WATER POLLUTION ABATEMENT PLAN
&
ORGANIZED SEWAGE COLLECTION PLAN
APPLICATION

FOR

TWELVE OAKS PROFESSIONAL PARK

HWY 29 W
Liberty Hill, TX 78642

Prepared For:

Twelve Oaks Professional Park Commercial LP
14205 N MOPAC EXPY, STE 450
Austin, TX 78728

Prepared By:

Sandlin Services, LLC
TBPELS Firm # 21356
P: (806) 679-7303

September 5, 2023

9/5/2023

STATE OF TEXAS
NICHOLAS R. SANDLIN
124404
LICENSED
PROFESSIONAL ENGINEER

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Edwards Aquifer Application Cover Page (TCEQ-20705)

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: **Twelve Oaks Professional Park**						**2. Regulated Entity No.:**			
3. Customer Name: Twelve Oaks Professional Park Commercial LP						**4. Customer No.:**			
5. Project Type: **(Please circle/check one)**	New		Modification			Extension		Exception	
6. Plan Type: **(Please circle/check one)**	WPAP	CZP	SCS	UST	AST	EXP	EXT	Technical Clarification	Optional Enhanced Measures
7. Land Use: **(Please circle/check one)**	Residential		Non-residential			**8. Site (acres):**			3.62
9. Application Fee:	$4,263		**10. Permanent BMP(s):**			Contech Jellyfish Filter			
11. SCS (Linear Ft.):	526		**12. AST/UST (No. Tanks):**						
13. County:	Williamson		**14. Watershed:**			North Fork San Gabriel River			

Application Distribution

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

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

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

Austin Region			
County:	**Hays**	**Travis**	**Williamson**
Original (1 req.)	___	___	_x_
Region (1 req.)	___	___	_x_
County(ies)	___	___	_x_
Groundwater Conservation District(s)	___Edwards Aquifer Authority ___Barton Springs/ Edwards Aquifer ___Hays Trinity ___Plum Creek	___Barton Springs/ Edwards Aquifer	NA
City(ies) Jurisdiction	___Austin ___Buda ___Dripping Springs ___Kyle ___Mountain City ___San Marcos ___Wimberley ___Woodcreek	___Austin ___Bee Cave ___Pflugerville ___Rollingwood ___Round Rock ___Sunset Valley ___West Lake Hills	___Austin ___Cedar Park ___Florence ___Georgetown ___Jerrell ___Leander _x_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. NICK SANDLIN, P.E. (SANDLIN SERVICES, LLC)
Print Name of Customer/Authorized Agent 9/5/2023
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
(TCEQ-0587)

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: NICK SANDLIN, P.E. (SANDLIN SERVICES, LLC)

Date: 9/5/2023

Signature of Customer/Agent:

Project Information

1. Regulated Entity Name: TWELVE OAKS PROFESSIONAL PARK
2. County: WILLIAMSON
3. Stream Basin: BRAZOS RIVER
4. Groundwater Conservation District (If applicable): N/A
5. Edwards Aquifer Zone:
   - ☒ Recharge Zone
   - ☐ Transition Zone
6. Plan Type:
   - ☒ WPAP
   - ☒ SCS
   - ☐ Modification
   - ☐ AST
   - ☐ UST
   - ☐ Exception Request

7. Customer (Applicant):

   Contact Person: Charbel Dahdah
   Entity: TWELVE OAKS PROFESSIONAL PARK COMMERCIAL LP
   Mailing Address: 7801 N CAPITAL OF TEXAS HIGHWAY, SUITE 450
   City, State: AUSTIN, TX Zip: 78728
   Telephone: 281-467-7422 FAX: _____
   Email Address: cdahdah@cadre-usa.com

8. Agent/Representative (If any):

   Contact Person: NICK SANDLIN, P.E.
   Entity: SANDLIN SERVICES, LLC
   Mailing Address: 9111 JOLLYVILLE RD, STE 212
   City, State: AUSTIN, TX Zip: 78759
   Telephone: 806-679-7303 FAX: _____
   Email Address: nick@sandlinservices.com

9. Project Location:

   ☐ The project site is located inside the city limits of _____.
   ☒ The project site is located outside the city limits but inside the ETJ (extra-territorial jurisdiction) of City of Liberty Hill.
   ☐ 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.

    Northeast of the intersection of State Highway 29 West & Ronald Reagan Blvd in Liberty Hill, TX 78642 - 2021 SH 29, Liberty Hill, TX 78642

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.

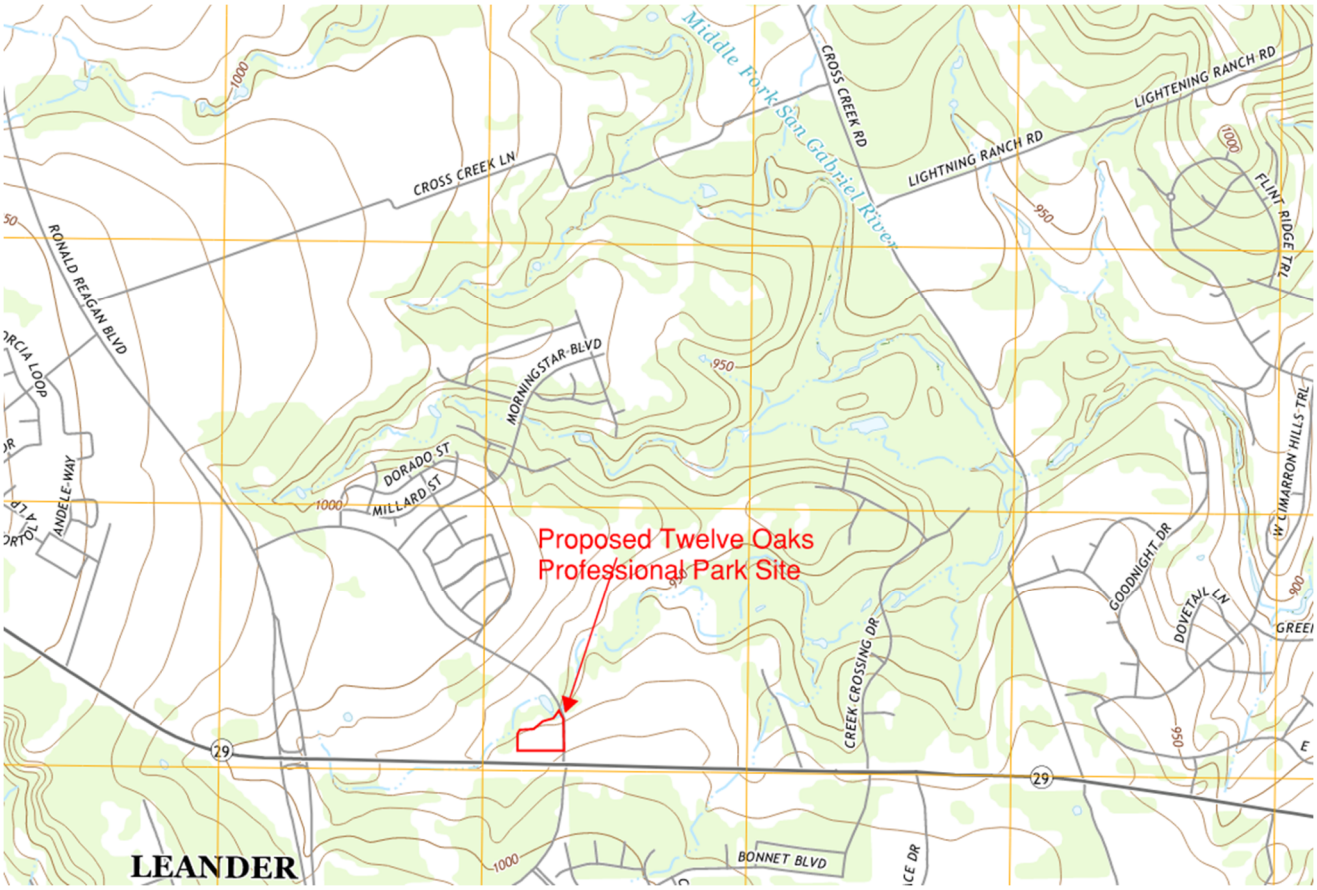
General Information Form
(TCEQ-0587)

Attachment A:
Road Map

Source: Google Earth Pro (accessed 08/15/2023)

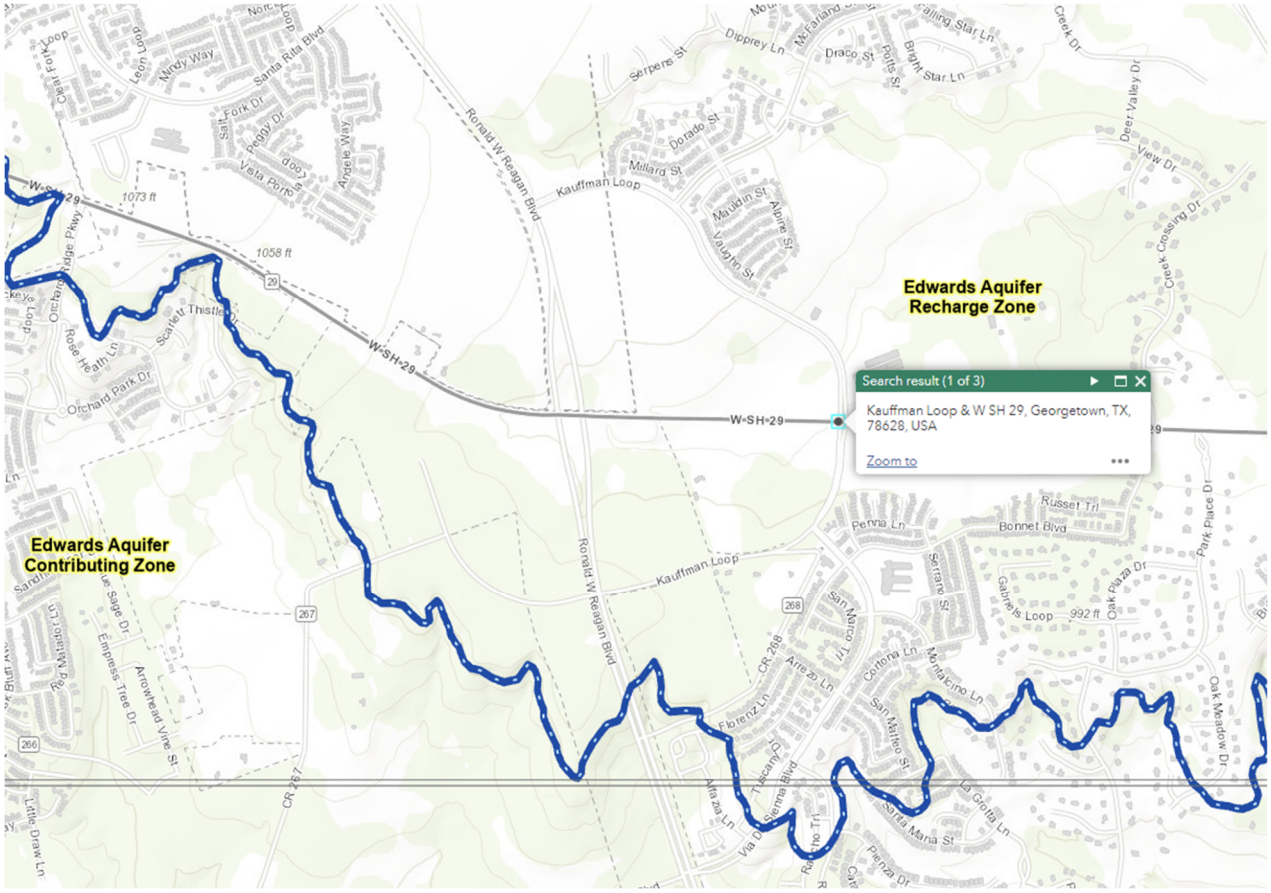
General Information Form
(TCEQ-0587)

Attachment B:
USGS Quadrangle Map
Edwards Aquifer Recharge Zone Map
FEMA FIRM Map

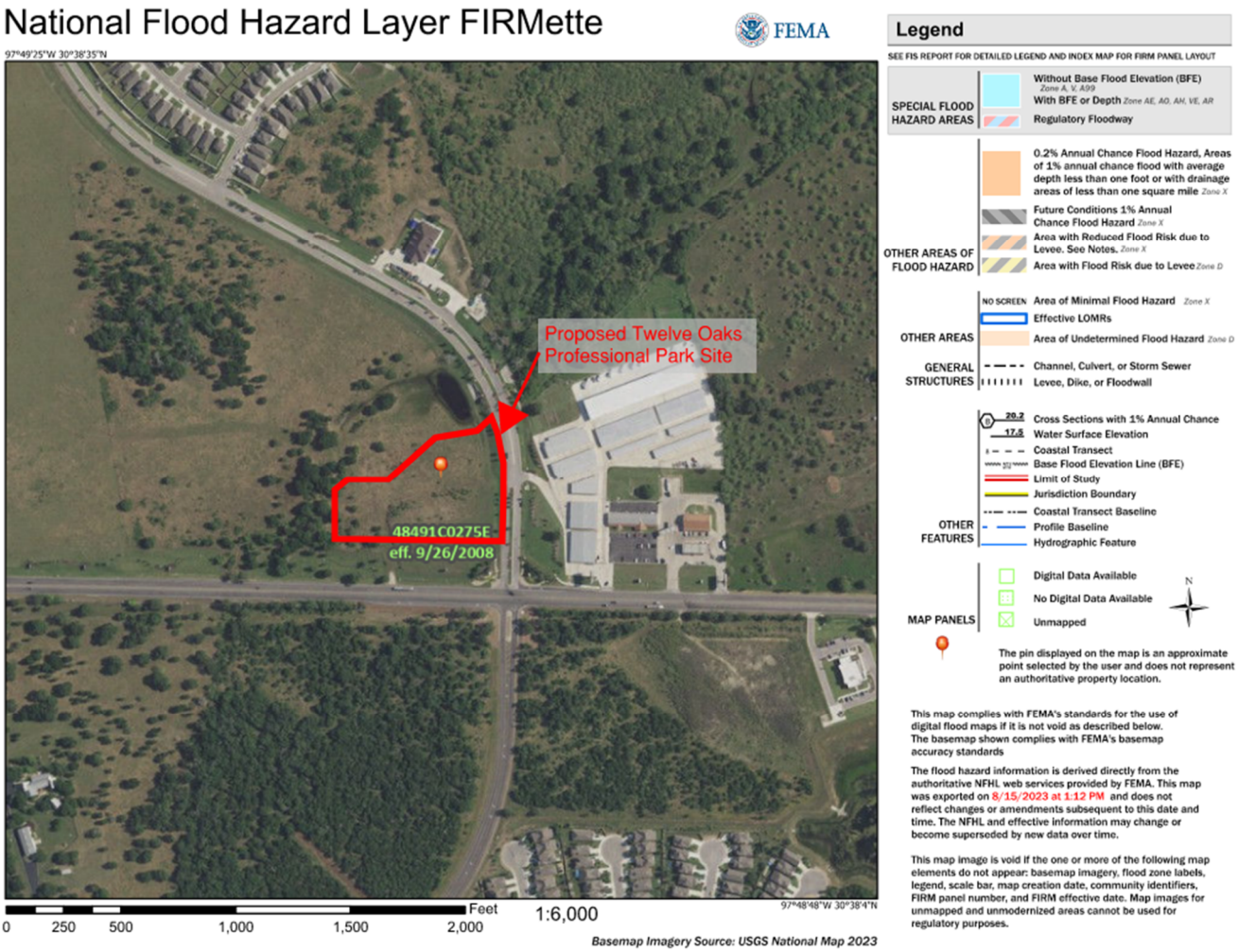


Source: Portion of USGS Quadrangle Map (TX_Leander_NE_20220808_TM_geo)

EDWARDS AQUIFER ZONE MAP
TWELVE OAKS PROFESSIONAL PARK
Kauffman Loop & W SH 29
Georgetown, Texas 78628
Source: TCEQ Edwards Aquifer Viewer
Prepared: August 15, 2023



FEMA FIRM MAP



Source: Portion of FEMA FIRMette Map Panel 48491C0275E (effective 09/26/2008)

Source: Portion of FEMA FIRM Map Panel 48491C0275E (effective 09/26/2008)

Source: Drainage path from USGS StreamStats (accessed 08/17/2023)

General Information Form
(TCEQ-0587)

Attachment C:
Project Description

Proposed Development

The 3.62 AC project site is located on the northwest corner of the intersection of Kauffman Loop and W SH 29, Liberty Hill, Texas 78642 (WCAD Parcel # R641660). The property is located inside the Liberty Hill ETJ 2019 in Williamson County. The project site is currently undeveloped land. Proposed development is four (4) professional office buildings with associated paving, drainage, utility and water quality infrastructure. The property is within the Edwards Aquifer Recharge Zone and will therefore need a Water Pollution Abatement Plan (WPAP). The WPAP proposes a Contech Jellyfish Filter and Vegetative Filter Strip (VFS) BMPs for permanent stormwater water quality control.

Site Description and History

The 3.62 AC project site property is owned by Twelve Oaks Professional Park Commercial, LP (Warranty Deed Document # 2023002896, dated 01/09/2023, with additional 12 Oaks Village Commercial Property Covenants, Conditions and Restrictions Document # 2023002582, dated 01/09/2023). Legal description of the property is AW0005 AW0005 - Fisk, G. Sur., ACRES 3.624. Survey of the 3.624 AC property includes Lot 1 of BLOCK A in the 12 Oaks Village Final Plat and Survey by HR Green dated 10/04/2022.

Total land area (3.62 AC) is on land with 0% - 15% slopes. The elevation is between 970 FT and 980 FT. Vegetation at the undeveloped site is primarily cedar and native vegetation.

Access

Two access points are proposed for the site: one access point from SH 29 and one access point from Kauffman Loop.

Impervious Cover (IC)

Total existing area of impervious cover is approximately 0.0 acres.

Total proposed Project Site IC is 2.93 AC, or 80.8%, which is associated with the proposed 38,700 SF of four office buildings and the associated civil infrastructure. Existing and proposed areas of impervious cover will be treated as shown in the permanent stormwater section.

Watershed and FEMA Floodplain Information

The project site is within the North Fork San Gabriel River Watershed, which drains to the Brazos River Basin. No surface streams run across the property. Drainage is generally to the east-northeast to the proposed Regional Detention Pond, that would eventually drain to the Middle Fork San Gabriel River, approximately one mile east of the site.

There is no portion of the project site located within the 100-year floodplain as defined by FEMA FIRM Panel No. 48491C0275E (dated 09-26-2008). All development will remain outside of the FEMA floodplain. The proposed development and infrastructure include 2.93 AC of impervious over (IC), approximately 80.8% of the total site area. There are no proposed impacts to the existing jurisdictional waters by construction.

Temporary Best Management Practices (BMPs)

Construction practices shall disturb the minimal amount of existing ground cover as required for land clearing, grading, and construction activity for the shortest amount of time possible to minimize the potential of erosion and sedimentation from the site.

Prior to soil disturbing construction activity, temporary BMPs will be installed. Silt fencing will be installed along the down-gradient sides of the property to intercept and detain waterborne sediment from unprotected areas. The silt fence shall remain in place until the disturbed area is permanently stabilized.

Permanent Best Management Practices (BMPs)

A Contech Jellyfish Filter and Vegetated Filter Strip (VFS) permanent BMPs are proposed for stormwater drainage and water quality at the developed project site. Detention for the Twelve Oaks Professional Park development will be handled by the 12 Oaks Village Regional Detention Pond.

After construction activities are complete, the Contech Jellyfish Filter permanent BMP will be maintained as described in Attachment G of the Permanent Stormwater Section. Permanent seeding, sodding or mulching will be utilized as described in Attachment J of the Temporary Stormwater Section. Permanent BMPs for trash, herbicide/pesticide use, and general maintenance of the Contech Jellyfish BMP is also described in Attachment G of the Permanent Stormwater Section.

Offsite Areas

No offsite areas are anticipated to be affected by pre and post construction activities at the site. Temporary BMPs will minimize any anticipated effects of the proposed construction activities. Permanent BMPs will address any anticipated water quality issues at the developed site.

Geologic Assessment Form
(TCEQ-0585)

Horizon™
Environmental Services, Inc.

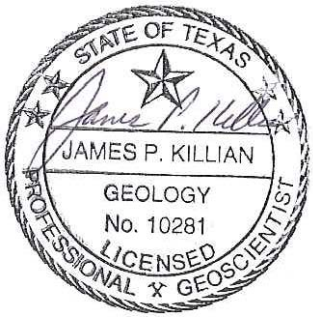
GEOLOGIC ASSESSMENT
MORNINGSTAR RANCH (DIPPREY TRACT)
LEANDER, WILLIAMSON COUNTY, TEXAS
HJN 140011 GA

PREPARED FOR:

MARLIN ATLANTIS GROUP
DALLAS, TEXAS

PREPARED BY:

HORIZON ENVIRONMENTAL SERVICES, INC.
TBPG FIRM REGISTRATION NO. 50488



SEPTEMBER 2014

CORPORATE HEADQUARTERS
1507 South IH 35 ★ Austin, Texas 78741 ★ 512.328.2430 ★ Fax 512.328.1804 ★ www.horizon-esi.com
Certified WBE/HUB/DBE/SBE

Horizon
Environmental Services, Inc.

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Horizon
Environmental Services, Inc.

TCEQ GEOLOGIC ASSESSMENT FORM

For Regulated Activities
on The Edwards Aquifer Recharge/Transition Zones
and Relating to 30 TAC 213.5(b)(3), Effective June 1, 1999

REGULATED ENTITY NAME: Morningstar Ranch; Leander, Williamson County, Texas

TYPE OF PROJECT: X WPAP _ AST X SCS _ UST

LOCATION OF PROJECT: X Recharge Zone __ Transition Zone __ Contributing Zone

PROJECT INFORMATION

Figure 1 shows the Site Location and Edwards Aquifer Recharge Zone.

1. X Geologic or manmade features are described and evaluated using the attached **GEOLOGIC ASSESSMENT TABLE** provided in Appendix C.

2. X Soil cover on the project site is summarized in the table below (Table 1) and uses the Soil Conservation Service (SCS) Hydrologic Soil Groups* (*Urban Hydrology for Small Watersheds, Technical Release No. 55, Appendix A*, SCS, 1986) (NRCS, 1975, and Werchan et al., 1983).

TABLE 1 – SURFACE SOILS

Soil Units, Infiltration Characteristics & Thickness		
Soil Name	Group*	Thickness (feet)
CfB - Crawford clay, 1-3% slopes	D	1 - 2
FaA - Fairlie clay, 0-1% slopes	D	1 - 2
FaB - Fairlie clay, 1-2% slopes	D	1 - 2
GeB - Georgetown clay loam, 0-2% slopes	D	2 - 3
GsB - Georgetown stony clay loam, 1-3% slopes	D	1 - 2

* Soil Group Definitions (Abbreviated)

A. Soils having a high infiltration rate when thoroughly wetted.

B. Soils having a moderate infiltration rate when thoroughly wetted.

C. Soils having a slow infiltration rate when thoroughly wetted.

D. Soils having a very slow infiltration rate when thoroughly wetted.

3. X A **STRATIGRAPHIC COLUMN** is attached at the end of this form in the additional comments section and shows formations, members, and thicknesses. The

outcropping unit should be at the top of the stratigraphic column (Appendix A, Figure 5).

4. X A **NARRATIVE DESCRIPTION OF SITE-SPECIFIC GEOLOGY** is attached at the end of this form. The description must include a discussion of the potential for fluid movement to the Edwards Aquifer, stratigraphy, structure, and karst characteristics of the site.

5. X Appropriate **SITE GEOLOGIC MAP(S)** are attached in Appendix B:

The Site Geologic Map must be the same scale as the applicant's Site Plan. The minimum scale is 1": 400'

Applicant's Site Plan Scale	1" = 400'
Site Geologic Map Scale	1" = 400'
Site Soils Map Scale (if more than 1 soil type)	1" = 1100'

6. Method of collecting positional data:
   X Global Positioning System (GPS) technology.
   _ Other method(s).

7. X The project site is shown and labeled on the Site Geologic Map (Appendix B).

8. X Surface geologic units are shown and labeled on the Site Geologic Map (Appendix B).

9. X Geologic or manmade features were discovered on the project site during the field investigation. They are shown and labeled on the Site Geologic Map (Appendix B) and are described in the attached Geologic Assessment Table (Appendix C).

   _ Geologic or manmade features were not discovered on the project site during the field investigation.

10. X The Recharge Zone boundary is shown and labeled, if appropriate (Appendix A, Figure 2).

11. All known wells (test holes, water, oil, unplugged, capped and/or abandoned, etc.):

   _ There are ___ (#) wells and ___ test wells present on the project site, and the locations are shown and labeled. (Check all of the following that apply.)
      _ The test well is not in use and has been properly abandoned.
      _ The wells are not in use and will be properly abandoned.
      _ The wells are in use and comply with 16 TAC §76.

   X There are no wells or test holes of any kind known to exist on the project site.

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ADMINISTRATIVE INFORMATION

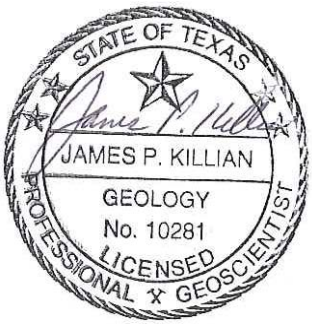
12. X Submit one (1) original and one (1) copy of the application, plus additional copies as needed for each affected incorporated city, groundwater conservation district, and county in which the project will be located. The TCEQ will distribute the additional copies to these jurisdictions. The copies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

Date(s) Geologic Assessment was performed: 10, 13, and 23 June 2014; 6 and 7 August 2014; and 17 September 2014
Date(s)

To the best of my knowledge, the responses to this form accurately reflect all information requested concerning the proposed regulated activities and methods to protect the Edwards Aquifer. My signature certifies that I am qualified as a geologist as defined by 30 TAC 213.

For Horizon Environmental Services, Inc.

James Killian, PG[1]
Print Name of Geologist



(512) 328-2430, Ext. 112
Telephone

(512) 328-2633
Fax

Signature of Geologist

18 September 2014
Date

Representing: Horizon Environmental Services, Inc., Austin, Texas

If you have questions on how to fill out this form or about the Edwards Aquifer protection program, please contact us at 210/490-3096 for projects located in the San Antonio Region or 512/339-2929 for projects located in the Austin Region.

Individuals are entitled to request and review their personal information that the agency gathers on its forms. They may also have any errors in their information corrected. To review such information, contact us at 512/239-3282.

[1] Registered Professional Geologist, State of Texas

TCEQ GEOLOGIC ASSESSMENT
ADDITIONAL COMMENTS

1.0 INTRODUCTION AND METHODOLOGY

This report and the planned abatement measures are intended to fulfill Texas Commission on Environmental Quality (TCEQ) reporting requirements (TCEQ, 1999). This geologic assessment includes a review of the site for potential aquifer recharge and documentation of general geologic characteristics for the subject site. Horizon conducted the necessary field and literature studies according to TCEQ Instructions to Geologists for completing Geologic Assessments within the Edwards Aquifer Recharge Zone (TCEQ, 2004).

Horizon walked transects spaced less than 50 feet apart and mapped the location of features using a subfoot accurate Trimble GeoHX handheld GPS and post-processed data utilizing aerial photographs, topographic maps, and GPS Pathfinder Office software. Horizon also searched the area around any potential recharge features that were encountered to look for any additional features.

The Geologic Assessment Table in Appendix C provides a description of any features that meet the TCEQ definition of potential recharge features (TCEQ, 2004). Features that do not meet the TCEQ definition, which include surface weathering, karren, or animal burrows, were evaluated in the field and omitted from this report. While walking transects, Horizon removed loose rocks and soil (by hand), when necessary, to preliminarily assess each feature's subsurface extent. However, labor-intensive excavation was not conducted.

The results of this survey do not preclude the possibility of finding subsurface voids or abandoned test or water wells during the clearing or construction phases of the proposed project. If a subsurface void is encountered during any phase of the project, construction should be halted until the TCEQ (or appropriate agency) is contacted and a geologist can investigate the feature.

2.0 ENVIRONMENTAL SETTING

2.1 LAND USE

The current use of the subject site is undeveloped rangeland, woodlands, and agricultural land with local electrical and water utilities. The subject site consists of approximately ±530 acres that are currently used to raise beef cattle in west-central Williamson County, Texas. Access to the site is along State Highway 29 (Appendix A, Figure 1). Surrounding land use is predominantly undeveloped rangeland and/or rural residential.

2.2 TOPOGRAPHY AND SURFACE WATER

The subject site is situated on gently to moderately sloping terrain within the Middle Fork of the San Gabriel River watershed (Appendix A, Figures 2 and 3). Surface elevations on the subject site vary from a minimum of approximately 940 feet above mean sea level (amsl) at the northeastern portion of the property corner to a maximum of approximately 1020 feet amsl at the western limits of the proposed right-of-way (ROW) connector (Kauffman Loop) to Ronald Reagan Boulevard. Drainage on most of the site occurs primarily by overland sheet flow in multiple directions based on location near several unnamed tributaries of the Middle Fork of the San Gabriel River.

2.3 EDWARDS AQUIFER ZONE

As shown in Appendix A, Figure 2, the subject site is found within the Edwards Aquifer Recharge Zone, as mapped by TCEQ Recharge Zone Boundary Maps (TCEQ, 2014).

2.4 SURFACE SOILS

Mapping by the Natural Resources Conservation Service (NRCS, 2014) shows approximately 5 soil mapping units within the subject site (Appendix A, Figure 4) associated with the soil series described below.

Crawford clay, 1 to 3% slopes (CfB): This gently sloping soil is on mesas, foot slopes, and at the head of drainage ways on uplands. Typically, the uppermost layer is neutral clay about 27 inches thick. It is brown in the upper 6 inches and dark reddish brown below that. The underlying material is whitish, fractured hard limestone. This soil is well drained, and the available water capacity is low. When the soil is dry and cracked, permeability is rapid; but when the soil is wet and the cracks are closed, permeability is very slow. Runoff is medium.

Fairlie clay, 0 to 1% slopes (FaA) and 1 to 2% slopes (FaB): This nearly level soil is on broad plateaus, slightly depressed areas near the head of drains, and in shallow valleys on uplands. Typically, this soil has a dark gray clay upper layer about 36 inches thick. The layer below that, which extends to about 46 inches, is gray clay. The underlying material to a depth of 55 inches is weakly cemented limestone interbedded with limy material. This soil is calcareous and moderately alkaline. This soil is moderately well drained. When dry, it has wide cracks, and water enters it rapidly. However, when this soil is wet and the cracks are sealed, water enters it very slowly. Surface runoff is slow when this soil is dry and cracked. The available water capacity is high and erosion is a slight hazard.

Fairlie clay, 1 to 2% slopes (FaB): This gently sloping soil is along broad flats and on the edges of drainageways on uplands. Typically, this soil has a dark gray clay upper layer about 21 inches thick. The layer below that, to 46 inches, is clay that is gray in the upper part and dark grayish brown in the lower part. The underlying material is weakly cemented limestone interbedded with limy material. This soil is calcareous and moderately alkaline throughout. This soil is moderately well drained. When dry, this soil cracks extensively, and water enters it rapidly. When this soil is wet and

the cracks are closed, water enters the soil very slowly. Runoff is medium. The available water capacity is high. Erosion is a slight hazard.

Georgetown clay loam, 0 to 2% slopes (GeB): This nearly level to gently sloping soil is on uplands. Most areas are irregular in shape and range from 10 to 50 acres. Typically, the surface layer is slightly acidic, brown clay loam about 7 inches thick. The subsoil extends to about 35 inches; it is neutral to slightly acidic, reddish brown clay in the upper part and cobbly clay in the lower part. The underlying material is indurated limestone that has limy earth imbedded in the crevices. This soil is well drained. Permeability is slow. Surface runoff is medium. The available water capacity is low.

Georgetown stony clay loam, 1 to 3% slopes (GsB). This gently sloping soil is mostly on the higher parts of uplands. Typically, this soil has a slightly acidic, brown stony clay loam surface layer about 7 inches thick and few to common stones on or near the surface. The subsoil, which extends down to a depth of about 35 inches, is neutral, reddish brown clay in the upper part and slightly acidic, reddish brown cobbly clay in the lower part. The underlying material is indurated, fractured limestone that has clay loam in crevices and fractures. This soil is well drained. Permeability is slow, and surface runoff is medium. The available water capacity is low. Reaction is neutral to slightly acidic. The erosion hazard ranges to slight.

2.5 GEOLOGY

A review of existing literature shows most of the subject site is underlain by the undifferentiated Edwards Limestone Formation (Ked) (Bureau of Economic Geology [UT-BEG, 1995]) with an estimated maximum thickness of about 40 feet at higher elevations located along the west-southwest side. In addition, Quaternary-age terrace deposits (terraces along streams [Qt]) occur at the highest elevations located near the west and central portions of the subject site with an estimated thickness of less than 20 feet. In general, the rock strata beneath the site dip to the southeast at about 10 to 30 feet per mile.

The subject site is located several miles west of the Balcones Fault Zone, and available geologic reports indicate the immediate area has not been affected by geologically inactive, normal faulting. A normal fault is an inclined fault in which the hanging wall appears to have slipped downward relative to the footwall. The nearest mapped fault is about 2 miles west of the site, and strikes N30°E (UT-BEG, 1995).

Table 2 depicts the stratigraphic relationship and approximate thicknesses of the uppermost geologic unit found at the subject site.

TABLE 2 – GEOLOGIC STRATIGRAPHIC COLUMN

Geologic Period	Hydrologic Unit	Geologic Unit	Geologic Member	Approximate Thickness (feet)	Description
Quaternary	--	Terraces along streams (Qt)	--	Up to 20	Gravel, sand, silt, and clay in various proportions with gravel more prominent in the older, higher terraces. Eroded fragments of dolomite, limestone, and chert from the Edwards Plateau; sand mostly quartz. No cave development.
Lower Cretaceous	Edwards Aquifer	Edwards Formation (Ked)	--	40	Gray to light brownish-gray, thin to medium-bedded, dense, dolomite, dolomitic limestone, and limestone containing rudists (long, conical bivalves). Gray to black chert is common. Low to moderate cave development.
Lower Cretaceous	Edwards Aquifer	Comanche Peak Formation (Kc)	--	50	Gray to very light brown, fine-grained, nodular limestone, marly limestone, and marl. No cave development.
Lower Cretaceous	Confining Unit	Walnut Formation (Kwa)	--	175	Composed of 4 thinly bedded limestone and marl members (Keys Valley Marl, Cedar Park Limestone, Bee Cave Marl, and Bull Creek Limestone). Uppermost member is Keys Valley Marl, fine- to very fine-grained, cream colored, fossiliferous marl with some thin interbeds of soft limestone. Low cave development.

2.6 WATER WELLS

A search was made for water wells on and within 0.5 miles of the subject site. A review of the records of the TCEQ and the Texas Water Development Board (TWDB) revealed no water wells at the subject site or within 0.5 miles from the subject site (TWDB, 2014). No evidence of water wells was present on the subject site during the field investigation. The results of this survey do not preclude the existence of an abandoned well.

Abandoned wells must be capped or properly abandoned according to the Administrative Rules of the Texas Department of Licensing and Regulation, 16 Texas Administrative Code (TAC), Chapter 76, effective 3 January 1999. A plugging report must be submitted (by a licensed water well driller) to the Texas Department of Licensing and Regulation, Water Well Driller's Program, Austin, Texas. If a well is intended for use, it must comply with 16 TAC §76.

2.7 GEOLOGIC AND MANMADE FEATURES

Field surveys of the subject site were conducted by a licensed Horizon geologist on 10, 13, and 23 June 2014; 6 and 7 August 2014; and 17 September 2014. Four natural geologic features (F-1 to F-4) were identified within the subject site. Five manmade features (M-1 to M-5) (all are stock

ponds) were observed at the subject site. These stock ponds appear to have been constructed over several years ago and are located within various unnamed tributaries of the Middle Fork of the San Gabriel River. Based on the presence of thick deposits of predominately very fine-grained (clay) fluvial sediments, all of the manmade features have very low relative infiltration rates.

Geologic Feature F-1: Sinkhole measuring approximately 7 feet in diameter x 1.5 feet deep with 2 drainage portal openings (1 foot in diameter x 1 to 1.5 feet deep) located along its clay and rock-laden floor. No air flow conductivity was noted at the openings. Probing with a steel rod encountered clay soil and cobbles about 2 feet below the feature's floor. On 6 August 2014, Horizon staff excavated an area about 6 feet long x 4 feet wide x 5 feet deep near the center of the sinkhole. No voids and/or drainage portals were observed along its floor or walls, and probing with a steel rod encountered very dense, weathered soil and rock about 2 feet below the lowest point of the excavation. Excavation was partially refilled due to the presence of livestock on the site. This feature has a low infiltration rate and a surface runoff catchment of less than 0.1 acres.

Geologic Feature F-2: Solution cavity measuring approximately 2 feet long x 1.5 feet wide x 0.5 feet deep with a semi-open drainage portal amongst loose rocks and soil. No air flow conductivity was noted at the opening. Probing with a steel rod encountered loose clay soil and cobbles about 1 foot below the feature's floor. On 6 August 2014, Horizon staff excavated an area about 5 feet long x 2 feet wide x 5.5 feet deep near the center of the feature. No voids and/or drainage portals were observed along its floor or walls, and probing with a steel rod encountered very dense, weathered soil and rock about 2 feet below the lowest point of the excavation. Excavation was refilled to existing grade due to the presence of livestock on the site. This feature has a low infiltration rate and a surface runoff catchment of less than 0.1 acres.

Geologic Feature F-3: Upland sinkhole measuring approximately 11 feet long x 9 feet wide x 2 feet deep with 2 drainage portal openings located along the edge of a rock headwall. Slight air flow conductivity was noted at the openings. Probing with a steel rod encountered loose cobbles and soil about 3 feet below the feature's floor. On 6 and 7 August 2014, Horizon staff excavated an area (6 feet long x 3 feet wide x 4.5 feet deep) along the north side of the rock headwall and discovered a low, horizontal bedding plane void (4 feet long x 3 feet wide x 1 to 0.3 feet high) about 2 feet below the surface that slopes down toward the south. No other voids and/or drainage portals were observed along the excavated floor or walls. This feature has an intermediate infiltration rate and a surface runoff catchment of less than 0.4 acres.

Geologic Feature F-4: Upland sinkhole measuring approximately 9 feet long x 6 feet wide x 2 feet deep with 2 semi-open drainage portal openings (0.8 feet in diameter and 0.9 feet in diameter x 1 foot deep) amongst loose clay and cobbles. No air flow conductivity was noted. Probing with a steel rod encountered firm clay soil and cobbles about 2 feet below the feature's floor. On 6 August 2014, Horizon staff excavated an area about 5 feet long x 3 feet wide x 3 feet deep near the center of the sinkhole. No voids and/or drainage portals were observed along its floor or walls, and probing with a steel rod encountered very dense, weathered soil and rock about 2 feet below the lowest point of the excavation. Excavation was partially refilled due to the presence of livestock on the site. This feature has a low infiltration rate and a surface runoff catchment of less than 0.1 acres.

A map detailing site geology and the location of the geologic features is provided in Appendix B. Further information pertaining to the geologic features is provided in the Geologic Assessment Table (Appendix C). Photographs of the geologic features are also provided in Appendix D.

3.0 CONCLUSIONS AND RECOMMENDATIONS

Four natural geologic features and 5 manmade features were identified at the subject site. All of the features were evaluated for their potential to be significant pathways for fluid movement into the Edwards Aquifer. The Geologic Assessment Table (Appendix C) summarizes this evaluation and assigns each feature's sensitivity a total point value. Those with a point value of 40 or higher are deemed to be sensitive groundwater recharge features and should be protected during site development pursuant to TCEQ rules for protection of the Edwards Aquifer (30 TAC 213).

One geologic feature (F-3) has been evaluated as sensitive for groundwater recharge capability and would therefore require a TCEQ protective setback buffer. In general, a protective buffer encompassing a sensitive feature is recommended to meet the TCEQ guidance for a setback of at least 50 feet in all directions from the feature's areal extent (perimeter), plus its watershed catchment up to 200 feet from the perimeter of the feature. Three geologic features (F-1, F-2, and F-4) have been evaluated as non-sensitive for groundwater recharge capability and would therefore not require TCEQ protective setback buffers. No further action is recommended for these non-sensitive geologic features.

Five manmade features (M-1 to M-5) have been evaluated as non-sensitive for groundwater recharge capability and would therefore not require TCEQ protective setback buffers. No further action is recommended for these non-sensitive manmade features.

The site appears generally well-suited to development prospectus. It should be noted that soil and drainage erosion would increase with ground disturbance. Native grasses and the cobbly content of the soil aid to prevent erosion. Soil and sedimentation fencing should be placed in all appropriate areas prior to any site construction activities.

Because the project site is located over the Edwards Aquifer Recharge Zone, it is possible that subsurface voids underlie the site. The nature of the sub-grade is fault-influenced, which can result with variable-sized voids in materials that may otherwise not be noted as void or cave forming. If any subsurface voids are encountered during the proposed development, construction should halt immediately so that a geologist may assess potential for the void(s) to provide meaningful recharge to the Edwards Aquifer.

4.0 REFERENCES

(CAPCOG) Capital Area Council of Governments. *Data, Maps, and Reports.* Contours 10 Foot Merge. <http://www.capcog.org/data-maps-and-reports/geospatial-data/>. Accessed 15 September 2014.

(ESRI) Environmental Systems Research Institute, Inc. Street Map North America Data Layer. ESRI, Redlands, California. 2012.

(NRCS) Natural Resources Conservation Service (formerly the Soil Conservation Service) US Department of Agriculture, Engineering Division Soil Series and Hydrologic Soil Groups of Urban Hydrology for Small Watersheds, Technical Release No. 55, Engineering Division, January 1975.

_____. US Department of Agriculture, Natural Resources Conservation Service. 2014a. Web Soil Survey, <http://websoilsurvey.nrcs.usda.gov/app/WebSoilSurvey.aspx>. Accessed 15 September 2014.

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_____. Texas Commission on Environmental Quality. Edwards Aquifer Protection Program. Edwards Aquifer Viewer, <http://tceq4apmgwebp1.tceq.texas.gov:8080/edwards Aquifer/>. Accessed 15 September 2014.

(TWDB) Texas Water Development Board. Water Information Integration and Dissemination System. TWDB Groundwater Database (ArcIMS), <http://wiid.twdb.state. tx.us/ims/wwm_drl/viewer.htm?>. Accessed 15 September 2014.

(USDA) US Department of Agriculture. National Agriculture Imagery Program, Farm Service Agency, Aerial Photography Field Office. Williamson County, Texas. 2012.

(USGS) US Geological Survey. 7.5-minute series topographic maps, Leander, Texas, quadrangle, 1987.

(UT-BEG) The University of Texas at Austin Bureau of Economic Geology; C.V. Proctor, Jr., T.E. Brown, J.H. McGowen, N.B. Waechter, and V.E. Barnes. *Geologic Atlas of Texas*, Austin Sheet. Francis Luther Whitney Memorial Edition. 1974; revised 1995.

(Werchan et al.) Werchan, L. E., and J. L. Coker. Soil survey of Williamson County, Texas. Soil Conservation Service, US Department of Agriculture, Washington, D.C. 1983.

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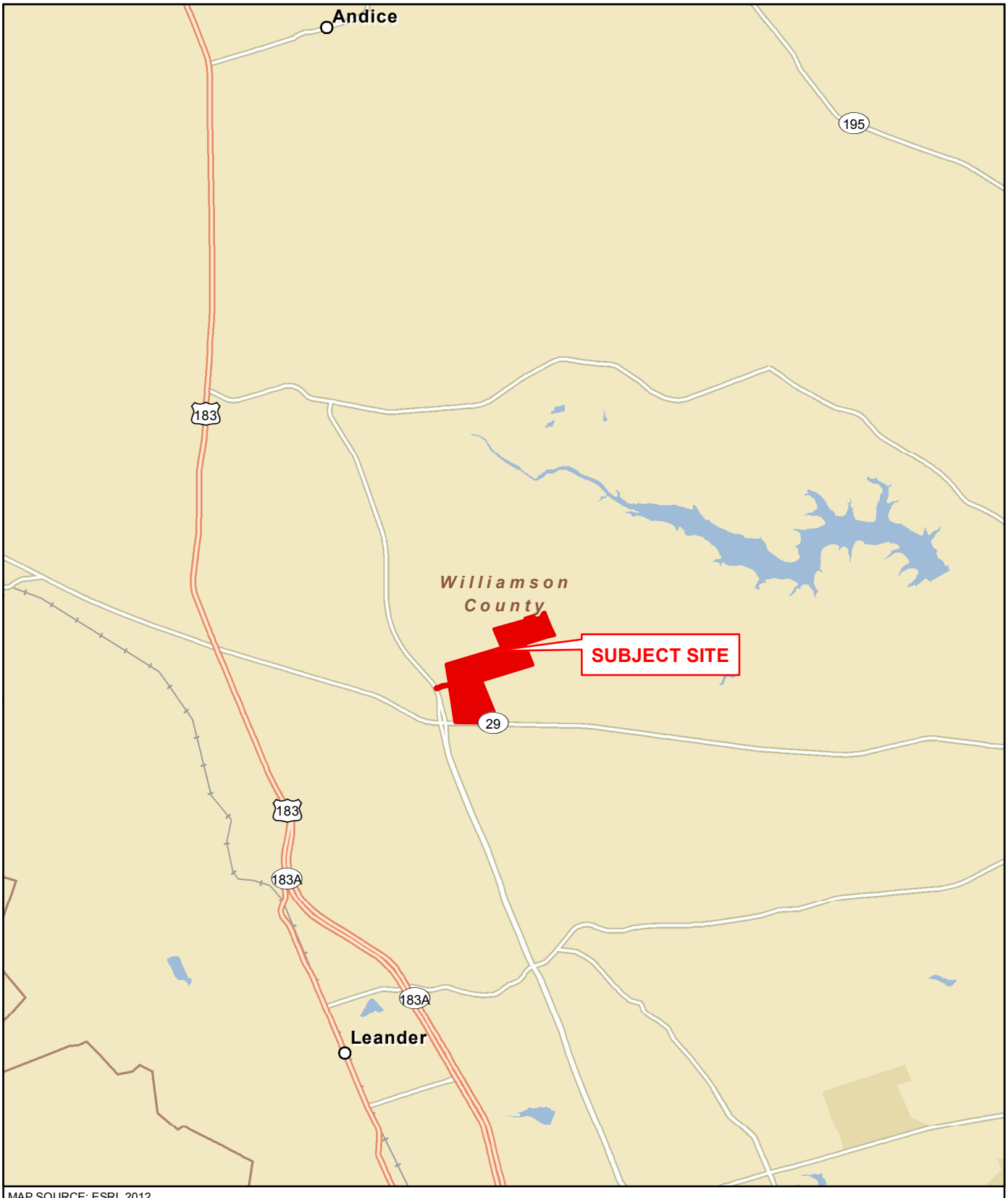
APPENDIX A

PROJECT FIGURES



140011 - 530-Acre Dipprey Tract Pl\Graphics\GA\140011A01GA_Vicinity Map.mxd | REM | 07-15-2014 | CEC | 9-17-2014

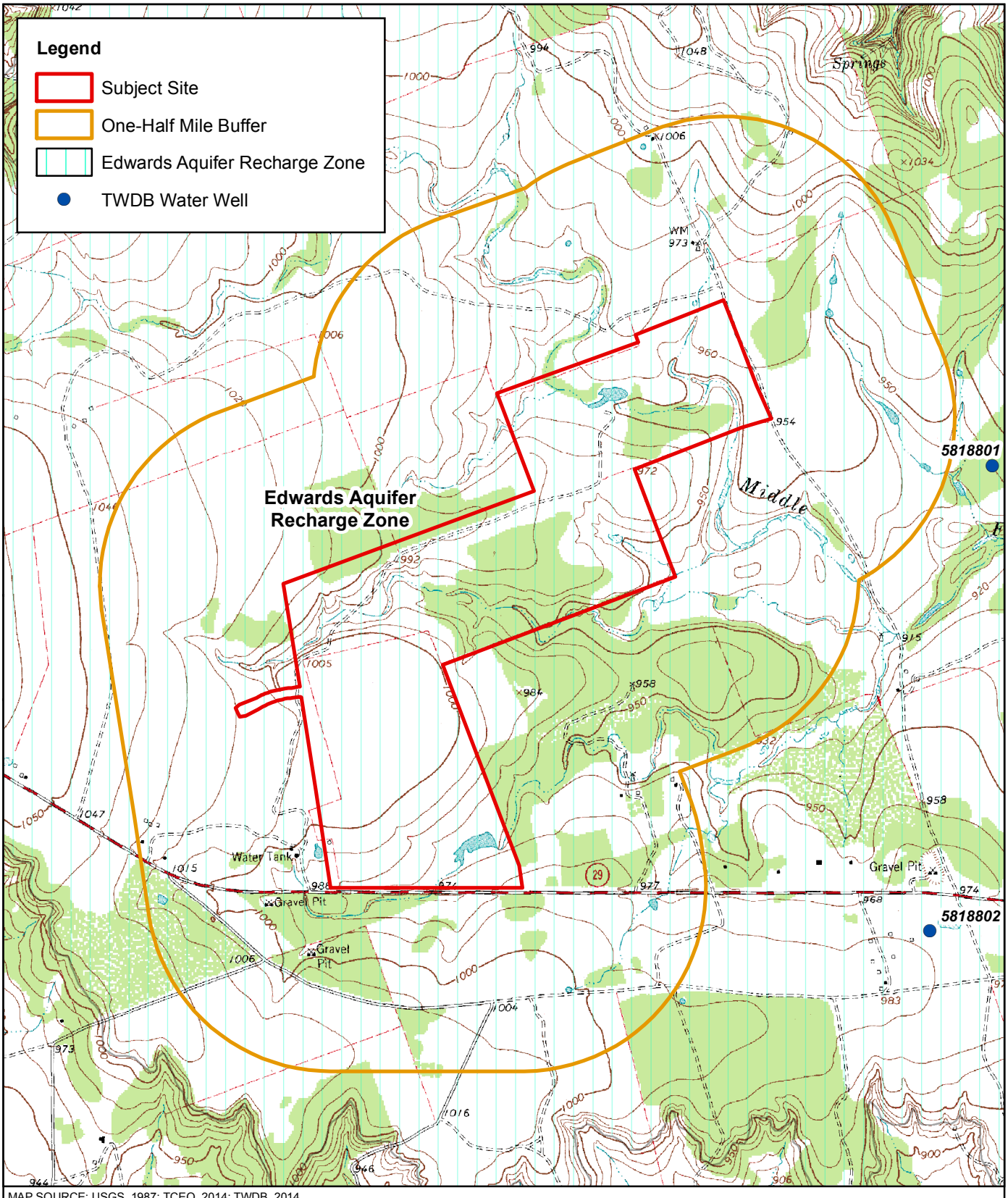
MAP SOURCE: ESRI, 2012.

0 1 2
Miles

Horizon
Environmental Services, Inc.

APPENDIX A, FIGURE 1

VICINITY MAP
MORNINGSTAR RANCH
GEORGETOWN,
WILLIAMSON COUNTY, TEXAS



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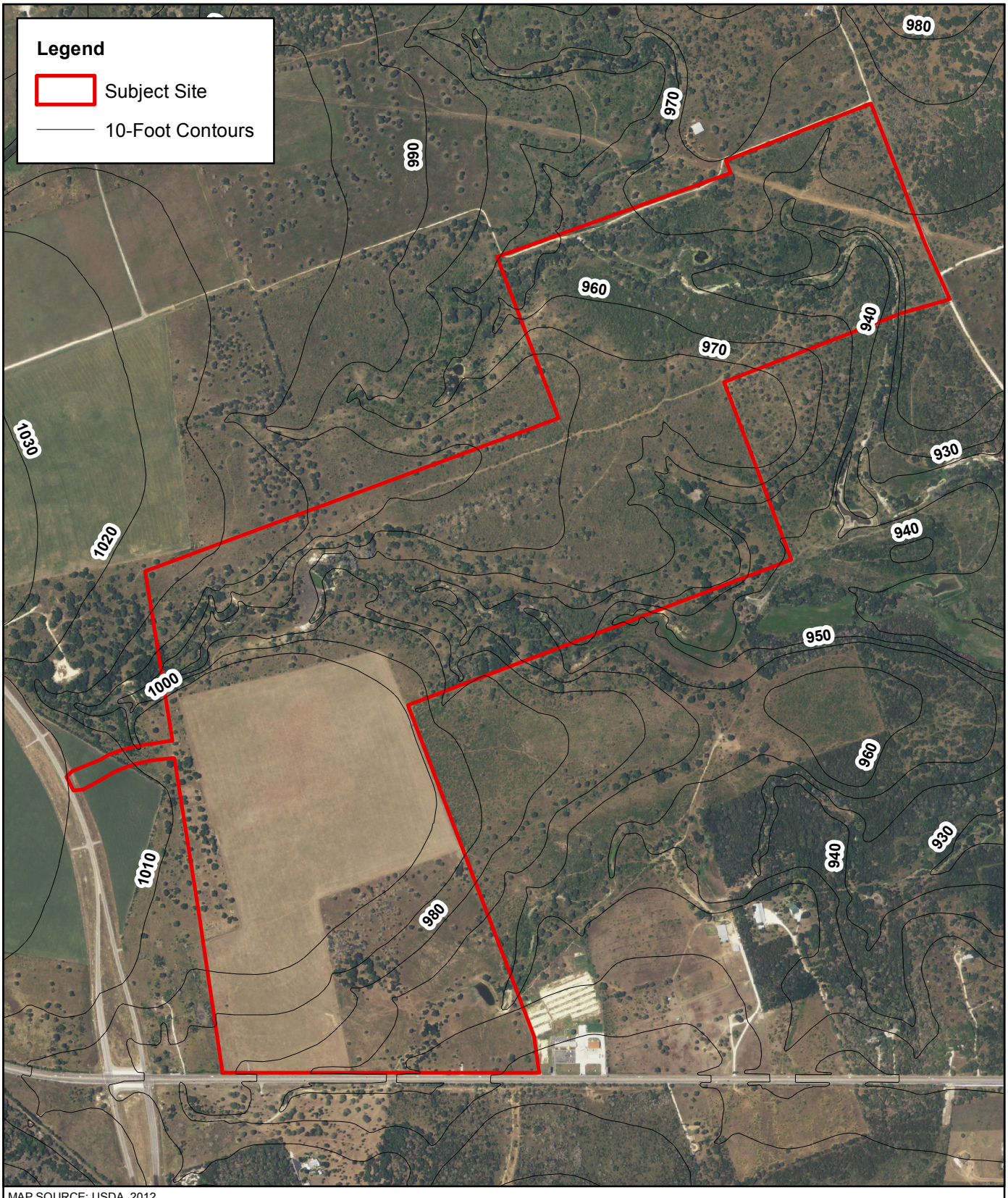
MAP SOURCE: USGS, 1987; TCEQ, 2014; TWDB, 2014.

0 1,000 2,000
Feet

Horizon Environmental Services, Inc.

APPENDIX A, FIGURE 2

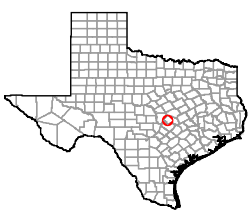
TOPOGRAPHY AND HYDROGEOLOGY MAP
MORNINGSTAR RANCH
GEORGETOWN,
WILLIAMSON COUNTY, TEXAS



140011 - 530-Acre Dipprey Tract P\Graphics\GA\140011A03GA_Topo.mxd | REM | 07-15-2014 | CEC | 9-15-2014

MAP SOURCE: USDA, 2012.

