properly installed according to specifications. If it is determined that a BMP or control measure is not operating effectively, maintenance must be accomplished as soon as possible and before the next anticipated rain event, but in no case later than 7 calendar days after being able to access the site. Maintenance shall be performed by the Contractor as indicated on the Field Inspection and Maintenance Report Form 2118 and retained in Attachment 2.5 of this SWP3. If contactor encounters any flowing water or seeps during subsurface disturbance activities, all work within 50 feet must be halted until an evaluation by a geoscientist can be completed, a determination of the water source to see if there is connectivity to the edwards aquifer, and implementation of a site-specific groundwater mitigation and solution feature closure plan that will be designed to permanently seal off the feature

DESIGN

STATE OF TEXAS — MARISSA GUZMAN — 130772 — LICENSED PROFESSIONAL ENGINEER

MARISSA GUZMAN, P.E.

7/3/2024
DATE

APPROVAL

STATE OF TEXAS — DAN THOMA — 98622 — LICENSED PROFESSIONAL ENGINEER

DAN THOMA, P.E.

7/3/2024
DATE

STORMWATER POLLUTION PREVENTION PLAN (SWP3)

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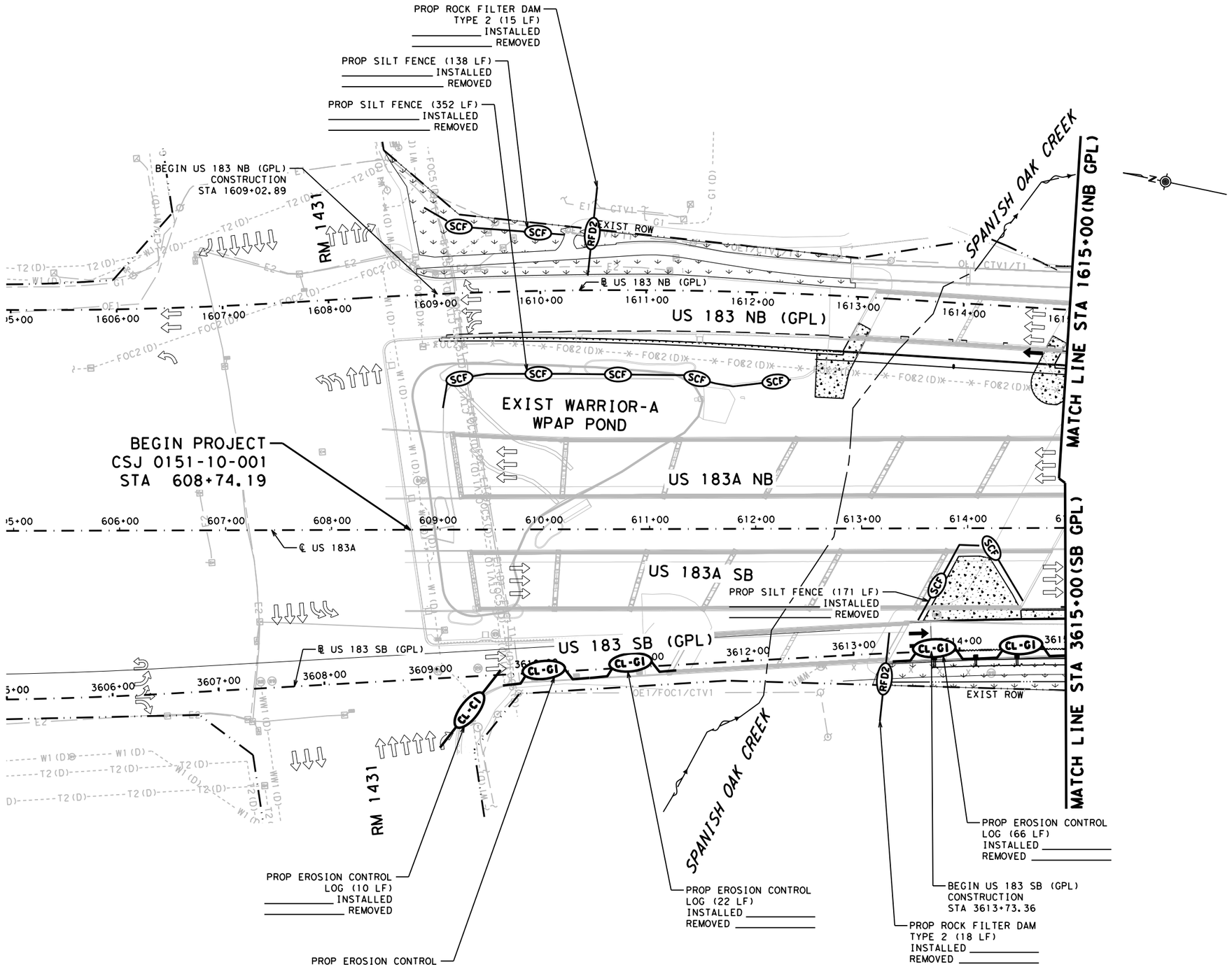
Sheet 2 of 2

Texas Department of Transportation

FED. RD. DIV. NO.	PROJECT NO.		SHEET NO.
			1367
STATE	STATE DIST.	COUNTY	
TEXAS	AUS	WILLIAMSON	
CONT.	SECT.	JOB	HIGHWAY NO.
0151	10	001	US 183



SW3P LEGEND

- CL-DI — CONTROL LOG AT DROP INLET
- CL-BOC — CONTROL LOG AT BACK OF CURB
- CL-CI — CONTROL LOG AT CURB INLET
- CL-GI — CONTROL LOG AT GRATE INLET
- RFD2 — ROCK FILTER DAM (TY 2)
- RFD4 — ROCK FILTER DAM (TY 4)
- SCF — SEDIMENT CONTROL FENCE
- DITCH FLOW
- PRESERVED TREE
- CONCRETE RIPRAP
- CONSTRUCTION EXIT
- TOPSOIL WITH BIOTIC SOIL AMENDMENT

SW3P NOTES:
1. REFER TO TEMPORARY EROSION CONTROL MEASURE STANDARDS FOR MORE INFORMATION.
2. CONSTRUCTION ENTRANCE/EXIT LOCATIONS TO BE DETERMINED IN THE FIELD.
3. SW3P CONTROL MEASURES INSTALLED DURING CONSTRUCTION ARE TO REMAIN IN PLACE UNTIL GRASS COVER IS ACHIEVED OR AS APPROVED BY THE ENGINEER.
4. SW3P CONTROLS MAY NEED TO BE MODIFIED IN THE FIELD TO ACCOMPLISH THE DESIRED EFFECT. ALL MODIFICATIONS ARE TO BE NOTED ON THIS SHEET AND SIGNED BY THE RESPONSIBLE PARTY.
5. ALL SW3P CONTROLS ARE TO BE MAINTAINED AND IN WORKING CONDITION AT ALL TIMES.
6. BIOTIC SOIL AMENDMENT SUBSIDIARY TO TOPSOIL.
7. ALL TREES WITHIN ROW NOT PROTECTED ARE IN CONFLICT WITH PROPOSED CONSTRUCTION AND WILL BE REMOVED SUBSIDIARY TO PREP ROW.

TEMPORARY SEDIMENT CONTROL FENCE SHOULD BE PLACED ON CONSTRUCTION EASEMENT LIMIT LINE WHENEVER PRESENT. IF NO CONSTRUCTION EASEMENT EXISTS IN AREA THEN PLACE ON RIGHT-OF-WAY LINE. TEMPORARY SEDIMENT CONTROL FENCE IS PURPOSELY SHOWN OFF-SET FROM SAID LINES FOR VISUAL CLARITY.

DESIGN

STATE OF TEXAS · MARISSA GUZMAN · 130772 · LICENSED PROFESSIONAL ENGINEER

MARISSA GUZMAN, P.E.
4/24/2024
DATE

APPROVAL

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DAN THOMA, P.E.
4/24/2024
DATE

0 50 100 150
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SW3P PLAN

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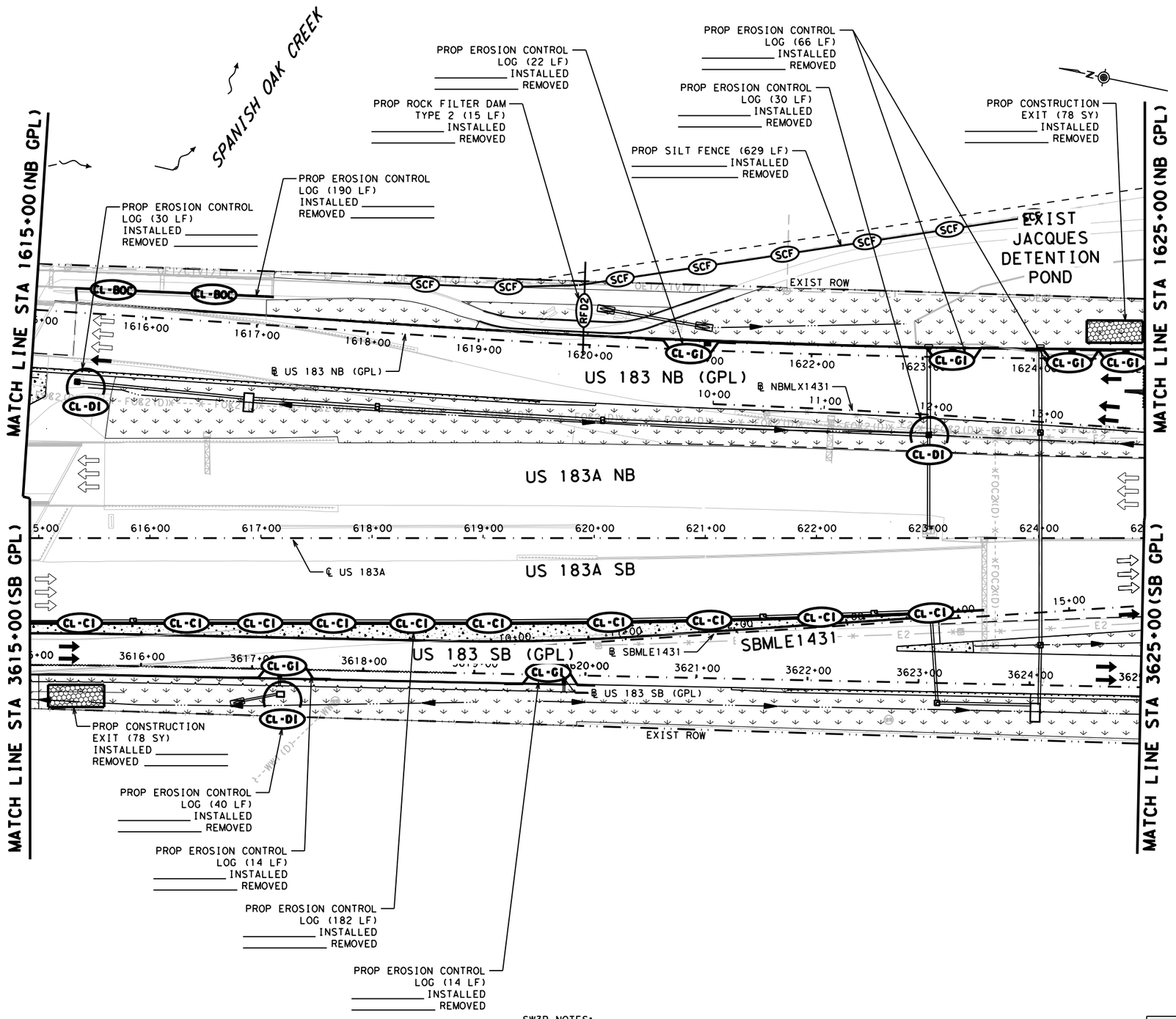

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SW3P PLAN

SHEET 2 OF 16

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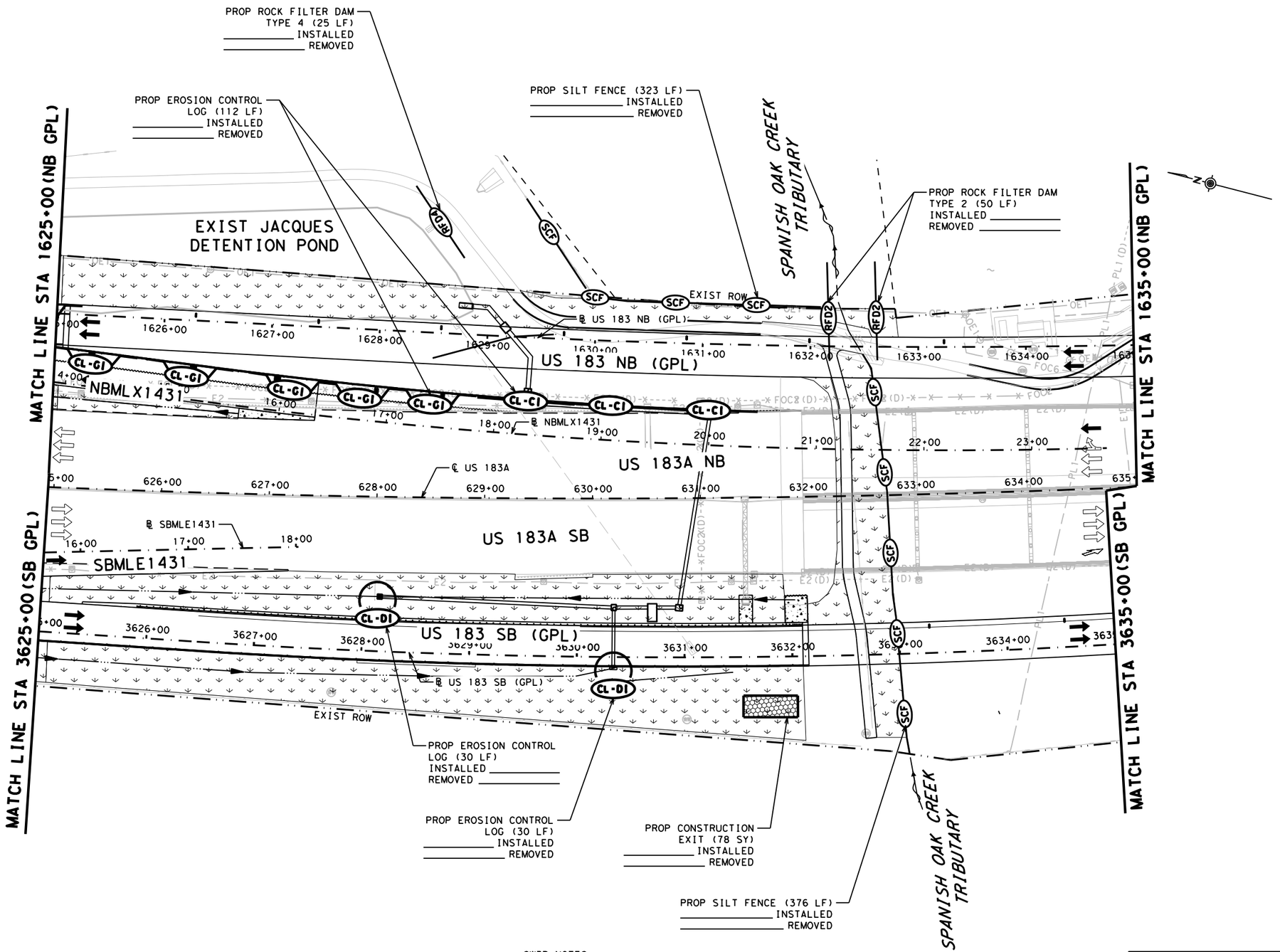

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SW3P PLAN

SHEET 3 OF 16

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	AUS	WILLIAMSON		1371

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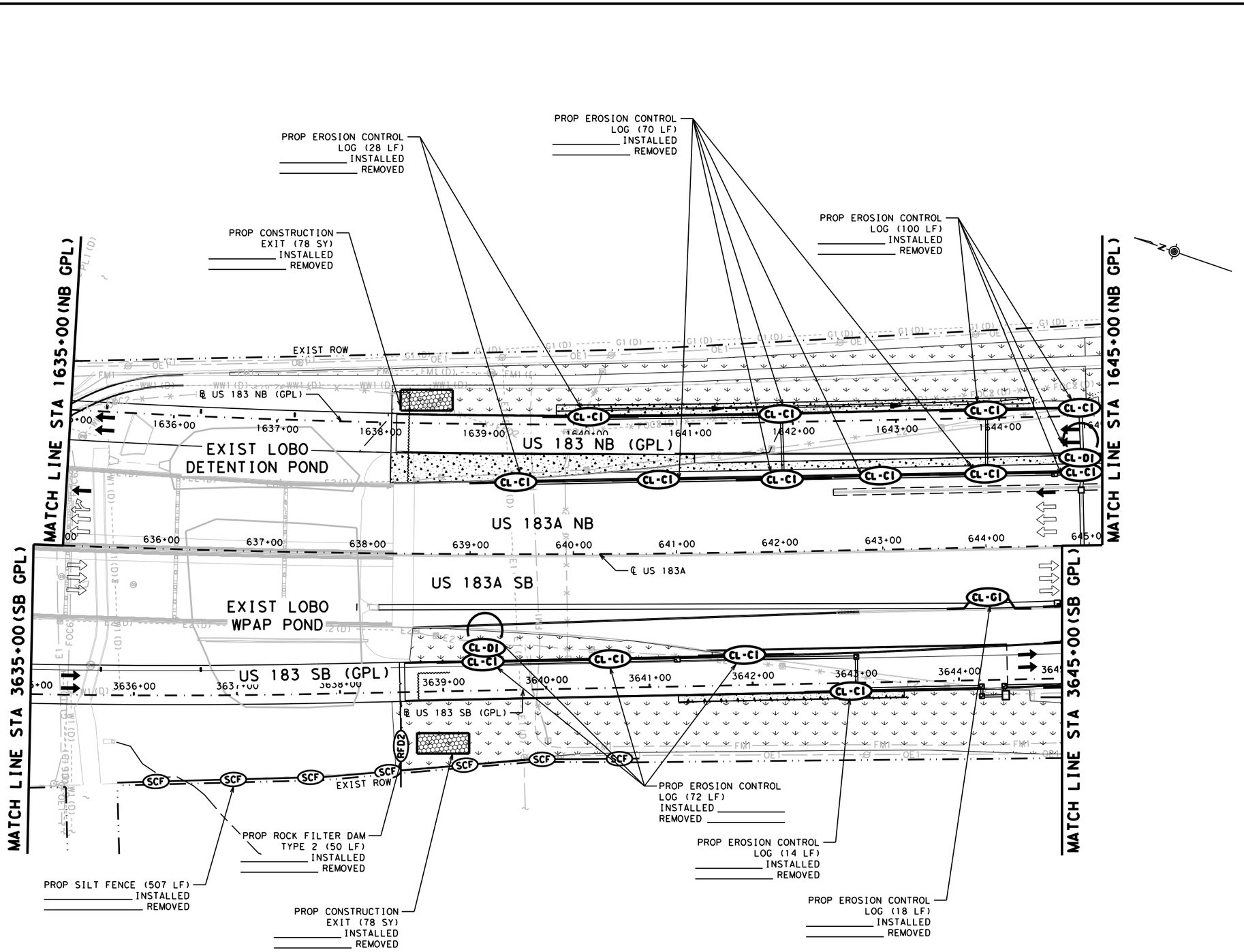

SW3P LEGEND

- CL-DI — CONTROL LOG AT DROP INLET
- CL-BOC — CONTROL LOG AT BACK OF CURB
- CL-CI — CONTROL LOG AT CURB INLET
- CL-GI — CONTROL LOG AT GRATE INLET
- RFD2 — ROCK FILTER DAM (TY 2)
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- SCF — SEDIMENT CONTROL FENCE
- DITCH FLOW
- PRESERVED TREE
- CONCRETE RIPRAP
- CONSTRUCTION EXIT
- TOPSOIL WITH BIOTIC SOIL AMENDMENT

SW3P NOTES:
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DESIGN

STATE OF TEXAS — MARISSA GUZMAN — 130772 — LICENSED PROFESSIONAL ENGINEER

MARISSA GUZMAN, P.E.
4/24/2024
DATE

APPROVAL

STATE OF TEXAS — DAN THOMA — 98622 — LICENSED PROFESSIONAL ENGINEER

DAN THOMA, P.E.
4/24/2024
DATE

0 50 100 150
SCALE: 1"= 100'

PAPE-DAWSON ENGINEERS
SAN ANTONIO | AUSTIN | HOUSTON | FORT WORTH | DALLAS
2000 NW LOOP 410 | SAN ANTONIO, TX 78213 | 210.375.9000
TEXAS ENGINEERING FIRM #470 | TEXAS SURVEYING FIRM #10028800

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US 183 GPL

SW3P PLAN

SHEET 4 OF 16

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DS: CK:	0151	10	001	US 183
DW: CK:	DIST	COUNTY		SHEET NO.
	AUS	WILLIAMSON		1372

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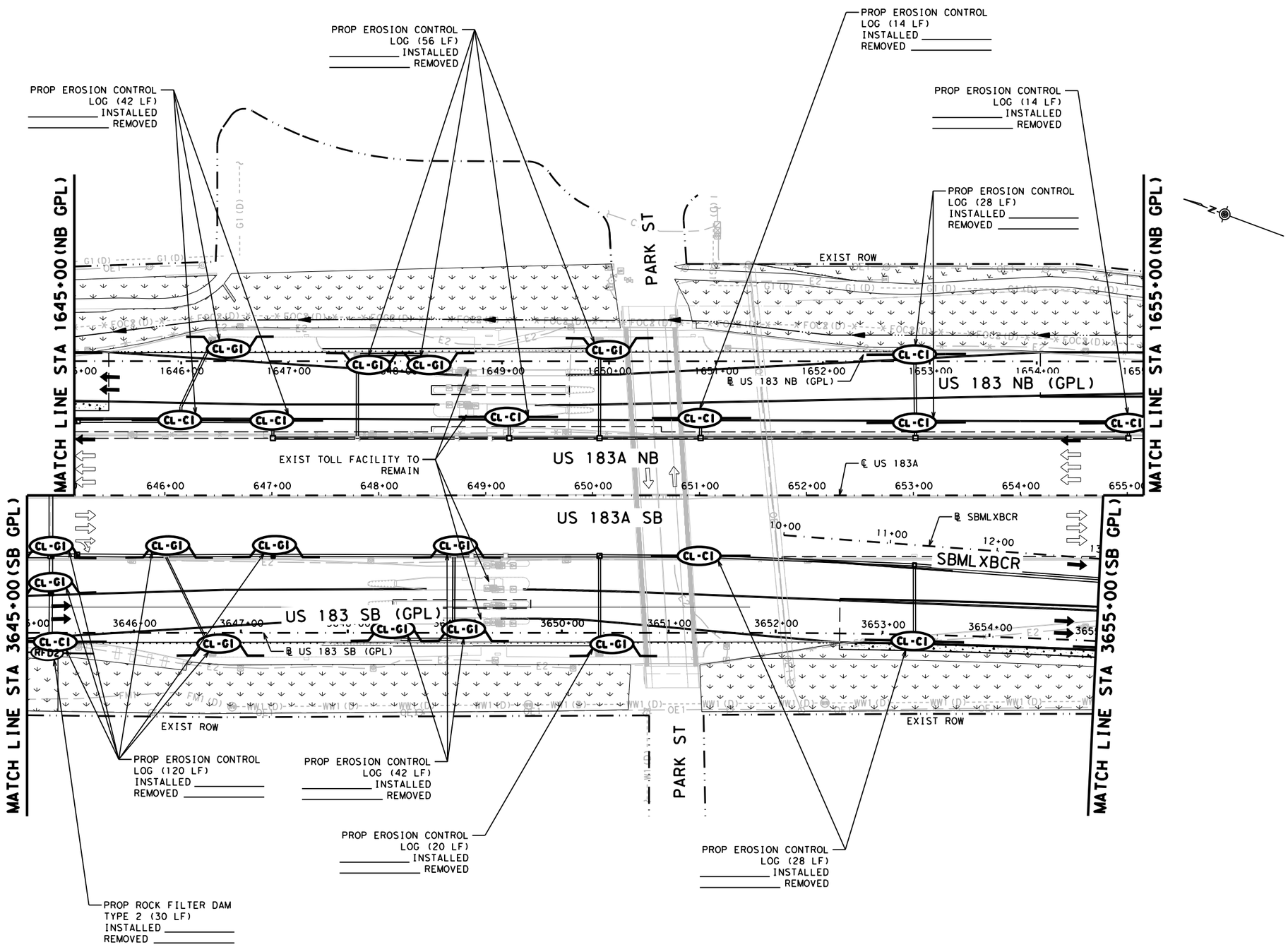

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DESIGN
STATE OF TEXAS · MARISSA GUZMAN · 130772 · LICENSED PROFESSIONAL ENGINEER
MARISSA GUZMAN, P.E.
4/24/2024
DATE

APPROVAL
STATE OF TEXAS · DAN THOMA · 98622 · LICENSED PROFESSIONAL ENGINEER
DAN THOMA, P.E.
4/24/2024
DATE

0 50 100 150
SCALE: 1" = 100'

PAPE-DAWSON ENGINEERS
SAN ANTONIO | AUSTIN | HOUSTON | FORT WORTH | DALLAS
2000 NW LOOP 410 | SAN ANTONIO, TX 78213 | 210.375.9000
TEXAS ENGINEERING FIRM #470 | TEXAS SURVEYING FIRM #10028800

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SW3P PLAN

SHEET 5 OF 16

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CONT	SECT	JOB	HIGHWAY
0151	10	001	US 183
DIST	COUNTY		SHEET NO.
AUS	WILLIAMSON		1373

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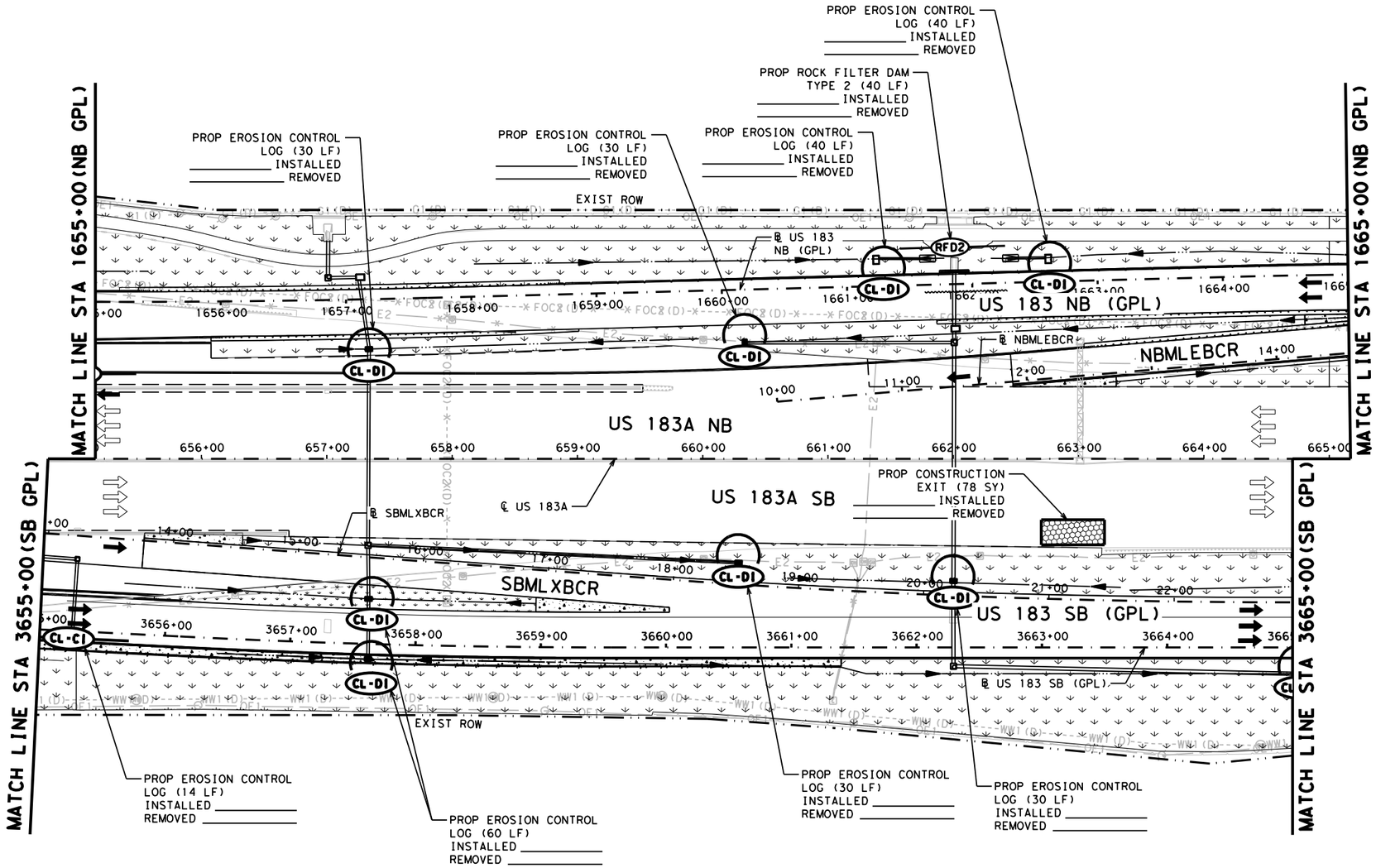

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STATE OF TEXAS — MARISSA GUZMAN — 130772 — LICENSED PROFESSIONAL ENGINEER

MARISSA GUZMAN, P.E.
4/24/2024
DATE

APPROVAL

STATE OF TEXAS — DAN THOMA — 98622 — LICENSED PROFESSIONAL ENGINEER

DAN THOMA, P.E.
4/24/2024
DATE

0 50 100 150
SCALE: 1"= 100'

PAPE-DAWSON ENGINEERS
SAN ANTONIO | AUSTIN | HOUSTON | FORT WORTH | DALLAS
2000 NW LOOP 410 | SAN ANTONIO, TX 78213 | 210.375.9000
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US 183 GPL

SW3P PLAN

SHEET 6 OF 16

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DS:	CK:	0151	10	001	US 183
		DIST	COUNTY		SHEET NO.
DW:	CK:	AUS	WILLIAMSON		1374

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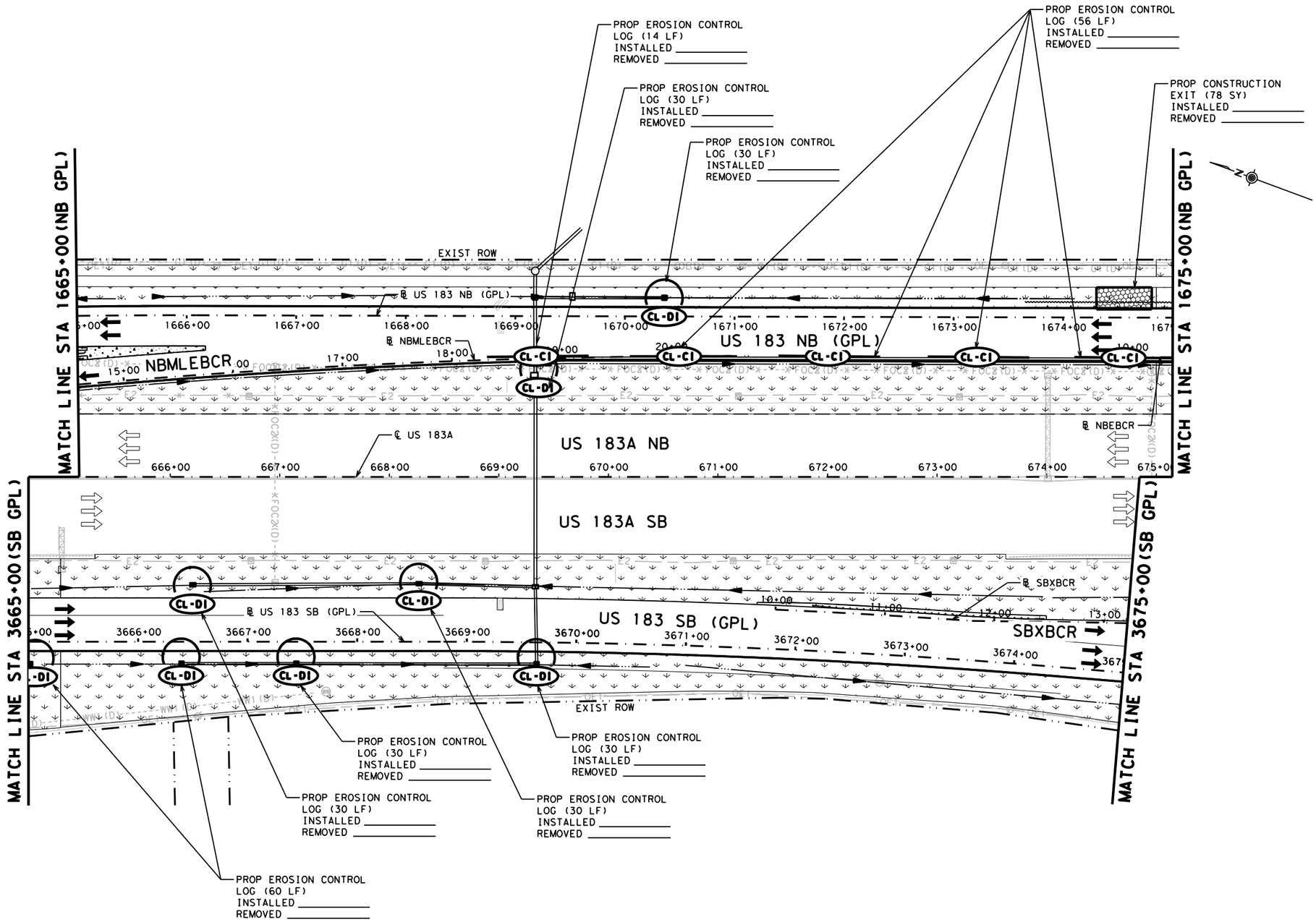

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STATE OF TEXAS — MARISSA GUZMAN — 130772 — LICENSED PROFESSIONAL ENGINEER

MARISSA GUZMAN, P.E.
4/24/2024
DATE

APPROVAL

STATE OF TEXAS — DAN THOMA — 98622 — LICENSED PROFESSIONAL ENGINEER

DAN THOMA, P.E.
4/24/2024
DATE

0 50 100 150
SCALE: 1" = 100'

PAPE-DAWSON ENGINEERS
SAN ANTONIO | AUSTIN | HOUSTON | FORT WORTH | DALLAS
2000 NW LOOP 410 | SAN ANTONIO, TX 78213 | 210.375.9000
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SW3P PLAN

SHEET 7 OF 16

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CONT	SECT	JOB	HIGHWAY
0151	10	001	US 183
DIST	COUNTY		SHEET NO.
AUS	WILLIAMSON		1375

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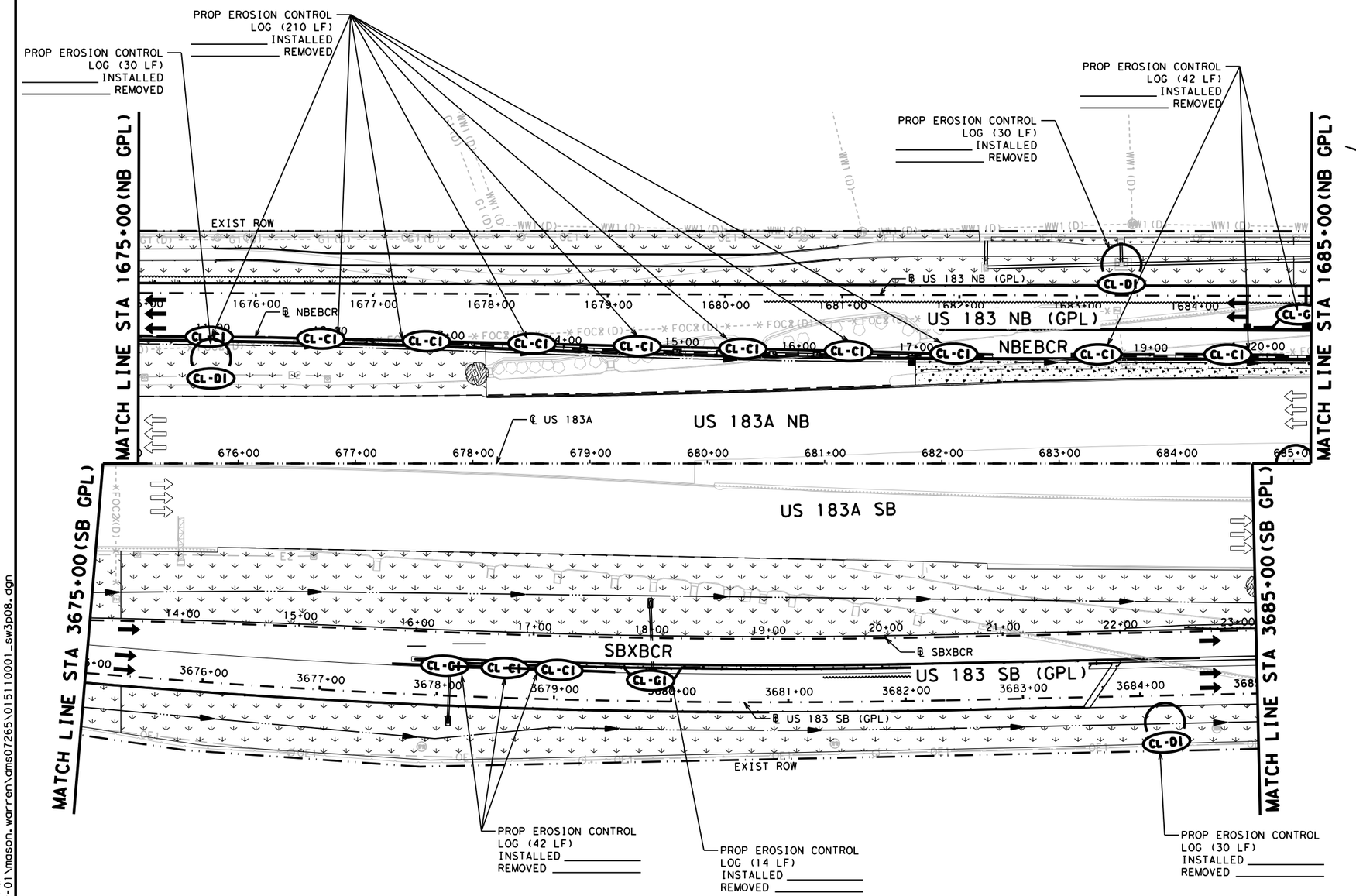

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STATE OF TEXAS — MARISSA GUZMAN — 130772 — LICENSED PROFESSIONAL ENGINEER
MARISSA GUZMAN, P.E.
4/24/2024
DATE

APPROVAL
STATE OF TEXAS — DAN THOMA — 98622 — LICENSED PROFESSIONAL ENGINEER
DAN THOMA, P.E.
4/24/2024
DATE

0 50 100 150
SCALE: 1"= 100'

PAPE-DAWSON ENGINEERS
SAN ANTONIO | AUSTIN | HOUSTON | FORT WORTH | DALLAS
2000 NW LOOP 410 | SAN ANTONIO, TX 78213 | 210.375.9000
TEXAS ENGINEERING FIRM #470 | TEXAS SURVEYING FIRM #10028800

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US 183 GPL

SW3P PLAN

SHEET 8 OF 16

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DS:	CK:	CONT	SECT	JOB	HIGHWAY
		0151	10	001	US 183
DW:	CK:	DIST	COUNTY		SHEET NO.
		AUS	WILLIAMSON		1376

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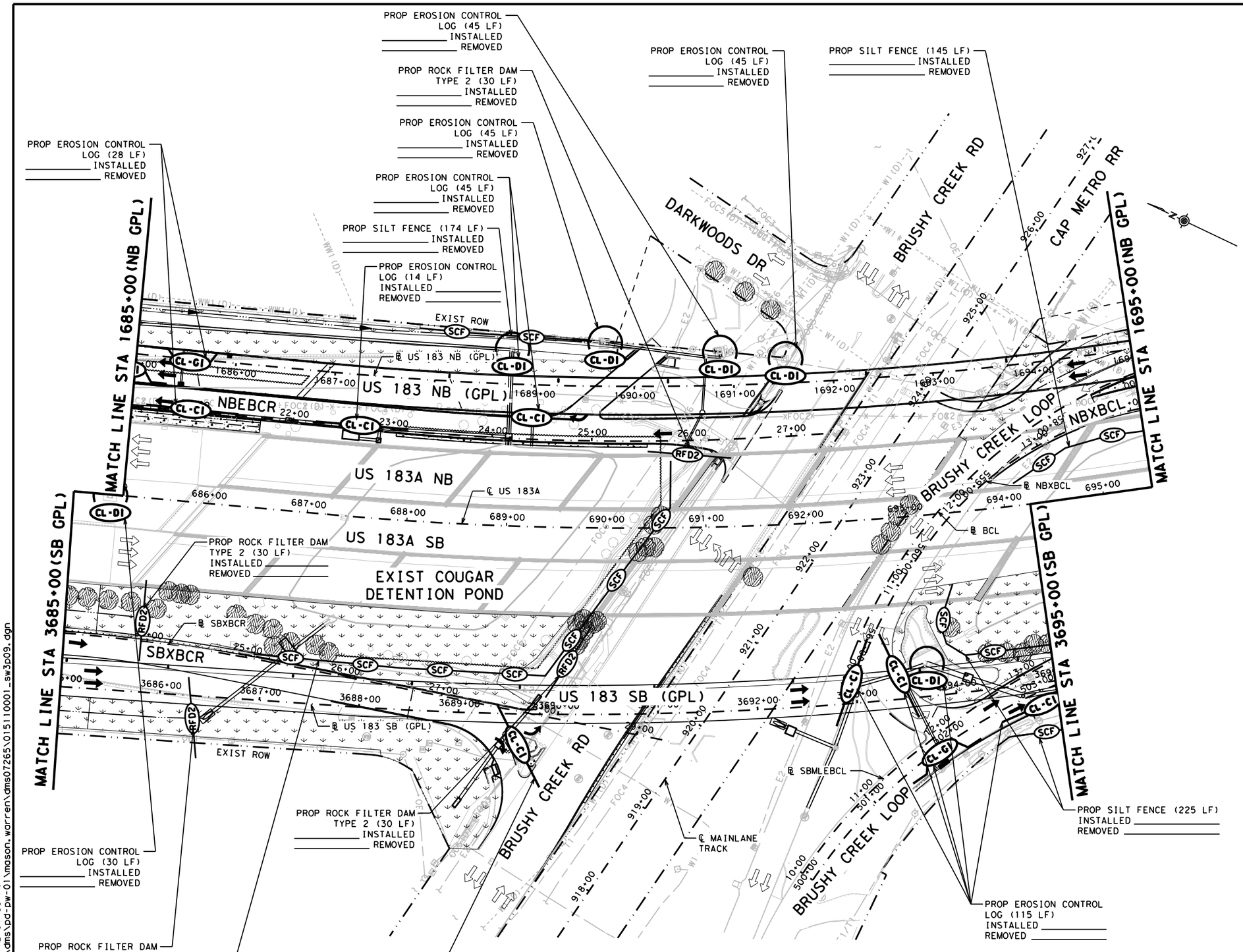

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MARISSA GUZMAN, P.E.
4/24/2024
DATE

APPROVAL
STATE OF TEXAS — DAN THOMA — 98622 — LICENSED PROFESSIONAL ENGINEER
DAN THOMA, P.E.
4/24/2024
DATE

0 50 100 150
SCALE: 1"= 100'

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SAN ANTONIO | AUSTIN | HOUSTON | FORT WORTH | DALLAS
2000 NW LOOP 410 | SAN ANTONIO, TX 78213 | 210.375.9000
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US 183 GPL

SW3P PLAN

SHEET 9 OF 16

© 2024		CONT	SECT	JOB	HIGHWAY
DS:	CK:	0151	10	001	US 183
DW:	CK:	DIST	COUNTY		SHEET NO.
		AUS	WILLIAMSON		1377

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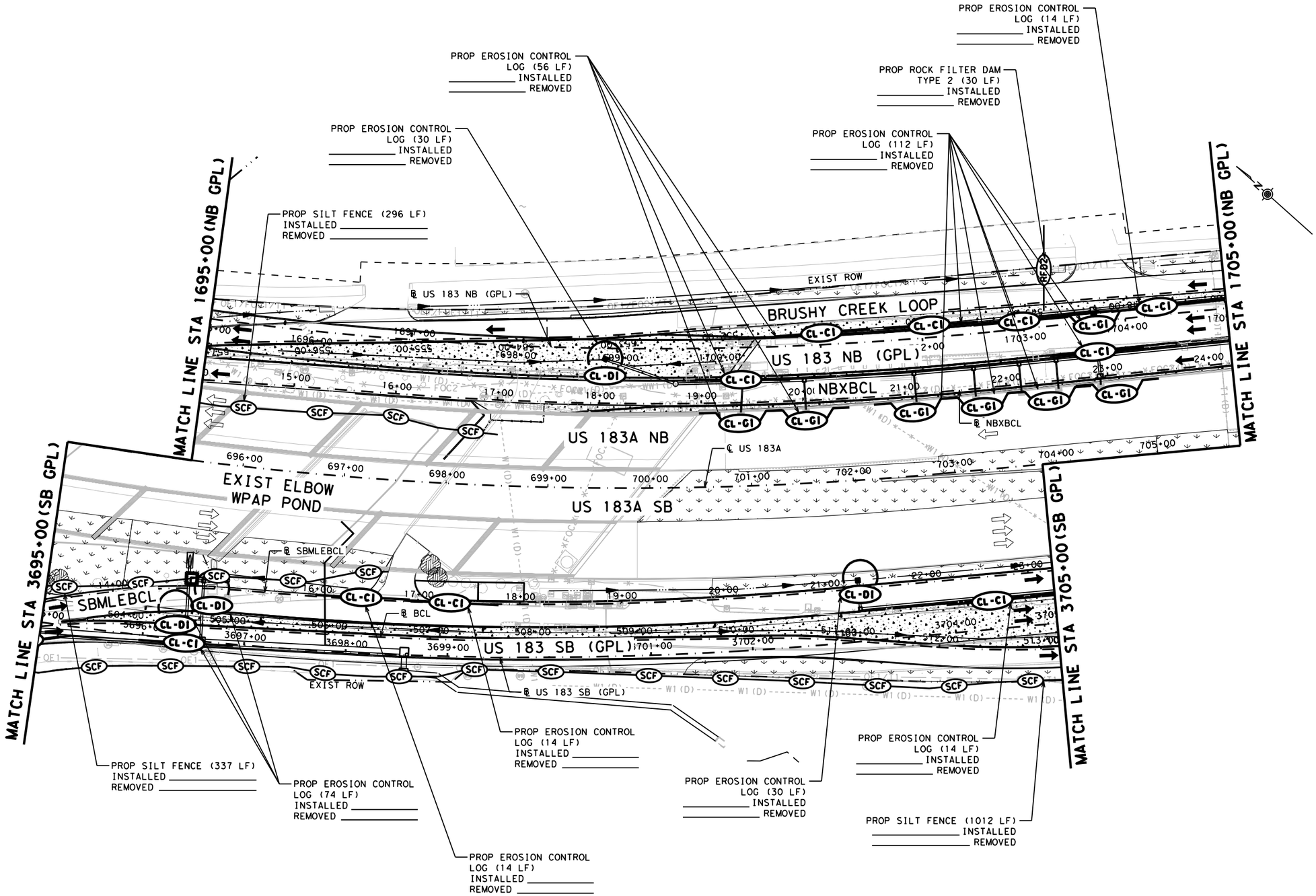

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0 50 100 150
SCALE: 1" = 100'

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US 183 GPL

SW3P PLAN

SHEET 10 OF 16

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DS:	CK:	0151	10	001	US 183
		DIST	COUNTY		SHEET NO.
DW:	CK:	AUS	WILLIAMSON		1378

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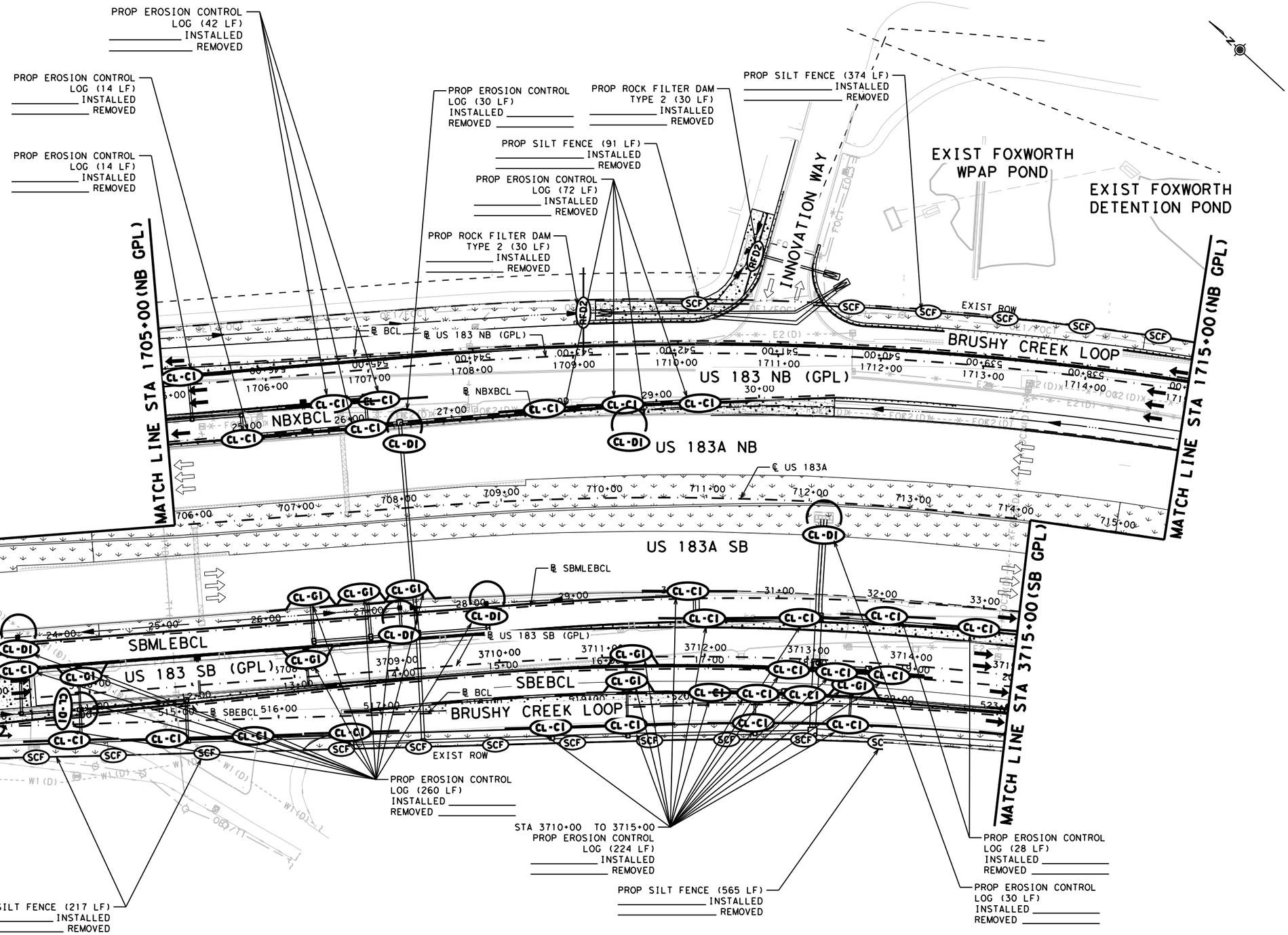

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SW3P PLAN

SHEET 11 OF 16

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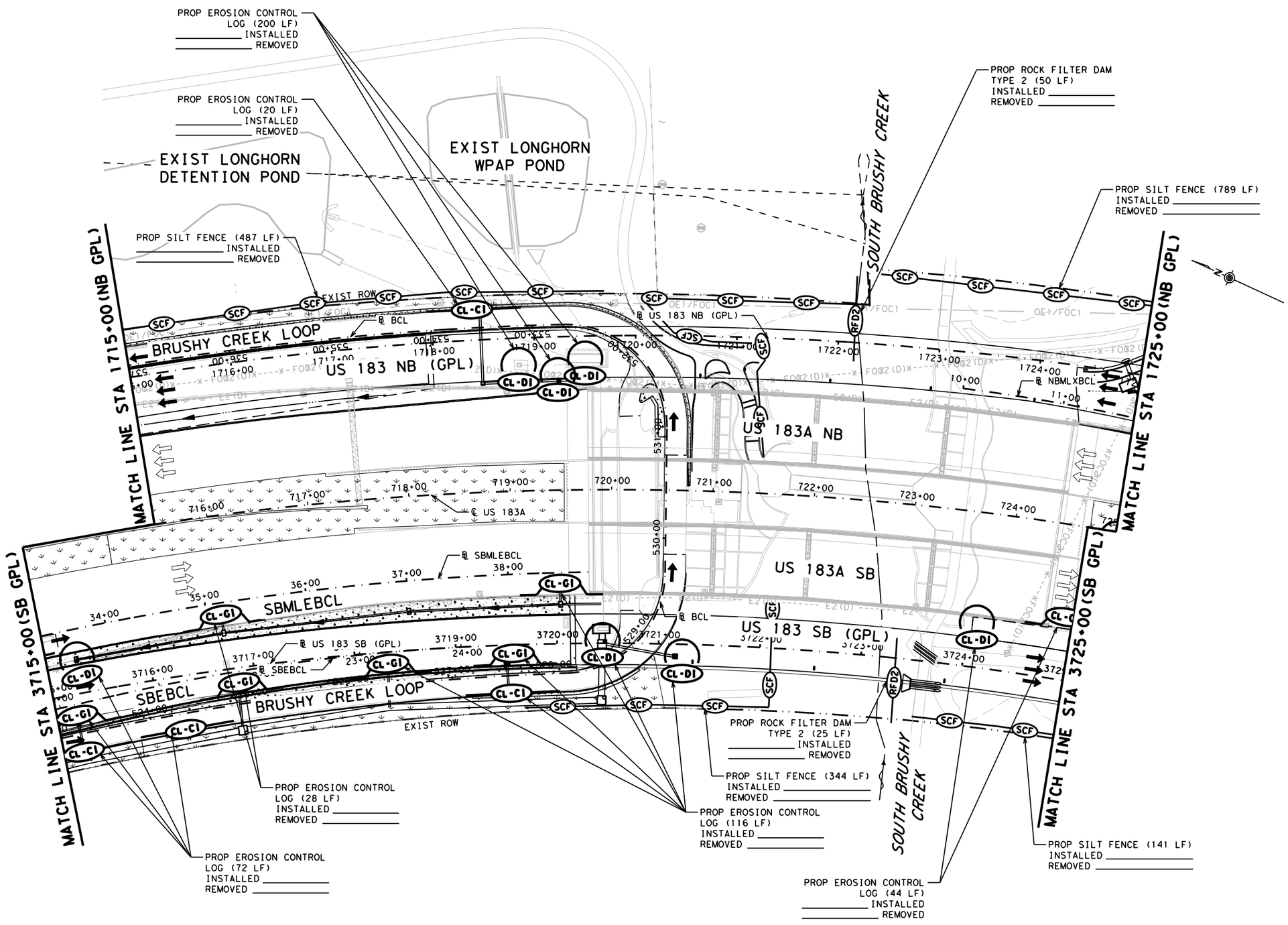

SW3P LEGEND

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- CL-BOC — CONTROL LOG AT BACK OF CURB
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- DITCH FLOW
- PRESERVED TREE
- CONCRETE RIPRAP
- CONSTRUCTION EXIT
- TOPSOIL WITH BIOTIC SOIL AMENDMENT

SW3P NOTES:
1. REFER TO TEMPORARY EROSION CONTROL MEASURE STANDARDS FOR MORE INFORMATION.
2. CONSTRUCTION ENTRANCE/EXIT LOCATIONS TO BE DETERMINED IN THE FIELD.
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DESIGN
STATE OF TEXAS — MARISSA GUZMAN — 130772 — LICENSED PROFESSIONAL ENGINEER
MARISSA GUZMAN, P.E.
4/24/2024
DATE

APPROVAL
STATE OF TEXAS — DAN THOMA — 98622 — LICENSED PROFESSIONAL ENGINEER
DAN THOMA, P.E.
4/24/2024
DATE

0 50 100 150
SCALE: 1"= 100'

PAPE-DAWSON ENGINEERS
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SW3P PLAN

SHEET 12 OF 16

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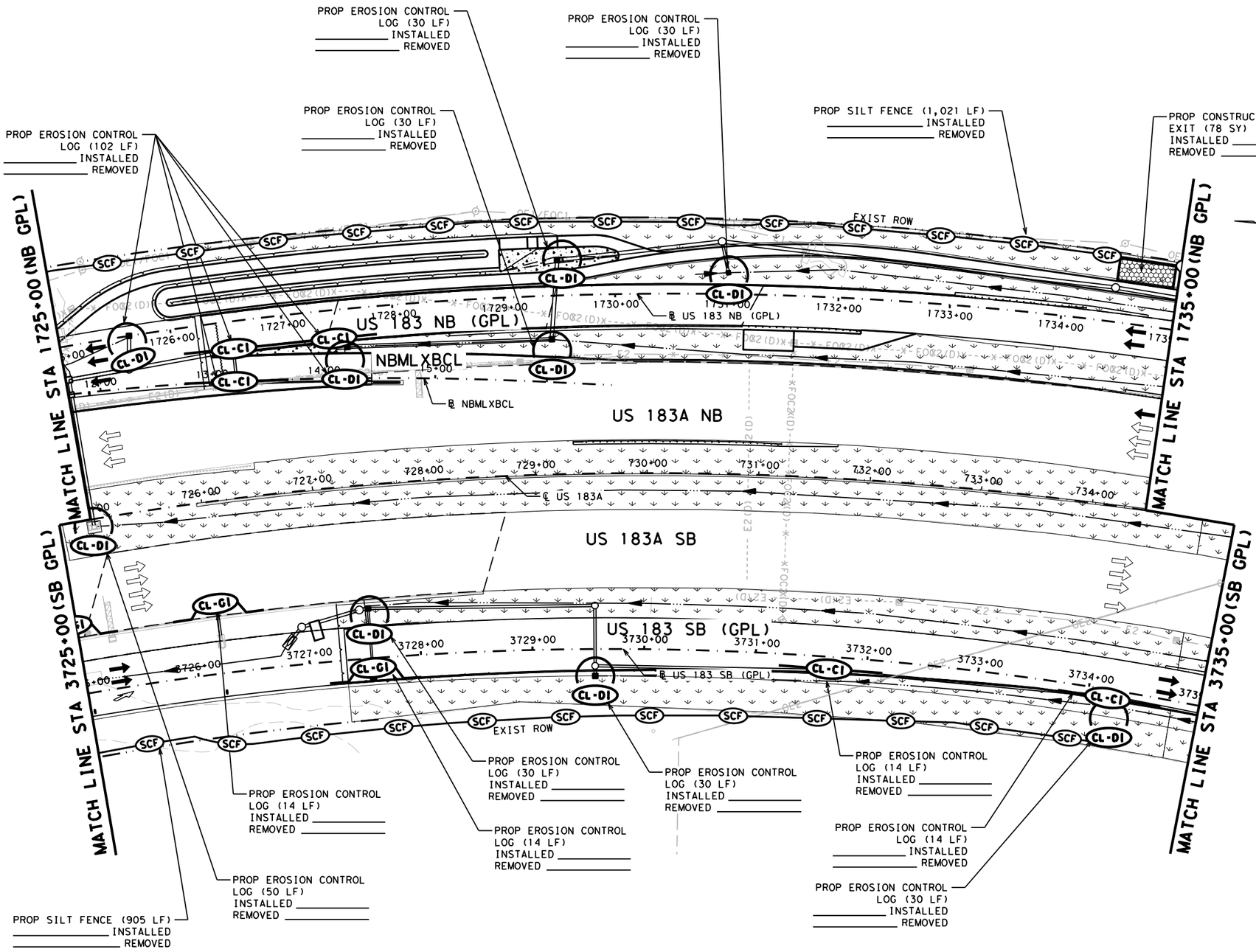

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MARISSA GUZMAN, P.E.
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APPROVAL

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DAN THOMA, P.E.
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SW3P PLAN

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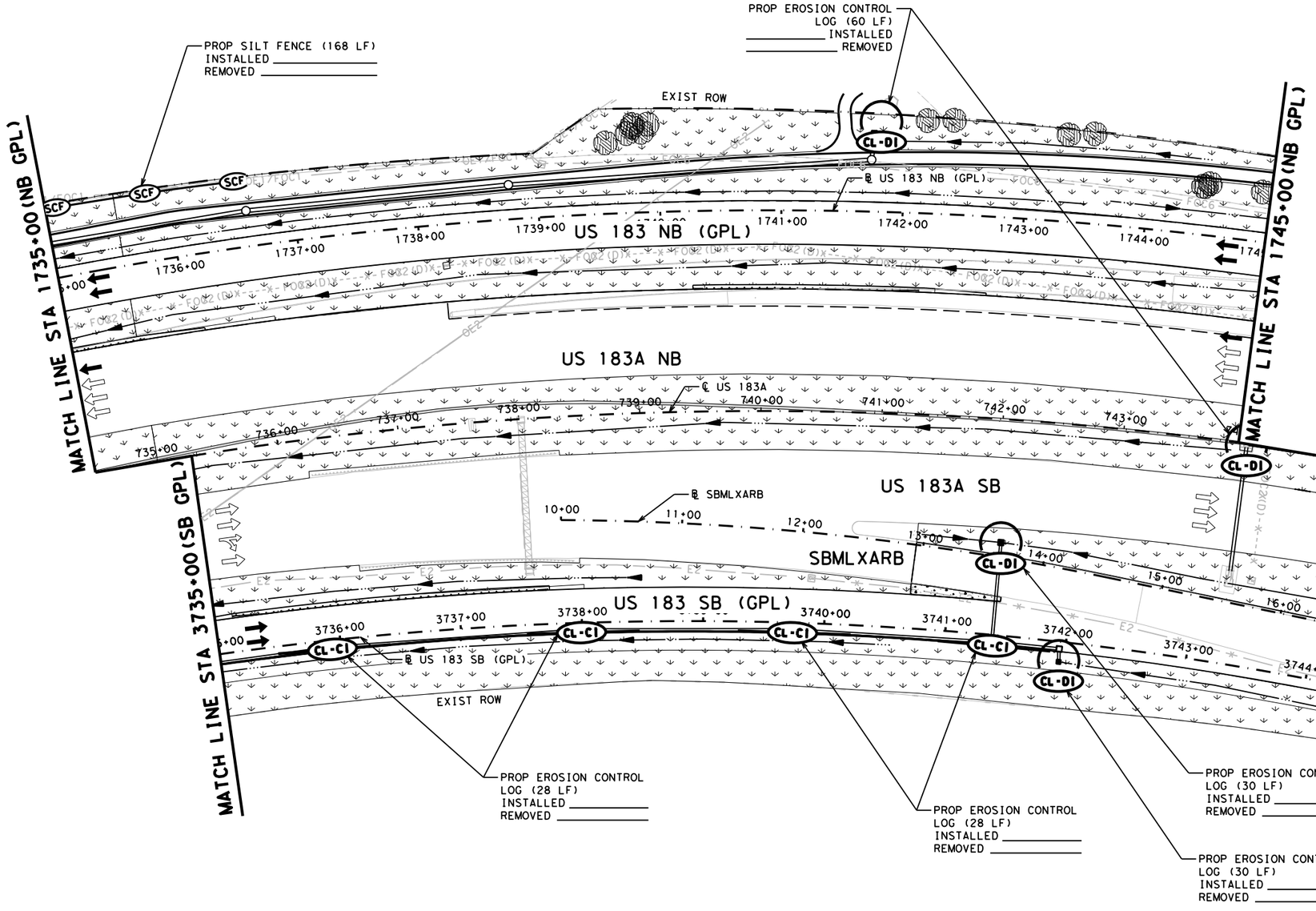

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MARISSA GUZMAN, P.E.

4/24/2024
DATE

APPROVAL

STATE OF TEXAS · DAN THOMA · 98622 · LICENSED PROFESSIONAL ENGINEER

DAN THOMA, P.E.

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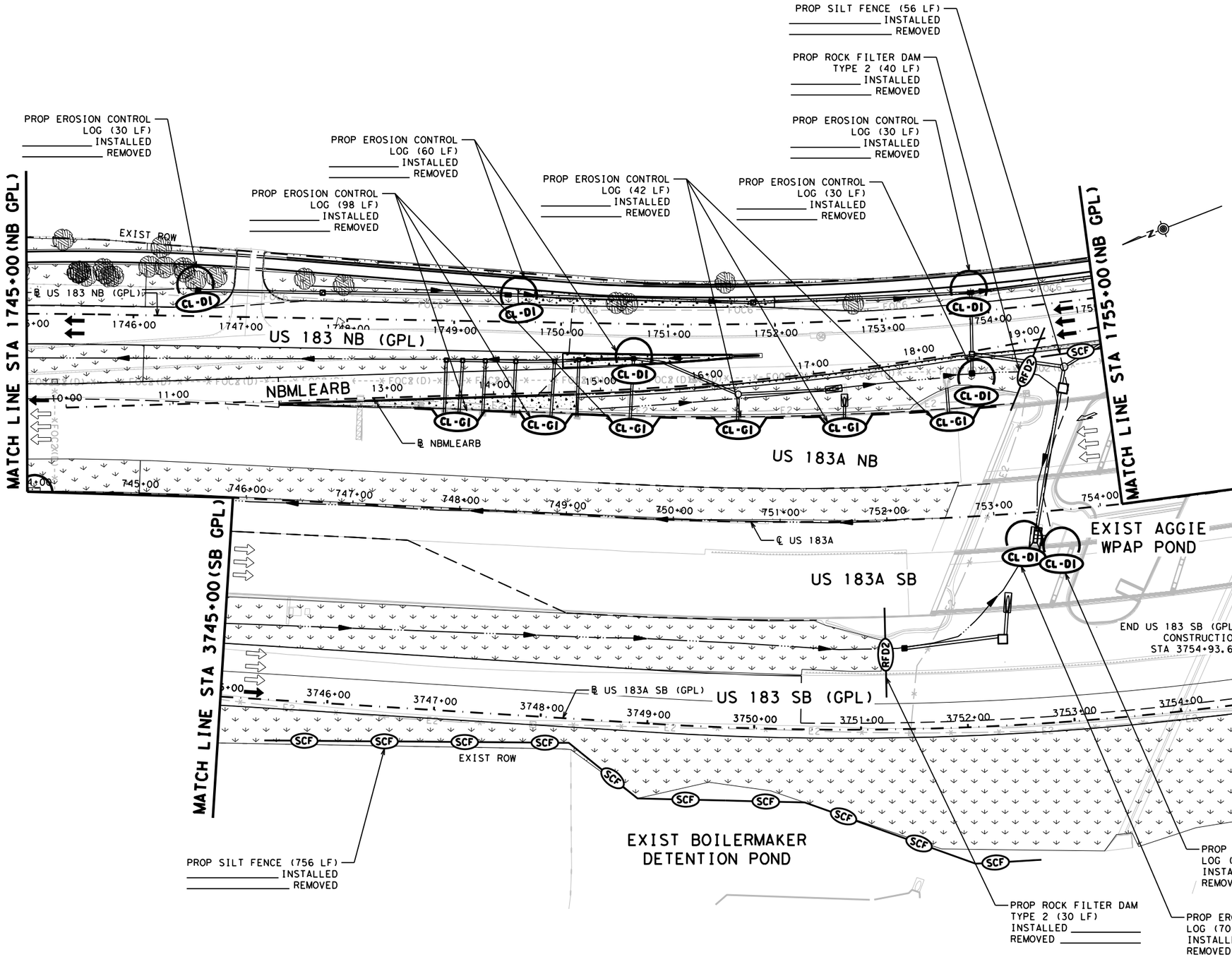

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MARISSA GUZMAN, P.E.
4/24/2024
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APPROVAL

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DAN THOMA, P.E.
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SW3P PLAN

SHEET 15 OF 16

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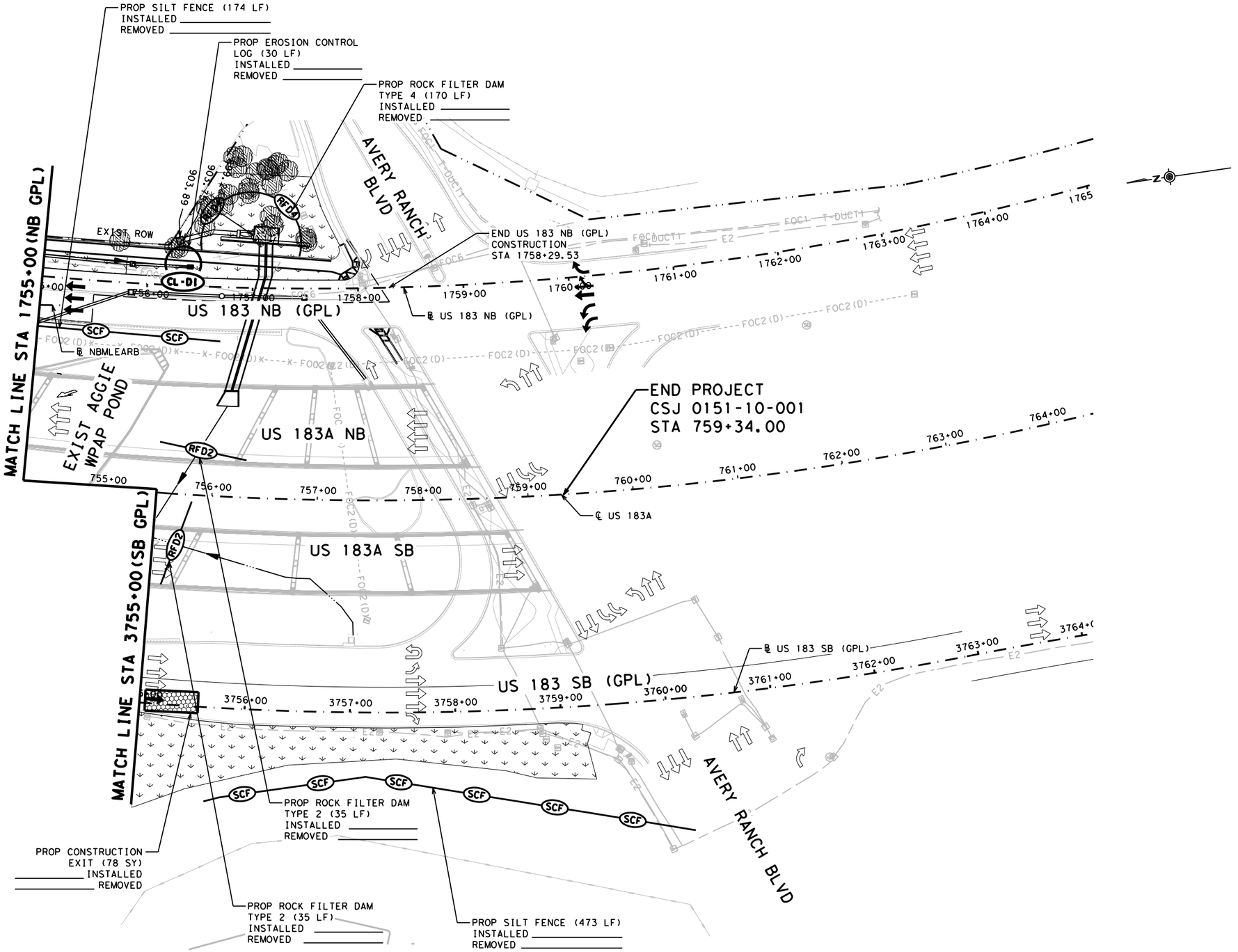

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MARISSA GUZMAN, P.E.
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DAN THOMA, P.E.
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SW3P PLAN

SHEET 16 OF 16

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VOIDS DEFINITION

- VOID GREATER THAN SIX INCHES ACROSS IN ANY DIRECTION AND/OR
- VOID IS GREATER THAN ONE SQUARE FOOT ALONG ANY PLANE AND/OR
- VOID BLOWS AIR AND/OR
- VOID CONTINUALLY RECEIVES WATER DURING A RAIN EVENT AND/OR
- VOID HAS WATER FLOWING THROUGH OR OUT OF IT AND/OR

GENERAL NOTES

1. USING EXPLOSIVES IS NOT ALLOWED.
2. THE PROJECT AREA IS A KNOWN KARST AREA. FRACTURED MATERIAL, BOULDERS,UNDERGROUND VOIDS, GROUNDWATER, UNSTABLE MATERIAL, AND DRASTICALLY VARYING STRATA CAN BE EXPECTED. THE CONTRACTOR SHALL WORK WITH TXDOT AND TXDOT'S PARTNERS TO ALLOW ACCESS AND ON-SITE MONITORING OF EXCAVATION.
3. THE VOID MITIGATION DETAILS ARE EXAMPLES. IMPLEMENTATION OF THE APPROVED MITIGATION PLAN SHOULD USE THE REFERENCED BID ITEMS.
4. CONCRETE USED FOR VOID MITIGATION SHALL BE 3,000 PSI IN ACCORDANCE WITH ITEM 420 CLASS A CONC (MISC). QUANTITIES UNDER 4 CY MAY BE HAND MIXED ON SITE USING 5,000 PSI RATED BAG MIX CONCRETE.
5. 3 IN. x 5 IN. ROCK SHALL BE IN ACCORDANCE WITH ITEM 506. LARGE ROCK > 1 FT. SHALL BE IN ACCORDANCE WITH 12 IN. ROCK PER ITEM 432.
6. FILTER FABRIC AND EROSION LOGS WILL BE IN ACCORDANCE WITH ITEM 506.
7. IMPERMEABLE LINER WILL BE IN ACCORDANCE WITH ITEM 5056. THE EDGE OF THE LINER SHALL BE ANCHORED IN A 6 IN. WIDE BY 18 IN. DEEP TRENCH.
8. STEEL CASING, USED FOR DRILL SHAFT CONSTRUCTION, SHALL BE IN ACCORDANCE WITH ITEM 416.
9. AGGREGATE OR OTHER BACKFILL WILL BE PAID FOR BY OVERRUN OF EXISTING EMBANKMENT ITEM. FILTER FABRIC OVER THE AGGREGATE IS SUBSIDIARY. SANDBAGS SHALL BE PAID USING SANDBAGS FOR EROSION CONTROL. THE SANDBAGS SHALL BE POLYPROPYLENE AND FILLED WITH PEA GRAVEL. CONNECTOR PIPE SHALL BE PAID USING PIPE(PVC)(SCH 80)(6 IN).
10. IF A SINGLE VOID IMPACT CAUSES DELAYS BY MORE THAN 20 WORKING DAYS, DELAY WILL BE CONSIDERED FOR THE IMPACT BEYOND THE INITIAL 20 DAYS. IF THE ACCUMULATION OF VOID IMPACTS CAUSE DELAYS BY MORE 40 WORKING DAYS, DELAY WILL BE CONSIDERED FOR THE IMPACT BEYOND THE 40 DAYS . OVERHEAD, BARRICADES AND DELAYS WILL BE EVALUATED AND PAID IN ACCORDANCE WITH THE CONTRACT. IMPACTS WILL NOT BE CONSIDERED IMPACT AFTER A RESPONSE PROCEDURE IS PROVIDED. ALL DELAYS CAUSED BY A VOID AND THE DURATION FOR IMPLEMENTATION OF A RESPONSE ARE NON-COMPENSABLE FOR LABOR, EQUIPMENT, STANDBY, MOBILIZATIONS, AND COST ESCALATIONS.

VOID MITIGATION AND PROTECTION MEASURES

REFER TO VOID MITIGATION DETAILS FOR ADDITIONAL INFORMATION. VOID MITIGATION DETAILS ARE TO BE APPROVED BY GEOSCIENTIST AND THE TCEQ (IF APPLICABLE) PRIOR TO IMPLEMENTATION.

1. IN THE EVENT THAT UNKNOWN KARST VOIDS ARE ENCOUNTERED, WORK AT THAT LOCATION WILL BE HALTED IMMEDIATELY AND THE FEATURE WILL BE INSPECTED PROMPTLY BY TXDOT.
2. WHEN REQUIRED, TXDOT WILL INSPECT ALL VOIDS TO DETERMINE THE POTENTIAL OF THE FEATURES TO PROVIDE SUITABLE HABITAT FOR ENDANGERED KARST INVERTEBRATES. WORK AT THAT LOCATION WILL NOT RESUME UNTIL AUTHORIZATION TO DISTURB THE FEATURE HAS BEEN OBTAINED. REFER TO THE EPIC SHEET FOR ADDITIONAL INFORMATION FOR THREATENED OR ENDANGERED SPECIES.

TXDOT WILL INSPECT ALL VOIDS TO DETERMINE THE APPROPRIATE VOID MITIGATION PLAN.

3. ADDITIONAL EXCAVATION OF THE VOID MAY BE REQUIRED BY TXDOT OR THE GEOSCIENTIST TO FULLY EVALUATE THE VOID AND/OR MITIGATION PLAN PREPERATION. TXDOT APPROVAL IS REQUIRED PRIOR THE EXCAVATION. THIS WORK IS SUBSIDIARY.

VOID DISCOVERY PROTOCOL

IF A VOID IS DISCOVERED, THE FOLLOWING PROTOCOL WILL BE FOLLOWED:

1. ALL VOIDS REQUIRE AN EMAIL NOTIFICATION TO TXDOT DESIGNATED REPRESENTATIVE WITHIN 2 HOURS OF DISCOVERY. THE EMAIL WILL REQUIRE LOCATION INFORMATION (STATION, LATITUDE & LONGITUDE), DATES OF DISCOVERY, VIDEO/PICTURE DOCUMENTATION, SIZE, ETC. CONTRACTOR SHALL SUPPLY A CAMERA AND DIGITAL PICTURE/VIDEO DOCUMENTATION OF ALL VOIDS AND PROVIDE A MEASUREMENT OF THE SIZE OF THE VOID. FOR VOIDS THAT CANNOT BE SAFELY EXPLORED, ANOTHER DEVICE SHALL BE PROVIDED TO DOCUMENT THE VOID. CONTACT THE DISTRICT CONSTRUCTION OFFICE FOR AN EXAMPLE EMAIL THAT SHALL BE FOLLOWED. THIS WORK IS SUBSIDIARY.
2. ALL ACTIVITY WITHIN A 50-FOOT RADIUS OF THE VOID SHALL STOP. BLOCK TRAFFIC FROM DRIVING NEAR THE VOID AND PREVENT CONSTRUCTION EQUIPMENT FROM OPERATING IN THE VICINITY OF THE VOID USING BARRELS, ORANGE CONSTRUCTION FENCE OR OTHER APPROVED HIGHLY VISIBLE BARRIER.
3. A DRY VOID THAT IS LESS THAN 1 CF IN VOLUME OR LESS THAN 6 IN. IN ALL DIRECTIONS WILL NOT REQUIRE ACTION BEYOND NOTIFICATION. TXDOT SHALL BE NOTIFIED IMMEDIATELY VIA EMAIL AND PHONE WHEN A VOID IS FOUND THAT REQUIRES ACTION. TXDOT WILL RESPOND WITHIN 6 BUSINESS DAYS FROM TIME OF EMAIL NOTIFICATION TO PROVIDE GUIDANCE TO THE CONTRACTOR.
4. COVER THE VOID TO PREVENT CONTAMINATION AND CHANGES IN AMBIENT CONDITIONS (TARPS AND PLYWOOD, OR SIMILAR MATERIALS ARE APPROPRIATE AS AVAILABLE). WHERE COVERING THE VOID IS NOT FEASIBLE, CONTRACTOR SHALL OBTAIN APPROVAL FROM TXDOT OF ALTERNATE TEMPORARY PROTECTION MEASURES. BIODEGRADABLE EROSION CONTROL LOG (BECL) SHOULD WRAP THE SURFACE PERIMETER OF THE VOID. TEMPORARY PROTECTIONS SHOULD REMAIN IN PLACE UNTIL FINAL MITIGATION AND PROTECTION MEASURES ARE APPROVED AND IN PLACE. AN EARTHEN BERM WILL BE MAINTAINED ON THE UP-GRADIENT SIDE OF VOID TO PREVENT ANY CONSTRUCTION RUNOFF FROM ENTERING ANY PART OF THE FEATURE WHICH MAY REMAIN. THIS WORK IS SUBSIDIARY.
5. WHEN REQUIRED TXDOT SHALL IMMEDIATELY NOTIFY THE TEXAS COMMISSION ON ENVIRONMENTAL QUALITY (TCEQ) AUSTIN REGIONAL OFFICE.
6. TXDOT WILL PROVIDE FOR THE EVALUATION OF THE VOID A QUALIFIED GEOSCIENTIST LICENSED BY THE TEXAS BOARD OF PROFESSIONAL GEOSCIENTISTS OR BY A PROFESSIONAL ENGINEER WHO QUALIFIES TO PRACTICE GEOSCIENCE ACCORDING TO THE TEXAS BOARD OF PROFESSIONAL GEOSCIENTISTS.
7. WHEN REQUIRED TXDOT WILL SUBMIT AND OBTAIN APPROVAL OF AN ENCOUNTERED FEATURE MITIGATION PLAN TO THE TCEQ AUSTIN REGION OFFICE.
8. WORK SHOULD CEASE IN THE AREA UNTIL ASSESSMENT OF THE VOID CAN BE COMPLETED, TCEQ APPROVES THE ENCOUNTERED FEATURE MITIGATION PLAN AND MITIGATION IS COMPLETED. WHEN THE VOID IS OUTSIDE TCEQ JURISDICTION, TXDOT WILL APPROVE THE ENCOUNTERED FEATURE MITIGATION PLAN.

VOIDS RELATED TO DRILLED SHAFTS, SOIL NAILS, ROCK NAILS AND OTHER SIMILAR FUNCTIONS

1. SUBMIT INSTALLATION PLAN FOR REVIEW NO LATER THAN 2 MONTHS BEFORE CONSTRUCTION.
2. THE USE OF DRILLING FLUIDS, UNDERWATER PLACEMENT, OR SLURRY METHOD WILL NOT BE ALLOWED IF A VOID IS EXPOSED DURING DRILLING OF SHAFTS OR NAILS. THE CONTRACTOR SHALL USE APPROPRIATE INDUSTRY APPROVED METHODS TO PROVIDE A PRODUCT IN COMPLIANCE WITH THE SPECIFICATIONS. ADDITIONAL TIME OR COMPENSATION WILL NOT BE ALLOWED FOR USE OF ALTERNATE METHODS OR CASING INSTALLATION.
3. DURING NON-WORK HOURS OPEN HOLES SHALL BE PROTECTED FOR SAFETY AND COVERED. SHAFTS SHALL BE SURROUNDED BY EROSION CONTROL LOGS AT AN OFFSET OF 10' FROM THE EDGE OF THE OPENING. THIS WORK IS SUBSIDIARY
4. VIDEO DOCUMENTATION SHALL BE CONDUCTED OF A DRILL SHAFT ONCE EXCAVATION IS COMPLETE AND PRIOR TO PLACING REINFORCEMENT. SUFFICIENT LIGHTING SHALL ACCOMPANY THE VIDEO CAMERA TO ENSURE THE SHAFT AND VOIDS ARE VISIBLE. THIS WORK IS SUBSIDIARY.
5. CONCRETE USED TO FILL THE VOIDS WILL BE PAID USING CLASS A CONC (MISC) ITEM BUT WILL USE THE CLASS OF CONCRETE AS REQUIRED BY THE SPECIFICATION. QUANTITY OF CONCRETE WILL BE BASED ON VISUAL INSPECTION PROVIDED BY THE CONTRACTOR. IF VISUAL INSPECTION IS UNABLE TO DETERMINE THE SIZE OF THE VOID THE CONCRETE FOR PAYMENT WILL BE MEASURED AS THE ADDITIONAL CONCRETE BEYOND THE AMOUNT REQUIRED TO PLACE A CLEAN SHAFT PLUS 10 PERCENT WASTE.
6. THE USE OF PERMANENT CASING SHALL BE IN ACCORDANCE WITH ITEM 416. MATERIAL COST FOR CASING THAT REMAINS WILL BE PAID BY INVOICE FROM SUPPLIER WITH MARK UP IN ACCORDANCE WITH MATERIAL FOR ITEM 9.7. ADDITIONAL LABOR, EQUIPMENT, TIME, ETC. FOR INSTALLATION OF THE CASING WILL NOT BE COMPENSABLE.
7. ADDITIONAL NAIL LENGTH WILL BE PAID BY OVERRUN OF EXISTING BID ITEM. ALTERNATE NAIL TYPE COST WILL BE PAID BY INVOICE FROM SUPPLIER WITH MARK UP IN ACCORDANCE WITH MATERIAL FOR ITEM 9.7. LABOR, EQUIPMENT, ADDITIONAL TIME, ETC. WILL NOT BE COMPENSABLE.
8. CORE HOLES ARE REQUIRED FOR ALL DRILLED SHAFTS.

PLEASE REFER TO VOID MITIGATION INFO FOUND IN THE APPENDIX OF THE AUSTIN DESIGNERS GUIDE. PLEASE DELETE THIS NOTE.

PLEASE CONTACT ZACH LANFEEAR AND ANDY BLAIR AT TXDOT AUS ENV OFFICE PRIOR TO USING THESE DETAILS. PLEASE DELETE THIS NOTE PRIOR TO PLACING THESE DETAILS IN THE PLANS.

Texas Department of Transportation | Austin District Standard

VOID MITIGATION NOTES

VMD-18(AUS)

SHEET 1 OF 7

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CONT	SECT	JOB	HIGHWAY
0151	10	001	US 183
DIST	COUNTY		SHEET NO.
AUS	WILLIAMSON		1410

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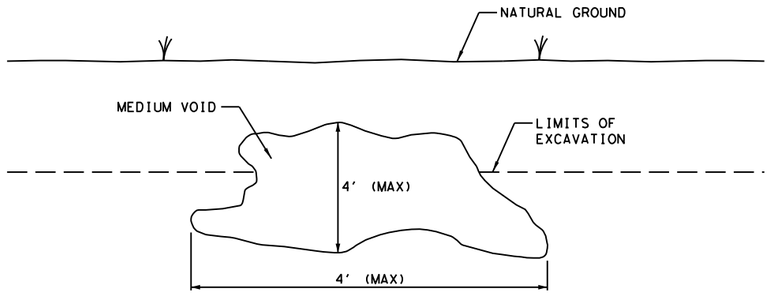
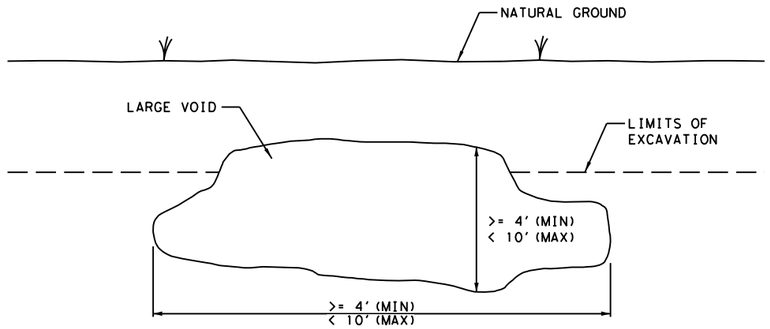
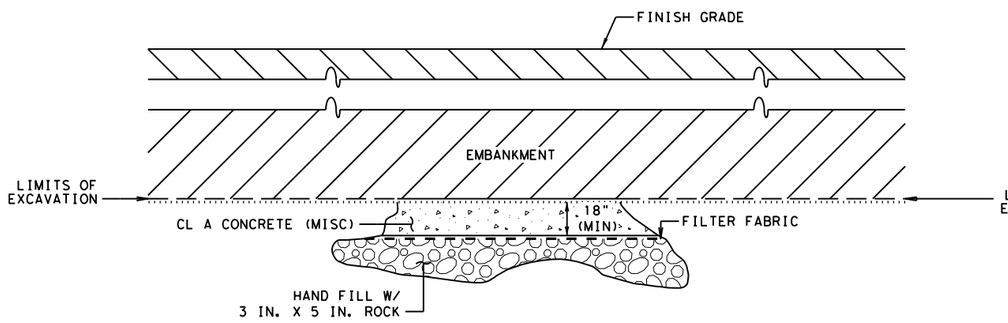
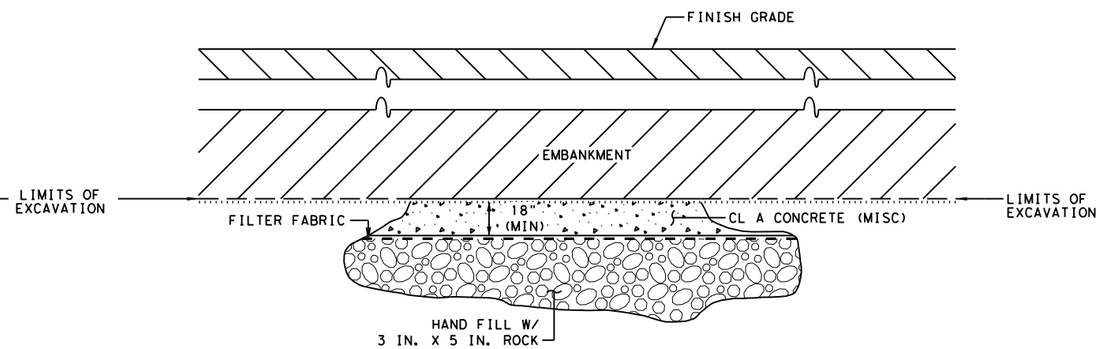






ROADWAY/S.U.P. GRADING OPERATIONS
MEDIUM (DRY VOID)
(<4' IN ANY DIRECTION)
(1 CF < 64 CF)



ROADWAY/S.U.P. GRADING OPERATIONS
LARGE (DRY VOID)
(>=4' <10' ANY DIRECTION)
(64 CF < 1000 CF)

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VOID MITIGATION DETAILS

VMD-18(AUS)

SHEET 2 OF 7

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CONT	SECT	JOB	HIGHWAY
0151	10	001	US 183
DIST	COUNTY		SHEET NO.
AUS	WILLIAMSON		1411

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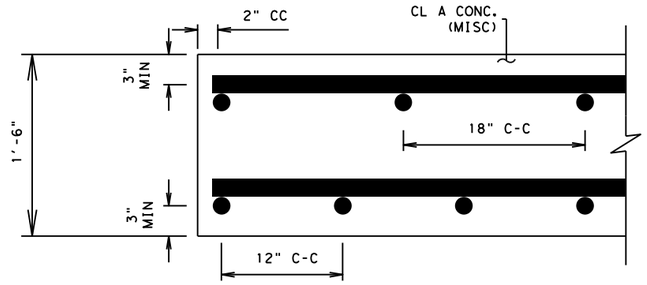
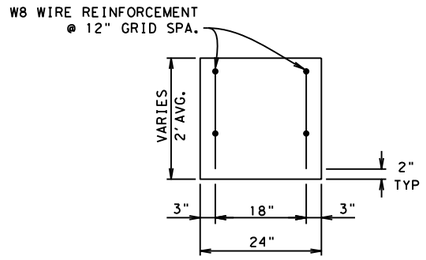


REINFORCING DETAIL



VARIABLE DEPTH CONCRETE WALL

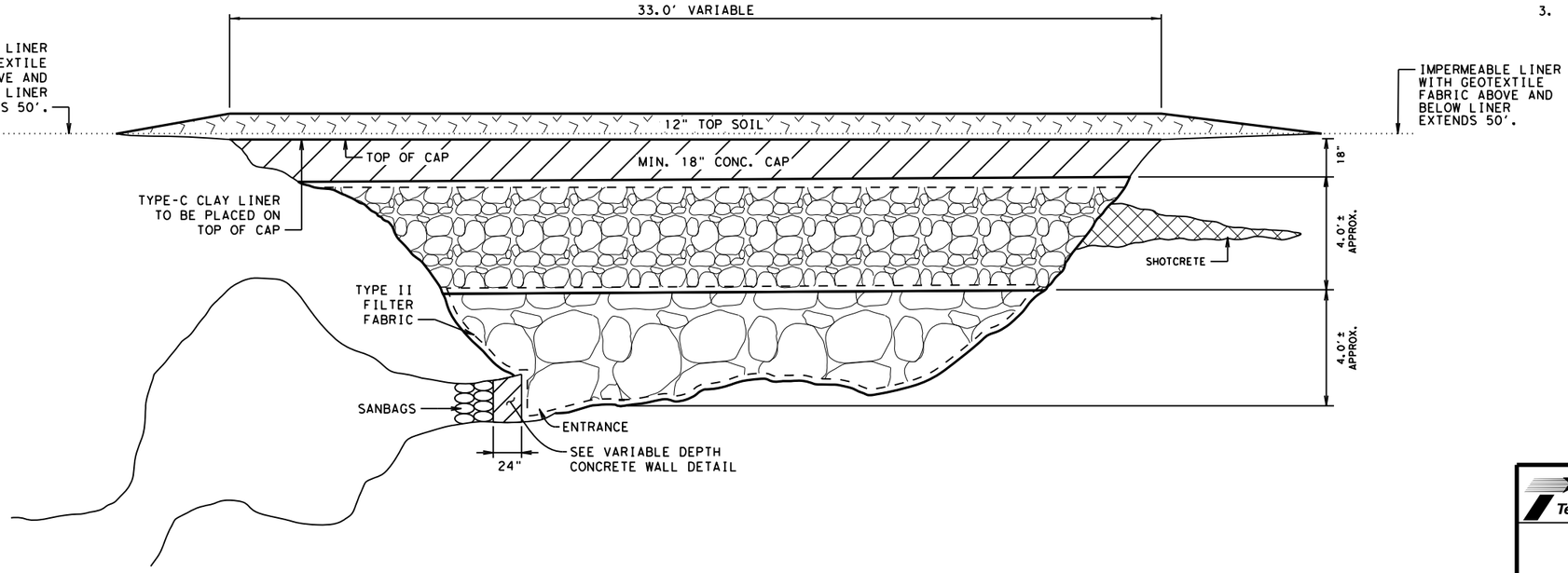
SCALE (IN FEET):
0 5

LEGEND

- CLASS A CONC. (MISC)
- 3 IN. x 5 IN. ROCK
- LARGE ROCK (≥ 1 FT)
- SHOTCRETE

NOTE:

1. CONCRETE WALL AND CONCRETE CAP SHALL BE PAID USING CLASS A CONC. (MISC).
2. SHOTCRETE WILL BE PAID USING CLASS A CONC. (MISC).
3. THE 12 IN. TOPSOIL AND LINER MAY NOT BE APPLICABLE IF THE VOID IS NOT IN A POND.



ELEVATION OF VOID IN A POND

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VOID MITIGATION DETAILS

VMD-18(AUS)

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CONT	SECT	JOB	HIGHWAY
0151	10	001	US 183
DIST	COUNTY		SHEET NO.
AUS	WILLIAMSON		1412

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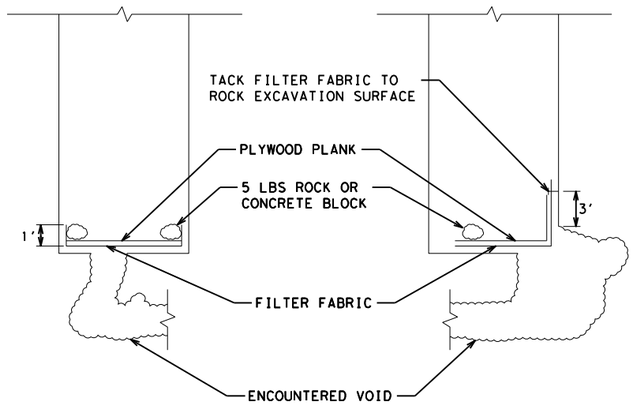

TEMPORARY PROTECTION
VOID AT BOTTOM OF TRENCH

NOTES:

1. PLACE TEMPORARY PROTECTION WITHIN TRENCH TO COVER VOID AS INDICATED. FABRIC SHALL EXTEND A MINIMUM OF 3 IN. BEYOND EDGE OF VOID. PLACE A PLYWOOD PLANK (MINIMUM 0.75 IN. THICK) OVER FABRIC. PLANK AND FABRIC SHALL BE WEIGHTED AS REQUIRED BY 5 LBS ROCK OR CONCRETE BLOCK TO SECURE FILTER FABRIC.

2. TEMPORARY PROTECTION SHALL BE IN PLACE AT ALL TIMES THAT CONSTRUCTION OPERATIONS ARE NOT IN ACTUAL PROGRESS.

3. CONSTRUCTION OPERATIONS WITHIN 50' SHALL NOT PROGRESS DURING OCCURRENCE OF RAIN TO ALLOW FOR PROTECTION OF VOID DURING A RAIN EVENT.

4. LOCALIZED EROSION MEASURES (SILT FENCE, EROSION CONTROL LOG OR TRIANGULAR FILTER DIKES) SHALL BE INSTALLED ALONG THE TRENCH TO ENSURE THAT LOOSE SPOILS OR RUNOFF DO NOT ENTER THE TRENCH OR AFFECT PERFORMANCE OF TEMPORARY PROTECTION. USE EARTHEN BERN TO DIVERT WATER AWAY FROM THE TRENCH.

5. SPECIAL CARE SHALL BE TAKEN TO ENSURE THAT EROSION CONTROL MEASURES REQUIRED ALONG THE TRENCH ARE MAINTAINED, CLEANED AND FULLY FUNCTIONAL.

6. FILTER FABRIC AND ROCK OR CONCRETE BLOCKS AND PLYWOOD PLANK SHALL BE REMOVED FROM THE TRENCH WHEN PERMANENT VOID MITIGATION MEASURES ARE INSTALLED.

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VOID MITIGATION DETAILS

VMD-18(AUS)

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CONT	SECT	JOB	HIGHWAY
0151	10	001	US 183
DIST	COUNTY		SHEET NO.
AUS	WILLIAMSON		1413

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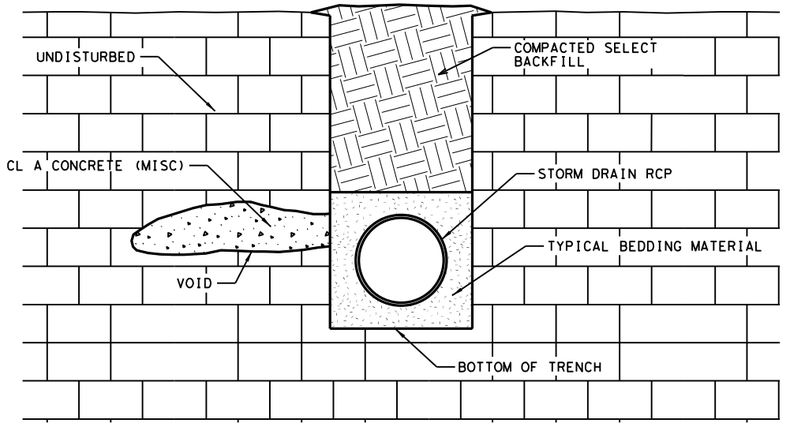
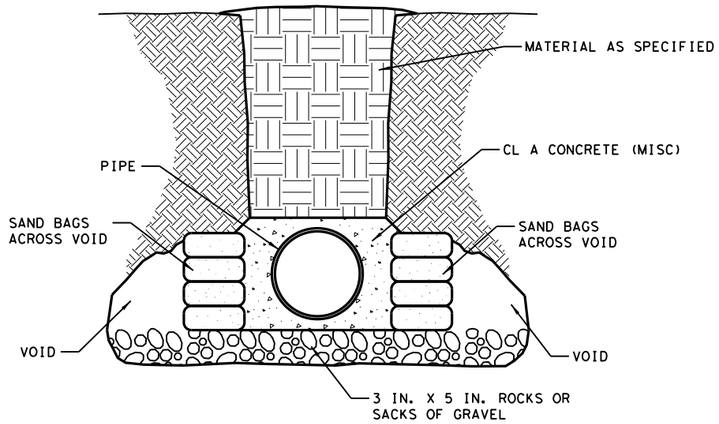


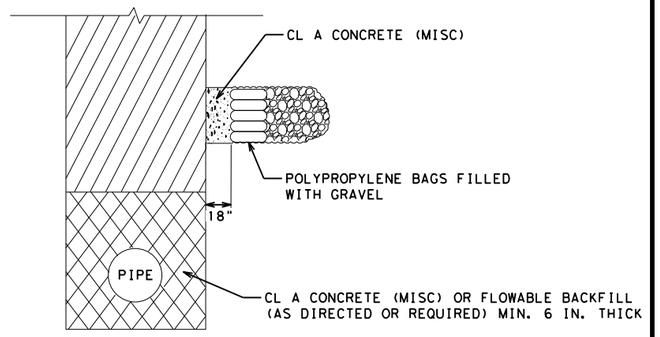
TRENCHING OPERATIONS
SMALL/MEDIUM (DRY VOID)
(<64 CF)

VOID IS EITHER LARGER THAN SIX (6) INCHES IN AT LEAST ONE DIRECTION OR IS LOCATED WITHIN THE LEVEL OF THE PIPE EMBEDMENT. ALL ROCK WITHIN AND SURROUNDING THE VOID IS SOUND.



TRENCHING OPERATIONS
LARGE (DRY VOID)
(64 CF < 1,000 CF)

VOID INTERSECTS THE PLANE OF THE TRENCH FLOOR AND ANY OPENING IN TRENCH FLOOR IS GREATER THAN FOUR (4) FEET IN ANY DIRECTION, OR THE TRENCH FLOOR IS UNSTABLE.

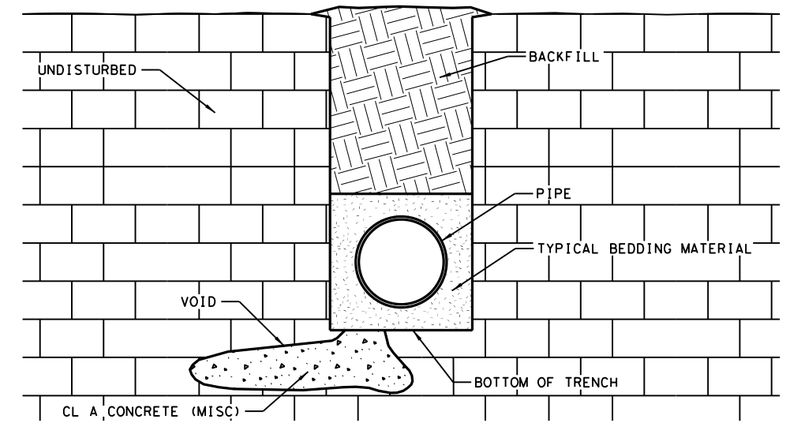


TRENCHING OPERATIONS
LARGE (DRY VOID)
(64 CF < 1,000 CF)

VOID IS ABOVE THE PLANE OF THE TRENCH FLOOR

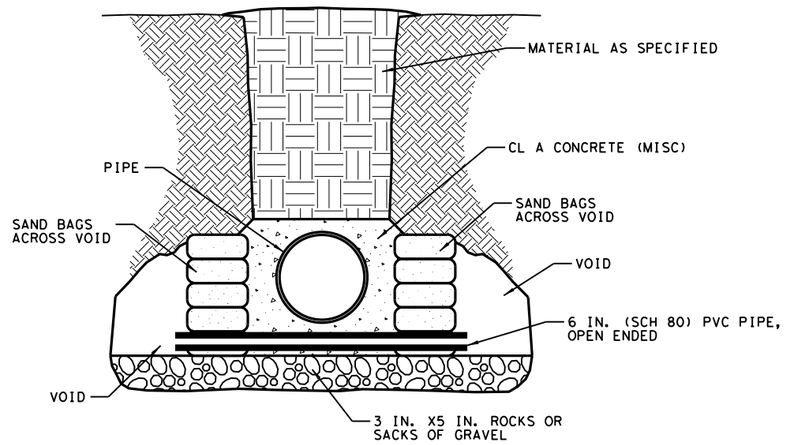
GENERAL NOTE:

1. ALL PIPES SHALL BE ENCASED WITH CLASS A CONCRETE THAT EXTENDS 5' BEYOND THE EDGE OF THE VOIDIN ALL DIRECTIONS. THE CONCRETE SHALL PROVIDE 6 IN. COVER AROUND THE PIPE.



TRENCHING OPERATIONS
SMALL/MEDIUM (DRY VOID)
(<64 CF)

VOID INTERSECTS THE PLANE OF THE TRENCH FLOOR AND IS LESS THAN FOUR (4) FEET IN ANY DIRECTION. ALL ROCK WITHIN AND SURROUNDING THE VOID IS SOUND.



TRENCHING OPERATIONS
LARGE (WET VOID)
(64 CF < 1,000 CF)

VOID INTERSECTS THE PLANE OF THE TRENCH FLOOR AND ANY OPENING IN TRENCH FLOOR IS GREATER THAN FOUR (4) FEET IN ANY DIRECTION, OR THE TRENCH FLOOR IS UNSTABLE.

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VOID MITIGATION DETAILS

VMD-18(AUS)

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CONT	SECT	JOB	HIGHWAY
0151	10	001	US 183
DIST	COUNTY		SHEET NO.
AUS	WILLIAMSON		1414

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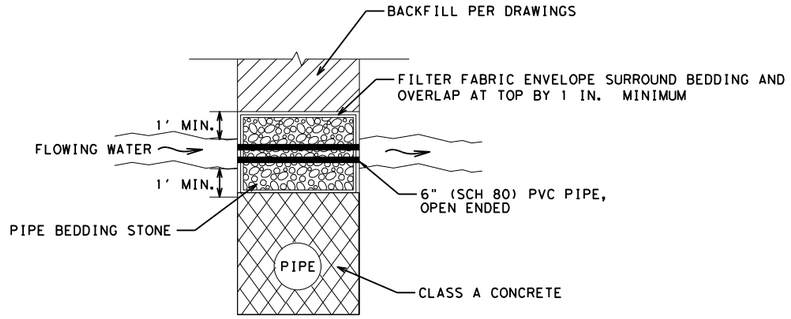
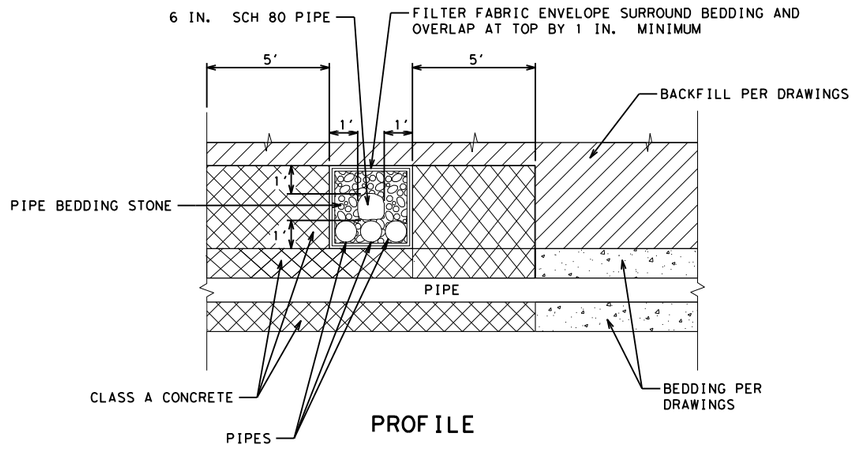


CROSS SECTION



PROFILE

TRENCHING OPERATIONS
GROUNDWATER ABOVE
BEDDING MATERIAL

GENERAL NOTE:

1. ALL PIPES SHALL BE ENCASED WITH CLASS A CONCRETE THAT EXTENDS 5' BEYOND THE EDGE OF THE VOID IN ALL DIRECTIONS. THE CONCRETE SHALL PROVIDE 6 IN. COVER AROUND THE PIPE.

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VOID MITIGATION DETAILS

VMD-18(AUS)

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CONT	SECT	JOB	HIGHWAY
0151	10	001	US 183
DIST	COUNTY		SHEET NO.
AUS	WILLIAMSON		1415

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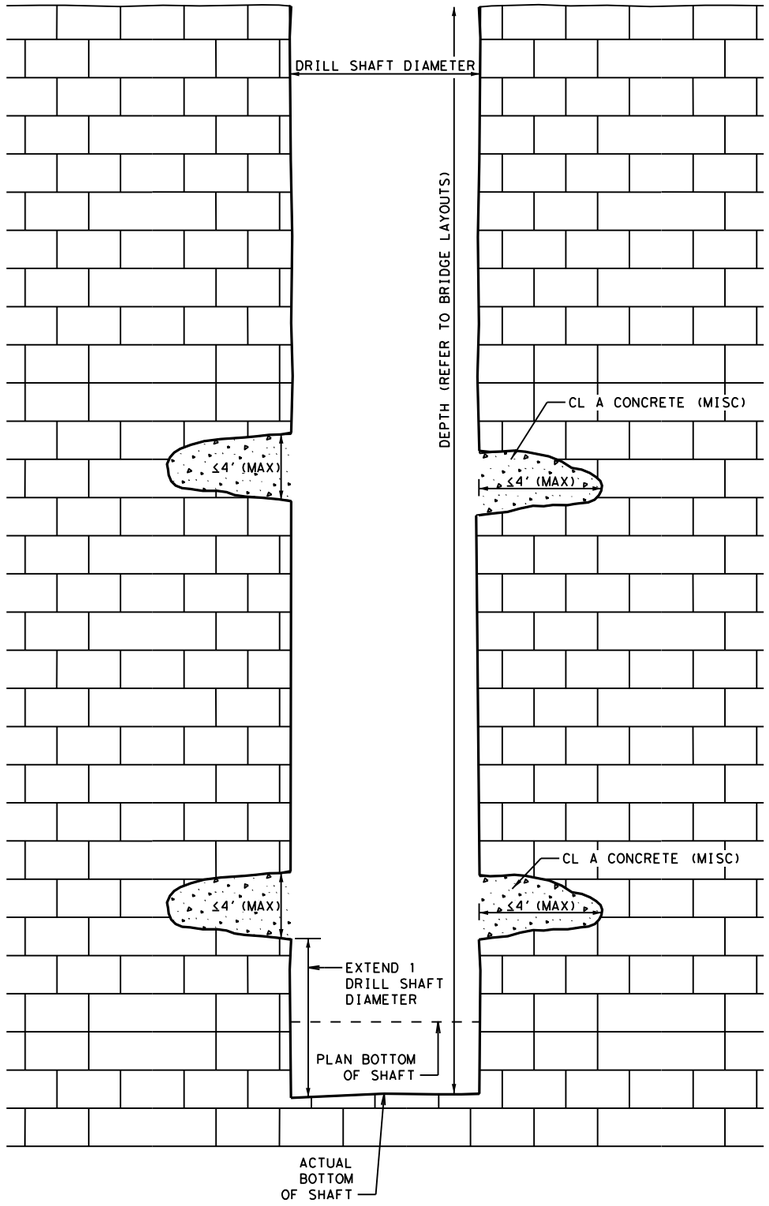
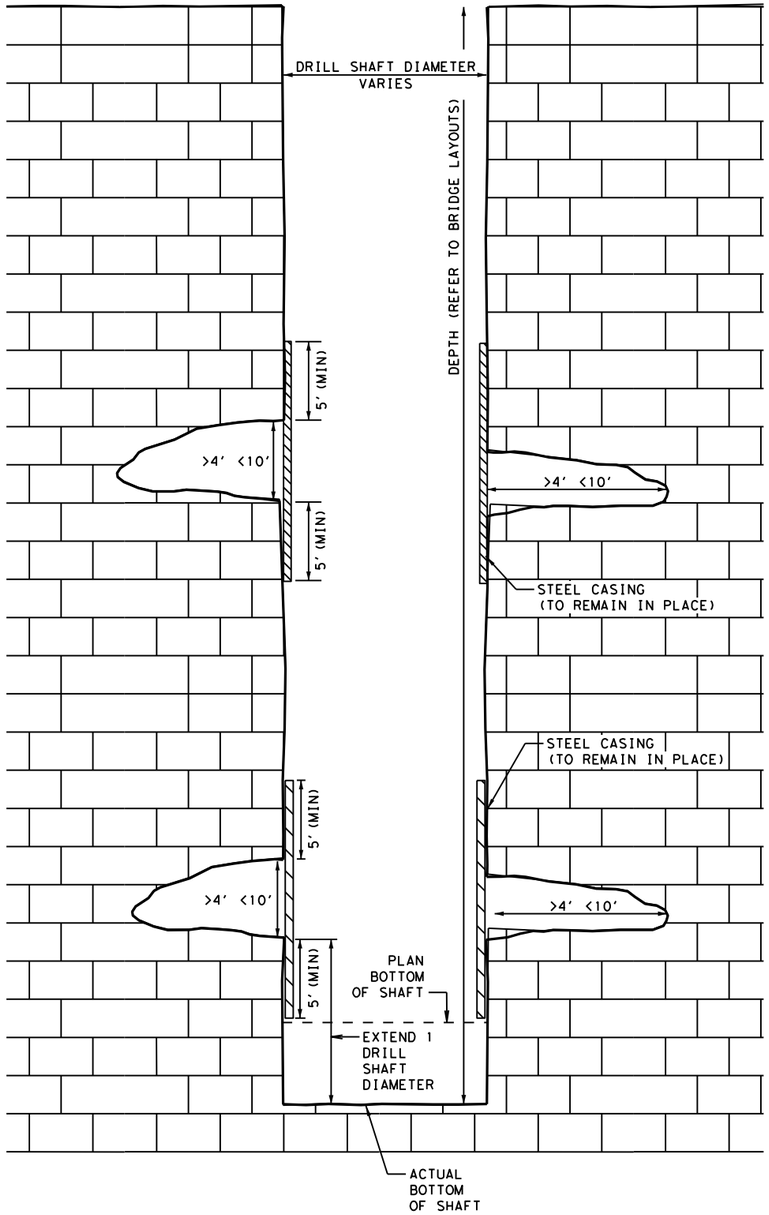


DRILL SHAFT OPERATIONS
SMALL/MEDIUM (DRY VOID)
(≤4' IN ANY DIRECTION)

CONCRETE FOR THE VOID SHALL BE PLACED CONTINUOUSLY WITH THE SHAFT

WHERE VOIDS ARE ENCOUNTERED, DRILL SHAFT LENGTHS MAY NEED TO BE INCREASED. APPROVAL FROM THE ENGINEER OF RECORD IS REQUIRED TO COMPLETE CONSTRUCTION OF THE DRILLED SHAFT.



DRILL SHAFT OPERATIONS
LARGE (DRY VOID)
(>4' <10' IN ANY DIRECTION)

WHERE VOIDS ARE ENCOUNTERED, DRILL SHAFT LENGTHS MAY NEED TO BE INCREASED. APPROVAL FROM THE ENGINEER OF RECORD IS REQUIRED TO COMPLETE CONSTRUCTION OF THE DRILL SHAFT.

NOTES:

1. STEEL CASING WILL BE USED FOR DRILL SHAFT CONSTRUCTION THAT ENCOUNTERS LARGE VOIDS, SO AS TO ALLOW A MINIMUM AMOUNT OF CONCRETE TO ENTER THE VOID.
2. STEEL CASING SHOULD EXTEND A MINIMUM OF FIVE FEET FROM THE EDGE OF THE VOID.
3. AS PART OF THE DRILL SHAFT INSTALLATION PLAN, CONTRACTOR SHALL PROVIDE MEANS AND METHODS FOR ANCHORING THE CASING.
4. REFER TO GENERAL NOTES FOR ADDITIONAL INFORMATION.
5. STEEL CASING MAYBE EXTENDED TO THE TOP OF THE SHAFT. THE ENTIRE LENGTH OF CASING INSTALLED IN A SHAFT WILL BE COMPENSATED IN ACCORDANCE WITH THE VOID MITIGATION NOTES.

Texas Department of Transportation

Austin District Standard

VOID MITIGATION DETAILS

VMD-18(AUS)

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CONT	SECT	JOB	HIGHWAY
0151	10	001	US 183
DIST	COUNTY		SHEET NO.
AUS	WILLIAMSON		1416

DATE: 3/14/2023 6:40:40 PM
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The following TCEQ requirements (Form TCEQ-0592A, Rev. 7/15/15) are applicable to all work that disturbs 5 or more acres in the contributing zone of the Edwards Aquifer in Hays, Travis and/or Williamson Counties and must be adhered to by the Contractor and all Subcontractors:

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

2. All contractors conducting regulated activities associated with this project should be provided with complete copies of the approved Contributing Zone Plan (CZP) and the TCEQ letter indicating the specific conditions of its approval. During the course of these regulated activities, the contractor(s) should keep copies of the approved plan and approval letter on-site.

3. No hazardous substance storage tank shall be installed within 150 feet of a water supply source, distribution system, well, or sensitive feature.

4. 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. If inspections indicate a control has been used inappropriately, or incorrectly, the applicant must replace or modify the control for site situations. These controls must remain in place until the disturbed areas have been permanently stabilized.

5. Any sediment that escapes the construction site must be collected and properly disposed of before the next rain event to ensure it is not washed into surface streams, sensitive features, etc.

6. Sediment must be removed from the sediment traps or sedimentation basins when it occupies 50% of the basin's design capacity.

7. Litter, construction debris, and construction chemicals exposed to stormwater shall be prevented from being discharged offsite.

8. All excavated material that will be stored on-site must have proper E&S controls.

9. If portions of the site will have a cease in construction activity lasting longer than 14 days, soilstabilization in those areas shall be initiated as soon as possible prior to the 14th day of inactivity. If activity will resume prior to the 21st day, stabilization measures are not required. If drought conditions or inclement weather prevent action by the 14th day, stabilization measures shall be initiated as soon as possible.

10. The following records should 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.

11. The holder of any approved CZP 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 best management practices (BMPs) or structure(s), including but not limited to temporary or permanent ponds, dams, berms, silt fences, and diversionary structures;
    B. any change in the nature or character of the regulated activity from that which was originally approved;
    C. any change that would significantly impact the ability to prevent pollution of the Edwards Aquifer; or
    D. any development of land previously identified as undeveloped in the approved contributing zone plan.

TCEQ REGIONAL OFFICE

Austin Regional Office
12100 Park 35 Circle
Bldg A, Room 179
Austin, Texas 78753
Phone: (512) 339-2929
Fax: (512) 339-3795

Texas Department of Transportation

Austin District Standard

TCEQ REQUIREMENTS FOR THE CONTRIBUTING ZONE OF THE EDWARDS AQUIFER

(DISTURBING 5 OR MORE ACRES)

TCEQ-CZ-19(AUS)

©TxDOT 2023

REVISIONS
01/10/14: REQUIREMENTS AND ADDRESS UPDATED
01/21/16: REQUIREMENTS UPDATED
09/24/19: UPDATED RELEASE YEAR

CONT	SECT	JOB	HIGHWAY
0151	10	001	US 183
DIST	COUNTY		SHEET NO.
AUS	WILLIAMSON		1408

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The following TCEQ requirements (Form TCEQ-0592, Rev. 7/15/15) are applicable to all work in the recharge zone of the Edwards Aquifer in Hays, Travis and/or Williamson Counties and must be adhered to by the Contractor and all Subcontractors:

1. A written notice of construction must be submitted to the 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.

2. All contractors conducting regulated activities associated with this project must be provided with complete copies of the approved Water Pollution Abatement Plan (WPAP) 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(s) (caves, solution cavity, sink hole, etc.) 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. Construction activities may not be resumed until the TCEQ has reviewed and approved the appropriate protective measures in order to protect any sensitive feature and the Edwards Aquifer from potentially adverse impacts to water quality.

4. No temporary or permanent hazardous substance storage tank shall be installed within 150 feet of a water supply source, distribution system, well, or sensitive feature.

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 approved plans and manufacturers specifications. If inspections indicate a control has been used inappropriately, or incorrectly, the applicant must replace or modify the control for site situations. These controls must remain in place until the disturbed areas have been permanently stabilized.

6. Any sediment that escapes the construction site must be collected and properly disposed of before the next rain event to ensure it is not washed into surface streams, sensitive features, etc.

7. Sediment must be removed from the sediment traps or sedimentation basins not later thanwhen it occupies 50% of the basin's design capacity.

8. Litter, construction debris, and construction chemicals exposed to stormwater shall be prevented from being discharged offsite.

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. If portions of the site will have a temporary or permanent cease in construction activity lasting longer than 14 days, soil stabilization in those areas shall be initiated as soon as possible prior to the 14th day of inactivity. If activity will resume prior to the 21st day, stabilization measures are not required. If drought conditions or inclement weather prevent action by the 14th day, stabilization measures shall be initiated as soon as possible.

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 Edward 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.

TCEQ REGIONAL OFFICE

Austin Regional Office
12100 Park 35 Circle
Bldg A, Room 179
Austin, Texas 78753
Phone: (512) 339-2929
Fax: (512) 339-3795

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TCEQ REQUIREMENTS FOR THE RECHARGE ZONE OF THE EDWARDS AQUIFER

TCEQ-RZ-19(AUS)

©TxDOT 2023

REVISIONS
01/10/14: REQUIREMENTS AND ADDRESS UPDATED
01/21/16: REQUIREMENTS UPDATED
09/24/19: UPDATED RELEASE YEAR

CONT	SECT	JOB	HIGHWAY
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DIST	COUNTY		SHEET NO.
AUS	WILLIAMSON		1409

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I. STORMWATER POLLUTION PREVENTION-CLEAN WATER ACT SECTION 402

TPDES TXR 150000: Stormwater Discharge Permit or Construction General Permit required for projects with 1 or more acres disturbed soil. Projects with any disturbed soil must protect for erosion and sedimentation in accordance with Item 506.

List MS4 Operator(s) that may receive discharges from this project. They may need to be notified prior to construction activities.

1.

2.

☐ No Action Required ☒ Required Action

Action No.

1. Prevent stormwater pollution by controlling erosion and sedimentation in accordance with TPDES Permit TXR 150000
2. Comply with the SW3P and revise when necessary to control pollution or required by the Engineer.
3. Post Construction Site Notice (CSN) with SW3P information on or near the site, accessible to the public and TCEQ, EPA or other inspectors.
4. When Contractor project specific locations (PSL's) increase disturbed soil area to 5 acres or more, submit NOI to TCEQ and the Engineer.

II. WORK IN OR NEAR STREAMS, WATERBODIES AND WETLANDS CLEAN WATER ACT SECTIONS 401 AND 404

USACE Permit required for filling, dredging, excavating or other work in any water bodies, rivers, creeks, streams, wetlands or wet areas.

The Contractor must adhere to all of the terms and conditions associated with the following permit(s):

☐ No Permit Required
☒ Nationwide Permit 14 - PCN not Required (less than 1/10th acre waters or wetlands affected)
☐ Nationwide Permit 14 - PCN Required (1/10 to <1/2 acre, 1/3 in tidal waters)
☐ Individual 404 Permit Required
☐ Other Nationwide Permit Required: NWP# _____

Required Actions: List waters of the US permit applies to, location in project and check Best Management Practices planned to control erosion, sedimentation and post-project TSS.

1. Spanish Oak Creek 614+28.29

2. South Brushy Creek 722+27.10

3. Spanish Oak Creek Tributary 632+33.70

4.

The elevation of the ordinary high water marks of any areas requiring work to be performed in the waters of the US requiring the use of a nationwide permit can be found on the Bridge Layouts.

Best Management Practices:

Erosion	Sedimentation	Post-Construction TSS
☒ Temporary Vegetation	☒ Silt Fence	☒ Vegetative Filter Strips
☒ Blankets/Matting	☒ Rock Berm	☐ Retention/Irrigation Systems
☐ Mulch	☐ Triangular Filter Dike	☒ Extended Detention Basin
☐ Sodding	☐ Sand Bag Berm	☐ Constructed Wetlands
☐ Interceptor Swale	☐ Straw Bale Dike	☐ Wet Basin
☐ Diversion Dike	☐ Brush Berms	☐ Erosion Control Compost
☒ Erosion Control Compost	☒ Erosion Control Compost	☐ Mulch Filter Berm and Socks
☐ Mulch Filter Berm and Socks	☐ Mulch Filter Berm and Socks	☐ Compost Filter Berm and Socks
☐ Compost Filter Berm and Socks	☐ Compost Filter Berm and Socks	☒ Vegetation Lined Ditches
	☒ Stone Outlet Sediment Traps	☒ Sand Filter Systems
	☐ Sediment Basins	☒ Grassy Swales

III. CULTURAL RESOURCES

Refer to TxDOT Standard Specifications in the event historical issues or archeological artifacts are found during construction. Upon discovery of archeological artifacts (bones, burnt rock, flint, pottery, etc.) cease work in the immediate area and contact the Engineer immediately.

☒ No Action Required ☐ Required Action

Action No.

1.

2.

3.

4.

IV. VEGETATION RESOURCES

Preserve native vegetation to the extent practical.
Contractor must adhere to Construction Specification Requirements Specs 162, 164, 192, 193, 506, 730, 751, 752 in order to comply with requirements for invasive species, beneficial landscaping, and tree/brush removal commitments.

☒ No Action Required ☐ Required Action

Action No.

1.

2.

3.

4.

V. FEDERAL LISTED, PROPOSED THREATENED, ENDANGERED SPECIES, CRITICAL HABITAT, STATE LISTED SPECIES, CANDIDATE SPECIES AND MIGRATORY BIRDS.

☐ No Action Required ☒ Required Action

Action No.
1. If karst void is encountered during construction, all work shall stop within 50 feet of the site and a qualified karst scientist shall be notified. During borehole activities for bridge piers voids are usually indicated by a bit drop. If a bit drop of more than 1 foot occurs, the borehole shall be inspected using a downhole camera.
2. If standing, seeping, or flowing water is encountered in an excavation, all work shall stop within 50 feet of the excavation and a qualified geoscientist shall be notified and appropriate BMPs shall be implemented to minimize surface runnoff from entering the excavation. If it is determined that the water is connected to the Edwards Aquifer, a site-specific groundwater mitigation and solution feature closure plan shall be developed and approved before work can continue near the groundwater feature.

If any of the listed species are observed, cease work in the immediate area, do not disturb species or habitat and contact the Engineer immediately. The work may not remove active nests from bridges and other structures during nesting season of the birds associated with the nests. If caves or sinkholes are discovered, cease work in the immediate area, and contact the Engineer immediately.

LIST OF ABBREVIATIONS

BMP:	Best Management Practice	SPCC:	Spill Prevention Control and Countermeasure
CGP:	Construction General Permit	SW3P:	Storm Water Pollution Prevention Plan
DSHS:	Texas Department of State Health Services	PCN:	Pre-Construction Notification
FHWA:	Federal Highway Administration	PSL:	Project Specific Location
MOA:	Memorandum of Agreement	TCEQ:	Texas Commission on Environmental Quality
MOU:	Memorandum of Understanding	TPDES:	Texas Pollutant Discharge Elimination System
MS4:	Municipal Separate Stormwater Sewer System	TPWD:	Texas Parks and Wildlife Department
MBTA:	Migratory Bird Treaty Act	TxDOT:	Texas Department of Transportation
NOT:	Notice of Termination	T&E:	Threatened and Endangered Species
NWP:	Nationwide Permit	USACE:	U.S. Army Corps of Engineers
NOI:	Notice of Intent	USFWS:	U.S. Fish and Wildlife Service

VI. HAZARDOUS MATERIALS OR CONTAMINATION ISSUES

General (applies to all projects):
Comply with the Hazard Communication Act (the Act) for personnel who will be working with hazardous materials by conducting safety meetings prior to beginning construction and making workers aware of potential hazards in the workplace. Ensure that all workers are provided with personal protective equipment appropriate for any hazardous materials used.

Obtain and keep on-site Material Safety Data Sheets (MSDS) for all hazardous products used on the project, which may include, but are not limited to the following categories: Paints, acids, solvents, asphalt products, chemical additives, fuels and concrete curing compounds or additives. Provide protected storage, off bare ground and covered, for products which may be hazardous. Maintain product labelling as required by the Act.

Maintain an adequate supply of on-site spill response materials, as indicated in the MSDS. In the event of a spill, take actions to mitigate the spill as indicated in the MSDS, in accordance with safe work practices, and contact the District Spill Coordinator immediately. The Contractor shall be responsible for the proper containment and cleanup of all product spills.

Contact the Engineer if any of the following are detected:
* Dead or distressed vegetation (not identified as normal)
* Trash piles, drums, canister, barrels, etc.
* Undesirable smells or odors
* Evidence of leaching or seepage of substances

Does the project involve any bridge class structure rehabilitation or replacements (bridge class structures not including box culverts)?

☒ Yes ☐ No

If "No", then no further action is required.
If "Yes", then TxDOT is responsible for completing asbestos assessment/inspection.

Are the results of the asbestos inspection positive (is asbestos present)?

☐ Yes ☒ No

If "Yes", then TxDOT must retain a DSHS licensed asbestos consultant to assist with the notification, develop abatement/mitigation procedures, and perform management activities as necessary. The notification form to DSHS must be postmarked at least 15 working days prior to scheduled demolition.

If "No", then TxDOT is still required to notify DSHS 15 working days prior to any scheduled demolition.

In either case, the Contractor is responsible for providing the date(s) for abatement activities and/or demolition with careful coordination between the Engineer and asbestos consultant in order to minimize construction delays and subsequent claims.

Any other evidence indicating possible hazardous materials or contamination discovered on site. Hazardous Materials or Contamination Issues Specific to this Project:

☒ No Action Required ☐ Required Action

Action No.

1.

2.

3.

VII. OTHER ENVIRONMENTAL ISSUES

(includes regional issues such as Edwards Aquifer District, etc.)

☐ No Action Required ☒ Required Action

Action No.

1. The project is located within the Edwards Recharge and Contributing Zones. A Water Pollution Abatement Plan (WPAP) is required. Maintain a copy of the plan and approval letter on site. If voids are encountered during constuction, refer to the Austin District Void Mitigation Details sheets, included in this plan set.

2.

3.

Texas Department of Transportation | Design Division Standard

ENVIRONMENTAL PERMITS, ISSUES AND COMMITMENTS

EPIC

FILE: epic.dgn	DN: TxDOT	CK: RG	DW: VP	CK: AR
© TxDOT: February 2015	CONT	SECT	JOB	HIGHWAY
REVISIONS 12-12-2011 (DS) 05-07-14 ADDED NOTE SECTION IV. 01-23-2015 SECTION I (CHANGED ITEM 1122 TO ITEM 506, ADDED GRASSY SWALES.	0151	10	001	US 183
	DIST	COUNTY		SHEET NO.
	AUS	WILLIAMSON		1368

Attachment H: Inspection, Maintenance, Repair, and Retrofit Plan

No alterations have been made to BMP type and the Attachment H from the approved WPAP shall be utilized.

Attachment I - Pilot-scale Field Testing Plan

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

Section not applicable to this project.

Attachment J:Measures for Minimizing Surface Stream Contamination

No alterations have been made to BMP type or Temporary Stormwater Control Measures, and the Attachment J from the approved WPAP shall be utilized.

Attachment K - Volume and Character of Stormwater

The volume of stormwater generated by the projected is increased due to two main factors. The pre-project runoff coefficients and flows were developed in 2006 and with the release of Atlas 14 rainfall data in 2018, the modeled runoff flows increased with this change as well the addition of impervious cover. The flow changes can be seen in the accompanying as-builts from the mainlanes if US 183 and the summary sheet from the proposed US 183A project.

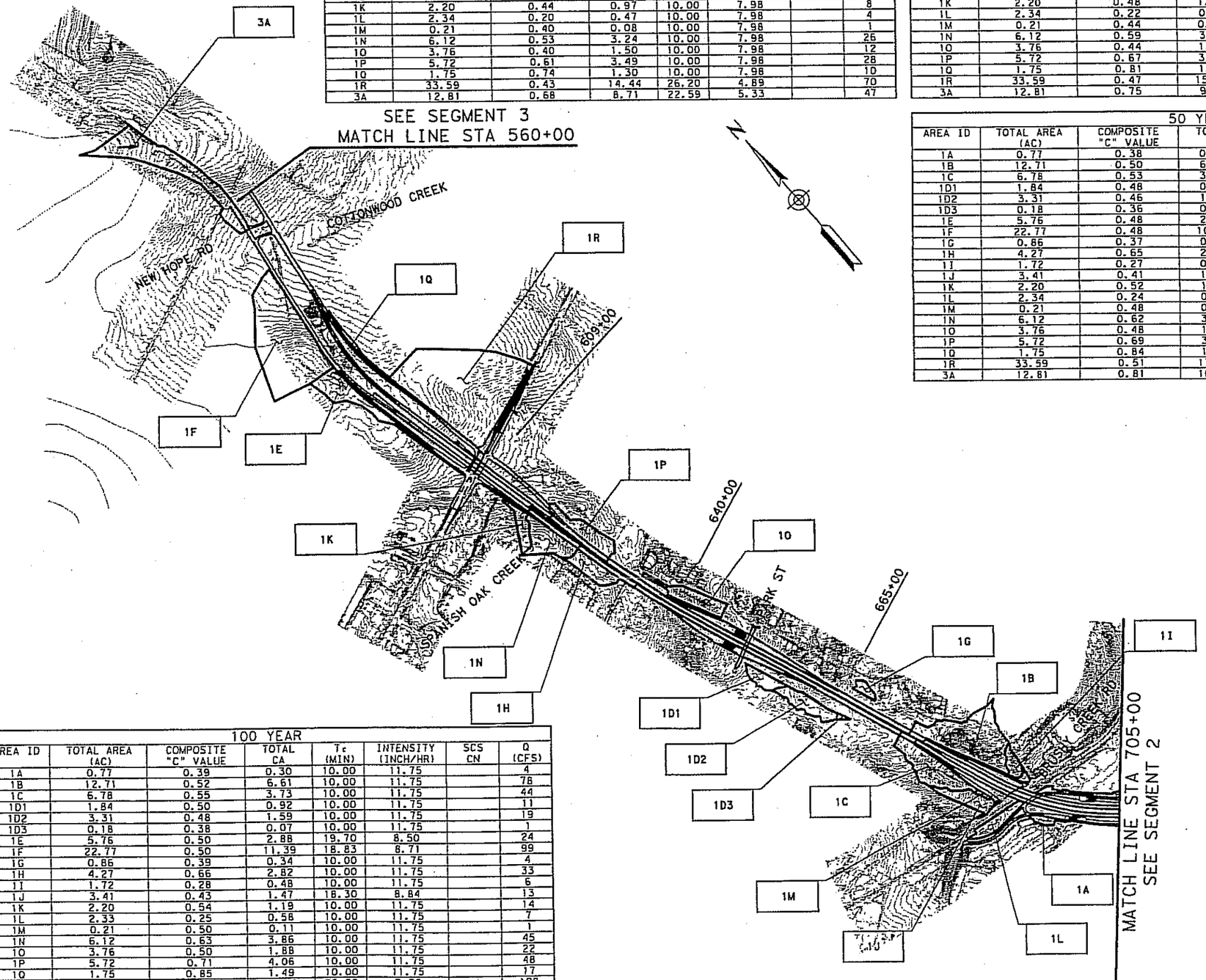
The character of stormwater will remain the same as the pre-project conditions, although there will be more water that contains higher loading of TSS as more of the site is now impervious cover.