0 550 1,100
Feet

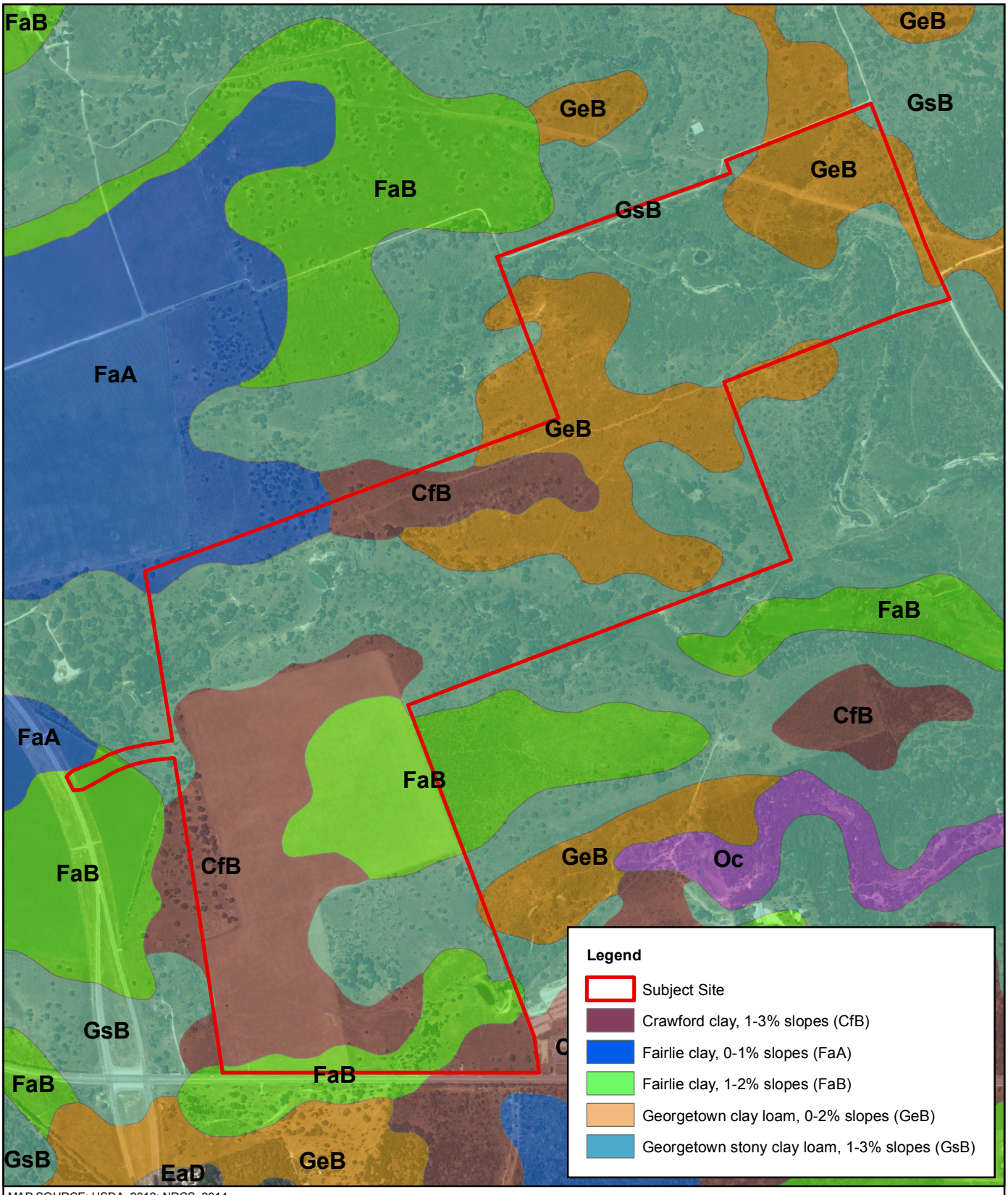


Horizon Environmental Services, Inc.

APPENDIX A, FIGURE 3

SITE TOPOGRAPHY MAP
MORNINGSTAR RANCH
GEORGETOWN,
WILLIAMSON COUNTY, TEXAS

140011 - 530-Acre Dipprey Tract PI\Graphics\GA\140011A04GA_Soils.mxd | REM | 07-15-2014 I CEC I 9-15-2014



MAP SOURCE: USDA, 2012; NRCS, 2014.

STATE OF TEXAS
JAMES P. KILLIAN
GEOLOGY
No. 10281
LICENSED
PROFESSIONAL GEOSCIENTIST

0 550 1,100
Feet

Horizon
Environmental Services, Inc.

APPENDIX A, FIGURE 4

SURFACE SOILS MAP
MORNINGSTAR RANCH
GEORGETOWN,
WILLIAMSON COUNTY, TEXAS

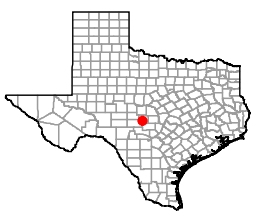
140011 - 530-Acre Dipprey Tract Pl\Graphics\GA\140011A05GA_Strat.mxd | REM | 07-15-2014 | CEC | 9-15-2014

Geologic Unit	Hydrologic Unit	Approx. Thickness at Project Site (ft)	Elevation (ft msl)	Depth (ft)
			1020	0
Terraces along streams (Qt)	-	20		
			1000	20
Edwards Formation (Ked)	Edwards Aquifer	40		
			960	60
Comanche Peak Formation (Kc)		50		
			910	110
Walnut Formation (Kwa)	Confining Unit	175		
			735	285

Note: Unit elevation and thickness given with respect to a ground surface elevation of 1020 ft on the western limit of proposed ROW connector (Kauffman Loop) at the project site.

Horizon Environmental Services, Inc.

STATE OF TEXAS
JAMES P. KILLIAN
GEOLOGY
No. 10281
LICENSED
PROFESSIONAL GEOSCIENTIST



APPENDIX A, FIGURE 5

STRATIGRAPHIC COLUMN
APPROXIMATELY 530-ACRE
MORNINGSTAR RANCH
GEORGETOWN,
WILLIAMSON COUNTY, TEXAS

Horizon
Environmental Services, Inc.

APPENDIX B

SITE GEOLOGIC MAP

140011 - 530-Acre Dipprey Tract PI\Graphics\GA\140011D01GA_SGM.mxd | REM | 07-21-2014

Qt

Qt

Ked

Qt

Ked

F-1

M-3

M-4

M-2

M-5

F-4

F-3

F-2

M-1

Legend

- Geologic Features
- Subject Site
- ROW Connector
- Manmade Features
- Terraces along streams (Qt)
- Edwards Formation (Ked)

MAP SOURCE: UT-BEG, 1974; USDA, 2012.

STATE OF TEXAS
JAMES P. KILLIAN
GEOLOGY
No. 10281
LICENSED
PROFESSIONAL GEOSCIENTIST

0 200 400
Feet

Scale: 1" = 400'

APPENDIX B, FIGURE 1

SITE GEOLOGIC MAP
MORNINGSTAR RANCH
GEORGETOWN,
WILLIAMSON COUNTY, TEXAS

Horizon
Environmental Services, Inc.

Horizon
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APPENDIX C

SITE GEOLOGIC ASSESSMENT TABLE

GEOLOGIC ASSESSMENT TABLE

PROJECT NAME: Morningstar Ranch; SH 29; Georgetown, Texas

LOCATION			FEATURE CHARACTERISTICS											EVALUATION			PHYSICAL SETTING		
1A	1B *	1C*	2A	2B	3	4			5	5A	6	7	8A	8B	9	10		11		12
FEATURE ID	LATITUDE	LONGITUDE	FEATURE TYPE	POINTS	FORMATION	DIMENSIONS (FEET)			TREND (DEGREES)	DIM	DENSITY (NO/FT)	APERTURE (FEET)	INFILL	RELATIVE INFILTRATION RATE	TOTAL	SENSITIVITY		CATCHMENT AREA (ACRES)		TOPOGRAPHY
						X	Y	Z		10						<40	>40	<1.6	>1.6	
F-1	30.65743	-97.80857	SH	20	Ked	7	7	1.5	--		--	--	C,F,O	12	32	X		X		Drainage
F-2	30.642261	97.818755	SC	20	Ked	2	1.5	0.5	--		--	--	C,F,O	10	30	X		X		Hillside
F-3	30.64369	-97.82655	SH	20	Ked	11	9	2	--		--	--	C,F,O	28	48		X	X		Hilltop
F-4	30.64388	-97.82603	SH	20	Ked	9	6	2	--		--	--	C,F,O	10	30	X		X		Hilltop
M-1	30.475226	-97.687841	MB	30	Ked	300	60	7	--		--	--	C,F,O	5	35	X		X		Drainage
M-2	30.64997	-97.82309	MB	30	Ked	300	50	6					C,F,O	5	35	X		X		Drainage
M-3	30.65704	-97.81167	MB	30	Ked	100	60	5					C,F,O	5	35	X		X		Drainage
M-4	30.65154	-97.81226	MB	30	Ked	50	50	4					C,F,O	5	35	X		X		Drainage
M-5	30.64884	-97.8171	MB	30	Ked	75	50	4					C,F,O	5	35	X		X		Drainage

* DATUM:_____

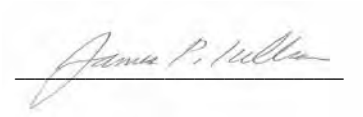
2A TYPI	TYPE	2B POINTS
C	Cave	30
SC	Solution cavity	20
SF	Solution-enlarged fracture(s)	20
F	Fault	20
O	Other natural bedrock features	5
MB	Manmade feature in bedrock	30
SW	Swallow hole	30
SH	Sinkhole	20
CD	Non-karst closed depression	5
Z	Zone, clustered or aligned features	30

8A INFILLING	
N	None, exposed bedrock
C	Coarse - cobbles, breakdown, sand, gravel
O	Loose or soft mud or soil, organics, leaves, sticks, dark colors
F	Fines, compacted clay-rich sediment, soil profile, gray or red colors
V	Vegetation. Give details in narrative description
FS	Flowstone, cements, cave deposits
X	Other materials

12 TOPOGRAPHY
Cliff, Hilltop, Hillside, Drainage, Floodplain, Streambed

I have read, I understood, and I have followed the Texas Commission on Environmental Quality's Instructions to Geologists. The information presented here complies with that document and is a true representation of the conditions observed in the field.
My signature certifies that I am qualified as a geologist as defined by 30 TAC Chapter 213.

Date : August 15, 2014



Sheet 1 of 1

TCEQ-0585-Table (Rev. 10-01-04)

Horizon
Environmental Services, Inc.

APPENDIX D

SITE PHOTOGRAPHS

PHOTO 1
View of geologic feature F-1 (sinkhole), facing southwest

PHOTO 2
Close up view of F-1, after excavation

PHOTO 3
View of geologic feature F-2 (solution cavity), facing east

PHOTO 4
Close up view of F-2, after excavation

Horizon
Environmental Services, Inc.

PHOTO 5
View of geologic feature F-3 (sinkhole), facing north

PHOTO 6
View of F-3 after excavation, facing southeast

PHOTO 7
View of geologic feature F-4 (sinkhole), with two partially open drainage portals, facing down

PHOTO 8
Close up view of F-4, after excavation

Horizon
Environmental Services, Inc.

Water Pollution Abatement Plan Application

Texas Commission on Environmental Quality

for Regulated Activities on the Edwards Aquifer Recharge Zone and Relating 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. This **Water Pollution Abatement Plan Application Form** is hereby submitted for TCEQ review and Executive Director approval. The form was prepared by:

Print Name of Customer/Agent: NICK SANDLIN, P.E.

Date: 9/5/2023

Signature of Customer/Agent:

Regulated Entity Name: TWELVE OAKS PROFESSIONAL PARK

Regulated Entity Information

1. The type of project is:

   ☐ Residential: Number of Lots:_____
   ☐ Residential: Number of Living Unit Equivalents:_____
   ☒ Commercial
   ☐ Industrial
   ☐ Other:_____

2. Total site acreage (size of property):3.62

3. Estimated projected population:N/A

4. The amount and type of impervious cover expected after construction are shown below:

Table 1 - Impervious Cover Table

Impervious Cover of Proposed Project	Sq. Ft.	Sq. Ft./Acre	Acres
Structures/Rooftops	38,700	÷ 43,560 =	.89
Parking	29,484	÷ 43,560 =	.68
Other paved surfaces	59,291	÷ 43,560 =	1.36
Total Impervious Cover	127,475	÷ 43,560 =	2.93

Total Impervious Cover 2.93 **÷ Total Acreage** 3.62 **X 100 =** 80.8**% Impervious Cover**

5. ☒ **Attachment A - Factors Affecting Surface Water Quality**. A detailed description of all factors that could affect surface water and groundwater quality that addresses ultimate land use is attached.

6. ☒ Only inert materials as defined by 30 TAC §330.2 will be used as fill material.

For Road Projects Only

Complete questions 7 - 12 if this application is exclusively for a road project.

7. Type of project:

   ☐ TXDOT road project.
   ☐ County road or roads built to county specifications.
   ☐ City thoroughfare or roads to be dedicated to a municipality.
   ☐ Street or road providing access to private driveways.

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

   ☐ Concrete
   ☐ Asphaltic concrete pavement
   ☐ Other: _____

9. Length of Right of Way (R.O.W.): _____ feet.

   Width of R.O.W.: _____ feet.
   L x W = _____ Ft^2 ÷ 43,560 Ft^2/Acre = _____ acres.

10. Length of pavement area: _____ feet.

    Width of pavement area: _____ feet.
    L x W = _____ Ft^2 ÷ 43,560 Ft^2/Acre = _____ acres.
    Pavement area _____ acres ÷ R.O.W. area _____ acres x 100 = _____% impervious cover.

11. ☐ A rest stop will be included in this project.

    ☐ A rest stop will not be included in this project.

12. ☐ Maintenance and repair of existing roadways that do not require approval from the TCEQ Executive Director. Modifications to existing roadways such as widening roads/adding shoulders totaling more than one-half (1/2) the width of one (1) existing lane require prior approval from the TCEQ.

Stormwater to be generated by the Proposed Project

13. ☒ **Attachment B - Volume and Character of Stormwater**. A detailed description of the volume (quantity) and character (quality) of the stormwater runoff which is expected to occur from the proposed project is attached. The estimates of stormwater runoff quality and quantity are based on the area and type of impervious cover. Include the runoff coefficient of the site for both pre-construction and post-construction conditions.

Wastewater to be generated by the Proposed Project

14. The character and volume of wastewater is shown below:

100% Domestic	10,987 Gallons/day
_____% Industrial	_____Gallons/day
_____% Commingled	_____Gallons/day
TOTAL gallons/day 10,987	

15. Wastewater will be disposed of by:

☐ On-Site Sewage Facility (OSSF/Septic Tank):

- ☐ **Attachment C - Suitability Letter from Authorized Agent**. An on-site sewage facility will be used to treat and dispose of the wastewater from this site. The appropriate licensing authority's (authorized agent) written approval is attached. It states that the land is suitable for the use of private sewage facilities and will meet or exceed the requirements for on-site sewage facilities as specified under 30 TAC Chapter 285 relating to On-site Sewage Facilities.
- ☐ Each lot in this project/development is at least one (1) acre (43,560 square feet) in size. The system will be designed by a licensed professional engineer or registered sanitarian and installed by a licensed installer in compliance with 30 TAC Chapter 285.

☒ Sewage Collection System (Sewer Lines):

- ☐ Private service laterals from the wastewater generating facilities will be connected to an existing SCS.
- ☐ Private service laterals from the wastewater generating facilities will be connected to a proposed SCS.

- ☐ The SCS was previously submitted on_____.
- ☒ The SCS was submitted with this application.
- ☐ The SCS will be submitted at a later date. The owner is aware that the SCS may not be installed prior to Executive Director approval.

☒ The sewage collection system will convey the wastewater to the City of Liberty Hill WWTP - Owned and operated by the COLH (name) Treatment Plant. The treatment facility is:

☒ Existing.
☐ Proposed.

16. ☒ All private service laterals will be inspected as required in 30 TAC §213.5.

Site Plan Requirements

Items 17 – 28 must be included on the Site Plan.

17. ☒ The Site Plan must have a minimum scale of 1" = 400'.

Site Plan Scale: 1" = 40'.

18. 100-year floodplain boundaries:

☐ Some part(s) of the project site is located within the 100-year floodplain. The floodplain is shown and labeled.
☒ No part of the project site is located within the 100-year floodplain.
The 100-year floodplain boundaries are based on the following specific (including date of material) sources(s): FEMA Firm Panel 48491C0275E (dated 09/26/2008)

19. ☒ The layout of the development is shown with existing and finished contours at appropriate, but not greater than ten-foot contour intervals. Lots, recreation centers, buildings, roads, open space, etc. are shown on the plan.

☐ The layout of the development is shown with existing contours at appropriate, but not greater than ten-foot intervals. Finished topographic contours will not differ from the existing topographic configuration and are not shown. Lots, recreation centers, buildings, roads, open space, etc. are shown on the site plan.

20. All known wells (oil, water, unplugged, capped and/or abandoned, test holes, etc.):

☐ There are _____ (#) wells present on the project site and the locations are shown and labeled. (Check all of the following that apply)

☐ The wells are not in use and have been properly abandoned.
☐ The wells are not in use and will be properly abandoned.
☐ The wells are in use and comply with 16 TAC §76.

☒ There are no wells or test holes of any kind known to exist on the project site.

21. Geologic or manmade features which are on the site:

☒ All sensitive geologic or manmade features identified in the Geologic Assessment are shown and labeled.
☐ No sensitive geologic or manmade features were identified in the Geologic Assessment.

☐ **Attachment D - Exception to the Required Geologic Assessment**. A request and justification for an exception to a portion of the Geologic Assessment is attached.

22. ☒ The drainage patterns and approximate slopes anticipated after major grading activities.
23. ☒ Areas of soil disturbance and areas which will not be disturbed.
24. ☒ Locations of major structural and nonstructural controls. These are the temporary and permanent best management practices.
25. ☒ Locations where soil stabilization practices are expected to occur.
26. ☐ Surface waters (including wetlands).

    ☒ N/A
27. ☐ Locations where stormwater discharges to surface water or sensitive features are to occur.

    ☒ There will be no discharges to surface water or sensitive features.
28. ☒ Legal boundaries of the site are shown.

Administrative Information

29. ☒ 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.
30. ☒ Any modification of this WPAP will require Executive Director approval, prior to construction, and may require submission of a revised application, with appropriate fees.

Water Pollution Abatement Plan Application
(TCEQ-0584)

Water Pollution Abatement Plan Application (TCEQ-0584)

Attachment A: Factors Affecting Surface Water Quality

Potential pollution sources during the construction phase include increased sediment erosion from disturbed soil; oil, grease, fuel, and hydraulic fluid contamination from construction equipment and vehicles; concrete washout waste; and miscellaneous trash and litter from construction. Potential pollution sources at the developed site include oil, grease, fuel, and hydraulic fluid contamination from vehicles, trash, and litter.

Water Pollution Abatement Plan Application (TCEQ-0584)

Attachment B: Volume and Character of Stormwater

The proposed site is located within the Edwards Aquifer Recharge Zone. The proposed development and infrastructure includes 2.93 AC of impervious cover (IC), which is 80.8% of the total 3.62 AC site. Stormwater from the developed IC will be split per the Water Quality Plan sheet and directed to a Vegetated Filter Strip and Jellyfish BMP. Please see the water quality and drainage sheets of the construction plans for calculations and details. There are no anticipated off-site impacts.

Water Pollution Abatement Plan Application (TCEQ-0584)

Attachment C:
Suitability Letter from Authorized Agent (if OSSF is proposed)

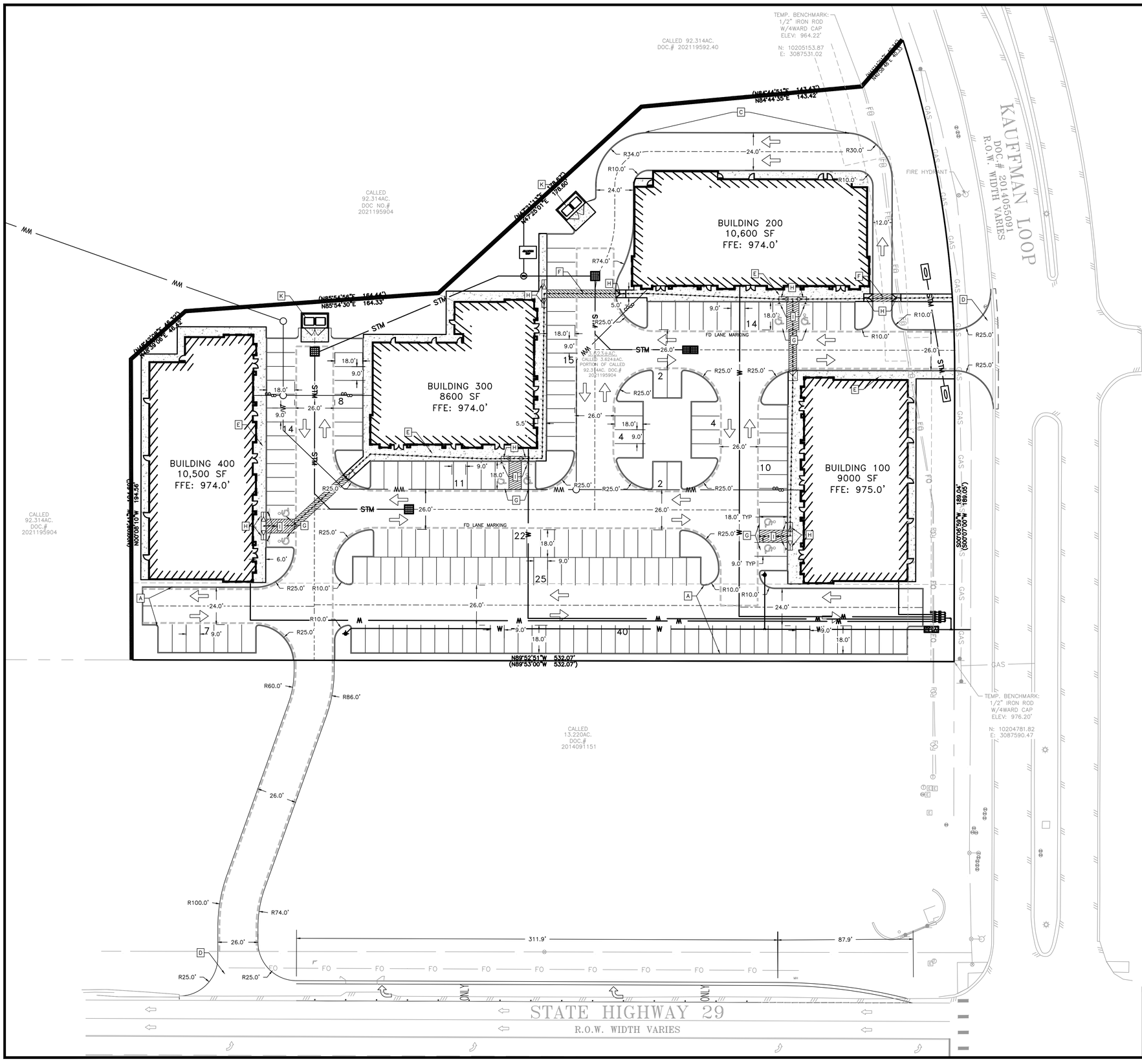
NOT APPLICABLE

Water Pollution Abatement Plan Application (TCEQ-0584)

Attachment D:
Exception to the Required Geologic Assessment (if requested)
NOT APPLICABLE

Water Pollution Abatement Plan Application (TCEQ-0584)

Site Plan



0 15' 30' 60'
SCALE: 1" = 30'

IF DRAWING BAR DOES NOT MEASURE 2" THIS PRINT IS NOT TO SCALE

9/5/2023

STATE OF TEXAS
NICHOLAS R. SANDLIN
124404
LICENSED
PROFESSIONAL ENGINEER

SITE PLAN LEGEND

- PROPOSED PROPERTY/ PROJECT BOUNDARY LINE
- EXISTING R.O.W./PROPERTY LINE
- EXISTING EASEMENT LINE
- FIRE LANE
- PROPOSED CURB & GUTTER
- STREET CENTERLINE
- FENCE
- STRUCTURAL RETAINING WALL (BY OTHERS)
- PROPOSED CONCRETE SIDEWALK
- (R) PROPOSED PARKING SPACES
- (T) TRANSFORMER PAD
- SITE WALLS
- PHASING

TAS ACCESSIBLE ROUTE
TAS ACCESSIBLE ROUTES MAY NOT EXCEED A CROSS SLOPE OF 1:50 (2%) OR EXCEED A RUNNING SLOPE OF 1:20 (5%) UNLESS DESIGNED AS A RAMP. THE MAXIMUM RUNNING SLOPE OF A RAMP IN NEW CONSTRUCTION IS 1:12 (8.33%). THE MAXIMUM RISE FOR ANY RAMP RUN IS 30 INCHES. REFER TO GRADING SHEET(S).

- EX. WATER LINE
- EX. WASTEWATER
- EX. STORM SEWER LINE
- EX. FIRE HYDRANT
- EX. WATER METER
- EX. WASTEWATER MANHOLE
- PR. WATER LINE
- FIRE LINE
- PR. WASTEWATER
- PR. STORM SEWER LINE
- PR. FIRE HYDRANT
- PR. WATER METER
- PR. WASTEWATER MANHOLE
- FITTINGS AS NOTED
- GATE VALVE AS NOTED
- WW CLEAN OUT
- BFP BACK FLOW PREVENTER
- FLOW ARROW
- EX. UTILITY POLE

SITE DATA	
	PROPOSED
TOTAL SITE AREA	3.62 AC / 157,829 SF
IMPERVIOUS COVER	127,475 SF / 2.93 AC = 80.8%
BUILDING HEIGHT	1 STORY – SEE ARCH. PLANS BY OTHERS
FOUNDATION TYPE	CONCRETE SLAB

PARKING TABLE	
TOTAL BUILDING AREA	38,700 SF
ALLOWABLE PARKING RATIO	1 SPACE: 218 SF
PARKING REQUIRED	38,700 SF / 218 = 178 SPACES
PARKING PROVIDED	178 SPACES INCLUDING 8 ADA & 4 VAN

SITE LEGEND

- A 6" CURB & GUTTER. SEE DETAIL SHEET.
- B RIBBON CURB. SEE DETAIL SHEET.
- C CASTELLATED CURB. SEE DETAIL SHEET.
- D STANDARD CITY/TXDOT TYPE II DRIVEWAY. SEE DETAIL SHEET
- E CONCRETE SIDEWALK. SEE DETAIL SHEET.
- F PEDESTRIAN CROSSWALK.
- G HANDICAP SPACE W/SIGN. SEE DETAIL SHEET.
- H PEDESTRIAN ADA RAMP OR AT GRADE ADA DOME PAVERS. SEE DETAIL SHEET.
- I CONCRETE WHEEL STOP. SEE DETAIL SHEET.
- J STANDARD CITY BIKE RACK. SEE DETAIL SHEET.
- K DUMPSTER ENCLOSURE WITH CONCRETE PAD PER GEOTECHNICAL REPORT AND CITY STANDARDS

TEXAS 811
811
BEFORE YOU DIG

WARNING !!!! CONTRACTOR TO FIELD VERIFY ALL EXIST. UTILITIES VERTICALLY AND HORIZONTALLY PRIOR TO CONSTRUCTION. THE CONTRACTOR IS TO CONTACT ENGINEER IF ANY EXISTING UTILITY INFORMATION DIFFERS FROM DATA SHOWN IN THE PLANS. CALL 811 BEFORE YOU DIG.

ENGINEERING | CONSULTING
SANDLIN
SERVICES, LLC
TBPELS FIRM #21356
4501 WHISPERING VALLEY DRIVE UNIT 27 AUSTIN, TX 78727

SITE PLAN

PROJECT CASE: XXXXXXX

TWELVE OAKS

#	REVISION DESCRIPTION	SIGNATURE	DATE

SHEET 11 OF 32

G:\Shared drives\Sandlin Services LLC\Sandlin Services Projects\Land Development Division\01-0089-003 Twelve Oaks\CAD\Construction Sheets\S 120 SITE.dwg-SITE PLAN Plotted Sep 06, 2023 at 2:27pm by Scott | Last Saved by: Scott

Organized Sewage Collection System Plan (TCEQ-0582)

Organized Sewage Collection System Application

Texas Commission on Environmental Quality

For Regulated Activities on the Edwards Aquifer Recharge Zone and Relating to 30 TAC §213.5(c), 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.

Regulated Entity Name: TWELVE OAKS PROFESIONAL PARK

1. ☒ **Attachment A – SCS Engineering Design Report**. This Engineering Design Report is provided to fulfill the requirements of 30 TAC Chapter 217, including 217.10 of Subchapter A, §§217.51 – 217.70 of Subchapter C, and Subchapter D as applicable, and is required to be submitted with this SCS Application Form.

Customer Information

2. The entity and contact person responsible for providing the required engineering certification of testing for this sewage collection system upon completion (including private service connections) and every five years thereafter to the appropriate TCEQ region office pursuant to 30 TAC §213.5(c) is:

   Contact Person: Charbel Dahdah
   Entity: Twelve Oaks Professional Park Commercial, LP
   Mailing Address: 14205 N MOPAC EXPRESSWAY, SUITE 450
   City, State: Austin, Texas Zip: 78728
   Telephone: 281-467-7422 Fax: _____
   Email Address: cdahdah@cadre-use.com
   The appropriate regional office must be informed of any changes in this information within 30 days of the change.

3. The engineer responsible for the design of this sewage collection system is:

   Contact Person: Nick Sandlin, P.E.
   Texas Licensed Professional Engineer's Number: 124404
   Entity: Sandlin Services, LLC
   Mailing Address: 9111 Jollyville Rd., Suite 212
   City, State:Austin, Texas Zip: 78759
   Telephone:806-679-7303 Fax:_____
   Email Address:nick@sandlinservices.com

Project Information

4. Anticipated type of development to be served (estimated future population to be served, plus adequate allowance for institutional and commercial flows):

   ☐ Residential: Number of single-family lots: _____
   ☐ Multi-family: Number of residential units: _____
   ☒ Commercial
   ☐ Industrial
   ☐ Off-site system (not associated with any development)
   ☐ Other: _____

5. The character and volume of wastewater is shown below:

100% Domestic	10,987 gallons/day
_____% Industrial	_____ gallons/day
_____% Commingled	_____ gallons/day

   Total gallons/day: 10,987

6. Existing and anticipated infiltration/inflow is 1.89 (PER City of Austin Utilities Criterial Manual) gallons/day. This will be addressed by: using standard manholes and included in out calculations for pipe design and flow determination.

7. A Water Pollution Abatement Plan (WPAP) is required for construction of any associated commercial, industrial or residential project located on the Recharge Zone.

   ☐ The WPAP application for this development was approved by letter dated _____. A copy of the approval letter is attached.
   ☒ The WPAP application for this development was submitted to the TCEQ on 9/5/2023, but has not been approved.
   ☐ A WPAP application is required for an associated project, but it has not been submitted.
   ☐ There is no associated project requiring a WPAP application.

8. Pipe description:

Table 1 - Pipe Description

Pipe Diameter(Inches)	*Linear Feet (1)*	*Pipe Material (2)*	*Specifications (3)*
6	506	PVC SDR-26	ASTM D3034
6	20	PVC SDR-26	ASTM 2241

Total Linear Feet: 526

(1) Linear feet - Include stub-outs and double service connections. Do not include private service laterals.
(2) Pipe Material - If PVC, state SDR value.

(3) Specifications - ASTM / ANSI / AWWA specification and class numbers should be included.

9. The sewage collection system will convey the wastewater to the City of Liberty Hill WWTP (name) Treatment Plant. The treatment facility is:

☒ Existing
☐ Proposed

10. All components of this sewage collection system will comply with:

☒ The City of Liberty Hill standard specifications.
☐ Other. Specifications are attached.

11. ☒ No force main(s) and/or lift station(s) are associated with this sewage collection system.

☐ A force main(s) and/or lift station(s) is associated with this sewage collection system and the **Lift Station/Force Main System Application** form (TCEQ-0624) is included with this application.

Alignment

12. ☒ There are no deviations from uniform grade in this sewage collection system without manholes and with open cut construction.

13. ☒ There are no deviations from straight alignment in this sewage collection system without manholes.

☐ **Attachment B - Justification and Calculations for Deviation in Straight Alignment without Manholes**. A justification for deviations from straight alignment in this sewage collection system without manholes with documentation from pipe manufacturer allowing pipe curvature is attached.

☐ For curved sewer lines, all curved sewer line notes (TCEQ-0596) are included on the construction plans for the wastewater collection system.

Manholes and Cleanouts

14. ☒ Manholes or clean-outs exist at the end of each sewer line(s). These locations are listed below: (Please attach additional sheet if necessary)

Table 2 - Manholes and Cleanouts

Line	*Shown on Sheet*	*Station*	*Manhole or Clean-out?*
A	1 Of 3	0+00	Manhole
A	1 Of 3	2+50.11	Manhole
A	1 Of 3	5+26	Manhole
	Of		
	Of		
	Of		

Line	*Shown on Sheet*	*Station*	*Manhole or Clean-out?*
	Of		
	Of		
	Of		
	Of		

15. ☒ Manholes are installed at all Points of Curvature and Points of Termination of a sewer line.

16. ☒ The maximum spacing between manholes on this project for each pipe diameter is no greater than:

Pipe Diameter (inches)	Max. Manhole Spacing (feet)
6 - 15	500
16 - 30	800
36 - 48	1000
≥54	2000

☐ **Attachment C – Justification for Variance from Maximum Manhole Spacing**. The maximum spacing between manholes on this project (for each pipe diameter used) is greater than listed in the table above. A justification for any variance from the maximum spacing is attached, and must include a letter from the entity which will operate and maintain the system stating that it has the capability to maintain lines with manhole spacing greater than the allowed spacing.

17. ☐ All manholes will be monolithic, cast-in-place concrete.

☒ The use of pre-cast manholes is requested for this project. The manufacturer's specifications and construction drawings, showing the method of sealing the joints, are attached.

Site Plan Requirements

Items 18 - 25 must be included on the Site Plan.

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

Site Plan Scale: 1" = 40'.

19. ☒ The Site Plan must include the sewage collection system general layout, including manholes with station numbers, and sewer pipe stub outs (if any). Site plan must be overlain by topographic contour lines, using a contour interval of not greater than ten feet and showing the area within both the five-year floodplain and the 100-year floodplain of any drainage way.

20. Lateral stub-outs:

☒ The location of all lateral stub-outs are shown and labeled.

☐ No lateral stub-outs will be installed during the construction of this sewer collection system.

21. Location of existing and proposed water lines:

☒ The entire water distribution system for this project is shown and labeled.
☒ If not shown on the Site Plan, a Utility Plan is provided showing the entire water and sewer systems.
☐ There will be no water lines associated with this project.

22. 100-year floodplain:

☒ After construction is complete, no part of this project will be in or cross a 100-year floodplain, either naturally occurring or manmade. (Do not include streets or concrete-lined channels constructed above of sewer lines.)
☐ After construction is complete, all sections located within the 100-year floodplain will have water-tight manholes. These locations are listed in the table below and are shown and labeled on the Site Plan. (Do not include streets or concrete-lined channels constructed above sewer lines.)

Table 3 - 100-Year Floodplain

Line	*Sheet*	*Station*
	of	to
	of	to
	of	to
	of	to

23. 5-year floodplain:

☒ After construction is complete, no part of this project will be in or cross a 5-year floodplain, either naturally occurring or man-made. (Do not include streets or concrete-lined channels constructed above sewer lines.)
☐ After construction is complete, all sections located within the 5-year floodplain will be encased in concrete or capped with concrete. These locations are listed in the table below and are shown and labeled on the Site Plan. (Do not include streets or concrete-lined channels constructed above sewer lines.)

Table 4 - 5-Year Floodplain

Line	*Sheet*	*Station*
	of	to
	of	to
	of	to
	of	to

24. ☒ Legal boundaries of the site are shown.

25. ☒ The ***final plans and technical specifications*** are submitted for the TCEQ's review. Each sheet of the construction plans and specifications are dated, signed, and sealed by the Texas Licensed Professional Engineer responsible for the design on each sheet.

Items 26 - 33 must be included on the Plan and Profile sheets.

26. ☒ All existing or proposed water line crossings and any parallel water lines within 9 feet of sewer lines are listed in the table below. These lines must have the type of pressure rated pipe to be installed shown on the plan and profile sheets. Any request for a variance from the required pressure rated piping at crossings must include a variance approval from 30 TAC Chapter 290.

☐ There will be no water line crossings.
☐ There will be no water lines within 9 feet of proposed sewer lines.

Table 5 - Water Line Crossings

Line	*Station or Closest Point*	*Crossing or Parallel*	*Horizontal Separation Distance*	*Vertical Separation Distance*
A	4+95.14	CROSSING	N/A	2 FT
A	6+31.89	CROSSING	N/A	2 FT

27. Vented Manholes:

☒ **No part** of this sewer line is within the 100-year floodplain and vented manholes are not required by 30 TAC Chapter 217.
☐ **A portion** of this sewer line is within the 100-year floodplain and vented manholes will be provided at less than 1500 foot intervals. These water-tight manholes are listed in the table below and labeled on the appropriate profile sheets.
☐ **A portion** of this sewer line is within the 100-year floodplain and an alternative means of venting shall be provided at less than 1500 feet intervals. A description of the alternative means is described on the following page.
☐ **A portion** of this sewer line is within the 100-year floodplain; however, there is no interval longer than 1500 feet located within. No vented manholes will be used.

Table 6 - Vented Manholes

Line	*Manhole*	*Station*	*Sheet*

Line	*Manhole*	*Station*	*Sheet*

28. Drop manholes:

☐ There are no drop manholes associated with this project.
☒ Sewer lines which enter new or existing manholes or "manhole structures" higher than 24 inches above the manhole invert are listed in the table below and labeled on the appropriate profile sheets. These lines meet the requirements of 30 TAC §217.55(l)(2)(H).

Table 7 - Drop Manholes

Line	*Manhole*	*Station*	*Sheet*
A	N/A	2+50.11	1 OF 3

29. Sewer line stub-outs (For proposed extensions):

☒ The placement and markings of all sewer line stub-outs are shown and labeled.
☐ No sewer line stub-outs are to be installed during the construction of this sewage collection system.

30. Lateral stub-outs (For proposed private service connections):

☒ The placement and markings of all lateral stub-outs are shown and labeled.
☐ No lateral stub-outs are to be installed during the construction of this sewage collection system.

31. Minimum flow velocity (From Appendix A)

☒ Assuming pipes are flowing full; all slopes are designed to produce flows equal to or greater than 2.0 feet per second for this system/line.

32. Maximum flow velocity/slopes (From Appendix A)

☒ Assuming pipes are flowing full, all slopes are designed to produce maximum flows of less than or equal to 10 feet per second for this system/line.
☐ **Attachment D – Calculations for Slopes for Flows Greater Than 10.0 Feet per Second.** Assuming pipes are flowing full, some slopes produce flows which are greater than 10 feet per second. These locations are listed in the table below. Calculations are attached.

Table 8 - Flows Greater Than 10 Feet per Second

Line	*Profile Sheet*	*Station to Station*	*FPS*	*% Slope*	*Erosion/Shock Protection*

33. Assuming pipes are flowing full, where flows are ≥ 10 feet per second, the provisions noted below have been made to protect against pipe displacement by erosion and/or shock under 30 TAC §217.53(l)(2)(B).

☐ Concrete encasement shown on appropriate Plan and Profile sheets for the locations listed in the table above.
☐ Steel-reinforced, anchored concrete baffles/retards placed every 50 feet shown on appropriate Plan and Profile sheets for the locations listed in the table above.
☒ N/A

Administrative Information

34. ☒ The final plans and technical specifications are submitted for TCEQ review. Each sheet of the construction plans and specifications are dated, signed, and sealed by the Texas Licensed Professional Engineer responsible for the design on each sheet.

35. ☒ Standard details are shown on the detail sheets, which are dated, signed, and sealed by the Texas Licensed Professional Engineer, as listed in the table below:

Table 9 - Standard Details

Standard Details	*Shown on Sheet*
Lateral stub-out marking **[Required]**	2 of 3
Manhole, showing inverts comply with 30 TAC §217.55(l)(2) **[Required]**	2 of 3
Alternate method of joining lateral to existing SCS line for potential future connections **[Required]**	2 of 3
Typical trench cross-sections **[Required]**	3 of 3
Bolted manholes **[Required]**	3 of 3
Sewer Service lateral standard details **[Required]**	2 of 3
Clean-out at end of line **[Required, if used]**	2 of 3
Baffles or concrete encasement for shock/erosion protection **[Required, if flow velocity of any section of pipe >10 fps]**	of
Detail showing Wastewater Line/Water Line Crossing **[Required, if crossings are proposed]**	2 of 3
Mandrel detail or specifications showing compliance with 30 TAC §217.57(b) and (c) **[Required, if Flexible Pipe is used]**	of

Standard Details	*Shown on Sheet*
Drop manholes **[Required, if a pipe entering a manhole is more than 24 inches above manhole invert]**	2 of 3

36. ☒ All organized sewage collection system general construction notes (TCEQ-0596) are included on the construction plans for this sewage collection system.

37. ☒ All proposed sewer lines will be sufficiently surveyed/staked to allow an assessment prior to TCEQ executive director approval. If the alignments of the proposed sewer lines are not walkable on that date, the application will be deemed incomplete and returned.

    ☐ Survey staking was completed on this date: _____

38. ☒ 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.

39. ☒ Any modification of this SCS application will require TCEQ approval, prior to construction, and may require submission of a revised application, with appropriate fees.

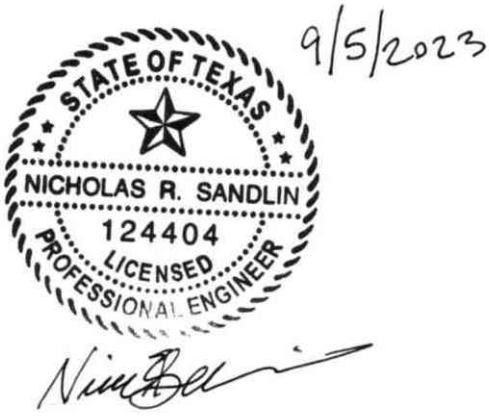
Signature

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 **Organized Sewage Collection System Application** is hereby submitted for TCEQ review and executive director approval. The system was designed in accordance with the requirements of 30 TAC §213.5(c) and 30 TAC §217 and prepared by:

Print Name of Licensed Professional Engineer: Nick Sandlin, P.E.

Date: 9/5/2023

Place engineer's seal here:



Signature of Licensed Professional Engineer:

Appendix A-Flow Velocity Table

Flow Velocity (Flowing Full) All gravity sewer lines on the Edwards Aquifer Recharge Zone shall be designed and constructed with hydraulic slopes sufficient to give a velocity when flowing full of not less than 2.0 feet per second, and not greater than 10 feet per second. The grades shown in the following table are based on Manning's formula and an n factor of 0.013 and shall be the minimum and maximum acceptable slopes unless provisions are made otherwise.

Table 10 - Slope Velocity

Pipe Diameter(Inches)	*% Slope required for minimum flow velocity of 2.0 fps*	*% Slope which produces flow velocity of 10.0 fps*
6	0.50	12.35
8	0.33	8.40
10	0.25	6.23
12	0.20	4.88
15	0.15	3.62
18	0.11	2.83
21	0.09	2.30
24	0.08	1.93
27	0.06	1.65
30	0.055	1.43
33	0.05	1.26
36	0.045	1.12
39	0.04	1.01
>39	*	*

**For lines larger than 39 inches in diameter, the slope may be determined by Manning's formula (as shown below) to maintain a minimum velocity greater than 2.0 feet per second when flowing full and a maximum velocity less than 10 feet per second when flowing full.*

$$v = \frac{1.49}{n} \times R_h^{0.67} \times \sqrt{S}$$

Figure 1 - Manning's Formula

Where:

v = velocity (ft/sec)
n = Manning's roughness coefficient (0.013)
Rh = hydraulic radius (ft)
S = slope (ft/ft)

Organized Sewage Collection System (TCEQ-0582)

Attachment A: SCS Engineering Design Report

Engineering Design Report
per TAC Rule 217.10(e)

For

Twelve Oaks Professional Park

By:
Nicholas Sandlin, PE
TX #124404
Sandlin Services, LLC
TBPELS Firm # 21356

September 5, 2023

The Project known as Twelve Oaks Professional Park is a 3.62-acre site plan proposing four professional office buildings. The site is currently undeveloped. The tract is within the City of Liberty Hill ETJ and in the Georgetown Utility Systems CCN. It lies over the Edwards Aquifer Recharge Zone.

This report addresses the requirements of TAC rule 217.10(e). The proposed sanitary sewer system will connect to an existing system that will gravity flow to the City of Georgetown Wastewater Treatment Plant. The capacity of the plant will treat the estimated LUE's proposed. The treatment plant and wastewater system is owned, operated, and maintained by the City of Georgetown.

(1) Maps of current, proposed, and future service areas have been included within the Construction Plans:

a. Proposed Service Area – the proposed service area is the 3.62 acres of land known as Twelve Oaks Professional Park. The proposed system consists of approximately 900 linear feet of 6-inch SDR 26 PVC pipe, and 4 service connections.

(2) Topographic Features of current, proposed, and future service areas:

The project site is within the North Fork San Gabriel River Watershed, which drains to the Brazos River Basin. No surface streams run across the property. Drainage is generally to the east-northeast to the proposed Regional Detention Pond, that would eventually drain to the Middle Fork San Gabriel River, approximately one mile east of the site.

(3) Description of Design Flow Determination:

The design flows for the sanitary sewer collection system lines are calculated by the Living Unit Equivalent (LUE) method prescribed by the City of Georgetown. One LUE consists of 3.5 individuals which produce an average flow of 75 gallons per day in accordance with Table B.1 of TCEQ Chapter 217.32 and the City of Georgetown design guidelines. An LUE is intended to represent one single family residence with typical wastewater usage rates for the City's service area.

The LUEs were calculated by totaling the number of services to residential lots that contribute to the particular pipe section or the upstream manhole. The population was derived by multiplying the number of LUEs by the given 3.5 individuals per household factor. The average flow was determined by multiplying the "population" by the factor of 75 gallons per person per day (flow is in units of gallons per day). The peak dry flow has been calculated by multiplying the average flow by a peaking factor of 4.0 as prescribed by TCEQ Chapter 217.32(a)(2). The derivation of the peak wet flow is described in "Section (7) Inflow and Infiltration". The "Full-Flow Capacity" has been calculated because all pipes are 6-inch PVC SDR 26, the only other variable that affects pipe capacity is the slope of the pipe, and the proposed system has pipes of slopes ranging from 0.50% to 6.50%. The full-flow capacity greatly exceeds the designed peak flows which will ensure conveyance through a 50-year life cycle.

(4) Minimum and Maximum Grades for each size and type of Pipe:

The minimum and maximum slopes of the pipes within the proposed system can be found in the plan sheets. All pipes are 6-inch, and the minimum and maximum pipe slopes are 0.50% and 1.00%, respectively.

In accordance with "Appendix A" of the TCEQ form #TCEQ-0582, a 6-inch pipe shall have a minimum slope of 0.50% and a maximum slope of 12.35% which complies with the proposed design.

(5) Minimum and Maximum Velocities in the System:

The design velocities for both peak dry flow and peak wet flow have been calculated by solving for the depth of flow through the pipe using an interpolative process. In accordance with "Appendix A" of the TCEQ form #TCEQ-00582, when assuming full-flow conditions, a 6-inch pipe shall be designed with slopes between 0.50% and 12.35% to produce a minimum flow velocity of 2.0 $^{ft}/_{s}$ and a maximum of 10.0 $^{ft}/_{s}$. The design slopes and velocities for the pipes in the proposed system falls within these criteria.

(6) Proposed System's Effect on Existing System's Capacity

The proposed system will connect to the existing 4' manhole to the northwest of the subject property. None of the existing infrastructure will be affected.

(7) Inflow and Infiltration

Inflow and infiltration flows were calculated for the wastewater line portions of the proposed system per the City of Georgetown design standards. The Inflow and infiltration rate is 750 gallons per day per acre of drainage basin. This is a very conservative estimate for modern materials and construction methods. For each section of pipe on the proposed system a drainage area was determined as seen in **Exhibit 2**. The calculated inflow and infiltration rates were used to determine the peak wet flow rates by adding them to the peak dry flows.

(8) Ability of Existing and Proposed Trunk and Interceptor wastewater collection systems

The existing downstream system has the capacity to accommodate the peak flow for this development. Most of the existing elements of this portion of the collection system will be gravity fed until it reaches the existing Wastewater treatment plant.

(9) Capability of receiving treatment facility to receive and treat the anticipated peak flow

The proposed system will contribute to an existing wastewater collection system that is routed to the Georgetown Wastewater Treatment Plant. This treatment facility has been designed to accommodate the increase in flow from the proposed development.

(10) Engineering Analysis of Structural Design, Minimization of Odor-Causing Conditions, and Pipe Design Requirements of TAC §217.55

Structural Analysis for Flexible Pipe per TAC §217.53(k)(2)

(A) Live Load Calculations:

The Uni-Bell Handbook, page 210, Table 6.6 Live Loads on Pipe, is referenced to determine live load based on burial depth and classification of vehicular traffic. Accordingly, a live load of 2.78 psi will be the maximum live load the pipe will experience at any point, based on a minimum burial depth of four feet and the highway classification H20.

The following structural analysis of flexible pipe considers both the maximum live load (at 4 feet minimum depth) and the maximum earth load (at 16.9 feet maximum depth) simultaneously when calculating deflection. Therefore, the analysis is conservative.

(B) Allowable Buckling Pressure Determinations:

For the purposes of this application, the buckling analysis has been performed using the method outlined below. The method of calculating allowable buckling pressure provided below is only valid for lines which are installed at depths of 2 feet ≤ H ≤ 80 feet.

(Equation 1) FS = 2.5 for $\frac{h}{D_0} > 2$

(Equation 2) $$R_W = 1 - 0.33(h_w/h)$$

(Equation 3) $$B' = \frac{1}{1 + 4 * e^{-0.065*H}}$$

(Equation 4) $$I = (t^3/12) * (inches^4 / Linch)$$

(Equation 5) $$q_a = \frac{1}{FS}\left(32 R_W B' E_b \frac{EI}{D_0^3}\right)^{1/2}$$

Or, where FS = 2.5, $$q_a = 0.4^2 \sqrt{32 R_W B' E_b \frac{EI}{D_0^3}}$$

h = maximum height of soil surface above top pipe (in)
6" PVC SDR 26, h = 202.8 in

D_O = outside diameter of the pipe (in)
6" PVC SDR 26, D_O = 6.625 in

FS = design factor of safety
See Equation 1
6" PVC SDR 26, FS = 2.5

h_w = height of ground water surface above top of pipe (in)
6" PVC SDR 26, h_w = 0 in

R_w = water buoyancy factor. If h_w=0, R_w=1. If $0 \leq h_w \leq h$ (groundwater elevation is between the top of the pipe and the ground surface), calculate R_w with Equation 2.
See Equation 2
6" PVC SDR 26, R_w = 1

H = depth of burial from ground surface to crown of pipe (ft)
6" PVC SDR 26, H = 16.9 ft

B' = empirical coefficient of elastic support
See Equation 3
6" PVC SDR 26, B' = 0.429

t = pipe wall thickness (in)
6" PVC SDR 26, t = 0.316 in

I = moment of inertia of pipe wall cross-section per linear inch of pipe ($inch^4$/lineal inch = $inch^3$). For solid wall pipe, moment of inertia can be calculated with Equation 4. If the pipe used is not solid wall pipe (for example a pipe with a ribbed cross section), the proper moment of inertia formula must be obtained from the manufacturer.
See Equation 4
6" PVC SDR 26, I = 0.0026 cubic inches

E_b = modulus of soil reaction for the bedding material (psi)
6" PVC SDR 26, E_b = 2,000 psi

Reference: USDA NRCS Part 636 Structural Engineering National Engineering Handbook

E = modulus of elasticity of pipe material (psi)
6" PVC SDR 26, E = 400,000 psi

Reference: USDA NRCS Part 636 Structural Engineering National Engineering Handbook

q_a = allowable buckling pressure (psi)
See Equation 5
6" PVC SDR 26, q_a = 50.14 psi

a) Calculate pressure applied to pipe under installed conditions:

(Equation 6) $$W_c = \gamma_s * H * (D+t)/144$$

(Equation 7) $$q_p = \gamma_w * h_w + R_w * (W_c/D) + L_l$$

γ_s = specific weight of soil in pounds per cubic foot (pcf)
γ_s = 139 pcf

Reference: Table 3.1 – Dense angular-grained silty sand and Table 3.2 - $\gamma_{sat} = \gamma_d + (\frac{e}{1+e})\gamma_w$, *Page 57 of Das Braja, Principles of Geotechnical Engineering Sixth Edition, Nelson: Toronto, Ontario, Canada, 2006.*

H = depth of burial from ground surface to crown of pipe (ft)
6" PVC SDR 26, H = 16.9 ft

D = mean pipe diameter (in)
6" PVC SDR 26, D = 6 in

t = pipe wall thickness (in)
6" PVC SDR 26, t = 0.316 in

W_c = vertical soil load on the pipe per unit length in pounds per linear inch (lb/in)
See Equation 6
6" PVC SDR 26, W_c = 103.03 lb/in

γ_w = 0.0361 pounds per cubic inch (pci), specific weight of water

h_w = height of ground water surface above top of pipe (in)
6" PVC SDR 26, h_w = 0 in

R_w = water buoyancy factor. If h_w=0, R_w=1. If 0≤h_w≤h (groundwater elevation is between the top of the pipe and the ground surface), calculate R_w with Equation 2.
See Equation 2
6" PVC SDR 26, R_w = 1

L_l = Live Load (psi)
6" PVC SDR 26, L_l = 2.78 psi

Reference: Uni-Bell Handbook, page 210, Table 6.6 Live Loads on Pipe, for highway H20 live load. The minimum depth of burial from ground surface to crown of pipe is four feet, which requires a live load of 2.78 psi.

q_p = pressure applied to pipe under installed conditions (psi)
See Equation 7
6" PVC SDR 26, q_p = 19.95 psi

If $q_a \geq q_p$, the specified pipe is acceptable f. If $q_a \leq q_p$, the wall thickness of the pipe must be increased and/or a pipe with a larger modulus of elasticity must be used. In which case, appropriate

modifications must be made and the buckling analysis must be repeated, showing that for the upgraded pipe, $q_a \geq q_p$. Reported below in Table 1 are q_a and q_p values for the type and size of the proposed pipe material. All pipe proposed for this project meets the requirement of $q_a \geq q_p$.

Table 1 – Allowable Buckling Pressure and Pressure Applied to Pipe under Installed Conditions

6-inch PVC SDR 26		
q_a=	50.14	psi
q_p=	19.95	psi

(C) Prism Load Calculations:

The prism load, L_p, value, calculated below, is utilized in Section (F) to calculate vertical deflection.

(Equation 8) $$L_p = \frac{\gamma_s \times H}{144}$$

γ_s = specific weight of soil (pcf)
γ_s = 139 pcf

Reference: Table 3.1 – Dense angular-grained silty sand and Table 3.2 - $\gamma_{sat} = \gamma_d + (\frac{e}{1+e})\gamma_w$*, Page 57 of Das Braja, Principles of Geotechnical Engineering Sixth Edition, Nelson: Toronto, Ontario, Canada, 2006.*

H = depth of burial from ground surface to crown of pipe (ft)
6" PVC SDR 26, H = 16.9 ft

L_p = prism load (psi)
If prism load is calculated using Marston's load formula, or other formulas less conservative than the one provided above, the load should be multiplied by a deflection lag factor D_L = 1.5 to account for long term deflection of the pipe as the bedding consolidates.
See Equation 8
6" PVC SDR 26, L_p = 16.31 psi

(D) Wall Crushing Determinations:

Wall crushing determinations are necessary for rigid pipe only. The proposed pipe material is flexible. Also, no section of the proposed pipe will be installed in rigid encasement. The calculations for determining a maximum depth that the pipe may be buried before wall crushing will occur for rigid pipe, based on TCEQ-10243, are provided below as supplemental information, rather than directly applicable information. Analysis was determined per linear foot of pipe section.

(Equation 9) $$H = \frac{24 * P_c * A}{\gamma_s * D_o}$$

24 = conversions and coefficients

Pc = compressive stress or hydrostatic design basis (HDB); For typical PVC pipes, assume 4,000 psi

A = surface area of the pipe wall cross-section (in²/ft)
6" PVC SDR 26, A = 6.20 in²/ft

γ_s = specific weight of soil (pcf)
γ_s = 139 pcf

Reference: Table 3.1 – Dense angular-grained silty sand and Table 3.2 - $\gamma_{sat} = \gamma_d + (\frac{e}{1+e})\gamma_w$, *Page 57 of Das Braja, Principles of Geotechnical Engineering Sixth Edition, Nelson: Toronto, Ontario, Canada, 2006.*

D_O = outside diameter of the pipe (in)
6" PVC SDR 26, D_O = 6.625 in

H = maximum allowable depth of burial from ground surface to crown of pipe (ft)
See Equation 9
6" PVC SDR 26, H = 646 ft

The maximum proposed depth is approximately 16.9 feet for 6" PVC SDR 26, which is well less than the maximum allowable burial depth provided above.

(E) Strain Prediction:

There are no special conditions of this installation which would create significant potential for a strain related failure. Tensile strength data is provided by manufacturers and is based on ASTM standards. Harrison Machine & Plastic Corporation specifies PVC cell class 12454 pipe with a tensile strength of 7,450 psi based on ASTM-D-1784.

(F) Long Term Pipe Deflection:

The ratio of bedding modulus to in-situ soil modulus is $E_b / E' =$ 2,000 psi / 1,500 psi = 1.33 (justification for these values is provided in Section (G)(i)). Since this ratio is greater than 1.25, a zeta factor must be calculated. Zeta is a factor which corrects for the effect of in-situ soil on pipe stability. If the ratio of bedding modulus to soil modulus is less than or equal to 1.25, a zeta value of one can be assumed. The following are direct calculations for zeta based on equations provided by TCEQ in various documents including TCEQ-10243 dated 10/01/04.

(Equation 10)
$$f = \frac{b/d_a - 1}{1.154 + 0.444 \times (b/d_a - 1)}$$

(Equation 11)
$$zeta = \frac{1.44}{f + (1.44 - f) \times (E_b / E_n')}$$

b = trench width (in)
6" PVC SDR 26, b = 18.625 in

Reference: City of Georgetown Trench and Embedment Detail Under Proposed Roadway.

d_a = outside pipe diameter (in)
6" PVC SDR 26, d_a = 6.625 in

f = pipe / trench width coefficient
See Equation 10
6" PVC SDR 26, f = 0.925

E_b = modulus of soil reaction for bedding material (psi)
6" PVC SDR 26, E_b = 2,000 psi

Reference: USDA NRCS Part 636 Structural Engineering National Engineering Handbook

E'_n = modulus of soil reaction for in-situ soils (psi)
6" PVC SDR 26, E'_n = 1,500 psi

Reference: Principles of Geotechnical Engineering Sixth Edition by Braja Das, page 306, Table 10.2.

zeta = Leonhardt's Zeta factor
See Equation 11
6" PVC SDR 26, zeta = 0.893

Pipe Stiffness (P_s) is based on manufacturer's data and national reference standards. The J-M Eagle pipe catalog is referenced in Section G as justification for a pipe stiffness value of 115 psi and is in compliance with ASTM 3034 standards. Pipe stiffness may also be calculated by Equation 12 and 13 as referenced in TCEQ documents, including TCEQ-10243 and the Texas Administrative Code, Chapter 217.

(Equation 12) $$P_s = \frac{EI}{0.149 * r^3}$$ or

(Equation 13) $$P_s = 0.80 * RSC * (\frac{8.337}{D})$$

where RSC = Ring Stiffness Coefficient based on manufacturer's data and
D = mean diameter in inches

E = modulus of elasticity of the pipe material (psi)
6" PVC SDR 26, E_b = 400,000 psi

Reference: USDA NRCS Part 636 Structural Engineering National Engineering Handbook

I = moment of inertia of pipe wall cross-section per linear inch of pipe (inch4/lineal inch = inch3). For solid wall pipe, moment of inertia can be calculated with Equation 4. If the pipe used is not solid wall pipe (for example a pipe with a ribbed cross section), the proper moment of inertia formula must be obtained from the manufacturer. $I = (t^3/12) * (inches4 / Linch)$

6" PVC SDR 26, I = 0.0026 cubic inches

r = mean radius (in)
6" PVC SDR 26, r = 3 in

P_s = pipe stiffness (psi)
See Equation 12
6" PVC SDR 26, Ps = 258.5 psi

In a conservative effort, the following calculations will utilize the manufacture's pipe stiffness value of 115 psi.

Because the terms in the denominator of the Modified Iowa Formula (Equation 15) are added, it is theoretically possible to have zero pipe stiffness and still predict flexible pipe deflections less than 5%. In order to ensure that the stiffness being provided to the installation has a reasonable contribution from pipe stiffness, and does not rely solely on the stiffness provided by the soil stiffness factor (SSF), the ratio of pipe stiffness to soil stiffness factor (P_s/SSF) must be calculated. If P_s/SSF < 0.15, a higher stiffness pipe must be chosen.

(Equation 14) $$\frac{P_s}{SSF} = \frac{P_s}{0.061 \times zeta \times E_b}$$

P_s = pipe stiffness (psi) – per national reference standards
6" PVC SDR 26, P_s = 115 psi

zeta = Leonhardt's Zeta factor
See Equation 11
6" PVC SDR 26, zeta = 0.893

E_b = modulus of soil reaction for bedding material (psi)
6" PVC SDR 26, E_b = 2,000 psi

Reference: USDA NRCS Part 636 Structural Engineering National Engineering Handbook

SSF = Soil Stiffness Factor
See Equation 14
6" PVC SDR 26, SSF = 106.23 psi

P_s / SSF= stiffness ratio
See Equation 14
6" PVC SDR 26, P_s /SSF = 1.06

Therefore, since Ps/SSF > 0.15, the stiffness being provided to the installation has a reasonable contribution from pipe stiffness and does not rely solely on the stiffness provided by the soil stiffness factor.

Finally, predicted deflection must be calculated. For the purposes of this application, predicted deflection shall be calculated using the method outlined below. Maximum allowable deflection is 5%, as determined by the deflection analysis and verified by a mandrel test. Some conservatism should be employed in determining allowable predicted deflections. This conservatism is necessary to allow for variability in in the quality of installation.

(Equation 15)
$$\Delta Y/D(\%) = \frac{K \times (L_p + L_l) \times 100}{(0.149 \times P_s) + (0.061 \times zeta \times E_b)}$$

K = Bending angle constant, assumed to be 0.110 unless otherwise justified
6" PVC SDR 26, K = 0.110

L_p = Prism Load (psi)
See Equation 8
6" PVC SDR 26, L_p = 16.31 psi

L_l = Live Load (psi)
6" PVC SDR 26, L_l = 2.78 psi

Reference: Uni-Bell Handbook, page 210, Table 6.6 Live Loads on Pipe, for highway H20 live load. The minimum depth of burial from ground surface to crown of pipe is four feet, which requires a live load of 2.78 psi.

P_s = pipe stiffness (psi) – per national reference standards
6" PVC SDR 26, P_s = 115 psi

zeta = Leonhardt's Zeta factor
See Equation 11
6" PVC SDR 26, zeta = 0.893

E_b = modulus of soil reaction for bedding material (psi)
6" PVC SDR 26, E_b = 2,000 psi

Reference: USDA NRCS Part 636 Structural Engineering National Engineering Handbook

ΔY/D% = Percent predicted vertical deflection under load
Or, change in vertical pipe diameter under load
See Equation 15
8" PVC SDR 26, ΔY/D = 1.67%

The predicted deflection is approximately 1.67% for 6" PVC SDR 26, which is less than the maximum allowable deflection of 5%. Therefore, the specified pipe size and material are structurally justified for the proposed use.

(G) Justification for Parameters and Assumptions:

(i) Determination of Modulus of Soil Reaction for Bedding and In-Situ Material:
The parameters representing soil conditions are based on the geotechnical report specific to this project, national standards and references, as well as engineering judgment. Reference to the United States Department of Agriculture Natural Resources Conservation Service's National Engineering Handbook, Part 636 Structural Engineering Table 52-2, as provided below, was made in order to specify the modulus of soil reaction for bedding. Per City of Georgetown Standards, the degree of compaction of bedding must be 95%.

Table 2 - USDA NRCS National Engineering Handbook, Part 636 Structural Engineering

Table 52–2 Average values of the modulus of soil reaction for the Modified Iowa Equation

Soil type – pipe bedding material (Unified Soil Classification – ASTM D2487)	E' for degree of compaction of bedding, lb/in² 1/			
	Dumped	Slight, < 85% proctor, < 40% relative density	Moderate, 85-95% proctor, 40-70% relative density	High, > 95% proctor, > 70% relative density
Fine-grained soil (LL>50) 2/ Soil with medium to high plasticity CH, MH, CH-MH	No data available, use E' = 0 or consult with a geotechnical engineer			
Fine-grained soil (LL<50) soil with medium to no plasticity CL, ML, ML-CL, with less than 25% coarse-grained particles	50	200	400	1,000
Fine-grained soil (LL<50) soil with medium to no plasticity CL, ML, ML-CL, with more than 25% coarse-grained particles. Coarse-grained soil with fines GM, GC, SM, SC contains more than 12% fines	100	400	1,000	2,000
Coarse-grained soil with little or no fines GW, GP, SW, SP contains less than 12% fines	200	1,000	2,000	3,000
Crushed rock	1,000	3,000	3,000	3,000

1/ Source ASCE Journal of Geotechnical Engineering Division, January 1977
2/ LL = liquid limit

The modulus of soil reaction for in-situ materials is developed with reference to the geotechnical report and the text, Principles of Geotechnical Engineering Sixth Edition by Braja Das, specifically, page 306, Table 10.2.

(ii) Pipe Diameters and Materials:
Pipe dimensions such as inside, outside and average diameters, thickness, and stiffness are based on pipe catalogs from manufacturers. Specifically, the J-M Eagle pipe catalog, referenced to ASTM 3034 standards, was referenced.

(iii) Modulus of Elasticity:
The modulus of elasticity values for the project pipe material, 8-inch PVC SDR 26, is based on values provided by the United States Department of Agriculture Natural Resources Conservation Service's National Engineering Handbook, Part 636 Structural Engineering, Page 52-11 and 52-12.

(iv) Tensile Strength:
Tensile strength data is provided by manufacturers and is based on ASTM standards. Harrison Machine & Plastic Corporation specifies PVC cell class 12454 pipe with a tensile strength of 7,450 psi based on ASTM-D-1784.

(v) Conversion of Pipe or Ring Stiffness Constant to Pipe Stiffness:
Pipe stiffness and Ring Stiffness constant are based on pipe catalogs from manufacturers. Specifically, the J-M Eagle pipe catalog was used, which complies with ASTM 3034 standards.

(vi) Leonhardt's Zeta Factor:
Leonhardt's Zeta Factor and other equations (Equations 1-15) are referenced in TCEQ form TCEQ-10243 dated 10/01/04 and the Texas Administrative Code Title 30 Chapter 217 available via the TCEQ website. In addition, some formulas may be found in the USDA NRCS National Engineering Handbook Part 636 Structural Engineering.

(vii) Trench Width:

Trench width is in accordance with the City of Georgetown standard details and specifications. The minimum trench width shall be 18. The proceeding calculations confirm the soundness of the design.

(viii) Depth of Cover:
The depth of cover ranges from approximately 4.00 feet to 16.9 feet below finished grade as provided in the construction plans.

(ix) Water Table Elevation:
Groundwater conditions will be monitored during construction.

(x) Unit Weight of Soil:
The unit weight of soil is developed with reference to the geotechnical report and the text: Principles of Geotechnical Engineering Sixth Edition by Braja Das, specifically, Table 3.1 and Table 3.2 on page 57. Table 3.1 provides the dry unit weight for dense angular-grained silty sand while Table 3.2 provides the saturated unit weight based on the following equation, $\gamma_{sat} = \gamma_d + (\frac{e}{1+e})\gamma_w$. The saturated unit weight is used in a conservative effort.

Odor Control per TAC §217.53(h)

No odor issues are to be anticipated, however, if odor becomes a nuisance after operation, measures such as ventilation can be applied as necessary. Based on estimated flows upon operation through a 50-year expected life cycle odor production is estimated to be insignificant.

Pipe Design Requirements per TAC §217.55

a. Manholes are included in the wastewater system at:
   i. All points of change in alignment, grade, or size;
   ii. At the intersections of three or more pipes; and
   iii. At the end of all pipes that may be extended at a future date.
   iv. There are future extensions of the system from Mayfield Office Park; therefore, manholes located at the ends of the system include stubs and plugs.
   v. Clean-outs with water tight plugs are not used within the public Right-of-Way. They are used at all terminal points of the private wastewater system.
   vi. Per the TCEQ Organized Sewage Collection System General Notes located within the plan set, all cleanout installations must pass the testing requirements outlined for gravity collection pipes in TAC §217.57.
b. Types (Materials):
   i. Manholes shall be made of either pre-cast or cast-in-place concrete bases and sections. The grade adjustment rings shall be made only of concrete.
   ii. The use of bricks to adjust manholes is prohibited by notes on the wastewater layout sheets and by a note within the TCEQ General Notes
c. Spacing:
   i. The maximum manhole spacing allowed is 500 linear feet for all proposed pipe sizes in this design. The maximum designed manhole spacing is 480 LF
   ii. There are no tunnels proposed with this plan.
d. Diameter/Size:
e. All manholes shall be 48" inside diameter per City of Georgetown Standard Detail
f. Manhole Covers:
   i. All manholes shall have a 30" cover that is heavy duty load rated and stamped "Sanitary Sewer" per City of Georgetown Standard Detail.
   ii. No manholes are to be located within the 100-year floodplain.
   iii. Manholes are to be constructed of cast iron. For more detail reference East Jordan Iron Works, Inc. Catalog No. 1480A V-1420/1480Z1.
g. Manhole Inverts:
   i. Manhole inverts shall be constructed for smooth flow in accordance with the City of Georgetown Standard Detail.
   ii. Inflow pipes greater than 24" above the flow line out will be required to be drop manholes.
h. Manhole Steps:
   i. Manhole steps are not included within the standard manhole details per the City of Georgetown

i. Connections:
    i. Rubber, water-tight gaskets are required for connections of wastewater pipes to manholes per City of Georgetown Standard Detail.
j. Venting:
    i. No gasketed and/or bolted manholes are proposed and no manhole separations exceed 1,500 feet; therefore, special ventilation will not be required.
k. Cleanouts:
    i. There are no proposed cleanouts for the proposed development of Mayfield Office Park

l. All manholes are all located in the pavement areas within the right-of-ways on the proposed development.

(11) Description of areas not initially served by this project, the projected means of providing service to said areas

As previously stated, the system is designed to serve the proposed development. The overall development includes future service areas outside of the proposed service area, as depicted in Exhibit 1, the Service Area Map. Portions of the future service area will connect to the proposed system via wastewater line 'E' at a later date.

(12) Safety considerations incorporated into the project design:

The design includes safety features commensurate with standard engineering practice and the standards and specifications of the Texas Commission on Environmental Quality, the City of Georgetown, and OSHA practices.
I certify that to the best of my knowledge, the proposed wastewater collection system for Mayfield Office Park is in compliance with *"Chapter 217 – Design Criteria for Domestic Wastewater Systems"*. No variances from the listed criteria will be necessary for the proposed system as it was designed and approved. Please let me know if there is any additional information that will be required.

Nicholas R. Sandlin, PE TBPELS #124404

Organized Sewage Collection System
(TCEQ-0582)

Attachment B:
Justification and Calculations for Deviation in Straight Alignment Without Manholes
(NOT APPLICABLE)

Organized Sewage Collection System
(TCEQ-0582)

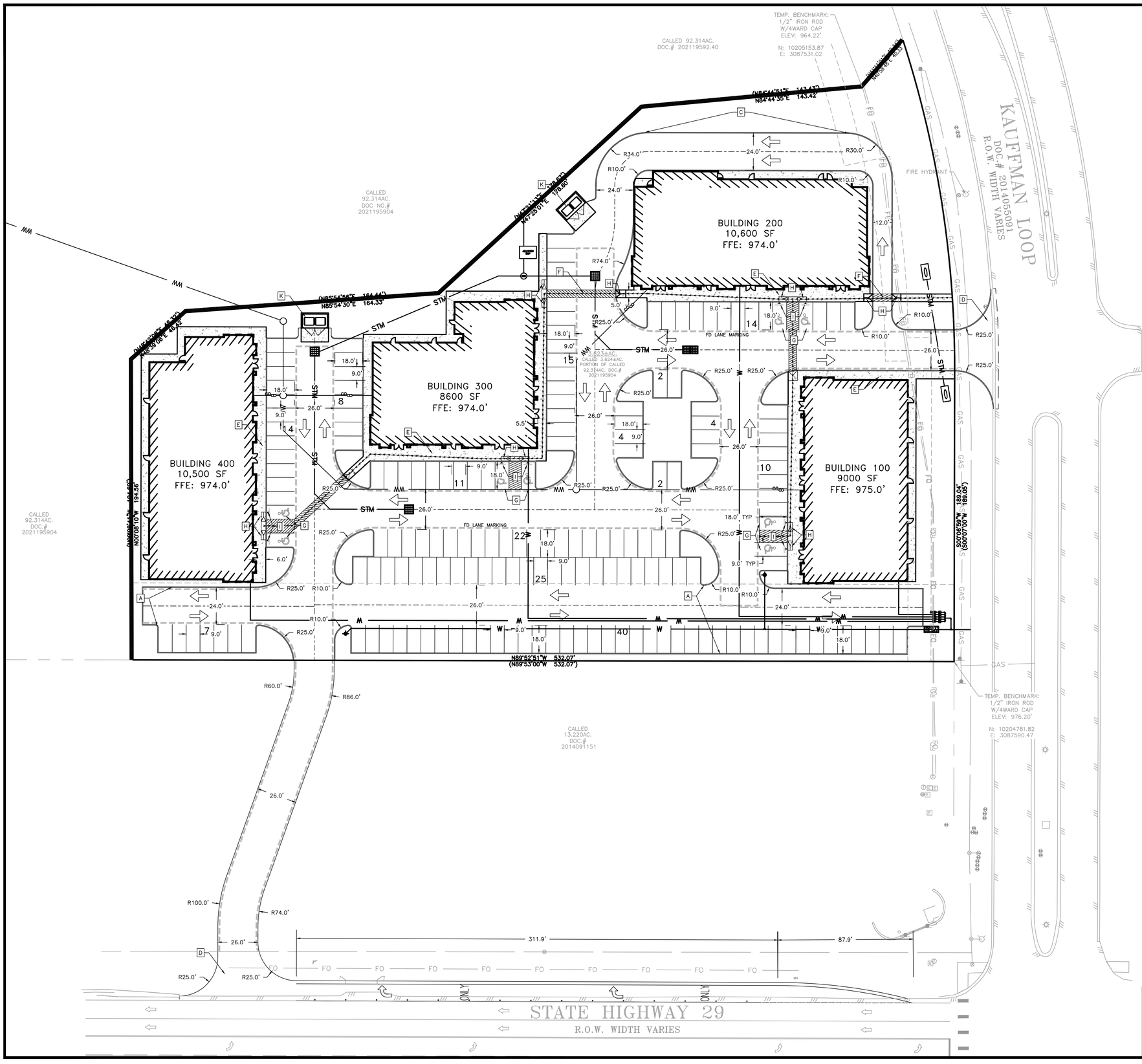
Attachment C:
Justification for Variance from Maximum Manhole Spacing
(NOT APPLICABLE)

Organized Sewage Collection System (TCEQ-0582)

Attachment D: Calculations for Slopes for Flows Greater Than 10.0 Feet Per Second (NOT APPLICABLE)

Organized Sewage Collection System (TCEQ-0582)

Site Plan



0 15' 30' 60'
SCALE: 1" = 30'

IF DRAWING BAR DOES NOT MEASURE 2" THIS PRINT IS NOT TO SCALE

9/5/2023

STATE OF TEXAS
NICHOLAS R. SANDLIN
124404
LICENSED
PROFESSIONAL ENGINEER

SITE PLAN LEGEND

- PROPOSED PROPERTY/ PROJECT BOUNDARY LINE
- EXISTING R.O.W./PROPERTY LINE
- EXISTING EASEMENT LINE
- FIRE LANE
- PROPOSED CURB & GUTTER
- STREET CENTERLINE
- FENCE
- STRUCTURAL RETAINING WALL (BY OTHERS)
- PROPOSED CONCRETE SIDEWALK
- (R) PROPOSED PARKING SPACES
- (T) TRANSFORMER PAD
- SITE WALLS
- PHASING

TAS ACCESSIBLE ROUTE
TAS ACCESSIBLE ROUTES MAY NOT EXCEED A CROSS SLOPE OF 1:50 (2%) OR EXCEED A RUNNING SLOPE OF 1:20 (5%) UNLESS DESIGNED AS A RAMP. THE MAXIMUM RUNNING SLOPE OF A RAMP IN NEW CONSTRUCTION IS 1:12 (8.33%). THE MAXIMUM RISE FOR ANY RAMP RUN IS 30 INCHES. REFER TO GRADING SHEET(S).

- EX. WATER LINE
- EX. WASTEWATER
- EX. STORM SEWER LINE
- EX. FIRE HYDRANT
- EX. WATER METER
- EX. WASTEWATER MANHOLE
- PR. WATER LINE
- FIRE LINE
- PR. WASTEWATER
- PR. STORM SEWER LINE
- PR. FIRE HYDRANT
- PR. WATER METER
- PR. WASTEWATER MANHOLE
- FITTINGS AS NOTED
- GATE VALVE AS NOTED
- WW CLEAN OUT
- BFP BACK FLOW PREVENTER
- FLOW ARROW
- EX. UTILITY POLE

SITE DATA	
	PROPOSED
TOTAL SITE AREA	3.62 AC / 157,829 SF
IMPERVIOUS COVER	127,475 SF / 2.93 AC = 80.8%
BUILDING HEIGHT	1 STORY – SEE ARCH. PLANS BY OTHERS
FOUNDATION TYPE	CONCRETE SLAB

PARKING TABLE	
TOTAL BUILDING AREA	38,700 SF
ALLOWABLE PARKING RATIO	1 SPACE: 218 SF
PARKING REQUIRED	38,700 SF / 218 = 178 SPACES
PARKING PROVIDED	178 SPACES INCLUDING 8 ADA & 4 VAN

SITE LEGEND

- A 6" CURB & GUTTER. SEE DETAIL SHEET.
- B RIBBON CURB. SEE DETAIL SHEET.
- C CASTELLATED CURB. SEE DETAIL SHEET.
- D STANDARD CITY/TXDOT TYPE II DRIVEWAY. SEE DETAIL SHEET
- E CONCRETE SIDEWALK. SEE DETAIL SHEET.
- F PEDESTRIAN CROSSWALK.
- G HANDICAP SPACE W/SIGN. SEE DETAIL SHEET.
- H PEDESTRIAN ADA RAMP OR AT GRADE ADA DOME PAVERS. SEE DETAIL SHEET.
- I CONCRETE WHEEL STOP. SEE DETAIL SHEET.
- J STANDARD CITY BIKE RACK. SEE DETAIL SHEET.
- K DUMPSTER ENCLOSURE WITH CONCRETE PAD PER GEOTECHNICAL REPORT AND CITY STANDARDS

TEXAS 811
811
BEFORE YOU DIG

WARNING !!!! CONTRACTOR TO FIELD VERIFY ALL EXIST. UTILITIES VERTICALLY AND HORIZONTALLY PRIOR TO CONSTRUCTION. THE CONTRACTOR IS TO CONTACT ENGINEER IF ANY EXISTING UTILITY INFORMATION DIFFERS FROM DATA SHOWN IN THE PLANS. CALL 811 BEFORE YOU DIG.

ENGINEERING | CONSULTING
SANDLIN
SERVICES, LLC
TBPELS FIRM #21356
4501 WHISPERING VALLEY DRIVE UNIT 27 AUSTIN, TX 78727

SITE PLAN

PROJECT CASE: XXXXXXX

TWELVE OAKS

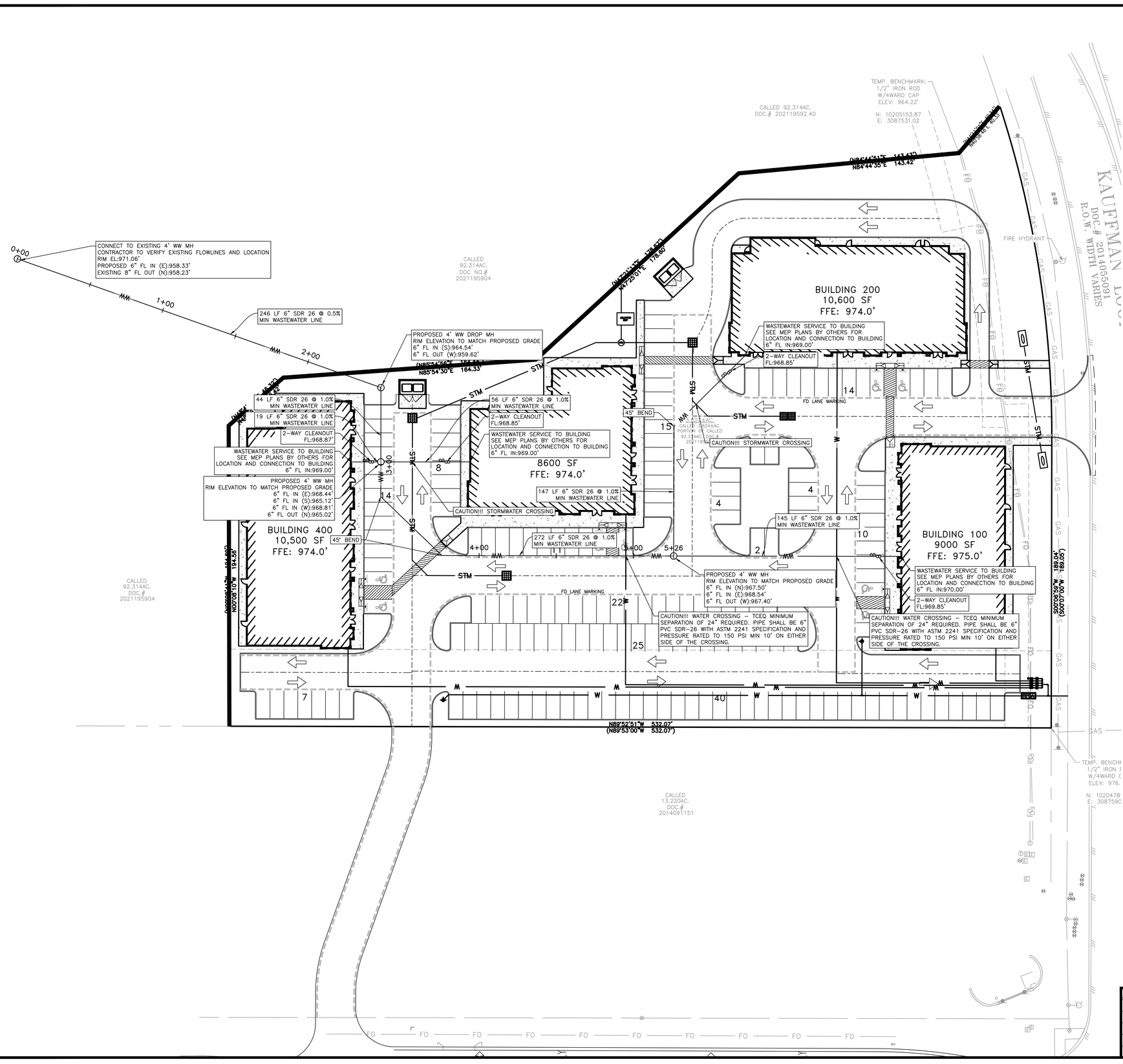
#	REVISION DESCRIPTION	SIGNATURE	DATE

SHEET 11 OF 32

G:\Shared drives\Sandlin Services LLC\Sandlin Services Projects\Land Development Division\01-0089-003 Twelve Oaks\CAD\Construction Sheets\S 120 SITE.dwg-SITE PLAN Plotted Sep 06, 2023 at 2:27pm by Scott | Last Saved by: Scott

Organized Sewage Collection System (TCEQ-0582)

Final Plan and Profile Sheets



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0 15' 30' 60'

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STATE OF TEXAS
NICHOLAS R. SANDLIN
124404
LICENSED PROFESSIONAL ENGINEER
9/5/2023

UTILITY LEGEND

- PROPOSED PROPERTY/ PROJECT BOUNDARY LINE
- EXISTING R.O.W./PROPERTY LINE
- EXISTING EASEMENT LINE
- PROPOSED CURB & GUTTER
- EXISTING CONTOURS / PROPOSED CONTOURS
- EX. WATER LINE / PR. WATER LINE
- EX. WASTEWATER / PR. WASTEWATER
- EX. STORM SEWER LINE / PR. STORM SEWER LINE
- EX. FIRE HYDRANT / PR. FIRE HYDRANT
- EX. WATER METER / PR. WATER METER
- EX. WASTEWATER MANHOLE / PR. WASTEWATER MANHOLE
- FITTINGS AS NOTED
- FLOW ARROW
- GATE VALVE AS NOTED
- ELECTRIC TRANSFORMER
- WW CLEAN OUT
- UTILITY POLE
- BACK FLOW PREVENTER (BFP)
- FIRE LINE
- EXISTING TREE (TO REMAIN)
- EXISTING TREE (TO BE REMOVED)

UTILITY NOTES:

ALL NON-CITY INFRASTRUCTURE (INCLUDING BUT NOT LIMITED TO GAS, ELECTRIC, CABLE, AND TELECOMMUNICATIONS) SHALL TRAVERSE UNDERNEATH CITY INFRASTRUCTURE (INCLUDED BUT NOT LIMITED TO WATERLINES, WASTEWATER LINES, AND STORMWATER LINES) WITH A MINIMUM OUTISTE-TO-OUTSIDE CLEARANCE OF 18". WHERE NON-CITY INFRASTRUCTURE WOULD HAVE TO BE PLACED AT A DEPTH OF 8' OR GREATER TO MEET THE PRECEDING REQUIREMENT, TRAVERSING ABOVE THE CITY INFRASTRUCTURE MAY BE ALLOWED, SUBJECT TO APPROVAL OF THE DEVELOPMENT SERVICES ENGINEERING REVIEWER, BUT ONLY IN CONFORMANCE WITH CROSS-SECTIONS, PROFILES, AND OR OTHER DETAILED INFORMATION INCORPORATED IN THESE PLANS.

WARNING
CONTRACTOR TO VERIFY ALL EXISTING UTILITIES VERTICALLY AND HORIZONTALLY PRIOR TO CONSTRUCTION. CONTRACTOR TO NOTIFY THE ENGINEER IMMEDIATELY OF ANY DISCREPANCIES.

IMPORTANT
A MINIMUM 24" SEPARATION DISTANCE IS REQUIRED AT ALL WATER AND WASTEWATER CROSSINGS. CENTER ONE JOINT OF WATER PIPE AT EACH CROSSING.

IMPORTANT
WHERE A NINE FOOT SEPARATION DISTANCE BETWEEN WATER AND WASTEWATER CANNOT BE ACHIEVED, PVC WITH MINIMUM PRESSURE RATING OF 150 PSI SHALL BE USED, A MINIMUM SEPARATION DISTANCE OF 6 INCHES BETWEEN OUTSIDE DIAMETERS OF PIPES SHALL BE ACHIEVED, WASTEWATER SHALL BE BELOW WATER, AND JOINTS SHALL BE LOCATED AS FAR AS POSSIBLE FROM THE INTERSECTION, IN ACCORDANCE WITH TAC TITLE 30 217.53(d)(3)(B)(i).

NOTES:

1. ON-SITE WASTEWATER AND WATER IMPROVEMENTS ARE PRIVATE. NINE (9) L.U.E. ARE SHOWN WITH THIS PLAN (OF 72 LUE)
2. PIPE FITTINGS SHALL BE JOINT-RESTRAINED.
3. FITTINGS SHALL HAVE THRUST BLOCKING.
4. FIRE LEADS SHALL BE DUCTILE IRON AND HAVE NO BENDS
5. A 3' CLEAR SPACE SHALL BE MAINTAINED AROUND THE CIRCUMFERANCE OF FIRE HYDRANTS EXCEPT AS OTHERWISE REQUIRED OR APPROVED.
6. TYPE OF CONSTRUCTION: V-B
7. ALL WASTEWATER MANHOLES OUTSIDE OF PAVED AREAS TO BE BOLTED

TEXAS 811 BEFORE YOU DIG

WARNING !!!! CONTRACTOR TO FIELD VERIFY ALL EXIST. UTILITIES VERTICALLY AND HORIZONTALLY PRIOR TO CONSTRUCTION. THE CONTRACTOR IS TO CONTACT ENGINEER IF ANY EXISTING UTILITY INFORMATION DIFFERS FROM DATA SHOWN IN THE PLANS. CALL 811 BEFORE YOU DIG.

ENGINEERING | CONSULTING
SANDLIN
SERVICES, LLC
TBPELS FIRM #21356
4501 WHISPERING VALLEY DRIVE UNIT 27 AUSTIN, TX 78727

WASTEWATER COLLECTION PLAN

PROJECT CASE: XXXXXXX

TWELVE OAKS

#	REVISION DESCRIPTION	SIGNATURE	DATE

SHEET 23 OF 32

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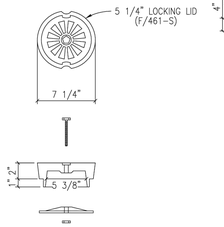
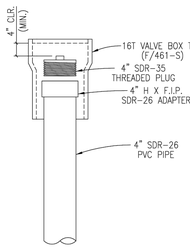


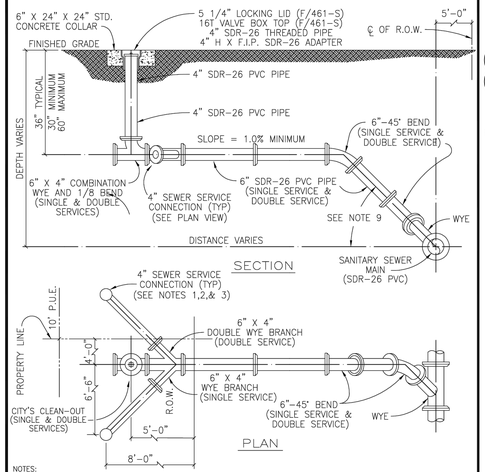
5 1/4" LOCKING LID
(F/461-S)



SEWER CLEAN-OUT
CITY OF GEORGETOWN
(RESIDENTIAL SERVICE)

The Architect/Engineer assumes responsibility for appropriate use of this standard.

CITY OF GEORGETOWN CONSTRUCTION STANDARDS AND DETAILS	REVISION NOTE: ADOPTED 6/21/2006
SEWER CLEAN-OUT DETAIL	DRAWING NAME: WW12
	SCALE: NTS · DATE: 1/2003 · DRAWN BY: MRS · APPROVED BY: TRB

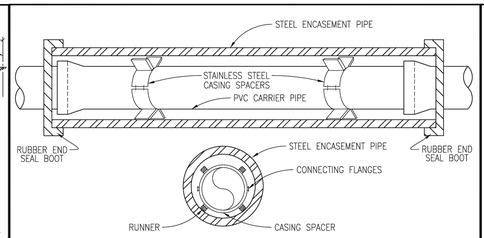


NOTES:

1. SERVICE CONNECTION RISERS SHALL TERMINATE 8' INSIDE THE PROPETY LINE.
2. THE END OF EACH SERVICE CONNECTION RISER SHALL BE EXTENDED 12" ABOVE FINISH GRADE.
3. EACH SERVICE CONNECTION SHALL BE PLUGGED WATER-TIGHT WITH AN APPROVED CAP OR PLUG.
4. FOR P.V.C. INSTALLATIONS, CONNECT TO EXISTING "BELL END" AND CONNECT OPPSITE END WITH P.V.C. TO P.V.C. KNOCK ON SLEEVE.
5. SOLIDLY TAMP BACKFILL AT LEAST ONE FOOT (1'-0") ABOVE TOP OF PIPE. SERVICES UNDER PAVED AREAS SHALL BE BACKFILLED TO THE SAME SPECIFICATIONS AS SHOWN ON PAVEMENT REPLACEMENT DETAIL.
6. CONTRACTOR SHALL MARK ON A CLEAN SET OF PLANS THE FINAL STATIONING OR DISTANCE AND DIRECTION FROM MANHOLE TO EACH SERVICE LATERAL AND GIVE TO ENGINEER FOR RECORD DRAWING PURPOSES.
7. ANY DEVIATION FROM THESE METHODS MUST BE APPROVED BY THE CITY OF GEORGETOWN ENGINEERING DEPARTMENT.
8. SERVICE LINE MATERIAL SHALL BE P.V.C., SDR-26.
9. SEWER SERVICE SLOPE TO BE 45° OFF CENTERLINE OF MAIN.

The Architect/Engineer assumes responsibility for appropriate use of this standard.

CITY OF GEORGETOWN CONSTRUCTION STANDARDS AND DETAILS	REVISION NOTE: ADOPTED 6/21/2006
SEWER SERVICE CONNECTIONS	DRAWING NAME: WW13
	SCALE: NTS · DATE: 1/2003 · DRAWN BY: MRS · APPROVED BY: TRB



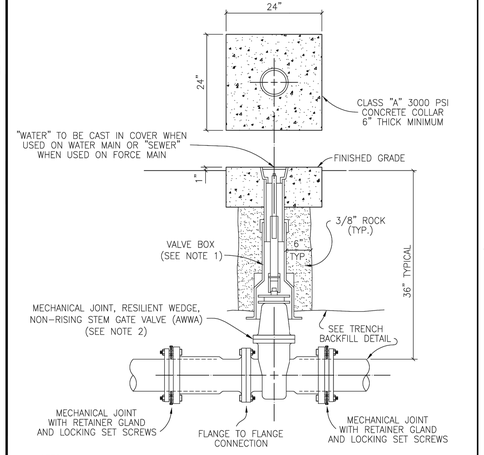
NOTES:

1. CASING SPACERS SHALL BE BOLT ON STYLE WITH A SHELL MADE IN TWO SECTIONS OF HEAVY T-304 STAINLESS STEEL. CONNECTING FLANGES SHALL BE RIBBED FOR EXTRA STRENGTH. CASING SPACERS SHALL BE MADE BY CASCADE WATERWORKS MFG. CO. OR APPROVED EQUAL.
2. CASING SPACERS SHALL HAVE RUNNERS MADE OF ULTRA HIGH MOLECULAR WEIGHT POLYMER, WITH A MINIMUM HEIGHT OF 2 INCHES.
3. DO NOT USE WEDGES BETWEEN TOP OF PVC CARRIER PIPE AND INSIDE OF CASING TO KEEP PVC FROM MOVING.
4. PRIOR TO INSERTING PVC CARRIER PIPE, ANY WATER SHOULD BE PUMPED OUT OF THE CASING PIPE SO THAT NO MORE THAN A FEW INCHES OF WATER REMAINS.
5. SPACERS WILL BE REQUIRED WITHIN AT LEAST 3 FEET FROM BOTH OPENINGS OF THE ENCASEMENT PIPE AND SPACED NO GREATER THAN 6 FEET THROUGHOUT THE ENCASEMENT PIPE.
6. ENCASEMENT PIPE SHALL BE SMOOTH STEEL 35,000 PSI YIELD STRENGTH WITH THICKNESS ACCORDING TO THE FOLLOWING TABLE:
7. WHEN CASING IS REQUIRED UNDER PAVEMENT WITHIN THE R.O.W., THE CASING SHALL EXTEND OUT TO WITHIN 4' INSIDE OF THE R.O.W. LINE, ON BOTH SIDES.
8. ALL JOINTS SHALL BE RESTRAINED ON PVC CARRIER PIPE.

PIPE SIZE-CARRIER (DIAMETER)	PIPE SIZE-CASING (DIAMETER)(MIN.)	MINIMUM PIPE THICKNESS (INCHES)	
6"	16"		
8"	18"	1/4	0.2500
10"	20"	5/16	0.3125
12" – 14"	24"	3/8	0.3750
16" – 18"	30"	7/16	0.4375
20"	36"	1/2	0.5000
24"	42"	1/2	0.5000
30"	48"	1/2	0.5000

The Architect/Engineer assumes responsibility for appropriate use of this standard.

CITY OF GEORGETOWN CONSTRUCTION STANDARDS AND DETAILS	REVISION NOTE: ADOPTED 6/21/2006
INSTALLATION OF P.V.C. PIPE THROUGH CASING	DRAWING NAME: W14
	SCALE: NTS · DATE: 1/2003 · DRAWN BY: MRS · APPROVED BY: TRB

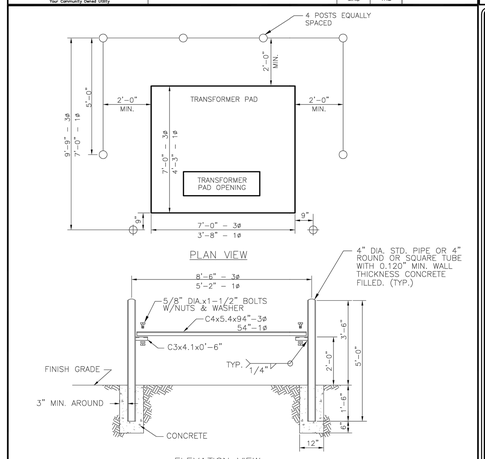


NOTES:

1. SEE VALVE SETTING DETAIL, DWG. #W-07.
2. ACCEPTABLE GATE VALVES ARE:
   A. MUELLER – 2360 SERIES
   B. CLOW

The Architect/Engineer assumes responsibility for appropriate use of this standard.

CITY OF GEORGETOWN CONSTRUCTION STANDARDS AND DETAILS	REVISION NOTE: ADOPTED 6/21/2006
INLINE VALVE INSTALLATION	DRAWING NAME: W21
	SCALE: NTS · DATE: 1/2003 · DRAWN BY: MRS · APPROVED BY: TRB

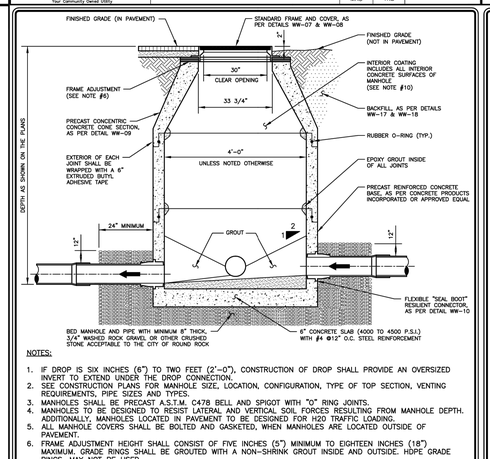


NOTES:

1. IF A BUILDING IS USED AS ANY PORTION OF THIS GUARD, THE TRANSFORMER PAD SHALL BE SO LOCATED THAT THE PAD SIDE OR SIDES ADJACENT TO THE SURFACE OF THE BUILDING SHALL HAVE A CLEARANCE OF NOT LESS THAN 5 FEET. FOR TRANSFORMERS 750 KVA AND ABOVE CONTACT GEORGETOWN UTILITY SERVICES ABOUT SPECIAL CLEARANCE REQUIREMENTS.
2. 10'-0" CLEARANCE SHALL BE PROVIDED IN FRONT OF THE EQUIPMENT TO PERMIT HOT STICK OPERATION.

The Architect/Engineer assumes responsibility for appropriate use of this standard.

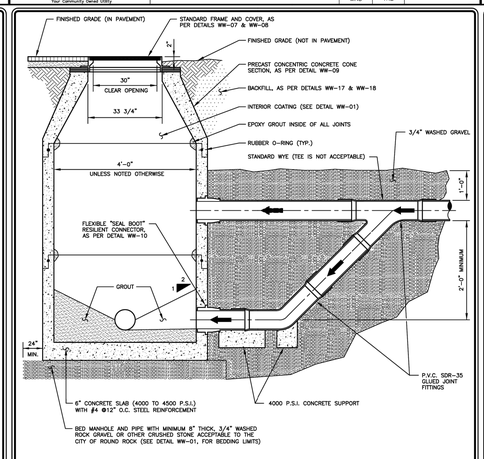
CITY OF GEORGETOWN CONSTRUCTION STANDARDS AND DETAILS	REVISION NOTE: ADOPTED 6/21/2006
PROTECTIVE BOLLARD INSTALLATION FOR PADMOUNT XFMRS, JUNCTION BOXES AND SWITCHGEAR	DRAWING NAME: UGPB1.1
	SCALE: NTS · DATE: 7/05 · DRAWN BY: JWL · APPROVED BY: MRM



NOTES:

1. IF DROP IS SIX INCHES (6") TO TWO FEET (2'-0"), CONSTRUCTION OF DROP SHALL PROVIDE AN OVERSIZED INVERT TO EXTEND UNDER THE DROP CONNECTION.
2. SEE CONSTRUCTION PLANS FOR MANHOLE SIZE, LOCATION, CONFIGURATION, TYPE OF TOP SECTION, VENTING REQUIREMENTS, PIPE SIZES AND TYPES.
3. MANHOLES SHALL BE PRECAST A.S.T.M. C478 BELL AND SPIGOT WITH "O" RING JOINTS.
4. MANHOLES TO BE DESIGNED TO RESIST LATERAL AND VERTICAL SOIL FORCES RESULTING FROM MANHOLE DEPTH. ADDITIONALLY, MANHOLES LOCATED IN PAVEMENT TO BE DESIGNED FOR H20 TRAFFIC LOADING.
5. ALL MANHOLE COVERS SHALL BE BOLTED AND GASKETED, WHEN MANHOLES ARE LOCATED OUTSIDE OF PAVEMENT.
6. FRAME ADJUSTMENT HEIGHT SHALL CONSIST OF FIVE INCHES (5") MINIMUM TO EIGHTEEN INCHES (18") MAXIMUM. GRADE RINGS SHALL BE GROUTED WITH A NON-SHRINK GROUT INSIDE AND OUTSIDE. HDPE GRADE RINGS, MAY NOT BE USED.
7. FOR MANHOLES TO BE VENTED, SEE DETAILS WW-05 AND WW-06.
8. A FLOW CHANNEL SHALL BE CONSTRUCTED INSIDE MANHOLE TO DIRECT INFLUENT INTO THE FLOW STREAM. ALL P.V.C. PIPE SHALL BE REMOVED FROM INVERT.
9. BASE SECTION SHALL BE DESIGNED FOR H20 LOADING, PLUS EARTH LOAD AT 130 PCF.
10. ENTIRE INTERIOR CONCRETE SURFACES OF WASTEWATER MANHOLES TO BE COATED WITH RAVEN 405, SPRAYWALL, OR APPROVED EQUAL, (WITH A UNIFORM THICKNESS OF 124 MILS AND A MINIMUM THICKNESS OF 100 MILS, APPLIED AFTER MANHOLE HAS PASSED THE VACUUM TEST). FOR REHABILITATING MANHOLES 1/2" MINIMUM THICKNESS CALCIUM ALUMINATE CEMENTITIOUS COATING AND OTHER INTERIOR SURFACES MAY BE COATED IF RECOMMENDED BY COATING MANUFACTURER. (IN LIEU OF INTERIOR COATINGS NEW PRECAST MANHOLES CONTAINING CONSHIELD WILL BE ACCEPTED PROVIDING THE MANUFACTURER STENCILS "CONSHIELD" ON THE INSIDE AND OUTSIDE OF ALL MANHOLE SECTIONS.)

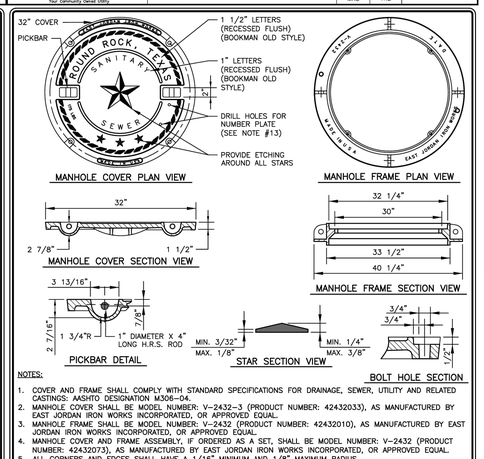
RECORD SIGNED COPY ON FILE AT U&ES DEPARTMENT	CITY OF ROUND ROCK	DRAWING NO: WW-01
APPROVED 03-01-18 DATE	PRECAST CONCRETE WASTEWATER MANHOLE DETAIL	ROUND ROCK TEXAS
THE ARCHITECT/ENGINEER ASSUMES RESPONSIBILITY FOR THE APPROPRIATE USE OF THIS DETAIL. (NOT TO SCALE)		



NOTES:

1. SEE NOTES #2 THROUGH #10 ON DETAIL WW-01.
2. DROP CONNECTIONS SHALL BE REQUIRED WHENEVER AN INFLUENT SEWER IS LOCATED MORE THAN TWO FEET (2'-0") ABOVE THE MAIN INVERT CHANNEL.
3. WHEN P.V.C. PIPE IS USED IN SANITARY SEWER LINES, SOLVENT TYPE JOINT P.V.C. FITTINGS TO BE UTILIZED IN THE DROP ASSEMBLY ONLY. FITTINGS TO BE P.V.C. SDR-35 WITH TWO PART WATER RESISTANT GLUE AT ALL JOINTS.

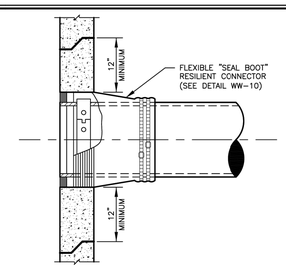
RECORD SIGNED COPY ON FILE AT U&ES DEPARTMENT	CITY OF ROUND ROCK	DRAWING NO: WW-02
APPROVED 03-01-18 DATE	PRECAST CONCRETE WASTEWATER MANHOLE WITH DROP CONNECTION DETAIL	ROUND ROCK TEXAS
THE ARCHITECT/ENGINEER ASSUMES RESPONSIBILITY FOR THE APPROPRIATE USE OF THIS DETAIL. (NOT TO SCALE)		



NOTES:

1. COVER AND FRAME SHALL COMPLY WITH STANDARD SPECIFICATIONS FOR DRAINAGE, SEWER, UTILITY AND RELATED CASTINGS: AASHTO DESIGNATION M306-04.
2. MANHOLE COVER SHALL BE MODEL NUMBER: V-2432-3 (PRODUCT NUMBER: 42432033), AS MANUFACTURED BY EAST JORDAN IRON WORKS INCORPORATED, OR APPROVED EQUAL.
3. MANHOLE FRAME SHALL BE MODEL NUMBER: V-2432 (PRODUCT NUMBER: 42432010), AS MANUFACTURED BY EAST JORDAN IRON WORKS INCORPORATED, OR APPROVED EQUAL.
4. MANHOLE COVER AND FRAME ASSEMBLY, IF ORDERED AS A SET, SHALL BE MODEL NUMBER: V-2432 (PRODUCT NUMBER: 42432073), AS MANUFACTURED BY EAST JORDAN IRON WORKS INCORPORATED, OR APPROVED EQUAL.
5. ALL CORNERS AND EDGES SHALL HAVE A 1/16" MINIMUM AND 1/8" MAXIMUM RADIUS.
6. MANHOLE COVERS SHALL BE CAST WITH TWO 1" DIAMETER STEEL PICKBARS.
7. MANHOLE COVER WEIGHT SHALL BE 175 LBS. FOR DUCTILE IRON. WEIGHT SHALL BE CAST ON BOTH TOP AND BOTTOM OF COVER.
8. MANUFACTURER SHALL CERTIFY THAT EACH MANHOLE COVER MEETS HS-20 LOADING.
9. FILLETS SHALL BE 1/4" RADIUS UNLESS OTHERWISE SPECIFIED.
10. MANUFACTURER SHALL REMOVE EXCESS IRON AND MACHINE FINISH SEATING SURFACES TO NOTED DIMENSIONS.
11. COVER SHALL BE DIPPED IN A WATER-BASED ASPHALTIC COATING, PRIOR TO SHIPMENT FROM FOUNDRY.
12. BOLTS SHALL BE 5/8"–11NC X 2" LONG HEX STAINLESS STEEL WITH WASHER.
13. MANUFACTURER SHALL DRILL 2–3/16" X 1/2" DEEP HOLES FOR A MANHOLE NUMBER PLATE TO BE PROVIDED BY THE CITY OF ROUND ROCK. THE TOP HOLE SHALL BE DRILLED 1" O.C. FROM THE BOTTOM OF THE PICKBAR AND THE BOTTOM HOLE SHALL BE DRILLED 4" O.C. FROM THE TOP HOLE.

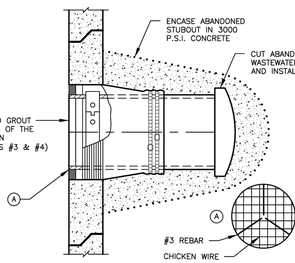
RECORD SIGNED COPY ON FILE AT U&ES DEPARTMENT	CITY OF ROUND ROCK	DRAWING NO: WW-07
APPROVED 03-01-18 DATE	BOLTED WASTEWATER MANHOLE COVER AND FRAME DETAIL	ROUND ROCK TEXAS
THE ARCHITECT/ENGINEER ASSUMES RESPONSIBILITY FOR THE APPROPRIATE USE OF THIS DETAIL. (NOT TO SCALE)		



NOTES:

1. EXISTING MANHOLES TO BE VACUUM TESTED PRIOR TO ANY CONNECTIONS.
2. NEW CONNECTIONS TO HAVE MINIMUM VERTICAL AND HORIZONTAL SEPARATION OF 12" ON THE OUTSIDE FACE OF THE MANHOLE FROM ANY EXISTING PENETRATIONS AND/OR MANHOLE JOINTS.
3. CONNECTIONS MADE INTO EXISTING MANHOLES ARE TO BE CORED AND NOT DRILLED/CHISELED.
4. CUT, SHAPE AND SLOPE NEW INVERT CHANNEL IN THE EXISTING CONCRETE BENCH FOR SMOOTH FLOW FROM THE NEW WASTEWATER CONNECTION.
5. EXISTING MANHOLES TO BE RECOATED AFTER ANY NEW WASTEWATER CONNECTION IS ADDED.

NEW CONNECTIONS TO EXISTING WASTEWATER MANHOLES



NOTES:

1. THIS DETAIL IS INTENDED FOR WASTEWATER MANHOLES THAT WILL REMAIN IN SERVICE. FOR WASTEWATER MANHOLES THAT ARE TO BE ABANDONED, REFERENCE DETAIL WW-15.
2. WASTEWATER MANHOLE TO BE RECOATED AFTER GROUT IS INSTALLED.
3. BLOCK THE INLET OF THE MANHOLE WITH CHICKEN WIRE AND 3–#3 REBAR. GROUT THE INSIDE OF THE MANHOLE FLUSH WITH THE MANHOLE WALL.
4. CONNECTIONS 24" AND LARGER REQUIRE BRICK BLOCKING TO BE INSTALLED PRIOR TO GROUTING.

ABANDONMENT OF CONNECTIONS TO EXISTING WASTEWATER MANHOLES

RECORD SIGNED COPY ON FILE AT U&ES DEPARTMENT	CITY OF ROUND ROCK	DRAWING NO: WW-21
APPROVED 03-01-18 DATE	EXISTING WASTEWATER MANHOLE CONNECTION DETAIL	ROUND ROCK TEXAS
THE ARCHITECT/ENGINEER ASSUMES RESPONSIBILITY FOR THE APPROPRIATE USE OF THIS DETAIL. (NOT TO SCALE)		

STATE OF TEXAS
NICHOLAS R. SANDLIN
124404
LICENSED
PROFESSIONAL ENGINEER
9/5/2023

TEXAS 811 BEFORE YOU DIG

WARNING !!!! CONTRACTOR TO FIELD VERIFY ALL EXIST. UTILITIES VERTICALLY AND HORIZONTALLY PRIOR TO CONSTRUCTION. THE CONTRACTOR IS TO CONTACT ENGINEER IF ANY EXISTING UTILITY INFORMATION DIFFERS FROM DATA SHOWN IN THE PLANS. CALL 811 BEFORE YOU DIG.