Username=Barbara McKinney 4/17/2006 9:35:01 AM
DGN File=p:\roads\sheets\drainage\damac.dgn

10 YEAR							
AREA ID	TOTAL AREA (AC)	COMPOSITE "C" VALUE	TOTAL CA	Tc (MIN)	INTENSITY (INCH/HR)	SCS CN	Q (CFS)
1A	0.77	0.31	0.24	10.00	7.98		2
1B	12.71	0.42	5.34	10.00	7.98		43
1C	6.78	0.45	3.05	10.00	7.98		24
1D1	1.84	0.40	0.74	10.00	7.98		6
1D2	3.31	0.38	1.26	10.00	7.98		10
1D3	0.18	0.30	0.05	10.00	7.98		0
1E	5.76	0.40	2.30	19.70	5.75		13
1F	22.77	0.40	9.11	18.83	5.89		54
1G	0.86	0.31	0.27	10.00	7.98		2
1H	4.27	0.56	2.39	10.00	7.98		19
1I	1.72	0.22	0.38	10.00	7.98		3
1J	3.41	0.35	1.19	18.30	5.98		7
1K	2.20	0.44	0.97	10.00	7.98		8
1L	2.34	0.20	0.47	10.00	7.98		4
1M	0.21	0.40	0.08	10.00	7.98		1
1N	6.12	0.53	3.24	10.00	7.98		26
1O	3.76	0.40	1.50	10.00	7.98		12
1P	5.72	0.61	3.49	10.00	7.98		28
1Q	1.75	0.74	1.30	10.00	7.98		10
1R	33.59	0.43	14.44	26.20	4.89		70
3A	12.81	0.68	8.71	22.59	5.33		47

25 YEAR							
AREA ID	TOTAL AREA (AC)	COMPOSITE "C" VALUE	TOTAL CA	Tc (MIN)	INTENSITY (INCH/HR)	SCS CN	Q (CFS)
1A	0.77	0.34	0.26	10.00	9.33		2
1B	12.71	0.46	5.85	10.00	9.33		55
1C	6.78	0.49	3.32	10.00	9.33		31
1D1	1.84	0.44	0.81	10.00	9.33		8
1D2	3.31	0.42	1.39	10.00	9.33		13
1D3	0.18	0.33	0.06	10.00	9.33		1
1E	5.76	0.44	2.53	19.70	6.75		17
1F	22.77	0.44	10.02	18.83	6.91		69
1G	0.86	0.34	0.29	10.00	9.33		3
1H	4.27	0.62	2.65	10.00	9.33		25
1I	1.72	0.25	0.43	10.00	9.33		4
1J	3.41	0.39	1.33	18.30	7.02		9
1K	2.20	0.48	1.06	10.00	9.33		10
1L	2.34	0.22	0.51	10.00	9.33		5
1M	0.21	0.44	0.09	10.00	9.33		1
1N	6.12	0.59	3.61	10.00	9.33		33
1O	3.76	0.44	1.65	10.00	9.33		15
1P	5.72	0.67	3.83	10.00	9.33		36
1Q	1.75	0.81	1.42	10.00	9.33		13
1R	33.59	0.47	15.79	26.20	5.75		90
3A	12.81	0.75	9.61	22.59	6.26		60

50 YEAR							
AREA ID	TOTAL AREA (AC)	COMPOSITE "C" VALUE	TOTAL CA	Tc (MIN)	INTENSITY (INCH/HR)	SCS CN	Q (CFS)
1A	0.77	0.38	0.29	10.00	10.28		3
1B	12.71	0.50	6.36	10.00	10.28		65
1C	6.78	0.53	3.59	10.00	10.28		37
1D1	1.84	0.48	0.88	10.00	10.28		9
1D2	3.31	0.46	1.52	10.00	10.28		16
1D3	0.18	0.36	0.06	10.00	10.28		1
1E	5.76	0.48	2.76	19.70	7.49		21
1F	22.77	0.48	10.93	18.83	7.67		84
1G	0.86	0.37	0.32	10.00	10.28		3
1H	4.27	0.65	2.78	10.00	10.28		28
1I	1.72	0.27	0.46	10.00	10.28		5
1J	3.41	0.41	1.40	18.30	7.78		11
1K	2.20	0.52	1.14	10.00	10.28		12
1L	2.34	0.24	0.56	10.00	10.28		6
1M	0.21	0.48	0.10	10.00	10.28		1
1N	6.12	0.62	3.79	10.00	10.28		39
1O	3.76	0.48	1.80	10.00	10.28		19
1P	5.72	0.69	3.95	10.00	10.28		41
1Q	1.75	0.84	1.47	10.00	10.28		15
1R	33.59	0.51	17.13	26.20	6.41		109
3A	12.81	0.81	10.38	22.59	6.96		72



100 YEAR							
AREA ID	TOTAL AREA (AC)	COMPOSITE "C" VALUE	TOTAL CA	Tc (MIN)	INTENSITY (INCH/HR)	SCS CN	Q (CFS)
1A	0.77	0.39	0.30	10.00	11.75		4
1B	12.71	0.52	6.61	10.00	11.75		78
1C	6.78	0.55	3.73	10.00	11.75		44
1D1	1.84	0.50	0.92	10.00	11.75		11
1D2	3.31	0.48	1.59	10.00	11.75		19
1D3	0.18	0.38	0.07	10.00	11.75		1
1E	5.76	0.50	2.88	19.70	8.50		24
1F	22.77	0.50	11.39	18.83	8.71		99
1G	0.86	0.39	0.34	10.00	11.75		4
1H	4.27	0.66	2.82	10.00	11.75		33
1I	1.72	0.28	0.48	10.00	11.75		6
1J	3.41	0.43	1.47	18.30	8.84		13
1K	2.20	0.54	1.19	10.00	11.75		14
1L	2.33	0.25	0.58	10.00	11.75		7
1M	0.21	0.50	0.11	10.00	11.75		1
1N	6.12	0.63	3.86	10.00	11.75		45
1O	3.76	0.50	1.88	10.00	11.75		22
1P	5.72	0.71	4.06	10.00	11.75		48
1Q	1.75	0.85	1.49	10.00	11.75		17
1R	33.59	0.53	17.80	26.20	7.26		128
3A	12.81	0.83	10.63	22.59	7.89		84

STATE OF TEXAS
DAVID L. GARRETT
76626
REGISTERED PROFESSIONAL ENGINEER
4/7/06

RFC
JUL 05 2006
Hill Country Constructors

NO	DATE	REVISION	APPROVED
0	11/04/05	GRADE AND DRAIN PACKAGE (WA1)	DLG
1	04/21/06	WA1 100% PLANS	DLG
	/ /		
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	/ /		
	/ /		
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183A TURNPIKE PROJECT
DRAINAGE AREA MAP

HORIZONTAL: 1" = 1500'

DRAWING: DAMAC
SHEET 3 OF 65 SHEETS

STATE OF TEXAS
CENTRAL TEXAS REGIONAL MOBILITY AUTHORITY
183A TURNPIKE PROJECT
INTERIM DESIGN
© 2006

400

Hill Country Constructors

DESIGNED BY: KH			
DATE: 2/05			
DRAWN BY: NSB			
DATE: 2-05			
CHECKED BY: KGS			
DATE: 2-06			
FED.RD. DIV.NO.	FEDERAL AID PROJECT NO.		SHEET NO.
6	MG 2002 (241)		
STATE	DIST.	COUNTY	
TEXAS	AUS	WILLIAMSON	
CONT.	SECT.	JOB	HIGHWAY NO.
0151	05	080	183A

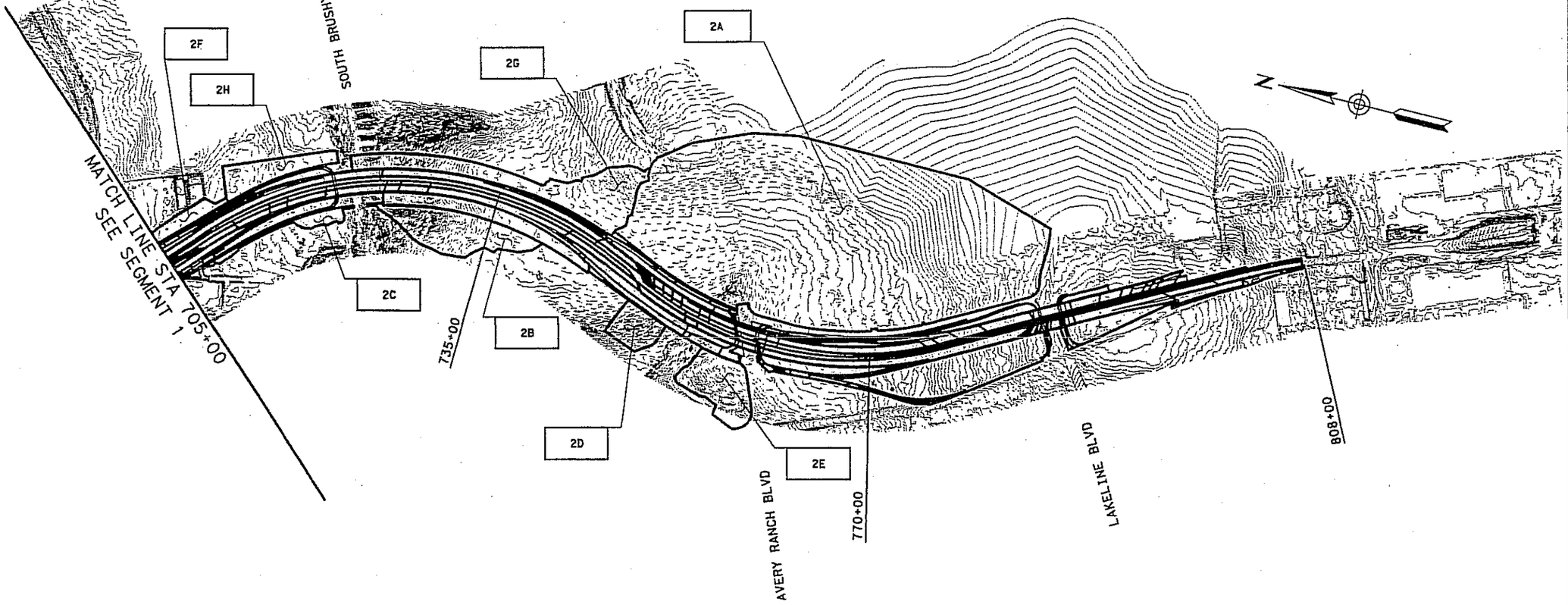
3/31/2006 3:46:24 P
Username • Barbara McKinney

10 YEAR						
AREA ID	TOTAL AREA (AC)	COMPOSITE "C" VALUE	TOTAL CA	Tc (MIN)	INTENSITY (INCH/HR)	Q (CFS)
2A	101.60	0.46	46.74	29.47	4.56	215
2B	7.84	0.40	3.14	28.79	4.63	15
2C	1.55	0.33	0.51	10.00	7.98	4
2D	2.83	0.20	0.57	10.00	7.98	5
2E	5.83	0.20	1.17	11.08	7.63	9
2F	2.90	0.50	1.45	10.00	7.98	11
2G	11.62	0.40	4.65	21.66	5.46	25
2H	3.97	0.20	0.79	10.00	7.98	6

25 YEAR						
AREA ID	TOTAL AREA (AC)	COMPOSITE "C" VALUE	TOTAL CA	Tc (MIN)	INTENSITY (INCH/HR)	Q (CFS)
2A	101.60	0.51	51.82	29.47	5.37	279
2B	7.84	0.44	3.45	28.79	5.44	19
2C	1.55	0.36	0.56	10.00	9.33	5
2D	2.83	0.22	0.62	10.00	9.33	6
2E	5.83	0.22	1.28	11.08	8.93	12
2F	2.90	0.55	1.60	10.00	9.33	15
2G	11.62	0.44	5.11	21.66	6.41	33
2H	3.97	0.22	0.87	10.00	9.33	8

50 YEAR						
AREA ID	TOTAL AREA (AC)	COMPOSITE "C" VALUE	TOTAL CA	Tc (MIN)	INTENSITY (INCH/HR)	Q (CFS)
2A	101.60	0.56	56.90	29.47	5.99	339
2B	7.84	0.48	3.76	28.79	6.07	23
2C	1.55	0.39	0.60	10.00	10.28	6
2D	2.83	0.24	0.68	10.00	10.28	7
2E	5.83	0.24	1.40	11.08	9.85	14
2F	2.90	0.59	1.71	10.00	10.28	18
2G	11.62	0.48	5.58	21.66	7.12	40
2H	3.97	0.24	0.95	10.00	10.28	10

100 YEAR						
AREA ID	TOTAL AREA (AC)	COMPOSITE "C" VALUE	TOTAL CA	Tc (MIN)	INTENSITY (INCH/HR)	Q (CFS)
2A	101.60	0.58	58.93	29.47	6.78	399
2B	7.84	0.50	3.92	28.79	6.87	27
2C	1.55	0.41	0.64	10.00	11.75	7
2D	2.83	0.25	0.71	10.00	11.75	8
2E	5.83	0.25	1.46	11.08	11.25	16
2F	2.90	0.62	1.80	10.00	11.75	21
2G	11.62	0.50	5.81	21.66	8.08	47
2H	3.97	0.25	0.99	10.00	11.75	12



STATE OF TEXAS
DAVID L. GARRETT
76626
REGISTERED PROFESSIONAL ENGINEER
7/06

RFC

JUN 15 2006

Hill Country Constructors

NO	DATE	REVISION	APPROVED
0	08/31/05	GRADE AND DRAIN PACKAGE (WA2)	DLG
1	04/07/06	WA2 100% PLANS	DLG

183A TURNPIKE PROJECT

DRAINAGE AREA MAP

HORIZONTAL: 1" = 1000'

DRAWING: DAMAD

SHEET 4 OF 65 SHEETS

STATE OF TEXAS

CENTRAL TEXAS REGIONAL MOBILITY AUTHORITY
183A TURNPIKE PROJECT
INTERIM DESIGN
© 2006

401

Hill Country Constructors

DESIGNED BY:				
BY				
DATE: 3/1/05				
DRAWN BY: NTB	FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.		SHEET NO.
DATE: 3/1/05	6	MG 2002 (241)		
CHECKED BY: TGS	STATE	DIST.	COUNTY	
DATE: 3/1/05	TEXAS	AUS	WILLIAMSON	
	CONT.	SECT.	JOB	HIGHWAY NO.
	0151	05	080	183A

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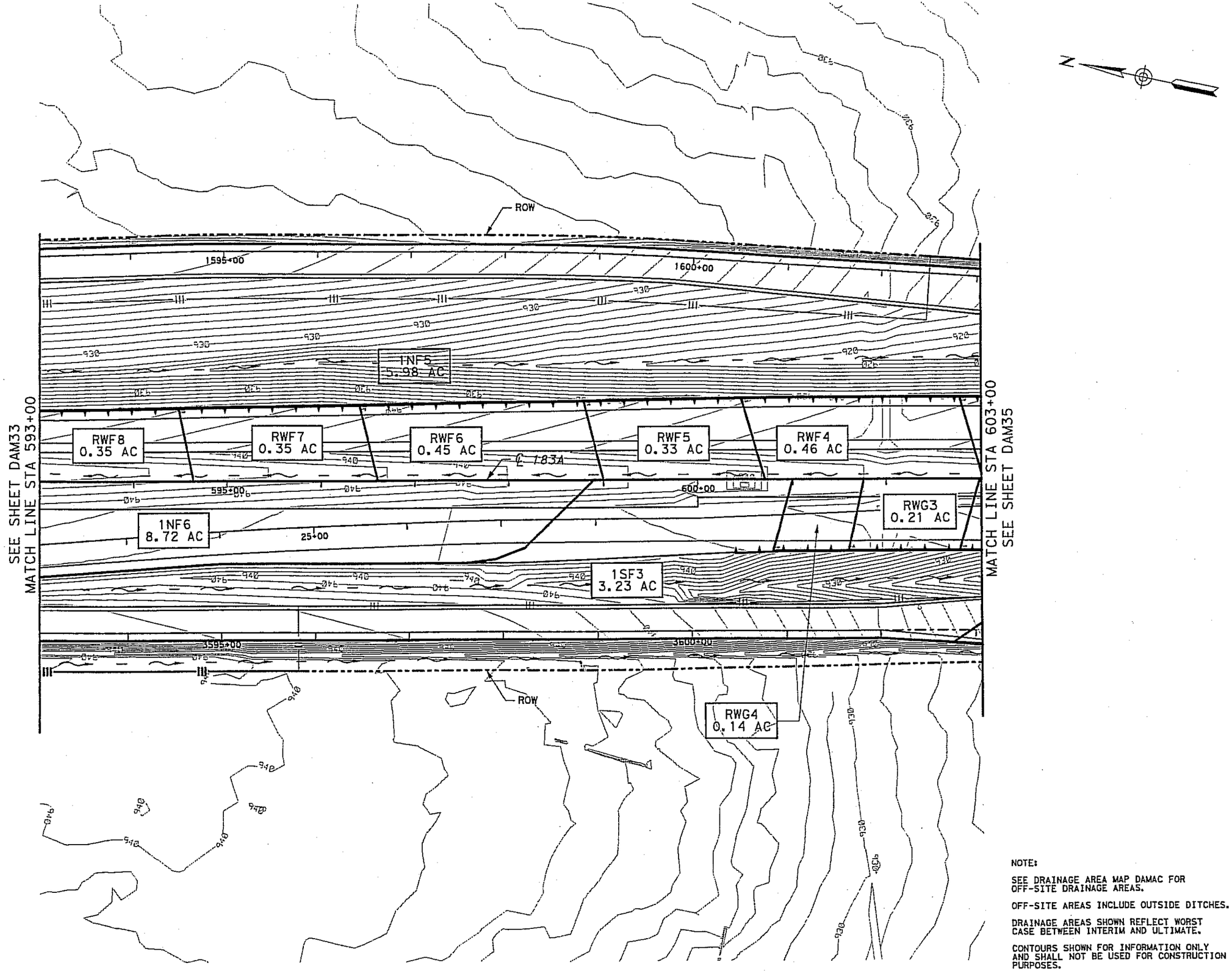

NOTE:

SEE DRAINAGE AREA MAP DAMAC FOR OFF-SITE DRAINAGE AREAS.

OFF-SITE AREAS INCLUDE OUTSIDE DITCHES.

DRAINAGE AREAS SHOWN REFLECT WORST CASE BETWEEN INTERIM AND ULTIMATE.

CONTOURS SHOWN FOR INFORMATION ONLY AND SHALL NOT BE USED FOR CONSTRUCTION PURPOSES.

STATE OF TEXAS
DAVID L. GARRETT
76626
REGISTERED PROFESSIONAL ENGINEER
4/27/06

RFC

JUL 05 2006

Hill Country Constructors

NO	DATE	REVISION	APPROVED
0	11/30/05	EARLY RFC PACKAGE 12	DLG
1	04/21/06	WA1 100% PLANS	DLG
	/ /		
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183A TURNPIKE PROJECT

DRAINAGE AREA MAP

STA 593+00 TO STA 603+00

HORIZONTAL: 1" = 100'

DRAWING: DAM34

SHEET 38 OF 65 SHEETS

STATE OF TEXAS

CENTRAL TEXAS REGIONAL MOBILITY AUTHORITY

183A TURNPIKE PROJECT

INTERIM DESIGN

© 2006

435

Hill Country Constructors

DESIGNED BY:	FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.		SHEET NO.
BY	6	MG 2002 (241)		
DATE: 3/7 05	STATE	DIST.	COUNTY	
CHECKED BY:	TEXAS	AUS	WILLIAMSON	
DATE: 3/7 05	CONT.	SECT.	JOB	HIGHWAY NO.
	0151	05	080	183A

4/17/2006 9:35:10 AM
Username: Barbara.McKinney
DGN File: p:\caddd\sheets\drainage\dam34.dgn

Username=Barbara McKinney 4/21/2006 8:36:44 AM

SEE SHEET DPL64
MATCH LINE STA 21+00

1431-15
0.50 AC

1431-2
0.11 AC

1431-6
0.11 AC

1431-14
0.50 AC

℄ FM 1431

1SF3-8
0.12 AC

RNB10-1
0.49 AC

RNB10-2
0.18 AC

SONB-6
0.04 AC

SONB-3
0.05 AC

SONB-2
0.05 AC

SPANISH OAK CREEK

RWF2
0.12 AC

RWF1
0.18 AC

MNBSO-1
0.09 AC

ROW

1NF5
5.98 AC

1605+00

10+00

15+00

MNBSO-4
0.27 AC

1431-5
0.08 AC

SONB-5
0.05 AC

SONB-4
0.02 AC

SONB-1
0.05 AC

SEE SHEET DAM34
MATCH LINE STA 603+00

30+00

RWF3
0.37 AC

MNBSO-2
0.20 AC

MNBSO-3
0.24 AC

MNBSO-5
0.21 AC

MNBSO-6
0.21 AC

MNBSO-7
0.40 AC

1M13-3
2.21 AC

℄ 183A

605+00

610+00

RWG2
0.40 AC

RWG1
0.27 AC

MSBSO-1
0.22 AC

MNBSO-2
0.21 AC

MSBSO-4
0.39 AC

1M13-1
0.51 AC

MATCH LINE STA 615+00
SEE SHEET DAM36

1SF3
3.23 AC

10+00

15+00

3505+00

MSBSO-3
0.12 AC

RWII1
0.22 AC

RWKK1
0.10 AC

ROW

1SF3-2
0.10 AC

1SF3-5
0.04 AC

1431-4
0.08 AC

RWII2
0.05 AC

1SF3-3
0.09 AC

1SF3-6
0.07 AC

1431-7
0.24 AC

RWII3
0.03 AC

1SF3-1
0.20 AC

1SF3-4
0.03 AC

1431-13
0.09 AC

1SF3-7
0.17 AC

1431-12
0.22 AC

1431-1
0.14 AC

1431-9
0.51 AC

1431-16
0.06 AC

1431-3
0.02 AC

1431-8
0.48 AC

1431-11
0.07 AC

1431-10
0.19 AC

MATCH LINE STA 11+50
SEE SHEET DPL63

NOTE:

SEE DRAINAGE AREA MAP DAMAB FOR OFF-SITE DRAINAGE AREAS.

OFF-SITE AREAS INCLUDE OUTSIDE DITCHES.

DRAINAGE AREAS SHOWN REFLECT WORST CASE BETWEEN INTERIM AND ULTIMATE.

CONTOURS SHOWN FOR INFORMATION ONLY AND SHALL NOT BE USED FOR CONSTRUCTION PURPOSES.

STATE OF TEXAS
DAVID L. GARRETT
76626
REGISTERED
PROFESSIONAL ENGINEER
4/27/06

RFC
JUL 05 2006
Hill Country Constructors

NO	DATE	REVISION	APPROVED
0	11/30/05	EARLY RFC PACKAGE 12	DLG
1	05/23/06	WA1 1431 GRADE AND DRAIN	DLG
2	04/21/06	WA1 100% PLANS	DLG
	/ /		
	/ /		
	/ /		
	/ /		
	/ /		
	/ /		
	/ /		

183A TURNPIKE PROJECT

DRAINAGE AREA MAP

STA 603+00 TO STA 615+00

HORIZONTAL: 1" = 100'

DRAWING: DAM35

SHEET 39 OF 65 SHEETS

STATE OF TEXAS

CENTRAL TEXAS REGIONAL MOBILITY AUTHORITY
183A TURNPIKE PROJECT
INTERIM DESIGN
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Hill Country Constructors

DESIGNED BY:	FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.		SHEET NO.
DLG	6	MG 2002 (241)		
DATE: 31-05	STATE	DIST.	COUNTY	
DRAWN BY: NJA	TEXAS	AUS	WILLIAMSON	
DATE: 31-05	CONT.	SECT.	JOB	HIGHWAY NO.
CHECKED BY: BGS	0151	05	080	183A
DATE: 31-05				

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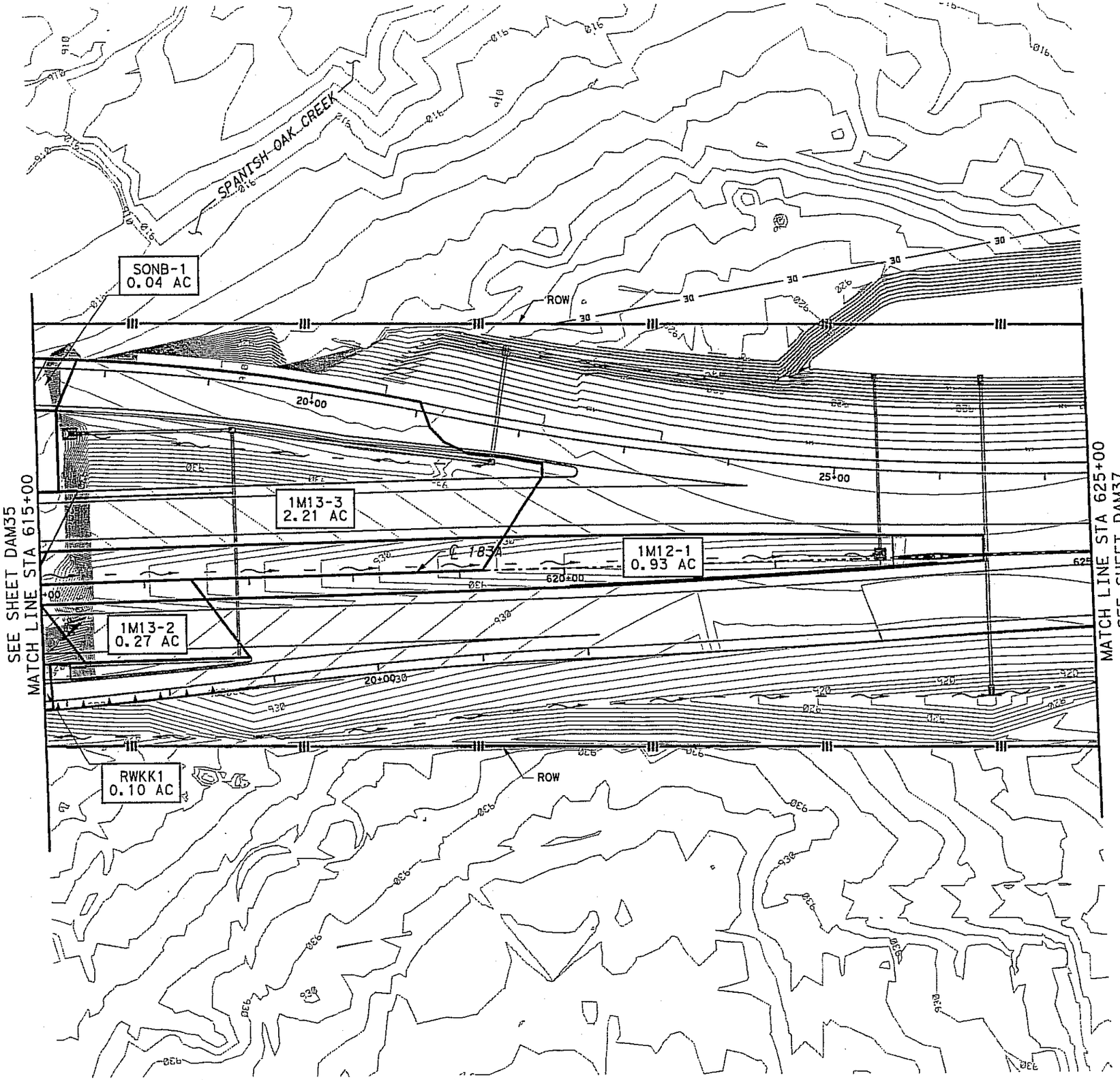

NOTE:

SEE DRAINAGE AREA MAP DAMAC FOR OFF-SITE DRAINAGE AREAS.

OFF-SITE AREAS INCLUDE OUTSIDE DITCHES.

DRAINAGE AREAS SHOWN REFLECT WORST CASE BETWEEN INTERIM AND ULTIMATE.

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STATE OF TEXAS
DAVID L. GARRETT
76626
REGISTERED PROFESSIONAL ENGINEER
4/27/06

RFC
JUL 05 2006
Hill Country Constructors

NO	DATE	REVISION	APPROVED
0	11/30/05	EARLY RFC PACKAGE 12	DLG
1	12/30/05	GRADE AND DRAIN PACKAGE (WA1)	DLG
2	04/21/06	WA1 100% PLANS	DLG

183A TURNPIKE PROJECT
DRAINAGE AREA MAP
STA 615+00 TO STA 625+00

HORIZONTAL: 1" = 100'

DRAWING: DAM36
SHEET 40 OF 65 SHEETS

STATE OF TEXAS
CENTRAL TEXAS REGIONAL MOBILITY AUTHORITY
183A TURNPIKE PROJECT
INTERIM DESIGN
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437

Hill Country Constructors

DESIGNED BY: BY				
DATE: 31-105				
DRAWN BY: KGS HF	FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.		SHEET NO.
DATE: 31-105	6	MG 2002 (241)		
CHECKED BY: KGS	STATE	DIST.	COUNTY	
	TEXAS	AUS	WILLIAMSON	
DATE: 21-105	CONT.	SECT.	JOB	HIGHWAY NO.
	0151	05	080	183A

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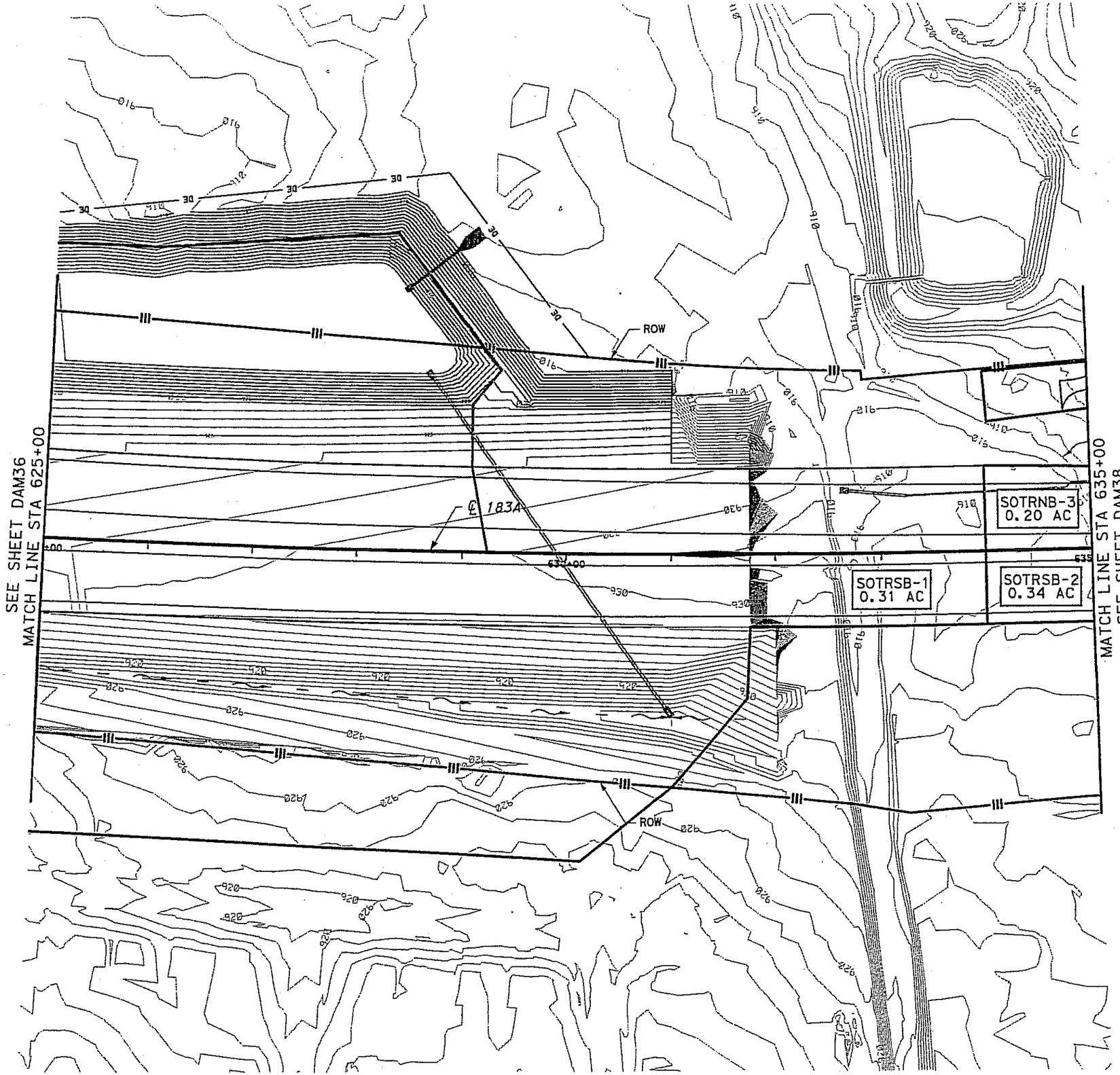

NOTE:

SEE DRAINAGE AREA MAP DAMAC FOR OFF-SITE DRAINAGE AREAS.

OFF-SITE AREAS INCLUDE OUTSIDE DITCHES.

DRAINAGE AREAS SHOWN REFLECT WORST CASE BETWEEN INTERIM AND ULTIMATE.

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STATE OF TEXAS
DAVID L. GARRETT
76626
REGISTERED PROFESSIONAL ENGINEER
4/27/06

RFC
JUL 05 2006
Hill Country Constructors

NO	DATE	REVISION	APPROVED
0	11/04/05	GRADE AND DRAIN PACKAGE (WA1)	DLG
1	12/29/05	GRADE AND DRAIN PACKAGE (WA1)	DLG
2	04/21/06	WA1 100% PLANS	DLG
	/ /		
	/ /		
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	/ /		
	/ /		
	/ /		
	/ /		
	/ /		

183A TURNPIKE PROJECT
DRAINAGE AREA MAP
STA 625+00 TO STA 635+00

HORIZONTAL: 1" = 100'

DRAWING: DAM37
SHEET 41 OF 65 SHEETS

STATE OF TEXAS
CENTRAL TEXAS REGIONAL MOBILITY AUTHORITY
183A TURNPIKE PROJECT
INTERIM DESIGN
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Hill Country Constructors

DESIGNED BY: BY				
DATE: 31-105				
DRAWN BY: NJB	FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.		SHEET NO.
DATE: 31-105	6	MG 2002 (241)		
CHECKED BY: KGC	STATE	DIST.	COUNTY	
	TEXAS	AUS	WILLIAMSON	
DATE: 31-105	CONT.	SECT.	JOB	HIGHWAY NO.
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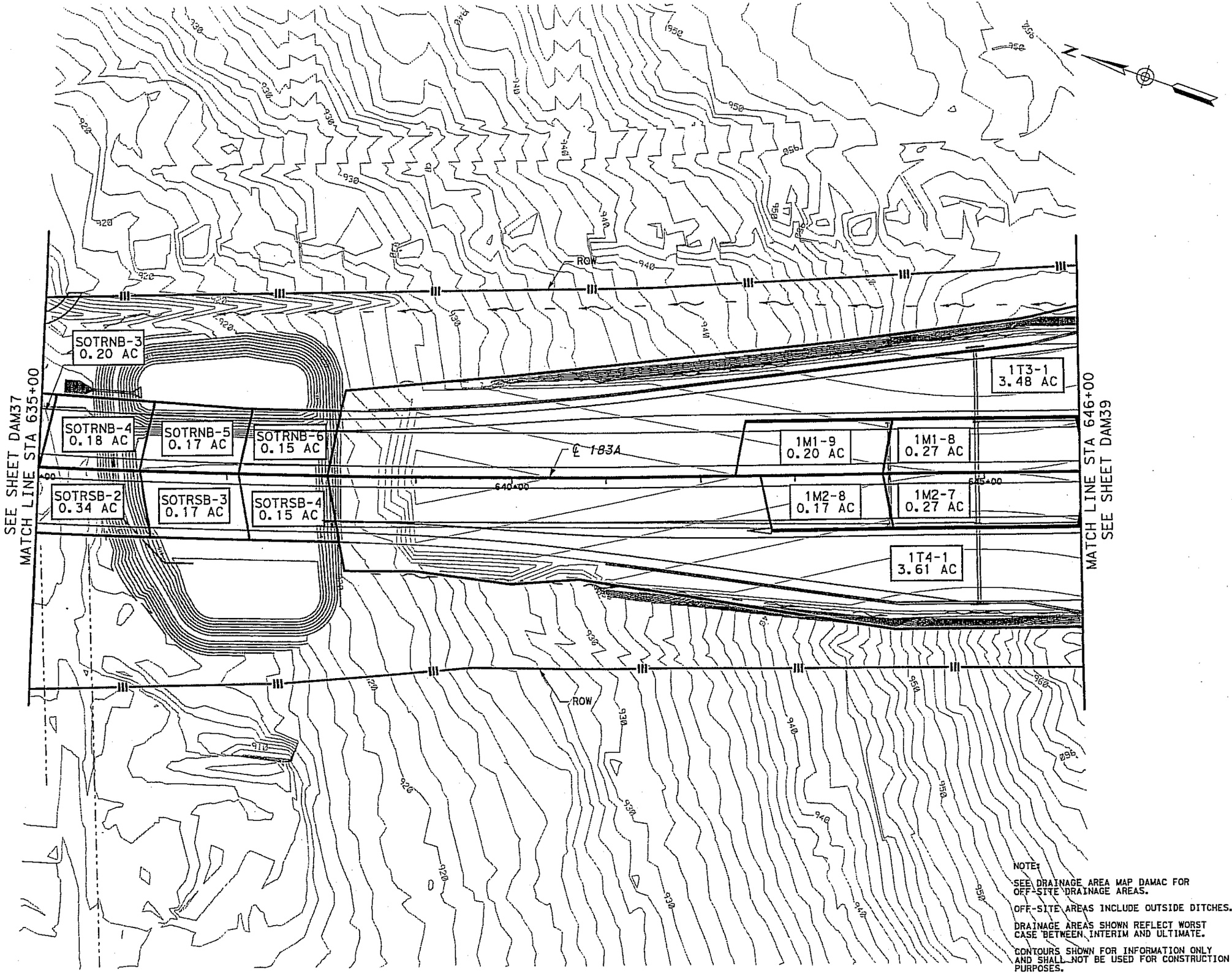

NOTE:

SEE DRAINAGE AREA MAP DAMAC FOR OFF-SITE DRAINAGE AREAS.

OFF-SITE AREAS INCLUDE OUTSIDE DITCHES.

DRAINAGE AREAS SHOWN REFLECT WORST CASE BETWEEN INTERIM AND ULTIMATE.

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STATE OF TEXAS
DAVID L. GARRETT
76626
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4/27/06

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JUL 05 2006

Hill Country Constructors

NO	DATE	REVISION	APPROVED
0	11/04/05	GRADE AND DRAIN PACKAGE (WA1)	DLG
1	12/29/05	GRADE AND DRAIN PACKAGE (WA1)	DLG
2	04/21/06	WA1 100% PLANS	DLG
	/ /		
	/ /		
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	/ /		
	/ /		
	/ /		

183A TURNPIKE PROJECT

DRAINAGE AREA MAP

STA 635+00 TO STA 646+00

HORIZONTAL: 1" = 100'

DRAWING: DAM38

SHEET 42 OF 65 SHEETS

STATE OF TEXAS

CENTRAL TEXAS REGIONAL MOBILITY AUTHORITY
183A TURNPIKE PROJECT
INTERIM DESIGN
© 2006

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Hill Country Constructors

DESIGNED BY: BY				
DATE: 31-105				
DRAWN BY: RJB	FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.		SHEET NO.
DATE: 31-105	6	MG 2002 (241)		
CHECKED BY: KGS	STATE	DIST.	COUNTY	
	TEXAS	AUS	WILLIAMSON	
DATE: 31-105	CONT.	SECT.	JOB	HIGHWAY NO.
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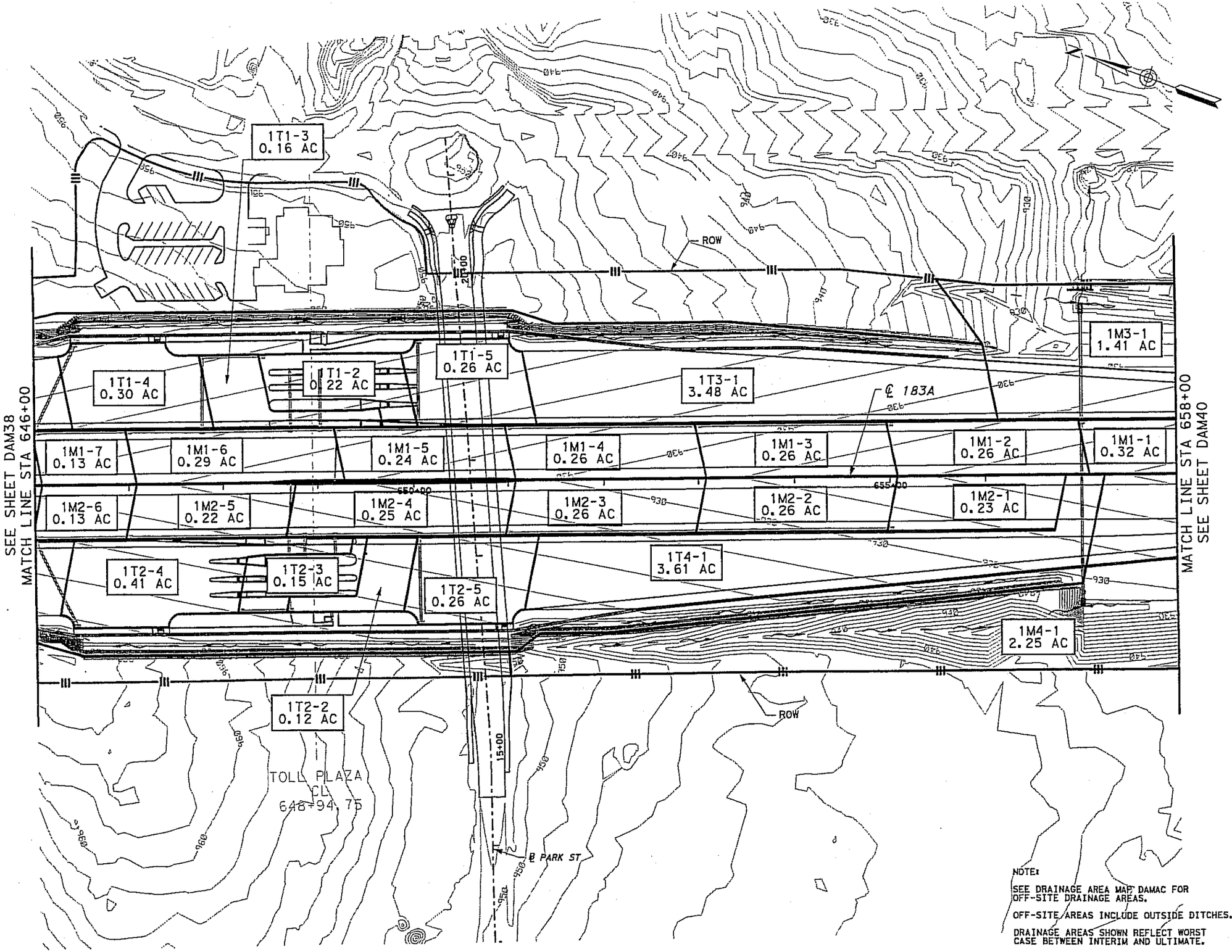

NOTE:

SEE DRAINAGE AREA MAP DAMAC FOR OFF-SITE DRAINAGE AREAS.

OFF-SITE AREAS INCLUDE OUTSIDE DITCHES.

DRAINAGE AREAS SHOWN REFLECT WORST CASE BETWEEN INTERIM AND ULTIMATE.

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STATE OF TEXAS
DAVID L. GARRETT
76626
REGISTERED PROFESSIONAL ENGINEER
4/27/06

RFC
JUL 05 2006
Hill Country Constructors

NO	DATE	REVISION	APPROVED
0	11/04/05	GRADE AND DRAIN PACKAGE (WA1)	DLG
1	12/29/05	GRADE AND DRAIN PACKAGE (WA1)	DLG
2	04/21/06	WA1 100% PLANS	DLG
	/ /		
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	/ /		

183A TURNPIKE PROJECT
DRAINAGE AREA MAP
STA 646+00 TO STA 658+00

HORIZONTAL: 1" = 100'

DRAWING: DAM39
SHEET 43 OF 65 SHEETS

STATE OF TEXAS
CENTRAL TEXAS REGIONAL MOBILITY AUTHORITY
183A TURNPIKE PROJECT
INTERIM DESIGN
© 2006

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Hill Country Constructors

DESIGNED BY: BY				
DATE: 31-105				
DRAWN BY: NJR	FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.		SHEET NO.
DATE: 31-105	6	MG 2002 (241)		
CHECKED BY: KGS	STATE	DIST.	COUNTY	
	TEXAS	AUS	WILLIAMSON	
DATE: 31-105	CONT.	SECT.	JOB	HIGHWAY NO.
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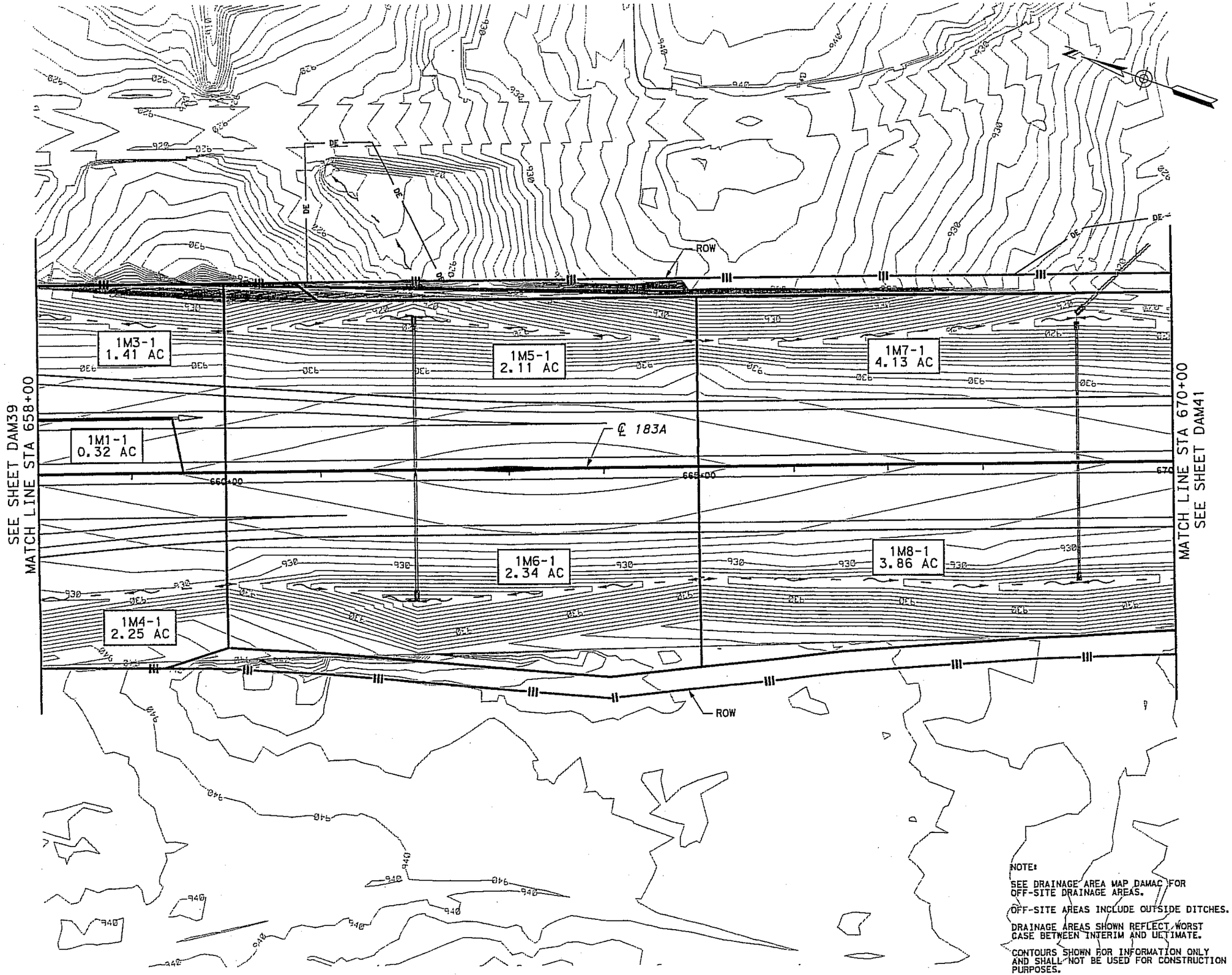

NOTE:

SEE DRAINAGE AREA MAP DAMAC FOR OFF-SITE DRAINAGE AREAS.

OFF-SITE AREAS INCLUDE OUTSIDE DITCHES.

DRAINAGE AREAS SHOWN REFLECT WORST CASE BETWEEN INTERIM AND ULTIMATE.

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STATE OF TEXAS
DAVID L. GARRETT
76626
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4/27/06

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JUL 05 2006
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NO	DATE	REVISION	APPROVED
0	11/04/05	GRADE AND DRAIN PACKAGE (WA1)	DLG
1	12/29/05	GRADE AND DRAIN PACKAGE (WA1)	DLG
2	04/21/06	WA1 100% PLANS	DLG
	/ /		
	/ /		
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	/ /		
	/ /		

183A TURNPIKE PROJECT
DRAINAGE AREA MAP
STA 658+00 TO STA 670+00

HORIZONTAL: 1" = 100'

DRAWING: DAM40
SHEET 44 OF 65 SHEETS

STATE OF TEXAS
CENTRAL TEXAS REGIONAL MOBILITY AUTHORITY
183A TURNPIKE PROJECT
INTERIM DESIGN
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Hill Country Constructors

DESIGNED BY: BY				
DATE: 3/-/05				
DRAWN BY: NTB	FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.		SHEET NO.
DATE: 3/-/05	6	MG 2002 (241)		
CHECKED BY: KGS	STATE	DIST.	COUNTY	
	TEXAS	AUS	WILLIAMSON	
DATE: 3/-/05	CONT.	SECT.	JOB	HIGHWAY NO.
	0151	05	080	183A

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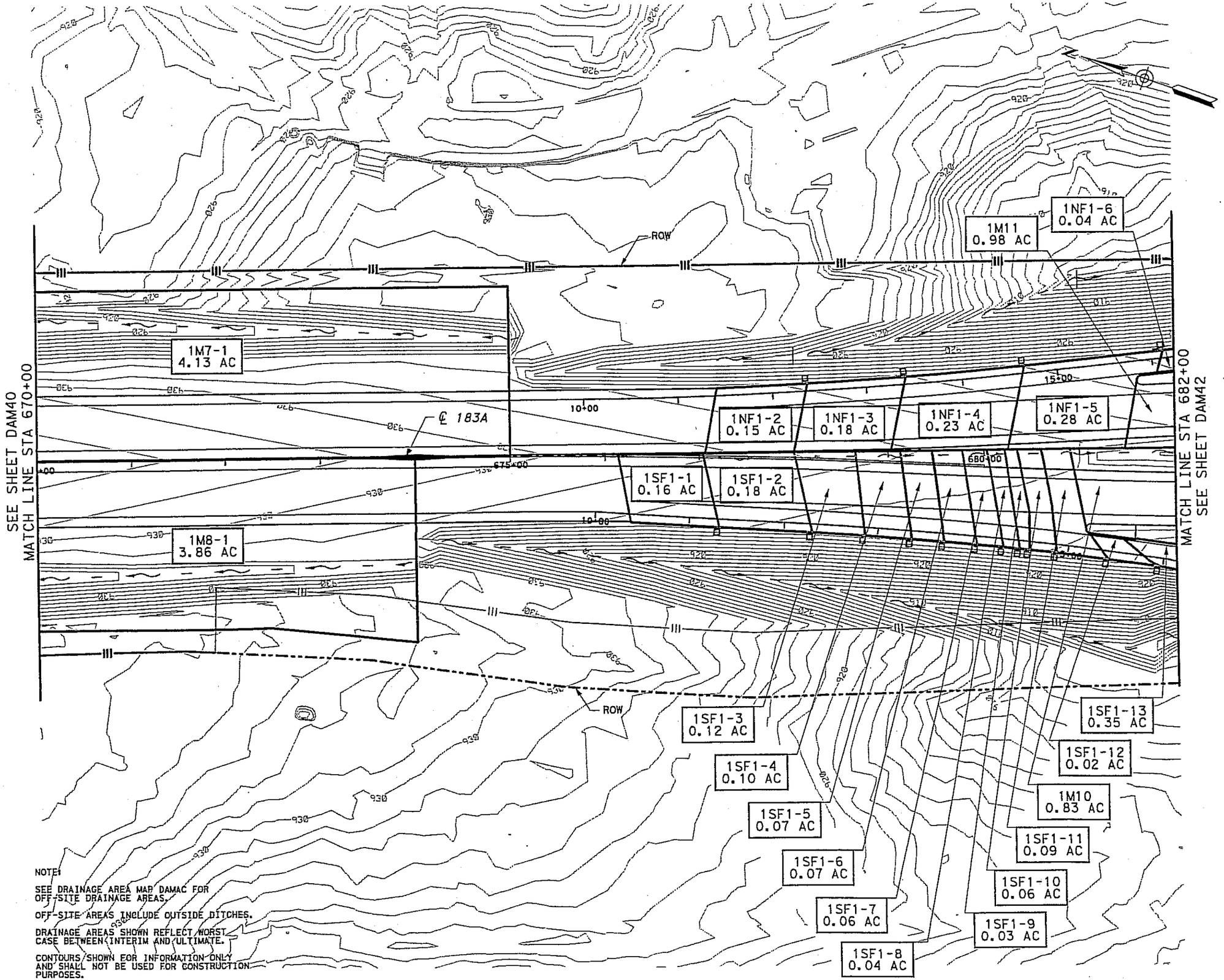

NOTE:

SEE DRAINAGE AREA MAP DAMAC FOR OFF-SITE DRAINAGE AREAS.

OFF-SITE AREAS INCLUDE OUTSIDE DITCHES.

DRAINAGE AREAS SHOWN REFLECT WORST CASE BETWEEN INTERIM AND ULTIMATE.

CONTOURS SHOWN FOR INFORMATION ONLY AND SHALL NOT BE USED FOR CONSTRUCTION PURPOSES.

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STATE OF TEXAS
DAVID L. GARRETT
76626
REGISTERED PROFESSIONAL ENGINEER
4/27/06

RFC JSA
JUL 05 2006
Hill Country Constructors

NO	DATE	REVISION	APPROVED
0	11/04/05	GRADE AND DRAIN PACKAGE (WA1)	DLG
1	12/29/05	GRADE AND DRAIN PACKAGE (WA1)	DLG
2	04/21/06	WA1 100% PLANS	DLG
	/ /		
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	/ /		
	/ /		
	/ /		
	/ /		
	/ /		

183A TURNPIKE PROJECT

DRAINAGE AREA MAP

STA 670+00 TO STA 682+00

HORIZONTAL: 1" = 100'

DRAWING: DAM41

SHEET 45 OF 65 SHEETS

STATE OF TEXAS

CENTRAL TEXAS REGIONAL MOBILITY AUTHORITY
183A TURNPIKE PROJECT
INTERIM DESIGN
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Hill Country Constructors

DESIGNED BY:			
BY			
DATE: 3/-/05			
DRAWN BY: NSB	FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.	SHEET NO.
DATE: 3/-/05	6	MG 2002 (241)	
CHECKED BY: KGS	STATE	DIST.	COUNTY
DATE: 3/-/05	TEXAS	AUS	WILLIAMSON
	CONT.	SECT.	JOB / HIGHWAY NO.
	0151	05	080 / 183A

Username: Barbara McKinney 4/17/2006 9:35:27 AM

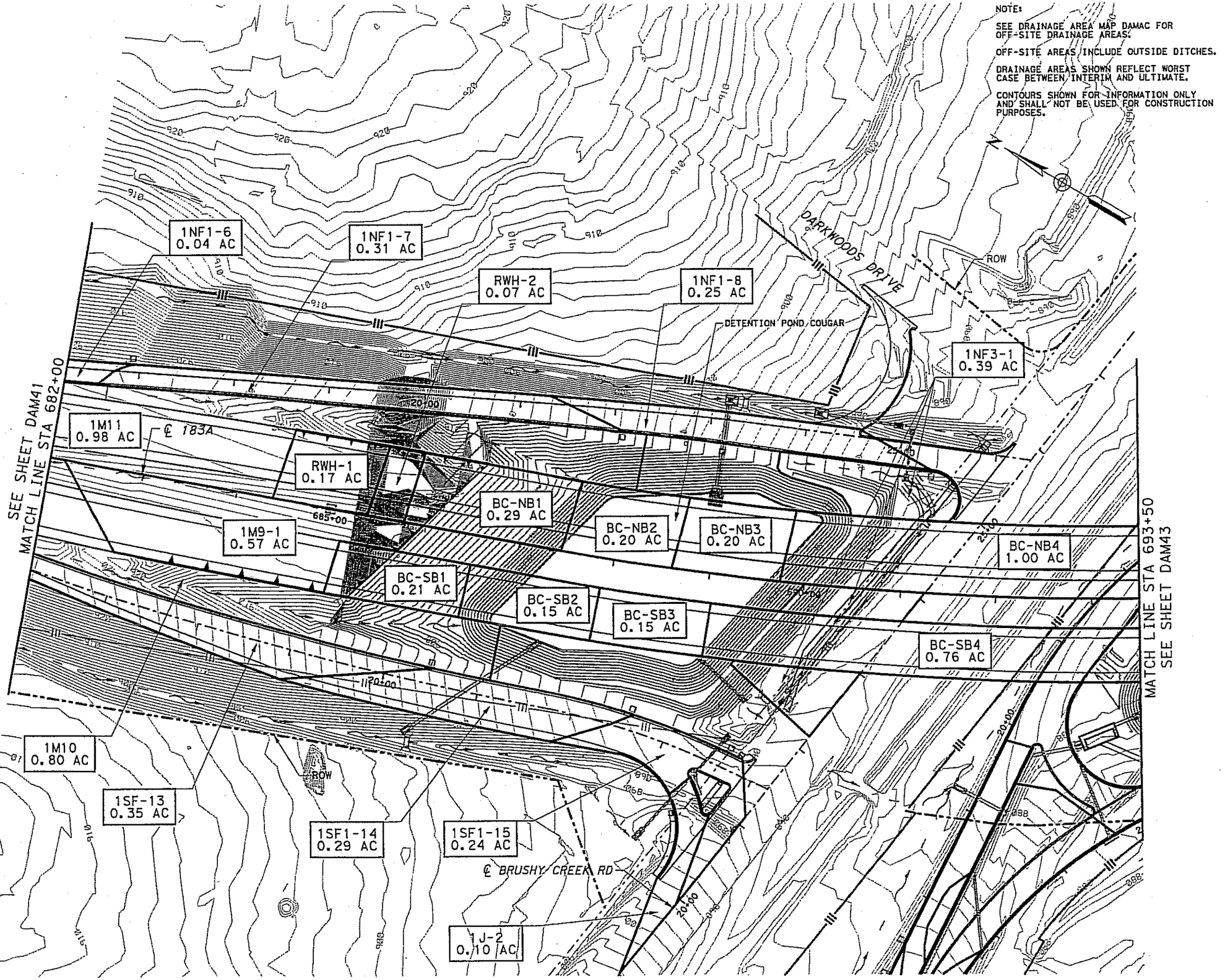
NOTE:

SEE DRAINAGE AREA MAP DAMAC FOR OFF-SITE DRAINAGE AREAS.

OFF-SITE AREAS INCLUDE OUTSIDE DITCHES.

DRAINAGE AREAS SHOWN REFLECT WORST CASE BETWEEN INTERIM AND ULTIMATE.

CONTOURS SHOWN FOR INFORMATION ONLY AND SHALL NOT BE USED FOR CONSTRUCTION PURPOSES.



STATE OF TEXAS
DAVID L. GARRETT
76626
REGISTERED PROFESSIONAL ENGINEER
6/27/06

RFC

JUL 05 2006

Hill Country Constructors

NO	DATE	REVISION	APPROVED
0	11/04/05	GRADE AND DRAIN PACKAGE (WA1)	DLG
1	11/17/05	NDC #38	DLG
2	12/29/05	GRADE AND DRAIN PACKAGE (WA1)	DLG
3	04/21/06	WA1 100% PLANS	DLG

183A TURNPIKE PROJECT

DRAINAGE AREA MAP

STA 682+00 TO STA 693+00

HORIZONTAL: 1" = 100'

DRAWING: DAM42

SHEET 46 OF 65 SHEETS

STATE OF TEXAS

CENTRAL TEXAS REGIONAL MOBILITY AUTHORITY
183A TURNPIKE PROJECT
INTERIM DESIGN
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Hill Country Constructors

DESIGNED BY:				
BY				
DATE: 3-705				
DRAWN BY: NJB	FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.		SHEET NO.
DATE: 3-705	6	MG 2002 (241)		
CHECKED BY: BGS	STATE	DIST.	COUNTY	
DATE: 3-705	TEXAS	AUS	WILLIAMSON	
	CONT.	SECT.	JOB	HIGHWAY NO.
	0151	05	080	183A

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Username: Barbara McKinney

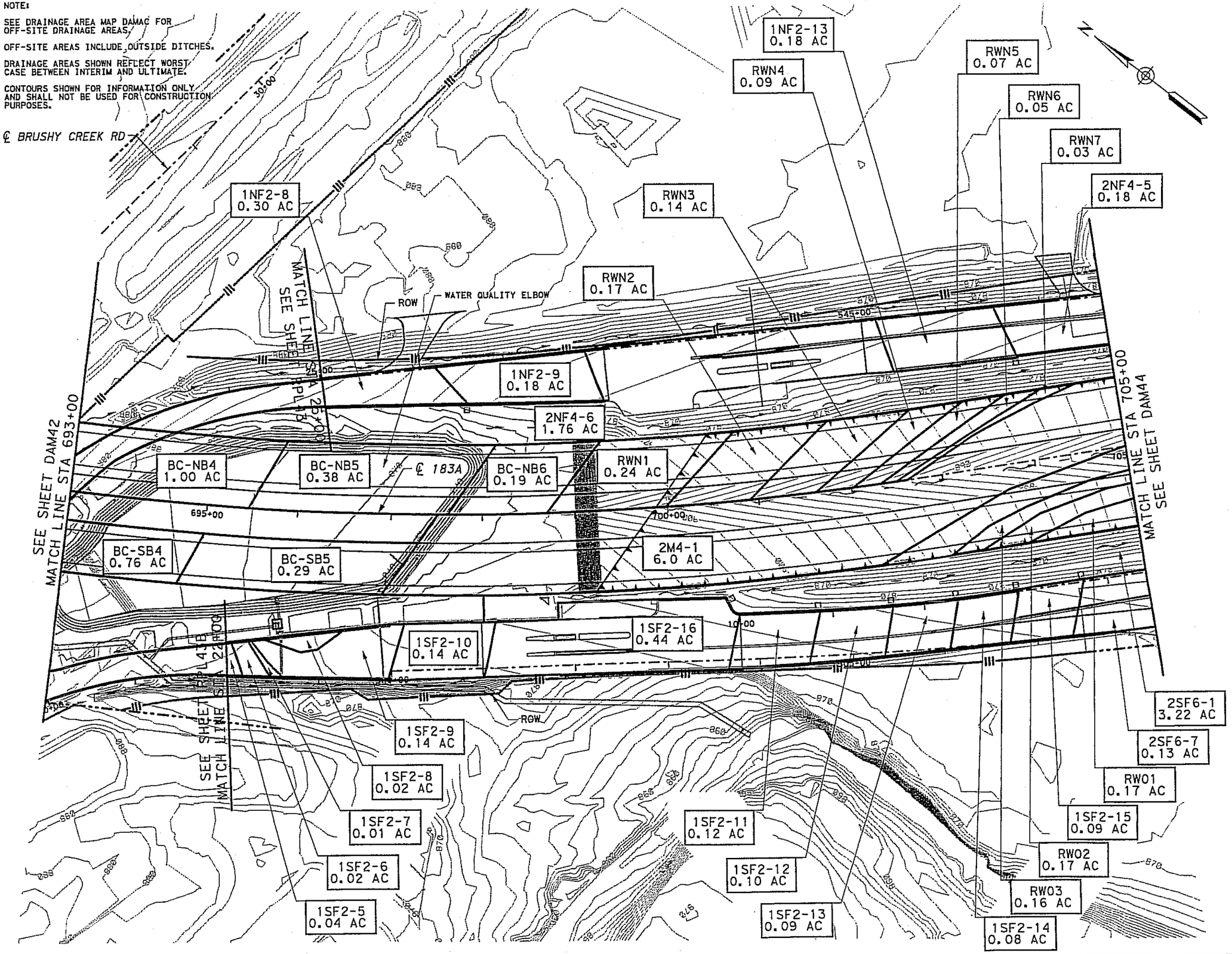
NOTE:

SEE DRAINAGE AREA MAP DAMAG FOR OFF-SITE DRAINAGE AREAS.

OFF-SITE AREAS INCLUDE OUTSIDE DITCHES.

DRAINAGE AREAS SHOWN REFLECT WORST CASE BETWEEN INTERIM AND ULTIMATE.

CONTOURS SHOWN FOR INFORMATION ONLY AND SHALL NOT BE USED FOR CONSTRUCTION PURPOSES.



STATE OF TEXAS
DAVID L. GARRETT
76626
REGISTERED PROFESSIONAL ENGINEER
4/27/06

RFC

JUL 05 2006

Hill Country Constructors

NO	DATE	REVISION	APPROVED
0	11/04/05	GRADE AND DRAIN PACKAGE (WA1)	DLG
1	12/29/05	GRADE AND DRAIN PACKAGE (WA1)	DLG
2	04/21/06	WA1 100% PLANS	DLG
	/ /		
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	/ /		
	/ /		

183A TURNPIKE PROJECT

DRAINAGE AREA MAP

STA 693+00 TO STA 705+00

HORIZONTAL: 1" = 100'

DRAWING: DAM43

SHEET 47 OF 65 SHEETS

STATE OF TEXAS

CENTRAL TEXAS REGIONAL MOBILITY AUTHORITY

183A TURNPIKE PROJECT

INTERIM DESIGN

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Hill Country Constructors

DESIGNED BY:				
BV				
DATE: 3/-/05				
DRAWN BY: NJB	FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.		SHEET NO.
DATE: 3/-/05	6	MG 2002 (241)		
CHECKED BY: KGS	STATE	DIST.	COUNTY	
DATE: 3/-/05	TEXAS	AUS	WILLIAMSON	
	CONT.	SECT.	JOB	HIGHWAY NO.
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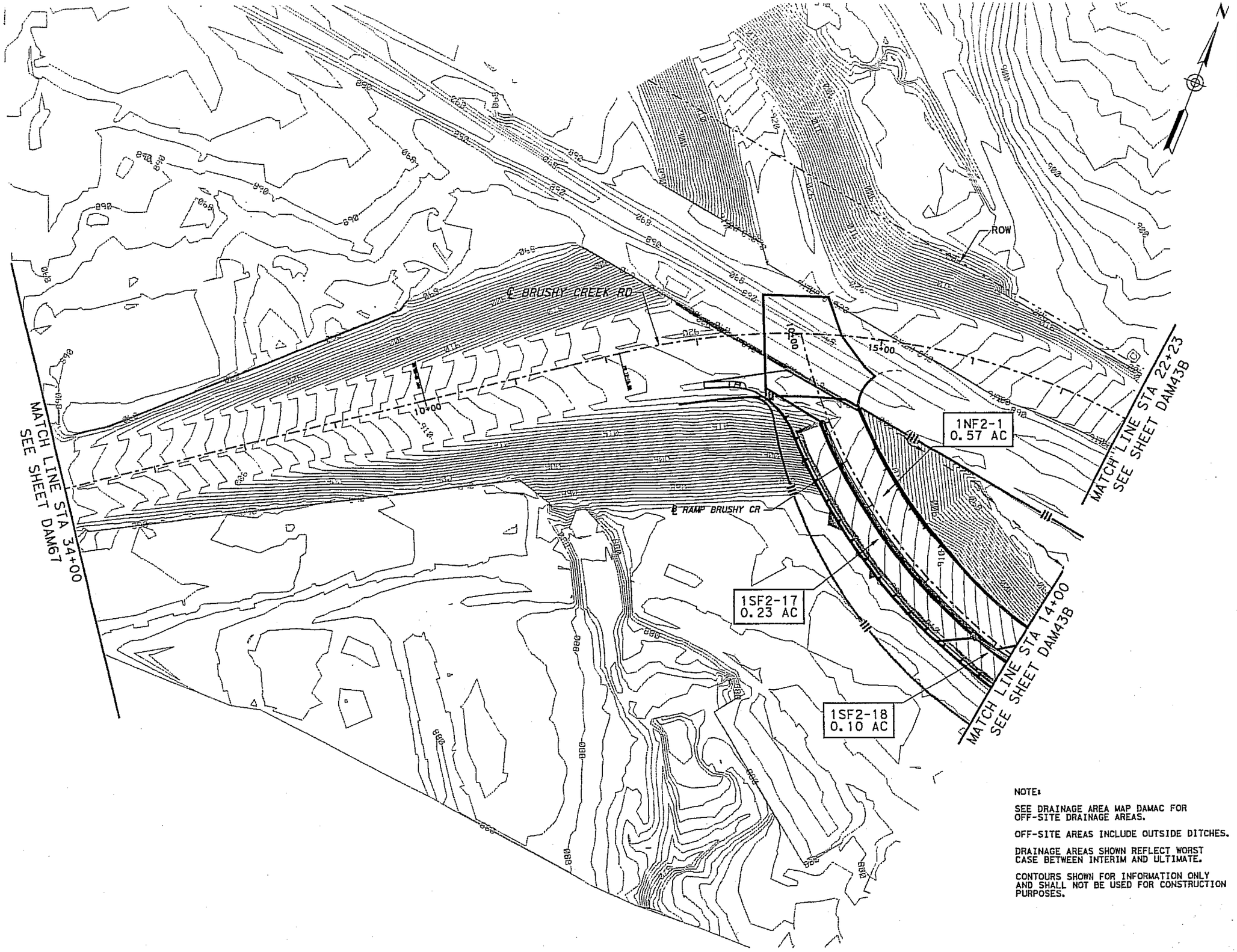

NOTE:

SEE DRAINAGE AREA MAP DAMAC FOR OFF-SITE DRAINAGE AREAS.

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DRAINAGE AREAS SHOWN REFLECT WORST CASE BETWEEN INTERIM AND ULTIMATE.

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STATE OF TEXAS
DAVID L. GARRETT
76626
REGISTERED PROFESSIONAL ENGINEER

4/27/06

RFC

JUL 05 2006

Hill Country Constructors

NO	DATE	REVISION	APPROVED
0	11/04/05	GRADE AND DRAIN PACKAGE (WA1)	DLG
1	12/29/05	GRADE AND DRAIN PACKAGE (WA1)	DLG
2	04/21/06	WA1 100% PLANS	DLG
	/ /		
	/ /		
	/ /		
	/ /		
	/ /		
	/ /		
	/ /		

183A TURNPIKE PROJECT

DRAINAGE AREA MAP

STA 682+00 TO STA 693+00

HORIZONTAL: 1" = 100'

DRAWING: DAM43A

SHEET 48 OF 65 SHEETS

STATE OF TEXAS

CENTRAL TEXAS REGIONAL MOBILITY AUTHORITY

183A TURNPIKE PROJECT

INTERIM DESIGN

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Hill Country Constructors

DESIGNED BY: BY				
DATE: 31-105				
DRAWN BY: NJR	FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.		SHEET NO.
DATE: 31-105	6	MG 2002 (241)		
CHECKED BY: KGS	STATE	DIST.	COUNTY	
	TEXAS	AUS	WILLIAMSON	
DATE: 31-105	CONT.	SECT.	JOB	HIGHWAY NO.
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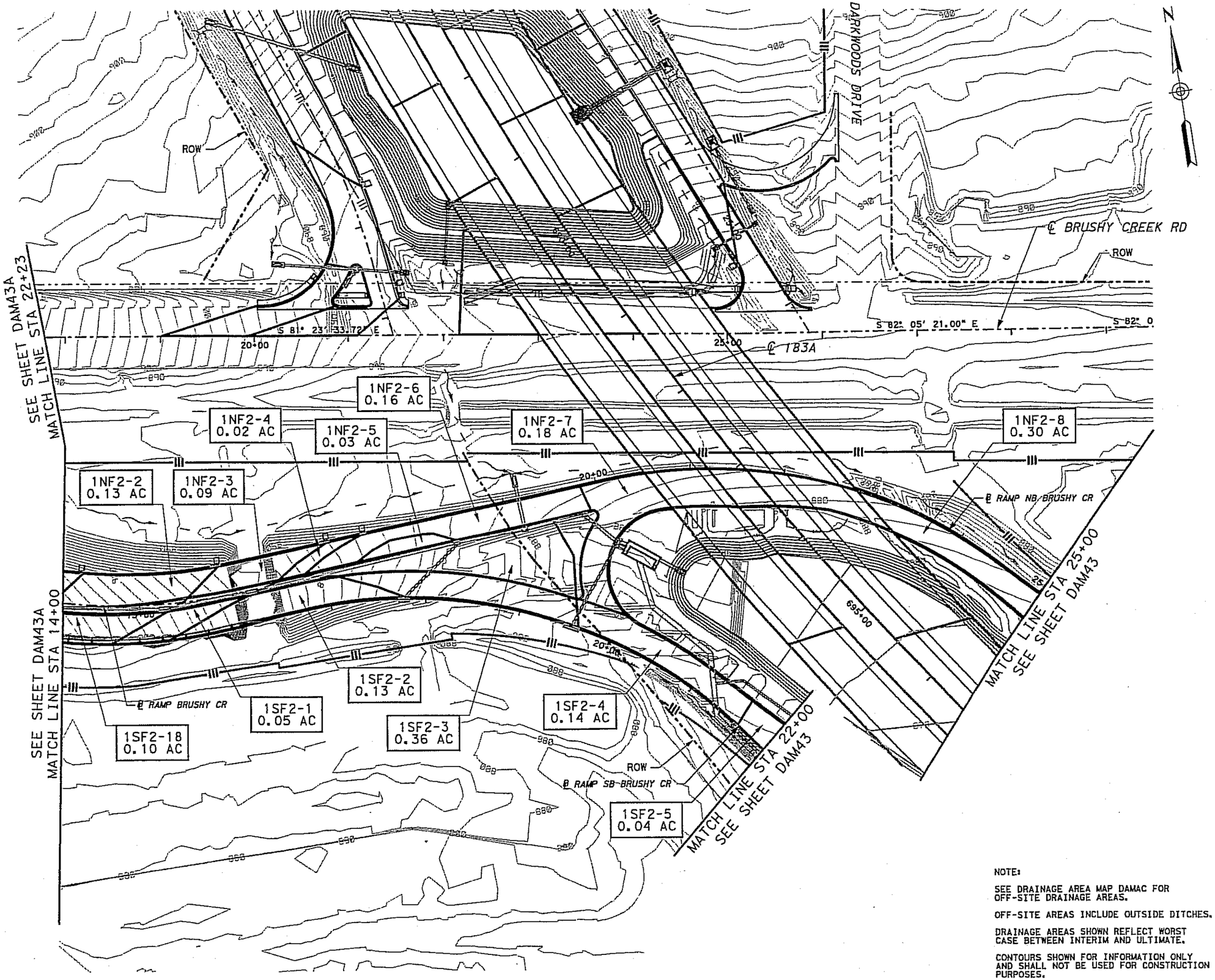

NOTE:

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OFF-SITE AREAS INCLUDE OUTSIDE DITCHES.

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STATE OF TEXAS
DAVID L. GARRETT
76626
REGISTERED PROFESSIONAL ENGINEER

4/27/06

RFC

JUL 05 2006

Hill Country Constructors

NO	DATE	REVISION	APPROVED
0	11/04/05	GRADE AND DRAIN PACKAGE (WA1)	DLG
1	12/29/05	GRADE AND DRAIN PACKAGE (WA1)	DLG
2	04/21/06	WA1 100% PLANS	DLG

183A TURNPIKE PROJECT

DRAINAGE AREA MAP

STA 682+00 TO STA 693+00

HORIZONTAL: 1" = 100'

DRAWING: DAM43B

SHEET 49 OF 65 SHEETS

STATE OF TEXAS

CENTRAL TEXAS REGIONAL MOBILITY AUTHORITY

183A TURNPIKE PROJECT

INTERIM DESIGN

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Hill Country Constructors

DESIGNED BY:	FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.		SHEET NO.
KY	6	MG 2002 (241)		
DATE: 31-105	STATE	DIST.	COUNTY	
DRAWN BY: NJB	TEXAS	AUS	WILLIAMSON	
DATE: 31-105	CONT.	SECT.	JOB	HIGHWAY NO.
CHECKED BY: KGS	0151	05	080	183A
DATE: 31-105				

Username: Barbara McKinney 4/17/2006 9:35:34 AM
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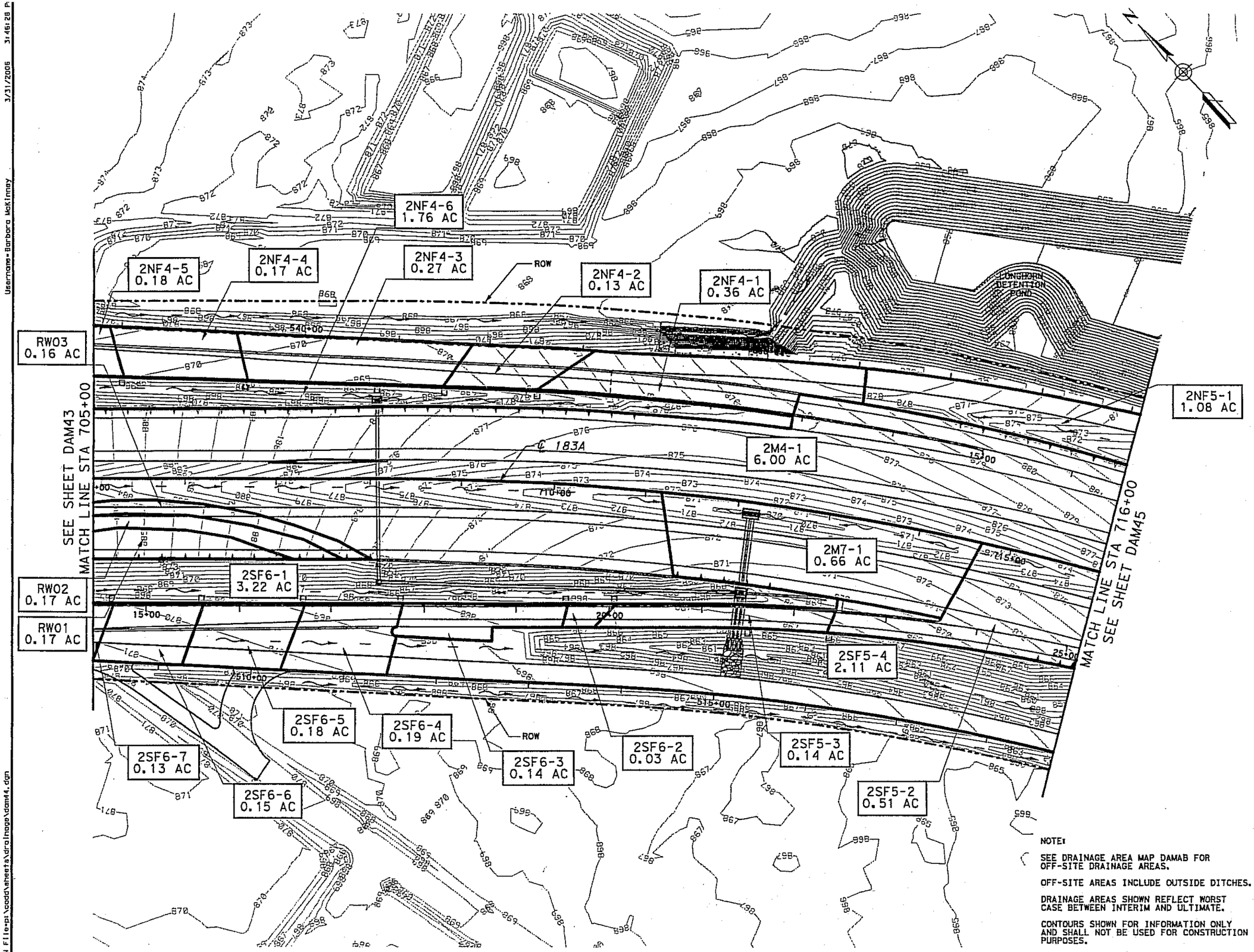

NOTE:

SEE DRAINAGE AREA MAP DAMAB FOR OFF-SITE DRAINAGE AREAS.

OFF-SITE AREAS INCLUDE OUTSIDE DITCHES.

DRAINAGE AREAS SHOWN REFLECT WORST CASE BETWEEN INTERIM AND ULTIMATE.

CONTOURS SHOWN FOR INFORMATION ONLY AND SHALL NOT BE USED FOR CONSTRUCTION PURPOSES.

STATE OF TEXAS
DAVID L. GARRETT
76626
REGISTERED PROFESSIONAL ENGINEER

4/7/06

RFC

JUN 15 2006

Hill Country Constructors

NO	DATE	REVISION	APPROVE
0	08/31/05	INITIAL RELEASE FOR CONSTRUCTION	DLG
1	04/07/06	WA2 100% PLANS	DLG
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183A TURNPIKE PROJECT

DRAINAGE AREA MAP

STA 705+00 TO STA 716+00

HORIZONTAL: 1" = 100'

DRAWING: DAM44

SHEET 50 OF 65 SHEETS

STATE OF TEXAS

CENTRAL TEXAS REGIONAL MOBILITY AUTHORITY
183A TURNPIKE PROJECT
INTERIM DESIGN
© 2006

447

Hill Country Constructors

DESIGNED BY:	FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.		SHEET NO.
BV	6	MG 2002 (241)		
DATE: 3/-/05	STATE	DIST.	COUNTY	
DRAWN BY: NJB	TEXAS	AUS	WILLIAMSON	
DATE: 3/-/05	CONT.	SECT.	JOB	HIGHWAY NO.
CHECKED BY: KGS	0151	05	080	183A
DATE: 3/-/05				

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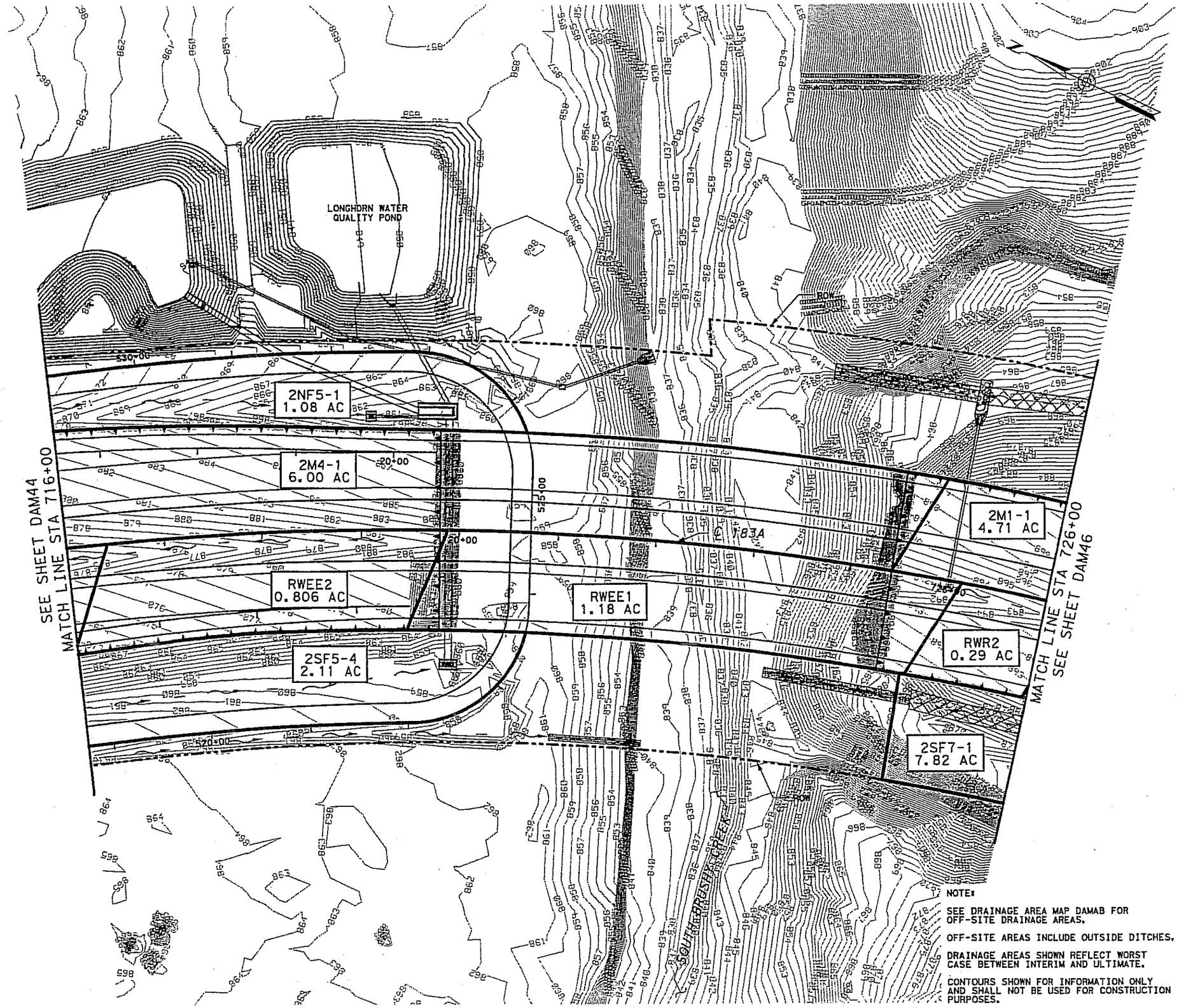

NOTE:

SEE DRAINAGE AREA MAP DAMAB FOR OFF-SITE DRAINAGE AREAS.

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STATE OF TEXAS
DAVID L. GARRETT
76626
REGISTERED PROFESSIONAL ENGINEER

4/7/06

RFC
JUN 15 2006
Hill Country Constructors

NO	DATE	REVISION	APPROVED
0	08/31/05	INITIAL RELEASE FOR CONSTRUCTION	DLG
1	04/07/06	WA2 100% PLANS	DLG
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183A TURNPIKE PROJECT

DRAINAGE AREA MAP

STA 716+00 TO STA 726+00

HORIZONTAL: 1" = 100'

DRAWING: DAM45

SHEET 51 OF 65 SHEETS

STATE OF TEXAS

CENTRAL TEXAS REGIONAL MOBILITY AUTHORITY
183A TURNPIKE PROJECT
INTERIM DESIGN
© 2006

448

Hill Country Constructors

DESIGNED BY: BY				
DATE: 3/-/05				
DRAWN BY: HSR	FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.		SHEET NO.
DATE: 3/-/05	6	MG 2002 (241)		
CHECKED BY: KGS	STATE	DIST.	COUNTY	
	TEXAS	AUS	WILLIAMSON	
DATE: 3/-/05	CONT.	SECT.	JOB	HIGHWAY NO.
	0151	05	080	183A

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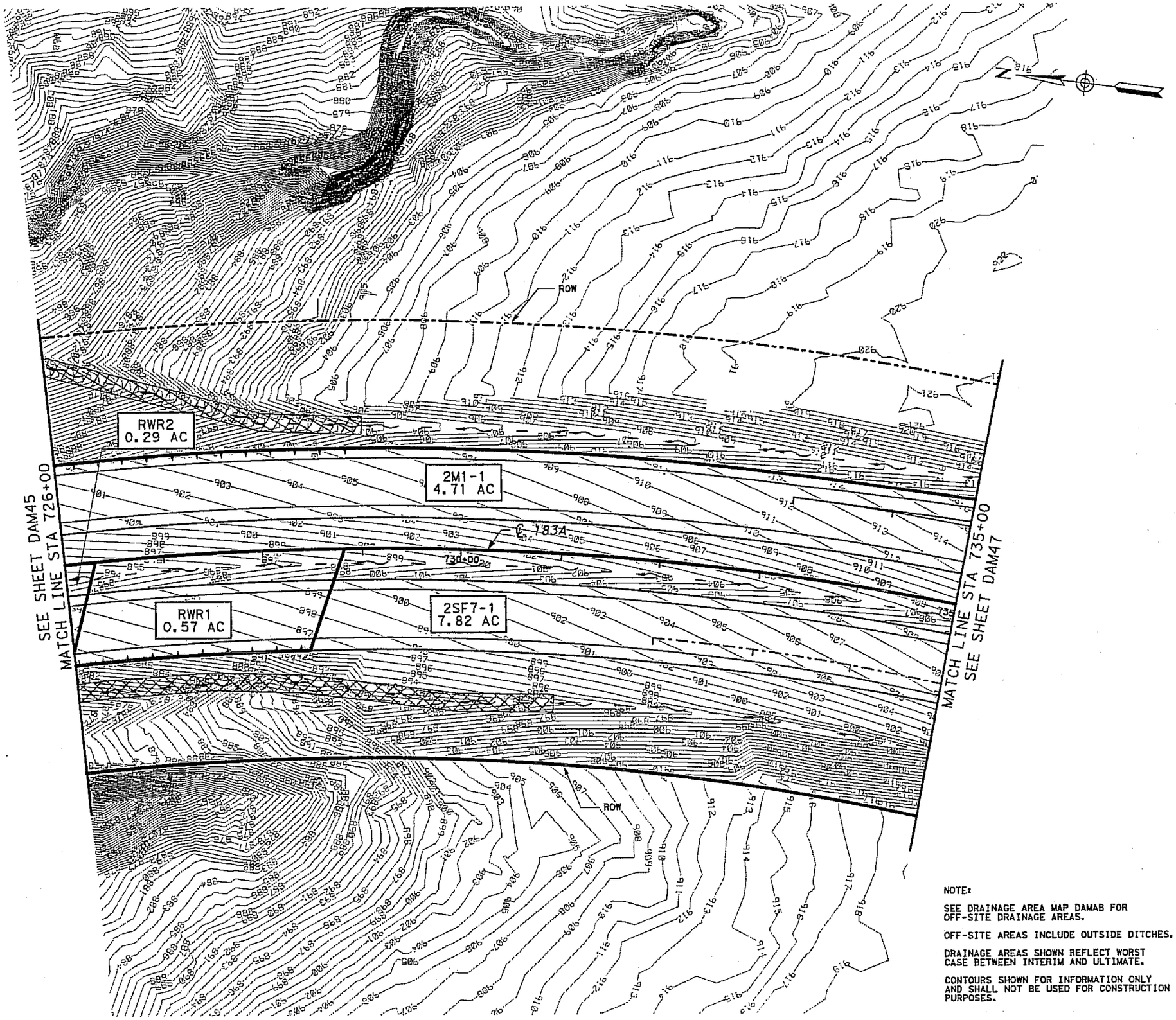

NOTE:

SEE DRAINAGE AREA MAP DAMAB FOR OFF-SITE DRAINAGE AREAS.

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STATE OF TEXAS
DAVID L. GARRETT
76626
REGISTERED PROFESSIONAL ENGINEER
4/7/06

RFC

JUN 15 2006

Hill Country Constructors

NO	DATE	REVISION	APPROVED
0	08/31/05	INITIAL RELEASE FOR CONSTRUCTION	DLG
1	04/07/06	WA2 100% PLANS	DLG
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183A TURNPIKE PROJECT

DRAINAGE AREA MAP

STA 726+00 TO STA 735+00

HORIZONTAL: 1" = 100'

DRAWING: DAM46

SHEET 52 OF 65 SHEETS

STATE OF TEXAS

CENTRAL TEXAS REGIONAL MOBILITY AUTHORITY
183A TURNPIKE PROJECT
INTERIM DESIGN
© 2006

449

Hill Country Constructors

DESIGNED BY:				
BJV				
DATE:				
3/-/05				
DRAWN BY:	FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.		SHEET NO.
NJB	6	MG 2002 (241)		
DATE:	STATE	DIST.	COUNTY	
3/-/05	TEXAS	AUS	WILLIAMSON	
CHECKED BY:	CONT.	SECT.	JOB	HIGHWAY NO
VGS	0151	05	080	183A
DATE:				
3/-/05				

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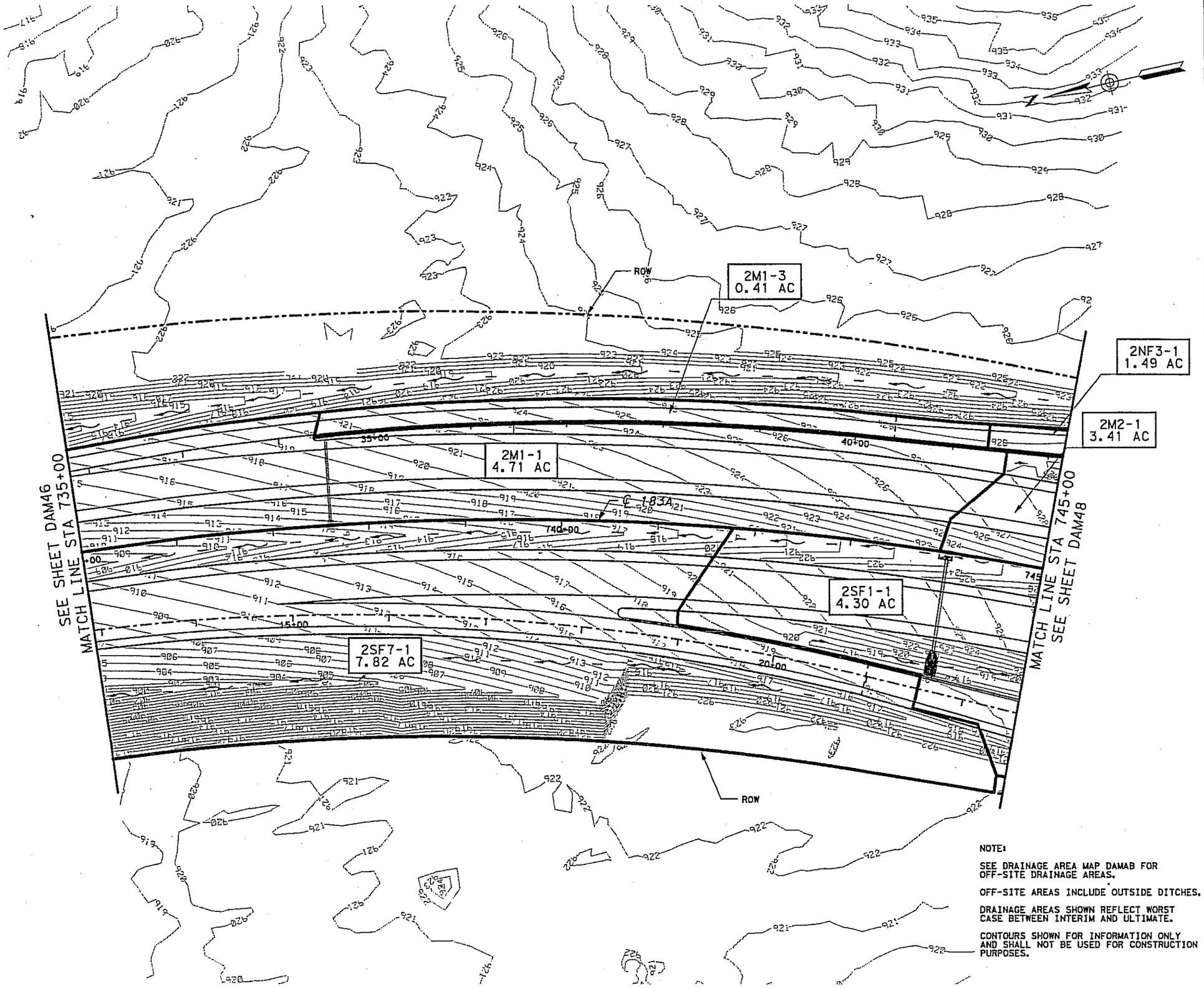

NOTE:

SEE DRAINAGE AREA MAP DAMAB FOR OFF-SITE DRAINAGE AREAS.

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DRAINAGE AREAS SHOWN REFLECT WORST CASE BETWEEN INTERIM AND ULTIMATE.

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STATE OF TEXAS
DAVID L. GARRETT
76626
REGISTERED PROFESSIONAL ENGINEER
4/7/06

RFC

JUN 15 2006

Hill Country Constructors

NO	DATE	REVISION	APPROVED
0	08/31/05	INITIAL RELEASE FOR CONSTRUCTION	DLG
1	04/07/06	WA2 100% PLANS	DLG
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183A TURNPIKE PROJECT

DRAINAGE AREA MAP

STA 735+00 TO STA 745+00

HORIZONTAL: 1" = 100'

DRAWING: DAM47

SHEET 53 OF 65 SHEETS

STATE OF TEXAS

CENTRAL TEXAS REGIONAL MOBILITY AUTHORITY
183A TURNPIKE PROJECT
INTERIM DESIGN
© 2006

450

Hill Country Constructors

DESIGNED BY:				
BJ				
DATE: 3-1-05				
DRAWN BY: NJH	FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.		SHEET NO.
DATE: 3-1-05	6	MG 2002 (241)		
CHECKED BY: DLG	STATE	DIST.	COUNTY	
	TEXAS	AUS	WILLIAMSON	
DATE: 3-1-06	CONT.	SECT.	JOB	HIGHWAY NO.
	0151	05	080	183A

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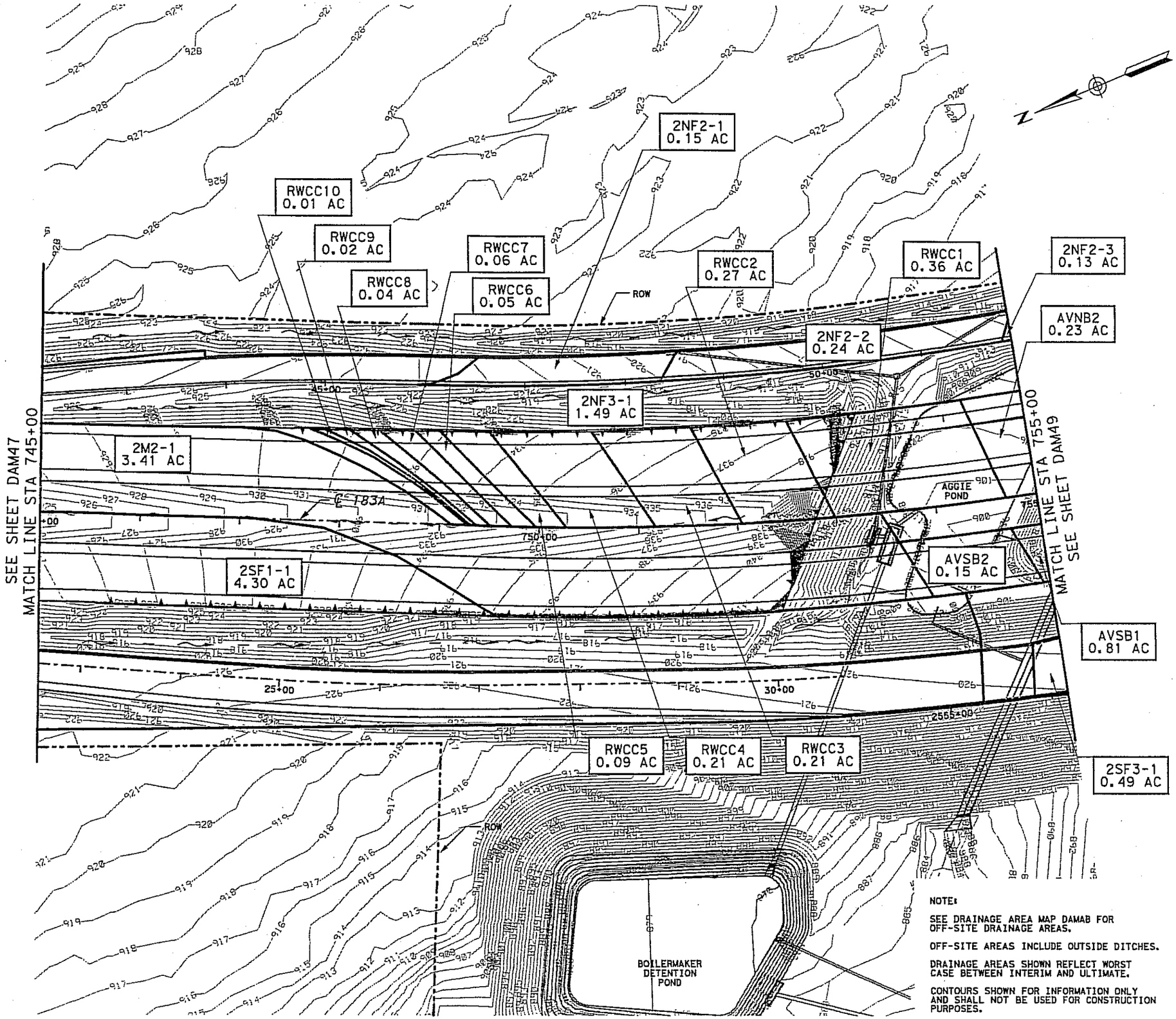

NOTE:

SEE DRAINAGE AREA MAP DAMAB FOR OFF-SITE DRAINAGE AREAS.

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STATE OF TEXAS
DAVID L. GARRETT
76626
REGISTERED
PROFESSIONAL ENGINEER
4/7/06

RFC

JUN 15 2006

Hill Country Constructors

NO	DATE	REVISION	APPROVED
0	08/31/05	INITIAL RELEASE FOR CONSTRUCTION	DLG
1	04/07/06	WA2 100X PLANS	DLG
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183A TURNPIKE PROJECT

DRAINAGE AREA MAP

STA 745+00 TO STA 755+00

HORIZONTAL: 1" = 100'

DRAWING: DAM48

SHEET 54 OF 65 SHEETS

STATE OF TEXAS

CENTRAL TEXAS REGIONAL MOBILITY AUTHORITY
183A TURNPIKE PROJECT
INTERIM DESIGN

© 2006

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Hill Country Constructors

DESIGNED BY:	FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.		SHEET NO.
BJ	6	MG 2002 (241)		
DATE: 3/-/05	STATE	DIST.	COUNTY	
DRAWN BY: NSB	TEXAS	AUS	WILLIAMSON	
DATE: 3/-/05	CONT.	SECT.	JOB	HIGHWAY NO.
CHECKED BY: KGS	0151	05	080	183A
DATE: 3/-/05				

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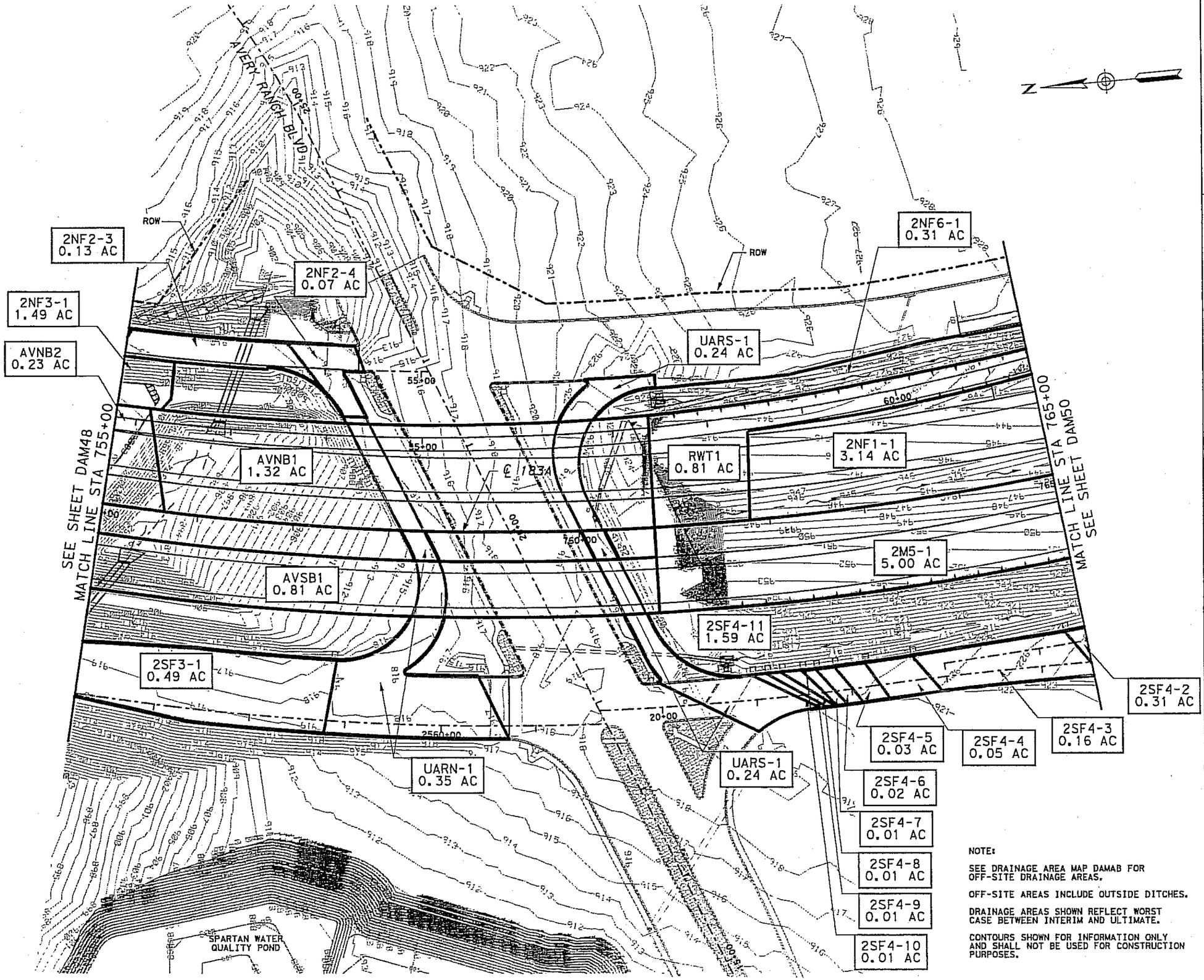

NOTE:

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STATE OF TEXAS
DAVID L. GARRETT
76626
REGISTERED PROFESSIONAL ENGINEER
5/1/06

RFC

JUN 15 2006

Hill Country Constructors

NO	DATE	REVISION	APPROVED
0	08/31/05	INITIAL RELEASE FOR CONSTRUCTION	DLG
1	04/07/06	WA2 100% PLANS	DLG
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183A TURNPIKE PROJECT

DRAINAGE AREA MAP

STA 755+00 TO STA 765+00

HORIZONTAL: 1" = 100'

DRAWING: DAM49

SHEET 55 OF 65 SHEETS

STATE OF TEXAS

CENTRAL TEXAS REGIONAL MOBILITY AUTHORITY
183A TURNPIKE PROJECT
INTERIM DESIGN
© 2006

452

Hill Country Constructors

DESIGNED BY:	FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.		SHEET NO.
BY	6	MG 2002 (241)		
DATE: 31-05	STATE	DIST.	COUNTY	
DRAWN BY: NSB	TEXAS	AUS	WILLIAMSON	
DATE: 31-05	CONT.	SECT.	JOB	HIGHWAY NO.
CHECKED BY: KGS	0151	05	080	183A
DATE: 31-05				

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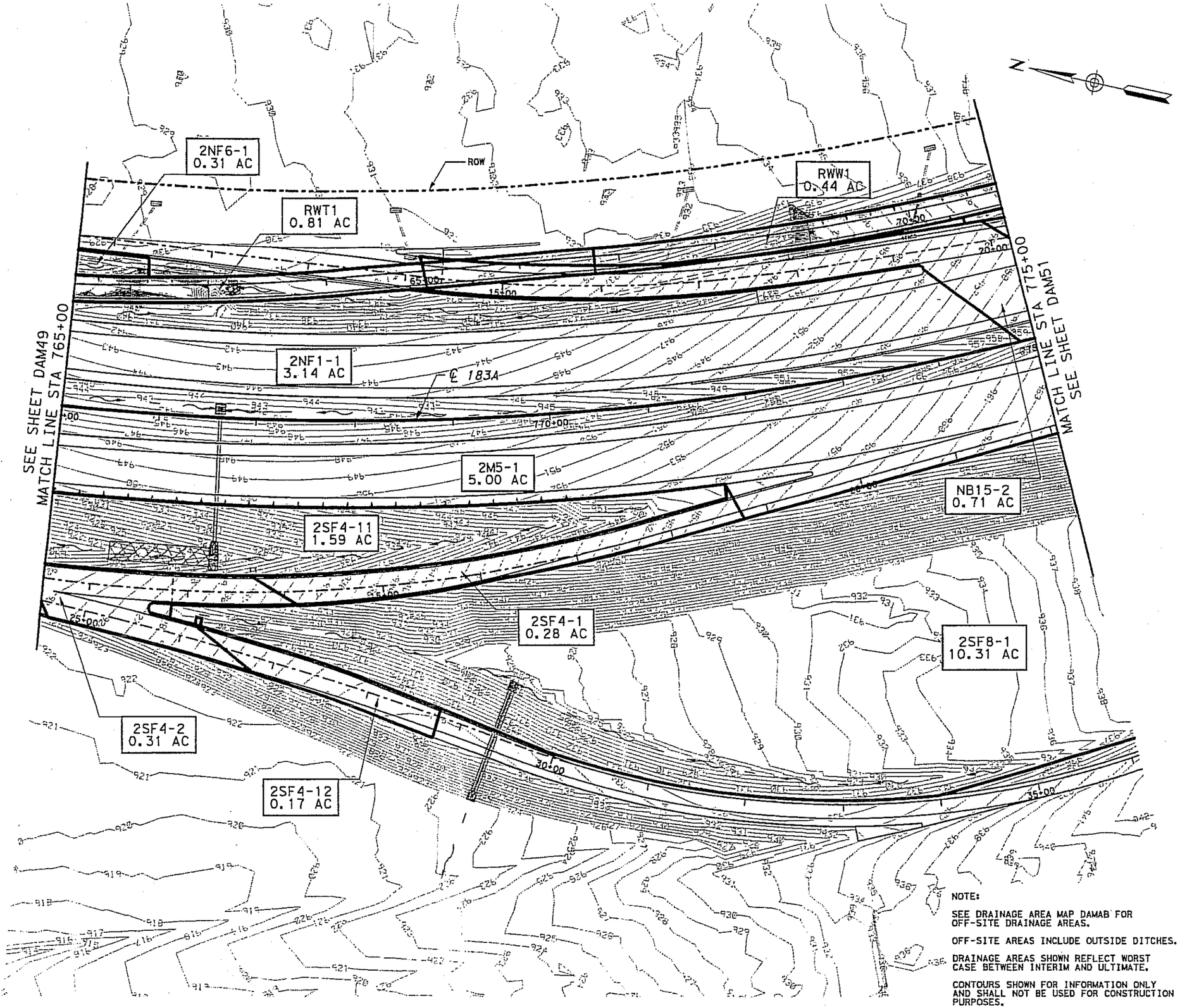

NOTE:

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STATE OF TEXAS
DAVID L. GARRETT
76626
REGISTERED PROFESSIONAL ENGINEER
5/1/06

RFC
JUN 15 2006
Hill Country Constructors

NO	DATE	REVISION	APPROVED
0	08/31/05	INITIAL RELEASE FOR CONSTRUCTION	DLG
1	04/07/06	WA2 100% PLANS	DLG

183A TURNPIKE PROJECT

DRAINAGE AREA MAP

STA 765+00 TO STA 775+00

HORIZONTAL: 1" = 100'

DRAWING: DAM50

SHEET 56 OF 65 SHEETS

STATE OF TEXAS

CENTRAL TEXAS REGIONAL MOBILITY AUTHORITY
183A TURNPIKE PROJECT
INTERIM DESIGN
© 2006

453

Hill Country Constructors

DESIGNED BY:				
BJ				
DATE: 3-7-05				
DRAWN BY: NTR	FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.		SHEET NO.
DATE: 3-7-05	6	MG 2002 (241)		
CHECKED BY: BGS	STATE	DIST.	COUNTY	
DATE: 3-7-05	TEXAS	AUS	WILLIAMSON	
	CONT.	SECT.	JOB	HIGHWAY NO.
	0151	05	080	183A

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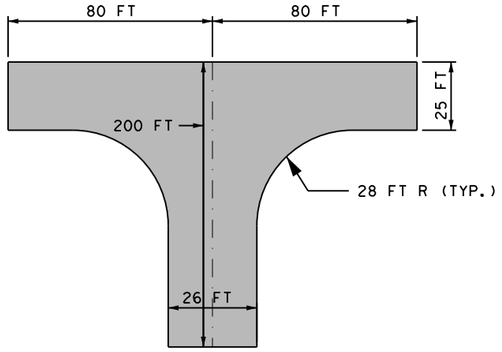
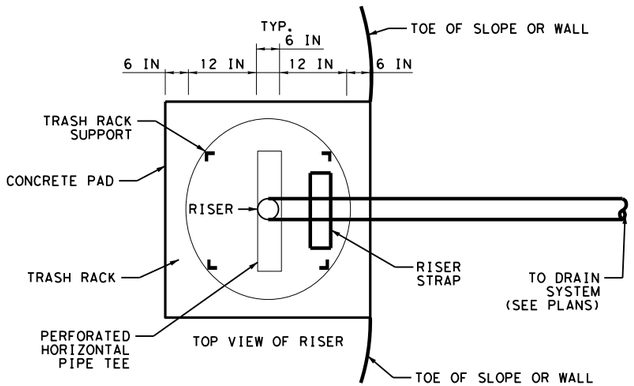
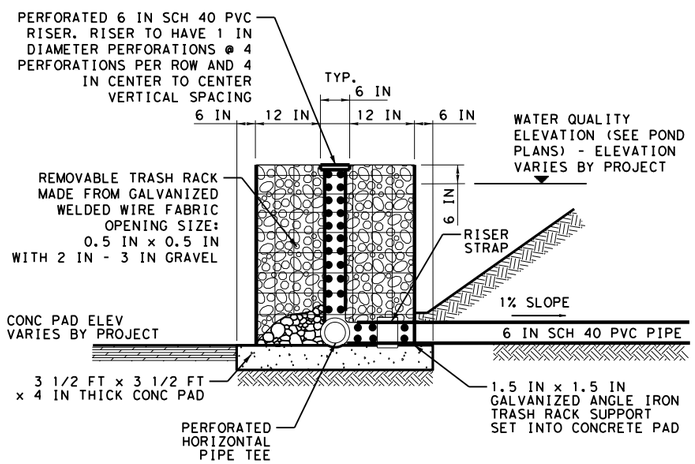


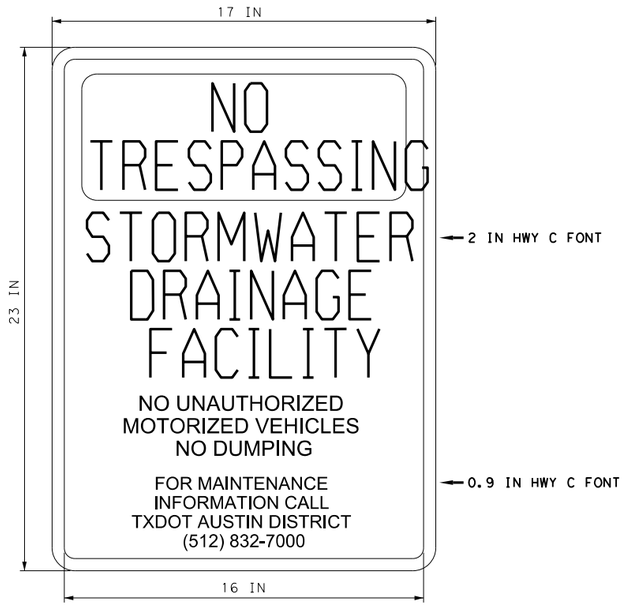
ACCESS DRIVE TURNAROUND-MINIMUM DIMENSIONS
(NOT REQUIRED IF LESS THAN 200 FEET LONG)
NOT TO SCALE



OUTLET STRUCTURE PLAN VIEW
NOT TO SCALE



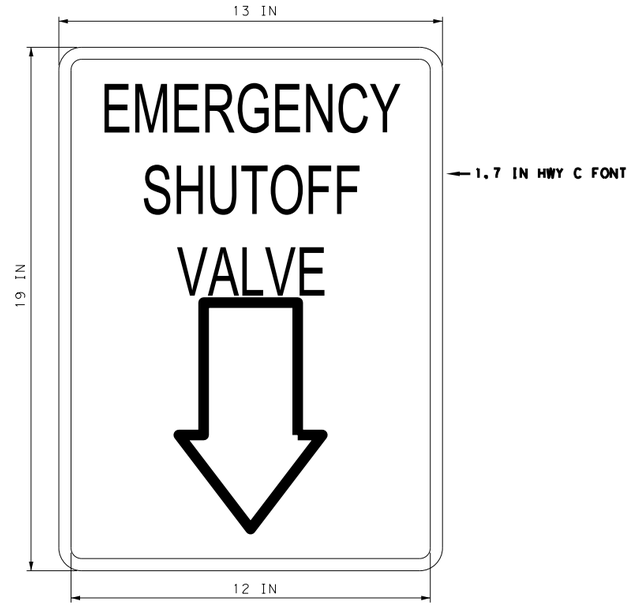
OUTLET STRUCTURE PROFILE VIEW
NOT TO SCALE



HEIGHT	24 IN
LENGTH	18 IN
THICKNESS	0.08 IN
SUBSTRATE	ALUMINUM ALLOY, ASTM B-209
NO TRESPASSING COLOR	BACKGROUND RED LETTERING WHITE
COLOR	BACKGROUND WHITE LETTERING AND BORDER BLACK

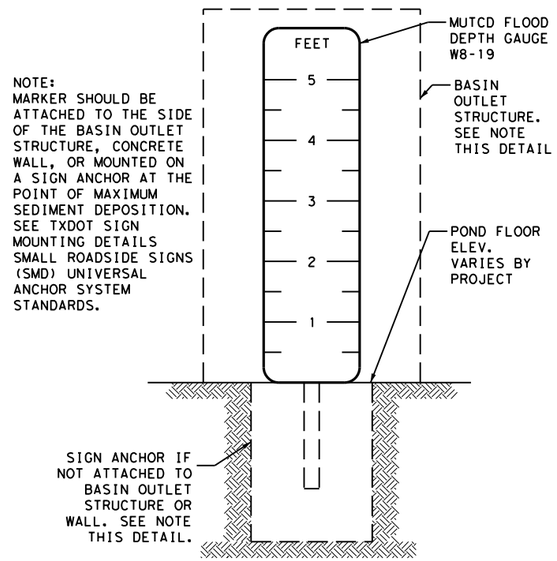
NOTE:
PONDS MAINTAINED BY THE CITY OF AUSTIN SHOULD USE THE STANDARD CITY OF AUSTIN STORM WATER FACILITY SIGN.

STORMWATER FACILITY SIGN
NOT TO SCALE

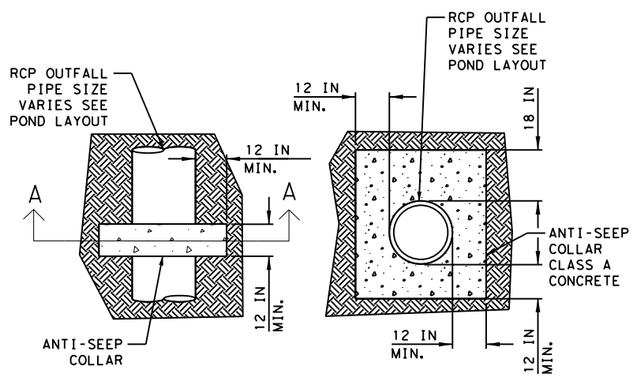


HEIGHT	20 IN
LENGTH	14 IN
THICKNESS	0.08 IN
SUBSTRATE	ALUMINUM ALLOY, ASTM B-209
COLOR	BACKGROUND RED LETTERING AND BORDER WHITE

EMERGENCY SHUTOFF VALVE MARKER
NOT TO SCALE



SEDIMENTATION DEPTH MARKER DETAIL
NOT TO SCALE



NOTE:
ANTI-SEEP COLLARS MUST EXTEND AT LEAST 6 IN BEYOND THE BEDDING ENVELOPE.

PLAN VIEW SECTION A-A

CONCRETE ANTI-SEEP COLLAR
NOT TO SCALE

DESIGN
STATE OF TEXAS · BRYAN SIERSMA · 147188 · LICENSED PROFESSIONAL ENGINEER
BRYAN SIERSMA, P.E.
4/23/2024
DATE

APPROVAL
STATE OF TEXAS · DAN THOMA · 98622 · LICENSED PROFESSIONAL ENGINEER
DAN THOMA, P.E.
4/23/2024
DATE

NOT TO SCALE

PAPE-DAWSON ENGINEERS
SAN ANTONIO | AUSTIN | HOUSTON | FORT WORTH | DALLAS
2000 NW LOOP 410 | SAN ANTONIO, TX 78213 | 210.375.9000
TEXAS ENGINEERING FIRM #470 | TEXAS SURVEYING FIRM #10028800

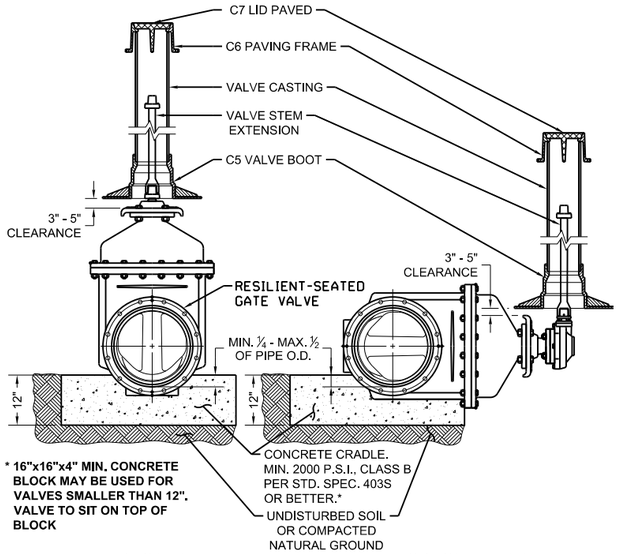
2024 Texas Department of Transportation

US 183 GPL
BEST MANAGEMENT PRACTICES (BMP)
MISCELLANEOUS DETAILS

SHEET 1 OF 2

© 2024	CONT	SECT	JOB	HIGHWAY
DS: CK:	0151	10	001	US 183
DW: CK:	DIST	COUNTY		SHEET NO.
	AUS	WILLIAMSON		794E

DATE: 4/23/2024 1:55:46 PM
FILE: v:\bentley\dms\pd-pw-01\olyssa.sage\dms07214\01511001_MISCDET_12.dgn



VERTICAL VALVE

HORIZONTAL VALVE

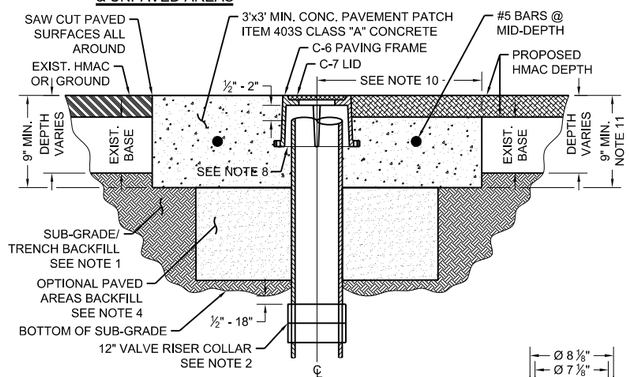
ONLY TO BE USED WHEN CALLED OUT ON THE DRAWINGS.

NOTES:

1. RESILIENT-SEATED GATE VALVE SHALL CONFORM TO AWWA C-509.
2. WELD SOCKET 2 ½" x 2" DEEP TO 1" SCH. 40 CARBON STEEL ROUND STEM EXTENSION, FITTED ON OPERATING NUT, [SCH. 80 FOR LENGTHS OVER 10'.]
3. VALVE CASTING SHALL BE 6" DI PIPE WITH BELL OR COLLAR CENTERED OVER VALVE BOOT.
4. NUT AT TOP OF VALVE EXTENSION ROD SHALL BE SQUARE 2" LONG WELDED TO TOP OF ROD.
5. VALVE STEM EXTENSIONS ARE REQUIRED ON ALL VALVES THAT EXCEED 3' DEEP FROM FINISHED GRADE. VALVE EXTENSIONS SHALL BE PLACED SUCH THAT THE EXTENSION NUT IS BETWEEN 12" AND 18" FROM FINISHED GRADE.

EMERGENCY SHUTOFF VALVE

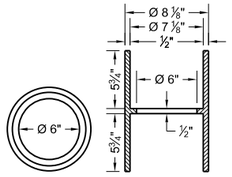
TYPICAL GATE VALVE 6" - 16"



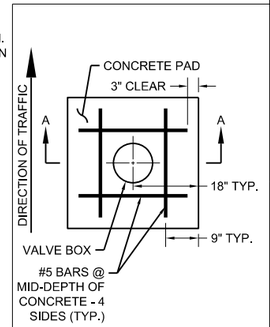
SECTION A - A

NOTES:

1. SUB-GRADE/TRENCH BACKFILL SHALL BE COMPACTED AS PER ITEM 201S, SUB-GRADE PREPARATION.
2. TO ADJUST VALVE CASTINGS TO FINAL GRADE, REMOVE RISER PIPE BELOW SUB-GRADE AND INSTALL APPROPRIATE LENGTH OF NEW RISER PIPE TO ACHIEVE FINAL GRADE. CONNECT THE TWO PIECES OF RISER PIPE WITH A 6" COLLAR MIN. 12" LENGTH APPROXIMATELY CENTERED ON THE JOINT WITH THE TOP OF SLEEVE LOCATED ½" - 18" BELOW SUB-GRADE. THE INSIDE "LIP" OF COLLAR TO BE PAINTED WITH FLUORESCENT WHITE PAINT OR COVERED WITH FLUORESCENT WHITE TAPE. ALTERNATE: FOR OPTIONAL SINGLE PIECE RISER INSTALLATION SEE SHEET 4 OF 4.
3. CLEAN VALVE BOX OF ALL DEBRIS DOWN TO THE NUT OF THE VALVE; NUT SHALL OPERATE WITH NO OBSTRUCTION.
4. WHERE CASTINGS TO BE REMOVED REQUIRE EXCAVATION GREATER THAN 20" DEEP, CONTRACTOR MAY ELECT TO FILL EXCAVATION WITH CONTROLLED LOW STRENGTH MATERIAL (SPEC. ITEM 402S) TO THE UNDERSIDE OF THE CONCRETE. PAVEMENT PATCH IN LIEU OF COMPACTED BACKFILL.
5. REINFORCING STEEL SHALL MEET SPEC. ITEM 406S.7.
6. NO MORE THAN 2 SECTIONS OF PIPE SHALL BE USED FROM VALVE TO FINAL GRADE.
7. BELL AND SPIGOT IS ACCEPTABLE FOR DEPTH OVER 18'.
8. PAVING FRAME SHALL BE FLUSH WITH THE CONC. PAD AND PLACED ½" - 2" ABOVE RISER PIPE (FRAME SHALL NOT REST ON RISER.)
9. INSTALL ONE EMERGENCY SHUTOFF VALVE MARKER IMMEDIATELY ADJACENT TO THE EDGE OF THE CONCRETE PAD. MARKER SHALL EXTEND AT LEAST 60" ABOVE GROUND AND BE CLEARLY VISIBLE FROM THE ACCESS GATE.
10. VALVE SHALL TYPICALLY BE CENTERED IN CONCRETE DIAMOND BUT MAY BE OFFSET WITH A MIN. OF 12" FROM CENTER OF VALVE LID TO EDGE OF CONCRETE IN ALL DIRECTIONS.
11. MIN. TOTAL DEPTH OF ASPHALT PLUS CONC. IS 9" AND MIN. DEPTH OF CONC. PAD SHALL BE 5".



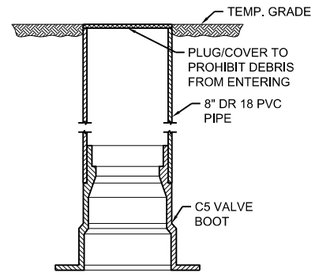
TOP VIEW COLLAR *



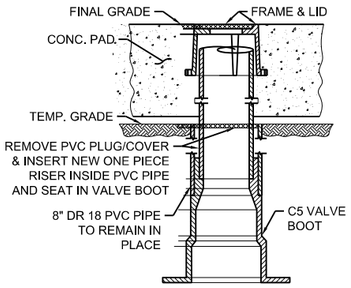
PLAN VIEW

12" VALVE RISER COLLAR

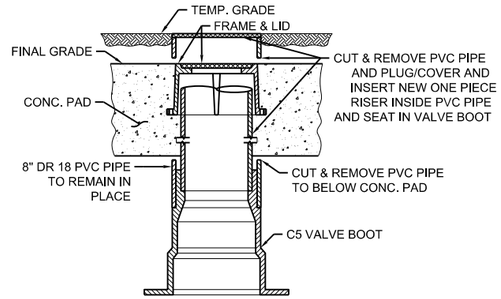
* 12" COLLAR: 39 LBS



STEP 1

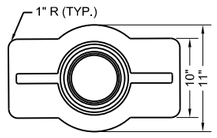


STEP 2A - RAISE TO FINAL GRADE

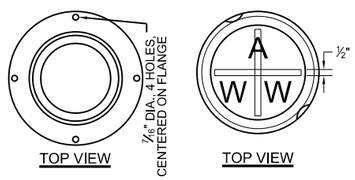


STEP 2B - LOWER TO FINAL GRADE

OPTIONAL ONE PIECE VALVE CASTING INSTALLATION

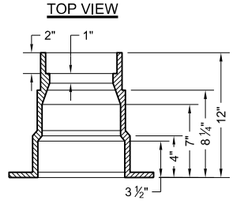


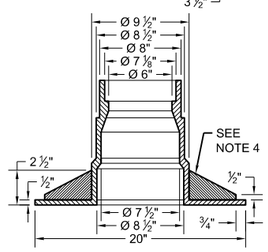
TOP VIEW



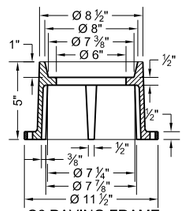
TOP VIEW

TOP VIEW

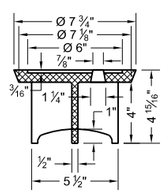




C5 VALVE BOOT



C6 PAVING FRAME (PAVEMENT ONLY)



C7 LID* (IN PAVEMENT)

NOTES:

1. MATERIAL SHALL BE GRAY CAST IRON, ASTM A48, GRADE 30B.
2. THE MANUFACTURER'S IDENTIFICATION AND CASTING NUMBER, AND THE COUNTRY WHERE CAST, SHALL BE DISTINCTLY CAST ONTO EACH LID, FRAME, COLLAR AND BASE.
3. DRAFT AND SHRINKAGE ALLOWANCE SHALL BE IN ACCORDANCE WITH NORMAL FOUNDRY PRACTICE.
4. CASTING FINISH BY MANUFACTURER SHALL INCLUDE REMOVAL OF FINS AND FLASHING, AND PAINT WITH BLACK ASPHALT COATING.

WEIGHTS:

C7 LID: 13 LBS
C6 FRAME: 23 LBS
C5 BASE: 78 LBS

* LETTERING SHALL BE 1 ½" 2 PICK BAR SLOTS REQUIRED

DESIGN

STATE OF TEXAS — BRYAN SIERSMA — 147188 — LICENSED PROFESSIONAL ENGINEER

BRYAN SIERSMA, P.E.

4/23/2024
DATE

APPROVAL

STATE OF TEXAS — DAN THOMA — 98622 — LICENSED PROFESSIONAL ENGINEER

DAN THOMA, P.E.

4/23/2024
DATE

NOT TO SCALE

PAPE-DAWSON ENGINEERS
SAN ANTONIO | AUSTIN | HOUSTON | FORT WORTH | DALLAS
2000 NW LOOP 410 | SAN ANTONIO, TX 78213 | 210.375.9000
TEXAS ENGINEERING FIRM #470 | TEXAS SURVEYING FIRM #10028800

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US 183 GPL

BEST MANAGEMENT PRACTICES (BMP) MISCELLANEOUS DETAILS

SHEET 2 OF 2

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GENERAL NOTES:

1. THE TXDOT AUSTIN DISTRICT STORMWATER MANAGEMENT GUIDELINES SHOULD BE REFERENCED IN TANDEM WITH THESE STANDARD DETAILS FOR DESIGN CONSIDERATIONS AND REQUIREMENTS.
2. POND LAYOUTS AND DETAILS PROVIDED TO CONVEY GENERAL MAINTENANCE REQUIREMENTS AND PREVENTATIVE MAINTENANCE PREFERENCES OF TXDOT. FINAL DESIGN, DETAILING, AND STRUCTURAL DETAILING SHOULD BE SHOWN ON THE DESIGN PLAN SHEETS.
3. TXDOT APPROVAL IS REQUIRED IN ORDER TO USE A PROPRIETARY TREATMENT SYSTEM OR PERMEABLE FRICTION COURSE.
4. FENCING NECESSITY AND TYPE SHOULD BE DETERMINED BY THE TXDOT AREA OFFICE.
5. FACILITIES WITH CHAIN LINK FENCING SHOULD HAVE ACCESS MAINTAINED BY CHAIN-LINK GATES. FACILITIES WITH BARBED-WIRE FENCING SHOULD HAVE ACCESS MAINTAINED BY A PIPE GATE. ALL GATES MUST BE AT LEAST 12 FEET WIDE.
6. BASINS WITHOUT FULL CONCRETE BOTTOMS MUST MAINTAIN A LONGITUDINAL SLOPE BETWEEN 1.0 - 5.0% WITH A LATERAL SLOPE BETWEEN 1.0 - 1.5%. UNLESS OTHERWISE APPROVED BY DISTRICT HYDRAULICS ENGINEER. CONCRETE TRICKLE CHANNELS, IF APPLICABLE, MUST BE CONSTRUCTED AT A SLOPE OF NO LESS THAN 0.5% FOR ALL BASINS.
7. BASIN SIDE SLOPES MUST BE 3:1 (H:V) OR FLATTER FOR GRASS STABILIZED SLOPES. SLOPES STEEPER THAN 3:1 (H:V) MUST NOT BE VEGETATED AND MUST BE STABILIZED WITH AN APPROPRIATE SLOPE STABILIZATION PRACTICE.
8. SIDE SLOPES WITHIN THE SAFETY CLEAR ZONE OF A ROADWAY MUST BE 4:1 (H:V) OR FLATTER.
9. STORMWATER FACILITIES MUST HAVE PERMANENT ALL-WEATHER ACCESS TO THE SITE AND TO EACH BASIN FOR MAINTENANCE. RAMPS MUST MEET THE REQUIREMENTS IN THE TABLE BELOW.

	SLOPE REQUIREMENT	MINIMUM REQUIRED WIDTH	
RAMPS	SLOPE SHOULD NOT EXCEED 4:1	15 FT	ANY AREA WITH VERTICAL CONCRETE WALLS
		12 FT	IN ALL OTHER CASES

10. ACCESS DRIVES MUST BE PROVIDED FOR ALL PONDS. ACCESS DRIVES MUST BE A MINIMUM OF 12 FEET WIDE AND NOT EXCEED 15% GRADE. GRADE CHANGES AND ALIGNMENT SHOULD BE CONSIDERED IN THE DESIGN OF THE ACCESS DRIVE. A TURNING RADIUS NOT LESS THAN 50 FEET MUST BE INCLUDED FOR HORIZONTAL ALIGNMENTS. GRADE CHANGES MUST NOT EXCEED 12% FOR VERTICAL ALIGNMENTS. THE ACCESS DRIVE MUST INCLUDE A MEANS FOR EQUIPMENT TO TURN AROUND WHEN LOCATED MORE THAN 200 FEET FROM A PAVED ROADWAY. ACCESS DRIVES MUST BE CLEARED AND SUITABLE FOR ALL-WEATHER USE. ACCESS DRIVES SHOULD BE CONSTRUCTED OUT OF FLEXIBLE BASE ON A PROOF ROLLED SUBGRADE AND AS SHOWN ON THE PLANS. ANY MAINTENANCE EQUIPMENT STAGING AREA SHOULD BE CONSTRUCTED WITH A FLEXIBLE BASE ON A PROOF-ROLLED SUBGRADE.
11. SEE DW-20(AUS) STANDARD FOR DRIVEWAY TO ROADWAY CONNECTION DETAIL.
12. ANY REQUIRED STAGING AREA SHOULD BE LOCATED ADJACENT TO THE STORMWATER FACILITY AND ACCESS DRIVE. THE STAGING AREA MUST BE CLEARED, GRADED, AND REVEGETATED, WITH SLOPES NOT EXCEEDING 10% IN ANY DIRECTION.
13. ALL VALVES 4 INCHES OR SMALLER MUST BE COMPOSED OF BRASS.
14. ALL TIES, BOLTS, AND STRAPS MUST BE GALVANIZED CORROSION RESISTANT MATERIALS.
15. IMPERMEABLE LINER, WHEN REQUIRED MUST BE INSTALLED AND KEYED IN ABOVE THE MAXIMUM WATER LEVEL AND MUST NOT BE EXPOSED TO OPEN AIR.

DESIGN

STATE OF TEXAS
BRYAN SIERSMA
147188
LICENSED PROFESSIONAL ENGINEER

BRYAN SIERSMA, P.E.
4/23/2024
DATE

APPROVAL

STATE OF TEXAS
DAN THOMA
98622
LICENSED PROFESSIONAL ENGINEER

DAN THOMA, P.E.
4/23/2024
DATE

NOT TO SCALE

PAPE-DAWSON ENGINEERS
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BEST MANAGEMENT PRACTICES (BMP) MISCELLANEOUS NOTES

SHEET 1 OF 1

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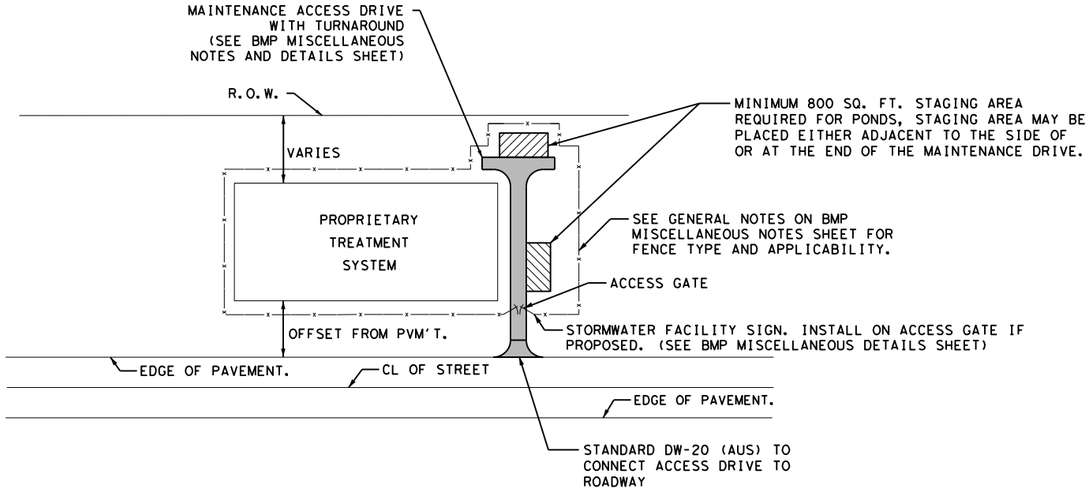

PLAN VIEW (FOR TREATMENT SYSTEMS OUTSIDE PAVEMENT AREA)

NOT TO SCALE

NOTES:

1. THE PROPRIETARY SYSTEM TO BE USED VARIES DEPENDING ON THE PROJECT. THIS DETAIL ONLY DEPICTS THE GENERAL PLACEMENT OF A PROPRIETARY SYSTEM IN RELATION TO THE ROW AND PAVEMENT EDGES. ANY SPECIFIC PLACEMENT SHOULD BE DETERMINED AND REFERENCED TO THE APPROVED PLANS AND MANUFACTURER SPECIFICATIONS.
2. ACCESS MANHOLES OR HATCHES MUST NOT BE INSTALLED WITHIN MAIN TRAFFIC LANES BUT MUST BE PLACED OUTSIDE OF PAVED AREAS OR IN A CENTER TURN LANE TO FACILITATE ACCESS AND MINIMIZE LANE CLOSURES DURING MAINTENANCE.
3. REFER TO BEST MANAGEMENT PRACTICES MISCELLANEOUS DETAILS SHEET FOR ACCESS DRIVE TURN AROUND AND STORMWATER FACILITY SIGN DETAILS.

DESIGN

STATE OF TEXAS · BRYAN SIERSMA · 147188 · LICENSED PROFESSIONAL ENGINEER

BRYAN SIERSMA, P.E.

4/23/2024
DATE

APPROVAL

STATE OF TEXAS · DAN THOMA · 98622 · LICENSED PROFESSIONAL ENGINEER

DAN THOMA, P.E.

4/23/2024
DATE

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US 183 GPL BEST MANAGEMENT PRACTICES (BMP) PROPRIETARY TREATMENT SYSTEM

SHEET 1 OF 1

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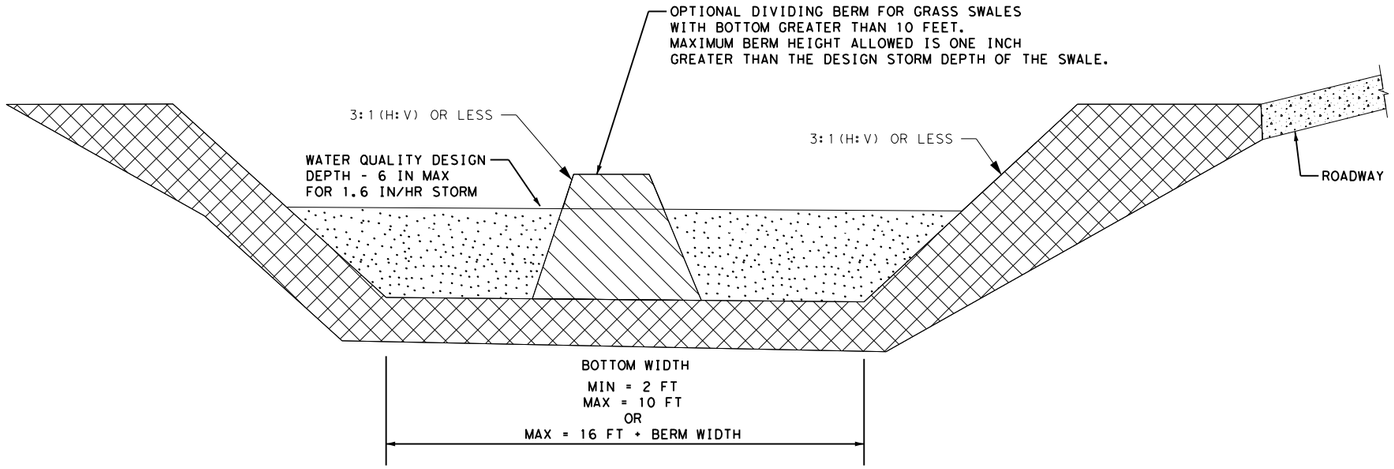
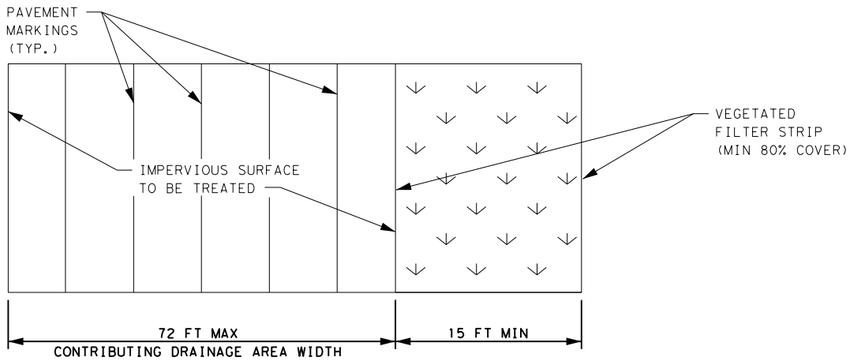


GRASSY SWALE SECTION

NOT TO SCALE

NOTES: (GRASSY SWALE)
1. THE CHANNEL SLOPE MUST BE AT LEAST 0.5% AND NO GREATER THAN 2.5%, WITH 1-2% PREFERRED.
2. SWALES MUST HAVE AT LEAST 80% VEGETATED COVER IN ORDER TO PROVIDE ADEQUATE TREATMENT OF RUNOFF.

NOTES: (VFS)
1. SOIL USED IN VEGETATED FILTER STRIP CONSTRUCTION SHOULD BE MACHINE COMPACTED.
2. THE MINIMUM ALLOWABLE VEGETATED COVER FOR ENGINEERED STRIPS IS 80%.
3. THE AREA TO BE USED FOR THE STRIP SHOULD BE FREE OF GULLIES OR RILLS CAPABLE OF CONCENTRATING OVERLAND FLOW.
4. TOP EDGE OF THE FILTER STRIP SHOULD BE LEVEL. A LEVEL SPREADER SHOULD NOT BE USED TO DISTRIBUTE RUNOFF TO AN ENGINERED FILTER STRIP.

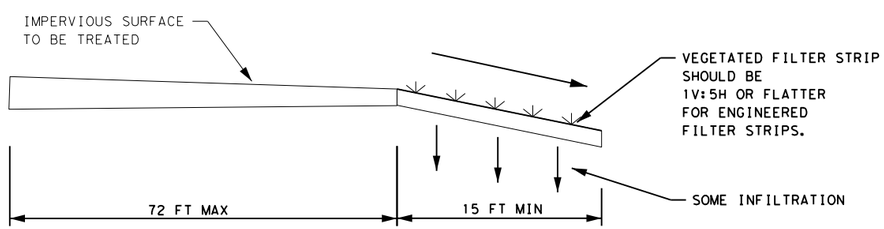


VEGETATED FILTER STRIP PLAN VIEW FOR ROADWAYS

NOT TO SCALE

FOR SIDEWALKS AND SHARED-USE PATHS ONLY	
TRAIL WIDTH (FT)	VFS WIDTH (FT)
4	2.1
6	3.1
8	4.2
10	5.2
12	6.3
14	7.3

NOTE:
REFER TO THE PLAN AND PROFILE VIEWS FOR VEGETATED FILTER STRIPS FOR ROADWAYS AND FOR THE GENERAL GEOMETRY OF VEGETATED FILTER STRIPS FOR SIDEWALKS AND SHARED-USE PATHS. THE WIDTHS OF THE IMPERVIOUS SURFACE AND THE VEGETATED FILTER STRIPS WILL BE MODIFIED PER THE TABLE.



VEGETATED FILTER STRIP PROFILE VIEW FOR ROADWAYS

NOT TO SCALE

DESIGN

STATE OF TEXAS · BRYAN SIERSMA · 147188 · LICENSED PROFESSIONAL ENGINEER

BRYAN SIERSMA, P.E.

4/23/2024
DATE

APPROVAL

STATE OF TEXAS · DAN THOMA · 98622 · LICENSED PROFESSIONAL ENGINEER

DAN THOMA, P.E.

4/23/2024
DATE

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BEST MANAGEMENT PRACTICES (BMP)
VEGETATED FILTER STRIP AND GRASSY SWALE

SHEET 1 OF 1

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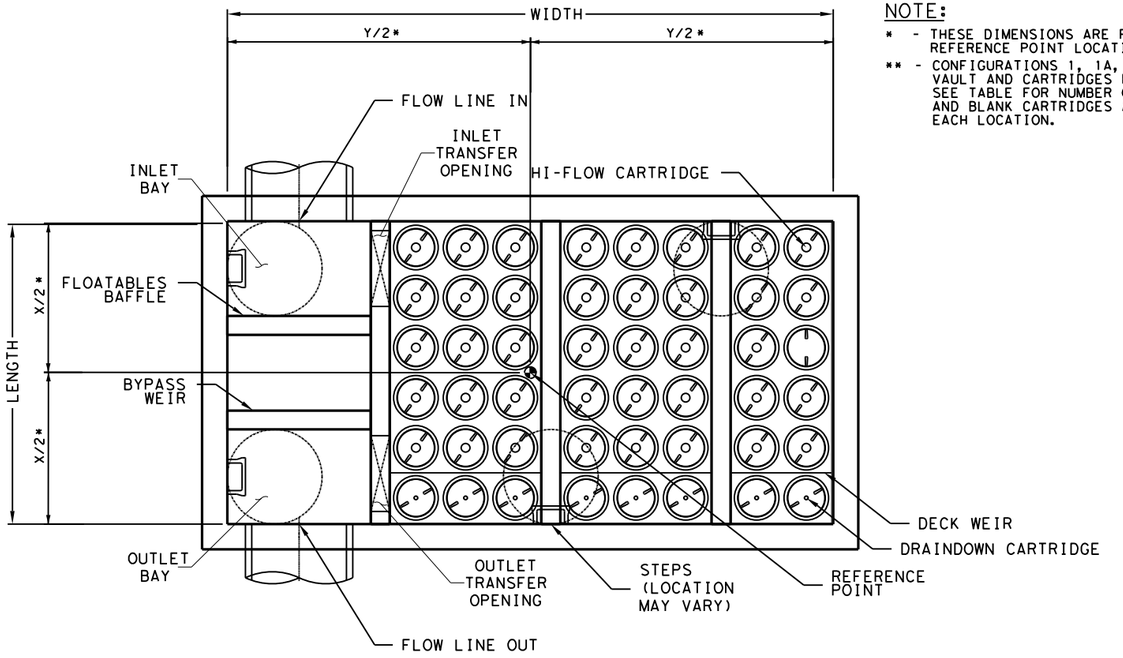
NOTE:

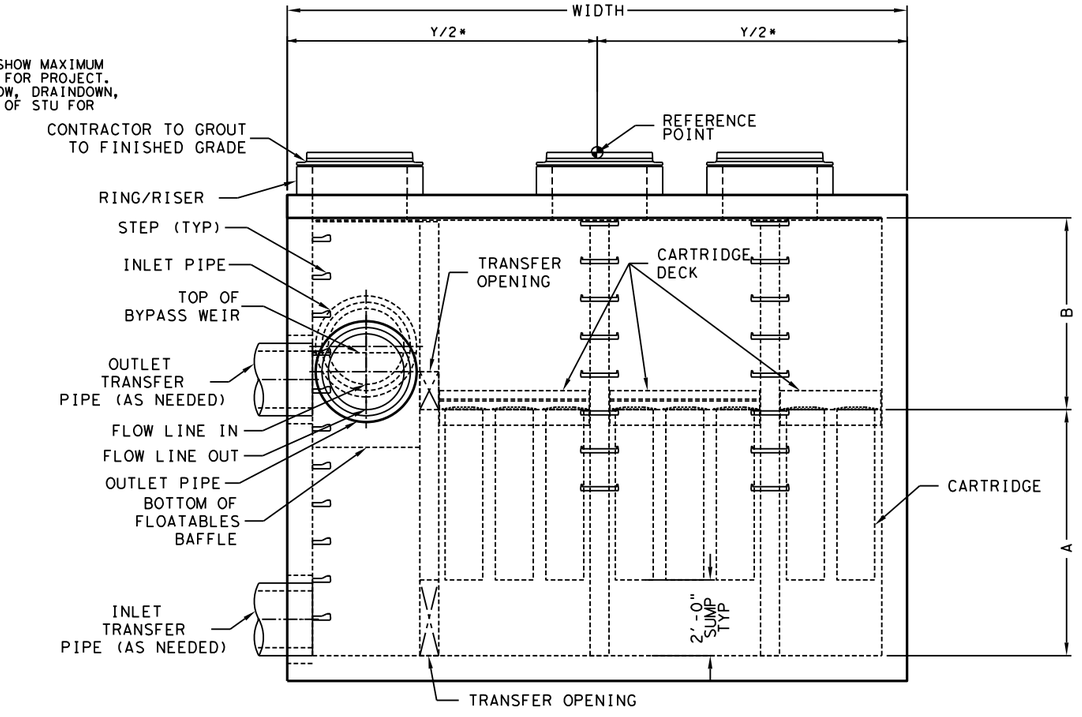
* - THESE DIMENSIONS ARE FOR REFERENCE POINT LOCATION ONLY

** - CONFIGURATIONS 1, 1A, AND 1B SHOW MAXIMUM VAULT AND CARTRIDGES REQUIRED FOR PROJECT. SEE TABLE FOR NUMBER OF HI-FLOW, DRAINDOWN, AND BLANK CARTRIDGES AND SIZE OF STU FOR EACH LOCATION.