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SANDLIN
SERVICES, LLC
TBPELS FIRM #21356
4501 WHISPERING VALLEY DRIVE UNIT 27 AUSTIN, TX 78727

UTILITY DETAILS (2 OF 3)

PROJECT CASE: XXXXXXX

TWELVE OAKS

#	REVISION DESCRIPTION	SIGNATURE	DATE

SHEET 26 OF 32

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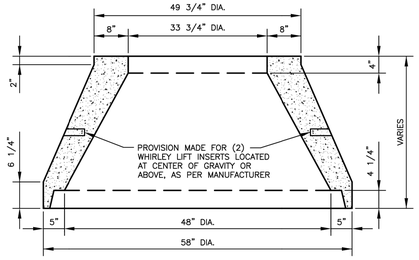
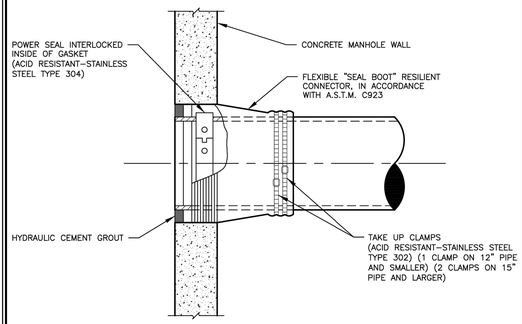


NOTE:

CONCENTRIC CONCRETE CONE SECTION SHALL BE MANUFACTURED USING 4000 TO 4500 P.S.I. CONCRETE, 28 DAY STRENGTH AND IN ACCORDANCE WITH A.S.T.M. C478, AS MANUFACTURED BY CONCRETE PRODUCTS INCORPORATED, OR APPROVED EQUAL.

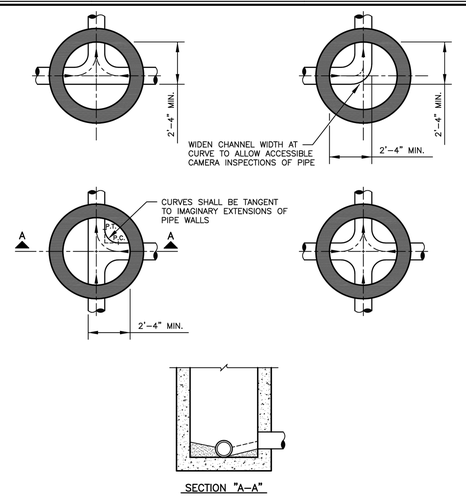
RECORD SIGNED COPY ON FILE AT U&ES DEPARTMENT	CITY OF ROUND ROCK	DRAWING NO: WW–09
APPROVED 03–01–18 DATE	PRECAST 48" CONCENTRIC CONCRETE CONE SECTION DETAIL	ROUND ROCK TEXAS
THE ARCHITECT/ENGINEER ASSUMES RESPONSIBILITY FOR THE APPROPRIATE USE OF THIS DETAIL. (NOT TO SCALE)		



NOTE:

1. FLEXIBLE "SEAL BOOT" RESILIENT CONNECTOR TO BE A MINIMUM OF 12 INCHES (12") FROM A MANHOLE JOINT.

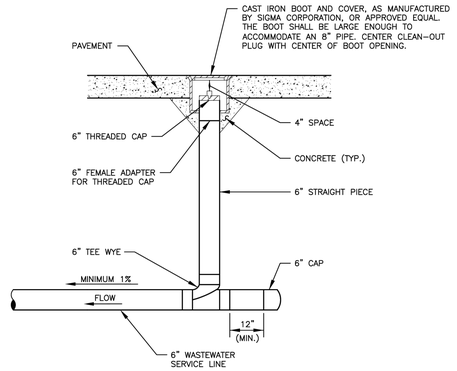
RECORD SIGNED COPY ON FILE AT U&ES DEPARTMENT	CITY OF ROUND ROCK	DRAWING NO: WW–10
APPROVED 03–01–18 DATE	FLEXIBLE "SEAL BOOT" RESILIENT CONNECTOR DETAIL	ROUND ROCK TEXAS
THE ARCHITECT/ENGINEER ASSUMES RESPONSIBILITY FOR THE APPROPRIATE USE OF THIS DETAIL. (NOT TO SCALE)		



NOTES:

1. MINIMUM DROP FROM INLET TO OUTLET OF MANHOLE IS 0.1 FEET AND MAXIMUM DROP IS 2 FEET, UNLESS SPECIAL APPROVAL IS OBTAINED FROM THE CITY OF ROUND ROCK.
2. INVERT CHANNELS TO BE CONSTRUCTED FOR SMOOTH FLOW WITH NO OBSTRUCTIONS.
3. SPILLWAYS SHALL BE CONSTRUCTED BETWEEN PIPES WITH DIFFERENT INVERT ELEVATIONS PROVIDING FOR SMOOTH FLOW.
4. CHANNELS FOR FUTURE CONSTRUCTIONS, SHALL BE CONSTRUCTED WITH PIPE EXTENDING 3" BEYOND EXTERIOR OF MANHOLE WALL, WITH GLUED PLUG.
5. SLOPE MANHOLE BENCH AT 2:1 SLOPE FROM MANHOLE WALL TO CHANNEL.
6. INVERT CHANNEL SHALL BE A MINIMUM OF 1/2 THE DIAMETER OF THE LARGEST PIPE OR FOUR INCHES (4") DEEP.

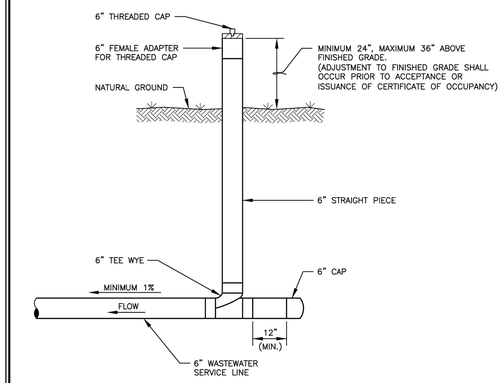
RECORD SIGNED COPY ON FILE AT U&ES DEPARTMENT	CITY OF ROUND ROCK	DRAWING NO: WW–11
APPROVED 03–01–18 DATE	WASTEWATER FLOW PATTERNS FOR INVERT CHANNELS DETAIL	ROUND ROCK TEXAS
THE ARCHITECT/ENGINEER ASSUMES RESPONSIBILITY FOR THE APPROPRIATE USE OF THIS DETAIL. (NOT TO SCALE)		



NOTES:

1. ALL PIPE TO BE SDR 26.
2. ALL FITTINGS TO BE SDR 35 SOLVENT WELD FITTINGS.

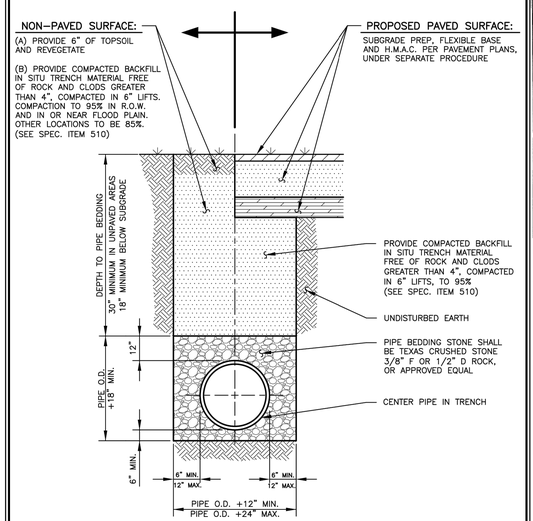
RECORD SIGNED COPY ON FILE AT U&ES DEPARTMENT	CITY OF ROUND ROCK	DRAWING NO: WW–13
APPROVED 03–01–18 DATE	WASTEWATER SERVICE CLEAN–OUT DETAIL (PAVED SURFACE)	ROUND ROCK TEXAS
THE ARCHITECT/ENGINEER ASSUMES RESPONSIBILITY FOR THE APPROPRIATE USE OF THIS DETAIL. (NOT TO SCALE)		



NOTES:

1. ALL PIPE TO BE SDR 26.
2. ALL FITTINGS TO BE SDR 35 SOLVENT WELD FITTINGS.

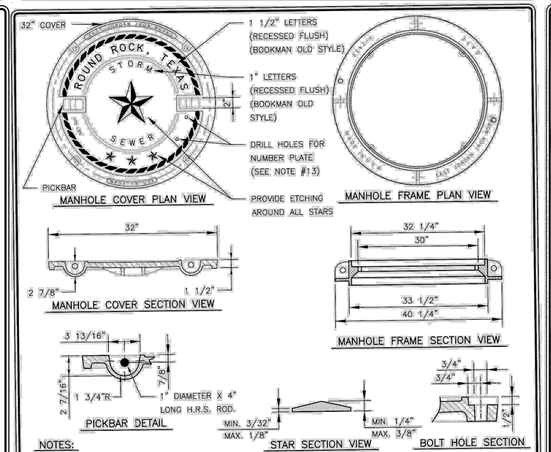
RECORD SIGNED COPY ON FILE AT U&ES DEPARTMENT	CITY OF ROUND ROCK	DRAWING NO: WW–14
APPROVED 03–01–18 DATE	WASTEWATER SERVICE CLEAN–OUT DETAIL (NON–PAVED SURFACE)	ROUND ROCK TEXAS
THE ARCHITECT/ENGINEER ASSUMES RESPONSIBILITY FOR THE APPROPRIATE USE OF THIS DETAIL. (NOT TO SCALE)		



NOTE:

ALL TRENCHING AND TRENCH SAFETY SHALL COMPLY WITH APPLICABLE FEDERAL, STATE AND LOCAL REGULATIONS.

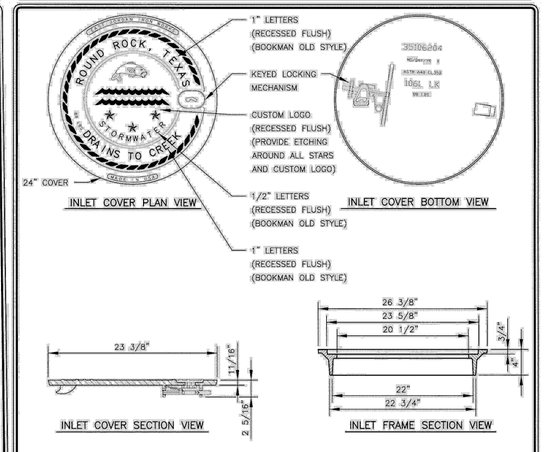
RECORD SIGNED COPY ON FILE AT U&ES DEPARTMENT	CITY OF ROUND ROCK	DRAWING NO: WW–18
APPROVED 03–01–18 DATE	WASTEWATER LINE BEDDING AND SURFACE REPAIR DETAIL (NON–PAVED & PROPOSED PAVED SURFACE)	ROUND ROCK TEXAS
THE ARCHITECT/ENGINEER ASSUMES RESPONSIBILITY FOR THE APPROPRIATE USE OF THIS DETAIL. (NOT TO SCALE)		



NOTES:

1. COVER AND FRAME SHALL COMPLY WITH STANDARD SPECIFICATIONS FOR DRAINAGE, SEWER, UTILITY AND RELATED CASTINGS, AASHTO DESIGNATION M306–04.
2. MANHOLE COVER SHALL BE MODEL NUMBER: P–2432–3 (PRODUCT NUMBER #24320332), AS MANUFACTURED BY EAST JORDAN IRON WORKS, INCORPORATED, OR APPROVED EQUAL.
3. MANHOLE FRAME SHALL BE MODEL NUMBER: V–2432 (PRODUCT NUMBER #24320170), AS MANUFACTURED BY EAST JORDAN IRON WORKS, INCORPORATED, OR APPROVED EQUAL.
4. MANHOLE COVER AND FRAME ASSEMBLY, IF ORDERED AS A SET, SHALL BE MODEL NUMBER: V–2432 (PRODUCT NUMBER: #24320272), AS MANUFACTURED BY EAST JORDAN IRON WORKS, INCORPORATED, OR APPROVED EQUAL.
5. ALL CORNERS AND EDGES SHALL HAVE A 1/16" MINIMUM AND 1/8" MAXIMUM RADIUS.
6. MANHOLE COVERS SHALL BE CAST WITH TWO 1" DIAMETER STEEL PICKBARS.
7. MANHOLE COVER WEIGHT SHALL BE 125 LBS. FOR DUCTILE IRON. WEIGHT SHALL BE CAST ON BOTH TOP AND BOTTOM OF COVER.
8. MANUFACTURER SHALL CERTIFY THAT EACH MANHOLE COVER MEETS HS–20 LOADING.
9. FILLETS SHALL BE 1/4" RADIUS UNLESS OTHERWISE SPECIFIED.
10. MANUFACTURER SHALL REMOVE EXCESS IRON AND MACHINE FINISH SEATING SURFACES TO NOTED DIMENSIONS.
11. COVER SHALL BE DIPPED IN A WATER–BASED ASPHALTIC COATING, PRIOR TO SHIPMENT FROM FOUNDRY.
12. BOLTS SHALL BE 5/8"–11NC X 2" LONG HEX STAINLESS STEEL WITH WASHERS.
13. MANUFACTURER SHALL DRILL 2–3/16"X1/2" DEEP HOLES FOR A MANHOLE NUMBER PLATE TO BE PROVIDED BY THE CITY OF ROUND ROCK.
THE TOP HOLE SHALL BE DRILLED 1" O.C. FROM THE BOTTOM OF THE PICKBAR AND THE BOTTOM HOLE SHALL BE DRILLED 4" O.C. FROM THE TOP HOLE.

RECORD SIGNED COPY ON FILE AT PUBLIC WORKS	CITY OF ROUND ROCK	DRAWING NO: DR–05
APPROVED 08–09–05 DATE	BOLTED STORMSEWER MANHOLE COVER AND FRAME DETAIL	ROUND ROCK TEXAS
THE ARCHITECT/ENGINEER ASSUMES RESPONSIBILITY FOR THE APPROPRIATE USE OF THIS DETAIL.		



NOTES:

1. COVER AND FRAME SHALL COMPLY WITH STANDARD SPECIFICATIONS FOR DRAINAGE, SEWER, UTILITY AND RELATED CASTINGS, AASHTO DESIGNATION M306–04.
2. INLET COVER SHALL BE MODEL NUMBER 106L (X) (PRODUCT NUMBER: 35105204), AS MANUFACTURED BY EAST JORDAN IRON WORKS, INCORPORATED, OR APPROVED EQUAL.
3. INLET FRAME SHALL BE MODEL NUMBER: 106L(X) (PRODUCT NUMBER: 35206004), AS MANUFACTURED BY EAST JORDAN IRON WORKS, INCORPORATED, OR APPROVED EQUAL.
4. INLET COVER AND FRAME ASSEMBLY, IF ORDERED AS A SET, SHALL BE MODEL NUMBER: 106L–6 LX (PRODUCT NUMBER: 35506204), AS MANUFACTURED BY EAST JORDAN IRON WORKS, INCORPORATED, OR APPROVED EQUAL.
5. ALL CORNERS AND EDGES SHALL HAVE A 1/16" MINIMUM AND 1/8" MAXIMUM RADIUS.
6. INLET COVER WEIGHT SHALL BE 88 LBS. FOR DUCTILE IRON. WEIGHT SHALL BE CAST ON BOTH TOP AND BOTTOM OF COVER.
7. FILLETS SHALL BE 1/4" RADIUS UNLESS OTHERWISE SPECIFIED.
8. MANUFACTURER SHALL REMOVE EXCESS IRON AND MACHINE FINISH SEATING SURFACES TO NOTED DIMENSIONS.
9. INLET COVER SHALL BE DIPPED IN A WATER–BASED ASPHALTIC COATING, PRIOR TO SHIPMENT FROM FOUNDRY.

RECORD SIGNED COPY ON FILE AT PUBLIC WORKS	CITY OF ROUND ROCK	DRAWING NO: DR–07
APPROVED 09–13–05 DATE	STORM SEWER INLET COVER AND FRAME DETAIL	ROUND ROCK TEXAS
THE ARCHITECT/ENGINEER ASSUMES RESPONSIBILITY FOR THE APPROPRIATE USE OF THIS DETAIL.		

STATE OF TEXAS
NICHOLAS R. SANDLIN
124404
LICENSED
PROFESSIONAL ENGINEER
9/5/2023

TEXAS 811 811 BEFORE YOU DIG

WARNING !!!! CONTRACTOR TO FIELD VERIFY ALL EXIST. UTILITIES VERTICALLY AND HORIZONTALLY PRIOR TO CONSTRUCTION. THE CONTRACTOR IS TO CONTACT ENGINEER IF ANY EXISTING UTILITY INFORMATION DIFFERS FROM DATA SHOWN IN THE PLANS. CALL 811 BEFORE YOU DIG.

ENGINEERING | CONSULTING
SANDLIN
SERVICES, LLC
TBPELS FIRM #21356
4501 WHISPERING VALLEY DRIVE UNIT 27 AUSTIN, TX 78727

UTILITY DETAILS (3 OF 3)

PROJECT CASE: XXXXXXX

TWELVE OAKS

#	REVISION DESCRIPTION	SIGNATURE	DATE

SHEET 26 OF 32

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Temporary Stormwater Section
(TCEQ-0602)

Temporary Stormwater Section

Texas Commission on Environmental Quality

for Regulated Activities on the Edwards Aquifer Recharge Zone and Relating to 30 TAC §213.5(b)(4)(A), (B), (D)(I) and (G); Effective June 1, 1999

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

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

Signature

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

Print Name of Customer/Agent: NICK SANDLIN, P.E.

Date: 9/5/2021

Signature of Customer/Agent:

9/5/2023

STATE OF TEXAS
NICHOLAS R. SANDLIN
124404
LICENSED
PROFESSIONAL ENGINEER

Regulated Entity Name: TWELVE OAKS PROFESSIOAL PARK

Project Information

Potential Sources of Contamination

Examples: Fuel storage and use, chemical storage and use, use of asphaltic products, construction vehicles tracking onto public roads, and existing solid waste.

1. Fuels for construction equipment and hazardous substances which will be used during construction:

   ☐ The following fuels and/or hazardous substances will be stored on the site: _____

   These fuels and/or hazardous substances will be stored in:

   ☐ Aboveground storage tanks with a cumulative storage capacity of less than 250 gallons will be stored on the site for less than one (1) year.

☐ Aboveground storage tanks with a cumulative storage capacity between 250 gallons and 499 gallons will be stored on the site for less than one (1) year.

☐ Aboveground storage tanks with a cumulative storage capacity of 500 gallons or more will be stored on the site. An Aboveground Storage Tank Facility Plan application must be submitted to the appropriate regional office of the TCEQ prior to moving the tanks onto the project.

☒ Fuels and hazardous substances will not be stored on the site.

2. ☒ **Attachment A - Spill Response Actions**. A site specific description of the measures to be taken to contain any spill of hydrocarbons or hazardous substances is attached.

3. ☒ Temporary aboveground storage tank systems of 250 gallons or more cumulative storage capacity must be located a minimum horizontal distance of 150 feet from any domestic, industrial, irrigation, or public water supply well, or other sensitive feature.

4. ☒ **Attachment B - Potential Sources of Contamination**. A description of any activities or processes which may be a potential source of contamination affecting surface water quality is attached.

Sequence of Construction

5. ☒ **Attachment C - Sequence of Major Activities**. A description of the sequence of major activities which will disturb soils for major portions of the site (grubbing, excavation, grading, utilities, and infrastructure installation) is attached.

   ☒ For each activity described, an estimate (in acres) of the total area of the site to be disturbed by each activity is given.

   ☐ For each activity described, include a description of appropriate temporary control measures and the general timing (or sequence) during the construction process that the measures will be implemented.

6. ☒ Name the receiving water(s) at or near the site which will be disturbed or which will receive discharges from disturbed areas of the project: Middle Fork San Gabriel River

Temporary Best Management Practices (TBMPs)

Erosion control examples: tree protection, interceptor swales, level spreaders, outlet stabilization, blankets or matting, mulch, and sod. Sediment control examples: stabilized construction exit, silt fence, filter dikes, rock berms, buffer strips, sediment traps, and sediment basins. Please refer to the Technical Guidance Manual for guidelines and specifications. All structural BMPs must be shown on the site plan.

7. ☒ **Attachment D – Temporary Best Management Practices and Measures**. TBMPs and measures will prevent pollution of surface water, groundwater, and stormwater. The construction-phase BMPs for erosion and sediment controls have been designed to retain sediment on site to the extent practicable. The following information is attached:

☒ A description of how BMPs and measures will prevent pollution of surface water, groundwater or stormwater that originates upgradient from the site and flows across the site.

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

☒ A description of how BMPs and measures will prevent pollutants from entering surface streams, sensitive features, or the aquifer.

☒ A description of how, to the maximum extent practicable, BMPs and measures will maintain flow to naturally-occurring sensitive features identified in either the geologic assessment, TCEQ inspections, or during excavation, blasting, or construction.

8. ☒ The temporary sealing of a naturally-occurring sensitive feature which accepts recharge to the Edwards Aquifer as a temporary pollution abatement measure during active construction should be avoided.

   ☐ **Attachment E - Request to Temporarily Seal a Feature**. A request to temporarily seal a feature is attached. The request includes justification as to why no reasonable and practicable alternative exists for each feature.

   ☒ There will be no temporary sealing of naturally-occurring sensitive features on the site.

9. ☒ **Attachment F - Structural Practices**. A description of the structural practices that will be used to divert flows away from exposed soils, to store flows, or to otherwise limit runoff discharge of pollutants from exposed areas of the site is attached. Placement of structural practices in floodplains has been avoided.

10. ☒ **Attachment G - Drainage Area Map**. A drainage area map supporting the following requirements is attached:

    ☐ For areas that will have more than 10 acres within a common drainage area disturbed at one time, a sediment basin will be provided.

    ☐ For areas that will have more than 10 acres within a common drainage area disturbed at one time, a smaller sediment basin and/or sediment trap(s) will be used.

    ☐ For areas that will have more than 10 acres within a common drainage area disturbed at one time, a sediment basin or other equivalent controls are not attainable, but other TBMPs and measures will be used in combination to protect down slope and side slope boundaries of the construction area.

    ☐ There are no areas greater than 10 acres within a common drainage area that will be disturbed at one time. A smaller sediment basin and/or sediment trap(s) will be used in combination with other erosion and sediment controls within each disturbed drainage area.

☒ There are no areas greater than 10 acres within a common drainage area that will be disturbed at one time. Erosion and sediment controls other than sediment basins or sediment traps within each disturbed drainage area will be used.

11. ☐ **Attachment H - Temporary Sediment Pond(s) Plans and Calculations**. Temporary sediment pond or basin construction plans and design calculations for a proposed temporary BMP or measure have been prepared by or under the direct supervision of a Texas Licensed Professional Engineer. All construction plans and design information must be signed, sealed, and dated by the Texas Licensed Professional Engineer. Construction plans for the proposed temporary BMPs and measures are attached.

    ☒ N/A

12. ☒ **Attachment I - Inspection and Maintenance for BMPs.** A plan for the inspection of each temporary BMP(s) and measure(s) and for their timely maintenance, repairs, and, if necessary, retrofit is attached. A description of the documentation procedures, recordkeeping practices, and inspection frequency are included in the plan and are specific to the site and/or BMP.

13. ☒ All control measures must be properly selected, installed, and maintained in accordance with the manufacturer's specifications and good engineering practices. If periodic inspections by the applicant or the executive director, or other information indicate a control has been used inappropriately, or incorrectly, the applicant must replace or modify the control for site situations.

14. ☒ If sediment escapes the construction site, off-site accumulations of sediment must be removed at a frequency sufficient to minimize offsite impacts to water quality (e.g., fugitive sediment in street being washed into surface streams or sensitive features by the next rain).

15. ☒ Sediment must be removed from sediment traps or sedimentation ponds not later than when design capacity has been reduced by 50%. A permanent stake will be provided that can indicate when the sediment occupies 50% of the basin volume.

16. ☒ Litter, construction debris, and construction chemicals exposed to stormwater shall be prevented from becoming a pollutant source for stormwater discharges (e.g., screening outfalls, picked up daily).

Soil Stabilization Practices

Examples: establishment of temporary vegetation, establishment of permanent vegetation, mulching, geotextiles, sod stabilization, vegetative buffer strips, protection of trees, or preservation of mature vegetation.

17. ☒ **Attachment J - Schedule of Interim and Permanent Soil Stabilization Practices**. A schedule of the interim and permanent soil stabilization practices for the site is attached.

18. ☒ Records must be kept at the site of the dates when major grading activities occur, the dates when construction activities temporarily or permanently cease on a portion of the site, and the dates when stabilization measures are initiated.

19. ☒ Stabilization practices must be initiated as soon as practicable where construction activities have temporarily or permanently ceased.

Administrative Information

20. ☒ All structural controls will be inspected and maintained according to the submitted and approved operation and maintenance plan for the project.

21. ☒ If any geologic or manmade features, such as caves, faults, sinkholes, etc., are discovered, all regulated activities near the feature will be immediately suspended. The appropriate TCEQ Regional Office shall be immediately notified. Regulated activities must cease and not continue until the TCEQ has reviewed and approved the methods proposed to protect the aquifer from any adverse impacts.

22. ☒ Silt fences, diversion berms, and other temporary erosion and sediment controls will be constructed and maintained as appropriate to prevent pollutants from entering sensitive features discovered during construction.

Temporary Stormwater Section (TCEQ-0602)

Attachment A: Spill Response Actions

Spill Response Actions

In the event of an accidental spill, immediate action shall be undertaken by the General Contractor to contain and remove the spilled material. All hazardous materials, including contaminated soil and liquid concrete waste (if applicable), shall be disposed of by the Contractor in the manner specified by Federal, State and Local regulations and by the manufacturer of such products. As soon as possible, the spill shall be reported to the appropriate agencies. As required under the provisions of the Clean Water Act, any spill or discharge entering waters of the United States shall be properly reported. The General Contractor shall prepare a written record of any spill and associated clean-up activities of petroleum products or hazardous materials in excess of 1 gallon or reportable quantities, whichever is less. The General Contractor shall provide notice to the Owner immediately upon identification of a reportable spill.

All spills of petroleum products or hazardous materials in excess of Reportable Quantities as defined by EPA or the State or Local agency regulations, shall be immediately reported within 24 hours to the EPA National Response Center (1-800-424-8802), TCEQ (1-800-832-8224), and local Fire Department (911).

The reportable quantity for hazardous materials can be found in 40 CFR 302:

Reportable Quantities		
Material	**Media Released to**	**Reportable Quantities**
Engine Oil, Fuel, Hydraulic & Brake Fluid	Land	25 gallons
Engine Oil, Fuel, Hydraulic & Brake Fluid	Water	Visible sheen
Antifreeze	Land	100 lbs (13 gal.)
Battery Acid	Land, Water	100 lbs
Refrigerant	Air	1 lb
Gasoline	Air, Land, Water	100 lbs
Engine Degreasers	Air, Land, Water	100 lbs

Please visit https://www.tceq.texas.gov/response/spills/spill_rq.html for more information

In order to minimize the potential for a spill of petroleum product or hazardous materials to come in contact with stormwater, the following steps shall be implemented.

a) All materials with hazardous properties (such as pesticides, petroleum products, fertilizers, detergents, construction chemicals, acids paints, paint solvents, additives for soil stabilization,

concrete curing compounds and additives, etc.) shall be stored in a secure location, under cover and in appropriate, tightly sealed containers when not in use.

b) The minimum practical quantity of all such materials shall be kept on the job site and scheduled for delivery as close to time of use as practical. Post Material Safety Data Sheets (MSDS), as well as proper storage, cleanup, and spill reporting instructions for hazardous materials stored or used on the project site in an open, conspicuous, and accessible location.

c) A spill control and containment kit (containing for example: absorbent material such as kitty litter or sawdust, acid neutralizing agent, brooms, dust pans, mops, rags, gloves, goggles, plastic and metal trash containers, etc.) shall be provided on the construction site and construction employees shall be trained in when and how to use spill containment materials.

d) The contractor personnel will immediately clean up any oil, fuel or hydraulic fluid if observed being released from equipment or vehicles. Vehicles or equipment will cease operation until required repairs are made to the equipment.

e) All of the product in a container shall be used before the container is disposed of. All such containers shall be triple rinsed with water prior to disposal. The rinse water used in these containers shall be disposed of in a manner in compliance with State and Federal regulations and shall not be allowed to mix with stormwater discharges.

f) All products shall be stored in and used from the original container with the original product label.

g) All products shall be used in strict compliance with instructions on the product label.

h) The disposal of the excess or used products shall be in strict compliance with instructions on the products label.

Spill Prevention and Control

Education

1.) Be aware that different materials pollute in different amounts. Make sure that each employee knows what a "significant spill" is for each material they use, and what is the appropriate response for "significant" and "insignificant" spills. Employees should also be aware of when spill must be reported to the TCEQ. Information available in 30 TAC 327.4 and 40 CFR 302.4.

2.) Educate employees and subcontractors on potential dangers to humans and the environment from spills and leaks.

3.) Hold regular meetings to discuss and reinforce appropriate disposal procedures (incorporate into regular safety meetings).

4.) Establish a continuing education program to indoctrinate new employees.

5.) Have contractor's superintendent or representative oversee and enforce proper spill prevention and control measures.

General Measures

1.) To the extent that the work can be accomplished safely, spills of oil, petroleum products, substances listed under 40 CFR parts 110,117, and 302, and sanitary and septic wastes should be contained and cleaned up immediately.

2.) Store hazardous materials and wastes in covered containers and protect from vandalism.

3.) Place a stockpile of spill cleanup materials where it will be readily accessible.

4.) Train employees in spill prevention and cleanup.

5.) Designate responsible individuals to oversee and enforce control measures.

6.) Spills should be covered and protected from stormwater runon during rainfall to the extent that it doesn't compromise cleanup activities.

7.) Do not bury or wash spills with water.

8.) Store and dispose of used clean up materials, contaminated materials, and recovered spill material that is no longer suitable for the intended purpose in conformance with the provisions in applicable BMPs.

9.) Do not allow water used for cleaning and decontamination to enter storm drains or watercourses. Collect and dispose of contaminated water in accordance with applicable regulations.

10.) Contain water overflow or minor water spillage and do not allow it to discharge into drainage facilities or watercourses.

11.) Place Material Safety Data Sheets (MSDS), as well as proper storage, cleanup, and spill reporting instructions for hazardous materials stored or used on the project site in an open, conspicuous, and accessible location.

12.) Keep waste storage areas clean, well-organized, and equipped with ample cleanup supplies as appropriate for the materials being stored. Perimeter controls, containment structures, covers, and liners should be repaired or replaced as needed to maintain proper function.

Cleanup

1.) Clean up leaks and spills immediately.

2.) Use a rag for small spills on paved surfaces, a damp mop for general cleanup, and absorbent material for larger spills. If the spilled material is hazardous, then the used cleanup materials are also hazardous and must be disposed of as hazardous waste.

3.) Never hose down or bury dry material spills. Clean up as much of the material as possible and dispose of properly. See the waste management BMPs in this section for specific information.

Minor Spills

1.) Minor spills typically involve small quantities of oil, gasoline, paint, etc. which can be controlled by the first responder at the discovery of the spill.

2.) Use absorbent materials on small spills rather than hosing down or burying the spill.

3.) Absorbent materials should be promptly removed and disposed of properly.

4.) Follow the practice below for a minor spill:

5.) Contain the spread of the spill.

6.) Recover spilled materials.

7.) Clean the contaminated area and properly dispose of contaminated materials.

Semi-Significant Spills

Semi-significant spills still can be controlled by the first responder along with the aid of other personnel such as laborers and the foreman, etc. This response may require the cessation of all other activities. Spills should be cleaned up immediately:

1.) Contain spread of the spill.

2.) Notify the project foreman immediately.

3.) If the spill occurs on paved or impermeable surfaces, clean up using "dry" methods (absorbent materials, cat litter and/or rags). Contain the spill by encircling with absorbent materials and do not let the spill spread widely.

4.) If the spill occurs in dirt areas, immediately contain the spill by constructing an earthen dike. Dig up and properly dispose of contaminated soil.

5.) If the spill occurs during rain, cover spill with tarps or other material to prevent contaminating runoff.

Significant/Hazardous Spills

For significant or hazardous spills that are in reportable quantities:

1.) Notify the TCEQ by telephone as soon as possible and within 24 hours at 512- 339-2929 (Austin) or 210-490-3096 (San Antonio) between 8 AM and 5 PM. After hours, contact the Environmental Release Hotline at 1-800-832-8224. It is the contractor's responsibility to have all emergency phone numbers at the construction site.

2.) For spills of federal reportable quantities, in conformance with the requirements in 40 CFR parts 110,119, and 302, the contractor should notify the National Response Center at (800) 424-8802.

3.) Notification should first be made by telephone and followed up with a written report.

4.) The services of a spills contractor or a Haz-Mat team should be obtained immediately. Construction personnel should not attempt to clean up until the appropriate and qualified staffs have arrived at the job site.

5.) Other agencies which may need to be consulted include, but are not limited to, the City Police Department, County Sheriff Office, Fire Departments, etc.

More information on spill rules and appropriate responses is available on the TCEQ website at: http://www.tnrcc.state.tx.us/enforcement/emergency_response.html.

Vehicle and Equipment Maintenance

1.) If maintenance must occur onsite, use a designated area and a secondary containment, located away from drainage courses, to prevent the runon of stormwater and the runoff of spills.

2.) Regularly inspect onsite vehicles and equipment for leaks and repair immediately.

3.) Check incoming vehicles and equipment (including delivery trucks, and employee and subcontractor vehicles) for leaking oil and fluids. Do not allow leaking vehicles or equipment onsite.

4.) Always use secondary containment, such as a drain pan or drop cloth, to catch spills or leaks when removing or changing fluids.

5.) Place drip pans or absorbent materials under paving equipment when not in use.

6.) Use absorbent materials on small spills rather than hosing down or burying the spill. Remove the absorbent materials promptly and dispose of properly.

7.) Promptly transfer used fluids to the proper waste or recycling drums. Don't leave full drip pans or other open containers lying around.

8.) Oil filters disposed of in trashcans or dumpsters can leak oil and pollute stormwater. Place the oil filter in a funnel over a waste oil-recycling drum to drain excess oil before disposal. Oil filters can also be recycled. Ask the oil supplier or recycler about recycling oil filters.

9.) Store cracked batteries in a non-leaking secondary container. Do this with all cracked batteries even if you think all the acid has drained out. If you drop a battery, treat it as if it is cracked. Put it into the containment area until you are sure it is not leaking.

Vehicle and Equipment Fueling

1.) If fueling must occur on site, use designated areas, located away from drainage courses, to prevent the runon of stormwater and the runoff of spills.

2.) Discourage "topping off" of fuel tanks.

Always use secondary containment, such as a drain pan, when fueling to catch spills/ leaks.

SPILL REPORT FORM

Notes to General Contractor:

- Control and contain the spill.
- Contact the appropriate regulatory agencies if the spill exceeds the applicable reportable quantity.
- Clean up the spill and dispose of waste according to federal, state and local regulations.
- Complete the Spill Report Form in full for each spill that exceeds the applicable reportable quantity and submit to the Owner.
- Call the Owner.
- Resolve as appropriate and as required by regulatory authorities.

SPILL REPORT FORM

DATE:
PROJECT:
PROJECT ADDRESS:

Spill Reported By: _____

Date / Time of Spill: _____

Describe spill location and events leading to spill: _____

_____

Material Spilled: _____

Source of Spill: _____

Amount Spilled: _____

Amount Spilled to Waterway (Name Waterway): _____

Containment or Clean up Action: _____

_____

Approximate depth (yards) of soil excavation: _____

List injuries or Personal Contamination: _____

Action to be taken to prevent future spills:
_____

Agencies notified of spill:
_____

_____

_____ _____
Contractor Signature and Printed Name **Date**

AFTER NOTIFYING GOVERNING AUTHORITIES, IMMEDIATELY COMPLETE THIS FORM AND CONTACT THE OWNER IF THE SPILL EXCEEDS THE REPORTABLE QUANTITY FOR THE GOVERNING AGENCY

Temporary Stormwater Section
(TCEQ-0602)

Attachment B:
Potential Sources of Contamination

Potential Sources of Contamination and Preventive Measures:

Potential Source: Concrete and concrete products used on-site during construction.
Preventive Measures: Concrete washout structure will be used if necessary.

Potential Source: Oil, grease, fuel, and hydraulic fluid contamination from construction equipment and vehicle dripping.
Preventative Measures: Vehicle maintenance will be performed at a local maintenance shop.

Potential Source: Miscellaneous trash and litter from construction workers and material wrappings.
Preventative Measures: Trash containers will be placed throughout the site to encourage proper disposal of trash.

Potential Source: Silt leaving the site.
Preventative Measures: Contractor will install all temporary best management practices prior to start of construction including the stabilized construction entrance to prevent tracking onto adjoining streets.

Potential Source: Construction debris
Preventative Measures: Construction debris will be monitored daily by contractor. Debris will be collected weekly and placed in disposal bins. Situations requiring immediate attention will be addressed on a case-by-case basis.

Potential Source: Soil and mud from construction vehicle tires as they leave the site.
Preventative Measures: a stabilized construction exit shall be utilized as vehicles leave the site. And soil, mud, etc. carried from the project onto public roads shall be cleaned up within 24 hours.

Potential Source: Sediment from soil, sand, gravel, and excavated materials stockpiled on site.
Preventative Measures: Silt fence shall be installed on the down gradient side of the stockpiled materials. Reinforced rock berms shall be installed at all downstream discharge locations.

Potential Source: Portable toilet spill
Preventative Measures: Toilets on the site will be emptied on a regular basis by the contracted toilet company.

Temporary Stormwater Section
(TCEQ-0602)

Attachment C:
Sequence of Major Activities

The installation of erosion and sedimentation controls shall occur prior to any excavation of materials or major disturbances on the site. The sequence of major construction activities will be as follows. Approximate acreage (AC) expected to be disturbed is listed in parentheses next to each activity.

Intended Schedule or Sequence of Major Activities:

1. Submit written notice of construction to TCEQ regional office at least 48 hours prior to the start of any regulated activities. (See Permanent Stormwater Section – Attachment F)

2. A pre-construction conference prior to commencement of construction. 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. Contractors must follow requirements as outlined in TCEQ General Construction Notes for the Water Pollution Abatement Plan (WPAP). WPAP Construction Notes are included on the Construction Plan sheets (See Permanent Stormwater Section – Attachment F).

4. Prior to beginning any construction activity, all temporary erosion and sedimentation BMPs and control measures must be properly installed and maintained in accordance with the approved plans and manufacturers specifications (5.04 Acres).

5. Evaluate temporary erosion control installation. 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. Review construction schedule and the Water Pollution Abatement Plan (WPAP) requirements.

7. Complete Permanent BMP construction and install landscaping (5.04Acres).

8. Topsoil, Irrigation and Landscaping: Revegetate all disturbed areas according to plan.

9. Site cleanup and removal of temporary erosion/sedimentation BMP controls. (5.04 Acres)

Maximum total construction time is not expected to exceed 12 months.

Temporary Stormwater Section
(TCEQ-0602)

Attachment D:
Temporary Best Management Practices and Measures

1. There are approximately 0.0 AC of storm water that originate up gradient from the site and flow across the site through an onsite BMP.

2. Temporary BMPs will be installed prior to soil disturbing construction activity. Silt fencing will be placed along the down-gradient sides of the property and limits of construction to prevent silt from escaping the construction area during permanent BMP construction.

3. A gravel construction entrance exists on site to reduce vehicle "tracking" onto adjoining streets. A concrete washout pit may be used to collect all excess concrete during construction, if needed.

4. Temporary BMPs for this project will protect surface water or groundwater from turbid water, phosphorus, sediment, oil and other contaminants, which may mobilize in stormwater flows by slowing the flow of runoff to allow sediment and suspended solids to settle out of the runoff.

5. Practices may also be implemented on site for interim and permanent stabilization. Stabilization practices may include but are not limited to establishment of temporary vegetation; establishment of permanent vegetation; mulching; geotextiles; sod stabilization; vegetative buffer strips; protection of existing trees and vegetation; and other similar measures.

6. There are no sensitive features or surface streams within the boundaries of the project that would require temporary BMPs. The temporary onsite BMPs will be used to treat stormwater runoff before it leaves the project and prevent pollutants from entering into surface streams or any sensitive features down gradient of the site.

Temporary Stormwater Section
(TCEQ-0602)

Attachment E:
Request to Temporarily Seal a Feature
(NOT APPLICABLE)

There are no sensitive features on the project site.

Temporary Stormwater Section (TCEQ-0602)

Attachment F: Structural Practices

Structural BMPs will be used to limit runoff discharge of pollutants from exposed areas of the site. BMPs will be installed prior to soil disturbing construction activity. Silt fencing will be placed along the down-gradient sides of the property to prevent silt from escaping the construction area. A temporary construction entrance will be placed at the site entry/exit point to reduce tracking onto adjoining streets. A construction staging area will be used onsite to perform all vehicle maintenance and for equipment and material storage. A concrete truck washout pit will be placed on site to provide containment and easier cleanup of waste from concrete operations. The location of all structural temporary BMPs is shown within the Site Plans.

Description of Temporary BMPs

Construction Entrance/Exit:
The purpose of a gravel construction entrance is to provide a stable entrance/exit condition from the construction site and keep mud and sediment off public roads. A stabilized construction entrance is a stabilized pad of crushed stone located at any point traffic will be entering or leaving the construction site from a public right-of-way. This practice should be used at all point of construction ingress and egress. Excessive amounts of mud can also present a safety hazard to roadway users. To minimize the amount of sediment loss to nearby roads, access to the construction site should be limited to as few points as possible and vegetation around the perimeter should be protected where access is not necessary. A rock stabilized construction entrance exists and will be used at all designated access points.

Silt Fence:
The purpose of a silt fence is to intercept and detain water-borne sediment from unprotected areas of a limited extent. Silt fence is used during the period of construction near the perimeter of a disturbed area to intercept sediment while allowing water to percolate through. This fence should remain in place until the disturbed area is permanently stabilized. Silt fence should not be used where there is a concentration of water in a channel or drainage way. If concentrated flow occurs after installation, corrective action must be taken such as placing a rock berm in the areas of concentrated flow.

Silt fencing within the site may be temporarily moved during the day to allow construction activity provided it is replaced and properly anchored to the ground at the end of the day. Silt fences on the perimeter of the site or around drainage ways should not be moved at any time.

Triangular Sediment Filter Dikes
Triangular sediment filter dikes (18"x18"x18" filter material with 6" square folded wire mesh frame) will be installed downgradient of the AST construction area with filter cloth placed over any existing stormwater

collection drains. The dike and filter cloth will be held in place with cloth sandbags. The facility existing topography will not change as the AST will be placed on existing crushed rock.

Concrete Washout Area (if applicable)

The purpose of concrete washout areas is to prevent or reduce the discharge of pollutants to stormwater from concrete waste by conducting washout offsite, performing onsite washout in a designated area, and training employees and subcontractors.

The following steps will help reduce stormwater pollution from concrete wastes:

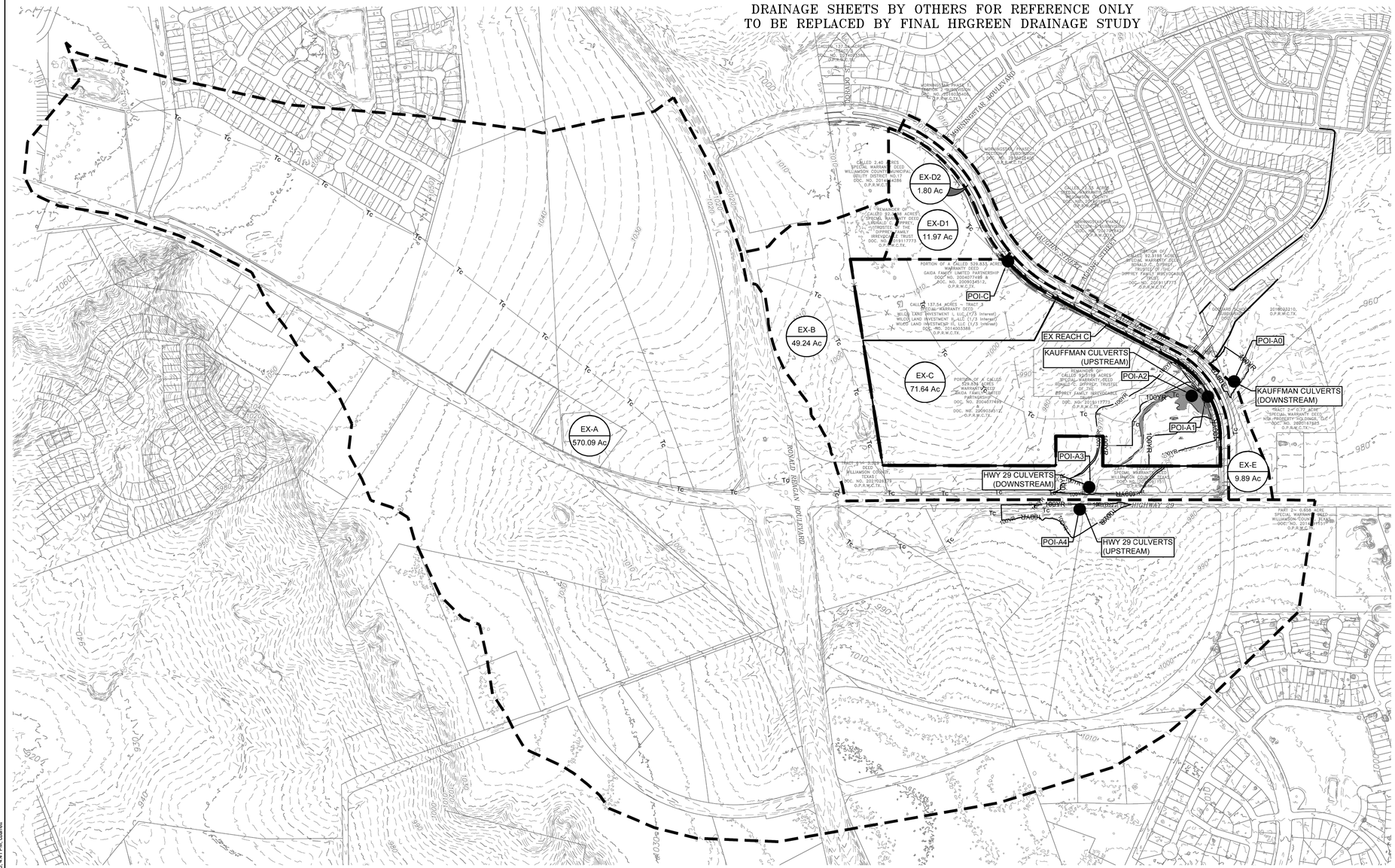
- Incorporate requirements for concrete waste management into material supplier and subcontractor agreements.
- Avoid mixing excess amounts of fresh concrete.
- Perform washout of concrete trucks in designated areas only.
- Do not wash out concrete trucks into storm drains, open ditches, streets, or streams.
- Do not allow excess concrete to be dumped onsite, except in designated areas.
- For onsite washout:
- Locate washout area at least 50 feet from sensitive features, storm drains, open ditches, or water bodies. Do not allow runoff from this area by constructing a temporary pit or bermed area large enough for liquid and solid waste.
- Wash out wastes into the temporary pit where the concrete can set, be broken up, and then disposed properly.

Temporary Stormwater Section
(TCEQ-0602)

Attachment G:
Drainage Area Map

Refer to the drainage sheets of the Twelve Oaks Professional Park construction plans.

DRAINAGE SHEETS BY OTHERS FOR REFERENCE ONLY
TO BE REPLACED BY FINAL HRGREEN DRAINAGE STUDY



0 400' 800'
SCALE: 1" = 400'

LEGEND

- EXISTING MAJOR CONTOUR
- EXISTING MINOR CONTOUR
- TIME OF CONCENTRATION
- CALCULATED 100-YEAR EXISTING FLOOD PLAIN
- FLOW ARROW
- EXISTING DRAINAGE LINE
- DA-1 xx.xx ac — EXISTING DRAINAGE LABEL
- POI A — POINT OF INTEREST

Kauffman Loop Existing Culverts Outfall Rating	
Elevation	Q (cfs)
962.10	0
962.65	10
962.76	30
962.84	50
963.07	80
963.42	120
963.97	200
964.82	350
965.03	390
965.07	400
965.52	500
966.28	700
966.95	900
967.27	1000
967.86	1200
968.43	1400
968.96	1600
969.47	1800
969.96	2000
970.44	2200
970.90	2400
971.34	2600
971.82	2800
971.90	3000
973.23	5000
974.57	10000

Kauffman Loop Culverts Existing Water Surface Elevation	
Storm	WSE
2-YR	965.87
10-YR	967.59
25-YR	968.62
100-YR	970.20

Routing Analysis Inputs - Existing Conditions

Drainage Areas		Land Use		TOC Calculation Table	HEC-HMS Inputs		
Contributing Area	Area (ac)	Base Curve Number	Existing Impervious Cover (ac)	TOC (min)	Area (sq. mi.)	Impervious Cover (%)	Lag Time (min)
EX-A	570.09	80	77.20	101.46	0.89076	13.54%	60.88
EX-B	49.24	80	4.64	49.53	0.07694	9.43%	29.72
EX-C	71.64	80	0.00	40.49	0.11194	0.00%	24.29
EX-D1	11.97	80	0.00	21.60	0.01870	0.00%	12.96
EX-D2	1.80	80	0.89	5.00	0.00281	49.66%	3.00
EX-E	9.89	80	4.47	15.11	0.01545	45.20%	9.06

Reach Lag Calculations				
Reach Name	Length (ft)	Velocity (ft/s)	T_c (min)	Lag Time (min)
EX R-D	1754	4.50	6.50	3.90

Time of Concentration Calculations - Existing Conditions

Contributing Area	Sheet Flow					Shallow Concentrated Flow (Unpaved)				Total Tc
	Length (ft)	Delta (ft)	Slope (ft/ft)	Roughness Coefficient	T_{sheet}	Length (ft)	Delta (ft)	Slope (ft/ft)	$T_{unpaved}$ (min)	T_c (min)
EX-A	100	0.5	0.0050	0.24	22.39	8478.0	104	0.0123	79.07	**101.46**
EX-B	100	0.65	0.0065	0.24	20.16	3362.0	47	0.0140	29.37	**49.53**
EX-C	100	1	0.0100	0.24	16.97	2899.0	47.0	0.0162	23.52	**40.49**
EX-D1	Tc = 21.6 min (Morningstar New Growth Plans)									**21.60**
EX-D2	Tc = 5 min									**5.00**
EX-E	100	3.1	0.0310	0.24	10.79	592.0	19	0.0275	4.31	**15.11**

Existing Hydrology Summary

Key Analysis Point	Peak Flow (cfs)			
	A14 Q_2	A14 Q_{10}	A14 Q_{25}	A14 Q_{100}
POI-A4	511	948	1,258	1,787
POI-A3	544	1,011	1,343	1,910
POI-A2	585	1,093	1,455	2,075
POI-A1	590	1,104	1,470	2,098
POI-A0	594	1,111	1,480	2,114

EXISTING DRAINAGE AREA MAP BY OTHERS

SHEET 16 OF 32

NO.	REVISION	BY	DATE

Know what's below. Call before you dig.

HRGreen
6500 HIGHWAY 290 WEST
SUITE 150
AUSTIN, TX 78735
512.872.6696
HRGREEN.COM
TBPE NO: 16384
TBPLS NO: 10194101
DEVELOPMENT TX

XAVIER GARZA-ROBLEDO 135174 LICENSED PROFESSIONAL ENGINEER
STATE OF TEXAS
06/16/2023

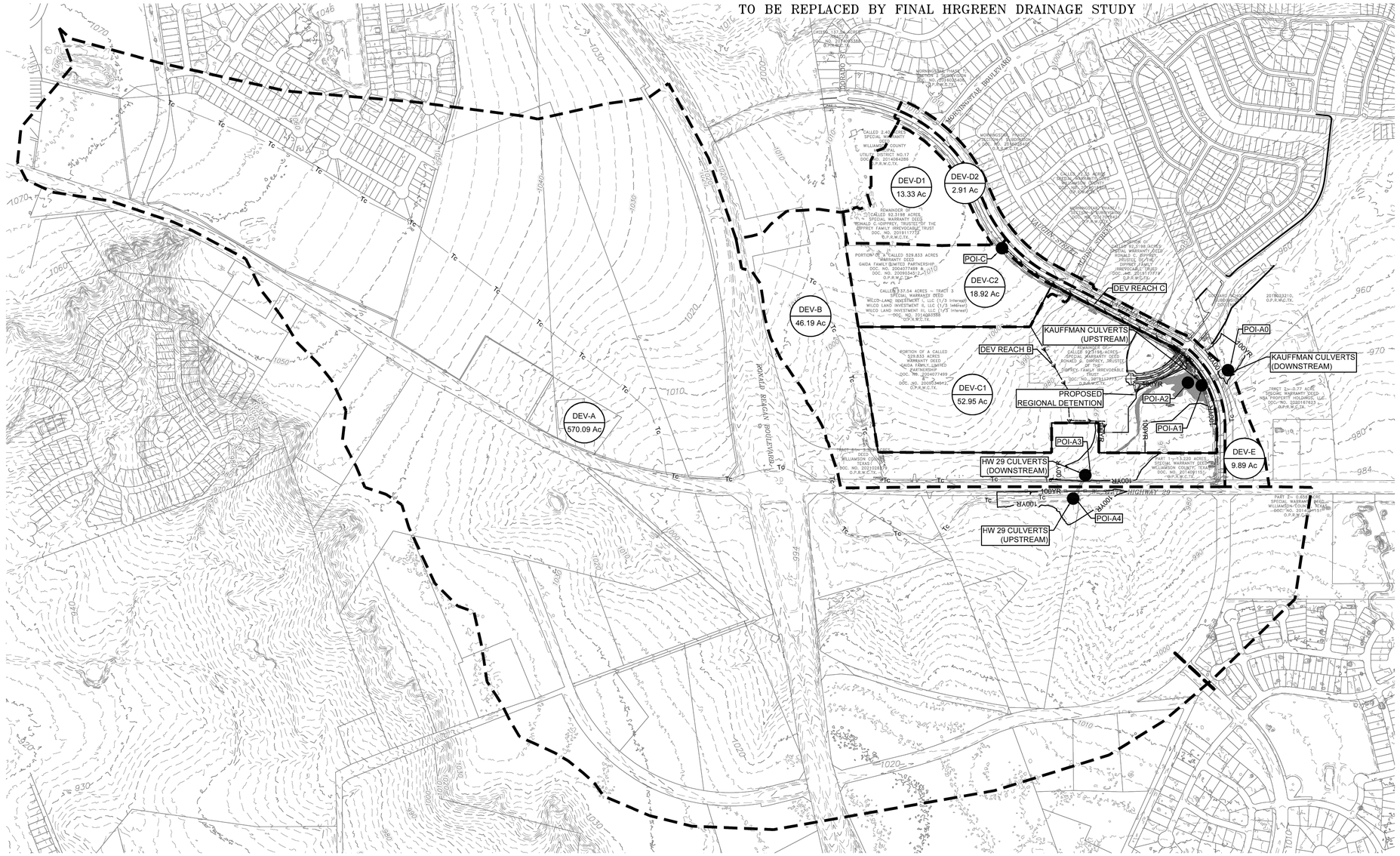
PRE DEVELOPED DRAINAGE AREA MAP
12 OAKS VILLAGE PHASE 1
SPINE INFRASTRUCTURE PLANS
LIBERTY HILL, TEXAS

DESIGNED BY: XG/AA
DRAWN BY: CB
CHECKED BY: XG
APPROVED BY: XG

SHT. 10 OF 33

P:\New Growth\2302047.0000 - 12 Oaks Spine Infrastructure_Phase 1\02_ACAD\10_Const. Plans\EXISTING DRAINAGE MAP.dwg, tristo, June 16, 2023, 4:41 PM, cbarrett

DRAINAGE SHEETS BY OTHERS FOR REFERENCE ONLY
TO BE REPLACED BY FINAL HRGREEN DRAINAGE STUDY



0 400' 800'
SCALE: 1" = 400'

LEGEND

- EXISTING MINOR CONTOUR
- EXISTING MAJOR CONTOUR
- PROPOSED MINOR CONTOUR
- PROPOSED MAJOR CONTOUR
- FLOW ARROW
- SWALE
- CALCULATED 100-YEAR PROPOSED FLOOD PLAIN
- TIME OF CONCENTRATION
- REACH
- PROPOSED DRAINAGE BOUNDARY
- STORM DRAIN LINE
- DA-1 xx.xx ac — PROPOSED DRAINAGE LABEL
- POI A — POINT OF INTEREST

12 Oaks Regional Pond : Elevation-Area-Storage

Elevation	Area (sf)	Area (ac)	Total Storage (cf)	Total Storage (Ac-Ft)
962.10	0	0.0000	0	0
963.00	101,852	2.3382	30,556	0.70
964.00	148,475	3.4085	154,989	3.56
965.00	176,573	4.0536	317,310	7.28
966.00	202,983	4.6599	506,934	11.64
967.00	240,965	5.5318	728,637	16.73
968.00	272,966	6.2664	985,436	22.62
969.00	299,047	6.8652	1,271,344	29.19
970.00	327,308	7.5140	1,584,415	36.37
971.00	359,650	8.2564	1,927,767	44.26

Kauffman Loop Culverts Proposed Water Surface Elevation

Storm	WSE
2-YR	965.22
10-YR	966.17
25-YR	968.26
100-YR	969.83

Routing Analysis Inputs - Proposed Conditions

Drainage Areas		Land Use		TOC Calculation Table	HEC-HMS Inputs		
Contributing Area	Area (ac)	Curve Number	Total Impervious Cover (ac)	TOC (min)	Area (sq. mi.)	Impervious Cover (%)	Lag Time
DEV-A	570.09	80	77.20	101.46	0.89076	13.54%	60.88
DEV-B	46.19	80	4.64	49.53	0.07218	10.05%	29.72
DEV-C1	52.95	80	42.36	5.00	0.08273	80.00%	3.00
DEV-C2	18.92	80	15.13	5.00	0.02956	80.00%	3.00
DEV-D1	13.33	80	8.67	5.00	0.02083	65.00%	3.00
DEV-D2	2.91	80	0.89	5.00	0.00455	30.65%	3.00
DEV-E	9.89	80	4.47	15.11	0.01545	45.20%	9.06

Time of Concentration Calculations - Proposed Conditions

Contributing Area	Sheet Flow					Shallow Concentrated Flow (Unpaved)				Total Tc (min)
	Length	Delta (ft)	Slope (ft/ft)	Roughness Coefficient	T_{sheet}	Length (ft)	Delta (ft)	Slope (ft/ft)	$T_{unpaved}$	T_c (min)
DEV-A	100	0.5	0.0050	0.24	22.39	8478.0	104	0.0123	78.07	101.46
DEV-B	100	0.65	0.0065	0.24	20.16	3362.0	47.0	0.0140	29.37	49.53
DEV-C1										5.00
DEV-C2										5.00
DEV-D1										5.00
DEV-D2										5.00
DEV-E	100	3.1	0.0310	0.24	10.79	692.0	19	0.0275	4.31	15.11

Reach Lag Calculations

Reach Name	Length (ft)	Velocity (ft/s)	T_c (min)	Lag Time (min)
DEV R-C	1130	4.50	4.19	2.51
DEV R-D	1754	4.50	6.50	3.90

Proposed Hydrology Summary

Key Analysis Point	Peak Flow (cfs)			
	A14 Q_2	A14 Q_{10}	A14 Q_{25}	A14 Q_{100}
POI-A4	511	948	1,258	1,787
POI-A3	542	1,007	1,338	1,902
POI-A2	564	1,051	1,399	2,000
POI-A1	554	1,056	1,395	1,971
POI-A0	557	1,061	1,403	1,983

Summary Table: Existing vs. Proposed

Analysis Point	Pre-Developed Peak Flow (cfs)				Developed Peak Flow (cfs)				Δ Peak Flow (cfs)			
	A14 Q_2	A14 Q_{10}	A14 Q_{25}	A14 Q_{100}	A14 Q_2	A14 Q_{10}	A14 Q_{25}	A14 Q_{100}	A14 Q_2	A14 Q_{10}	A14 Q_{25}	A14 Q_{100}
POI-A4	511	948	1,258	1,787	511	948	1,258	1,787	0	0	0	0
POI-A3	544	1,011	1,343	1,910	542	1,007	1,338	1,902	-2	-4	-5	-8
POI-A2	585	1,093	1,455	2,075	564	1,051	1,399	2,000	-21	-42	-56	-75
POI-A1	590	1,104	1,470	2,098	554	1,056	1,395	1,971	-36	-48	-75	-127
POI-A0	594	1,111	1,480	2,114	557	1,061	1,403	1,983	-37	-50	-77	-131

PROPOSED DRAINAGE AREA MAP BY OTHERS

SHEET 17 OF 32

NO.	REVISION	BY	DATE

811 Know what's below. Call before you dig.

6509 HIGHWAY 290 WEST
SUITE 150
AUSTIN, TX 78735
512.872.6696
HRGREEN.COM
TBPE NO: 16384
TBPLS NO: 10194101
HRGreen
DEVELOPMENT TX

XAVIER GARZA-ROBLEDO
135174
LICENSED PROFESSIONAL ENGINEER
STATE OF TEXAS
06/16/2025

DEVELOPED DRAINAGE AREA MAP
12 OAKS VILLAGE
PHASE 1
SPINE INFRASTRUCTURE PLANS
LIBERTY HILL, TEXAS

DESIGNED BY: XG/AA
DRAWN BY: CB
CHECKED BY: XG
APPROVED BY: XG

SHT. 11 OF 33

P:\New Growth\2020\47.0000 - 12 Oaks Spine Infrastructure_Phase 1\02_ACAD\10_Const. Plans\PROPOSED DRAINAGE.dwg, PRDA, June 16, 2025, 4:42 PM, cbarrett

Temporary Stormwater Section
(TCEQ-0602)

Attachment H:
Temporary Sediment Pond(s) Plans and Calculations
(NOT APPLICABLE)

There are no temporary sediment ponds associate with this project.

Temporary Stormwater Section
(TCEQ-0602)

Attachment I:
Inspection and Maintenance for BMPs

Inspection and Maintenance Guidelines for Construction BMPs

Silt Fence – Section 1.4.3
(1) Inspect all fencing weekly, and after any rainfall.
(2) Remove sediment when buildup reaches 6 inches.
(3) Replace any torn fabric or install a second line of fencing parallel to the torn section.
(4) Replace or repair any sections crushed or collapsed in the course of construction activity. If a section of fence is obstructing vehicular access, consider relocating it to a spot where it will provide equal protection, but will not obstruct vehicles. A triangular filter dike may be preferable to a silt fence at common vehicle access points.
(5) When construction is complete, the sediment should be disposed of in a manner that will not cause additional siltation and the prior location of the silt fence should be revegetated. The fence itself should be disposed of in an approved landfill.

Rock Berms – Section 1.4.5
(1) Inspection should be made weekly and after each rainfall by the responsible party. For installations in streambeds, additional daily inspections should be made.
(2) Remove sediment and other debris when buildup reaches 6 inches and dispose of the accumulated silt in an approved manner that will not cause any additional siltation.
(3) Repair any loose wire sheathing.
(4) The berm should be reshaped as needed during inspection.
(5) The berm should be replaced when the structure ceases to function as intended due to silt accumulation among the rocks, washout, construction traffic damage, etc.
(6) The rock berm should be left in place until all upstream areas are stabilized and accumulated silt removed.

Temporary Construction Entrance/Exit – Section 1.4.2
(1) The entrance should be maintained in a condition which will prevent tracking or flowing of sediment onto public rights-of-way. This may require periodic top dressing with additional stone as conditions demand and repair and/or cleanout of any measures used to trap sediment.
(2) All sediment spilled, dropped, washed or tracked onto public rights-of-way should be removed immediately by contractor.
(3) When necessary, wheels should be cleaned to remove sediment prior to entrance onto public right-of-way.

(4) When washing is required, it should be done on an area stabilized with crushed stone that drains into an approved sediment trap or sediment basin.
(5) All sediment should be prevented from entering any storm drain, ditch or water course by using approved methods.

Personnel Responsible for Inspections
The agent that performs the inspections should be knowledgeable of this general permit, familiar with the construction site, and knowledgeable of the SWPPP for the site. Documentation of the inspector's qualifications is to be included in the attached Inspector Qualifications Log.

Inspection Schedule
The primary operator is required to choose one of the two inspections listed below.

☐ **Option 1:** Once every seven calendar days. If this alternative schedule is developed, then the inspection must occur regardless of whether or not there has been a rainfall event since the previous inspection.

☐ **Option 2:** Once every 14 calendar days and within 24 hours of the end of a storm event of two inches or greater.

The inspections may occur on either schedule provided that documentation reflects the current schedule and that any changes to the schedule are conducted in accordance with the following provisions: the schedule may be changed a maximum of one time each month, the schedule change must be implemented at the beginning of a calendar month, and the reason for the schedule change must be documented (e.g., end of "dry" season and beginning of "wet" season).

If option 2 is the chosen frequency of inspections a rain gauge must be properly maintained on site or the storm event information from a weather station that is representative of the site location. For any day of rainfall during normal business hours that measures 0.25 inches or greater, proper documentation of the total rainfall measured for that day must be recorded.

Personnel provided by the permittee must inspect:

- disturbed areas of the construction site that have not been finally stabilized,
- areas used for storage of materials that are exposed to precipitation,
- structural controls (for evidence of, or the potential for, pollutants entering the drainage system),
- sediment and erosion control measures identified in the SWP3 (to ensure they are operating correctly), and
- locations where vehicles enter or exit the site (for evidence of off-site sediment tracking).

Reductions in Inspection Frequency
Where sites have been finally or temporarily stabilized or where runoff is unlikely due to winter conditions (e.g., site is covered with snow, ice, or frozen ground exists), inspections must be conducted at least once every month. In arid, semi-arid, or drought-stricken areas, inspections must be conducted at least once every month and within 24 hours after the end of a storm event of 0.5 inches or greater. A record of the total

rainfall measured, as well as the approximate beginning and ending dates of winter or drought conditions resulting in monthly frequency of inspections in the attached Rain Gauge Log.

In the event of flooding or other uncontrollable situations which prohibit access to the inspection sites, inspections must be conducted as soon as access is practicable.

Inspection Report Forms

Use the Inspection Report Forms given as a checklist to ensure that all required areas of the construction site are addressed. There is space to document the inspector's name as well as when the inspections regularly take place. The tables will document that the required area was inspected. (If there were any areas of concern, briefly describe them in this space with a more detailed description in the narrative section. Use the last table to document any discharges found during the inspections).

Describe how effective the installed BMPs are performing. Describe any BMP failures that were noted during the investigation and describe any maintenance required due to the failure. If new BMPs are needed as the construction site changes, the inspector can use the space at the bottom of the section to list BMPs to be implemented before the next inspection.

Describe the inspector's qualifications, how the inspection was conducted, and describe any areas of non-compliance in detail. If an inspection report does not identify any incidents of non- compliance, then it must contain a certifying signature stating that the facility or site is in compliance. The report must be signed by a person and in a manner required by 30 TAC 305.128. There is space at the end of the form to allow for this certifying signature.

Whenever an inspection shows that BMP modifications are needed to better control pollutants in runoff, the changes must be completed within seven calendar days following the inspection. If existing BMPs are modified or if additional BMPs are needed, you must describe your implementation schedule, and wherever possible, make the required BMP changes before the next storm event.

The Inspection Report Form functions as the required report and must be signed in accordance with TCEQ rules at 30 TAC 305.128.

Corrective Action

Personnel Responsible for Corrective Actions

Both Primary and Secondary Operators are responsible for maintaining all necessary Corrective Actions. If an individual is specifically identified as the responsible party for modifying the contact information for that individual should be documented in the attached Inspector Qualifications Log.

Corrective Action Forms

The Temporary BMPs must be modified based on the results of inspections, as necessary, to better control pollutants in runoff. Revisions must be completed within seven (7) calendar days following the inspection. If existing BMPs are modified or if additional BMPs are necessary, an implementation schedule must be described in the attached forms and wherever possible those changes implemented before the next storm event. If implementation before the next anticipated storm event is impracticable, these changes must be implemented as soon as practicable. Actions taken as a result of inspections must be properly documented by completing the corrective action forms given.

Inspector Qualifications Log*

Inspector Name: _____
Qualifications (Check as appropriate and provide description):
☐ Training Course _____
☐ Supervised Experience _____
☐ Other _____
Inspector Name: _____
Qualifications (Check as appropriate and provide description):
☐ Training Course _____
☐ Supervised Experience _____
☐ Other _____

Inspector Name: _____
Qualifications (Check as appropriate and provide description):
☐ Training Course _____
☐ Supervised Experience _____
☐ Other _____

Inspector Name: _____
Qualifications (Check as appropriate and provide description):
☐ Training Course _____
☐ Supervised Experience _____
☐ Other _____

Inspector Name: _____
Qualifications (Check as appropriate and provide description):
☐ Training Course _____
☐ Supervised Experience _____
☐ Other _____

Inspector Name: _____
Qualifications (Check as appropriate and provide description):
☐ Training Course _____
☐ Supervised Experience _____
☐ Other _____

*The agent that performs the inspections should be knowledgeable of this general permit, familiar with the construction site, and knowledgeable of the SWPPP for the site. The contractor is to provide an inspector with a CPESC, CESSWI, or CISEC certification.

Amendment Log

No.	Description of the Amendment	Date of Amendment	Amendment Prepared by [Name(s) and Title]

Construction Activity Sequence Log*

Name of Operator	Projected Dates Month/Year	Activity Disturbing Soil clearing, excavation, etc.	Location on-site where activity will be conducted	Acreage being disturbed

*Construction activity sequences for linear projects may be conducted on a rolling basis. As a result, construction activities may be at different stages at different locations in the project area. The Contractor is required to complete and update the schedule and adjust as necessary.

Stormwater Control Installation and Removal Log

Stormwater Control	Location On-Site	Installation Date	Removal Date

Stabilization Activities Log*

Date Activity Initiated	Description of Activity	Description of Stabilization Measure and Location	Date Activity Ceased (Indicate Temporary or Permanent)	Date When Stabilization Measures Initiated

*****Stabilization and erosion control practices may include, but are not limited to, establishing temporary or permanent vegetation, mulching, geotextiles, sod stabilization, vegetative buffer strips, and protecting existing trees and vegetation. List practices used where they are located, when they will be implemented, and whether they are temporary (interim) or permanent.

Inspection Frequency Log

Date	Frequency

Rain Gauge Log

Date	Location of Rain Gauge	Gauge Reading

General Information					
Name of Project		**Tracking Number**		**Inspection Date**	
Inspector Name, Title & Contact Information					
Present Phase of Construction					
Inspection Location (if multiple inspections are required, specify location where this inspection is being conducted)					

Inspection Frequency

Standard Frequency: ☐ Weekly ☐Every 14 days and within 24 hours of a 0.25" rain

Increased Frequency: ☐ Every 7 days and within 24 hours of a 0.25" rain

Reduced Frequency:

☐ Once per month (for stabilized areas)

☐ Once per month and within 24 hours of a 0.25" rain (for arid, semi-arid, or drought-stricken areas during seasonally dry periods or during drought)

☐ Once per month (for frozen conditions where earth-disturbing activities are being conducted)

Was this inspection triggered by a 0.25" storm event? ☐ Yes ☐ No

If yes, how did you determine whether a 0.25" storm event has occurred?

☐ Rain gauge on site ☐Weather station representative of site. Specify weather station source.

Total rainfall amount that triggered the inspection (in inches):

Unsafe Conditions for Inspection

Did you determine that any portion of your site was unsafe for inspection? ☐ Yes ☐No

If "yes," complete the following:

- Describe the conditions that prevented you from conducting the inspection in this location:

- Location(s) where conditions were found:

Condition and Effectiveness of Erosion and Sediment (E&S) Controls				
Type / Location of E&S Control	**Repairs or Other Maintenance Needed?**	**Corrective Action Required?**	**Date on Which Maintenance of Corrective Action First Identified?**	**Notes**
1.	☐ Yes ☐ No	☐ Yes ☐ No		
2.	☐ Yes ☐ No	☐ Yes ☐ No		
3.	☐ Yes ☐ No	☐ Yes ☐ No		
4.	☐ Yes ☐ No	☐ Yes ☐ No		
5.	☐ Yes ☐ No	☐ Yes ☐ No		
6.	☐ Yes ☐ No	☐ Yes ☐ No		
7.	☐ Yes ☐ No	☐ Yes ☐ No		
8.	☐ Yes ☐ No	☐ Yes ☐ No		
9.	☐ Yes ☐ No	☐ Yes ☐ No		

Condition and Effectiveness of Pollution Prevention (P_2) Practices				
Type / Location of P_2 Practices	**Repairs or Other Maintenance Needed?**	**Corrective Action Required?**	**Identification Date**	**Notes**
1.	☐ Yes ☐ No	☐ Yes ☐ No		
2.	☐ Yes ☐ No	☐ Yes ☐ No		
3.	☐ Yes ☐ No	☐ Yes ☐ No		
4.	☐ Yes ☐ No	☐ Yes ☐ No		
5.	☐ Yes ☐ No	☐ Yes ☐ No		
6.	☐ Yes ☐ No	☐ Yes ☐ No		
7.	☐ Yes ☐ No	☐ Yes ☐ No		
8.	☐ Yes ☐ No	☐ Yes ☐ No		
9.	☐ Yes ☐ No	☐ Yes ☐ No		

Stabilization of Exposed Soil			
Stabilization Area	**Stabilization Method**	**Have you Initiated Stabilization?**	**Notes**

1.		☐ YES ☐ NO If yes, provide date:	
2.		☐ YES ☐ NO If yes, provide date:	
3.		☐ YES ☐ NO If yes, provide date:	
4.		☐ YES ☐ NO If yes, provide date:	

Description of Discharges

Was a stormwater discharge or other discharge occurring from any part of your site at the time of the inspection? ☐ YES ☐ NO
If "YES," provide the following information for each point of discharge:

Discharge Locations	**Observations**
1.	Describe the discharge: At points of discharge and the channels and banks of surface waters in the immediate vicinity, are there any visible signs of erosion and / or sediment accumulation that can be attributed to your discharge? ☐ YES. ☐ NO If yes, describe what you see, specify the location(s) where these conditions were found, and indicate whether modification, maintenance, or corrective action is needed to resolve the issue:
2.	Describe the discharge: At points of discharge and the channels and banks of surface waters in the immediate vicinity, are there any visible signs of erosion and / or sediment accumulation that can be attributed to your discharge? ☐ YES. ☐ NO If yes, describe what you see, specify the location(s) where these conditions were found, and indicate whether modification, maintenance, or corrective action is needed to resolve the issue:
3.	Describe the discharge: At points of discharge and the channels and banks of surface waters in the immediate vicinity, are there any visible signs of erosion and / or sediment accumulation that can be attributed to your discharge? ☐ YES. ☐ NO If yes, describe what you see, specify the location(s) where these conditions were found, and indicate whether modification, maintenance, or corrective action is needed to resolve the issue:

Contractor or Subcontractor Certification and Signature

"I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gathered and evaluated the information, submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am, aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations."

Signature of Contractor or Subcontractor: _____ Date**:**

Printed Name and Affiliation:

Certification and Signature by Permittee

"I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gathered and evaluated the information, submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am, aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations."

Signature of Permittee or
"Duly Authorized Representative": _____ **Date:**

Printed Name and Affiliation:

Section A – Initial Report **(Complete this section within 24 hours of discovering the condition that triggered corrective action.)**		
Name of Project:	Tracking Number:	Today's Date
Date Problem First Discovered:	Time Problem First Discovered:	
Name of Individual Completing this Form:	Contact Information:	

What site conditions triggered the requirement to conduct corrective action:

☐ A required stormwater control was never installed, was installed incorrectly, or not in accordance with the requirements in Part 2 and/or Part 3

☐ The stormwater controls that have been installed and maintained are not effective enough for the discharge to meet applicable water quality standards

☐ A prohibited discharge has occurred or is occurring

Provide a description of the problem:

Deadline for completing corrective action (Enter date that is either: (1) no more than 7 calendar days after the date you discovered the problem, or (2) if it is infeasible to complete work within the first 7 days, enter the date that is as soon as practicable following the 7th day):

If your estimated date of completion falls after the 7-day deadline, explain (1) why you believe it is infeasible to complete work within 7 days, and (2) why the date you have established for making the new or modified stormwater control operational is the soonest practicable timeframe:

Section B – Corrective Action Progress
(Complete this section no later than 7 calendar days after discovering the condition that triggered corrective action.)

Section B.1 – Why the Problem Occurred

Cause(s) of Problem (Add an additional sheet if necessary)	How This Was Determined and the Date You Determined the Cause
1.	1.
2.	2.

Section B.2 – Stormwater Control Modifications to be Implemented to Correct the Problem

List of Stormwater control Modification(s) Needed to Correct Problem (Add an additional sheet if necessary)	Completion Date	SWPPP Update Necessary?	Notes
1.		☐ Yes ☐ No Date:	
2.		☐ Yes ☐ No Date:	

Section A – Initial Report **(Complete this section within 24 hours of discovering the condition that triggered corrective action.)**		
Name of Project:	Tracking Number:	Today's Date
Date Problem First Discovered:	Time Problem First Discovered:	
Name of Individual Completing this Form:	Contact Information:	

What site conditions triggered the requirement to conduct corrective action:

☐ A required stormwater control was never installed, was installed incorrectly, or not in accordance with the requirements in Part 2 and/or Part 3

☐ The stormwater controls that have been installed and maintained are not effective enough for the discharge to meet applicable water quality standards

☐ A prohibited discharge has occurred or is occurring

Provide a description of the problem:

Deadline for completing corrective action (Enter date that is either: (1) no more than 7 calendar days after the date you discovered the problem, or (2) if it is infeasible to complete work within the first 7 days, enter the date that is as soon as practicable following the 7th day):

If your estimated date of completion falls after the 7-day deadline, explain (1) why you believe it is infeasible to complete work within 7 days, and (2) why the date you have established for making the new or modified stormwater control operational is the soonest practicable timeframe:

Section B – Corrective Action Progress
(Complete this section no later than 7 calendar days after discovering the condition that triggered corrective action.)

Section B.1 – Why the Problem Occurred	
Cause(s) of Problem (Add an additional sheet if necessary)	How This Was Determined and the Date You Determined the Cause
1.	1.
2.	2.

Section B.2 – Stormwater Control Modifications to be Implemented to Correct the Problem			
List of Stormwater control Modification(s) Needed to Correct Problem (Add an additional sheet if necessary)	Completion Date	SWPPP Update Necessary?	Notes
1.		☐ Yes ☐ No Date:	
2.		☐ Yes ☐ No Date:	

Contractor or Subcontractor Certification and Signature

"I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gathered and evaluated the information, submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am, aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations."

Signature of Contractor or Subcontractor: _____ **Date:**

Printed Name and Affiliation:

Certification and Signature by Permittee

"I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gathered and evaluated the information, submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am, aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations."

Signature of Permittee or
"Duly Authorized Representative": _____ **Date:**

Printed Name and Affiliation:

Temporary Stormwater Section
TCEQ-0602)

Attachment J:
Schedule of Interim and Permanent
Soil Stabilization Practices

Interim Vegetative Stabilization

Interim soil stabilization will not be required.

Permanent Vegetative Stabilization

Construction practices shall disturb the minimal amount of existing ground cover as required for land clearing, grading, and construction activity for the shortest amount of time possible to minimize the potential of erosion and sedimentation from the site. Existing vegetation shall be maintained and left in place until it is necessary to disturb for construction activity. For this project, the following stabilization practices will be implemented:

1. Hydraulic Mulch and Seeding: Disturbed areas subject to erosion shall be stabilized with hydraulic mulch and/or seeded and watered to provide interim stabilization.

2. Sodding and Wood Mulch: As per the project landscaping plan, sodding and wood mulch will be applied to landscaped areas to provide permanent stabilization prior to project completion.

Records of the following shall be maintained:

1. The dates when major grading activities occur,

2. The dates when construction activities temporarily or permanently cease on a portion of the site, and

3. The dates when stabilization measures are initiated.

Stabilization measures must be initiated as soon as practical in portions of the site where construction activities have temporarily or permanently ceased, and except as provided in the following, must be initiated no more than fourteen (14) days after the construction activity in that portion of the site has temporarily or permanently ceased:

Where the initiation of stabilization measures by the 14th day after construction activity temporarily or permanently ceased is precluded by snow cover or frozen ground conditions, stabilization measures must be initiated as soon as practical.

Where construction activity on a portion of the site is temporarily ceased and earth disturbing activities will be resumed within twenty-one (21) days, temporary stabilization measures do not have to be initiated on that portion of the site.

In arid areas (areas with an average rainfall of 0-10 inches), semiarid areas (areas with an average annual rainfall of 10 to 20 inches), and areas experiencing droughts where the initiation of stabilization measures by the 14th day after construction activity has temporarily or permanently ceased is precluded by seasonably arid conditions, stabilization measures must be initiated as soon as practical.

Permanent Stormwater Section
(TCEQ-0600)

Permanent Stormwater Section

Texas Commission on Environmental Quality

for Regulated Activities on the Edwards Aquifer Recharge Zone and Relating to 30 TAC §213.5(b)(4)(C), (D)(Ii), (E), and (5), 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 **Permanent Stormwater Section** is hereby submitted for TCEQ review and executive director approval. The application was prepared by:

Print Name of Customer/Agent: NICK SANDLIN, P.E.

Date: 9/5/2023

Signature of Customer/Agent

Regulated Entity Name: TWELVE OAKS PROFESSIONAL PARK

Permanent Best Management Practices (BMPs)

Permanent best management practices and measures that will be used during and after construction is completed.

1. ☒ Permanent BMPs and measures must be implemented to control the discharge of pollution from regulated activities after the completion of construction.

   ☐ N/A

2. ☒ These practices and measures have been designed, and will be constructed, operated, and maintained to insure 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 prepared or 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 is: _____

☐ N/A

3. ☒ Owners must insure that permanent BMPs and measures are constructed and function as designed. A Texas Licensed Professional Engineer must certify in writing that the permanent BMPs or measures were constructed as designed. The certification letter must be submitted to the appropriate regional office within 30 days of site completion.

   ☐ N/A

4. Where a site is used for low density single-family residential development and has 20 % or less impervious cover, other permanent BMPs are not required. This exemption from permanent BMPs must be recorded in the county deed records, with a notice that if the percent impervious cover increases above 20% or land use changes, the exemption for the whole site as described in the property boundaries required by 30 TAC §213.4(g) (relating to Application Processing and Approval), may no longer apply and the property owner must notify the appropriate regional office of these changes.

   ☐ The site will be used for low density single-family residential development and has 20% or less impervious cover.
   ☐ The site will be used for low density single-family residential development but has more than 20% impervious cover.
   ☒ The site will not be used for low density single-family residential development.

5. The executive director may waive the requirement for other permanent BMPs for multi-family residential developments, schools, or small business sites where 20% or less impervious cover is used at the site. This exemption from permanent BMPs must be recorded in the county deed records, with a notice that if the percent impervious cover increases above 20% or land use changes, the exemption for the whole site as described in the property boundaries required by 30 TAC §213.4(g) (relating to Application Processing and Approval), may no longer apply and the property owner must notify the appropriate regional office of these changes.

   ☐ **Attachment A - 20% or Less Impervious Cover Waiver**. The site will be used for multi-family residential developments, schools, or small business sites and has 20% or less impervious cover. A request to waive the requirements for other permanent BMPs and measures is attached.
   ☐ The site will be used for multi-family residential developments, schools, or small business sites but has more than 20% impervious cover.
   ☒ The site will not be used for multi-family residential developments, schools, or small business sites.

6. ☒ **Attachment B - BMPs for Upgradient 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.

7. ☒ **Attachment C - 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.

8. ☐ **Attachment D - BMPs for Surface Streams**. A description of the BMPs and measures that prevent pollutants from entering surface streams, sensitive features, or the aquifer is attached. Each feature identified in the Geologic Assessment as sensitive has been addressed.

   ☒ N/A

9. ☒ The applicant understands that to the extent practicable, BMPs and measures must maintain flow to naturally occurring sensitive features identified in either the geologic assessment, executive director review, or during excavation, blasting, or construction.

   ☒ The permanent sealing of or diversion of flow from a naturally-occurring sensitive feature that accepts recharge to the Edwards Aquifer as a permanent pollution abatement measure has not been proposed.

   ☐ **Attachment E - Request to Seal Features**. A request to seal a naturally-occurring sensitive feature, that includes, for each feature, a justification as to why no reasonable and practicable alternative exists, is attached.

10. ☒ **Attachment F - Construction Plans**. All construction plans and design calculations for the proposed permanent BMP(s) and measures have been prepared by or under the direct supervision of a Texas Licensed Professional Engineer, and are signed, sealed, and dated. The plans are attached and, if applicable include:

    ☒ Design calculations (TSS removal calculations)
    ☒ TCEQ construction notes
    ☒ All geologic features
    ☒ All proposed structural BMP(s) plans and specifications

    ☐ N/A

11. ☒ **Attachment G - Inspection, Maintenance, Repair and Retrofit Plan**. A plan for the inspection, maintenance, repairs, and, if necessary, retrofit of the permanent BMPs and measures is attached. The plan includes all of the following:

    ☒ Prepared and certified by the engineer designing the permanent BMPs and measures
    ☒ Signed by the owner or responsible party
    ☒ Procedures for documenting inspections, maintenance, repairs, and, if necessary retrofit
    ☒ A discussion of record keeping procedures

    ☐ N/A

12. ☐ **Attachment H - 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

13. ☐ **Attachment I -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 velocities, and other in-stream effects caused by the regulated activity, which increase erosion that results in water quality degradation.

    ☒ N/A

Responsibility for Maintenance of Permanent BMP(s)

Responsibility for maintenance of best management practices and measures after construction is complete.

14. ☒ 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 having ownership or control of the property (such as without limitation, an owner's association, a new property owner or lessee, a district, or municipality) or the ownership of the property is transferred to the entity. Such entity shall then be responsible for maintenance until another entity assumes such obligations in writing or ownership is transferred.

    ☐ N/A

15. ☒ A copy of the transfer of responsibility must be filed with the executive director at the appropriate regional office within 30 days of the transfer if the site is for use as a multiple single-family residential development, a multi-family residential development, or a non-residential development such as commercial, industrial, institutional, schools, and other sites where regulated activities occur.

    ☐ N/A

Permanent Stormwater Section
(TCEQ-0600)

Attachment A:
20% or Less Impervious Cover Waiver (if requested for multi-family, school, or small business site)
(NOT APPLICABLE)

Permanent Stormwater Section
(TCEQ-0600)

Attachment B:
BMPs for Upgradient Stormwater

Permanent Stormwater Section
(TCEQ-0600)

Attachment C:
BMPs for On-Site Stormwater

The Twelve Oaks Professional Park project will increase impervious cover (IC) and the volume of potential on-site stormwater.

Runoff from WQ DA-1 will convey to a Contech Jellyfish Filter BMP that is designed to treat the required water quality volume. WQ DA-2 stormwater will be directed toward the proposed Vegetated Filter Strip for water quality treatment. The Contech Jellyfish Filter will remove more than the required 80% of the increase in TSS load. Refer to the Water Quality Details sheets within the construction plans for all load removal calculations and impervious cover.

Detention for the Twelve Oaks Professional Park development will be handled by the 12 Oaks Village Regional Detention Pond.

Permanent Stormwater Section
(TCEQ-0600)

Attachment D:
BMPs for Surface Streams
(NOT APPLICABLE)

No surface streams flow across the property. No portion of this project is located within the 100-year floodplain as defined by FEMA FIRM Panel No. 48491C0275E dated 09-26-2008.

Permanent Stormwater Section
(TCEQ-0600)

Attachment E:
Request to Seal Features (if sealing a feature)
(NOT APPLICABLE)

Permanent Stormwater Section
(TCEQ-0600)

Attachment F:
Construction Plans

G:\Shared drives\Sandlin Services LLC\Sandlin Services Projects\Land Development Division\01-0089-003 Twelve Oaks\CAD\Construction Sheets\S 120 CVR.dwg-COVER PAGE Printed Sep 06, 2023 at 2:26pm by Scott | Last Saved by: Scott

PROJECT CONTACTS

OWNER:

TWELVE OAKS PROFESSIONAL PARK COMMERCIAL LP.
7801 N. CAPITAL OF TEXAS HWY, SUITE 260
AUSTIN, TX 78731
512-948-5008
CDAHDAH@CADRE-USA.COM
CONTACT: CHARBEL DAHDAH

ENGINEER:

SANDLIN SERVICES, LLC
4501 WHISPERING VALLEY DR. UNIT#27
AUSTIN, TEXAS 78727
806-679-7303
CONTACT: NICHOLAS SANDLIN, P.E.

LAND SURVEYOR:

HR GREEN DEVELOPMENT TX, LLC
5508 HWY 290 WEST, STE 150
AUSTIN, TEXAS 78735
512-872-6696
ERNESTO.NAVARETTE@HRGREEN.COM
CONTACT: ERNESTO NAVARETTE

ARCHITECT:

BLUEFIN DESIGN
14205 N. MOPAC EXPRWY, STE 100B
AUSTIN, TX 78728
865-228-7440
WINCE@BLUEFINDESIGN.COM
CONTACT: STEVEN L. BIEGEL

SURVEY AND BENCHMARK

ALL ELEVATIONS SHOWN HEREON ARE BASED ON THE FOLLOWING BENCHMARKS AND INFORMATION.

BM 1386_9: SQUARE W/ X ETCHED ON CONCRETE TRANSFORMER PAD LOCATED ALONG THE SOUTHWEST ROW LINE OF KAUFFMAN LOOP. EL = 1008.58'

BM 1386_12: SQUARE W/ X ETCHED ON CONCRETE TRANSFORMER PAD LOCATED ALONG THE SOUTHWEST ROW LINE OF KAUFFMAN LOOP. EL = 968.52'

BEARINGS ARE BASED ON THE TEXAS STATE PLAN COORDINATE SYSTEM OF 1983, TEXAS CENTRAL ZONE (NAD 83)

LEGAL DESCRIPTION

GREENLEAF FISK SURVEY, ABSTRACT NO. 5
SEE PLAT SHEET

ZONING AND USE

JURISDICTION:	CITY OF LIBERTY HILL ETJ
ZONING:	N/A
EXISTING LAND USE:	VACANT
PROPOSED LAND USE:	OFFICES

WATERSHED

WATERSHED:	NORTH FORK SAN GABRIEL RIVER

EDWARDS AQUIFER

THIS PROJECT LIES WITHIN THE EDWARDS AQUIFER RECHARGE ZONE AS DEFINED BY THE TEXAS COMMISSION ON ENVIRONMENTAL QUALITY (TCEQ)

FLOODPLAIN NOTE

THE 100-YEAR FLOODPLAIN AS DEFINED BY THE CITY REGULATION, IS CONTAINED WITHIN THE DRAINAGE EASEMENT(S) SHOWN HEREON, "NO/A" PORTION OF THIS TRACT IS WITHIN THE BOUNDARIES OF THE 100-YEAR FLOODPLAIN OF ANY WATERWAY THAT IS WITHIN THE LIMITS OF THE STUDY OF THE FEDERAL INSURANCE ADMINISTRATION FIRM PANEL #48491C0275E , AND INCORPORATED AREAS EFFECTIVE DATE 9/26/2008 FOR WILLIAMSON COUNTY, TEXAS.

UTILITIES

WATER:	CITY OF GEORGETOWN
WASTEWATER:	CITY OF LIBERTY HILL

FIRE DEMAND

FIRE FLOW:	2,750 GPM FOR DURATION OF 2 HOURS
LARGEST BUILDING FIRE AREA:	10,600 SF
BUILDING CONSTRUCTION:	TYPE V-B
HYDRANTS REQUIRED:	3 AT 450' SPACING
CODE OF RECORD:	2021 INTERNATIONAL FIRE CODE

NOTES:

1. ALL RESPONSIBILITY FOR THE ADEQUACY OF THESE PLANS REMAINS WITH THE ENGINEER WHO PREPARED THEM. IN REVIEWING THESE PLANS, THE CITY OF LIBERTY HILL MUST RELY UPON THE ADEQUACY OF THE WORK OF THE DESIGN ENGINEER.
2. RELEASE OF THIS APPLICATION DOES NOT CONSTITUTE A VERIFICATION OF ALL DATA, INFORMATION, AND CALCULATIONS SUPPLIED BY THE APPLICANT. THE ENGINEER OF RECORD IS SOLELY RESPONSIBLE FOR THE COMPLETENESS, ACCURACY, AND ADEQUACY OF HIS/HER SUBMITTAL, WHETHER OR NOT THE APPLICATION IS REVIEWED FOR CODE COMPLIANCE BY CITY ENGINEERS.
3. THIS SITE IS LOCATED WITHIN THE EDWARDS AQUIFER RECHARGE ZONE. A TCEQ WPAP PERMIT IS REQUIRED.
4. WPAP #: XXX, SCS #: XXX
5. SEE TREE LIST FOR TREES LOCATED ONSITE.
6. ANY PROTECTED TREE REMOVED MUST BE MITIGATED ON AN INCH PER INCH BASIS.
7. ANY STREET CLOSURE REQUIRES PRIOR APPROVAL FROM CITY OF LIBERTY HILL TRANSPORTATION DEPARTMENT OR TXDOT.

TWELVE OAKS

SITE DEVELOPMENT IMPROVEMENTS

ADDRESS: 2021 KAUFFMAN LOOP, LIBERTY HILL, TX 78642

SDPXXXX-XXX

APPROVED BY:

BASED ON THE DESIGN ENGINEER'S CERTIFICATION OF COMPLIANCE WITH ALL APPLICABLE CITY, STATE AND FEDERAL REGULATIONS, THE PLANS AND SPECIFICATIONS CONTAINED HEREIN HAVE BEEN REVIEWED AND ARE FOUND TO BE IN COMPLIANCE WITH THE REQUIREMENTS OF THE CITY OF LIBERTY HILL

_____ _____
CURTIS STEGER, P.E. DATE
CITY ENGINEER

_____ _____
JERRY L. MILLARD, JR DIRECTOR OF PLANNING DATE
CITY OF LIBERTY HILL

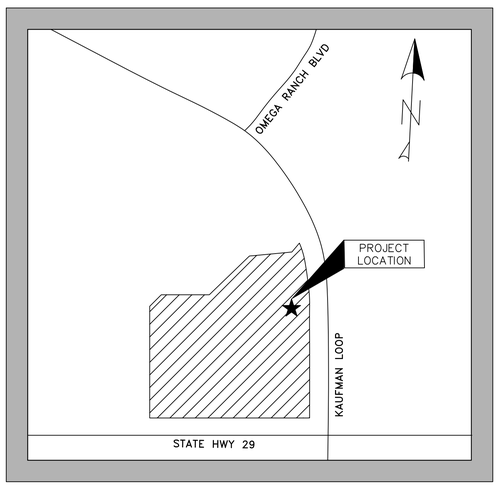
_____ _____
WILLIAMSON COUNTY ESD # 4

_____ _____
LIZ BRANIGAN, MAYOR DATE

_____ _____
ELAINE SIMPSON, CITY SECRETARY DATE

_____ _____
DAVID MUNK DATE
CITY OF GEORGETOWN

23-XXXSDP
SITE DEVELOPMENT PERMIT NUMBER



PROJECT LOCATION MAP
N.T.S.

THIS PROPOSED DEVELOPMENT WILL NOT RESULT IN ANY IDENTIFIABLE ADVERSE IMPACT TO OTHER PROPERTIES. SEE DRAINAGE AREA MAPS AND CALCULATIONS FOR DETAILED ANALYSIS.

SHEET LIST	
NUMBER	TITLE
1	COVER PAGE
2	GENERAL NOTES (1 OF 3)
3	GENERAL NOTES (2 OF 3)
4	GENERAL NOTES (3 OF 3)
5	FINAL PLAT (1 OF 5)
6	FINAL PLAT (2 OF 5)
7	FINAL PLAT (3 OF 5)
8	FINAL PLAT (4 OF 5)
9	FINAL PLAT (5 OF 5)
10	EROSION CONTROL AND DEMOLITION PLAN
11	SITE PLAN
12	TXDOT DRIVEWAY PLAN
13	FIRE PROTECTION PLAN
14	GRADING PLAN (1 OF 2)
15	GRADING PLAN (2 OF 2)
16	EXISTING DRAINAGE AREA MAP BY OTHERS
17	PROPOSED DRAINAGE AREA MAP BY OTHERS
18	STORM SEWER DRAINAGE AREA MAP
19	WATER QUALITY PLAN
20	WATER QUALITY DETAILS (1 OF 2)
21	WATER QUALITY DETAILS (2 OF 2)
22	WATER DISTRIBUTION PLAN
23	WASTEWATER COLLECTION PLAN
24	EROSION CONTROL DETAILS
25	UTILITY DETAILS (1 OF 3)
26	UTILITY DETAILS (2 OF 3)
26	UTILITY DETAILS (3 OF 3)
27	CONSTRUCTION DETAILS (1 OF 3)
28	CONSTRUCTION DETAILS (2 OF 3)
29	CONSTRUCTION DETAILS (3 OF 3)
30	TXDOT DETAILS (1 OF 3)
31	TXDOT DETAILS (2 OF 3)
32	TXDOT DETAILS (3 OF 3)

STATE OF TEXAS
NICHOLAS R. SANDLIN
124404
LICENSED
PROFESSIONAL ENGINEER
9/5/2023

CONTRACTOR NOTES:

1. THE CONTRACTOR SHALL OBTAIN A "NOTICE OF PROPOSED INSTALLATION OF UTILITY LINE" PERMIT FROM THE COUNTY FOR ANY WORK PERFORMED IN THE EXISTING COUNTY RIGHT-OF-WAY (DRIVEWAY APRON, WATER MAIN TIE-IN, ETC.) THIS PERMIT APPLICATION WILL REQUIRE A LIABILITY AGREEMENT, A CONSTRUCTION COST ESTIMATE FOR WORK WITHIN THE RIGHT-OF-WAY INCLUDING PAVEMENT REPAIR (IF NEEDED), A PERFORMANCE BOND, CONSTRUCTION PLANS AND, IF NECESSARY, A TRAFFIC CONTROL PLAN. AN INSPECTION FEE, AND A PRE-CONSTRUCTION MEETING MAY ALSO BE REQUIRED, DEPENDING ON THE SCOPE OF WORK. THE PERMIT WILL BE REVIEWED AND APPROVED BY THE COUNTY ENGINEER, AND MUST ALSO BE APPROVED BY THE COUNTY COMMISSIONERS COURT IF ANY ROAD CLOSURE IS INVOLVED.
2. BY THE ACT OF SUBMITTING A BID FOR THIS PROPOSED CONTRACT, THE BIDDER WARRANTS THAT THE BIDDER, AND ALL SUBCONTRACTORS AND MATERIAL SUPPLIERS HE INTENDS TO USE, HAVE CAREFULLY AND THOROUGHLY REVIEWED THE DRAWINGS, SPECIFICATIONS AND ALL OTHER CONTRACT DOCUMENTS AND HAVE FOUND THEM COMPLETE AND FREE FROM ANY AMBIGUITIES AND SUFFICIENT FOR THE PURPOSE INTENDED. THE BIDDER FURTHER WARRANTS THAT TO THE BEST OF HIS OR HIS SUBCONTRACTORS' AND MATERIAL SUPPLIERS' KNOWLEDGE, ALL MATERIALS AND PRODUCTS SPECIFIED OR INDICATED HEREIN ARE ACCEPTABLE FOR ALL APPLICABLE CODES AND AUTHORITIES.
3. THE LOCATION OF ALL EXISTING UTILITIES SHOWN ON THESE PLANS HAS BEEN BASED UPON RECORD INFORMATION ONLY AND MAY NOT MATCH LOCATIONS AND/OR DEPTHS AS CONSTRUCTED. THE CONTRACTOR SHALL CONTACT THE AUSTIN AREA "ONE CALL" SYSTEM 1-800-245-4545, OR THE OWNER OF EACH INDIVIDUAL UTILITY, FOR ASSISTANCE IN DETERMINING EXISTING UTILITY LOCATIONS AND DEPTHS PRIOR TO BEGINNING ANY CONSTRUCTION. CONTRACTOR SHALL FIELD VERIFY LOCATIONS OF ALL UTILITY CROSSINGS PRIOR TO BEGINNING ANY CONSTRUCTION.
4. ENVIRONMENTAL INSPECTION HAS THE AUTHORITY TO MODIFY/CHANGE EROSION AND SEDIMENTATION CONTROLS TO KEEP THE PROJECT IN COMPLIANCE.
5. THE CONTRACTOR OR SURVEYOR WILL OBTAIN A DIGITAL COPY OF THE CAD FILES THAT REPRESENT THESE IMPROVEMENTS; SANDLIN SERVICES, LLC AND IT'S ASSOCIATES TAKE NO RESPONSIBILITY FOR THE LOCATION OF THESE IMPROVEMENTS IN ANY COORDINATE SYSTEM. DIGITAL FILES USED TO PRODUCE THESE PLANS WERE PARTIALLY CREATED BY PARTIES OTHER THAN SANDLIN SERVICES, LLC AND ARE NOT INTENDED FOR USE IN CONSTRUCTION STAKING. VERTICAL AND HORIZONTAL DATA SHALL BE INDEPENDENTLY VERIFIED BY CONTRACTOR'S R.P.L.S.
6. SANDLIN SERVICES, LLC HAS ENDEAVORED TO DESIGN THESE PLANS COMPLIANT WITH ADA/TDLR AND OTHER ACCESSIBILITY REQUIREMENTS. HOWEVER, THE CONTRACTOR SHALL NOT BE RELIEVED OF ANY RESPONSIBILITY FOR CONSTRUCTING THESE IMPROVEMENTS COMPLIANT WITH ALL APPLICABLE ACCESSIBILITY STANDARDS. IF THE CONTRACTOR NOTICES ANY DISCREPANCIES BETWEEN THESE PLANS AND ACCESSIBILITY LAWS/RULES, HE IS TO STOP WORK IN THE AREA OF CONFLICT AND NOTIFY THE ENGINEER IMMEDIATELY FOR A RESOLUTION AND/OR REVISION TO THESE PLANS. SANDLIN SERVICES, LLC SHALL NOT BE HELD RESPONSIBLE FOR CONSTRUCTING THIS SITE COMPLIANT WITH ACCESSIBILITY LAWS/RULES REGARDLESS OF WHAT IS SHOWN IN THESE PLANS.

TEXAS 811 BEFORE YOU DIG

WARNING !!!! CONTRACTOR TO FIELD VERIFY ALL EXIST. UTILITIES VERTICALLY AND HORIZONTALLY PRIOR TO CONSTRUCTION. THE CONTRACTOR IS TO CONTACT ENGINEER IF ANY EXISTING UTILITY INFORMATION DIFFERS FROM DATA SHOWN IN THE PLANS. CALL 811 BEFORE YOU DIG.

ENGINEERING | CONSULTING
SANDLIN
SERVICES, LLC

TBPELS FIRM #21356
4501 WHISPERING VALLEY DRIVE UNIT 27 AUSTIN, TX 78727

COVER PAGE

PROJECT CASE: XXXXXXX

TWELVE OAKS

CORRECTIONS RECORD

NO.	DESCRIPTION	REVISE (R) ADD (D) VOID (V) SHEET NO.'s	TOTAL # SHEETS IN PLAN SET	NET CHANGE IMP. COVER (sq.ft.)	TOTAL SITE IMP. COVER (sq.ft.)/%	APPROVAL/ DATE	DATE IMAGED

#	REVISION DESCRIPTION	SIGNATURE	DATE

SHEET 1 OF 32

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PAVEMENT RECOMMENDATIONS FORTHCOMING

ABBREVIATIONS AND DEFINITIONS	
A	AREA
ADA	AMERICANS WITH DISABILITIES ACT
AWWA	AMERICAN WATER WORKS ASSOCIATION
B-B	BACK TO BACK
BC	BEGIN CURVE
BC	BACK OF CURB
BCR	BEGIN CURB RETURN
BMP	BEST MANAGEMENT PRACTICE
BVCE	BEGIN VERTICAL CURVE ELEVATION
BVCS	BEGIN VERTICAL CURVE STATION
BW	BOTTOM OF WALL
CFS	CUBIC FEET PER SECOND
CITY	CITY, TOWN, OR OTHER LOCAL APPLICABLE JURISDICTION
CL	CENTERLINE
CONC	CONCRETE
CY	CUBIC YARD
DEMO	DEMOLITION
DG	DECOMPOSED GRANITE
EA	EACH
EC	END CURVE
ECR	END CURB RETURN
EG	EXISTING GROUND/GRADE
EL	ELEVATION
ELEC	ELECTRICAL/ELECTRICITY
EPA	UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
ESMT	EASEMENT
EVCE	END VERTICAL CURVE ELEVATION
EVCS	END VERTICAL CURVE STATION
EX	EXISTING
F-F	FACE TO FACE
FG	FINISHED GRADE/GROUND
FH	FIRE HYDRANT
FL	FLOWLINE
FC	FACE OF CURB
FT	FEET
HGL	HYDRAULIC GRADE LINE
LF	LINEAR FEET
LT	LEFT
MH	MANHOLE
MN	MINUTE/MINIMUM
NOI	NOTICE OF INTENT, REF. TCEQ GENERAL PERMIT
NOT	NOTICE OF TERMINATION, REF. TCEQ GENERAL PERMIT
NTS	NOT TO SCALE
OC	ON CENTER
OFF	OFFSET
OSHA	OCCUPATIONAL SAFETY AND HEALTH ADMINISTRATION
PC	POINT OF CURVATURE
PCC	PORTLAND CEMENT CONCRETE/POINT OF COMPOUND CURVATURE
PG	PROPOSED GRADE
PI	POINT OF INFLECTION
PVMT	PAVEMENT
RCP	REINFORCED CONCRETE PIPE
ROW	RIGHT OF WAY
RT	RIGHT
SF	SQUARE FEET
SS	SANITARY SEWER
SSMH	SANITARY SEWER MANHOLE
STA	STATION
STD	STANDARD
SY	SQUARE YARD
TAS	ARCHITECTURAL BARRIERS TEXAS ACCESSIBILITY STANDARDS
TC	TOP OF CURB
TCEQ	TEXAS COMMISSION OF ENVIRONMENTAL QUALITY
TEMP	TEMPORARY
TXDOT	TEXAS DEPARTMENT OF TRANSPORTATION
TXMUTCD	TEXAS MANUAL OF UNIFORM TRAFFIC CONTROL DEVICES
TW	TOP OF WALL
TYP	TYPICAL
VC	VERTICAL CURVE
WTR	WATER
WW	WASTEWATER

NOTICE: ALTERATION OF A SEALED DRAWING WITHOUT PROPER NOTIFICATION TO THE ENGINEER OF RECORD IS A VIOLATION OF THE TEXAS ENGINEERING PRACTICES ACT

TRENCH EXCAVATION NOTES:

1. THE CONTRACTOR IS RESPONSIBLE FOR OBTAINING AND SUBMITTING A TRENCH SAFETY PLAN, PREPARED BY A PROFESSIONAL ENGINEER IN THE STATE OF TEXAS, TO THE CITY PRIOR TO CONSTRUCTION. CONTRACTOR IS RESPONSIBLE FOR MAINTAINING TRENCH SAFETY REQUIREMENTS IN ACCORDANCE WITH CITY, STATE, AND FEDERAL REQUIREMENTS, INCLUDING OSHA, FOR ALL TRENCHES. THE CONTRACTOR SHALL KEEP TRENCHES FREE FROM WATER.
2. CONTRACTOR AND/OR CONTRACTOR'S INDEPENDENTLY RETAINED EMPLOYEE OR STRUCTURAL DESIGN / GEOTECHNICAL / SAFETY / EQUIPMENT CONSULTANT, IF ANY, SHALL REVIEW THESE PLANS AND ANY AVAILABLE GEOTECHNICAL INFORMATION AND THE ANTICIPATED INSTALLATION SITES WITHIN THE PROJECT WORK AREA IN ORDER TO IMPLEMENT CONTRACTOR'S TRENCH EXCAVATION SAFETY PROTECTION SYSTEMS, PROGRAMS, AND/OR PROCEDURES FOR THE PROJECT DESCRIBED IN THE CONTRACT DOCUMENTS. THE CONTRACTOR'S IMPLEMENTATION OF THESE SYSTEMS, PROGRAMS, AND/OR PROCEDURES SHALL PROVIDE FOR ADEQUATE TRENCH EXCAVATION SAFETY PROTECTION THAT COMPLY WITH AS A MINIMUM, OSHA STANDARDS FOR TRENCH EXCAVATIONS. SPECIFICALLY, CONTRACTOR AND/OR CONTRACTOR'S INDEPENDENTLY RETAINED EMPLOYEE OR SAFETY CONSULTANT SHALL IMPLEMENT A TRENCH SAFETY PROGRAM IN ACCORDANCE WITH OSHA STANDARDS GOVERNING THE PRESENCE AND ACTIVITIES OF INDIVIDUALS WORKING IN AND AROUND TRENCH EXCAVATION.
3. BRACING OF UTILITY POLES MAY BE REQUIRED WHEN TRENCHING OR EXCAVATING IN CLOSE PROXIMITY TO THE POLES AND IS THE RESPONSIBILITY OF THE CONTRACTOR.
4. ALL TRENCH BACKFILL SHALL BE IMPORTED GRANULAR MATERIAL UNLESS EXISTING GRANULAR MATERIALS ARE SPECIFICALLY APPROVED BY THE OWNER'S REPRESENTATIVE.

STORM WATER DISCHARGE AUTHORIZATION

THE CONTRACTOR AND WHERE APPLICABLE SUBCONTRACTORS ARE RESPONSIBLE FOR:

1. COMPLIANCE WITH ALL TCEQ AND EPA STORM WATER POLLUTION PREVENTION REQUIREMENTS.
2. ENSURING THAT ALL PRIMARY OPERATORS SUBMIT A NOI TO TCEQ AT LEAST 7 DAYS PRIOR CONSTRUCTION. AND THEY PROVIDE A COPY OF ALL SIGNED NOI'S TO THE OPERATOR OF ANY MS4 RECEIVING DISCHARGE FROM THE SITE.
3. IMPLEMENTATION OF THE STORM WATER POLLUTION PREVENTION PLAN (SWPPP), IF IT APPLIES, IE. POST SITE NOTICE, INSPECTIONS, DOCUMENTATION AND SUBMISSION OF ANY INFORMATION, SUCH AS NOI, REQUIRED BY TCEQ AND EPA.
4. SIGNING THE REQUIRED CERTIFICATION STATEMENT ACKNOWLEDGING THEIR RESPONSIBILITIES AS STATED IN THE SWPPP IF PROVIDING SERVICES RELATED TO SWPPP.
5. SUBMITTING TO THE CITY, AND RETAINING ON SITE DURING CONSTRUCTION, A COPY OF THE SWPPP INCLUDING NOI, SITE NOTICE, CONTRACTOR CERTIFICATION, AND ANY REVISIONS.
6. PRIMARY OPERATOR IS RESPONSIBLE FOR SUBMITTING A NOTICE OF TERMINATION (NOT) TO TCEQ WITH 30 DAYS AFTER ALL SOIL DISTURBING ACTIVITIES HAVE BEEN COMPLETED AND A VEGETATIVE COVER HAS BEEN ESTABLISHED ON ALL UNPAVED AREA AND ALL AREAS NOT COVERED BY STRUCTURES, A TRANSFER OF OPERATIONAL CONTROL HAS OCCURRED, OR THE OPERATOR HAS AN ALTERNATIVE AUTHORIZATION UNDER A DIFFERENT PERMIT. A COPY OF THE NOT SHALL BE PROVIDED TO THE OPERATOR OF ANY MS4 RECEIVING DISCHARGE FROM THE SITE.