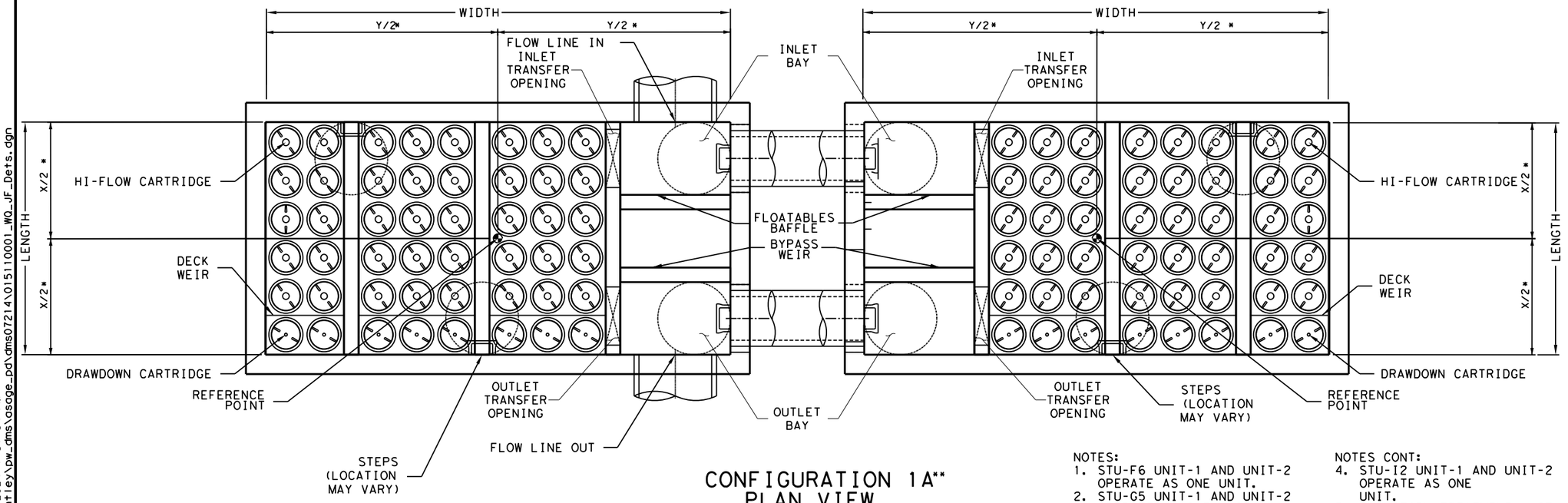


CONFIGURATION 1**
PLAN VIEW

(TOP SLAB NOT SHOWN FOR CLARITY)



CONFIGURATION 1, 1A, AND 1B**
ELEVATION VIEW



CONFIGURATION 1A**
PLAN VIEW

(TOP SLAB NOT SHOWN FOR CLARITY)

NOTES:
1. STU-F6 UNIT-1 AND UNIT-2 OPERATE AS ONE UNIT.
2. STU-G5 UNIT-1 AND UNIT-2 OPERATE AS ONE UNIT.
3. STU-H4 UNIT-1, UNIT-2, AND UNIT-3 OPERATE AS ONE UNIT.

NOTES CONT:
4. STU-I2 UNIT-1 AND UNIT-2 OPERATE AS ONE UNIT.
5. FOR STORM TREATMENT UNIT (STU), ELEVATION CAN BE ABOVE FINISHED GRADE.

DESIGN

STATE OF TEXAS — BRYAN SIERSMA — 147188 — LICENSED PROFESSIONAL ENGINEER

BRYAN SIERSMA, P.E.

10/25/2024
DATE

APPROVAL

STATE OF TEXAS — DAN THOMA — 98622 — LICENSED PROFESSIONAL ENGINEER

DAN THOMA, P.E.

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WATER QUALITY STU DETAILS

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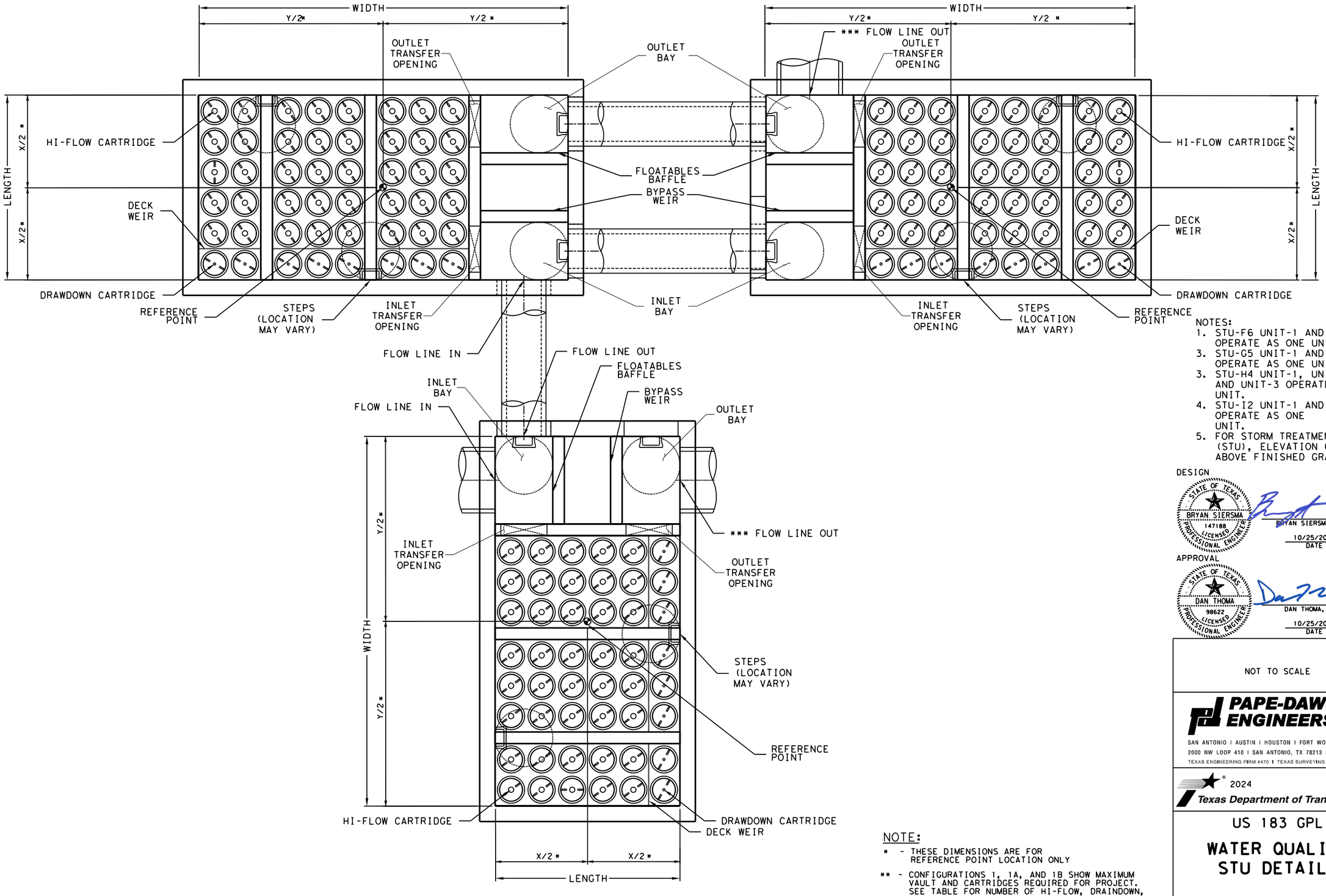

CONFIGURATION 1B PLAN VIEW **

(TOP SLAB NOT SHOWN FOR CLARITY)

NOTES:
1. STU-F6 UNIT-1 AND UNIT-2 OPERATE AS ONE UNIT.
3. STU-G5 UNIT-1 AND UNIT-2 OPERATE AS ONE UNIT.
3. STU-H4 UNIT-1, UNIT-2, AND UNIT-3 OPERATE AS ONE UNIT.
4. STU-I2 UNIT-1 AND UNIT-2 OPERATE AS ONE UNIT.
5. FOR STORM TREATMENT UNIT (STU), ELEVATION CAN BE ABOVE FINISHED GRADE.

NOTE:
* - THESE DIMENSIONS ARE FOR REFERENCE POINT LOCATION ONLY

** - CONFIGURATIONS 1, 1A, AND 1B SHOW MAXIMUM VAULT AND CARTRIDGES REQUIRED FOR PROJECT. SEE TABLE FOR NUMBER OF HI-FLOW, DRAINDOWN, AND BLANK CARTRIDGES AND SIZE OF STU FOR EACH LOCATION.

*** - FLOW LINES OUT CONNECTS DOWNSTREAM. SEE SB STORM SEWER PLAN & PROFILE SHEETS FOR MORE INFORMATION.

DESIGN

STATE OF TEXAS · BRYAN SIERSMA · 147188 · LICENSED PROFESSIONAL ENGINEER

BRYAN SIERSMA, P.E.

10/25/2024
DATE

APPROVAL

STATE OF TEXAS · DAN THOMA · 98622 · LICENSED PROFESSIONAL ENGINEER

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WATER QUALITY STU DETAILS

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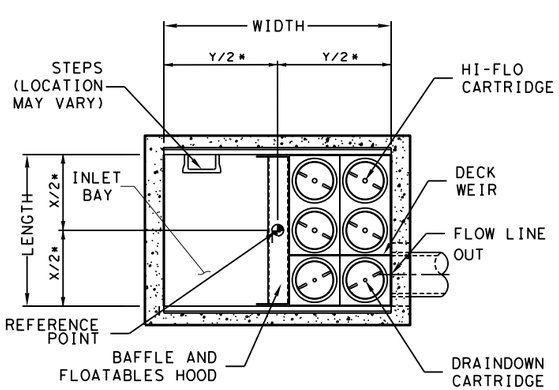
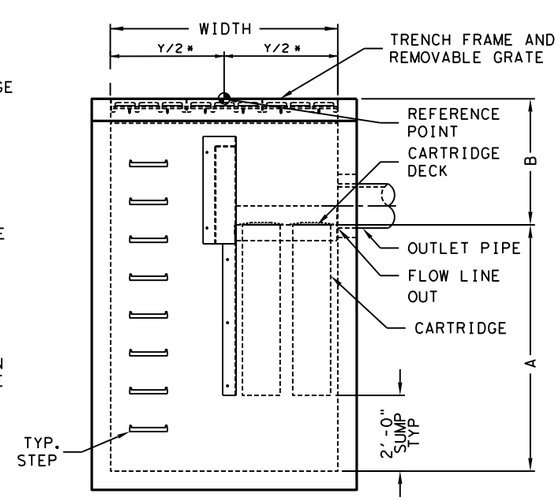
REQUIRED TREATMENT FLOW RATE (CFS)	0.36	1.34	2.45	5.96	2.04	0.35	2.47	7.64	0.33	0.17	2.94	0.31	2.65	9.94	9.94	14.89	14.89	1.01	23.51	23.51	23.51
PROVIDED TREATMENT FLOW RATE (CFS)	0.45	1.43	2.58	5.97	2.05	0.45	2.58	7.66	0.45	0.27	2.94	0.45	2.76	9.98	9.98	14.96	14.96	1.07	23.52	23.52	23.52
TREATMENT AREA (AC)	0.20	1.06	1.35	9.63	1.27	0.45	2.73	7.32	0.71	0.26	6.11	0.84	5.86	6.52		36.20		1.09	19.94		
IMPERVIOUS COVER (AC)	0.20	0.73	1.35	5.58	1.12	0.33	2.35	7.32	0.30	0.07	2.70	0.28	1.31	5.44		18.72		0.54	16.06		
STU WIDTH (FT) (EACH STU)	4	6	8	16	9*	6	8	16	4	4	8	6	8	12	12	16	16	6	20*	16	16
STU LENGTH (FT) (EACH STU)	4	8	8	8	8	4	8	8	4	4	8	4	8	8	8	8	8	8	8	8	8
# OF HI-FLOW CARTRIDGES (EACH STU)	2	7	13	30	10	2	13	39	2	1	15	2	14	25	25	38	38	5	40	40	40
# OF DRAINDOWN CARTRIDGES (EACH STU)	1	2	3	7	3	1	3	8	1	1	3	1	3	6	6	8	8	2	8	8	8
# OF BLANKS (EACH STU)	0	3	2	11	5	3	2	1	0	1	0	3	1	5	5	2	2	5	0	0	0
CARTRIDGE LENGTH (IN)	54	54	54	54	54	54	54	54	54	54	54	54	54	54	54	54	54	54	54	54	54
CONFIGURATION	2	1	1	1	1	1	1	1	2	2	1	1	1	1A	1A	1A	1A	1	1B	1B	1B
CHAIN	SB	NB	SB	SB	NBMLX1431	SB	NB	NB	NB	NB	NB	NB	SBXBCR	NBEBCR	NBEBCR	BCL	BCL	BCL	BCL	BCL	BCL
STATION	3617+25.00	1616+97.00	3624+11.62	3630+82.18	18+01.93	3644+45.50	1657+12.75	1661+86.84	1661+23.77	1662+61.15	1669+16.00	1669+51.97	25+45.29	22+69.71	22+50.29	500+98.46	500+80.42	504+59.00	528+75.02	528+58.74	528+46.92
OFFSET	22.50 RT	65.50 RT	17.00 RT	52.13 LT	96.15' LT	15.00 RT	17.00 LT	36.60 RT	22.00 LT	19.16 LT	55.77 RT	18.50 LT	20.92 LT	30.00 LT	30.00 LT	114.61 LT	106.19 LT	47.50 LT	26.53 LT	44.47 LT	27.18 LT
FLOW LINE IN	NA	917.75	916.72	914.89	912.63	919.34	923.28	917.56	NA	NA	918.10	915.46	891.54	896.46	896.46	878.30	878.30	870.33	852.56	852.56	852.56
FLOW LINE OUT	922.62	917.25	916.22	914.39	912.13	918.84	922.78	917.06	917.66	917.36	915.52	915.29	888.22	895.96	895.96	878.06	878.06	870.20	852.37	852.37	852.37
STU REFERENCE EL	925.95	924.79	923.43	924.27	917.70	922.79	928.82	929.77	921.00	920.78	929.24	920.83	897.33	905.07	906.20	883.09	883.19	875.62	857.47	858.42	858.09

BMP/STU	STU-I2 (UNIT-1)	STU-I2 (UNIT-2)	STU-I1	STU-J7	STU-J6	STU-K1
REQUIRED TREATMENT FLOW RATE (CFS)	13.75	13.75	7.82	4.81	5.15	0.85
PROVIDED TREATMENT FLOW RATE (CFS)	13.90	13.90	7.84	4.90	5.17	0.89
TREATMENT AREA (AC)	16.80		7.06	4.70	4.14	0.47
IMPERVIOUS COVER (AC)	7.26		4.71	2.58	2.79	0.47
STU WIDTH (FT) (EACH STU)	17*	16	16	11	12	6
STU LENGTH (FT) (EACH STU)	8	8	8	8	8	4
# OF HI-FLOW CARTRIDGES (EACH STU)	35	35	40	25	26	4
# OF DRAINDOWN CARTRIDGES (EACH STU)	8	8	8	5	6	2
# OF BLANKS (EACH STU)	5	5	0	0	4	0
CARTRIDGE LENGTH (IN)	54	54	54	54	54	54
CONFIGURATION	1A	1A	1	1	1	2
CHAIN	NB	NB	SB	SB	NB	SB
STATION	1725+00.01	1724+79.33	3727+09.00	3752+25.49	1754+54.60	3757+01.34
OFFSET	5.98' RT	17.78 RT	29.40 LT	77.48 LT	78.28 RT	85.57 LT
FLOW LINE IN	864.59	864.59	878.80	910.04	904.58	NA
FLOW LINE OUT	864.09	864.09	878.30	909.54	904.08	911.08
STU REFERENCE EL	874.30	873.53	881.65	915.82	913.20	914.41
DIMENSION B (FT)	10.21	9.44	3.35	6.28	9.12	3.33



CONFIGURATION 2
PLAN VIEW

(TOP SLAB NOT SHOWN FOR CLARITY)



CONFIGURATION 2
ELEVATION VIEW

NOTES:
1. STU-F6 UNIT-1 AND UNIT-2 OPERATE AS ONE UNIT.
2. STU-G5 UNIT-1 AND UNIT-2 OPERATE AS ONE UNIT.
3. STU-H4 UNIT-1, UNIT-2, AND UNIT-3 OPERATE AS ONE UNIT.

NOTES CONT:
4. STU-I2 UNIT-1 AND UNIT-2 OPERATE AS ONE UNIT.
5. FOR STORM TREATMENT UNIT (STU), ELEVATION CAN BE ABOVE FINISHED GRADE.

1 STU WIDTH MARKED WITH * NOTES THE SIZE IN THE APPROVED WPAP DIFFER FROM PLANS DUE TO UP SIZING THE INLET BAY TO ACCOUNT FOR A LARGER INLET PIPE THAN STANDARD. THIS DOES NOT AFFECT WPAP CALCULATIONS.

NOTE:
* - THESE DIMENSIONS ARE FOR REFERENCE POINT LOCATION ONLY

DESIGN

STATE OF TEXAS · BRYAN SIERSMA · 147188 · LICENSED PROFESSIONAL ENGINEER

BRYAN SIERSMA, P.E.
1/19/2026
DATE

APPROVAL

STATE OF TEXAS · DAN THOMA · 98622 · LICENSED PROFESSIONAL ENGINEER

DAN THOMA, P.E.
1/19/2026
DATE

REV. NO.	DATE	DESCRIPTION	BY
1	1/19/2026	ADDED NOTE ABOUT STU SIZING. UPDATED AREAS	

PAPE-DAWSON ENGINEERS
SAN ANTONIO | AUSTIN | HOUSTON | FORT WORTH | DALLAS
2000 NW LOOP 410 | SAN ANTONIO, TX 78213 | 210.375.9000
TEXAS ENGINEERING FIRM #470 | TEXAS SURVEYING FIRM #10028800

2024 Texas Department of Transportation

US 183 GPL

WATER QUALITY STU DETAILS

© 2024

DS:	CK:	CONT	SECT	JOB	HIGHWAY
DW:	CK:	0151	10	001	US 183
		DIST	COUNTY		SHEET NO.
		AUS	WILLIAMSON		794L

DATE: 1/19/2026 9:12:27 AM
FILE: v:\bentley\pw_dms\osage_pd\dms07214\01510001_WQ_JF_Dets_03_REV03.dgn

RUNOFF COMPUTATIONS - RATIONAL METHOD						Design		Check		
NETWORK	DRAINAGE AREA - ID	AREA (AC)	C (WEIGHTED)	TOTAL CA	Tc (MINUTES)	I 10 YR (IN/HR)	Q 10 YR (CFS)	I 100 YR (IN/HR)	Q 100 YR (CFS)	TO INLET/JUNCTION
B1	B1-1	0.16	0.90	0.14	10.00	7.18	1.02	11.15	1.6	BD-B1-1
B3	B3-1	0.03	0.90	0.03	10.00	7.18	0.19	11.15	0.3	RW-B3-1
B4	B4-1	0.04	0.90	0.03	10.00	7.18	0.24	11.15	0.4	RW-B4-1
B5	B5-1	0.06	0.90	0.05	10.00	7.18	0.38	11.15	0.6	RW-B5-1
B6	B6-1EX	0.33	0.90	0.30	10.00	7.18	2.15	11.15	3.3	CI-B6-1EX
	B6-2EX	0.03	0.90	0.03	10.00	7.18	0.21	11.15	0.3	RW-B6-2EX
	B6-3EX	0.04	0.90	0.04	10.00	7.18	0.27	11.15	0.4	RW-B6-3EX
	B6-4EX	0.22	0.90	0.20	10.00	7.18	1.43	11.15	2.2	RW-B6-4EX
B7	B7-1	0.20	0.90	0.18	10.00	7.18	1.31	11.15	2.0	RW-B7-1
B10	B10-1	0.20	0.90	0.18	10.00	7.18	1.31	11.15	2.0	STU-B10-1
*	B-SOC-DITCH	1.47	0.71	1.04	10.00	7.18	7.46	11.15	11.6	n/a
C1	C1-1	1.06	0.78	0.83	10.00	7.18	5.93	11.15	9.2	GI-C1-1
	C1-7	2.09	0.79	1.65	10.00	7.18	11.87	11.15	18.4	GI-C1-7
	C1-13EX	0.87	0.52	0.45	10.00	7.18	3.26	11.15	5.1	GI-C1-13EX
C2	C2-1	0.29	0.90	0.26	10.00	7.18	1.90	11.15	2.9	RW-C2-1
C3	C3-1	0.08	0.90	0.07	10.00	7.18	0.53	11.15	0.8	BI-C3-1
	C3-2	0.09	0.89	0.08	10.00	7.18	0.57	11.15	0.9	BI-C3-2
	C3-3	0.09	0.89	0.08	10.00	7.18	0.58	11.15	0.9	BI-C3-3
	C3-4	0.14	0.90	0.12	10.00	7.18	0.87	11.15	1.4	BI-C3-4
	C3-5	0.11	0.90	0.10	10.00	7.18	0.71	11.15	1.1	BI-C3-5
	C3-6	0.06	0.90	0.06	10.00	7.18	0.41	11.15	0.6	BI-C3-6
	C3-7	0.06	0.90	0.05	10.00	7.18	0.40	11.15	0.6	BI-C3-7
	C3-9	0.07	0.90	0.06	10.00	7.18	0.45	11.15	0.7	BI-C3-9
	C3-10	0.07	0.90	0.06	10.00	7.18	0.44	11.15	0.7	BI-C3-10
	C3-13	0.08	0.90	0.07	10.00	7.18	0.50	11.15	0.8	BI-C3-13
	C3-14	0.07	0.90	0.06	10.00	7.18	0.42	11.15	0.7	BI-C3-14
	C3-15	0.06	0.90	0.05	10.00	7.18	0.38	11.15	0.6	BI-C3-15
	C3-16	0.37	0.90	0.34	10.00	7.18	2.41	11.15	3.8	BI-C3-16
C4	C4-1	0.22	0.90	0.20	10.00	7.18	1.44	11.15	2.2	RW-C4-1
C5	C5-1	0.31	0.89	0.28	10.00	7.18	1.99	11.15	3.1	RW-C5-1
C6	C6-1	0.33	0.90	0.29	10.00	7.18	2.10	11.15	3.3	RW-C6-1
C9	C9-1	0.08	0.90	0.08	10.00	7.18	0.54	11.15	0.8	RW-C9-1
C10	C10-1	0.18	0.90	0.17	10.00	7.18	1.19	11.15	1.8	RW-C10-1
C11	C11-1	0.17	0.90	0.15	10.00	7.18	1.09	11.15	1.7	RW-C11-1
C12	C12-1	0.14	0.90	0.13	10.00	7.18	0.91	11.15	1.4	RW-C12-1
C13	C13-1	0.15	0.90	0.14	10.00	7.18	0.98	11.15	1.5	RW-C13-1
C14	C14-1	0.13	0.90	0.11	10.00	7.18	0.82	11.15	1.3	BI-C14-1
	C14-2	0.16	0.90	0.14	10.00	7.18	1.02	11.15	1.6	BI-C14-2
	C14-3	0.47	0.90	0.42	10.00	7.18	3.04	11.15	4.7	BI-C14-3
	C14-6	3.12	0.81	2.53	10.00	7.18	18.19	11.15	28.3	GI-C14-6
	C14-7	6.51	0.71	4.63	16.80	5.83	27.01	9.21	42.7	HW-C14-7
C15	C15-1	0.12	0.90	0.11	10.00	7.18	0.79	11.15	1.2	RW-C15-1
C16	C16-1	0.10	0.90	0.09	10.00	7.18	0.62	11.15	1.0	BD-C16-1
C17	C17-1	0.10	0.90	0.09	10.00	7.18	0.63	11.15	1.0	BD-C17-1
C18	C18-1	0.10	0.90	0.09	10.00	7.18	0.64	11.15	1.0	BD-C18-1
C19	C19-1	0.10	0.90	0.09	10.00	7.18	0.64	11.15	1.0	BD-C19-1
C20	C20-1	0.11	0.90	0.09	10.00	7.18	0.68	11.15	1.1	BD-C20-1
C21	C21-1	0.10	0.90	0.09	10.00	7.18	0.67	11.15	1.0	BD-C21-1
C22	C22-1	0.11	0.90	0.10	10.00	7.18	0.70	11.15	1.1	BD-C22-1
*	C-JAC-DITCH	0.72	0.68	0.49	10.00	7.18	3.53	11.15	5.5	n/a
D1	D1-2	0.18	0.90	0.16	10.00	7.18	1.15	11.15	1.8	BI-D1-2
	D1-3	0.09	0.90	0.08	10.00	7.18	0.59	11.15	0.9	GI-D1-3

* AREA DRAINS TO CREEK OR POND.

NOTES

1. STORM DRAIN COMPONENTS SCREENED BACK ARE EXISTING TO REMAIN AND ARE SHOWN FOR ANALYSIS PURPOSES. "EX" DENOTES EXISTING COMPONENTS TO REMAIN.
2. C VALUES WERE DEVELOPED USING AERIAL PHOTOGRAPHY AND TABLE 4-10 IN TXDOT HYDRAULIC DESIGN MANUAL.
3. CALCULATIONS COMPUTED USING NOAA ATLAS-14 RAINFALL INTENSITIES.

DESIGN

STATE OF TEXAS · BRYAN SIERSMA · 147188 · LICENSED PROFESSIONAL ENGINEER

BRYAN SIERSMA, P.E.

5/9/2024
DATE

APPROVAL

STATE OF TEXAS · DAN THOMA · 98622 · LICENSED PROFESSIONAL ENGINEER

DAN THOMA, P.E.

5/9/2024
DATE

PAPE-DAWSON ENGINEERS
SAN ANTONIO | AUSTIN | HOUSTON | FORT WORTH | DALLAS
2000 NW LOOP 410 | SAN ANTONIO, TX 78213 | 210.375.9000
TEXAS ENGINEERING FIRM #470 | TEXAS SURVEYING FIRM #10028800

2024 Texas Department of Transportation

US 183 GPL

RUNOFF COMPUTATIONS

SHEET 1 OF 6

© 2024		CONT	SECT	JOB	HIGHWAY
DS:	CK:	0151	10	001	US 183
		DIST	COUNTY		SHEET NO.
DW:	CK:	AUS	WILLIAMSON		707

DATE: 5/9/2024 8:18:32 PM
FILE: v:\bentley\dms\pd-pw-01\alyssa.sage\dms07214\015110001_Runoff_Comp_01.dgn

RUNOFF COMPUTATIONS - RATIONAL METHOD						Design		Check		
NETWORK	DRAINAGE AREA - ID	AREA (AC)	C (WEIGHTED)	TOTAL CA	Tc (MINUTES)	I 10 YR (IN/HR)	Q 10 YR (CFS)	I 100 YR (IN/HR)	Q 100 YR (CFS)	TO INLET/JUNCTION
D1 CONT.	D1-4	0.11	0.90	0.10	10.00	7.18	0.71	11.15	1.1	BI-D1-4
	D1-8	0.16	0.90	0.14	10.00	7.18	1.04	11.15	1.6	BI-D1-8
	D1-9	0.21	0.90	0.19	10.00	7.18	1.36	11.15	2.1	GI-D1-9
	D1-10	0.36	0.90	0.33	10.00	7.18	2.34	11.15	3.6	BI-D1-10
	D1-22	0.30	0.90	0.27	10.00	7.18	1.92	11.15	3.0	BI-D1-22
	D1-24	0.34	0.90	0.30	10.00	7.18	2.16	11.15	3.4	BI-D1-24
	D1-28	0.34	0.90	0.31	10.00	7.18	2.19	11.15	3.4	BI-D1-28
	D1-30	0.32	0.90	0.29	10.00	7.18	2.09	11.15	3.2	BI-D1-30
	D1-31	0.31	0.90	0.28	10.00	7.18	1.99	11.15	3.1	BI-D1-31
	D1-32	1.98	0.62	1.23	10.00	7.18	8.82	11.15	13.7	HW-D1-32
	D1-35	0.17	0.90	0.15	10.00	7.18	1.07	11.15	1.7	BI-D1-35
	D1-36	0.20	0.90	0.18	10.00	7.18	1.29	11.15	2.0	BI-D1-36
	D1-37	0.22	0.90	0.20	10.00	7.18	1.44	11.15	2.2	BI-D1-37
	D1-38	0.21	0.90	0.19	10.00	7.18	1.35	11.15	2.1	BI-D1-38
	D1-40	0.77	0.90	0.69	10.00	7.18	4.99	11.15	7.7	GI-D1-40
	D1-49	0.16	0.90	0.14	10.00	7.18	1.03	11.15	1.6	BI-D1-49
	D1-50	0.18	0.90	0.17	10.00	7.18	1.19	11.15	1.8	BI-D1-50
	D1-51	0.23	0.90	0.21	10.00	7.18	1.50	11.15	2.3	BI-D1-51
	D1-53	0.22	0.90	0.20	10.00	7.18	1.43	11.15	2.2	BI-D1-53
	D1-57	2.21	0.90	1.99	10.00	7.18	14.25	11.15	22.1	GI-D1-57
	D1-60	0.16	0.90	0.14	10.00	7.18	1.04	11.15	1.6	BI-D1-60
	D1-61	0.09	0.90	0.08	10.00	7.18	0.57	11.15	0.9	BI-D1-61
	D1-69	0.13	0.90	0.12	10.00	7.18	0.85	11.15	1.3	BD-D1-69
	D1-70	0.09	0.90	0.08	10.00	7.18	0.55	11.15	0.9	BD-D1-70
	D1-71	0.10	0.90	0.09	10.00	7.18	0.65	11.15	1.0	BD-D1-71
	D1-72	0.11	0.90	0.10	10.00	7.18	0.73	11.15	1.1	BD-D1-72
	D1-73	0.13	0.89	0.12	10.00	7.18	0.84	11.15	1.3	BD-D1-73
	D1-74	0.06	0.90	0.06	10.00	7.18	0.41	11.15	0.6	BD-D1-74
	D1-75	0.11	0.89	0.10	10.00	7.18	0.70	11.15	1.1	BI-D1-75
	D1-76	0.02	0.90	0.02	10.00	7.18	0.11	11.15	0.2	BI-D1-76
	D1-77	0.11	0.89	0.10	10.00	7.18	0.70	11.15	1.1	BI-D1-77
	D1-79	0.08	0.90	0.07	10.00	7.18	0.50	11.15	0.8	BD-D1-79
	D1-81	0.25	0.90	0.23	10.00	7.18	1.62	11.15	2.5	BI-D1-81
	D1-82	0.17	0.55	0.09	10.00	7.18	0.67	11.15	1.0	GI-D1-82
	D1-86	0.08	0.90	0.07	10.00	7.18	0.52	11.15	0.8	BD-D1-86
	D1-87	0.11	0.90	0.10	10.00	7.18	0.70	11.15	1.1	BI-D1-87
	D1-88	0.15	0.90	0.14	10.00	7.18	1.00	11.15	1.5	BI-D1-88
	D1-89	0.10	0.90	0.09	10.00	7.18	0.62	11.15	1.0	GI-D1-89
	D1-90	0.11	0.90	0.10	10.00	7.18	0.73	11.15	1.1	GI-D1-90
	D1-92	0.06	0.90	0.05	10.00	7.18	0.36	11.15	0.5	BI-D1-92
	D1-93	0.03	0.90	0.03	10.00	7.18	0.18	11.15	0.3	BI-D1-93
	D1-94	0.02	0.90	0.02	10.00	7.18	0.16	11.15	0.2	BI-D1-94
	D1-95	0.02	0.90	0.02	10.00	7.18	0.11	11.15	0.2	BI-D1-95
	D1-1EX	0.17	0.90	0.15	10.00	7.18	1.10	11.15	1.7	GI-D1-1EX
	D1-6EX	1.97	0.66	1.30	10.00	7.18	9.30	11.15	14.4	HW-D1-6EX
	D1-7EX	0.13	0.90	0.12	10.00	7.18	0.84	11.15	1.3	GI-D1-7EX
	D1-12EX	0.30	0.90	0.27	10.00	7.18	1.96	11.15	3.0	GI-D1-12EX
	D1-13EX	0.22	0.90	0.20	10.00	7.18	1.40	11.15	2.2	GI-D1-13EX
	D1-14EX	0.14	0.90	0.12	10.00	7.18	0.89	11.15	1.4	GI-D1-14EX
	D1-15EX	0.06	0.90	0.05	10.00	7.18	0.37	11.15	0.6	GI-D1-15EX
	D1-16EX	0.17	0.90	0.15	10.00	7.18	1.07	11.15	1.7	GI-D1-16EX
	D1-17EX	0.07	0.90	0.06	10.00	7.18	0.44	11.15	0.7	GI-D1-17EX
	D1-18EX	0.17	0.90	0.16	10.00	7.18	1.13	11.15	1.7	GI-D1-18EX
	D1-19EX	0.35	0.90	0.32	10.00	7.18	2.27	11.15	3.5	GI-D1-19EX
	D1-29EX	0.32	0.90	0.28	10.00	7.18	2.04	11.15	3.2	GI-D1-29EX
	D1-62EX	0.17	0.90	0.15	10.00	7.18	1.09	11.15	1.7	BD-D1-62EX
	D1-63EX	0.16	0.90	0.15	10.00	7.18	1.06	11.15	1.6	BD-D1-63EX
	D1-64EX	0.32	0.90	0.29	10.00	7.18	2.05	11.15	3.2	BD-D1-64EX
	D1-65EX	0.18	0.90	0.16	10.00	7.18	1.14	11.15	1.8	BD-D1-65EX
	D1-66EX	0.18	0.90	0.17	10.00	7.18	1.19	11.15	1.8	BD-D1-66EX
	D1-67EX	0.18	0.90	0.16	10.00	7.18	1.15	11.15	1.8	BD-D1-67EX
	D1-68EX	0.15	0.90	0.13	10.00	7.18	0.94	11.15	1.5	BD-D1-68EX
E1	E1-1	0.89	0.83	0.74	10.00	7.18	5.30	11.15	8.2	GI-E1-1
	E1-3	0.64	0.90	0.58	10.00	7.18	4.13	11.15	6.4	GI-E1-3
	E1-4	0.08	0.71	0.06	10.00	7.18	0.42	11.15	0.7	GI-E1-4
	E1-5	1.12	0.90	1.00	10.00	7.18	7.20	11.15	11.2	GI-E1-5
E2	E2-2	0.96	0.83	0.80	10.00	7.18	5.74	11.15	8.9	GI-E2-2
	E2-4	0.71	0.67	0.48	10.00	7.18	3.42	11.15	5.3	STU-E2-4
	E2-5	0.26	0.51	0.13	10.00	7.18	0.96	11.15	1.5	STU-E2-5
	E2-7	1.36	0.83	1.12	10.00	7.18	8.06	11.15	12.5	GI-E2-7
	E2-8	5.00	0.56	2.80	10.00	7.18	20.05	11.15	31.2	GI-E2-8
E3	E3-6	1.73	0.61	1.06	10.00	7.18	7.59	11.15	11.8	GI-E3-6
	E3-7	0.65	0.54	0.35	10.00	7.18	2.52	11.15	3.9	GI-E3-7
	E3-8	0.64	0.55	0.35	10.00	7.18	2.53	11.15	3.9	GI-E3-8
	E3-9	0.84	0.65	0.54	10.00	7.18	3.87	11.15	6.0	GI-E3-9
	E3-17	2.05	0.77	1.57	10.00	7.18	11.31	11.15	17.6	GI-E3-17
	E3-18	1.04	0.82	0.85	10.00	7.18	6.12	11.15	9.5	GI-E3-18

NOTES

1. STORM DRAIN COMPONENTS SCREENED BACK ARE EXISTING TO REMAIN AND ARE SHOWN FOR ANALYSIS PURPOSES. "EX" DENOTES EXISTING COMPONENTS TO REMAIN.
2. C VALUES WERE DEVELOPED USING AERIAL PHOTOGRAPHY AND TABLE 4-10 IN TXDOT HYDRAULIC DESIGN MANUAL.
3. CALCULATIONS COMPUTED USING NOAA ATLAS-14 RAINFALL INTENSITIES.

DESIGN

STATE OF TEXAS · BRYAN SIERSMA · 147188 · LICENSED PROFESSIONAL ENGINEER

BRYAN SIERSMA, P.E.

5/9/2024
DATE

APPROVAL

STATE OF TEXAS · DAN THOMA · 98622 · LICENSED PROFESSIONAL ENGINEER

DAN THOMA, P.E.

5/9/2024
DATE

PAPE-DAWSON ENGINEERS
SAN ANTONIO | AUSTIN | HOUSTON | FORT WORTH | DALLAS
2000 NW LOOP 410 | SAN ANTONIO, TX 78213 | 210.375.9000
TEXAS ENGINEERING FIRM #470 | TEXAS SURVEYING FIRM #10028800

2024 Texas Department of Transportation

US 183 GPL

RUNOFF COMPUTATIONS

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DS:	CK:	CONT	SECT	JOB	HIGHWAY
		0151	10	001	US 183
DW:	CK:	DIST	COUNTY		SHEET NO.
		AUS	WILLIAMSON		708

DATE: 5/9/2024 8:18:43 PM
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RUNOFF COMPUTATIONS - RATIONAL METHOD						Design		Check		
NETWORK	DRAINAGE AREA - ID	AREA (AC)	C (WEIGHTED)	TOTAL CA	Tc (MINUTES)	I 10 YR (IN/HR)	Q 10 YR (CFS)	I 100 YR (IN/HR)	Q 100 YR (CFS)	TO INLET/JUNCTION
F2	F2-1	0.10	0.88	0.08	10.00	7.18	0.60	11.15	0.9	BI-F2-1
F3	F3-1	0.01	0.90	0.01	10.00	7.18	0.06	11.15	0.1	BD-F3-1
	F3-2	0.06	0.90	0.05	10.00	7.18	0.39	11.15	0.6	BD-F3-2
	F3-3	5.79	0.60	3.46	10.00	7.18	24.83	11.15	38.6	SET-F3-3
F4	F4-1	0.43	0.90	0.39	10.00	7.18	2.77	11.15	4.3	RW-F4-1
F5	F5-1	0.04	0.90	0.03	10.00	7.18	0.23	11.15	0.4	BI-F5-1
	F5-2	0.07	0.90	0.07	10.00	7.18	0.48	11.15	0.7	BI-F5-2
	F5-3	0.04	0.90	0.03	10.00	7.18	0.22	11.15	0.4	BI-F5-3
F6	F6-8	1.26	0.77	0.97	10.00	7.18	6.97	11.15	10.8	GI-F6-8
	F6-9	0.02	0.90	0.02	10.00	7.18	0.13	11.15	0.2	BI-F6-9
	F6-10	0.04	0.90	0.03	10.00	7.18	0.24	11.15	0.4	BI-F6-10
	F6-11	0.06	0.90	0.05	10.00	7.18	0.38	11.15	0.6	BI-F6-11
	F6-12	0.07	0.90	0.06	10.00	7.18	0.46	11.15	0.7	BI-F6-12
	F6-13	0.05	0.90	0.05	10.00	7.18	0.34	11.15	0.5	BI-F6-13
	F6-14	0.05	0.90	0.05	10.00	7.18	0.33	11.15	0.5	BI-F6-14
	F6-15	0.05	0.90	0.05	10.00	7.18	0.34	11.15	0.5	BI-F6-15
	F6-16	0.05	0.90	0.05	10.00	7.18	0.35	11.15	0.5	BI-F6-16
	F6-17	0.06	0.90	0.05	10.00	7.18	0.37	11.15	0.6	BI-F6-17
	F6-18	0.05	0.90	0.05	10.00	7.18	0.33	11.15	0.5	BI-F6-18
	F6-19	0.05	0.90	0.05	10.00	7.18	0.34	11.15	0.5	BI-F6-19
	F6-20	0.06	0.90	0.05	10.00	7.18	0.35	11.15	0.6	BI-F6-20
	F6-21	0.06	0.90	0.05	10.00	7.18	0.37	11.15	0.6	BI-F6-21
	F6-22	0.06	0.90	0.05	10.00	7.18	0.38	11.15	0.6	BI-F6-22
	F6-23	0.05	0.90	0.05	10.00	7.18	0.33	11.15	0.5	BI-F6-23
	F6-24	0.05	0.89	0.05	10.00	7.18	0.33	11.15	0.5	BI-F6-24
	F6-25	0.05	0.89	0.05	10.00	7.18	0.33	11.15	0.5	BI-F6-25
	F6-26	0.11	0.89	0.10	10.00	7.18	0.70	11.15	1.1	BI-F6-26
	F6-27	0.12	0.89	0.11	10.00	7.18	0.77	11.15	1.2	BI-F6-27
	F6-28	1.66	0.76	1.26	10.00	7.18	9.09	11.15	14.1	GI-F6-28
	F6-29	0.15	0.90	0.14	10.00	7.18	0.98	11.15	1.5	BI-F6-29
	F6-30	0.15	0.90	0.14	10.00	7.18	0.97	11.15	1.5	BI-F6-30
	F6-31	0.15	0.89	0.13	10.00	7.18	0.96	11.15	1.5	BI-F6-31
	F6-32	0.13	0.89	0.12	10.00	7.18	0.86	11.15	1.3	BI-F6-32
	F6-33	0.17	0.89	0.15	10.00	7.18	1.09	11.15	1.7	BI-F6-33
	F6-34	1.63	0.83	1.34	10.00	7.18	9.65	11.15	15.0	GI-F6-34
	F6-35	0.02	0.90	0.02	10.00	7.18	0.15	11.15	0.2	BI-F6-35
	F6-36	0.02	0.90	0.02	10.00	7.18	0.13	11.15	0.2	BI-F6-36
	F6-37	0.03	0.90	0.03	10.00	7.18	0.21	11.15	0.3	BI-F6-37
	F6-38	0.04	0.90	0.03	10.00	7.18	0.23	11.15	0.4	BI-F6-38
	F6-1EX	1.60	0.70	1.11	15.00	6.13	6.81	9.65	10.7	CI-F6-1EX
	F6-2EX	2.00	0.76	1.52	16.00	5.96	9.06	9.40	14.3	CI-F6-2EX
	F6-3EX	4.70	0.78	3.66	16.00	5.96	21.79	9.40	34.4	CI-F6-3EX
	F6-4EX	0.16	0.63	0.10	10.00	7.18	0.71	11.15	1.1	GI-F6-4EX
*	F-COU-1	5.27	0.74	3.89	10.00	7.18	27.95	11.15	43.4	n/a
	F-COU-2	0.59	0.88	0.51	10.00	7.18	3.69	11.15	5.7	n/a
G1	G1-2	0.09	0.88	0.08	10.00	7.18	0.59	11.15	0.9	BD-G1-2
	G1-3	0.09	0.88	0.08	10.00	7.18	0.59	11.15	0.9	BD-G1-3
	G1-4	0.08	0.90	0.07	10.00	7.18	0.50	11.15	0.8	BD-G1-4
	G1-5	0.07	0.90	0.06	10.00	7.18	0.46	11.15	0.7	BD-G1-5
G2	G2-1	0.11	0.89	0.09	10.00	7.18	0.67	11.15	1.0	BD-G2-1
	G2-2	0.10	0.74	0.07	10.00	7.18	0.53	11.15	0.8	BD-G2-2
	G2-3	0.09	0.90	0.08	10.00	7.18	0.59	11.15	0.9	BD-G2-3
	G2-4	0.11	0.90	0.10	10.00	7.18	0.72	11.15	1.1	BD-G2-4
	G2-5	0.12	0.90	0.10	10.00	7.18	0.75	11.15	1.2	BD-G2-5
	G2-6	0.11	0.90	0.10	10.00	7.18	0.69	11.15	1.1	BD-G2-6
	G2-7	0.08	0.90	0.07	10.00	7.18	0.54	11.15	0.8	BD-G2-7
G3	G3-1	0.10	0.90	0.09	10.00	7.18	0.62	11.15	1.0	RW-G3-1
G4	G4-1	0.02	0.90	0.02	10.00	7.18	0.13	11.15	0.2	RW-G4-1
G5	G5-1	16.67	0.58	9.70	17.60	5.71	55.37	9.03	87.6	SET-G5-1
	G5-9	0.28	0.71	0.20	10.00	7.18	1.44	11.15	2.2	CI-G5-9
	G5-14EX	0.13	0.90	0.12	10.00	7.18	0.85	11.15	1.3	CI-G5-14EX
	G5-15EX	0.06	0.90	0.05	10.00	7.18	0.37	11.15	0.6	CI-G5-15EX
	G5-18EX	0.11	0.89	0.10	10.00	7.18	0.73	11.15	1.1	CI-G5-18EX
G6	G6-1	0.11	0.90	0.10	10.00	7.18	0.73	11.15	1.1	BD-G6-1
	G6-2	0.10	0.90	0.09	10.00	7.18	0.61	11.15	1.0	BD-G6-2
	G6-3	0.09	0.90	0.08	10.00	7.18	0.58	11.15	0.9	BD-G6-3
	G6-4	0.09	0.90	0.08	10.00	7.18	0.58	11.15	0.9	BD-G6-4
G7	G7-1	0.41	0.90	0.37	10.00	7.18	2.63	11.15	4.1	CI-G7-1
	G7-3	8.37	0.61	5.07	17.00	5.80	29.40	9.16	46.5	SET-G7-3

* AREA DRAINS TO CREEK OR POND

NOTES

1. STORM DRAIN COMPONENTS SCREENED BACK ARE EXISTING TO REMAIN AND ARE SHOWN FOR ANALYSIS PURPOSES. "EX" DENOTES EXISTING COMPONENTS TO REMAIN.
2. C VALUES WERE DEVELOPED USING AERIAL PHOTOGRAPHY AND TABLE 4-10 IN TXDOT HYDRAULIC DESIGN MANUAL.
3. CALCULATIONS COMPUTED USING NOAA ATLAS-14 RAINFALL INTENSITIES.

DESIGN

STATE OF TEXAS · BRYAN SIERSMA · 147188 · LICENSED PROFESSIONAL ENGINEER

BRYAN SIERSMA, P.E.

5/9/2024
DATE

APPROVAL

STATE OF TEXAS · DAN THOMA · 98622 · LICENSED PROFESSIONAL ENGINEER

DAN THOMA, P.E.

5/9/2024
DATE

PAPE-DAWSON ENGINEERS
SAN ANTONIO | AUSTIN | HOUSTON | FORT WORTH | DALLAS
2000 NW LOOP 410 | SAN ANTONIO, TX 78213 | 210.375.9000
TEXAS ENGINEERING FIRM #470 | TEXAS SURVEYING FIRM #10028800

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US 183 GPL

RUNOFF COMPUTATIONS

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DS:	CK:	CONT	SECT	JOB	HIGHWAY
		0151	10	001	US 183
DW:	CK:	DIST	COUNTY		SHEET NO.
		AUS	WILLIAMSON		709

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RUNOFF COMPUTATIONS - RATIONAL METHOD						Design		Check		
NETWORK	DRAINAGE AREA - ID	AREA (AC)	C (WEIGHTED)	TOTAL CA	Tc (MINUTES)	I 10 YR (IN/HR)	Q 10 YR (CFS)	I 100 YR (IN/HR)	Q 100 YR (CFS)	TO INLET/JUNCTION
G8	G8-1EX	0.09	0.60	0.05	10.00	7.18	0.37	11.15	0.6	CI-G8-1EX
G9	G9-3	0.10	0.74	0.08	10.00	7.18	0.55	11.15	0.8	GI-G9-3
	G9-1EX	4.19	0.69	2.90	15.23	6.09	17.66	9.59	27.8	GI-G9-1EX
	G9-4EX	1.76	0.71	1.25	15.23	6.09	7.60	9.59	12.0	GI-G9-4EX
G10	G10-1	0.11	0.90	0.10	10.00	7.18	0.72	11.15	1.1	BI-G5-6
	G10-2	0.45	0.90	0.40	10.00	7.18	2.88	11.15	4.5	GI-G5-11
	G10-3	0.14	0.83	0.12	10.00	7.18	0.84	11.15	1.3	BI-G5-12
G11	G11-1	0.03	0.90	0.03	10.00	7.18	0.22	11.15	0.3	RW-G11-1
G12	G12-1	0.23	0.90	0.20	10.00	7.18	1.46	11.15	2.3	RW-G12-1
G13	G13-1	0.17	0.90	0.15	10.00	7.18	1.09	11.15	1.7	RW-G13-1
*	G-ELBOW	0.07	1.80	0.12	10.00	7.18	0.87	11.15	1.4	n/a
H1	H1-1	0.12	0.82	0.09	10.00	7.18	0.68	11.15	1.1	BD-H1-1
	H1-2	0.08	0.81	0.06	10.00	7.18	0.46	11.15	0.7	BD-H1-2
	H1-3	0.09	0.90	0.08	10.00	7.18	0.57	11.15	0.9	BD-H1-3
	H1-4	0.11	0.90	0.09	10.00	7.18	0.68	11.15	1.1	BD-H1-4
	H1-5	0.09	0.90	0.08	10.00	7.18	0.60	11.15	0.9	BD-H1-5
	H1-6	0.09	0.90	0.08	10.00	7.18	0.59	11.15	0.9	BD-H1-6
H2	H2-1	0.09	0.90	0.08	10.00	7.18	0.60	11.15	0.9	BD-H2-1
	H2-2	0.10	0.90	0.09	10.00	7.18	0.64	11.15	1.0	BD-H2-2
	H2-3	0.10	0.90	0.09	10.00	7.18	0.66	11.15	1.0	BD-H2-3
	H2-4	0.11	0.90	0.09	10.00	7.18	0.68	11.15	1.1	BD-H2-4
H3	H3-1	1.16	0.64	0.74	10.00	7.18	5.30	11.15	8.2	n/a
	H3-2	0.56	0.64	0.36	10.00	7.18	2.59	11.15	4.0	n/a
	H3-3	0.76	0.76	0.58	10.00	7.18	4.19	11.15	6.5	n/a
	H3-4	0.36	0.61	0.22	10.00	7.18	1.58	11.15	2.4	n/a
H4	H4-8	0.26	0.90	0.23	10.00	7.18	1.69	11.15	2.6	BI-H4-8
	H4-10	0.21	0.90	0.19	10.00	7.18	1.35	11.15	2.1	CI-H4-10
	H4-12	0.20	0.90	0.18	10.00	7.18	1.28	11.15	2.0	RW-H4-12
	H4-13	0.13	0.90	0.11	10.00	7.18	0.81	11.15	1.3	RW-H4-13
	H4-15	0.39	0.90	0.35	10.00	7.18	2.49	11.15	3.9	BI-H4-15
	H4-16	0.41	0.90	0.37	10.00	7.18	2.63	11.15	4.1	BI-H4-16
	H4-17	0.17	0.90	0.15	10.00	7.18	1.11	11.15	1.7	RW-H4-17
	H4-18	0.21	0.90	0.19	10.00	7.18	1.36	11.15	2.1	RW-H4-18
	H4-20	0.10	0.90	0.09	10.00	7.18	0.67	11.15	1.0	CI-H4-20
	H4-21	0.19	0.90	0.17	10.00	7.18	1.25	11.15	1.9	RW-H4-21
	H4-23	0.15	0.90	0.14	10.00	7.18	0.99	11.15	1.5	BI-H4-23
	H4-24	0.04	0.90	0.03	10.00	7.18	0.23	11.15	0.4	BI-H4-24
	H4-25	0.05	0.90	0.05	10.00	7.18	0.32	11.15	0.5	BI-H4-25
	H4-26	0.16	0.90	0.14	10.00	7.18	1.02	11.15	1.6	BI-H4-26
	H4-28	0.09	0.90	0.08	10.00	7.18	0.60	11.15	0.9	CI-H4-28
	H4-30	0.13	0.90	0.12	10.00	7.18	0.85	11.15	1.3	CI-H4-30
	H4-31	0.11	0.90	0.10	10.00	7.18	0.69	11.15	1.1	CI-H4-31
	H4-32	0.26	0.90	0.23	10.00	7.18	1.65	11.15	2.6	RW-H4-32
	H4-33	0.06	0.90	0.05	10.00	7.18	0.39	11.15	0.6	CI-H4-33
	H4-35	0.14	0.90	0.13	10.00	7.18	0.90	11.15	1.4	RW-H4-35
	H4-38	0.08	0.90	0.07	10.00	7.18	0.49	11.15	0.8	CI-H4-38
	H4-39	0.09	0.90	0.08	10.00	7.18	0.59	11.15	0.9	CI-H4-39
	H4-40	0.13	0.90	0.12	10.00	7.18	0.86	11.15	1.3	CI-H4-40
	H4-41	0.69	0.90	0.62	10.00	7.18	4.48	11.15	7.0	GI-H4-41
	H4-44	0.51	0.90	0.46	10.00	7.18	3.31	11.15	5.1	GI-H4-44
	H4-45	0.81	0.89	0.72	10.00	7.18	5.19	11.15	8.1	GI-H4-45
	H4-46	0.14	0.90	0.12	10.00	7.18	0.88	11.15	1.4	BD-H4-46
	H4-47	0.14	0.90	0.13	10.00	7.18	0.92	11.15	1.4	BD-H4-47
	H4-48	0.13	0.90	0.12	10.00	7.18	0.83	11.15	1.3	BD-H4-48
	H4-49	0.13	0.90	0.12	10.00	7.18	0.86	11.15	1.3	BD-H4-49
	H4-50	0.15	0.90	0.13	10.00	7.18	0.96	11.15	1.5	BD-H4-50
	H4-51	0.14	0.90	0.12	10.00	7.18	0.88	11.15	1.4	GI-H4-51
	H4-53	0.14	0.90	0.12	10.00	7.18	0.87	11.15	1.4	BI-H4-53
	H4-54	0.23	0.90	0.21	10.00	7.18	1.50	11.15	2.3	BI-H4-54
	H4-55	0.02	0.90	0.01	10.00	7.18	0.10	11.15	0.1	BI-H4-55
	H4-64	0.83	0.89	0.74	10.00	7.18	5.29	11.15	8.2	GI-H4-64
	H4-65	0.11	0.90	0.10	10.00	7.18	0.74	11.15	1.1	BI-H4-65
	H4-66	0.08	0.89	0.07	10.00	7.18	0.49	11.15	0.8	BI-H4-66
	H4-67	0.07	0.90	0.06	10.00	7.18	0.44	11.15	0.7	BI-H4-67
	H4-68	0.05	0.90	0.05	10.00	7.18	0.35	11.15	0.5	RW-H4-68
	H4-69	0.02	0.90	0.01	10.00	7.18	0.10	11.15	0.2	BI-H4-69
	H4-70	0.22	0.90	0.20	10.00	7.18	1.41	11.15	2.2	BI-H4-70
	H4-71	0.06	0.90	0.05	10.00	7.18	0.36	11.15	0.6	BI-H4-71
	H4-72	0.07	0.90	0.06	10.00	7.18	0.42	11.15	0.7	BI-H4-72
	H4-73	0.08	0.90	0.07	10.00	7.18	0.48	11.15	0.8	BI-H4-73

* AREA DRAINS TO CREEK OR POND

NOTES

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2. C VALUES WERE DEVELOPED USING AERIAL PHOTOGRAPHY AND TABLE 4-10 IN TXDOT HYDRAULIC DESIGN MANUAL.
3. CALCULATIONS COMPUTED USING NOAA ATLAS-14 RAINFALL INTENSITIES.

DESIGN

STATE OF TEXAS · BRYAN SIERSMA · 147188 · LICENSED PROFESSIONAL ENGINEER

BRYAN SIERSMA, P.E.

5/9/2024
DATE

APPROVAL

STATE OF TEXAS · DAN THOMA · 98622 · LICENSED PROFESSIONAL ENGINEER

DAN THOMA, P.E.

5/9/2024
DATE

PAPE-DAWSON ENGINEERS
SAN ANTONIO | AUSTIN | HOUSTON | FORT WORTH | DALLAS
2000 NW LOOP 410 | SAN ANTONIO, TX 78213 | 210.375.9000
TEXAS ENGINEERING FIRM #470 | TEXAS SURVEYING FIRM #10028800

2024 Texas Department of Transportation

US 183 GPL

RUNOFF COMPUTATIONS

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DS:	CK:	CONT	SECT	JOB	HIGHWAY
		0151	10	001	US 183
DW:	CK:	DIST	COUNTY		SHEET NO.
		AUS	WILLIAMSON		710

DATE: 5/9/2024 8:19:04 PM
FILE: v:\bentley\dms\pd-pw-01\alyssa.sage\dms07214\015110001_Runoff_Comp_04.dgn

RUNOFF COMPUTATIONS - RATIONAL METHOD						Design		Check		
NETWORK	DRAINAGE AREA - ID	AREA (AC)	C (WEIGHTED)	TOTAL CA	Tc (MINUTES)	I 10 YR (IN/HR)	Q 10 YR (CFS)	I 100 YR (IN/HR)	Q 100 YR (CFS)	TO INLET/JUNCTION
H4 CONT.	H4-74	0.26	0.90	0.24	10.00	7.18	1.70	11.15	2.6	BI-H4-74
	H4-75	1.23	0.90	1.11	10.00	7.18	7.95	11.15	12.3	GI-H4-75
	H4-77	0.05	0.89	0.04	10.00	7.18	0.32	11.15	0.5	BI-H4-77
	H4-86	0.09	0.90	0.08	10.00	7.18	0.59	11.15	0.9	RW-H4-86
	H4-87	0.15	0.90	0.13	10.00	7.18	0.93	11.15	1.5	RW-H4-87
	H4-91	0.06	0.90	0.05	10.00	7.18	0.36	11.15	0.6	CI-H4-91
	H4-92	0.05	0.90	0.05	10.00	7.18	0.33	11.15	0.5	CI-H4-92
	H4-94	0.12	0.90	0.11	10.00	7.18	0.78	11.15	1.2	BI-H4-94
	H4-95	0.08	0.90	0.07	10.00	7.18	0.50	11.15	0.8	BI-H4-95
	H4-96	0.23	0.90	0.21	10.00	7.18	1.50	11.15	2.3	BI-H4-96
	H4-97	0.16	0.90	0.14	10.00	7.18	1.02	11.15	1.6	BI-H4-97
	H4-109	0.11	0.90	0.10	10.00	7.18	0.73	11.15	1.1	GI-H4-109
	H4-110	0.06	0.71	0.05	10.00	7.18	0.33	11.15	0.5	GI-H4-110
	H4-111	0.72	0.90	0.65	10.00	7.18	4.66	11.15	7.2	GI-H4-111
	H4-113	0.03	0.90	0.03	10.00	7.18	0.22	11.15	0.3	BI-H4-113
	H4-114	0.05	0.90	0.05	10.00	7.18	0.35	11.15	0.5	BI-H4-114
	H4-115	0.04	0.90	0.03	10.00	7.18	0.24	11.15	0.4	BI-H4-115
	H4-116	0.05	0.90	0.05	10.00	7.18	0.33	11.15	0.5	BI-H4-116
	H4-120	0.13	0.89	0.11	10.00	7.18	0.80	11.15	1.2	BI-H4-120
	H4-121	0.09	0.90	0.08	10.00	7.18	0.61	11.15	0.9	RW-H4-121
	H4-122	0.22	0.90	0.19	10.00	7.18	1.39	11.15	2.2	BI-H4-122
	H4-123	0.32	0.90	0.29	10.00	7.18	2.08	11.15	3.2	RW-H4-123
	H4-43EX	6.20	0.75	4.64	10.00	7.18	33.30	11.15	51.7	GI-H4-43EX
	H4-57EX	0.20	0.90	0.18	10.00	7.18	1.28	11.15	2.0	RW-H4-57EX
	H4-58EX	0.08	0.90	0.07	10.00	7.18	0.52	11.15	0.8	RW-H4-58EX
	H4-59EX	0.11	0.90	0.10	10.00	7.18	0.69	11.15	1.1	RW-H4-59EX
	H4-60EX	0.06	0.90	0.05	10.00	7.18	0.36	11.15	0.6	RW-H4-60EX
	H4-61EX	0.07	0.90	0.06	10.00	7.18	0.43	11.15	0.7	RW-H4-61EX
	H4-62EX	0.01	0.90	0.01	10.00	7.18	0.09	11.15	0.1	RW-H4-62EX
	H4-63EX	0.09	0.90	0.08	10.00	7.18	0.58	11.15	0.9	RW-H4-63EX
	H4-98EX	0.07	0.90	0.06	10.00	7.18	0.46	11.15	0.7	RW-H4-98EX
	H4-99EX	0.03	0.90	0.03	10.00	7.18	0.19	11.15	0.3	RW-H4-99EX
	H4-100EX	0.05	0.90	0.05	10.00	7.18	0.35	11.15	0.5	RW-H4-100EX
H5	H5-5	0.19	0.90	0.17	10.00	7.18	1.23	11.15	1.9	GI-H5-5
	H5-1EX	0.83	0.90	0.74	10.00	7.18	5.31	11.15	8.2	RW-H5-1EX
	H5-3EX	0.57	0.89	0.51	10.00	7.18	3.66	11.15	5.7	RW-H5-3EX
H6	H6-2	0.26	0.90	0.23	10.00	7.18	1.68	11.15	2.6	CI-H6-2
	H6-3	0.14	0.90	0.13	10.00	7.18	0.93	11.15	1.4	BD-H6-3
	H6-5	0.14	0.90	0.13	10.00	7.18	0.93	11.15	1.4	BD-H6-5
	H6-6	0.11	0.90	0.10	10.00	7.18	0.73	11.15	1.1	BD-H6-6
	H6-7	0.03	0.58	0.02	10.00	7.18	0.11	11.15	0.2	GI-H6-7
I1	I1-1	0.98	0.90	0.88	10.00	7.18	6.33	11.15	9.8	GI-I1-1
	I1-3	0.09	0.90	0.08	10.00	7.18	0.56	11.15	0.9	BI-I1-3
	I1-6	0.22	0.90	0.20	10.00	7.18	1.42	11.15	2.2	BI-I1-6
	I1-9	0.15	0.90	0.13	10.00	7.18	0.95	11.15	1.5	BI-I1-9
	I1-12	0.17	0.90	0.15	10.00	7.18	1.09	11.15	1.7	BI-I1-12
	I1-15	0.14	0.90	0.13	10.00	7.18	0.93	11.15	1.4	BI-I1-15
	I1-16	0.23	0.90	0.21	10.00	7.18	1.50	11.15	2.3	BI-I1-16
	I1-19	0.42	0.90	0.38	10.00	7.18	2.74	11.15	4.3	RW-I1-19
	I1-20	3.08	0.80	2.46	10.00	7.18	17.64	11.15	27.4	GI-I1-20
	I1-27	0.36	0.51	0.18	10.00	7.18	1.31	11.15	2.0	GI-I1-27
	I1-28	0.72	0.50	0.36	10.00	7.18	2.57	11.15	4.0	GI-I1-28
	I1-29	0.50	0.78	0.39	10.00	7.18	2.82	11.15	4.4	GI-I1-29
	I1-CLV	16.94	0.45	7.56	22.60	5.05	38.14	8.07	60.9	n/a
	I1-21EX	0.39	0.90	0.35	10.00	7.18	2.52	11.15	3.9	RW-I1-21EX
	I1-23EX	0.18	0.90	0.17	10.00	7.18	1.19	11.15	1.8	RW-I1-23EX
I2	I2-2	0.16	0.72	0.12	11.50	6.82	0.79	10.64	1.2	GI-I2-2
	I2-3	0.07	0.89	0.06	10.00	7.18	0.46	11.15	0.7	BI-I2-3
	I2-4	0.08	0.90	0.07	10.00	7.18	0.49	11.15	0.8	BI-I2-4
	I2-5	3.42	0.72	2.48	11.50	6.82	16.91	10.64	26.4	GI-I2-5
	I2-10	0.24	0.84	0.21	10.00	7.18	1.47	11.15	2.3	GI-I2-10
	I2-11	0.10	0.89	0.09	10.00	7.18	0.62	11.15	1.0	BI-I2-11
	I2-14	4.36	0.84	3.66	11.00	6.94	25.38	10.80	39.5	GI-I2-14
	I2-20	1.59	0.59	0.93	10.00	7.18	6.67	11.15	10.4	GI-I2-20
	I2-22	0.14	0.90	0.12	10.00	7.18	0.88	11.15	1.4	GI-I2-22
	I2-1EX	5.92	0.72	4.25	10.00	7.18	30.49	11.15	47.3	GI-I2-1EX
I3	I3-1	0.18	0.90	0.16	10.00	7.18	1.16	11.15	1.8	BD-I3-1
	I3-2	0.14	0.90	0.13	10.00	7.18	0.93	11.15	1.4	BD-I3-2
	I3-3	0.11	0.90	0.10	10.00	7.18	0.73	11.15	1.1	BD-I3-3
I4	I4-1	0.40	0.90	0.36	10.00	7.18	2.58	11.15	4.0	n/a
J1	J1-1EX	2.62	0.71	1.87	10.00	7.18	13.44	11.15	20.9	GI-J1-1EX
	J1-3EX	0.90	0.90	0.81	10.00	7.18	5.78	11.15	9.0	BD-J1-3EX
J2	J2-1	0.30	0.57	0.17	10.00	7.18	1.25	11.15	1.9	n/a

NOTES

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3. CALCULATIONS COMPUTED USING NOAA ATLAS-14 RAINFALL INTENSITIES.

DESIGN

STATE OF TEXAS · BRYAN SIERSMA · 147188 · LICENSED PROFESSIONAL ENGINEER

BRYAN SIERSMA, P.E.

5/9/2024
DATE

APPROVAL

STATE OF TEXAS · DAN THOMA · 98622 · LICENSED PROFESSIONAL ENGINEER

DAN THOMA, P.E.

5/9/2024
DATE

PAPE-DAWSON ENGINEERS
SAN ANTONIO | AUSTIN | HOUSTON | FORT WORTH | DALLAS
2000 NW LOOP 410 | SAN ANTONIO, TX 78213 | 210.375.9000
TEXAS ENGINEERING FIRM #470 | TEXAS SURVEYING FIRM #10028800

2024
Texas Department of Transportation

US 183 GPL

RUNOFF COMPUTATIONS

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DS:	CK:	CONT	SECT	JOB	HIGHWAY
		0151	10	001	US 183
DW:	CK:	DIST	COUNTY		SHEET NO.
		AUS	WILLIAMSON		711

DATE: 5/9/2024 8:19:18 PM
FILE: v:\bentley\dms\pd-pw-01\alyssa.sage\dms07214\0151l0001_Runoff_Comp_05.dgn

RUNOFF COMPUTATIONS - RATIONAL METHOD						Design		Check		
NETWORK	DRAINAGE AREA - ID	AREA (AC)	C (WEIGHTED)	TOTAL CA	Tc (MINUTES)	I 10 YR (IN/HR)	Q 10 YR (CFS)	I 100 YR (IN/HR)	Q 100 YR (CFS)	TO INLET/JUNCTION
J2 CONT.	J2-3	0.13	0.90	0.11	10.00	7.18	0.82	11.15	1.3	GI-J2-3
	J2-1EX	0.15	0.90	0.13	10.00	7.18	0.94	11.15	1.5	RW-J2-1EX
	J2-17EX	0.14	0.90	0.12	10.00	7.18	0.87	11.15	1.4	RW-J2-17EX
	J2-18EX	0.07	0.90	0.07	10.00	7.18	0.47	11.15	0.7	RW-J2-18EX
	J2-19EX	0.04	0.90	0.03	10.00	7.18	0.24	11.15	0.4	RW-J2-19EX
	J2-20EX	0.06	0.90	0.05	10.00	7.18	0.36	11.15	0.6	RW-J2-20EX
	J2-21EX	0.03	0.90	0.03	10.00	7.18	0.21	11.15	0.3	RW-J2-21EX
	J2-22EX	0.03	0.90	0.03	10.00	7.18	0.22	11.15	0.3	RW-J2-22EX
	J2-23EX	0.02	0.90	0.02	10.00	7.18	0.14	11.15	0.2	RW-J2-23EX
J4	J4-1EX	0.15	0.90	0.14	10.00	7.18	0.98	11.15	1.5	RW-J4-1EX
J5	J5-1EX	0.30	0.90	0.27	10.00	7.18	1.94	11.15	3.0	RW-J5-1EX
	J5-2EX	0.97	0.90	0.88	10.00	7.18	6.28	11.15	9.8	BD-J5-2EX
J6	J6-3	0.55	0.75	0.41	10.00	7.18	2.93	11.15	4.5	GI-J6-3
	J6-4	0.84	0.83	0.69	10.00	7.18	4.99	11.15	7.7	GI-J6-4
	J6-11	0.49	0.91	0.45	10.00	7.18	3.21	11.15	5.0	GI-J6-11
	J6-12	0.30	0.97	0.29	10.00	7.18	2.07	11.15	3.2	GI-J6-12
	J6-18	1.46	0.82	1.20	10.00	7.18	8.59	11.15	13.3	GI-J6-18
	J6-1EX	5.24	0.72	3.78	10.00	7.18	27.14	11.15	42.1	GI-J6-1EX
	J6-6EX	0.50	0.90	0.45	10.00	7.18	3.22	11.15	5.0	CI-J6-6EX
J7	J7-1	5.01	0.73	3.67	10.00	7.18	26.34	11.15	40.9	GI-J7-1
K1	K1-3EX	0.47	0.90	0.42	10.00	7.18	3.05	11.15	4.7	CI-K1-3EX

CULVERT K HYDROLOGY*			
AREA SIZE (AC)		104.93	
FREQUENCY	10 YR	25 YR	100 YR
AURA	53.8	70.8	100.5
LAKELINE	198.4	265.7	388.5
TOTAL Q (CFS)	252.2	336.5	489.0

* DISCHARGES FOR THESE AREAS ARE FROM STUDIES DONE BY JONES AND CARTER FOR THE AURA AVERY RANCH AND AVERY LAKELINE DEVELOPMENTS.

NOTES

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DESIGN

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BRYAN SIERSMA, P.E.

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US 183 GPL

RUNOFF COMPUTATIONS

SHEET 6 OF 6

© 2024		CONT	SECT	JOB	HIGHWAY
DS:	CK:	0151	10	001	US 183
DW:	CK:	DIST	COUNTY		SHEET NO.
		AUS	WILLIAMSON		711A

DATE: 5/9/2024 8:19:34 PM
FILE: v:\bentley\dms\pd-pw-01\aly\ssa.sage\dms07214\01511001_Runoff_Comp_06.dgn

CURB INLET COMPUTATIONS

	INLET				CURB INLET DESCRIPTION	INLET TYPE	DRAINAGE AREA	Q FROM AREA	CARRY OVER FLOW	TOTAL Q 10 YR	CURB INLET ON GRADE			CURB INLET IN SAG		ALLOWABLE PONDED WIDTH	LENGTH INLET	REQUIRED LENGTH INLET	BYPASS FLOW	BYPASS FLOW
	NO	OFFSET (FT)	CHAIN	STATION			NO	(CFS)	(CFS)	(CFS)	LONGIT-UDINAL ROAD SLOPE (FT/FT)	DEPTH OF FLOW (FT)	PONDED WIDTH (FT)	DEPTH OF FLOW (FT)	TOTAL PONDED WIDTH (FT)	(FT)	(FT)	(FT)	(CFS)	NODE
	CI-B6-1EX	31.90 'RT	SB	3609+37.22	EX CISP5	Sag	B6-1EX	2.2	0.00	2.2	---	---	---	0.25	12.26	20.00	5.0	6.4	---	---
	CI-F6-1EX	23.58 'LT	NB	1682+22.64	EX TYPAC15	On Grade	F6-1EX	6.8	0.00	6.8	0.0068	0.40	23.48	---	---	30.00	5.0	14.6	3.20	F6-4EX
	CI-F6-2EX	46.31 'LT	NB	1683+37.55	EX TYPAC15	Sag	F6-2EX	9.1	0.00	9.1	---	---	---	0.64	2.13	15.00	5.0	16.9	---	---
	CI-F6-3EX	47.70 'LT	NB	1682+22.57	EX TYPBCI10	Sag	F6-3EX	21.8	0.00	21.8	---	---	---	0.66	2.19	15.00	10.0	16.9	---	---
	CI-G5-9	15.00 'RT	BCL	501+78.50	PCU5-3X5	On Grade	G5-9	1.4	0.00	1.4	0.0189	0.14	7.18	---	---	14.00	10.0	n/a	0.16	G10-3
	CI-G5-14EX	16.06 'LT	BCL	561+33.64	EX TYPBCI10	On Grade	G5-14EX	0.8	0.00	0.8	0.0133	0.16	4.54	---	---	8.00	10.0	5.8	0.00	G5-18EX
	CI-G5-15EX	46.01 'LT	BCL	500+48.08	EX TYPBCI10	On Grade	G5-15EX	0.4	0.00	0.4	0.0400	0.09	2.98	---	---	13.00	10.0	5.2	0.00	EX-G4-14
	CI-G5-18EX	52.00 'LT	BCL	561+13.85	EX TYPBCI10	Sag	G5-18EX	0.7	0.00	0.7	---	---	---	0.09	3.10	13.00	10.0	17.0	---	---
	CI-G7-1	33.50 'RT	SBXBCR	27+85.00	PCO10R-4X5	On Grade	G7-1	2.6	0.00	2.6	0.0111	0.18	11.89	---	---	13.00	9.5	14.9	0.42	G8-1EX
	CI-G8-1EX	8.75 'LT	SBXBCR	28+03.50	EX CISP5	On Grade	G8-1EX	0.4	0.42	0.8	0.0115	0.15	5.01	---	---	12.00	5.0	5.0	0.00	OFF SITE
*	CI-H4-10	18.50 'RT	BCL	527+55.00	PCO10R-3X5	On Grade	H4-10	1.3	0.00	1.3	0.0126	0.16	7.74	---	---	8.00	9.5	9.1	0.00	H4-45
	CI-H4-20	18.50 'RT	BCL	523+30.00	PCO10R-3X5	On Grade	H4-20	0.7	0.00	0.7	0.0126	0.12	5.96	---	---	8.00	9.5	6.2	0.00	H4-33
	CI-H4-28	18.50 'RT	BCL	520+64.00	PCO10R-3X5	On Grade	H4-28	0.6	0.00	0.6	0.0050	0.14	6.79	---	---	8.00	9.5	4.7	0.00	H4-91
	CI-H4-30	18.50 'RT	BCL	518+66.00	PCO10R-3X5	On Grade	H4-30	0.8	0.00	0.8	0.0050	0.16	7.74	---	---	8.00	9.5	5.7	0.00	H4-92
	CI-H4-31	18.50 'RT	BCL	516+70.50	PCO10R-3X5	On Grade	H4-31	0.7	0.00	0.7	0.0050	0.14	7.15	---	---	8.00	9.5	5.0	0.00	H4-30
	CI-H4-33	18.50 'RT	BCL	524+34.00	PCO10R-3X5	On Grade	H4-33	0.4	0.00	0.4	0.0126	0.10	4.84	---	---	8.00	9.5	4.5	0.00	H4-10
	CI-H4-38	18.50 'RT	BCL	515+76.00	PCO5-3X5	On Grade	H4-38	0.5	0.00	0.5	0.0050	0.13	6.31	---	---	8.00	5.0	4.2	0.00	H4-31
	CI-H4-39	18.50 'RT	BCL	515+10.75	PCO5-3X5	On Grade	H4-39	0.6	0.02	0.6	0.0050	0.14	6.86	---	---	8.00	5.0	4.7	0.00	H4-38
	CI-H4-40	18.50 'RT	BCL	514+07.25	PCO5-3X5	On Grade	H4-40	0.9	0.00	0.9	0.0050	0.16	7.77	---	---	8.00	5.0	5.7	0.02	H4-39
	CI-H4-91	19.00 'RT	BCL	521+56.00	PCO10R-3X5	On Grade	H4-91	0.4	0.00	0.4	0.0075	0.10	5.22	---	---	8.00	9.5	3.9	0.00	H4-20
	CI-H4-92	18.50 'RT	BCL	519+39.00	PCO10R-3X5	On Grade	H4-92	0.3	0.00	0.3	0.0050	0.11	5.41	---	---	8.00	9.5	3.3	0.00	H4-28
*	CI-H6-2	18.50 'RT	BCL	533+57.25	3-PCO5-3X5	On Grade	H6-2	1.7	0.00	1.7	0.0242	0.15	7.43	---	---	8.00	15.0	12.0	0.00	H6-7
	CI-J6-6EX	90.70 'RT	NB	1758+07.93	EX CIII10L	On Grade	J6-6EX	3.2	0.00	3.2	0.0096	0.25	9.81	---	---	11.00	10.0	11.3	0.07	CLV K
	CI-K1-3EX	65.00 'LT	SB	3756+98.43	EX CISP10	On Grade	K1-3EX	3.0	0.00	3.0	0.0050	0.27	10.86	---	---	15.00	10.0	9.5	0.00	EXIST CULVERT

* - THESE INLETS ARE PLACED AT SUPERELEVATION TRANSITION AREAS AND WILL NOT NECESSARILY MEET PONDING WIDTH CRITERIA. THE INTENT OF THESE INLETS IS TO PICK UP AS MUCH CONCENTRATED FLOW AS POSSIBLE BEFORE FLOW CROSSES THE PAVEMENT AND CREATES A POTENTIAL HYDROPLANE ISSUE.

DESIGN

STATE OF TEXAS · BRYAN SIERSMA · 147188 · LICENSED PROFESSIONAL ENGINEER

BRYAN SIERSMA, P.E.

5/9/2024
DATE

APPROVAL

STATE OF TEXAS · DAN THOMA · 98622 · LICENSED PROFESSIONAL ENGINEER

DAN THOMA, P.E.

5/9/2024
DATE

PAPE-DAWSON ENGINEERS
SAN ANTONIO | AUSTIN | HOUSTON | FORT WORTH | DALLAS
2000 NW LOOP 410 | SAN ANTONIO, TX 78213 | 210.375.9000
TEXAS ENGINEERING FIRM #470 | TEXAS SURVEYING FIRM #10028800

2024 Texas Department of Transportation

US 183 GPL

CURB INLET COMPUTATIONS

SHEET 1 OF 1

© 2024		CONT	SECT	JOB	HIGHWAY
DS:	CK:	0151	10	001	US 183
DW:	CK:	DIST	COUNTY		SHEET NO.
		AUS	WILLIAMSON		712

DATE: 5/9/2024 8:19:46 PM
FILE: v:\bentley\dms\pd-pw-01\aly\ssa.sage\dms07214\0151l0001_Curb_Inlet_01.dgn

DROP/TRAFFIC INLET COMPUTATIONS

INLET				DROP/TRAFFIC INLET DESCRIPTION	INLET TYPE	DRAINAGE AREA	Q FROM AREA	CARRY OVER FLOW	TOTAL Q 10 YR	DROP INLET ON GRADE			DROP INLET IN SAG		ALLOWABLE PONDED WIDTH	LENGTH INLET	REQUIRED LENGTH INLET	BY PASS FLOW	BY PASS FLOW
NO	OFFSET (FT)	CHAIN	STATION			NO	(CFS)	(CFS)	(CFS)	LONGIT-UDINAL ROAD SLOPE (FT/FT)	DEPTH OF FLOW (FT)	PONDED WIDTH (FT)	DEPTH OF FLOW (FT)	PONDED WIDTH (TOTAL) (FT)	(FT)	(FT)	(FT)	(CFS)	NODE
BD-B1-1	60.00 'RT	NB	1613+94.00	BD3	On Grade	B1-1	1.015	0.0	1.0	0.0123	0.14	6.83	---	---	10.00	n/a	n/a	0.66	WARRIOR
BD-C16-1	5.00 'LT	NB	1626+29.00	BD1	On Grade	C16-1	0.623	0.4	1.0	0.0019	0.19	9.62	---	---	10.00	n/a	n/a	0.24	C15-1
BD-C17-1	5.00 'LT	NB	1627+43.00	BD1	On Grade	C17-1	0.632	0.3	0.9	0.0135	0.13	6.54	---	---	10.00	n/a	n/a	0.37	C16-1
BD-C18-1	5.00 'LT	NB	1628+57.00	BD1	On Grade	C18-1	0.638	0.2	0.9	0.0135	0.13	6.27	---	---	10.00	n/a	n/a	0.32	C17-1
BD-C19-1	5.00 'LT	NB	1629+71.00	BD1	On Grade	C19-1	0.638	0.0	0.6	0.0135	0.11	5.63	---	---	10.00	n/a	n/a	0.21	C18-1
BD-C20-1	5.00 'LT	NB	1630+85.00	BD1	On Grade	C20-1	0.681	0.0	0.7	0.0135	0.12	5.77	---	---	9.00	n/a	n/a	0.23	C21-1
BD-C21-1	5.00 'LT	NB	1631+99.00	BD1	On Grade	C21-1	0.673	0.2	0.9	0.0114	0.13	6.64	---	---	9.00	n/a	n/a	0.34	C23-1
BD-C22-1	5.00 'LT	NB	1633+24.00	BD1	On Grade	C22-1	0.695	0.0	0.7	0.0055	0.14	6.89	---	---	9.00	n/a	n/a	0.20	C25-1
BD-D1-62EX	68.00 'RT	183A	638+19.50	EXBD1	On Grade	D1-62EX	1.091	0.6	1.7	0.0050	0.23	8.19	---	---	16.00	n/a	n/a	0.55	D1-57
BD-D1-63EX	68.00 'RT	183A	637+23.00	EXBD1	On Grade	D1-63EX	1.061	0.7	1.8	0.0050	0.23	8.36	---	---	16.00	n/a	n/a	0.59	D1-62EX
BD-D1-64EX	68.00 'RT	183A	636+18.00	EXBD1	On Grade	D1-64EX	2.047	0.0	2.0	0.0050	0.24	8.82	---	---	16.00	n/a	n/a	0.72	D1-63EX
BD-D1-65EX	74.00 'LT	183A	635+16.00	EXBD1	On Grade	D1-65EX	1.141	0.0	1.1	0.0050	0.20	7.08	---	---	16.00	n/a	n/a	0.32	D1-66EX
BD-D1-66EX	70.00 'LT	183A	636+20.50	EXBD1	On Grade	D1-66EX	1.187	0.3	1.5	0.0050	0.22	7.85	---	---	16.00	n/a	n/a	0.47	D1-67EX
BD-D1-67EX	65.00 'LT	183A	637+25.00	EXBD1	On Grade	D1-67EX	1.152	0.5	1.6	0.0050	0.22	8.08	---	---	16.00	n/a	n/a	0.52	D1-68EX
BD-D1-68EX	65.00 'LT	183A	638+19.50	EXBD1	On Grade	D1-68EX	0.937	0.5	1.5	0.0050	0.21	7.76	---	---	16.00	n/a	n/a	0.45	D1-38
BD-D1-69	25.00 'LT	SB	3638+15.00	BD1	On Grade	D1-69	0.848	0.3	1.1	0.0050	0.17	8.52	---	---	10.00	n/a	n/a	0.36	D1-75
BD-D1-70	25.00 'LT	SB	3636+65.00	BD1	On Grade	D1-70	0.554	0.3	0.8	0.0050	0.16	7.73	---	---	10.00	n/a	n/a	0.25	D1-69
BD-D1-71	25.00 'LT	SB	3635+68.00	BD1	On Grade	D1-71	0.646	0.3	0.9	0.0050	0.16	8.07	---	---	10.00	n/a	n/a	0.29	D1-70
BD-D1-72	25.00 'LT	SB	3634+54.00	BD1	On Grade	D1-72	0.725	0.2	1.0	0.0050	0.16	8.13	---	---	10.00	n/a	n/a	0.30	D1-71
BD-D1-73	25.00 'LT	SB	3633+28.00	BD1	On Grade	D1-73	0.835	0.0	0.8	0.0050	0.15	7.69	---	---	10.00	n/a	n/a	0.25	D1-72
BD-D1-74	5.00 'LT	NB	1635+35.00	BD1	On Grade	D1-74	0.405	0.0	0.4	0.0035	0.13	6.27	---	---	16.00	n/a	n/a	0.08	D1-79
BD-D1-79	5.00 'LT	NB	1636+26.00	BD1	On Grade	D1-79	0.502	0.1	0.6	0.0075	0.12	6.20	---	---	16.00	n/a	n/a	0.16	D1-86
BD-D1-86	5.00 'LT	NB	1637+17.00	BD1	On Grade	D1-86	0.523	0.2	0.7	0.0115	0.12	6.10	---	---	16.00	n/a	n/a	0.22	D1-80
BD-F3-1	27.00 'LT	SB	3685+04.00	BD3	On Grade	F3-1	0.062	0.0	0.1	0.0041	0.06	2.95	---	---	16.00	n/a	n/a	0.02	F4-1
BD-F3-2	27.00 'LT	SB	3686+06.00	BD3	On Grade	F3-2	0.39	0.0	0.4	0.0129	0.09	4.72	---	---	16.00	n/a	n/a	0.20	G2-1
BD-G1-2	5.00 'LT	NB	1688+14.50	BD1	On Grade	G1-2	0.589	0.2	0.8	0.0050	0.15	7.32	---	---	20.00	n/a	n/a	0.23	G13-1
BD-G1-3	5.00 'LT	NB	1689+24.00	BD1	On Grade	G1-3	0.585	0.1	0.7	0.0050	0.14	6.98	---	---	20.00	n/a	n/a	0.19	G1-2
BD-G1-4	5.00 'LT	NB	1690+34.00	BD1	On Grade	G1-4	0.503	0.0	0.5	0.0030	0.14	6.83	---	---	20.00	n/a	n/a	0.10	G1-3
BD-G1-5	5.00 'LT	NB	1692+33.00	BD1	On Grade	G1-5	0.456	0.0	0.5	0.0062	0.12	5.74	---	---	20.00	n/a	n/a	0.11	G1-6
BD-G2-1	27.00 'LT	SB	3687+32.00	BD3	On Grade	G2-1	0.673	0.0	0.9	0.0136	0.13	6.36	---	---	16.00	n/a	n/a	0.56	G2-2
BD-G2-2	27.00 'LT	SB	3688+52.00	BD3	On Grade	G2-2	0.526	0.6	1.1	0.0136	0.14	6.85	---	---	16.00	n/a	n/a	0.71	G2-3
BD-G2-3	27.00 'LT	SB	3689+61.00	BD3	On Grade	G2-3	0.588	0.7	1.3	0.0136	0.15	7.33	---	---	16.00	n/a	n/a	0.87	G2-4
BD-G2-4	27.00 'LT	SB	3690+97.00	BD3	On Grade	G2-4	0.717	0.9	1.6	0.0136	0.16	7.91	---	---	16.00	n/a	n/a	1.10	G2-5
BD-G2-5	27.00 'LT	SB	3692+37.00	BD3	On Grade	G2-5	0.745	1.1	1.8	0.0136	0.17	8.37	---	---	16.00	n/a	n/a	1.31	G2-6
BD-G2-6	27.00 'LT	SB	3693+65.50	BD3	On Grade	G2-6	0.686	1.3	2.0	0.0136	0.17	8.62	---	---	16.00	n/a	n/a	1.43	G2-7
BD-G2-7	27.00 'LT	SB	3694+65.50	BD3	On Grade	G2-7	0.537	1.4	2.0	0.0136	0.17	8.57	---	---	16.00	n/a	n/a	1.40	G6-1
BD-G6-1	27.00 'LT	SB	3696+00.00	BD3	On Grade	G6-1	0.734	1.4	2.1	0.0136	0.18	8.85	---	---	16.00	n/a	n/a	1.54	G6-2
BD-G6-2	27.00 'LT	SB	3697+14.50	BD3	On Grade	G6-2	0.612	1.5	2.2	0.0136	0.18	8.88	---	---	16.00	n/a	n/a	1.56	G6-3
BD-G6-3	27.00 'LT	SB	3698+24.50	BD3	On Grade	G6-3	0.582	1.6	2.1	0.0136	0.18	8.85	---	---	16.00	n/a	n/a	1.55	G6-4
BD-G6-4	27.00 'LT	SB	3699+34.50	BD3	On Grade	G6-4	0.575	1.5	2.1	0.0140	0.18	8.78	---	---	16.00	n/a	n/a	1.53	H2-1
BD-H1-1	5.00 'LT	NB	1693+74.50	BD1	On Grade	H1-1	0.678	0.0	0.7	0.0156	0.11	5.61	---	---	20.00	n/a	n/a	0.24	H1-2
BD-H1-2	5.00 'LT	NB	1694+64.00	BD1	On Grade	H1-2	0.456	0.2	0.7	0.0215	0.11	5.32	---	---	20.00	n/a	n/a	0.25	H1-3
BD-H1-3	5.00 'LT	NB	1695+73.00	BD1	On Grade	H1-3	0.569	0.3	0.8	0.0243	0.11	5.54	---	---	20.00	n/a	n/a	0.32	H1-4
BD-H1-4	5.00 'LT	NB	1696+98.00	BD1	On Grade	H1-4	0.678	0.3	1.0	0.0243	0.12	5.97	---	---	20.00	n/a	n/a	0.42	H1-5
BD-H1-5	5.00 'LT	NB	1698+08.00	BD1	On Grade	H1-5	0.596	0.4	1.0	0.0243	0.12	6.00	---	---	20.00	n/a	n/a	0.43	H1-6
BD-H1-6	5.00 'LT	NB	1699+18.00	BD1	On Grade	H1-6	0.591	0.4	1.0	0.0243	0.12	6.01	---	---	20.00	n/a	n/a	0.43	H4-68
BD-H2-1	27.00 'LT	SB	3700+44.50	BD3	On Grade	H2-1	0.596	0.0	0.6	0.0236	0.10	4.95	---	---	16.00	n/a	n/a	0.34	H2-2
BD-H2-2	27.00 'LT	SB	3701+64.50	BD3	On Grade	H2-2	0.642	0.3	1.0	0.0340	0.11	5.57	---	---	16.00	n/a	n/a	0.60	H2-3
BD-H2-3	27.00 'LT	SB	3702+89.50	BD3	On Grade	H2-3	0.658	0.6	1.3	0.0449	0.12	5.81	---	---	16.00	n/a	n/a	0.80	H2-4
BD-H2-4	27.00 'LT	SB	3704+14.50	BD3	On Grade	H2-4	0.681	0.8	1.5	0.0453	0.12	6.16	---	---	16.00	n/a	n/a	0.97	F2-5
BD-H4-46	17.00 'RT	SB	3721+34.00	BD1	On Grade	H4-46	0.88	0.7	1.6	0.0157	0.16	7.87	---	---	10.00	n/a	n/a	0.73	H4-12
BD-H4-47	17.00 'RT	SB	3722+55.00	BD1	On Grade	H4-47	0.917	0.6	1.5	0.0157	0.16	7.76	---	---	10.00	n/a	n/a	0.69	H4-46
BD-H4-48	17.00 'RT	SB	3723+84.50	BD1	On Grade	H4-48	0.828	0.5	1.4	0.0157	0.15	7.45	---	---	10.00	n/a	n/a	0.60	H4-47
BD-H4-49	17.00 'RT	SB	3725+03.00	BD1	On Grade	H4-49	0.861	0.4	1.2	0.0157	0.14	7.19	---	---	10.00	n/a	n/a	0.53	H4-48
BD-H4-50	17.00 'RT	SB	3726+23.50	BD1	On Grade	H4-50	0.959	0.0	1.0	0.0157	0.13	6.54	---	---	10.00	n/a	n/a	0.38	H4-49
BD-H6-3	39.00 'RT	NB	1719+34.50	BD3	On Grade	H6-3	0.929	1.5	2.4	0.0185	0.18	8.91	---	---	16.00	n/a	n/a	1.74	H4-75
BD-H6-5	39.00 'RT	NB	1720+64.50	BD3	On Grade	H6-5	0.929	1.1	2.0	0.0185	0.17	8.40	---	---	16.00	n/a	n/a	1.46	H6-3
BD-H6-6	39.00 'RT	NB	1721+94.50	BD3	On Grade	H6-6	0.73	0.0	1.6	0.0185	0.15	7.68	---	---	16.00	n/a	n/a	1.11	H6-5
BD-I3-1	45.00 'RT	NB	1725+19.00	BD3	On Grade	I3-1	1.162	0.0	1.2	0.0185	0.18	4.32	---	---	20.00	n/a	n/a	0.60	I3-2
BD-I3-2	39.00 'RT	NB	1723+99.00	BD3	On Grade	I3-2	0.929	0.6	1.5	0.0185	0.20	4.75	---	---	20.00	n/a	n/a	0.83	I3-3
BD-I3-3	39.00 'RT	NB	1722+95.00	BD3	On Grade	I3-3	0.734	0.8	1.6	0.0185	0.20	4.79	---	---	20.00	n/a	n/a	0.85	H6-6
BD-J1-3EX	33.00 'RT	183A	753+75.00	EXBD1	On Grade	J1-3EX	5.779	0.0	5.8	0.0516	0.24	7.79	---	---	20.00	n/a	n/a	3.35	J1-1EX

* - THESE INLETS ARE PLACED AT SUPERELEVATION TRANSITION AREAS AND WILL NOT NECESSARILY MEET PONDING WIDTH CRITERIA. THE INTENT OF THESE INLETS IS TO PICK UP AS MUCH CONCENTRATED FLOW AS POSSIBLE BEFORE FLOW CROSSES THE PAVEMENT AND CREATES A POTENTIAL HYDROPLANE ISSUE.

** - THESE INLETS ARE PLACED OUTSIDE OF THE PAVEMENT AND FUNCTION AS FIELD INLETS.

DESIGN

STATE OF TEXAS · BRYAN SIERSMA · 147188 · LICENSED PROFESSIONAL ENGINEER

BRYAN SIERSMA, P.E.

5/9/2024
DATE

APPROVAL

STATE OF TEXAS · DAN THOMA · 98622 · LICENSED PROFESSIONAL ENGINEER

DAN THOMA, P.E.

5/9/2024
DATE

PAPE-DAWSON ENGINEERS
SAN ANTONIO | AUSTIN | HOUSTON | FORT WORTH | DALLAS
2000 NW LOOP 410 | SAN ANTONIO, TX 78213 | 210.375.9000
TEXAS ENGINEERING FIRM #470 | TEXAS SURVEYING FIRM #10028800

2024 Texas Department of Transportation

US 183 GPL

DROP INLET COMPUTATIONS

SHEET 1 OF 6

© 2024		CONT	SECT	JOB	HIGHWAY
DS:	CK:	0151	10	001	US 183
DW:	CK:	DIST	COUNTY		SHEET NO.
		AUS	WILLIAMSON		713

DATE: 5/9/2024 8:19:51 PM
FILE: v:\bentley\dms\pd-pw-01\alysso.sage\dms07214\015110001_Drop_Inlet_01.dgn

DROP/TRAFFIC INLET COMPUTATIONS

	INLET			DROP/TRAFFIC INLET DESCRIPTION	INLET TYPE	DRAINAGE AREA	Q FROM AREA	CARRY OVER FLOW	TOTAL Q 10 YR	DROP INLET ON GRADE			DROP INLET IN SAG		ALLOWABLE PONDED WIDTH	LENGTH INLET	REQUIRED LENGTH INLET	BY PASS FLOW	BY PASS FLOW
										LONGIT-UDINAL ROAD SLOPE	DEPTH OF FLOW	PONDED WIDTH	DEPTH OF FLOW	PONDED WIDTH (TOTAL)					
	NO	OFFSET (FT)	CHAIN	STATION			NO	(CFS)	(CFS)	(CFS)	(FT/FT)	(FT)	(FT)	(FT)	(FT)	(FT)	(FT)	(FT)	(FT)	(CFS)	NODE
	BD-J5-2EX	102.00 'LT	183A	754+43.00	EXBD1	On Grade	J5-2EX	6.283	0.0	6.3	0.0146	0.32	10.19	---	---	20.00	n/a	n/a	3.51	J2-1EX
	BI-C14-1	29.50 'LT	NBMLX1431	18+29.00	PMBD 5	On Grade	C14-1	0.823	0.9	1.8	0.0085	0.20	7.82	---	---	22.00	n/a	20.67	0.63	C13-1
	BI-C14-2	29.50 'LT	NBMLX1431	19+02.50	PMBD 5	On Grade	C14-2	1.019	1.3	2.4	0.0075	0.22	8.91	---	---	20.00	n/a	22.52	0.94	C14-1
	BI-C14-3	29.50 'LT	NBMLX1431	20+00.00	PMBD 5	On Grade	C14-3	3.041	0.0	3.0	0.0069	0.25	9.97	---	---	16.00	n/a	24.48	1.33	C14-2
	BI-C3-1	74.65 'RT	183A	617+61.00	PMBD 4	On Grade	C3-1	0.528	0.3	0.8	0.0186	0.13	5.15	---	---	16.00	n/a	19.30	0.27	C3-2
	BI-C3-2	74.65 'RT	183A	618+38.00	PMBD 4	On Grade	C3-2	0.571	0.3	0.8	0.0180	0.13	5.18	---	---	16.00	n/a	17.96	0.24	C3-3
	BI-C3-3	74.60 'RT	183A	619+07.00	PMBD 4	On Grade	C3-3	0.58	0.2	0.8	0.0184	0.13	5.20	---	---	16.00	n/a	18.20	0.24	C3-4
	BI-C3-4	73.65 'RT	183A	620+15.50	PMBD 4	On Grade	C3-4	0.873	0.2	1.1	0.0155	0.15	6.16	---	---	16.00	n/a	20.08	0.38	C3-5
	BI-C3-5	72.00 'RT	183A	621+04.50	PMBD 4	On Grade	C3-5	0.713	0.4	1.1	0.0116	0.16	6.49	---	---	16.00	n/a	18.34	0.33	C3-10
	BI-C3-6	69.15 'RT	183A	622+04.50	PMBD 4	On Grade	C3-6	0.409	0.1	0.5	0.0080	0.12	4.93	---	---	16.00	n/a	11.93	0.04	C3-7
	BI-C3-7	65.50 'RT	183A	623+03.00	PMBD 4	On Grade	C3-7	0.397	0.0	0.4	0.0040	0.13	5.42	---	---	16.00	n/a	9.32	0.00	C3-8
	BI-C3-9	67.50 'RT	183A	622+52.00	PMBD 4	On Grade	C3-9	0.449	0.0	0.4	0.0040	0.13	5.48	---	---	16.00	n/a	9.43	0.00	C3-7
	BI-C3-10	70.75 'RT	183A	621+52.00	PMBD 4	On Grade	C3-10	0.443	0.3	0.8	0.0040	0.16	6.70	---	---	16.00	n/a	11.82	0.06	C3-6
	BI-C3-13	74.60 'RT	183A	617+00.87	PMBD 4	On Grade	C3-13	0.503	0.4	0.9	0.0190	0.14	5.42	---	---	16.00	n/a	19.35	0.30	C3-1
	BI-C3-14	74.50 'RT	183A	616+33.50	PMBD 4	On Grade	C3-14	0.419	0.7	1.1	0.0181	0.15	6.07	---	---	16.00	n/a	21.35	0.42	C3-13
	BI-C3-15	74.60 'RT	183A	615+85.00	PMBD 4	On Grade	C3-15	0.383	1.2	1.6	0.0175	0.16	7.19	---	---	16.00	n/a	25.22	0.72	C3-14
	BI-C3-16	74.60 'RT	183A	615+38.00	PMBD 4	On Grade	C3-16	2.414	0.0	2.4	0.0150	0.20	8.47	---	---	16.00	n/a	28.11	1.21	C3-15
	BI-D1-2	69.90 'LT	183A	644+02.00	PMBD 4	On Grade	D1-2	1.148	0.4	1.5	0.0071	0.19	8.05	---	---	30.00	n/a	18.22	0.45	D1-87
	BI-D1-4	69.63 'LT	183A	644+95.00	PMBD 4	Sag	D1-4	0.708	0.5	1.2	---	---	---	0.19	8.06	30.00	n/a	17.01	---	---
	BI-D1-8	69.30 'LT	183A	646+15.00	PMBD 4	On Grade	D1-8	1.042	1.2	2.3	0.0053	0.24	9.89	---	---	30.00	n/a	19.77	0.77	D1-88
	BI-D1-10	69.00 'LT	183A	647+01.00	PMBD 4	On Grade	D1-10	2.344	0.7	3.1	0.0061	0.26	10.52	---	---	30.00	n/a	22.74	1.24	D1-8
	BI-D1-22	68.38 'LT	183A	649+22.00	PMBD 4	On Grade	D1-22	1.916	0.8	2.7	0.0030	0.29	11.40	---	---	30.00	n/a	17.40	0.73	D1-10
	BI-D1-24	67.85 'LT	183A	651+01.00	PMBD 4	On Grade	D1-24	2.164	1.0	3.1	0.0023	0.32	12.59	---	---	30.00	n/a	17.03	0.81	D1-22
	BI-D1-28	57.00 'RT	183A	651+01.00	PMBD 4	On Grade	D1-28	2.188	0.0	2.2	0.0023	0.26	11.40	---	---	16.00	n/a	16.12	0.50	D1-12EX
	BI-D1-30	67.25 'LT	183A	653+02.00	PMBD 4	On Grade	D1-30	2.087	0.6	2.7	0.0050	0.26	10.44	---	---	30.00	n/a	20.44	0.95	D1-24
	BI-D1-31	66.60 'LT	183A	655+01.00	PMBD 4	On Grade	D1-31	1.989	0.0	2.0	0.0058	0.22	9.12	---	---	30.00	n/a	18.91	0.62	D1-30
	BI-D1-35	70.21 'LT	183A	643+00.00	PMBD 4	On Grade	D1-35	1.065	0.6	1.7	0.0042	0.22	9.10	---	---	30.00	n/a	16.03	0.38	D1-2
	BI-D1-36	70.50 'LT	183A	642+05.00	PMBD 4	On Grade	D1-36	1.289	0.7	2.0	0.0054	0.23	9.30	---	---	30.00	n/a	18.60	0.61	D1-35
	BI-D1-37	70.25 'LT	183A	640+84.00	PMBD 4	On Grade	D1-37	1.435	0.8	2.3	0.0048	0.24	9.97	---	---	30.00	n/a	18.96	0.72	D1-36
	BI-D1-38	68.51 'LT	183A	639+48.00	PMBD 4	On Grade	D1-38	1.348	0.4	1.8	0.0200	0.17	6.98	---	---	30.00	n/a	26.32	0.85	D1-37
	BI-D1-49	6.00 'LT	NB	1641+89.00	PMBD 4	On Grade	D1-49	1.031	0.6	1.7	0.0139	0.18	7.16	---	---	20.00	n/a	22.55	0.67	D1-50
	BI-D1-50	6.00 'LT	NB	1643+88.00	PMBD 4	On Grade	D1-50	1.186	0.7	1.9	0.0064	0.22	8.61	---	---	20.00	n/a	18.67	0.57	D1-51
	BI-D1-51	6.00 'LT	NB	1644+79.00	PMBD 4	Sag	D1-51	1.501	0.6	2.1	---	---	---	0.25	9.91	20.00	n/a	15.61	---	---
	BI-D1-53	6.00 'LT	NB	1652+86.00	PMBD 4	On Grade	D1-53	1.429	0.0	1.4	0.0050	0.20	8.61	---	---	20.00	n/a	16.37	0.34	D1-32
	BI-D1-60	6.00 'RT	SB	3653+30.00	PMBD 4	On Grade	D1-60	1.04	0.0	1.1	0.0061	0.18	7.04	---	---	15.00	n/a	14.60	0.19	D1-29EX
	BI-D1-61	6.00 'RT	SB	3655+26.00	PMBD 4	On Grade	D1-61	0.565	0.0	0.6	0.0054	0.14	5.70	---	---	15.00	n/a	10.76	0.02	D1-60
	BI-D1-75	26.00 'LT	SB	3639+40.00	PMBD 4	On Grade	D1-75	0.698	0.4	1.1	0.0076	0.16	7.77	---	---	10.00	n/a	17.76	0.30	D1-77
*	BI-D1-76	26.00 'LT	SB	3642+30.00	PMBD 4	On Grade	D1-76	0.11	0.0	0.2	0.0122	0.04	8.14	---	---	10.00	n/a	20.73	0.05	D1-6EX
	BI-D1-77	26.00 'LT	SB	3640+63.00	PMBD 4	On Grade	D1-77	0.7	0.3	1.0	0.0157	0.13	6.63	---	---	10.00	n/a	21.55	0.38	D1-92
	BI-D1-81	6.00 'LT	NB	1640+03.12	PMBD 4	On Grade	D1-81	1.623	0.0	1.6	0.0139	0.18	7.09	---	---	20.00	n/a	22.28	0.64	D1-49
	BI-D1-87	69.70 'LT	183A	644+68.00	PMBD 4	On Grade	D1-87	0.696	0.4	1.1	0.0028	0.21	8.61	---	---	30.00	n/a	12.20	0.10	D1-4
	BI-D1-88	69.50 'LT	183A	645+18.00	PMBD 4	On Grade	D1-88	0.996	0.8	1.8	0.0035	0.23	9.70	---	---	30.00	n/a	15.63	0.38	D1-4
	BI-D1-92	26.00 'LT	SB	3641+27.50	PMBD 4	On Grade	D1-92	0.355	0.4	0.7	0.0157	0.12	6.06	---	---	10.00	n/a	19.39	0.24	D1-93
	BI-D1-93	26.00 'LT	SB	3641+60.00	PMBD 4	On Grade	D1-93	0.178	0.2	0.4	0.0157	0.09	5.10	---	---	10.00	n/a	15.89	0.09	D1-94
	BI-D1-94	26.00 'LT	SB	3641+90.00	PMBD 4	On Grade	D1-94	0.157	0.1	0.2	0.0142	0.07	5.54	---	---	10.00	n/a	15.85	0.06	D1-95
	BI-D1-95	26.00 'LT	SB	3642+10.00	PMBD 4	On Grade	D1-95	0.11	0.1	0.2	0.0131	0.05	6.21	---	---	10.00	n/a	16.59	0.04	D1-76
	BI-F2-1	20.00 'LT	NBEBCR	24+40.00	PMBD 4	On Grade	F2-1	0.602	0.1	0.7	0.0500	0.10	4.11	---	---	14.00	n/a	24.72	0.32	G9-4EX
	BI-F5-1	26.00 'LT	SB	3678+10.50	PMBD 4	On Grade	F5-1	0.233	0.0	0.2	0.0036	0.10	4.98	---	---	18.00	n/a	7.91	0.00	DITCH F-COU
	BI-F5-2	26.00 'LT	SB	3678+97.00	PMBD 4	On Grade	F5-2	0.476	0.6	1.0	0.0036	0.17	8.62	---	---	18.00	n/a	14.63	0.18	F5-3
	BI-F5-3	26.00 'LT	SB	3678+54.00	PMBD 4	On Grade	F5-3	0.223	0.2	0.4	0.0036	0.12	6.09	---	---	18.00	n/a	9.91	0.00	F5-1
*	BI-F6-9	0.00 'RT	NBEBCR	22+65.46	PMBD 4	On Grade	F6-9	0.125	0.0	0.2	0.0500	0.03	8.75	---	---	15.00	n/a	46.75	0.11	F2-1
	BI-F6-10	0.00 'RT	NBEBCR	20+95.50	PMBD 4	On Grade	F6-10	0.236	0.1	0.4	0.0369	0.08	3.74	---	---	14.00	n/a	18.73	0.11	F6-37
	BI-F6-11	0.00 'RT	NBEBCR	19+67.00	PMBD 4	On Grade	F6-11	0.383	0.1	0.5	0.0258	0.09	4.56	---	---	14.00	n/a	19.44	0.16	F6-38
	BI-F6-12	0.00 'RT	NBEBCR	18+57.00	PMBD 4	On Grade	F6-12	0.457	0.0	0.5	0.0163	0.10	4.88	---	---	14.00	n/a	16.60	0.12	F6-11
	BI-F6-13	0.00 'RT	NBEBCR	17+30.50	PMBD 4	On Grade	F6-13	0.335	0.0	0.4	0.0068	0.10	5.15	---	---	14.00	n/a	11.28	0.02	F6-12
	BI-F6-14	51.95 'RT	NB	1681+59.55	PMBD 4	On Grade	F6-14	0.332	0.0	0.4	0.0068	0.10	5.15	---	---	9.00	n/a	11.28	0.02	F6-13
	BI-F6-15	51.75 'RT	NB	1681+19.50	PMBD 4	On Grade	F6-15	0.341	0.0	0.4	0.0068	0.10	5.21	---	---	9.00	n/a	11.43	0.02	F6-14
	BI-F6-16	51.42 'RT	NB	1680+78.50	PMBD 4	On Grade	F6-16	0.348	0.0	0.4	0.0068	0.11	5.26	---	---	9.00	n/a	11.55	0.03	F6-15
	BI-F6-17	50.90 'RT	NB	1680+40.75	PMBD 4	On Grade	F6-17	0.366	0.0	0.4	0.0068	0.11	5.31	---	---	9.00	n/a	11.68	0.03	F6-16
	BI-F6-18	50.15 'RT	NB	1679+96.00	PMBD 4	On Grade	F6-18	0.33	0.0	0.4	0.0068	0.10	5.14	---	---	9.00	n/a	11.26	0.02	F6-17
	BI-F6-19	49.30 'RT	NB	1679+58.75	PMBD 4	On Grade	F6-19	0.343	0.0	0.4	0.0068	0.10	5.22	---	---	9.00	n/a	11.48	0.02	F6-18

* - THESE INLETS ARE PLACED AT SUPERELEVATION TRANSITION AREAS AND WILL NOT NECESSARILY MEET PONDING WIDTH CRITERIA. THE INTENT OF THESE INLETS IS TO PICK UP AS MUCH CONCENTRATED FLOW AS POSSIBLE BEFORE FLOW CROSSES THE PAVEMENT AND CREATES A POTENTIAL HYDROPLANE ISSUE.

** - THESE INLETS ARE PLACED OUTSIDE OF THE PAVEMENT AND FUNCTION AS FIELD INLETS.

DESIGN

STATE OF TEXAS · BRYAN SIERSMA · 147188 · LICENSED PROFESSIONAL ENGINEER

BRYAN SIERSMA, P.E.

5/9/2024
DATE

APPROVAL

STATE OF TEXAS · DAN THOMA · 98622 · LICENSED PROFESSIONAL ENGINEER

DAN THOMA, P.E.

5/9/2024
DATE

PAPE-DAWSON ENGINEERS

SAN ANTONIO | AUSTIN | HOUSTON | FORT WORTH | DALLAS
2000 NW LOOP 410 | SAN ANTONIO, TX 78213 | 210.375.9000
TEXAS ENGINEERING FIRM #470 | TEXAS SURVEYING FIRM #10028800

2024
Texas Department of Transportation

US 183 GPL

DROP INLET COMPUTATIONS

© 2024

CONT	SECT	JOB	HIGHWAY
0151	10	001	US 183
DIST	COUNTY		SHEET NO.
AUS	WILLIAMSON		714

DS: CK: DW: CK:

DATE: 5/9/2024 8:20:10 PM
FILE: v:\bentley\dms\pd-pw-01\alysso.sage\dms07214\015110001_Drop_Inlet_02.dgn

DROP/TRAFFIC INLET COMPUTATIONS

	INLET			DROP/TRAFFIC INLET DESCRIPTION	INLET TYPE	DRAINAGE AREA	Q FROM AREA	CARRY OVER FLOW	TOTAL Q 10 YR	DROP INLET ON GRADE			DROP INLET IN SAG		ALLOWABLE PONDED WIDTH	LENGTH INLET	REQUIRED LENGTH INLET	BY PASS FLOW	BY PASS FLOW
	NO	OFFSET (FT)	CHAIN	STATION			NO	(CFS)	(CFS)	(CFS)	LONGIT-UDINAL ROAD SLOPE (FT/FT)	DEPTH OF FLOW (FT)	PONDED WIDTH (FT)	DEPTH OF FLOW (FT)	PONDED WIDTH (TOTAL) (FT)	(FT)	(FT)	(FT)	(CFS)	NODE
	BI-F6-20	48.30 'RT	NB	1679+20.00	PMBD 4	On Grade	F6-20	0.353	0.0	0.4	0.0068	0.11	5.30	---	---	9.00	n/a	11.67	0.03	F6-19
	BI-F6-21	47.10 'RT	NB	1678+79.50	PMBD 4	On Grade	F6-21	0.371	0.0	0.4	0.0068	0.11	5.40	---	---	9.00	n/a	11.90	0.03	F6-20
	BI-F6-22	45.40 'RT	NB	1678+31.75	PMBD 4	On Grade	F6-22	0.378	0.0	0.4	0.0068	0.11	5.40	---	---	9.00	n/a	11.91	0.03	F6-21
	BI-F6-23	43.70 'RT	NB	1677+83.75	PMBD 4	On Grade	F6-23	0.331	0.0	0.4	0.0068	0.11	5.27	---	---	9.00	n/a	11.59	0.03	F6-22
	BI-F6-24	42.30 'RT	NB	1677+40.00	PMBD 4	On Grade	F6-24	0.33	0.1	0.5	0.0068	0.11	5.65	---	---	9.50	n/a	12.53	0.05	F6-23
	BI-F6-25	41.10 'RT	NB	1676+97.50	PMBD 4	On Grade	F6-25	0.327	0.4	0.7	0.0068	0.13	6.56	---	---	10.00	n/a	14.81	0.13	F6-24
	BI-F6-26	40.10 'RT	NB	1676+51.16	PMBD 4	On Grade	F6-26	0.699	0.5	1.2	0.0068	0.16	8.02	---	---	10.00	n/a	18.56	0.35	F6-25
	BI-F6-27	38.68 'RT	NB	1675+62.70	PMBD 4	On Grade	F6-27	0.771	0.6	1.4	0.0068	0.17	8.52	---	---	10.00	n/a	19.87	0.46	F6-26
	BI-F6-29	38.00 'RT	NB	1674+55.00	PMBD 4	On Grade	F6-29	0.977	0.6	1.6	0.0068	0.18	9.05	---	---	10.00	n/a	21.26	0.60	F6-27
	BI-F6-30	38.00 'RT	NB	1673+20.00	PMBD 4	On Grade	F6-30	0.974	0.6	1.6	0.0089	0.17	8.49	---	---	10.00	n/a	22.76	0.63	F6-29
	BI-F6-31	38.00 'RT	NB	1671+85.00	PMBD 4	On Grade	F6-31	0.961	0.5	1.4	0.0101	0.16	8.05	---	---	10.00	n/a	22.78	0.58	F6-30
	BI-F6-32	38.00 'RT	NB	1670+50.00	PMBD 4	On Grade	F6-32	0.856	0.4	1.2	0.0101	0.15	7.63	---	---	10.00	n/a	21.46	0.47	F6-31
	BI-F6-33	38.45 'RT	NB	1669+30.00	PMBD 4	On Grade	F6-33	1.09	0.0	1.1	0.0101	0.15	7.28	---	---	12.00	n/a	20.35	0.38	F6-32
	BI-F6-35	0.00 'RT	NBEBCR	21+95.25	PMBD 4	On Grade	F6-35	0.146	0.1	0.2	0.0455	0.06	3.12	---	---	14.00	n/a	16.98	0.06	F6-36
	BI-F6-36	0.00 'RT	NBEBCR	22+31.00	PMBD 4	On Grade	F6-36	0.131	0.1	0.2	0.0486	0.06	2.83	---	---	14.00	n/a	15.77	0.04	F6-9
	BI-F6-37	0.00 'RT	NBEBCR	21+53.00	PMBD 4	On Grade	F6-37	0.207	0.1	0.3	0.0419	0.07	3.51	---	---	14.00	n/a	18.55	0.10	F6-35
	BI-F6-38	0.00 'RT	NBEBCR	20+30.00	PMBD 4	On Grade	F6-38	0.228	0.2	0.4	0.0312	0.08	4.01	---	---	14.00	n/a	18.57	0.12	F6-10
	BI-G5-6	16.00 'RT	BCL	504+60.00	PMBD 4	On Grade	G10-1	0.716	0.2	0.9	0.0080	0.14	7.02	---	---	8.00	n/a	17.34	0.24	H4-40
	BI-G5-12	13.00 'RT	BCL	503+00.00	PMBD 4	On Grade	G10-3	0.844	0.2	1.0	0.0116	0.17	4.69	---	---	7.00	n/a	14.22	0.17	G10-1
	BI-H4-8	19.00 'RT	SBMLEBCL	31+39.50	PMBD 6	On Grade	H4-8	1.686	0.2	1.9	0.0058	0.26	6.94	---	---	10.00	n/a	14.51	0.33	H4-15
	BI-H4-113	26.00 'RT	NB	1706+75.00	PMBD 4	On Grade	H4-113	0.215	0.2	0.4	0.0220	0.09	4.41	---	---	16.00	n/a	16.20	0.09	H4-69
	BI-H4-114	20.00 'RT	SBEBCL	17+15.00	PMBD 4	On Grade	H4-114	0.35	0.0	0.4	0.0023	0.17	4.06	---	---	14.00	n/a	4.98	0.00	H4-24
	BI-H4-115	20.00 'RT	SBEBCL	17+75.00	PMBD 4	On Grade	H4-115	0.241	0.2	0.4	0.0022	0.18	4.34	---	---	14.00	n/a	5.34	0.00	H4-24
	BI-H4-116	6.00 'RT	SB	3713+60.00	PMBD 4	On Grade	H4-116	0.33	0.0	0.3	0.0026	0.16	3.85	---	---	18.00	n/a	5.08	0.00	H4-25
	BI-H4-120	89.33 'RT	183A	710+75.00	PMBD 4	On Grade	H4-120	0.799	0.0	0.8	0.0145	0.14	4.86	---	---	24.00	n/a	15.18	0.16	H4-55
	BI-H4-122	26.00 'RT	NB	1706+34.50	TY MSE2	On Grade	H4-122	1.39	0.3	1.7	0.0253	0.13	8.81	---	---	16.00	n/a	n/a	0.18	H4-113
	BI-H4-15	20.00 'RT	SBMLEBCL	32+08.00	PMBD 4	Sag	H4-15	2.488	2.5	5.0	---	---	---	0.39	9.50	12.00	n/a	9.43	---	---
	BI-H4-16	20.00 'RT	SBMLEBCL	32+93.00	PMBD 4	On Grade	H4-16	2.627	2.0	4.7	0.0189	0.31	6.79	---	---	12.00	n/a	26.44	2.21	H4-15
	BI-H4-23	20.00 'RT	SBMLEBCL	30+34.00	PMBD 4	On Grade	H4-23	0.991	0.0	1.0	0.0126	0.16	5.35	---	---	12.00	n/a	15.77	0.22	H4-8
	BI-H4-24	20.00 'RT	SBEBCL	17+45.50	PMBD 4	Sag	H4-24	0.233	0.0	0.2	---	---	---	0.08	2.48	14.00	n/a	9.12	---	---
	BI-H4-25	6.00 'RT	SB	3713+30.00	PMBD 4	Sag	H4-25	0.32	0.2	0.5	---	---	---	0.13	3.02	18.00	n/a	9.12	---	---
	BI-H4-26	5.00 'RT	SB	3713+08.75	PMBD 6	On Grade	H4-26	1.018	0.0	1.0	0.0018	0.27	6.31	---	---	18.00	n/a	7.27	0.00	H4-25
	BI-H4-53	20.00 'RT	SBMLEBCL	22+63.75	PMBD 4	Sag	H4-53	0.871	0.4	1.2	---	---	---	0.19	9.60	12.00	n/a	9.43	---	---
	BI-H4-54	20.00 'RT	SBMLEBCL	23+58.20	PMBD 4	On Grade	H4-54	1.504	0.0	1.5	0.0037	0.20	10.12	---	---	12.00	n/a	16.64	0.37	H4-53
	BI-H4-55	89.33 'RT	183A	710+89.00	PMBD 4	On Grade	H4-55	0.099	0.2	0.3	0.0155	0.10	3.31	---	---	24.00	n/a	10.19	0.00	H4-8
	BI-H4-65	12.75 'LT	BCL	551+00.00	PMBD 4	On Grade	H4-65	0.735	0.0	0.7	0.0047	0.15	7.00	---	---	12.75	n/a	12.43	0.07	H4-95
	BI-H4-66	12.00 'LT	BCL	549+00.00	PMBD 4	On Grade	H4-66	0.488	0.0	0.5	0.0047	0.14	6.15	---	---	12.00	n/a	10.74	0.02	H4-77
	BI-H4-67	6.75 'LT	BCL	546+78.00	PMBD 4	On Grade	H4-67	0.437	0.1	0.5	0.0047	0.09	11.60	---	---	6.75	n/a	19.76	0.18	H3-4
	BI-H4-69	26.00 'RT	NB	1706+95.00	PMBD 4	On Grade	H4-69	0.103	0.1	0.2	0.0204	0.07	3.43	---	---	16.00	n/a	11.76	0.01	H4-74
	BI-H4-70	20.00 'LT	NBXBCL	19+41.00	PMBD 4	On Grade	H4-70	1.408	0.0	1.4	0.0099	0.21	5.73	---	---	12.00	n/a	15.36	0.29	H4-64
*	BI-H4-71	0.00 'RT	NBXBCL	22+92.75	PMBD 4	On Grade	H4-71	0.359	0.0	0.4	0.0078	0.10	5.16	---	---	12.00	n/a	11.36	0.02	H4-70
	BI-H4-72	0.00 'RT	NBXBCL	24+96.00	PMBD 4	On Grade	H4-72	0.419	0.0	0.4	0.0094	0.11	5.28	---	---	14.00	n/a	12.81	0.05	H4-73
	BI-H4-73	0.00 'RT	NBXBCL	26+17.75	PMBD 4	On Grade	H4-73	0.482	0.0	0.5	0.0196	0.12	3.67	---	---	14.00	n/a	13.07	0.07	H4-74
	BI-H4-74	49.00 'RT	NB	1709+47.75	PMBD 4	Sag	H4-74	1.695	0.2	1.9	---	---	---	0.24	4.70	9.00	n/a	38.85	---	---
	BI-H4-77	10.50 'LT	BCL	548+33.50	PMBD 4	On Grade	H4-77	0.319	0.0	0.3	0.0047	0.12	5.24	---	---	12.00	n/a	8.97	0.00	H4-94
	BI-H4-94	9.00 'LT	BCL	547+77.50	PMBD 4	On Grade	H4-94	0.779	0.0	0.8	0.0047	0.16	7.16	---	---	12.00	n/a	12.74	0.09	H4-67
	BI-H4-95	13.75 'LT	BCL	549+97.50	PMBD 4	On Grade	H4-95	0.504	0.1	0.6	0.0047	0.14	6.39	---	---	12.00	n/a	11.22	0.03	H4-66
	BI-H4-96	52.15 'RT	NB	1708+69.00	PMBD 4	On Grade	H4-96	1.497	0.0	1.5	0.0063	0.26	5.17	---	---	6.00	n/a	11.20	0.08	H4-74
	BI-H4-97	45.50 'RT	NB	1710+26.50	PMBD 4	On Grade	H4-97	1.016	0.0	1.0	0.0065	0.22	4.44	---	---	9.00	n/a	9.62	0.00	H4-74
	BI-I1-3	6.00 'RT	SB	3741+39.00	PMBD 4	On Grade	I1-3	0.563	0.0	0.6	0.0178	0.14	3.29	---	---	16.00	n/a	11.28	0.03	I1-4
	BI-I1-6	6.00 'RT	SB	3739+74.00	PMBD 4	On Grade	I1-6	1.42	0.0	1.4	0.0178	0.20	4.65	---	---	16.00	n/a	16.64	0.35	I1-9
	BI-I1-9	6.00 'RT	SB	3738+01.00	PMBD 4	On Grade	I1-9	0.947	0.4	1.3	0.0157	0.19	4.60	---	---	16.00	n/a	15.41	0.27	I1-12
	BI-I1-12	6.00 'RT	SB	3735+94.00	PMBD 4	On Grade	I1-12	1.094	0.3	1.4	0.0157	0.20	4.69	---	---	16.00	n/a	15.73	0.30	I1-15
	BI-I1-15	6.00 'RT	SB	3734+20.00	PMBD 4	On Grade	I1-15	0.926	0.3	1.2	0.0157	0.19	4.50	---	---	16.00	n/a	15.03	0.24	I1-16
	BI-I1-16	12.25 'RT	SB	3731+68.00	PMBD 4	On Grade	I1-16	1.495	0.2	1.7	0.0157	0.22	5.13	---	---	16.00	n/a	17.40	0.47	I1-19
	BI-I2-3	26.00 'RT	NB	1726+54.00	PMBD 4	On Grade	I2-3	0.46	0.0	0.5	0.0185	0.13	3.14	---	---	20.00	n/a	10.93	0.02	I3-1
	BI-I2-4	0.00 'RT	NBMLXBCL	13+22.00	PMBD 4	On Grade	I2-4	0.491	0.0	0.5	0.0175	0.14	2.81	---	---	8.00	n/a	9.54	0.00	I3-1
	BI-I2-11	26.00 'RT	NB	1727+42.50	PMBD 4	On Grade	I2-11	0.623	0.0	0.6	0.0185	0.14	3.39	---	---	20.00	n/a	11.90	0.05	I2-3
**	GI-C1-1	62.25 'RT	NB	1615+42.00	PSL FG 4x4	Sag	C1-1	5.93	0.0	5.9	---	---	---	0.38	2.74	11.00	n/a	n/a	---	---
**	GI-C1-7	70.25 'RT	NB	1623+06.75	PSL FG-SFG 4x4	Sag	C1-7	11.865	0.0	11.9	---	---	---	0.60	3.32	14.50	n/a	n/a	---	---
	GI-C1-13EX	6.00 'LT	183A	623+01.00	DITIS	Sag	C1-13EX	3.259	0.0	3.3	---	---	---	0.22	8.15	10.00	n/a	n/a	---	---

* - THESE INLETS ARE PLACED AT SUPERELEVATION TRANSITION AREAS AND WILL NOT NECESSARILY MEET PONDING WIDTH CRITERIA. THE INTENT OF THESE INLETS IS TO PICK UP AS MUCH CONCENTRATED FLOW AS POSSIBLE BEFORE FLOW CROSSES THE PAVEMENT AND CREATES A POTENTIAL HYDROPLANE ISSUE.

** - THESE INLETS ARE PLACED OUTSIDE OF THE PAVEMENT AND FUNCTION AS FIELD INLETS.

DESIGN

STATE OF TEXAS · BRYAN SIERSMA · 147188 · LICENSED PROFESSIONAL ENGINEER

BRYAN SIERSMA, P.E.

5/9/2024
DATE

APPROVAL

STATE OF TEXAS · DAN THOMA · 98622 · LICENSED PROFESSIONAL ENGINEER

DAN THOMA, P.E.

5/9/2024
DATE

PAPE-DAWSON ENGINEERS

SAN ANTONIO | AUSTIN | HOUSTON | FORT WORTH | DALLAS
2000 NW LOOP 410 | SAN ANTONIO, TX 78213 | 210.375.9000
TEXAS ENGINEERING FIRM #470 | TEXAS SURVEYING FIRM #10028800

2024
Texas Department of Transportation

US 183 GPL

DROP INLET COMPUTATIONS

SHEET 3 OF 6

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DS:	CK:	CONT	SECT	JOB	HIGHWAY
		0151	10	001	US 183
DW:	CK:	DIST	COUNTY		SHEET NO.
		AUS	WILLIAMSON		715

DATE: 5/9/2024 8:20:21 PM
FILE: v:\bentley\dms\pd-pw-01\alysso.sage\dms07214\015110001_Drop_Inlet_03.dgn

DROP/TRAFFIC INLET COMPUTATIONS

	INLET				DROP/TRAFFIC INLET DESCRIPTION	INLET TYPE	DRAINAGE AREA	Q FROM AREA	CARRY OVER FLOW	TOTAL Q 10 YR	DROP INLET ON GRADE			DROP INLET IN SAG		ALLOWABLE PONDED WIDTH	LENGTH INLET	REQUIRED LENGTH INLET	BY PASS FLOW	BY PASS FLOW
	NO	OFFSET (FT)	CHAIN	STATION			NO	(CFS)	(CFS)	(CFS)	LONGIT-UDINAL ROAD SLOPE (FT/FT)	DEPTH OF FLOW (FT)	PONDED WIDTH (FT)	DEPTH OF FLOW (FT)	PONDED WIDTH (TOTAL) (FT)	(FT)	(FT)	(FT)	(CFS)	NODE
**	GI-C14-6	50.75 'LT	SB	3628+14.98	PSL FG 4x4	Sag	C14-6	18.185	0.0	18.2	---	---	---	0.79	4.58	15.00	n/a	n/a	---	---
	GI-D1-3	55.75 'RT	183A	644+93.50	PSL FG 5x6 w 3x3 gr	Sag	D1-3	0.586	0.2	0.8	---	---	---	0.12	5.73	16.00	n/a	n/a	---	---
	GI-D1-9	56.00 'RT	183A	647+01.30	PSL FG 3x5 w 3x3 gr	On Grade	D1-9	1.36	0.4	1.8	0.0061	0.20	8.86	---	---	16.00	n/a	n/a	0.34	D1-7EX
	GI-D1-12EX	56.60 'RT	183A	648+70.35	GRAAD4S	On Grade	D1-12EX	1.957	0.5	2.5	0.0095	0.22	8.51	---	---	16.00	n/a	n/a	0.45	D1-9
	GI-D1-13EX	20.00 'RT	SB	3646+73.50	GRAAD4S	On Grade	D1-13EX	1.4	0.0	1.4	0.0063	0.20	7.13	---	---	16.00	n/a	n/a	0.15	D1-6EX
	GI-D1-14EX	6.00 'RT	SB	3648+98.90	GRAAD4S	On Grade	D1-14EX	0.893	0.0	0.9	0.0040	0.18	6.99	---	---	14.00	n/a	n/a	0.06	D1-15EX
	GI-D1-15EX	6.05 'RT	SB	3648+46.70	GRAAD4S	On Grade	D1-15EX	0.372	0.1	0.4	0.0040	0.14	5.24	---	---	14.00	n/a	n/a	0.01	D1-13EX
	GI-D1-16EX	20.50 'LT	NB	1646+29.00	GRAAD4S	On Grade	D1-16EX	1.067	0.0	1.1	0.0050	0.17	7.70	---	---	26.00	n/a	n/a	0.11	D1-32
	GI-D1-17EX	6.25 'LT	NB	1647+64.75	GRAAD4S	On Grade	D1-17EX	0.437	0.1	0.5	0.0050	0.14	5.70	---	---	20.00	n/a	n/a	0.02	D1-16EX
	GI-D1-18EX	6.25 'LT	NB	1648+27.25	GRAAD4S	On Grade	D1-18EX	1.125	0.0	1.1	0.0050	0.18	7.48	---	---	20.00	n/a	n/a	0.11	D1-17EX
	GI-D1-19EX	20.20 'LT	NB	1649+91.35	GRAAD4S	Sag	D1-19EX	2.274	0.0	2.3	---	---	---	0.16	8.43	24.00	n/a	n/a	---	---
	GI-D1-1EX	56.50 'RT	183A	644+01.00	GRAAD4S	On Grade	D1-1EX	1.098	0.0	1.1	0.0071	0.16	6.31	---	---	16.00	n/a	n/a	0.12	D1-89
	GI-D1-29EX	20.00 'RT	SB	3650+35.50	GRAAD4S	Sag	D1-29EX	2.035	0.2	2.2	---	---	---	0.16	8.83	26.00	n/a	n/a	---	---
**	GI-D1-40	85.00 'LT	183A	644+95.00	PSL FG 4x4	Sag	D1-40	4.99	0.0	5.0	---	---	---	0.34	13.40	14.75	n/a	n/a	---	---
**	GI-D1-57	91.50 'RT	183A	644+93.50	PSL FG 4x4	Sag	D1-57	14.248	0.5	14.8	---	---	---	0.69	27.66	32.75	n/a	n/a	---	---
	GI-D1-7EX	56.57 'RT	183A	646+01.30	GRAAD4S	On Grade	D1-7EX	0.84	0.3	1.2	0.0032	0.20	8.40	---	---	16.00	n/a	n/a	0.11	D1-90
**	GI-D1-82	45.00 'LT	SB	3639+40.00	PSL FG-SFG 3x5	Sag	D1-82	0.668	0.0	0.7	---	---	---	0.09	1.42	10.00	n/a	n/a	---	---
	GI-D1-89	55.75 'RT	183A	644+68.00	PSL FG 5x6 w 3x3 gr	On Grade	D1-89	0.621	0.1	0.7	0.0022	0.17	8.35	---	---	16.00	n/a	n/a	0.08	D1-3
	GI-D1-90	56.00 'RT	183A	645+18.00	PSL FG 4x4 w 3x3 gr	On Grade	D1-90	0.727	0.1	0.8	0.0022	0.18	8.75	---	---	16.00	n/a	n/a	0.10	D1-3
**	GI-E1-1	39.75 'RT	NB	1657+17.50	PSL FG-SFG 3x5	Sag	E1-1	5.303	0.0	5.3	---	---	---	0.35	2.97	8.00	n/a	n/a	---	---
**	GI-E1-3	33.10 'RT	SBMLXBCR	15+58.50	PSL FG-SFG 3x5	Sag	E1-3	4.127	0.0	4.1	---	---	---	0.30	2.81	11.00	n/a	n/a	---	---
**	GI-E1-4	12.00 'RT	SB	3657+62.50	PSL FG-SFG 3x5	Sag	E1-4	0.419	0.0	0.4	---	---	---	0.06	0.76	3.85	n/a	n/a	---	---
**	GI-E1-5	17.33 'LT	SBMLXBCR	18+51.00	PSL FG-SFG 3x5	Sag	E1-5	7.202	0.0	7.2	---	---	---	0.43	10.92	15.00	n/a	n/a	---	---
**	GI-E2-2	53.00 'LT	SB	3662+29.40	PSL FG-SFG 3x5	On Grade	E2-2	5.739	0.0	5.7	0.0050	0.82	2.45	---	---	6.00	n/a	n/a	0.00	E2-9
**	GI-E2-7	42.50 'RT	NB	1660+17.25	PSL FG-SFG 3x5	Sag	E2-7	8.06	0.0	8.1	---	---	---	0.46	4.60	7.50	n/a	n/a	---	---
**	GI-E2-8	21.00 'RT	SB	3665+02.00	PSL FG-SFG 3x5	Sag	E2-8	20.051	0.0	20.1	---	---	---	0.94	5.95	7.00	n/a	n/a	---	---
**	GI-E3-6	20.00 'RT	SB	3669+64.00	PSL FG 4x4	Sag	E3-6	7.592	0.0	7.6	---	---	---	0.44	2.95	3.00	n/a	n/a	---	---
**	GI-E3-7	20.00 'RT	SB	3667+44.42	PSL FG-SFG 4x4	On Grade	E3-7	2.521	0.0	2.5	0.0046	0.91	2.73	---	---	5.00	n/a	n/a	0.00	E3-6
**	GI-E3-8	20.00 'RT	SB	3666+39.67	PSL FG-SFG 4x4	On Grade	E3-8	2.533	0.0	2.5	0.0039	0.94	2.82	---	---	5.00	n/a	n/a	0.00	E3-7
**	GI-E3-9	17.00 'LT	NB	1670+36.00	PSL FG 4x4	Sag	E3-9	3.872	0.0	3.9	---	---	---	0.28	2.57	9.20	n/a	n/a	---	---
**	GI-E3-17	53.00 'LT	SB	3668+56.50	PSL FG-SFG 3x5	Sag	E3-17	11.311	0.0	11.3	---	---	---	0.58	4.85	11.00	n/a	n/a	---	---
**	GI-E3-18	52.00 'LT	SB	3666+50.00	PSL FG-SFG 3x5	Sag	E3-18	6.121	0.0	6.1	---	---	---	0.38	2.50	4.50	n/a	n/a	---	---
**	GI-F6-8	5.75 'RT	NBEBCR	16+97.00	PSL FG-SFG 3x5	On Grade	F6-8	6.97	0.0	7.0	0.0060	0.59	2.09	---	---	0.83	n/a	n/a	1.57	COUGAR
**	GI-F6-28	7.00 'RT	NBEBCR	11+00.00	PSL FG-SFG 3x5	Sag	F6-28	9.085	0.2	9.3	---	---	---	0.51	3.51	0.75	n/a	n/a	---	---
**	GI-F6-34	43.50 'RT	NB	1669+30.00	PSL FG-SFG 3x5	On Grade	F6-34	9.652	0.0	5.0	0.0090	1.05	1.05	---	---	1.25	n/a	n/a	0.20	F6-28
	GI-F6-4EX	26.68 'LT	NB	1683+38.07	DITIS	Sag	F6-4EX	0.714	3.2	3.9	---	---	---	0.25	1.11	15.00	n/a	n/a	---	---
**	GI-G5-11	8.00 'LT	BCL	504+60.00	PSL FG-SFG 4x4	Sag	G10-2	2.879	0.0	2.9	---	---	---	0.23	5.08	5.70	n/a	n/a	---	---
**	GI-G9-3	68.00 'RT	NB	1690+46.00	PSL FG-SFG 3x3 w 3x3 gr	Sag	G9-3	0.545	0.0	0.5	---	---	---	0.09	0.17	10.00	n/a	n/a	---	---
	GI-G9-1EX	42.99 'LT	NB	1689+69.46	DITIS	Sag	G9-1EX	17.657	0.0	17.7	---	---	---	0.67	2.80	31.00	n/a	n/a	---	---
	GI-G9-4EX	32.78 'LT	NB	1690+86.73	DITIS	Sag	G9-4EX	7.595	0.2	7.8	---	---	---	0.39	2.59	59.00	n/a	n/a	---	---
**	GI-H4-109	8.00 'LT	SBMLEBCL	23+58.20	PSL FG-SFG 3x3 w 3x3 gr	Sag	H4-109	0.728	0.0	0.7	---	---	---	0.11	1.25	4.00	n/a	n/a	---	---
**	GI-H4-110	8.25 'LT	SBMLEBCL	27+31.25	PSL FG-SFG 3x3 w 3x3 gr	Sag	H4-110	0.328	0.0	0.3	---	---	---	0.07	1.18	4.00	n/a	n/a	---	---
**	GI-H4-111	6.00 'LT	SBMLEBCL	28+15.50	PSL FG-SFG 3x3 w 3x3 gr	Sag	H4-111	4.657	0.0	4.7	---	---	---	0.38	2.18	4.00	n/a	n/a	---	---
**	GI-H4-41	14.00 'LT	BCL	514+07.25	PSL FG 3x5 w 3x3 gr	Sag	H4-41	4.481	0.0	4.5	---	---	---	0.38	5.31	6.00	n/a	n/a	---	---
	GI-H4-43EX	15.00 'RT	183A	712+15.25	DITIS3	Sag	H4-43EX	33.298	0.3	33.6	---	---	---	0.65	4.38	18.00	n/a	n/a	---	---
**	GI-H4-44	8.00 'LT	SBMLEBCL	21+33.00	PSL FG 4x4	Sag	H4-44	3.308	0.0	3.3	---	---	---	0.26	3.33	6.00	n/a	n/a	---	---
**	GI-H4-45	19.25 'LT	BCL	528+58.75	PSL FG 8x8 w 3x3 gr	Sag	H4-45	5.192	0.0	5.2	---	---	---	0.41	3.25	10.00	n/a	n/a	---	---
**	GI-H4-51	37.85 'RT	BCL	529+02.00	PSL FG 4x4	Sag	H4-51	0.88	0.0	4.4	---	---	---	0.31	15.41	20.00	n/a	n/a	---	---
**	GI-H4-64	43.50 'LT	NBXBCL	18+05.00	PSL FG 4x4	Sag	H4-64	5.291	0.3	5.6	---	---	---	0.36	3.03	20.00	n/a	n/a	---	---
**	GI-H4-75	55.00 'RT	NB	1709+47.75	PSL FG 3x5 w 3x3 gr	Sag	H4-75	7.948	1.7	9.7	---	---	---	0.63	3.48	8.00	n/a	n/a	---	---
**	GI-H5-5	30.00 'RT	SBMLEBCL	33+65.00	PSL FG 3x5 w 3x3 gr	Sag	H5-5	1.227	0.0	1.2	---	---	---	0.16	1.82	10.00	n/a	n/a	---	---
**	GI-H6-7	55.00 'LT	BCL	532+75.50	PSL FG-SFG 3x3 w 3x3 gr	Sag	H6-7	0.11	0.0	0.1	---	---	---	0.03	2.77	16.00	n/a	n/a	---	---
**	GI-I1-1	16.58 'RT	SB	3741+95.67	PSL FG-SFG 3x3 w 3x3 gr	Sag	I1-1	6.332	0.0	6.3	---	---	---	0.47	3.04	9.00	n/a	n/a	---	---
	GI-I1-20	44.61 'LT	SB	3727+56.00	PSL FG 4x4	On Grade	I1-20	17.636	0.0	17.6	0.0157	1.09	2.63	---	---	13.00	n/a	n/a	7.60	I1-24
**	GI-I1-27	24.00 'RT	SB	3729+56.00	PSL FG 4x4	Sag	I1-27	1.312	0.0	1.3	---	---	---	0.14	1.62	2.00	n/a	n/a	---	---
**	GI-I1-28	14.00 'RT	SB	3734+20.00	PSL FG 4x4	Sag	I1-28	2.565	0.0	2.6	---	---	---	0.22	2.88	4.75	n/a	n/a	---	---
**	GI-I1-29	76.50 'LT	SB	3741+39.00	PSL FG 4x4	On Grade	I1-29	2.819	0.0	2.8	0.0178	0.36	7.23	---	---	9.50	n/a	n/a	0.09	I1-4
**	GI-I2-2	34.17 'RT	NB	1727+56.75	PSL FG 4x4	Sag	I2-2	0.792	0.0	0.8	---	---	---	0.10	1.20	13.00	n/a	n/a	---	---
**	GI-I2-5	39.00 'RT	NB	1729+42.00	PSL FG 4x4	Sag	I2-5	16.913	0.0	16.9	---	---	---	0.76	5.84	13.00	n/a	n/a	---	---
**	GI-I2-10	0.00 'RT	NB	1725+62.75	PSL FG 4x4	Sag	I2-10	1.474	0.0	1.5	---	---	---	0.15	4.14	32.00	n/a	n/a	---	---
**	GI-I2-14	25.67 'LT	NBSUP_201	127+28.26	PAZD FG 4X4-4	Sag	I2-14	25.38	0.0	25.4	---	---	---	0.35	4.41	17.00	16.00	13.68	---	---

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** - THESE INLETS ARE PLACED OUTSIDE OF THE PAVEMENT AND FUNCTION AS FIELD INLETS.

DESIGN

STATE OF TEXAS — BRYAN SIERSMA — 147188 — LICENSED PROFESSIONAL ENGINEER

BRYAN SIERSMA, P.E.

5/9/2024
DATE

APPROVAL

STATE OF TEXAS — DAN THOMA — 98622 — LICENSED PROFESSIONAL ENGINEER

DAN THOMA, P.E.

5/9/2024
DATE

PAPE-DAWSON ENGINEERS

SAN ANTONIO | AUSTIN | HOUSTON | FORT WORTH | DALLAS
2000 NW LOOP 410 | SAN ANTONIO, TX 78213 | 210.375.9000
TEXAS ENGINEERING FIRM #470 | TEXAS SURVEYING FIRM #10028800

2024
Texas Department of Transportation

US 183 GPL

DROP INLET COMPUTATIONS

SHEET 4 OF 6

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DS:	CK:	0151	10	001	US 183
DW:	CK:	DIST	COUNTY		SHEET NO.
		AUS	WILLIAMSON		716

DATE: 5/9/2024 8:20:35 PM
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DROP/TRAFFIC INLET COMPUTATIONS

	INLET				DROP/TRAFFIC INLET DESCRIPTION	INLET TYPE	DRAINAGE AREA	Q FROM AREA	CARRY OVER FLOW	TOTAL Q 10 YR	DROP INLET ON GRADE			DROP INLET IN SAG		ALLOWABLE PONDED WIDTH	LENGTH INLET	REQUIRED LENGTH INLET	BY PASS FLOW	BY PASS FLOW
	NO	OFFSET (FT)	CHAIN	STATION			NO	(CFS)	(CFS)	(CFS)	LONGIT-UDINAL ROAD SLOPE (FT/FT)	DEPTH OF FLOW (FT)	PONDED WIDTH (FT)	DEPTH OF FLOW (FT)	PONDED WIDTH (TOTAL) (FT)	(FT)	(FT)	(FT)	(CFS)	NODE
	GI-I2-1EX	7.27 'RT	183A	725+01.54	DIT1S	Sag	I2-1EX	30.493	0.0	30.5	---	---	---	1.90	11.38	32.00	n/a	n/a	---	---
**	GI-I2-20	13.49 'RT	NBSUP_201	116+41.30	PSL FG-SFG 3x3 w 3x3 gr	Sag	I2-20	6.672	0.0	6.7	---	---	---	0.49	1.95	20.00	n/a	n/a	---	---
**	GI-I2-22	19.60 'LT	NBSUP_201	114+89.30	PSL FG 4x4	Sag	I2-22	0.88	0.0	0.9	---	---	---	0.11	0.94	9.00	n/a	n/a	---	---
	GI-J1-1EX	1.21 'RT	183A	744+02.11	DIT1S	Sag	J1-1EX	13.435	3.4	16.8	---	---	---	0.65	10.01	20.00	n/a	n/a	---	---
**	GI-J2-3	32.50 'RT	NB	1750+68.25	PSL FG-SFG 3x3 w 3x3 gr	Sag	J2-3	0.815	0.0	0.8	---	---	---	0.12	1.21	5.00	n/a	n/a	---	---
**	GI-J6-3	18.00 'LT	NB	1756+40.00	PSL FG-SFG 3x5	Sag	J6-3	2.93	0.0	2.9	---	---	---	0.24	2.62	3.00	n/a	n/a	---	---
**	GI-J6-4	18.00 'LT	NB	1753+85.00	PSL FG-SFG 3x5	On Grade	J6-4	4.986	0.0	5.0	0.0200	0.80	3.20	---	---	4.00	n/a	n/a	0.00	J6-3
**	GI-J6-11	24.00 'LT	NB	1746+59.96	PSL FG-SFG 4x4EO	Sag	J6-11	3.209	0.0	3.2	---	---	---	0.25	13.42	20.00	n/a	n/a	---	---
**	GI-J6-12	25.00 'LT	NB	1749+49.73	PSL FG-SFG 3x5	Sag	J6-12	2.065	0.0	2.1	---	---	---	0.19	2.97	20.00	n/a	n/a	---	---
**	GI-J6-18	133.53 'LT	183A	752+88.00	PSL FG-SFG 4x4	On Grade	J6-18	8.589	0.0	8.6	0.0400	0.86	3.45	---	---	5.00	n/a	n/a	0.00	---
	GI-J6-1EX	23.02 'RT	183A	753+37.53	DIT1DB3	Sag	J6-1EX	27.137	0.0	27.1	---	---	---	0.56	9.57	13.00	n/a	n/a	---	---
	GI-J7-1	120.00 'RT	183A	752+12.00	PSL FG-SFG 4x4	Sag	J7-1	26.34	0.0	26.3	---	---	---	1.43	5.90	5.00	n/a	n/a	---	---
	RW-B3-1	6.25 'RT	SB	3613+76.00	TY MSE1	On Grade	B3-1	0.19	0.0	0.2	0.0127	0.08	3.77	---	---	14.00	n/a	n/a	0.00	B6-4EX
	RW-B4-1	6.25 'RT	SB	3614+15.00	TY MSE1	On Grade	B4-1	0.24	0.0	0.3	0.0093	0.10	3.73	---	---	14.00	n/a	n/a	0.00	B3-1
	RW-B5-1	6.25 'RT	SB	3614+54.00	TY MSE1	On Grade	B5-1	0.383	0.0	0.4	0.0059	0.13	4.15	---	---	14.00	n/a	n/a	0.02	B4-1
	RW-B6-2EX	5.54 'RT	SB	3609+97.78	EX RW(RI)-2	On Grade	B6-2EX	0.214	0.0	0.2	0.0182	0.06	4.24	---	---	14.00	n/a	n/a	0.00	B6-1EX
	RW-B6-3EX	5.08 'RT	SB	3610+37.64	EX RW(RI)-2	On Grade	B6-3EX	0.274	0.1	0.3	0.0357	0.07	3.93	---	---	14.00	n/a	n/a	0.00	B6-2EX
	RW-B6-4EX	5.06 'RT	SB	3610+97.08	EX RW(RI)-2	On Grade	B6-4EX	1.428	0.0	1.4	0.0351	0.12	6.87	---	---	14.00	n/a	n/a	0.05	B6-3EX
	RW-B7-1	6.00 'RT	SB	3617+25.00	TY MSE1	On Grade	B7-1	1.311	0.0	1.3	0.0165	0.14	7.11	---	---	12.00	n/a	n/a	0.34	C2-1
	RW-C10-1	30.00 'LT	NBMLX1431	15+16.00	TY MSE2	On Grade	C10-1	1.19	0.1	1.3	0.0076	0.17	7.60	---	---	22.00	n/a	n/a	0.07	C9-1
	RW-C11-1	30.00 'LT	NBMLX1431	15+61.20	TY MSE2	On Grade	C11-1	1.085	0.4	1.5	0.0045	0.21	8.22	---	---	22.00	n/a	n/a	0.10	C10-1
	RW-C12-1	28.75 'LT	NBMLX1431	16+54.20	TY MSE1	On Grade	C12-1	0.913	0.5	1.4	0.0049	0.18	9.19	---	---	22.00	n/a	n/a	0.43	C11-1
	RW-C13-1	30.00 'LT	NBMLX1431	17+16.20	TY MSE1	On Grade	C13-1	0.978	0.6	1.6	0.0050	0.19	9.59	---	---	22.00	n/a	n/a	0.51	C12-1
	RW-C15-1	6.00 'LT	NB	1624+83.00	TY MSE2	On Grade	C15-1	0.793	0.2	1.0	0.0135	0.14	6.74	---	---	20.00	n/a	n/a	0.03	C6-1
	RW-C2-1	6.00 'RT	SB	3619+81.00	TY MSE1	On Grade	C2-1	1.902	0.0	1.6	0.0165	0.15	7.71	---	---	12.00	n/a	n/a	0.49	C14-7
	RW-C4-1	6.00 'LT	NB	1621+06.00	TY MSE2	On Grade	C4-1	1.438	0.0	1.4	0.0013	0.21	14.28	---	---	20.00	n/a	n/a	0.25	C5-1
	RW-C5-1	6.00 'LT	NB	1623+27.00	TY MSE2	On Grade	C5-1	1.992	0.3	2.2	0.0097	0.19	9.60	---	---	20.00	n/a	n/a	0.29	C6-1
	RW-C6-1	6.00 'LT	NB	1624+34.50	TY MSE2	Sag	C6-1	2.102	0.3	2.4	---	---	---	0.23	11.32	20.00	n/a	n/a	---	---
	RW-C9-1	30.00 'LT	NBMLX1431	13+87.14	TY MSE2	On Grade	C9-1	0.541	0.1	0.6	0.0104	0.12	5.81	---	---	22.00	n/a	n/a	0	C6-1
	RW-F4-1	26.00 'LT	SB	3679+84.00	TY MSE2	On Grade	F4-1	2.773	0.0	2.8	0.0036	0.25	12.52	---	---	18.00	n/a	n/a	0.55	F5-2
*	RW-G11-1	26.00 'RT	NB	1685+47.00	TY MSE2	On Grade	G11-1	0.218	0.1	0.3	0.0029	0.07	14.49	---	---	16.00	n/a	n/a	0.07	G3-1
	RW-G12-1	26.00 'RT	NB	1684+45.50	TY MSE2	On Grade	G12-1	1.457	0.0	1.5	0.0028	0.21	10.55	---	---	16.00	n/a	n/a	0.17	G3-1
	RW-G13-1	6.50 'LT	NB	1686+18.00	TY MSE2	On Grade	G13-1	1.09	0.2	1.3	0.0030	0.16	15.50	---	---	20.00	n/a	n/a	0.34	G4-1
	RW-G3-1	26.00 'RT	NB	1684+95.50	TY MSE2	Sag	G3-1	0.615	0.2	0.9	---	---	---	0.11	8.45	16.00	n/a	n/a	---	---
*	RW-G4-1	6.50 'LT	NB	1685+93.00	TY MSE2	On Grade	G4-1	0.132	0.3	0.5	0.0030	0.08	16.22	---	---	20.00	n/a	n/a	0.12	G11-1
	RW-H4-100EX	87.00 'RT	183A	707+93.50	GRAAD4S	On Grade	H4-100EX	0.346	0.0	0.4	0.0300	0.07	5.45	---	---	24.00	n/a	n/a	0.04	H4-55
	RW-H4-12	18.00 'RT	SB	3719+50.00	TY MSE2	On Grade	H4-12	1.277	0.7	2.0	0.0203	0.22	5.16	---	---	18.00	n/a	n/a	0	H4-13
	RW-H4-121	26.00 'LT	SB	3707+07.00	TY MSE2	On Grade	H4-121	0.609	0.0	0.6	0.0453	0.09	4.53	---	---	16.00	n/a	n/a	0.00	H4-86
	RW-H4-123	6.00 'LT	NB	1703+03.15	TY MSE2	On Grade	H4-123	2.079	0.0	2.1	0.0400	0.10	13.00	---	---	18.00	n/a	n/a	0.58	H4-68
	RW-H4-13	19.00 'RT	SB	3718+32.00	TY MSE2	On Grade	H4-13	0.81	0.0	0.8	0.0254	0.15	3.53	---	---	18.00	n/a	n/a	0.00	H4-17
	RW-H4-17	23.00 'RT	SB	3716+82.50	TY MSE1	On Grade	H4-17	1.113	0.0	1.1	0.0254	0.17	3.97	---	---	12.00	n/a	n/a	0.06	H4-18
	RW-H4-18	30.25 'RT	SB	3715+19.75	TY MSE1	On Grade	H4-18	1.357	0.1	1.4	0.0165	0.20	4.72	---	---	18.00	n/a	n/a	0.14	H4-21
	RW-H4-21	20.25 'RT	SBEBCL	18+40.50	TY MSE1	On Grade	H4-21	1.253	0.1	1.4	0.0071	0.23	5.49	---	---	14.00	n/a	n/a	0.18	H4-115
	RW-H4-32	6.00 'RT	SB	3711+23.15	TY MSE1	On Grade	H4-32	1.652	0.1	1.8	0.0179	0.21	5.04	---	---	18.00	n/a	n/a	0.22	H4-25
	RW-H4-35	20.00 'RT	SBEBCL	16+20.50	PMBD 4	On Grade	H4-35	0.895	0.0	0.9	0.0050	0.21	4.96	---	---	14.00	n/a	9.36	0	H4-114
	RW-H4-57EX	71.00 'LT	183A	700+92.00	GRAAD4S	On Grade	H4-57EX	1.283	0.0	1.3	0.0250	0.15	5.81	---	---	16.00	n/a	n/a	0.15	H4-58EX
	RW-H4-58EX	71.00 'LT	183A	701+57.25	GRAAD4S	On Grade	H4-58EX	0.517	0.2	0.7	0.0240	0.11	5.28	---	---	16.00	n/a	n/a	0.06	H4-59EX
	RW-H4-59EX	71.00 'LT	183A	702+68.50	GRAAD4S	On Grade	H4-59EX	0.691	0.1	0.8	0.0260	0.10	6.72	---	---	16.00	n/a	n/a	0.12	H4-60EX
	RW-H4-60EX	71.00 'LT	183A	703+27.50	GRAAD4S	On Grade	H4-60EX	0.364	0.1	0.5	0.0270	0.07	6.65	---	---	16.00	n/a	n/a	0.08	H4-61EX
	RW-H4-61EX	71.00 'LT	183A	703+72.50	GRAAD4S	On Grade	H4-61EX	0.433	0.1	0.5	0.0255	0.07	8.56	---	---	16.00	n/a	n/a	0.12	H4-62EX
	RW-H4-62EX	71.00 'LT	183A	704+09.00	GRAAD4S	On Grade	H4-62EX	0.092	0.1	0.2	0.0266	0.04	7.14	---	---	16.00	n/a	n/a	0.04	H4-63EX
	RW-H4-63EX	71.00 'LT	183A	704+50.50	GRAAD4S	On Grade	H4-63EX	0.577	0.0	0.6	0.0260	0.05	14.97	---	---	16.00	n/a	n/a	0.27	H4-43EX
*	RW-H4-68	6.00 'LT	NB	1703+69.75	TY MSE2	On Grade	H4-68	0.348	1.0	1.4	0.0400	0.09	11.08	---	---	18.00	n/a	n/a	0.28	H4-122
*	RW-H4-86	26.00 'LT	SB	3708+13.00	TY MSE2	On Grade	H4-86	0.585	0.0	0.6	0.0447	0.05	10.62	---	---	16.00	n/a	n/a	0.11	H4-32
	RW-H4-87	26.00 'LT	SB	3705+91.00	TY MSE2	On Grade	H4-87	0.934	0.0	0.9	0.0453	0.11	5.31	---	---	16.00	n/a	n/a	0	H4-121
	RW-H4-98EX	86.50 'RT	183A	707+08.00	GRAAD4S	On Grade	H4-98EX	0.459	0.0	0.5	0.0335	0.06	7.64	---	---	24.00	n/a	n/a	0.10	H4-99EX
	RW-H4-99EX	87.00 'RT	183A	707+63.00	GRAAD4S	On Grade	H4-99EX	0.192	0.1	0.3	0.0320	0.06	5.17	---	---	24.00	n/a	n/a	0.03	H4-100EX
	RW-H5-1EX	100.50 'RT	183A	719+47.75	GRAAD4S	On Grade	H5-1EX	5.307	0.0	5.3	0.0189	0.24	11.98	---	---	12.00	n/a	n/a	1.90	H5-3EX
	RW-H5-3EX	20.50 'RT	SBMLEBCL	35+14.25	GRAAD4S	On Grade	H5-3EX	3.655	1.9	5.6	0.0212	0.24	11.94	---	---	12.00	n/a	n/a	2.05	H4-16
	RW-I1-19	18.00 'RT	SB	3727+56.00	TY MSE2	On Grade	I1-19	2.742	0.5	3.2	0.0157	0.27	6.46	---	---	20.00	n/a	n/a	0.07	H4-50

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** - THESE INLETS ARE PLACED OUTSIDE OF THE PAVEMENT AND FUNCTION AS FIELD INLETS.

DESIGN

STATE OF TEXAS · BRYAN SIERSMA · 147188 · LICENSED PROFESSIONAL ENGINEER

BRYAN SIERSMA, P.E.

5/9/2024
DATE

APPROVAL

STATE OF TEXAS · DAN THOMA · 98622 · LICENSED PROFESSIONAL ENGINEER

DAN THOMA, P.E.

5/9/2024
DATE

PAPE-DAWSON ENGINEERS

SAN ANTONIO | AUSTIN | HOUSTON | FORT WORTH | DALLAS
2000 NW LOOP 410 | SAN ANTONIO, TX 78213 | 210.375.9000
TEXAS ENGINEERING FIRM #470 | TEXAS SURVEYING FIRM #10028800

2024
Texas Department of Transportation

US 183 GPL

DROP INLET COMPUTATIONS

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DS:	CK:	CONT	SECT	JOB	HIGHWAY
		0151	10	001	US 183
DW:	CK:	DIST	COUNTY		SHEET NO.
		AUS	WILLIAMSON		717

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DROP/TRAFFIC INLET COMPUTATIONS

INLET				DROP/TRAFFIC INLET DESCRIPTION	INLET TYPE	DRAINAGE AREA	Q FROM AREA	CARRY OVER FLOW	TOTAL Q 10 YR	DROP INLET ON GRADE			DROP INLET IN SAG		ALLOWABLE PONDED WIDTH	LENGTH INLET	REQUIRED LENGTH INLET	BY PASS FLOW	BY PASS FLOW
NO	OFFSET (FT)	CHAIN	STATION			NO	(CFS)	(CFS)	(CFS)	LONGIT-UDINAL ROAD SLOPE (FT/FT)	DEPTH OF FLOW (FT)	PONDED WIDTH (FT)	DEPTH OF FLOW (FT)	PONDED WIDTH (TOTAL) (FT)	(FT)	(FT)	(FT)	(CFS)	NODE
RW-I1-21EX	100.00 'RT	183A	726+01.00	EX RW(RI)-2	On Grade	I1-21EX	2.524	0.0	2.5	0.0172	0.26	5.34	---	---	17.50	n/a	n/a	0	I1-23EX
RW-I1-23EX	100.00 'RT	183A	724+79.00	EX RW(RI)-2	On Grade	I1-23EX	1.19	0.0	1.2	0.0395	0.17	3.45	---	---	17.50	n/a	n/a	0.00	H5-1EX
RW-J2-17EX	92.30 'LT	183A	749+54.98	EX RW(RI)-2	On Grade	J2-17EX	0.872	0.9	1.8	0.0163	0.14	10.77	---	---	20.00	n/a	n/a	0.33	J2-18EX
RW-J2-18EX	91.68 'LT	183A	749+05.16	EX RW(RI)-2	On Grade	J2-18EX	0.473	0.3	0.8	0.0147	0.09	10.19	---	---	20.00	n/a	n/a	0.12	J2-19EX
RW-J2-19EX	90.66 'LT	183A	748+80.86	EX RW(RI)-2	On Grade	J2-19EX	0.243	0.1	0.4	0.0147	0.07	8.01	---	---	20.00	n/a	n/a	0.03	J2-20EX
RW-J2-1EX	94.73 'LT	183A	750+58.61	EX RW(RI)-2	On Grade	J2-1EX	0.942	3.5	4.5	0.0234	0.21	11.29	---	---	20.00	n/a	n/a	0.93	J2-17EX
RW-J2-20EX	90.33 'LT	183A	748+45.54	EX RW(RI)-2	On Grade	J2-20EX	0.355	0.0	0.4	0.0155	0.06	9.55	---	---	20.00	n/a	n/a	0.05	J2-21EX
RW-J2-21EX	90.18 'LT	183A	748+17.06	EX RW(RI)-2	On Grade	J2-21EX	0.21	0.0	0.3	0.0155	0.05	7.96	---	---	20.00	n/a	n/a	0.02	J2-22EX
RW-J2-22EX	89.62 'LT	183A	747+94.80	EX RW(RI)-2	On Grade	J2-22EX	0.217	0.0	0.2	0.0143	0.05	9.35	---	---	20.00	n/a	n/a	0.03	J2-23EX
RW-J2-23EX	89.57 'LT	183A	747+81.14	EX RW(RI)-2	On Grade	J2-23EX	0.138	0.0	0.2	0.0157	0.04	9.13	---	---	20.00	n/a	n/a	0.02	J1-1EX
RW-J4-1EX	96.91 'LT	183A	751+62.07	EX RW(RI)-2	On Grade	J4-1EX	0.98	0.0	1.0	0.0110	0.16	5.98	---	---	20.00	n/a	n/a	0.01	J2-1EX
RW-J5-1EX	98.28 'LT	183A	752+62.96	EX RW(RI)-2	On Grade	J5-1EX	1.942	0.0	1.9	0.0270	0.18	5.85	---	---	20.00	n/a	n/a	0.02	J4-1EX

* - THESE INLETS ARE PLACED AT SUPERELEVATION TRANSITION AREAS AND WILL NOT NECESSARILY MEET PONDING WIDTH CRITERIA. THE INTENT OF THESE INLETS IS TO PICK UP AS MUCH CONCENTRATED FLOW AS POSSIBLE BEFORE FLOW CROSSES THE PAVEMENT AND CREATES A POTENTIAL HYDROPLANE ISSUE.

** - THESE INLETS ARE PLACED OUTSIDE OF THE PAVEMENT AND FUNCTION AS FIELD INLETS.

183A MAINLANE "SAG" DROP/TRAFFIC INLET COMPUTATIONS -- 50YR STORM

INLET				DROP/TRAFFIC INLET DESCRIPTION	INLET TYPE	DRAINAGE AREA	Q FROM AREA	CARRY OVER FLOW	TOTAL Q 50 YR	DROP INLET ON GRADE			DROP INLET IN SAG		ALLOWABLE PONDED WIDTH	LENGTH INLET	REQUIRED LENGTH INLET	BY PASS FLOW	BY PASS FLOW
NO	OFFSET (FT)	CHAIN	STATION			NO	(CFS)	(CFS)	(CFS)	LONGIT-UDINAL ROAD SLOPE (FT/FT)	DEPTH OF FLOW (FT)	PONDED WIDTH (FT)	DEPTH OF FLOW (FT)	PONDED WIDTH (TOTAL) (FT)	(FT)	(FT)	(FT)	(CFS)	NODE
BI-D1-4	69.63 'LT	183A	644+95.00	PMBD 4	Sag	D1-4	0.977	1.4	2.4	---	---	---	0.27	11.39	30.00	n/a	17.01	---	---
GI-D1-3	55.75 'RT	183A	644+93.50	PSL FG 5x6 w 3x3 gr	Sag	D1-3	0.81	0.3	1.2	---	---	---	0.15	7.57	16.00	n/a	n/a	---	---

183A "SAG" DROP/TRAFFIC INLET COMPUTATIONS (PAVEMENT INLETS) -- 25YR STORM

INLET				DROP/TRAFFIC INLET DESCRIPTION	INLET TYPE	DRAINAGE AREA	Q FROM AREA	CARRY OVER FLOW	TOTAL Q 25 YR	DROP INLET ON GRADE			DROP INLET IN SAG		ALLOWABLE PONDED WIDTH	LENGTH INLET	REQUIRED LENGTH INLET	BY PASS FLOW	BY PASS FLOW
NO	OFFSET (FT)	CHAIN	STATION			NO	(CFS)	(CFS)	(CFS)	LONGIT-UDINAL ROAD SLOPE (FT/FT)	DEPTH OF FLOW (FT)	PONDED WIDTH (FT)	DEPTH OF FLOW (FT)	PONDED WIDTH (TOTAL) (FT)	(FT)	(FT)	(FT)	(CFS)	NODE
BI-D1-51	6.00 'LT	NB	1644+79.00	PMBD 4	Sag	D1-51	1.822	0.9	2.7	---	---	---	0.28	11.27	20.00	n/a	15.61	---	---
BI-H4-15	20.00 'RT	SBMLEBCL	32+08.00	PMBD 4	Sag	H4-15	3.019	3.6	6.6	---	---	---	0.47	11.43	12.00	n/a	9.43	---	---
BI-H4-24	20.00 'RT	SBEBCL	17+45.50	PMBD 4	Sag	H4-24	0.283	0.0	0.3	---	---	---	0.09	2.66	14.00	n/a	9.12	---	---
BI-H4-25	6.00 'RT	SB	3713+30.00	PMBD 4	Sag	H4-25	0.389	0.3	0.7	---	---	---	0.15	3.49	18.00	n/a	9.12	---	---
BI-H4-53	20.00 'RT	SBMLEBCL	22+63.75	PMBD 4	Sag	H4-53	1.057	0.5	1.6	---	---	---	0.22	10.84	12.00	n/a	9.43	---	---
BI-H4-74	49.00 'RT	NB	1709+47.75	PMBD 4	Sag	H4-74	2.057	0.4	2.4	---	---	---	0.27	5.35	9.00	n/a	38.85	---	---
RW-C6-1	6.00 'LT	NB	1624+34.50	TY MSE2	Sag	C6-1	2.55	0.5	3.1	---	---	---	0.27	13.24	20.00	n/a	n/a	---	---
RW-G3-1	26.00 'RT	NB	1684+95.50	TY MSE2	Sag	G3-1	0.747	0.4	1.1	---	---	---	0.14	9.32	16.00	n/a	n/a	---	---

DESIGN

STATE OF TEXAS — BRYAN SIERSMA — 147188 — LICENSED PROFESSIONAL ENGINEER

BRYAN SIERSMA, P.E.

5/9/2024
DATE

APPROVAL

STATE OF TEXAS — DAN THOMA — 98622 — LICENSED PROFESSIONAL ENGINEER

DAN THOMA, P.E.

5/9/2024
DATE

PAPE-DAWSON ENGINEERS

SAN ANTONIO | AUSTIN | HOUSTON | FORT WORTH | DALLAS
2000 NW LOOP 410 | SAN ANTONIO, TX 78213 | 210.375.9000
TEXAS ENGINEERING FIRM #470 | TEXAS SURVEYING FIRM #10028800

2024
Texas Department of Transportation

US 183 GPL

DROP INLET COMPUTATIONS

SHEET 6 OF 6

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DS:	CK:	CONT	SECT	JOB	HIGHWAY
		0151	10	001	US 183
DW:	CK:	DIST	COUNTY		SHEET NO.
		AUS	WILLIAMSON		717A

DATE: 5/9/2024 8:21:05 PM
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STORM SEWER COMPUTATIONS

ID	LINE NO	FROM NODE	TO NODE	STRUCTURE SIZE	LENGTH	TC	STORM FREQUENCY	I 10 YR	Q 10 YR	CAPACITY	SLOPE	VELOCITY	INVERT UPSTREAM	INVERT DOWNSTREAM	MANNING'S N VALUE
					(FT)	(MIN)	(YRS)	(in/hr)	(CFS)	(CFS)	%	(FT/SEC)	(FT)	(FT)	
LINE B10	B10-1	STU-B10	B10-OUT	1 - 18 IN RCP	30.70	10.16	10.00	7.14	1.3	8.7	0.50	3.4	922.66	922.51	0.012
LINE B3	B3-1	RW-B3-1	OUT-B3	1 - 18 IN RCP	8.75	10.08	10.00	7.16	0.2	8.7	0.50	1.9	920.29	920.25	0.012
LINE B4	B4-1	RW-B4-1	OUT-B4	1 - 18 IN RCP	8.75	10.07	10.00	7.16	0.2	8.7	0.50	2.0	921.74	921.70	0.012
LINE B5	B5-1	RW-B5-1	OUT-B5	1 - 18 IN RCP	8.75	10.06	10.00	7.16	0.4	8.7	0.50	2.3	923.04	923.00	0.012
LINE B7	B7-1	RW-B7-1	OUT-B7	1 - 18 IN RCP	9.00	10.05	10.00	7.16	1.0	8.7	0.50	3.1	928.05	928.00	0.012
LINE C1	LAT C1-1	GI-C1-1	STU-C1	1 - 24 IN RCP	149.08	10.56	10.00	7.18	5.9	16.7	0.40	4.6	918.35	917.75	0.012
	LAT C1-2	STU-C1	MH-C1-10	1 - 30 IN RCP	110.50	10.99	10.00	7.18	5.9	30.2	0.40	4.5	917.25	916.81	0.012
	LAT C1-3	MH-C1-3	GI-C1-7	1 - 36 IN RCP	290.38	14.18	10.00	6.28	5.9	45.9	0.35	1.3	915.41	914.40	0.012
	C1-7	GI-C1-7	OUT-C1	1 - 36 IN RCP	76.26	14.34	10.00	6.25	18.4	116.0	2.23	10.6	914.40	912.70	0.012
	LAT C1-10	MH-C1-10	MH-C1-3	1 - 30 IN RCP	200.11	11.74	10.00	7.18	5.9	30.2	0.40	4.5	916.71	915.91	0.012
	C1-13EX	GI-C1-13EX	GI-C1-7	1 - EX 24 IN RCP	83.17	14.18	10.00	6.28	3.3	51.7	3.85	8.7	918.60	915.40	0.012
LINE C10	C10-1	RW-C10-1	OUT-C10	1 - 18 IN RCP	3.50	10.02	10.00	7.17	1.2	8.7	0.50	3.2	919.02	919.00	0.012
LINE C11	C11-1	RW-C11-1	OUT-C11	1 - 18 IN RCP	3.50	10.02	10.00	7.17	1.4	8.7	0.50	3.4	919.02	919.00	0.012
LINE C12	C12-1	RW-C12-1	OUT-C12	1 - 18 IN RCP	4.75	10.03	10.00	7.17	1.0	8.7	0.50	3.1	920.02	920.00	0.012
LINE C13	C13-1	RW-C13-1	OUT-C13	1 - 18 IN RCP	3.50	10.02	10.00	7.17	1.1	8.7	0.50	3.1	924.77	924.75	0.012
LINE C14	LAT C14-6	GI-C14-6	MH-C14-5	1 - 36 IN RCP	213.37	16.97	10.00	5.80	18.2	55.0	0.50	6.6	916.51	915.44	0.012
	LAT C14-7	HW-C14-7	MH-C14-5	1 - 30 IN RCP	52.13	16.97	10.00	5.80	27.0	30.2	0.40	5.5	915.29	915.08	0.012
	LAT C14-5	MH-C14-5	STU-C14-2	1 - 3FT x 3FT SBC	42.02	17.12	10.00	5.80	41.6	60.3	0.30	6.3	915.02	914.89	0.012
	LAT C14-9	STU-C14-2	MH-C14-8	1 - 3FT x 3FT SBC	5.73	17.17	10.00	5.80	41.6	60.3	0.30	5.2	914.39	914.37	0.012
	LAT C14-8	MH-C14-8	BI-C14-3	1 - 3FT x 3FT SBC	177.58	17.69	10.00	5.69	41.6	60.3	0.30	5.6	914.37	913.84	0.012
	C14-3	BI-C14-3	BI-C14-2	1 - 3FT x 3FT SBC	91.96	17.95	10.00	5.65	41.9	69.6	0.40	6.1	913.74	913.37	0.012
	C14-2	BI-C14-2	BI-C14-1	1 - 3FT x 3FT SBC	68.09	18.16	10.00	5.62	42.8	69.6	0.40	5.6	913.27	913.00	0.012
	C14-1	BI-C14-1	MH-C14-4	1 - 3FT x 3FT SBC	5.50	18.18	10.00	5.62	43.5	69.6	0.40	6.7	912.90	912.88	0.012
	C14-4	MH-C14-4	STU-C14-1	1 - 4FT x 3FT SBC	61.37	18.39	10.00	5.62	45.9	104.8	0.40	5.4	912.88	912.63	0.012
	C14-10	STU-C14-1	OUT-C14	1 - 4FT x 3FT SBC	35.64	18.54	10.00	5.57	45.9	99.7	0.36	4.6	912.13	912.00	0.012
LINE C15	C15-1	RW-C15-1	OUT-C15	1 - 18 IN RCP	3.50	10.02	10.00	7.17	1.1	8.7	0.50	3.2	915.02	915.00	0.012
LINE C17	C17-1	BD-C17-1	J-C18-2	1 - 8 IN PVC	105.98	10.38	10.00	7.08	0.6	2.4	2.00	5.3	925.00	922.88	0.010
LINE C18	C18-1	BD-C18-1	J-C18-2	1 - 8 IN PVC	8.02	10.38	10.00	7.08	0.5	2.4	2.00	1.5	923.04	922.88	0.010
	C18-2	J-C18-2	J-C18-3	1 - 8 IN PVC	27.87	10.45	10.00	7.08	1.1	2.4	2.00	6.0	922.88	922.32	0.010
	C18-3	J-C18-3	J-C18-11	1 - 8 IN PVC	78.64	10.82	10.00	6.98	1.1	1.3	0.64	4.0	913.50	913.00	0.010
	C18-11	J-C18-11	C18-OUT	1 - 4FT x 3FT SBC	1.00	10.83	10.00	6.98	2.5	234.3	2.00	3.3	912.65	912.63	0.012
LINE C19	C19-1	BD-C19-1	J-C18-11	1 - 8 IN PVC	47.30	10.82	10.00	6.98	1.4	2.4	2.00	6.6	913.95	913.00	0.010
LINE C2	C2-1	RW-C2-1	OUT-C2	1 - 18 IN RCP	9.00	0.05	10.00	11.34	1.1	8.7	0.50	3.2	926.25	926.20	0.012
LINE C20	C20-1	BD-C20-1	BD-C19-1	1 - 8 IN PVC	113.95	10.70	10.00	7.01	1.0	2.4	2.00	6.2	928.89	926.61	0.010
LINE C21	C21-1	BD-C21-1	BD-C20-1	1 - 8 IN PVC	113.94	10.39	10.00	7.08	0.6	2.4	2.00	5.3	931.17	928.89	0.010
LINE C3	C3-1	BI-C3-1	BI-C3-2	1 - 24 IN RCP	72.00	10.92	10.00	6.96	9.5	18.6	0.50	5.6	926.36	926.00	0.012
	C3-2	BI-C3-2	BI-C3-3	1 - 24 IN RCP	64.00	11.12	10.00	6.91	10.0	18.6	0.50	5.7	924.92	924.60	0.012
	C3-3	BI-C3-3	BI-C3-4	1 - 24 IN RCP	103.50	11.43	10.00	6.84	10.6	18.6	0.50	5.8	923.52	923.00	0.012
	C3-4	BI-C3-4	BI-C3-5	1 - 24 IN RCP	84.02	11.69	10.00	6.78	11.2	18.6	0.50	5.8	922.42	922.00	0.012
	C3-5	BI-C3-5	BI-C3-10	1 - 24 IN RCP	42.52	11.82	10.00	6.75	11.9	18.6	0.50	5.9	921.48	921.27	0.012
	C3-6	BI-C3-6	BI-C3-9	1 - 24 IN RCP	42.53	12.10	10.00	6.69	12.9	18.6	0.50	6.0	920.83	920.62	0.012
	C3-9	BI-C3-9	BI-C3-7	1 - 24 IN RCP	46.04	12.24	10.00	6.66	13.3	18.6	0.50	6.1	920.51	920.28	0.012
	C3-7	BI-C3-7	MH-C3-8	1 - 24 IN RCP	81.01	12.50	10.00	6.66	13.7	18.6	0.50	4.9	917.66	917.25	0.012
	C3-8	MH-C3-8	STU-C3	1 - 24 IN RCP	88.90	12.76	10.00	6.66	13.7	18.6	0.50	6.2	917.15	916.71	0.012
	LAT C3-17	C3-17EX	BI-C3-16	1 - 8 IN PVC	5.50	10.00	10.00	7.18	2.8	1.3	0.50	8.1	932.03	932.00	0.009
	LAT C3-16	BI-C3-16	BI-C3-15	1 - 24 IN RCP	42.00	10.15	10.00	7.14	6.8	18.6	0.50	5.2	930.53	930.32	0.012
	LAT C3-15	BI-C3-15	BI-C3-14	1 - 24 IN RCP	43.50	10.30	10.00	7.10	7.7	18.6	0.50	5.3	930.22	930.00	0.012
	LAT C3-14	BI-C3-14	BI-C3-13	1 - 24 IN RCP	62.37	10.51	10.00	7.05	8.4	18.6	0.50	5.4	929.90	929.59	0.012
	LAT C3-13	BI-C3-13	BI-C3-1	1 - 24 IN RCP	55.13	10.69	10.00	7.01	9.0	18.6	0.50	5.6	926.78	926.50	0.012
	C3-10	BI-C3-10	BI-C3-6	1 - 24 IN RCP	47.52	11.96	10.00	6.72	12.5	18.6	0.50	6.0	921.17	920.93	0.012
	C3-18	STU-C3	MH-C3-11	1 - 24 IN RCP	46.99	12.90	10.00	6.66	13.7	18.6	0.50	6.2	916.22	915.98	0.012
	C3-11EX	MH-C3-11	MH-C3-12	1 - EX 30 IN RCP	187.25	13.38	10.00	6.66	13.7	44.9	0.88	7.6	915.48	913.83	0.012
	C3-12	MH-C3-12	OUT-C3	1 - 30 IN RCP	73.89	13.59	10.00	6.39	13.7	33.8	0.50	6.2	913.85	913.48	0.012
LINE C4	C4-1	RW-C4-1	OUT-C4	1 - 18 IN RCP	3.50	10.02	10.00	7.17	1.3	8.7	0.50	3.3	917.46	917.44	0.012
LINE C5	C5-1	RW-C5-1	OUT-C5	1 - 18 IN RCP	4.00	10.02	10.00	7.17	1.9	8.7	0.50	3.7	915.02	915.00	0.012
LINE C6	C6-1	RW-C6-1	OUT-C6	1 - 18 IN RCP	3.50	10.01	10.00	7.17	2.4	8.7	0.50	3.9	915.02	915.00	0.012
LINE C9	C9-1	RW-C9-1	OUT-C9	1 - 18 IN RCP	3.50	10.04	10.00	7.17	0.6	8.7	0.50	2.6	919.52	919.50	0.012

DESIGN

STATE OF TEXAS
BRYAN SIERSMA
147188
LICENSED PROFESSIONAL ENGINEER

BRYAN SIERSMA, P.E.
5/9/2024
DATE

APPROVAL

STATE OF TEXAS
DAN THOMA
98622
LICENSED PROFESSIONAL ENGINEER

DAN THOMA, P.E.
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PAPE-DAWSON ENGINEERS
SAN ANTONIO | AUSTIN | HOUSTON | FORT WORTH | DALLAS
2000 NW LOOP 410 | SAN ANTONIO, TX 78213 | 210.375.9000
TEXAS ENGINEERING FIRM #470 | TEXAS SURVEYING FIRM #10028800

2024 Texas Department of Transportation

US 183 GPL
STORM SEWER HYDRAULIC COMPUTATIONS

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CONT	SECT	JOB	HIGHWAY
0151	10	001	US 183
DIST	COUNTY		SHEET NO.
AUS	WILLIAMSON		718

DS: CK:
DW: CK:

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STORM SEWER COMPUTATIONS

ID	LINE NO	FROM NODE	TO NODE	STRUCTURE SIZE	LENGTH	TC	STORM FREQUENCY	I 10 YR	Q 10 YR	CAPACITY	SLOPE	VELOCITY	INVERT UPSTREAM	INVERT DOWNSTREAM	MANNING'S N VALUE
					(FT)	(MIN)	(YRS)	(in/hr)	(CFS)	(CFS)	%	(FT/SEC)	(FT)	(FT)	
LINE D1A	LAT D1A-32	HW-D1-32	BI-D1-51	1 - 24 IN RCP	3.50	10.00	10.00	7.18	8.7	63.0	5.71	2.8	919.30	919.10	0.012
	LAT D1A-31	BI-D1-31	JB-D1-47	1 - 24 IN RCP	9.10	10.10	10.00	7.18	1.4	15.1	0.33	2.2	925.44	925.41	0.012
	LAT D1A-51EX	BI-D1-51	GI-D1-40	1 - EX 36 IN RCP	42.45	10.50	10.00	7.05	10.8	42.6	0.30	1.5	918.77	918.64	0.012
	D1A-38	BI-D1-38	BI-D1-37	1 - 24 IN RCP	130.22	10.75	10.00	6.99	0.9	19.1	0.52	3.0	923.10	922.42	0.012
	LAT D1A-53	BI-D1-53	BI-D1-30	1 - 24 IN RCP	60.06	11.24	10.00	6.88	1.1	11.8	0.20	0.8	922.95	922.83	0.012
	LAT D1A-81	BI-D1-81	BI-D1-49	1 - 24 IN RCP	180.77	11.31	10.00	6.87	1.0	18.6	0.50	3.0	922.10	921.20	0.012
	LAT D1A-30	BI-D1-30	JB-D1-46	1 - 24 IN RCP	9.65	11.36	10.00	6.85	2.7	14.7	0.31	1.9	922.83	922.80	0.012
	D1A-47EX	JB-D1-47	JB-D1-46	1 - EX 24 IN RCP	195.00	11.36	10.00	6.85	1.4	18.9	0.51	3.3	925.41	924.41	0.012
	LAT D1A-24	BI-D1-24	JB-D1-45	1 - 24 IN RCP	10.25	12.25	10.00	6.66	2.3	18.6	0.50	3.8	923.46	923.41	0.012
	D1A-46	JB-D1-46	JB-D1-45	1 - 24 IN RCP	197.00	12.25	10.00	6.66	4.0	16.7	0.40	4.1	922.80	922.01	0.012
	D1A-37	BI-D1-37	BI-D1-36	1 - 24 IN RCP	115.29	12.27	10.00	6.66	2.4	18.6	0.50	3.9	921.99	921.41	0.012
	LAT D1A-49	BI-D1-49	BI-D1-36	1 - 24 IN RCP	56.99	12.27	10.00	6.66	1.9	18.6	0.50	0.9	920.97	920.68	0.012
	LAT D1A-18EX	GI-D1-18EX	GI-D1-17EX	1 - EX 24 IN RCP	57.41	12.29	10.00	6.65	1.0	18.1	0.47	0.4	921.13	920.86	0.012
	D1A-45	JB-D1-45	JB-D1-23	1 - 24 IN RCP	90.50	12.67	10.00	6.57	6.0	18.6	0.50	5.0	921.91	921.46	0.012
	LAT D1A-19EX	GI-D1-19EX	JB-D1-23	1 - EX 24 IN RCP	88.82	12.67	10.00	6.57	2.3	16.3	0.38	1.0	921.70	921.36	0.012
	D1A-36	BI-D1-36	BI-D1-35	1 - 24 IN RCP	90.00	12.92	10.00	6.52	5.4	18.6	0.50	2.0	920.68	920.23	0.012
	LAT D1A-22	BI-D1-22	JB-D1-44	1 - 24 IN RCP	10.88	13.09	10.00	6.49	2.0	18.6	0.50	3.6	922.15	922.10	0.012
	D1A-23EX	JB-D1-23	JB-D1-44	1 - EX 24 IN RCP	80.50	13.09	10.00	6.49	8.0	17.9	0.46	2.9	921.36	920.99	0.012
	D1A-44EX	JB-D1-44	JB-D1-21EX	1 - EX 24 IN RCP	14.00	13.17	10.00	6.49	9.6	15.8	0.36	3.7	920.99	920.94	0.012
	D1A-21EX	JB-D1-21EX	JB-D1-20EX	1 - EX 24 IN RCP	27.00	13.31	10.00	6.49	9.6	15.2	0.33	3.6	920.94	920.85	0.012
	LAT D1A-16EX	GI-D1-16EX	J-D1-42	1 - EX 24 IN RCP	68.23	13.69	10.00	7.18	1.0	19.5	0.55	0.3	919.83	919.45	0.012
	D1A-35	BI-D1-35	BI-D1-2	1 - 24 IN RCP	97.00	13.73	10.00	6.36	6.5	18.6	0.50	2.1	920.02	919.53	0.012
	LAT D1A-50	BI-D1-50	BI-D1-2	1 - 24 IN RCP	57.57	13.73	10.00	6.36	1.3	14.4	0.30	0.4	919.24	919.07	0.012
	D1A-2	BI-D1-2	BI-D1-87	1 - 24 IN RCP	61.00	14.15	10.00	6.28	8.4	18.6	0.50	2.7	919.24	918.94	0.012
	LAT D1A-17EX	GI-D1-17EX	JB-D1-11EX	1 - EX 24 IN RCP	74.90	14.78	10.00	6.17	1.4	16.4	0.39	0.5	920.86	920.57	0.012
	D1A-20EX	JB-D1-20EX	JB-D1-11EX	1 - EX 24 IN RCP	89.00	14.78	10.00	6.17	9.6	14.8	0.31	3.3	920.85	920.57	0.012
	D1A-11EX	JB-D1-11EX	JB-D1-43	1 - EX 24 IN RCP	75.00	15.15	10.00	6.17	10.4	14.9	0.32	3.4	920.57	920.33	0.012
	D1A-43	JB-D1-43	BI-D1-10	1 - 24 IN RCP	11.50	15.23	10.00	6.09	10.4	18.6	0.50	3.5	920.33	920.27	0.012
	D1A-10	BI-D1-10	BI-D1-8	1 - 24 IN RCP	81.00	15.56	10.00	6.03	11.8	18.3	0.48	3.9	920.27	919.88	0.012
	LAT D1A-42	J-D1-42	BI-D1-8	1 - 24 IN RCP	11.77	15.56	10.00	6.03	1.0	19.6	0.55	0.3	919.45	919.39	0.012
	D1A-8	BI-D1-8	BI-D1-88	1 - 30 IN RCP	92.00	16.13	10.00	5.94	13.8	33.8	0.50	2.8	919.38	918.92	0.012
	D1A-87	BI-D1-87	BI-D1-4	1 - 24 IN RCP	22.00	16.26	10.00	5.92	9.2	18.6	0.50	2.9	918.91	918.80	0.012
	D1A-88	BI-D1-88	BI-D1-4	1 - 30 IN RCP	18.00	16.26	10.00	5.92	14.8	33.8	0.50	3.0	918.89	918.80	0.012
	LAT D1A-40EX	GI-D1-40	BI-D1-4	1 - EX 36 IN RCP	11.37	16.26	10.00	5.92	15.7	42.6	0.30	2.2	918.60	918.57	0.012
	LAT D1A-4EX	BI-D1-4	JB-D1-83	1 - EX 36 IN RCP	11.55	16.30	10.00	5.92	39.1	39.6	0.26	6.4	918.57	918.54	0.012
	LAT D1A-83EX	JB-D1-83	GI-D1-3	1 - EX 42 IN RCP	103.92	17.08	10.00	5.78	39.1	66.1	0.32	5.1	918.54	918.21	0.012
LINE D1B	LAT D1B-82	GI-D1-82	BI-D1-75	1 - 24 IN RCP	15.50	10.16	10.00	7.14	0.7	26.2	0.99	3.3	923.83	923.68	0.012
	LAT D1B-61	BI-D1-61	MH-D1-34	1 - 24 IN RCP	60.11	10.51	10.00	7.18	0.5	14.4	0.30	2.4	923.18	923.00	0.012
	LAT D1B-75	BI-D1-75	BI-D1-77	1 - 24 IN RCP	118.00	10.64	10.00	7.02	1.4	26.4	1.00	4.3	923.58	922.40	0.012
	LAT D1B-77	BI-D1-77	BI-D1-92	1 - 24 IN RCP	59.50	10.92	10.00	6.96	2.0	26.4	1.00	4.7	922.16	921.57	0.012
	LAT D1B-92	BI-D1-92	BI-D1-93	1 - 24 IN RCP	27.50	11.03	10.00	6.93	2.5	26.4	1.00	4.9	921.52	921.24	0.012
	LAT D1B-93	BI-D1-93	BI-D1-94	1 - 24 IN RCP	25.00	11.12	10.00	6.91	2.8	26.4	1.00	5.0	921.14	920.89	0.012
	LAT D1B-94	BI-D1-94	BI-D1-95	1 - 24 IN RCP	15.00	11.21	10.00	6.89	3.0	18.6	0.50	4.1	920.79	920.71	0.012
	LAT-D1B-95	BI-D1-95	BI-D1-76	1 - 24 IN RCP	15.00	11.30	10.00	6.87	3.1	18.6	0.50	4.1	920.71	920.63	0.012
	LAT D1B-76	BI-D1-76	MH-D1-78	1 - 24 IN RCP	66.51	11.61	10.00	6.87	3.2	18.6	0.50	4.2	920.63	920.30	0.012
	LAT D1B-78	MH-D1-78	MH-D1-55	1 - 24 IN RCP	27.00	11.79	10.00	6.87	3.2	18.6	0.50	2.4	920.30	920.17	0.012
	D1B-34	MH-D1-34	MH-D1-33	1 - 24 IN RCP	197.56	12.24	10.00	6.66	0.5	14.4	0.30	1.1	922.91	922.32	0.012
	LAT D1B-60	BI-D1-60	MH-D1-33	1 - 24 IN RCP	67.74	12.24	10.00	6.66	0.9	13.9	0.28	1.4	922.41	922.22	0.012
	LAT D1B-15EX	GI-D1-15EX	GI-D1-14EX	1 - EX 24 IN RCP	47.11	12.84	10.00	6.54	0.4	17.6	0.45	0.3	921.10	920.89	0.012
	LAT D1B-55	MH-D1-55	MH-D1-56	1 - 24 IN RCP	117.00	12.98	10.00	6.87	3.2	18.6	0.50	1.2	920.06	919.48	0.012
	LAT D1B-56	MH-D1-56	MH-D1-59	1 - 24 IN RCP	5.50	13.11	10.00	6.87	3.2	18.6	0.50	1.2	919.41	919.38	0.012
	LAT D1B-59	MH-D1-59	STU-D1	1 - 24 IN RCP	18.00	13.44	10.00	6.87	3.2	14.4	0.30	1.2	919.38	919.33	0.012
	LAT D1B-91	STU-D1	MH-D1-58	1 - 24 IN RCP	3.00	13.60	10.00	6.87	3.2	14.4	0.30	1.0	918.83	918.82	0.012
	D1B-33	MH-D1-33	BI-D1-28	1 - 24 IN RCP	196.16	13.77	10.00	6.35	1.3	14.4	0.30	1.2	922.22	921.63	0.012
	D1B-28	BI-D1-28	MH-D1-27	1 - 24 IN RCP	90.01	14.50	10.00	6.22	2.7	14.4	0.30	1.8	921.63	921.36	0.012
	LAT D1B-29EX	GI-D1-29EX	MH-D1-27	1 - EX 24 IN RCP	88.76	14.50	10.00	6.22	2.2	14.8	0.32	1.5	921.64	921.36	0.012
	D1B-27EX	MH-D1-27	JB-D1-26EX	1 - EX 24 IN RCP	83.74	14.88	10.00	6.22	4.5	19.3	0.54	4.8	921.36	920.91	0.012
	LAT D1B-58	MH-D1-58	MH-D1-54	1 - 24 IN RCP	73.50	14.89	10.00	6.15	3.2	14.4	0.30	1.0	918.82	918.60	0.012

DESIGN

STATE OF TEXAS
BRYAN SIERSMA
147188
LICENSED PROFESSIONAL ENGINEER

BRYAN SIERSMA, P.E.
5/9/2024
DATE

APPROVAL

STATE OF TEXAS
DAN THOMA
98622
LICENSED PROFESSIONAL ENGINEER

DAN THOMA, P.E.
5/9/2024
DATE

PAPE-DAWSON ENGINEERS
SAN ANTONIO | AUSTIN | HOUSTON | FORT WORTH | DALLAS
2000 NW LOOP 410 | SAN ANTONIO, TX 78213 | 210.375.9000
TEXAS ENGINEERING FIRM #470 | TEXAS SURVEYING FIRM #10028800

2024
Texas Department of Transportation

US 183 GPL
STORM SEWER
HYDRAULIC
COMPUTATIONS

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CONT	SECT	JOB	HIGHWAY
0151	10	001	US 183
DIST	COUNTY		SHEET NO.
AUS	WILLIAMSON		719

DS: CK: DW: CK:

DATE: 5/9/2024 8:21:23 PM
FILE: v:\bentley\dms\pd-pw-01\aly\ssa.sage\dms07214\01511001_SS_COMP02.dgn

STORM SEWER COMPUTATIONS

ID	LINE NO	FROM NODE	TO NODE	STRUCTURE SIZE	LENGTH	TC	STORM FREQUENCY	I 10 YR	Q 10 YR	CAPACITY	SLOPE	VELOCITY	INVERT UPSTREAM	INVERT DOWNSTREAM	MANNING'S N VALUE
					(FT)	(MIN)	(YRS)	(in/hr)	(CFS)	(CFS)	%	(FT/SEC)	(FT)	(FT)	
LINE D1B CONT.	LAT D1B-6EX	HW-D1-6EX	MH-D1-54	1 - EX 36 IN RCP	3.50	14.89	10.00	6.15	9.3	42.6	0.30	1.6	918.57	918.56	0.012
	D1B-26EX	JB-D1-26EX	JB-D1-25EX	1 - EX 24 IN RCP	28.00	15.08	10.00	6.22	4.5	20.5	0.61	2.4	920.91	920.74	0.012
	LAT D1B-14EX	GI-D1-14EX	GI-D1-12EX	1 - EX 24 IN RCP	75.42	15.20	10.00	6.09	1.1	14.9	0.32	0.5	920.89	920.65	0.012
	D1B-25EX	JB-D1-25EX	GI-D1-12EX	1 - EX 24 IN RCP	11.85	15.20	10.00	6.09	4.5	23.0	0.76	2.2	920.74	920.65	0.012
	LAT D1B-54EX	MH-D1-54	GI-D1-57	1 - EX 36 IN RCP	39.50	15.29	10.00	6.08	10.8	42.6	0.30	1.7	918.56	918.44	0.012
	D1B-12EX	GI-D1-12EX	GI-D1-9	1 - EX 24 IN RCP	165.01	16.02	10.00	5.95	7.2	14.5	0.30	4.2	920.65	920.15	0.012
	D1B-9EX	GI-D1-9	GI-D1-7EX	1 - EX 24 IN RCP	95.96	16.35	10.00	5.90	8.3	21.2	0.65	6.0	920.15	919.53	0.012
	LAT D1B-13EX	GI-D1-13EX	GI-D1-7EX	1 - EX 18 IN RCP	99.39	16.35	10.00	5.90	1.3	6.7	0.30	0.8	919.83	919.53	0.012
	D1B-7EX	GI-D1-7EX	GI-D1-90	1 - EX 30 IN RCP	78.76	16.91	10.00	5.81	10.1	26.7	0.31	2.3	919.02	918.77	0.012
	LAT D1B-57EX	GI-D1-57	GI-D1-3	1 - EX 36 IN RCP	30.75	17.08	10.00	5.78	23.3	42.6	0.30	3.6	918.30	918.21	0.012
	D1B-90EX	GI-D1-90	GI-D1-3	1 - EX 30 IN RCP	20.00	17.08	10.00	5.78	10.6	26.7	0.31	2.4	918.76	918.70	0.012
	D1B-3EX	GI-D1-3	GI-D1-89	1 - EX 5FT x 3FT SBC	20.50	17.13	10.00	5.78	71.9	172.2	0.58	8.6	918.21	918.09	0.012
	D1B-89EX	GI-D1-89	GI-D1-1EX	1 - EX 5FT x 3FT SBC	61.96	17.26	10.00	5.76	72.3	172.1	0.58	9.0	918.06	917.70	0.012
	D1B-1EX	GI-D1-1EX	OUT-D1EX	1 - EX 5FT x 3FT SBC	588.45	18.42	10.00	5.58	72.9	152.7	0.46	8.5	917.70	915.00	0.012
LINE E1	E1-4	GI-E1-4	GI-E1-3	1 - 24 IN RCP	44.99	14.84	10.00	6.16	0.4	14.4	0.30	0.2	924.16	924.02	0.012
	E1-3	GI-E1-3	MH-E1-2	1 - 24 IN RCP	39.24	15.34	10.00	6.07	3.9	14.4	0.30	1.4	924.02	923.90	0.012
	LAT E1-5	GI-E1-5	MH-E1-2	1 - 24 IN RCP	291.45	15.34	10.00	6.07	7.2	13.5	0.26	2.6	924.65	923.89	0.012
	E1-2	MH-E1-2	GI-E1-1	1 - 24 IN RCP	153.10	16.03	10.00	5.95	9.9	14.4	0.30	3.5	923.90	923.44	0.012
	E1-1	GI-E1-1	STU-E1	1 - 24 IN RCP	54.37	16.21	10.00	5.95	14.1	14.4	0.30	5.8	923.44	923.28	0.012
	E1-6	STU-E1	MH-E1-7	1 - 24 IN RCP	20.70	16.29	10.00	5.95	14.1	14.4	0.30	5.2	922.78	922.72	0.012
	E1-7EX	MH-E1-7	OUT-E1-EX	1 - EX 30 IN RCP	27.92	16.38	10.00	5.89	14.1	34.5	0.52	6.2	922.72	922.57	0.012
LINE E2	E2-5	STU-E2-5	E2-5OUT	1 - 18 IN RCP	22.38	10.13	10.00	7.14	1.0	8.7	0.50	3.1	917.36	917.25	0.012
	E2-4	STU-E2-4	E2-4OUT	1 - 18 IN RCP	33.25	10.13	10.00	7.14	3.4	8.7	0.50	4.4	917.66	917.49	0.012
	E2-8	GI-E2-8	MH-E2-3	1 - 30 IN RCP	269.17	10.81	10.00	7.18	20.1	28.1	0.35	5.2	922.50	921.57	0.012
	E2-3	MH-E2-3	GI-E2-2	1 - 30 IN RCP	64.50	10.97	10.00	6.94	20.1	33.8	0.50	6.8	921.44	921.12	0.012
	LAT E2-7	GI-E2-7	MH-E2-1	1 - 24 IN RCP	163.65	11.31	10.00	6.87	8.1	26.4	1.00	7.0	919.80	918.16	0.012
	E2-1	MH-E2-1	STU-E2	1 - 30 IN RCP	3.96	11.33	10.00	6.87	32.4	37.0	0.60	8.0	917.59	917.56	0.012
	E2-9	STU-E2	OUT-E2	1 - 30 IN RCP	42.31	11.43	10.00	6.84	32.4	37.0	0.60	8.0	917.06	916.81	0.012
	E2-2EX	GI-E2-2	MH-E2-1	1 - EX 30 IN RCP	186.87	11.31	10.00	6.87	24.9	58.5	1.50	10.7	920.65	917.85	0.012
LINE E3	E3-8	GI-E3-8	GI-E3-7	1 - 24 IN RCP	100.75	10.52	10.00	7.05	2.5	18.6	0.50	3.9	921.90	921.40	0.012
	LAT E3-9	GI-E3-9	STU-E3-2	1 - 24 IN RCP	80.00	11.14	10.00	7.18	3.9	14.4	0.30	1.2	915.70	915.46	0.012
	E3-7	GI-E3-7	GI-E3-6	1 - 24 IN RCP	215.33	12.05	10.00	6.70	5.0	18.6	0.50	4.8	921.38	920.30	0.012
	E3-6	GI-E3-6	MH-E3-5	1 - 24 IN RCP	67.28	12.35	10.00	6.64	11.8	18.6	0.50	3.8	920.24	919.90	0.012
	E3-5	MH-E3-5	STU-E3-1	1 - 30 IN RCP	185.84	12.73	10.00	6.64	27.8	40.0	0.70	8.3	919.40	918.10	0.012
	E3-4	STU-E3-1	MH-E3-3	1 - 30 IN RCP	66.76	12.94	10.00	6.52	27.8	33.8	0.50	5.7	915.52	915.19	0.012
	E3-3	MH-E3-3	MH-E3-1	1 - 30 IN RCP	19.25	13.01	10.00	6.52	30.8	33.8	0.50	6.5	915.19	915.09	0.012
	LAT E3-14	BI-F6-31	BI-F6-30	1 - 24 IN RCP	130.00	11.37	10.00	6.85	7.0	18.6	0.50	5.2	919.15	918.50	0.012
	LAT E3-18	GI-E3-18	GI-E3-17	1 - 24 IN RCP	201.50	11.42	10.00	6.84	6.1	14.4	0.30	2.1	921.20	920.60	0.012
	LAT E3-15	BI-F6-30	BI-F6-29	1 - 24 IN RCP	130.00	11.79	10.00	6.76	7.9	18.6	0.50	5.4	918.15	917.50	0.012
	LAT E3-16	BI-F6-29	BI-F6-27	1 - 24 IN RCP	102.70	12.14	10.00	6.68	8.8	18.6	0.50	5.5	917.31	916.80	0.012
	LAT E3-17	GI-E3-17	MH-E3-5	1 - 24 IN RCP	101.15	12.35	10.00	6.64	16.6	18.6	0.50	5.3	920.41	919.90	0.012
	LAT E3-19	STU-E3-2	MH-E3-3	1 - 24 IN RCP	30.00	12.94	10.00	6.52	3.9	14.4	0.30	1.2	915.29	915.20	0.012
	E3-1EX	MH-E3-1	OUT-E3	1 - EX 30 IN RCP	54.15	13.09	10.00	6.49	30.8	91.6	3.67	13.4	914.99	913.00	0.012
LINE F2	F2-1	BI-F2-1	OUT-F2	1 - 24 IN RCP	25.00	13.06	10.00	6.49	0.6	18.6	0.50	0.2	885.59	885.46	0.012
LINE F3	F3-4	SET-F3-3	STU-F3	1 - 36 IN RCP	95.37	10.13	10.00	7.18	24.8	116.6	2.25	11.6	893.82	891.67	0.012
	F3-3EX	STU-F3	OUT-F3	1 - EX 36 IN RCP	38.82	10.20	10.00	7.13	24.8	175.9	5.12	13.4	888.53	886.54	0.012
LINE F4	F4-1	RW-F4-1	F4-OUT	1 - 18 IN RCP	54.08	10.23	10.00	7.12	2.2	8.7	0.50	3.9	922.67	922.40	0.012
LINE F5	F5-2	BI-F5-2	BI-F5-3	1 - 18 IN RCP	37.84	10.32	10.00	7.10	0.8	6.7	0.30	2.1	926.71	926.60	0.012
	F5-3	BI-F5-3	BI-F5-1	1 - 18 IN RCP	38.33	10.63	10.00	7.02	1.2	6.7	0.30	2.1	926.52	926.40	0.012
	F5-1	BI-F5-1	OUT-F5	1 - 18 IN RCP	41.64	10.95	10.00	6.95	1.5	6.7	0.30	3.2	926.34	926.22	0.012
LINE F6	LAT F6-8	GI-F6-8	BI-F6-14	1 - 24 IN RCP	2.27	13.67	10.00	6.37	5.4	18.6	0.50	2.7	912.91	912.90	0.012
	LAT F6-9	BI-F6-9	STU-F6	1 - 30 IN RCP	3.00	15.07	10.00	6.14	27.8	33.8	0.50	7.4	896.50	896.49	0.012
	F6-6	MH-F6-6	OUT-F6	2 - 24 IN RCP	5.50	17.41	10.00	5.73	63.0	92.7	3.09	10.0	885.45	885.28	0.012
	LAT F6-34	GI-F6-34	BI-F6-33	1 - 24 IN RCP	1.55	10.00	10.00	7.18	4.8	16.7	0.40	3.2	920.26	920.25	0.012
	LAT F6-33	BI-F6-33	BI-F6-32	1 - 24 IN RCP	115.00	10.46	10.00	7.06	5.5	16.7	0.40	4.5	920.15	919.69	0.012
	LAT F6-32	BI-F6-32	BI-F6-31	1 - 24 IN RCP	130.00	10.94	10.00	6.95	6.3	16.7	0.40	4.7	919.77	919.25	0.012
	LAT F6-28	GI-F6-28	BI-F6-27	1 - 24 IN RCP	1.55	12.14	10.00	6.68	9.3	18.6	0.50	5.5	917.21	917.20	0.012
	LAT F6-27	BI-F6-27	BI-F6-26	1 - 30 IN RCP	83.47	12.36	10.00	6.64	18.2	33.8	0.50	6.6	916.17	915.75	0.012

DESIGN

STATE OF TEXAS · BRYAN SIERSMA · 147188 · LICENSED PROFESSIONAL ENGINEER

BRYAN SIERSMA, P.E.

5/9/2024
DATE

APPROVAL

STATE OF TEXAS · DAN THOMA · 98622 · LICENSED PROFESSIONAL ENGINEER

DAN THOMA, P.E.

5/9/2024
DATE

PAPE-DAWSON ENGINEERS

SAN ANTONIO | AUSTIN | HOUSTON | FORT WORTH | DALLAS
2000 NW LOOP 410 | SAN ANTONIO, TX 78213 | 210.375.9000
TEXAS ENGINEERING FIRM #470 | TEXAS SURVEYING FIRM #10028800

2024 Texas Department of Transportation

US 183 GPL
STORM SEWER HYDRAULIC COMPUTATIONS

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DS:	CK:	CONT	SECT	JOB	HIGHWAY
		0151	10	001	US 183
DW:	CK:	DIST	COUNTY		SHEET NO.
		AUS	WILLIAMSON		720

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STORM SEWER COMPUTATIONS

ID	LINE NO	FROM NODE	TO NODE	STRUCTURE SIZE	LENGTH	TC	STORM FREQUENCY	I 10 YR	Q 10 YR	CAPACITY	SLOPE	VELOCITY	INVERT UPSTREAM	INVERT DOWNSTREAM	MANNING'S N VALUE
					(FT)	(MIN)	(YRS)	(in/hr)	(CFS)	(CFS)	%	(FT/SEC)	(FT)	(FT)	
LINE F6 CONT.	LAT F6-26	BI-F6-26	BI-F6-25	1 - 30 IN RCP	41.35	12.48	10.00	6.61	18.9	33.8	0.50	6.7	915.61	915.40	0.012
	LAT F6-25	BI-F6-25	BI-F6-24	1 - 30 IN RCP	37.52	12.59	10.00	6.59	19.4	33.8	0.50	6.7	915.19	915.00	0.012
	LAT F6-24	BI-F6-24	BI-F6-23	1 - 30 IN RCP	38.77	12.70	10.00	6.57	19.7	33.8	0.50	6.7	914.99	914.80	0.012
	LAT F6-23	BI-F6-23	BI-F6-22	1 - 30 IN RCP	43.03	12.82	10.00	6.54	20.0	33.8	0.50	6.8	914.62	914.40	0.012
	LAT F6-22	BI-F6-22	BI-F6-21	1 - 30 IN RCP	42.78	12.93	10.00	6.52	20.3	33.8	0.50	6.8	914.21	914.00	0.012
	LAT F6-21	BI-F6-21	BI-F6-20	1 - 30 IN RCP	35.52	13.03	10.00	6.50	20.5	33.8	0.50	6.8	913.93	913.75	0.012
	LAT F6-20	BI-F6-20	BI-F6-19	1 - 30 IN RCP	33.76	13.14	10.00	6.48	20.8	33.8	0.50	6.8	913.57	913.40	0.012
	LAT F6-19	BI-F6-19	BI-F6-18	1 - 30 IN RCP	32.26	13.23	10.00	6.46	21.1	33.8	0.50	6.8	913.36	913.20	0.012
	LAT F6-18	BI-F6-18	BI-F6-17	1 - 30 IN RCP	39.76	13.34	10.00	6.44	21.3	33.8	0.50	6.9	913.10	912.90	0.012
	LAT F6-17	BI-F6-17	BI-F6-16	1 - 30 IN RCP	32.75	13.43	10.00	6.42	21.6	33.8	0.50	6.9	912.76	912.60	0.012
	LAT F6-16	BI-F6-16	BI-F6-15	1 - 30 IN RCP	36.00	13.54	10.00	6.40	21.9	33.8	0.50	5.6	912.48	912.30	0.012
	LAT F6-15	BI-F6-15	BI-F6-14	1 - 30 IN RCP	35.05	13.67	10.00	6.37	22.1	33.8	0.50	5.0	912.18	912.00	0.012
	LAT F6-14	BI-F6-14	BI-F6-13	1 - 30 IN RCP	28.50	13.75	10.00	6.36	27.0	33.8	0.50	7.3	911.94	911.80	0.012
	LAT F6-13	BI-F6-13	BI-F6-12	1 - 30 IN RCP	121.50	14.04	10.00	6.30	27.2	33.8	0.50	7.3	911.01	910.40	0.012
	LAT F6-12	BI-F6-12	BI-F6-11	1 - 30 IN RCP	105.00	14.30	10.00	6.25	27.3	33.8	0.50	7.3	908.63	908.10	0.012
	LAT F6-11	BI-F6-11	BI-F6-38	1 - 30 IN RCP	58.00	14.44	10.00	6.23	27.4	33.8	0.50	7.2	904.72	904.43	0.012
	LAT F6-38	BI-F6-38	BI-F6-10	1 - 30 IN RCP	63.00	14.59	10.00	6.20	27.5	33.8	0.50	7.3	904.42	904.10	0.012
	LAT F6-10	BI-F6-10	BI-F6-37	1 - 30 IN RCP	52.50	14.74	10.00	6.17	27.7	33.8	0.50	6.5	897.42	897.16	0.012
	LAT F6-37	BI-F6-37	BI-F6-35	1 - 30 IN RCP	37.25	14.85	10.00	6.15	27.7	33.8	0.50	6.2	897.14	896.95	0.012
	LAT F6-35	BI-F6-35	BI-F6-36	1 - 30 IN RCP	30.75	14.95	10.00	6.14	27.8	33.8	0.50	6.0	896.93	896.77	0.012
	LAT F6-36	BI-F6-36	BI-F6-9	1 - 30 IN RCP	29.46	15.05	10.00	6.14	27.9	33.8	0.50	5.9	896.75	896.60	0.012
	LAT F6-40	STU-F6	MH-F6-41	1 - 30 IN RCP	18.42	15.13	10.00	6.14	27.9	33.8	0.50	5.9	892.12	892.03	0.012
	LAT F6-41	MH-F6-41	MH-F6-36	1 - 30 IN RCP	8.17	15.16	10.00	6.14	27.9	33.8	0.50	7.4	891.93	891.89	0.012
	F6-3EX	CI-F6-3EX	CI-F6-1EX	1 - EX 30 IN RCP	20.38	16.07	10.00	5.94	21.8	64.4	1.82	9.1	903.45	903.08	0.012
	F6-1EX	CI-F6-1EX	GI-F6-4EX	1 - EX 30 IN RCP	112.47	16.28	10.00	5.91	25.1	78.7	2.71	12.8	903.02	899.97	0.012
	LAT F6-2EX	CI-F6-2EX	GI-F6-4EX	1 - EX 24 IN RCP	16.65	16.28	10.00	5.91	9.1	75.9	8.29	11.6	901.54	900.16	0.012
	F6-4EX	GI-F6-4EX	JB-F6-5EX	1 - EX 30 IN RCP	532.52	17.22	10.00	5.91	37.8	60.8	1.62	12.3	899.86	891.24	0.012
	F6-5EX	JB-F6-5EX	JB-F6-7EX	2 - EX 24 IN RCP	47.25	17.29	10.00	5.91	37.8	140.4	7.09	15.3	891.19	887.84	0.012
	LAT F6-36	MH-F6-36	MH-F6-6	1 - 30 IN RCP	124.60	17.39	10.00	5.74	27.9	33.8	0.50	7.4	889.12	888.50	0.012
	F6-7EX	JB-F6-7EX	MH-F6-6	2 - EX 24 IN RCP	31.21	17.39	10.00	5.74	37.8	54.2	1.06	6.0	885.88	885.55	0.012
LINE G10	G10-3	BI-G5-12	BI-G5-6	1 - 24 IN RCP	152.62	18.50	10.00	5.57	0.8	18.6	0.50	0.3	872.01	871.25	0.012
	G10-1	BI-G5-6	GI-G5-11	1 - 24 IN RCP	20.00	19.61	10.00	5.42	1.1	18.6	0.50	0.4	870.70	870.60	0.012
	G10-2	GI-G5-11	G10-OUT	1 - 24 IN RCP	33.50	20.18	10.00	5.35	3.3	18.6	0.50	1.0	870.50	870.33	0.012
LINE G11	G11-1	RW-G11-1	G11-OUT	1 - 18 IN RCP	35.00	10.28	10.00	7.11	0.3	8.7	0.50	2.1	909.18	909.00	0.012
LINE G12	G12-1	RW-G12-1	G12-OUT	1 - 18 IN RCP	35.00	10.18	10.00	7.13	1.3	8.7	0.50	3.3	909.18	909.00	0.012
LINE G13	G13-1	RW-G13-1	OUT-G13	1 - 18 IN RCP	2.50	10.01	10.00	7.17	1.0	8.7	0.50	3.0	906.54	906.53	0.012
LINE G3	G3-1	RW-G3-1	OUT-G3	1 - 18 IN RCP	35.00	10.20	10.00	7.13	0.9	8.7	0.50	3.0	909.18	909.00	0.012
LINE G4	G4-1	RW-G4-1	OUT-G4	1 - 18 IN RCP	2.50	10.03	10.00	7.17	0.3	8.7	0.50	2.3	906.54	906.53	0.012
LINE G5	LAT G5-9	CI-G5-9	J-G5-10	1 - 24 IN RCP	3.27	10.22	10.00	7.18	1.3	27.8	1.11	0.7	875.00	874.96	0.012
	LAT G5-1	SET-G5-1	STU-G5	1 - 36 IN RCP	3.34	17.61	10.00	5.71	83.4	109.9	2.00	11.8	878.37	878.30	0.012
	G5-7	MH-G5-7	J-G5-8	1 - 5FT x 3FT SBC	52.95	33.19	10.00	5.71	85.9	390.5	3.00	13.9	870.95	869.36	0.012
	G5-8	J-G5-8	MH-G5-6	1 - 5FT x 3FT SBC	186.65	33.38	10.00	5.71	85.9	374.5	2.76	16.0	868.93	863.78	0.012
	G5-6	MH-G5-6	MH-G5-5	1 - 5FT x 3FT SBC	192.13	33.64	10.00	5.71	89.2	356.5	2.50	15.7	863.30	858.50	0.012
	G5-5	MH-G5-5	MH-G5-4	1 - 5FT x 3FT SBC	12.51	33.69	10.00	5.71	89.2	270.5	1.44	6.1	858.50	858.32	0.012
	LAT G5-12	IN-G5-12	MH-G5-13	1 - 24 IN RCP	5.50	0.03	10.00	11.35	3.3	18.6	0.50	4.1	870.20	870.17	0.012
	G5-15EX	CI-G5-15EX	JB-G5-16EX	1 - EX 36 IN RCP	64.50	32.86	10.00	5.71	0.4	156.6	4.06	0.1	879.72	877.10	0.012
	LAT G5-17EX	STU-G5	JB-G5-16EX	1 - EX 36 IN RCP	41.08	32.86	10.00	5.71	83.4	118.7	2.33	11.8	878.06	877.10	0.012
	G5-16EX	JB-G5-16EX	CI-G5-14EX	1 - EX 36 IN RCP	59.75	32.95	10.00	5.71	83.7	87.7	1.27	11.8	877.10	876.34	0.012
	LAT G5-10EX	J-G5-10	CI-G5-18EX	1 - EX 24 IN RCP	90.74	32.99	10.00	5.71	1.3	27.8	1.11	0.4	874.96	873.95	0.012
	G5-14EX	CI-G5-14EX	CI-G5-18EX	1 - EX 36 IN RCP	42.95	32.99	10.00	5.71	84.3	183.4	5.56	17.7	876.34	873.95	0.012
	G5-18EX	CI-G5-18EX	JB-G5-19EX	2 - EX 36 IN RCP	23.06	33.04	10.00	5.71	85.9	114.5	0.54	8.3	873.95	873.83	0.012
	G5-19EX	JB-G5-19EX	MH-G5-7	1 - EX 5FT x 3FT SBC	44.01	33.11	10.00	5.71	85.9	279.2	1.53	11.4	871.75	871.07	0.012
	LAT G5-13	MH-G5-13	MH-G5-6	1 - 24 IN RCP	54.00	33.38	10.00	5.71	3.3	37.3	2.00	6.8	870.00	868.92	0.012
	G5-4EX	MH-G5-4	J-G5-3EX	1 - EX 5FT x 3FT SBC	29.36	33.74	10.00	5.71	89.2	370.4	2.70	12.4	858.32	857.53	0.012
	G5-3EX	J-G5-3EX	J-G5-2EX	1 - EX 5FT x 3FT SBC	24.60	33.78	10.00	5.71	89.2	363.6	2.60	11.8	857.53	856.89	0.012
	G5-2EX	J-G5-2EX	J-G5-1EX	1 - EX 5FT x 3FT SBC	210.41	34.25	10.00	5.71	89.2	135.5	0.36	6.5	856.89	856.13	0.012
	G5-1EX	J-G5-1EX	OUT-G5	1 - EX 5FT x 3FT SBC	54.33	34.37	10.00	4.02	89.2	101.4	0.20	8.3	856.13	856.02	0.012
LINE G7	LAT G7-1	CI-G7-1	J-G7-4	1 - 24 IN RCP	12.74	10.29	10.00	7.18	2.2	26.4	1.00	0.8	887.67	887.54	0.012

DESIGN

STATE OF TEXAS
BRYAN SIERSMA
147188
LICENSED PROFESSIONAL ENGINEER

BRYAN SIERSMA, P.E.
5/9/2024
DATE

APPROVAL

STATE OF TEXAS
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2024
Texas Department of Transportation

US 183 GPL
STORM SEWER
HYDRAULIC
COMPUTATIONS

SHEET 4 OF 8

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0151	10	001	US 183
DIST	COUNTY		SHEET NO.
AUS	WILLIAMSON		721

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STORM SEWER COMPUTATIONS															
ID	LINE NO	FROM NODE	TO NODE	STRUCTURE SIZE	LENGTH	TC	STORM FREQUENCY	I 10 YR	Q 10 YR	CAPACITY	SLOPE	VELOCITY	INVERT UPSTREAM	INVERT DOWNSTREAM	MANNING'S N VALUE
					(FT)	(MIN)	(YRS)	(in/hr)	(CFS)	(CFS)	%	(FT/SEC)	(FT)	(FT)	
LINE G7 CONT.	G7-3	SET-G7-3	JB-G7-2	1 - 3FT x 2FT SBC	63.73	17.13	10.00	5.78	29.4	78.3	1.40	9.6	888.44	887.55	0.012
	LAT G7-4	J-G7-4	JB-G7-2	1 - 24 IN RCP	9.26	17.13	10.00	5.78	2.2	26.4	1.00	0.8	887.54	887.45	0.012
	G7-2	JB-G7-2	OUT-G7	1 - 3FT x 2FT SBC	52.33	17.27	10.00	5.75	31.0	41.9	0.40	6.9	887.45	887.24	0.012
LINE G9	LAT G9-3	GI-G9-3	MH-G9-5	1 - 18 IN RCP	43.27	10.34	10.00	7.18	0.5	8.7	0.50	2.6	885.34	885.13	0.012
	G9-1EX	GI-G9-1EX	JB-G9-2EX	1 - EX 24 IN RCP	98.92	15.35	10.00	6.07	17.7	51.9	3.88	13.5	887.64	883.80	0.012
	LAT G9-5EX	MH-G9-5	JB-G9-2EX	1 - EX 18 IN RCP	52.02	15.35	10.00	6.07	0.5	20.2	2.72	4.7	885.13	883.71	0.012
	G9-2EX	JB-G9-2EX	OUT-G9EX	1 - EX 24 IN RCP	13.42	15.39	10.00	6.06	18.1	22.1	0.70	7.3	883.54	883.45	0.012
	LAT G9-4EX	GI-G9-4EX	OUT-G9EX	1 - EX 24 IN RCP	3.16	15.39	10.00	6.06	6.6	115.2	19.10	10.1	884.05	883.45	0.012
LINE H4	LAT H4-8	BI-H4-8	BI-H4-26	1 - 6FT x 4FT SBC	37.09	11.11	10.00	6.91	43.0	297.1	0.50	7.0	858.09	857.90	0.012
	H4-7	MH-H4-7	J-H4-22	1 - 6FT x 4FT SBC	31.16	17.80	10.00	5.68	84.1	297.1	0.50	8.5	856.45	856.29	0.012
	H4-6	MH-H4-6	J-H4-14	1 - 6FT x 4FT SBC	141.86	18.73	10.00	5.54	86.5	297.1	0.50	8.9	854.57	853.86	0.012
	H4-5	MH-H4-5	GI-H4-45	1 - 6FT x 4FT SBC	47.34	19.30	10.00	5.46	88.8	265.8	0.40	6.4	852.77	852.58	0.012
	LAT H4-111	GI-H4-111	MH-H4-104	1 - 24 IN RCP	20.00	10.10	10.00	7.18	4.7	14.4	0.30	4.3	868.01	867.95	0.012
	LAT H4-100EX	RW-H4-100EX	GI-H4-110	1 - EX 24 IN RCP	6.87	10.10	10.00	7.15	0.3	18.6	0.50	1.3	866.14	866.11	0.012
	LAT H4-43EX	GI-H4-43EX	J-H4-93EX	2 - EX 36 IN RCP	75.73	10.11	10.00	7.18	33.6	395.4	6.47	15.1	865.70	860.80	0.012
	LAT H4-44	GI-H4-44	MH-H4-108	1 - 24 IN RCP	24.50	10.11	10.00	7.18	3.3	18.6	0.50	4.2	867.00	866.88	0.012
	LAT H4-120	BI-H4-120	BI-H4-55	1 - 24 IN RCP	8.58	10.13	10.00	7.14	0.6	14.4	0.30	1.6	865.43	865.40	0.012
	LAT H4-98EX	RW-H4-98EX	J-H4-106	1 - EX 24 IN RCP	17.11	10.14	10.00	7.18	0.4	18.6	0.50	2.2	866.48	866.39	0.012
	LAT H4-18	RW-H4-18	CI-H4-20	1 - 18 IN RCP	27.62	10.15	10.00	7.14	1.3	8.7	0.50	3.3	859.09	858.95	0.012
	LAT H4-99EX	RW-H4-99EX	J-H4-105	1 - EX 24 IN RCP	16.62	10.15	10.00	7.18	0.3	18.6	0.50	2.0	866.22	866.14	0.012
	LAT H4-12	RW-H4-12	CI-H4-10	1 - 18 IN RCP	30.73	10.15	10.00	7.14	2.0	8.7	0.50	3.8	855.50	855.35	0.012
	LAT H4-21	RW-H4-21	CI-H4-91	1 - 18 IN RCP	30.32	10.16	10.00	7.14	1.2	8.7	0.50	3.3	863.01	862.86	0.012
	LAT H4-32	RW-H4-32	RW-H4-35	1 - 18 IN RCP	24.01	10.17	10.00	7.13	1.5	8.7	0.50	2.1	864.40	864.28	0.012
	H4-121	RW-H4-121	H4-121-OUT	1 - 18 IN RCP	30.00	10.21	10.00	7.12	0.6	8.7	0.50	2.7	865.15	865.00	0.012
	H4-86	RW-H4-86	H4-86-OUT	1 - 18 IN RCP	34.00	10.23	10.00	7.12	0.5	8.7	0.50	2.5	865.17	865.00	0.012
	LAT H4-106	J-H4-106	MH-H4-101	1 - 24 IN RCP	15.50	10.28	10.00	7.18	0.4	18.6	0.50	2.2	866.39	866.32	0.012
	LAT H4-55	BI-H4-55	MH-H4-56	1 - 24 IN RCP	25.21	10.30	10.00	7.14	0.9	18.6	0.50	2.9	865.34	865.21	0.012
	LAT H4-35	RW-H4-35	CI-H4-92	1 - 18 IN RCP	33.32	10.33	10.00	7.10	2.4	8.7	0.50	4.0	864.28	864.11	0.012
	LAT H4-56	MH-H4-56	BI-H4-23	1 - 24 IN RCP	11.88	10.42	10.00	7.07	0.9	18.6	0.50	2.9	865.16	865.10	0.012
	LAT H4-114	BI-H4-114	BI-H4-24	1 - 24 IN RCP	25.28	10.48	10.00	7.06	0.4	14.4	0.30	2.1	863.73	863.65	0.012
	LAT H4-115	BI-H4-115	BI-H4-24	1 - 24 IN RCP	24.29	10.48	10.00	7.06	0.4	14.4	0.30	2.3	863.72	863.65	0.012
	H4-48	BD-H4-48	BD-H4-47	1 - 8 IN PVC	128.63	10.61	10.00	7.03	0.8	2.4	2.00	5.8	886.58	884.01	0.010
	LAT H4-24	BI-H4-24	CI-H4-28	1 - 18 IN RCP	30.41	10.66	10.00	7.02	1.0	8.7	0.50	3.1	862.82	862.67	0.012
	LAT H4-16	BI-H4-16	BI-H4-15	1 - 24 IN RCP	79.37	10.69	10.00	7.01	2.5	16.2	0.38	1.6	864.30	864.00	0.012
	LAT H4-101	MH-H4-101	MH-H4-102	1 - 24 IN RCP	52.50	10.69	10.00	7.01	0.4	18.6	0.50	2.2	866.20	865.94	0.012
	LAT H4-105	J-H4-105	MH-H4-102	1 - 24 IN RCP	15.50	10.69	10.00	7.01	0.3	18.6	0.50	2.0	866.14	866.06	0.012
	LAT H4-116	BI-H4-116	BI-H4-25	1 - 24 IN RCP	24.93	10.74	10.00	7.00	0.3	18.6	0.50	0.6	858.22	858.10	0.012
	LAT H4-108	MH-H4-108	BI-H4-53	1 - 24 IN RCP	126.75	10.83	10.00	6.98	3.3	16.6	0.39	3.9	866.75	866.25	0.012
	LAT H4-102	MH-H4-102	MH-H4-103	1 - 24 IN RCP	27.25	10.89	10.00	6.96	0.6	18.6	0.50	2.6	865.80	865.66	0.012
	LAT H4-110	GI-H4-110	MH-H4-103	1 - 24 IN RCP	22.25	10.89	10.00	6.96	0.7	18.6	0.50	2.6	866.06	865.95	0.012
	LAT H4-15	BI-H4-15	BI-H4-8	1 - 24 IN RCP	61.55	10.92	10.00	6.95	7.4	18.6	0.50	5.3	863.90	863.59	0.012
	LAT H4-23	BI-H4-23	BI-H4-8	1 - 24 IN RCP	98.27	10.92	10.00	6.95	1.7	18.6	0.50	3.5	864.99	864.50	0.012
	LAT H4-93	J-H4-93EX	BI-H4-8	2 - 36 IN RCP	16.00	10.92	10.00	6.95	33.6	395.4	6.47	11.5	860.81	859.77	0.012
	H4-47	BD-H4-47	BD-H4-46	1 - 8 IN PVC	120.19	10.98	10.00	6.94	1.5	2.4	2.00	6.9	884.01	881.61	0.010
	H4-46	BD-H4-46	H4-146	1 - 8 IN PVC	12.43	11.01	10.00	6.94	2.3	2.4	2.00	7.0	881.61	881.36	0.010
	H4-146	H4-146	H4-46-OUT	1 - 8 IN PVC	4.64	11.02	10.00	6.93	2.3	2.4	2.00	6.9	860.09	860.00	0.010
	LAT H4-25	BI-H4-25	BI-H4-26	1 - 24 IN RCP	14.85	11.11	10.00	6.91	0.9	18.6	0.50	0.9	857.97	857.90	0.012
	LAT H4-53	BI-H4-53	BI-H4-54	1 - 24 IN RCP	89.45	11.49	10.00	6.83	4.4	10.4	0.16	2.3	866.15	866.01	0.012
	LAT H4-109	GI-H4-109	BI-H4-54	1 - 24 IN RCP	24.50	11.49	10.00	6.83	0.7	14.4	0.30	0.3	865.87	865.80	0.012
	LAT H4-54	BI-H4-54	MH-H4-52	1 - 24 IN RCP	43.04	11.80	10.00	6.83	6.1	14.4	0.30	2.4	865.71	865.58	0.012
	LAT H4-40	CI-H4-40	GI-H4-41	1 - 24 IN RCP	31.00	12.25	10.00	6.66	0.8	18.6	0.50	0.3	865.36	865.20	0.012
	LAT H4-52	MH-H4-52	GI-H4-41	1 - 24 IN RCP	53.29	12.25	10.00	6.66	6.1	14.4	0.30	2.0	865.36	865.20	0.012
	LAT H4-87	RW-H4-87	GI-H4-41	1 - 18 IN RCP	39.60	12.25	10.00	6.66	0.9	8.7	0.50	0.6	865.90	865.70	0.012
	LAT H4-113	BI-H4-113	BI-H4-69	1 - 24 IN RCP	15.00	12.46	10.00	6.61	0.3	18.6	0.50	0.1	863.35	863.27	0.012
	LAT H4-123	RW-H4-123	BI-H4-66	1 - 18 IN RCP	4.11	12.65	10.00	6.58	1.5	8.7	0.50	3.5	865.83	865.81	0.012
	LAT H4-41	GI-H4-41	MH-H4-112	1 - 24 IN RCP	99.20	12.68	10.00	6.66	11.7	14.4	0.30	4.0	865.10	864.80	0.012
	LAT H4-112	MH-H4-112	CI-H4-39	1 - 24 IN RCP	36.75	12.83	10.00	6.54	11.7	16.3	0.38	4.3	864.80	864.66	0.012
	H4-39	CI-H4-39	CI-H4-38	1 - 24 IN RCP	60.25	13.02	10.00	6.50	12.1	18.6	0.50	6.0	864.66	864.36	0.012

DESIGN

STATE OF TEXAS
BRYAN SIERSMA
147188
LICENSED PROFESSIONAL ENGINEER

BRYAN SIERSMA, P.E.

5/9/2024
DATE

APPROVAL

STATE OF TEXAS
DAN THOMA
98622
LICENSED PROFESSIONAL ENGINEER

DAN THOMA, P.E.

5/9/2024
DATE

PAPE-DAWSON ENGINEERS
SAN ANTONIO | AUSTIN | HOUSTON | FORT WORTH | DALLAS
2000 NW LOOP 410 | SAN ANTONIO, TX 78213 | 210.375.9000
TEXAS ENGINEERING FIRM #470 | TEXAS SURVEYING FIRM #10028800

2024
Texas Department of Transportation

US 183 GPL
STORM SEWER HYDRAULIC COMPUTATIONS

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DS:	CK:	CONT	SECT	JOB	HIGHWAY
		0151	10	001	US 183
DW:	CK:	DIST	COUNTY		SHEET NO.
		AUS	WILLIAMSON		722

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STORM SEWER COMPUTATIONS														
ID	LINE NO	FROM NODE	TO NODE	STRUCTURE SIZE	LENGTH	TC	STORM FREQUENCY	I 10 YR	Q 10 YR	CAPACITY	SLOPE	VELOCITY	INVERT UPSTREAM	INVERT DOWNSTREAM	MANNING'S N VALUE
					(FT)	(MIN)	(YRS)	(in/hr)	(CFS)	(CFS)	%	(FT/SEC)	(FT)	(FT)	
LINE H4 CONT.	H4-38	CI-H4-38	CI-H4-31	1 - 24 IN RCP	89.50	13.32	10.00	6.44	12.5	18.6	0.50	6.0	864.07	863.62	0.012
	H4-31	CI-H4-31	JB-H4-37	1 - 24 IN RCP	3.00	13.33	10.00	6.44	13.0	18.6	0.50	6.0	863.52	863.51	0.012
	LAT H4-122	BI-H4-122	MH-H4-118	1 - 18 IN RCP	26.50	15.71	10.00	6.01	1.5	8.7	0.50	1.2	864.18	864.05	0.012
	LAT H4-118	MH-H4-118	BI-H4-73	1 - 24 IN RCP	56.55	15.88	10.00	5.98	15.2	16.7	0.40	5.9	863.33	863.10	0.012
	LAT H4-85	MH-H4-85	J-H4-90	1 - 36 IN RCP	5.50	15.99	10.00	5.96	27.9	46.9	0.36	5.6	861.97	861.95	0.012
	LAT H4-90EX	J-H4-90	J-H4-107	1 - EX 36 IN RCP	180.19	16.57	10.00	5.96	27.9	42.6	0.30	4.8	861.95	861.41	0.012
	LAT H4-103	MH-H4-103	MH-H4-88	1 - 24 IN RCP	11.50	16.63	10.00	5.85	1.2	18.6	0.50	0.6	862.45	862.39	0.012
	LAT H4-104	MH-H4-104	MH-H4-88	1 - 24 IN RCP	64.75	16.63	10.00	5.85	4.7	14.4	0.30	2.2	862.58	862.39	0.012
	LAT H4-107	J-H4-107	MH-H4-88	1 - 36 IN RCP	15.50	16.63	10.00	5.85	27.9	42.6	0.30	4.8	861.41	861.36	0.012
	H4-37	JB-H4-37	MH-H4-89	1 - 24 IN RCP	66.00	16.92	10.00	5.81	13.0	18.6	0.50	4.1	861.43	861.10	0.012
	LAT H4-88	MH-H4-88	MH-H4-89	1 - 36 IN RCP	100.53	16.92	10.00	5.81	32.2	42.6	0.30	6.6	861.40	861.09	0.012
	LAT H4-30	CI-H4-30	JB-H4-36	1 - 24 IN RCP	3.00	17.18	10.00	5.77	0.8	18.6	0.50	0.3	859.51	859.49	0.012
	H4-89	MH-H4-89	JB-H4-36	1 - 36 IN RCP	122.50	17.18	10.00	5.77	43.7	55.0	0.50	8.1	860.10	859.49	0.012
	H4-36	JB-H4-36	JB-H4-42	1 - 36 IN RCP	70.50	17.34	10.00	5.75	44.1	55.0	0.50	8.1	859.39	859.04	0.012
	LAT H4-92	CI-H4-92	JB-H4-42	1 - 24 IN RCP	3.04	17.34	10.00	5.75	2.7	18.6	0.50	3.9	862.52	862.50	0.012
	LAT H4-28	CI-H4-28	JB-H4-29	1 - 24 IN RCP	3.50	17.59	10.00	5.71	1.6	18.6	0.50	3.4	861.17	861.15	0.012
	H4-42	JB-H4-42	JB-H4-29	1 - 36 IN RCP	120.65	17.59	10.00	5.71	46.1	55.0	0.50	8.3	859.04	858.43	0.012
	LAT H4-26	BI-H4-26	MH-H4-7	1 - 6FT x 4FT SBC	58.46	17.73	10.00	5.69	44.6	297.1	0.50	3.5	856.74	856.45	0.012
	H4-29	JB-H4-29	MH-H4-7	1 - 36 IN RCP	50.45	17.73	10.00	5.69	47.1	55.0	0.50	8.3	857.70	857.45	0.012
	LAT H4-91	CI-H4-91	J-H4-22	1 - 24 IN RCP	5.00	17.80	10.00	5.68	1.6	18.6	0.50	0.8	857.03	857.00	0.012
	LAT H4-20	CI-H4-20	J-H4-19	1 - 18 IN RCP	5.50	18.14	10.00	5.63	1.9	8.7	0.50	1.1	855.78	855.75	0.012
	H4-22	J-H4-22	J-H4-19	1 - 6FT x 4FT SBC	172.20	18.14	10.00	5.63	85.2	297.1	0.50	8.9	856.29	855.43	0.012
	H4-19	J-H4-19	J-H4-34	1 - 6FT x 4FT SBC	102.94	18.34	10.00	5.63	86.0	297.1	0.50	8.9	855.43	854.92	0.012
	LAT H4-33	CI-H4-33	J-H4-34	1 - 30 IN RCP	5.50	18.34	10.00	5.63	0.4	33.8	0.50	0.1	855.03	855.00	0.012
	LAT H4-17	RW-H4-17	MH-H4-6	1 - 18 IN RCP	34.77	18.44	10.00	5.58	1.1	8.7	0.50	3.2	858.17	858.00	0.012
	H4-34	J-H4-34	MH-H4-6	1 - 6FT x 4FT SBC	49.97	18.44	10.00	5.58	86.3	297.1	0.50	8.7	854.92	854.67	0.012
	LAT H4-13	RW-H4-13	J-H4-14	1 - 18 IN RCP	35.61	18.73	10.00	5.54	0.8	8.7	0.50	1.0	855.28	855.10	0.012
	LAT H4-10	CI-H4-10	J-H4-11	1 - 24 IN RCP	5.59	18.96	10.00	5.51	3.3	18.6	0.50	4.2	855.30	855.27	0.012
	H4-14	J-H4-14	J-H4-11	1 - 6FT x 4FT SBC	118.35	18.96	10.00	5.51	86.5	297.1	0.50	8.9	853.86	853.27	0.012
	H4-11	J-H4-11	MH-H4-5	1 - 6FT x 4FT SBC	86.63	19.17	10.00	5.51	88.8	297.1	0.50	8.9	853.27	852.84	0.012
	LAT H4-51	GI-H4-51	GI-H4-45	1 - 24 IN RCP	66.94	19.30	10.00	5.46	4.4	18.6	0.50	1.4	853.13	852.79	0.012
	H4-45	GI-H4-45	STU-H4	1 - 6FT x 4FT SBC	4.97	19.33	10.00	5.46	96.4	265.8	0.40	7.4	852.58	852.56	0.012
	H4-119EX	STU-H4	OUT-H4	1 - EX 7FT x 4FT SBC	256.93	20.30	10.00	5.33	96.4	392.0	0.57	3.4	852.37	850.90	0.012
LINE H4A	LAT H4A-63	RW-H4-63EX	BI-H4-71	1 - 12 IN RCP	6.40	10.07	10.00	7.16	0.3	2.9	0.50	2.4	868.28	868.25	0.012
	H4A-64	GI-H4-64	MH-H4-76	1 - 24 IN RCP	69.39	10.32	10.00	7.18	5.6	14.4	0.30	3.7	867.26	867.05	0.012
	LAT H4A-57	RW-H4-57EX	BI-H4-70	1 - 12 IN RCP	27.81	10.63	10.00	7.02	1.1	2.9	0.50	3.3	868.35	868.21	0.012
	H4A-76	MH-H4-76	BI-H4-70	1 - 24 IN RCP	61.11	10.63	10.00	7.02	5.6	16.7	0.40	3.0	867.05	866.81	0.012
	LAT H4A-58	RW-H4-58EX	MH-H4-78	1 - 12 IN RCP	27.59	10.84	10.00	6.97	0.6	2.9	0.50	2.8	869.02	868.88	0.012
	H4A-70	BI-H4-70	MH-H4-78	1 - 24 IN RCP	56.63	10.84	10.00	6.97	7.7	16.7	0.40	4.7	866.71	866.48	0.012
	LAT H4A-65	BI-H4-65	BI-H4-95	1 - 24 IN RCP	97.51	11.07	10.00	6.92	0.7	16.7	0.40	1.0	866.14	865.75	0.012
	LAT H4A-59	RW-H4-59EX	MH-H4-79	1 - 12 IN RCP	26.46	11.20	10.00	6.89	0.6	2.9	0.50	2.8	866.99	866.86	0.012
	H4A-78	MH-H4-78	MH-H4-79	1 - 24 IN RCP	104.85	11.20	10.00	6.89	8.2	16.7	0.40	4.9	866.38	865.96	0.012
	LAT H4A-60	RW-H4-60EX	MH-H4-80	1 - 12 IN RCP	26.04	11.39	10.00	6.85	0.4	2.9	0.50	2.5	866.66	866.53	0.012
	H4A-79	MH-H4-79	MH-H4-80	1 - 24 IN RCP	55.65	11.39	10.00	6.85	8.7	16.7	0.40	5.2	865.86	865.64	0.012
	LAT H4A-61	RW-H4-61EX	MH-H4-81	1 - 12 IN RCP	26.30	11.54	10.00	6.81	0.4	2.9	0.50	2.6	866.35	866.22	0.012
	H4A-80	MH-H4-80	MH-H4-81	1 - 24 IN RCP	41.86	11.54	10.00	6.81	9.1	18.6	0.50	5.6	865.53	865.32	0.012
	LAT H4A-62	RW-H4-62EX	MH-H4-82	1 - 12 IN RCP	26.58	11.68	10.00	6.78	0.2	2.9	0.50	0.3	865.86	865.73	0.012
	H4A-81	MH-H4-81	MH-H4-82	1 - 24 IN RCP	33.50	11.68	10.00	6.78	9.4	16.7	0.40	4.5	865.22	865.09	0.012
	LAT H4A-71	BI-H4-71	MH-H4-124	1 - 24 IN RCP	16.50	11.87	10.00	6.74	0.7	18.6	0.50	0.3	864.92	864.84	0.012
	H4A-82	MH-H4-82	MH-H4-124	1 - 24 IN RCP	38.75	11.87	10.00	6.74	9.5	16.7	0.40	3.9	865.00	864.84	0.012
	LAT H4A-95	BI-H4-95	BI-H4-66	1 - 24 IN RCP	92.52	12.65	10.00	6.58	1.2	14.4	0.30	0.9	865.69	865.41	0.012
	LAT H4A-75	GI-H4-75	BI-H4-74	1 - 24 IN RCP	2.50	12.89	10.00	6.53	9.7	18.6	0.50	3.5	864.03	864.02	0.012
	H4A-97	BI-H4-97	BI-H4-74	1 - 24 IN RCP	72.64	12.89	10.00	6.53	1.0	18.6	0.50	0.4	864.48	864.12	0.012
	H4A-74	BI-H4-74	BI-H4-96	1 - 24 IN RCP	72.54	13.11	10.00	6.48	11.6	18.6	0.50	5.9	864.02	863.66	0.012
	LAT H4A-66	BI-H4-66	BI-H4-77	1 - 24 IN RCP	61.52	13.31	10.00	6.44	2.9	16.7	0.40	1.5	865.31	865.06	0.012
	LAT H4A-68	RW-H4-68	BI-H4-77	1 - 18 IN RCP	3.99	13.31	10.00	6.44	1.1	8.7	0.50	1.2	865.49	865.47	0.012
	LAT H4A-77	BI-H4-77	BI-H4-94	1 - 24 IN RCP	51.02	13.81	10.00	6.34	4.2	14.4	0.30	1.8	864.93	864.78	0.012
	LAT H4A-94	BI-H4-94	BI-H4-67	1 - 24 IN RCP	94.53	14.78	10.00	6.17	4.7	14.4	0.30	1.6	864.68	864.40	0.012

DESIGN

STATE OF TEXAS
BRYAN SIERSMA
147188
LICENSED PROFESSIONAL ENGINEER

BRYAN SIERSMA, P.E.
5/9/2024
DATE

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US 183 GPL
STORM SEWER HYDRAULIC COMPUTATIONS

SHEET 6 OF 8

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DS:	CK:	CONT	SECT	JOB	HIGHWAY
		0151	10	001	US 183
DW:	CK:	DIST	COUNTY		SHEET NO.
		AUS	WILLIAMSON		723

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STORM SEWER COMPUTATIONS

ID	LINE NO	FROM NODE	TO NODE	STRUCTURE SIZE	LENGTH	TC	STORM FREQUENCY	I 10 YR	Q 10 YR	CAPACITY	SLOPE	VELOCITY	INVERT UPSTREAM	INVERT DOWNSTREAM	MANNING'S N VALUE
					(FT)	(MIN)	(YRS)	(in/hr)	(CFS)	(CFS)	%	(FT/SEC)	(FT)	(FT)	
LINE H4A CONT.	LAT H4A-67	BI-H4-67	MH-H4-83	1 - 24 IN RCP	42.43	15.26	10.00	6.08	4.9	16.7	0.40	1.6	864.30	864.13	0.012
	H4A-124	MH-H4-124	MH-H4-83	1 - 24 IN RCP	152.25	15.26	10.00	6.08	10.1	16.7	0.40	3.2	864.74	864.13	0.012
	H4A-83	MH-H4-83	MH-H4-84	1 - 24 IN RCP	45.00	15.43	10.00	6.08	13.9	16.7	0.40	4.5	864.03	863.85	0.012
	H4A-84	MH-H4-84	BI-H4-72	1 - 24 IN RCP	16.50	15.50	10.00	6.04	13.9	16.7	0.40	4.6	863.75	863.68	0.012
	H4A-72	BI-H4-72	MH-H4-118	1 - 24 IN RCP	57.20	15.71	10.00	6.01	14.1	16.7	0.40	5.0	863.58	863.35	0.012
	LAT H4A-69	BI-H4-69	BI-H4-73	1 - 24 IN RCP	24.00	15.88	10.00	5.98	0.5	18.6	0.50	0.2	863.27	863.15	0.012
	H4A-73	BI-H4-73	MH-H4-85	1 - 24 IN RCP	26.45	15.97	10.00	5.96	16.0	18.6	0.50	6.5	863.01	862.88	0.012
	H4A-96	BI-H4-96	MH-H4-85	1 - 24 IN RCP	135.66	15.97	10.00	5.96	12.8	18.6	0.50	6.0	863.56	862.88	0.012
LINE H5	H5-5	GI-H5-5	JB-H5-4	1 - 18 IN RCP	144.58	11.77	10.00	6.76	1.2	8.7	0.50	3.3	861.57	860.85	0.012
	H5-4	JB-H5-4	MH-H5-6	1 - 18 IN RCP	180.66	12.42	10.00	6.76	4.5	8.7	0.50	4.7	860.75	859.85	0.012
	H5-6	MH-H5-6	JB-H5-2	1 - 18 IN RCP	146.48	12.95	10.00	6.51	4.5	8.7	0.50	4.7	858.63	857.90	0.012
	H5-2	JB-H5-2	OUT-H5	1 - 18 IN RCP	38.68	13.11	10.00	6.48	7.2	8.7	0.50	4.1	853.19	853.00	0.012
	LAT H5-3EX	RW-H5-3EX	JB-H5-4	1 - EX 18 IN RCP	5.76	11.77	10.00	6.76	3.5	8.7	0.50	2.6	860.78	860.75	0.012
	LAT H5-1EX	RW-H5-1EX	JB-H5-2	1 - EX 18 IN RCP	8.26	12.95	10.00	6.51	3.4	8.7	0.50	4.4	857.94	857.90	0.012
LINE H6	H6-6	BD-H6-6	BD-H6-5	1 - 8 IN PVC	128.41	10.00	10.00	7.18	0.5	2.4	2.00	5.1	893.33	890.77	0.010
	H6-5	BD-H6-5	BD-H6-3	1 - 8 IN PVC	128.41	10.40	10.00	7.08	1.1	2.4	2.00	6.3	890.76	888.20	0.010
	H6-3	BD-H6-3	H6-4	1 - 8 IN PVC	12.57	10.43	10.00	7.08	1.7	2.4	2.00	6.3	888.20	887.94	0.010
	H6-4	H6-4	OUT-H6-3	1 - 8 IN PVC	5.50	10.44	10.00	7.07	1.7	2.4	2.00	5.9	863.63	863.52	0.010
	H6-2	CI-H6-2	MH-H6-1	1 - 24 IN RCP	72.01	11.71	10.00	7.18	1.7	18.6	0.50	0.7	853.86	853.50	0.012
	H6-1	MH-H6-1	GI-H6-7	1 - 24 IN RCP	71.91	13.93	10.00	7.18	1.7	18.6	0.50	0.5	853.36	853.00	0.012
	H6-7	GI-H6-7	OUT-H6	1 - 24 IN RCP	35.32	15.01	10.00	6.12	1.8	18.6	0.50	0.6	851.68	851.50	0.012
LINE I1	I1-1	GI-I1-1	JB-I1-2	1 - 24 IN RCP	7.12	10.04	10.00	7.18	6.3	18.6	0.50	3.9	911.40	911.36	0.012
	I1-2	JB-I1-2	BI-I1-3	1 - 24 IN RCP	51.38	10.27	10.00	7.11	6.3	18.6	0.50	5.1	911.25	910.99	0.012
	I1-3	BI-I1-3	BI-I1-6	1 - 24 IN RCP	159.62	10.64	10.00	7.02	9.5	26.4	1.00	7.3	910.10	908.50	0.012
	I1-6	BI-I1-6	BI-I1-9	1 - 24 IN RCP	167.60	11.03	10.00	6.93	10.4	26.4	1.00	7.5	907.53	905.85	0.012
	I1-9	BI-I1-9	BI-I1-12	1 - 24 IN RCP	201.50	11.49	10.00	6.82	11.3	26.4	1.00	7.6	903.70	901.68	0.012
	I1-21EX	RW-I1-21EX	SET-I1-22EX	1 - EX 24 IN RCP	20.00	10.10	10.00	7.15	2.5	18.6	0.50	3.9	876.71	876.61	0.012
	LAT I1-29	GI-I1-29	BI-I1-3	1 - 24 IN RCP	78.50	10.27	10.00	7.11	2.7	26.4	1.00	5.1	912.44	911.65	0.012
	I1-12	BI-I1-12	BI-I1-15	1 - 24 IN RCP	168.60	11.86	10.00	6.74	12.1	26.4	1.00	7.8	901.58	899.89	0.012
	LAT I1-28	GI-I1-28	BI-I1-15	1 - 24 IN RCP	4.00	11.86	10.00	6.74	2.6	26.4	1.00	4.5	899.63	899.59	0.012
	I1-15	BI-I1-15	BI-I1-16	1 - 24 IN RCP	246.17	12.37	10.00	6.63	15.3	26.4	1.00	8.2	897.76	895.30	0.012
	I1-16	BI-I1-16	MH-I1-17	1 - 24 IN RCP	205.92	12.83	10.00	6.54	16.2	26.4	1.00	8.3	893.96	891.90	0.012
	LAT I1-27	GI-I1-27	MH-I1-17	1 - 24 IN RCP	4.50	12.83	10.00	6.54	1.3	26.4	1.00	0.4	891.95	891.90	0.012
	I1-17	MH-I1-17	MH-I1-18	1 - 24 IN RCP	49.00	12.94	10.00	6.54	17.2	26.4	1.00	8.2	891.80	891.31	0.012
	I1-18	MH-I1-18	GI-I1-20	1 - 24 IN RCP	198.57	13.34	10.00	6.44	17.2	26.4	1.00	8.4	884.44	882.45	0.012
	LAT I1-19	RW-I1-19	GI-I1-20	1 - 18 IN RCP	60.61	13.34	10.00	6.44	3.1	8.7	0.50	4.3	883.25	882.95	0.012
	I1-20	GI-I1-20	MH-I1-26	1 - 30 IN RCP	3.00	13.36	10.00	6.44	27.9	58.5	1.50	8.5	879.47	879.42	0.012
	I1-26	MH-I1-26	STU-I1	1 - 30 IN RCP	34.78	13.44	10.00	6.44	27.9	58.5	1.50	9.8	879.32	878.80	0.012
	I1-30	STU-I1	MH-I1-25	1 - 30 IN RCP	5.00	13.47	10.00	6.44	27.9	58.5	1.50	5.7	878.30	878.22	0.012
	I1-25	MH-I1-25	OUT-I1	1 - 30 IN RCP	7.82	13.50	10.00	6.40	27.9	58.5	1.50	5.7	878.12	878.00	0.012
LINE I2	I2-5	GI-I2-5	GI-I2-2	1 - 36 IN RCP	179.12	14.27	10.00	6.26	45.6	71.7	0.85	10.1	897.00	895.48	0.012
	I2-2	GI-I2-2	MH-I2-12	1 - 36 IN RCP	8.60	14.30	10.00	6.26	45.7	71.7	0.85	6.5	895.40	895.33	0.012
	LAT I2-4	BI-I2-4	BI-I2-3	1 - 24 IN RCP	23.86	14.47	10.00	6.22	0.5	26.4	1.00	3.1	897.10	896.86	0.012
	I2-3	BI-I2-3	MH-I2-8	1 - 36 IN RCP	89.57	14.61	10.00	6.20	46.8	77.7	1.00	10.4	876.80	875.90	0.012
	I2-8	MH-I2-8	MH-I2-7	1 - 36 IN RCP	49.04	14.70	10.00	6.18	49.1	77.7	1.00	10.2	868.55	868.06	0.012
	LAT I2-9	JB-I2-9	MH-I2-7	1 - 30 IN RCP	9.10	14.70	10.00	6.18	30.5	33.8	0.50	6.2	864.74	864.70	0.012
	I2-7	MH-I2-7	STU-I2	1 - 42 IN RCP	16.78	14.74	10.00	6.18	77.5	82.9	0.50	9.5	864.67	864.59	0.012
	LAT I2-1EX	GI-I2-1EX	JB-I2-9	1 - EX 30 IN RCP	116.50	10.22	10.00	7.18	30.5	69.4	2.11	12.3	868.25	865.79	0.012
	I2-14	GI-I2-14	MH-I2-15	1 - 36 IN RCP	16.84	11.07	10.00	6.94	25.4	55.0	0.50	5.3	914.00	913.92	0.012
	I2-15	MH-I2-15	MH-I2-16	1 - 36 IN RCP	294.36	11.76	10.00	6.94	25.4	55.0	0.50	7.2	913.75	912.28	0.012
	I2-16	MH-I2-16	MH-I2-17	1 - 36 IN RCP	211.54	12.26	10.00	6.94	25.4	55.0	0.50	7.2	912.15	911.09	0.012
	I2-17	MH-I2-17	MH-I2-18	1 - 36 IN RCP	211.70	12.77	10.00	6.94	25.4	55.0	0.50	7.2	911.00	909.94	0.012
	I2-18	MH-I2-18	MH-I2-21	1 - 36 IN RCP	348.66	13.38	10.00	6.43	25.4	81.7	1.10	9.7	909.85	906.00	0.012
	LAT I2-20	GI-I2-20	MH-I2-21	1 - 24 IN RCP	24.01	13.38	10.00	6.43	6.7	18.6	0.50	5.1	907.00	906.88	0.012
	I2-21	MH-I2-21	GI-I2-22	1 - 36 IN RCP	143.81	13.71	10.00	6.36	29.5	55.0	0.50	7.5	901.82	901.10	0.012
	I2-22	GI-I2-22	GI-I2-5	1 - 36 IN RCP	67.09	13.86	10.00	6.34	30.0	77.7	1.00	9.2	898.67	898.00	0.012
	I2-12	MH-I2-12	BI-I2-11	1 - 36 IN RCP	3.19	14.32	10.00	6.25	45.7	71.7	0.85	6.5	895.25	895.22	0.012
	I2-11	BI-I2-11	BI-I2-3	1 - 36 IN RCP	82.76	14.47	10.00	6.22	46.2	71.7	0.85	9.9	895.15	894.45	0.012

DESIGN

STATE OF TEXAS · BRYAN SIERSMA · 147188 · LICENSED PROFESSIONAL ENGINEER

BRYAN SIERSMA, P.E.

5/9/2024
DATE

APPROVAL

STATE OF TEXAS · DAN THOMA · 98622 · LICENSED PROFESSIONAL ENGINEER

DAN THOMA, P.E.

5/9/2024
DATE

PAPE-DAWSON ENGINEERS

SAN ANTONIO | AUSTIN | HOUSTON | FORT WORTH | DALLAS
2000 NW LOOP 410 | SAN ANTONIO, TX 78213 | 210.375.9000
TEXAS ENGINEERING FIRM #470 | TEXAS SURVEYING FIRM #10028800

2024 Texas Department of Transportation

US 183 GPL
STORM SEWER HYDRAULIC COMPUTATIONS

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CONT	SECT	JOB	HIGHWAY
0151	10	001	US 183
DIST	COUNTY		SHEET NO.
AUS	WILLIAMSON		724

DS: CK: DW: CK:

DATE: 5/9/2024 8:22:07 PM
FILE: v:\bentley\dms\pd-pw-01\aly\ssa.sage\dms07214\01511001_SS_COMP07.dgn

STORM SEWER COMPUTATIONS

ID	LINE NO	FROM NODE	TO NODE	STRUCTURE SIZE	LENGTH	TC	STORM FREQUENCY	I 10 YR	Q 10 YR	CAPACITY	SLOPE	VELOCITY	INVERT UPSTREAM	INVERT DOWNSTREAM	MANNING'S N VALUE
					(FT)	(MIN)	(YRS)	(in/hr)	(CFS)	(CFS)	%	(FT/SEC)	(FT)	(FT)	
LINE I2 CONT.	LAT I2-10	GI-I2-10	MH-I2-8	1 - 36 IN RCP	24.85	14.61	10.00	6.20	2.7	55.0	0.50	0.4	868.75	868.63	0.012
	I2-23	STU-I2	OUT-I2	1 - 42 IN RCP	18.70	14.78	10.00	6.16	77.5	82.9	0.50	9.5	864.09	864.00	0.012
LINE I3	I3-2	BD-I3-1	I3-4	1 - 6 IN PVC	10.15	10.34	10.00	7.09	0.6	1.1	2.00	4.9	894.45	894.25	0.010
	I3-3	BD-I3-2	I3-4	1 - 6 IN PVC	112.94	10.34	10.00	7.09	0.7	1.1	2.00	5.6	896.51	894.25	0.010
	I3-4	I3-4	I3-OUT	1 - 6 IN PVC	4.64	10.35	10.00	7.09	1.3	1.6	4.00	7.0	880.19	880.00	0.010
LINE J1	LAT J1-1EX	GI-J1-1EX	OUT-J1-2EX	1 - EX 30 IN RCP	102.96	10.32	10.00	7.10	16.8	26.2	0.30	6.0	918.94	918.63	0.012
LINE J2	J2-9	MH-J2-9	MH-J2-8	1 - 24 IN RCP	12.25	10.64	10.00	7.02	0.1	18.6	0.50	1.3	919.11	919.05	0.012
	J2-8	MH-J2-8	MH-J2-7	1 - 24 IN RCP	18.25	10.80	10.00	6.98	0.3	18.6	0.50	1.9	918.94	918.85	0.012
	J2-7	MH-J2-7	MH-J2-6	1 - 24 IN RCP	25.50	11.12	10.00	6.91	0.6	18.6	0.50	2.5	918.73	918.60	0.012
	J2-6	MH-J2-6	MH-J2-5	1 - 24 IN RCP	33.26	11.65	10.00	6.79	0.9	18.6	0.50	2.9	918.57	918.40	0.012
	J2-5	MH-J2-5	MH-J2-4	1 - 24 IN RCP	19.83	11.83	10.00	6.75	1.2	18.6	0.50	1.7	918.30	918.20	0.012
	J2-4	MH-J2-4	GI-J2-3	1 - 24 IN RCP	48.04	12.32	10.00	6.64	1.8	18.6	0.50	1.4	918.07	917.83	0.012
	J2-3	GI-J2-3	MH-J2-2	1 - 24 IN RCP	100.25	12.93	10.00	6.52	4.0	40.3	2.33	7.7	917.75	915.41	0.012
	J2-2	MH-J2-2	OUT-J2	1 - 24 IN RCP	79.73	13.24	10.00	6.46	7.4	14.4	0.30	4.9	915.40	915.16	0.012
	LAT J2-17EX	RW-J2-17EX	J-J2-16	1 - EX 24 IN RCP	7.70	10.04	10.00	7.18	1.5	18.6	0.50	3.3	919.12	919.08	0.012
	LAT J2-19EX	RW-J2-19EX	J-J2-14	1 - EX 24 IN RCP	9.34	10.07	10.00	7.18	0.3	18.6	0.50	2.1	920.08	920.03	0.012
	LAT J2-20EX	RW-J2-20EX	J-J2-13	1 - EX 24 IN RCP	9.67	10.07	10.00	7.18	0.3	18.6	0.50	2.0	921.05	921.00	0.012
	LAT J2-18EX	RW-J2-18EX	J-J2-15	1 - EX 24 IN RCP	9.32	10.09	10.00	7.18	0.7	18.6	0.50	2.7	919.71	919.66	0.012
	LAT J2-21EX	RW-J2-21EX	J-J2-12	1 - EX 24 IN RCP	9.82	10.09	10.00	7.18	0.2	18.6	0.50	2.0	921.87	921.82	0.012
	LAT J2-22EX	RW-J2-22EX	J-J2-11	1 - EX 24 IN RCP	10.38	10.09	10.00	7.18	0.2	18.6	0.50	1.7	922.49	922.44	0.012
	LAT J2-23EX	RW-J2-23EX	J-J2-10	1 - EX 24 IN RCP	10.43	10.10	10.00	7.18	0.1	18.6	0.50	1.5	922.87	922.82	0.012
	LAT J2-1EX	RW-J2-1EX	J-J2-24	1 - EX 24 IN RCP	18.28	10.12	10.00	7.18	3.5	18.6	0.50	2.3	917.53	917.44	0.012
	LAT J2-10	J-J2-10	MH-J2-9	1 - 24 IN RCP	37.06	10.49	10.00	7.18	0.1	18.6	0.50	1.8	922.82	922.63	0.012
	LAT J2-11	J-J2-11	MH-J2-8	1 - 24 IN RCP	37.57	10.64	10.00	7.02	0.2	18.6	0.50	2.6	922.44	922.25	0.012
	LAT J2-12	J-J2-12	MH-J2-7	1 - 24 IN RCP	38.27	10.80	10.00	6.98	0.2	18.6	0.50	2.0	921.82	921.63	0.012
	LAT J2-13	J-J2-13	MH-J2-6	1 - 24 IN RCP	39.21	11.12	10.00	6.91	0.3	18.6	0.50	2.2	921.00	920.80	0.012
	LAT J2-14	J-J2-14	MH-J2-5	1 - 24 IN RCP	41.16	11.65	10.00	6.79	0.3	18.6	0.50	2.3	920.03	919.82	0.012
	LAT J2-15	J-J2-15	MH-J2-4	1 - 24 IN RCP	42.67	11.83	10.00	6.75	0.7	18.6	0.50	2.7	919.66	919.45	0.012
	LAT J2-16	J-J2-16	GI-J2-3	1 - 24 IN RCP	47.35	12.32	10.00	6.64	1.5	18.6	0.50	3.4	919.08	918.84	0.012
	LAT J2-24	J-J2-24	MH-J2-2	1 - 24 IN RCP	3.50	12.93	10.00	6.52	3.5	93.5	12.57	8.6	917.44	917.00	0.012
LINE J4	LAT J4-1EX	RW-J4-1EX	OUT-J4	1 - EX 24 IN RCP	11.09	10.06	10.00	7.16	1.0	18.6	0.50	3.0	915.64	915.58	0.012
LINE J5	LAT J5-1EX	RW-J5-1EX	OUT-J5-EX	1 - EX 24 IN RCP	23.37	10.15	10.00	7.14	1.9	6.4	0.06	3.3	913.95	913.94	0.012
LINE J6	LAT J6-3	GI-J6-3	MH-J6-15	1 - 24 IN RCP	50.15	10.40	10.00	7.18	2.9	18.6	0.50	4.1	906.75	906.50	0.012
	J6-4	GI-J6-4	JB-J6-6	1 - 24 IN RCP	54.15	15.25	10.00	6.08	11.3	18.6	0.50	3.6	905.40	905.13	0.012
	J6-6	JB-J6-6	MH-J6-7	1 - 30 IN RCP	82.11	15.56	10.00	6.03	18.5	33.8	0.50	4.2	905.06	904.65	0.012
	J6-7	MH-J6-7	STU-J6	1 - 30 IN RCP	13.01	15.61	10.00	6.03	20.9	33.8	0.50	6.8	904.65	904.58	0.012
	LAT J6-6EX	CI-J6-6EX	JB-J6-8	1 - EX 24 IN RCP	94.89	10.34	10.00	7.18	3.2	32.5	1.52	6.2	910.09	908.65	0.012
	LAT J6-8EX	JB-J6-8	MH-J6-9	1 - EX 24 IN RCP	74.23	10.79	10.00	7.18	3.2	14.7	0.31	3.0	908.65	908.42	0.012
	LAT J6-9EX	MH-J6-9	JB-J6-10	1 - EX 24 IN RCP	82.26	11.30	10.00	7.18	3.2	12.7	0.23	2.7	908.42	908.23	0.012
	LAT J6-11	GI-J6-11	MH-J6-13	1 - 24 IN RCP	112.42	11.72	10.00	7.18	3.2	18.6	0.50	4.2	916.66	916.10	0.012
	LAT J6-13	MH-J6-13	GI-J6-12	1 - 24 IN RCP	168.86	13.80	10.00	6.35	3.2	18.6	0.50	4.2	916.09	915.25	0.012
	LAT J6-12	GI-J6-12	MH-J6-14	1 - 24 IN RCP	225.03	14.43	10.00	6.35	4.7	26.4	1.00	6.0	915.25	913.00	0.012
	LAT J6-14	MH-J6-14	GI-J6-4	1 - 24 IN RCP	199.08	14.99	10.00	6.13	4.7	26.4	1.00	6.0	911.49	909.50	0.012
	LAT J6-15	MH-J6-15	GI-J6-4	1 - 24 IN RCP	194.18	14.99	10.00	6.13	2.9	18.6	0.50	0.9	906.37	905.40	0.012
	LAT J6-18	GI-J6-18	JB-J6-6	1 - 24 IN RCP	14.00	15.25	10.00	6.08	8.6	18.6	0.50	5.5	910.00	909.93	0.012
	LAT J6-10EX	JB-J6-10	MH-J6-7	1 - EX 24 IN RCP	127.91	15.56	10.00	6.03	3.2	22.8	0.75	4.8	908.23	907.27	0.012
	J6-16	STU-J6	GI-J6-1EX	1 - 30 IN RCP	131.88	16.05	10.00	5.95	20.9	59.7	1.56	10.3	904.08	902.02	0.012
	J6-1EX	GI-J6-1EX	OUT-J6-EX	1 - EX 36 IN RCP	7.77	16.09	10.00	5.94	43.1	115.0	2.19	6.1	901.52	901.35	0.012
LINE J7	J7-1	GI-J7-1	STU-J7	1 - 30 IN RCP	82.68	10.23	10.00	7.18	26.3	30.2	0.40	6.8	910.34	910.01	0.012
	J7-3	STU-J7	J7-OUT	1 - 30 IN RCP	23.70	10.30	10.00	7.10	26.3	30.2	0.40	7.2	909.51	909.42	0.012
LINE K1	K1-3	STU-K1	K1-OUT	1 - 18 IN RCP	16.79	0.07	10.00	11.32	3.0	8.7	0.50	4.2	911.20	911.12	0.012

DESIGN

STATE OF TEXAS
BRYAN SIERSMA
147188
LICENSED PROFESSIONAL ENGINEER

BRYAN SIERSMA, P.E.
5/9/2024
DATE

APPROVAL

STATE OF TEXAS
DAN THOMA
98622
LICENSED PROFESSIONAL ENGINEER

DAN THOMA, P.E.
5/9/2024
DATE

PAPE-DAWSON ENGINEERS
SAN ANTONIO | AUSTIN | HOUSTON | FORT WORTH | DALLAS
2000 NW LOOP 410 | SAN ANTONIO, TX 78213 | 210.375.9000
TEXAS ENGINEERING FIRM #470 | TEXAS SURVEYING FIRM #10028800

2024
Texas Department of Transportation

US 183 GPL
STORM SEWER HYDRAULIC COMPUTATIONS

SHEET 8 OF 8

© 2024		CONT	SECT	JOB	HIGHWAY
DS:	CK:	0151	10	001	US 183
		DIST	COUNTY		SHEET NO.
DW:	CK:	AUS	WILLIAMSON		724A

DATE: 5/9/2024 8:22:16 PM
FILE: v:\bentley\dms\pd-pw-01\aljyssa.sage\dms07214\015110001_SS_COMP08.dgn

WATER QUALITY SUMMARY

WATERSHED ANALYSIS									BMP INFO					ANALYSIS							RESULTS	
SEGMENT	Drainage Area (ac)	Pre-rule Impervious Cover (ac)	Proposed Impervious Cover (ac)	Pre-rule Existing TSS Load Produced (lbs)	Pre-rule Existing TSS Load Removed (lbs)	Proposed TSS Load Produced (lbs)	Proposed TSS Load Removed (lbs)	TCEQ REQUIRED TSS Removal (lbs)	BMP NAME	BMP TYPE	BMP Efficiency (%)	Treated Drainage Area (ac)	Treated Impervious Cover (ac)	MAXIMUM Load Removal Avaliable (lbs)	ACTUAL Load Removed (lbs)	F Value	TCEQ Capture Depth (in)	TCEQ Required WQ Volume (cf)	TCEQ Filtration Required (sf)	WQ Volume Provided (cf)	Filtration Provided (sf)
						(Pg 3-33 Eq 3.7) /0.8	BMP Calcs	pg 3-29 eq 3.3			RG-348 pg 3-32			RG-348 Pg 3-33 Eq 3.7	(RG-348 Pg 3-33 Eq 3.7)* Eff	RG-348 pg 3-34 to 3-36					
RECHARGE ZONE																						
SPANISH OAK CREEK																						
BASIN A	17.55	0.62	10.74	675	-	12,009	10,114	8,804	In Series EX-VFS-A - WARRIOR	VFS-Ext. Det. InSeries	92.31	6.28	6.28	6,419	6,419	1.00	4.00				
									EX-Warrior Pond	Ext Det Pond	75.00	4.47	4.47	3,713	3,695	1.00	4.00	52,998.05		112,388.00	
BASIN B*	5.74	0.10	2.71	111	-	3,050	231	2,267	STU B10	Jellyfish	86.00	0.20	0.20	190	185	0.97	3.00				
									VFS-B-1	VFS	85.00	0.05	0.05	46	46	1.00	4.00				
SPANISH OAK TOTAL	23.29	0.73	13.45	786		15,059	10,345	11,071				11.00	11.00	10,368	10,345			52,998.05	-	112,388.00	-
SPANISH OAK CREEK TRIBUTARY 1																						
BASIN C1*	19.56	0.06	9.87	63	-	11,098	8,267	8,542	VFS-C1-1	VFS	85.00	0.79	0.79	742	742	1.00	4.00				
									STU C1 & C3	Jellyfish	86.00	2.18	2.08	1,989	1,931	0.97	3.00				
									(5) STU C14-2	Jellyfish	86.00	9.63	5.58	5,373	4,890	0.91	1.80				
									EX-GS-C1-1,2	GS	70.00	0.91	0.91	704	704	1.00	4.00				
BASIN C2	1.73	-	1.38	-	-	1,533	1,199	1,201	(1) STU C14-1	Jellyfish	86.00	1.27	1.12	1,209	1,173	0.97	1.14				
									VFS-C2-1	VFS	85.00	0.03	0.03	26	26	1.00	4.00				
BASIN D	19.09	0.11	14.63	124	-	16,276	13,461	12,634	VFS-D-1	VFS	85.00	0.36	0.36	335	335	1.00	4.00				
									(5) STU D-1 - SF LOBO	Jellyfish-SF In Series	94.10	0.54	0.33	351	319	0.91	1.80				
									EX - SF - LOBO	Lobo Pond Only (Sand Filter)	89.00	13.35	13.35	13,156	12,807	0.97	3.00	118,679.86	11,867.99	144,221.00	8,578.00
SPANISH OAK TRIB 1 TOTAL	40.38	0.17	25.88	187		28,907	22,927	22,376				29.05	24.54	23,885	22,927			118,679.86	11,867.99	144,221.00	8,578.00
SOUTH BRUSHY CREEK TRIBUTARY 1 (Neighborhood)																						
BASIN E1*	3.23	-	2.32	-	-	2,584	2,029	2,019	STU E1 & E2 & E2-4 & E2-5	Jellyfish	86.00	3.19	2.27	2,174	2,002	0.92	2.00				
									(5) In Series EX-GS - STU E2-4	GS/Jellyfish	86.77	0.03	0.03	27	27	1.00	4.00				
BASIN E2*	0.97	-	0.20	-	-	275	250	175	STU E3-2	Jellyfish	86.00	0.84	0.28	275	250	0.91	1.80				
BASIN E3*	6.09	0.18	2.56	189	-	2,893	2,386	2,073	STU E3-1	Jellyfish	86.00	6.11	2.70	2,622	2,386	0.91	1.80				
BASIN E4*	5.94	0.52	0.81	562	-	2,321	2,112	701	(2) STU E2	Jellyfish	86.00	7.32	2.36	2,321	2,112	0.91	1.80				
BASIN E5	1.85	0.02	1.62	16	-	1,798	2,041	1,411	(3) STU E1	Jellyfish	86.00	2.73	2.35	2,243	2,041	0.91	1.80				
SOUTH BRUSHY CREEK TRIB 1 TOTAL	18.08	0.71	7.50	768		9,871	8,818	6,379				20.22	9.98	9,662	8,818						
CLUCK CREEK																						
BASIN F*	29.00	0.78	12.38	845	-	13,997	14,774	10,778	(5) STU F3 & F6 - SF - ELBOW	Jellyfish-SF In Series	94.10	12.38	6.75	7,124	6,946	0.97	3.00				
									(4)(5) STU G5 - SF - ELBOW	Jellyfish-SF In Series	94.10	14.42	7.60	8,029	7,828	0.97	3.00	58,550.90	5,855.09		
BASIN G*	20.19	1.48	9.16	1,594	-	10,337	9,910	7,977	(5) STU G5 & G10	Jellyfish-Elbow In Series	94.10	10.49	4.91	5,204	4,424	0.85	1.32				
									EX - SF - ELBOW	Elbow Pond Only (Sand Filter)	89.00	5.57	5.57	5,486	5,486	1.00	4.00	65,980.09	6,598.01	197,115.00	12,453.00
CLUCK CREEK TOTAL	49.19	2.26	21.55	2,439		24,335	24,684	18,755				42.86	24.82	25,843	24,684			124,530.99	12,453.10	197,115.00	12,453.00
SOUTH BRUSHY CREEK																						
BASIN H	29.95	1.12	20.14	1,209	-	22,473	19,047	17,534	EX - SF - LONGHORN	Longhorn Pond Only (Sand Filter)	89.00	3.14	3.14	3,091	3,091	1.00	4.00	37,176.68	3,717.67	398,936.00	15,300.00
									(5) STU H4 - LONGHORN	Jellyfish - SF In Series	94.10	19.94	16.06	16,795	15,956	0.95	2.60	118,821.78	11,882.18		
BASIN I	40.75	-	13.82	-	-	15,763	10,501	12,026	EX - SF - LONGHORN	Longhorn Pond Only (Sand Filter)	89.00	0.01	0.01	13	13	1.00	4.00	153.18	15.32		
									STU I1 & I2	Jellyfish	86.00	23.90	11.97	11,575	10,489	0.97	3.00				
BASIN J*	12.01	-	7.65	-	-	8,540	7,742	6,654	(5) STU J6 & J7	Jellyfish - SF In Series	94.10	8.84	5.37	5,651	5,491	0.97	3.00				
									EX - SF - AGGIE	Aggie Pond Only (Sand Filter)	89.00	2.28	2.28	2,251	2,251	1.00	4.00	27,072.19	2,707.22		
BASIN K	103.75	-	0.74	-	-	2,595	633	640	STU K1	Jellyfish	86.00	0.47	0.47	448	436	0.97	3.00				
									EX - SF - AGGIE	Aggie Pond Only (Sand Filter)	89.00	0.20	0.20	197	197	1.00	4.00	2,371.66	237.17	103,502.00	6,357.00
SOUTH BRUSHY CREEK TOTAL	186.45	1.12	42.34	1,209		49,371	37,923	36,854				58.78	39.50	40,021	37,923			185,595.49	18,559.55	502,438.00	21,657.00
RECHARGE ZONE TOTAL	**317.39**	**4.99**	**110.72**	**5,389**		**127,541**	**104,696**	**95,435**				**161.91**	**109.86**	**109,778**	**104,696**			**481,804.39**	**42,880.63**	**956,162.00**	**42,688.00**

(*) Asterisk denotes a basin where there is offsite flow entering but that load is being accounted for in that site's WPAP (or exemption letter).

(1) STU C14-1 collects drainage from both Drainage Basin C1 (.1 ac of previously untreated) and C2.

(2) Some portion of drainage area drains to STU E2 located in basin E1.

(3) Some portion of drainage area drains to STU E1 located in basin E1.

(4) Drainage areas drain to STU G5 located in basin G.

(5) Calculations for Jellyfish unit from Contech are used for unit sizing purposes only. However, Jellyfish loading calculations utilize in-series treatment and use standard RG-348 loading calculations, when a jellyfish unit is used in series with a BMP that is not a downstream Jellyfish.

Texas Commission on Environmental Quality

TSS Removal Calculations 04-20-2009

Project Name: US 183A
Date Prepared: 1/16/2026

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 * =	17.55	acres
Predevelopment impervious area within the limits of the plan * =	0.00	acres
Total post-development impervious area within the limits of the plan* =	10.72	acres
Total post-development impervious cover fraction * =	0.61	
P =	32	inches
$L_{M\ TOTAL\ PROJECT}$ =	9331	lbs.

* The values entered in these fields should be for the total project area.

Number of drainage basins / outfalls areas leaving the plan area = ?

2. Drainage Basin Parameters (This information should be provided for each basin):

Drainage Basin/Outfall Area No. = VFS - Warrior Pond-1

Total drainage basin/outfall area =	17.55	acres
Predevelopment impervious area within drainage basin/outfall area =	0.00	acres
Post-development impervious area within drainage basin/outfall area =	6.28	acres
Post-development impervious fraction within drainage basin/outfall area =	0.36	
$L_{M\ THIS\ BASIN}$ =	5466	lbs.

3. Indicate the proposed BMP Code for this basin.

Proposed BMP = Vegetated Filter Strips
Removal efficiency = 92 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 =	6.28	acres
A_I =	6.28	acres
A_P =	0.00	acres
L_R =	6419	lbs

5. Calculate Fraction of Annual Runoff to Treat the drainage basin / outfall area

Desired $L_{M\ THIS\ BASIN}$ = 6419 lbs.

F = 1.00

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

RG-348 pg 3-34 to 3-36

Rainfall Depth =	4.00	inches
Post Development Runoff Coefficient =	0.82	
On-site Water Quality Volume =	74434	cubic feet

19. BMPs Installed in a Series Designed as Required in RG-348 Pages 3-32

Michael E. Barrett, Ph.D.. P.E. recommended that the coefficient for E_2 be changed from 0.5 to 0.65 on May 3, 2006

$E_{TOT} = [1 - ((1 - E_1) \times (1 - 0.65E_2) \times (1 - 0.25E_3))] \times 100$ =	92.31	percent	NET EFFICIENCY OF THE BMPs IN THE SERIES
EFFICIENCY OF FIRST BMP IN THE SERIES = E_1 =	85.00	percent	VFS
EFFICIENCY OF THE SECOND BMP IN THE SERIES = E_2 =	75.00	percent	Warrior Extended Detention
EFFICIENCY OF THE THIRD BMP IN THE SERIES = E_3 =	0.00	percent	

THEREFORE, THE NET LOAD REMOVAL WOULD BE:
(A_I AND A_P VALUES ARE FROM SECTION 3 ABOVE)

$L_R = E_{TOT} \times P \times (A_I \times 34.6 \times A_P \times 0.54)$ = 6418.69 lbs

Texas Commission on Environmental Quality

TSS Removal Calculations 04-20-2009

Project Name: US 183A
Date Prepared: 1/16/2026

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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 * =	17.55	acres
Predevelopment impervious area within the limits of the plan * =	0.62	acres
Total post-development impervious area within the limits of the plan* =	10.72	acres
Total post-development impervious cover fraction * =	0.61	
P =	32	inches
$L_{M\ TOTAL\ PROJECT}$ =	8791	lbs.

* The values entered in these fields should be for the total project area.

Number of drainage basins / outfalls areas leaving the plan area = ?

2. Drainage Basin Parameters (This information should be provided for each basin):

Drainage Basin/Outfall Area No. = Warrior Pond-1

Total drainage basin/outfall area =	17.55	acres
Predevelopment impervious area within drainage basin/outfall area =	0.62	acres
Post-development impervious area within drainage basin/outfall area =	4.47	acres
Post-development impervious fraction within drainage basin/outfall area =	0.25	
$L_{M\ THIS\ BASIN}$ =	3352	lbs.

3. Indicate the proposed BMP Code for this basin.

Proposed BMP = Extended Detention
Removal efficiency = 75 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 =	4.47	acres
A_I =	4.47	acres
A_P =	0.00	acres
L_R =	3713	lbs

5. Calculate Fraction of Annual Runoff to Treat the drainage basin / outfall area

Desired $L_{M\ THIS\ BASIN}$ = 3695 lbs.

F = 1.00

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 =	4.00	inches
Post Development Runoff Coefficient =	0.82	
On-site Water Quality Volume =	52998	cubic feet

19. BMPs Installed in a Series Designed as Required in RG-348 Pages 3-32

Michael E. Barrett, Ph.D.. P.E. recommended that the coefficient for E_2 be changed from 0.5 to 0.65 on May 3, 2006

$E_{TOT} = [1 - ((1 - E_1) \times (1 - 0.65E_2) \times (1 - 0.25E_3))] \times 100$ = 75.00 percent NET EFFICIENCY OF THE BMPs IN THE SERIES

EFFICIENCY OF FIRST BMP IN THE SERIES = E_1 = 75.00 percent Ext. Det

EFFICIENCY OF THE SECOND BMP IN THE SERIES = E_2 = 0.00 percent

EFFICIENCY OF THE THIRD BMP IN THE SERIES = E_3 = 0.00 percent

THEREFORE, THE NET LOAD REMOVAL WOULD BE:
(A_I AND A_P VALUES ARE FROM SECTION 3 ABOVE)

$L_R = E_{TOT} \times P \times (A_I \times 34.6 \times A_P \times 0.54)$ = 3713.10 lbs

Texas Commission on Environmental Quality

TSS Removal Calculations 04-20-2009

Project Name: US 183A
Date Prepared: 1/16/2026

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 * =	5.74	acres
Predevelopment impervious area within the limits of the plan * =	0.10	acres
Total post-development impervious area within the limits of the plan* =	3.06	acres
Total post-development impervious cover fraction * =	0.53	
P =	32	inches
$L_{M\ TOTAL\ PROJECT}$ =	2576	lbs.

* The values entered in these fields should be for the total project area.

Number of drainage basins / outfalls areas leaving the plan area = ?

2. Drainage Basin Parameters (This information should be provided for each basin):

Drainage Basin/Outfall Area No. = STU B10

Total drainage basin/outfall area =	0.20	acres
Predevelopment impervious area within drainage basin/outfall area =	0.00	acres
Post-development impervious area within drainage basin/outfall area =	0.20	acres
Post-development impervious fraction within drainage basin/outfall area =	1.00	
$L_{M\ THIS\ BASIN}$ =	174	lbs.

3. Indicate the proposed BMP Code for this basin.

Proposed BMP = Jellyfish
Removal efficiency = 86 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 =	0.20	acres
A_I =	0.20	acres
A_P =	0.00	acres
L_R =	190	lbs

5. Calculate Fraction of Annual Runoff to Treat the drainage basin / outfall area

Desired $L_{M\ THIS\ BASIN}$ = 185 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 =	0.82	
On-site Water Quality Volume =	1778	cubic feet

19. BMPs Installed in a Series Designed as Required in RG-348 Pages 3-32

Michael E. Barrett, Ph.D.. P.E. recommended that the coefficient for E_2 be changed from 0.5 to 0.65 on May 3, 2006

$E_{TOT} = [1 - ((1 - E_1) \times (1 - 0.65E_2) \times (1 - 0.25E_3))] \times 100$ = 86.00 percent NET EFFICIENCY OF THE BMPs IN THE SERIES

EFFICIENCY OF FIRST BMP IN THE SERIES = E_1 = 86.00 percent

EFFICIENCY OF THE SECOND BMP IN THE SERIES = E_2 = 0.00 percent

EFFICIENCY OF THE THIRD BMP IN THE SERIES = E_3 = 0.00 percent

THEREFORE, THE NET LOAD REMOVAL WOULD BE:
(A_I AND A_P VALUES ARE FROM SECTION 3 ABOVE)

$L_R = E_{TOT} \times P \times (A_I \times 34.6 \times A_P \times 0.54)$ = 190.44 lbs

Contech Engineered Solutions Calculations for Texas Commission on Environmental Quality
TSS Removal Calculations

Project Name: **US183A**
Date Prepared: **12/3/2025**

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: $L_M = 27.2(A_N \times P)$

$L_{M\ TOTAL\ PROJECT}$ = 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 * =	**0.20**	acres
Predevelopment impervious area within the limits of the plan * =	**0.00**	acres
Total post-development impervious area within the limits of the plan* =	**0.20**	acres
Total post-development impervious cover fraction * =	**1.00**	
P =	**32**	inches
$L_{M\ TOTAL\ PROJECT}$ =	**174**	lbs.
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. =	**STU-B10**	
Total drainage basin/outfall area =	**0.20**	acres
Predevelopment impervious area within drainage basin/outfall area =	**0.00**	acres
Post-development impervious area within drainage basin/outfall area =	**0.20**	acres
Post-development impervious fraction within drainage basin/outfall area =	**1.00**	
$L_{M\ THIS\ BASIN}$ =	**174**	lbs.

3. Indicate the proposed BMP Code for this basin.

Proposed BMP =	**JF**	abbreviation
Removal efficiency =	**86**	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:
LR = (BMP efficiency) x P x (A_I x 34.6 + A_P x 0.54)

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 =	**0.20**	acres
A_I =	**0.20**	acres
A_P =	**0.00**	acres
L_R =	**190**	lbs.

5. Calculate Fraction of Annual Runoff to Treat the drainage basin / outfall area

Desired $L_{M\ THIS\ BASIN}$ =	**185**	lbs.
F =	**0.97**	

6. Calculate Treated Flow required by the BMP Type for this drainage basin / outfall area.

Offsite area draining to BMP =	**0.00**	acres
Offsite impervious cover draining to BMP =	**0.00**	acres

Calculations from RG-348
Pages Section 3.2.22

Rainfall Intensity =	**2.00**	inches per hour
Effective Area =	**0.18**	acres
Cartridge Length =	**54**	inches
Peak Treatment Flow Required =	**0.36**	cubic feet per second

7. Jellyfish

Designed as Required in RG-348
Section 3.2.22

Flow Through Jellyfish Size	**Surface Inlet**	
Jellyfish Size for Flow-Based Configuration =	**JFSI0404-2-1**	
Jellyfish Treatment Flow Rate =	**0.45**	cfs

Texas Commission on Environmental Quality

TSS Removal Calculations 04-20-2009

Project Name: US 183A
Date Prepared: 1/16/2026

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 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 * =	5.74	acres
Predevelopment impervious area within the limits of the plan * =	0.00	acres
Total post-development impervious area within the limits of the plan* =	3.06	acres
Total post-development impervious cover fraction * =	0.53	
P =	32	inches
$L_{M\ TOTAL\ PROJECT}$ =	2663	lbs.