CONSTRUCTION MEANS METHODS& SAFETY PROTECTION NOTES:

THE CONTRACTOR SHALL BE RESPONSIBLE FOR COMPLIANCE WITH ALL FEDERAL, STATE, AND LOCAL LAWS, INCLUDING OSHA STANDARDS AND WITH ANY OTHER APPLICABLE LAWS, ORDINANCES, RULES, REGULATIONS AND ORDERS OF ANY PUBLIC BODY HAVING JURISDICTION FOR THE SAFETY OF PERSONS OR PROPERTY OR TO PROTECT THEM FROM DAMAGE, INJURY OR LOSS. THE CONTRACTOR SHALL PROVIDE ALL SAFEGUARDS, SAFETY DEVICES, AND PROTECTIVE EQUIPMENT AND SHALL BE RESPONSIBLE FOR INITIATING, MAINTAINING, AND SUPERVISING ALL SAFETY PRECAUTIONS AND PROGRAMS UTILIZED BY THE CONTRACTOR AND HIS SUB-CONTRACTORS IN THE PERFORMANCE OF THEIR WORK AND SHALL TAKE ANY OTHER ACTIONS NECESSARY TO PROTECT THE LIFE AND HEALTH OF EMPLOYEES ON THE JOB AND THE SAFETY OF THE PUBLIC AND TO PROTECT PROPERTY IN CONNECTION WITH THE PERFORMANCE OF WORK ON THIS PROJECT.

THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE CONSTRUCTION MEANS, METHODS, TECHNIQUES OR PROCEDURES, EQUIPMENT, AND FOR SAFETY PRECAUTIONS OR PROGRAMS, UNLESS SUCH MEANS AND EQUIPMENT ARE SPECIFIED IN THE CONTRACT DOCUMENTS. THE CONTRACTOR SHALL COMPLY WITH SECTION 108.06 LABOR, METHODS, AND EQUIPMENT OF THE "STANDARD SPECIFICATIONS".

INDEMNIFICATION

THE CONTRACTOR SHALL INDEMNIFY AND HOLD HARMLESS THE OWNER, THE CITY, AND SANDLIN SERVICES, LLC. FROM AND AGAINST ALL CLAIMS, DAMAGES, LOSSES AND EXPENSES INCLUDING ATTORNEY'S FEES ARISING OUT OF OR RESULTING FROM THE PERFORMANCE OF THE CONTRACTOR'S WORK. IN ANY AND ALL CLAIMS AGAINST THE OWNER OR SANDLIN SERVICES, LLC. BY ANY EMPLOYEE OF THE CONTRACTOR OR ANYONE DIRECTLY OR INDIRECTLY EMPLOYED BY THE CONTRACTOR OR ANYONE FOR WHOSE ACTS THE CONTRACTOR MAY LIABLE, THE INDEMNIFICATION OBLIGATION SHALL NOT BE LIMITED IN ANY WAY BY ANY LIMITATION ON THE AMOUNT OF DAMAGES, COMPENSATION, OR BENEFITS PAYABLE BY OR FOR THE CONTRACTOR UNDER WORKER'S COMPENSATION ACTS, DISABILITY BENEFIT ACTS OR OTHER EMPLOYEE BENEFIT ACTS.

SAFETY

1. CONTRACTOR SHALL USE ALL NECESSARY SAFETY PRECAUTIONS TO AVOID CONTACT WITH OVERHEAD AND UNDERGROUND POWER LINES. CONTRACTOR SHALL COMPLY WITH ALL APPLICABLE LOCAL, STATE, FEDERAL, AND UTILITY OWNER REGULATIONS PERTAINING TO WORK SETBACKS FROM POWER LINES.
2. ESTABLISH FIRE ZONES AS SHOWN ON SITE BY PAINTING CURB RED. STENCIL THE WORDS, "FIRE ZONE/TOW-AWAY ZONE", IN WHITE LETTERS AT LEAST 3 INCHES HIGH AT 35-FOOT INTERVALS ALONG THE CURB. ALSO, SIGNS SHALL BE POSTED AT BOTH ENDS OF A FIRE ZONE. ALTERNATE MARKING OF THE FIRE LANES MY BE APPROVED BY THE FIRE CHIEF PROVIDED THE FIRE LANES ARE CLEARLY IDENTIFIED AT BOTH ENDS AND AT INTERVALS NOT TO EXCEED 35 FEET.
3. WARNING ARE REQUIRED TO BE PLACED UNDER THE OVERHEAD ELECTRIC LINES TO MAKE ALL PERSONNEL AWARE OF THE ELECTRIC HAZARD.
4. ALL FDC'S TO BE TWO 2 $\frac{1}{2}$ INCH SIAMESE CONNECTIONS.
5. THE CONTRACTOR SHALL FURNISH, ERECT, AND MAINTAIN MARKINGS AND ASSOCIATED HAZARD WARNING LIGHTS, DELINEATOR FENCE, AND OTHER ASSOCIATED FACILITIES AS REQUIRED FOR OPEN TRENCHES, EXCAVATIONS. TEMPORARY STOCK PILES, AND PARKED CONSTRUCTION EQUIPMENT THAT MAY POSE A POTENTIAL HAZARD AS PART OF THE DAILY OPERATIONS AT THIS SITE. CONTRACTOR IS SOLELY RESPONSIBLE FOR SITE SAFETY.

ACCESSIBLE PARKING NOTE:

1. BEFORE PLACING PAVEMENT, CONTRACTOR SHALL VERIFY THAT SUITABLE HANDICAPPED ROUTES (PER ADA) EXIST TO AND FROM DESIGNATED DOORS. IN NO CASE SHALL HANDICAP RAMP SLOPES EXCEED 1 VERTICAL TO 12 HORIZONTAL. IN NO CASE SHALL SIDEWALK CROSS SLOPES EXCEED 2.0 PERCENT. IN NO CASE SHALL LONGITUDINAL SIDEWALK SLOPES EXCEED 5.0 PERCENT. CONTRACTOR SHALL CONTACT ENGINEER PRIOR TO PAVING IF ANY EXCESSIVE SLOPES ARE ENCOUNTERED. NO CONTRACTOR CHANGE ORDERS WILL BE ACCEPTED FOR ADA COMPLIANCE ISSUES.
2. ALL ACCESSIBLE SPACES AND ACCESSIBLE ROUTES SHALL COMPLY WITH THE TEXAS ACCESSIBILITY STANDARDS (TAS) AND THE CITY REQUIREMENTS.
3. PARKING SPACES AND ACCESS AISLES SHALL BE LEVEL WITH SURFACE SLOPES NOT EXCEEDING 1:50 (2%) IN ALL DIRECTIONS. CURB RAMPS COMPLYING WITH TAS SHALL BE PROVIDED AT ALL PASSENGER LOADING ZONES.
4. EACH ACCESSIBLE PARKING SPACE SHALL BE DESIGNATED AS RESERVED BY A VERTICALLY MOUNTED OR SUSPENDED SIGN SHOWING THE SYMBOL OF ACCESSIBILITY PER TAS. SPACES COMPLYING WITH TAS SHALL HAVE AN ADDITIONAL SIGN "VAN ACCESSIBLE" MOUNTED BELOW THE SYMBOL OF ACCESSIBILITY WHEN REQUIRED.
   (A) CHARACTERS AND SYMBOLS ON SUCH SIGNS SHALL BE LOCATED 60" MINIMUM ABOVE THE GROUND, FLOOR, OR PAVING SURFACE SO THEY CANNOT BE OBSCURED BY A VEHICLE PARKED IN THE SPACE.
   (B) SIGNS LOCATED WITHIN AN ACCESSIBLE ROUTE SHALL COMPLY WITH TAS.
   (C) CHARACTERS AND SYMBOLS ON OVERHEAD SIGNS SHALL COMPLY WITH TAS.
5. SLOPES OF CURB RAMPS SHALL COMPLY WITH TAS. TRANSITIONS FROM RAMPS TO WALKS, GUTTERS, OR STREETS SHALL BE FLUSH AND FREE OF ABRUPT CHANGES. MAXIMUM SLOPES OF ADJOINING GUTTERS, ROAD SURFACE IMMEDIATELY ADJACENT TO THE CURB RAMP, OR ACCESSIBLE ROUTE SHALL NOT EXCEED 1:20.
6. SURFACES OF CURB RAMPS SHALL COMPLY WITH TAS.
   (A) TEXTURES SHALL CONSIST OF EXPOSED CRUSHED STONE AGGREGATE, ROUGHENED CONCRETE, RUBBER, RAISED ABRASIVE STRIPS, OR GROOVES EXTENDING THE FULL WIDTH AND DEPTH OF THE CURB RAMP. SURFACES THAT ARE RAISED, ETCHED, OR GROOVED IN A WAY THAT WOULD ALLOW WATER TO ACCUMULATE ARE PROHIBITED.
   (B) FOR PURPOSES OF WARNING, THE FULL WIDTH AND DEPTH OF CURB RAMPS SHALL HAVE A LIGHT REFLECTIVE VALUE AND TEXTURE THAT SIGNIFICANTLY CONTRASTS WITH THAT OF ADJOINING PEDESTRIAN ROUTES.
7. EVERY HANDICAP ACCESSIBLE PARKING SPACE SHALL BE IDENTIFIED BY A SIGN CENTERED 5 FEET ABOVE THE PARKING SURFACE, AT THE HEAD OF THE PARKING SPACE. THE SIGN MUST INCLUDE THE INTERNATIONAL SYMBOL OF ACCESSIBILITY. SUCH SIGNS SHALL NOT BE OBSCURED BY A VEHICLE PARKED THE SPACE AND SHALL MEET THE CRITERIA SET FORTH IN UBC AND ANSI.
8. SLOPES ON ACCESSIBLE ROUTES MAY NOT EXCEED 1:20 UNLESS DESIGNED AS A RAMP.
9. THE MAXIMUM SLOPE OF A RAMP IN NEW CONSTRUCTION IS 1:12. THE MAXIMUM RISE FOR ANY RAMP RUN IS 30 IN.
10. ACCESSIBLE ROUTES MUST HAVE A CROSS-SLOPE NO GREATER THAN 1:30.
11. GROUND SURFACES ALONG ACCESSIBLE ROUTES MUST BE STABLE, FIRM, AND SLIP RESISTANT.

TRAFFIC CONTROL NOTES:

1. ALL SIGNS, PAVEMENT MARKINGS, AND OTHER TRAFFIC CONTROL DEVICES SHALL CONFORM TO THE "TEXAS MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES".
2. ALL FIRE DEPARTMENT ACCESS DRIVES/ROADS TO HAVE A MINIMUM 14' VERTICAL CLEARANCE.
3. ALL PARKING SPACES SHALL HAVE A MINIMUM 7'-0" VERTICAL CLEARANCE.
4. ALL LANDSCAPED AREAS ARE TO BE PROTECTED BY SIX-INCH WHEEL CURBS, WHEELSTOPS, OR OTHER APPROVED BARRIERS AS PER ECM.
5. ADEQUATE BARRIERS BETWEEN ALL VEHICULAR USE AREAS AND ADJACENT LANDSCAPE AREAS, SUCH AS A 6" CONCRETE CURB ARE REQUIRED. IF A STANDARD 6' CURB AND GUTTER ARE NOT PROVIDED FOR ALL VEHICULAR USE AREAS AND ADJACENT LANDSCAPE AREAS, COMPLY WITH ECM.
6. EACH COMPACT PARKING SPACE/AISLE WILL BE SIGNED "SMALL CAR ONLY".
7. PRIOR TO PERFORMING ANY WORK IN OR ON THE RIGHT OF WAY OF ANY CITY OR STATE ROADWAY, THE CONTRACTOR SHALL NOTIFY THE CITY/STATE TRAFFIC ENGINEER'S OFFICE. THE CONTRACTOR SHALL ERECT WARNING SIGNS AND BARRICADES TO PROTECT THE TRAVELING PUBLIC. THE SIGNING AND BARRICADING SHALL CONFORM TO THE APPROPRIATE APPLICATIONS OUTLINED IN THE MANUAL OF UNIFORM TRAFFIC CONTROL DEVICES OR AS OTHERWISE DIRECTED BY THE CITY/STATE TRAFFIC ENGINEER. IF PERMITS ARE REQUIRED TO CONDUCT THE WORK, THE CONTRACTOR SHALL SECURE THE PERMITS AND SUPPLY THEM TO THE OWNER AT NO ADDITIONAL COST. ALL FULL WIDTH LANE CLOSURES, PARTIAL LANE CLOSURES, OR CONSTRUCTION ADJACENT TO PAVEMENT, SHALL BE IDENTIFIED, SIGNED, AND BARRICADES ERECTED IN CONFORMANCE WITH THE APPLICABLE ARTICLES OF THE STANDARD SPECIFICATIONS AND THE MUNICIPALITY'S REQUIREMENTS. ALL TRAFFIC PROTECTION, BOTH ONSITE AND OFFSITE SHALL BE CONSIDERED INCIDENTAL TO THE CONTRACT.

EARTHWORK NOTES AND REQUIREMENTS:

1. CONTRACTOR IS RESPONSIBLE FOR ALL MATERIALS TESTING AND CERTIFICATION, UNLESS SPECIFIED OTHERWISE BY OWNER. ALL MATERIALS TESTING SHALL BE COORDINATED WITH THE APPROPRIATE CITY INSPECTOR AND COMPLY WITH CITY STANDARD SPECIFICATIONS AND GEOTECHNICAL REPORT. TESTING SHALL BE PERFORMED BY AN APPROVED INDEPENDENT AGENCY FOR TESTING MATERIALS. OWNER SHALL APPROVE THE AGENCY NOMINATED BY THE CONTRACTOR FOR MATERIALS TESTING.
2. ALL COPIES OF MATERIALS TEST RESULTS SHALL BE SENT TO THE OWNER, ENGINEER AND ARCHITECT DIRECTLY FROM THE TESTING AGENCY.
3. IT SHALL BE THE CONTRACTOR'S RESPONSIBILITY TO SHOW, BY THE STANDARD TESTING PROCEDURES OF THE MATERIALS, THAT THE WORK CONSTRUCTED MEETS THE PROJECT REQUIREMENTS AND CITY SPECIFICATIONS.
4. DUE TO THE POTENTIAL FOR DIFFERENTIAL SOIL MOVEMENT ADJACENT TO THE BUILDING, THE CONTRACTOR SHALL ADHERE TO THE GEOTECHNICAL REPORT'S RECOMMENDATION FOR SUBGRADE PREPARATION SPECIFIC TO FLATWORK ADJACENT TO THE BUILDING. THE OWNER AND CONTRACTOR ARE ADVISED TO OBTAIN A GEOTECHNICAL ENGINEER RECOMMENDATION SPECIFIC TO FLATWORK ADJACENT TO THE BUILDING, IF NONE IS CURRENTLY EXISTING.
5. THE CONTRACTOR SHALL COMPLY WITH ALL LOCAL, STATE, AND FEDERAL EROSION CONTROL AND WATER QUALITY REQUIREMENTS.
6. A RETAINING WALL OVER 4 FEET IN HEIGHT MEASURED FROM THE BOTTOM OF THE FOOTING TO THE TOP OF THE WALL SHALL BE ENGINEERED AND REQUIRE A SEPARATE BUILDING PERMIT.
7. CONTRACTOR SHALL REMOVE EARTHEN MATERIAL, EXISTING SURFACES, AND STRUCTURES AS REQUIRED. ALL WASTE MATERIAL SHALL BE PROPERLY DISPOSED OFF-SITE AND SHALL BE INCIDENTAL TO THE CONTRACT.
8. ALL AGGREGATE BASE COURSE SHALL BE COMPACTED TO 95% STANDARD PROCTOR DENSITY MAXIMUM DRY DENSITY WITHIN 2 PERCENT OF OPTIMUM MOISTURE CONTENT.

GENERAL NOTES AND REQUIREMENTS:

1. ALL CONTRACTORS MUST CONFINE THEIR ACTIVITIES TO THE WORK AREA. NO ENCROACHMENTS OUTSIDE OF THE WORK AREA WILL BE ALLOWED. ANY DAMAGE RESULTING THEREFROM SHALL BE CONTRACTOR'S SOLE RESPONSIBILITY TO REPAIR.
2. THE CONTRACTOR SHALL PROTECT ALL EXISTING STRUCTURES, UTILITIES, MANHOLES, POLES, GUY WIRES, VALVE COVERS, VAULT LIDS, FIRE HYDRANTS, COMMUNICATION BOXES/PEDESTALS, AND OTHER FACILITIES TO REMAIN, AND SHALL REPAIR ANY DAMAGES AT NO COST TO THE OWNER.
3. THE CONTRACTOR SHALL IMMEDIATELY REPAIR OR REPLACE ANY PHYSICAL DAMAGE TO PRIVATE PROPERTY OR PUBLIC IMPROVEMENTS, INCLUDING BUT NOT LIMITED TO: FENCES, WALLS, SIGNS, PAVEMENT, CURBS, UTILITIES, SIDEWALKS, GRASS,TREES, LANDSCAPING, AND IRRIGATION SYSTEMS, ETC.... TO ORIGINAL CONDITION OR BETTER AT NO COST TO THE OWNER.
4. ALL AREAS IN EXISTING RIGHT-OF-WAY DISTURBED BY SITE CONSTRUCTION SHALL BE REPAIRED TO ORIGINAL CONDITION OR BETTER, INCLUDING AS NECESSARY, GRADING, LANDSCAPING, CULVERTS, AND PAVEMENT.
5. THE CONTRACTOR SHALL SALVAGE ALL EXISTING POWER POLES, SIGNS, WATER VALVES, FIRE HYDRANTS, METERS, ETC... THAT ARE TO BE RELOCATED DURING CONSTRUCTION.
6. CONTRACTOR SHALL MAINTAIN ADEQUATE SITE DRAINAGE DURING ALL PHASES OF CONSTRUCTION, INCLUDING MAINTAINING EXISTING DITCHES OR CULVERTS FREE OF OBSTRUCTIONS AT ALL TIMES.
7. SITE SAFETY IS SOLELY THE RESPONSIBILITY OF THE CONTRACTOR.
8. THESE PLANS DO NOT EXTEND TO OR INCLUDE DESIGNS OR SYSTEMS PERTAINING TO THE SAFETY OF THE CONTRACTOR OR ITS EMPLOYEES, AGENTS, OR REPRESENTATIVES IN THE PERFORMANCE OF THE WORK. THE ENGINEER'S SEAL HEREON DOES NOT EXTEND TO ANY SUCH SAFETY SYSTEM. THE CONTRACTOR SHALL BE RESPONSIBLE FOR ALL REQUIRED SAFETY PROCEDURES AND PROGRAMS.
9. SIGNS RELATED TO SITE OPERATION OR SAFETY ARE NOT INCLUDED IN THESE PLANS.
10. CONTRACTOR OFFICE AND STAGING AREA SHALL BE AGREED ON BY THE OWNER AND CONTRACTOR PRIOR TO BEGINNING OF CONSTRUCTION. CONTRACTOR IS RESPONSIBLE FOR ALL PERMITTING REQUIREMENTS FOR THE CONSTRUCTION OFFICE, TRAILER, STORAGE, AND STAGING OPERATIONS AND LOCATIONS.
11. LIGHT POLES, SIGNS, AND OTHER OBSTRUCTIONS SHALL NOT BE PLACED IN ACCESSIBLE ROUTES.
12. TOP RIM ELEVATIONS OF ALL EXISTING AND PROPOSED MANHOLES SHALL BE COORDINATED WITH TOP OF PAVEMENT OR FINISHED GRADE AND SHALL BE ADJUSTED TO BE FLUSH WITH THE ACTUAL FINISHED GRADE AT THE TIME OF PAVING.
13. CONTRACTOR SHALL ADJUST ALL EXISTING AND PROPOSED VALVES, FIRE HYDRANTS, AND OTHER UTILITY APPURTENANCES TO MATCH ACTUAL FINISHED GRADES AT THE TIME OF PAVING.
14. THE CONTRACTOR IS RESPONSIBLE FOR CONSTRUCTION SEQUENCING AND PHASING AND SHALL CONTACT THE APPROPRIATE CITY OFFICIALS, INCLUDING BUILDING OFFICIAL, ENGINEERING INSPECTOR, AND FIRE MARSHALL TO LEARN OF ANY REQUIREMENTS.
15. CONTRACTOR IS RESPONSIBLE FOR PREPARATION, SUBMITTAL, AND APPROVAL BY THE CITY OF A TRAFFIC CONTROL PLAN PRIOR TO THE START OF CONSTRUCTION, AND THEN THE IMPLEMENTATION OF THE PLAN.
16. THE CONTRACTOR SHALL VISIT THE SITE PRIOR TO BIDDING TO DETERMINE EXISTING CONDITIONS.
17. THE CONTRACTOR SHALL BE RESPONSIBLE FOR PROVIDING AS-BUILT PLANS TO THE ENGINEER AND CITY IDENTIFYING ALL DEVIATIONS AND VARIATIONS FROM THESE PLANS MADE DURING CONSTRUCTION.
18. THE CONTRACTOR SHALL COMPLY WITH ALL LOCAL, STATE, AND FEDERAL EROSION CONTROL AND WATER QUALITY REQUIREMENTS.
19. PRIOR TO COMMENCEMENT OF CONSTRUCTION, THE CONTRACTOR SHALL VERIFY ALL DIMENSIONS AND CONDITIONS AFFECTING THEIR WORK WITH THE ACTUAL CONDITION AT THE PROJECT SITE. IN ADDITION, THE CONTRACTOR MUST VERIFY THE ENGINEER'S LINE AND GRADE STAKES. IF THERE ARE ANY DISCREPANCIES FROM WHAT IS SHOWN ON THE CONSTRUCTION PLANS, THE CONTRACTOR MUST IMMEDIATELY PROVIDE THE INFORMATION TO THE ENGINEER BEFORE DOING ANY WORK, OTHERWISE, THE CONTRACTOR ASSUMES FULL RESPONSIBILITY. IN THE EVENT OF A DISAGREEMENT BETWEEN THE CONSTRUCTION PLANS, STANDARD SPECIFICATIONS, AND/OR DETAILS. THE CONTRACTOR SHALL SECURE WRITTEN INSTRUCTIONS FROM THE ENGINEER PRIOR TO PROCEEDING WITH ANY PART OF THE WORK AFFECTED BY OMISSIONS OR DISCREPANCIES. IF THE CONTRACTOR FAILS TO SECURE WRITTEN INSTRUCTIONS FROM THE ENGINEER, THE CONTRACTOR WILL BE CONSIDERED TO HAVE PROCEEDED AT THEIR OWN RISK AND EXPENSE. IN THE EVENT OF ANY DOUBT OR QUESTION ARISING WITH RESPECT TO SPECIFICATIONS, THE DECISION OF THE ENGINEER SHALL BE FINAL.
20. THE CONTRACTOR SHALL COMPLY WITH JURISDICTIONAL "GENERAL NOTES" FOR CONSTRUCTION, JURISDICTIONAL NOTES SHALL SUPERCEDE ANY CONFLICT WITH THE SANDLIN SERVICES, LLC. NOTES.
21. IT IS THE CONTRACTOR'S RESPONSIBILITY TO CONTACT THE VARIOUS UTILITY COMPANIES WHICH MAY HAVE BURIED OR AERIAL UTILITIES WITH OR NEAR THE CONSTRUCTION AREA BEFORE COMMENCING WORK TO HAVE THEM LOCATE THEIR EXISTING UTILITIES PRIOR TO CONSTRUCTION. CONTRACTOR SHALL USE EXTREME CAUTION AS THE SITE CONTAINS VARIOUS KNOWN AND UNKNOWN PUBLIC AND PRIVATE UTILITIES.
22. CONTRACTOR SHALL COORDINATE ALL UTILITY LINE CROSSINGS TO ENSURE ALL PIPES MAINTAIN MINIMUM COVER, MINIMUM CLEARANCES, AND PROPER SEPARATION.
23. THE LOCATIONS, ELEVATIONS, DEPTH, AND DIMENSIONS OF EXISTING UTILITIES SHOWN ON THE PLANS WERE OBTAINED FROM AVAILABLE UTILITY COMPANY MAPS AND PLANS, AND ARE CONSIDERED APPROXIMATE. THE ENGINEER SHALL BE NOTIFIED WHEN A PROPOSED IMPROVEMENT CONFLICTS WITH AN EXISTING UTILITY.
24. THE CONTRACTOR IS RESPONSIBLE FOR COORDINATING ANY ADJUSTMENTS AND RELOCATIONS OF EXISTING UTILITIES THAT CONFLICT WITH THE PROPOSED IMPROVEMENTS THAT MAY BE ENCOUNTERED THAT ARE UNKNOWN AT THIS TIME AND NOT SHOWN ON THESE PLANS. CONTRACTOR SHALL ARRANGE FOR OR PROVIDE, ALL GAS, TELECOMMUNICATIONS, CABLE, OVERHEAD AND UNDERGROUND POWER LINE, AND UTILITY POLE ADJUSTMENTS NEEDED. CONTRACTOR IS RESPONSIBLE FOR COORDINATING INSTALLATION OF FRANCHISE UTILITIES THAT ARE NECESSARY FOR ON-SITE AND OFF-SITE CONSTRUCTION, AND SERVICE TO THE PROPOSED DEVELOPMENT.
25. THE IMPLIED PRESENCE OR ABSENCE OF UTILITIES IS NOT TO BE CONSTRUED BY THE OWNER, ENGINEER, CONTRACTOR, OR SUBCONTRACTORS TO BE AN ACCURATE AND COMPLETE REPRESENTATION OF UTILITIES THAT MAY OR MAY NOT EXIST ON THE CONSTRUCTION SITE. BURIED AND ABOVE GROUND UTILITY LOCATION, IDENTIFICATION AND MARKING IS THE SOLE RESPONSIBILITY OF THE CONTRACTOR. REROUTING, DISCONNECTION, PROTECTION, ETC. OF ANY UTILITIES MUST BE COORDINATED BETWEEN THE CONTRACTOR, UTILITY COMPANY, AND OWNER. SITE SAFETY, INCLUDING THE AVOIDANCE OF HAZARDS ASSOCIATED WITH BURIED AND ABOVE GROUND UTILITIES, REMAINS THE SOLE RESPONSIBILITY OF THE THE CONTRACTOR. THE CONTRACTOR SHALL BE RESPONSIBLE FOR PROTECTING UTILITY PROPERTY FROM CONSTRUCTION OPERATIONS.
26. THE CONTRACTOR TO FIELD VERIFY LOCATION AND ELEVATION OF ALL EXISTING UTILITIES PRIOR TO CONSTRUCTION.
27. THE CONTRACTOR SHALL BE FULLY RESPONSIBLE FOR ALL DAMAGES DUE TO THE CONTRACTOR'S FAILURE TO EXACTLY LOCATE AND PRESERVE ALL UTILITIES. THE OWNER OR ENGINEER WILL ASSUME NOT LIABILITY FOR ANY DAMAGES SUSTAINED OR COST INCURRED BECAUSE OF THE OPERATIONS IN THE VICINITY OF EXISTING UTILITIES OR STRUCTURES.

21. ALL SHOP DRAWINGS AND OTHER DOCUMENTS THAT REQUIRE ENGINEER REVIEW SHALL BE SUBMITTED BY THE CONTRACTOR SUFFICIENTLY IN ADVANCE OF CONSTRUCTION OF THAT ITEM, SO THAT NO LESS THAN 10 BUSINESS DAYS FOR REVIEW AND RESPONSE IS AVAILABLE.
22. ALL NECESSARY INSPECTIONS AND/OR CERTIFICATIONS REQUIRED BY CODES, JURISDICTIONAL AGENCIES, AND/OR UTILITY SERVICE COMPANIES SHALL BE PERFORMED PRIOR TO USE OF THE FACILITY AND THE FINAL CONNECTION OF SERVICES.
23. CONTRACTOR SHALL ARRANGE FOR REQUIRED CITY INSPECTIONS.
24. CONTRACTOR'S BID PRICE SHALL INCLUDE ALL INSPECTION FEE.
25. ALL SYMBOLS SHOWN ON THESE PLANS ARE FOR PRESENTATION PURPOSES ONLY AND ARE NOT TO SCALE. CONTRACTOR SHALL COORDINATE FINAL SIZES AND LOCATIONS WITH APPROPRIATE CITY INSPECTOR.REFER TO ARCHITECTURAL AND STRUCTURAL PLANS FOR ALL FINAL BUILDING DIMENSIONS.
26. COMPLIANCE WITH COMMERCIAL AND MULTI-FAMILY RECYCLING ORDINANCE IS MANDATORY FOR MULTI-FAMILY COMPLEXES WITH 100 OR MORE UNITS AND BUSINESSES WITH 100 OR MORE EMPLOYEES.
27. CONTRACTOR PARKING AND LAYDOWN AREAS SHALL BE COORDINATED WITH THE OWNER.
28. THE CONTRACTOR SHALL PROVIDE ANY FINANCIAL SURETIES REQUIRED AS PART OF ANY PERMIT.
29. CONTRACTOR SHALL BE RESPONSIBLE FOR PREPARING AND SUBMITTING ELECTRONIC AS-BUILT DRAWINGS FOR UTILITIES AND DETENTION AREAS TO THE OWNER AND ENGINEER FOR REVIEW AND APPROVAL PRIOR TO PROJECT ACCEPTANCE.
30. CONTRACTOR SHALL SUBMIT SHOP DRAWINGS FOR ALL ITEMS INCORPORATED INTO THE WORK FOR ENGINEER REVIEW AND APPROVAL OF MINIMUM OF 4 WEEKS PRIOR TO ORDERING.
31. REFERENCES TO "INSPECTION" OR "INSPECTOR" IN THE SPECIFICATIONS SHALL NOT CREATE, IMPOSE, OR GIVE RISE TO ANY DUTY OWED BY THE OWNER OR ENGINEER TO THE CONTRACTOR, ANY SUBCONTRACTOR, OR ANY SUPPLIER. ALL IMPROVEMENTS SHALL BE SUBJECT TO INSPECTION BY A DULY AUTHORIZED AND QUALIFIED OWNER'S REPRESENTATIVE BOTH DURING THE COURSE OF CONSTRUCTION AND AFTER CONSTRUCTION IS COMPLETE. THE INSPECTOR SHALL HAVE AUTHORITY OVER MATERIALS OF CONSTRUCTION, METHODS OF CONSTRUCTION, AND WORKMANSHIP, TO ENSURE COMPLIANCE WITH WORKING DRAWINGS AND SPECIFICATIONS. THE CONTRACTOR SHALL PROVIDE FOR REASONABLE TESTS AND PROOF OF QUALITY OF MATERIALS AS REQUESTED BY THE INSPECTOR. UPON DUE CAUSE, WHICH SHALL INCLUDE WEATHER CONDITION, WORKMANSHIP OR NON-ADHERENCE TO THE APPROVED PLANS AND SPECIFICATIONS, THE INSPECTOR SHALL HAVE THE AUTHORITY TO STOP CONSTRUCTION.
32. WHERE SECTION, SUB-SECTION, SUBDIVISION, OR PROPERTY MONUMENTS ARE ENCOUNTERED, THE OWNER'S REPRESENTATIVE SHALL BE NOTIFIED BEFORE SUCH MONUMENTS ARE REMOVED. THE CONTRACTOR SHALL PROTECT AND PRESERVE ALL PROPERTY MARKERS UNTIL AN OWNER OR AUTHORIZED SURVEYOR HAS WITNESSED OR REFERENCED THEIR LOCATION.
33. CONTRACTOR SHALL NOTIFY THE APPROPRIATE AGENCY A MINIMUM OF 48 HOURS PRIOR TO CONNECTING TO OR INSTALLING ANY PUBLIC SEWER OR WATER MAINS.

BUILDING COORDINATION & CONSTRUCTION NOTES:

1. THE SCOPE OF WORK FOR THE CIVIL IMPROVEMENTS SHOWN ON THESE PLANS TERMINATES 5-FEET FROM THE BUILDING. REFERENCE THE BUILDING PLANS (E.G. ARCHITECTURAL, STRUCTURAL, MEP) FOR AREAS WITH 5-FEET OF THE BUILDING AND WITHIN THE BUILDING FOOTPRINT.
2. REFER TO ARCHITECTURAL AND STRUCTURAL PLANS FOR ALL FINAL BUILDING DIMENSIONS.
3. THE PROPOSED BUILDING FOOTPRINT(S) SHOWN IN THESE PLANS WAS PROVIDED TO SANDLIN SERVICES, LLC. BY THE PROJECT ARCHITECT AT THE TIME THESE PLANS WERE PREPARED. IT MAY NOT BE THE FINAL CORRECT VERSION BECAUSE THE BUILDING DESIGN ONGOING. THE CONTRACTOR IS SOLELY RESPONSIBLE FOR CONFIRMING THE FINAL CORRECT VERSION OF THE BUILDING FOOTPRINT WITH THE ARCHITECT AND STRUCTURAL ENGINEER PRIOR TO LAYOUT. DIMENSIONS AND/OR COORDINATES SHOWN ON THESE PLANS WERE BASED ON THE ABOVE STATED ARCHITECTURAL FOOTPRINT, AND ARE THEREFORE A PRELIMINARY LOCATION OF THE BUILDING. THE CONTRACTOR IS SOLELY RESPONSIBLE TO VERIFY WHAT PART OF THE BUILDING THE ARCHITECT'S FOOTPRINT REPRESENTS (E.G. SLAB, OUTSIDE WALL, MASONRY LEDGE, ETC....) AND TO CONFIRM ITS FINAL POSITION ON THE SITE BASED ON THE FINAL ARCHITECTURAL FOOTPRINT, CIVIL DIMENSION CONTROL PLAN, SURVEY BOUNDARY AND/OR PLAT. ANY DIFFERENCES FOUND SHALL BE REPORTED TO SANDLIN SERVICES, LLC. IMMEDIATELY.
4. ALL CONSTRUCTION AND MATERIALS SHALL BE IN ACCORDANCE WITH THESE PLANS, LOCAL JURISDICTION STANDARD DETAILS AND SPECIFICATIONS, THE FINAL GEOTECHNICAL REPORT, AND ALL ISSUED ADDENDA, AND COMMONLY ACCEPTED CONSTRUCTION STANDARDS. THE CITY SPECIFICATIONS SHALL GOVERN WHERE OTHER SPECIFICATIONS DO NOT EXIST. IN CASE OF CONFLICTING SPECIFICATIONS OR DETAILS, THE MORE SPECIFICATION AND DETAILS SHALL BE FOLLOWED.
5. THE CONTRACTOR SHALL FURNISH ALL MATERIAL AND LABOR TO CONSTRUCT THE FACILITY AS SHOWN AND DESCRIBED IN THE CONSTRUCTION DOCUMENTS IN ACCORDANCE WITH ALL APPROPRIATE AUTHORITIES' SPECIFICATIONS AND REQUIREMENTS.
6. THE EXISTING CONDITIONS SHOWN ON THESE PLANS WERE PROVIDED BY THE TOPOGRAPHIC SURVEY PREPARED BY THE PROJECT SURVEYOR, AND ARE BASED ON THE BENCHMARKS SHOWN. THE CONTRACTOR SHALL REFERENCE THE SAME BENCHMARKS. THE CONTRACTOR SHALL REVIEW AND VERIFY THE EXISTING TOPOGRAPHIC SURVEY SHOWN ON THE PLANS REPRESENTS THE EXISTING FIELD CONDITIONS PRIOR TO CONSTRUCTION, AND SHALL REPORT ANY DISCREPANCIES FOUND TO THE OWNER AND ENGINEER IMMEDIATELY.
7. ALL CONSTRUCTION SURVEYING AND STAKING SHALL BE PROVIDED BY THE GENERAL CONTRACTOR.
8. CONTRACTOR SHALL VERIFY HORIZONTAL AND VERTICAL CONTROL, INCLUDING BENCHMARKS, PRIOR TO COMMENCING CONSTRUCTION OR STAKING OF IMPROVEMENTS.
9. PRIOR TO COMMENCEMENT OF CONSTRUCTION, THE CONTRACTOR SHALL VERIFY ALL DIMENSIONS AND CONDITIONS AFFECTING THEIR WORK WITH THE ACTUAL CONDITION AT THE PROJECT SITE. IN ADDITION, THE CONTRACTOR MUST VERIFY THE ENGINEER'S LINE AND GRADE STAKES. IF THERE ARE ANY DISCREPANCIES FROM WHAT IS SHOWN ON THE CONSTRUCTION PLANS, THE CONTRACTOR MUST IMMEDIATELY PROVIDE THE INFORMATION TO THE ENGINEER BEFORE DOING ANY WORK, OTHERWISE, THE CONTRACTOR ASSUMES FULL RESPONSIBILITY. IN THE EVENT OF A DISAGREEMENT BETWEEN THE CONSTRUCTION PLANS, STANDARD SPECIFICATIONS, AND/OR DETAILS. THE CONTRACTOR SHALL SECURE WRITTEN INSTRUCTIONS FROM THE ENGINEER PRIOR TO PROCEEDING WITH ANY PART OF THE WORK AFFECTED BY OMISSIONS OR DISCREPANCIES. IF THE CONTRACTOR FAILS TO SECURE WRITTEN INSTRUCTIONS FROM THE ENGINEER, THE CONTRACTOR WILL BE CONSIDERED TO HAVE PROCEEDED AT THEIR OWN RISK AND EXPENSE. IN THE EVENT OF ANY DOUBT OR QUESTION ARISING WITH RESPECT TO SPECIFICATIONS, THE DECISION OF THE ENGINEER SHALL BE FINAL.
10. THE CONTRACTOR SHALL REVIEW ALL DIMENSIONS, ELEVATIONS, AND FIELD CONDITIONS THAT MAY AFFECT CONSTRUCTION. ANY DISCREPANCIES ON THE DRAWINGS SHALL BE BROUGHT TO THE ATTENTION OF THE ARCHITECT AND ENGINEER IMMEDIATELY.
11. NO FIELD CHANGES OR DEVIATION FROM DESIGN ARE TO BE MADE WITHOUT PRIOR APPROVAL OF THE ARCHITECT, ENGINEER, OWNER, AND IF APPLICABLE THE CITY,
12. THE CONTRACTOR SHALL THOROUGHLY CHECK COORDINATION OF CIVIL, LANDSCAPE, MEP, ARCHITECTURAL, AND OTHER PLANS, PRIOR TO COMMENCING CONSTRUCTION AND NOTIFY OWNER/ENGINEER OF ANY DISCREPANCY PRIOR TO COMMENCING WITH CONSTRUCTION.
13. THE CONTRACTOR SHALL BE RESPONSIBLE TO OBTAIN ALL REQUIRED CONSTRUCTION PERMITS, APPROVALS, AND BONDS PRIOR TO CONSTRUCTION.
14. THE CONTRACTOR SHALL HAVE AVAILABLE AT THE JOB SITE AT ALL TIMES A COPY OF THE CONTRACT DOCUMENTS INCLUDING PLANS, GEOTECHNICAL REPORT AND ADDENDA, PROJECT AND CITY SPECIFICATIONS, AND SPECIAL CONDITIONS, COPIES OF ANY REQUIRED CONSTRUCTION PERMITS, EROSION CONTROL PLANS, SWPPP, AND INSPECTION REPORTS.
15. THE CONTRACTOR SHALL KEEP A NEAT AND ACCURATE RECORD OF CONSTRUCTION, INCLUDING ANY DEVIATIONS OR VARIANCES FROM THE PLANS.
16. THE CONTRACTOR SHALL BE RESPONSIBLE FOR PROVIDING AS-BUILT PLANS TO THE ENGINEER AND CITY IDENTIFYING ALL DEVIATIONS AND VARIATIONS FROM THESE PLANS MADE DURING CONSTRUCTION.
17. THE CONTRACTOR TO COORDINATE WITH PROJECT ARBORIST TO TRIM TREES TO ENSURE VISIBILITY NEAR PARKING AREAS.
18. ALL DIMENSIONS ARE TO FACE OF CURB UNLESS OTHERWISE NOTED.
19. ALL RADII TO BE 2' UNLESS OTHERWISE NOTED.
20. ALL ON-SITE UTILITIES SHALL BE LOCATED UNDERGROUND UNLESS REQUIRED BY THE UTILITY TO BE OTHERWISE LOCATED.
21. SIDEWALKS CITY PARK ROAD ARE REQUIRED TO BE CONSTRUCTED BY THE PROPERTY OWNER AFTER THE ABUTTING ROADWAY IS IMPROVED AND CONCRETE CURBS ARE IN PLACE.
22. WHEN CONCRETE IS PLACED ABUTTING STRUCTURES, FOUNDATIONS OR EXISTING SIDEWALKS, A BOND BREAKER CONSISTING OF 1" PJF AND ELASTOMERIC SEALANT SHALL BE USED FULL DEPTH UNTIL OTHERWISE NOTED.
23. SIDEWALK RAMPS FOR ADA SHALL BE IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS.
24. CONSTRUCTION STAKING, LAYOUT, AND GRADING SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR USING THE BASIC TOPOGRAPHIC SURVEY CONTROLS. CONTRACTOR SHALL VERIFY SURVEY CONTROLS PRIOR TO BEGINNING CONSTRUCTION. ANY DISCREPANCIES IN THE SURVEY CONTROLS SHALL BE REPORTED TO THE OWNER AND ENGINEER PRIOR TO CONSTRUCTION. ANY ADDITIONAL SURVEY CONTROLS REQUIRED FOR CONSTRUCTION SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR.
25. ANY SIDEWALKS, FENCES, AND OTHER ITEMS NOT SHOWN TO BE REMOVED, BUT DAMAGED DURING CONSTRUCTION, SHALL BE REPAIRED BY THE CONTRACTOR AT NO COST TO THE OWNER.

STATE OF TEXAS
NICHOLAS R. SANDLIN
124404
LICENSED
PROFESSIONAL ENGINEER
9/5/2023

TEXAS 811 BEFORE YOU DIG

WARNING !!!! CONTRACTOR TO FIELD VERIFY ALL EXIST. UTILITIES VERTICALLY AND HORIZONTALLY PRIOR TO CONSTRUCTION. THE CONTRACTOR IS TO CONTACT ENGINEER IF ANY EXISTING UTILITY INFORMATION DIFFERS FROM DATA SHOWN IN THE PLANS. CALL 811 BEFORE YOU DIG.

ENGINEERING | CONSULTING
SANDLIN
SERVICES, LLC

TBPELS FIRM #21356
4501 WHISPERING VALLEY DRIVE UNIT 27 AUSTIN, TX 78727

GENERAL NOTES (1 OF 3)

PROJECT CASE: XXXXXXX

TWELVE OAKS

#	REVISION DESCRIPTION	SIGNATURE	DATE

SHEET 2 OF 32

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

Edwards Aquifer Protection Program Construction Notes – Legal Disclaimer

The following/listed "construction notes" are intended to be advisory in nature only and do not constitute an approval or conditional approval by the Executive Director, nor do they constitute a comprehensive listing of rules or conditions to be followed during construction. Further actions may be required to achieve compliance with TCEQ regulations found in Title 30, Texas Administrative Code, Chapters 213 and 217, as well as local ordinances and regulations providing for the protection of water quality. Additionally, nothing contained in the following/listed "construction notes" restricts the powers of the Executive Director, the commission or any other governmental entity to prevent, correct, or curtail activities that result or may result in pollution of the Edwards Aquifer or hydrologically connected surface waters. The holder of any Edwards Aquifer Protection Plan containing "construction notes" is still responsible for compliance with Title 30, Texas Administrative Code, Chapters 213 or any other applicable TCEQ regulation, as well as all conditions of an Edwards Aquifer Protection Plan through all phases of plan implementation. Failure to comply with any condition of the Executive Director's approval, whether or not in contradiction of any "construction notes," is a violation of TCEQ regulations and any violation is subject to administrative rules, orders, and penalties as provided under Title 30, Texas Administrative Code § 213.10 (relating to Enforcement). Such violations may also be subject to civil penalties and injunction. The following/listed "construction notes" in no way represent an approved exception by the Executive Director to any part of Title 30 Texas Administrative Code, Chapters 213 and 217, or any other TCEQ applicable regulation.

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

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

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

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

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

6. If any sensitive features are discovered during the wastewater line trenching activities, all regulated activities near the sensitive feature must be suspended immediately. The applicant must immediately notify the appropriate regional office of the TCEQ of the feature discovered. A geologist's assessment of the location and extent of the feature discovered must be reported to that regional office in writing and the applicant must submit a plan for ensuring the structural integrity of the sewer line or for modifying the proposed collection system alignment around the feature. The regulated activities near the sensitive feature may not proceed until the

executive director has reviewed and approved the methods proposed to protect the sensitive feature and the Edwards Aquifer from any potentially adverse impacts to water quality while maintaining the structural integrity of the line.

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

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

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

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

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

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

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

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

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

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

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

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

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

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

15. All sewer lines must be tested in accordance with 30 TAC §217.57. The engineer must retain copies of all test results which must be made available to the executive director upon request. The engineer must certify in writing that all wastewater lines have passed all required testing to the appropriate regional office within 30 days of test completion and prior to use of the new collection system. Testing method will be:
    (a) For a collection system pipe that will transport wastewater by gravity flow, the design must specify an infiltration and exfiltration test or a low-pressure air test. A test must conform to the following requirements:
        (1) *Low Pressure Air Test.*
            (A) A low pressure air test must follow the procedures described in American Society For Testing And Materials (ASTM) C-828, ASTM C-924, or ASTM F-1417 or other procedure approved by the executive director, except as to testing times as required in Table C.3 in subparagraph (C) of this paragraph or Equation C.3 in subparagraph (B)(ii) of this paragraph.
            (B) For sections of collection system pipe less than 36 inch average inside diameter, the following procedure must apply, unless a pipe is to be tested as required by paragraph (2) of this subsection.
                (i) A pipe must be pressurized to 3.5 pounds per square inch (psi) greater than the pressure exerted by groundwater above the pipe.
                (ii) Once the pressure is stabilized, the minimum time allowable for the pressure to drop from 3.5 psi gauge to 2.5 psi gauge is computed from the following equation:

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

Where:

T = time for pressure to drop 1.0 pound per square inch gauge in seconds
K = 0.000419 X D X L, but not less than 1.0
D = average inside pipe diameter in inches

L = length of line of same size being tested, in feet
Q = rate of loss, 0.0015 cubic feet per minute per square foot internal surface

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

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

(D) An owner may stop a test if no pressure loss has occurred during the first 25% of the calculated testing time.
(E) If any pressure loss or leakage has occurred during the first 25% of a testing period, then the test must continue for the entire test duration as outlined above or until failure.
(F) Wastewater collection system pipes with a 27 inch or larger average inside diameter may be air tested at each joint instead of following the procedure outlined in this section.
(G) A testing procedure for pipe with an inside diameter greater than 33 inches must be approved by the executive director.

(2) *Infiltration/Exfiltration Test.*
(A) The total exfiltration, as determined by a hydrostatic head test, must not exceed 50 gallons per inch of diameter per mile of pipe per 24 hours at a minimum test head of 2.0 feet above the crown of a pipe at an upstream manhole.
(B) An owner shall use an infiltration test in lieu of an exfiltration test when pipes are installed below the groundwater level.
(C) The total exfiltration, as determined by a hydrostatic head test, must not exceed 50 gallons per inch diameter per mile of pipe per 24 hours at a minimum test head of two feet above the crown of a pipe at an upstream manhole, or at least two feet above existing groundwater level, whichever is greater.
(D) For construction within a 25-year flood plain, the infiltration or exfiltration must not exceed 10 gallons per inch diameter per mile of pipe per 24 hours at the same minimum test head as in subparagraph (C) of this paragraph.
(E) If the quantity of infiltration or exfiltration exceeds the maximum quantity specified, an owner shall undertake remedial action in order to reduce

the infiltration or exfiltration to an amount within the limits specified. An owner shall retest a pipe following a remediation action.

(b) If a gravity collection pipe is composed of flexible pipe, deflection testing is also required. The following procedures must be followed:
(1) For a collection pipe with inside diameter less than 27 inches, deflection measurement requires a rigid mandrel.
(A) *Mandrel Sizing.*
(i) A rigid mandrel must have an outside diameter (OD) not less than 95% of the base inside diameter (ID) or average ID of a pipe, as specified in the appropriate standard by the ASTMs, American Water Works Association, UNI-BELL, or American National Standards Institute, or any related appendix.
(ii) If a mandrel sizing diameter is not specified in the appropriate standard, the mandrel must have an OD equal to 95% of the ID of a pipe. In this case, the ID of the pipe, for the purpose of determining the OD of the mandrel, must equal be the average outside diameter minus two minimum wall thicknesses for OD controlled pipe and the average inside diameter for ID controlled pipe.
(iii) All dimensions must meet the appropriate standard.
(B) *Mandrel Design.*
(i) A rigid mandrel must be constructed of a metal or a rigid plastic material that can withstand 200 psi without being deformed.
(ii) A mandrel must have nine or more odd number of runners or legs.
(iii) A barrel section length must equal at least 75% of the inside diameter of a pipe.
(iv) Each size mandrel must use a separate proving ring.
(C) *Method Options.*
(i) An adjustable or flexible mandrel is prohibited.
(ii) A test may not use television inspection as a substitute for a deflection test.
(iii) If requested, the executive director may approve the use of a deflectometer or a mandrel with removable legs or runners on a case-by-case basis.
(2) For a gravity collection system pipe with an inside diameter 27 inches and greater, other test methods may be used to determine vertical deflection.
(3) A deflection test method must be accurate to within plus or minus 0.2% deflection.
(4) An owner shall not conduct a deflection test until at least 30 days after the final backfill.
(5) Gravity collection system pipe deflection must not exceed five percent (5%).
(6) If a pipe section fails a deflection test, an owner shall correct the problem and conduct a second test after the final backfill has been in place at least 30 days.

16. All manholes must be tested to meet or exceed the requirements of 30 TAC §217.58.
(a) All manholes must pass a leakage test.
(b) An owner shall test each manhole (after assembly and backfilling) for leakage, separate and independent of the collection system pipes, by hydrostatic exfiltration testing, vacuum testing, or other method approved by the executive director.
(1) Hydrostatic Testing.

(A) The maximum leakage for hydrostatic testing or any alternative test methods is 0.025 gallons per foot diameter per foot of manhole depth per hour.
(B) To perform a hydrostatic exfiltration test, an owner shall seal all wastewater pipes coming into a manhole with an internal pipe plug, fill the manhole with water, and maintain the test for at least one hour.
(C) A test for concrete manholes may use a 24-hour wetting period before testing to allow saturation of the concrete.

(2) Vacuum Testing.
(A) To perform a vacuum test, an owner shall plug all lift holes and exterior joints with a non-shrink grout and plug all pipes entering a manhole.
(B) No grout must be placed in horizontal joints before testing.
(C) Stub-outs, manhole boots, and pipe plugs must be secured to prevent movement while a vacuum is drawn.
(D) An owner shall use a minimum 60 inch/lb torque wrench to tighten the external clamps that secure a test cover to the top of a manhole.
(E) A test head must be placed at the inside of the top of a cone section, and the seal inflated in accordance with the manufacturer's recommendations.
(F) There must be a vacuum of 10 inches of mercury inside a manhole to perform a valid test.
(G) A test does not begin until after the vacuum pump is off.
(H) A manhole passes the test if after 2.0 minutes and with all valves closed, the vacuum is at least 9.0 inches of mercury.

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

Austin Regional Office 12100 Park 35 Circle, Building A Austin, Texas 78753-1808 Phone (512) 339-2929 Fax (512) 339-3795	San Antonio Regional Office 14250 Judson Road San Antonio, Texas 78233-4480 Phone (210) 490-3096 Fax (210) 545-4329

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

STATE OF TEXAS
NICHOLAS R. SANDLIN
124404
LICENSED
PROFESSIONAL ENGINEER
9/5/2023

TEXAS 811 BEFORE YOU DIG

WARNING !!!! CONTRACTOR TO FIELD VERIFY ALL EXIST. UTILITIES VERTICALLY AND HORIZONTALLY PRIOR TO CONSTRUCTION. THE CONTRACTOR IS TO CONTACT ENGINEER IF ANY EXISTING UTILITY INFORMATION DIFFERS FROM DATA SHOWN IN THE PLANS. CALL 811 BEFORE YOU DIG.

ENGINEERING | CONSULTING
SANDLIN
SERVICES, LLC
TBPELS FIRM #21356
4501 WHISPERING VALLEY DRIVE UNIT 27 AUSTIN, TX 78727

GENERAL NOTES (2 OF 3)

PROJECT CASE: XXXXXXX

TWELVE OAKS

#	REVISION DESCRIPTION	SIGNATURE	DATE

SHEET 3 OF 32

G:\Shared drives\Sandlin Services LLC\Sandlin Services Projects\Land Development Division\01-0089-003 Twelve Oaks\CAD\Construction Sheets\S 120 CVR.dwg-GENERAL NOTES (2 OF 3) Plotted Sep 06, 2023 at 2:26pm by Scott | Last Saved by: Scott

Texas Commission on Environmental Quality
Water Pollution Abatement Plan
General Construction Notes

Edwards Aquifer Protection Program Construction Notes – Legal Disclaimer

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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 than when 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.

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STATE OF TEXAS
NICHOLAS R. SANDLIN
124404
LICENSED
PROFESSIONAL ENGINEER
9/5/2023

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TBPELS FIRM #21356
4501 WHISPERING VALLEY DRIVE UNIT 27 AUSTIN, TX 78727

GENERAL NOTES (3 OF 3)

PROJECT CASE: XXXXXXX

TWELVE OAKS

#	REVISION DESCRIPTION	SIGNATURE	DATE

SHEET 4 OF 32

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FINAL PLAT
12 OAKS VILLAGE

OWNERS: TR4 HOLDING 1, LLC.
22701 MARY NELL LANE
SPICEWOOD, TEXAS 78669

TWELVE OAKS PROFESSIONAL PARK COMMERCIAL LP,
14205 N. MOPAC EXPRESSWAY
SUITE 450
AUSTIN, TEXAS 78728

12 OAKS VILLAGE, L.P.
7801 N. CAPITAL OF TEXAS HWY,
SUITE 390
AUSTIN, TEXAS 78731

SURVEYOR: ERNESTO NAVARRETE, R.P.L.S.
REGISTERED PROFESSIONAL LAND SURVEYOR
NO. 6642 – STATE OF TEXAS
HR GREEN DEVELOPMENT TX, LLC
5508 HWY 290 WEST, SUITE 150
AUSTIN, TEXAS 78735
512.872.6696
ERNESTO.NAVARRETE@HRGREEN.COM
TBPLS FIRM NO. 10194101

ENGINEER: XAVIER GARZA–ROBLEDO, P.E.
REGISTERED PROFESSIONAL ENGINEER
NO. 135174– STATE OF TEXAS
HR GREEN DEVELOPMENT TX, LLC
5508 HWY 290 WEST, SUITE 150
AUSTIN, TEXAS 78735
512.872.6696
XAVIER.GARZA@HRGREEN.COM
TBPE FIRM NO. F–16384

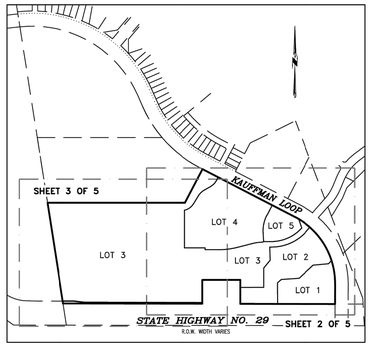
SURVEY: GREENLEAF FISK SURVEY, ABSTRACT NO. 5

ACREAGE: 53.19 ACRES
NUMBER OF BLOCKS: 1
NUMBER OF LOTS: 5
RIGHT–OF–WAY ACREAGE: 0.338 OF ONE ACRE (14,725 SQ. FT.)
LINEAR FEET OF NEW STREET: 0'
PATENT SURVEY: GREENLEAF FISK SURVEY, ABST. A–5

SHEET INDEX
1. COVER SHEET & SHEET INDEX
2. PLAT
3. PLAT
4. METES AND BOUNDS, LINE AND CURVE TABLES & GENERAL NOTES
5. SIGNATURE BLOCKS

STREET INDEX
NO NEW STREETS

VICINITY MAP
1" = 3000'



SHEET INDEX
N.T.S.