* The values entered in these fields should be for the total project area.

Number of drainage basins / outfalls areas leaving the plan area = ?

2. Drainage Basin Parameters (This information should be provided for each basin):

Drainage Basin/Outfall Area No. = VFS-B-1

Total drainage basin/outfall area =	5.74	acres
Predevelopment impervious area within drainage basin/outfall area =	0.00	acres
Post-development impervious area within drainage basin/outfall area =	0.05	acres
Post-development impervious fraction within drainage basin/outfall area =	0.01	
$L_{M\ THIS\ BASIN}$ =	42	lbs.

3. Indicate the proposed BMP Code for this basin.

Proposed BMP = Vegetated Filter Strips
Removal efficiency = 85 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 =	0.05	acres
A_I =	0.05	acres
A_P =	0.00	acres
L_R =	46	lbs

5. Calculate Fraction of Annual Runoff to Treat the drainage basin / outfall area

Desired $L_{M\ THIS\ BASIN}$ = 46 lbs.

F = 1.00

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 =	4.00	inches
Post Development Runoff Coefficient =	0.82	
On-site Water Quality Volume =	574	cubic feet

19. BMPs Installed in a Series Designed as Required in RG-348 Pages 3-32

Michael E. Barrett, Ph.D.. P.E. recommended that the coefficient for E_2 be changed from 0.5 to 0.65 on May 3, 2006

$E_{TOT} = [1 - ((1 - E_1) \times (1 - 0.65E_2) \times (1 - 0.25E_3))] \times 100$ = 85.00 percent NET EFFICIENCY OF THE BMPs IN THE SERIES

EFFICIENCY OF FIRST BMP IN THE SERIES = E_1 = 85.00 percent VFS

EFFICIENCY OF THE SECOND BMP IN THE SERIES = E_2 = 0.00 percent

EFFICIENCY OF THE THIRD BMP IN THE SERIES = E_3 = 0.00 percent

THEREFORE, THE NET LOAD REMOVAL WOULD BE:
(A_I AND A_P VALUES ARE FROM SECTION 3 ABOVE)

$L_R = E_{TOT} \times P \times (A_I \times 34.6 \times A_P \times 0.54)$ = 45.57 lbs

Texas Commission on Environmental Quality

TSS Removal Calculations 04-20-2009

Project Name: US 183A
Date Prepared: 1/16/2026

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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 * =	19.56	acres
Predevelopment impervious area within the limits of the plan * =	0.00	acres
Total post-development impervious area within the limits of the plan* =	11.88	acres
Total post-development impervious cover fraction * =	0.61	
P =	32	inches
$L_{M\ TOTAL\ PROJECT}$ =	10340	lbs.

* The values entered in these fields should be for the total project area.

Number of drainage basins / outfalls areas leaving the plan area = ?

2. Drainage Basin Parameters (This information should be provided for each basin):

Drainage Basin/Outfall Area No. = VFS-C1-1

Total drainage basin/outfall area =	19.85	acres
Predevelopment impervious area within drainage basin/outfall area =	0.00	acres
Post-development impervious area within drainage basin/outfall area =	0.79	acres
Post-development impervious fraction within drainage basin/outfall area =	0.04	
$L_{M\ THIS\ BASIN}$ =	687	lbs.

3. Indicate the proposed BMP Code for this basin.

Proposed BMP = Vegetated Filter Strips
Removal efficiency = 85 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 =	0.79	acres
A_I =	0.79	acres
A_P =	0.00	acres
L_R =	742	lbs

5. Calculate Fraction of Annual Runoff to Treat the drainage basin / outfall area

Desired $L_{M\ THIS\ BASIN}$ = 742 lbs.

F = 1.00

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 =	4.00	inches
Post Development Runoff Coefficient =	0.82	
On-site Water Quality Volume =	9351	cubic feet

19. BMPs Installed in a Series Designed as Required in RG-348 Pages 3-32

Michael E. Barrett, Ph.D.. P.E. recommended that the coefficient for E_2 be changed from 0.5 to 0.65 on May 3, 2006

$E_{TOT} = [1 - ((1 - E_1) \times (1 - 0.65E_2) \times (1 - 0.25E_3))] \times 100$ = 85.00 percent NET EFFICIENCY OF THE BMPs IN THE SERIES

EFFICIENCY OF FIRST BMP IN THE SERIES = E_1 = 85.00 percent VFS

EFFICIENCY OF THE SECOND BMP IN THE SERIES = E_2 = 0.00 percent

EFFICIENCY OF THE THIRD BMP IN THE SERIES = E_3 = 0.00 percent

THEREFORE, THE NET LOAD REMOVAL WOULD BE:
(A_I AND A_P VALUES ARE FROM SECTION 3 ABOVE)

$L_R = E_{TOT} \times P \times (A_I \times 34.6 \times A_P \times 0.54)$ = 742.46 lbs

Texas Commission on Environmental Quality

TSS Removal Calculations 04-20-2009

Project Name: US 183A
Date Prepared: 1/16/2026

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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 * =	19.56	acres
Predevelopment impervious area within the limits of the plan * =	0.06	acres
Total post-development impervious area within the limits of the plan* =	11.88	acres
Total post-development impervious cover fraction * =	0.61	
P =	32	inches
$L_{M\ TOTAL\ PROJECT}$ =	10288	lbs.

* The values entered in these fields should be for the total project area.

Number of drainage basins / outfalls areas leaving the plan area = ?

2. Drainage Basin Parameters (This information should be provided for each basin):

Drainage Basin/Outfall Area No. = STU C14-2

Total drainage basin/outfall area =	9.63	acres
Predevelopment impervious area within drainage basin/outfall area =	0.00	acres
Post-development impervious area within drainage basin/outfall area =	5.58	acres
Post-development impervious fraction within drainage basin/outfall area =	0.58	
$L_{M\ THIS\ BASIN}$ =	4857	lbs.

3. Indicate the proposed BMP Code for this basin.

Proposed BMP = Jellyfish
Removal efficiency = 86 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 =	9.63	acres
A_I =	5.58	acres
A_P =	4.05	acres
L_R =	5373	lbs

5. Calculate Fraction of Annual Runoff to Treat the drainage basin / outfall area

Desired $L_{M\ THIS\ BASIN}$ = 4890 lbs.

F = 0.91

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 =	1.80	inches
Post Development Runoff Coefficient =	0.41	
On-site Water Quality Volume =	25540	cubic feet

19. BMPs Installed in a Series Designed as Required in RG-348 Pages 3-32

Michael E. Barrett, Ph.D.. P.E. recommended that the coefficient for E_2 be changed from 0.5 to 0.65 on May 3, 2006

$E_{TOT} = [1 - ((1 - E_1) \times (1 - 0.65E_2) \times (1 - 0.25E_3))] \times 100$ = 86.00 percent NET EFFICIENCY OF THE BMPs IN THE SERIES

EFFICIENCY OF FIRST BMP IN THE SERIES = E_1 = 86.00 percent Jellyfish

EFFICIENCY OF THE SECOND BMP IN THE SERIES = E_2 = 0.00 percent Jellyfish

EFFICIENCY OF THE THIRD BMP IN THE SERIES = E_3 = 0.00 percent

THEREFORE, THE NET LOAD REMOVAL WOULD BE:
(A_I AND A_P VALUES ARE FROM SECTION 3 ABOVE)

$L_R = E_{TOT} \times P \times (A_I \times 34.6 \times A_P \times 0.54)$ = 5373.42 lbs

Texas Commission on Environmental Quality

TSS Removal Calculations 04-20-2009

Project Name: US 183A
Date Prepared: 1/16/2026

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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 * =	19.56	acres
Predevelopment impervious area within the limits of the plan * =	0.00	acres
Total post-development impervious area within the limits of the plan* =	11.88	acres
Total post-development impervious cover fraction * =	0.61	
P =	32	inches
$L_{M\ TOTAL\ PROJECT}$ =	10340	lbs.

* The values entered in these fields should be for the total project area.

Number of drainage basins / outfalls areas leaving the plan area = ?

2. Drainage Basin Parameters (This information should be provided for each basin):

Drainage Basin/Outfall Area No. = STU C1 & C3

Total drainage basin/outfall area =	19.85	acres
Predevelopment impervious area within drainage basin/outfall area =	0.00	acres
Post-development impervious area within drainage basin/outfall area =	2.18	acres
Post-development impervious fraction within drainage basin/outfall area =	0.11	
$L_{M\ THIS\ BASIN}$ =	1895	lbs.

3. Indicate the proposed BMP Code for this basin.

Proposed BMP = Jellyfish
Removal efficiency = 86 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 =	2.62	acres
A_I =	2.08	acres
A_P =	0.54	acres
L_R =	1989	lbs

5. Calculate Fraction of Annual Runoff to Treat the drainage basin / outfall area

Desired $L_{M\ THIS\ BASIN}$ = 1931 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 =	0.62	
On-site Water Quality Volume =	17561	cubic feet

19. BMPs Installed in a Series Designed as Required in RG-348 Pages 3-32

Michael E. Barrett, Ph.D.. P.E. recommended that the coefficient for E_2 be changed from 0.5 to 0.65 on May 3, 2006

$E_{TOT} = [1 - ((1 - E_1) \times (1 - 0.65E_2) \times (1 - 0.25E_3))] \times 100$ = 86.00 percent NET EFFICIENCY OF THE BMPs IN THE SERIES

EFFICIENCY OF FIRST BMP IN THE SERIES = E_1 = 86.00 percent Jellyfish

EFFICIENCY OF THE SECOND BMP IN THE SERIES = E_2 = 0.00 percent

EFFICIENCY OF THE THIRD BMP IN THE SERIES = E_3 = 0.00 percent

THEREFORE, THE NET LOAD REMOVAL WOULD BE:
(A_I AND A_P VALUES ARE FROM SECTION 3 ABOVE)

$L_R = E_{TOT} \times P \times (A_I \times 34.6 \times A_P \times 0.54)$ = 1988.58 lbs

Contech Engineered Solutions Calculations for Texas Commission on Environmental Quality
TSS Removal Calculations

Project Name: **US183A**
Date Prepared: **3/13/2024**

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: $L_M = 27.2(A_N \times P)$

$L_{M\ TOTAL\ PROJECT}$ = 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 * =	**9.63**	acres
Predevelopment impervious area within the limits of the plan * =	**0.00**	acres
Total post-development impervious area within the limits of the plan* =	**5.58**	acres
Total post-development impervious cover fraction * =	**0.58**	
P =	**32**	inches
$L_{M\ TOTAL\ PROJECT}$ =	**4857**	lbs.
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. =	**STU-C14-2**	
Total drainage basin/outfall area =	**9.63**	acres
Predevelopment impervious area within drainage basin/outfall area =	**0.00**	acres
Post-development impervious area within drainage basin/outfall area =	**5.58**	acres
Post-development impervious fraction within drainage basin/outfall area =	**0.58**	
$L_{M\ THIS\ BASIN}$ =	**4857**	lbs.

3. Indicate the proposed BMP Code for this basin.

Proposed BMP =	**JF**	abbreviation
Removal efficiency =	**86.00**	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:
$LR = (\text{BMP efficiency}) \times P \times (A_I \times 34.6 + A_P \times 0.54)$

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 =	**9.63**	acres
A_I =	**5.58**	acres
A_P =	**4.05**	acres
L_R =	**5373**	lbs.

5. Calculate Fraction of Annual Runoff to Treat the drainage basin / outfall area

Desired $L_{M\ THIS\ BASIN}$ =	**4890**	lbs.
F =	**0.91**	

6. Calculate Treated Flow required by the BMP Type for this drainage basin / outfall area.

Offsite area draining to BMP =	**0.00**	acres
Offsite impervious cover draining to BMP =	**0.00**	acres

Calculations from RG-348
Pages Section 3.2.22

Rainfall Intensity =	**1.15**	inches per hour
Effective Area =	**5.14**	acres
Cartridge Length =	**54**	inches
Peak Treatment Flow Required =	**5.96**	cubic feet per second

7. Jellyfish

Designed as Required in RG-348
Section 3.2.22

Flow Through Jellyfish Size	**Vault**	
Jellyfish Size for Flow-Based Configuration =	**JFPD0816-30-7**	
Jellyfish Treatment Flow Rate =	**5.97**	cfs

Texas Commission on Environmental Quality

TSS Removal Calculations 04-20-2009

Project Name: US 183A
Date Prepared: 1/16/2026

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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 * =	19.56	acres
Predevelopment impervious area within the limits of the plan * =	0.00	acres
Total post-development impervious area within the limits of the plan* =	11.88	acres
Total post-development impervious cover fraction * =	0.61	
P =	32	inches
$L_{M\ TOTAL\ PROJECT}$ =	10340	lbs.

* The values entered in these fields should be for the total project area.

Number of drainage basins / outfalls areas leaving the plan area = ?

2. Drainage Basin Parameters (This information should be provided for each basin):

Drainage Basin/Outfall Area No. = GS-C1-1,2

Total drainage basin/outfall area =	19.85	acres
Predevelopment impervious area within drainage basin/outfall area =	0.00	acres
Post-development impervious area within drainage basin/outfall area =	0.91	acres
Post-development impervious fraction within drainage basin/outfall area =	0.05	
$L_{M\ THIS\ BASIN}$ =	790	lbs.

3. Indicate the proposed BMP Code for this basin.

Proposed BMP = Grassy Swale
Removal efficiency = 70 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 =	0.91	acres
A_I =	0.91	acres
A_P =	0.00	acres
L_R =	704	lbs

5. Calculate Fraction of Annual Runoff to Treat the drainage basin / outfall area

Desired $L_{M\ THIS\ BASIN}$ = 704 lbs.

F = 1.00

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 =	4.00	inches
Post Development Runoff Coefficient =	0.82	
On-site Water Quality Volume =	10759	cubic feet

19. BMPs Installed in a Series Designed as Required in RG-348 Pages 3-32

Michael E. Barrett, Ph.D.. P.E. recommended that the coefficient for E_2 be changed from 0.5 to 0.65 on May 3, 2006

$E_{TOT} = [1 - ((1 - E_1) X (1 - 0.65E_2) x (1 - 0.25E_3))] X 100$ =	70.00	percent	NET EFFICIENCY OF THE BMPs IN THE SERIES
EFFICIENCY OF FIRST BMP IN THE SERIES = E_1 =	70.00	percent	GS
EFFICIENCY OF THE SECOND BMP IN THE SERIES = E_2 =	0.00	percent	
EFFICIENCY OF THE THIRD BMP IN THE SERIES = E_3 =	0.00	percent	

THEREFORE, THE NET LOAD REMOVAL WOULD BE:
(A_I AND A_P VALUES ARE FROM SECTION 3 ABOVE)

$L_R = E_{TOT} X P X (A_I X 34.6 X A_P X 0.54)$ = 703.54 lbs

Contech Engineered Solutions Calculations for Texas Commission on Environmental Quality
TSS Removal Calculations

Project Name: US183A
Date Prepared: 12/3/2025

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: $L_M = 27.2(A_N \times P)$

$L_{M\ TOTAL\ PROJECT}$ = 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 * =	1.06	acres
Predevelopment impervious area within the limits of the plan * =	0.00	acres
Total post-development impervious area within the limits of the plan* =	0.73	acres
Total post-development impervious cover fraction * =	0.69	
P =	32	inches
$L_{M\ TOTAL\ PROJECT}$ =	635	lbs.
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. =	STU-C1	
Total drainage basin/outfall area =	1.06	acres
Predevelopment impervious area within drainage basin/outfall area =	0.00	acres
Post-development impervious area within drainage basin/outfall area =	0.73	acres
Post-development impervious fraction within drainage basin/outfall area =	0.69	
$L_{M\ THIS\ BASIN}$ =	635	lbs.

3. Indicate the proposed BMP Code for this basin.

Proposed BMP =	JF	abbreviation
Removal efficiency =	86	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:
$LR = (\text{BMP efficiency}) \times P \times (A_I \times 34.6 + A_P \times 0.54)$

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 =	1.06	acres
A_I =	0.73	acres
A_P =	0.33	acres
L_R =	700	lbs.

5. Calculate Fraction of Annual Runoff to Treat the drainage basin / outfall area

Desired $L_{M\ THIS\ BASIN}$ =	679	lbs.
F =	0.97	

6. Calculate Treated Flow required by the BMP Type for this drainage basin / outfall area.

Offsite area draining to BMP =	0.00	acres
Offsite impervious cover draining to BMP =	0.00	acres

Calculations from RG-348
Pages Section 3.2.22

Rainfall Intensity =	2.00	inches per hour
Effective Area =	0.67	acres
Cartridge Length =	54	inches
Peak Treatment Flow Required =	1.34	cubic feet per second

7. Jellyfish

Designed as Required in RG-348
Section 3.2.22

Flow Through Jellyfish Size	Vault	
Jellyfish Size for Flow-Based Configuration =	JFPD0806-7-2	
Jellyfish Treatment Flow Rate =	1.43	cfs

Contech Engineered Solutions Calculations for Texas Commission on Environmental Quality
TSS Removal Calculations

Project Name: **US183A**
Date Prepared: **12/3/2025**

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: $L_M = 27.2(A_N \times P)$

$L_{M\ TOTAL\ PROJECT}$ = 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 * =	**1.35**	acres
Predevelopment impervious area within the limits of the plan * =	**0.00**	acres
Total post-development impervious area within the limits of the plan * =	**1.35**	acres
Total post-development impervious cover fraction * =	**1.00**	
P =	**32**	inches
$L_{M\ TOTAL\ PROJECT}$ =	**1175**	lbs.
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. =	**STU-C3**	
Total drainage basin/outfall area =	**1.35**	acres
Predevelopment impervious area within drainage basin/outfall area =	**0.00**	acres
Post-development impervious area within drainage basin/outfall area =	**1.35**	acres
Post-development impervious fraction within drainage basin/outfall area =	**1.00**	
$L_{M\ THIS\ BASIN}$ =	**1175**	lbs.

3. Indicate the proposed BMP Code for this basin.

Proposed BMP =	**JF**	abbreviation
Removal efficiency =	**86**	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:
$LR = (\text{BMP efficiency}) \times P \times (A_I \times 34.6 + A_P \times 0.54)$

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 =	**1.35**	acres
A_I =	**1.35**	acres
A_P =	**0.00**	acres
L_R =	**1285**	lbs.

5. Calculate Fraction of Annual Runoff to Treat the drainage basin / outfall area

Desired $L_{M\ THIS\ BASIN}$ =	**1252**	lbs.
F =	**0.97**	

6. Calculate Treated Flow required by the BMP Type for this drainage basin / outfall area.

Offsite area draining to BMP =	**0.00**	acres
Offsite impervious cover draining to BMP =	**0.00**	acres

Calculations from RG-348
Pages Section 3.2.22

Rainfall Intensity =	**2.00**	inches per hour
Effective Area =	**1.22**	acres
Cartridge Length =	**54**	inches
Peak Treatment Flow Required =	**2.45**	cubic feet per second

7. Jellyfish

Designed as Required in RG-348
Section 3.2.22

Flow Through Jellyfish Size	**Vault**	
Jellyfish Size for Flow-Based Configuration =	**JFPD0808-13-3**	
Jellyfish Treatment Flow Rate =	**2.58**	cfs

Contech Engineered Solutions Calculations for Texas Commission on Environmental Quality
TSS Removal Calculations

Project Name: **US183A**
Date Prepared: **12/3/2025**

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: $L_M = 27.2(A_N \times P)$

$L_{M\ TOTAL\ PROJECT}$ = 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 * =	**1.27**	acres
Predevelopment impervious area within the limits of the plan * =	**0.00**	acres
Total post-development impervious area within the limits of the plan* =	**1.12**	acres
Total post-development impervious cover fraction * =	**0.88**	
P =	**32**	inches
$L_{M\ TOTAL\ PROJECT}$ =	**975**	lbs.
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. =	**STU-C14-1**	
Total drainage basin/outfall area =	**1.27**	acres
Predevelopment impervious area within drainage basin/outfall area =	**0.00**	acres
Post-development impervious area within drainage basin/outfall area =	**1.12**	acres
Post-development impervious fraction within drainage basin/outfall area =	**0.88**	
$L_{M\ THIS\ BASIN}$ =	**975**	lbs.

3. Indicate the proposed BMP Code for this basin.

Proposed BMP =	**JF**	abbreviation
Removal efficiency =	**86**	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:
$LR = (\text{BMP efficiency}) \times P \times (A_I \times 34.6 + A_P \times 0.54)$

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 =	**1.27**	acres
A_I =	**1.12**	acres
A_P =	**0.15**	acres
L_R =	**1069**	lbs.

5. Calculate Fraction of Annual Runoff to Treat the drainage basin / outfall area

Desired $L_{M\ THIS\ BASIN}$ =	**1037**	lbs.
F =	**0.97**	

6. Calculate Treated Flow required by the BMP Type for this drainage basin / outfall area.

Offsite area draining to BMP =	**0.00**	acres
Offsite impervious cover draining to BMP =	**0.00**	acres

Calculations from RG-348
Pages Section 3.2.22

Rainfall Intensity =	**2.00**	inches per hour
Effective Area =	**1.01**	acres
Cartridge Length =	**54**	inches
Peak Treatment Flow Required =	**2.04**	cubic feet per second

7. Jellyfish

Designed as Required in RG-348
Section 3.2.22

Flow Through Jellyfish Size	**Vault**	
Jellyfish Size for Flow-Based Configuration =	**JFPD0808-10-3**	
Jellyfish Treatment Flow Rate =	**2.05**	cfs

Texas Commission on Environmental Quality

TSS Removal Calculations 04-20-2009

Project Name: US 183A
Date Prepared: 1/16/2026

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 * =	1.73	acres
Predevelopment impervious area within the limits of the plan * =	0.00	acres
Total post-development impervious area within the limits of the plan* =	1.36	acres
Total post-development impervious cover fraction * =	0.79	
P =	32	inches
$L_{M\ TOTAL\ PROJECT}$ =	1184	lbs.

* The values entered in these fields should be for the total project area.

Number of drainage basins / outfalls areas leaving the plan area = ?

2. Drainage Basin Parameters (This information should be provided for each basin):

Drainage Basin/Outfall Area No. = STU C14-1

Total drainage basin/outfall area =	1.74	acres
Predevelopment impervious area within drainage basin/outfall area =	0.00	acres
Post-development impervious area within drainage basin/outfall area =	1.11	acres
Post-development impervious fraction within drainage basin/outfall area =	0.64	
$L_{M\ THIS\ BASIN}$ =	969	lbs.

3. Indicate the proposed BMP Code for this basin.

Proposed BMP = Jellyfish
Removal efficiency = 86 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 =	1.27	acres
A_I =	1.12	acres
A_P =	0.15	acres
L_R =	1069	lbs

5. Calculate Fraction of Annual Runoff to Treat the drainage basin / outfall area

Desired $L_{M\ THIS\ BASIN}$ = 1037 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 =	0.72	
On-site Water Quality Volume =	9960	cubic feet

19. BMPs Installed in a Series Designed as Required in RG-348 Pages 3-32

Michael E. Barrett, Ph.D.. P.E. recommended that the coefficient for E_2 be changed from 0.5 to 0.65 on May 3, 2006

$E_{TOT} = [1 - ((1 - E_1) \times (1 - 0.65E_2) \times (1 - 0.25E_3))] \times 100$ = 86.00 percent NET EFFICIENCY OF THE BMPs IN THE SERIES

EFFICIENCY OF FIRST BMP IN THE SERIES = E_1 = 86.00 percent Jellyfish

EFFICIENCY OF THE SECOND BMP IN THE SERIES = E_2 = 0.00 percent

EFFICIENCY OF THE THIRD BMP IN THE SERIES = E_3 = 0.00 percent

THEREFORE, THE NET LOAD REMOVAL WOULD BE:
(A_I AND A_P VALUES ARE FROM SECTION 3 ABOVE)

$L_R = E_{TOT} \times P \times (A_I \times 34.6 \times A_P \times 0.54)$ = 1068.68 lbs

Texas Commission on Environmental Quality

TSS Removal Calculations 04-20-2009

Project Name: US 183A
Date Prepared: 1/16/2026

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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 * =	1.73	acres
Predevelopment impervious area within the limits of the plan * =	0.00	acres
Total post-development impervious area within the limits of the plan* =	1.36	acres
Total post-development impervious cover fraction * =	0.79	
P =	32	inches
$L_{M\ TOTAL\ PROJECT}$ =	1184	lbs.

* The values entered in these fields should be for the total project area.

Number of drainage basins / outfalls areas leaving the plan area = ?

2. Drainage Basin Parameters (This information should be provided for each basin):

Drainage Basin/Outfall Area No. = VFS-C2-1

Total drainage basin/outfall area =	1.74	acres
Predevelopment impervious area within drainage basin/outfall area =	0.00	acres
Post-development impervious area within drainage basin/outfall area =	0.03	acres
Post-development impervious fraction within drainage basin/outfall area =	0.02	
$L_{M\ THIS\ BASIN}$ =	24	lbs.

3. Indicate the proposed BMP Code for this basin.

Proposed BMP = Vegetated Filter Strips
Removal efficiency = 85 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 =	0.03	acres
A_I =	0.03	acres
A_P =	0.00	acres
L_R =	26	lbs

5. Calculate Fraction of Annual Runoff to Treat the drainage basin / outfall area

Desired $L_{M\ THIS\ BASIN}$ = 26 lbs.

F = 1.00

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 =	4.00	inches
Post Development Runoff Coefficient =	0.82	
On-site Water Quality Volume =	330	cubic feet

19. BMPs Installed in a Series Designed as Required in RG-348 Pages 3-32

Michael E. Barrett, Ph.D.. P.E. recommended that the coefficient for E_2 be changed from 0.5 to 0.65 on May 3, 2006

$E_{TOT} = [1 - ((1 - E_1) \times (1 - 0.65E_2) \times (1 - 0.25E_3))] \times 100$ =	85.00	percent	NET EFFICIENCY OF THE BMPs IN THE SERIES
EFFICIENCY OF FIRST BMP IN THE SERIES = E_1 =	85.00	percent	VFS
EFFICIENCY OF THE SECOND BMP IN THE SERIES = E_2 =	0.00	percent	
EFFICIENCY OF THE THIRD BMP IN THE SERIES = E_3 =	0.00	percent	

THEREFORE, THE NET LOAD REMOVAL WOULD BE:
(A_I AND A_P VALUES ARE FROM SECTION 3 ABOVE)

$L_R = E_{TOT} \times P \times (A_I \times 34.6 \times A_P \times 0.54)$ = 26.20 lbs

Texas Commission on Environmental Quality

TSS Removal Calculations 04-20-2009

Project Name: US 183A
Date Prepared: 1/16/2026

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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 * =	19.09	acres
Predevelopment impervious area within the limits of the plan * =	0.00	acres
Total post-development impervious area within the limits of the plan* =	14.28	acres
Total post-development impervious cover fraction * =	0.75	
P =	32	inches
$L_{M\ TOTAL\ PROJECT}$ =	12429	lbs.

* The values entered in these fields should be for the total project area.

Number of drainage basins / outfalls areas leaving the plan area = ?

This sheet is for total load removal for in-series calculations. The next sheet is for Jellyfish STU sizing purposes only.

2. Drainage Basin Parameters (This information should be provided for each basin):

Drainage Basin/Outfall Area No. = STU D-1 - SF LOBO

Total drainage basin/outfall area =	19.09	acres
Predevelopment impervious area within drainage basin/outfall area =	0.00	acres
Post-development impervious area within drainage basin/outfall area =	0.33	acres
Post-development impervious fraction within drainage basin/outfall area =	0.02	
$L_{M\ THIS\ BASIN}$ =	290	lbs.

3. Indicate the proposed BMP Code for this basin.

Proposed BMP = InSeries
Removal efficiency = 94 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 =	0.54	acres
A_I =	0.33	acres
A_P =	0.21	acres
L_R =	351	lbs

5. Calculate Fraction of Annual Runoff to Treat the drainage basin / outfall area

Desired $L_{M\ THIS\ BASIN}$ = 319 lbs.

F = 0.91

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 =	1.80	inches
Post Development Runoff Coefficient =	0.43	
On-site Water Quality Volume =	1529	cubic feet

19. BMPs Installed in a Series Designed as Required in RG-348 Pages 3-32

Michael E. Barrett, Ph.D.. P.E. recommended that the coefficient for E_2 be changed from 0.5 to 0.65 on May 3, 2006

$E_{TOT} = [1 - ((1 - E_1) X (1 - 0.65E_2) x (1 - 0.25E_3))] X 100$ =	94.10	percent	NET EFFICIENCY OF THE BMPs IN THE SERIES
EFFICIENCY OF FIRST BMP IN THE SERIES = E_1 =	86.00	percent	Jellyfish
EFFICIENCY OF THE SECOND BMP IN THE SERIES = E_2 =	89.00	percent	Lobo SF
EFFICIENCY OF THE THIRD BMP IN THE SERIES = E_3 =	0.00	percent	

THEREFORE, THE NET LOAD REMOVAL WOULD BE:
(A_I AND A_P VALUES ARE FROM SECTION 3 ABOVE)

$L_R = E_{TOT} X P X (A_I X 34.6 X A_P X 0.54)$ = 350.79 lbs

Contech Engineered Solutions Calculations for Texas Commission on Environmental Quality
TSS Removal Calculations

Project Name: **US183A**
Date Prepared: **12/3/2025**

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: $L_M = 27.2(A_N \times P)$

$L_{M\ TOTAL\ PROJECT}$ = 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 *	**0.45**	acres
Predevelopment impervious area within the limits of the plan *	**0.00**	acres
Total post-development impervious area within the limits of the plan*	**0.33**	acres
Total post-development impervious cover fraction *	**0.73**	
P	**32**	inches
$L_{M\ TOTAL\ PROJECT}$	**287**	lbs.
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.	**STU-D1**	
Total drainage basin/outfall area	**0.45**	acres
Predevelopment impervious area within drainage basin/outfall area	**0.00**	acres
Post-development impervious area within drainage basin/outfall area	**0.33**	acres
Post-development impervious fraction within drainage basin/outfall area	**0.73**	
$L_{M\ THIS\ BASIN}$	**287**	lbs.

3. Indicate the proposed BMP Code for this basin.

Proposed BMP	**JF**	abbreviation
Removal efficiency	**86**	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:
$LR = (\text{BMP efficiency}) \times P \times (A_I \times 34.6 + A_P \times 0.54)$

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	**0.45**	acres
A_I	**0.33**	acres
A_P	**0.12**	acres
L_R	**316**	lbs.

5. Calculate Fraction of Annual Runoff to Treat the drainage basin / outfall area

Desired $L_{M\ THIS\ BASIN}$	**288**	lbs.
F	**0.91**	

6. Calculate Treated Flow required by the BMP Type for this drainage basin / outfall area.

Offsite area draining to BMP	**0.00**	acres
Offsite impervious cover draining to BMP	**0.00**	acres

Calculations from RG-348
Pages Section 3.2.22

Rainfall Intensity	**1.15**	inches per hour
Effective Area	**0.30**	acres
Cartridge Length	**54**	inches
Peak Treatment Flow Required	**0.35**	cubic feet per second

7. Jellyfish

Designed as Required in RG-348
Section 3.2.22

Flow Through Jellyfish Size	**Vault**	
Jellyfish Size for Flow-Based Configuration	**JFPD0406-2-1**	
Jellyfish Treatment Flow Rate	**0.45**	cfs

Texas Commission on Environmental Quality

TSS Removal Calculations 04-20-2009

Project Name: US 183A
Date Prepared: 1/16/2026

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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 * =	19.09	acres
Predevelopment impervious area within the limits of the plan * =	0.00	acres
Total post-development impervious area within the limits of the plan* =	14.28	acres
Total post-development impervious cover fraction * =	0.75	
P =	32	inches
$L_{M\ TOTAL\ PROJECT}$ =	12429	lbs.

* The values entered in these fields should be for the total project area.

Number of drainage basins / outfalls areas leaving the plan area = ?

2. Drainage Basin Parameters (This information should be provided for each basin):

Drainage Basin/Outfall Area No. = VFS-C2-1

Total drainage basin/outfall area =	19.09	acres
Predevelopment impervious area within drainage basin/outfall area =	0.00	acres
Post-development impervious area within drainage basin/outfall area =	0.36	acres
Post-development impervious fraction within drainage basin/outfall area =	0.02	
$L_{M\ THIS\ BASIN}$ =	310	lbs.

3. Indicate the proposed BMP Code for this basin.

Proposed BMP = Vegetated Filter Strips
Removal efficiency = 85 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 =	0.36	acres
A_I =	0.36	acres
A_P =	0.00	acres
L_R =	335	lbs

5. Calculate Fraction of Annual Runoff to Treat the drainage basin / outfall area

Desired $L_{M\ THIS\ BASIN}$ = 335 lbs.

F = 1.00

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 =	4.00	inches
Post Development Runoff Coefficient =	0.82	
On-site Water Quality Volume =	4220	cubic feet

19. BMPs Installed in a Series Designed as Required in RG-348 Pages 3-32

Michael E. Barrett, Ph.D.. P.E. recommended that the coefficient for E_2 be changed from 0.5 to 0.65 on May 3, 2006

$E_{TOT} = [1 - ((1 - E_1) \times (1 - 0.65E_2) \times (1 - 0.25E_3))] \times 100$ = 85.00 percent NET EFFICIENCY OF THE BMPs IN THE SERIES

EFFICIENCY OF FIRST BMP IN THE SERIES = E_1 = 85.00 percent VFS

EFFICIENCY OF THE SECOND BMP IN THE SERIES = E_2 = 0.00 percent

EFFICIENCY OF THE THIRD BMP IN THE SERIES = E_3 = 0.00 percent

THEREFORE, THE NET LOAD REMOVAL WOULD BE:
(A_I AND A_P VALUES ARE FROM SECTION 3 ABOVE)

$L_R = E_{TOT} \times P \times (A_I \times 34.6 \times A_P \times 0.54)$ = 335.05 lbs

Texas Commission on Environmental Quality

TSS Removal Calculations 04-20-2009

Project Name: US 183A
Date Prepared: 1/16/2026

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 * =	19.09	acres
Predevelopment impervious area within the limits of the plan * =	0.15	acres
Total post-development impervious area within the limits of the plan * =	14.28	acres
Total post-development impervious cover fraction * =	0.75	
P =	32	inches
$L_{M\ TOTAL\ PROJECT}$ =	12299	lbs.

* The values entered in these fields should be for the total project area.

Number of drainage basins / outfalls areas leaving the plan area = ?

2. Drainage Basin Parameters (This information should be provided for each basin):

Drainage Basin/Outfall Area No. = SF-1

Total drainage basin/outfall area =	19.09	acres
Predevelopment impervious area within drainage basin/outfall area =	0.11	acres
Post-development impervious area within drainage basin/outfall area =	13.35	acres
Post-development impervious fraction within drainage basin/outfall area =	0.70	
$L_{M\ THIS\ BASIN}$ =	11525	lbs.

3. Indicate the proposed BMP Code for this basin.

Proposed BMP = Sand Filter
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 =	13.35	acres
A_I =	13.35	acres
A_P =	0.00	acres
L_R =	13156	lbs

5. Calculate Fraction of Annual Runoff to Treat the drainage basin / outfall area

Desired $L_{M\ THIS\ BASIN}$ = 12807 lbs. (Desired LM is amount that pond can physically treat)

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 =	0.82	
On-site Water Quality Volume =	118680	cubic feet

19. BMPs Installed in a Series Designed as Required in RG-348 Pages 3-32

Michael E. Barrett, Ph.D.. P.E. recommended that the coefficient for E_2 be changed from 0.5 to 0.65 on May 3, 2006

$E_{TOT} = [1 - ((1 - E_1) \times (1 - 0.65E_2) \times (1 - 0.25E_3))] \times 100$ = 89.00 percent NET EFFICIENCY OF THE BMPs IN THE SERIES

EFFICIENCY OF FIRST BMP IN THE SERIES = E_1 = 89.00 percent Sand Filter

EFFICIENCY OF THE SECOND BMP IN THE SERIES = E_2 = 0.00 percent

EFFICIENCY OF THE THIRD BMP IN THE SERIES = E_3 = 0.00 percent

THEREFORE, THE NET LOAD REMOVAL WOULD BE:
(A_I AND A_P VALUES ARE FROM SECTION 3 ABOVE)

$L_R = E_{TOT} \times P \times (A_I \times 34.6 \times A_P \times 0.54)$ = 13155.94 lbs

9B. Partial Sedimentation and Filtration System

Water Quality Volume for combined basins =	142416	cubic feet
Minimum filter basin area =	11868	square feet

Texas Commission on Environmental Quality

TSS Removal Calculations 04-20-2009

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Date Prepared: 1/16/2026

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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 * =	3.23	acres
Predevelopment impervious area within the limits of the plan * =	0.00	acres
Total post-development impervious area within the limits of the plan* =	2.37	acres
Total post-development impervious cover fraction * =	0.73	
P =	32	inches
$L_{M\ TOTAL\ PROJECT}$ =	2063	lbs.

* The values entered in these fields should be for the total project area.

Number of drainage basins / outfalls areas leaving the plan area = ?

2. Drainage Basin Parameters (This information should be provided for each basin):

Drainage Basin/Outfall Area No. = STU E1 & E2 & E2-4 & E2-5

Total drainage basin/outfall area =	3.19	acres
Predevelopment impervious area within drainage basin/outfall area =	0.00	acres
Post-development impervious area within drainage basin/outfall area =	2.27	acres
Post-development impervious fraction within drainage basin/outfall area =	0.71	
$L_{M\ THIS\ BASIN}$ =	1975	lbs.

3. Indicate the proposed BMP Code for this basin.

Proposed BMP = Jellyfish
Removal efficiency = 86 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 =	3.19	acres
A_I =	2.27	acres
A_P =	0.92	acres
L_R =	2174	lbs

5. Calculate Fraction of Annual Runoff to Treat the drainage basin / outfall area

Desired $L_{M\ THIS\ BASIN}$ = 2002 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 =	0.52	
On-site Water Quality Volume =	11977	cubic feet

19. BMPs Installed in a Series Designed as Required in RG-348 Pages 3-32

Michael E. Barrett, Ph.D.. P.E. recommended that the coefficient for E_2 be changed from 0.5 to 0.65 on May 3, 2006

$E_{TOT} = [1 - ((1 - E_1) \times (1 - 0.65E_2) \times (1 - 0.25E_3))] \times 100$ = 86.00 percent NET EFFICIENCY OF THE BMPs IN THE SERIES

EFFICIENCY OF FIRST BMP IN THE SERIES = E_1 = 86.00 percent Jellyfish

EFFICIENCY OF THE SECOND BMP IN THE SERIES = E_2 = 0.00 percent

EFFICIENCY OF THE THIRD BMP IN THE SERIES = E_3 = 0.00 percent

THEREFORE, THE NET LOAD REMOVAL WOULD BE:
(A_I AND A_P VALUES ARE FROM SECTION 3 ABOVE)

$L_R = E_{TOT} \times P \times (A_I \times 34.6 \times A_P \times 0.54)$ = 2174.21 lbs

Texas Commission on Environmental Quality

TSS Removal Calculations 04-20-2009

Project Name: US 183A
Date Prepared: 1/16/2026

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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 * =	2.73	acres
Predevelopment impervious area within the limits of the plan * =	0.00	acres
Total post-development impervious area within the limits of the plan* =	2.35	acres
Total post-development impervious cover fraction * =	0.86	
P =	32	inches
$L_{M\ TOTAL\ PROJECT}$ =	2045	lbs.

* The values entered in these fields should be for the total project area.

Number of drainage basins / outfalls areas leaving the plan area = ?

2. Drainage Basin Parameters (This information should be provided for each basin):

Drainage Basin/Outfall Area No. = STU E1

Total drainage basin/outfall area =	2.73	acres
Predevelopment impervious area within drainage basin/outfall area =	0.00	acres
Post-development impervious area within drainage basin/outfall area =	2.35	acres
Post-development impervious fraction within drainage basin/outfall area =	0.86	
$L_{M\ THIS\ BASIN}$ =	2045	lbs.

3. Indicate the proposed BMP Code for this basin.

Proposed BMP = Jellyfish
Removal efficiency = 86 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 =	2.73	acres
A_I =	2.35	acres
A_P =	0.38	acres
L_R =	2243	lbs

5. Calculate Fraction of Annual Runoff to Treat the drainage basin / outfall area

Desired $L_{M\ THIS\ BASIN}$ = 2041 lbs.

F = 0.91

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 =	1.80	inches
Post Development Runoff Coefficient =	0.70	
On-site Water Quality Volume =	12539	cubic feet

19. BMPs Installed in a Series Designed as Required in RG-348 Pages 3-32

Michael E. Barrett, Ph.D.. P.E. recommended that the coefficient for E_2 be changed from 0.5 to 0.65 on May 3, 2006

$E_{TOT} = [1 - ((1 - E_1) \times (1 - 0.65E_2) \times (1 - 0.25E_3))] \times 100$ = 86.00 percent NET EFFICIENCY OF THE BMPs IN THE SERIES

EFFICIENCY OF FIRST BMP IN THE SERIES = E_1 = 86.00 percent Jellyfish

EFFICIENCY OF THE SECOND BMP IN THE SERIES = E_2 = 0.00 percent

EFFICIENCY OF THE THIRD BMP IN THE SERIES = E_3 = 0.00 percent

THEREFORE, THE NET LOAD REMOVAL WOULD BE:
(A_I AND A_P VALUES ARE FROM SECTION 3 ABOVE)

$L_R = E_{TOT} \times P \times (A_I \times 34.6 \times A_P \times 0.54)$ = 2243.30 lbs

Contech Engineered Solutions Calculations for Texas Commission on Environmental Quality
TSS Removal Calculations

Project Name: **US183A**
Date Prepared: **12/3/2025**

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: $L_M = 27.2(A_N \times P)$

$L_{M\ TOTAL\ PROJECT}$ = 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 * =	**2.73**	acres
Predevelopment impervious area within the limits of the plan * =	**0.00**	acres
Total post-development impervious area within the limits of the plan * =	**2.35**	acres
Total post-development impervious cover fraction * =	**0.86**	
P =	**32**	inches
$L_{M\ TOTAL\ PROJECT}$ =	**2045**	lbs.
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. =	**STU-E1**	
Total drainage basin/outfall area =	**2.73**	acres
Predevelopment impervious area within drainage basin/outfall area =	**0.00**	acres
Post-development impervious area within drainage basin/outfall area =	**2.35**	acres
Post-development impervious fraction within drainage basin/outfall area =	**0.86**	
$L_{M\ THIS\ BASIN}$ =	**2045**	lbs.

3. Indicate the proposed BMP Code for this basin.

Proposed BMP =	**JF**	abbreviation
Removal efficiency =	**86**	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:
LR = (BMP efficiency) x P x (A_I x 34.6 + A_P x 0.54)

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 =	**2.73**	acres
A_I =	**2.35**	acres
A_P =	**0.38**	acres
L_R =	**2243**	lbs.

5. Calculate Fraction of Annual Runoff to Treat the drainage basin / outfall area

Desired $L_{M\ THIS\ BASIN}$ =	**2041**	lbs.
F =	**0.91**	

6. Calculate Treated Flow required by the BMP Type for this drainage basin / outfall area.

Offsite area draining to BMP =	**0.00**	acres
Offsite impervious cover draining to BMP =	**0.00**	acres

Calculations from RG-348
Pages Section 3.2.22

Rainfall Intensity =	**1.15**	inches per hour
Effective Area =	**2.13**	acres
Cartridge Length =	**54**	inches
Peak Treatment Flow Required =	**2.47**	cubic feet per second

7. Jellyfish
Designed as Required in RG-348
Section 3.2.22

Flow Through Jellyfish Size	**Vault**	
Jellyfish Size for Flow-Based Configuration =	**JFPD0808-13-3**	
Jellyfish Treatment Flow Rate =	**2.58**	cfs

Texas Commission on Environmental Quality

TSS Removal Calculations 04-20-2009

Project Name: US 183A
Date Prepared: 1/16/2026

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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 * =	7.32	acres
Predevelopment impervious area within the limits of the plan * =	0.00	acres
Total post-development impervious area within the limits of the plan* =	2.36	acres
Total post-development impervious cover fraction * =	0.32	
P =	32	inches
$L_{M\ TOTAL\ PROJECT}$ =	2054	lbs.

* The values entered in these fields should be for the total project area.

Number of drainage basins / outfalls areas leaving the plan area = ?

2. Drainage Basin Parameters (This information should be provided for each basin):

Drainage Basin/Outfall Area No. = STU E2

Total drainage basin/outfall area =	7.32	acres
Predevelopment impervious area within drainage basin/outfall area =	0.00	acres
Post-development impervious area within drainage basin/outfall area =	2.36	acres
Post-development impervious fraction within drainage basin/outfall area =	0.32	
$L_{M\ THIS\ BASIN}$ =	2054	lbs.

3. Indicate the proposed BMP Code for this basin.

Proposed BMP = Jellyfish
Removal efficiency = 86 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 =	7.32	acres
A_I =	2.36	acres
A_P =	4.96	acres
L_R =	2321	lbs

5. Calculate Fraction of Annual Runoff to Treat the drainage basin / outfall area

Desired $L_{M\ THIS\ BASIN}$ = 2112 lbs.

F = 0.91

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 =	1.80	inches
Post Development Runoff Coefficient =	0.27	
On-site Water Quality Volume =	12886	cubic feet

19. BMPs Installed in a Series Designed as Required in RG-348 Pages 3-32

Michael E. Barrett, Ph.D.. P.E. recommended that the coefficient for E_2 be changed from 0.5 to 0.65 on May 3, 2006

$E_{TOT} = [1 - ((1 - E_1) X (1 - 0.65E_2) x (1 - 0.25E_3))] X 100$ =	86.00	percent	NET EFFICIENCY OF THE BMPs IN THE SERIES
EFFICIENCY OF FIRST BMP IN THE SERIES = E_1 =	86.00	percent	Jellyfish
EFFICIENCY OF THE SECOND BMP IN THE SERIES = E_2 =	0.00	percent	
EFFICIENCY OF THE THIRD BMP IN THE SERIES = E_3 =	0.00	percent	

THEREFORE, THE NET LOAD REMOVAL WOULD BE:
(A_I AND A_P VALUES ARE FROM SECTION 3 ABOVE)

$L_R = E_{TOT} X P X (A_I X 34.6 X A_P X0.54)$ = 2320.88 lbs

Contech Engineered Solutions Calculations for Texas Commission on Environmental Quality
TSS Removal Calculations

Project Name: **US183A**
Date Prepared: **12/3/2025**

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: $L_M = 27.2(A_N \times P)$

$L_{M\ TOTAL\ PROJECT}$ = 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 * =	**7.32**	acres
Predevelopment impervious area within the limits of the plan * =	**0.00**	acres
Total post-development impervious area within the limits of the plan* =	**2.36**	acres
Total post-development impervious cover fraction * =	**0.32**	
P =	**32**	inches
$L_{M\ TOTAL\ PROJECT}$ =	**2054**	lbs.
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. =	**STU-E2**	
Total drainage basin/outfall area =	**7.32**	acres
Predevelopment impervious area within drainage basin/outfall area =	**0.00**	acres
Post-development impervious area within drainage basin/outfall area =	**2.36**	acres
Post-development impervious fraction within drainage basin/outfall area =	**0.32**	
$L_{M\ THIS\ BASIN}$ =	**2054**	lbs.

3. Indicate the proposed BMP Code for this basin.

Proposed BMP =	**JF**	abbreviation
Removal efficiency =	**86**	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:
$LR = (\text{BMP efficiency}) \times P \times (A_I \times 34.6 + A_P \times 0.54)$

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 =	**7.32**	acres
A_I =	**2.36**	acres
A_P =	**4.96**	acres
L_R =	**2321**	lbs.

5. Calculate Fraction of Annual Runoff to Treat the drainage basin / outfall area

Desired $L_{M\ THIS\ BASIN}$ =	**2112**	lbs.
F =	**0.91**	

6. Calculate Treated Flow required by the BMP Type for this drainage basin / outfall area.

Offsite area draining to BMP =	**0.00**	acres
Offsite impervious cover draining to BMP =	**0.00**	acres

Calculations from RG-348
Pages Section 3.2.22

Rainfall Intensity =	**1.15**	inches per hour
Effective Area =	**2.27**	acres
Cartridge Length =	**54**	inches
Peak Treatment Flow Required =	**2.64**	cubic feet per second

7. Jellyfish

Designed as Required in RG-348
Section 3.2.22

Flow Through Jellyfish Size	**Vault**	
Jellyfish Size for Flow-Based Configuration =	**JFPD0808-14-3**	
Jellyfish Treatment Flow Rate =	**2.76**	cfs

Contech Engineered Solutions Calculations for Texas Commission on Environmental Quality
TSS Removal Calculations

Project Name: **US183A**
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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: $L_M = 27.2(A_N \times P)$

$L_{M\ TOTAL\ PROJECT}$ = 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 * =	**0.71**	acres
Predevelopment impervious area within the limits of the plan * =	**0.00**	acres
Total post-development impervious area within the limits of the plan * =	**0.30**	acres
Total post-development impervious cover fraction * =	**0.42**	
P =	**32**	inches
$L_{M\ TOTAL\ PROJECT}$ =	**261**	lbs.
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. =	**STU-E2-4**	
Total drainage basin/outfall area =	**0.71**	acres
Predevelopment impervious area within drainage basin/outfall area =	**0.00**	acres
Post-development impervious area within drainage basin/outfall area =	**0.30**	acres
Post-development impervious fraction within drainage basin/outfall area =	**0.42**	
$L_{M\ THIS\ BASIN}$ =	**261**	lbs.

3. Indicate the proposed BMP Code for this basin.

Proposed BMP =	**JF**	abbreviation
Removal efficiency =	**86**	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:
$LR = (\text{BMP efficiency}) \times P \times (A_I \times 34.6 + A_P \times 0.54)$

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 =	**0.71**	acres
A_I =	**0.30**	acres
A_P =	**0.41**	acres
L_R =	**292**	lbs.

5. Calculate Fraction of Annual Runoff to Treat the drainage basin / outfall area

Desired $L_{M\ THIS\ BASIN}$ =	**265**	lbs.
F =	**0.91**	

6. Calculate Treated Flow required by the BMP Type for this drainage basin / outfall area.

Offsite area draining to BMP =	**0.00**	acres
Offsite impervious cover draining to BMP =	**0.00**	acres

Calculations from RG-348
Pages Section 3.2.22

Rainfall Intensity =	**1.15**	inches per hour
Effective Area =	**0.28**	acres
Cartridge Length =	**54**	inches
Peak Treatment Flow Required =	**0.33**	cubic feet per second

7. Jellyfish

Designed as Required in RG-348
Section 3.2.22

Flow Through Jellyfish Size	**Surface Inlet**	
Jellyfish Size for Flow-Based Configuration =	**JFSI0404-2-1**	
Jellyfish Treatment Flow Rate =	**0.45**	cfs

Contech Engineered Solutions Calculations for Texas Commission on Environmental Quality
TSS Removal Calculations

Project Name: **US183A**
Date Prepared: **12/3/2025**

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: $L_M = 27.2(A_N \times P)$

$L_{M\ TOTAL\ PROJECT}$ = 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 * =	**0.26**	acres
Predevelopment impervious area within the limits of the plan * =	**0.00**	acres
Total post-development impervious area within the limits of the plan * =	**0.07**	acres
Total post-development impervious cover fraction * =	**0.27**	
P =	**32**	inches
$L_{M\ TOTAL\ PROJECT}$ =	**61**	lbs.
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. =	**STU-E2-5**	
Total drainage basin/outfall area =	**0.26**	acres
Predevelopment impervious area within drainage basin/outfall area =	**0.00**	acres
Post-development impervious area within drainage basin/outfall area =	**0.07**	acres
Post-development impervious fraction within drainage basin/outfall area =	**0.27**	
$L_{M\ THIS\ BASIN}$ =	**61**	lbs.

3. Indicate the proposed BMP Code for this basin.

Proposed BMP =	**JF**	abbreviation
Removal efficiency =	**86**	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:
$LR = (\text{BMP efficiency}) \times P \times (A_I \times 34.6 + A_P \times 0.54)$

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 =	**0.26**	acres
A_I =	**0.07**	acres
A_P =	**0.19**	acres
L_R =	**69**	lbs.

5. Calculate Fraction of Annual Runoff to Treat the drainage basin / outfall area

Desired $L_{M\ THIS\ BASIN}$ =	**68**	lbs.
F =	**0.98**	

6. Calculate Treated Flow required by the BMP Type for this drainage basin / outfall area.

Offsite area draining to BMP =	**0.00**	acres
Offsite impervious cover draining to BMP =	**0.00**	acres

Calculations from RG-348
Pages Section 3.2.22

Rainfall Intensity =	**2.50**	inches per hour
Effective Area =	**0.07**	acres
Cartridge Length =	**54**	inches
Peak Treatment Flow Required =	**0.17**	cubic feet per second

7. Jellyfish

Designed as Required in RG-348
Section 3.2.22

Flow Through Jellyfish Size	**Surface Inlet**	
Jellyfish Size for Flow-Based Configuration =	**JFSI0404-1-1**	
Jellyfish Treatment Flow Rate =	**0.27**	cfs

1

Texas Commission on Environmental Quality

TSS Removal Calculations 04-20-2009

Project Name: US 183A
Date Prepared: 1/16/2026

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 * =	0.97	acres
Predevelopment impervious area within the limits of the plan * =	0.00	acres
Total post-development impervious area within the limits of the plan* =	0.28	acres
Total post-development impervious cover fraction * =	0.29	
P =	32	inches
$L_{M\ TOTAL\ PROJECT}$ =	244	lbs.

* The values entered in these fields should be for the total project area.

Number of drainage basins / outfalls areas leaving the plan area = ?

2. Drainage Basin Parameters (This information should be provided for each basin):

Drainage Basin/Outfall Area No. = STU E3-2

Total drainage basin/outfall area =	0.84	acres
Predevelopment impervious area within drainage basin/outfall area =	0.00	acres
Post-development impervious area within drainage basin/outfall area =	0.28	acres
Post-development impervious fraction within drainage basin/outfall area =	0.33	
$L_{M\ THIS\ BASIN}$ =	244	lbs.

3. Indicate the proposed BMP Code for this basin.

Proposed BMP = Jellyfish
Removal efficiency = 86 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 =	0.84	acres
A_I =	0.28	acres
A_P =	0.56	acres
L_R =	275	lbs

5. Calculate Fraction of Annual Runoff to Treat the drainage basin / outfall area

Desired $L_{M\ THIS\ BASIN}$ = 250 lbs.

F = 0.91

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 =	1.80	inches
Post Development Runoff Coefficient =	0.27	
On-site Water Quality Volume =	1493	cubic feet

19. BMPs Installed in a Series Designed as Required in RG-348 Pages 3-32

Michael E. Barrett, Ph.D.. P.E. recommended that the coefficient for E_2 be changed from 0.5 to 0.65 on May 3, 2006

$E_{TOT} = [1 - ((1 - E_1) \times (1 - 0.65E_2) \times (1 - 0.25E_3))] \times 100$ = 86.00 percent NET EFFICIENCY OF THE BMPs IN THE SERIES

EFFICIENCY OF FIRST BMP IN THE SERIES = E_1 = 86.00 percent Jellyfish

EFFICIENCY OF THE SECOND BMP IN THE SERIES = E_2 = 0.00 percent

EFFICIENCY OF THE THIRD BMP IN THE SERIES = E_3 = 0.00 percent

THEREFORE, THE NET LOAD REMOVAL WOULD BE:
(A_I AND A_P VALUES ARE FROM SECTION 3 ABOVE)

$L_R = E_{TOT} \times P \times (A_I \times 34.6 \times A_P \times 0.54)$ = 270.57 lbs

Contech Engineered Solutions Calculations for Texas Commission on Environmental Quality
TSS Removal Calculations

Project Name: **US183A**
Date Prepared: **12/3/2025**

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: $L_M = 27.2(A_N \times P)$

$L_{M\ TOTAL\ PROJECT}$ = 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 * =	**0.84**	acres
Predevelopment impervious area within the limits of the plan * =	**0.00**	acres
Total post-development impervious area within the limits of the plan * =	**0.28**	acres
Total post-development impervious cover fraction * =	**0.33**	
P =	**32**	inches
$L_{M\ TOTAL\ PROJECT}$ =	**244**	lbs.
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. =	**STU-E3-2**	
Total drainage basin/outfall area =	**0.84**	acres
Predevelopment impervious area within drainage basin/outfall area =	**0.00**	acres
Post-development impervious area within drainage basin/outfall area =	**0.28**	acres
Post-development impervious fraction within drainage basin/outfall area =	**0.33**	
$L_{M\ THIS\ BASIN}$ =	**244**	lbs.

3. Indicate the proposed BMP Code for this basin.

Proposed BMP =	**JF**	abbreviation
Removal efficiency =	**86**	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:
LR = (BMP efficiency) x P x (A_I x 34.6 + A_P x 0.54)

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 =	**0.84**	acres
A_I =	**0.28**	acres
A_P =	**0.56**	acres
L_R =	**275**	lbs.

5. Calculate Fraction of Annual Runoff to Treat the drainage basin / outfall area

Desired $L_{M\ THIS\ BASIN}$ =	**250**	lbs.
F =	**0.91**	

6. Calculate Treated Flow required by the BMP Type for this drainage basin / outfall area.

Offsite area draining to BMP =	**0.00**	acres
Offsite impervious cover draining to BMP =	**0.00**	acres

Calculations from RG-348
Pages Section 3.2.22

Rainfall Intensity =	**1.15**	inches per hour
Effective Area =	**0.27**	acres
Cartridge Length =	**54**	inches
Peak Treatment Flow Required =	**0.31**	cubic feet per second

7. Jellyfish
Designed as Required in RG-348
Section 3.2.22

Flow Through Jellyfish Size	**Vault**	
Jellyfish Size for Flow-Based Configuration =	**JFPD0406-2-1**	
Jellyfish Treatment Flow Rate =	**0.45**	cfs

1

Texas Commission on Environmental Quality

TSS Removal Calculations 04-20-2009

Project Name: US 183A
Date Prepared: 1/16/2026

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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 * =	6.11	acres
Predevelopment impervious area within the limits of the plan * =	0.00	acres
Total post-development impervious area within the limits of the plan* =	2.70	acres
Total post-development impervious cover fraction * =	0.44	
P =	32	inches
$L_{M\ TOTAL\ PROJECT}$ =	2350	lbs.

* The values entered in these fields should be for the total project area.

Number of drainage basins / outfalls areas leaving the plan area = ?

2. Drainage Basin Parameters (This information should be provided for each basin):

Drainage Basin/Outfall Area No. = STU E3-1

Total drainage basin/outfall area =	6.11	acres
Predevelopment impervious area within drainage basin/outfall area =	0.00	acres
Post-development impervious area within drainage basin/outfall area =	2.70	acres
Post-development impervious fraction within drainage basin/outfall area =	0.44	
$L_{M\ THIS\ BASIN}$ =	2350	lbs.

3. Indicate the proposed BMP Code for this basin.

Proposed BMP = Jellyfish
Removal efficiency = 86 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 =	6.11	acres
A_I =	2.70	acres
A_P =	3.41	acres
L_R =	2622	lbs

5. Calculate Fraction of Annual Runoff to Treat the drainage basin / outfall area

Desired $L_{M\ THIS\ BASIN}$ = 2386 lbs.

F = 0.91

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 =	1.80	inches
Post Development Runoff Coefficient =	0.33	
On-site Water Quality Volume =	13065	cubic feet

19. BMPs Installed in a Series Designed as Required in RG-348 Pages 3-32

Michael E. Barrett, Ph.D.. P.E. recommended that the coefficient for E_2 be changed from 0.5 to 0.65 on May 3, 2006

$E_{TOT} = [1 - ((1 - E_1) X (1 - 0.65E_2) x (1 - 0.25E_3))] X 100$ =	86.00	percent	NET EFFICIENCY OF THE BMPs IN THE SERIES
EFFICIENCY OF FIRST BMP IN THE SERIES = E_1 =	86.00	percent	Jellyfish
EFFICIENCY OF THE SECOND BMP IN THE SERIES = E_2 =	0.00	percent	
EFFICIENCY OF THE THIRD BMP IN THE SERIES = E_3 =	0.00	percent	

THEREFORE, THE NET LOAD REMOVAL WOULD BE:
(A_I AND A_P VALUES ARE FROM SECTION 3 ABOVE)

$L_R = E_{TOT} X P X (A_I X 34.6 X A_P X0.54)$ = 2621.59 lbs

Contech Engineered Solutions Calculations for Texas Commission on Environmental Quality
TSS Removal Calculations

Project Name: **US183A**
Date Prepared: **12/3/2025**

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: $L_M = 27.2(A_N \times P)$

$L_{M\ TOTAL\ PROJECT}$ = 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 * =	**6.11**	acres
Predevelopment impervious area within the limits of the plan * =	**0.00**	acres
Total post-development impervious area within the limits of the plan* =	**2.70**	acres
Total post-development impervious cover fraction * =	**0.44**	
P =	**32**	inches
$L_{M\ TOTAL\ PROJECT}$ =	**2350**	lbs.
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. =	**STU-E3-1**	
Total drainage basin/outfall area =	**6.11**	acres
Predevelopment impervious area within drainage basin/outfall area =	**0.00**	acres
Post-development impervious area within drainage basin/outfall area =	**2.70**	acres
Post-development impervious fraction within drainage basin/outfall area =	**0.44**	
$L_{M\ THIS\ BASIN}$ =	**2350**	lbs.

3. Indicate the proposed BMP Code for this basin.

Proposed BMP =	**JF**	abbreviation
Removal efficiency =	**86**	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:
$LR = (\text{BMP efficiency}) \times P \times (A_I \times 34.6 + A_P \times 0.54)$

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 =	**6.11**	acres
A_I =	**2.70**	acres
A_P =	**3.41**	acres
L_R =	**2622**	lbs.

5. Calculate Fraction of Annual Runoff to Treat the drainage basin / outfall area

Desired $L_{M\ THIS\ BASIN}$ =	**2386**	lbs.
F =	**0.91**	

6. Calculate Treated Flow required by the BMP Type for this drainage basin / outfall area.

Offsite area draining to BMP =	**0.00**	acres
Offsite impervious cover draining to BMP =	**0.00**	acres

Calculations from RG-348 Pages Section 3.2.22

Rainfall Intensity =	**1.15**	inches per hour
Effective Area =	**2.53**	acres
Cartridge Length =	**54**	inches
Peak Treatment Flow Required =	**2.94**	cubic feet per second

7. Jellyfish

Designed as Required in RG-348 Section 3.2.22

Flow Through Jellyfish Size	**Vault**	
Jellyfish Size for Flow-Based Configuration =	**JFPD0808-15-3**	
Jellyfish Treatment Flow Rate =	**2.94**	cfs

Texas Commission on Environmental Quality

TSS Removal Calculations 04-20-2009

Project Name: US 183A
Date Prepared: 1/16/2026

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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 * =	3.23	acres
Predevelopment impervious area within the limits of the plan * =	0.00	acres
Total post-development impervious area within the limits of the plan* =	2.37	acres
Total post-development impervious cover fraction * =	0.73	
P =	32	inches
$L_{M\ TOTAL\ PROJECT}$ =	2063	lbs.

* The values entered in these fields should be for the total project area.

Number of drainage basins / outfalls areas leaving the plan area = ?

2. Drainage Basin Parameters (This information should be provided for each basin):

Drainage Basin/Outfall Area No. = GS-E1-1

Total drainage basin/outfall area =	3.23	acres
Predevelopment impervious area within drainage basin/outfall area =	0.00	acres
Post-development impervious area within drainage basin/outfall area =	0.03	acres
Post-development impervious fraction within drainage basin/outfall area =	0.01	
$L_{M\ THIS\ BASIN}$ =	24	lbs.

3. Indicate the proposed BMP Code for this basin.

Proposed BMP = Grassy Swale
Removal efficiency = 87 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 =	0.03	acres
A_I =	0.03	acres
A_P =	0.00	acres
L_R =	27	lbs

5. Calculate Fraction of Annual Runoff to Treat the drainage basin / outfall area

Desired $L_{M\ THIS\ BASIN}$ = 27 lbs.

F = 1.00

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 =	4.00	inches
Post Development Runoff Coefficient =	0.82	
On-site Water Quality Volume =	330	cubic feet

19. BMPs Installed in a Series Designed as Required in RG-348 Pages 3-32

Michael E. Barrett, Ph.D.. P.E. recommended that the coefficient for E_2 be changed from 0.5 to 0.65 on May 3, 2006

$E_{TOT} = [1 - ((1 - E_1) X (1 - 0.65E_2) x (1 - 0.25E_3))] X 100$ =	86.77	percent	NET EFFICIENCY OF THE BMPs IN THE SERIES
EFFICIENCY OF FIRST BMP IN THE SERIES = E_1 =	70.00	percent	GS
EFFICIENCY OF THE SECOND BMP IN THE SERIES = E_2 =	86.00	percent	Jellyfish
EFFICIENCY OF THE THIRD BMP IN THE SERIES = E_3 =	0.00	percent	

THEREFORE, THE NET LOAD REMOVAL WOULD BE:
(A_I AND A_P VALUES ARE FROM SECTION 3 ABOVE)

$L_R = E_{TOT} X P X (A_I X 34.6 X A_P X0.54)$ = 26.75 lbs

Texas Commission on Environmental Quality

TSS Removal Calculations 04-20-2009

Project Name: US 183A
Date Prepared: 1/16/2026

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 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 * =	29.00	acres
Predevelopment impervious area within the limits of the plan * =	0.00	acres
Total post-development impervious area within the limits of the plan* =	14.13	acres
Total post-development impervious cover fraction * =	0.49	
P =	32	inches
$L_{M\ TOTAL\ PROJECT}$ =	12299	lbs.

* The values entered in these fields should be for the total project area.

Number of drainage basins / outfalls areas leaving the plan area = ?

This sheet is for total load removal for in-series calculations. The next sheet is for Jellyfish STU sizing purposes only.

2. Drainage Basin Parameters (This information should be provided for each basin):

Drainage Basin/Outfall Area No. = STU F3 & F6 - SF - ELBOW

Total drainage basin/outfall area =	29.00	acres
Predevelopment impervious area within drainage basin/outfall area =	0.00	acres
Post-development impervious area within drainage basin/outfall area =	6.75	acres
Post-development impervious fraction within drainage basin/outfall area =	0.23	
$L_{M\ THIS\ BASIN}$ =	5875	lbs.

3. Indicate the proposed BMP Code for this basin.

Proposed BMP = InSeries
Removal efficiency = 94 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 =	12.38	acres
A_I =	6.75	acres
A_P =	5.63	acres
L_R =	7124	lbs

5. Calculate Fraction of Annual Runoff to Treat the drainage basin / outfall area

Desired $L_{M\ THIS\ BASIN}$ = 6946 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 =	0.38	
On-site Water Quality Volume =	51741	cubic feet

19. BMPs Installed in a Series Designed as Required in RG-348 Pages 3-32

Michael E. Barrett, Ph.D.. P.E. recommended that the coefficient for E_2 be changed from 0.5 to 0.65 on May 3, 2006

$E_{TOT} = [1 - ((1 - E_1) \times (1 - 0.65E_2) \times (1 - 0.25E_3))] \times 100$ = 94.10 percent NET EFFICIENCY OF THE BMPs IN THE SERIES

EFFICIENCY OF FIRST BMP IN THE SERIES = E_1 = 86.00 percent Jellyfish

EFFICIENCY OF THE SECOND BMP IN THE SERIES = E_2 = 89.00 percent SF

EFFICIENCY OF THE THIRD BMP IN THE SERIES = E_3 = 0.00 percent

THEREFORE, THE NET LOAD REMOVAL WOULD BE:
(A_I AND A_P VALUES ARE FROM SECTION 3 ABOVE)

$L_R = E_{TOT} \times P \times (A_I \times 34.6 \times A_P \times 0.54)$ = 7124.13 lbs

Contech Engineered Solutions Calculations for Texas Commission on Environmental Quality
TSS Removal Calculations

Project Name: **US183A**
Date Prepared: **12/3/2025**

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: $L_M = 27.2(A_N \times P)$

$L_{M\ TOTAL\ PROJECT}$ = 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 * =	**5.86**	acres
Predevelopment impervious area within the limits of the plan * =	**0.00**	acres
Total post-development impervious area within the limits of the plan * =	**1.31**	acres
Total post-development impervious cover fraction * =	**0.22**	
P =	**32**	inches
$L_{M\ TOTAL\ PROJECT}$ =	**1140**	lbs.
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. =	**STU-F3**	
Total drainage basin/outfall area =	**5.86**	acres
Predevelopment impervious area within drainage basin/outfall area =	**0.00**	acres
Post-development impervious area within drainage basin/outfall area =	**1.31**	acres
Post-development impervious fraction within drainage basin/outfall area =	**0.22**	
$L_{M\ THIS\ BASIN}$ =	**1140**	lbs.

3. Indicate the proposed BMP Code for this basin.

Proposed BMP =	**JF**	abbreviation
Removal efficiency =	**86**	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:
$LR = (\text{BMP efficiency}) \times P \times (A_I \times 34.6 + A_P \times 0.54)$

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 =	**5.86**	acres
A_I =	**1.31**	acres
A_P =	**4.55**	acres
L_R =	**1315**	lbs.

5. Calculate Fraction of Annual Runoff to Treat the drainage basin / outfall area

Desired $L_{M\ THIS\ BASIN}$ =	**1276**	lbs.
F =	**0.97**	

6. Calculate Treated Flow required by the BMP Type for this drainage basin / outfall area.

Offsite area draining to BMP =	**0.00**	acres
Offsite impervious cover draining to BMP =	**0.00**	acres

Calculations from RG-348
Pages Section 3.2.22

Rainfall Intensity =	**2.00**	inches per hour
Effective Area =	**1.32**	acres
Cartridge Length =	**54**	inches
Peak Treatment Flow Required =	**2.65**	cubic feet per second

7. Jellyfish

Designed as Required in RG-348
Section 3.2.22

Flow Through Jellyfish Size	**Vault**	
Jellyfish Size for Flow-Based Configuration =	**JFPD0808-14-3**	
Jellyfish Treatment Flow Rate =	**2.76**	cfs

Contech Engineered Solutions Calculations for Texas Commission on Environmental Quality
TSS Removal Calculations

Project Name: **US183A**
Date Prepared: **12/3/2025**

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: $L_M = 27.2(A_N \times P)$

$L_{M\ TOTAL\ PROJECT}$ = 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 * =	**6.52**	acres
Predevelopment impervious area within the limits of the plan * =	**0.00**	acres
Total post-development impervious area within the limits of the plan* =	**5.44**	acres
Total post-development impervious cover fraction * =	**0.83**	
P =	**32**	inches
$L_{M\ TOTAL\ PROJECT}$ =	**4735**	lbs.
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. =	**STU-F6**	
Total drainage basin/outfall area =	**6.52**	acres
Predevelopment impervious area within drainage basin/outfall area =	**0.00**	acres
Post-development impervious area within drainage basin/outfall area =	**5.44**	acres
Post-development impervious fraction within drainage basin/outfall area =	**0.83**	
$L_{M\ THIS\ BASIN}$ =	**4735**	lbs.

3. Indicate the proposed BMP Code for this basin.

Proposed BMP =	**JF**	abbreviation
Removal efficiency =	**86**	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:
$LR = (\text{BMP efficiency}) \times P \times (A_I \times 34.6 + A_P \times 0.54)$

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 =	**6.52**	acres
A_I =	**5.44**	acres
A_P =	**1.08**	acres
L_R =	**5196**	lbs.

5. Calculate Fraction of Annual Runoff to Treat the drainage basin / outfall area

Desired $L_{M\ THIS\ BASIN}$ =	**5040**	lbs.
F =	**0.97**	

6. Calculate Treated Flow required by the BMP Type for this drainage basin / outfall area.

Offsite area draining to BMP =	**0.00**	acres
Offsite impervious cover draining to BMP =	**0.00**	acres

Calculations from RG-348 Pages Section 3.2.22

Rainfall Intensity =	**2.00**	inches per hour
Effective Area =	**4.93**	acres
Cartridge Length =	**54**	inches
Peak Treatment Flow Required =	**9.94**	cubic feet per second

7. Jellyfish

Designed as Required in RG-348 Section 3.2.22

Flow Through Jellyfish Size	**Vault**	
Jellyfish Size for Flow-Based Configuration =	**2ea JFPD0812-25-6**	
Jellyfish Treatment Flow Rate =	**9.98**	cfs

Texas Commission on Environmental Quality

TSS Removal Calculations 04-20-2009

Project Name: US 183A
Date Prepared: 1/16/2026

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 * =	29.00	acres
Predevelopment impervious area within the limits of the plan * =	0.78	acres
Total post-development impervious area within the limits of the plan * =	14.13	acres
Total post-development impervious cover fraction * =	0.49	
P =	32	inches
$L_{M\ TOTAL\ PROJECT}$ =	11620	lbs.

* The values entered in these fields should be for the total project area.

Number of drainage basins / outfalls areas leaving the plan area = ?

2. Drainage Basin Parameters (This information should be provided for each basin):

Drainage Basin/Outfall Area No. = STU G5 - SF - ELBOW

Total drainage basin/outfall area =	14.42	acres
Predevelopment impervious area within drainage basin/outfall area =	0.78	acres
Post-development impervious area within drainage basin/outfall area =	7.60	acres
Post-development impervious fraction within drainage basin/outfall area =	0.53	
$L_{M\ THIS\ BASIN}$ =	5936	lbs.

3. Indicate the proposed BMP Code for this basin.

Proposed BMP = Sand Filter
Removal efficiency = 94 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 =	14.42	acres
A_I =	7.60	acres
A_P =	6.82	acres
L_R =	8029	lbs

5. Calculate Fraction of Annual Runoff to Treat the drainage basin / outfall area

Desired $L_{M\ THIS\ BASIN}$ = 7828 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 =	0.37		
On-site Water Quality Volume =	58551	cubic feet	64707

19. BMPs Installed in a Series Designed as Required in RG-348 Pages 3-32

Michael E. Barrett, Ph.D.. P.E. recommended that the coefficient for E_2 be changed from 0.5 to 0.65 on May 3, 2006

$E_{TOT} = [1 - ((1 - E_1) X (1 - 0.65E_2) x (1 - 0.25E_3))] X 100$ = 94.10 percent NET EFFICIENCY OF THE BMPs IN THE SERIES

EFFICIENCY OF FIRST BMP IN THE SERIES = E_1 = 86.00 percent Jellyfish

EFFICIENCY OF THE SECOND BMP IN THE SERIES = E_2 = 89.00 percent Sand Filter

EFFICIENCY OF THE THIRD BMP IN THE SERIES = E_3 = 0.00 percent

THEREFORE, THE NET LOAD REMOVAL WOULD BE:
(A_I AND A_P VALUES ARE FROM SECTION 3 ABOVE)

$L_R = E_{TOT}$ X P X (A_I X 34.6 X A_P X0.54) = 8029.06 lbs

9B. Partial Sedimentation and Filtration System

Water Quality Volume for combined basins =	70261	cubic feet
Minimum filter basin area =	5855	square feet

This sheet is for total load removal for in-series calculations. The next sheet is for Jellyfish STU sizing purposes only.

Contech Engineered Solutions Calculations for Texas Commission on Environmental Quality
TSS Removal Calculations

Project Name: **US183A**
Date Prepared: **12/3/2025**

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: $L_M = 27.2(A_N \times P)$

$L_{M\ TOTAL\ PROJECT}$ = 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 * =	**36.20**	acres
Predevelopment impervious area within the limits of the plan * =	**0.00**	acres
Total post-development impervious area within the limits of the plan * =	**18.72**	acres
Total post-development impervious cover fraction * =	**0.52**	
P =	**32**	inches
$L_{M\ TOTAL\ PROJECT}$ =	**16294**	lbs.
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. =	**STU-G5**	
Total drainage basin/outfall area =	**36.20**	acres
Predevelopment impervious area within drainage basin/outfall area =	**0.00**	acres
Post-development impervious area within drainage basin/outfall area =	**18.72**	acres
Post-development impervious fraction within drainage basin/outfall area =	**0.52**	
$L_{M\ THIS\ BASIN}$ =	**16294**	lbs.

3. Indicate the proposed BMP Code for this basin.

Proposed BMP =	**JF**	abbreviation
Removal efficiency =	**86**	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:
LR = (BMP efficiency) x P x (A_I x 34.6 + A_P x 0.54)

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 =	**36.20**	acres
A_I =	**18.72**	acres
A_P =	**17.48**	acres
L_R =	**18085**	lbs.

5. Calculate Fraction of Annual Runoff to Treat the drainage basin / outfall area

Desired $L_{M\ THIS\ BASIN}$ =	**15372**	lbs.
F =	**0.85**	

6. Calculate Treated Flow required by the BMP Type for this drainage basin / outfall area.

Offsite area draining to BMP =	**0.00**	acres
Offsite impervious cover draining to BMP =	**0.00**	acres

Calculations from RG-348
Pages Section 3.2.22

Rainfall Intensity =	**0.85**	inches per hour
Effective Area =	**17.37**	acres
Cartridge Length =	**54**	inches
Peak Treatment Flow Required =	**14.89**	cubic feet per second

7. Jellyfish
Designed as Required in RG-348
Section 3.2.22

Flow Through Jellyfish Size	**Vault**	
Jellyfish Size for Flow-Based Configuration =	**2ea JFPD0816-38-8**	
Jellyfish Treatment Flow Rate =	**14.96**	cfs

1

Texas Commission on Environmental Quality

TSS Removal Calculations 04-20-2009

Project Name: US 183A
Date Prepared: 1/16/2026

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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 * =	20.19	acres
Predevelopment impervious area within the limits of the plan * =	0.00	acres
Total post-development impervious area within the limits of the plan * =	10.73	acres
Total post-development impervious cover fraction * =	0.53	
P =	32	inches
$L_{M\ TOTAL\ PROJECT}$ =	9339	lbs.

* The values entered in these fields should be for the total project area.

Number of drainage basins / outfalls areas leaving the plan area = ?

2. Drainage Basin Parameters (This information should be provided for each basin):

Drainage Basin/Outfall Area No. = STU G5 & G10

Total drainage basin/outfall area =	20.19	acres
Predevelopment impervious area within drainage basin/outfall area =	0.00	acres
Post-development impervious area within drainage basin/outfall area =	4.91	acres
Post-development impervious fraction within drainage basin/outfall area =	0.24	
$L_{M\ THIS\ BASIN}$ =	4272	lbs.

3. Indicate the proposed BMP Code for this basin.

Proposed BMP = InSeries
Removal efficiency = 94 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 =	10.49	acres
A_I =	4.91	acres
A_P =	5.58	acres
L_R =	5204	lbs

5. Calculate Fraction of Annual Runoff to Treat the drainage basin / outfall area

Desired $L_{M\ THIS\ BASIN}$ = 4424 lbs.

F = 0.85

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 =	0.34	
On-site Water Quality Volume =	17110	cubic feet

19. BMPs Installed in a Series Designed as Required in RG-348 Pages 3-32

Michael E. Barrett, Ph.D.. P.E. recommended that the coefficient for E_2 be changed from 0.5 to 0.65 on May 3, 2006

$E_{TOT} = [1 - ((1 - E_1) \times (1 - 0.65E_2) \times (1 - 0.25E_3))] \times 100$ = 94.10 percent NET EFFICIENCY OF THE BMPs IN THE SERIES

EFFICIENCY OF FIRST BMP IN THE SERIES = E_1 = 86.00 percent Jellyfish

EFFICIENCY OF THE SECOND BMP IN THE SERIES = E_2 = 89.00 percent Sand Filter

EFFICIENCY OF THE THIRD BMP IN THE SERIES = E_3 = 0.00 percent

THEREFORE, THE NET LOAD REMOVAL WOULD BE:
(A_I AND A_P VALUES ARE FROM SECTION 3 ABOVE)

$L_R = E_{TOT} \times P \times (A_I \times 34.6 \times A_P \times 0.54)$ = 5204.38 lbs

9B. Partial Sedimentation and Filtration System

Water Quality Volume for combined basins = NA cubic feet

Minimum filter basin area = NA square feet

Contech Engineered Solutions Calculations for Texas Commission on Environmental Quality
TSS Removal Calculations

Project Name: **US183A**
Date Prepared: **12/3/2025**

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: $L_M = 27.2(A_N \times P)$

$L_{M\ TOTAL\ PROJECT}$ = 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 * =	**1.09**	acres
Predevelopment impervious area within the limits of the plan * =	**0.00**	acres
Total post-development impervious area within the limits of the plan* =	**0.54**	acres
Total post-development impervious cover fraction * =	**0.50**	
P =	**32**	inches
$L_{M\ TOTAL\ PROJECT}$ =	**470**	lbs.
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. =	**STU-G10**	
Total drainage basin/outfall area =	**1.09**	acres
Predevelopment impervious area within drainage basin/outfall area =	**0.00**	acres
Post-development impervious area within drainage basin/outfall area =	**0.54**	acres
Post-development impervious fraction within drainage basin/outfall area =	**0.50**	
$L_{M\ THIS\ BASIN}$ =	**470**	lbs.

3. Indicate the proposed BMP Code for this basin.

Proposed BMP =	**JF**	abbreviation
Removal efficiency =	**86**	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:
$LR = (\text{BMP efficiency}) \times P \times (A_I \times 34.6 + A_P \times 0.54)$

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 =	**1.09**	acres
A_I =	**0.54**	acres
A_P =	**0.55**	acres
L_R =	**522**	lbs.

5. Calculate Fraction of Annual Runoff to Treat the drainage basin / outfall area

Desired $L_{M\ THIS\ BASIN}$ =	**507**	lbs.
F =	**0.97**	

6. Calculate Treated Flow required by the BMP Type for this drainage basin / outfall area.

Offsite area draining to BMP =	**0.00**	acres
Offsite impervious cover draining to BMP =	**0.00**	acres

Calculations from RG-348
Pages Section 3.2.22

Rainfall Intensity =	**2.00**	inches per hour
Effective Area =	**0.50**	acres
Cartridge Length =	**54**	inches
Peak Treatment Flow Required =	**1.01**	cubic feet per second

7. Jellyfish

Designed as Required in RG-348
Section 3.2.22

Flow Through Jellyfish Size	**Vault**	
Jellyfish Size for Flow-Based Configuration =	**JFPD0806-5-2**	
Jellyfish Treatment Flow Rate =	**1.07**	cfs

Texas Commission on Environmental Quality

TSS Removal Calculations 04-20-2009

Project Name: US 183A
Date Prepared: 1/16/2026

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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 * =	20.19	acres
Predevelopment impervious area within the limits of the plan * =	1.48	acres
Total post-development impervious area within the limits of the plan * =	10.73	acres
Total post-development impervious cover fraction * =	0.53	
P =	32	inches
$L_{M\ TOTAL\ PROJECT}$ =	8051	lbs.

* The values entered in these fields should be for the total project area.

Number of drainage basins / outfalls areas leaving the plan area = ?

2. Drainage Basin Parameters (This information should be provided for each basin):

Drainage Basin/Outfall Area No. = SF-3

Total drainage basin/outfall area =	20.19	acres
Predevelopment impervious area within drainage basin/outfall area =	2.47	acres
Post-development impervious area within drainage basin/outfall area =	5.57	acres
Post-development impervious fraction within drainage basin/outfall area =	0.28	
$L_{M\ THIS\ BASIN}$ =	2695	lbs.

3. Indicate the proposed BMP Code for this basin.

Proposed BMP = Sand Filter
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 =	5.57	acres
A_I =	5.57	acres
A_P =	0.00	acres
L_R =	5486	lbs

5. Calculate Fraction of Annual Runoff to Treat the drainage basin / outfall area

Desired $L_{M\ THIS\ BASIN}$ = 5486 lbs.

F = 1.00

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 =	4.00	inches
Post Development Runoff Coefficient =	0.82	
On-site Water Quality Volume =	65980	cubic feet

19. BMPs Installed in a Series Designed as Required in RG-348 Pages 3-32

Michael E. Barrett, Ph.D.. P.E. recommended that the coefficient for E_2 be changed from 0.5 to 0.65 on May 3, 2006

$E_{TOT} = [1 - ((1 - E_1) \times (1 - 0.65E_2) \times (1 - 0.25E_3))] \times 100$ = 89.00 percent NET EFFICIENCY OF THE BMPs IN THE SERIES

EFFICIENCY OF FIRST BMP IN THE SERIES = E_1 = 89.00 percent Sand Filter

EFFICIENCY OF THE SECOND BMP IN THE SERIES = E_2 = 0.00 percent

EFFICIENCY OF THE THIRD BMP IN THE SERIES = E_3 = 0.00 percent

THEREFORE, THE NET LOAD REMOVAL WOULD BE:
(A_I AND A_P VALUES ARE FROM SECTION 3 ABOVE)

$L_R = E_{TOT} \times P \times (A_I \times 34.6 \times A_P \times 0.54)$ = 5485.53 lbs

9B. Partial Sedimentation and Filtration System

Water Quality Volume for combined basins =	79176	cubic feet
Minimum filter basin area =	6598	square feet

Texas Commission on Environmental Quality

TSS Removal Calculations 04-20-2009

Project Name: US 183A
Date Prepared: 1/16/2026

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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 * =	29.95	acres
Predevelopment impervious area within the limits of the plan * =	0.00	acres
Total post-development impervious area within the limits of the plan * =	19.89	acres
Total post-development impervious cover fraction * =	0.66	
P =	32	inches
$L_{M\ TOTAL\ PROJECT}$ =	17312	lbs.

* The values entered in these fields should be for the total project area.

Number of drainage basins / outfalls areas leaving the plan area = ?

2. Drainage Basin Parameters (This information should be provided for each basin):

Drainage Basin/Outfall Area No. = STU H4 - LONGHORN

Total drainage basin/outfall area =	29.95	acres
Predevelopment impervious area within drainage basin/outfall area =	0.00	acres
Post-development impervious area within drainage basin/outfall area =	16.06	acres
Post-development impervious fraction within drainage basin/outfall area =	0.54	
$L_{M\ THIS\ BASIN}$ =	13979	lbs.

3. Indicate the proposed BMP Code for this basin.

Proposed BMP = Sand Filter
Removal efficiency = 94 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 =	19.94	acres
A_I =	16.06	acres
A_P =	3.88	acres
L_R =	16795	lbs

5. Calculate Fraction of Annual Runoff to Treat the drainage basin / outfall area

Desired $L_{M\ THIS\ BASIN}$ = 15956 lbs.

F = 0.95

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 =	2.60	inches
Post Development Runoff Coefficient =	0.63	
On-site Water Quality Volume =	118822	cubic feet

19. BMPs Installed in a Series Designed as Required in RG-348 Pages 3-32

Michael E. Barrett, Ph.D.. P.E. recommended that the coefficient for E_2 be changed from 0.5 to 0.65 on May 3, 2006

$E_{TOT} = [1 - ((1 - E_1) \times (1 - 0.65E_2) \times (1 - 0.25E_3))] \times 100$ = 94.10 percent NET EFFICIENCY OF THE BMPs IN THE SERIES

EFFICIENCY OF FIRST BMP IN THE SERIES = E_1 = 86.00 percent Jellyfish

EFFICIENCY OF THE SECOND BMP IN THE SERIES = E_2 = 89.00 percent SF

EFFICIENCY OF THE THIRD BMP IN THE SERIES = E_3 = 0.00 percent

THEREFORE, THE NET LOAD REMOVAL WOULD BE:
(A_I AND A_P VALUES ARE FROM SECTION 3 ABOVE)

$L_R = E_{TOT} \times P \times (A_I \times 34.6 \times A_P \times 0.54)$ = 16795.43 lbs

9B. Partial Sedimentation and Filtration System

Water Quality Volume for combined basins = **142586** cubic feet

Minimum filter basin area = **11882** square feet

Texas Commission on Environmental Quality

TSS Removal Calculations 04-20-2009

Project Name: US 183A
Date Prepared: 1/16/2026

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 * =	29.95	acres
Predevelopment impervious area within the limits of the plan * =	1.12	acres
Total post-development impervious area within the limits of the plan * =	19.89	acres
Total post-development impervious cover fraction * =	0.66	
P =	32	inches
$L_{M\ TOTAL\ PROJECT}$ =	16337	lbs.

* The values entered in these fields should be for the total project area.

Number of drainage basins / outfalls areas leaving the plan area = ?

2. Drainage Basin Parameters (This information should be provided for each basin):

Drainage Basin/Outfall Area No. = SF-H-4

Total drainage basin/outfall area =	29.95	acres
Predevelopment impervious area within drainage basin/outfall area =	1.18	acres
Post-development impervious area within drainage basin/outfall area =	3.14	acres
Post-development impervious fraction within drainage basin/outfall area =	0.10	
$L_{M\ THIS\ BASIN}$ =	1703	lbs.

3. Indicate the proposed BMP Code for this basin.

Proposed BMP =	Sand Filter	
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 =	3.14	acres
A_I =	3.14	acres
A_P =	0.00	acres
L_R =	3091	lbs

5. Calculate Fraction of Annual Runoff to Treat the drainage basin / outfall area

Desired $L_{M\ THIS\ BASIN}$ =	3091	lbs.
F =	1.00	

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 =	4.00	inches
Post Development Runoff Coefficient =	0.82	
On-site Water Quality Volume =	37177	cubic feet

19. BMPs Installed in a Series Designed as Required in RG-348 Pages 3-32

Michael E. Barrett, Ph.D.. P.E. recommended that the coefficient for E_2 be changed from 0.5 to 0.65 on May 3, 2006

$E_{TOT} = [1 - ((1 - E_1) X (1 - 0.65E_2) x (1 - 0.25E_3))] X 100$ =	89.00	percent	NET EFFICIENCY OF THE BMPs IN THE SERIES
EFFICIENCY OF FIRST BMP IN THE SERIES = E_1 =	89.00	percent	Sand Filter
EFFICIENCY OF THE SECOND BMP IN THE SERIES = E_2 =	0.00	percent	
EFFICIENCY OF THE THIRD BMP IN THE SERIES = E_3 =	0.00	percent	

THEREFORE, THE NET LOAD REMOVAL WOULD BE:
(A_I AND A_P VALUES ARE FROM SECTION 3 ABOVE)

$L_R = E_{TOT}$ X P X (A_I X 34.6 X A_P X0.54) = 3090.84 lbs

9B. Partial Sedimentation and Filtration System

Water Quality Volume for combined basins =	44612	cubic feet
Minimum filter basin area =	3718	square feet

This sheet is for total load removal for in-series calculations. The next sheet is for Jellyfish STU sizing purposes only.

Contech Engineered Solutions Calculations for Texas Commission on Environmental Quality
TSS Removal Calculations

Project Name: **US183A**
Date Prepared: **12/3/2025**

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: $L_M = 27.2(A_N \times P)$

$L_{M\ TOTAL\ PROJECT}$ = 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 * =	**19.94**	acres
Predevelopment impervious area within the limits of the plan * =	**0.00**	acres
Total post-development impervious area within the limits of the plan * =	**16.06**	acres
Total post-development impervious cover fraction * =	**0.81**	
P =	**32**	inches
$L_{M\ TOTAL\ PROJECT}$ =	**13979**	lbs.
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. =	**STU-H4**	
Total drainage basin/outfall area =	**19.94**	acres
Predevelopment impervious area within drainage basin/outfall area =	**0.00**	acres
Post-development impervious area within drainage basin/outfall area =	**16.06**	acres
Post-development impervious fraction within drainage basin/outfall area =	**0.81**	
$L_{M\ THIS\ BASIN}$ =	**13979**	lbs.

3. Indicate the proposed BMP Code for this basin.

Proposed BMP =	**JF**	abbreviation
Removal efficiency =	**86**	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:
$LR = (\text{BMP efficiency}) \times P \times (A_I \times 34.6 + A_P \times 0.54)$

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 =	**19.94**	acres
A_I =	**16.06**	acres
A_P =	**3.88**	acres
L_R =	**15350**	lbs.

5. Calculate Fraction of Annual Runoff to Treat the drainage basin / outfall area

Desired $L_{M\ THIS\ BASIN}$ =	**14582**	lbs.
F =	**0.95**	

6. Calculate Treated Flow required by the BMP Type for this drainage basin / outfall area.

Offsite area draining to BMP =	**0.00**	acres
Offsite impervious cover draining to BMP =	**0.00**	acres

Calculations from RG-348
Pages Section 3.2.22

Rainfall Intensity =	**1.60**	inches per hour
Effective Area =	**14.57**	acres
Cartridge Length =	**54**	inches
Peak Treatment Flow Required =	**23.51**	cubic feet per second

7. Jellyfish

Designed as Required in RG-348
Section 3.2.22

Flow Through Jellyfish Size	**Vault**	
Jellyfish Size for Flow-Based Configuration =	**3ea JFPD0816-40-8**	
Jellyfish Treatment Flow Rate =	**23.52**	cfs

1

Texas Commission on Environmental Quality

TSS Removal Calculations 04-20-2009

Project Name: US 183A
Date Prepared: 1/16/2026

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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 * =	40.75	acres
Predevelopment impervious area within the limits of the plan * =	0.00	acres
Total post-development impervious area within the limits of the plan * =	13.34	acres
Total post-development impervious cover fraction * =	0.33	
P =	32	inches
$L_{M\ TOTAL\ PROJECT}$ =	11611	lbs.

* The values entered in these fields should be for the total project area.

Number of drainage basins / outfalls areas leaving the plan area = ?

2. Drainage Basin Parameters (This information should be provided for each basin):

Drainage Basin/Outfall Area No. = SF-I-4

Total drainage basin/outfall area =	40.75	acres
Predevelopment impervious area within drainage basin/outfall area =	0.00	acres
Post-development impervious area within drainage basin/outfall area =	0.01	acres
Post-development impervious fraction within drainage basin/outfall area =	0.00	
$L_{M\ THIS\ BASIN}$ =	11	lbs.

3. Indicate the proposed BMP Code for this basin.

Proposed BMP = Sand Filter
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 =	0.01	acres
A_I =	0.01	acres
A_P =	0.00	acres
L_R =	13	lbs

5. Calculate Fraction of Annual Runoff to Treat the drainage basin / outfall area

Desired $L_{M\ THIS\ BASIN}$ = 13 lbs.

F = 1.00

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 =	4.00	inches
Post Development Runoff Coefficient =	0.82	
On-site Water Quality Volume =	153	cubic feet

19. BMPs Installed in a Series Designed as Required in RG-348 Pages 3-32

Michael E. Barrett, Ph.D.. P.E. recommended that the coefficient for E_2 be changed from 0.5 to 0.65 on May 3, 2006

$E_{TOT} = [1 - ((1 - E_1) \times (1 - 0.65E_2) \times (1 - 0.25E_3))] \times 100$ = 89.00 percent NET EFFICIENCY OF THE BMPs IN THE SERIES

EFFICIENCY OF FIRST BMP IN THE SERIES = E_1 = 89.00 percent Sand Filter

EFFICIENCY OF THE SECOND BMP IN THE SERIES = E_2 = 0.00 percent

EFFICIENCY OF THE THIRD BMP IN THE SERIES = E_3 = 0.00 percent

THEREFORE, THE NET LOAD REMOVAL WOULD BE:
(A_I AND A_P VALUES ARE FROM SECTION 3 ABOVE)

$L_R = E_{TOT} \times P \times (A_I \times 34.6 \times A_P \times 0.54)$ = 12.74 lbs

9B. Partial Sedimentation and Filtration System

Water Quality Volume for combined basins =	184	cubic feet
Minimum filter basin area =	15	square feet

Texas Commission on Environmental Quality

TSS Removal Calculations 04-20-2009

Project Name: US 183A
Date Prepared: 1/16/2026

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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 * =	23.86	acres
Predevelopment impervious area within the limits of the plan * =	0.00	acres
Total post-development impervious area within the limits of the plan* =	11.97	acres
Total post-development impervious cover fraction * =	0.50	
P =	32	inches
$L_{M\ TOTAL\ PROJECT}$ =	10419	lbs.

* The values entered in these fields should be for the total project area.

Number of drainage basins / outfalls areas leaving the plan area = ?

2. Drainage Basin Parameters (This information should be provided for each basin):

Drainage Basin/Outfall Area No. = STU I1 & I2

Total drainage basin/outfall area =	23.86	acres
Predevelopment impervious area within drainage basin/outfall area =	0.00	acres
Post-development impervious area within drainage basin/outfall area =	11.97	acres
Post-development impervious fraction within drainage basin/outfall area =	0.50	
$L_{M\ THIS\ BASIN}$ =	10419	lbs.

3. Indicate the proposed BMP Code for this basin.

Proposed BMP = Jellyfish
Removal efficiency = 86 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 =	23.90	acres
A_I =	11.97	acres
A_P =	11.93	acres
L_R =	11575	lbs

5. Calculate Fraction of Annual Runoff to Treat the drainage basin / outfall area

Desired $L_{M\ THIS\ BASIN}$ = 11182 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 =	0.36	
On-site Water Quality Volume =	93167	cubic feet

19. BMPs Installed in a Series Designed as Required in RG-348 Pages 3-32

Michael E. Barrett, Ph.D.. P.E. recommended that the coefficient for E_2 be changed from 0.5 to 0.65 on May 3, 2006

$E_{TOT} = [1 - ((1 - E_1) \times (1 - 0.65E_2) \times (1 - 0.25E_3))] \times 100$ = 86.00 percent NET EFFICIENCY OF THE BMPs IN THE SERIES

EFFICIENCY OF FIRST BMP IN THE SERIES = E_1 = 86.00 percent Jellyfish

EFFICIENCY OF THE SECOND BMP IN THE SERIES = E_2 = 0.00 percent

EFFICIENCY OF THE THIRD BMP IN THE SERIES = E_3 = 0.00 percent

THEREFORE, THE NET LOAD REMOVAL WOULD BE:
(A_I AND A_P VALUES ARE FROM SECTION 3 ABOVE)

$L_R = E_{TOT} \times P \times (A_I \times 34.6 \times A_P \times 0.54)$ = 11575.03 lbs

Contech Engineered Solutions Calculations for Texas Commission on Environmental Quality
TSS Removal Calculations

Project Name: **US183A**
Date Prepared: **12/3/2025**

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: $L_M = 27.2(A_N \times P)$

$L_{M\ TOTAL\ PROJECT}$ = 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 * =	**7.06**	acres
Predevelopment impervious area within the limits of the plan * =	**0.00**	acres
Total post-development impervious area within the limits of the plan* =	**4.71**	acres
Total post-development impervious cover fraction * =	**0.67**	
P =	**32**	inches
$L_{M\ TOTAL\ PROJECT}$ =	**4100**	lbs.
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. =	**STU-I1**	
Total drainage basin/outfall area =	**7.06**	acres
Predevelopment impervious area within drainage basin/outfall area =	**0.00**	acres
Post-development impervious area within drainage basin/outfall area =	**4.71**	acres
Post-development impervious fraction within drainage basin/outfall area =	**0.67**	
$L_{M\ THIS\ BASIN}$ =	**4100**	lbs.

3. Indicate the proposed BMP Code for this basin.

Proposed BMP =	**JF**	abbreviation
Removal efficiency =	**86**	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:
$LR = (\text{BMP efficiency}) \times P \times (A_I \times 34.6 + A_P \times 0.54)$

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 =	**7.06**	acres
A_I =	**4.71**	acres
A_P =	**2.35**	acres
L_R =	**4520**	lbs.

5. Calculate Fraction of Annual Runoff to Treat the drainage basin / outfall area

Desired $L_{M\ THIS\ BASIN}$ =	**4339**	lbs.
F =	**0.96**	

6. Calculate Treated Flow required by the BMP Type for this drainage basin / outfall area.

Offsite area draining to BMP =	**0.00**	acres
Offsite impervious cover draining to BMP =	**0.00**	acres

Calculations from RG-348 Pages Section 3.2.22

Rainfall Intensity =	**1.80**	inches per hour
Effective Area =	**4.31**	acres
Cartridge Length =	**54**	inches
Peak Treatment Flow Required =	**7.82**	cubic feet per second

7. Jellyfish

Designed as Required in RG-348 Section 3.2.22

Flow Through Jellyfish Size	**Vault**	
Jellyfish Size for Flow-Based Configuration =	**JFPD0816-40-8**	
Jellyfish Treatment Flow Rate =	**7.84**	cfs

Contech Engineered Solutions Calculations for Texas Commission on Environmental Quality
TSS Removal Calculations

Project Name: **US183A**
Date Prepared: **12/3/2025**

1. The Required Load Reduction for the total project:

Calculations from RG-348 Page 3-29 Equation 3.3: $L_M = 27.2(A_N \times P)$
Pages 3-27 to 3-30

$L_{M\ TOTAL\ PROJECT}$ = 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 * =	**16.80**	acres
Predevelopment impervious area within the limits of the plan * =	**0.00**	acres
Total post-development impervious area within the limits of the plan * =	**7.26**	acres
Total post-development impervious cover fraction * =	**0.43**	
P =	**32**	inches
$L_{M\ TOTAL\ PROJECT}$ =	**6319**	lbs.
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. =	**STU-I2**	
Total drainage basin/outfall area =	**16.80**	acres
Predevelopment impervious area within drainage basin/outfall area =	**0.00**	acres
Post-development impervious area within drainage basin/outfall area =	**7.26**	acres
Post-development impervious fraction within drainage basin/outfall area =	**0.43**	
$L_{M\ THIS\ BASIN}$ =	**6319**	lbs.

3. Indicate the proposed BMP Code for this basin.

Proposed BMP =	**JF**	abbreviation
Removal efficiency =	**86**	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:
LR = (BMP efficiency) x P x (A_I x 34.6 + A_P x 0.54)

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 =	**16.80**	acres
A_I =	**7.26**	acres
A_P =	**9.54**	acres
L_R =	**7055**	lbs.

5. Calculate Fraction of Annual Runoff to Treat the drainage basin / outfall area

Desired $L_{M\ THIS\ BASIN}$ =	**6843**	lbs.
F =	**0.97**	

6. Calculate Treated Flow required by the BMP Type for this drainage basin / outfall area.

Offsite area draining to BMP =	**0.00**	acres
Offsite impervious cover draining to BMP =	**0.00**	acres

Calculations from RG-348
Pages Section 3.2.22

Rainfall Intensity =	**2.00**	inches per hour
Effective Area =	**6.82**	acres
Cartridge Length =	**54**	inches
Peak Treatment Flow Required =	**13.75**	cubic feet per second

7. Jellyfish
Designed as Required in RG-348
Section 3.2.22

Flow Through Jellyfish Size	**Vault**	
Jellyfish Size for Flow-Based Configuration =	**2ea JFPD0816-35-8**	
Jellyfish Treatment Flow Rate =	**13.90**	cfs

Texas Commission on Environmental Quality

TSS Removal Calculations 04-20-2009

Project Name: US 183A
Date Prepared: 1/16/2026

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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 * =	8.84	acres
Predevelopment impervious area within the limits of the plan * =	0.00	acres
Total post-development impervious area within the limits of the plan* =	5.37	acres
Total post-development impervious cover fraction * =	0.61	
P =	32	inches
$L_{M\ TOTAL\ PROJECT}$ =	4674	lbs.

* The values entered in these fields should be for the total project area.

Number of drainage basins / outfalls areas leaving the plan area = ?

2. Drainage Basin Parameters (This information should be provided for each basin):

Drainage Basin/Outfall Area No. = STU J6 & J7

Total drainage basin/outfall area =	8.84	acres
Predevelopment impervious area within drainage basin/outfall area =	0.00	acres
Post-development impervious area within drainage basin/outfall area =	5.37	acres
Post-development impervious fraction within drainage basin/outfall area =	0.61	
$L_{M\ THIS\ BASIN}$ =	4674	lbs.

3. Indicate the proposed BMP Code for this basin.

Proposed BMP = In Series
Removal efficiency = 94 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 =	8.84	acres
A_I =	5.37	acres
A_P =	3.47	acres
L_R =	5651	lbs

5. Calculate Fraction of Annual Runoff to Treat the drainage basin / outfall area

Desired $L_{M\ THIS\ BASIN}$ = 5491 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 =	0.43	
On-site Water Quality Volume =	40989	cubic feet

19. BMPs Installed in a Series Designed as Required in RG-348 Pages 3-32

Michael E. Barrett, Ph.D.. P.E. recommended that the coefficient for E_2 be changed from 0.5 to 0.65 on May 3, 2006

$E_{TOT} = [1 - ((1 - E_1) \times (1 - 0.65E_2) \times (1 - 0.25E_3))] \times 100$ = 94.10 percent NET EFFICIENCY OF THE BMPs IN THE SERIES

EFFICIENCY OF FIRST BMP IN THE SERIES = E_1 = 86.00 percent Jellyfish

EFFICIENCY OF THE SECOND BMP IN THE SERIES = E_2 = 89.00 percent SF

EFFICIENCY OF THE THIRD BMP IN THE SERIES = E_3 = 0.00 percent

THEREFORE, THE NET LOAD REMOVAL WOULD BE:
(A_I AND A_P VALUES ARE FROM SECTION 3 ABOVE)

$L_R = E_{TOT} \times P \times (A_I \times 34.6 \times A_P \times 0.54)$ = 5651.23 lbs

Contech Engineered Solutions Calculations for Texas Commission on Environmental Quality
TSS Removal Calculations

Project Name: **US183A**
Date Prepared: **12/3/2025**

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: $L_M = 27.2(A_N \times P)$

$L_{M\ TOTAL\ PROJECT}$ = 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 * =	**4.14**	acres
Predevelopment impervious area within the limits of the plan * =	**0.00**	acres
Total post-development impervious area within the limits of the plan * =	**2.79**	acres
Total post-development impervious cover fraction * =	**0.67**	
P =	**32**	inches
$L_{M\ TOTAL\ PROJECT}$ =	**2428**	lbs.
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. =	**STU-J6**	
Total drainage basin/outfall area =	**4.14**	acres
Predevelopment impervious area within drainage basin/outfall area =	**0.00**	acres
Post-development impervious area within drainage basin/outfall area =	**2.79**	acres
Post-development impervious fraction within drainage basin/outfall area =	**0.67**	
$L_{M\ THIS\ BASIN}$ =	**2428**	lbs.

3. Indicate the proposed BMP Code for this basin.

Proposed BMP =	**JF**	abbreviation
Removal efficiency =	**86**	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:
$LR = (\text{BMP efficiency}) \times P \times (A_I \times 34.6 + A_P \times 0.54)$

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 =	**4.14**	acres
A_I =	**2.79**	acres
A_P =	**1.35**	acres
L_R =	**2677**	lbs.

5. Calculate Fraction of Annual Runoff to Treat the drainage basin / outfall area

Desired $L_{M\ THIS\ BASIN}$ =	**2596**	lbs.
F =	**0.97**	

6. Calculate Treated Flow required by the BMP Type for this drainage basin / outfall area.

Offsite area draining to BMP =	**0.00**	acres
Offsite impervious cover draining to BMP =	**0.00**	acres

Calculations from RG-348
Pages Section 3.2.22

Rainfall Intensity =	**2.00**	inches per hour
Effective Area =	**2.55**	acres
Cartridge Length =	**54**	inches
Peak Treatment Flow Required =	**5.15**	cubic feet per second

7. Jellyfish

Designed as Required in RG-348
Section 3.2.22

Flow Through Jellyfish Size	**Vault**	
Jellyfish Size for Flow-Based Configuration =	**JFPD0812-26-6**	
Jellyfish Treatment Flow Rate =	**5.17**	cfs

Contech Engineered Solutions Calculations for Texas Commission on Environmental Quality
TSS Removal Calculations

Project Name: **US183A**
Date Prepared: **12/3/2025**

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: $L_M = 27.2(A_N \times P)$

$L_{M\ TOTAL\ PROJECT}$ = 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 * =	**4.70**	acres
Predevelopment impervious area within the limits of the plan * =	**0.00**	acres
Total post-development impervious area within the limits of the plan * =	**2.58**	acres
Total post-development impervious cover fraction * =	**0.55**	
P =	**32**	inches
$L_{M\ TOTAL\ PROJECT}$ =	**2246**	lbs.
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. =	**STU-J7**	
Total drainage basin/outfall area =	**4.70**	acres
Predevelopment impervious area within drainage basin/outfall area =	**0.00**	acres
Post-development impervious area within drainage basin/outfall area =	**2.58**	acres
Post-development impervious fraction within drainage basin/outfall area =	**0.55**	
$L_{M\ THIS\ BASIN}$ =	**2246**	lbs.

3. Indicate the proposed BMP Code for this basin.

Proposed BMP =	**JF**	abbreviation
Removal efficiency =	**86**	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:
$LR = (\text{BMP efficiency}) \times P \times (A_I \times 34.6 + A_P \times 0.54)$

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 =	**4.70**	acres
A_I =	**2.58**	acres
A_P =	**2.12**	acres
L_R =	**2488**	lbs.

5. Calculate Fraction of Annual Runoff to Treat the drainage basin / outfall area

Desired $L_{M\ THIS\ BASIN}$ =	**2414**	lbs.
F =	**0.97**	

6. Calculate Treated Flow required by the BMP Type for this drainage basin / outfall area.

Offsite area draining to BMP =	**0.00**	acres
Offsite impervious cover draining to BMP =	**0.00**	acres

Calculations from RG-348
Pages Section 3.2.22

Rainfall Intensity =	**2.00**	inches per hour
Effective Area =	**2.39**	acres
Cartridge Length =	**54**	inches
Peak Treatment Flow Required =	**4.81**	cubic feet per second

7. Jellyfish

Designed as Required in RG-348
Section 3.2.22

Flow Through Jellyfish Size	**Vault**	
Jellyfish Size for Flow-Based Configuration =	**JFPD0811-25-5**	
Jellyfish Treatment Flow Rate =	**4.90**	cfs

Texas Commission on Environmental Quality

TSS Removal Calculations 04-20-2009

Project Name: US 183A
Date Prepared: 1/16/2026

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 * =	12.01	acres
Predevelopment impervious area within the limits of the plan * =	0.00	acres
Total post-development impervious area within the limits of the plan * =	7.77	acres
Total post-development impervious cover fraction * =	0.65	
P =	32	inches
$L_{M\ TOTAL\ PROJECT}$ =	6766	lbs.

* The values entered in these fields should be for the total project area.

Number of drainage basins / outfalls areas leaving the plan area = ?

2. Drainage Basin Parameters (This information should be provided for each basin):

Drainage Basin/Outfall Area No. = SF-5

Total drainage basin/outfall area =	12.01	acres
Predevelopment impervious area within drainage basin/outfall area =	0.00	acres
Post-development impervious area within drainage basin/outfall area =	2.28	acres
Post-development impervious fraction within drainage basin/outfall area =	0.19	
$L_{M\ THIS\ BASIN}$ =	1988	lbs.

3. Indicate the proposed BMP Code for this basin.

Proposed BMP = Sand Filter
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 =	2.28	acres
A_I =	2.28	acres
A_P =	0.00	acres
L_R =	2251	lbs

5. Calculate Fraction of Annual Runoff to Treat the drainage basin / outfall area

Desired $L_{M\ THIS\ BASIN}$ = 2251 lbs.

F = 1.00

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 =	4.00	inches
Post Development Runoff Coefficient =	0.82	
On-site Water Quality Volume =	27072	cubic feet

19. BMPs Installed in a Series Designed as Required in RG-348 Pages 3-32

Michael E. Barrett, Ph.D.. P.E. recommended that the coefficient for E_2 be changed from 0.5 to 0.65 on May 3, 2006

$E_{TOT} = [1 - ((1 - E_1) \times (1 - 0.65E_2) \times (1 - 0.25E_3))] \times 100$ = 89.00 percent NET EFFICIENCY OF THE BMPs IN THE SERIES

EFFICIENCY OF FIRST BMP IN THE SERIES = E_1 = 89.00 percent Sand Filter

EFFICIENCY OF THE SECOND BMP IN THE SERIES = E_2 = 0.00 percent

EFFICIENCY OF THE THIRD BMP IN THE SERIES = E_3 = 0.00 percent

THEREFORE, THE NET LOAD REMOVAL WOULD BE:
(A_I AND A_P VALUES ARE FROM SECTION 3 ABOVE)

$L_R = E_{TOT} \times P \times (A_I \times 34.6 \times A_P \times 0.54)$ = 2250.76 lbs

9B. Partial Sedimentation and Filtration System

Water Quality Volume for combined basins = 32487 cubic feet

Minimum filter basin area = 2707 square feet

Texas Commission on Environmental Quality

TSS Removal Calculations 04-20-2009

Project Name: US 183A
Date Prepared: 1/16/2026

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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 * =	0.47	acres
Predevelopment impervious area within the limits of the plan * =	0.00	acres
Total post-development impervious area within the limits of the plan* =	0.47	acres
Total post-development impervious cover fraction * =	1.00	
P =	32	inches
$L_{M\ TOTAL\ PROJECT}$ =	409	lbs.

* The values entered in these fields should be for the total project area.

Number of drainage basins / outfalls areas leaving the plan area = ?

2. Drainage Basin Parameters (This information should be provided for each basin):

Drainage Basin/Outfall Area No. = STU K1

Total drainage basin/outfall area =	0.47	acres
Predevelopment impervious area within drainage basin/outfall area =	0.00	acres
Post-development impervious area within drainage basin/outfall area =	0.47	acres
Post-development impervious fraction within drainage basin/outfall area =	1.00	
$L_{M\ THIS\ BASIN}$ =	409	lbs.

3. Indicate the proposed BMP Code for this basin.

Proposed BMP = Jellyfish
Removal efficiency = 86 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 =	0.47	acres
A_I =	0.47	acres
A_P =	0.00	acres
L_R =	448	lbs

5. Calculate Fraction of Annual Runoff to Treat the drainage basin / outfall area

Desired $L_{M\ THIS\ BASIN}$ = 436 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 =	0.82	
On-site Water Quality Volume =	4178	cubic feet

19. BMPs Installed in a Series Designed as Required in RG-348 Pages 3-32

Michael E. Barrett, Ph.D.. P.E. recommended that the coefficient for E_2 be changed from 0.5 to 0.65 on May 3, 2006

$E_{TOT} = [1 - ((1 - E_1) \times (1 - 0.65E_2) \times (1 - 0.25E_3))] \times 100$ = 86.00 percent NET EFFICIENCY OF THE BMPs IN THE SERIES

EFFICIENCY OF FIRST BMP IN THE SERIES = E_1 = 86.00 percent Jellyfish

EFFICIENCY OF THE SECOND BMP IN THE SERIES = E_2 = 0.00 percent

EFFICIENCY OF THE THIRD BMP IN THE SERIES = E_3 = 0.00 percent

THEREFORE, THE NET LOAD REMOVAL WOULD BE:
(A_I AND A_P VALUES ARE FROM SECTION 3 ABOVE)

$L_R = E_{TOT} \times P \times (A_I \times 34.6 \times A_P \times 0.54)$ = 447.53 lbs

Contech Engineered Solutions Calculations for Texas Commission on Environmental Quality
TSS Removal Calculations

Project Name: **US183A**
Date Prepared: **12/3/2025**

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: $L_M = 27.2(A_N \times P)$

$L_{M\ TOTAL\ PROJECT}$ = 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 =	**0.47**	acres
Predevelopment impervious area within the limits of the plan =	**0.00**	acres
Total post-development impervious area within the limits of the plan =	**0.47**	acres
Total post-development impervious cover fraction =	**1.00**	
P =	**32**	inches
$L_{M\ TOTAL\ PROJECT}$ =	**409**	lbs.
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. =	**STU-K1**	
Total drainage basin/outfall area =	**0.47**	acres
Predevelopment impervious area within drainage basin/outfall area =	**0.00**	acres
Post-development impervious area within drainage basin/outfall area =	**0.47**	acres
Post-development impervious fraction within drainage basin/outfall area =	**1.00**	
$L_{M\ THIS\ BASIN}$ =	**409**	lbs.

3. Indicate the proposed BMP Code for this basin.

Proposed BMP =	**JF**	abbreviation
Removal efficiency =	**86**	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:
$LR = (\text{BMP efficiency}) \times P \times (A_I \times 34.6 + A_P \times 0.54)$

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 =	**0.47**	acres
A_I =	**0.47**	acres
A_P =	**0.00**	acres
L_R =	**448**	lbs.

5. Calculate Fraction of Annual Runoff to Treat the drainage basin / outfall area

Desired $L_{M\ THIS\ BASIN}$ =	**436**	lbs.
F =	**0.97**	

6. Calculate Treated Flow required by the BMP Type for this drainage basin / outfall area.

Offsite area draining to BMP =	**0.00**	acres
Offsite impervious cover draining to BMP =	**0.00**	acres

Calculations from RG-348
Pages Section 3.2.22

Rainfall Intensity =	**2.00**	inches per hour
Effective Area =	**0.42**	acres
Cartridge Length =	**54**	inches
Peak Treatment Flow Required =	**0.85**	cubic feet per second

7. Jellyfish

Designed as Required in RG-348
Section 3.2.22

Flow Through Jellyfish Size	**Surface Inlet**	
Jellyfish Size for Flow-Based Configuration =	**JFSI0406-4-2**	
Jellyfish Treatment Flow Rate =	**0.89**	cfs

Texas Commission on Environmental Quality

TSS Removal Calculations 04-20-2009

Project Name: US 183A
Date Prepared: 1/16/2026

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 * =	103.75	acres
Predevelopment impervious area within the limits of the plan * =	0.00	acres
Total post-development impervious area within the limits of the plan * =	0.74	acres
Total post-development impervious cover fraction * =	0.01	
P =	32	inches
$L_{M\ TOTAL\ PROJECT}$ =	644	lbs.

* The values entered in these fields should be for the total project area.

Number of drainage basins / outfalls areas leaving the plan area = ?

2. Drainage Basin Parameters (This information should be provided for each basin):

Drainage Basin/Outfall Area No. = SF-6

Total drainage basin/outfall area =	107.52	acres
Predevelopment impervious area within drainage basin/outfall area =	0.00	acres
Post-development impervious area within drainage basin/outfall area =	0.20	acres
Post-development impervious fraction within drainage basin/outfall area =	0.00	
$L_{M\ THIS\ BASIN}$ =	174	lbs.

3. Indicate the proposed BMP Code for this basin.

Proposed BMP = Sand Filter
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 =	0.20	acres
A_I =	0.20	acres
A_P =	0.00	acres
L_R =	197	lbs

5. Calculate Fraction of Annual Runoff to Treat the drainage basin / outfall area

Desired $L_{M\ THIS\ BASIN}$ = 197 lbs.

F = 1.00

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 =	4.00	inches
Post Development Runoff Coefficient =	0.82	
On-site Water Quality Volume =	2372	cubic feet

19. BMPs Installed in a Series Designed as Required in RG-348 Pages 3-32

Michael E. Barrett, Ph.D.. P.E. recommended that the coefficient for E_2 be changed from 0.5 to 0.65 on May 3, 2006

$E_{TOT} = [1 - ((1 - E_1) \times (1 - 0.65E_2) \times (1 - 0.25E_3))] \times 100$ = 89.00 percent NET EFFICIENCY OF THE BMPs IN THE SERIES

EFFICIENCY OF FIRST BMP IN THE SERIES = E_1 = 89.00 percent Sand Filter

EFFICIENCY OF THE SECOND BMP IN THE SERIES = E_2 = 0.00 percent

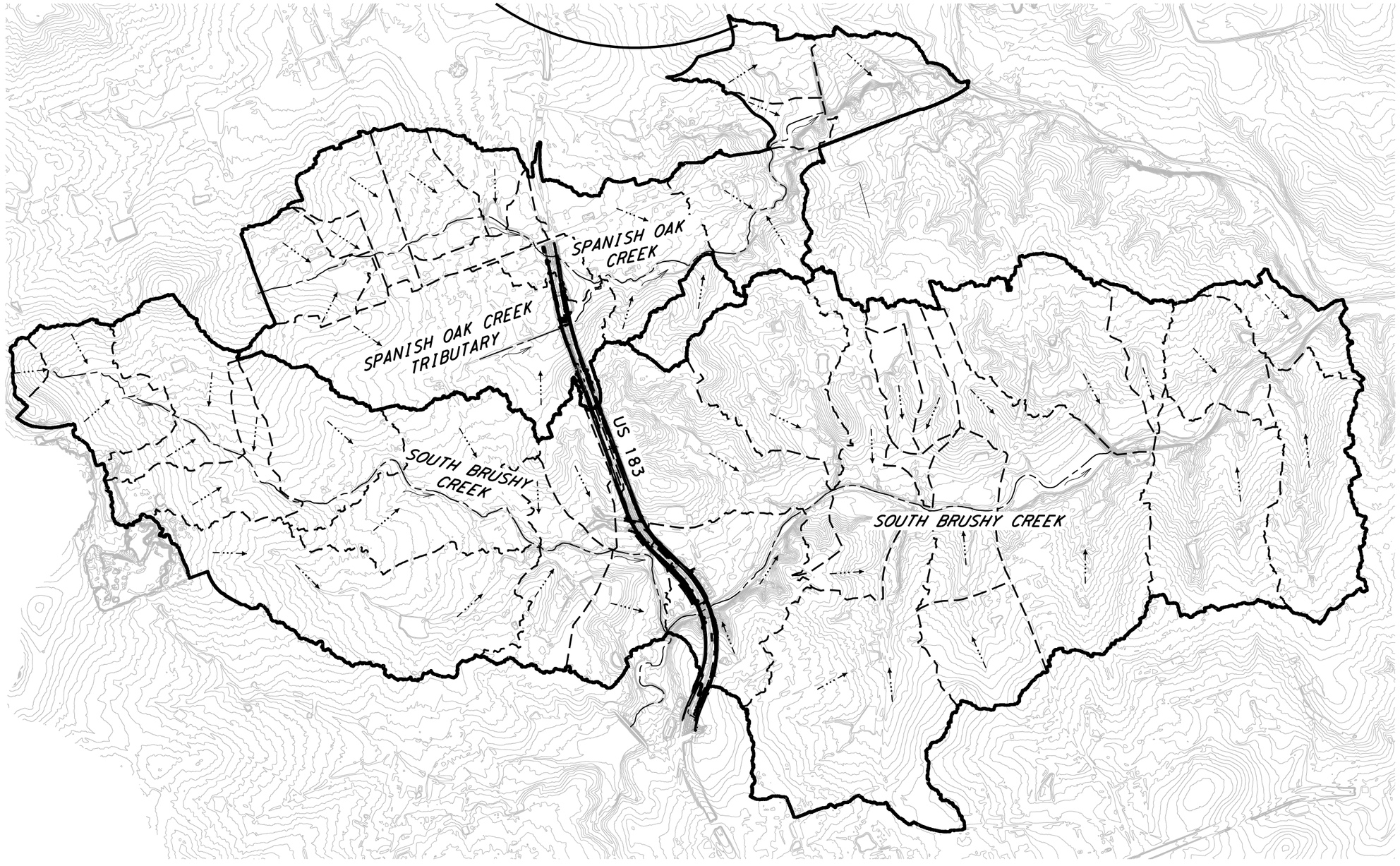
EFFICIENCY OF THE THIRD BMP IN THE SERIES = E_3 = 0.00 percent

THEREFORE, THE NET LOAD REMOVAL WOULD BE:
(A_I AND A_P VALUES ARE FROM SECTION 3 ABOVE)

$L_R = E_{TOT} \times P \times (A_I \times 34.6 \times A_P \times 0.54)$ = 197.18 lbs

9B. Partial Sedimentation and Filtration System

Water Quality Volume for combined basins =	2846	cubic feet
Minimum filter basin area =	237	square feet



LEGEND

- EXISTING WATERSHED DRAINAGE AREA
- EXISTING WATERSHED SUBBASIN DIVIDE
- CREEK ℄
- EXISTING 5′ CONTOURS
- FLOW ARROW

NOTES

1. EXISTING CONTOURS ARE 5′ CONTOURS GENERATED FROM 2017 LIDAR DATA.
2. DRAINAGE AREAS AND SUBBASINS SHOWN ARE FROM APPROVED FEMA MODELS "SOUTHBRUSHEY.PRJ" AND "SPANIOAK.PRJ".

HYDROLOGIC METHOD

EFFECTIVE FLOWS WERE OBTAINED FROM THE 2020 FEMA STUDY HEC-HMS MODEL "SBR_APPROVED_FEMA_HYDROLOGY_HMS". FLOWS WERE USED TO ANALYZE THE CORRECTED EFFECTIVE EXISTING CONDITIONS AND THE PROPOSED MODEL.

DESIGN

STATE OF TEXAS — BRYAN SIERSMA — 147188 — LICENSED PROFESSIONAL ENGINEER

BRYAN SIERSMA, P.E.

4/24/2024
DATE

APPROVAL

STATE OF TEXAS — DAN THOMA — 98622 — LICENSED PROFESSIONAL ENGINEER

DAN THOMA, P.E.

4/24/2024
DATE

0 1500 3000 4500

SCALE: 1"= 3000′

PAPE-DAWSON ENGINEERS

SAN ANTONIO | AUSTIN | HOUSTON | FORT WORTH | DALLAS
2000 NW LOOP 410 | SAN ANTONIO, TX 78213 | 210.375.9000
TEXAS ENGINEERING FIRM #470 | TEXAS SURVEYING FIRM #10028800

2024
Texas Department of Transportation

US 183 GPL EXTERIOR DRAINAGE SUBBASINS SPANISH OAK CREEK AND SOUTH BRUSHY CREEK

© 2024

DS:	CK:	CONT	SECT	JOB	HIGHWAY
		0151	10	001	US 183
DW:	CK:	DIST	COUNTY		SHEET NO.
		AUS	WILLIAMSON		664

DATE: 4/24/2024 4:05:58 PM
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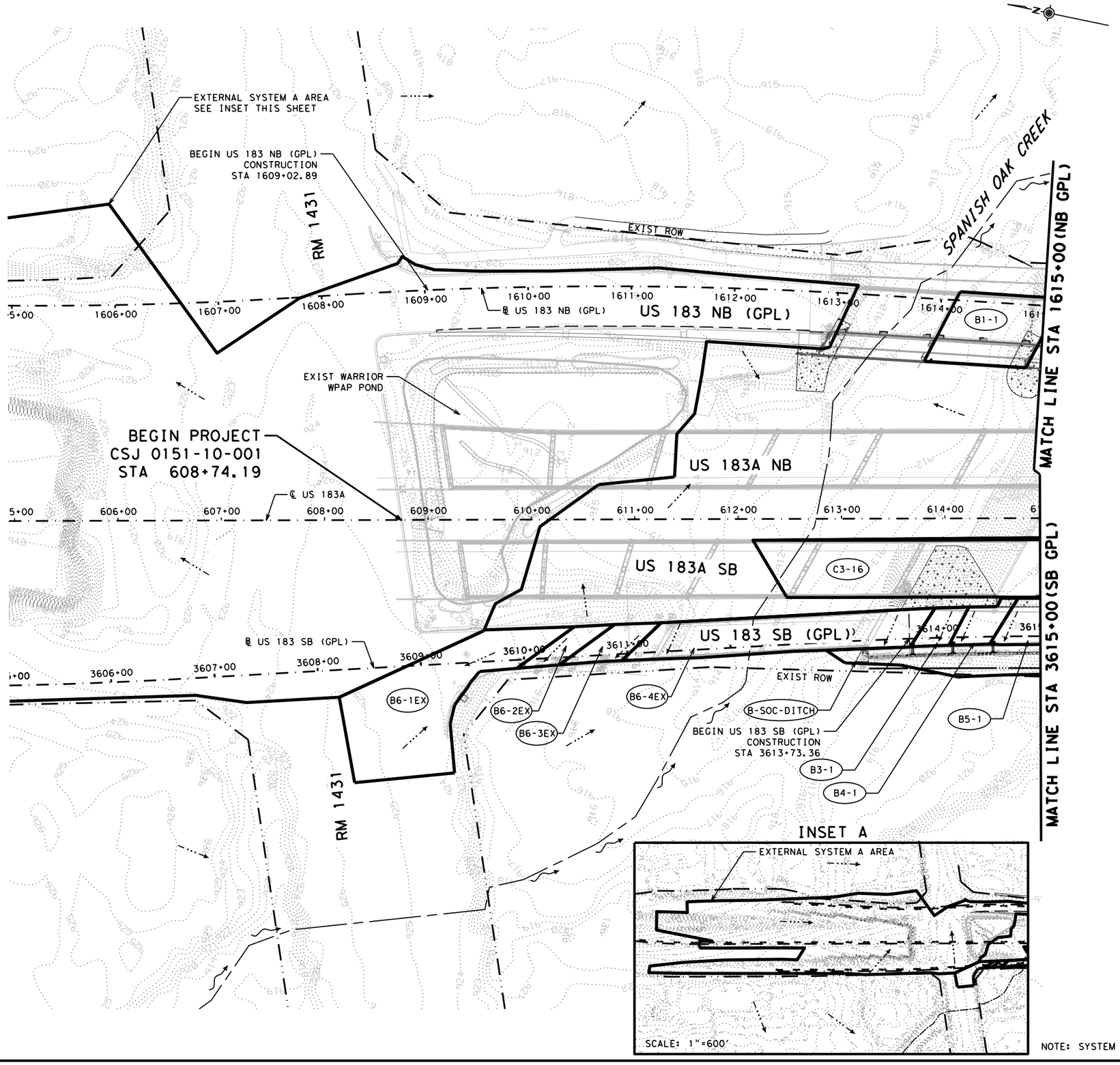

NOTE: SYSTEM A IS EXISTING TO REMAIN.

LEGEND

- R.O.W.
- EXISTING EASEMENT
- PROPOSED INTERIOR DRAINAGE AREA
- PROPOSED RDWY SAWCUT
- PROPOSED DITCH ℄
- EXISTING DITCH ℄
- CREEK ℄
- 850 1' CONTOURS
- FLOW ARROW
- CONCRETE RIPRAP
- PROPOSED DETENTION POND EXPANSION
- XX-XX DRAINAGE AREA ID

NOTES

1. LOCATION AND ELEVATION OF EXISTING UTILITIES ARE APPROXIMATED BASED ON SURVEY AND AVAILABLE SUE DATA. UTILITIES TO BE CLEAR PRIOR TO CONSTRUCTION. CONTRACTOR TO VERIFY LOCATION OF EXISTING UTILITIES.
2. STORM DRAIN COMPONENTS SCREENED BACK ARE EXISTING TO REMAIN AND ARE SHOWN FOR ANALYSIS PURPOSES. "EX" DENOTES EXISTING COMPONENTS TO REMAIN.
3. CONTOURS SHOWN ARE A COMBINATION OF EXISTING AND PROPOSED. CONTOURS ARE GENERATED FROM 2021 SURVEY DATA, 2015 LIDAR DATA, AND PROPOSED CONTOURS.
4. C VALUES WERE DEVELOPED USING AERIAL PHOTOGRAPHY AND TABLE 4-10 IN TXDOT HYDRAULIC DESIGN MANUAL.

DESIGN

STATE OF TEXAS · BRYAN SIERSMA · 147188 · LICENSED PROFESSIONAL ENGINEER

BRYAN SIERSMA, P.E.

4/24/2024
DATE

APPROVAL

STATE OF TEXAS · DAN THOMA · 98622 · LICENSED PROFESSIONAL ENGINEER

DAN THOMA, P.E.

4/24/2024
DATE

0 50 100 150
SCALE: 1"= 100'

PAPE-DAWSON ENGINEERS
SAN ANTONIO | AUSTIN | HOUSTON | FORT WORTH | DALLAS
2000 NW LOOP 410 | SAN ANTONIO, TX 78213 | 210.375.9000
TEXAS ENGINEERING FIRM #470 | TEXAS SURVEYING FIRM #10028800

2024 Texas Department of Transportation

US 183 GPL

INTERIOR DRAINAGE AREA LAYOUT

SHEET 1 OF 16

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DS:	CK:	CONT	SECT	JOB	HIGHWAY
		0151	10	001	US 183
DW:	CK:	DIST	COUNTY		SHEET NO.
		AUS	WILLIAMSON		665

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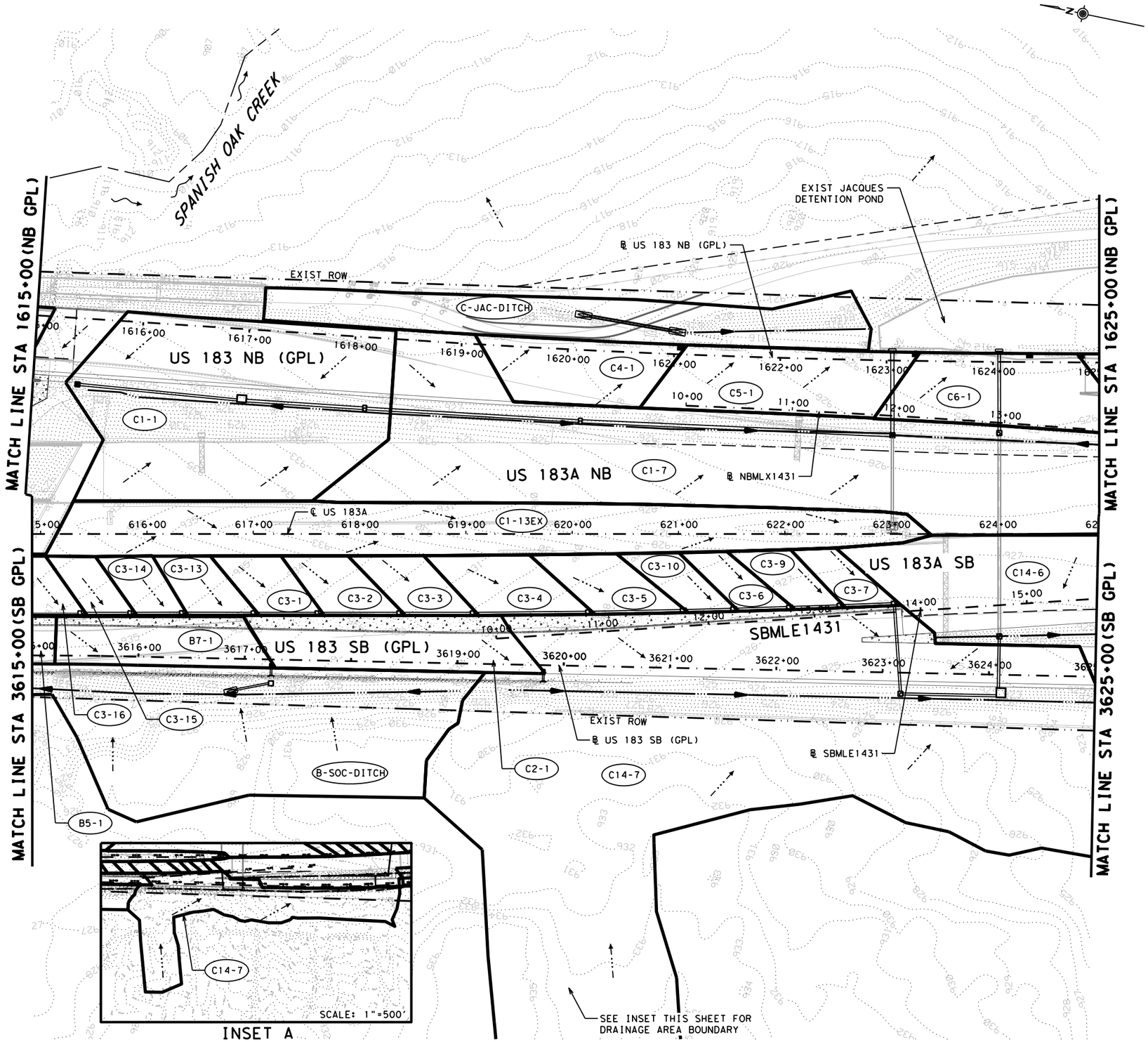

LEGEND

- R.O.W.
- EXISTING EASEMENT
- PROPOSED INTERIOR DRAINAGE AREA
- PROPOSED RDWY SAWCUT
- PROPOSED DITCH ℄
- EXISTING DITCH ℄
- CREEK ℄
- 850 1' CONTOURS
- FLOW ARROW
- CONCRETE RIPRAP
- PROPOSED DETENTION POND EXPANSION
- XX-XX DRAINAGE AREA ID

NOTES

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DESIGN

STATE OF TEXAS · BRYAN SIERSMA · 147188 · LICENSED PROFESSIONAL ENGINEER

BRYAN SIERSMA, P.E.

6/5/2024
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APPROVAL

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DAN THOMA, P.E.

6/5/2024
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US 183 GPL

INTERIOR DRAINAGE AREA LAYOUT

SHEET 2 OF 16

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		DIST	COUNTY		SHEET NO.
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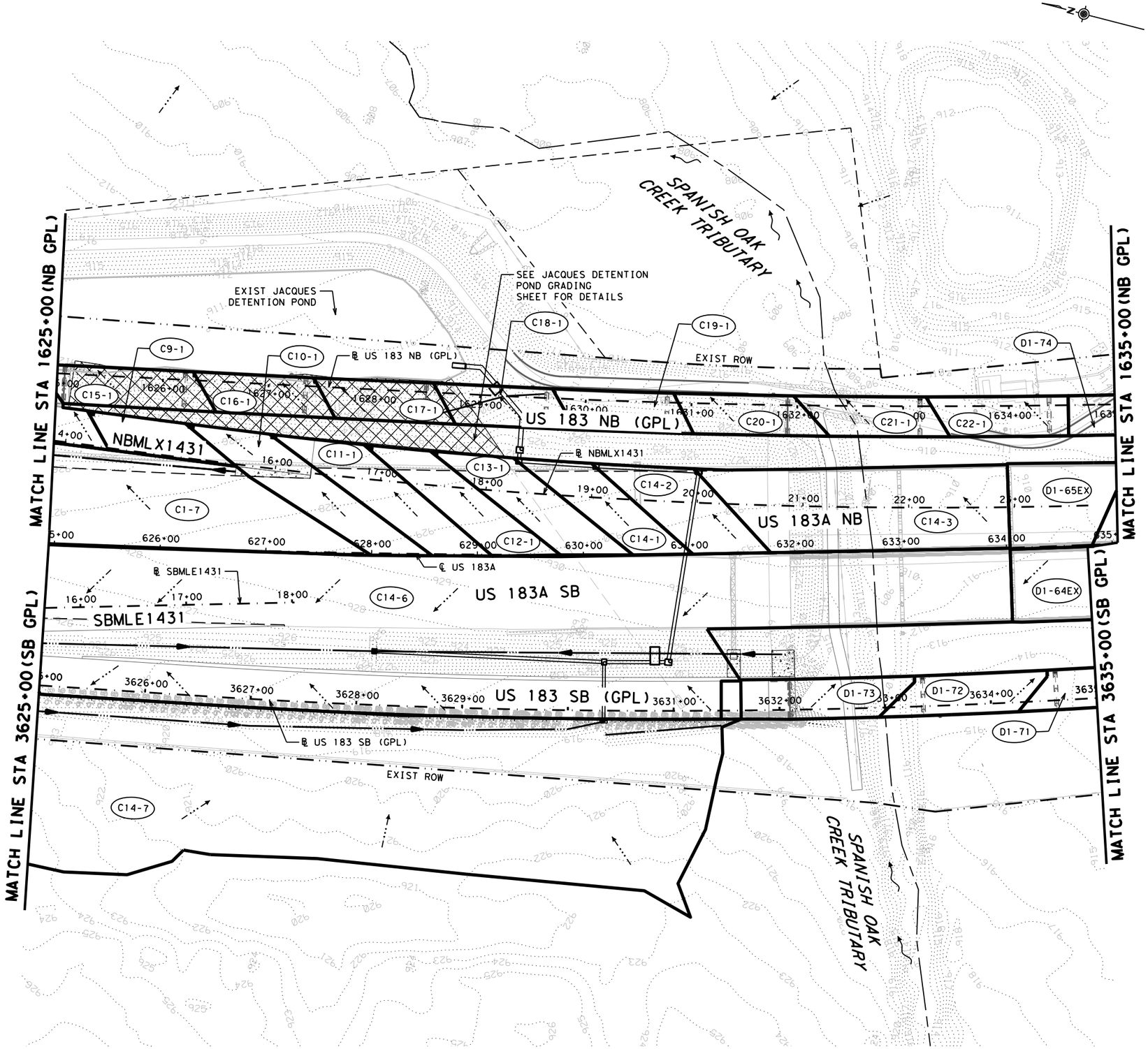

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BRYAN SIERSMA, P.E.

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US 183 GPL

INTERIOR DRAINAGE AREA LAYOUT

SHEET 3 OF 16

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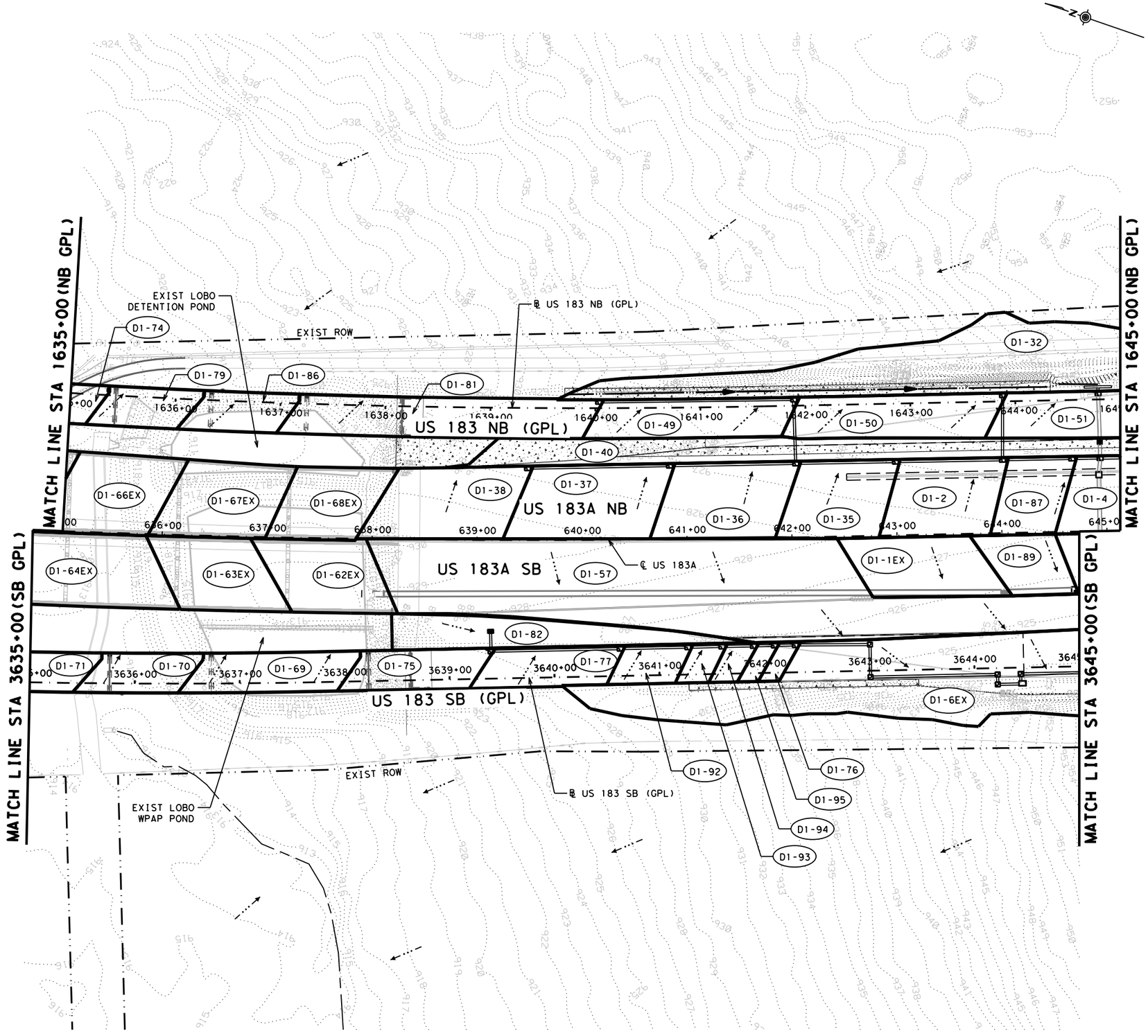

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INTERIOR DRAINAGE AREA LAYOUT

SHEET 4 OF 16

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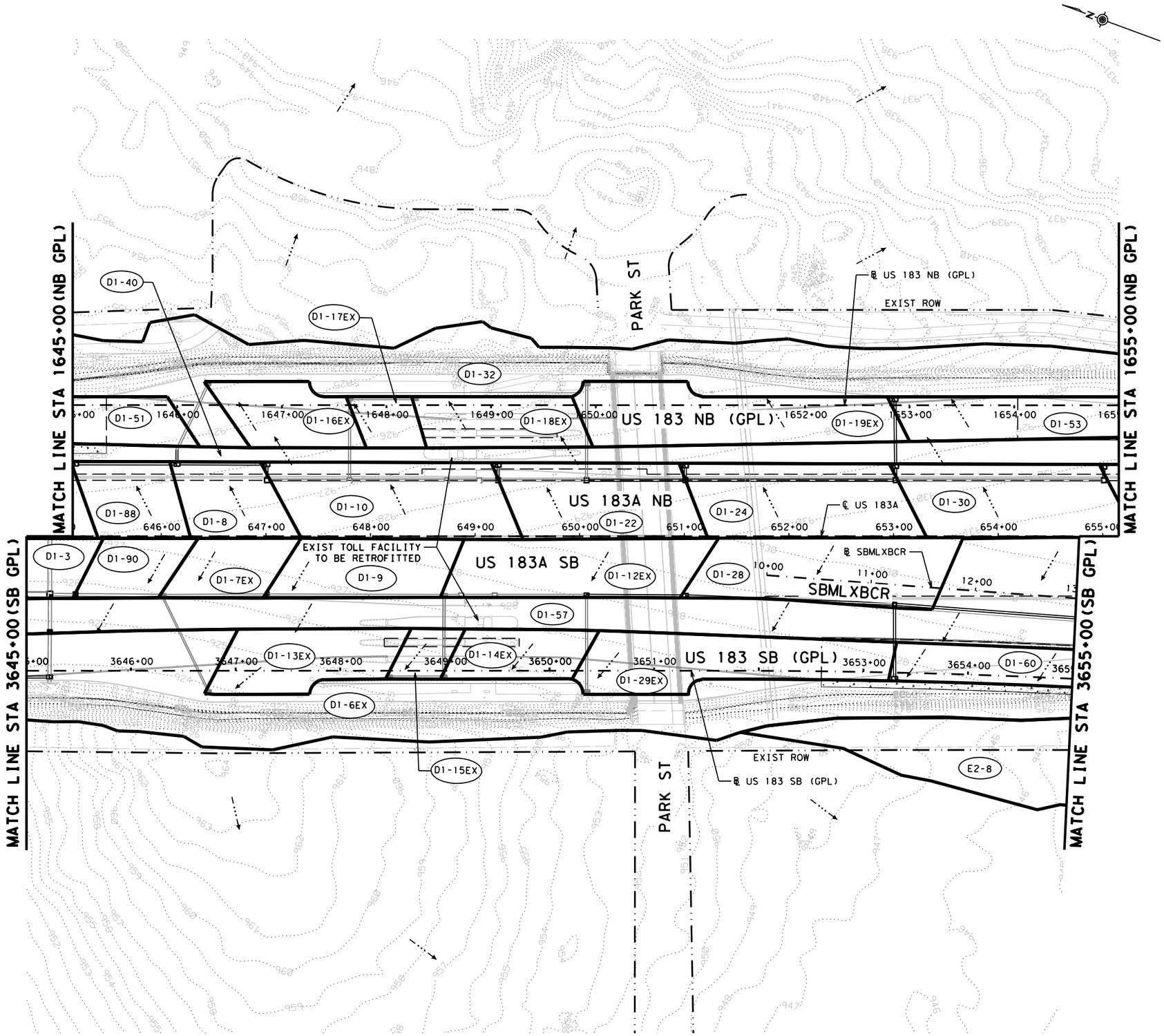

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4/24/2024
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US 183 GPL

INTERIOR DRAINAGE AREA LAYOUT

SHEET 5 OF 16

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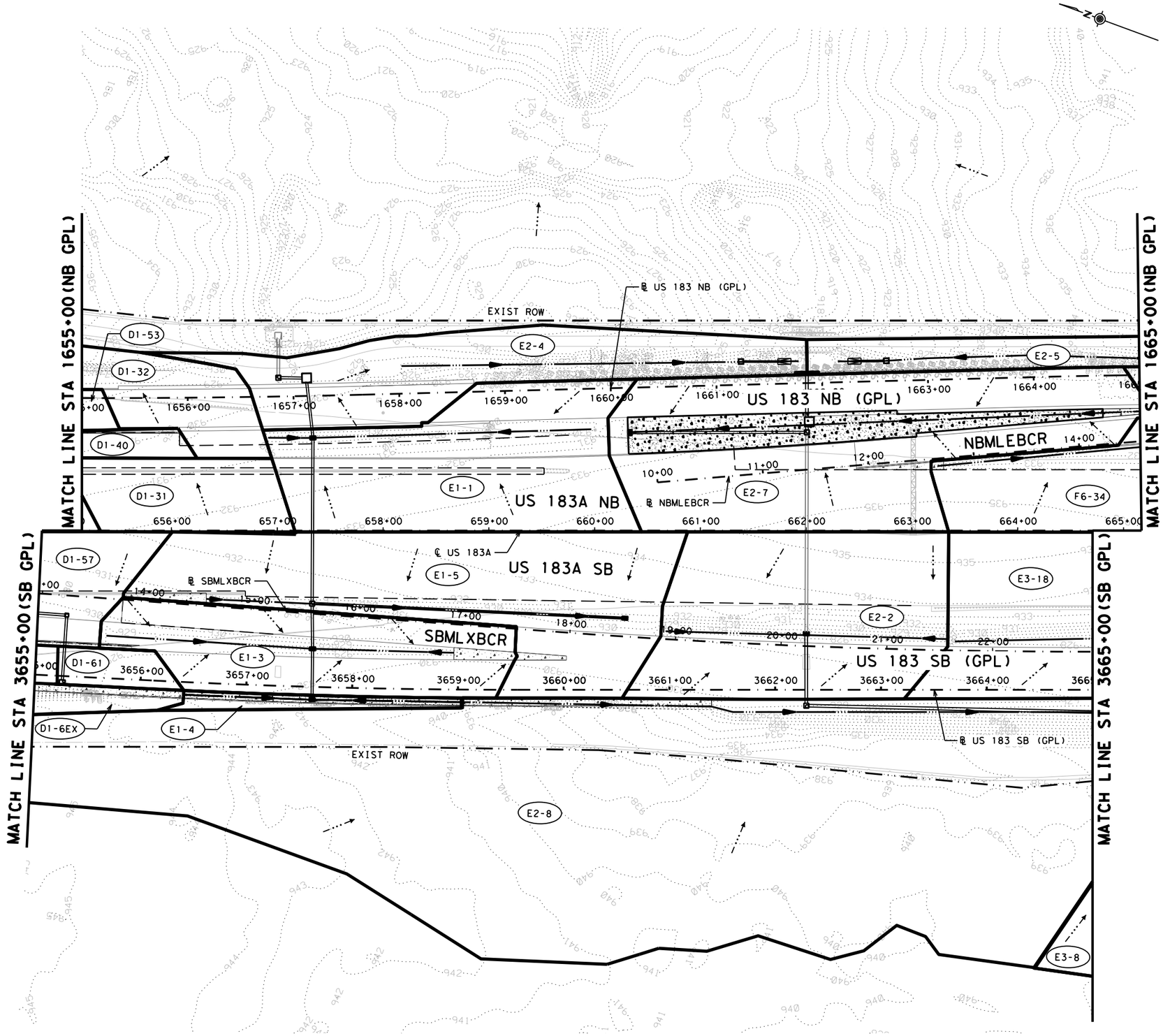

LEGEND

- R.O.W.
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DESIGN

STATE OF TEXAS · BRYAN SIERSMA · 147188 · LICENSED PROFESSIONAL ENGINEER

BRYAN SIERSMA, P.E.

6/5/2024
DATE

APPROVAL

STATE OF TEXAS · DAN THOMA · 98622 · LICENSED PROFESSIONAL ENGINEER

DAN THOMA, P.E.

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DATE

0 50 100 150
SCALE: 1"= 100'

PAPE-DAWSON ENGINEERS
SAN ANTONIO | AUSTIN | HOUSTON | FORT WORTH | DALLAS
2000 NW LOOP 410 | SAN ANTONIO, TX 78213 | 210.375.9000
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INTERIOR DRAINAGE AREA LAYOUT

SHEET 6 OF 16

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		0151	10	001	US 183
DW:	CK:	DIST	COUNTY		SHEET NO.
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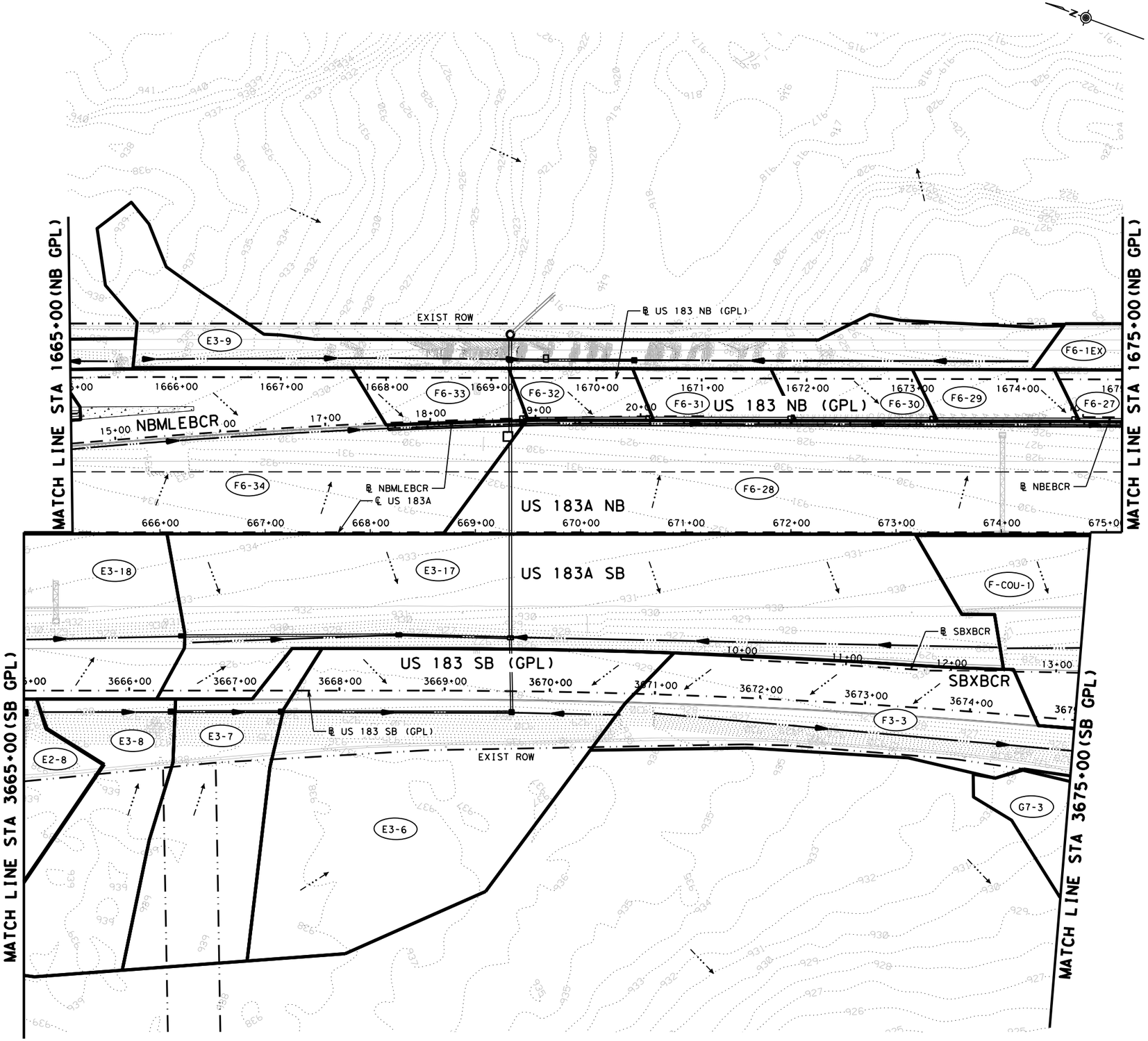

LEGEND

- R.O.W.
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0 50 100 150
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2000 NW LOOP 410 | SAN ANTONIO, TX 78213 | 210.375.9000
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INTERIOR DRAINAGE AREA LAYOUT

SHEET 7 OF 16

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DS: CK:	0151	10	001	US 183
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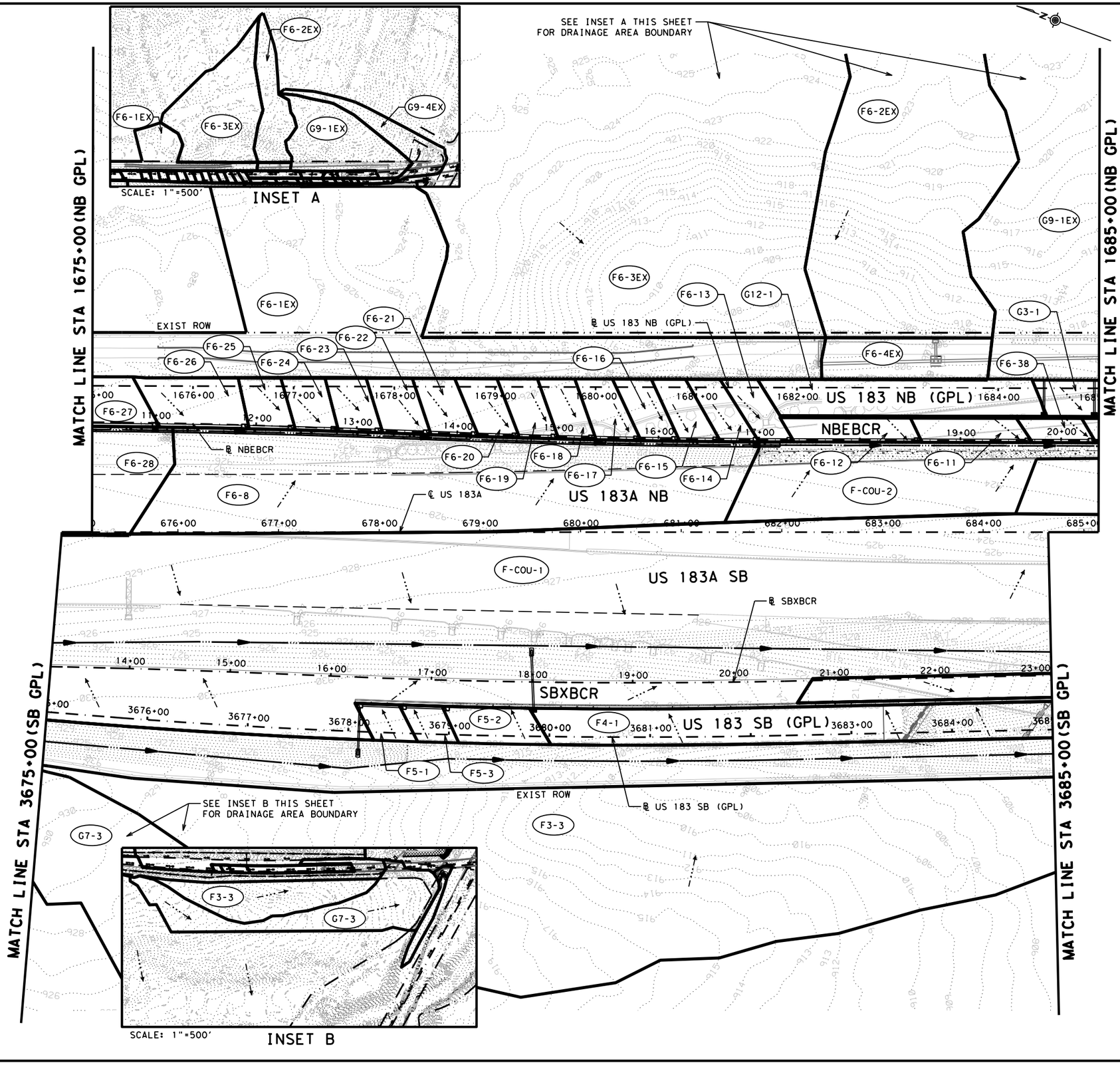

LEGEND

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DESIGN

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BRYAN SIERSMA, P.E.

5/9/2024
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APPROVAL

STATE OF TEXAS · DAN THOMA · 98622 · LICENSED PROFESSIONAL ENGINEER

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0 50 100 150
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2000 NW LOOP 410 | SAN ANTONIO, TX 78213 | 210.375.9000
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2024 Texas Department of Transportation

US 183 GPL

INTERIOR DRAINAGE AREA LAYOUT

SHEET 8 OF 16

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DW:	CK:	0151	10	001	US 183
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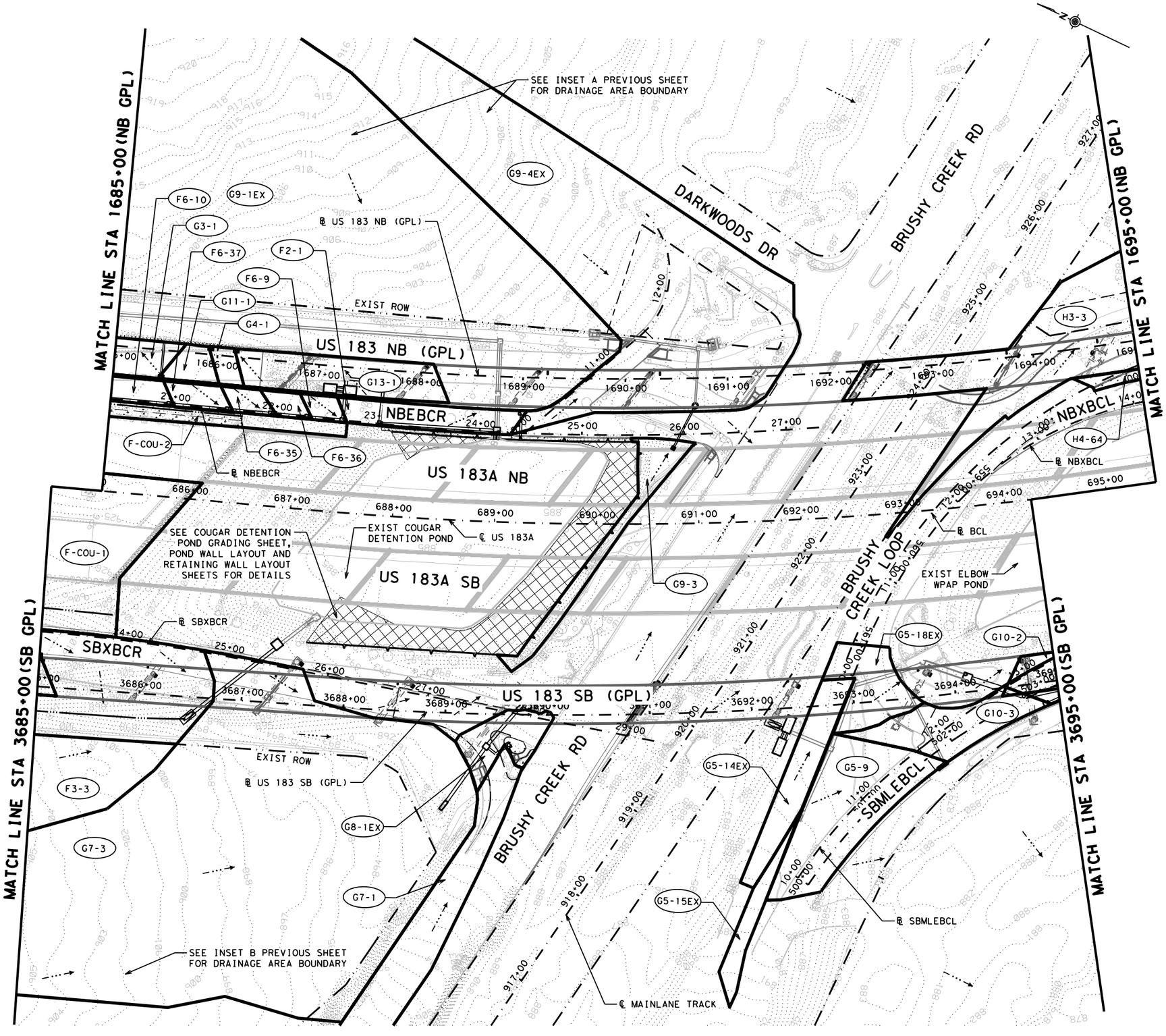

LEGEND

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INTERIOR DRAINAGE AREA LAYOUT

SHEET 9 OF 16

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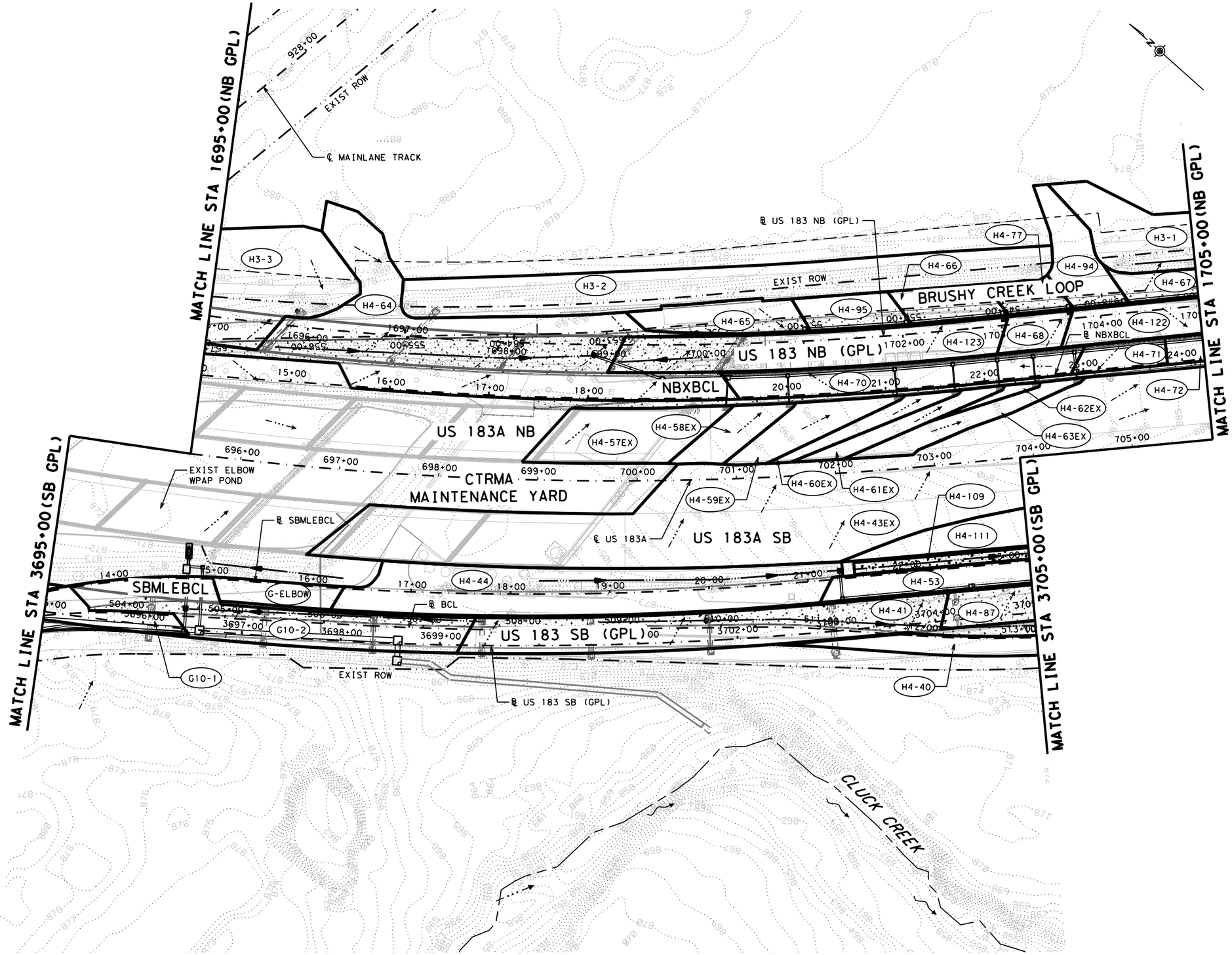

LEGEND

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SHEET 10 OF 16

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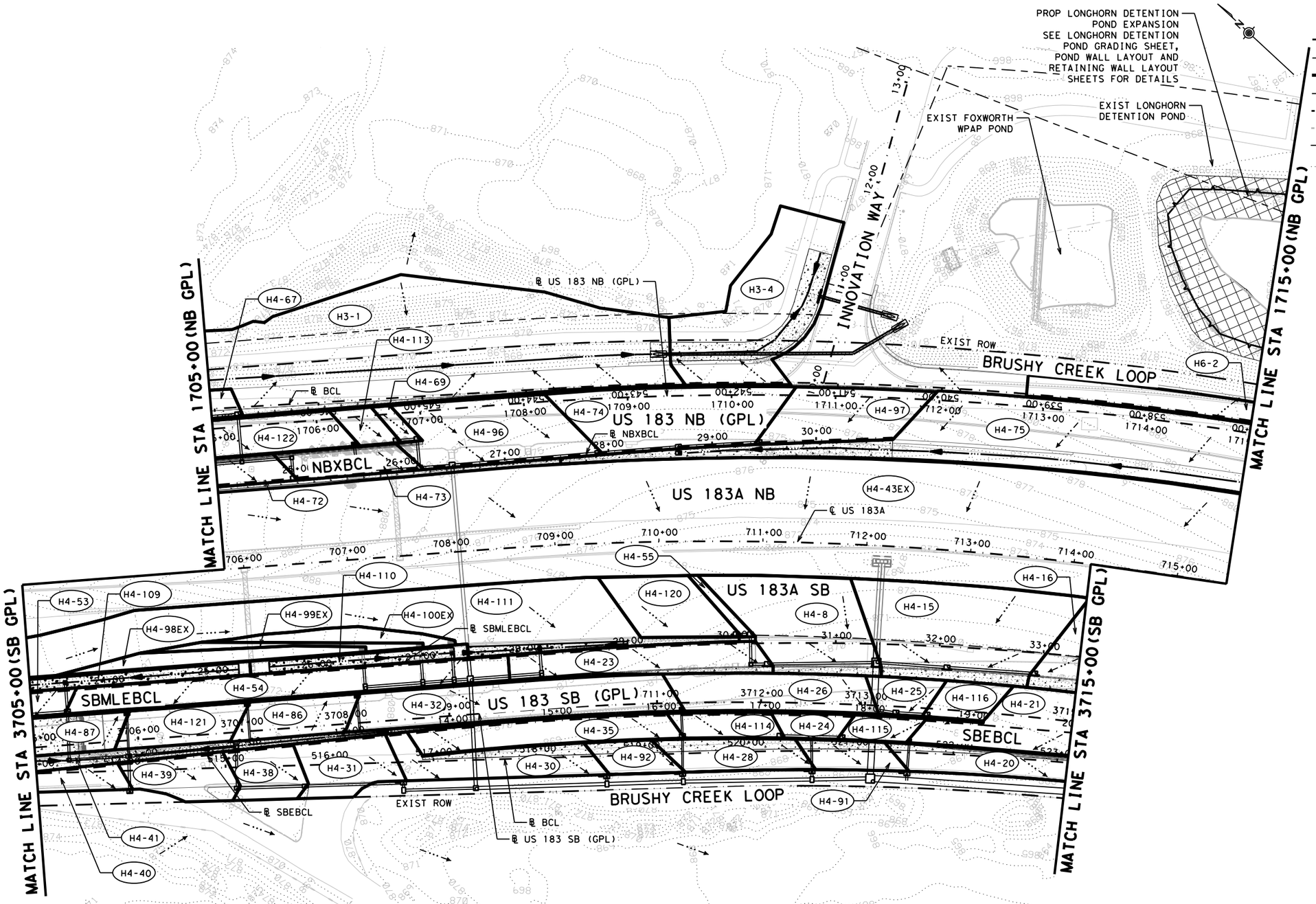

LEGEND

- R.O.W.
- EXISTING EASEMENT
- PROPOSED INTERIOR DRAINAGE AREA
- PROPOSED RDWY SAWCUT
- PROPOSED DITCH ℄
- EXISTING DITCH ℄
- CREEK ℄
- 1' CONTOURS
- FLOW ARROW
- CONCRETE RIPRAP
- PROPOSED DETENTION POND EXPANSION
- XX-XX DRAINAGE AREA ID

NOTES

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4. C VALUES WERE DEVELOPED USING AERIAL PHOTOGRAPHY AND TABLE 4-10 IN TXDOT HYDRAULIC DESIGN MANUAL.

DESIGN

STATE OF TEXAS — BRYAN SIERSMA — 147188 — LICENSED PROFESSIONAL ENGINEER

BRYAN SIERSMA, P.E.

4/24/2024
DATE

APPROVAL

STATE OF TEXAS — DAN THOMA — 98622 — LICENSED PROFESSIONAL ENGINEER

DAN THOMA, P.E.

4/24/2024
DATE

0 50 100 150
SCALE: 1" = 100'

PAPE-DAWSON ENGINEERS
SAN ANTONIO | AUSTIN | HOUSTON | FORT WORTH | DALLAS
2000 NW LOOP 410 | SAN ANTONIO, TX 78213 | 210.375.9000
TEXAS ENGINEERING FIRM #470 | TEXAS SURVEYING FIRM #10028800

2024 Texas Department of Transportation

US 183 GPL

INTERIOR DRAINAGE AREA LAYOUT

SHEET 11 OF 16

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DS:	CK:	0151	10	001	US 183
		DIST	COUNTY		SHEET NO.
DW:	CK:	AUS	WILLIAMSON		675

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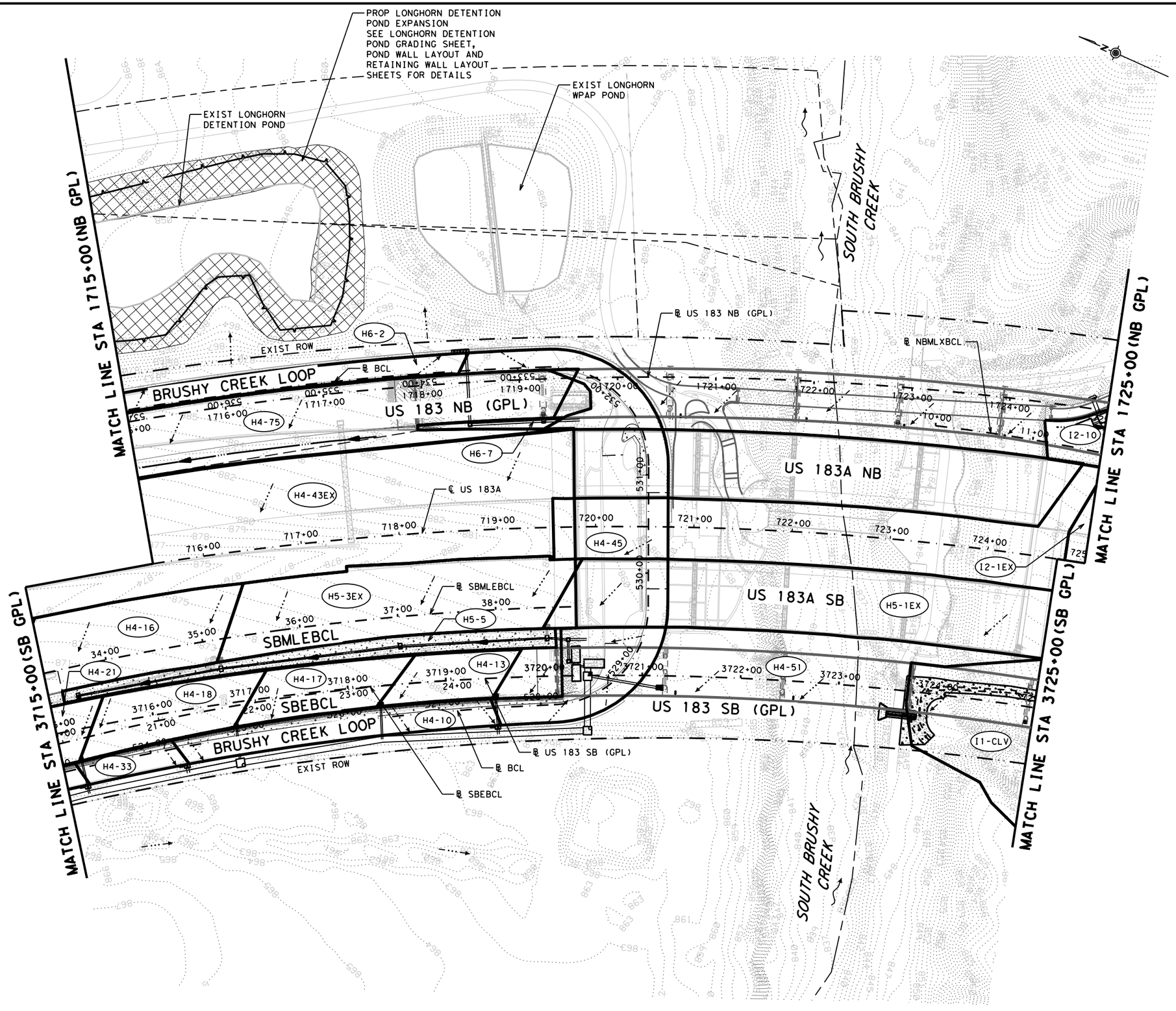

LEGEND

- R.O.W.
- EXISTING EASEMENT
- PROPOSED INTERIOR DRAINAGE AREA
- PROPOSED RDWY SAWCUT
- PROPOSED DITCH ℄
- EXISTING DITCH ℄
- CREEK ℄
- 850 1' CONTOURS
- FLOW ARROW
- CONCRETE RIPRAP
- PROPOSED DETENTION POND EXPANSION
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DESIGN

STATE OF TEXAS — BRYAN SIERSMA — 147188 — LICENSED PROFESSIONAL ENGINEER

BRYAN SIERSMA, P.E.

6/5/2024
DATE

APPROVAL

STATE OF TEXAS — DAN THOMA — 98622 — LICENSED PROFESSIONAL ENGINEER

DAN THOMA, P.E.

6/5/2024
DATE

0 50 100 150
SCALE: 1"= 100'

PAPE-DAWSON ENGINEERS
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2000 NW LOOP 410 | SAN ANTONIO, TX 78213 | 210.375.9000
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US 183 GPL

INTERIOR DRAINAGE AREA LAYOUT

SHEET 12 OF 16

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DS:	CK:	0151	10	001	US 183
		DIST	COUNTY		SHEET NO.
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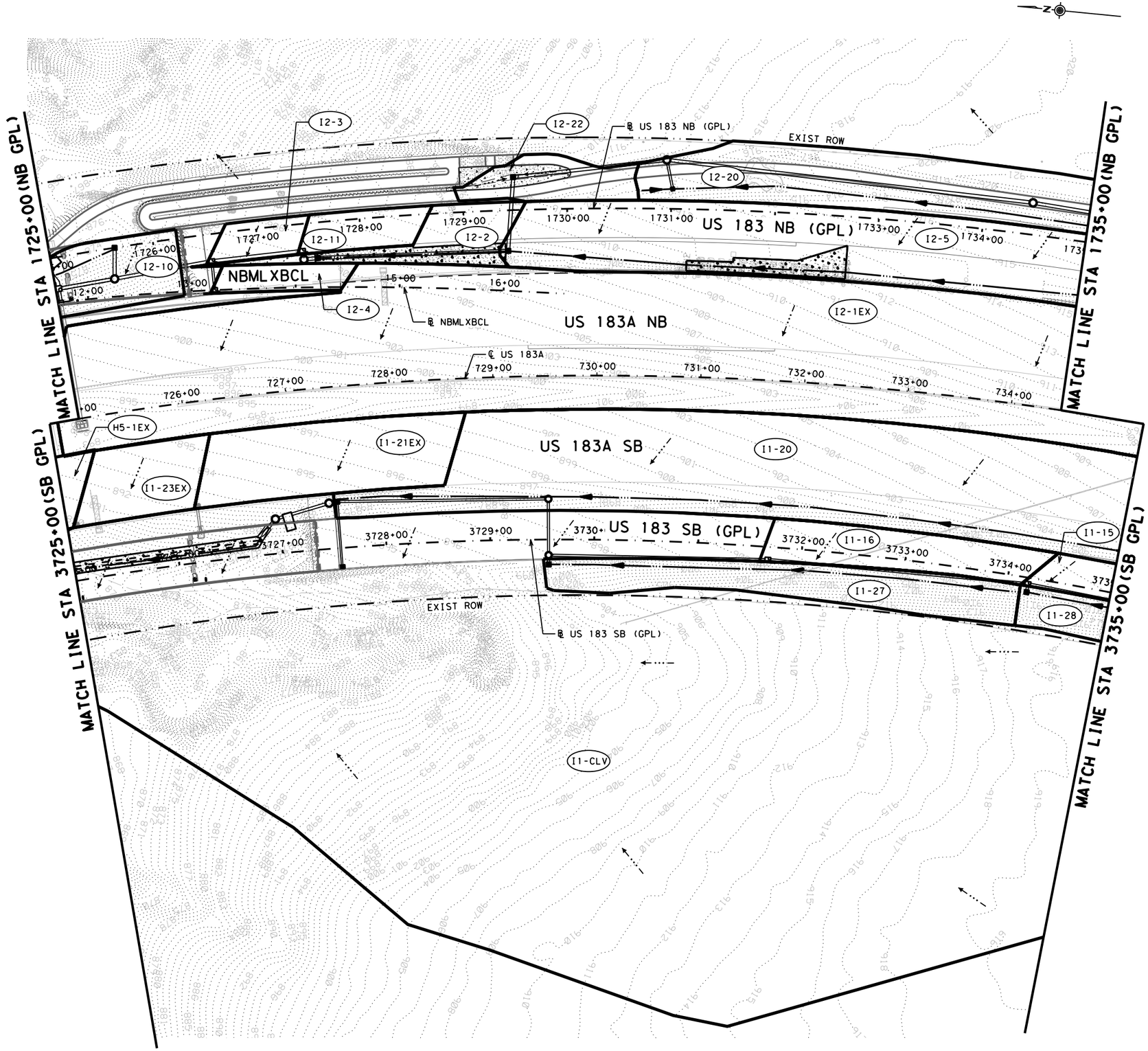

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STATE OF TEXAS · BRYAN SIERSMA · 147188 · LICENSED PROFESSIONAL ENGINEER

BRYAN SIERSMA, P.E.

6/5/2024
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APPROVAL

STATE OF TEXAS · DAN THOMA · 98622 · LICENSED PROFESSIONAL ENGINEER

DAN THOMA, P.E.

6/5/2024
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2000 NW LOOP 410 | SAN ANTONIO, TX 78213 | 210.375.9000
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INTERIOR DRAINAGE AREA LAYOUT

SHEET 13 OF 16

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		0151	10	001	US 183
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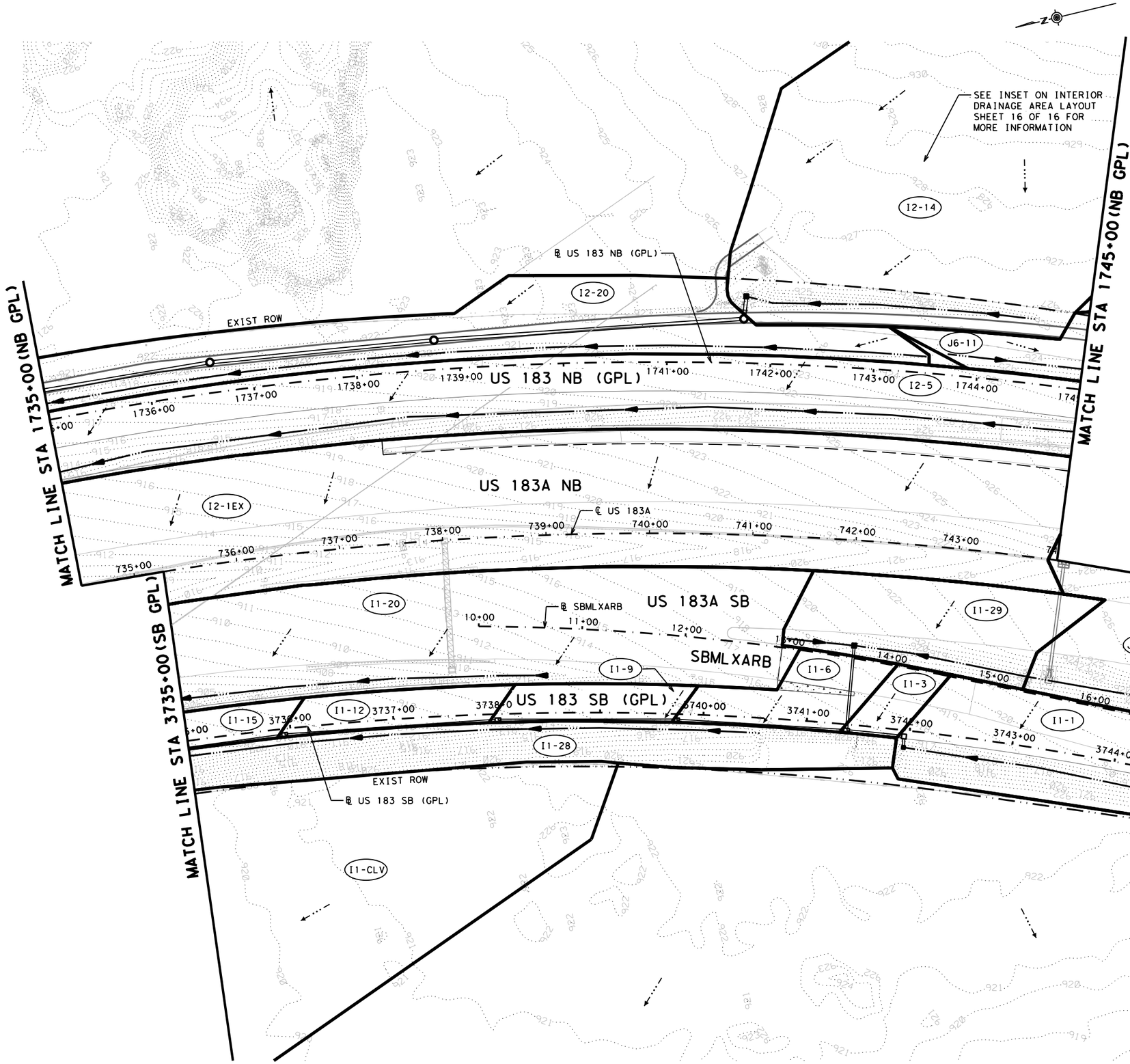

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- R.O.W.
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DESIGN

STATE OF TEXAS — BRYAN SIERSMA — 147188 — LICENSED PROFESSIONAL ENGINEER

BRYAN SIERSMA, P.E.

4/24/2024
DATE

APPROVAL

STATE OF TEXAS — DAN THOMA — 98622 — LICENSED PROFESSIONAL ENGINEER

DAN THOMA, P.E.

4/24/2024
DATE

0 50 100 150
SCALE: 1"= 100'

PAPE-DAWSON ENGINEERS
SAN ANTONIO | AUSTIN | HOUSTON | FORT WORTH | DALLAS
2000 NW LOOP 410 | SAN ANTONIO, TX 78213 | 210.375.9000
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US 183 GPL

INTERIOR DRAINAGE AREA LAYOUT

SHEET 14 OF 16

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		DIST	COUNTY		SHEET NO.
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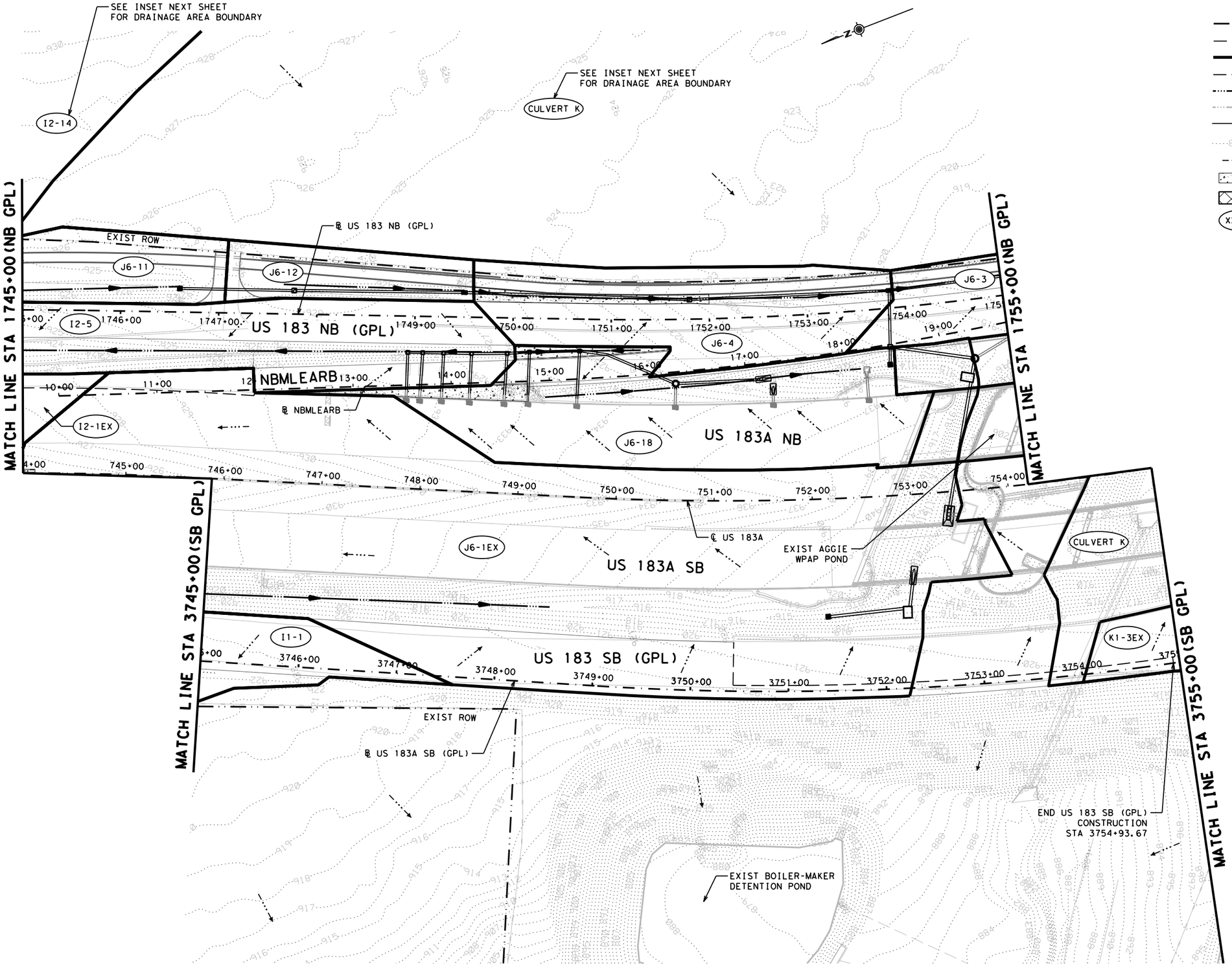

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DESIGN

STATE OF TEXAS · BRYAN SIERSMA · 147188 · LICENSED PROFESSIONAL ENGINEER

BRYAN SIERSMA, P.E.

6/5/2024
DATE

APPROVAL

STATE OF TEXAS · DAN THOMA · 98622 · LICENSED PROFESSIONAL ENGINEER

DAN THOMA, P.E.

6/5/2024
DATE

0 50 100 150
SCALE: 1" = 100'

PAPE-DAWSON ENGINEERS
SAN ANTONIO | AUSTIN | HOUSTON | FORT WORTH | DALLAS
2000 NW LOOP 410 | SAN ANTONIO, TX 78213 | 210.375.9000
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US 183 GPL

INTERIOR DRAINAGE AREA LAYOUT

SHEET 15 OF 16

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DS:	CK:	CONT	SECT	JOB	HIGHWAY
		0151	10	001	US 183
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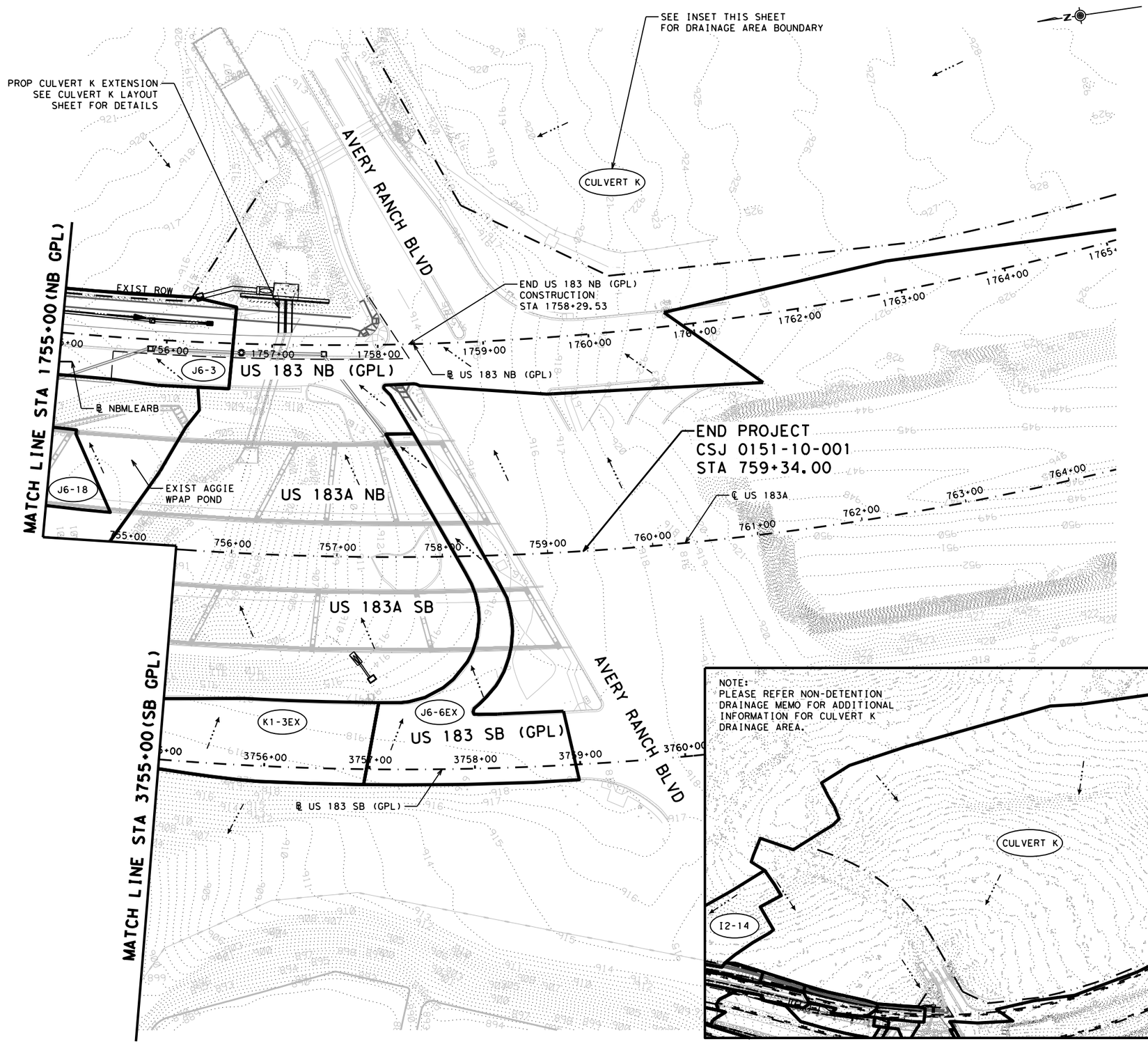

LEGEND

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DESIGN

STATE OF TEXAS — BRYAN SIERSMA — 147188 — LICENSED PROFESSIONAL ENGINEER

BRYAN SIERSMA, P.E.

5/10/2024
DATE

APPROVAL

STATE OF TEXAS — DAN THOMA — 98622 — LICENSED PROFESSIONAL ENGINEER

DAN THOMA, P.E.

5/10/2024
DATE

0 50 100 150
SCALE: 1"= 100'

PAPE-DAWSON ENGINEERS
SAN ANTONIO | AUSTIN | HOUSTON | FORT WORTH | DALLAS
2000 NW LOOP 410 | SAN ANTONIO, TX 78213 | 210.375.9000
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US 183 GPL

INTERIOR DRAINAGE AREA LAYOUT

SHEET 16 OF 16

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DS:	CK:	CONT	SECT	JOB	HIGHWAY
		0151	10	001	US 183
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		AUS	WILLIAMSON		680

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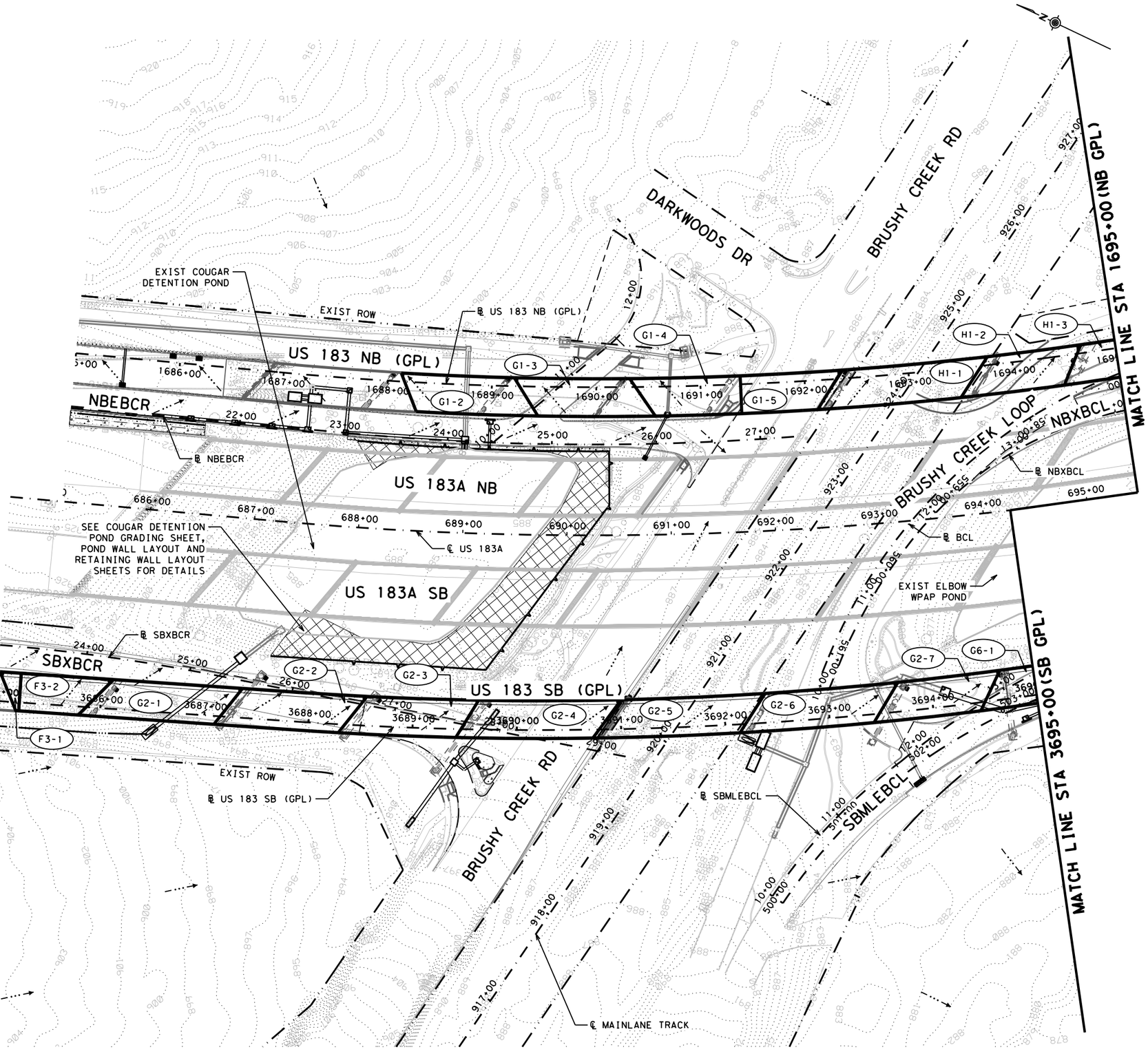

LEGEND

- R.O.W.
- EXISTING EASEMENT
- PROPOSED INTERIOR DRAINAGE AREA
- PROPOSED RDWY SAWCUT
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STATE OF TEXAS — BRYAN SIERSMA — 147188 — LICENSED PROFESSIONAL ENGINEER

BRYAN SIERSMA, P.E.

6/5/2024
DATE

APPROVAL

STATE OF TEXAS — DAN THOMA — 98622 — LICENSED PROFESSIONAL ENGINEER

DAN THOMA, P.E.

6/5/2024
DATE

0 50 100 150
SCALE: 1" = 100'

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SAN ANTONIO | AUSTIN | HOUSTON | FORT WORTH | DALLAS
2000 NW LOOP 410 | SAN ANTONIO, TX 78213 | 210.375.9000
TEXAS ENGINEERING FIRM #470 | TEXAS SURVEYING FIRM #10028800

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US 183 GPL
BRIDGE INTERIOR DRAINAGE AREA LAYOUT

SHEET 1 OF 6

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CONT	SECT	JOB	HIGHWAY
0151	10	001	US 183
DIST	COUNTY		SHEET NO.
AUS	WILLIAMSON		681

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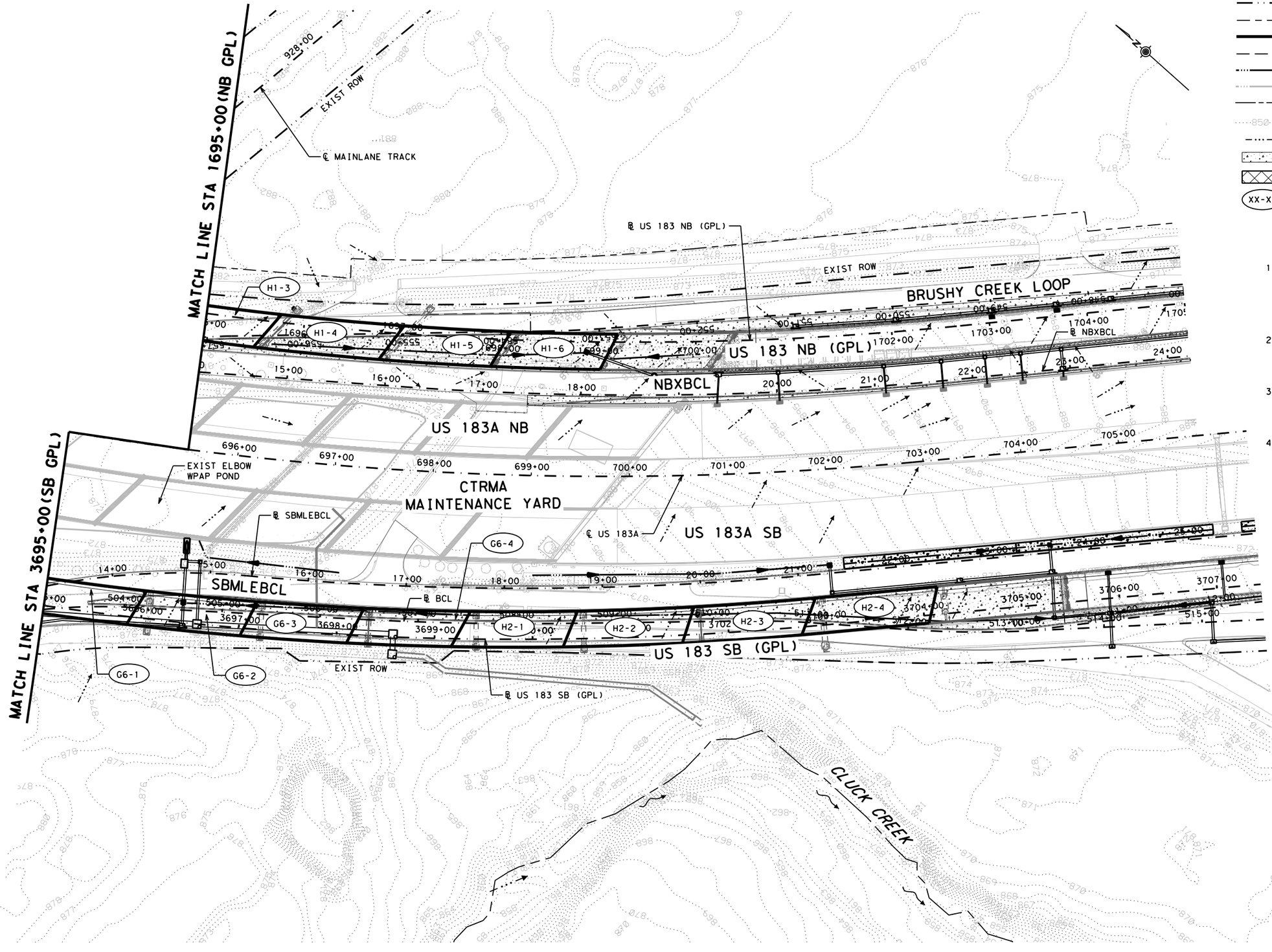

LEGEND

- R.O.W.
- EXISTING EASEMENT
- PROPOSED INTERIOR DRAINAGE AREA
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STATE OF TEXAS · BRYAN SIERSMA · 147188 · LICENSED PROFESSIONAL ENGINEER

BRYAN SIERSMA, P.E.

6/5/2024
DATE

APPROVAL

STATE OF TEXAS · DAN THOMA · 98622 · LICENSED PROFESSIONAL ENGINEER

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0 50 100 150

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SAN ANTONIO | AUSTIN | HOUSTON | FORT WORTH | DALLAS
2000 NW LOOP 410 | SAN ANTONIO, TX 78213 | 210.375.9000
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US 183 GPL
BRIDGE INTERIOR DRAINAGE AREA LAYOUT

SHEET 2 OF 6

© 2024	CONT	SECT	JOB	HIGHWAY
DS: CK:	0151	10	001	US 183
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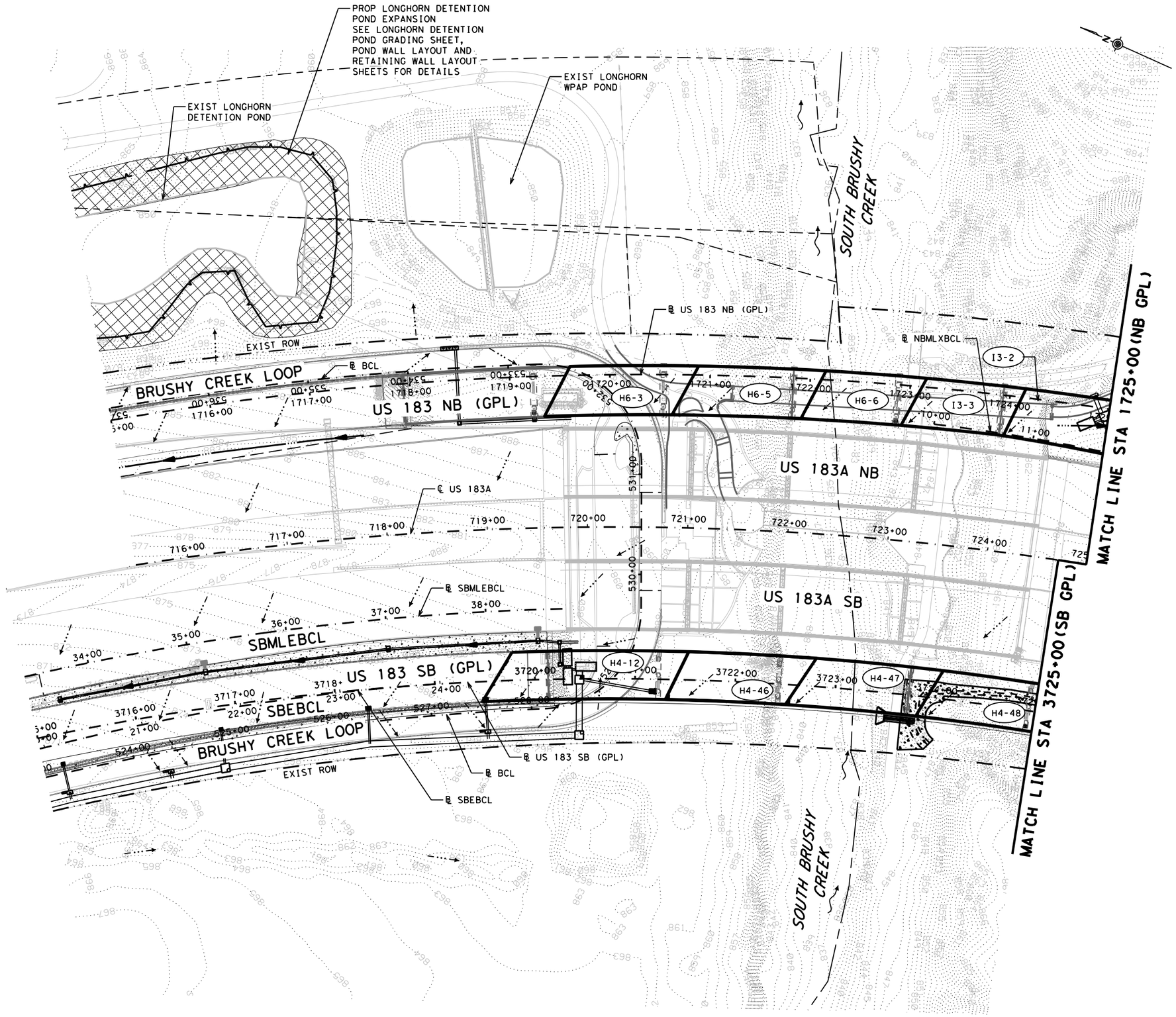

LEGEND

- R.O.W.
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APPROVAL

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BRIDGE INTERIOR DRAINAGE AREA LAYOUT

SHEET 3 OF 6

© 2024		CONT	SECT	JOB	HIGHWAY
DS:	CK:	0151	10	001	US 183
		DIST	COUNTY		SHEET NO.
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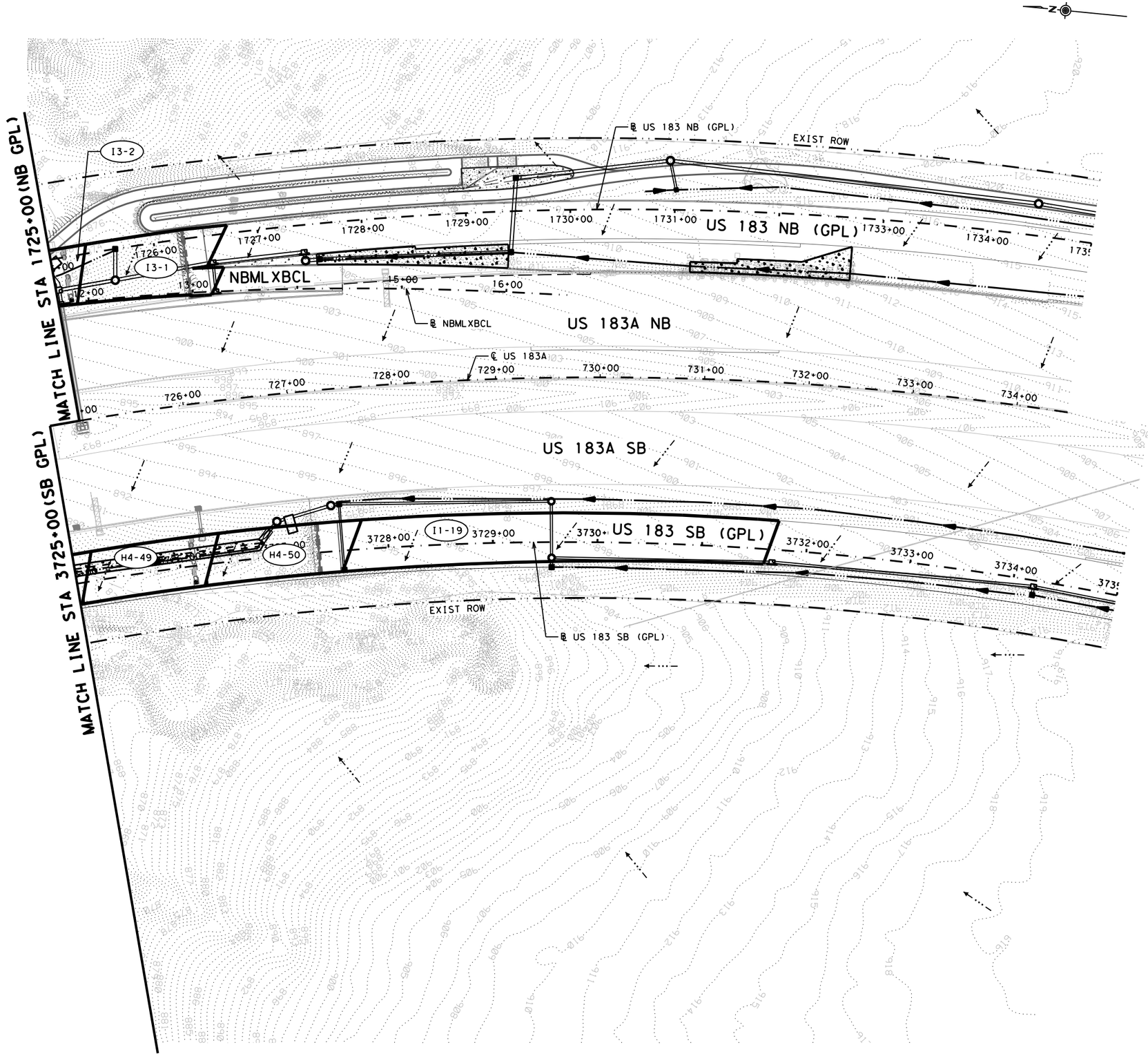

LEGEND

- R.O.W.
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4. C VALUES WERE DEVELOPED USING AERIAL PHOTOGRAPHY AND TABLE 4-10 IN TXDOT HYDRAULIC DESIGN MANUAL.

DESIGN

STATE OF TEXAS · BRYAN SIERSMA · 147188 · LICENSED PROFESSIONAL ENGINEER

BRYAN SIERSMA, P.E.

6/5/2024
DATE

APPROVAL

STATE OF TEXAS · DAN THOMA · 98622 · LICENSED PROFESSIONAL ENGINEER

DAN THOMA, P.E.

6/5/2024
DATE

0 50 100 150
SCALE: 1"= 100'

PAPE-DAWSON ENGINEERS
SAN ANTONIO | AUSTIN | HOUSTON | FORT WORTH | DALLAS
2000 NW LOOP 410 | SAN ANTONIO, TX 78213 | 210.375.9000
TEXAS ENGINEERING FIRM #470 | TEXAS SURVEYING FIRM #10028800

2024
Texas Department of Transportation

US 183 GPL
BRIDGE INTERIOR DRAINAGE AREA LAYOUT

SHEET 4 OF 6

© 2024	CONT	SECT	JOB	HIGHWAY
DS: CK:	0151	10	001	US 183
	DIST	COUNTY		SHEET NO.
DW: CK:	AUS	WILLIAMSON		684

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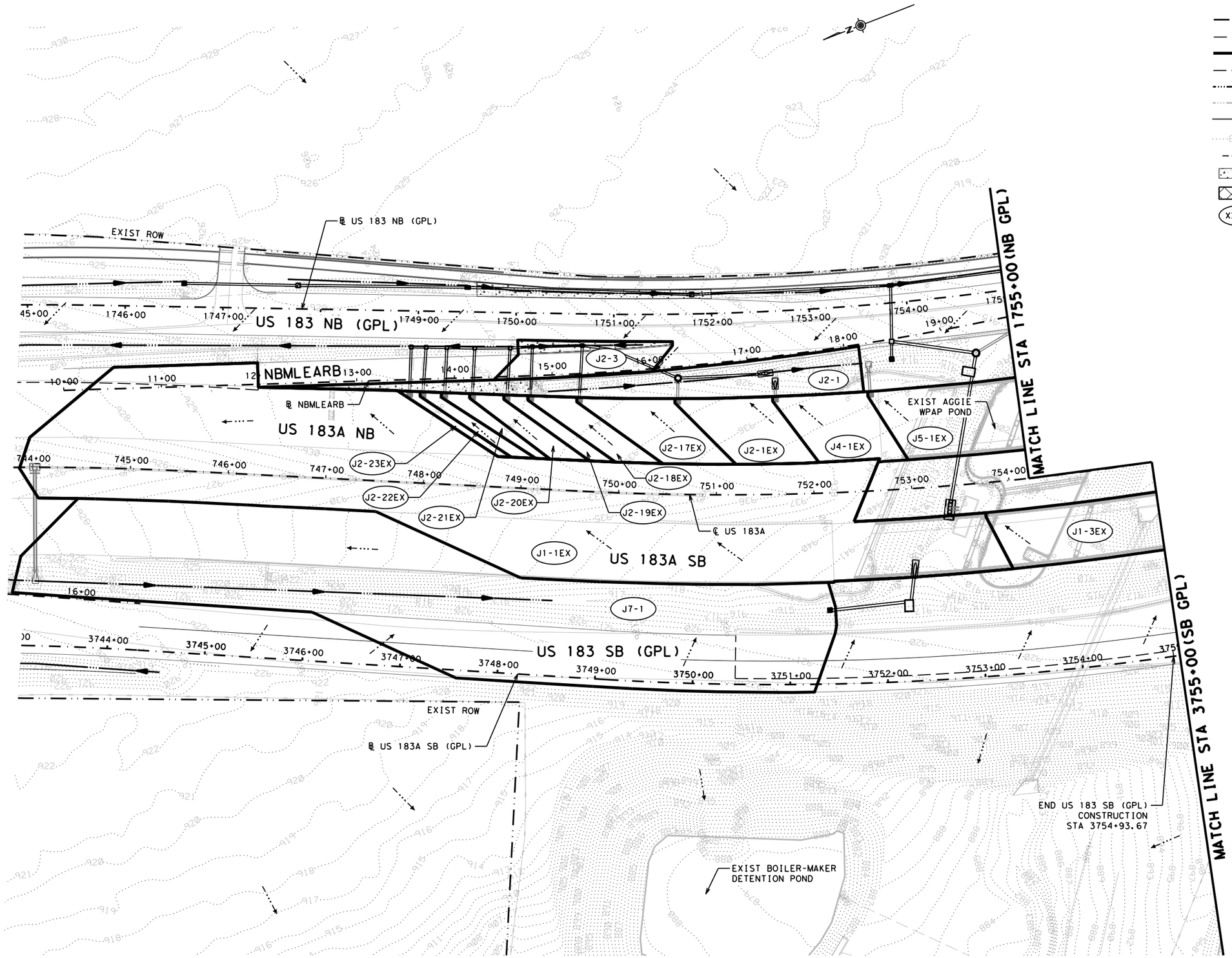

LEGEND

- R.O.W.
- EXISTING EASEMENT
- PROPOSED INTERIOR DRAINAGE AREA
- PROPOSED RDWY SAWCUT
- PROPOSED DITCH ℄
- EXISTING DITCH ℄
- CREEK ℄
- 850 1' CONTOURS
- FLOW ARROW
- CONCRETE RIPRAP
- PROPOSED DETENTION POND EXPANSION
- XX-XX DRAINAGE AREA ID

NOTES

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US 183 GPL
BRIDGE INTERIOR DRAINAGE AREA LAYOUT

SHEET 5 OF 6

© 2024	CONT	SECT	JOB	HIGHWAY
DS: CK:	0151	10	001	US 183
DW: CK:	DIST	COUNTY		SHEET NO.
	AUS	WILLIAMSON		685

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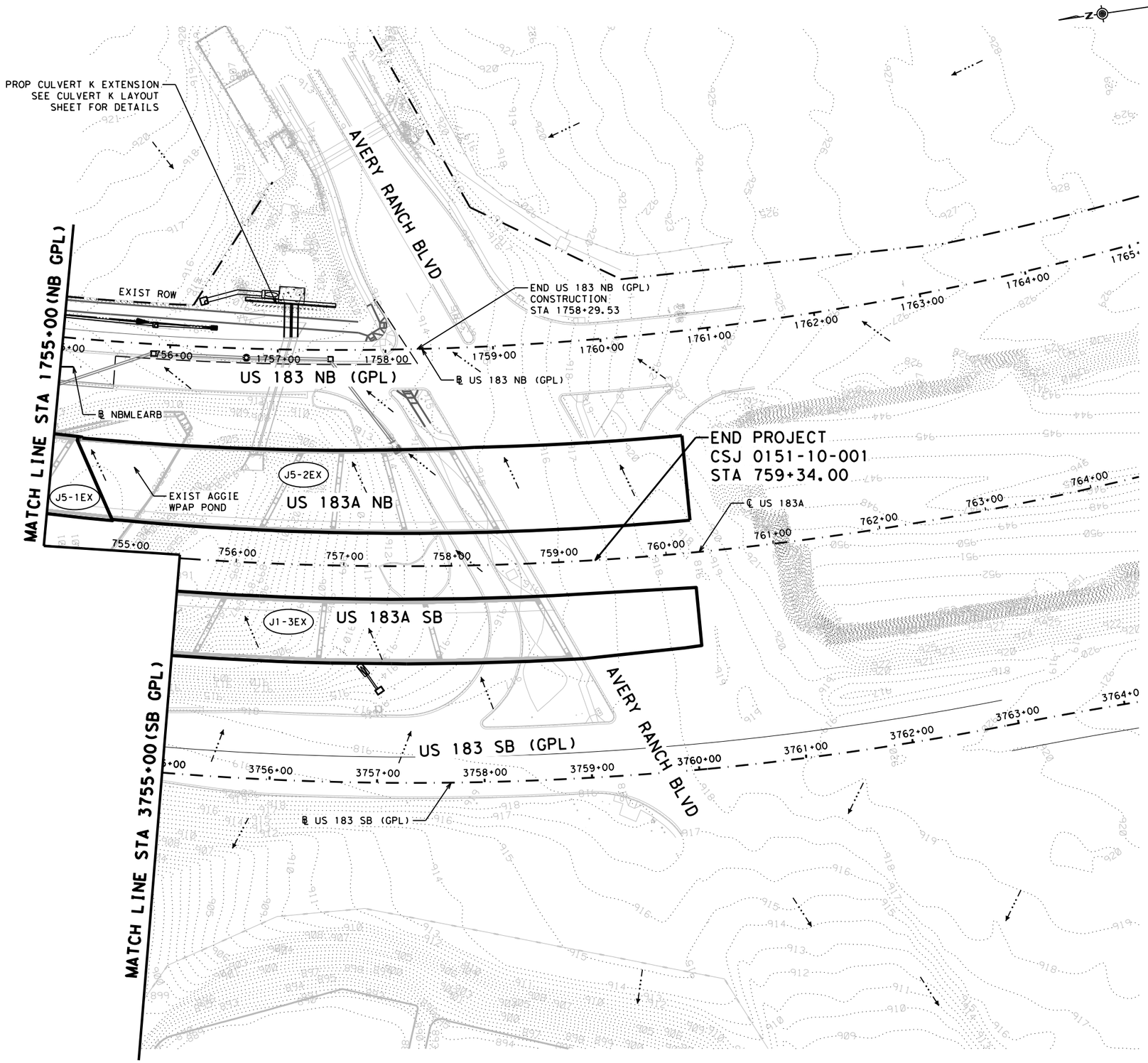

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BRYAN SIERSMA, P.E.
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Texas Department of Transportation

US 183 GPL
BRIDGE INTERIOR DRAINAGE AREA LAYOUT

SHEET 6 OF 6

© 2024

DS:	CK:	CONT	SECT	JOB	HIGHWAY
		0151	10	001	US 183
DW:	CK:	DIST	COUNTY		SHEET NO.
		AUS	WILLIAMSON		686

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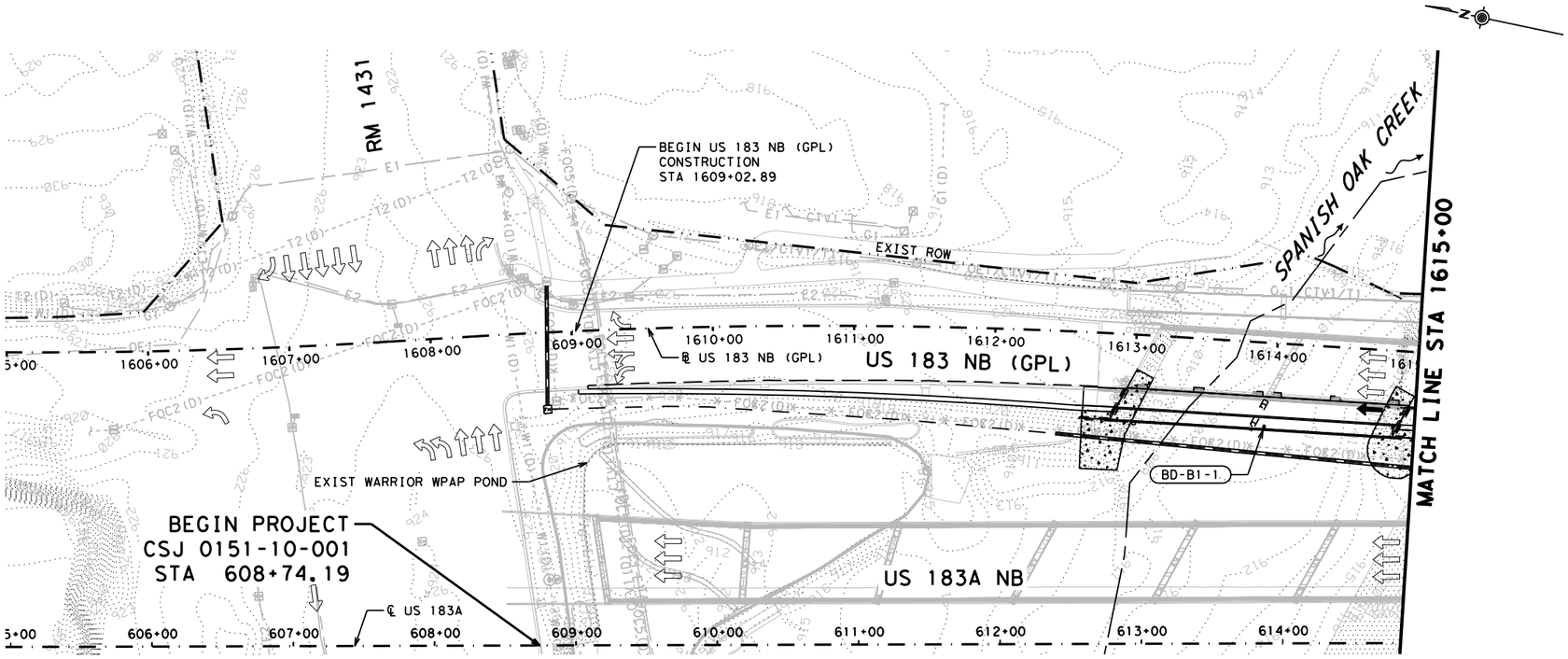

LEGEND

- EXIST TRAFFIC FLOW ARROW
- PROP TRAFFIC FLOW ARROW
- PROPERTY EASEMENT
- PROPOSED RDWY SAWCUT
- W 12" EXISTING UTILITY
- CREEK ℄
- HGL (10 YR STORM)
- EGL (10 YR STORM)
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8. SEE CTRMA ITS SHEETS FOR LOCATION AND ADDITIONAL INFORMATION.

NO PROPOSED DRAINAGE PROFILES THIS SHEET

940
930
920
910
900

1605+00 1606+00 1607+00 1608+00 1609+00 1610+00 1611+00 1612+00 1613+00 1614+00 1615+00

NOTE:

FOR INLETS/MANHOLES ON GRADE, TOPS SHALL BE PLACED FLUSH WITH THE SLOPE OF THE FINISHED GRADE AND SHALL NOT BE LEVEL. FOR NODES WITH MULTIPLE INLETS, THE ELEVATION SHOWN REPRESENTS THE CENTER ELEVATION. CONSTRUCT INLET TOPS ACCORDINGLY, FLUSH WITH THE SLOPE OF THE FINISHED GRADE. SEE "MISCELLANEOUS DRAINAGE DETAILS - INLET REFERENCE POINTS".

DESIGN

STATE OF TEXAS · BRYAN SIERSMA · 147188 · LICENSED PROFESSIONAL ENGINEER

BRYAN SIERSMA, P.E.

4/24/2024
DATE

APPROVAL

STATE OF TEXAS · DAN THOMA · 98622 · LICENSED PROFESSIONAL ENGINEER

DAN THOMA, P.E.

4/24/2024
DATE

0 50 100

SCALE: PLAN 1" = 100'
PROFILE: 1" = 10'

PAPE-DAWSON ENGINEERS
SAN ANTONIO | AUSTIN | HOUSTON | FORT WORTH | DALLAS
2000 NW LOOP 410 | SAN ANTONIO, TX 78213 | 210.375.9000
TEXAS ENGINEERING FIRM #470 | TEXAS SURVEYING FIRM #10028800

2024 Texas Department of Transportation

US 183 GPL

NB STORM SEWER PLAN & PROFILE

SHEET 1 OF 16

© 2024		CONT	SECT	JOB	HIGHWAY
DS:	CK:	0151	10	001	US 183
		DIST	COUNTY		SHEET NO.
DW:	CK:	AUS	WILLIAMSON		731

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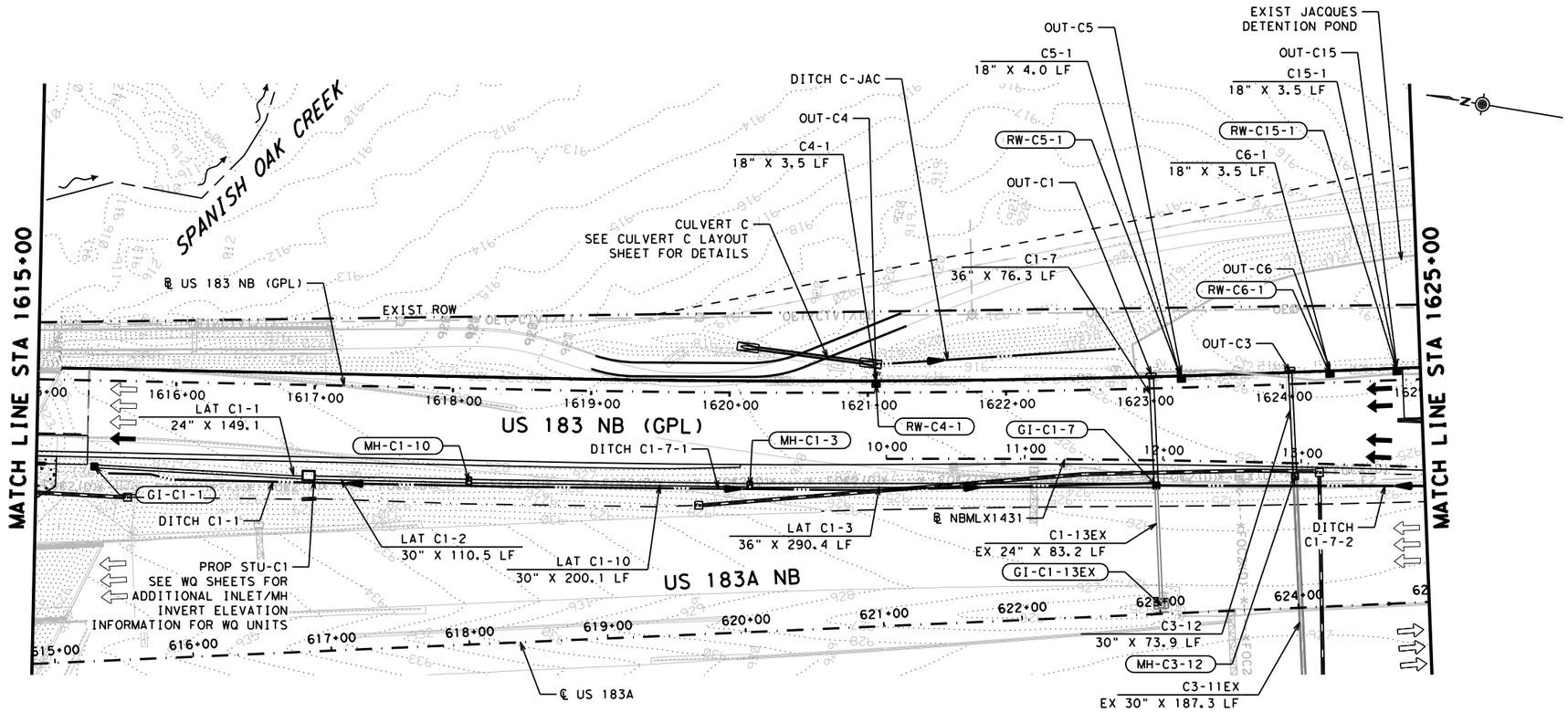

LEGEND

- EXIST TRAFFIC FLOW ARROW
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- PROPERTY EASEMENT
- PROPOSED RDWY SAWCUT
- W 12" EXISTING UTILITY
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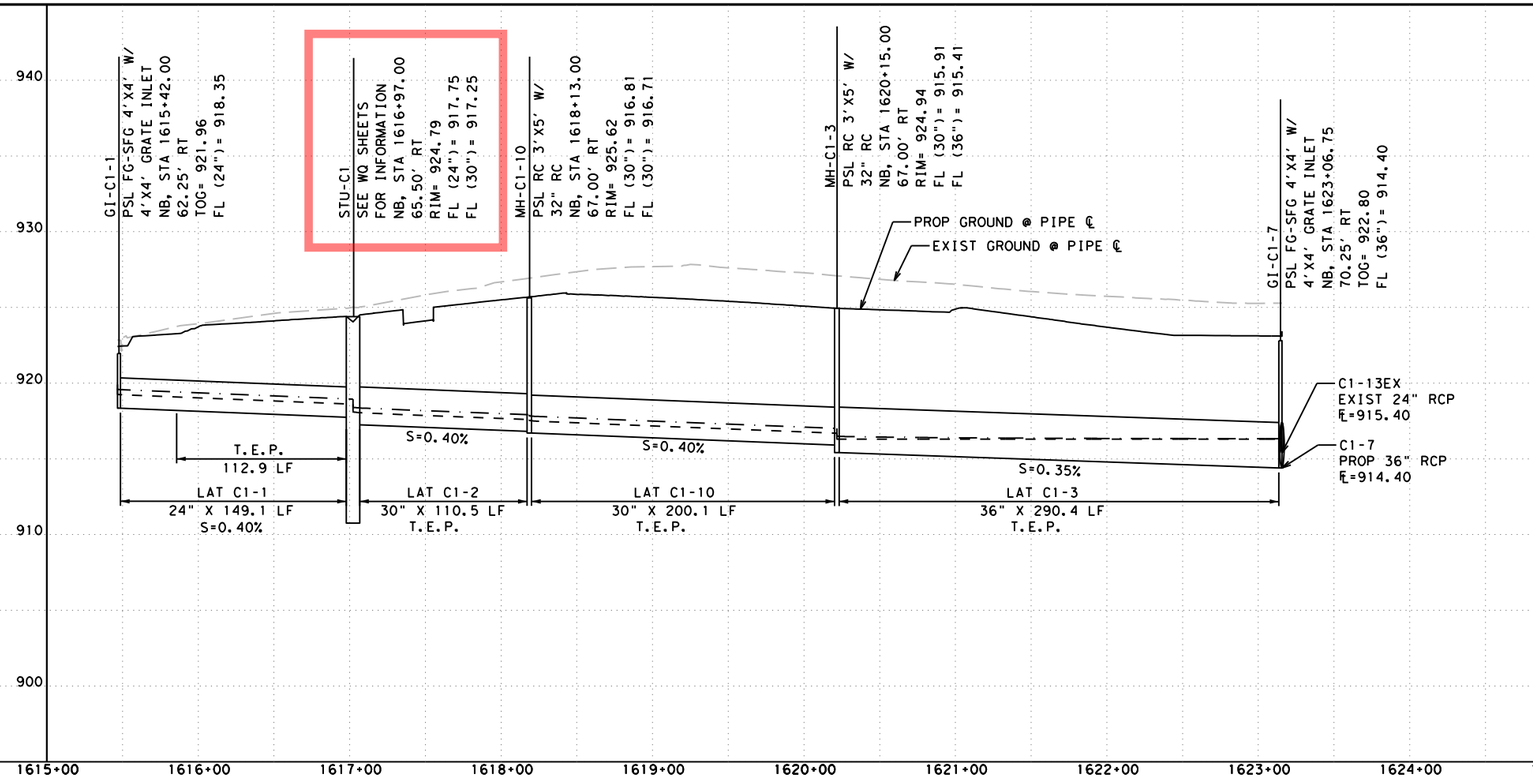

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DESIGN

STATE OF TEXAS — BRYAN SIERSMA — 147188 — LICENSED PROFESSIONAL ENGINEER

BRYAN SIERSMA, P.E.

6/5/2024
DATE

APPROVAL

STATE OF TEXAS — DAN THOMA — 98622 — LICENSED PROFESSIONAL ENGINEER

DAN THOMA, P.E.

6/5/2024
DATE

0 50 100

SCALE: PLAN 1" = 100'
PROFILE: 1" = 10'

PAPE-DAWSON ENGINEERS

SAN ANTONIO | AUSTIN | HOUSTON | FORT WORTH | DALLAS
2000 NW LOOP 410 | SAN ANTONIO, TX 78213 | 210.375.9000
TEXAS ENGINEERING FIRM #470 | TEXAS SURVEYING FIRM #10028800

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US 183 GPL

NB STORM SEWER PLAN & PROFILE

SHEET 2 OF 16

© 2024		CONT	SECT	JOB	HIGHWAY
DS:	CK:	0151	10	001	US 183
		DIST	COUNTY		SHEET NO.
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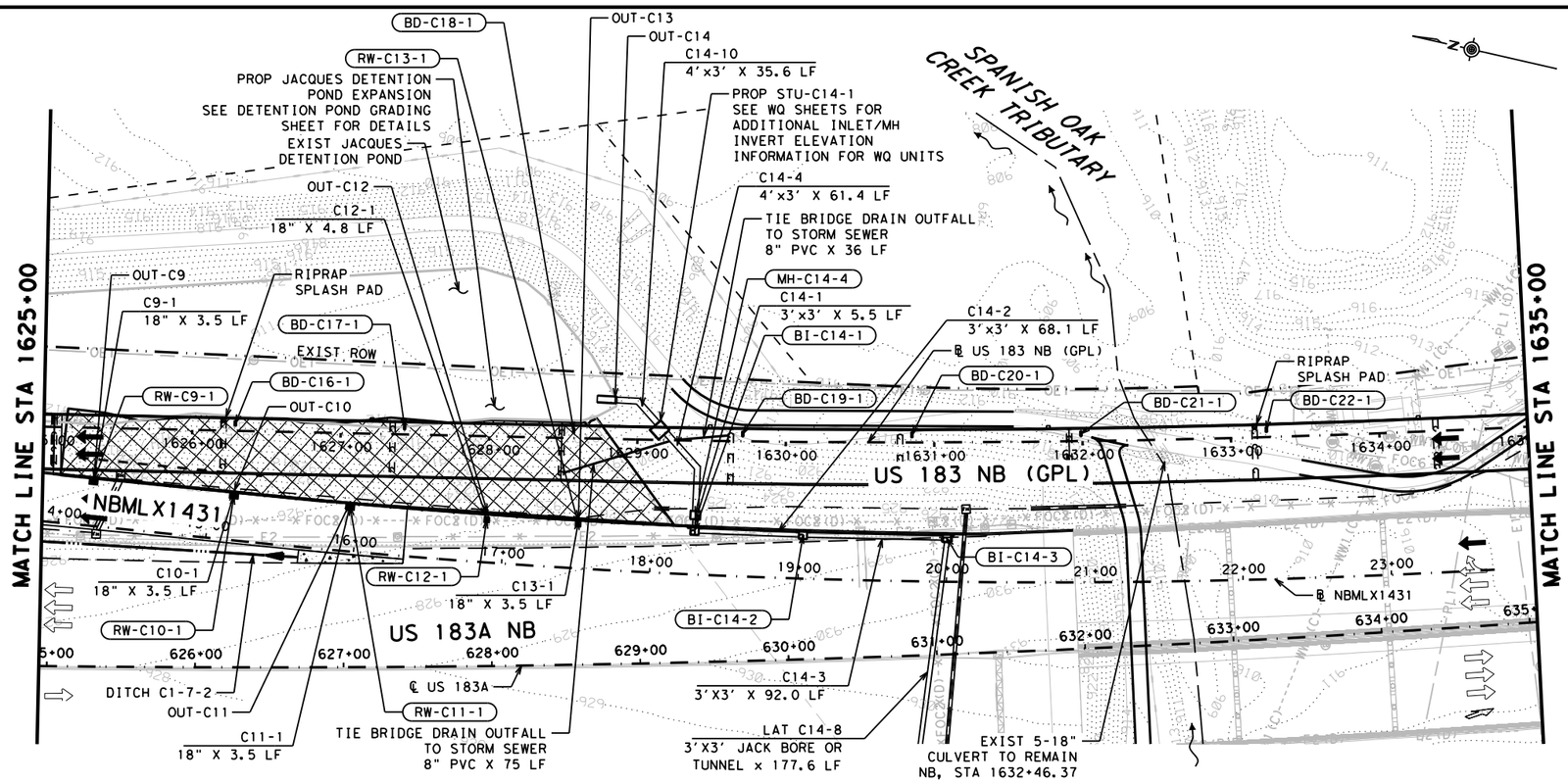

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- PROPOSED RDWY SAWCUT
- W 12" EXISTING UTILITY
- CREEK ℄
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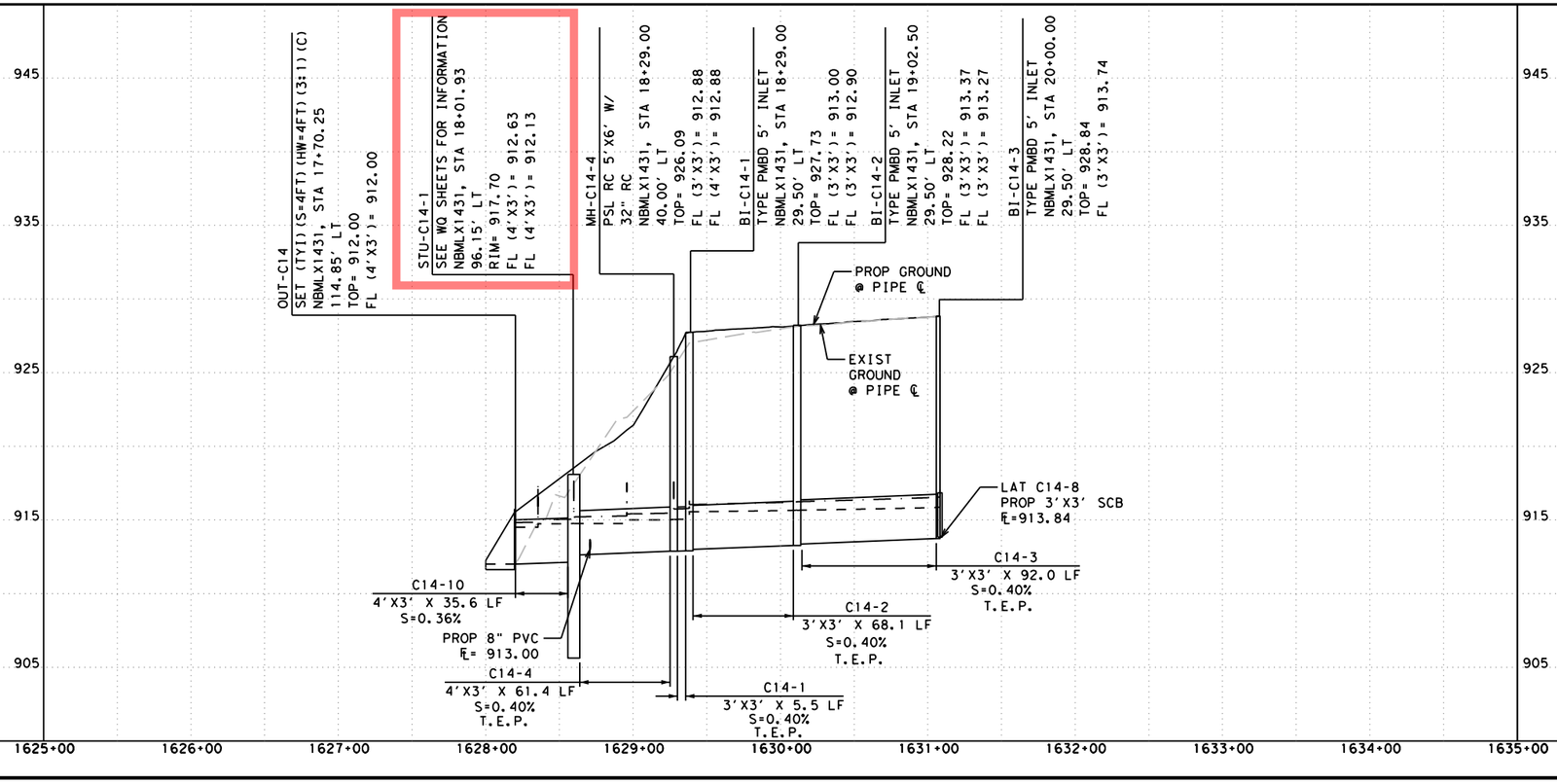

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DESIGN

STATE OF TEXAS — BRYAN SIERSMA — 147188 — LICENSED PROFESSIONAL ENGINEER

BRYAN SIERSMA, P.E.

6/5/2024
DATE

APPROVAL

STATE OF TEXAS — DAN THOMA — 98622 — LICENSED PROFESSIONAL ENGINEER

DAN THOMA, P.E.

6/5/2024
DATE

0 50 100

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2000 NW LOOP 410 | SAN ANTONIO, TX 78213 | 210.375.9000
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US 183 GPL

NB STORM SEWER PLAN & PROFILE

SHEET 3 OF 16

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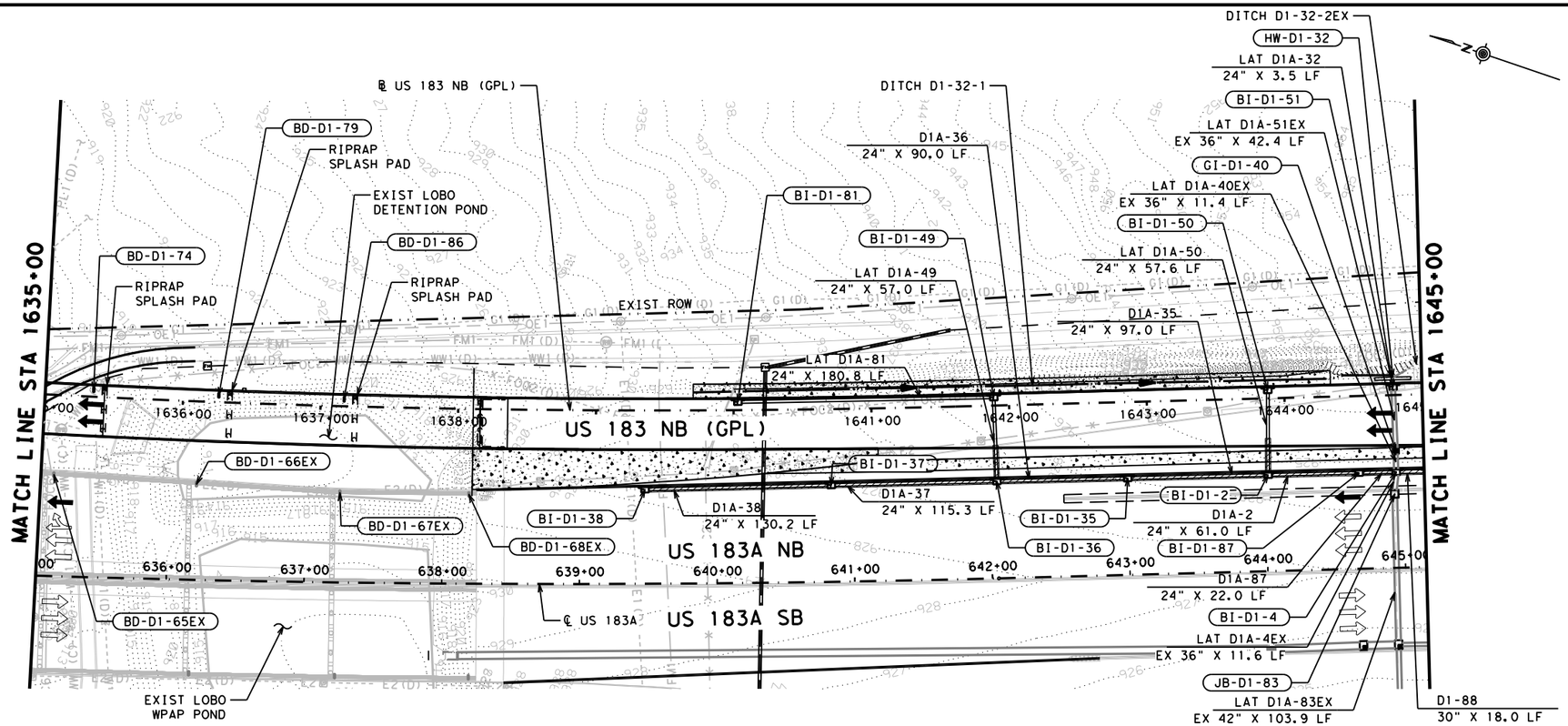

LEGEND

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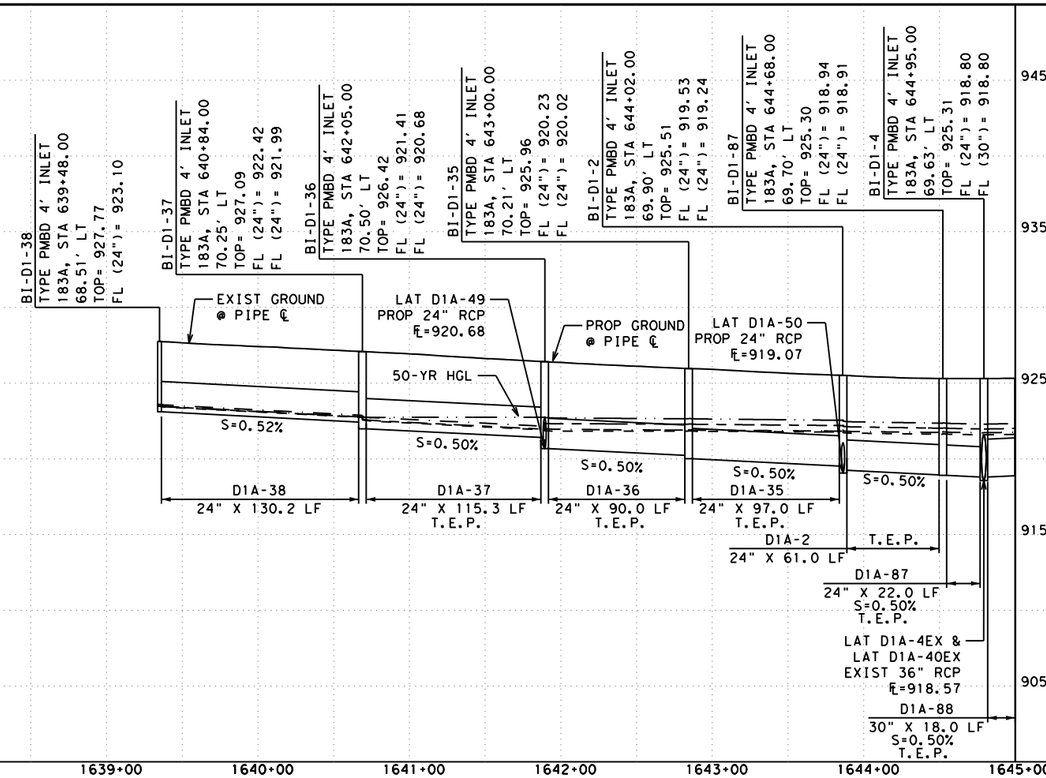

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BRYAN SIERSMA, P.E.

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US 183 GPL

NB STORM SEWER PLAN & PROFILE

SHEET 4 OF 16

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DS:	CK:	0151	10	001	US 183
		DIST	COUNTY		SHEET NO.
DW:	CK:	AUS	WILLIAMSON		734

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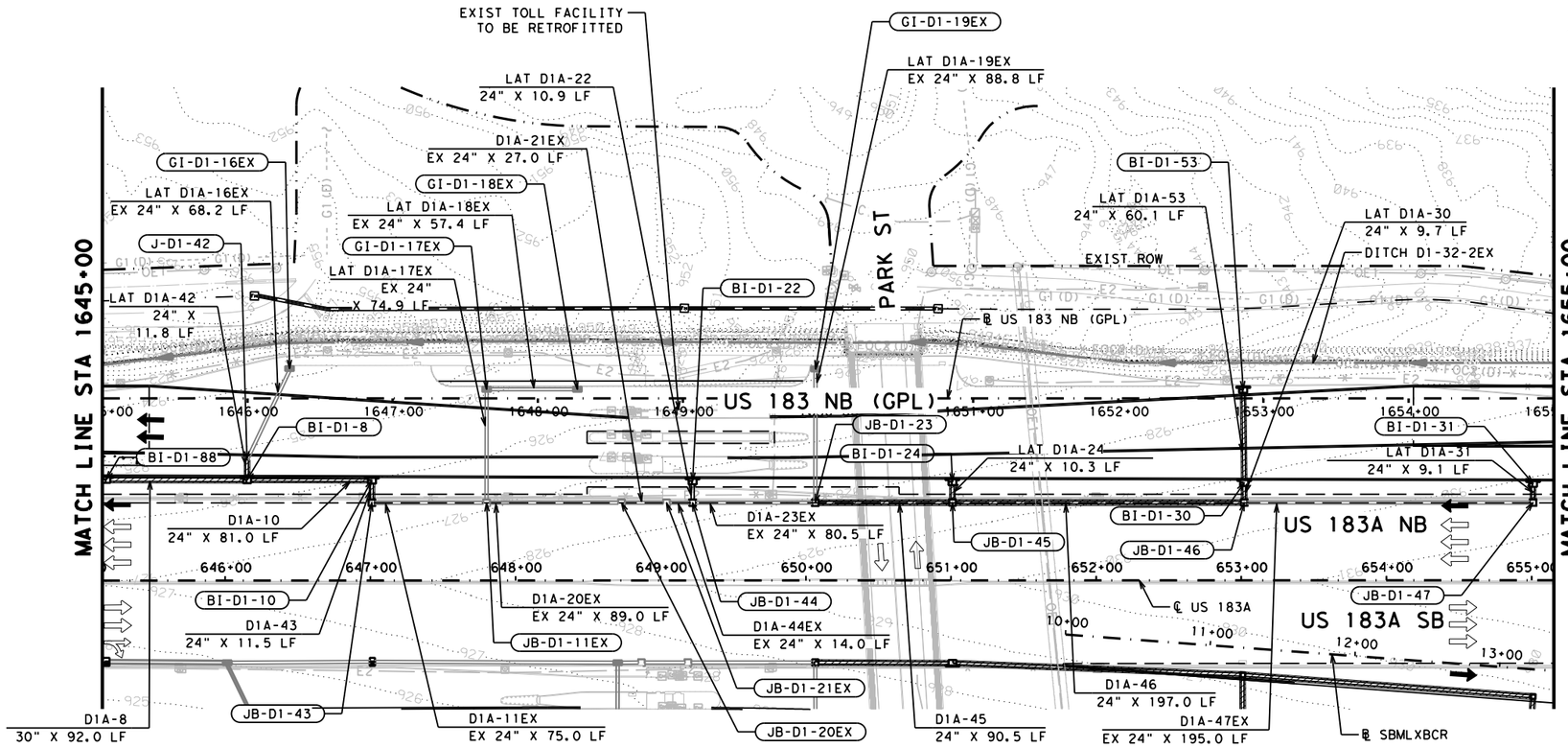

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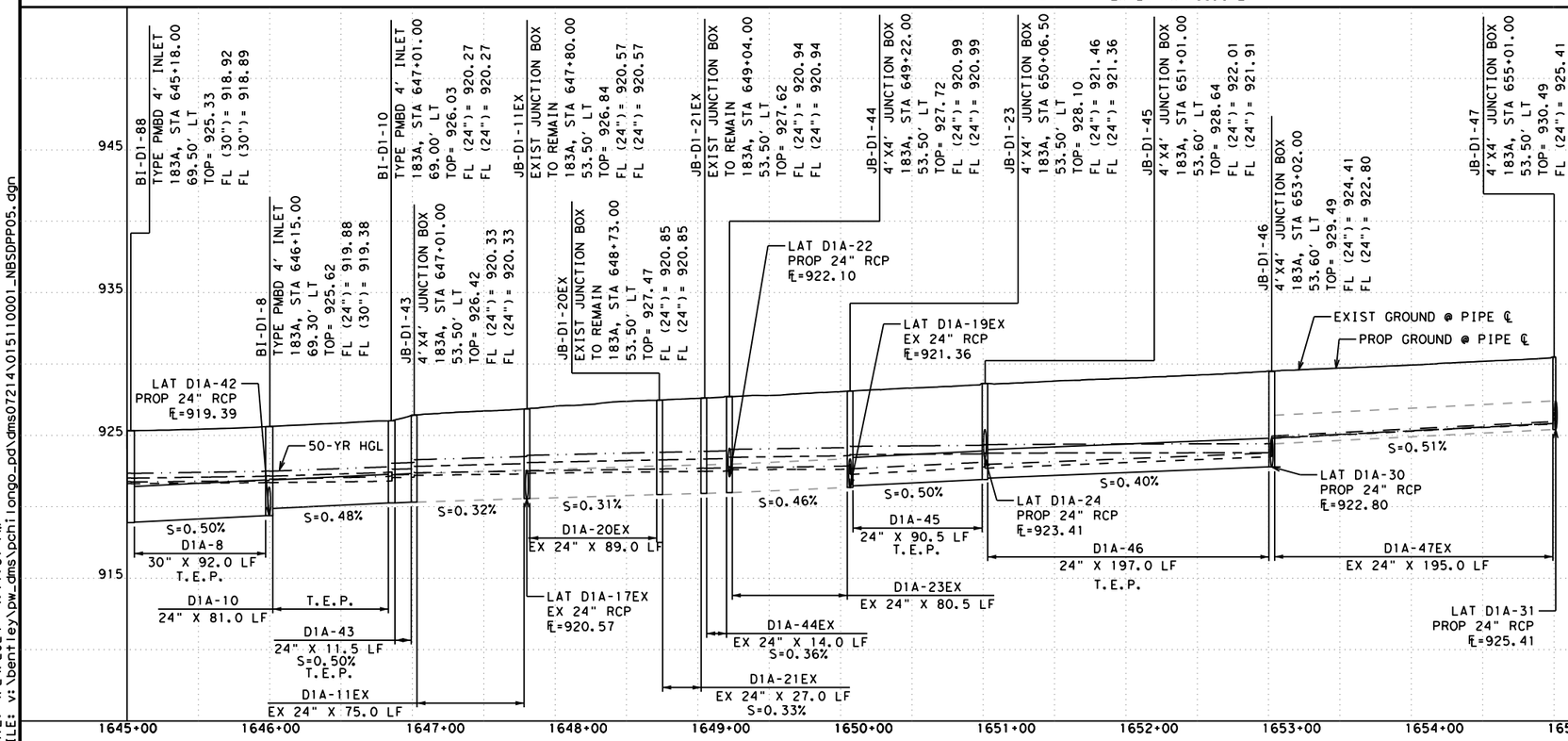

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BRYAN SIERSMA, P.E.

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0 50 100

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PROFILE: 1" = 10'

PAPE-DAWSON ENGINEERS

SAN ANTONIO | AUSTIN | HOUSTON | FORT WORTH | DALLAS
2000 NW LOOP 410 | SAN ANTONIO, TX 78213 | 210.375.9000
TEXAS ENGINEERING FIRM #470 | TEXAS SURVEYING FIRM #10028800

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US 183 GPL

NB STORM SEWER PLAN & PROFILE

SHEET 5 OF 16

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DS:	CK:	0151	10	001	US 183
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		AUS	WILLIAMSON		735

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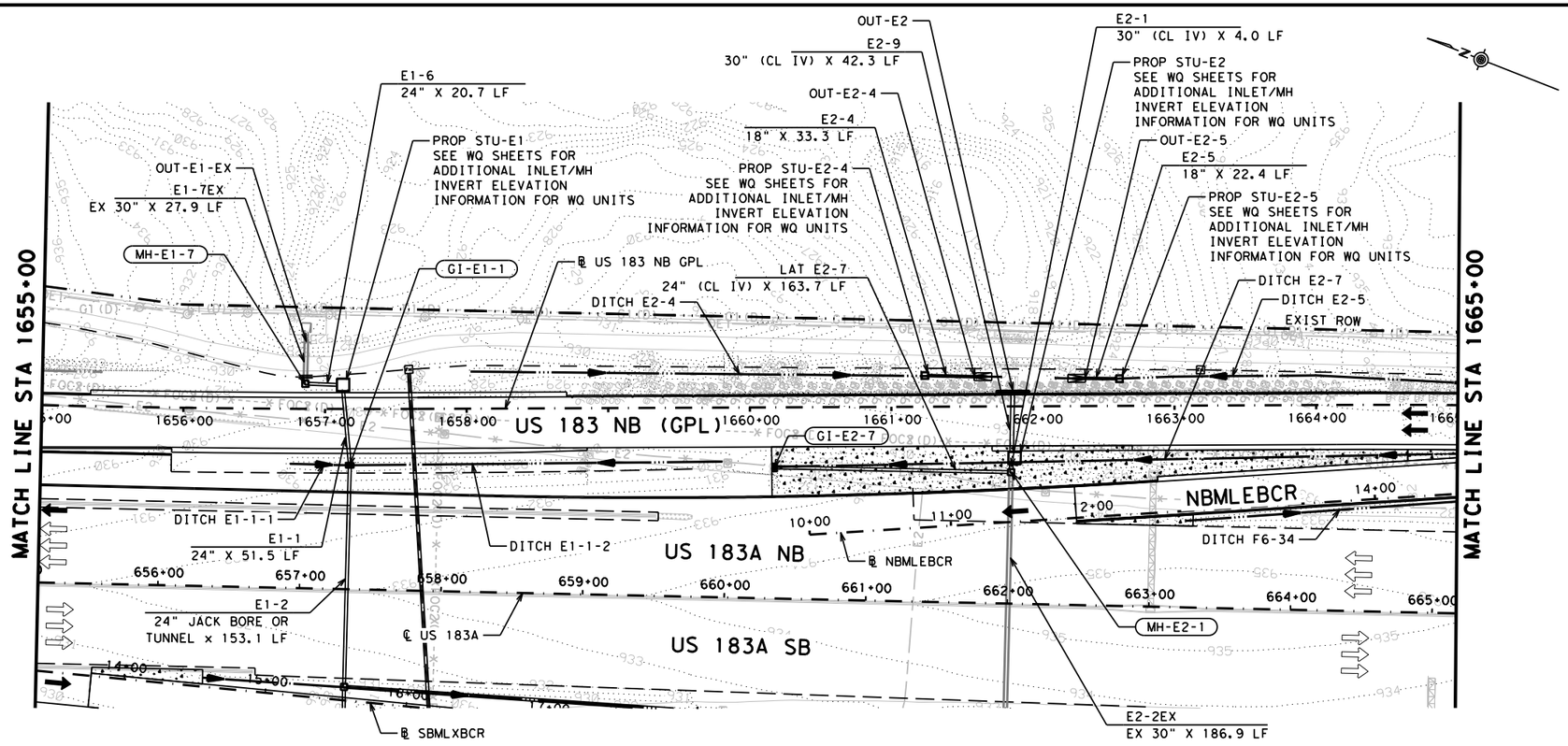

LEGEND

- EXIST TRAFFIC FLOW ARROW
- PROP TRAFFIC FLOW ARROW
- PROPERTY EASEMENT
- PROPOSED RDWY SAWCUT
- EXISTING UTILITY
- CREEK ℄
- HGL (10 YR STORM)
- EGL (10 YR STORM)
- PROPOSED DITCH ℄
- EXISTING DITCH ℄
- 1' CONTOURS
- CUT AND RESTORE
- PROP DETENTION POND EXPANSION

NOTES

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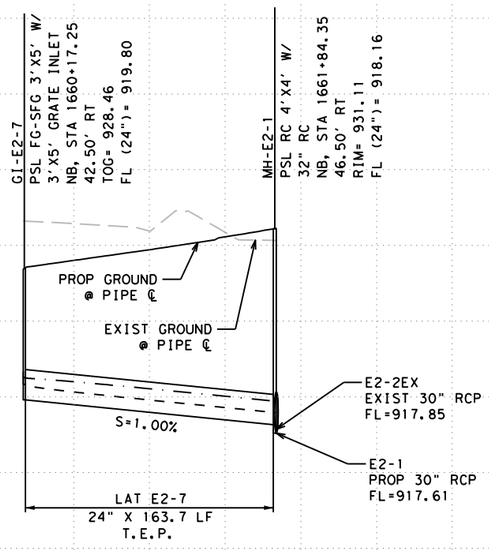

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DESIGN

STATE OF TEXAS — BRYAN SIERSMA — 147188 — LICENSED PROFESSIONAL ENGINEER

BRYAN SIERSMA, P.E.

6/5/2024
DATE

APPROVAL

STATE OF TEXAS — DAN THOMA — 98622 — LICENSED PROFESSIONAL ENGINEER

DAN THOMA, P.E.

6/5/2024
DATE

SCALE: PLAN 1" = 100'
PROFILE: 1" = 10'

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SHEET 6 OF 16

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		AUS	WILLIAMSON		736

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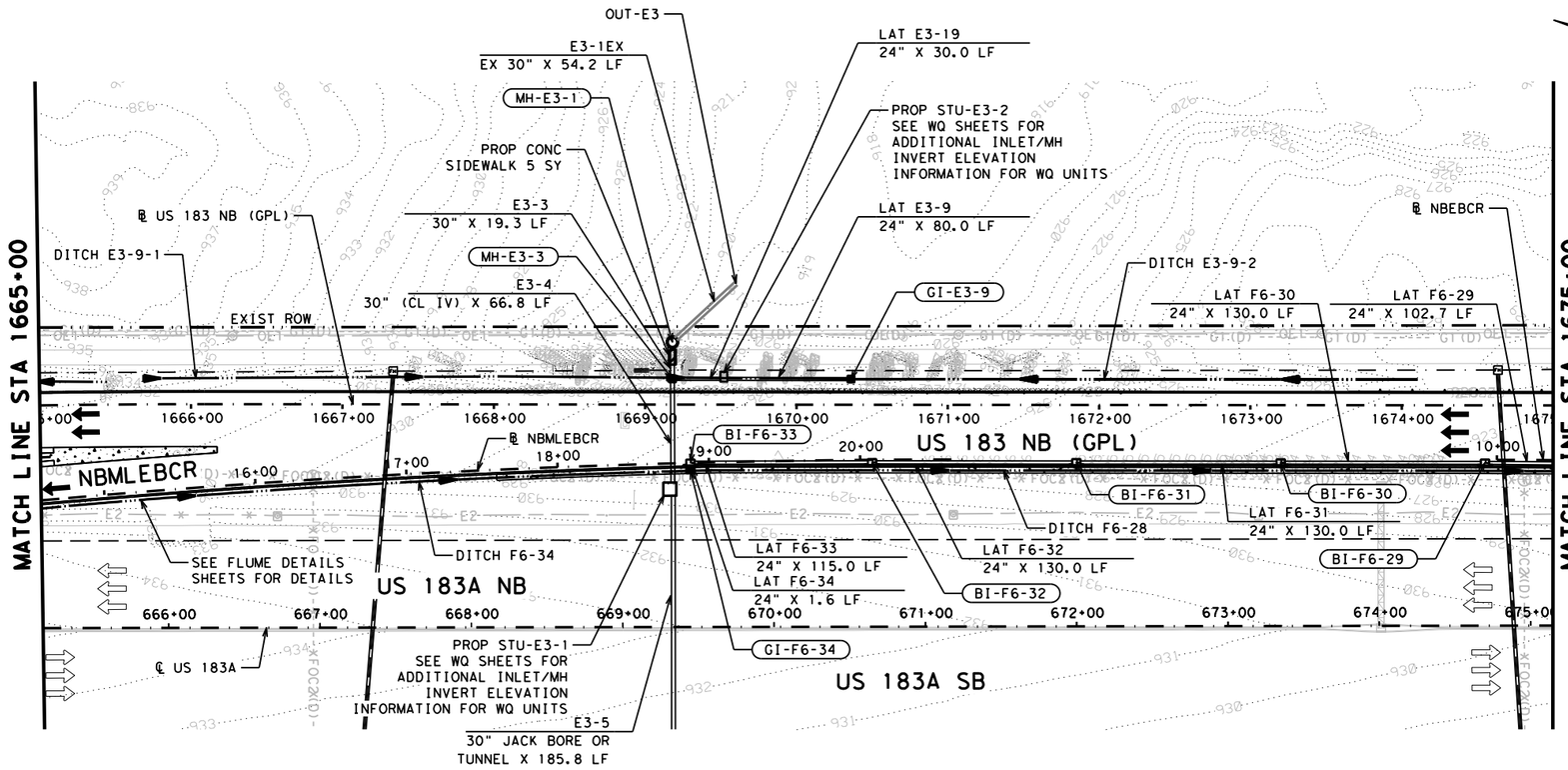

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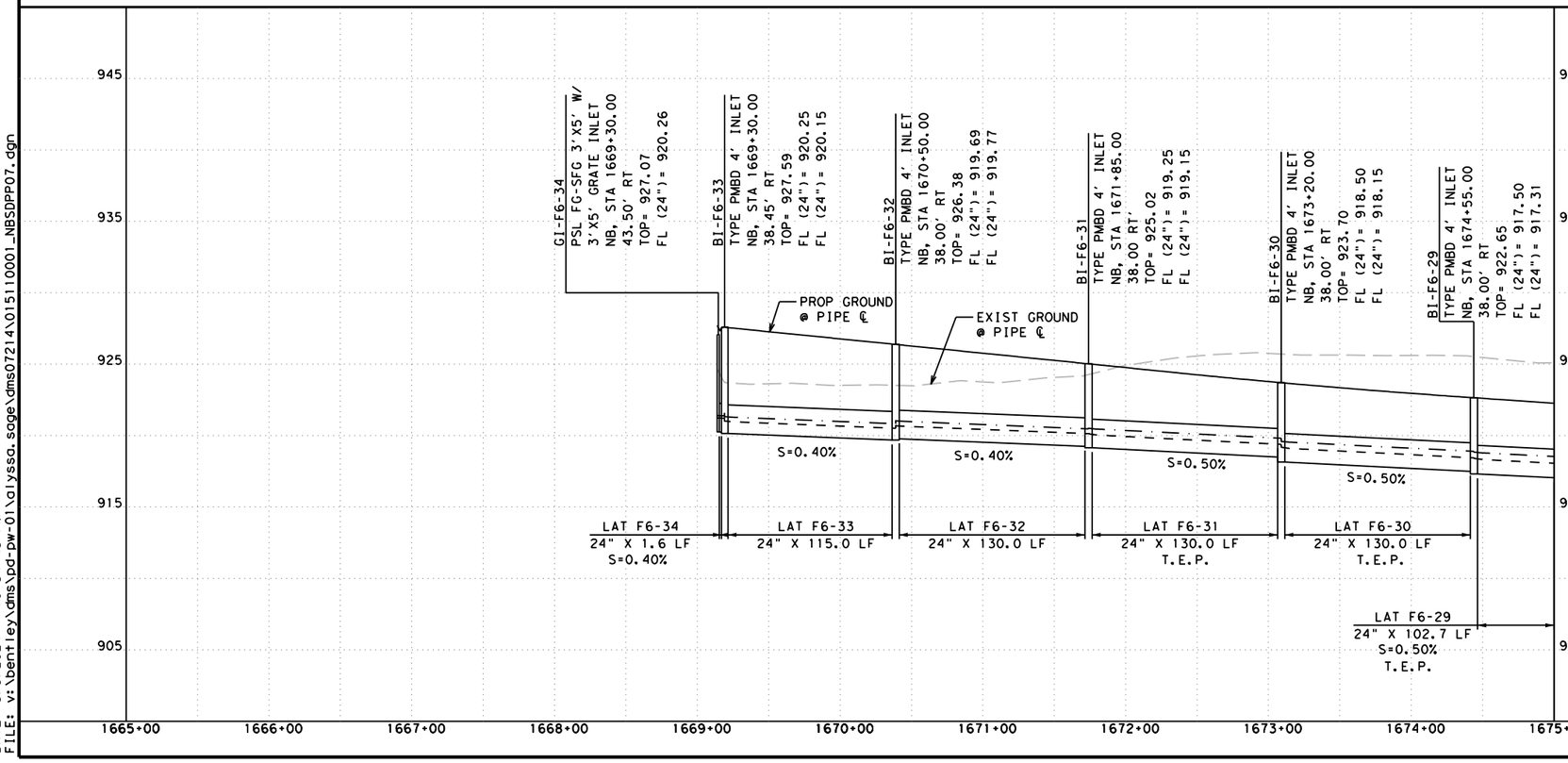

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STATE OF TEXAS — BRYAN SIERSMA — 147188 — LICENSED PROFESSIONAL ENGINEER

BRYAN SIERSMA, P.E.

5/9/2024
DATE

APPROVAL

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DAN THOMA, P.E.

5/9/2024
DATE

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SCALE: PLAN 1" = 100'
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PAPE-DAWSON ENGINEERS
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		AUS	WILLIAMSON		737

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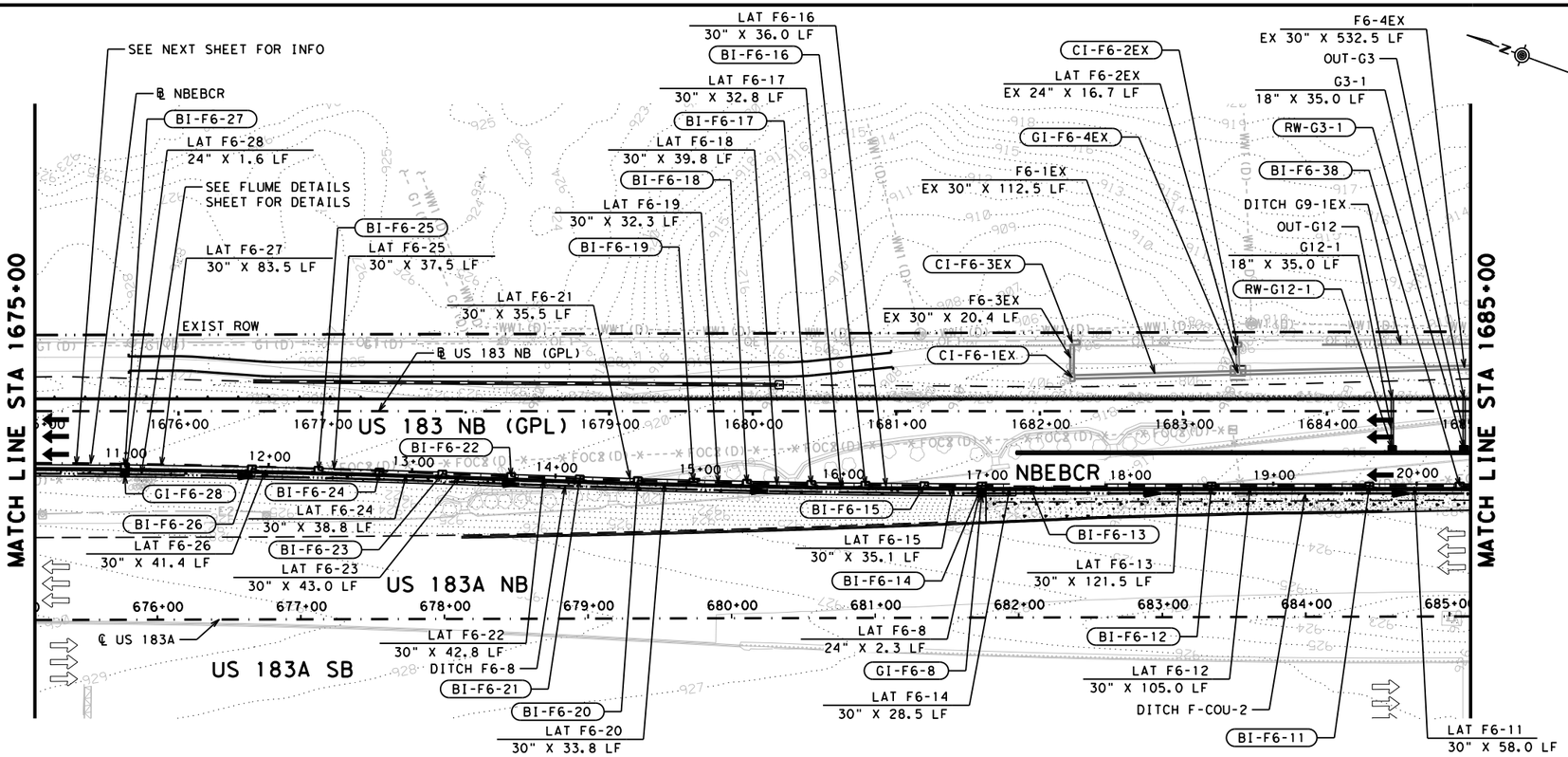

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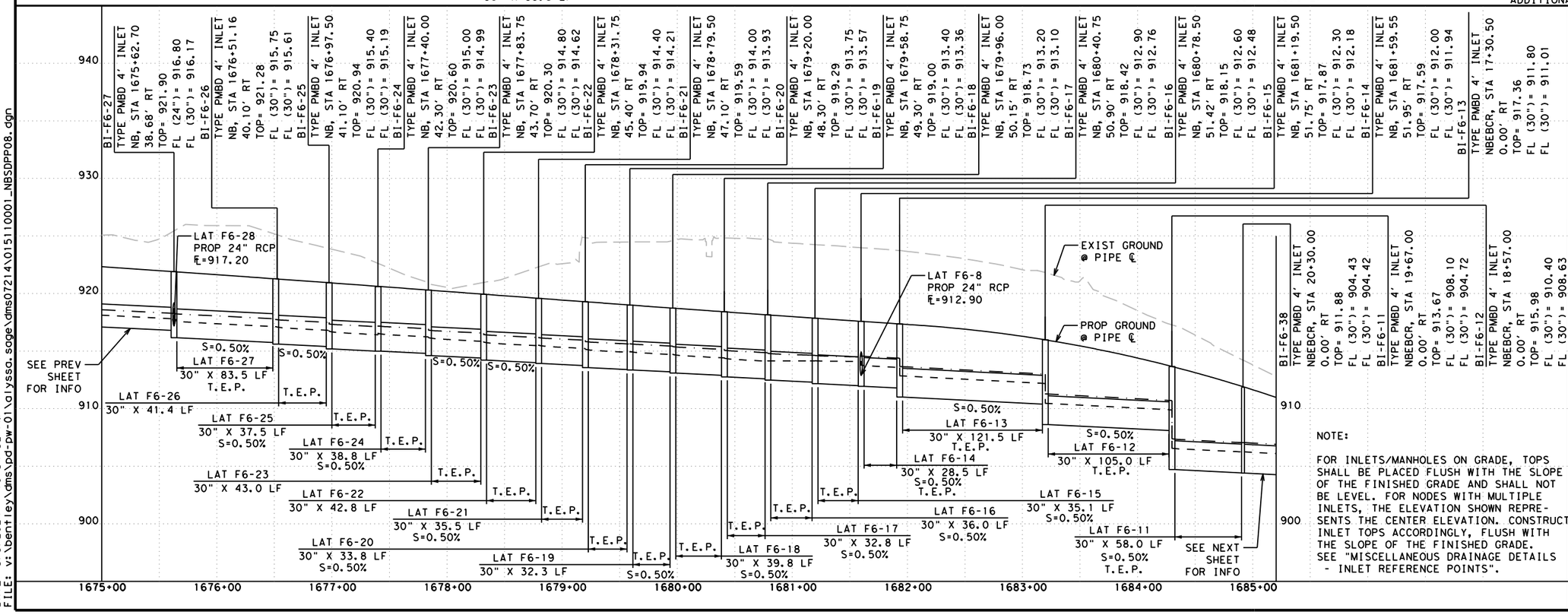

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STATE OF TEXAS · BRYAN SIERSMA · 147188 · LICENSED PROFESSIONAL ENGINEER

BRYAN SIERSMA, P.E.

5/9/2024
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APPROVAL

STATE OF TEXAS · DAN THOMA · 98622 · LICENSED PROFESSIONAL ENGINEER

DAN THOMA, P.E.

5/9/2024
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PAPE-DAWSON ENGINEERS

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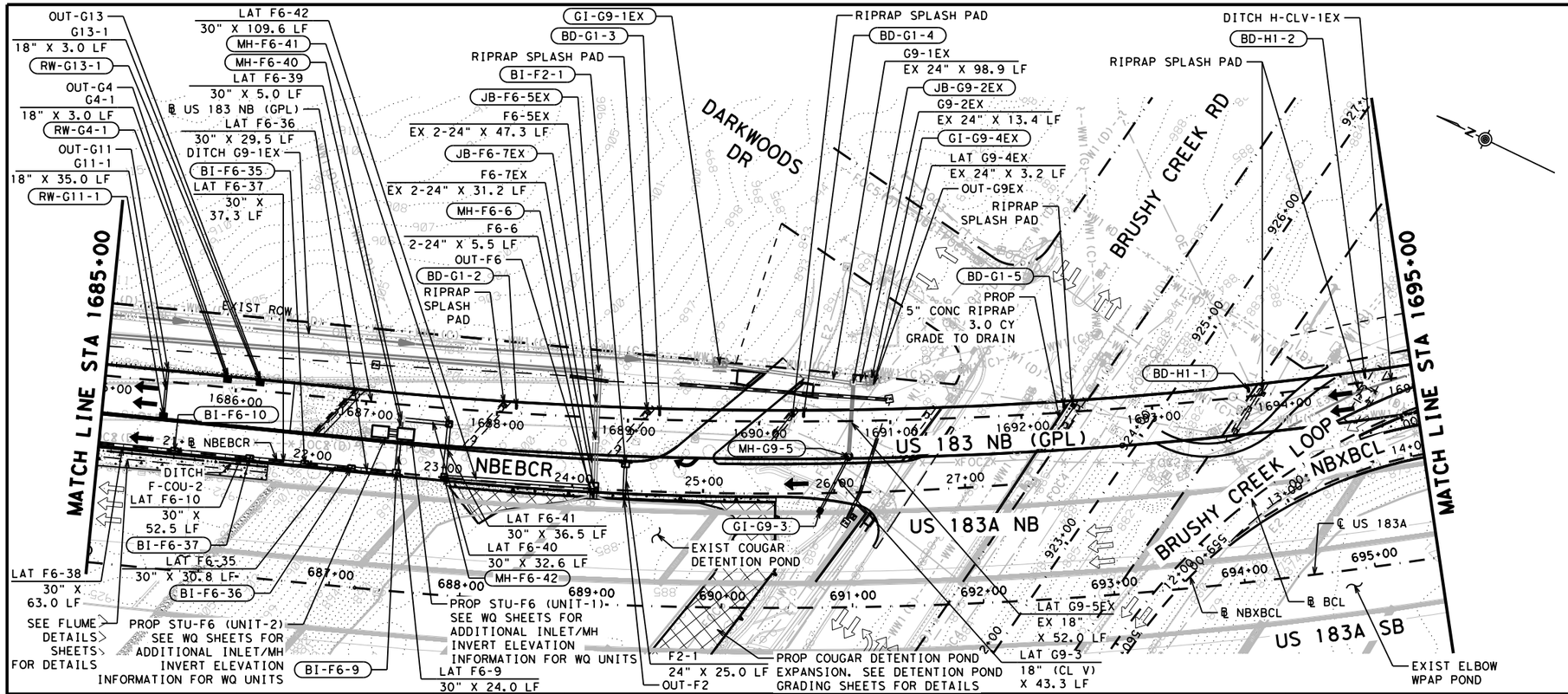

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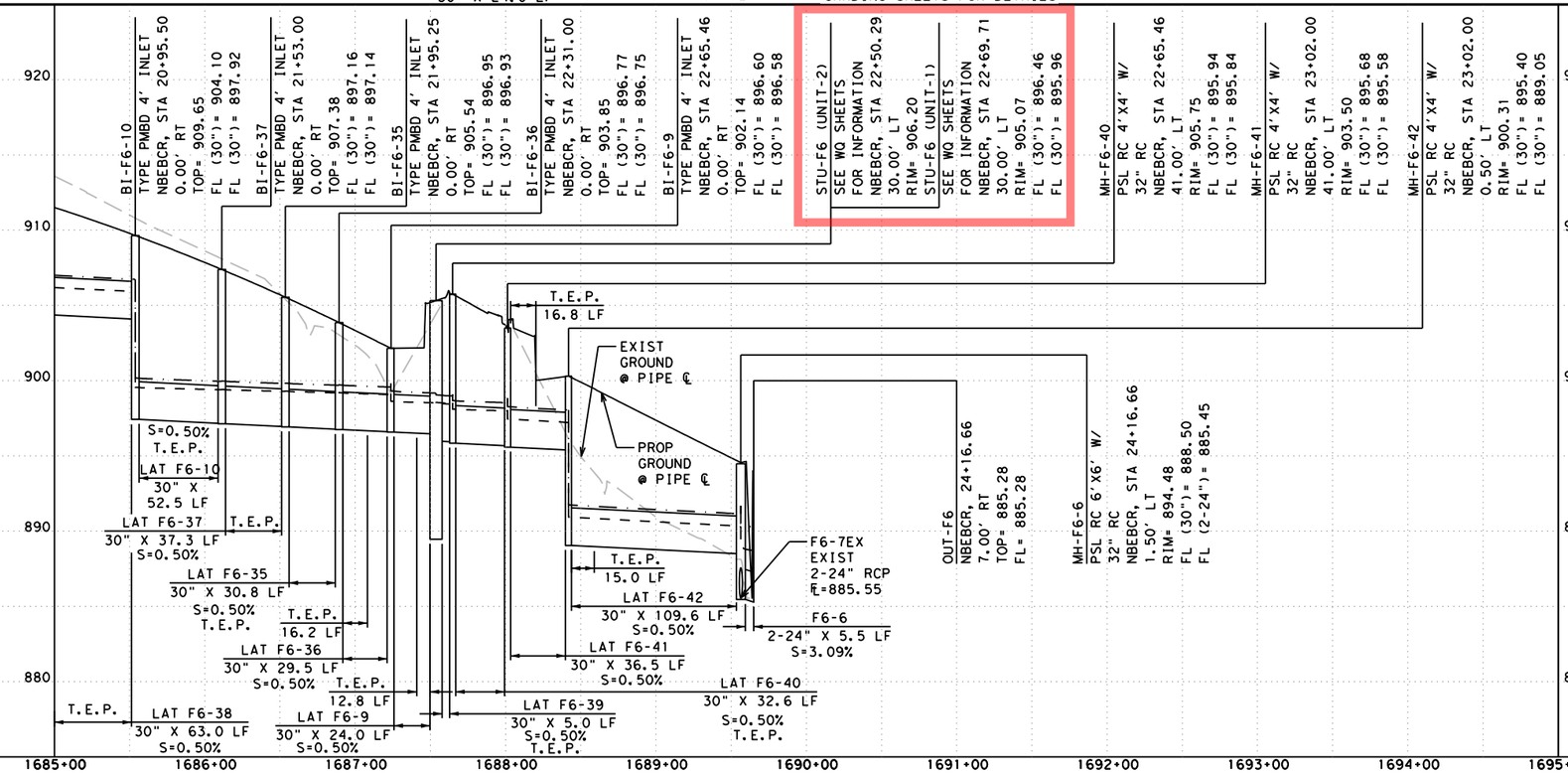

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STATE OF TEXAS
BRYAN SIERSMA
147188
LICENSED
PROFESSIONAL ENGINEER

BRYAN SIERSMA, P.E.
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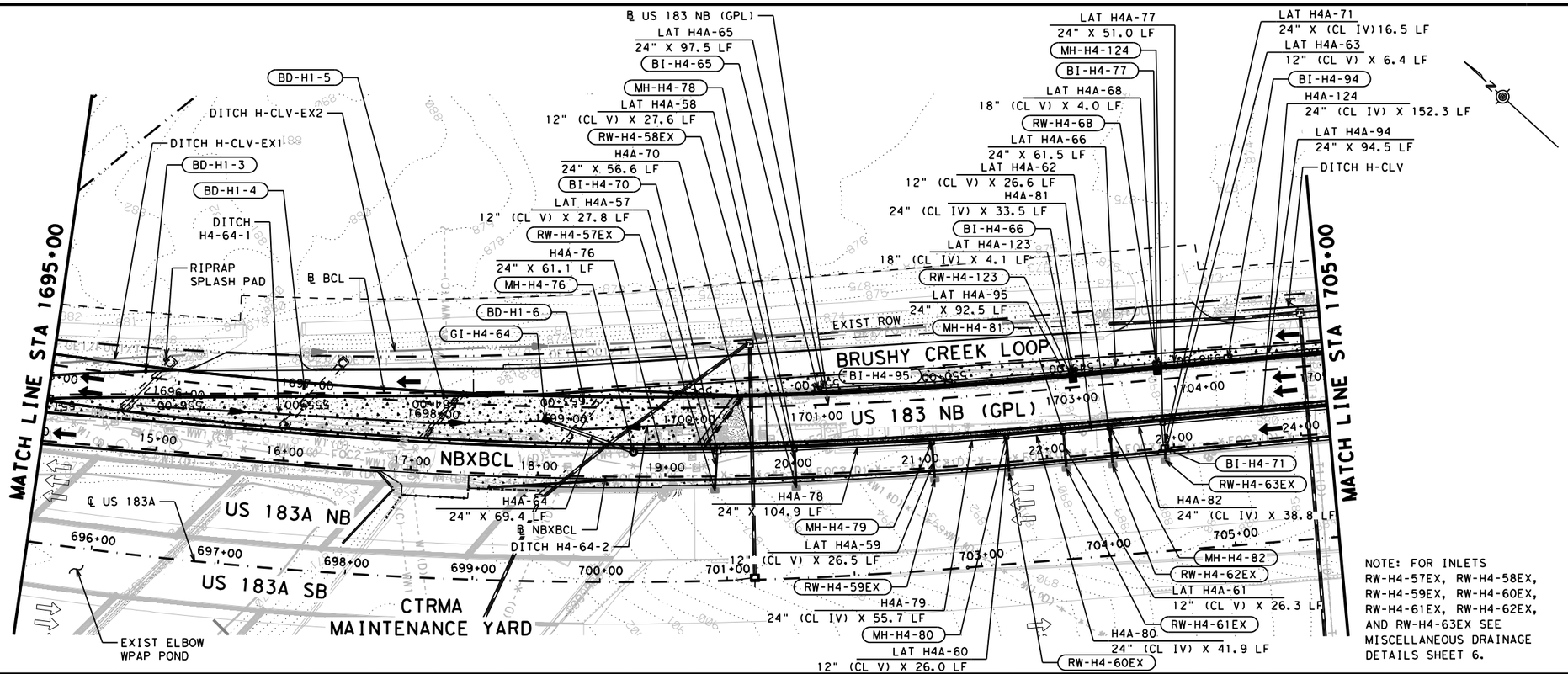

NOTE: FOR INLETS RW-H4-57EX, RW-H4-58EX, RW-H4-59EX, RW-H4-60EX, RW-H4-61EX, RW-H4-62EX, AND RW-H4-63EX SEE MISCELLANEOUS DRAINAGE DETAILS SHEET 6.