NOTES:

1. BEARING BASIS IS TEXAS COORDINATE SYSTEM, CENTRAL ZONE, NAD83(2011), GRID.
2. DISTANCES SHOWN HEREON ARE BASED ON SURFACE MEASUREMENTS, TO CONVERT SURFACE DISTANCES TO GRID, MULTIPLY BY THE COMBINED SCALE FACTOR.
3. THE COMBINED SCALE FACTOR FOR THIS PROJECT IS 0.9998532817.
4. COORDINATES SHOWN HEREON ARE TEXAS COORDINATE SYSTEM, CENTRAL ZONE, NAD83(2011), GRID.

BENCHMARK: NAVD88 GEOID12B – OPUS

BM 1386_9: SQUARE W/ X ETCHED ON CONCRETE TRANSFORMER PAD LOCATED ALONG THE SOUTHWEST RIGHT–OF–WAY LINE OF KAUFFMAN LOOP, APPROXIMATELY 80 FEET SOUTHEAST OF MORNINGSTAR BLVD.
ELEVATION = 1008.58'

BM 1386_12: SQUARE W/ X ETCHED ON CONCRETE TRANSFORMER PAD LOCATED ALONG THE SOUTHWEST RIGHT–OF–WAY LINE OF KAUFFMAN LOOP, AT THE "T" OF OMEGA RANCH RD.
ELEVATION = 968.52'

NOTES:

THE FOLLOWING DOCUMENTS OF RECORD AFFECT THE SUBJECT TRACT AS SHOWN HEREON:

TERMS, CONDITIONS, AND STIPULATIONS IN THE DEVELOPMENT AGREEMENT AS RECORDED IN DOCUMENT NUMBER 2006035818, OF THE OFFICIAL PUBLIC RECORDS OF WILLIAMSON COUNTY, TEXAS.

TERMS, CONDITIONS, AND STIPULATIONS IN THE PETITION FOR CREATION OF A MUNICIPAL UTILITY DISTRICT, AS RECORDED IN DOCUMENT NUMBER 2006096636, OF THE OFFICIAL PUBLIC RECORDS OF WILLIAMSON COUNTY, TEXAS.

ACCESS EASEMENT AGREEMENT, BY INSTRUMENT DATED 7/2/2021, RECORDED IN/UNDER DOCUMENT NO. 2021100747, OF THE OFFICIAL PUBLIC RECORDS, WILLIAMSON COUNTY, TEXAS.

ALL TERMS, CONDITIONS AND PROVISIONS OF THAT CERTAIN MEMORANDUM OF DEVELOPMENT AGREEMENT, DATED 7/2/2021, FILED 7/6/2021, RECORDED IN/UNDER DOCUMENT NO. 2021100749, OFFICIAL PUBLIC RECORDS, WILLIAMSON COUNTY, TEXAS.

SUBMITTED: OCTOBER 04, 2022

CITY PROJECT NUMBER 22–039MPL

FILE No: 1386

	PLAT PREPARATION DATE		SEPTEMBER, 2022
	APPLICATION SUBMITTAL DATE		
2	ACCESS EASEMENT ADDED	M.B.	01–05–23
3	STAFF REVIEW COMMENTS	M.B.	02–16–23
4	LOT REVISIONS & R.O.W. DEDICATION	M.B.	05–19–23
5	STAFF REVIEW COMMENTS	E.N.	07–10–23
No:	REVISION:	BY:	DATE:

HRGreen. DEVELOPMENT TX

5508 HIGHWAY 290 WEST
SUITE 150
AUSTIN, TX 78735
512.872.6696
HRGREEN.COM
TBPE NO: 16384
TBPLS NO: 10194101

FINAL PLAT
12 OAKS VILLAGE
GREENLEAF FISK SURVEY, A–5
WILLIAMSON COUNTY, TEXAS

L:\Projects\1386-104a Plat Morningstar Comm600-Survey\607-CAD\Plats\12 Oaks Village\1386_12 Oaks Village Final Plat.dwg
PLOT DATE: Aug 07,2023-3:31pm

STATE OF TEXAS
NICHOLAS R. SANDLIN
124404
LICENSED
PROFESSIONAL ENGINEER
9/5/2023

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FINAL PLAT (1 OF 5)

PROJECT CASE: XXXXXXX

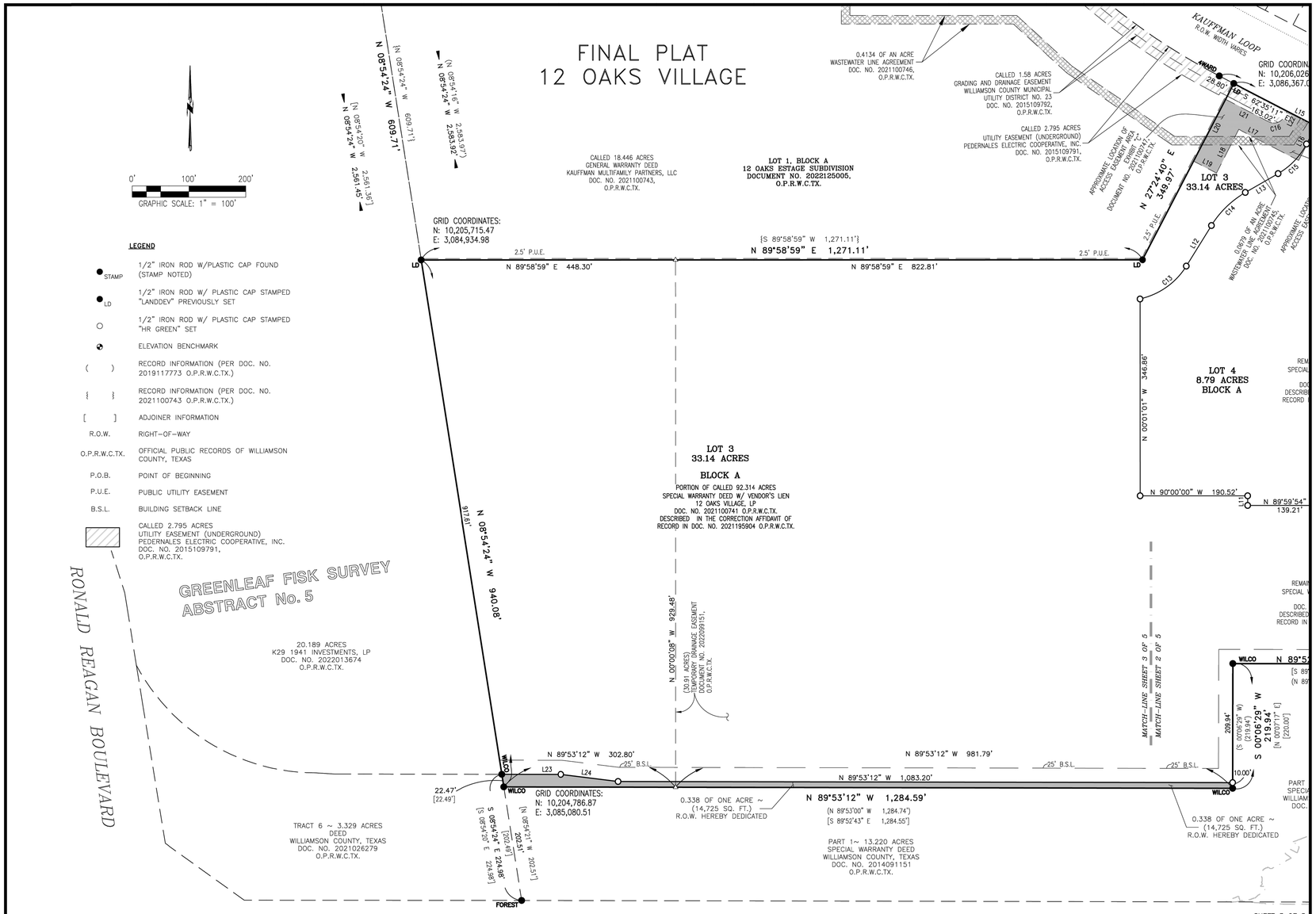
TWELVE OAKS

#	REVISION DESCRIPTION	SIGNATURE	DATE

SHEET 5 OF 32

G:\Shared drives\Sandlin Services LLC\Sandlin Services Projects\Land Development Division\01-0089-003 Twelve Oaks\CAD\Construction Sheets\5 120 CVR.dwg-FINAL PLAT (1 OF 5) Plotted Sep 06, 2023 at 2:28pm by Scott | Last Saved by: Scott

FINAL PLAT
12 OAKS VILLAGE



SHEET 3 OF 5

SUBMITTED: OCTOBER 04, 2022

CITY PROJECT NUMBER 22-039MPL

	PLAT PREPARATION DATE		SEPTEMBER, 2022
	APPLICATION SUBMITTAL DATE		
2	ACCESS EASEMENT ADDED	M.B.	01-05-23
3	STAFF REVIEW COMMENTS	M.B.	02-16-23
4	LOT REVISIONS & R.O.W. DEDICATION	M.B.	05-19-23
5	STAFF REVIEW COMMENTS	E.N.	07-10-23
No:	REVISION:	BY:	DATE:

FILE No: 1386

HRGreen. DEVELOPMENT TX

5508 HIGHWAY 290 WEST
SUITE 150
AUSTIN, TX 78735
512.872.6696
HRGREEN.COM
TBPE NO: 16384
TBPLS NO: 10194101

FINAL PLAT
12 OAKS VILLAGE
GREENLEAF FISK SURVEY, A-5
WILLIAMSON COUNTY, TEXAS

L:\Projects\1386-16\4c Plat Mornington Comm\800-Survey\607-CAD\Plats\12 Oaks Village\1386_12 Oaks Village Final Plat.dwg
PLOT DATE: Aug 07,2023 - 3:21pm

STATE OF TEXAS
NICHOLAS R. SANDLIN
124404
LICENSED
PROFESSIONAL ENGINEER
9/5/2023

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ENGINEERING | CONSULTING
SANDLIN
SERVICES, LLC

TBPELS FIRM #21356
4501 WHISPERING VALLEY DRIVE UNIT 27 AUSTIN, TX 78727

FINAL PLAT (2 OF 5)

PROJECT CASE: XXXXXXX

TWELVE OAKS

#	REVISION DESCRIPTION	SIGNATURE	DATE

SHEET 6 OF 32

G:\Shared drives\Sandlin Services LLC\Sandlin Services Projects\Land Development Division\01-0069-003 Twelve Oaks\CAD\Construction Sheets\S 120 CVR.dwg-FINAL PLAT (2 OF 5) Plotted Sep 06, 2023 at 2:26pm by Scott | Last Saved by: Scott

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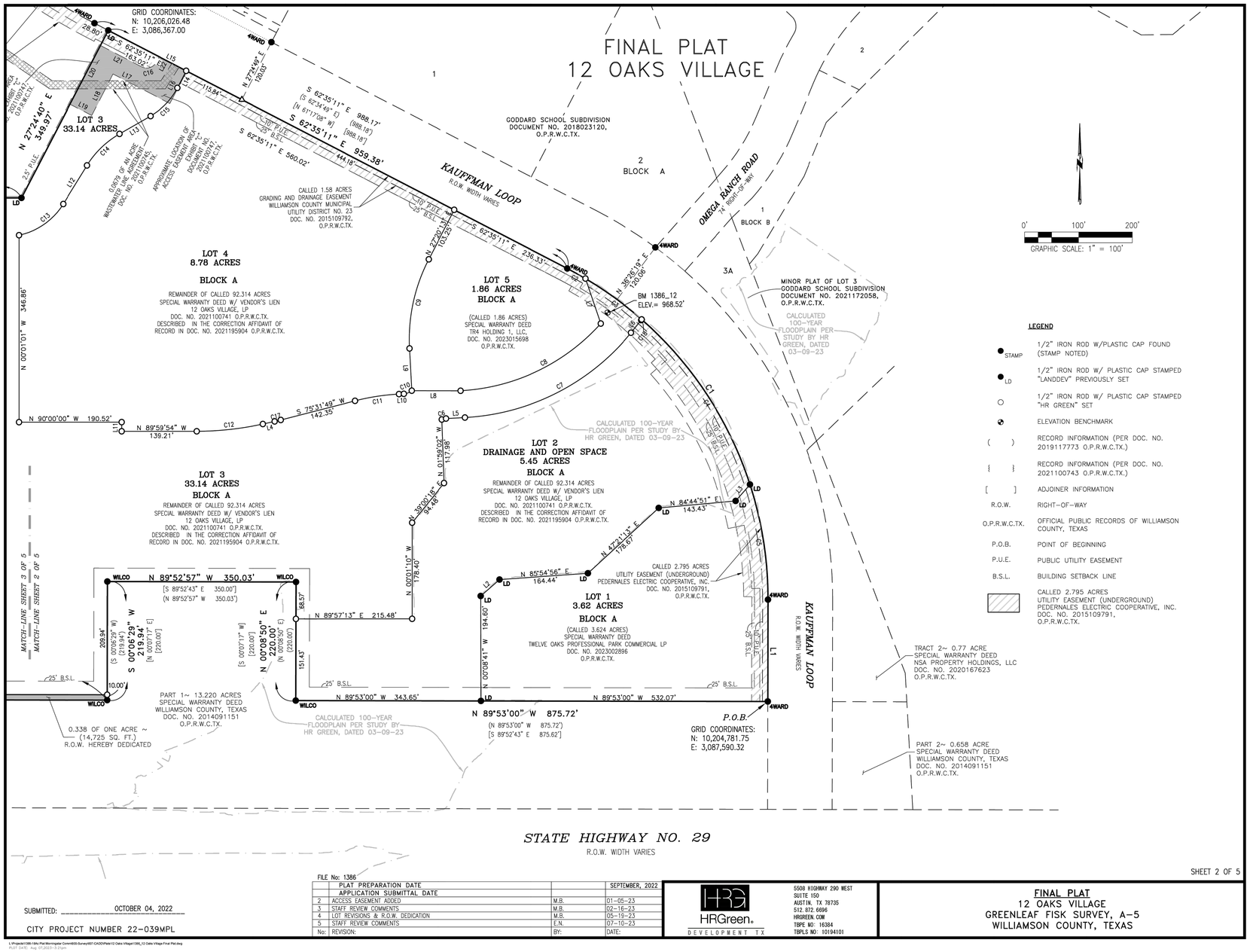

LEGEND

● STAMP	1/2" IRON ROD W/PLASTIC CAP FOUND (STAMP NOTED)
● LD	1/2" IRON ROD W/ PLASTIC CAP STAMPED "LANDDEV" PREVIOUSLY SET
○	1/2" IRON ROD W/ PLASTIC CAP STAMPED "HR GREEN" SET
⊗	ELEVATION BENCHMARK
( )	RECORD INFORMATION (PER DOC. NO. 2019117773 O.P.R.W.C.TX.)
{ }	RECORD INFORMATION (PER DOC. NO. 2021100743 O.P.R.W.C.TX.)
[ ]	ADJOINER INFORMATION
R.O.W.	RIGHT-OF-WAY
O.P.R.W.C.TX.	OFFICIAL PUBLIC RECORDS OF WILLIAMSON COUNTY, TEXAS
P.O.B.	POINT OF BEGINNING
P.U.E.	PUBLIC UTILITY EASEMENT
B.S.L.	BUILDING SETBACK LINE
▨	CALLED 2.795 ACRES UTILITY EASEMENT (UNDERGROUND) PEDERNALES ELECTRIC COOPERATIVE, INC. DOC. NO. 2015109791, O.P.R.W.C.TX.

SUBMITTED: OCTOBER 04, 2022

CITY PROJECT NUMBER 22-039MPL

SHEET 2 OF 5

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FIELD NOTES DESCRIPTION

DESCRIPTION OF 53.19 ACRES OF LAND IN THE GREENLEAF FISK SURVEY, ABSTRACT NO. 5, WILLIAMSON COUNTY, TEXAS; BEING A PORTION OF A CERTAIN CALLED 92.314 ACRE TRACT OF LAND CONVEYED IN THE SPECIAL WARRANTY DEED W/VENDOR'S LIEN TO 12 OAKS VILLAGE, LP OF RECORD IN DOCUMENT NO. 2021100741, OFFICIAL PUBLIC RECORDS OF WILLIAMSON COUNTY, TEXAS, AND DESCRIBED IN THE CORRECTION AFFIDAVIT OF RECORD IN DOCUMENT NO. 2021195904, OFFICIAL PUBLIC RECORDS OF WILLIAMSON COUNTY, TEXAS; SAID 53.19 ACRES OF LAND, AS SURVEYED BY HR GREEN DEVELOPMENT TX, LLC, BEING MORE PARTICULARLY DESCRIBED BY METES AND BOUNDS AS FOLLOWS:

BEGINNING at a 1/2–inch iron rod with a plastic cap stamped "4WARD BOUNDARY" found in the intersecting north right–of–way line of State Highway No. 29, a variable width right–of–way and the west right–of–way line of Kauffman Loop, a variable width right–of–way, and also in the west line of a certain called 12.35 acre tract described in the Deed to Williamson County, Texas, of record in Document No. 2016016908, Official Public Records of Williamson County, Texas, same being the most easterly northeast corner of that certain called 13.220 acre tract of land designated as Part 1 and described in the Special Warranty Deed to Williamson County, Texas, of record in Document No. 2014091151, Official Public Records of Williamson County, Texas, at the southerly southeast corner of the said 92.314 acre tract, for the southeast corner and POINT OF BEGINNING of the tract described herein, from which the approximate southwest corner of the said Greenleaf Fisk Survey, Abstract No. 5, bears approximately S 00°27'20" E, a distance of 10,733 feet;

THENCE leaving the west right–of–way line of said Kauffman Loop and the west line of the said 12.35 acre tract, with the north right–of–way line of said State Highway No. 29 and the north line of the said 13.220 acre tract, with the south line of the said 92.314 acre tract, with the south line of the tract described herein, the following five (5) courses and distances:

1. N 89°53'00" W, a distance of 875.72 feet to a 5/8–inch iron rod with an aluminum cap stamped "WILCO ROW" found at an angle point,

2. N 00°08'50" E, a distance of 220.00 feet to a 5/8–inch iron rod with an aluminum cap stamped "WILCO ROW" found at an angle point,

3. N 89°52'57" W, a distance of 350.03 feet to a 5/8–inch iron rod with an aluminum cap stamped "WILCO ROW" found at an angle point,

4. S 00°06'29" W, a distance of 219.94 feet to a 5/8–inch iron rod with an aluminum cap stamped "WILCO ROW" found at an angle point, and

5. N 89°53'12" W, a distance of 1,284.59 feet to a 5/8–inch iron rod with an aluminum cap stamped "WILCO ROW" found in the east line of a certain called 3.329 acre tract of land designated as Tract 6 and described in the Deed to Williamson County, Texas, of record in Document No. 2021026279, Official Public Records of Williamson County, Texas, at the southwest corner of the said 92.314 acre tract, same being the westerly northwest corner of the said 13.220 acre tract, for the southwest corner of the tract described herein;

THENCE N 08°54'24" W, leaving the westerly northwest corner of the said 13.220 acre tract, with the east line of the said 3.329 acre tract and the west line of the said 92.314 acre tract, with the west line of the tract described herein, a distance of 22.47 feet to a 5/8–inch iron rod with an aluminum cap stamped "WILCO ROW" found at the northeast corner of the said 3.329 acre tract, same being the southeast corner of a certain called 20.189 acre tract conveyed in the deed to K29 1941 Investments, LP of record in Document No. 2021168915, Official Public Records of Williamson County, Texas, and described in the Correction Affidavit as to Deed of record in Document No. 2022013674, Official Public Records of Williamson County, Texas, for a point–on–line in the west line of the said 92.314 acre tract and in the west line of the tract described herein;

THENCE N 08°54'24" W, leaving the northeast corner of the said 3.329 acre tract, continuing with the west line of the said 92.314 acre tract, with the east line of the said 20.189 acre tract, with the west line of the tract described herein, a distance of 917.61 feet to a ½–inch iron rod with a plastic cap stamped "LANDDEV" previously set for the southwest corner of a certain called 18.446 acre tract described in the General Warranty Deed to Kauffman Multifamily Partners, LLC of record in Document No. 2021100743, Official Public Records of Williamson County, Texas, for the northwest corner of the tract described herein;

THENCE leaving the east line of the said 20.189 acre tract, crossing the said 92.314 acre tract, with the south line of the said 18.446 acre tract, with the north line of the tract described herein, the following two (2) courses and distances:

1. N 89°58'59" E, a distance of 1,271.11 feet to a ½–inch iron rod with a plastic cap stamped "LANDDEV" previously set for the southeast corner of the said 18.446 acre tract, for an angle point in the north line of the tract described herein, and

2. N 27°24'40" E, a distance of 349.97 feet to a ½–inch iron rod with a plastic cap stamped "LANDDEV" previously set in the southwest right–of–way line of said Kauffman Loop and the southwest line of the said 12.35 acre tract, same being the east line of the said 92.314 acre tract, for an east corner of the said 18.446 acre tract, for a north corner of the tract described herein, from which a ½–inch iron rod with a plastic cap stamped "4WARD BOUNDARY" found at a point–of–curvature in the southwest right–of–way line of said Kauffman Loop and the southwest line of the said 12.35 acre tract, same being the east line of the said 92.314 acre tract and the east line of the said 18.446 acre tract bears N 62°35'11" W, a distance of 28.80 feet;

THENCE with the southwest and west right–of–way line of said Kauffman Loop and the southwest and west line of the said 12.35 acre tract, with the east line of the said 92.314 acre tract, with the east line of the tract described herein, the following three (3) courses and distances:

1. S 62°35'11" E, a distance of 959.38 feet to a ½–inch iron rod with a plastic cap stamped "4WARD BOUNDARY" found at a point–of–curvature,

2. With the arc of a curve to the right, having a radius of 690.00 feet, an arc distance of 755.30 feet, and a chord which bears S 31°13'11" E, a distance of 718.15 feet to a ½–inch iron rod with a plastic cap stamped "4WARD BOUNDARY" found at a point–of–tangency, and

3. S 00°07'00" W, a distance of 189.05 feet to the POINT OF BEGINNING and containing 53.19 acres of land, more or less.

Bearing Basis: Texas Coordinate System, Central Zone, NAD83, Grid.

LINE TABLE

LINE #	BEARING	DISTANCE
L1	S 00°07'00" W	189.05'
L2	S 48°42'08" W	46.32'
L3	S 41°11'01" W	40.34'
L4	S 77°39'44" W	22.37'
L5	N 86°57'58" E	34.98'
L6	N 38°55'18" E	29.95'
L7	S 18°47'25" E	88.08'
L8	N 89°52'31" W	90.74'
L9	N 03°02'02" W	78.42'
L10	S 86°57'58" W	8.93'
L11	N 00°00'00" W	17.00'
L12	N 31°44'59" E	84.08'
L13	N 60°03'39" E	66.39'
L14	N 27°25'11" E	35.69'
L15	S 62°35'11" E	58.43'
L16	S 27°43'01" W	67.74'
L17	N 62°35'10" W	118.99'
L18	S 27°03'43" W	86.48'
L19	N 62°29'16" W	45.49'
L20	N 27°24'40" E	122.64'
L21	S 62°34'13" E	85.69'
L22	N 27°22'47" E	11.35'
L23	S 89°52'43" E	103.98'
L24	S 83°00'29" E	101.66'

CURVE TABLE

CURVE #	RADIUS	ARC DISTANCE	CHORD BEARING	CHORD DISTANCE
C1	690.00'	755.30'	S 31°13'11" E	718.15'
C2	690.00'	38.48'	N 60°58'53" W	38.47'
C3	690.00'	129.33'	N 54°00'51" W	129.14'
C4	690.00'	370.56'	N 33°15'35" W	366.12'
C5	690.00'	216.94'	N 08°52'04" W	216.04'
C6	24.50'	8.05'	S 77°33'26" W	8.01'
C7	425.00'	356.38'	N 62°56'38" E	346.03'
C8	375.00'	295.98'	N 64°21'17" E	288.36'
C9	323.00'	171.21'	S 12°09'06" W	169.22'
C10	25.00'	16.09'	N 68°31'52" E	15.81'
C11	413.50'	82.50'	S 81°15'00" W	82.37'
C12	587.00'	123.76'	N 83°42'17" E	123.53'
C13	128.50'	103.22'	N 54°45'42" E	100.47'
C14	171.50'	84.74'	S 45°54'19" W	83.88'
C15	128.50'	73.21'	N 43°44'25" E	72.22'
C16	20.00'	31.78'	N 72°26'55" E	28.54'
C17	313.50'	11.66'	N 76°35'46" E	11.66'
C18	24.50'	1.66'	S 40°52'00" W	1.66'

GENERAL NOTES:

1. IT IS UNDERSTOOD THAT THE BUILDING OF ALL ROADS, AND OTHER PUBLIC THOROUGHFARES AND ANY BRIDGES OR CULVERTS NECESSARY TO BE CONSTRUCTED OR PLACED IS THE RESPONSIBILITY OF THE OWNER(S) OF THE TRACT OF LAND COVERED BY THIS PLAT IN ACCORDANCE WITH THE PLANS AND SPECIFICATIONS PRESCRIBED BY WILLIAMSON COUNTY, TEXAS. THE CITY NOR THE COUNTY ASSUME ANY OBLIGATION TO BUILD ANY OF THE ROADS, OR OTHER PUBLIC THOROUGHFARES SHOWN ON THIS PLAT, OR OF CONSTRUCTING ANY OF THE BRIDGES OR DRAINAGE IMPROVEMENTS IN THE CONNECTION THEREWITH. NEITHER THE CITY NOR THE COUNTY ASSUME ANY RESPONSIBILITY FOR DRAINAGE WAYS OR EASEMENTS IN THE SUBDIVISION, OTHER THAN THOSE DRAINING OR PROTECTING THE ROAD SYSTEM.

2. IT IS THE RESPONSIBILITY OF THE OWNER(S), NOT THE COUNTY OR THE CITY, TO ASSURE COMPLIANCE WITH THE PROVISIONS OF ALL APPLICABLE STATE, FEDERAL AND LOCAL LAWS AND REGULATIONS RELATING TO THE PLATTING AND DEVELOPMENT OF THIS PROPERTY. THE CITY OF LIBERTY HILL NOR WILLIAMSON COUNTY ASSUME RESPONSIBILITY FOR THE ACCURACY OF REPRESENTATIONS BY OTHER PARTIES IN THIS PLAT. FLOODPLAIN DATA, IN PARTICULAR, MAY CHANGE. IT IS FURTHER UNDERSTOOD THAT THE OWNER(S) OF THE TRACT OF LAND COVERED BY THIS PLAT MUST INSTALL AT THEIR OWN EXPENSE ALL TRAFFIC CONTROL DEVICES AND SIGNAGE THAT MAY BE REQUIRED BEFORE THE ROADS IN THE SUBDIVISION HAVE FINALLY BEEN ACCEPTED FOR MAINTENANCE BY THE WCMUD #23.

3. ALL UTILITY LINES MUST BE LOCATED UNDERGROUND.

4. THIS SUBDIVISION IS WHOLLY CONTAINED WITHIN THE EXTRA TERRITORIAL JURISDICTION OF THE CITY OF LIBERTY HILL, WILLIAMSON COUNTY, TEXAS.

5. NO LOT IN THIS SUBDIVISION SHALL BE OCCUPIED UNTIL CONNECTED TO PERMITTED WATER DISTRIBUTION AND WASTEWATER COLLECTION FACILITIES.

6. PROPERTY OWNERS SHALL PROVIDE FOR ACCESS TO DRAINAGE EASEMENTS AS MAY BE NECESSARY AND SHALL NOT PROHIBIT ACCESS BY THE CITY OF LIBERTY HILL.

7. ALL EASEMENTS ON PRIVATE PROPERTY SHALL BE MAINTAINED BY THE PROPERTY OWNER OR HIS OR HER ASSIGNS.

8. ALL PUBLIC ROADWAYS AND EASEMENTS AS SHOWN ON THIS PLAT ARE FREE OF LIENS.

9. NO CONSTRUCTION, PLANTING OR GRADING SHALL BE PERMITTED TO INTERFERE WITH SIGHT EASEMENTS BETWEEN THE HEIGHTS OF THREE AND EIGHT FEET AS MEASURED FROM THE CROWNS OF THE ADJACENT STREETS.

10. UTILITY PROVIDERS:
 WATER SERVICE – GEORGETOWN UTILITY SYSTEMS
 WASTEWATER SERVICE – CITY OF LIBERTY HILL

11. MAINTENANCE RESPONSIBILITY FOR DRAINAGE WILL NOT BE ACCEPTED BY THE COUNTY OTHER THAN THAT ACCEPTED IN CONNECTION WITH DRAINING OR PROTECTING THE ROAD SYSTEM. MAINTENANCE RESPONSIBILITY FOR STORM WATER MANAGEMENT CONTROLS WILL REMAIN WITH THE OWNER.

12. THE MINIMUM FINISHED FLOOR ELEVATION SHALL BE AT LEAST ONE FOOT ABOVE THE ADJACENT FINISHED GRADE AND BASE FLOOD ELEVATION. EXCEPTIONS CAN BE MADE AT ENTRANCE AND EGRESS POINTS, WHERE NECESSARY, TO MEET THE AMERICANS WITH DISABILITIES ACT (ADA). RECREATIONAL VEHICLE PARKING PADS MUST ALSO BE PLACED AT LEAST ONE FOOT ABOVE BASE FLOOD ELEVATION.

13. NO LOT IN THIS SUBDIVISION IS ENCROACHED BY A SPECIAL FLOOD HAZARD AREA(S) INUNDATED BY THE 100–YEAR (1% CHANCE) FLOOD AS IDENTIFIED BY THE U.S. FEDERAL EMERGENCY MANAGEMENT AGENCY FLOOD INSURANCE RATE MAP, COMMUNITY PANEL NO. 48491C0275E, EFFECTIVE DATE SEPTEMBER 26, 2008 FOR WILLIAMSON COUNTY, TEXAS.

14. NO STRUCTURE OR LAND IN THIS PLAT SHALL HEREAFTER BE LOCATED OR ALTERED WITHOUT FIRST OBTAINING A CERTIFICATE OF COMPLIANCE OR FLOODPLAIN DEVELOPMENT PERMIT FROM THE WILLIAMSON COUNTY FLOODPLAIN ADMINISTRATOR.

15. THIS SUBDIVISION IS SUBJECT TO STORMWATER MANAGEMENT CONTROLS AS REQUIRED BY WILLIAMSON COUNTY SUBDIVISION REGULATIONS SECTION B11.1, ON NEW DEVELOPMENT THAT WOULD EVOKE SUCH CONTROLS BEYOND EXISTING CONDITIONS.

16. IMPROVEMENTS WITHIN THE COUNTY ROAD RIGHT–OF–WAY INCLUDING, BUT NOT LIMITED TO, LANDSCAPING, IRRIGATION LIGHTING, CUSTOM SIGNS, IS PROHIBITED WITHOUT FIRST OBTAINING AND EXECUTED LICENSE AGREEMENT WITH WILLIAMSON COUNTY.

17. ALL SIDEWALKS SHALL BE MAINTAINED BY THE PROPERTY OWNERS.

18. THE PURPOSE OF THIS PLAT IS TO SHOW THE PROPOSED IMPROVEMENTS TO THE OWNER'S PROPERTY, INCLUDING THE EXISTING TOPOGRAPHY, TO EVALUATE THE EXISTING AND PROPOSED DRAINAGE PATTERNS. THERE ARE NO IMPROVEMENTS OR SUBDIVISION OF LOTS 1–5, BLOCK A PROPOSED WITH THIS PLAT. A REVISED PRELIMINARY PLAT SHALL BE SUBMITTED AND APPROVED PRIOR TO ANY DIVISION OF LOTS 1–5, BLOCK A INTO TWO OR MORE PARTS TO LAY OUT (1) A SUBDIVISION OF THE TRACT, INCLUDING AN ADDITION; (2) LOTS; OR (3) STREETS, ALLEYS, SQUARES, PARKS, OR OTHER PARTS OF THE TRACT INTENDED TO BE DEDICATED TO PUBLIC USE OR FOR THE USE OF PURCHASERS OR OWNERS OF LOTS FRONTING ON OR ADJACENT TO THE STREETS, ALLEYS, SQUARES, PARKS, OR OTHER PARTS. A LOT IS ANY PARCEL OR TRACT OF LAND EXCLUSIVE OF ANY ADJOINING ROAD OR ROAD RIGHT–OF–WAY THAT IS SEPARATED FROM OTHER PARCELS BY A LEGAL DESCRIPTION, A SUBDIVISION OF RECORD, OR SURVEY MAP. THE TERMS "STREET" OR "ROAD" ARE INTERCHANGEABLE AND ARE USED TO DESCRIBE ALL VEHICULAR WAYS, REGARDLESS OF ANY OTHER DESIGNATION THEY MAY CARRY OR WHETHER THE STREET OR ROAD WILL BE PUBLIC OR PRIVATELY OWNED.

19. NO OBSTRUCTION, INCLUDING BUT NOT LIMITED TO FENCING OR STORAGE, SHALL BE PERMITTED IN ANY DRAINAGE EASEMENTS SHOWN HEREON.

20. A TEN (10') P.U.E. ABUTTING AND ALONG THE STREET SIDE PROPERTY LINE IS HEREBY DEDICATED FOR ALL STREET SIDE PROPERTY LOTS SHOWN HEREON.

21. RECIPROCAL JOINT ACCESS AND PARKING BETWEEN ALL LOTS DEPICTED ON THIS FINAL PLAT IS HEREBY GRANTED. THE JOINT ACCESS MUST ALLOW PEDESTRIAN AND/OR VEHICULAR TRAFFIC/PARKING TO MOVE FREELY TO THE ADJACENT PUBLIC RIGHT–OF–WAY, OR BETWEEN THE TRACTS, OR BOTH, EACH OWNER MUST MAINTAIN ITS TRACT, AND THAT PORTION OF THE ACCESS AND PARKING AREA LOCATED ON ITS TRACT IF ANY, AND ALL IMPROVEMENTS, TO ALLOW CONTINUOUS FREE VEHICULAR AND PEDESTRIAN INGRESS AND EGRESS.

22. DRIVEWAY MAINTENANCE WILL BE THE RESPONSIBILITY OF THE PROPERTY OWNER. IF OBSTRUCTIONS OCCUR WITHIN THE DRIVEWAY CULVERT, THE COUNTY RESERVES THE RIGHT TO CLEAR OBSTRUCTIONS THAT ARE CAUSING ADVERSE IMPACTS TO THE ROADWAY.

23. A FLOODPLAIN DEVELOPMENT PERMIT MAY BE REQUIRED FOR BLOCK A LOT 2 PRIOR TO ANY CONSTRUCTION OR DEVELOPMENT. THE NEED FOR A FLOODPLAIN DEVELOPMENT PERMIT WILL BE DETERMINED BY WILLIAMSON COUNTY UPON REVIEW OF THE PROPOSED STRUCTURE LOCATION.

24. BASED ON THE CONDUCTED FLOODPLAIN STUDY PERFORMED BY HR GREEN, DATED MARCH 9, 2023, THE MINIMUM FINISHED FLOOR ELEVATION (FFE) WILL BE SET AT 972 FEET FOR LOTS ADJACENT TO THE FLOODPLAIN.

25. FLOODPLAIN INFORMATION, SUCH AS FLOODPLAIN BOUNDARIES, DEPTHS, ELEVATIONS, AND THE MINIMUM FINISHED FLOOR ELEVATIONS SHOWN ON THIS PLAT, WILL CHANGE OVER TIME WITH BETTER DATA AND FLOOD STUDIES. THE FLOODPLAIN INFORMATION SHOWN ON THIS PLAT WAS ACCURATE AT THE TIME OF PLATTING, BUT MAY BE SUPERSEDED AT THE TIME OF CONSTRUCTION. THE BEST AVAILABLE FLOODPLAIN DATA SHALL BE UTILIZED AT THE TIME OF CONSTRUCTION, AS DETERMINED BY THE WILLIAMSON COUNTY FLOODPLAIN ADMINISTRATOR. A FLOODPLAIN DEVELOPMENT PERMIT APPLICATION MUST BE SUBMITTED AND APPROVED PRIOR TO ANY CONSTRUCTION OR DEVELOPMENT WITHIN OR ADJACENT TO A REGULATED FLOODPLAIN.

26. THIS SUBDIVISION WAS EXEMPT FROM PROVIDING STORM–WATER MANAGEMENT CONTROLS (DETENTION) AT THE TIME OF FILING THIS PLAT BASED ON WILLIAMSON COUNTY SUBDIVISION REGULATION B11.1.4. PRIOR TO ANY DEVELOPMENT WITHIN THIS SUBDIVISION, STORM–WATER MANAGEMENT CONTROLS SHALL BE DESIGNED, CONSTRUCTED AND MAINTAINED BY THE OWNER IN ACCORDANCE WITH THE APPLICABLE REGULATIONS IN EFFECT AT THE TIME OF DEVELOPMENT. CONTACT THE WILLIAMSON COUNTY FLOODPLAIN ADMINISTRATOR FOR REVIEW AND APPROVAL OF THE PROPOSED STORM–WATER MANAGEMENT CONTROLS PRIOR TO ANY DEVELOPMENT WITHIN THIS SUBDIVISION.

SHEET 4 OF 5

SUBMITTED: OCTOBER 04, 2022

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§ KNOW ALL MEN BY THESE PRESENTS
COUNTY OF WILLIAMSON §

WE, 12 OAKS VILLAGE, LP, OWNER OF 47.37 ACRES OF LAND IN THE GREENLEAF FISK SURVEY, ABSTRACT NO. 5, WILLIAMSON COUNTY, TEXAS; BEING A PORTION OF THAT CALLED 92.314 ACRE TRACT OF LAND DESCRIBED IN THE SPECIAL WARRANTY DEED WITH VENDOR'S LIEN TO 12 OAKS VILLAGE, LP OF RECORD IN DOCUMENT NO. 2021100741, OFFICIAL PUBLIC RECORDS OF WILLIAMSON COUNTY, TEXAS, AND CORRECTED IN THE CORRECTION AFFIDAVIT OF RECORD IN DOCUMENT NO. 2021195904, OFFICIAL PUBLIC RECORDS OF WILLIAMSON COUNTY, TEXAS; SAID 47.37 ACRES OF LAND AS SHOWN HEREON, AND DO CONSENT TO ALL PLAT REQUIREMENTS SHOWN HEREON, AND HEREBY DEDICATE TO THE PUBLIC THE STREETS, RIGHTS-OF-WAY, EASEMENTS, AND PUBLIC PLACES SHOWN HEREON. IT IS THE RESPONSIBILITY OF THE OWNERS, NOT THE COUNTY, TO ASSURE COMPLIANCE WITH THE PROVISIONS OF ALL APPLICABLE STATE, FEDERAL AND LOCAL LAWS AND REGULATIONS RELATED TO THE ENVIRONMENT, INCLUDING (BUT NOT LIMITED TO) THE ENDANGERED SPECIES ACT, STATE AQUIFER REGULATIONS AND MUNICIPAL WATERSHED ORDINANCES. THIS SUBDIVISION IS TO BE KNOWN AS:

12 OAKS VILLAGE

TO CERTIFY WHICH, WITNESS BY MY HAND THIS________ DAY OF________________, 20_______.

____

PRINT: ______________________________
12 OAKS VILLAGE, L.P.
7801 N. CAPITAL OF TEXAS HWY,
SUITE 390
AUSTIN, TEXAS 78731

STATE OF TEXAS §
§ KNOW ALL MEN BY THESE PRESENTS
COUNTY OF WILLIAMSON §

BEFORE ME, THE UNDERSIGNED, A NOTARY PUBLIC IN AND FOR SAID COUNTY AND STATE, ON THIS DAY PERSONALLY APPEARED ______________________________, KNOWN TO ME TO BE THE PERSON WHOSE NAME IS SUBSCRIBED TO THE FOREGOING INSTRUMENT.

GIVEN UNDER MY HAND AND SEAL OF OFFICE THIS__________ DAY OF______________, 20__.

____
NOTARY PUBLIC IN AND FOR THE STATE OF TEXAS
MY COMMISSION EXPIRES ON: ____________________

STATE OF TEXAS §
§ KNOW ALL MEN BY THESE PRESENTS
COUNTY OF WILLIAMSON §

THAT, FRONTIER BANK OF TEXAS, LIEN HOLDER OF A PORTION OF 47.37 ACRES OF LAND SHOWN HEREON AND DESCRIBED IN DOCUMENT NO. 2021100741, AND CORRECTED IN DOCUMENT NO. 2021195904, OFFICIAL PUBLIC RECORDS OF WILLIAMSON COUNTY, TEXAS; DOES HEREBY CONSENT TO THE SUBDIVISION OF SAID 47.37 ACRES AS SHOWN HEREON, AND DOES FURTHER HEREBY, JOIN, APPROVE AND CONSENT TO ALL PLAT NOTE REQUIREMENTS SHOWN HEREON, AND DOES HEREBY DEDICATE TO THE CITY OF LIBERTY HILL THE STREETS, ALLEYS, RIGHTS-OF-WAY, EASEMENTS AND PUBLIC PLACES SHOWN HEREON FOR SUCH PUBLIC PURPOSES AS THE CITY OF LIBERTY HILL MAY DEEM APPROPRIATE. THIS SUBDIVISION IS TO BE KNOWN AS:

12 OAKS VILLAGE

TO CERTIFY WHICH, WITNESS BY MY HAND THIS ____ DAY OF ______________________, 20___.

____

STATE OF TEXAS §
§ KNOW ALL MEN BY THESE PRESENTS
COUNTY OF WILLIAMSON §

BEFORE ME, THE UNDERSIGNED, A NOTARY PUBLIC IN AND FOR SAID COUNTY AND STATE, ON THIS DAY PERSONALLY APPEARED ______________________________, KNOWN TO ME TO BE THE PERSON WHOSE NAME IS SUBSCRIBED TO THE FOREGOING INSTRUMENT.

GIVEN UNDER MY HAND AND SEAL OF OFFICE THIS ____ DAY OF ______________________, 20___.

____
NOTARY PUBLIC IN AND FOR THE STATE OF TEXAS
MY COMMISSION EXPIRES ON: ____________________

STATE OF TEXAS §
§ KNOW ALL MEN BY THESE PRESENTS
COUNTY OF WILLIAMSON §

WE, TR4 HOLDING 1, LLC, OWNER OF 1.86 ACRES OF LAND IN THE GREENLEAF FISK SURVEY, ABSTRACT NO. 5, WILLIAMSON COUNTY, TEXAS; BEING ALL OF A CALLED 1.86 ACRE TRACT OF LAND DESCRIBED IN THE SPECIAL WARRANTY DEED TO TR4 HOLDING 1, LLC, OF RECORD IN DOCUMENT NO. 2023015698, OFFICIAL PUBLIC RECORDS OF WILLIAMSON COUNTY, TEXAS; SAID 1.86 ACRES OF LAND AS SHOWN HEREON, AND DO CONSENT TO ALL PLAT REQUIREMENTS SHOWN HEREON, AND HEREBY DEDICATE TO THE PUBLIC THE STREETS, RIGHTS-OF-WAY, EASEMENTS, AND PUBLIC PLACES SHOWN HEREON. IT IS THE RESPONSIBILITY OF THE OWNERS, NOT THE COUNTY, TO ASSURE COMPLIANCE WITH THE PROVISIONS OF ALL APPLICABLE STATE, FEDERAL AND LOCAL LAWS AND REGULATIONS RELATED TO THE ENVIRONMENT, INCLUDING (BUT NOT LIMITED TO) THE ENDANGERED SPECIES ACT, STATE AQUIFER REGULATIONS AND MUNICIPAL WATERSHED ORDINANCES. THIS SUBDIVISION IS TO BE KNOWN AS:

12 OAKS VILLAGE

TO CERTIFY WHICH, WITNESS BY MY HAND THIS________ DAY OF________________, 20_______.

____

TR4 HOLDING 1, LLC.
22701 MARY NELL LANE
SPICEWOOD, TEXAS 78669

STATE OF TEXAS §
§ KNOW ALL MEN BY THESE PRESENTS
COUNTY OF WILLIAMSON §

BEFORE ME, THE UNDERSIGNED, A NOTARY PUBLIC IN AND FOR SAID COUNTY AND STATE, ON THIS DAY PERSONALLY APPEARED ____________________________, KNOWN TO ME TO BE THE PERSON WHOSE NAME IS SUBSCRIBED TO THE FOREGOING INSTRUMENT.

GIVEN UNDER MY HAND AND SEAL OF OFFICE THIS__________ DAY OF______________, 20__.

____
NOTARY PUBLIC IN AND FOR THE STATE OF TEXAS
MY COMMISSION EXPIRES ON: ____________________

SUBMITTED: OCTOBER 04, 2022

CITY PROJECT NUMBER 22-039MPL

STATE OF TEXAS §
§ KNOW ALL MEN BY THESE PRESENTS
COUNTY OF WILLIAMSON §

WE, TWELVE OAKS PROFESSIONAL PARK COMMERCIAL LP, OWNER OF 3.624 ACRES OF LAND IN THE GREENLEAF FISK SURVEY, ABSTRACT NO. 5, WILLIAMSON COUNTY, TEXAS; BEING ALL OF A CALLED 3.624 ACRE TRACT OF LAND DESCRIBED IN THE SPECIAL WARRANTY DEED WITH VENDOR'S LIEN TO TWELVE OAKS PROFESSIONAL PARK COMMERCIAL LP, OF RECORD IN DOCUMENT NO. 2023002896, OFFICIAL PUBLIC RECORDS OF WILLIAMSON COUNTY, TEXAS; SAID 3.624 ACRES OF LAND AS SHOWN HEREON, AND DO CONSENT TO ALL PLAT REQUIREMENTS SHOWN HEREON, AND HEREBY DEDICATE TO THE PUBLIC THE STREETS, RIGHTS-OF-WAY, EASEMENTS, AND PUBLIC PLACES SHOWN HEREON. IT IS THE RESPONSIBILITY OF THE OWNERS, NOT THE COUNTY, TO ASSURE COMPLIANCE WITH THE PROVISIONS OF ALL APPLICABLE STATE, FEDERAL AND LOCAL LAWS AND REGULATIONS RELATED TO THE ENVIRONMENT, INCLUDING (BUT NOT LIMITED TO) THE ENDANGERED SPECIES ACT, STATE AQUIFER REGULATIONS AND MUNICIPAL WATERSHED ORDINANCES. THIS SUBDIVISION IS TO BE KNOWN AS:

12 OAKS VILLAGE

TO CERTIFY WHICH, WITNESS BY MY HAND THIS________ DAY OF________________, 20_______.

____

PRINT:______________________________
TWELVE OAKS PROFESSIONAL PARK COMMERCIAL LP,
14205 N. MOPAC EXPRESSWAY
SUITE 450
AUSTIN, TEXAS 78728

STATE OF TEXAS §
§ KNOW ALL MEN BY THESE PRESENTS
COUNTY OF WILLIAMSON §

BEFORE ME, THE UNDERSIGNED, A NOTARY PUBLIC IN AND FOR SAID COUNTY AND STATE, ON THIS DAY PERSONALLY APPEARED ____________________________, KNOWN TO ME TO BE THE PERSON WHOSE NAME IS SUBSCRIBED TO THE FOREGOING INSTRUMENT.

GIVEN UNDER MY HAND AND SEAL OF OFFICE THIS__________ DAY OF______________, 20__.

____
NOTARY PUBLIC IN AND FOR THE STATE OF TEXAS
MY COMMISSION EXPIRES ON: ____________________

STATE OF TEXAS §
§ KNOW ALL MEN BY THESE PRESENTS
COUNTY OF WILLIAMSON §

THAT, CADENCE BANK, A MISSISSIPPI STATE CHARTERED BANK, LIEN HOLDER OF 3.624 ACRES OF LAND SHOWN HEREON AND DESCRIBED IN DOCUMENT NO. 2023002896, OFFICIAL PUBLIC RECORDS OF WILLIAMSON COUNTY, TEXAS; DOES HEREBY CONSENT TO THE SUBDIVISION OF SAID 3.624 ACRES AS SHOWN HEREON, AND DOES FURTHER HEREBY, JOIN, APPROVE AND CONSENT TO ALL PLAT NOTE REQUIREMENTS SHOWN HEREON, AND DOES HEREBY DEDICATE TO THE CITY OF LIBERTY HILL THE STREETS, ALLEYS, RIGHTS-OF-WAY, EASEMENTS AND PUBLIC PLACES SHOWN HEREON FOR SUCH PUBLIC PURPOSES AS THE CITY OF LIBERTY HILL MAY DEEM APPROPRIATE. THIS SUBDIVISION IS TO BE KNOWN AS:

12 OAKS VILLAGE

TO CERTIFY WHICH, WITNESS BY MY HAND THIS ____ DAY OF ______________________, 20___.

____

STATE OF TEXAS §
§ KNOW ALL MEN BY THESE PRESENTS
COUNTY OF WILLIAMSON §

BEFORE ME, THE UNDERSIGNED, A NOTARY PUBLIC IN AND FOR SAID COUNTY AND STATE, ON THIS DAY PERSONALLY APPEARED ______________________________, KNOWN TO ME TO BE THE PERSON WHOSE NAME IS SUBSCRIBED TO THE FOREGOING INSTRUMENT.

GIVEN UNDER MY HAND AND SEAL OF OFFICE THIS ____ DAY OF ______________________, 20___.

____
NOTARY PUBLIC IN AND FOR THE STATE OF TEXAS
MY COMMISSION EXPIRES ON: ____________________

BASED UPON THE REPRESENTATIONS OF THE ENGINEER OR SURVEYOR WHOSE SEAL IS AFFIXED HERETO, AND AFTER REVIEW OF THE PLAT AS REPRESENTED BY THE SAID ENGINEER OR SURVEYOR, I FIND THAT THIS PLAT COMPLIES WITH THE WILLIAMSON COUNTY FLOODPLAIN REGULATIONS. THIS CERTIFICATION IS MADE SOLELY UPON SUCH REPRESENTATIONS AND SHOULD NOT BE RELIED UPON FOR VERIFICATION OF THE FACTS ALLEGED. WILLIAMSON COUNTY DISCLAIMS ANY RESPONSIBILITY TO ANY MEMBER OF THE PUBLIC FOR INDEPENDENT VERIFICATION OF THE REPRESENTATIONS, FACTUAL OR OTHERWISE, CONTAINED IN THIS PLAT AND THE DOCUMENTS ASSOCIATION WITHIN IT.

______________________________ ____________________.
ADAM D. BOATRIGHT, P.E. COUNTY ENGINEER — DATE
WILLIAMSON COUNTY FLOODPLAIN ADMINISTRATOR

I, JERRY L. MILLARD, JR., DIRECTOR OF PLANNING, DESIGNEE, OF THE CITY OF LIBERTY HILL, TEXAS, UNDER THE AUTHORITY GRANTED ME IN SECTION 3.09.02 OF THE UNIFIED DEVELOPMENT CODE, IN ACCORDANCE WITH THE TEXAS LOCAL GOVERNMENT CODE, DO HEREBY CERTIFY THIS PLAT AS APPROVED FOR FILING OF RECORD WITH THE COUNTY CLERK OF WILLIAMSON COUNTY, TEXAS.

______________________________ ____________________
JERRY L. MILLARD, JR., DIRECTOR OF PLANNING — DATE

ROAD NAMES AND ADDRESS ASSIGNMENTS VERIFIED THIS THE ______ DAY OF ______________________, 20_______ A.D.,

____
CINDY BRIDGES, ENP
WILLIAMSON COUNTY ADDRESSING COORDINATOR
512-943-3708
CBRIDGES@WILCO.ORG

STATE OF TEXAS §
§ KNOW ALL MEN BY THESE PRESENTS
COUNTY OF TRAVIS §

I, ERNESTO NAVARRETE, REGISTERED PROFESSIONAL LAND SURVEYOR IN THE STATE OF TEXAS, DO HEREBY CERTIFY THAT I PREPARED THIS PLAT FROM AN ACTUAL AND ACCURATE ON-THE-GROUND SURVEY OF THE LAND AND THAT THE MONUMENTS SHOWN THEREON WERE PROPERLY PLACED UNDER MY PERSONAL SUPERVISION, IN ACCORDANCE WITH CHAPTER 5, SUBDIVISIONS, CITY OF LIBERTY HILL UNIFIED DEVELOPMENT. LOT CORNERS WILL BE SET AFTER THE PLAT IS RECORDED AND SITE GRADING IS COMPLETE. ALL EASEMENTS OF RECORDS ARE SHOWN OR NOTED ON THE PLAT, AND ARE BASED ON THE TITLE COMMITMENT PREPARED BY STEWART TITLE GUARANTY COMPANY, GF NO. 1594366, EFFECTIVE DATE FEBRUARY 15, 2022.

TO CERTIFY WHICH, WITNESS MY HAND AND SEAL AT AUSTIN, TRAVIS, COUNTY TEXAS, THIS ______________ DAY OF ________________, 20_____.

____
ERNESTO NAVARRETE, R.P.L.S.
REGISTERED PROFESSIONAL LAND SURVEYOR
NO. 6642 – STATE OF TEXAS
HR GREEN DEVELOPMENT TX, LLC
5508 HWY 290 WEST, SUITE 150
AUSTIN, TEXAS 78735
512.872.6696
ERNESTO.NAVARRETE@HRGREEN.COM
TBPLS FIRM NO. 10194101

STATE OF TEXAS §
§ KNOW ALL MEN BY THESE PRESENTS
COUNTY OF TRAVIS §

I, XAVIER GARZA-ROBLEDO, A REGISTERED PROFESSIONAL ENGINEER IN THE STATE OF TEXAS, DO HEREBY CERTIFY THAT THIS PLAT IS IN COMPLIANCE WITH THE CODES AND ORDINANCES OF THE CITY OF LIBERTY HILL, TEXAS.

TO CERTIFY WHICH, WITNESS MY HAND AND SEAL AT AUSTIN, TRAVIS, COUNTY TEXAS, THIS ______________ DAY OF ________________, 20_____.

____
XAVIER GARZA-ROBLEDO, P.E.
REGISTERED PROFESSIONAL ENGINEER
NO. 135174 – STATE OF TEXAS
HR GREEN DEVELOPMENT TX, LLC
5508 HWY 290 WEST, SUITE 150
AUSTIN, TEXAS 78735
512.872.6696
XAVIER.GARZA@HRGREEN.COM
TBPE FIRM NO. F-16384

STATE OF TEXAS §
§ KNOW ALL MEN BY THESE PRESENTS
COUNTY OF WILLIAMSON §

I, NANCY E. RISTER, CLERK OF THE COUNTY COURT OF SAID COUNTY, DO HEREBY CERTIFY THAT THE FOREGOING INSTRUMENT IN WRITING, WITH ITS CERTIFICATE OF AUTHENTICATION WAS FILED FOR RECORD IN MY OFFICE ON THE_______ DAY OF___________, 20__, A.D., AT _________ O'CLOCK, ______.M., AND DULY RECORDED THIS THE____ DAY OF_____________, 20___, A.D., AT_ O'CLOCK,___.M., IN THE OFFICIAL PUBLIC RECORDS OF SAID COUNTY IN INSTRUMENT NO. ____________________.

TO CERTIFY WHICH, WITNESS MY HAND AND SEAL AT THE COUNTY COURT OF SAID COUNTY, AT MY OFFICE IN GEORGETOWN, TEXAS, THE DATE LAST SHOWN ABOVE WRITTEN.