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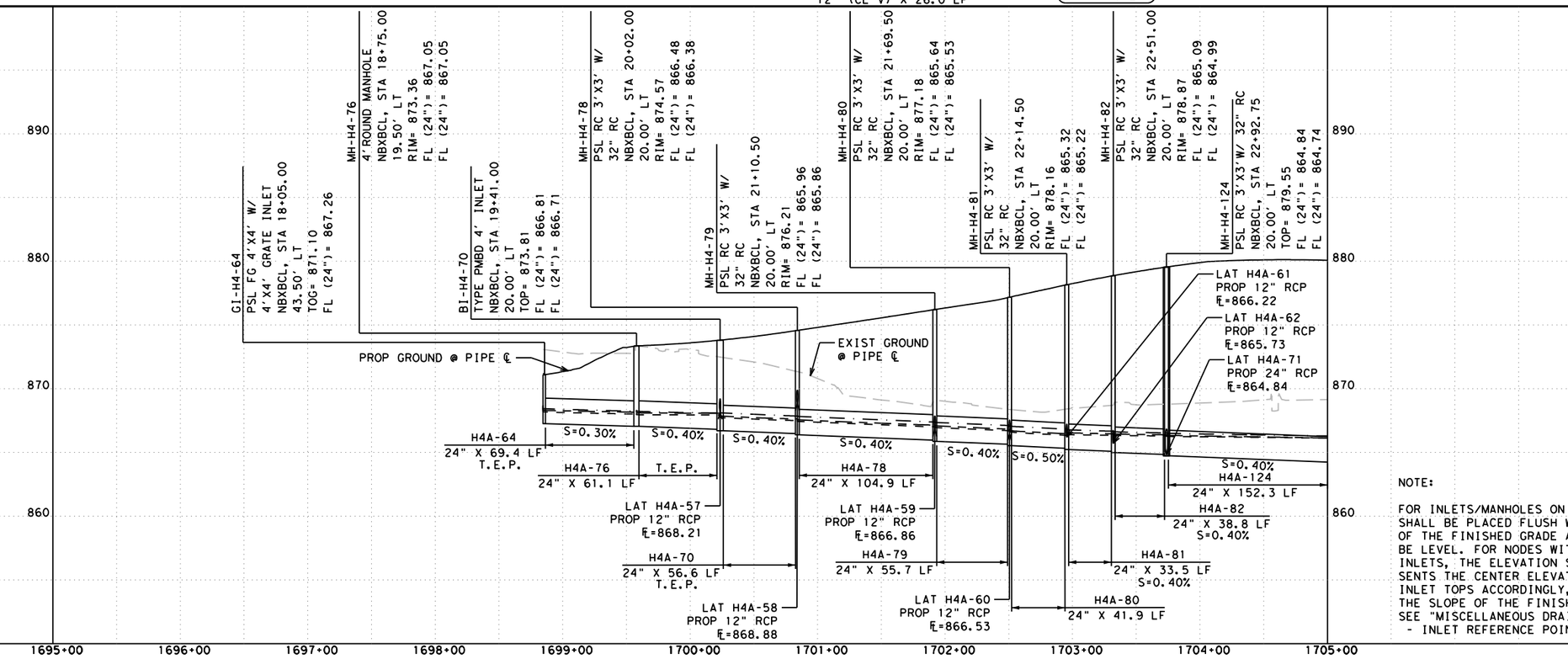

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STATE OF TEXAS — BRYAN SIERSMA — 147188 — LICENSED PROFESSIONAL ENGINEER

BRYAN SIERSMA, P.E.

4/24/2024
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APPROVAL

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0 50 100

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SHEET 10 OF 16

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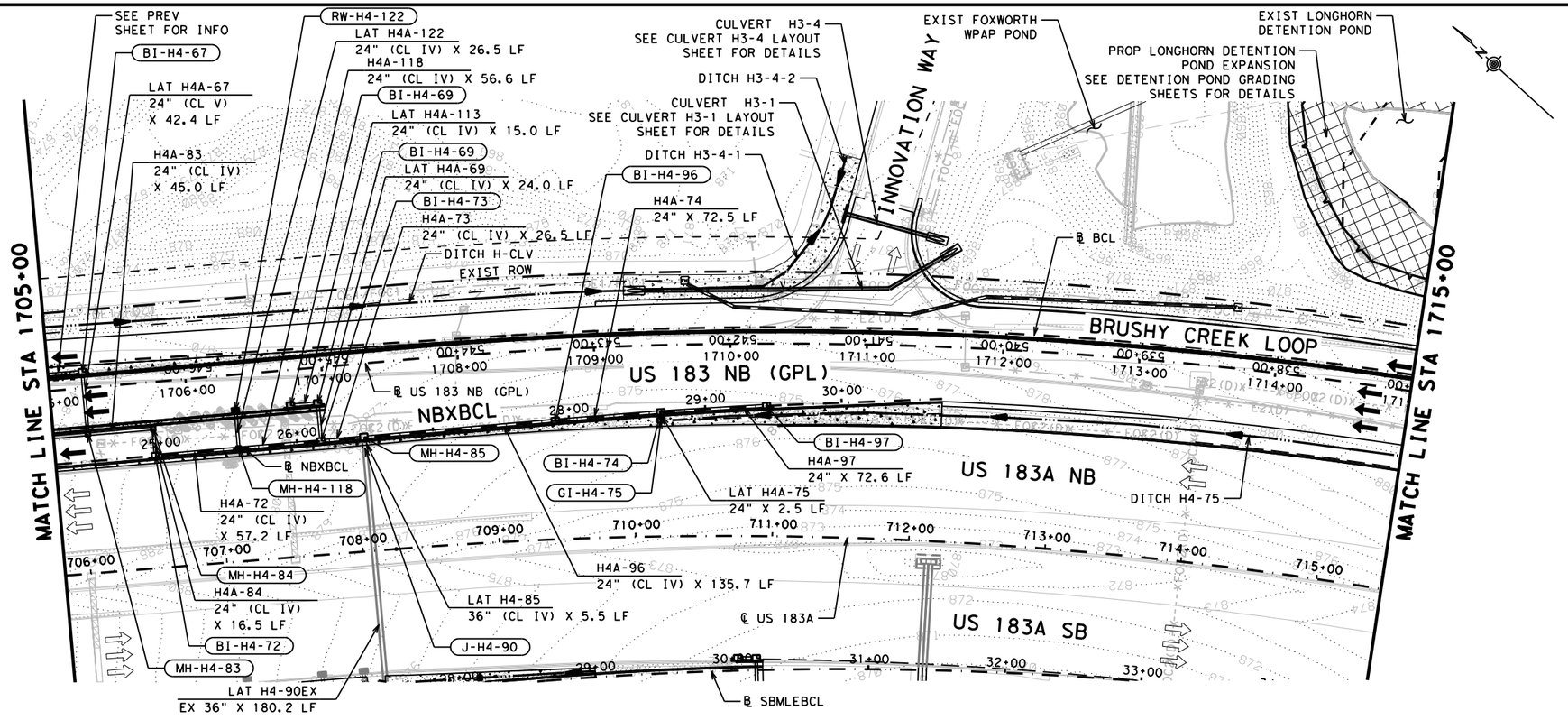

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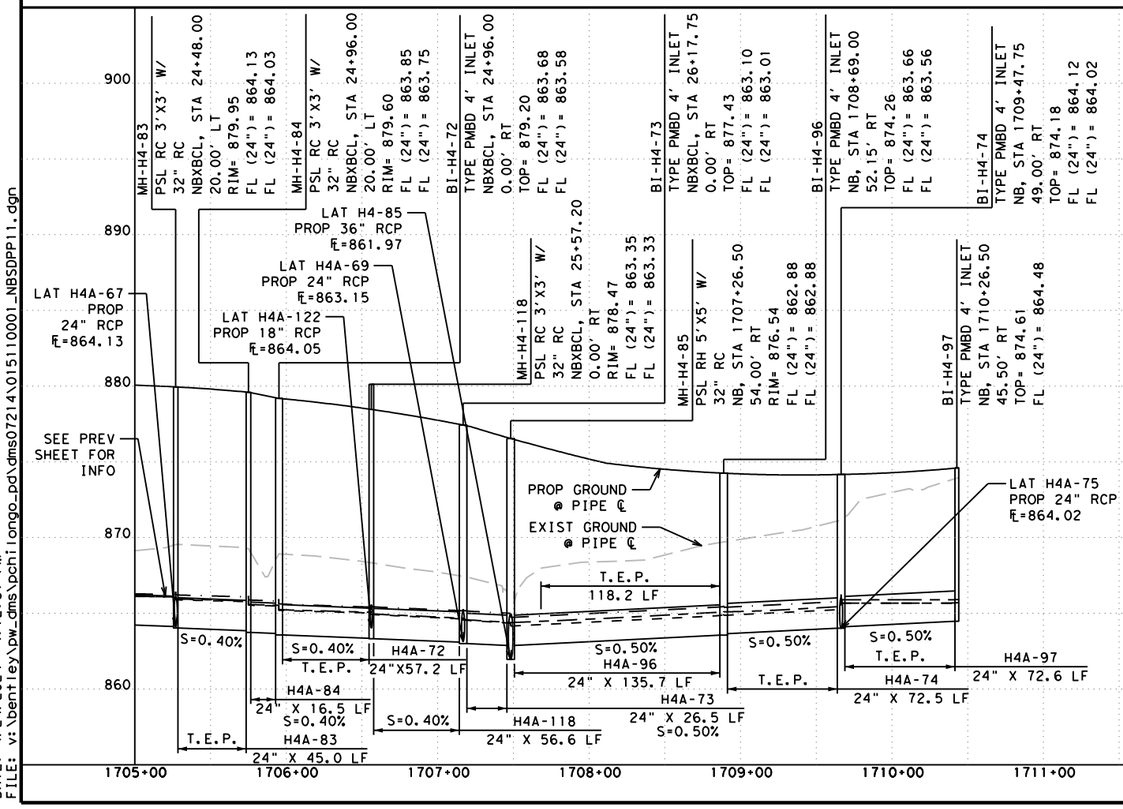

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SHEET 11 OF 16

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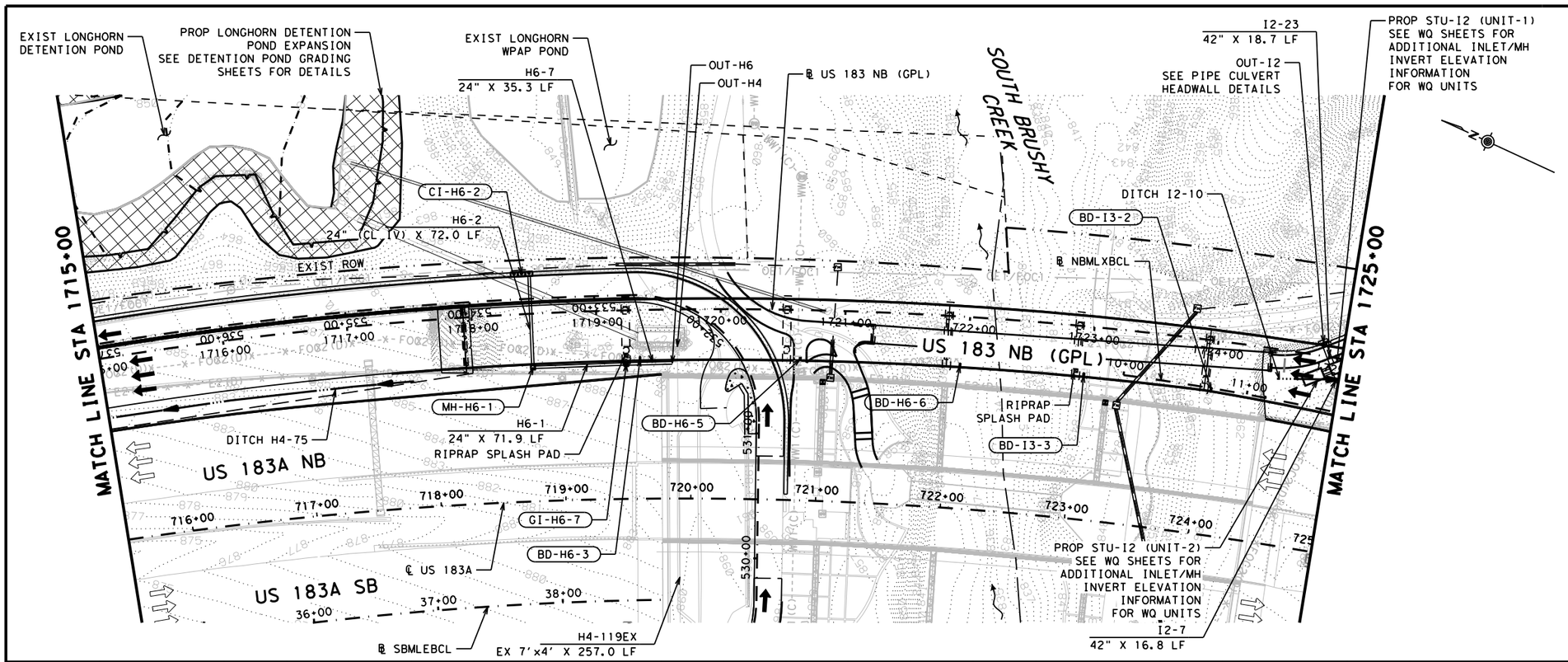

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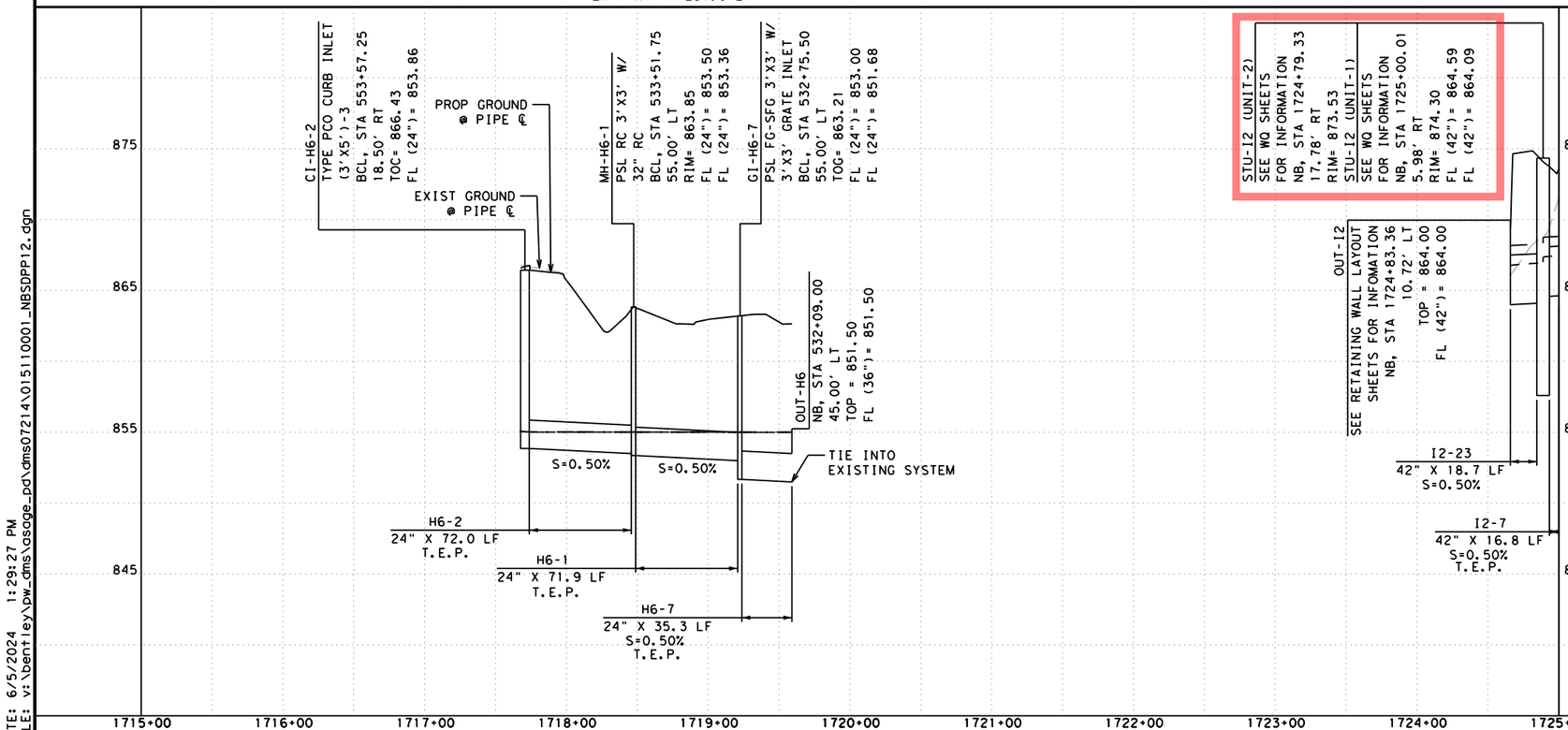

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DESIGN

STATE OF TEXAS — BRYAN SIERSMA — 147188 — LICENSED PROFESSIONAL ENGINEER

BRYAN SIERSMA, P.E.
6/5/2024
DATE

APPROVAL

STATE OF TEXAS — DAN THOMA — 98622 — LICENSED PROFESSIONAL ENGINEER

DAN THOMA, P.E.
6/5/2024
DATE

0 50 100
SCALE: PLAN 1" = 100'
PROFILE: 1" = 10'

PAPE-DAWSON ENGINEERS
SAN ANTONIO | AUSTIN | HOUSTON | FORT WORTH | DALLAS
2000 NW LOOP 410 | SAN ANTONIO, TX 78213 | 210.375.9000
TEXAS ENGINEERING FIRM #470 | TEXAS SURVEYING FIRM #10028800

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US 183 GPL

NB STORM SEWER PLAN & PROFILE

SHEET 12 OF 16

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DS:	CK:	0151	10	001	US 183
		DIST	COUNTY		SHEET NO.
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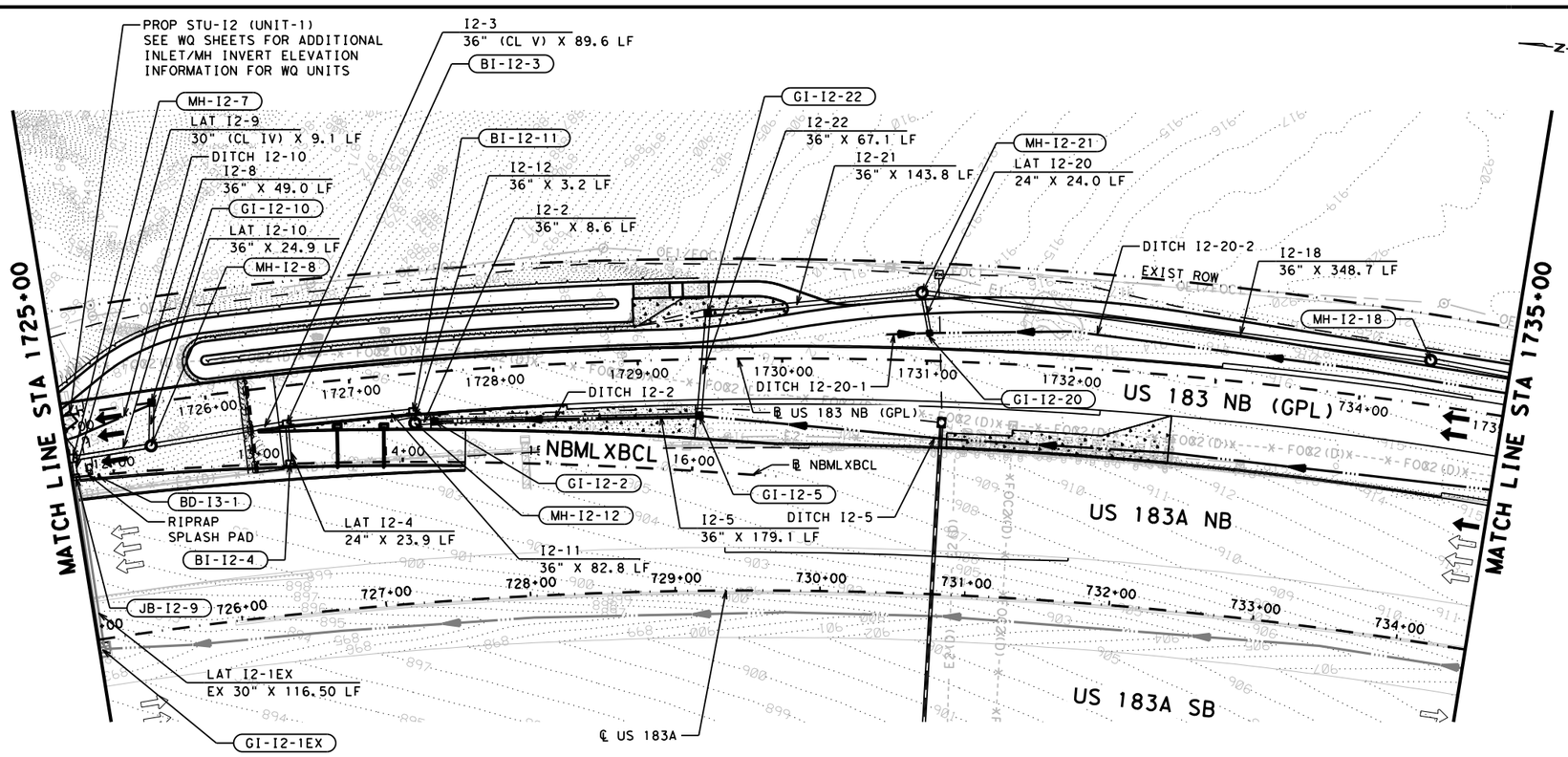

LEGEND

- EXIST TRAFFIC FLOW ARROW
- PROP TRAFFIC FLOW ARROW
- PROPERTY EASEMENT
- PROPOSED RDWY SAWCUT
- EXISTING UTILITY
- CREEK ℄
- HGL (10 YR STORM)
- EGL (10 YR STORM)
- PROPOSED DITCH ℄
- EXISTING DITCH ℄
- 1' CONTOURS
- CUT AND RESTORE
- PROP DETENTION POND EXPANSION

NOTES

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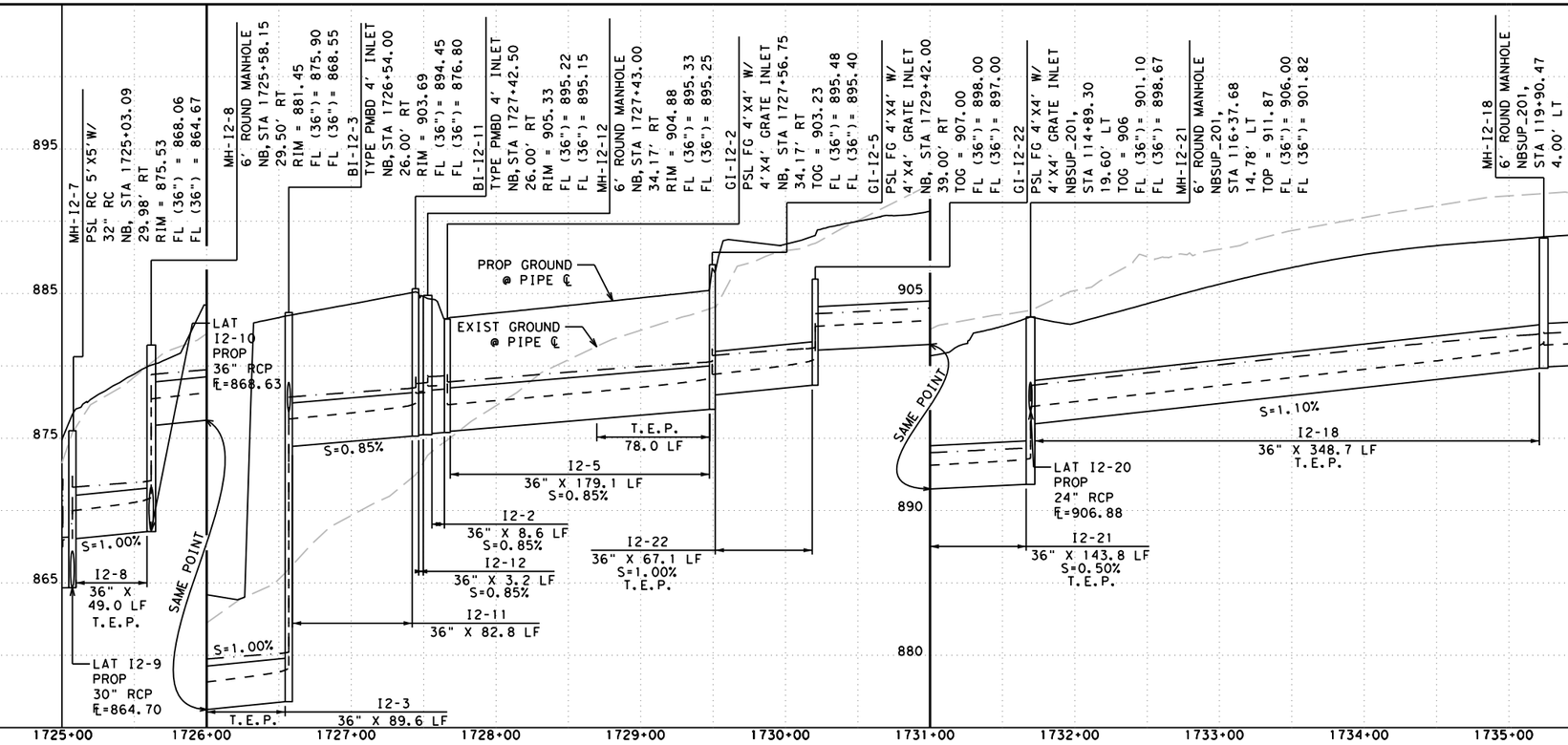

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SHEET 13 OF 16

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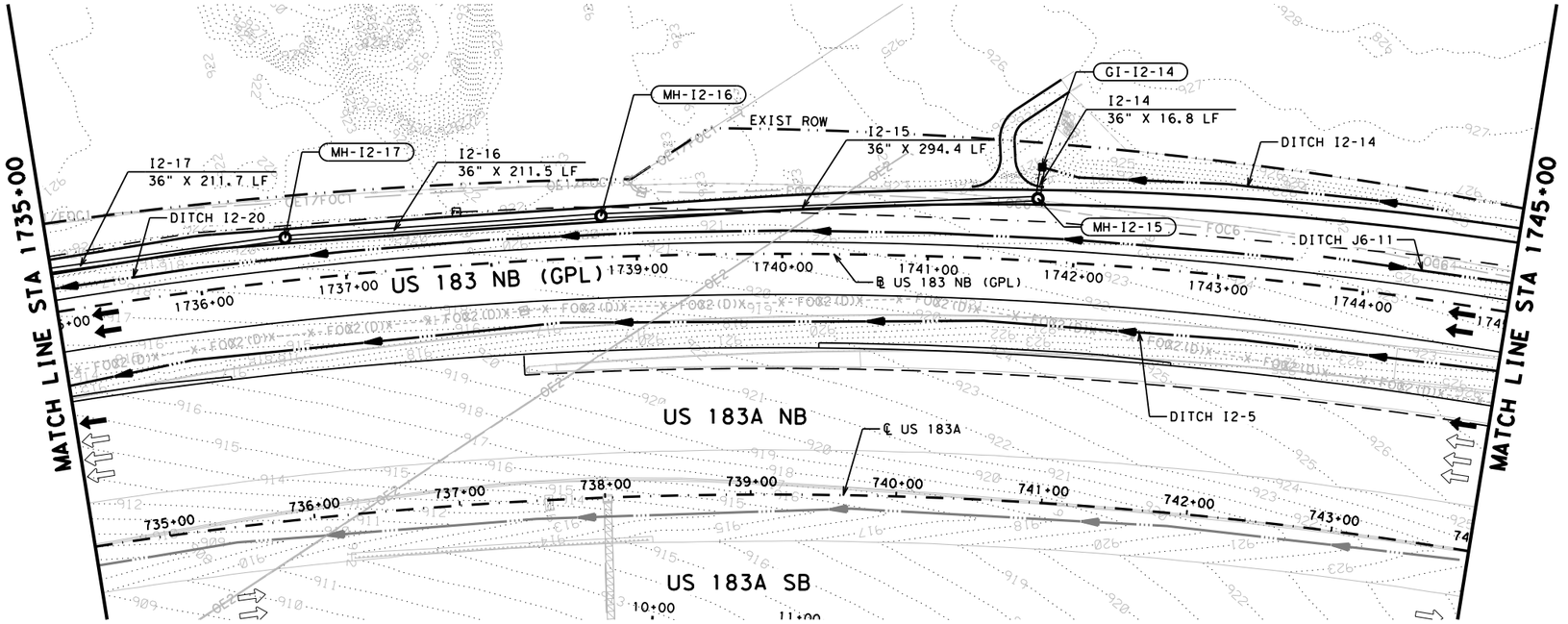

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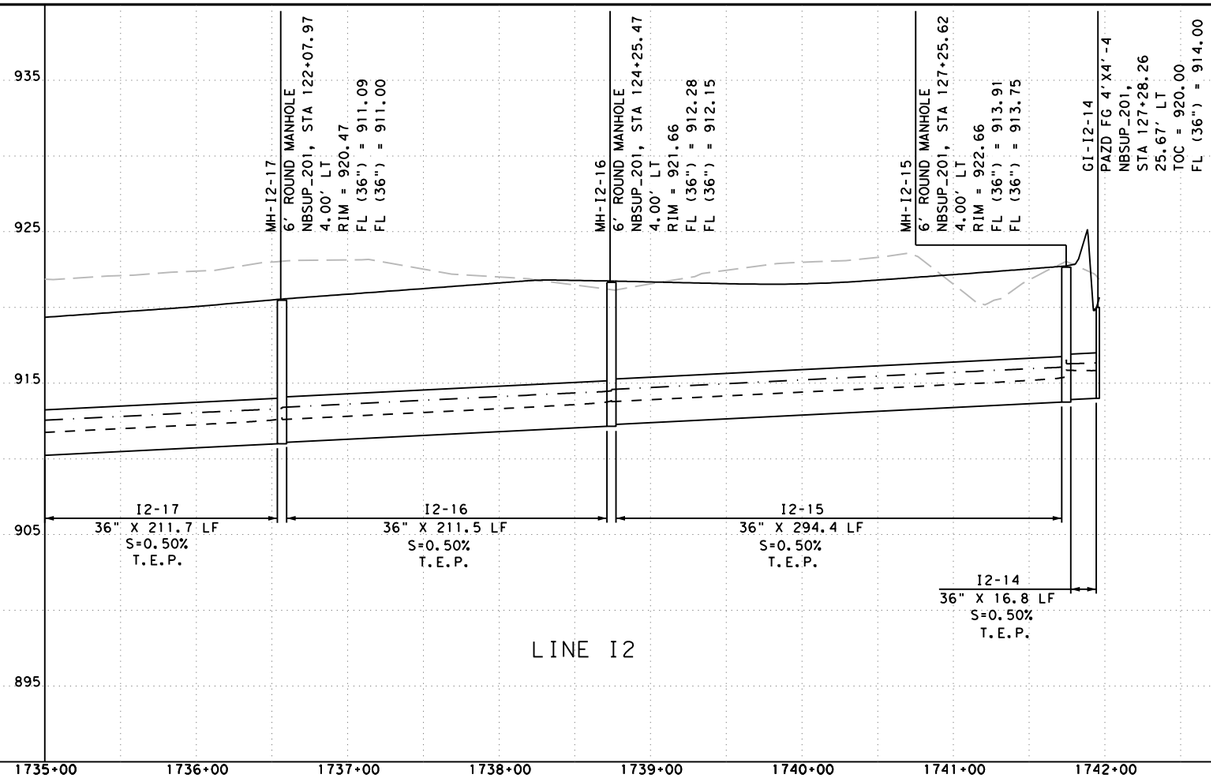

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STATE OF TEXAS · BRYAN SIERSMA · 147188 · LICENSED PROFESSIONAL ENGINEER

BRYAN SIERSMA, P.E.

4/24/2024
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APPROVAL

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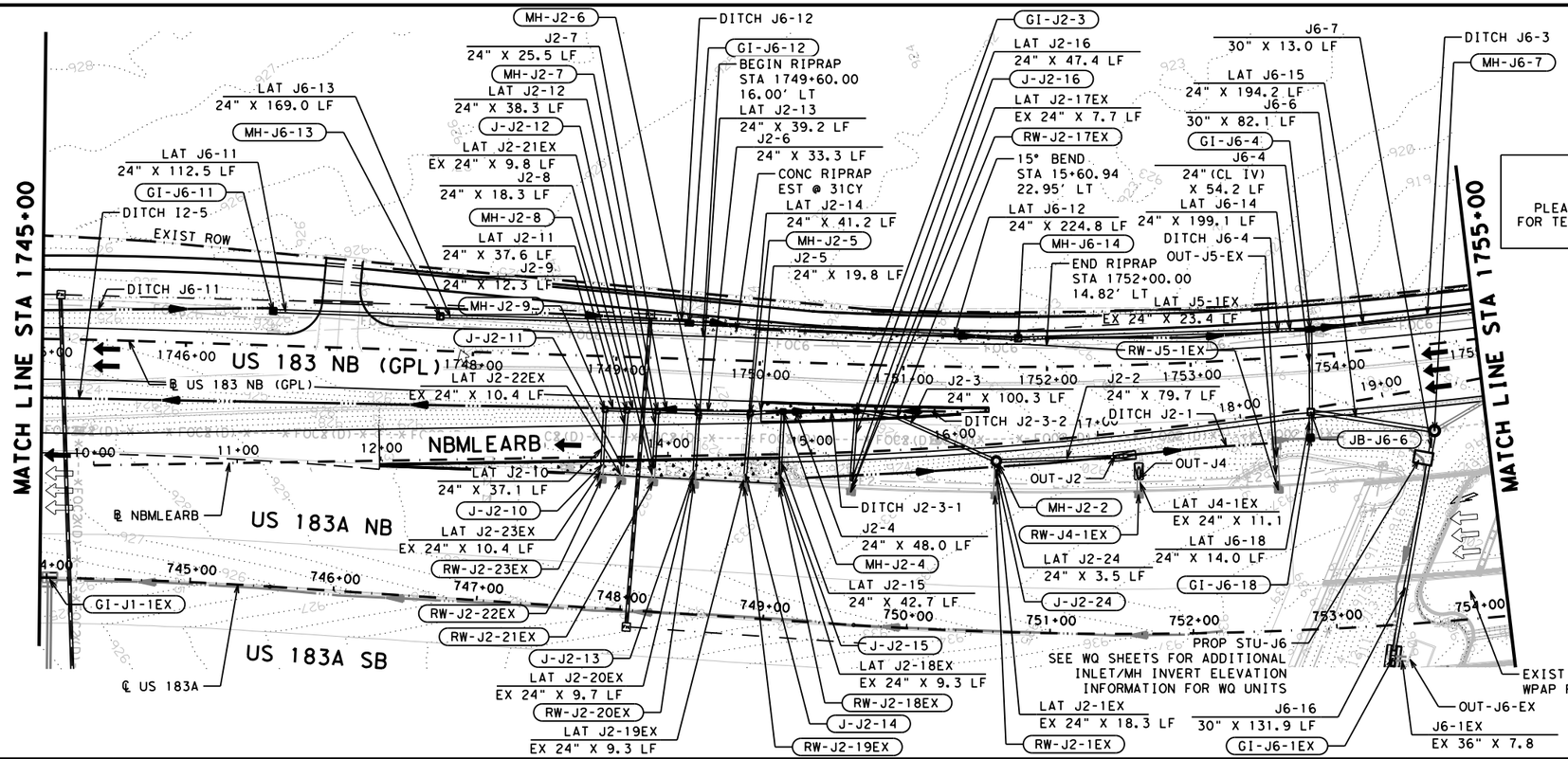

ATTENTION

PLEASE REFERENCE TCP PLANS FOR TEMPORARY DRAINAGE DETAILS

LEGEND

- EXIST TRAFFIC FLOW ARROW
- PROP TRAFFIC FLOW ARROW
- PROPERTY EASEMENT
- PROPOSED RDWY SAWCUT
- W 12" EXISTING UTILITY
- CREEK ℄
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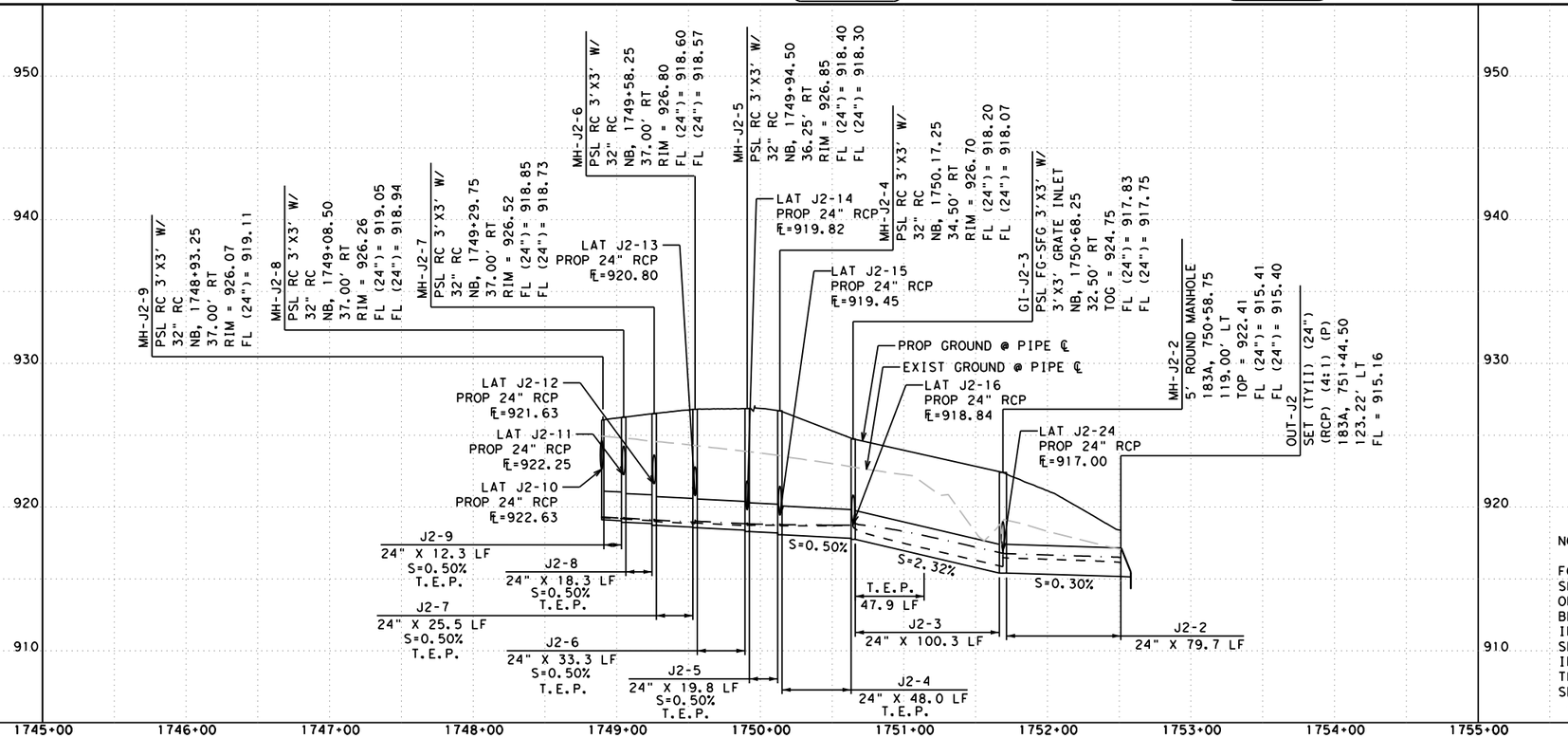

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BRYAN SIERSMA, P.E.

6/5/2024
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PAPE-DAWSON ENGINEERS

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SHEET 15 OF 16

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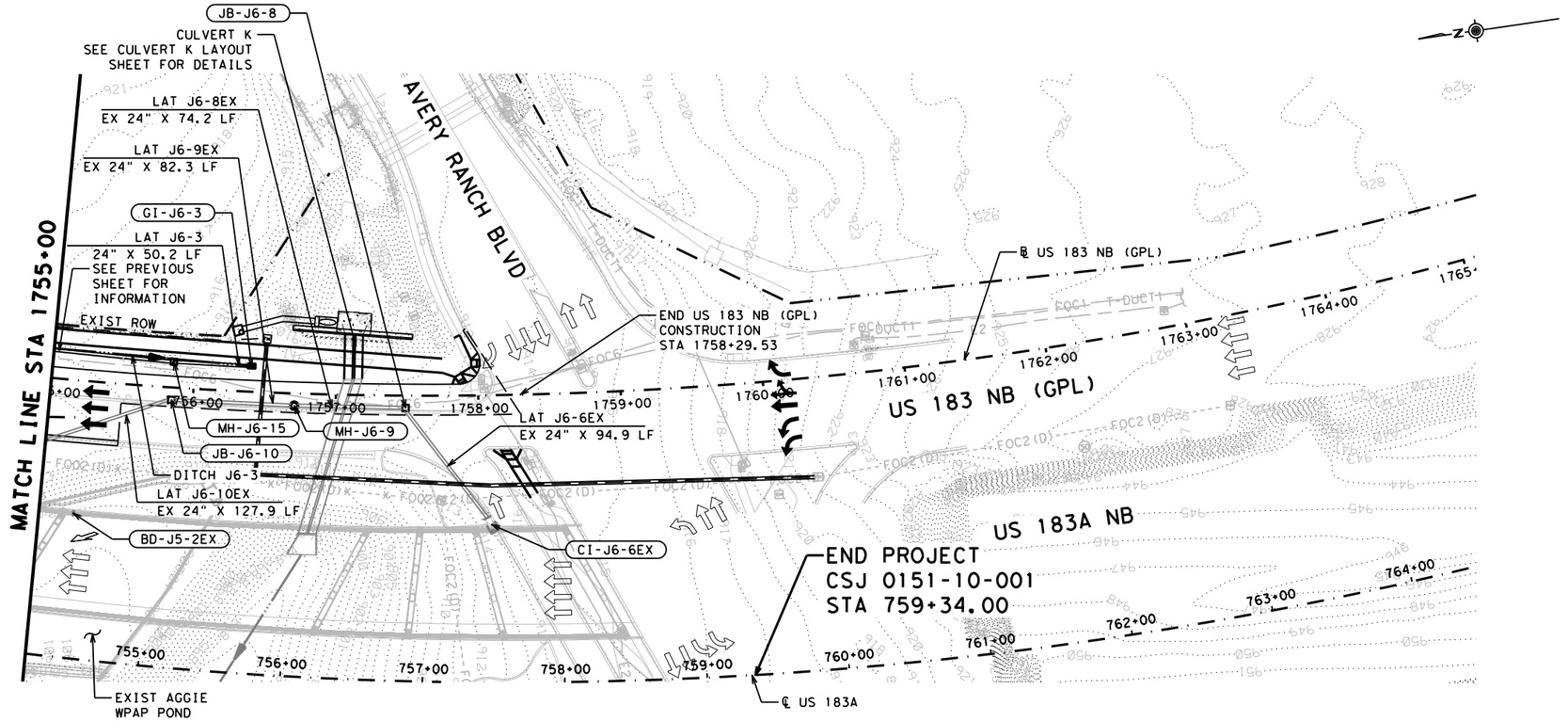

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SEE DRAINAGE PROFILE SHEETS FOR PROFILE INFORMATION

930 920 910 900 890

1755+00 1756+00 1757+00 1758+00 1759+00 1760+00 1761+00 1762+00 1763+00 1764+00 1765+00

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BRYAN SIERSMA, P.E.

4/24/2024
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SHEET 16 OF 16

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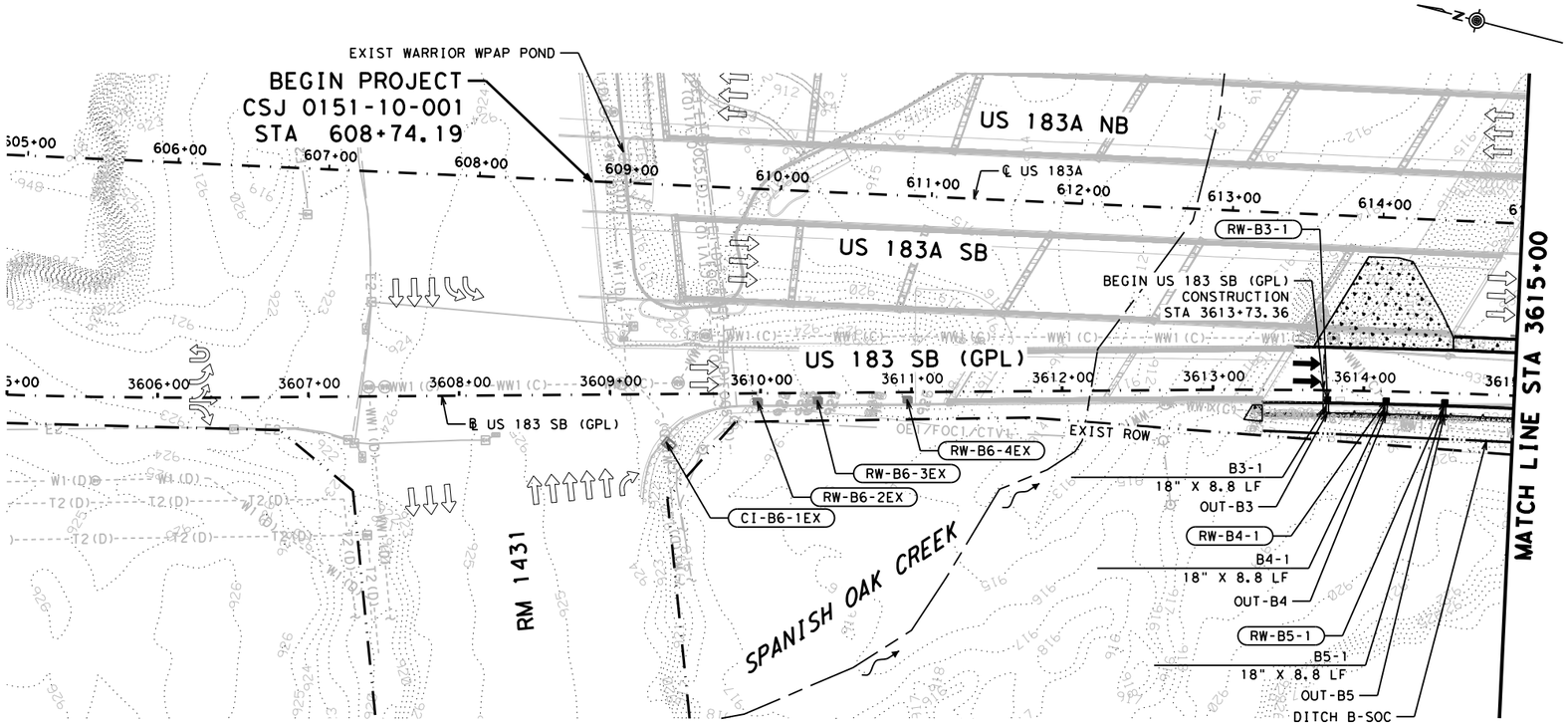

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NO PROPOSED DRAINAGE PROFILES THIS SHEET

945 935 925 915 905

3605+00 3606+00 3607+00 3608+00 3609+00 3610+00 3611+00 3612+00 3613+00 3614+00 3615+00

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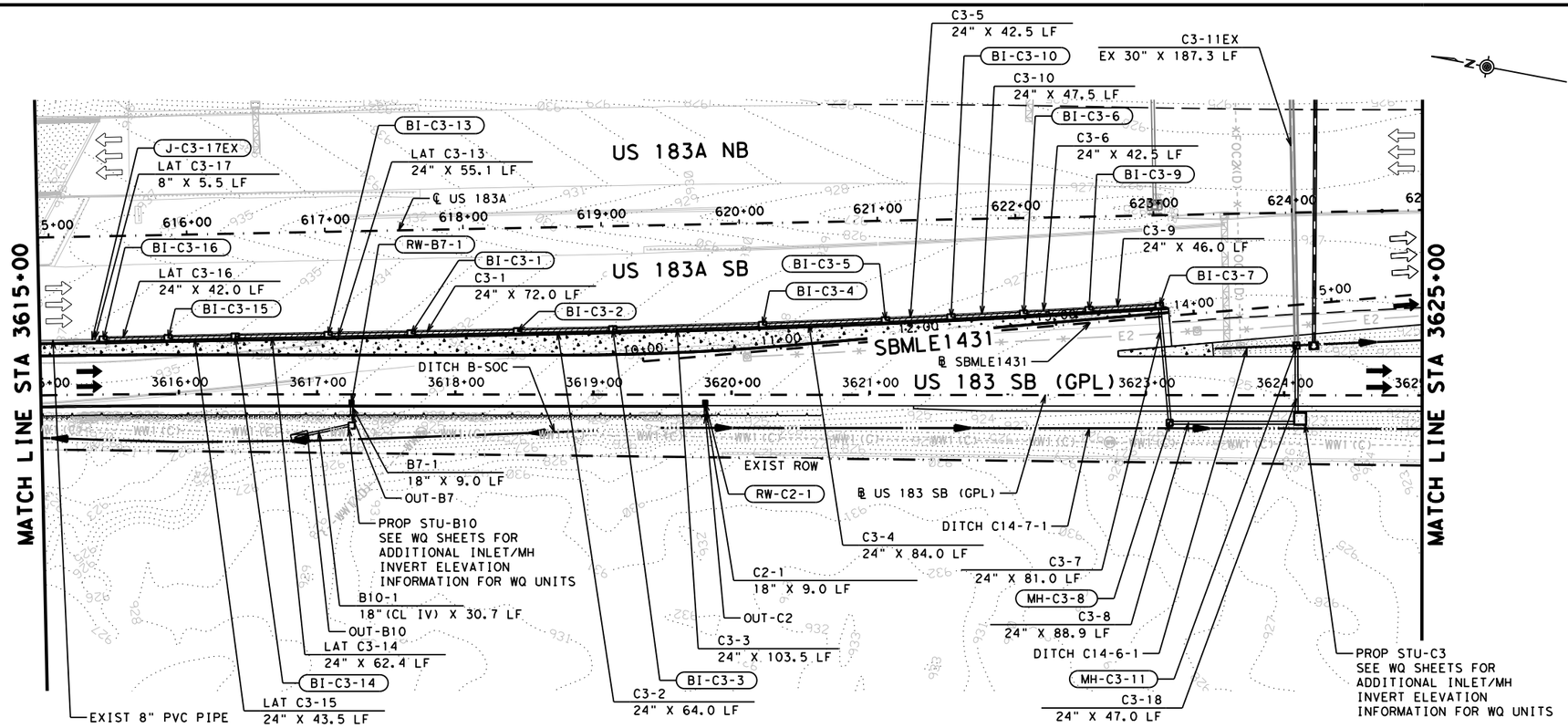

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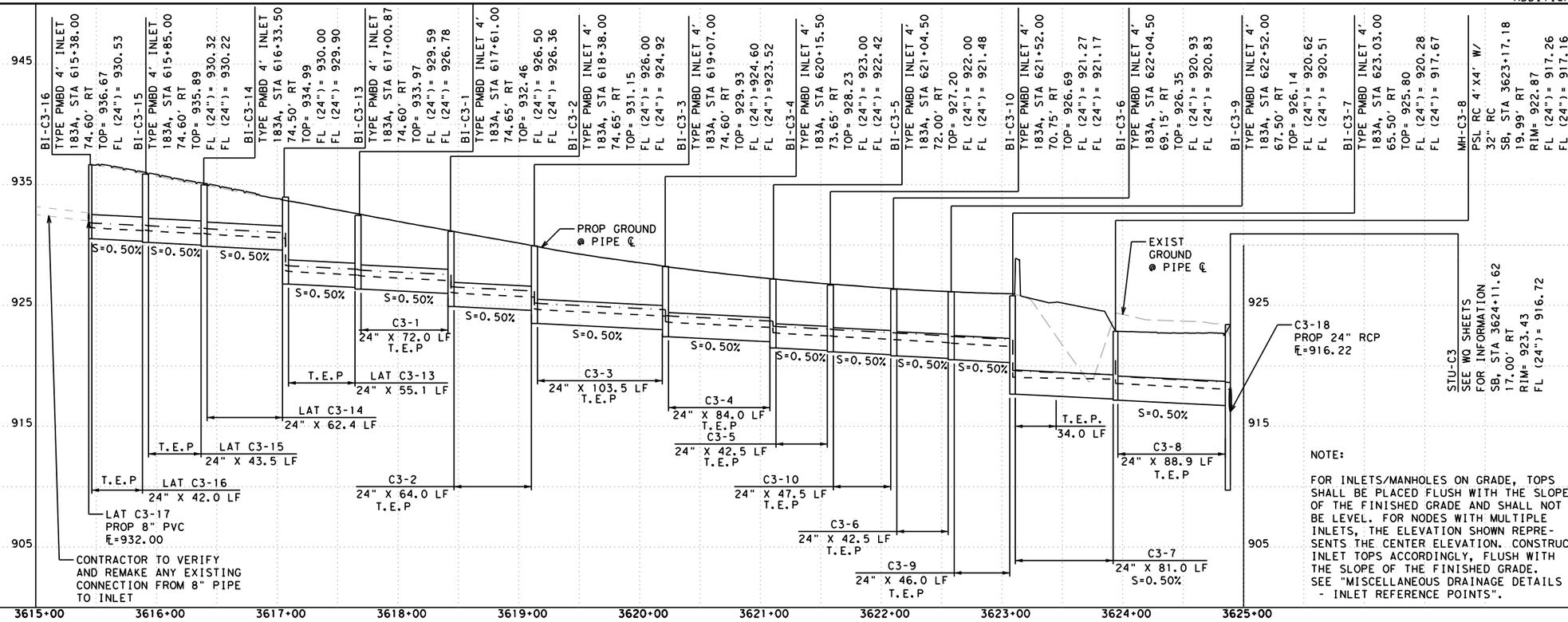

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SHEET 2 OF 16

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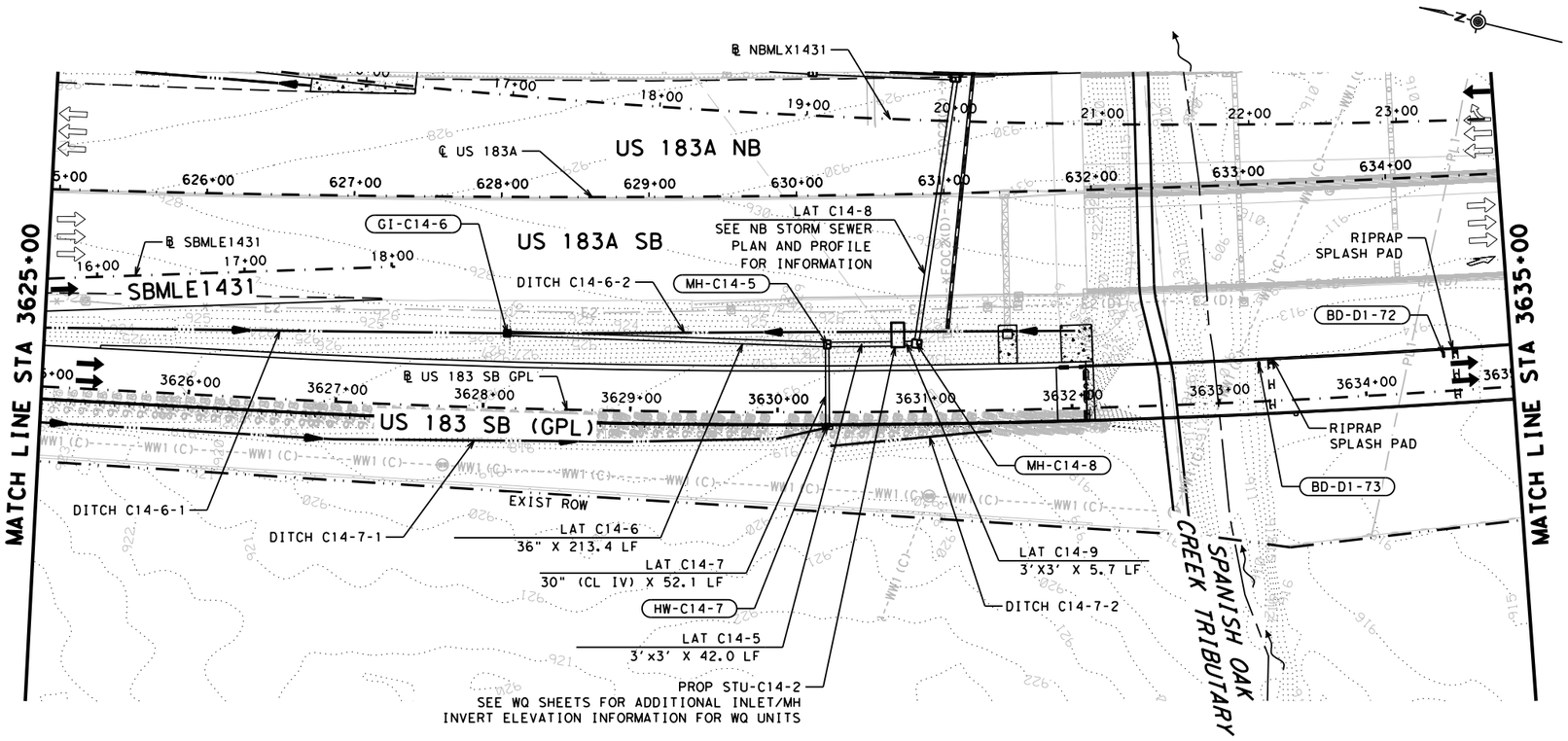

LEGEND

- EXIST TRAFFIC FLOW ARROW
- PROP TRAFFIC FLOW ARROW
- PROPERTY EASEMENT
- PROPOSED RDWY SAWCUT
- EXISTING UTILITY
- CREEK ℄
- HGL (10 YR STORM)
- EGL (10 YR STORM)
- PROPOSED DITCH ℄
- EXISTING DITCH ℄
- 1' CONTOURS
- CUT AND RESTORE
- PROP DETENTION POND EXPANSION

NOTES

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7. EXISTING AND PROPOSED GROUND PROFILES ARE SHOWN AT THE CENTERLINE OF PIPE/NODE.
8. SEE CTRMA ITS SHEETS FOR LOCATION AND ADDITIONAL INFORMATION.

SEE DRAINAGE PROFILE SHEETS FOR PROFILE INFORMATION

945 935 925 915 905

3625+00 3626+00 3627+00 3628+00 3629+00 3630+00 3631+00 3632+00 3633+00 3634+00 3635+00

NOTE:

FOR INLETS/MANHOLES ON GRADE, TOPS SHALL BE PLACED FLUSH WITH THE SLOPE OF THE FINISHED GRADE AND SHALL NOT BE LEVEL. FOR NODES WITH MULTIPLE INLETS, THE ELEVATION SHOWN REPRESENTS THE CENTER ELEVATION. CONSTRUCT INLET TOPS ACCORDINGLY, FLUSH WITH THE SLOPE OF THE FINISHED GRADE. SEE "MISCELLANEOUS DRAINAGE DETAILS - INLET REFERENCE POINTS".

DESIGN

STATE OF TEXAS · BRYAN SIERSMA · 147188 · LICENSED PROFESSIONAL ENGINEER

BRYAN SIERSMA, P.E.

6/5/2024
DATE

APPROVAL

STATE OF TEXAS · DAN THOMA · 98622 · LICENSED PROFESSIONAL ENGINEER

DAN THOMA, P.E.

6/5/2024
DATE

0 50 100

SCALE: PLAN 1" = 100'
PROFILE: 1" = 10'

PAPE-DAWSON ENGINEERS

SAN ANTONIO | AUSTIN | HOUSTON | FORT WORTH | DALLAS
2000 NW LOOP 410 | SAN ANTONIO, TX 78213 | 210.375.9000
TEXAS ENGINEERING FIRM #470 | TEXAS SURVEYING FIRM #10028800

2024 Texas Department of Transportation

US 183 GPL

SB STORM SEWER PLAN & PROFILE

SHEET 3 OF 16

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DS:	CK:	0151	10	001	US 183
		DIST	COUNTY		SHEET NO.
DW:	CK:	AUS	WILLIAMSON		749

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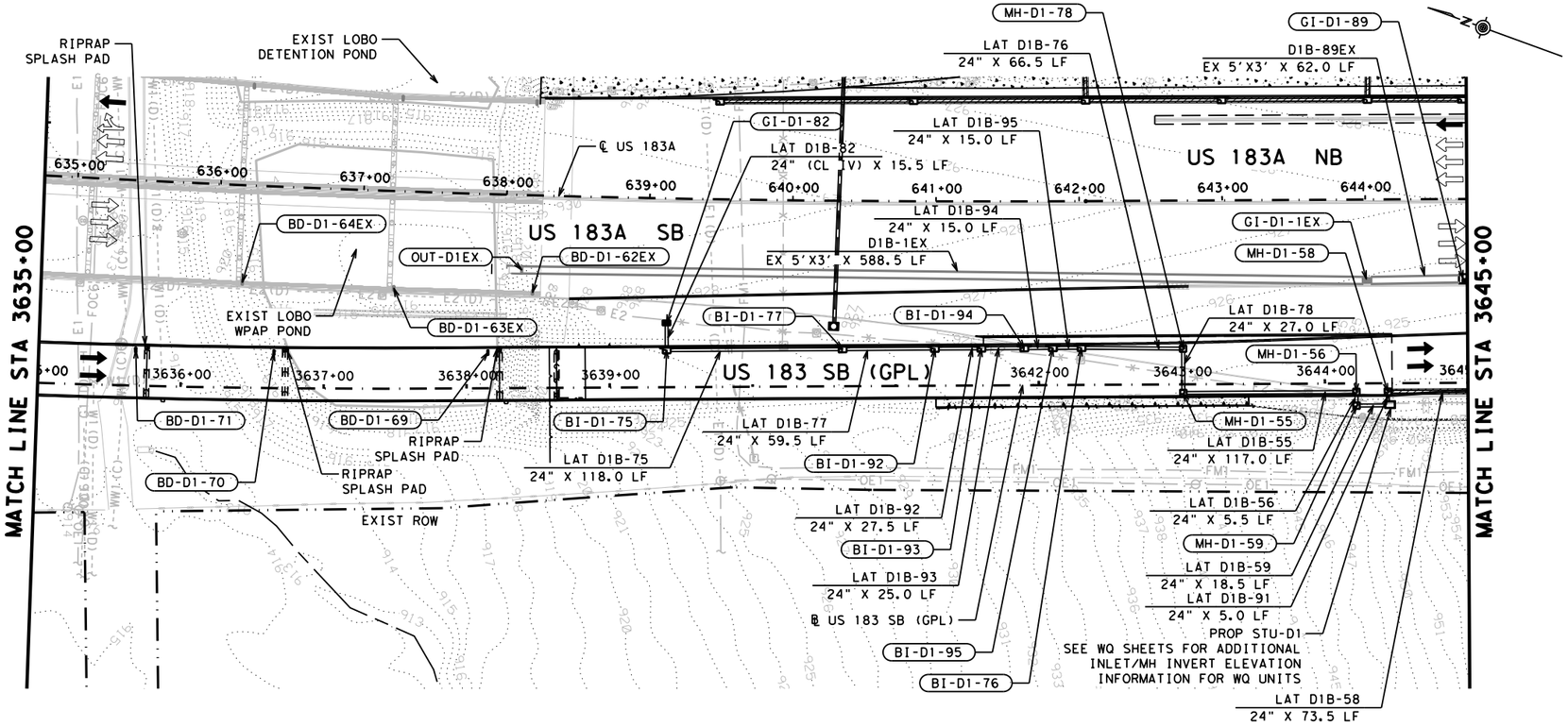

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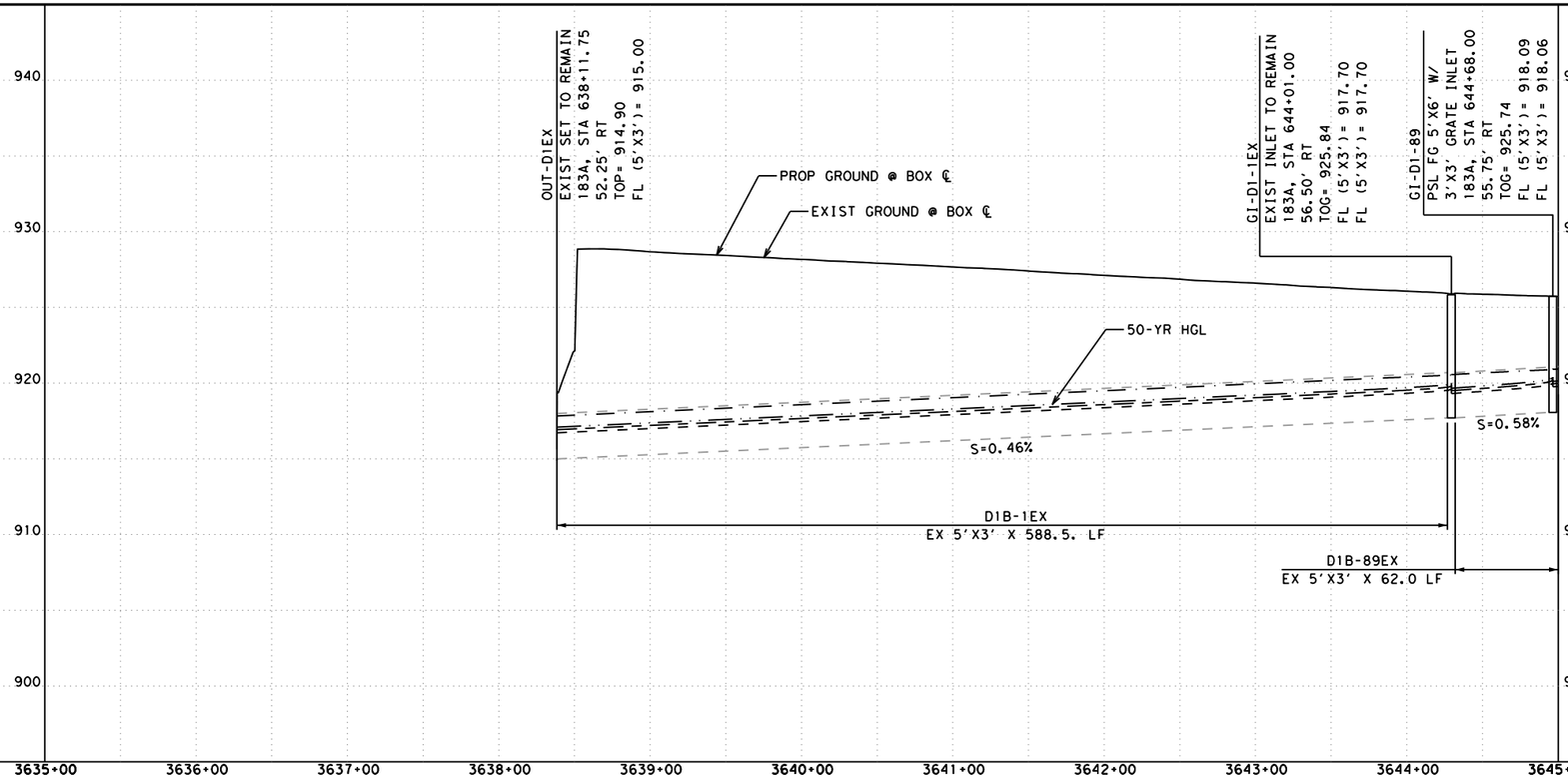

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BRYAN SIERSMA, P.E.

6/5/2024
DATE

APPROVAL

STATE OF TEXAS — DAN THOMA — 98622 — LICENSED PROFESSIONAL ENGINEER

DAN THOMA, P.E.

6/5/2024
DATE

0 50 100

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PAPE-DAWSON ENGINEERS
SAN ANTONIO | AUSTIN | HOUSTON | FORT WORTH | DALLAS
2000 NW LOOP 410 | SAN ANTONIO, TX 78213 | 210.375.9000
TEXAS ENGINEERING FIRM #470 | TEXAS SURVEYING FIRM #10028800

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US 183 GPL

SB STORM SEWER PLAN & PROFILE

SHEET 4 OF 16

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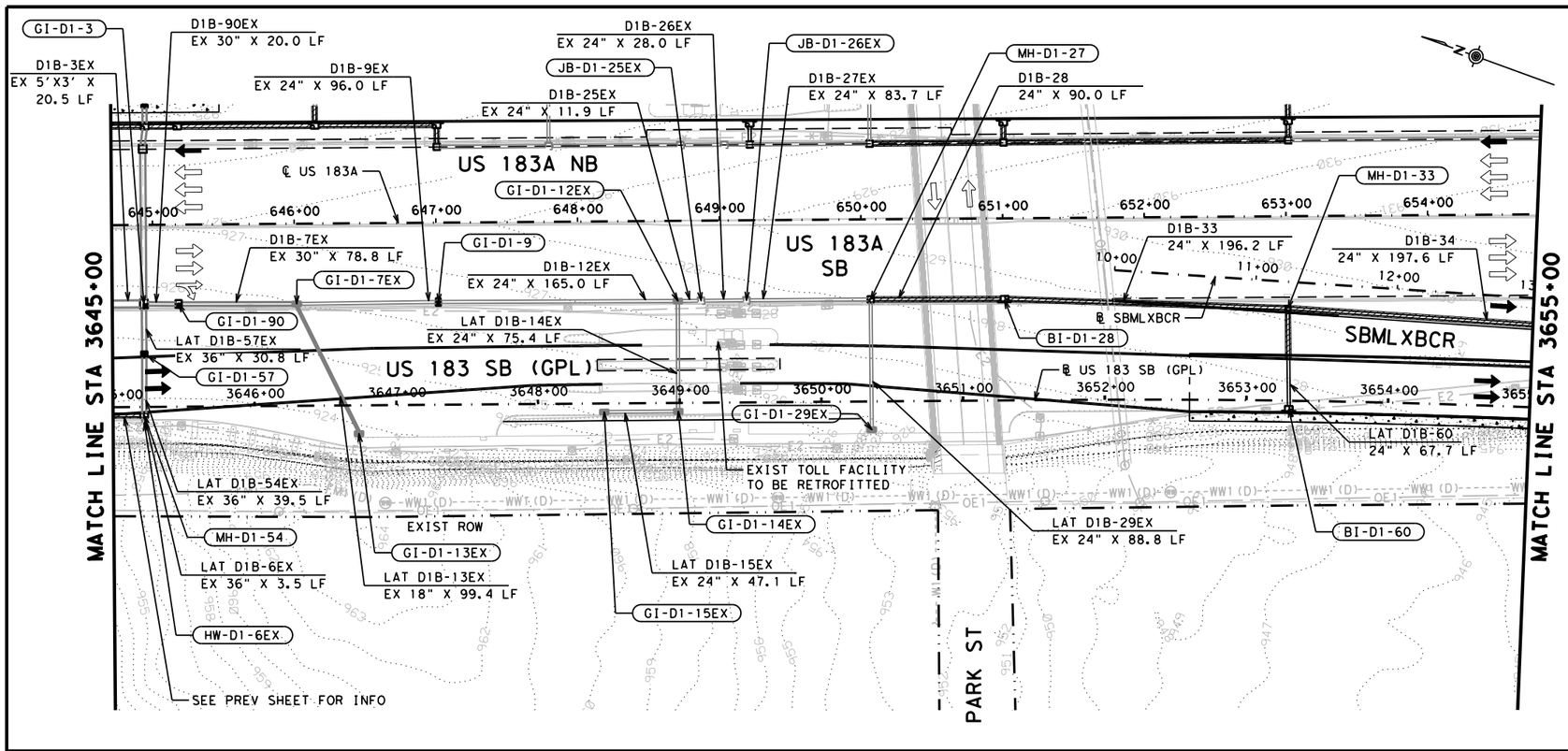

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- PROP TRAFFIC FLOW ARROW
- PROPERTY EASEMENT
- PROPOSED RDWY SAWCUT
- W 12" EXISTING UTILITY
- CREEK ℄
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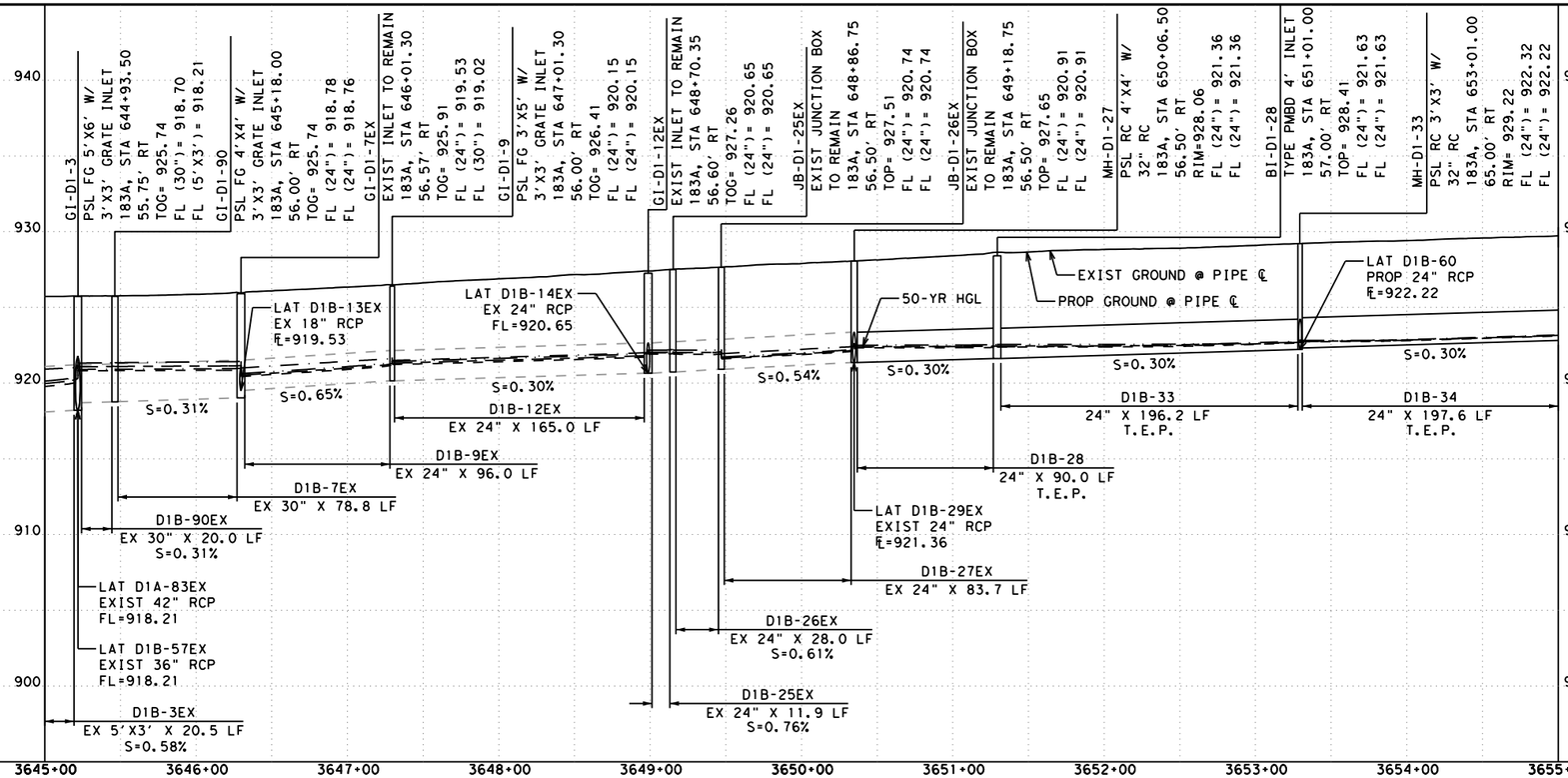

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DESIGN

STATE OF TEXAS · BRYAN SIERSMA · 147188 · LICENSED PROFESSIONAL ENGINEER

BRYAN SIERSMA, P.E.

4/24/2024
DATE

APPROVAL

STATE OF TEXAS · DAN THOMA · 98622 · LICENSED PROFESSIONAL ENGINEER

DAN THOMA, P.E.

4/24/2024
DATE

0 50 100

SCALE: PLAN 1" = 100'
PROFILE: 1" = 10'

PAPE-DAWSON ENGINEERS

SAN ANTONIO | AUSTIN | HOUSTON | FORT WORTH | DALLAS
2000 NW LOOP 410 | SAN ANTONIO, TX 78213 | 210.375.9000
TEXAS ENGINEERING FIRM #470 | TEXAS SURVEYING FIRM #10028800

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US 183 GPL

SB STORM SEWER PLAN & PROFILE

SHEET 5 OF 16

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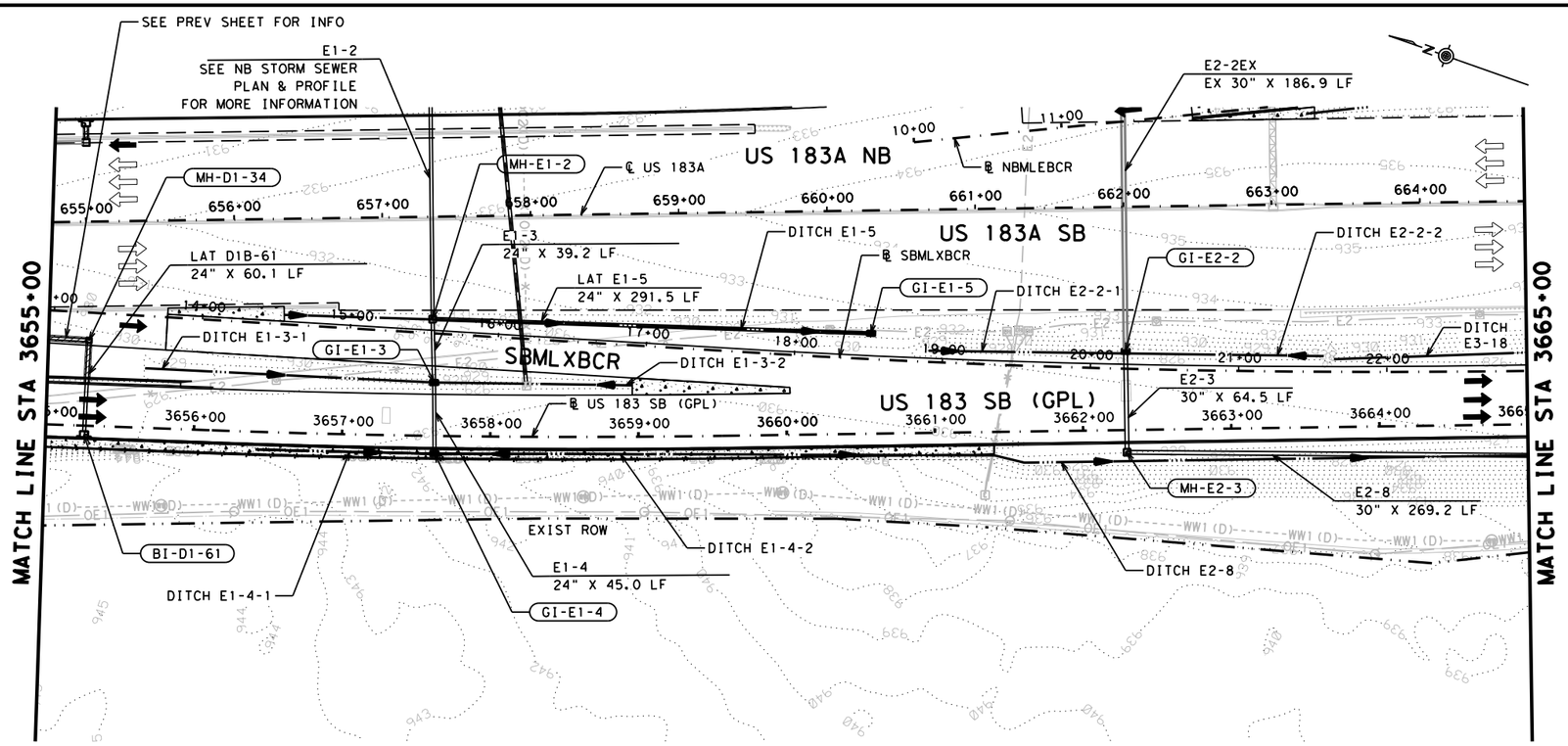

LEGEND

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- PROP TRAFFIC FLOW ARROW
- PROPERTY EASEMENT
- PROPOSED RDWY SAWCUT
- W 12" EXISTING UTILITY
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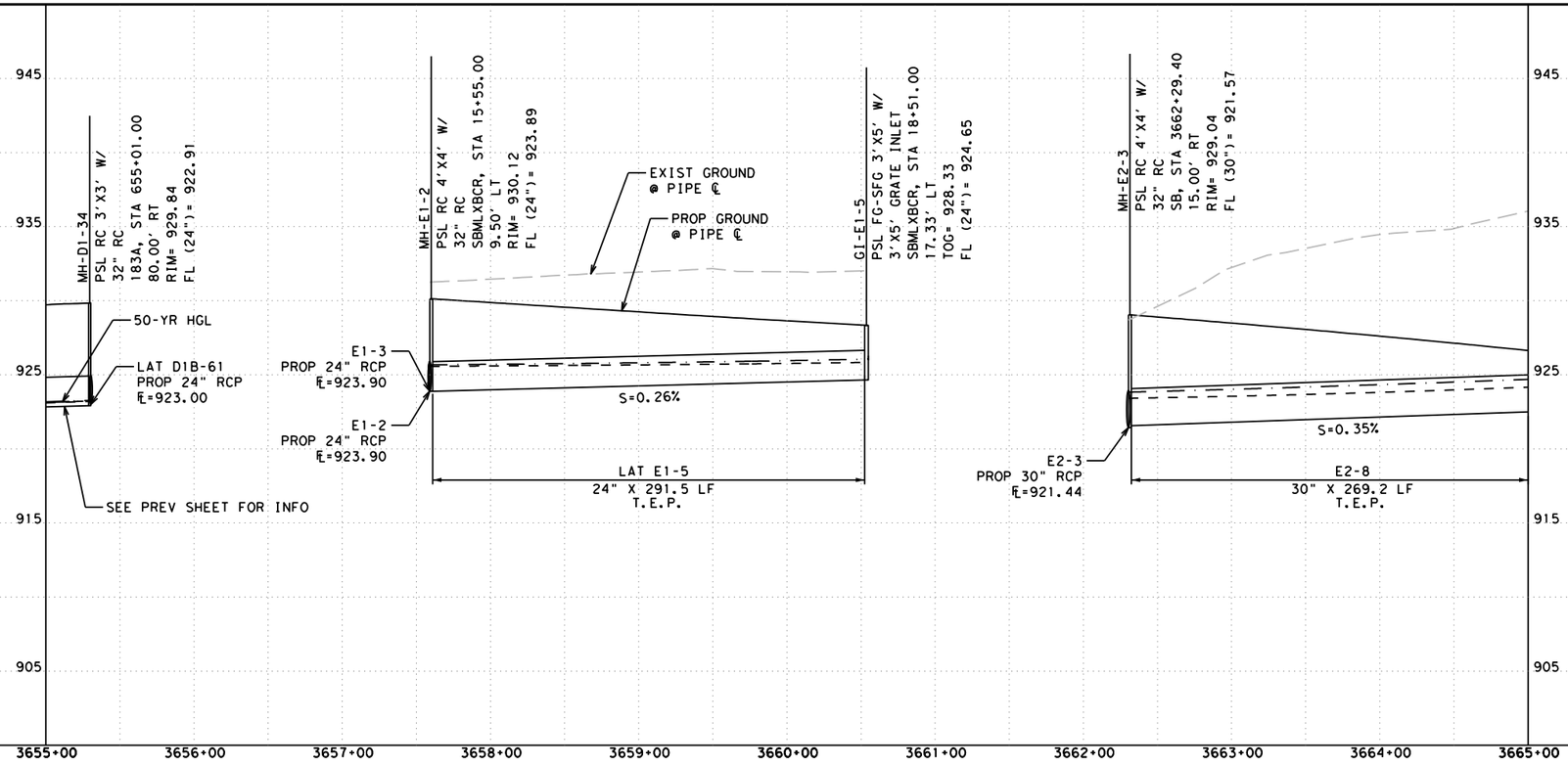

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DESIGN

STATE OF TEXAS — BRYAN SIERSMA — 147188 — LICENSED PROFESSIONAL ENGINEER

BRYAN SIERSMA, P.E.

4/24/2024
DATE

APPROVAL

STATE OF TEXAS — DAN THOMA — 98622 — LICENSED PROFESSIONAL ENGINEER

DAN THOMA, P.E.

4/24/2024
DATE

0 50 100

SCALE: PLAN 1" = 100'
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PAPE-DAWSON ENGINEERS
SAN ANTONIO | AUSTIN | HOUSTON | FORT WORTH | DALLAS
2000 NW LOOP 410 | SAN ANTONIO, TX 78213 | 210.375.9000
TEXAS ENGINEERING FIRM #470 | TEXAS SURVEYING FIRM #10028800

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SB STORM SEWER PLAN & PROFILE

SHEET 6 OF 16

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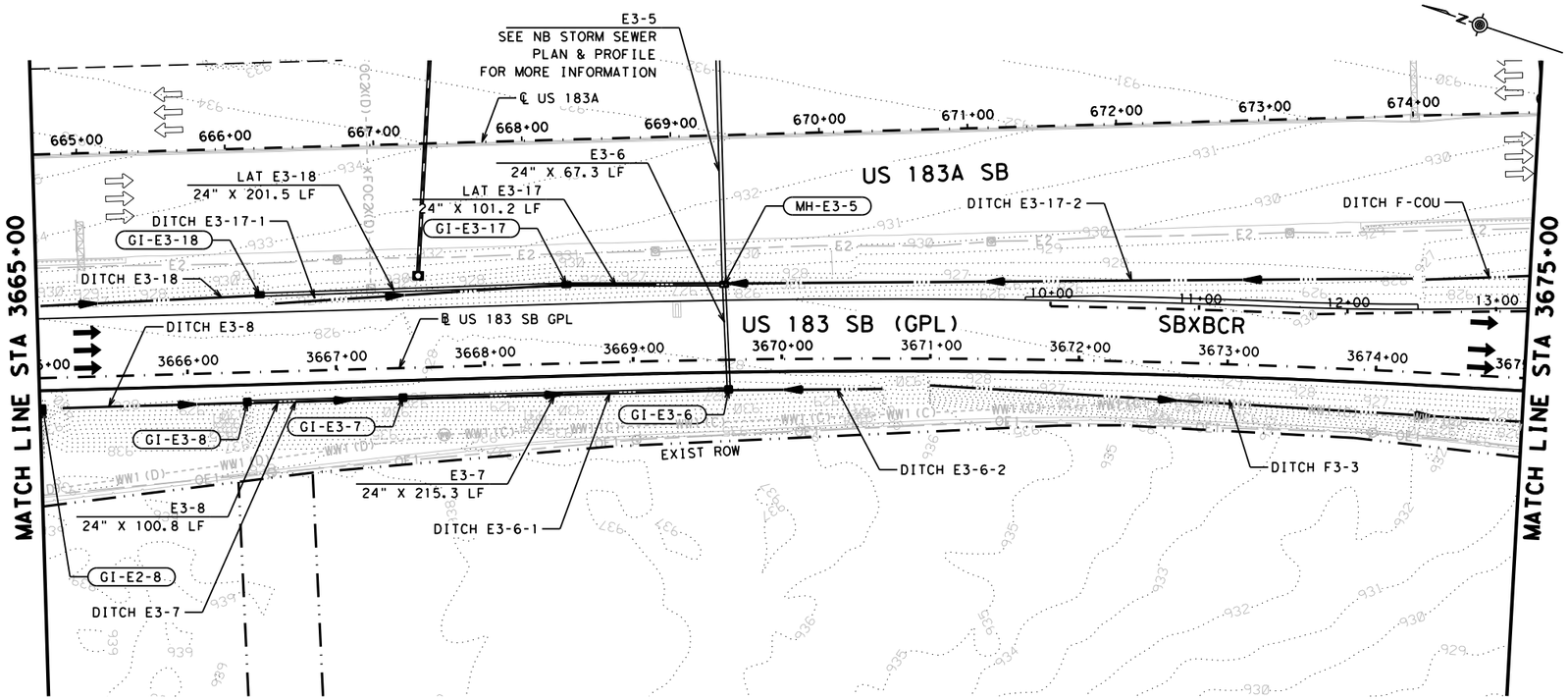

LEGEND

- EXIST TRAFFIC FLOW ARROW
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- PROPERTY EASEMENT
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- CREEK ℄
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- EGL (10 YR STORM)
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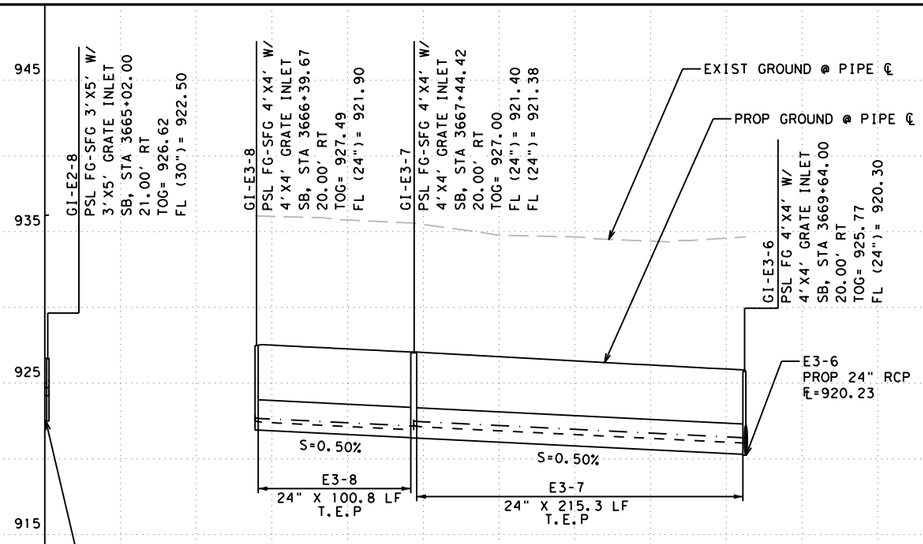

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STATE OF TEXAS — BRYAN SIERSMA — 147188 — LICENSED PROFESSIONAL ENGINEER

BRYAN SIERSMA, P.E.

4/24/2024
DATE

APPROVAL

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DAN THOMA, P.E.

4/24/2024
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2000 NW LOOP 410 | SAN ANTONIO, TX 78213 | 210.375.9000
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SB STORM SEWER PLAN & PROFILE

SHEET 7 OF 16

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DW:	CK:	0151	10	001	US 183
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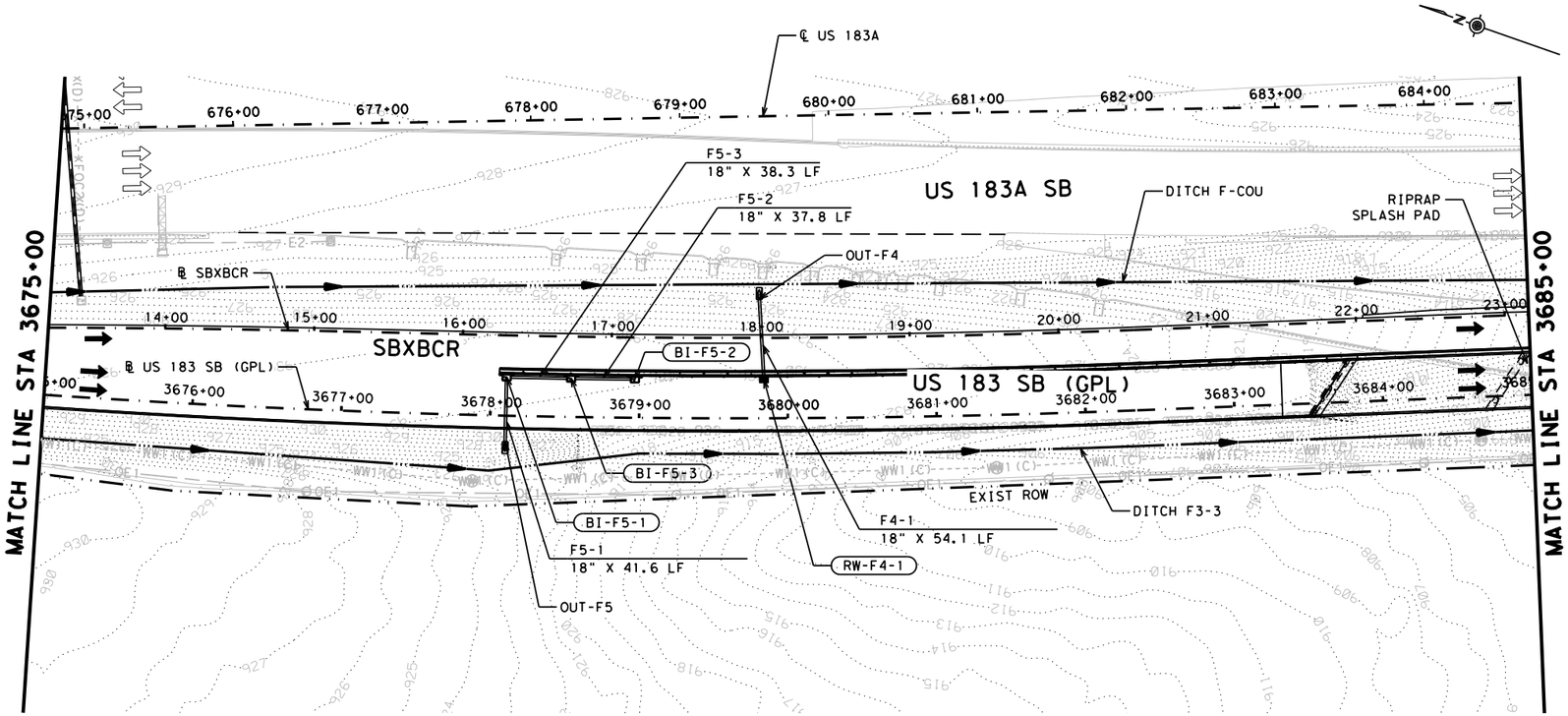

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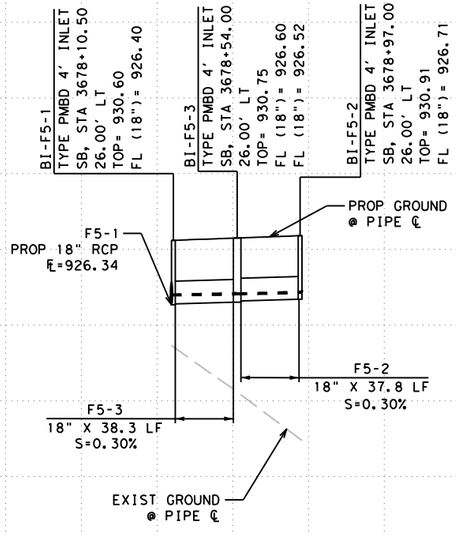

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BRYAN SIERSMA, P.E.

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2024
Texas Department of Transportation

US 183 GPL

SB STORM SEWER PLAN & PROFILE

SHEET 8 OF 16

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DS:	CK:	0151	10	001	US 183
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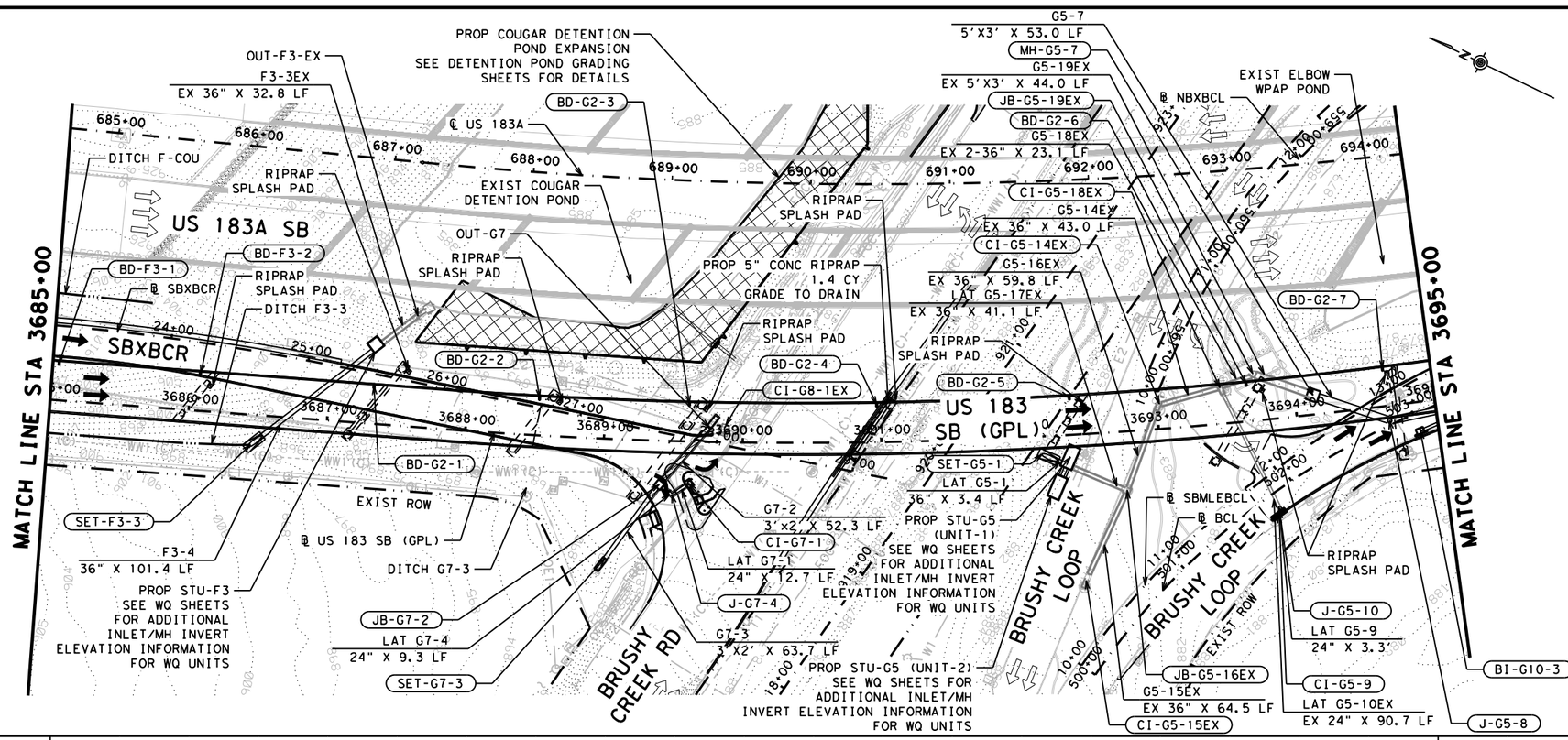

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SEE DRAINAGE PROFILE SHEETS FOR PROFILE INFORMATION

895 / 885 / 875 / 865 / 855

3685+00 3686+00 3687+00 3688+00 3689+00 3690+00 3691+00 3692+00 3693+00 3694+00 3695+00

NOTE:

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DESIGN

STATE OF TEXAS · BRYAN SIERSMA · 147188 · LICENSED PROFESSIONAL ENGINEER

BRYAN SIERSMA, P.E.
6/5/2024
DATE

APPROVAL

STATE OF TEXAS · DAN THOMA · 98622 · LICENSED PROFESSIONAL ENGINEER

DAN THOMA, P.E.
6/5/2024
DATE

0 50 100
SCALE: PLAN 1" = 100'
PROFILE: 1" = 10'

PAPE-DAWSON ENGINEERS
SAN ANTONIO | AUSTIN | HOUSTON | FORT WORTH | DALLAS
2000 NW LOOP 410 | SAN ANTONIO, TX 78213 | 210.375.9000
TEXAS ENGINEERING FIRM #470 | TEXAS SURVEYING FIRM #10028800

2024 Texas Department of Transportation

US 183 GPL

SB STORM SEWER PLAN & PROFILE

SHEET 9 OF 16

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DS: CK:	0151	10	001	US 183
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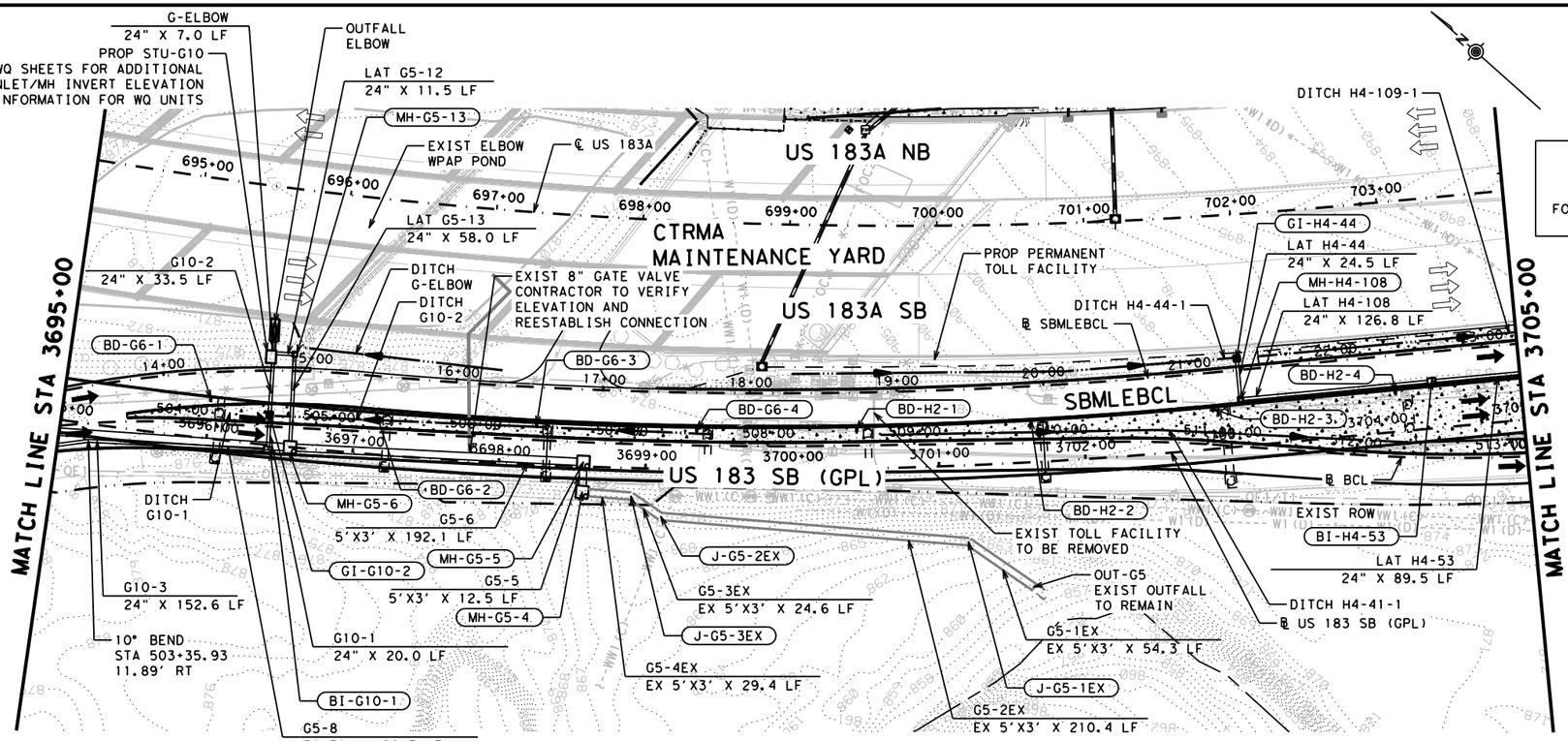

ATTENTION

PLEASE REFERENCE TCP PLANS FOR TEMPORARY DRAINAGE DETAILS

LEGEND

- EXIST TRAFFIC FLOW ARROW
- PROP TRAFFIC FLOW ARROW
- PROPERTY EASEMENT
- PROPOSED RDWY SAWCUT
- EXISTING UTILITY
- CREEK ℄
- HGL (10 YR STORM)
- EGL (10 YR STORM)
- PROPOSED DITCH ℄
- EXISTING DITCH ℄
- 1' CONTOURS
- CUT AND RESTORE
- PROP DETENTION POND EXPANSION

NOTES

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SEE DRAINAGE PROFILE SHEETS FOR PROFILE INFORMATION

885
875
865
855
845

3695+00 3696+00 3697+00 3698+00 3699+00 3700+00 3701+00 3702+00 3703+00 3704+00 3705+00

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SB STORM SEWER PLAN & PROFILE

SHEET 10 OF 16

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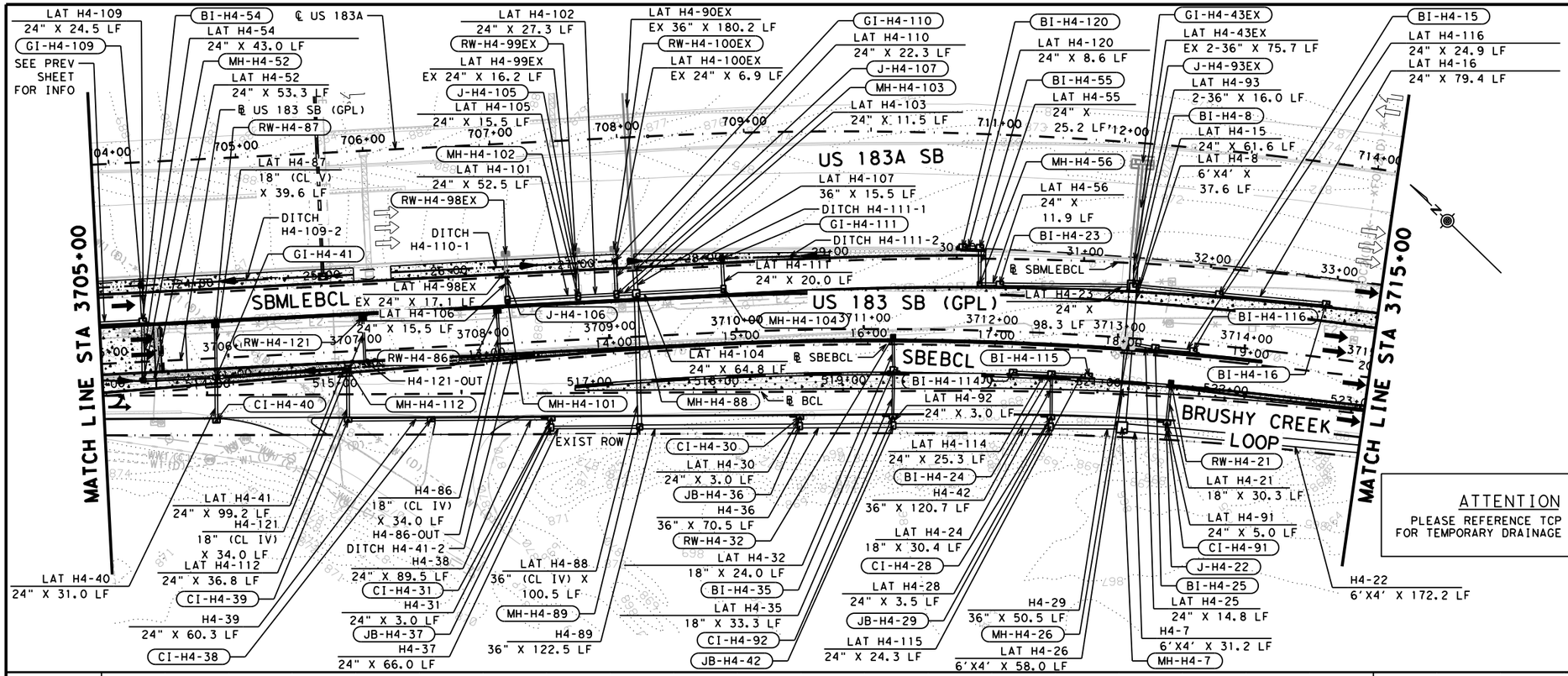

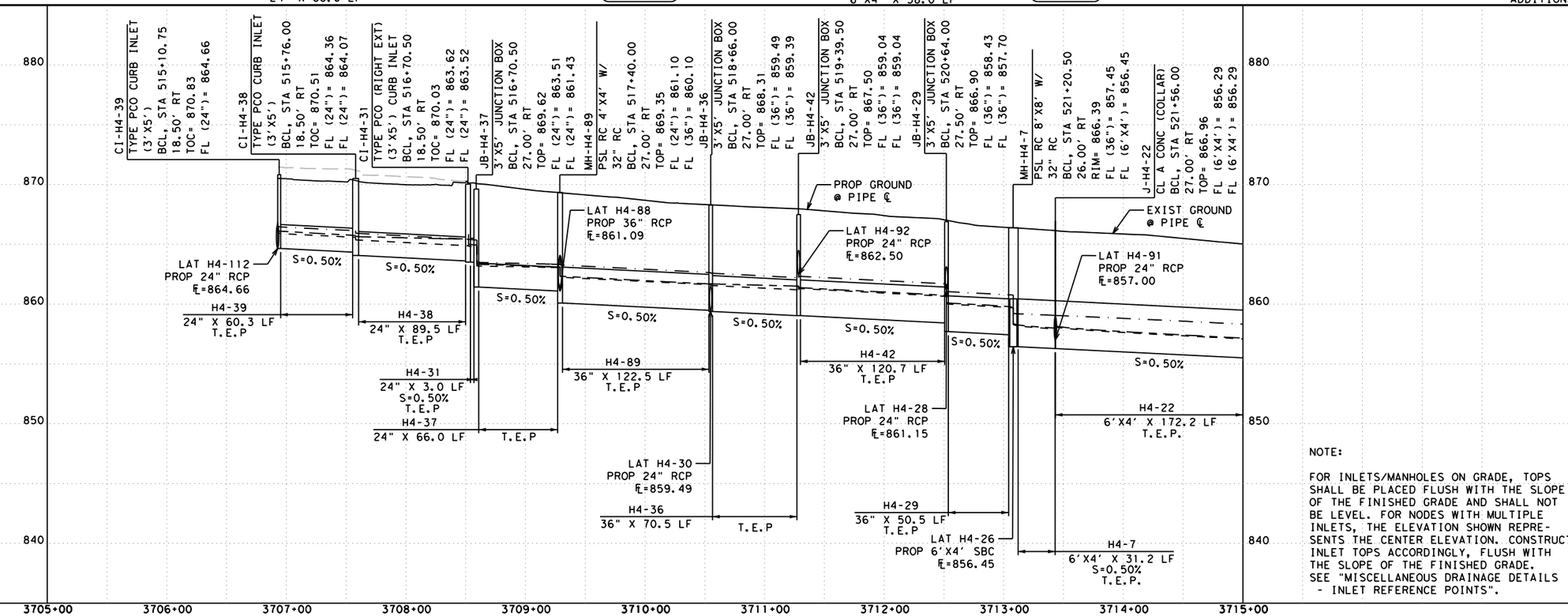

LEGEND

- EXIST TRAFFIC FLOW ARROW
- PROP TRAFFIC FLOW ARROW
- PROPERTY EASEMENT
- PROPOSED RDWY SAWCUT
- W 12" EXISTING UTILITY
- CREEK ℄
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DESIGN

STATE OF TEXAS — BRYAN SIERSMA — 147188 — LICENSED PROFESSIONAL ENGINEER

BRYAN SIERSMA, P.E.

4/24/2024
DATE

APPROVAL

STATE OF TEXAS — DAN THOMA — 98622 — LICENSED PROFESSIONAL ENGINEER

DAN THOMA, P.E.

4/24/2024
DATE

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SCALE: PLAN 1" = 100'
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PAPE-DAWSON ENGINEERS
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2000 NW LOOP 410 | SAN ANTONIO, TX 78213 | 210.375.9000
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SB STORM SEWER PLAN & PROFILE

SHEET 11 OF 16

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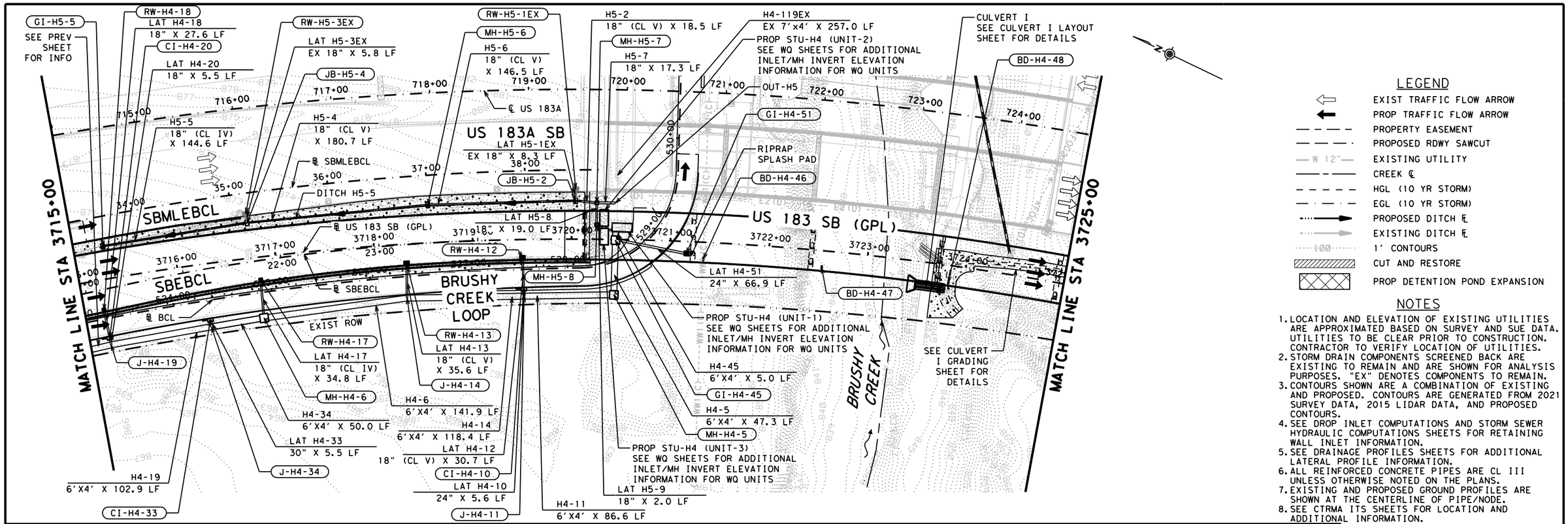

LEGEND

- EXIST TRAFFIC FLOW ARROW
- PROP TRAFFIC FLOW ARROW
- PROPERTY EASEMENT
- PROPOSED RDWY SAWCUT
- W 12" EXISTING UTILITY
- CREEK ℄
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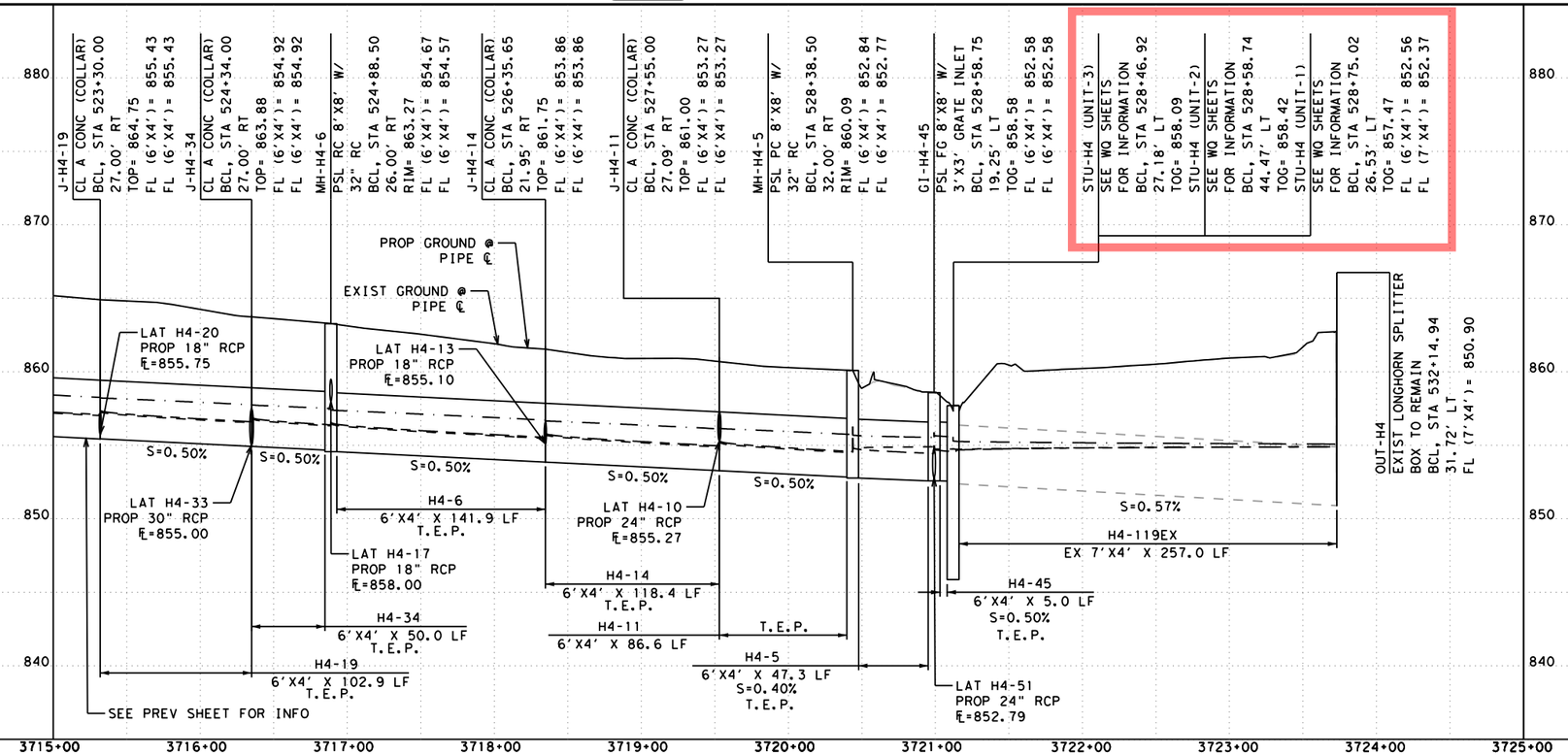

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STATE OF TEXAS — BRYAN SIERSMA — 147188 — LICENSED PROFESSIONAL ENGINEER

BRYAN SIERSMA, P.E.
6/5/2024
DATE

APPROVAL

STATE OF TEXAS — DAN THOMA — 98622 — LICENSED PROFESSIONAL ENGINEER

DAN THOMA, P.E.
6/5/2024
DATE

0 50 100
SCALE: PLAN 1" = 100'
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PAPE-DAWSON ENGINEERS
SAN ANTONIO | AUSTIN | HOUSTON | FORT WORTH | DALLAS
2000 NW LOOP 410 | SAN ANTONIO, TX 78213 | 210.375.9000
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SB STORM SEWER PLAN & PROFILE

SHEET 12 OF 16

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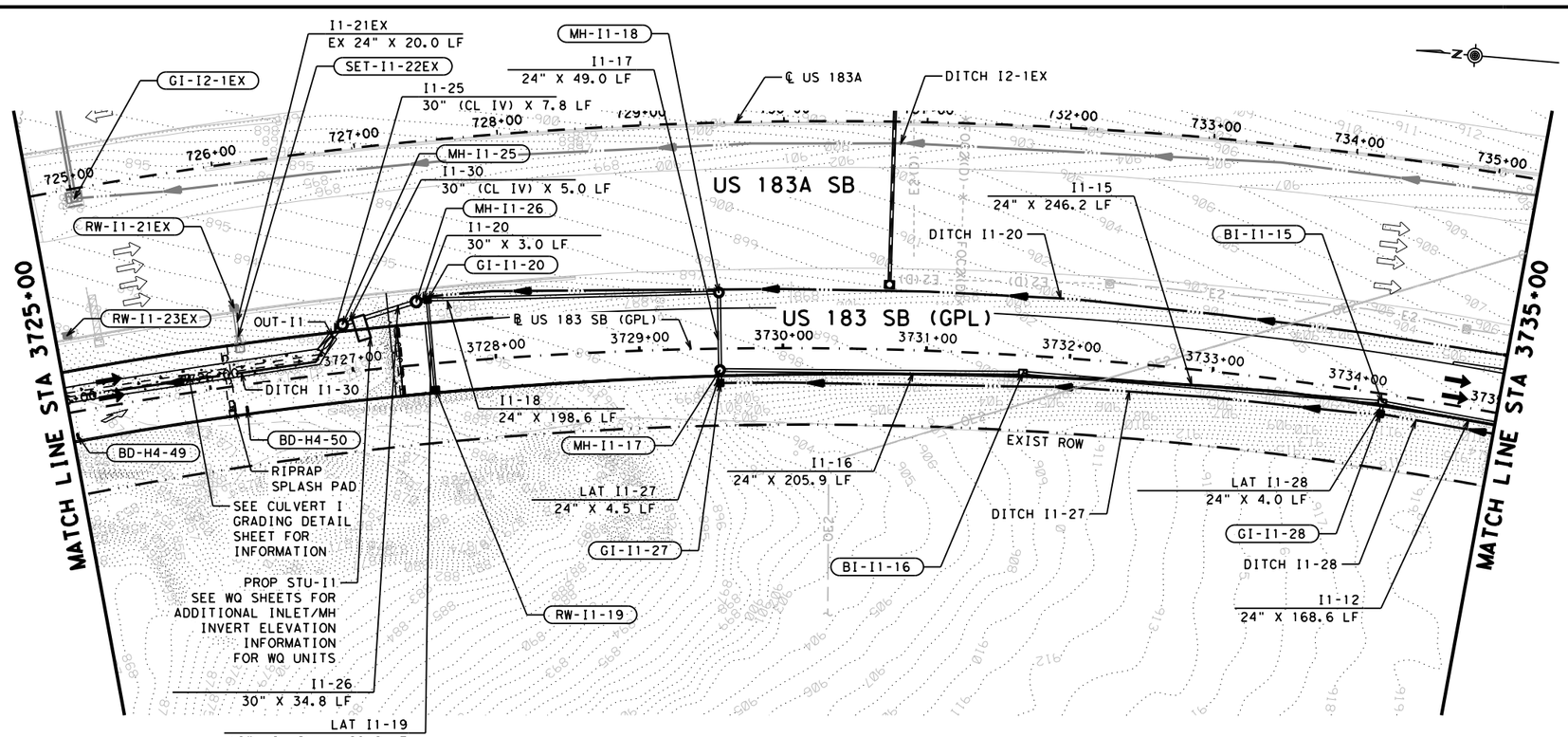

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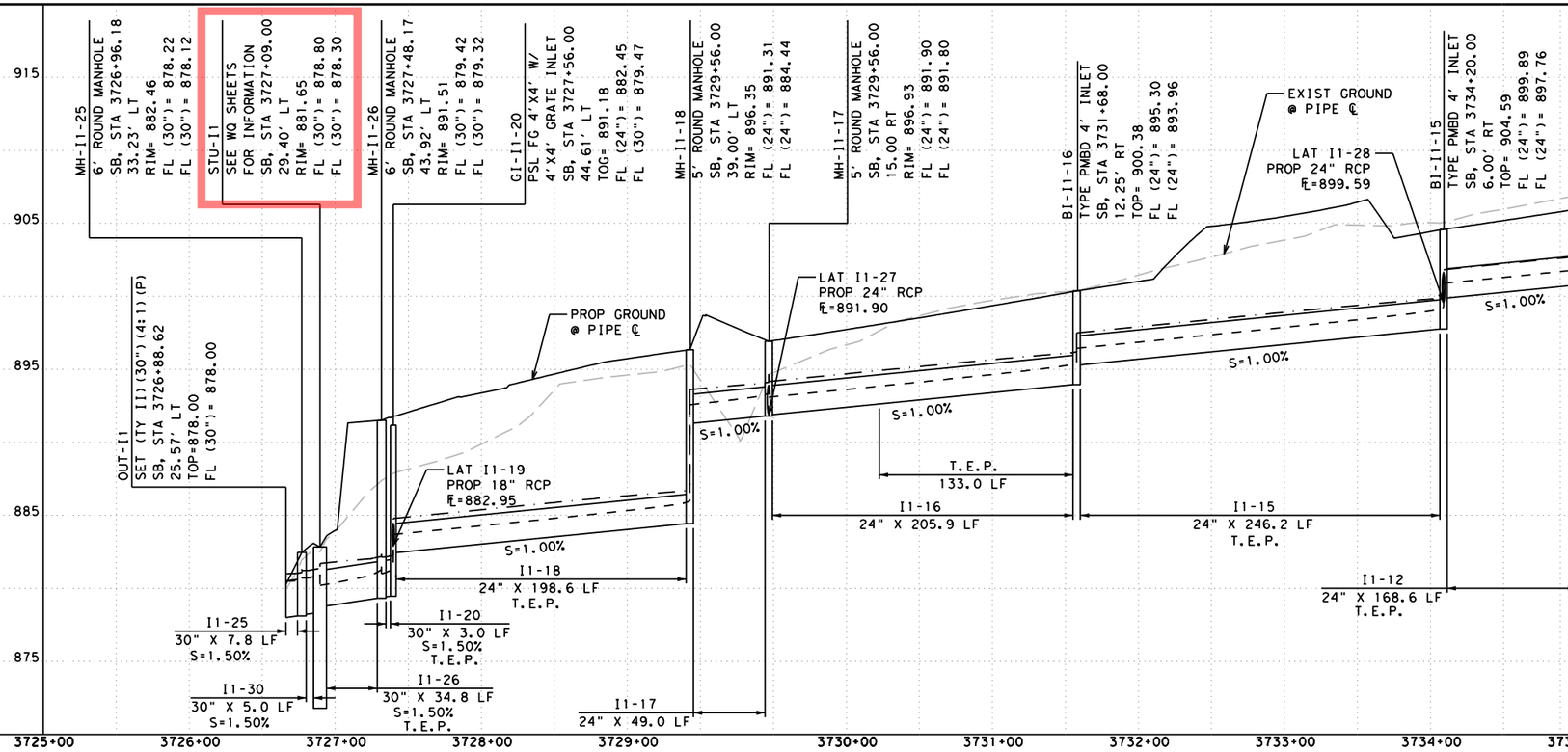

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DESIGN

STATE OF TEXAS — BRYAN SIERSMA — 147188 — LICENSED PROFESSIONAL ENGINEER

BRYAN SIERSMA, P.E.

6/5/2024
DATE

APPROVAL

STATE OF TEXAS — DAN THOMA — 98622 — LICENSED PROFESSIONAL ENGINEER

DAN THOMA, P.E.

6/5/2024
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0 50 100

SCALE: PLAN 1" = 100'
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PAPE-DAWSON ENGINEERS
SAN ANTONIO | AUSTIN | HOUSTON | FORT WORTH | DALLAS
2000 NW LOOP 410 | SAN ANTONIO, TX 78213 | 210.375.9000
TEXAS ENGINEERING FIRM #470 | TEXAS SURVEYING FIRM #10028800

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SB STORM SEWER PLAN & PROFILE

SHEET 13 OF 16

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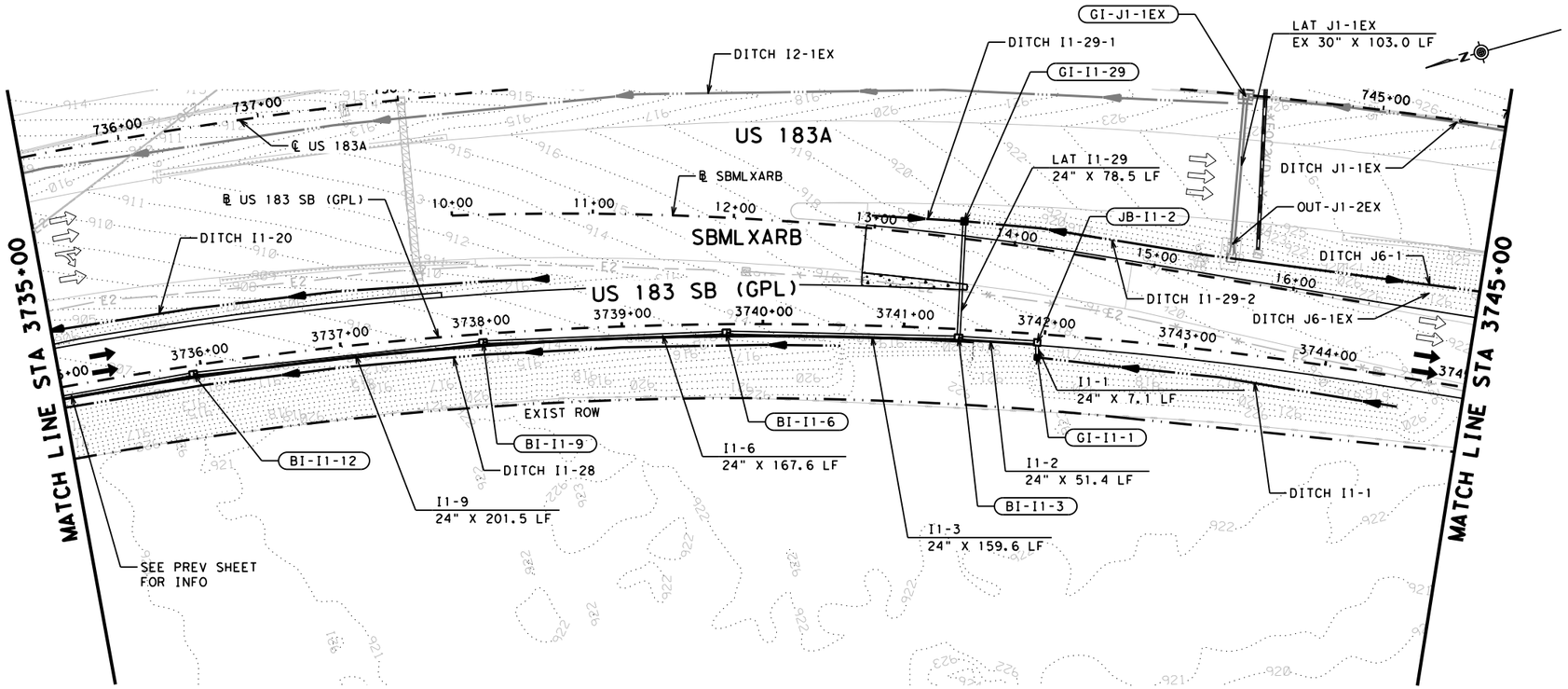

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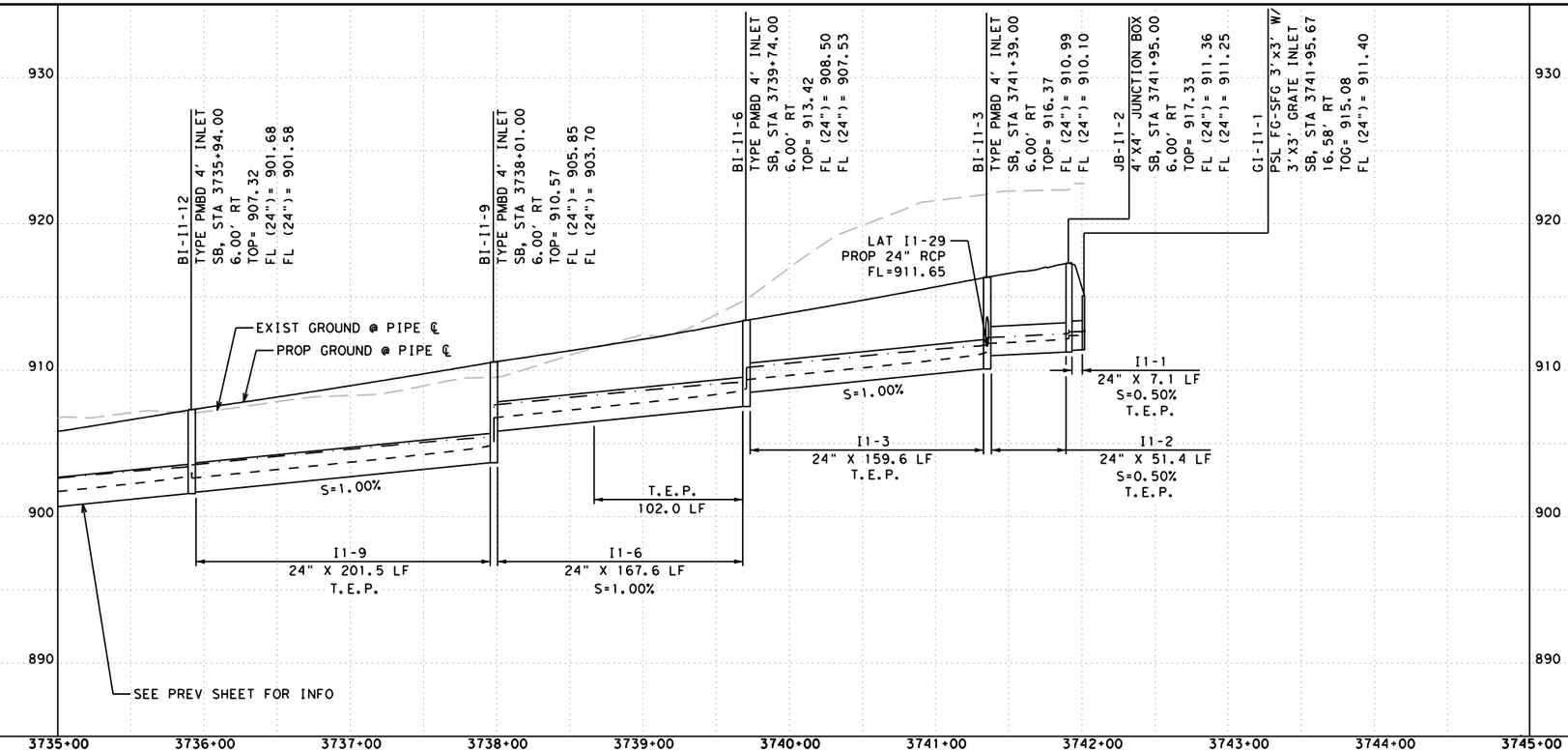

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STATE OF TEXAS — BRYAN SIERSMA — 147188 — LICENSED PROFESSIONAL ENGINEER

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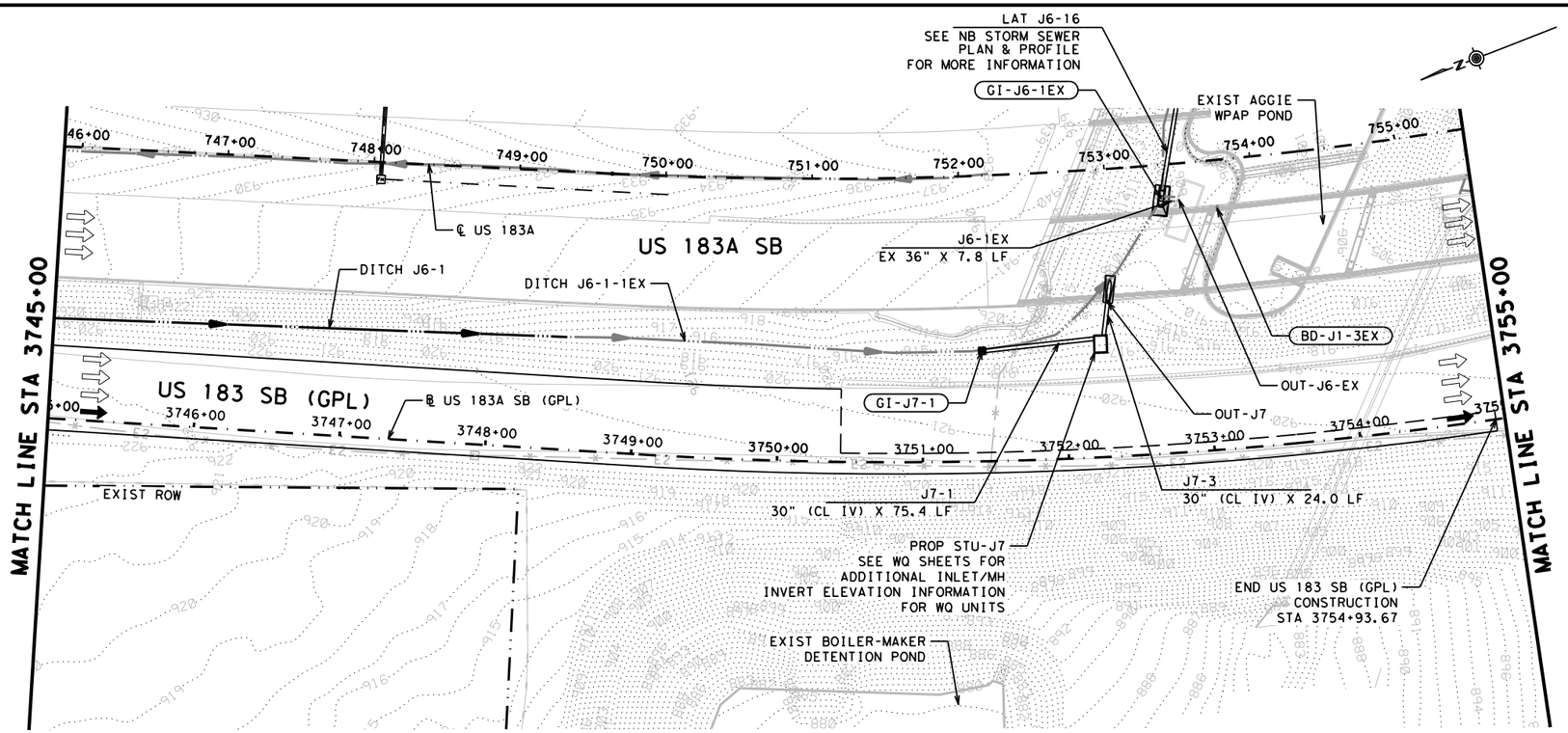

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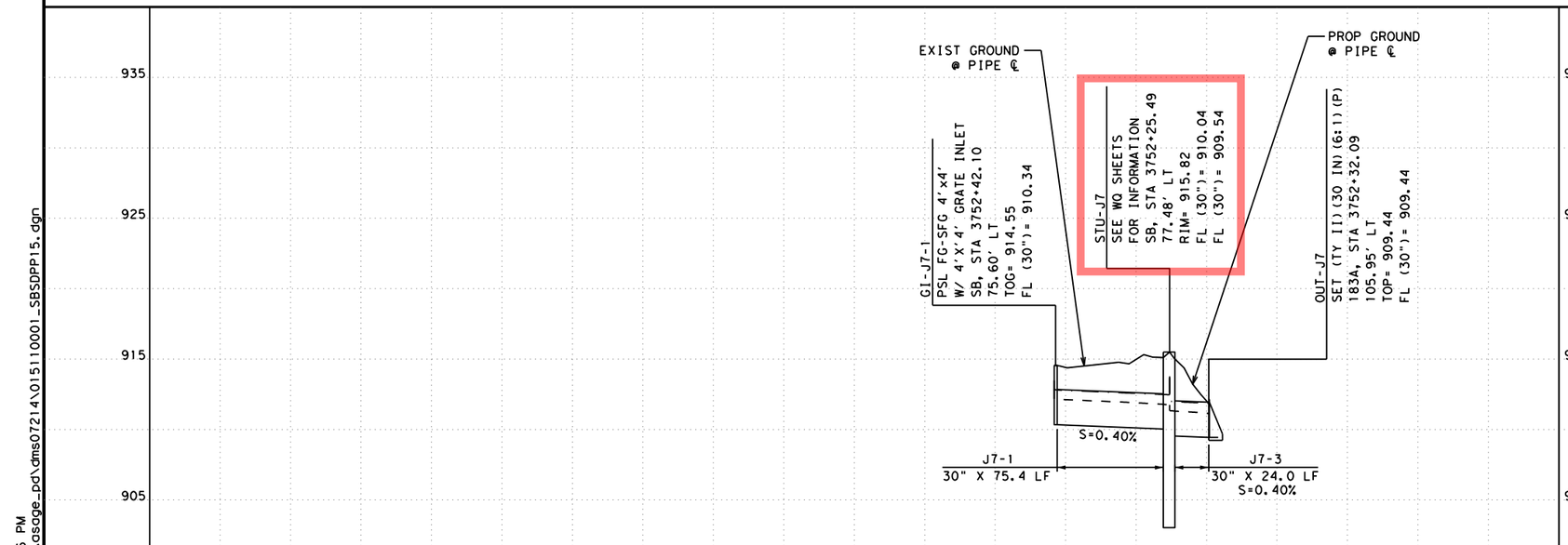

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BRYAN SIERSMA, P.E.

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SHEET 15 OF 16

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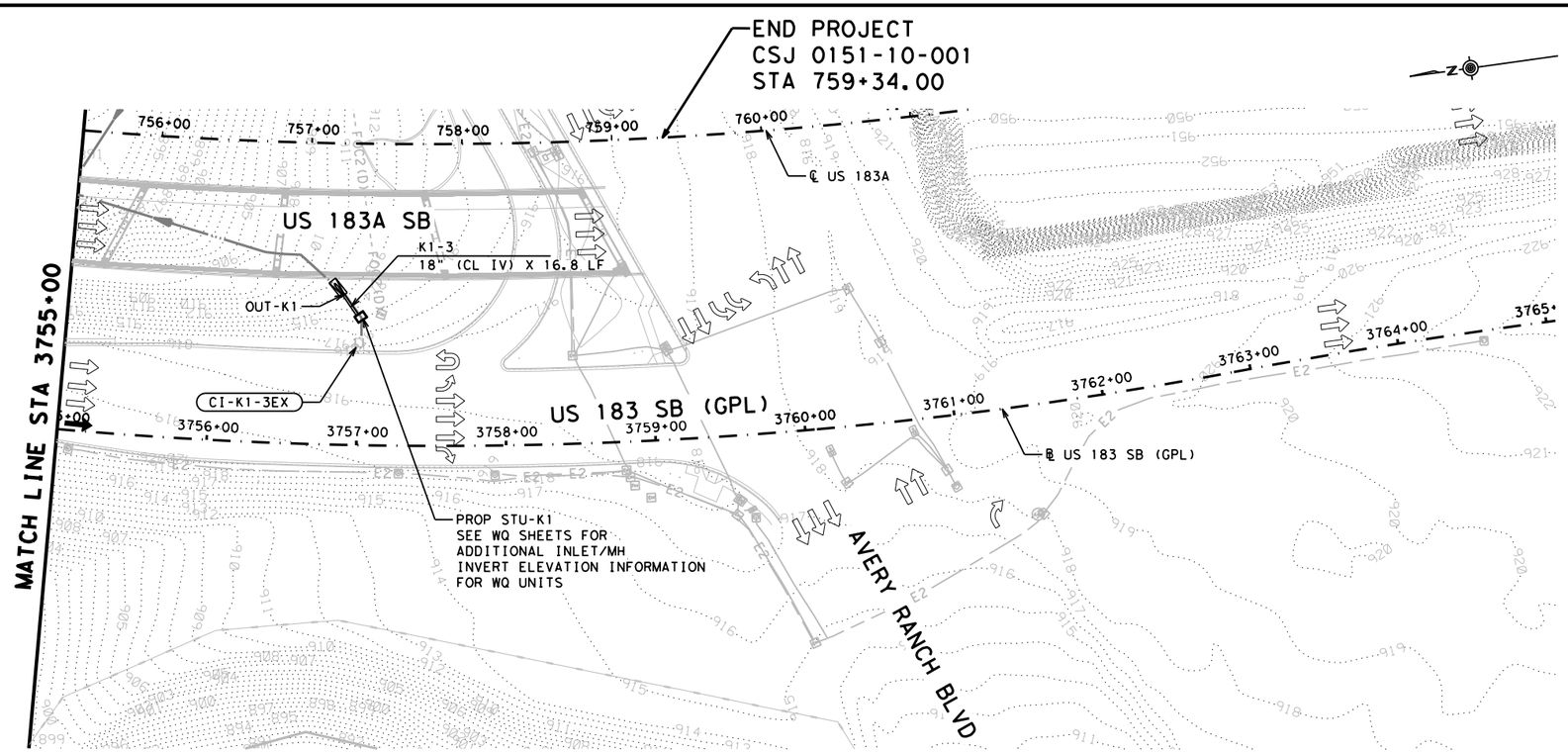

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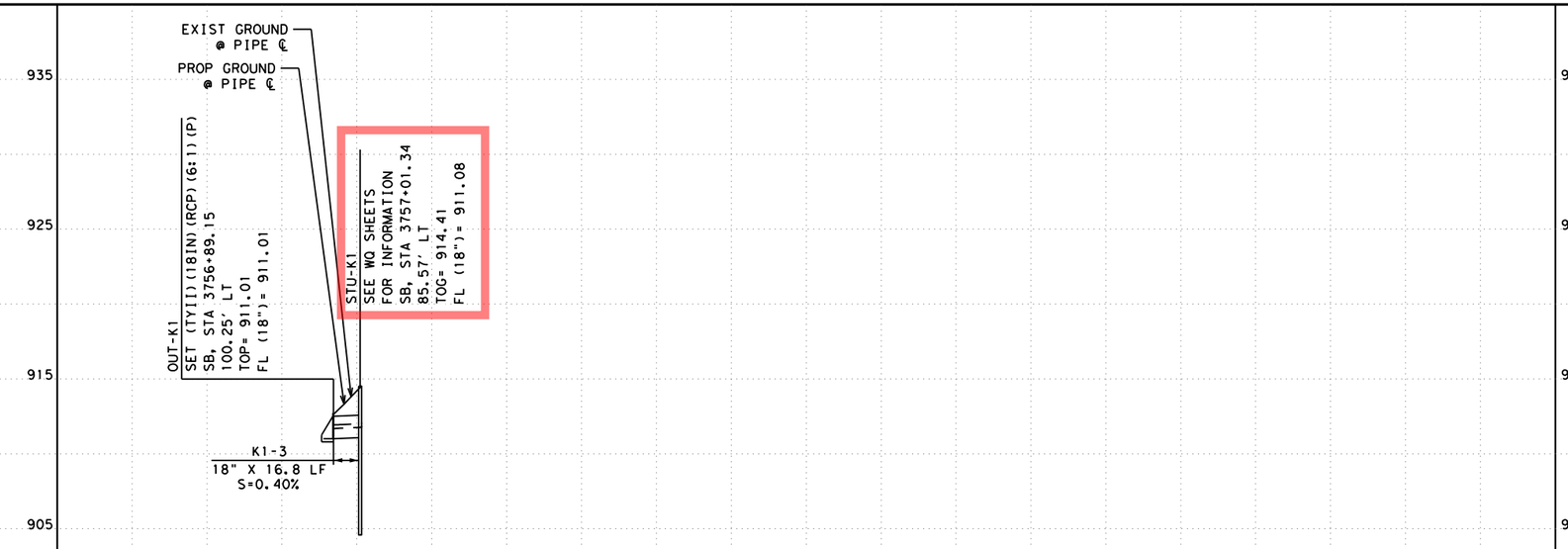
- CREEK ℄
- HGL (10 YR STORM)
- EGL (10 YR STORM)
- PROPOSED DITCH ℄
- EXISTING DITCH ℄
- 1' CONTOURS
- CUT AND RESTORE
- PROP DETENTION POND EXPANSION

NOTES

1. LOCATION AND ELEVATION OF EXISTING UTILITIES ARE APPROXIMATED BASED ON SURVEY AND SUE DATA. UTILITIES TO BE CLEAR PRIOR TO CONSTRUCTION. CONTRACTOR TO VERIFY LOCATION OF UTILITIES.
2. STORM DRAIN COMPONENTS SCREENED BACK ARE EXISTING TO REMAIN AND ARE SHOWN FOR ANALYSIS PURPOSES. "EX" DENOTES COMPONENTS TO REMAIN.
3. CONTOURS SHOWN ARE A COMBINATION OF EXISTING AND PROPOSED. CONTOURS ARE GENERATED FROM 2021 SURVEY DATA, 2015 LIDAR DATA, AND PROPOSED CONTOURS.
4. SEE DROP INLET COMPUTATIONS AND STORM SEWER HYDRAULIC COMPUTATIONS SHEETS FOR RETAINING WALL INLET INFORMATION.
5. SEE DRAINAGE PROFILES SHEETS FOR ADDITIONAL LATERAL PROFILE INFORMATION.
6. ALL REINFORCED CONCRETE PIPES ARE CL III UNLESS OTHERWISE NOTED ON THE PLANS.
7. EXISTING AND PROPOSED GROUND PROFILES ARE SHOWN AT THE CENTERLINE OF PIPE/NODE.
8. SEE CTRMA ITS SHEETS FOR LOCATION AND ADDITIONAL INFORMATION.



NOTE:

FOR INLETS/MANHOLES ON GRADE, TOPS SHALL BE PLACED FLUSH WITH THE SLOPE OF THE FINISHED GRADE AND SHALL NOT BE LEVEL. FOR NODES WITH MULTIPLE INLETS, THE ELEVATION SHOWN REPRESENTS THE CENTER ELEVATION. CONSTRUCT INLET TOPS ACCORDINGLY, FLUSH WITH THE SLOPE OF THE FINISHED GRADE. SEE "MISCELLANEOUS DRAINAGE DETAILS - INLET REFERENCE POINTS".

DESIGN

STATE OF TEXAS — BRYAN SIERSMA — 147188 — LICENSED PROFESSIONAL ENGINEER

BRYAN SIERSMA, P.E.

6/5/2024
DATE

APPROVAL

STATE OF TEXAS — DAN THOMA — 98622 — LICENSED PROFESSIONAL ENGINEER

DAN THOMA, P.E.

6/5/2024
DATE

0 50 100

SCALE: PLAN 1" = 100'
PROFILE: 1" = 10'

PAPE-DAWSON ENGINEERS
SAN ANTONIO | AUSTIN | HOUSTON | FORT WORTH | DALLAS
2000 NW LOOP 410 | SAN ANTONIO, TX 78213 | 210.375.9000
TEXAS ENGINEERING FIRM #470 | TEXAS SURVEYING FIRM #10028800

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US 183 GPL

SB STORM SEWER PLAN & PROFILE

SHEET 16 OF 16

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DS:	CK:	0151	10	001	US 183
DW:	CK:	DIST	COUNTY		SHEET NO.
		AUS	WILLIAMSON		762

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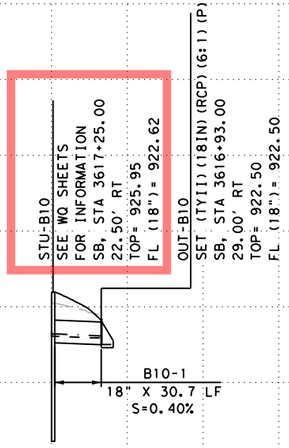

LINE B10-1

940 935 930 925 920 915 910 905 900

LEGEND

- EXIST GROUND
- EXIST PIPE TO REMAIN
- HGL (10 YR STORM)
- EGL (10 YR STORM)
- HGL (25 YR STORM)
- HGL (50 YR STORM)
- PROP FINISHED GRADE

NOTES:
1. ALL PIPES ARE CL III UNLESS OTHERWISE INDICATED.
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NOTE:

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DESIGN

STATE OF TEXAS · BRYAN SIERSMA · 147188 · LICENSED PROFESSIONAL ENGINEER

BRYAN SIERSMA, P.E.

6/5/2024
DATE

APPROVAL

STATE OF TEXAS · DAN THOMA · 98622 · LICENSED PROFESSIONAL ENGINEER

DAN THOMA, P.E.

6/5/2024
DATE

0 50 100

SCALE: HORIZONTAL 1" = 100'
VERTICAL: 1" = 10'

PAPE-DAWSON ENGINEERS
SAN ANTONIO | AUSTIN | HOUSTON | FORT WORTH | DALLAS
2000 NW LOOP 410 | SAN ANTONIO, TX 78213 | 210.375.9000
TEXAS ENGINEERING FIRM #470 | TEXAS SURVEYING FIRM #10028800

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US 183 GPL

DRAINAGE PROFILES SYSTEM B

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		0151	10	001	US 183
DW:	CK:	DIST	COUNTY		SHEET NO.
		AUS	WILLIAMSON		763

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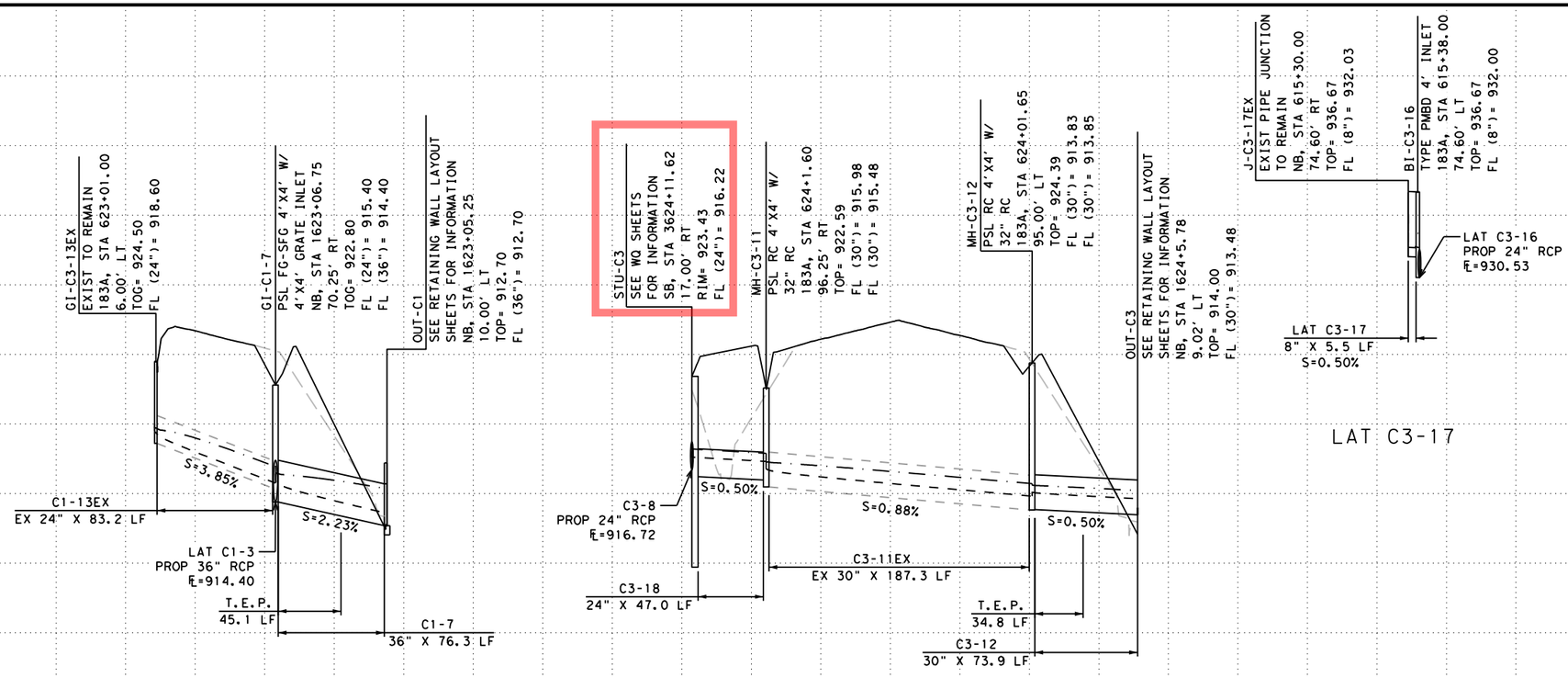

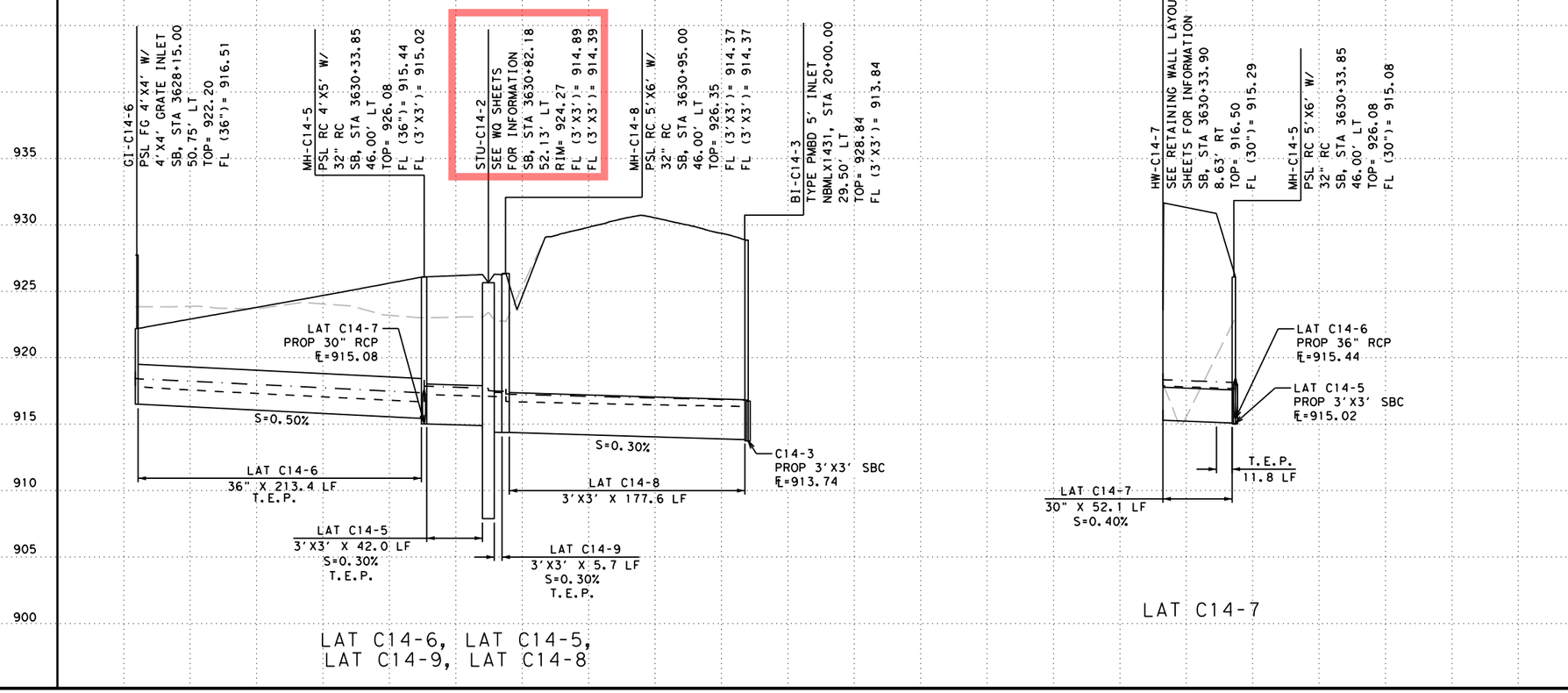

LEGEND

- EXIST GROUND
- EXIST PIPE TO REMAIN
- HGL (10 YR STORM)
- EGL (10 YR STORM)
- HGL (25 YR STORM)
- HGL (50 YR STORM)
- PROP FINISHED GRADE

NOTES:
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DESIGN

STATE OF TEXAS · BRYAN SIERSMA · 147188 · LICENSED PROFESSIONAL ENGINEER

BRYAN SIERSMA, P.E.

6/5/2024
DATE

APPROVAL

STATE OF TEXAS · DAN THOMA · 98622 · LICENSED PROFESSIONAL ENGINEER

DAN THOMA, P.E.

6/5/2024
DATE

0 50 100

SCALE: HORIZONTAL 1" = 100'
VERTICAL: 1" = 10'

PAPE-DAWSON ENGINEERS
SAN ANTONIO | AUSTIN | HOUSTON | FORT WORTH | DALLAS
2000 NW LOOP 410 | SAN ANTONIO, TX 78213 | 210.375.9000
TEXAS ENGINEERING FIRM #470 | TEXAS SURVEYING FIRM #10028800

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US 183 GPL

DRAINAGE PROFILES SYSTEM C

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CONT	SECT	JOB	HIGHWAY
0151	10	001	US 183
DIST	COUNTY		SHEET NO.
AUS	WILLIAMSON		764

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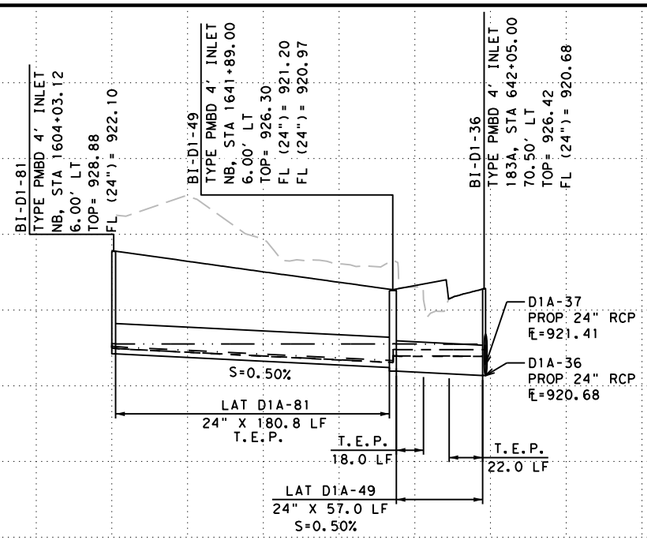

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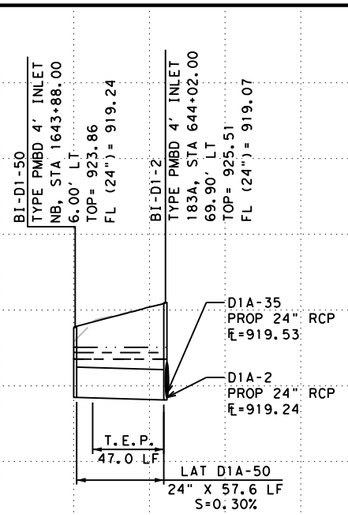
LAT D1A-49



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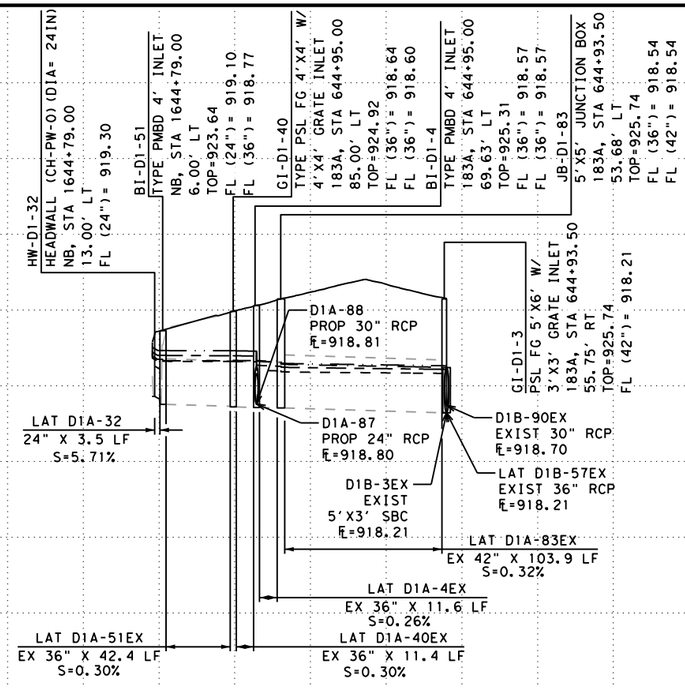

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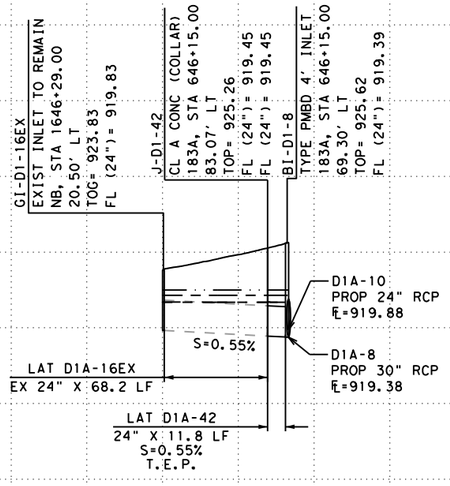
LAT D1A-4EX, LAT D1A-83EX



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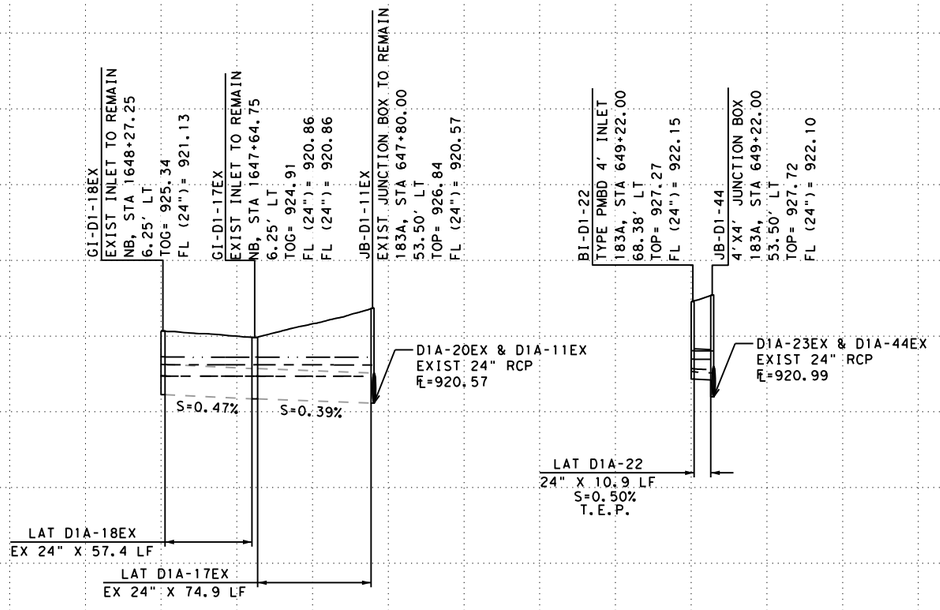

LAT D1A-18EX,
LAT D1A-17EX

LAT D1A-22

LEGEND

- EXIST GROUND
- EXIST PIPE TO REMAIN
- HGL (10 YR STORM)
- EGL (10 YR STORM)
- HGL (25 YR STORM)
- HGL (50 YR STORM)
- PROP FINISHED GRADE

NOTES:
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DESIGN

STATE OF TEXAS · BRYAN SIERSMA · 147188 · LICENSED PROFESSIONAL ENGINEER

BRYAN SIERSMA, P.E.

4/23/2024
DATE

APPROVAL

STATE OF TEXAS · DAN THOMA · 98622 · LICENSED PROFESSIONAL ENGINEER

DAN THOMA, P.E.

4/23/2024
DATE

0 50 100

SCALE: HORIZONTAL 1" = 100'
VERTICAL: 1" = 10'

PAPE-DAWSON ENGINEERS
SAN ANTONIO | AUSTIN | HOUSTON | FORT WORTH | DALLAS
2000 NW LOOP 410 | SAN ANTONIO, TX 78213 | 210.375.9000
TEXAS ENGINEERING FIRM #470 | TEXAS SURVEYING FIRM #10028800

2024
Texas Department of Transportation

US 183 GPL

DRAINAGE PROFILES SYSTEM D

SHEET 3 OF 22

© 2024	CONT	SECT	JOB	HIGHWAY
DS: CK:	0151	10	001	US 183
DW: CK:	DIST	COUNTY		SHEET NO.
	AUS	WILLIAMSON		765

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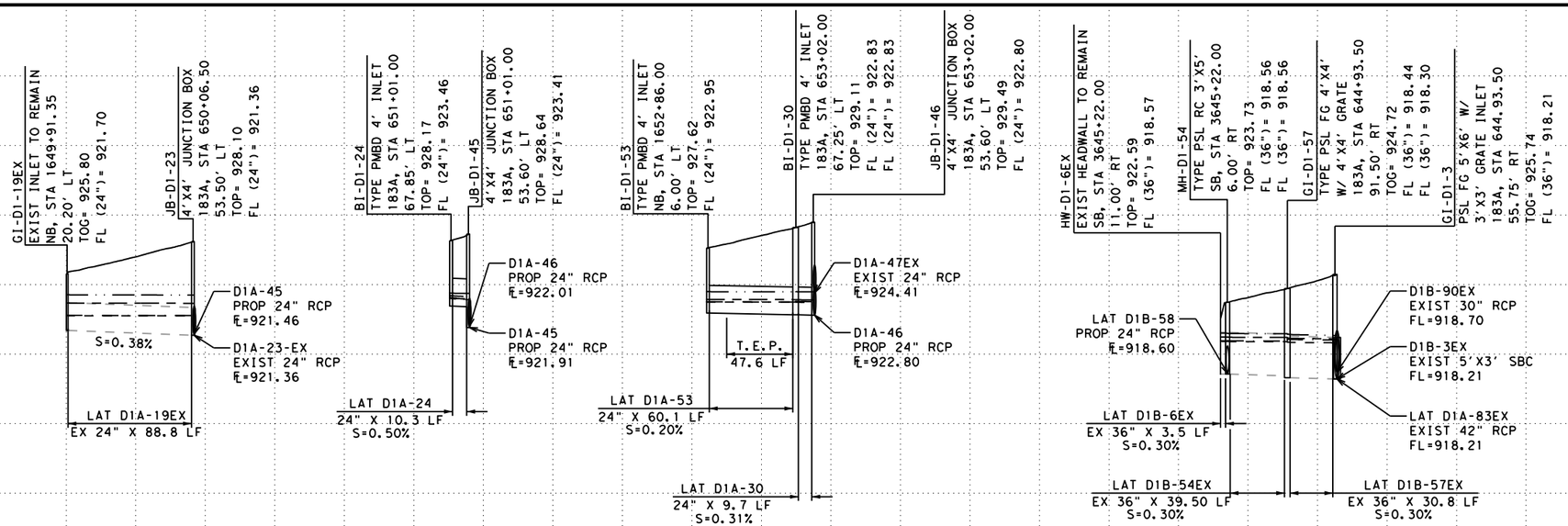

LEGEND

- EXIST GROUND
- EXIST PIPE TO REMAIN
- HGL (10 YR STORM)
- EGL (10 YR STORM)
- HGL (25 YR STORM)
- HGL (50 YR STORM)
- PROP FINISHED GRADE

NOTES:
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DESIGN

BRYAN SIERSMA
147188
LICENSED PROFESSIONAL ENGINEER
STATE OF TEXAS

BRYAN SIERSMA, P.E.
6/5/2024
DATE

APPROVAL

DAN THOMA
98622
LICENSED PROFESSIONAL ENGINEER
STATE OF TEXAS

DAN THOMA, P.E.
6/5/2024
DATE

0 50 100
SCALE: HORIZONTAL 1" = 100'
VERTICAL: 1" = 10'

PAPE-DAWSON ENGINEERS
SAN ANTONIO | AUSTIN | HOUSTON | FORT WORTH | DALLAS
2000 NW LOOP 410 | SAN ANTONIO, TX 78213 | 210.375.9000
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US 183 GPL

DRAINAGE PROFILES SYSTEM D

SHEET 4 OF 22

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	AUS	WILLIAMSON		766

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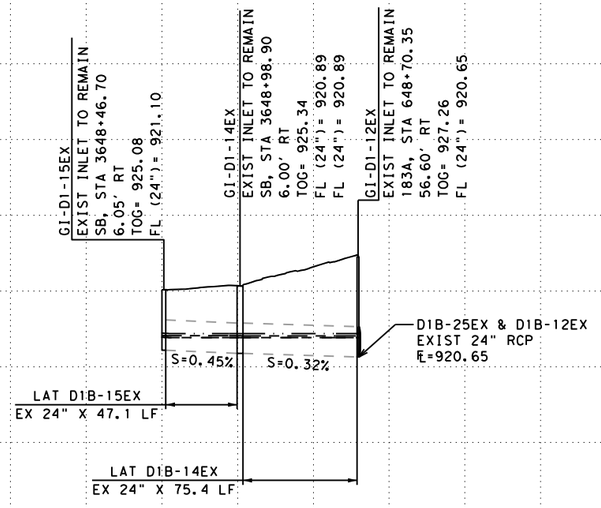

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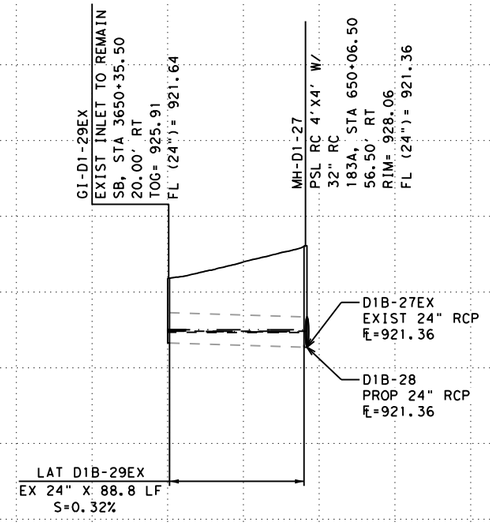

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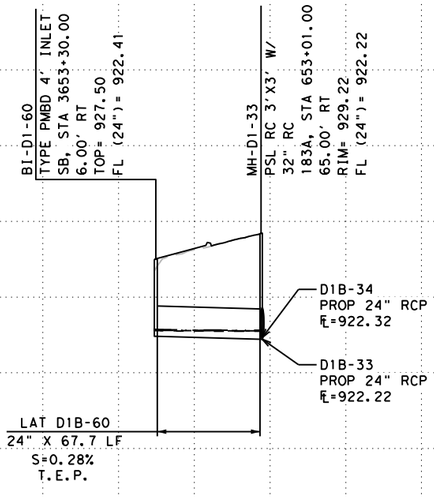

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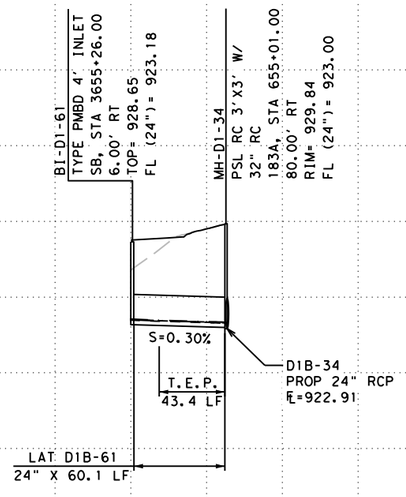

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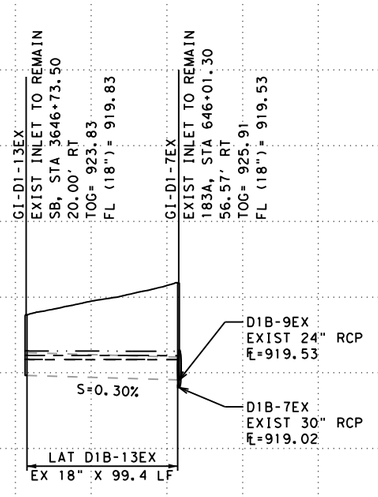

LAT D1B-13EX

LEGEND

- EXIST GROUND
- EXIST PIPE TO REMAIN
- HGL (10 YR STORM)
- EGL (10 YR STORM)
- HGL (25 YR STORM)
- HGL (50 YR STORM)
- PROP FINISHED GRADE

NOTES:
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DESIGN

STATE OF TEXAS · BRYAN SIERSMA · 147188 · LICENSED PROFESSIONAL ENGINEER

BRYAN SIERSMA, P.E.

4/23/2024
DATE

APPROVAL

STATE OF TEXAS · DAN THOMA · 98622 · LICENSED PROFESSIONAL ENGINEER

DAN THOMA, P.E.

4/23/2024
DATE

0 50 100

SCALE: HORIZONTAL 1" = 100'
VERTICAL: 1" = 10'

PAPE-DAWSON ENGINEERS
SAN ANTONIO | AUSTIN | HOUSTON | FORT WORTH | DALLAS
2000 NW LOOP 410 | SAN ANTONIO, TX 78213 | 210.375.9000
TEXAS ENGINEERING FIRM #470 | TEXAS SURVEYING FIRM #10028800

2024
Texas Department of Transportation

US 183 GPL

DRAINAGE PROFILES SYSTEM D

SHEET 5 OF 22

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DS: CK:	0151	10	001	US 183
	DIST	COUNTY		SHEET NO.
DW: CK:	AUS	WILLIAMSON		767

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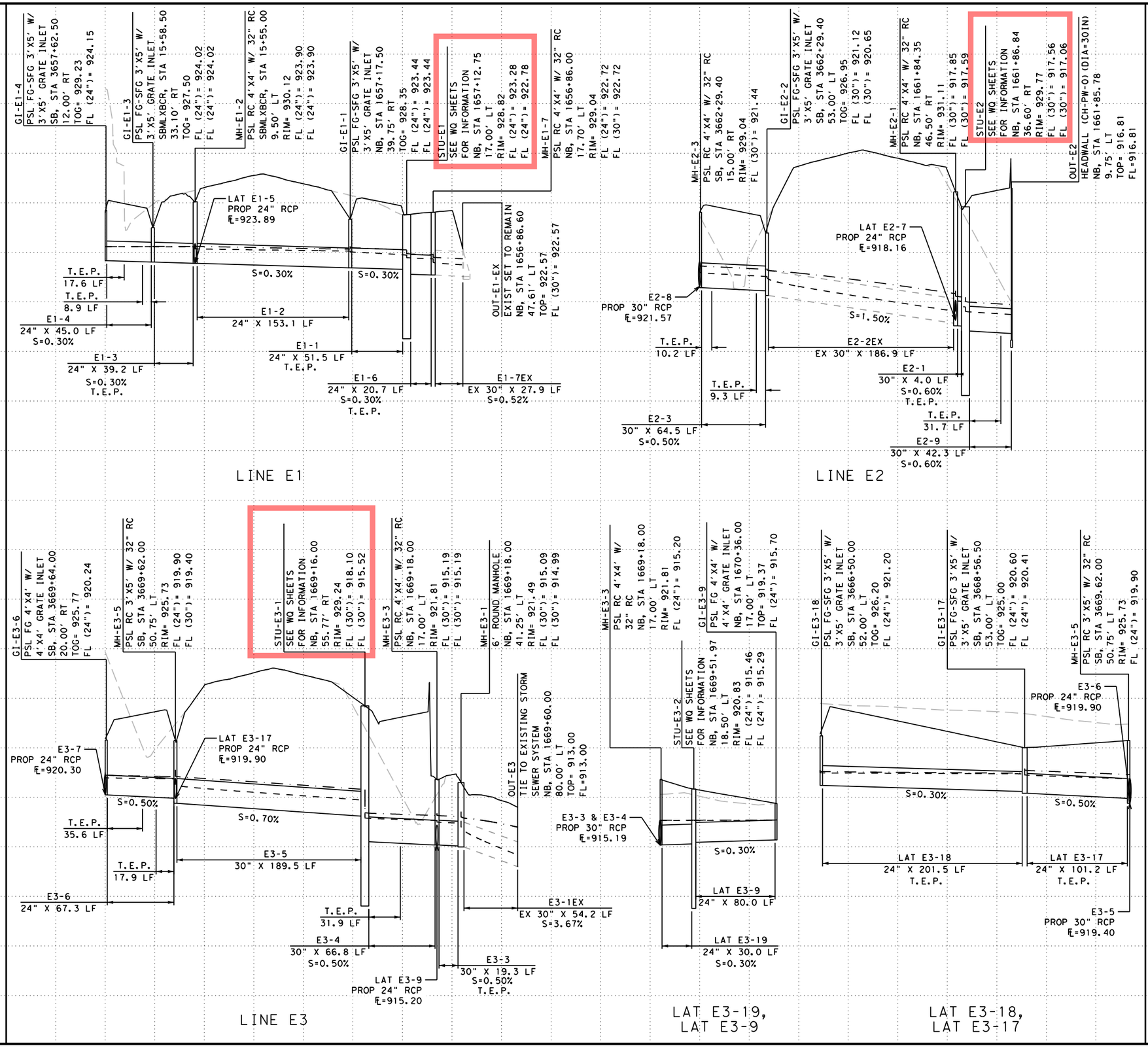

LEGEND

- EXIST GROUND
- EXIST PIPE TO REMAIN
- HGL (10 YR STORM)
- EGL (10 YR STORM)
- HGL (25 YR STORM)
- HGL (50 YR STORM)
- PROP FINISHED GRADE

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DESIGN

STATE OF TEXAS · BRYAN SIERSMA · 147188 · LICENSED PROFESSIONAL ENGINEER

BRYAN SIERSMA, P.E.

6/5/2024
DATE

APPROVAL

STATE OF TEXAS · DAN THOMA · 98622 · LICENSED PROFESSIONAL ENGINEER

DAN THOMA, P.E.

6/5/2024
DATE

0 50 100

SCALE: HORIZONTAL 1" = 100'
VERTICAL: 1" = 10'

PAPE-DAWSON ENGINEERS
SAN ANTONIO | AUSTIN | HOUSTON | FORT WORTH | DALLAS
2000 NW LOOP 410 | SAN ANTONIO, TX 78213 | 210.375.9000
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2024
Texas Department of Transportation

US 183 GPL

DRAINAGE PROFILES SYSTEM E

SHEET 6 OF 22

© 2024	CONT	SECT	JOB	HIGHWAY
DS: CK:	0151	10	001	US 183
DW: CK:	DIST	COUNTY		SHEET NO.
	AUS	WILLIAMSON		768

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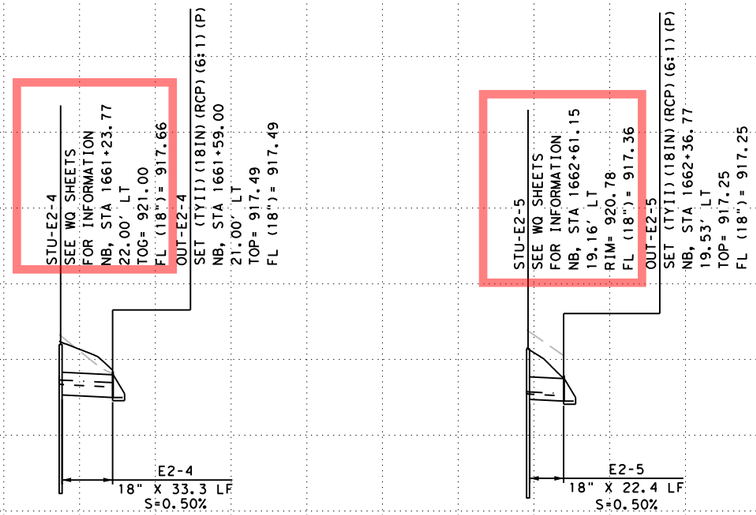
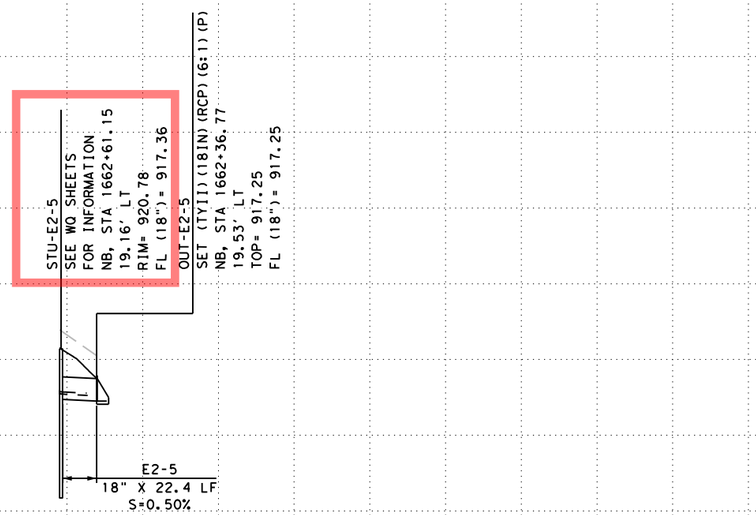


LINE E2-4



LINE E2-5

940
935
930
925
920
915
910
905
935
930
925
920
915
910
905
900

LEGEND

- EXIST GROUND
- EXIST PIPE TO REMAIN
- HGL (10 YR STORM)
- EGL (10 YR STORM)
- HGL (25 YR STORM)
- HGL (50 YR STORM)
- PROP FINISHED GRADE

NOTES:
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5. SEE CTRMA ITS SHEETS FOR LOCATION AND ADDITIONAL INFORMATION.

NOTE:

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DESIGN

STATE OF TEXAS · BRYAN SIERSMA · 147188 · LICENSED PROFESSIONAL ENGINEER

BRYAN SIERSMA, P.E.

6/5/2024
DATE

APPROVAL

STATE OF TEXAS · DAN THOMA · 98622 · LICENSED PROFESSIONAL ENGINEER

DAN THOMA, P.E.

6/5/2024
DATE

0 50 100

SCALE: HORIZONTAL 1" = 100'
VERTICAL: 1" = 10'

PAPE-DAWSON ENGINEERS

SAN ANTONIO | AUSTIN | HOUSTON | FORT WORTH | DALLAS
2000 NW LOOP 410 | SAN ANTONIO, TX 78213 | 210.375.9000
TEXAS ENGINEERING FIRM #470 | TEXAS SURVEYING FIRM #10028800

2024
Texas Department of Transportation

US 183 GPL

DRAINAGE PROFILES SYSTEM E

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CONT	SECT	JOB	HIGHWAY
0151	10	001	US 183
DIST	COUNTY		SHEET NO.
AUS	WILLIAMSON		769

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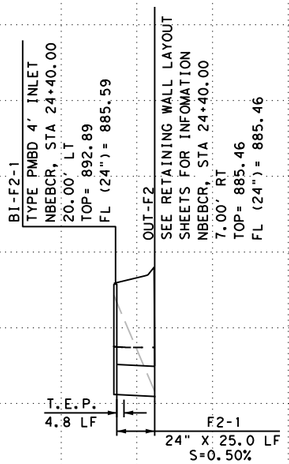
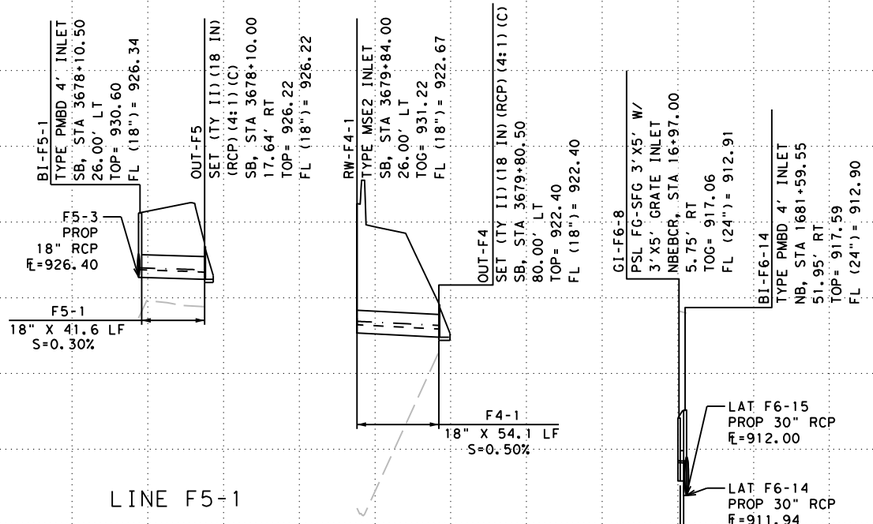


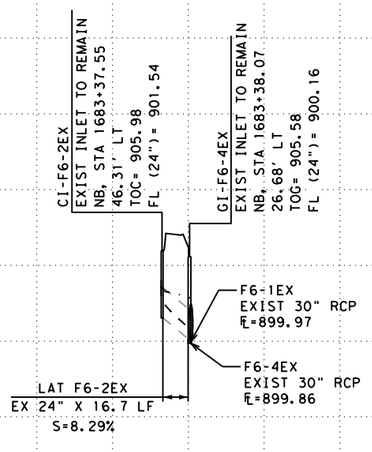
LINE F2-1



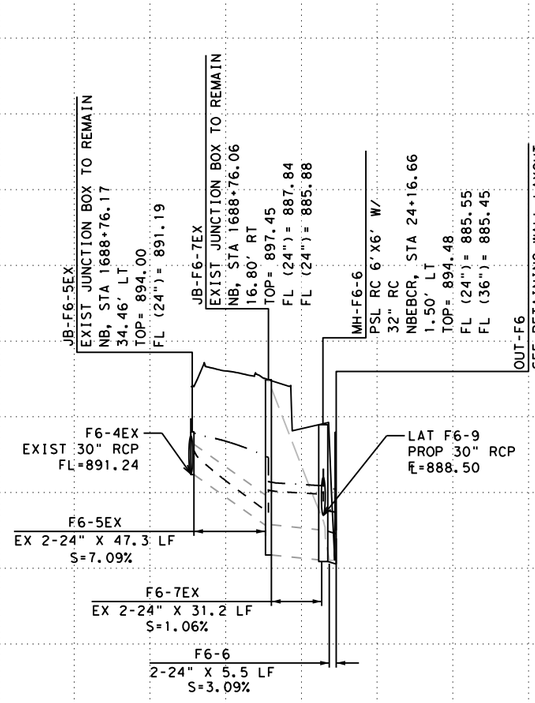
LINE F5-1

LINE F4-1

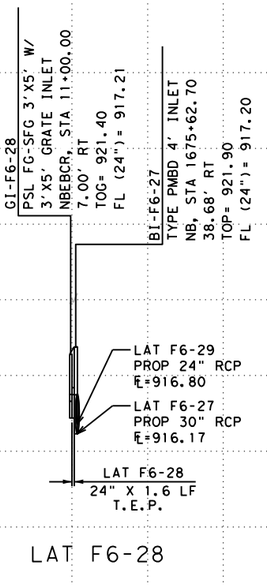
LAT F6-8



LAT F6-2EX



LINE F6-5EX, LINE F6-7EX,
LINE F6-6



LAT F6-28

LEGEND

- EXIST GROUND
- EXIST PIPE TO REMAIN
- HGL (10 YR STORM)
- EGL (10 YR STORM)
- HGL (25 YR STORM)
- HGL (50 YR STORM)
- PROP FINISHED GRADE

NOTES:
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DESIGN

STATE OF TEXAS · BRYAN SIERSMA · 147188 · LICENSED PROFESSIONAL ENGINEER

BRYAN SIERSMA, P.E.

4/23/2024
DATE

APPROVAL

STATE OF TEXAS · DAN THOMA · 98622 · LICENSED PROFESSIONAL ENGINEER

DAN THOMA, P.E.

4/23/2024
DATE

0 50 100

SCALE: HORIZONTAL 1" = 100'
VERTICAL: 1" = 10'

PAPE-DAWSON ENGINEERS
SAN ANTONIO | AUSTIN | HOUSTON | FORT WORTH | DALLAS
2000 NW LOOP 410 | SAN ANTONIO, TX 78213 | 210.375.9000
TEXAS ENGINEERING FIRM #470 | TEXAS SURVEYING FIRM #10028800

2024 Texas Department of Transportation

US 183 GPL

DRAINAGE PROFILES SYSTEM F

SHEET 8 OF 22

© 2024	CONT	SECT	JOB	HIGHWAY
DS: CK:	0151	10	001	US 183
	DIST	COUNTY		SHEET NO.
DW: CK:	AUS	WILLIAMSON		770

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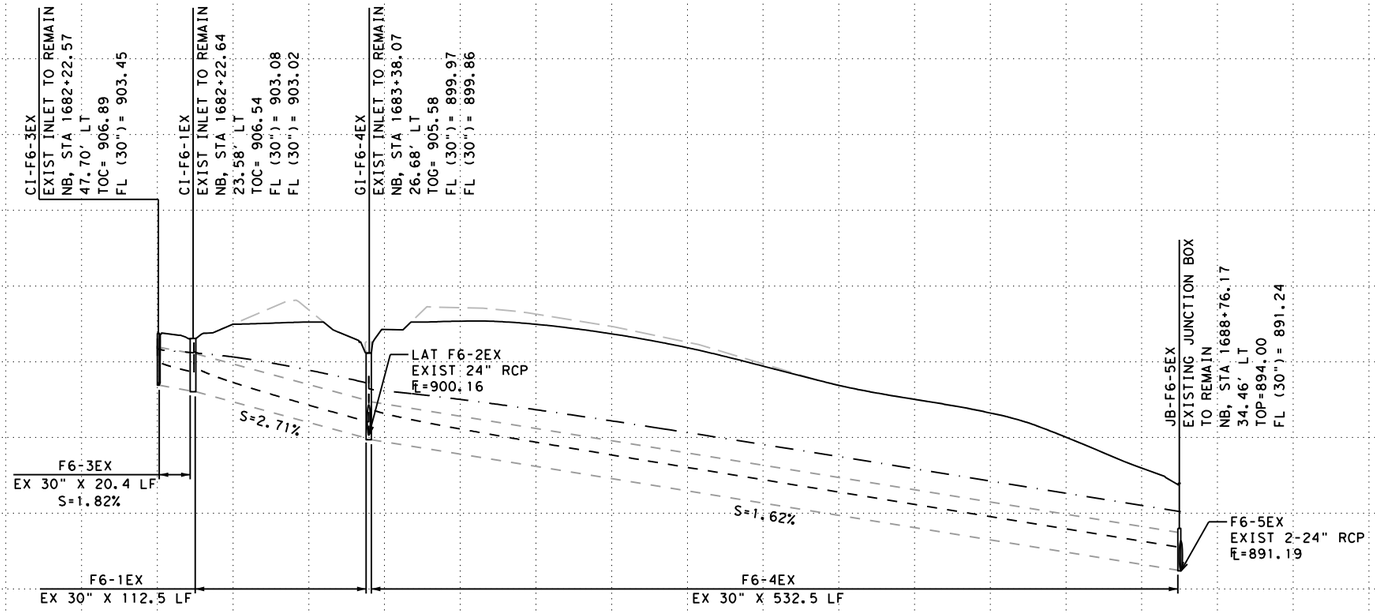

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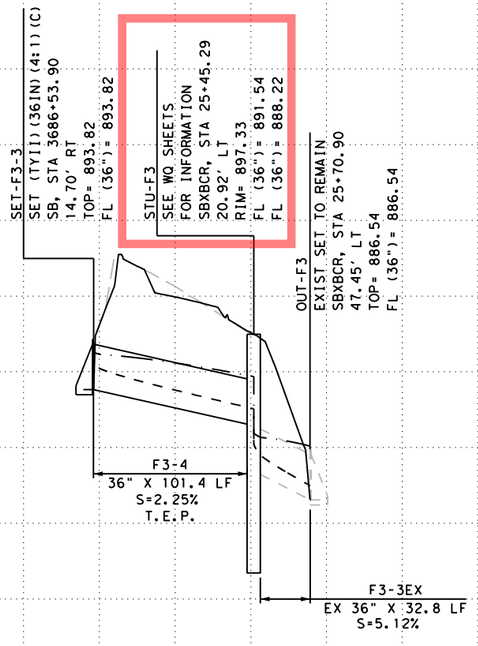

LINE F3-3EX

LEGEND

- EXIST GROUND
- EXIST PIPE TO REMAIN
- HGL (10 YR STORM)
- EGL (10 YR STORM)
- HGL (25 YR STORM)
- HGL (50 YR STORM)
- PROP FINISHED GRADE

NOTES:
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DESIGN

STATE OF TEXAS · BRYAN SIERSMA · 147188 · LICENSED PROFESSIONAL ENGINEER

BRYAN SIERSMA, P.E.

6/5/2024
DATE

APPROVAL

STATE OF TEXAS · DAN THOMA · 98622 · LICENSED PROFESSIONAL ENGINEER

DAN THOMA, P.E.

6/5/2024
DATE

0 50 100

SCALE: HORIZONTAL 1" = 100'
VERTICAL: 1" = 10'

PAPE-DAWSON ENGINEERS
SAN ANTONIO | AUSTIN | HOUSTON | FORT WORTH | DALLAS
2000 NW LOOP 410 | SAN ANTONIO, TX 78213 | 210.375.9000
TEXAS ENGINEERING FIRM #470 | TEXAS SURVEYING FIRM #10028800

2024
Texas Department of Transportation

US 183 GPL

DRAINAGE PROFILES SYSTEM F

SHEET 9 OF 22

© 2024	CONT	SECT	JOB	HIGHWAY
DS: CK:	0151	10	001	US 183
DW: CK:	DIST	COUNTY		SHEET NO.
	AUS	WILLIAMSON		771

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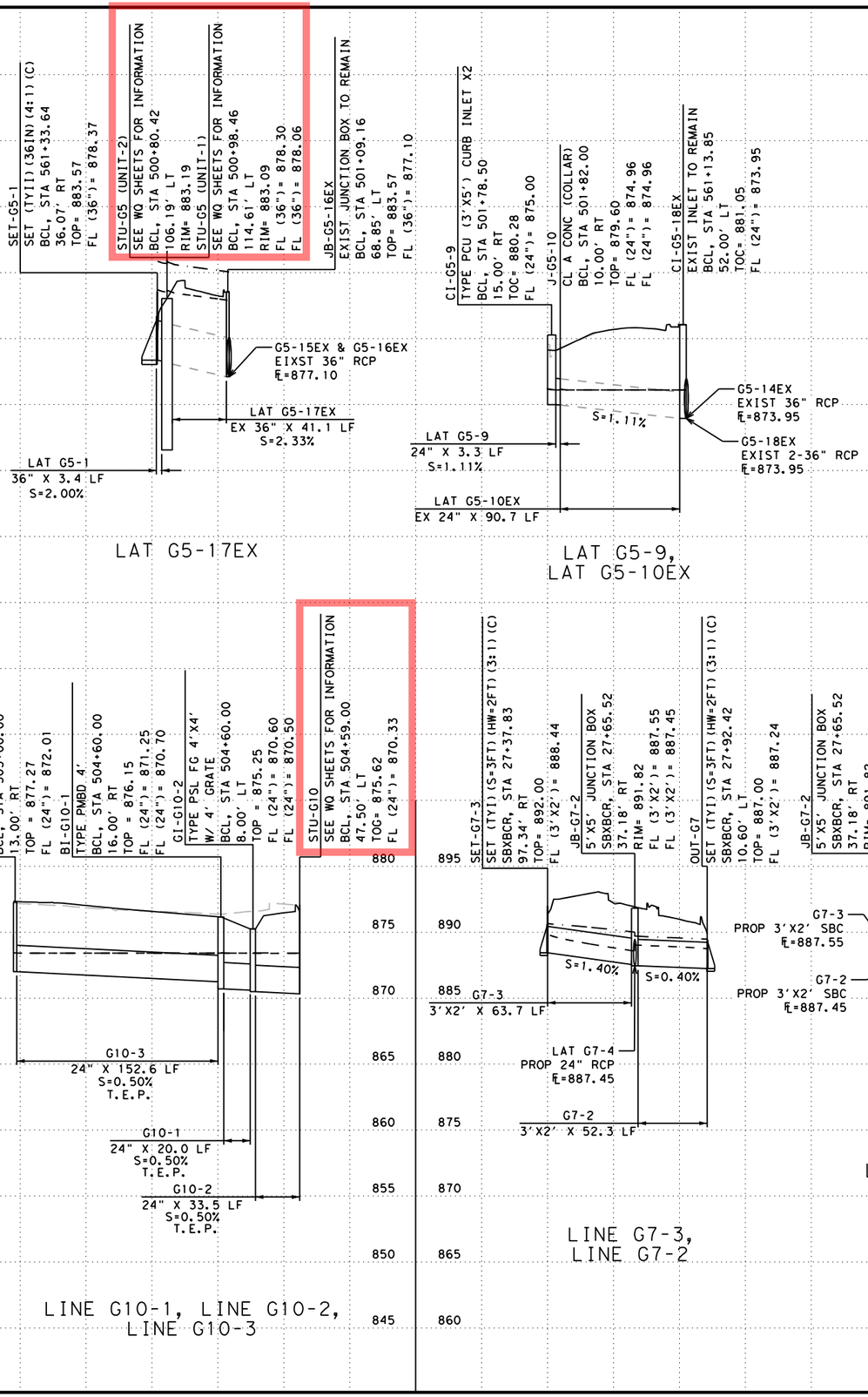

LEGEND

- EXIST GROUND
- EXIST PIPE TO REMAIN
- HGL (10 YR STORM)
- EGL (10 YR STORM)
- HGL (25 YR STORM)
- HGL (50 YR STORM)
- PROP FINISHED GRADE

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DESIGN

STATE OF TEXAS · BRYAN SIERSMA · 147188 · LICENSED PROFESSIONAL ENGINEER

BRYAN SIERSMA, P.E.

6/5/2024
DATE

APPROVAL

STATE OF TEXAS · DAN THOMA · 98622 · LICENSED PROFESSIONAL ENGINEER

DAN THOMA, P.E.

6/5/2024
DATE

0 50 100

SCALE: HORIZONTAL 1" = 100'
VERTICAL: 1" = 10'

PAPE-DAWSON ENGINEERS
SAN ANTONIO | AUSTIN | HOUSTON | FORT WORTH | DALLAS
2000 NW LOOP 410 | SAN ANTONIO, TX 78213 | 210.375.9000
TEXAS ENGINEERING FIRM #470 | TEXAS SURVEYING FIRM #10028800

2024 Texas Department of Transportation

US 183 GPL

DRAINAGE PROFILES SYSTEM G

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DS:	CK:	CONT	SECT	JOB	HIGHWAY
		0151	10	001	US 183
DW:	CK:	DIST	COUNTY		SHEET NO.
		AUS	WILLIAMSON		772

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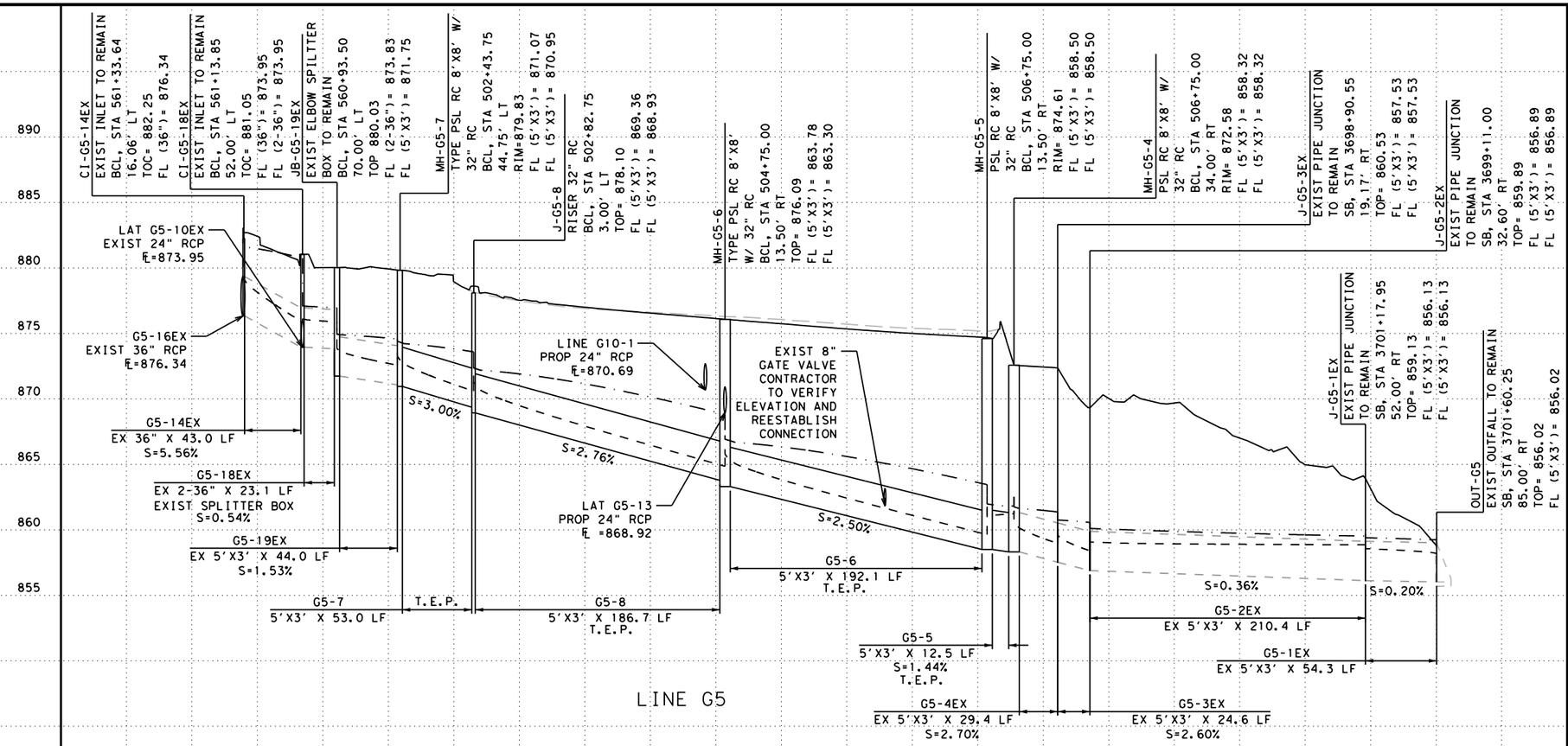

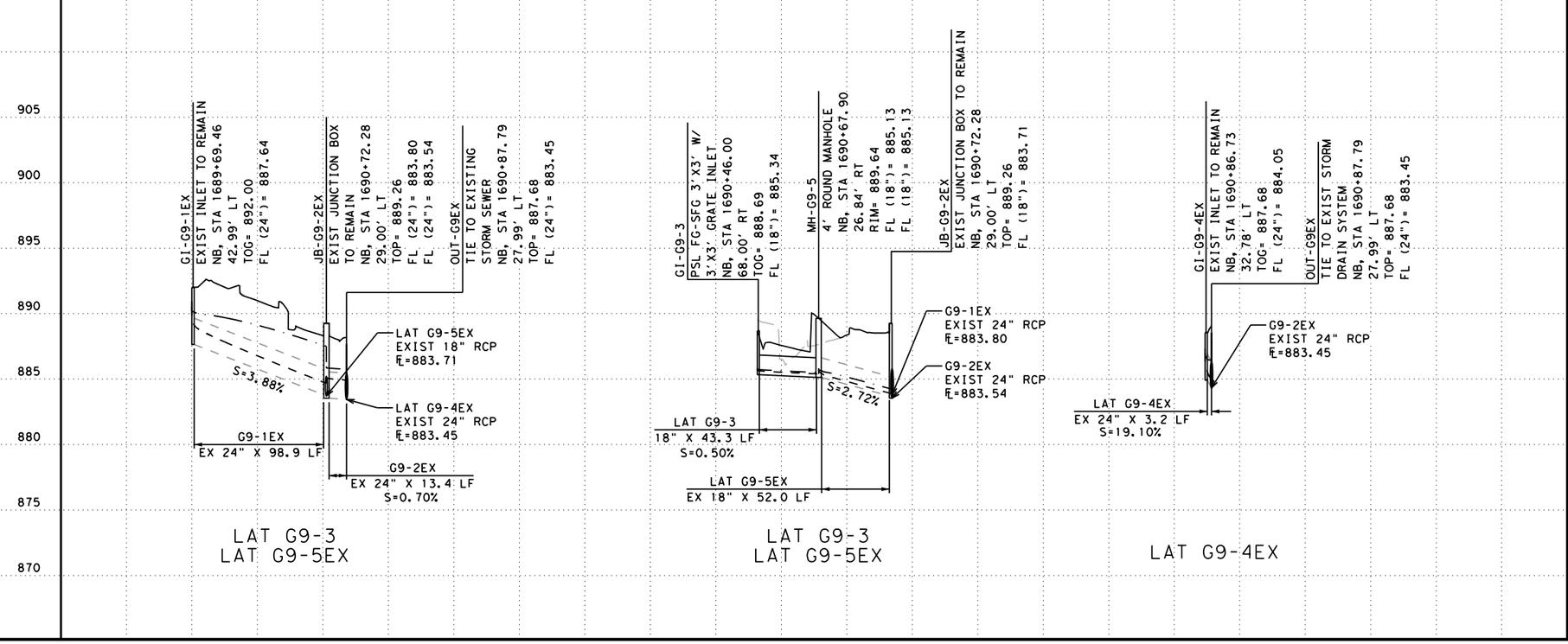

LEGEND

- EXIST GROUND
- EXIST PIPE TO REMAIN
- HGL (10 YR STORM)
- EGL (10 YR STORM)
- HGL (25 YR STORM)
- HGL (50 YR STORM)
- PROP FINISHED GRADE

NOTES:
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DESIGN

STATE OF TEXAS · BRYAN SIERSMA · 147188 · LICENSED PROFESSIONAL ENGINEER

BRYAN SIERSMA, P.E.

6/5/2024
DATE

APPROVAL

STATE OF TEXAS · DAN THOMA · 98622 · LICENSED PROFESSIONAL ENGINEER

DAN THOMA, P.E.

6/5/2024
DATE

0 50 100

SCALE: HORIZONTAL 1" = 100'
VERTICAL: 1" = 10'

PAPE-DAWSON ENGINEERS

SAN ANTONIO | AUSTIN | HOUSTON | FORT WORTH | DALLAS
2000 NW LOOP 410 | SAN ANTONIO, TX 78213 | 210.375.9000
TEXAS ENGINEERING FIRM #470 | TEXAS SURVEYING FIRM #10028800

2024 Texas Department of Transportation

US 183 GPL

DRAINAGE PROFILES SYSTEM G

SHEET 11 OF 22

© 2024		CONT	SECT	JOB	HIGHWAY
DS:	CK:	0151	10	001	US 183
DW:	CK:	DIST	COUNTY		SHEET NO.
		AUS	WILLIAMSON		773

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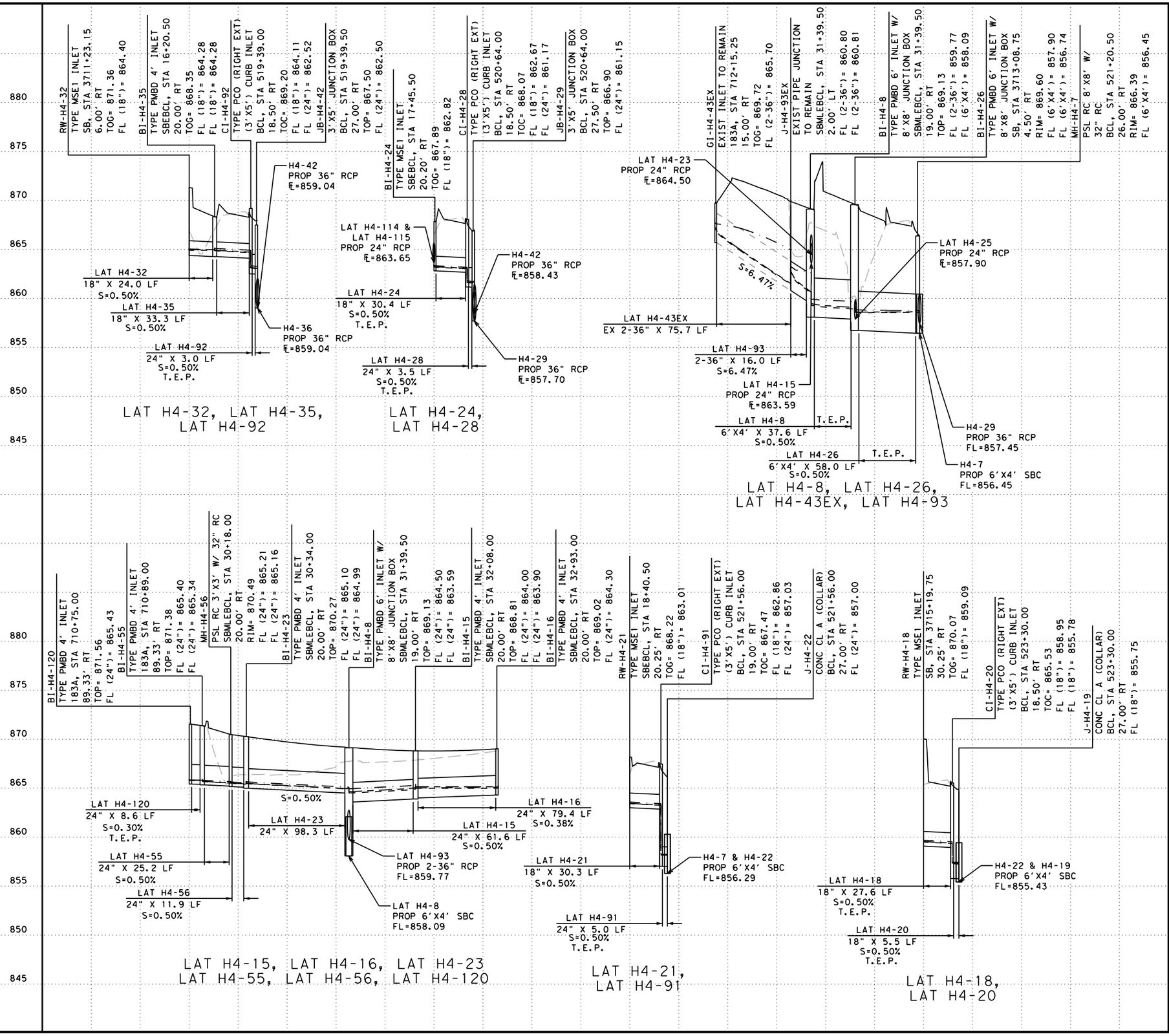

LEGEND

- EXIST GROUND
- EXIST PIPE TO REMAIN
- HGL (10 YR STORM)
- EGL (10 YR STORM)
- HGL (25 YR STORM)
- HGL (50 YR STORM)
- PROP FINISHED GRADE

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DESIGN

BRYAN SIERSMA
147188
LICENSED PROFESSIONAL ENGINEER
STATE OF TEXAS

BRYAN SIERSMA, P.E.
4/23/2024
DATE

APPROVAL

DAN THOMA
98622
LICENSED PROFESSIONAL ENGINEER
STATE OF TEXAS

DAN THOMA, P.E.
4/23/2024
DATE

0 50 100
SCALE: HORIZONTAL 1" = 100'
VERTICAL: 1" = 10'

PAPE-DAWSON ENGINEERS
SAN ANTONIO | AUSTIN | HOUSTON | FORT WORTH | DALLAS
2000 NW LOOP 410 | SAN ANTONIO, TX 78213 | 210.375.9000
TEXAS ENGINEERING FIRM #470 | TEXAS SURVEYING FIRM #10028800

2024 Texas Department of Transportation

US 183 GPL

DRAINAGE PROFILES SYSTEM H

SHEET 12 OF 22

© 2024	CONT	SECT	JOB	HIGHWAY
DS: CK:	0151	10	001	US 183
DW: CK:	DIST	COUNTY		SHEET NO.
	AUS	WILLIAMSON		774

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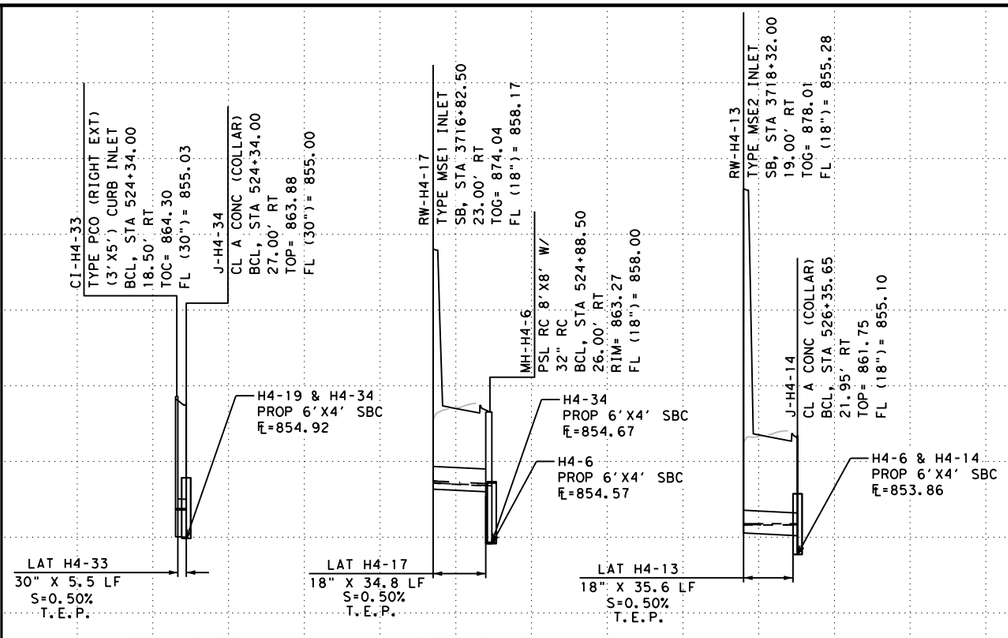

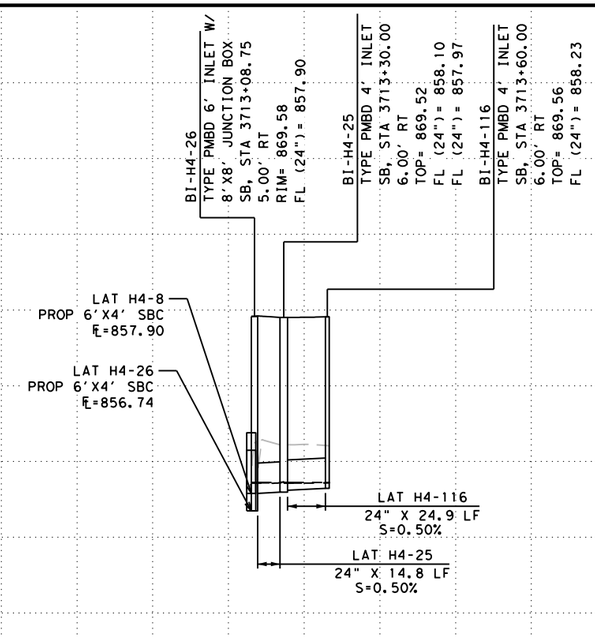

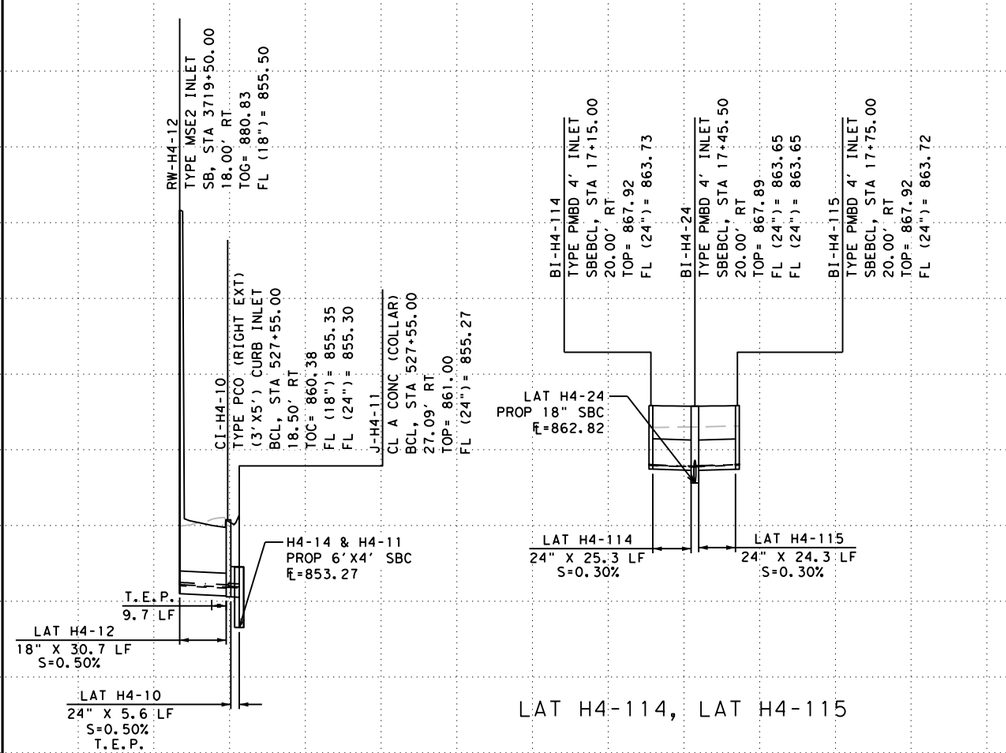

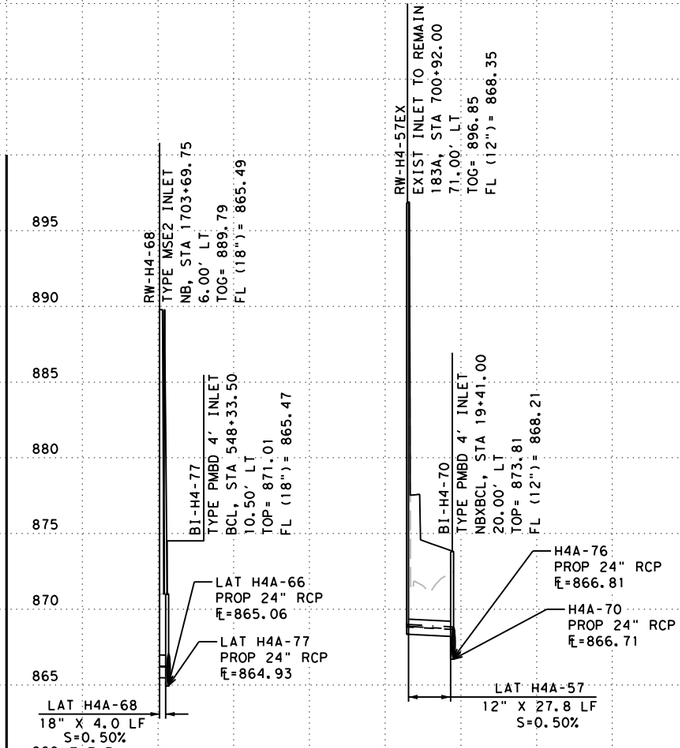

LEGEND

- EXIST GROUND
- EXIST PIPE TO REMAIN
- HGL (10 YR STORM)
- EGL (10 YR STORM)
- HGL (25 YR STORM)
- HGL (50 YR STORM)
- PROP FINISHED GRADE

NOTES:
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DESIGN

STATE OF TEXAS · BRYAN SIERSMA · 147188 · LICENSED PROFESSIONAL ENGINEER

BRYAN SIERSMA, P.E.

4/23/2024
DATE

APPROVAL

STATE OF TEXAS · DAN THOMA · 98622 · LICENSED PROFESSIONAL ENGINEER

DAN THOMA, P.E.

4/23/2024
DATE

0 50 100

SCALE: HORIZONTAL 1" = 100'
VERTICAL: 1" = 10'

PAPE-DAWSON ENGINEERS
SAN ANTONIO | AUSTIN | HOUSTON | FORT WORTH | DALLAS
2000 NW LOOP 410 | SAN ANTONIO, TX 78213 | 210.375.9000
TEXAS ENGINEERING FIRM #470 | TEXAS SURVEYING FIRM #10028800

2024 Texas Department of Transportation

US 183 GPL

DRAINAGE PROFILES SYSTEM H

SHEET 13 OF 22

© 2024	CONT	SECT	JOB	HIGHWAY
DS: CK:	0151	10	001	US 183
DW: CK:	DIST	COUNTY		SHEET NO.
	AUS	WILLIAMSON		775

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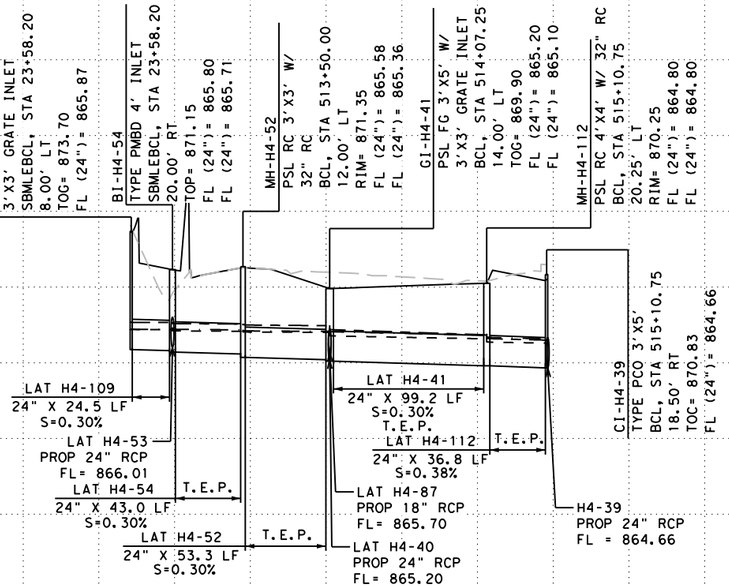
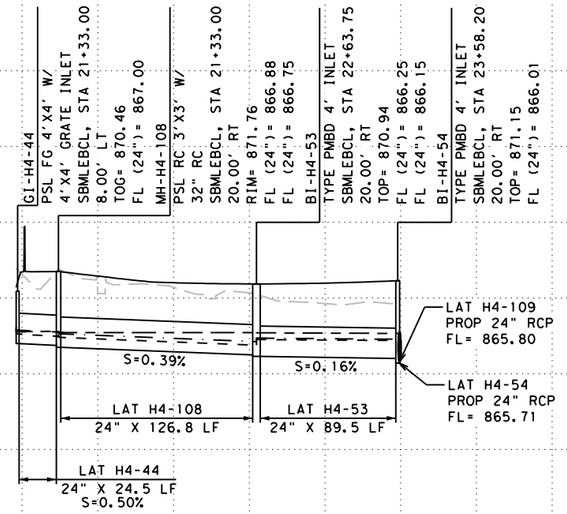


LAT H4-41, LAT H4-52, LAT H4-54,
LAT H4-109, LAT H4-112



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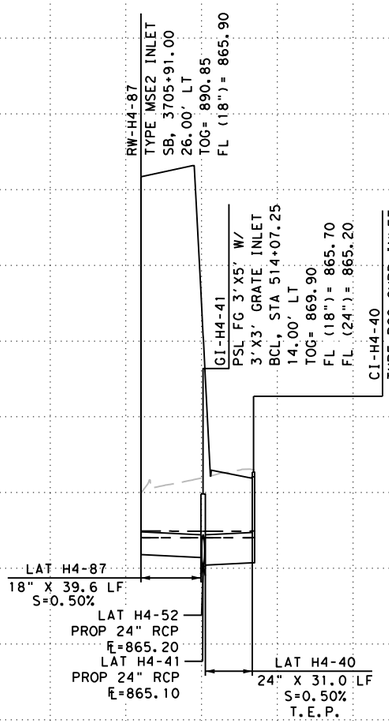

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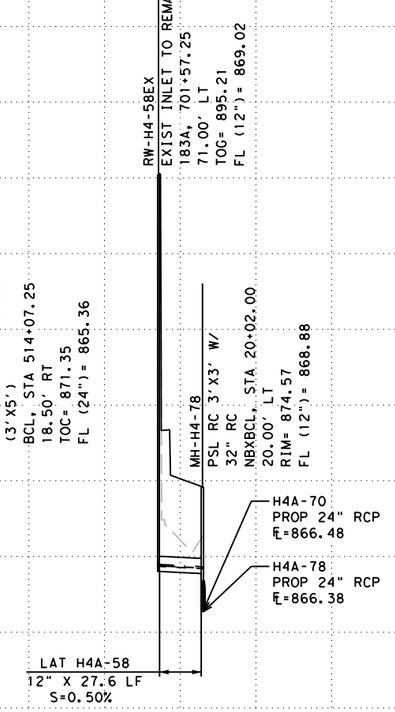

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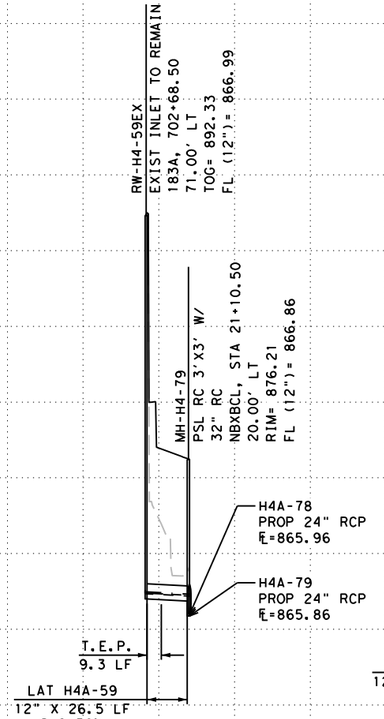

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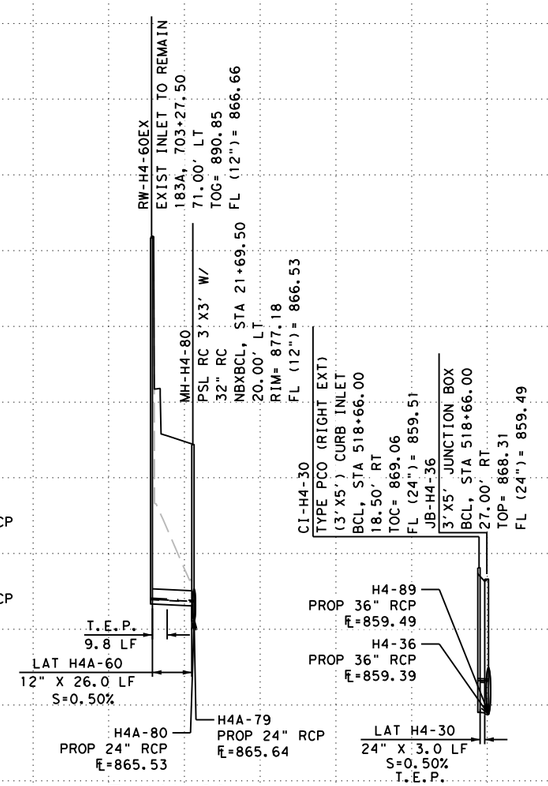

LAT H4A-60

LAT H4-30

LEGEND

- EXIST GROUND
- EXIST PIPE TO REMAIN
- HGL (10 YR STORM)
- EGL (10 YR STORM)
- HGL (25 YR STORM)
- HGL (50 YR STORM)
- PROP FINISHED GRADE

NOTES:
1. ALL PIPES ARE CL III UNLESS OTHERWISE INDICATED.
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3. STORM DRAIN COMPONENTS SCREENED BACK ARE EXISTING TO REMAIN AND ARE SHOWN FOR ANALYSIS PURPOSES. "EX" DENOTES COMPONENTS TO REMAIN.
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5. SEE CTRMA ITS SHEETS FOR LOCATION AND ADDITIONAL INFORMATION.

NOTE:

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DESIGN

STATE OF TEXAS · BRYAN SIERSMA · 147188 · LICENSED PROFESSIONAL ENGINEER

BRYAN SIERSMA, P.E.

4/23/2024
DATE

APPROVAL

STATE OF TEXAS · DAN THOMA · 98622 · LICENSED PROFESSIONAL ENGINEER

DAN THOMA, P.E.

4/23/2024
DATE

0 50 100

SCALE: HORIZONTAL 1" = 100'
VERTICAL: 1" = 10'

PAPE-DAWSON ENGINEERS

SAN ANTONIO | AUSTIN | HOUSTON | FORT WORTH | DALLAS
2000 NW LOOP 410 | SAN ANTONIO, TX 78213 | 210.375.9000
TEXAS ENGINEERING FIRM #470 | TEXAS SURVEYING FIRM #10028800

2024 Texas Department of Transportation

US 183 GPL

DRAINAGE PROFILES SYSTEM H

SHEET 14 OF 22

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DS:	CK:	CONT	SECT	JOB	HIGHWAY
		0151	10	001	US 183
DW:	CK:	DIST	COUNTY		SHEET NO.
		AUS	WILLIAMSON		776

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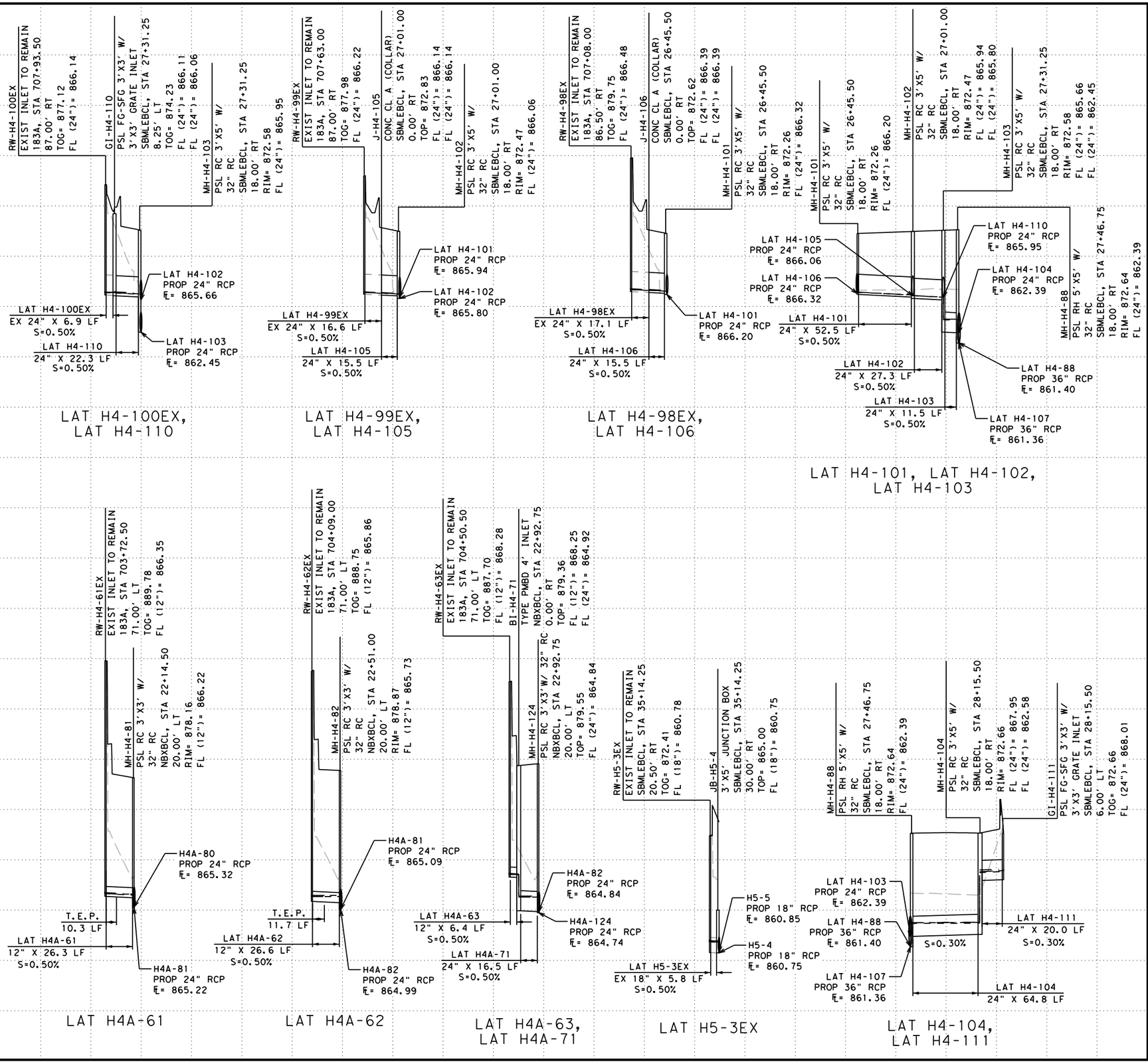

LEGEND

- EXIST GROUND
- EXIST PIPE TO REMAIN
- HGL (10 YR STORM)
- EGL (10 YR STORM)
- HGL (25 YR STORM)
- HGL (50 YR STORM)
- PROP FINISHED GRADE

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DESIGN

STATE OF TEXAS · BRYAN SIERSMA · 147188 · LICENSED PROFESSIONAL ENGINEER

BRYAN SIERSMA, P.E.

4/23/2024
DATE

APPROVAL

STATE OF TEXAS · DAN THOMA · 98622 · LICENSED PROFESSIONAL ENGINEER

DAN THOMA, P.E.

4/23/2024
DATE

0 50 100

SCALE: HORIZONTAL 1" = 100'
VERTICAL: 1" = 10'

PAPE-DAWSON ENGINEERS
SAN ANTONIO | AUSTIN | HOUSTON | FORT WORTH | DALLAS
2000 NW LOOP 410 | SAN ANTONIO, TX 78213 | 210.375.9000
TEXAS ENGINEERING FIRM #470 | TEXAS SURVEYING FIRM #10028800

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US 183 GPL

DRAINAGE PROFILES SYSTEM H

SHEET 15 OF 22

© 2024	CONT	SECT	JOB	HIGHWAY
DS: CK:	0151	10	001	US 183
	DIST	COUNTY		SHEET NO.
DW: CK:	AUS	WILLIAMSON		777

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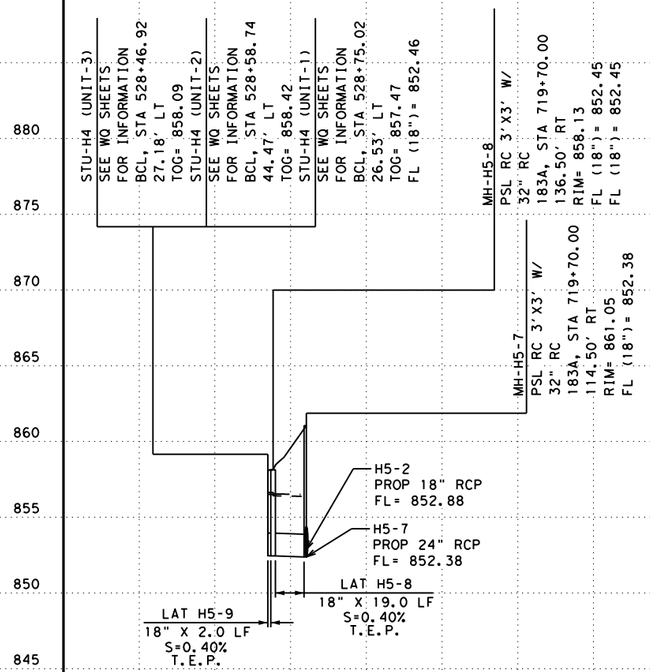
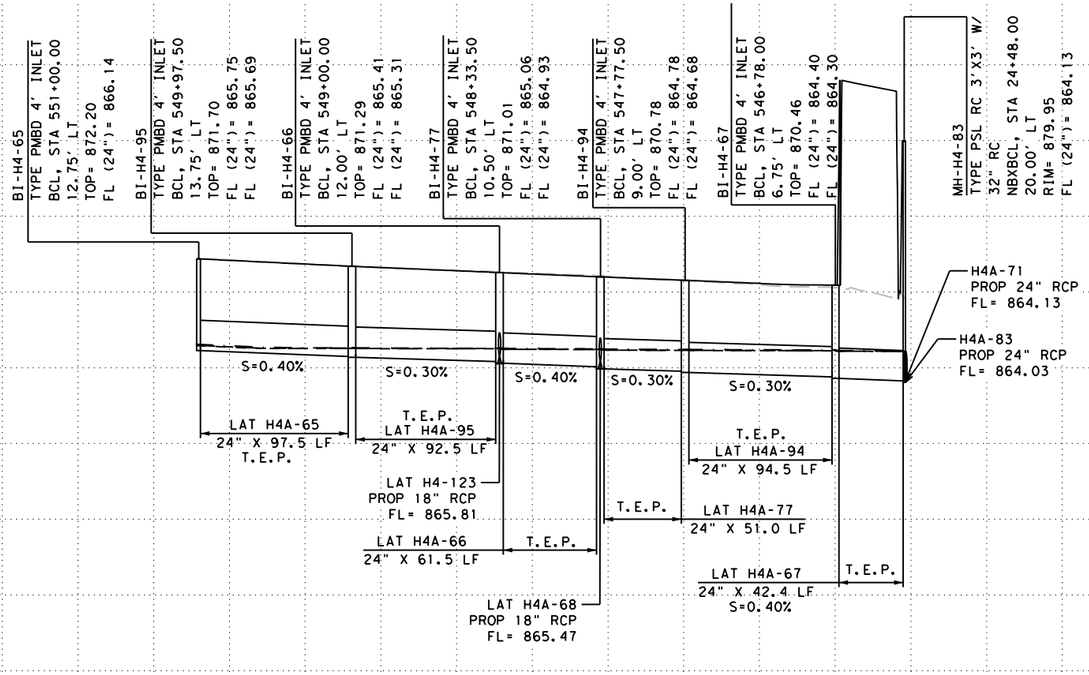


LAT H5-9,
LAT 5-8



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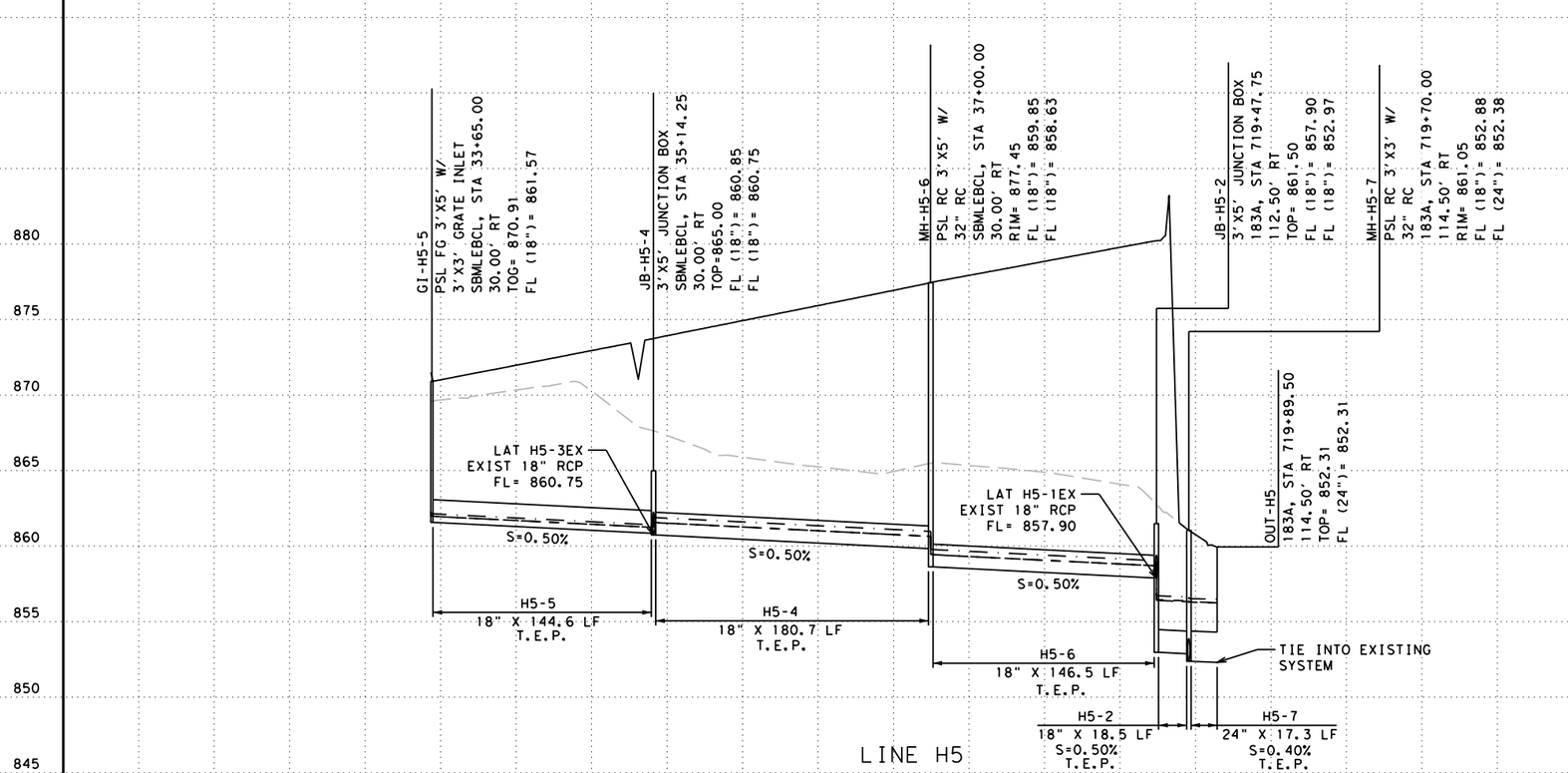
LAT H4A-77, LAT H4A-94, LAT H4A-95



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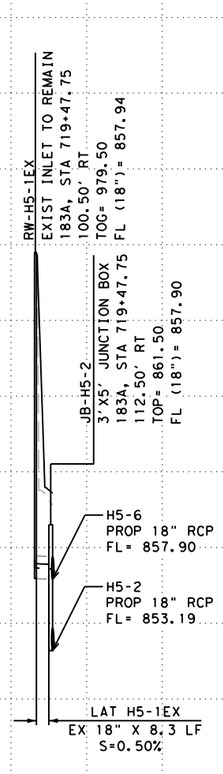

LAT H5-1EX

LEGEND

- EXIST GROUND
- EXIST PIPE TO REMAIN
- HGL (10 YR STORM)
- EGL (10 YR STORM)
- HGL (25 YR STORM)
- HGL (50 YR STORM)
- PROP FINISHED GRADE

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DESIGN

STATE OF TEXAS · BRYAN SIERSMA · 147188 · LICENSED PROFESSIONAL ENGINEER

BRYAN SIERSMA, P.E.

6/5/2024
DATE

APPROVAL

STATE OF TEXAS · DAN THOMA · 98622 · LICENSED PROFESSIONAL ENGINEER

DAN THOMA, P.E.

6/5/2024
DATE

0 50 100

SCALE: HORIZONTAL 1" = 100'
VERTICAL: 1" = 10'

PAPE-DAWSON ENGINEERS
SAN ANTONIO | AUSTIN | HOUSTON | FORT WORTH | DALLAS
2000 NW LOOP 410 | SAN ANTONIO, TX 78213 | 210.375.9000
TEXAS ENGINEERING FIRM #470 | TEXAS SURVEYING FIRM #10028800

2024
Texas Department of Transportation

US 183 GPL

DRAINAGE PROFILES SYSTEM H

SHEET 16 OF 22

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DS: CK:	0151	10	001	US 183
	DIST	COUNTY		SHEET NO.
DW: CK:	AUS	WILLIAMSON		778

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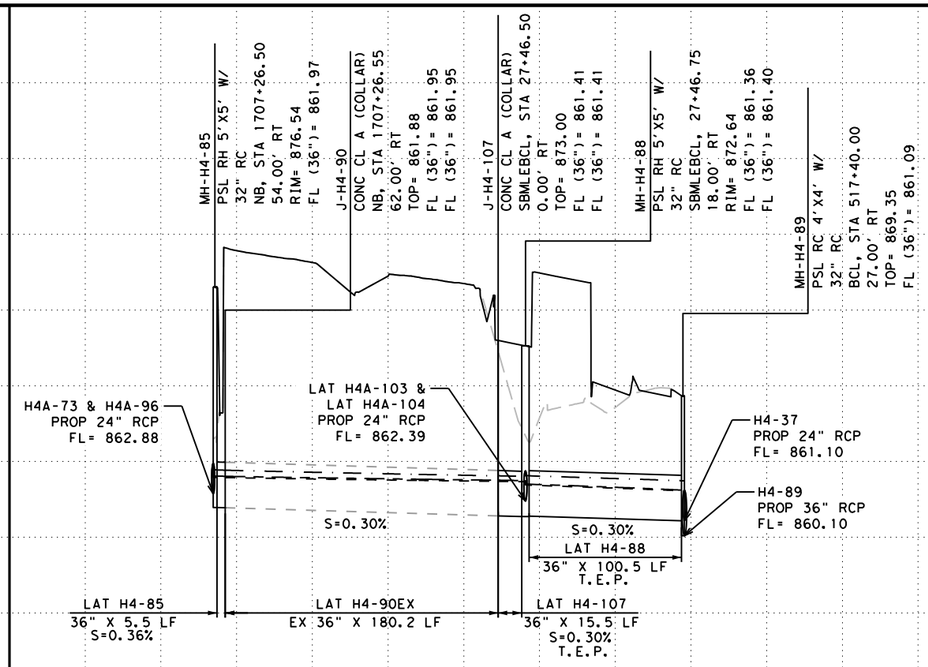

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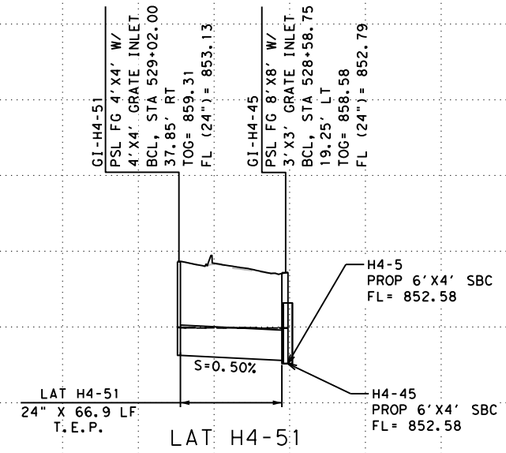
LAT H4-90EX, LAT H4-107



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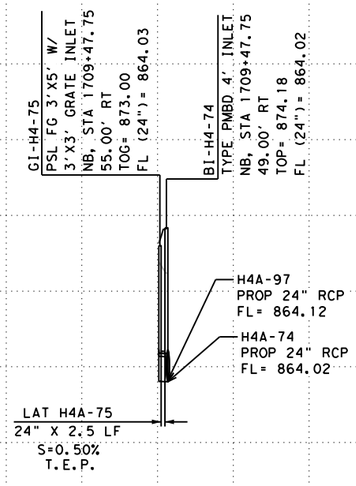

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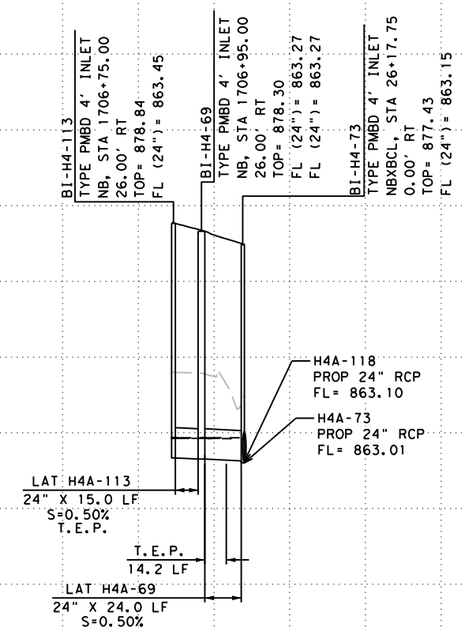

LAT H4A-69,
LAT H4A-113

LEGEND

- EXIST GROUND
- EXIST PIPE TO REMAIN
- HGL (10 YR STORM)
- EGL (10 YR STORM)
- HGL (25 YR STORM)
- HGL (50 YR STORM)
- PROP FINISHED GRADE

NOTES:
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DESIGN

STATE OF TEXAS · BRYAN SIERSMA · 147188 · LICENSED PROFESSIONAL ENGINEER

BRYAN SIERSMA, P.E.

4/23/2024
DATE

APPROVAL

STATE OF TEXAS · DAN THOMA · 98622 · LICENSED PROFESSIONAL ENGINEER

DAN THOMA, P.E.

4/23/2024
DATE

0 50 100

SCALE: HORIZONTAL 1" = 100'
VERTICAL: 1" = 10'

PAPE-DAWSON ENGINEERS
SAN ANTONIO | AUSTIN | HOUSTON | FORT WORTH | DALLAS
2000 NW LOOP 410 | SAN ANTONIO, TX 78213 | 210.375.9000
TEXAS ENGINEERING FIRM #470 | TEXAS SURVEYING FIRM #10028800

2024 Texas Department of Transportation

US 183 GPL

DRAINAGE PROFILES SYSTEM H

SHEET 17 OF 22

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DS: CK:	0151	10	001	US 183
	DIST	COUNTY		SHEET NO.
DW: CK:	AUS	WILLIAMSON		779

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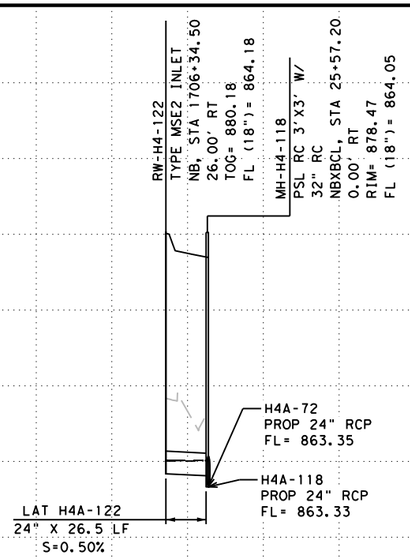

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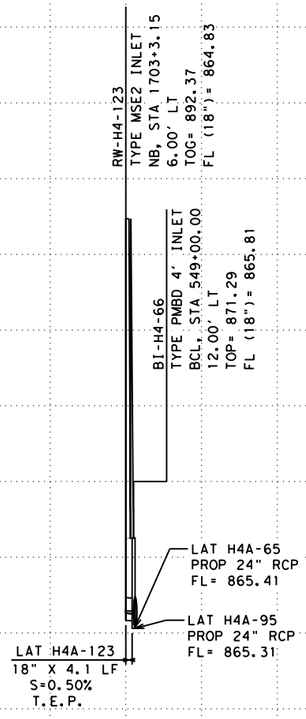

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LEGEND

- EXIST GROUND
- EXIST PIPE TO REMAIN
- HGL (10 YR STORM)
- EGL (10 YR STORM)
- HGL (25 YR STORM)
- HGL (50 YR STORM)
- PROP FINISHED GRADE

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DESIGN

STATE OF TEXAS · BRYAN SIERSMA · 147188 · LICENSED PROFESSIONAL ENGINEER

BRYAN SIERSMA, P.E.

4/23/2024
DATE

APPROVAL

STATE OF TEXAS · DAN THOMA · 98622 · LICENSED PROFESSIONAL ENGINEER

DAN THOMA, P.E.

4/23/2024
DATE

0 50 100

SCALE: HORIZONTAL 1" = 100'
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PAPE-DAWSON ENGINEERS
SAN ANTONIO | AUSTIN | HOUSTON | FORT WORTH | DALLAS
2000 NW LOOP 410 | SAN ANTONIO, TX 78213 | 210.375.9000
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DRAINAGE PROFILES SYSTEM H

SHEET 18 OF 22

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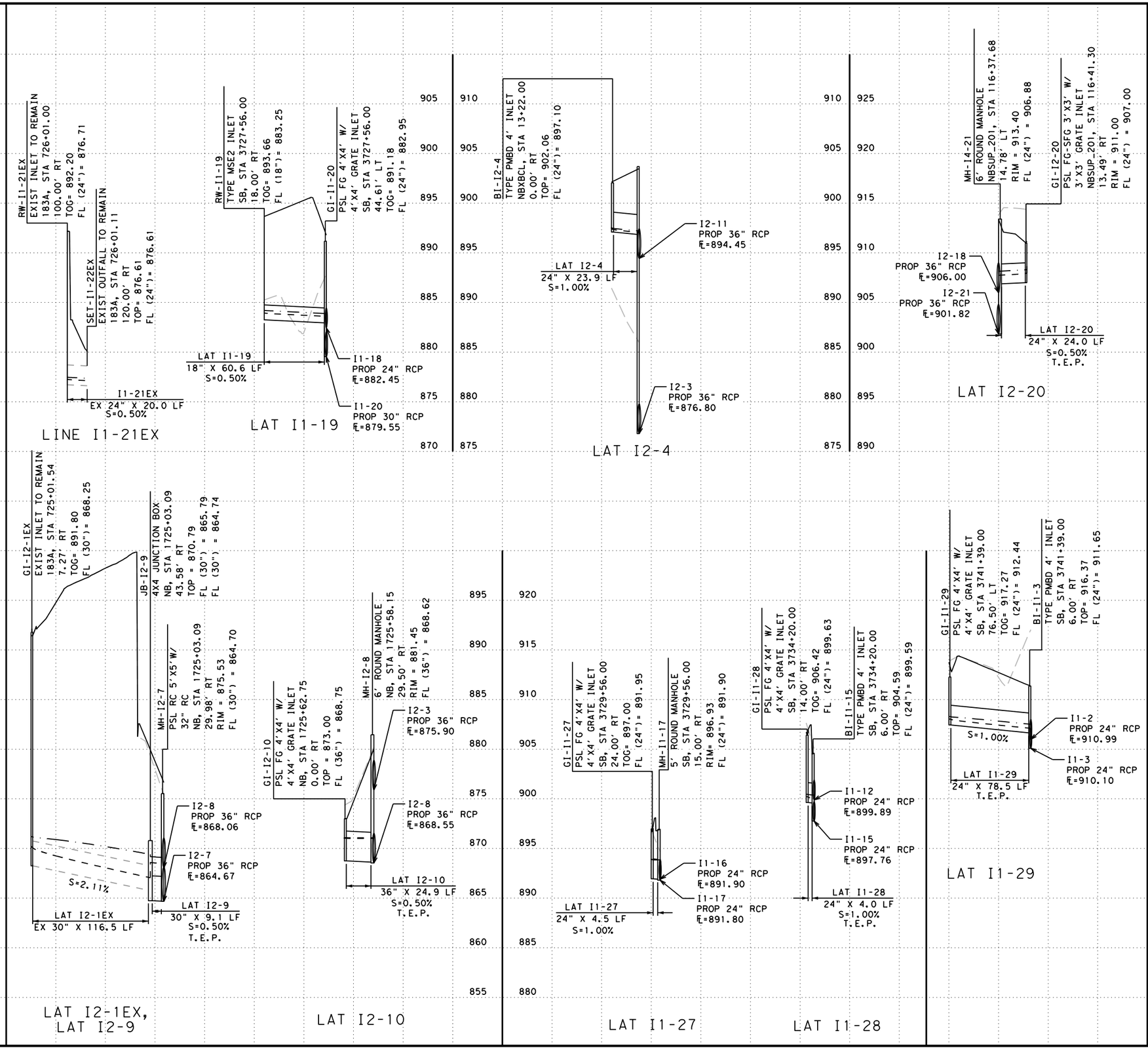
		0151	10	001	US 183
DW:	CK:	DIST	COUNTY		SHEET NO.
		AUS	WILLIAMSON		780



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LEGEND

- EXIST GROUND
- EXIST PIPE TO REMAIN
- HGL (10 YR STORM)
- EGL (10 YR STORM)
- HGL (25 YR STORM)
- HGL (50 YR STORM)
- PROP FINISHED GRADE

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DESIGN

STATE OF TEXAS · BRYAN SIERSMA · 147188 · LICENSED PROFESSIONAL ENGINEER

BRYAN SIERSMA, P.E.
4/23/2024
DATE

APPROVAL

STATE OF TEXAS · DAN THOMA · 98622 · LICENSED PROFESSIONAL ENGINEER

DAN THOMA, P.E.
4/23/2024
DATE

0 50 100
SCALE: HORIZONTAL 1" = 100'
VERTICAL: 1" = 10'

PAPE-DAWSON ENGINEERS
SAN ANTONIO | AUSTIN | HOUSTON | FORT WORTH | DALLAS
2000 NW LOOP 410 | SAN ANTONIO, TX 78213 | 210.375.9000
TEXAS ENGINEERING FIRM #470 | TEXAS SURVEYING FIRM #10028800

2024
Texas Department of Transportation

US 183 GPL

DRAINAGE PROFILES SYSTEM I

SHEET 19 OF 22

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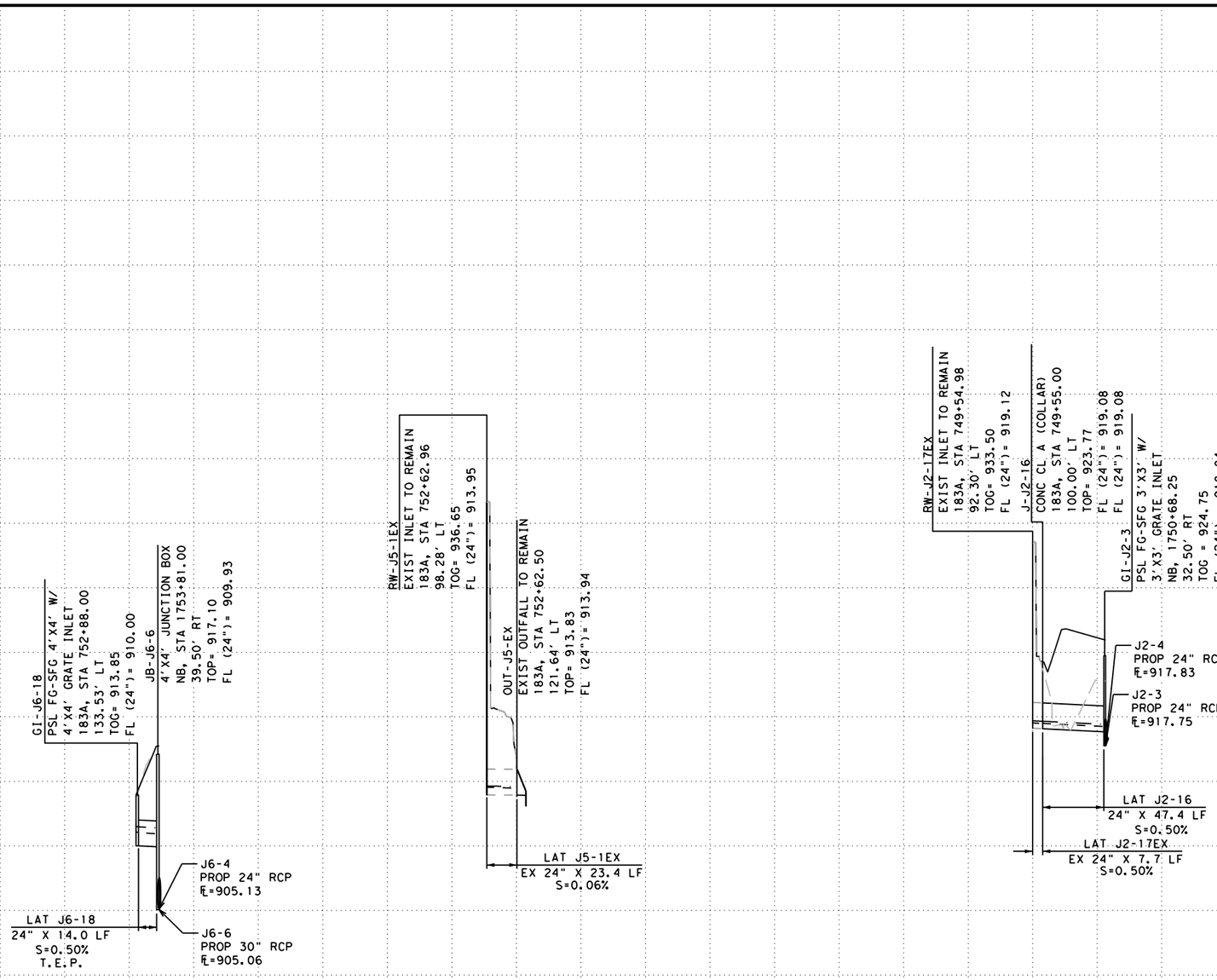
DS: CK:	0151	10	001	US 183
DW: CK:	DIST	COUNTY		SHEET NO.
	AUS	WILLIAMSON		780A



LEGEND

- EXIST GROUND
- EXIST PIPE TO REMAIN
- HGL (10 YR STORM)
- EGL (10 YR STORM)
- HGL (25 YR STORM)
- HGL (50 YR STORM)
- PROP FINISHED GRADE

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STATE OF TEXAS · BRYAN SIERSMA · 147188 · LICENSED PROFESSIONAL ENGINEER

BRYAN SIERSMA, P.E.

4/23/2024
DATE

APPROVAL

STATE OF TEXAS · DAN THOMA · 98622 · LICENSED PROFESSIONAL ENGINEER

DAN THOMA, P.E.

4/23/2024
DATE

0 50 100

SCALE: HORIZONTAL 1" = 100'
VERTICAL: 1" = 10'

PAPE-DAWSON ENGINEERS

SAN ANTONIO | AUSTIN | HOUSTON | FORT WORTH | DALLAS
2000 NW LOOP 410 | SAN ANTONIO, TX 78213 | 210.375.9000
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DRAINAGE PROFILES SYSTEM J

SHEET 20 OF 22

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CONT	SECT	JOB	HIGHWAY
0151	10	001	US 183

DIST	COUNTY	SHEET NO.
AUS	WILLIAMSON	780B

DS: CK:
DW: CK:

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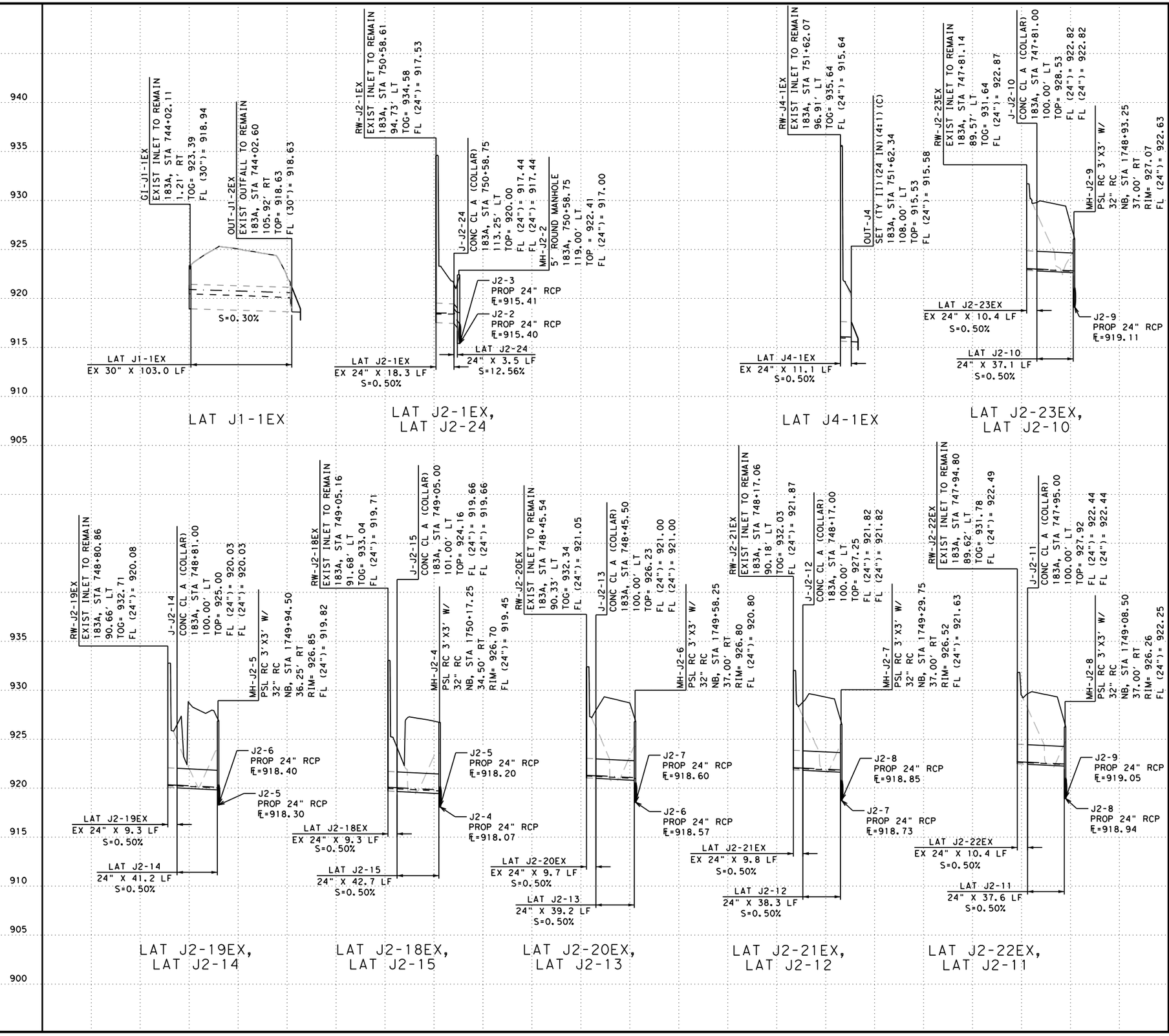

LEGEND

- EXIST GROUND
- EXIST PIPE TO REMAIN
- HGL (10 YR STORM)
- EGL (10 YR STORM)
- HGL (25 YR STORM)
- HGL (50 YR STORM)
- PROP FINISHED GRADE

NOTES:
1. ALL PIPES ARE CL III UNLESS OTHERWISE INDICATED.
2. LOCATION AND ELEVATIONS OF EXISTING UTILITIES ARE APPROXIMATED BASED UPON SURVEY AND SUE DATA. UTILITIES TO BE CLEAR PRIOR TO CONSTRUCTION. CONTRACTOR TO VERIFY LOCATION OF UTILITIES.
3. STORM DRAIN COMPONENTS SCREENED BACK ARE EXISTING TO REMAIN AND ARE SHOWN FOR ANALYSIS PURPOSES. "EX" DENOTES COMPONENTS TO REMAIN.
4. EXISTING AND PROPOSED GROUND PROFILES ARE SHOWN AT THE CENTERLINE OF PIPE/NODE.
5. SEE CTRMA ITS SHEETS FOR LOCATION AND ADDITIONAL INFORMATION.

NOTE:

FOR INLETS/MANHOLES ON GRADE, TOPS SHALL BE PLACED FLUSH WITH THE SLOPE OF THE FINISHED GRADE AND SHALL NOT BE LEVEL. FOR NODES WITH MULTIPLE INLETS, THE ELEVATION SHOWN REPRESENTS THE CENTER ELEVATION. CONSTRUCT INLET TOPS ACCORDINGLY, FLUSH WITH THE SLOPE OF THE FINISHED GRADE. SEE "MISCELLANEOUS DRAINAGE DETAILS - INLET REFERENCE POINTS".

DESIGN

STATE OF TEXAS · BRYAN SIERSMA · 147188 · LICENSED PROFESSIONAL ENGINEER

BRYAN SIERSMA, P.E.

4/23/2024
DATE

APPROVAL

STATE OF TEXAS · DAN THOMA · 98622 · LICENSED PROFESSIONAL ENGINEER

DAN THOMA, P.E.

4/23/2024
DATE

0 50 100

SCALE: HORIZONTAL 1" = 100'
VERTICAL: 1" = 10'

PAPE-DAWSON ENGINEERS
SAN ANTONIO | AUSTIN | HOUSTON | FORT WORTH | DALLAS
2000 NW LOOP 410 | SAN ANTONIO, TX 78213 | 210.375.9000
TEXAS ENGINEERING FIRM #470 | TEXAS SURVEYING FIRM #10028800

2024 Texas Department of Transportation

US 183 GPL

DRAINAGE PROFILES SYSTEM J

SHEET 21 OF 22

© 2024	CONT	SECT	JOB	HIGHWAY
DS: CK:	0151	10	001	US 183
DW: CK:	DIST	COUNTY		SHEET NO.
	AUS	WILLIAMSON		780C

DATE: 4/23/2024 5:18:26 PM
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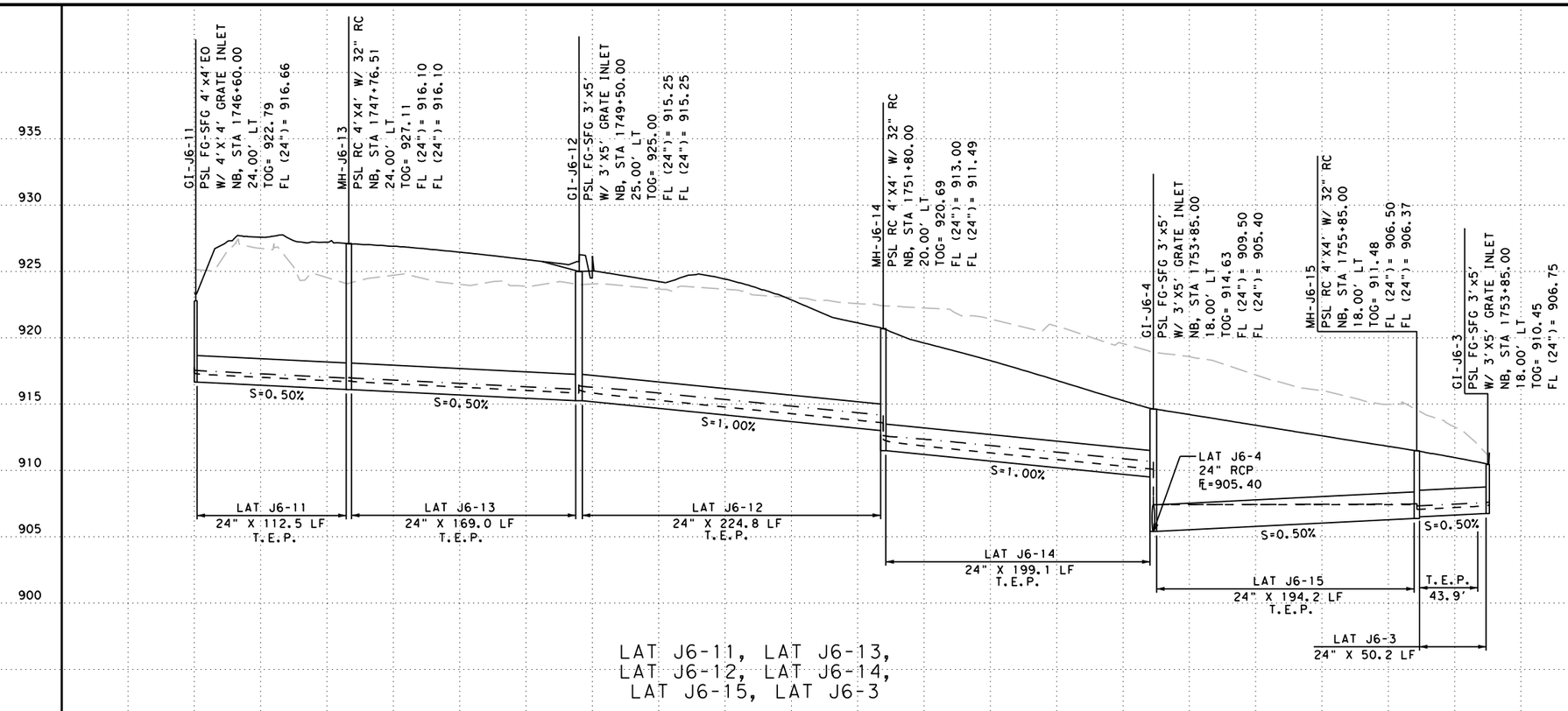
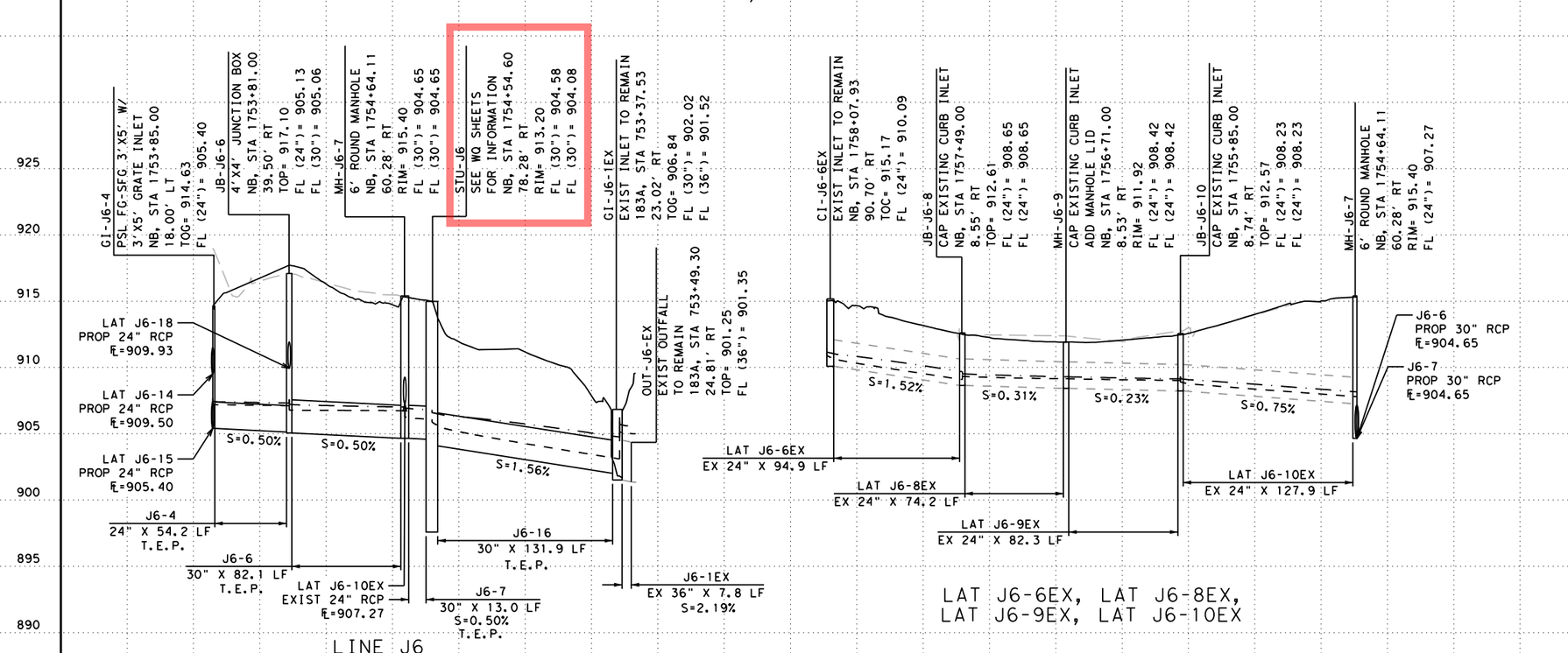


LAT J6-11, LAT J6-13,
LAT J6-12, LAT J6-14,
LAT J6-15, LAT J6-3



LINE J6

LAT J6-6EX, LAT J6-8EX,
LAT J6-9EX, LAT J6-10EX

LEGEND

- EXIST GROUND
- EXIST PIPE TO REMAIN
- HGL (10 YR STORM)
- EGL (10 YR STORM)
- HGL (25 YR STORM)
- HGL (50 YR STORM)
- PROP FINISHED GRADE

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DESIGN

STATE OF TEXAS
BRYAN SIERSMA
147188
LICENSED PROFESSIONAL ENGINEER

BRYAN SIERSMA, P.E.
6/5/2024
DATE

APPROVAL

STATE OF TEXAS
DAN THOMA
98622
LICENSED PROFESSIONAL ENGINEER

DAN THOMA, P.E.
6/5/2024
DATE

0 50 100
SCALE: HORIZONTAL 1" = 100'
VERTICAL: 1" = 10'

PAPE-DAWSON ENGINEERS
SAN ANTONIO | AUSTIN | HOUSTON | FORT WORTH | DALLAS
2000 NW LOOP 410 | SAN ANTONIO, TX 78213 | 210.375.9000
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2024
Texas Department of Transportation

US 183 GPL

DRAINAGE PROFILES SYSTEM J

SHEET 22 OF 22

© 2024	CONT	SECT	JOB	HIGHWAY
DS: CK:	0151	10	001	US 183
DW: CK:	DIST	COUNTY		SHEET NO.
	AUS	WILLIAMSON		780D

DATE: 6/5/2024 10:49:32 AM
FILE: v:\bentley\pw_dms\osage_pd\dms07214\015110001_lat17.dgn

Agent Authorization Form
For Required Signature
Edwards Aquifer Protection Program
Relating to 30 TAC Chapter 213
Effective June 1, 1999

I Shane Rotter, (Print Name)

Environmental Project Planner, (Title - Owner/President/Other)

of TXDOT, (Corporation/Partnership/Entity Name)

have authorized Clint Smith (Print Name of Agent/Engineer)

of Halff Associates, 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

2/23/26
Date

THE STATE OF _____ §

County of _____ §

BEFORE ME, the undersigned authority, on this day personally appeared _____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 ____ day of _____,____.

NOTARY PUBLIC

_____
Typed or Printed Name of Notary

MY COMMISSION EXPIRES: _____

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 600803456		**RN 104348743**

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:*

Texas Department of Transportation

7. TX SOS/CPA Filing Number	**8. TX State Tax ID** (11 digits)	**9. Federal Tax ID** (9 digits)	**10. DUNS Number** *(if applicable)*

11. Type of Customer:

☐ Corporation ☐ Individual Partnership: ☐ General ☐ Limited
Government: ☐ City ☐ County ☐ Federal ☐ Local ☒ State ☐ Other ☐ Sole Proprietorship ☐ Other:

12. Number of Employees

☐ 0-20 ☐ 21-100 ☐ 101-250 ☐ 251-500 ☒ 501 and higher

13. Independently Owned and Operated?

☐ **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:							
	City		**State**		**ZIP**	**ZIP + 4**	

16. Country Mailing Information *(if outside USA)*	**17. E-Mail Address** *(if applicable)*

18. Telephone Number	19. Extension or Code	20. Fax Number *(if applicable)*
( ) -		( ) -

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.)*

US 183A General Purpose Lanes

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:	US 183A from Avery Ranch Blvd to Whitestone Blvd (RM 1431)		
26. Nearest City		**State**	**Nearest ZIP Code**
Cedar Park		TX	78613

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:	30.505427		**28. Longitude (W) In Decimal:**	-97.809645	
Degrees	Minutes	Seconds	Degrees	Minutes	Seconds
30	30	19.5372	-97	48	34.722

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.)*

Transportation Agency

34. Mailing Address:	**2727 S Austin Ave**						
	City	**Georgetown**	**State**	**TX**	**ZIP**	**78726**	**ZIP + 4**
35. E-Mail Address:	**kyle.russell@txdot.gov**						

36. Telephone Number	**37. Extension or Code**	**38. Fax Number** *(if applicable)*
(512) 930-5402		( ) -

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
		11004130		
☐ 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:

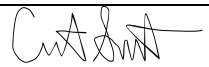
SECTION IV: Preparer Information

40. Name:	Clint Smith, P.E.	**41. Title:**	Project Manager

42. Telephone Number	**43. Ext./Code**	**44. Fax Number**	**45. E-Mail Address**
(737 **)** 787-2704		**( )** -	clint.smith@halff.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:	Halff Associates, Inc.	**Job Title:**	Project Manager
Name *(In Print):*	Clint Smith	**Phone:**	**(** 737 **)** 787- **2704**
Signature:		**Date:**	1/21/2026