BY: ______________________________
NANCY E. RISTER
CLERK, COUNTY COURT
WILLIAMSON COUNTY, TEXAS

SHEET 5 OF 5

FILE No: 1386

No:	REVISION:	BY:	DATE:
	PLAT PREPARATION DATE		SEPTEMBER, 2022
	APPLICATION SUBMITTAL DATE		
2	ACCESS EASEMENT ADDED	M.B.	01-05-23
3	STAFF REVIEW COMMENTS	M.B.	02-16-23
4	LOT REVISIONS & R.O.W. DEDICATION	M.B.	05-19-23
5	STAFF REVIEW COMMENTS	E.N.	07-10-23

HRGreen.
DEVELOPMENT TX

5508 HIGHWAY 290 WEST
SUITE 150
AUSTIN, TX 78735
512.872.6696
HRGREEN.COM
TBPE NO: 16384
TBPLS NO: 10194101

FINAL PLAT
12 OAKS VILLAGE
GREENLEAF FISK SURVEY, A-5
WILLIAMSON COUNTY, TEXAS

STATE OF TEXAS
NICHOLAS R. SANDLIN
124404
LICENSED PROFESSIONAL ENGINEER
9/5/2023

WARNING !!!! CONTRACTOR TO FIELD VERIFY ALL EXIST. UTILITIES VERTICALLY AND HORIZONTALLY PRIOR TO CONSTRUCTION. THE CONTRACTOR IS TO CONTACT ENGINEER IF ANY EXISTING UTILITY INFORMATION DIFFERS FROM DATA SHOWN IN THE PLANS. CALL 811 BEFORE YOU DIG.

TEXAS 811 BEFORE YOU DIG

ENGINEERING | CONSULTING
SANDLIN
SERVICES, LLC

TBPELS FIRM #21356
4501 WHISPERING VALLEY DRIVE UNIT 27 AUSTIN, TX 78727

FINAL PLAT (5 OF 5)

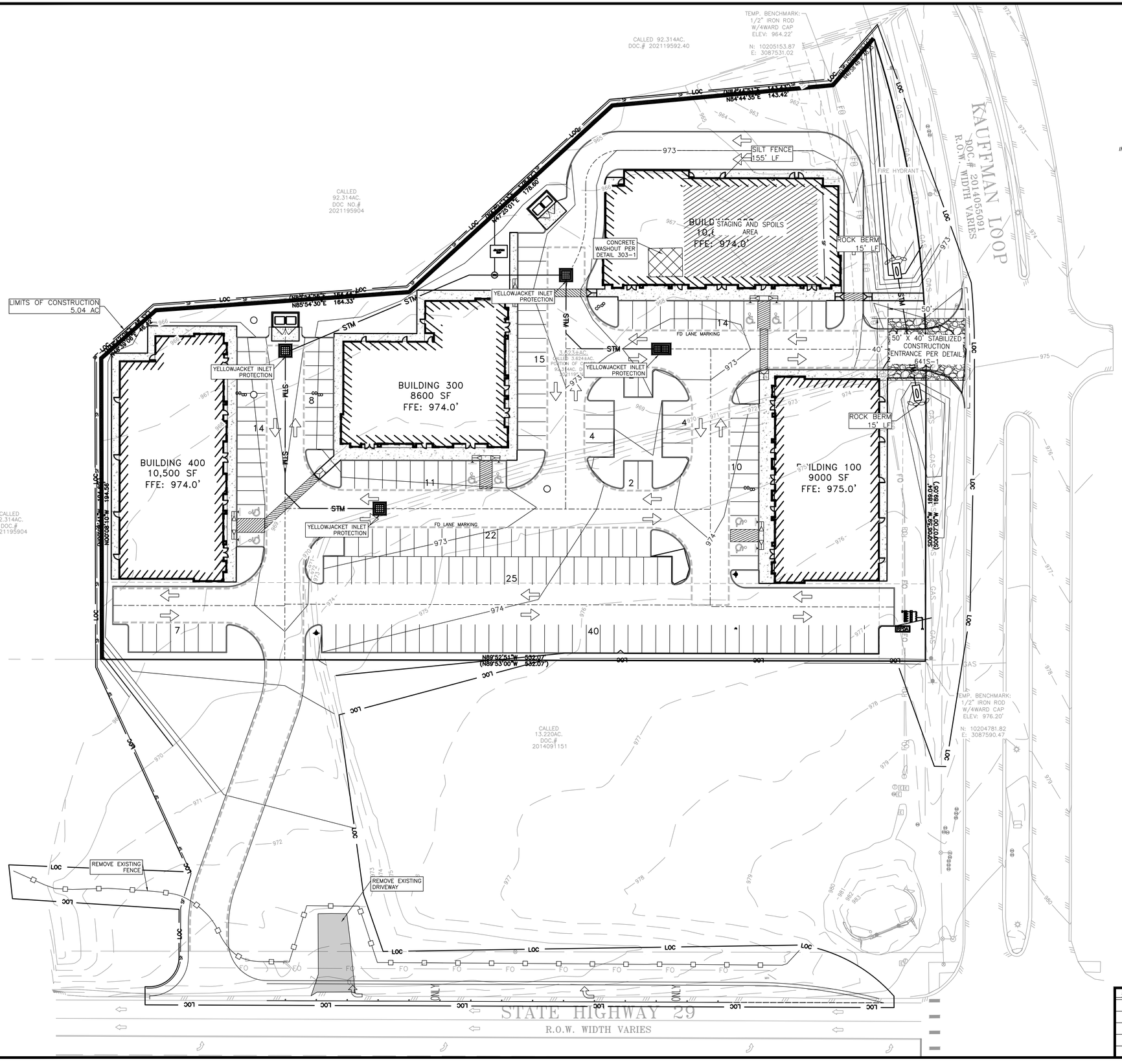
PROJECT CASE: XXXXXXX

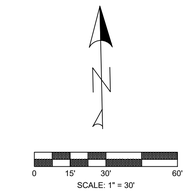
TWELVE OAKS

#	REVISION DESCRIPTION	SIGNATURE	DATE

SHEET 9 OF 32

G:\Shared drives\Sandlin Services LLC\Sandlin Services Projects\Land Development Division\01-0089-003 Twelve Oaks\CAD\Construction Sheets\S 120 CVR.dwg-FINAL PLAT (5 OF 5) Plotted Sep 06, 2023 at 2:26pm by Scott | Last Saved by: Scott





IF DRAWING BAR DOES NOT MEASURE 2" THIS PRINT IS NOT TO SCALE

9/5/2023

STATE OF TEXAS
NICHOLAS R. SANDLIN
124404
LICENSED PROFESSIONAL ENGINEER

EROSION CONTROL LEGEND

- PROPOSED PROPERTY/ PROJECT BOUNDARY LINE
- EXISTING R.O.W./PROPERTY LINE
- EXISTING EASEMENT LINE
- PROPOSED CURB & GUTTER
- LOC LOC LOC — LIMITS OF CONSTRUCTION
- SF SF SF — SILT FENCE
- T T T — TREE PROTECTION FENCE
- STAGING & TEMPORARY SPOILS AREA
- STABILIZED CONSTRUCTION ENTRANCE
- CONCRETE WASHOUT
- TEMPORARY ROCK BERM
- AREA INLET PROTECTION
- CURB INLET PROTECTION
- 750 EXISTING CONTOURS
- 755 PROPOSED CONTOURS
- 100 EXISTING TREE (TO REMAIN)
- 100 EXISTING TREE (TO BE REMOVED)

NOTE: ADDITIONAL EROSION CONTROL MEASURES MAY BE REQUIRED BY INSPECTOR AT TIME OF CONSTRUCTION.

EROSION CONTROL NOTES:

1. LIMITS OF CONSTRUCTION 5.04 AC (TOTAL DISTURBED ACREAGE)
2. THERE ARE NO HERITAGE OR PROTECTED TREES ONSITE
3. ALL STAGING & STORAGE SHALL OCCUR WITHIN THE BOUNDARIES OF THE PROPERTY AND LIMITS OF CONSTRUCTION.
4. INSTALL EROSION CONTROLS PER PLAN. WITH THE APPROVAL OF THE ENVIRONMENTAL INSPECTOR, ADJUST AS NEEDED DURING CONSTRUCTION.
5. CONTRACTOR SHALL REMOVE ALL SILT AND DEBRIS FROM ALL EXISTING OR NEWLY PAVED SURFACES AT THE END OF CONSTRUCTION.
6. TEMPORARY STAGING & STORAGE AREA/TEMPORARY SPOILS AREA IS TO BE USED DURING NORMAL WORK HOURS (7 A.M. TO 7 P.M.). ONCE CONSTRUCTION IS COMPLETE, CONTRACTOR SHALL REMOVE ALL SILT AND DEBRIS FROM AREA AND RESTORE TO ORIGINAL CONDITION OR BETTER.
7. ALL INLETS SHALL HAVE INLET PROTECTION IN PLACE UNTIL THE COMPLETION OF GRADING AND REVEGETATION.
8. IN AREAS WHERE SILT FENCE IS TO BE INSTALLED CROSSING CONTOURS, J-HOOKS SHALL BE ADDED TO THE SILT FENCE EVERY 100 FEET.
9. STABILIZATION OF ALL SLOPES 3:1 OR GREATER, SUITABLE MATTING (TYPE I) WILL BE UTILIZED IN CONJUNCTION WITH REVEGETATIVE EFFORTS ONSITE. CHANNEL STABILIZATION WILL USE TYPE II.

TEXAS 811 BEFORE YOU DIG

WARNING !!!! CONTRACTOR TO FIELD VERIFY ALL EXIST. UTILITIES VERTICALLY AND HORIZONTALLY PRIOR TO CONSTRUCTION. THE CONTRACTOR IS TO CONTACT ENGINEER IF ANY EXISTING UTILITY INFORMATION DIFFERS FROM DATA SHOWN IN THE PLANS. CALL 811 BEFORE YOU DIG.

ENGINEERING | CONSULTING
SANDLIN
SERVICES, LLC
TBPELS FIRM #21356
4501 WHISPERING VALLEY DRIVE UNIT 27 AUSTIN, TX 78727

EROSION CONTROL AND DEMOLITION PLAN

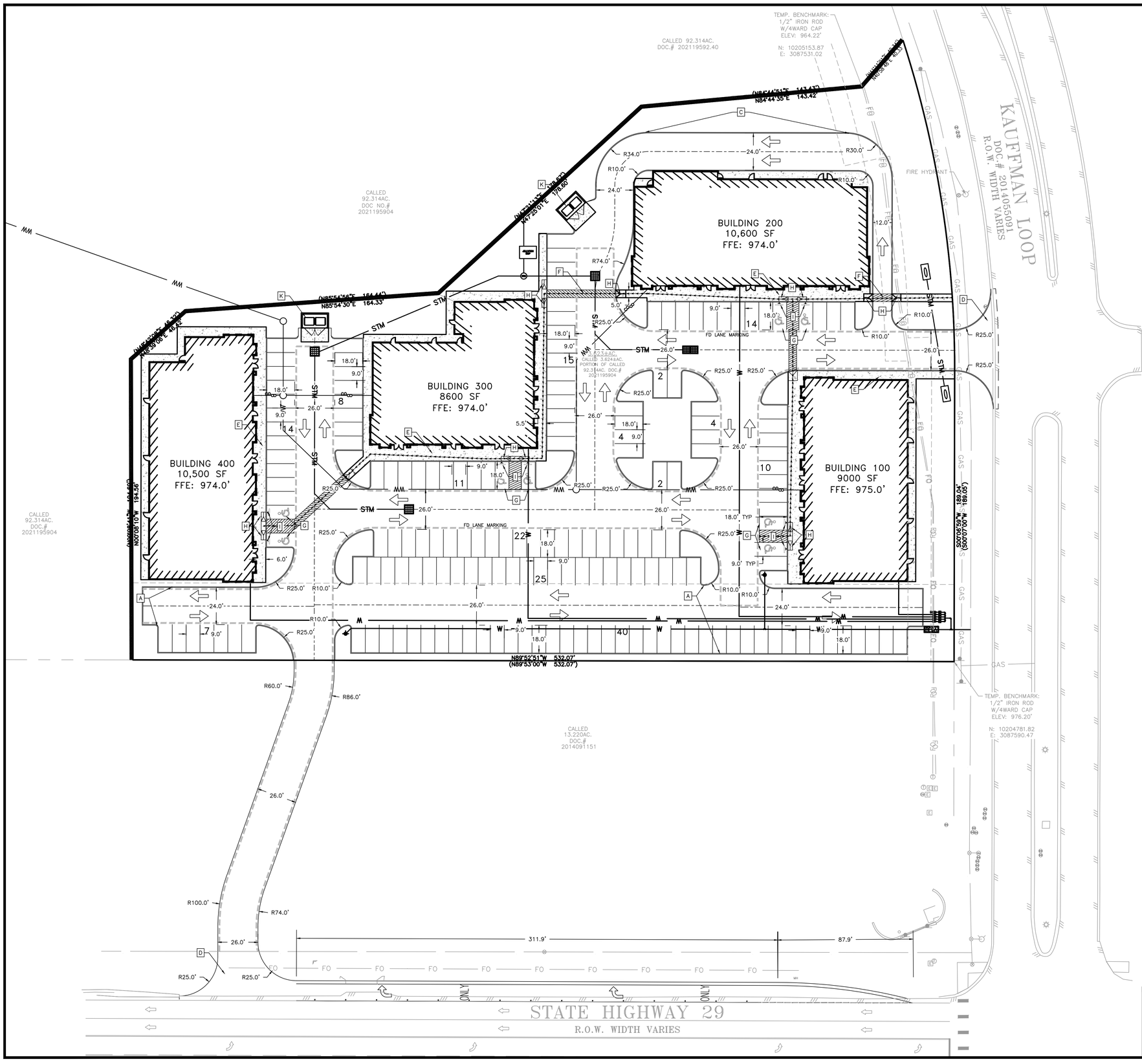
PROJECT CASE: XXXXXXX

TWELVE OAKS

#	REVISION DESCRIPTION	SIGNATURE	DATE

SHEET 10 OF 32

G:\Shared drives\Sandlin Services LLC\Sandlin Services Projects\Land Development Division\01-0089-003 Twelve Oaks\CAD\Construction Sheets\S 120 ESC.dwg-EROSION CONTROL AND DEMOLITION PLAN Plotted Sep 06, 2023 at 2:27pm by Scott | Last Saved by: Scott



0 15' 30' 60'
SCALE: 1" = 30'

IF DRAWING BAR DOES NOT MEASURE 2" THIS PRINT IS NOT TO SCALE

9/5/2023

STATE OF TEXAS
NICHOLAS R. SANDLIN
124404
LICENSED
PROFESSIONAL ENGINEER

SITE PLAN LEGEND

- PROPOSED PROPERTY/ PROJECT BOUNDARY LINE
- EXISTING R.O.W./PROPERTY LINE
- EXISTING EASEMENT LINE
- FIRE LANE
- PROPOSED CURB & GUTTER
- STREET CENTERLINE
- FENCE
- STRUCTURAL RETAINING WALL (BY OTHERS)
- PROPOSED CONCRETE SIDEWALK
- (R) PROPOSED PARKING SPACES
- (T) TRANSFORMER PAD
- SITE WALLS
- PHASING

TAS ACCESSIBLE ROUTE
TAS ACCESSIBLE ROUTES MAY NOT EXCEED A CROSS SLOPE OF 1:50 (2%) OR EXCEED A RUNNING SLOPE OF 1:20 (5%) UNLESS DESIGNED AS A RAMP. THE MAXIMUM RUNNING SLOPE OF A RAMP IN NEW CONSTRUCTION IS 1:12 (8.33%). THE MAXIMUM RISE FOR ANY RAMP RUN IS 30 INCHES. REFER TO GRADING SHEET(S).

- EX. WATER LINE
- EX. WASTEWATER
- EX. STORM SEWER LINE
- EX. FIRE HYDRANT
- EX. WATER METER
- EX. WASTEWATER MANHOLE
- PR. WATER LINE
- FIRE LINE
- PR. WASTEWATER
- PR. STORM SEWER LINE
- PR. FIRE HYDRANT
- PR. WATER METER
- PR. WASTEWATER MANHOLE
- FITTINGS AS NOTED
- GATE VALVE AS NOTED
- WW CLEAN OUT
- BFP BACK FLOW PREVENTER
- FLOW ARROW
- EX. UTILITY POLE

SITE DATA	
	PROPOSED
TOTAL SITE AREA	3.62 AC / 157,829 SF
IMPERVIOUS COVER	127,475 SF / 2.93 AC = 80.8%
BUILDING HEIGHT	1 STORY – SEE ARCH. PLANS BY OTHERS
FOUNDATION TYPE	CONCRETE SLAB

PARKING TABLE	
TOTAL BUILDING AREA	38,700 SF
ALLOWABLE PARKING RATIO	1 SPACE: 218 SF
PARKING REQUIRED	38,700 SF / 218 = 178 SPACES
PARKING PROVIDED	178 SPACES INCLUDING 8 ADA & 4 VAN

SITE LEGEND

- A 6" CURB & GUTTER. SEE DETAIL SHEET.
- B RIBBON CURB. SEE DETAIL SHEET.
- C CASTELLATED CURB. SEE DETAIL SHEET.
- D STANDARD CITY/TXDOT TYPE II DRIVEWAY. SEE DETAIL SHEET
- E CONCRETE SIDEWALK. SEE DETAIL SHEET.
- F PEDESTRIAN CROSSWALK.
- G HANDICAP SPACE W/SIGN. SEE DETAIL SHEET.
- H PEDESTRIAN ADA RAMP OR AT GRADE ADA DOME PAVERS. SEE DETAIL SHEET.
- I CONCRETE WHEEL STOP. SEE DETAIL SHEET.
- J STANDARD CITY BIKE RACK. SEE DETAIL SHEET.
- K DUMPSTER ENCLOSURE WITH CONCRETE PAD PER GEOTECHNICAL REPORT AND CITY STANDARDS

TEXAS 811
811
BEFORE YOU DIG

WARNING !!!! CONTRACTOR TO FIELD VERIFY ALL EXIST. UTILITIES VERTICALLY AND HORIZONTALLY PRIOR TO CONSTRUCTION. THE CONTRACTOR IS TO CONTACT ENGINEER IF ANY EXISTING UTILITY INFORMATION DIFFERS FROM DATA SHOWN IN THE PLANS. CALL 811 BEFORE YOU DIG.

ENGINEERING | CONSULTING
SANDLIN
SERVICES, LLC
TBPELS FIRM #21356
4501 WHISPERING VALLEY DRIVE UNIT 27 AUSTIN, TX 78727

SITE PLAN

PROJECT CASE: XXXXXXX

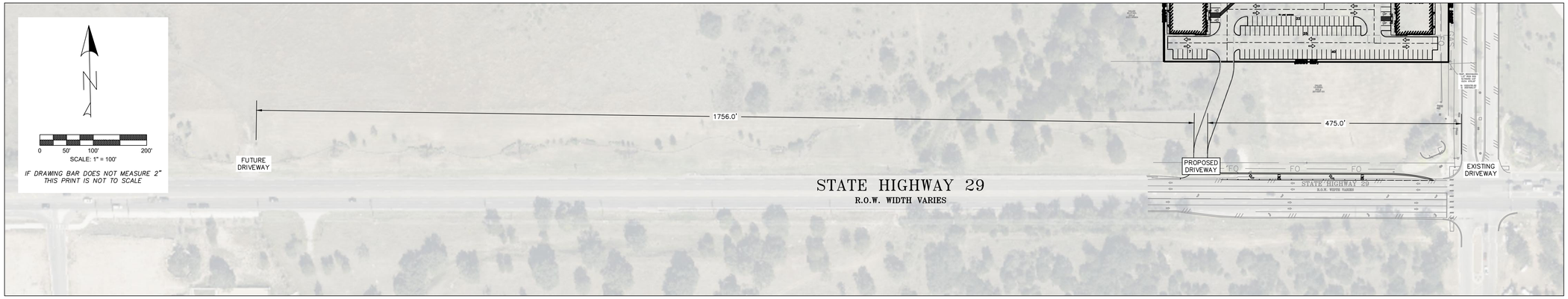
TWELVE OAKS

#	REVISION DESCRIPTION	SIGNATURE	DATE

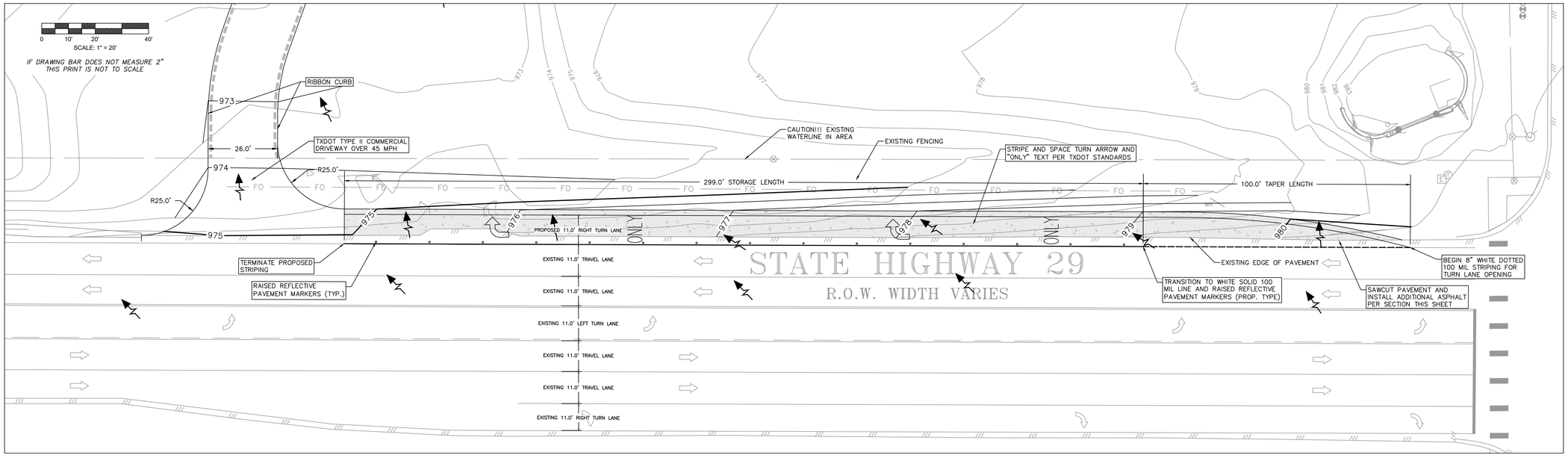
SHEET 11 OF 32

G:\Shared drives\Sandlin Services LLC\Sandlin Services Projects\Land Development Division\01-0089-003 Twelve Oaks\CAD\Construction Sheets\S 120 SITE.dwg-SITE PLAN Plotted Sep 06, 2023 at 2:27pm by Scott | Last Saved by: Scott

DRIVEWAY SPACING PLAN



DECELERATION LANE ONTO PROPOSED DRIVEWAY



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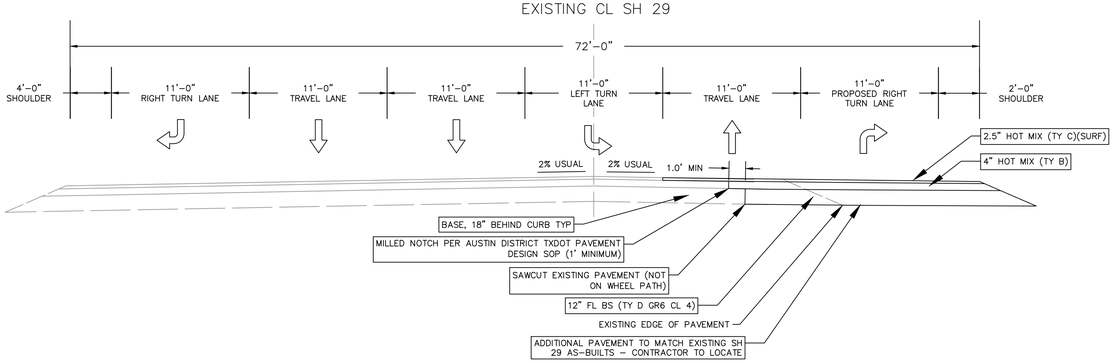
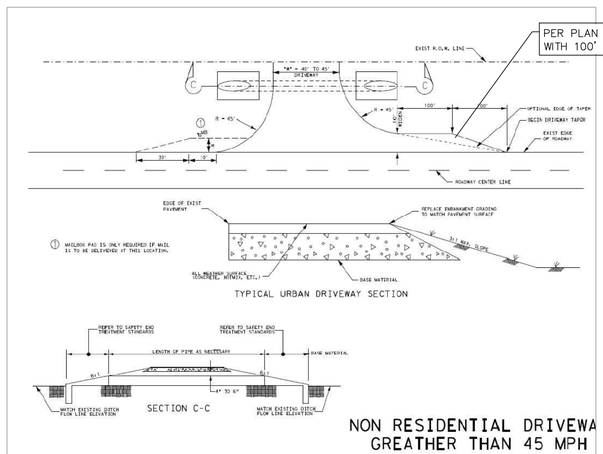


PROPOSED DECELERATION LANE SECTION
N.T.S.

TXDOT DRIVEWAY DETAIL



NON RESIDENTIAL DRIVEWA
GREATHER THAN 45 MPH

STATE OF TEXAS
NICHOLAS R. SANDLIN
124404
LICENSED PROFESSIONAL ENGINEER
9/5/2023

DRIVEWAY AND TURN LANE LEGEND

- PROPOSED PROPERTY/ PROJECT BOUNDARY LINE
- EXISTING R.O.W./PROPERTY LINE
- EXISTING EASEMENT LINE
- FIRE LANE
- PROPOSED CURB & GUTTER
- STREET CENTERLINE
- PROPOSED CONCRETE SIDEWALK
- TRAFFIC DIRECTION
- EXISTING CONTOURS (750)
- PROPOSED CONTOURS (755)
- P — UTILITY POLE
- W — EX. WATER LINE
- WW — EX. WASTEWATER
- STM — EX. STORM SEWER LINE
- EX. FIRE HYDRANT
- WM — EX. WATER METER
- WW — EX. WASTEWATER MANHOLE
- F — FIRE LINE
- W — PR. WATER LINE
- WW — PR. WASTEWATER
- STM — PR. STORM SEWER LINE
- PR. FIRE HYDRANT
- PR. WATER METER
- WW — PR. WASTEWATER MANHOLE

NOTES:

1. DRAINAGE FOR THIS DEVELOPMENT HAS BEEN DESIGNED SUCH THAT THERE WILL BE NO ADVERSE IMPACTS ON THE CAPACITY, FUNCTION OR INTEGRITY OF TEXAS DEPARTMENT OF TRANSPORTATION RIGHT OF WAY DRAINAGE FACILITIES.
2. ALL DRIVEWAY CULVERTS MUST BE INSTALLED PRIOR TO ISSUANCE OF BUILDING PERMITS OR CLOSEOUT OF CONSTRUCTION ACTIVITIES.
3. CONTRACTOR TO VERIFY EXISTING ROADWAY CROSS-SECTIONS MATCH ON-SITE CONDITIONS PRIOR TO CONSTRUCTION AND NOTIFY ENGINEER OF ANY DISCREPANCIES.
4. THIS PROJECT IS PART OF A MASTER DRAINAGE STUDY CONDUCTED BY HRGREEN. SEE SHEET 16 AND 17 FOR APPROVED CALCULATIONS BY OTHERS FOR DRAINAGE WITHIN THE ROW.

TXDOT TRAFFIC CONTROL NOTES:

1. CONTRACTOR SHALL DEVELOP A TRAFFIC CONTROL PLAN PER TXDOT STANDARD DETAILS BASED ON SCHEDULE AND MEANS AND METHODS. THIS TRAFFIC CONTROL PLAN SHALL BE COORDINATED WITH THE TXDOT AREA OFFICE PRIOR TO IMPLEMENTATION/CONSTRUCTION.
2. ALL WORK WITHIN THE TXDOT RIGHT OF WAY SUCH AS STRIPING, MILLING, AND OVERLAYS SHALL BE TO TXDOT SPECIFICATIONS.

TEXAS 811 BEFORE YOU DIG

WARNING !!!! CONTRACTOR TO FIELD VERIFY ALL EXIST. UTILITIES VERTICALLY AND HORIZONTALLY PRIOR TO CONSTRUCTION. THE CONTRACTOR IS TO CONTACT ENGINEER IF ANY EXISTING UTILITY INFORMATION DIFFERS FROM DATA SHOWN IN THE PLANS. CALL 811 BEFORE YOU DIG.

ENGINEERING | CONSULTING
SANDLIN
SERVICES, LLC
TBPELS FIRM #21356
4501 WHISPERING VALLEY DRIVE UNIT 27 AUSTIN, TX 78727

TXDOT DRIVEWAY PLAN

PROJECT CASE: XXXXXXX

TWELVE OAKS

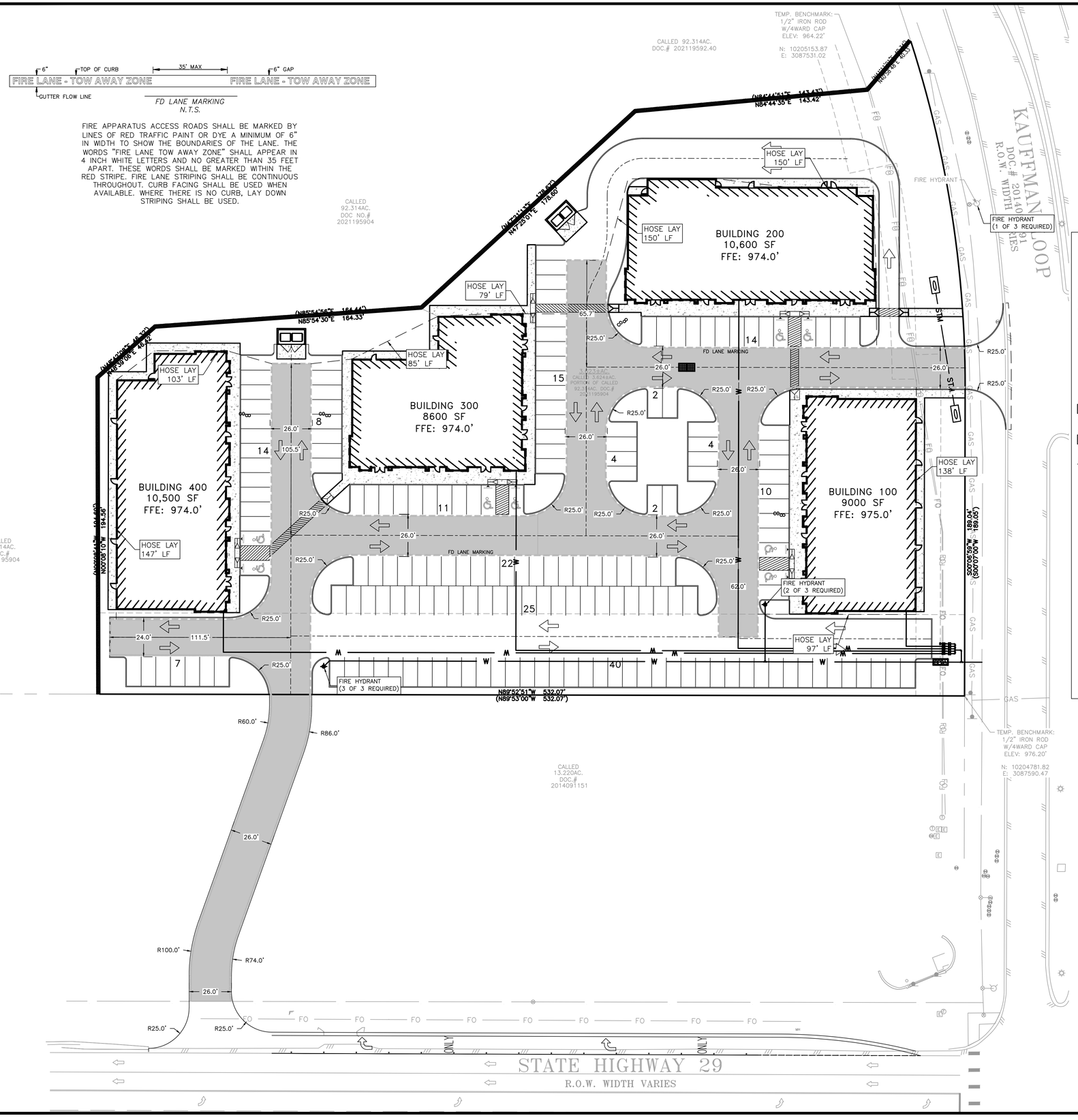
#	REVISION DESCRIPTION	SIGNATURE	DATE

SHEET 12 OF 32

G:\Shared drives\Sandlin Services LLC\Sandlin Services Projects\Land Development Division\01-0089-003 Twelve Oaks\CAD\Construction Sheets\S 120 DWY.dwg-TXDOT DRIVEWAY PLAN Plotted Sep 06, 2023 at 2:27pm by Scott | Last Saved by: Scott

FD LANE MARKING
N.T.S.

FIRE APPARATUS ACCESS ROADS SHALL BE MARKED BY LINES OF RED TRAFFIC PAINT OR DYE A MINIMUM OF 6" IN WIDTH TO SHOW THE BOUNDARIES OF THE LANE. THE WORDS "FIRE LANE TOW AWAY ZONE" SHALL APPEAR IN 4 INCH WHITE LETTERS AND NO GREATER THAN 35 FEET APART. THESE WORDS SHALL BE MARKED WITHIN THE RED STRIPE. FIRE LANE STRIPING SHALL BE CONTINUOUS THROUGHOUT. CURB FACING SHALL BE USED WHEN AVAILABLE. WHERE THERE IS NO CURB, LAY DOWN STRIPING SHALL BE USED.



Fire Hydrant Flow Test Report

Date: 9/4/2023, 1110 hrs

Location: 7858 W SH 29, Georgetown, TX 78628

Test Hydrant:	7858 W SH 29 (Kauffman Loop)	**Flow Hydrant:**	7858 W SH 29 (Kauffman Loop)
Hydrant ID:	H58618G	**Hydrant ID:**	H58617G
GPS:	30.637697/ -97.817808	**GPS:**	30.639024/ -97.817805

Water District: City of Georgetown

Flow Data

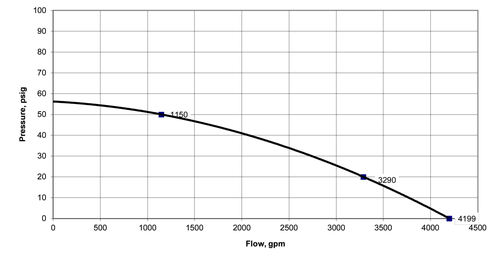
SIZE OPENING:	2.5
COEFFICIENT:	0.9
PITOT READING:	47
GPM:	1150

TOTAL FLOW DURING TEST: **1150** GPM

STATIC READING: 55 PSI RESIDUAL: 50 PSI

Predicted flow: at 20 psi residual --- **3290** GPM | at 0 psi residual --- **4199** GPM

Remarks:



All equipment was left in operational condition upon completion of testing.
Capital Hydrant certifies the test results only on the date and time listed above.

STATE OF TEXAS
NICHOLAS R. SANDLIN
124404
LICENSED
PROFESSIONAL ENGINEER
9/5/2023

FIRE LEGEND

- PROPOSED PROPERTY/ PROJECT BOUNDARY LINE
- EXISTING R.O.W./PROPERTY LINE
- EXISTING EASEMENT LINE
- PROPOSED CURB & GUTTER
- FIRE ZONE MARKINGS: FIRE LANES TO BE MARKED BY PAINTING THE CURB RED WITH WHITE STENCILING READING "FIRE ZONE/TOW-AWAY ZONE" WITH LETTERING AT LEAST 3 INCHES IN HEIGHT. SUCH STENCILING SHALL BE AT INTERVALS OF 35 FEET OR LESS. IN ADDITION, SIGNS SHALL BE POSTED AT BOTH ENDS OF A FIRE ZONE. REFER TO C.O.A. STANDARD DETAILS 901S-5 & 901S-6.
- PROPOSED FIRE ACCESS

NOTES:

FACILITIES, BUILDINGS OR PORTIONS OF BUILDINGS HEREAFTER CONSTRUCTED SHALL BE ACCESSIBLE TO FIRE DEPARTMENT APPARATUS BY WAY OF AN APPROVED FIRE APPARATUS ACCESS ROAD WITH AN ASPHALT, CONCRETE OR OTHER APPROVED (MUST HAVE A PERMIT OF THE FIRE MARSHAL'S OFFICE)DRIVING SURFACE CAPABLE OF SUPPORTING THE IMPOSED LOAD OF FIRE APPARATUS WEIGHING AT LEAST 75,000 POUNDS (34 050 KG).

FIRE APPARATUS ACCESS ROADS SHALL BE DESIGNED AND MAINTAINED TO SUPPORT THE IMPOSED LOADS OF FIRE APPARATUS AND SHALL BE SURFACED SO AS TO PROVIDE ALL- WEATHER DRIVING CAPABILITIES.

A 3' CLEAR SPACE SHALL BE MAINTAINED AROUND THE CIRCUMFERANCE OF FIRE HYDRANTS EXCEPT AS OTHERWISE REQUIRED OR APPROVED.

FIRE DEPT. NOTES:

1. ALL THRUST BLOCKS ON FIRE LINES SHALL BE VERIFIED BY THE FIRE CODE OFFICIAL.
2. NEW HYDRANTS SHALL BE HYDROSTATIC TESTED AND VERIFIED BY THE FIRE CODE OFFICIAL
3. NO CONSTRUCTION OF COMBUSTIBLE MATERIALS MAY BE PERFORMED UNTIL HYDRANTS ARE INSTALLED AND OPERATIONAL.
4. NO OVERHEAD OBSTRUCTION SHALL BE LOCATED LESS THAN 14' HIGH ABOVE A FIRE LANE
5. FACILITIES, BUILDINGS OR PORTIONS OF BUILDINGS HEREAFTER CONSTRUCTED SHALL BE ACCESSIBLE TO FIRE DEPARTMENT APPARATUS BY WAY OF AN APPROVED FIRE APPARATUS ACCESS ROAD WITH AN ASPHALT, CONCRETE OR OTHER APPROVED (MUST HAVE A PERMIT OF THE FIRE MARSHAL'S OFFICE)DRIVING SURFACE CAPABLE OF SUPPORTING THE IMPOSED LOAD OF FIRE APPARATUS WEIGHING AT LEAST 75,000 POUNDS (34 050 KG).

N

0 15' 30' 60'
SCALE: 1" = 30'

IF DRAWING BAR DOES NOT MEASURE 2"
THIS PRINT IS NOT TO SCALE

WARNING !!!! CONTRACTOR TO FIELD VERIFY ALL EXIST. UTILITIES VERTICALLY AND HORIZONTALLY PRIOR TO CONSTRUCTION. THE CONTRACTOR IS TO CONTACT ENGINEER IF ANY EXISTING UTILITY INFORMATION DIFFERS FROM DATA SHOWN IN THE PLANS. CALL 811 BEFORE YOU DIG.

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4501 WHISPERING VALLEY DRIVE UNIT 27 AUSTIN, TX 78727

FIRE PROTECTION PLAN

PROJECT CASE: XXXXXXX

TWELVE OAKS

#	REVISION DESCRIPTION	SIGNATURE	DATE

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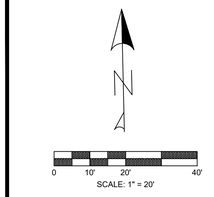
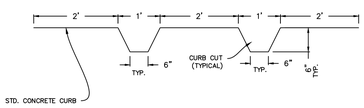


IF DRAWING BAR DOES NOT MEASURE 2" THIS PRINT IS NOT TO SCALE

CASTELLATED CURB DETAIL
N.T.S.



9/5/2023

GRADING LEGEND

- PROPOSED PROPERTY/ PROJECT BOUNDARY LINE
- EXISTING R.O.W./PROPERTY LINE
- EXISTING EASEMENT LINE
- GRADE CONTROL LINE
- PROPOSED CURB & GUTTER
- EXISTING CONTOURS (750)
- PROPOSED CONTOURS (755)
- EX. WATER LINE / PR. WATER LINE
- EX. WASTEWATER / PR. WASTEWATER
- EX. STORM SEWER LINE / PR. STORM SEWER LINE
- EX. FIRE HYDRANT / PR. FIRE HYDRANT
- EX. WATER METER / PR. WATER METER
- EX. WASTEWATER MANHOLE / PR. WASTEWATER MANHOLE
- (100) EXISTING TREE (TO REMAIN)
- (100) EXISTING TREE (TO BE REMOVED)
- EL:800.0 EXISTING GROUND ELEVATION
- TC:800.0 BC:800.0 PROPOSED CURB & GUTTER
- HP:800.0 HIGH POINT ELEVATION
- LP:800.0 LOW POINT ELEVATION
- TW:800.0 BW:800.0 PROPOSED TOP AND BOTTOM OF WALL
- FL:800.0 PROPOSED FLOW LINE
- 1.00% PROPOSED SLOPE (SLOPE DOWN)

GRADING NOTES

1. ALL MATERIALS AND CONSTRUCTION PROCEDURE WITHIN THE SCOPE OF THIS CONTRACT WHERE NO SPECIFICALLY COVERED IN THE CONSTRUCTION DOCUMENTS SHALL CONFORM TO ALL APPLICABLE CODES AND REGULATIONS.
2. CONTRACTOR SHALL BE RESPONSIBLE FOR RESTORING TO ITS ORIGINAL CONDITION ANY DAMAGE DONE TO EXISTING IMPROVEMENTS OR UTILITIES.
3. EARTHWORK FOR THE BUILDING FOUNDATION, CONCRETE SLABS AND CONCRETE AND ASPHALT PAVEMENT SHALL BE IN ACCORDANCE WITH THE GEOTECHNICAL REPORT.
4. ADJUST PAVEMENT, CURB ELEVATIONS, AND/OR SIDEWALK ELEVATIONS AS NECESSARY TO ENSURE A CONTINUOUS GRADE WITH EXISTING ELEVATIONS.
5. EXISTING AND PROPOSED GRADE CONTOUR INTERVALS SHOWN ARE ONE FOOT (1').
6. ALL UNSURFACED AREAS DISTURBED BY GRADING OPERATIONS SHALL RECEIVE FOUR (4) INCHES OF TOPSOIL.
7. REFER TO GEOTECHNICAL REPORT FOR PAVING SECTION RECOMMENDATIONS.

WARNING !!!! CONTRACTOR TO FIELD VERIFY ALL EXIST. UTILITIES VERTICALLY AND HORIZONTALLY PRIOR TO CONSTRUCTION. THE CONTRACTOR IS TO CONTACT ENGINEER IF ANY EXISTING UTILITY INFORMATION DIFFERS FROM DATA SHOWN IN THE PLANS. CALL 811 BEFORE YOU DIG.

SANDLIN
ENGINEERING | CONSULTING
SERVICES, LLC

TBPELS FIRM #21356
4501 WHISPERING VALLEY DRIVE UNIT 27 AUSTIN, TX 78727

GRADING PLAN (1 OF 2)

PROJECT CASE: XXXXXXX

TWELVE OAKS

#	REVISION DESCRIPTION	SIGNATURE	DATE

SHEET 14 OF 32

MATCHLINE – SEE SHEET 15

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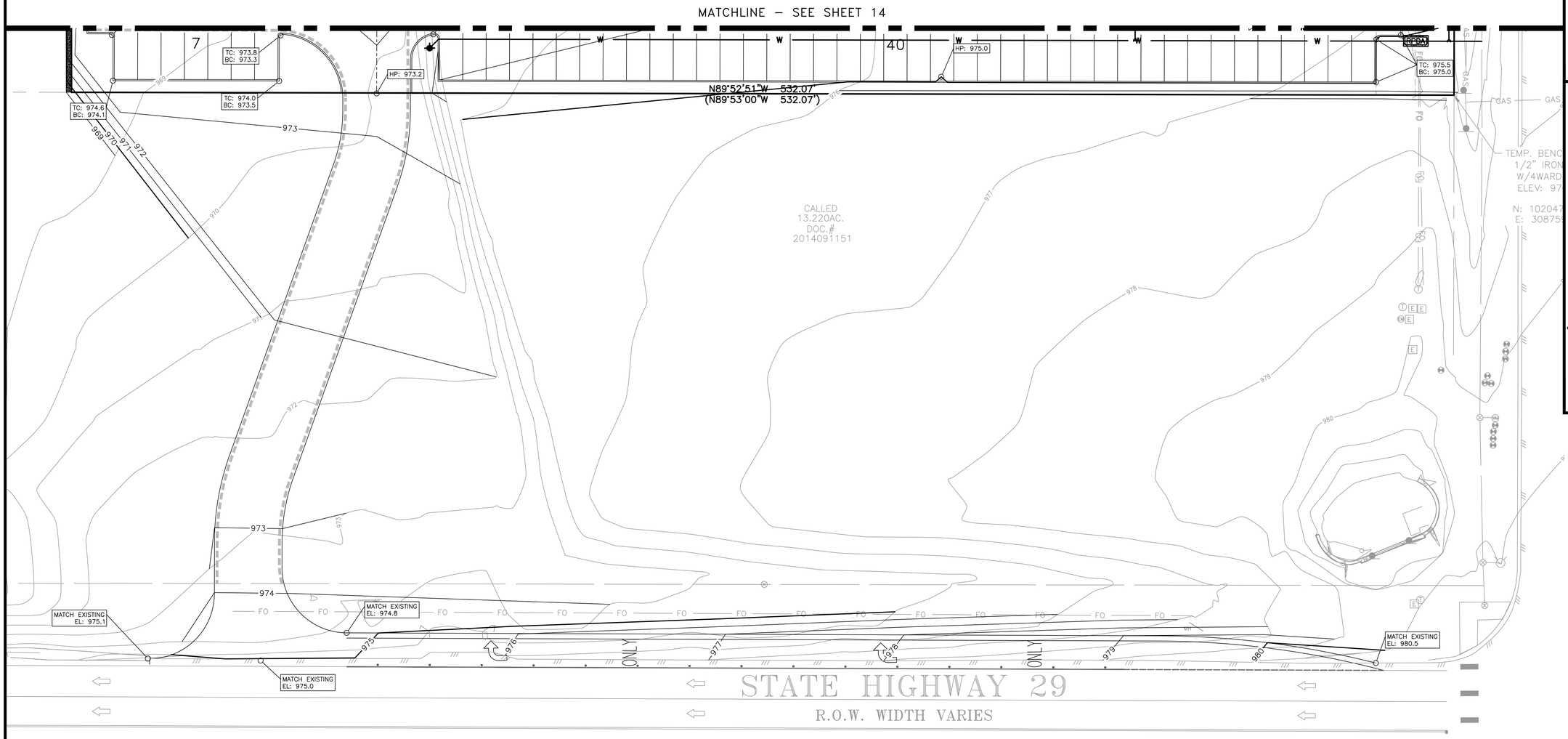

STATE OF TEXAS
NICHOLAS R. SANDLIN
124404
LICENSED
PROFESSIONAL ENGINEER
9/5/2023

GRADING LEGEND

- PROPOSED PROPERTY/ PROJECT BOUNDARY LINE
- EXISTING R.O.W./PROPERTY LINE
- EXISTING EASEMENT LINE
- GRADE CONTROL LINE
- PROPOSED CURB & GUTTER
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- PR. WASTEWATER
- EX. STORM SEWER LINE
- PR. STORM SEWER LINE
- EX. FIRE HYDRANT
- PR. FIRE HYDRANT
- EX. WATER METER
- PR. WATER METER
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- PR. WASTEWATER MANHOLE
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- TC:800.0 BC:800.0 PROPOSED CURB & GUTTER
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- FL:800.0 PROPOSED FLOW LINE
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TEXAS 811 BEFORE YOU DIG

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N

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

IF DRAWING BAR DOES NOT MEASURE 2" THIS PRINT IS NOT TO SCALE

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SANDLIN
SERVICES, LLC
TBPELS FIRM #21356
4501 WHISPERING VALLEY DRIVE UNIT 27 AUSTIN, TX 78727

GRADING PLAN (2 OF 2)

PROJECT CASE: XXXXXXX

TWELVE OAKS

#	REVISION DESCRIPTION	SIGNATURE	DATE

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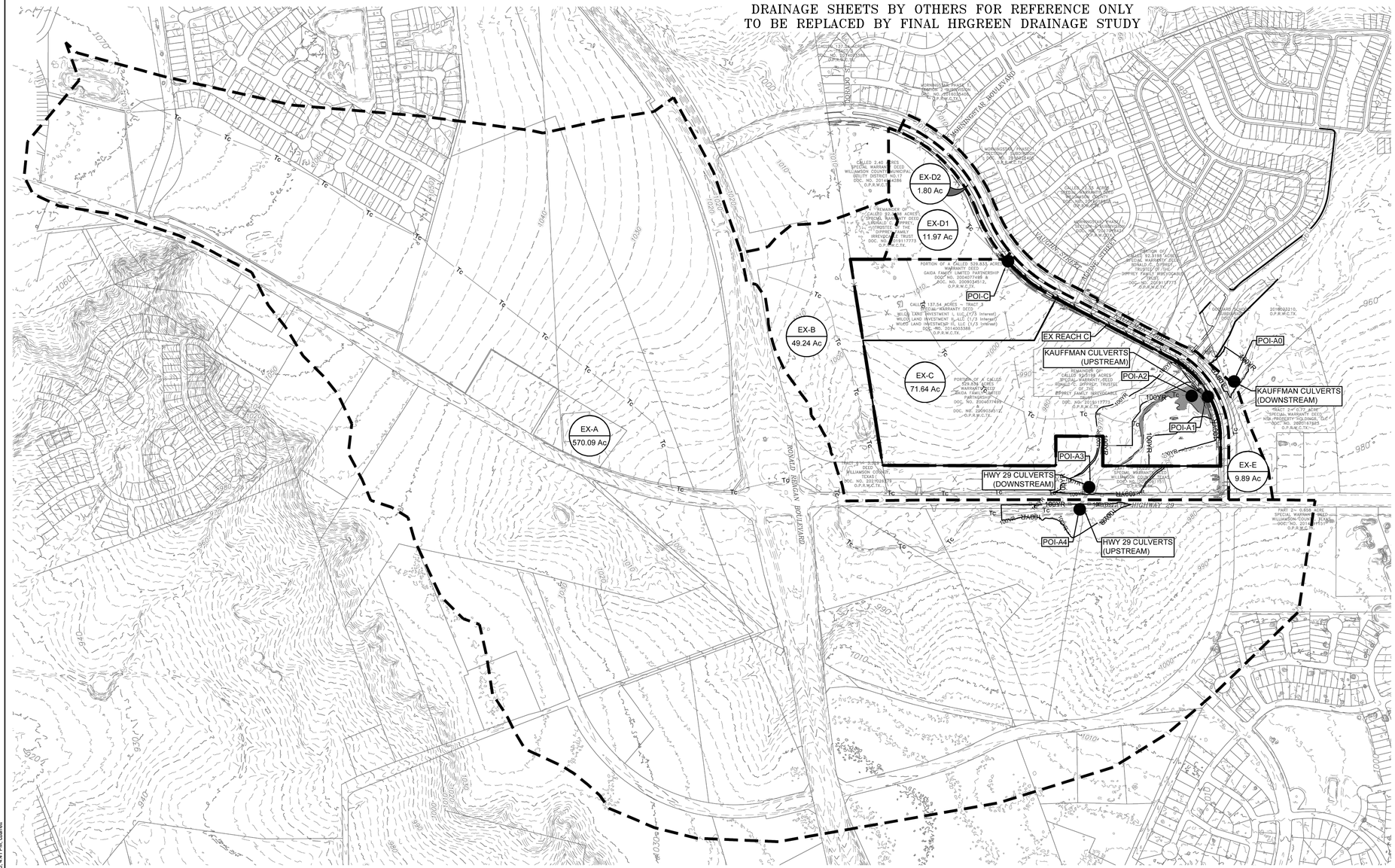
DRAINAGE SHEETS BY OTHERS FOR REFERENCE ONLY
TO BE REPLACED BY FINAL HRGREEN DRAINAGE STUDY



0 400' 800'
SCALE: 1" = 400'

LEGEND

- EXISTING MAJOR CONTOUR
- EXISTING MINOR CONTOUR
- TIME OF CONCENTRATION
- CALCULATED 100-YEAR EXISTING FLOOD PLAIN
- FLOW ARROW
- EXISTING DRAINAGE LINE
- DA-1 xx.xx ac — EXISTING DRAINAGE LABEL
- POI A — POINT OF INTEREST

Kauffman Loop Existing Culverts Outfall Rating	
Elevation	Q (cfs)
962.10	0
962.65	10
962.76	30
962.84	50
963.07	80
963.42	120
963.97	200
964.82	350
965.03	390
965.07	400
965.52	500
966.28	700
966.95	900
967.27	1000
967.86	1200
968.43	1400
968.96	1600
969.47	1800
969.96	2000
970.44	2200
970.90	2400
971.34	2600
971.82	2800
971.90	3000
973.23	5000
974.57	10000

Kauffman Loop Culverts Existing Water Surface Elevation	
Storm	WSE
2-YR	965.87
10-YR	967.59
25-YR	968.62
100-YR	970.20

Routing Analysis Inputs - Existing Conditions

Drainage Areas		Land Use		TOC Calculation Table	HEC-HMS Inputs		
Contributing Area	Area (ac)	Base Curve Number	Existing Impervious Cover (ac)	TOC (min)	Area (sq. mi.)	Impervious Cover (%)	Lag Time (min)
EX-A	570.09	80	77.20	101.46	0.89076	13.54%	60.88
EX-B	49.24	80	4.64	49.53	0.07694	9.43%	29.72
EX-C	71.64	80	0.00	40.49	0.11194	0.00%	24.29
EX-D1	11.97	80	0.00	21.60	0.01870	0.00%	12.96
EX-D2	1.80	80	0.89	5.00	0.00281	49.66%	3.00
EX-E	9.89	80	4.47	15.11	0.01545	45.20%	9.06

Reach Lag Calculations				
Reach Name	Length (ft)	Velocity (ft/s)	T_c (min)	Lag Time (min)
EX R-D	1754	4.50	6.50	3.90

Time of Concentration Calculations - Existing Conditions

Contributing Area	Sheet Flow					Shallow Concentrated Flow (Unpaved)				Total Tc
	Length (ft)	Delta (ft)	Slope (ft/ft)	Roughness Coefficient	T_{sheet}	Length (ft)	Delta (ft)	Slope (ft/ft)	$T_{unpaved}$ (min)	T_c (min)
EX-A	100	0.5	0.0050	0.24	22.39	8478.0	104	0.0123	79.07	**101.46**
EX-B	100	0.65	0.0065	0.24	20.16	3362.0	47	0.0140	29.37	**49.53**
EX-C	100	1	0.0100	0.24	16.97	2899.0	47.0	0.0162	23.52	**40.49**
EX-D1	Tc = 21.6 min (Morningstar New Growth Plans)									**21.60**
EX-D2	Tc = 5 min									**5.00**
EX-E	100	3.1	0.0310	0.24	10.79	592.0	19	0.0275	4.31	**15.11**

Existing Hydrology Summary

Key Analysis Point	Peak Flow (cfs)			
	A14 Q_2	A14 Q_{10}	A14 Q_{25}	A14 Q_{100}
POI-A4	511	948	1,258	1,787
POI-A3	544	1,011	1,343	1,910
POI-A2	585	1,093	1,455	2,075
POI-A1	590	1,104	1,470	2,098
POI-A0	594	1,111	1,480	2,114

EXISTING DRAINAGE AREA MAP BY OTHERS

SHEET 16 OF 32

NO.	REVISION	BY	DATE

Know what's below. Call before you dig.

HRGreen
6500 HIGHWAY 290 WEST
SUITE 150
AUSTIN, TX 78735
512.872.6696
HRGREEN.COM
TBPE NO: 16384
TBPLS NO: 10194101
DEVELOPMENT TX

XAVIER GARZA-ROBLEDO 135174 LICENSED PROFESSIONAL ENGINEER
STATE OF TEXAS
06/16/2023

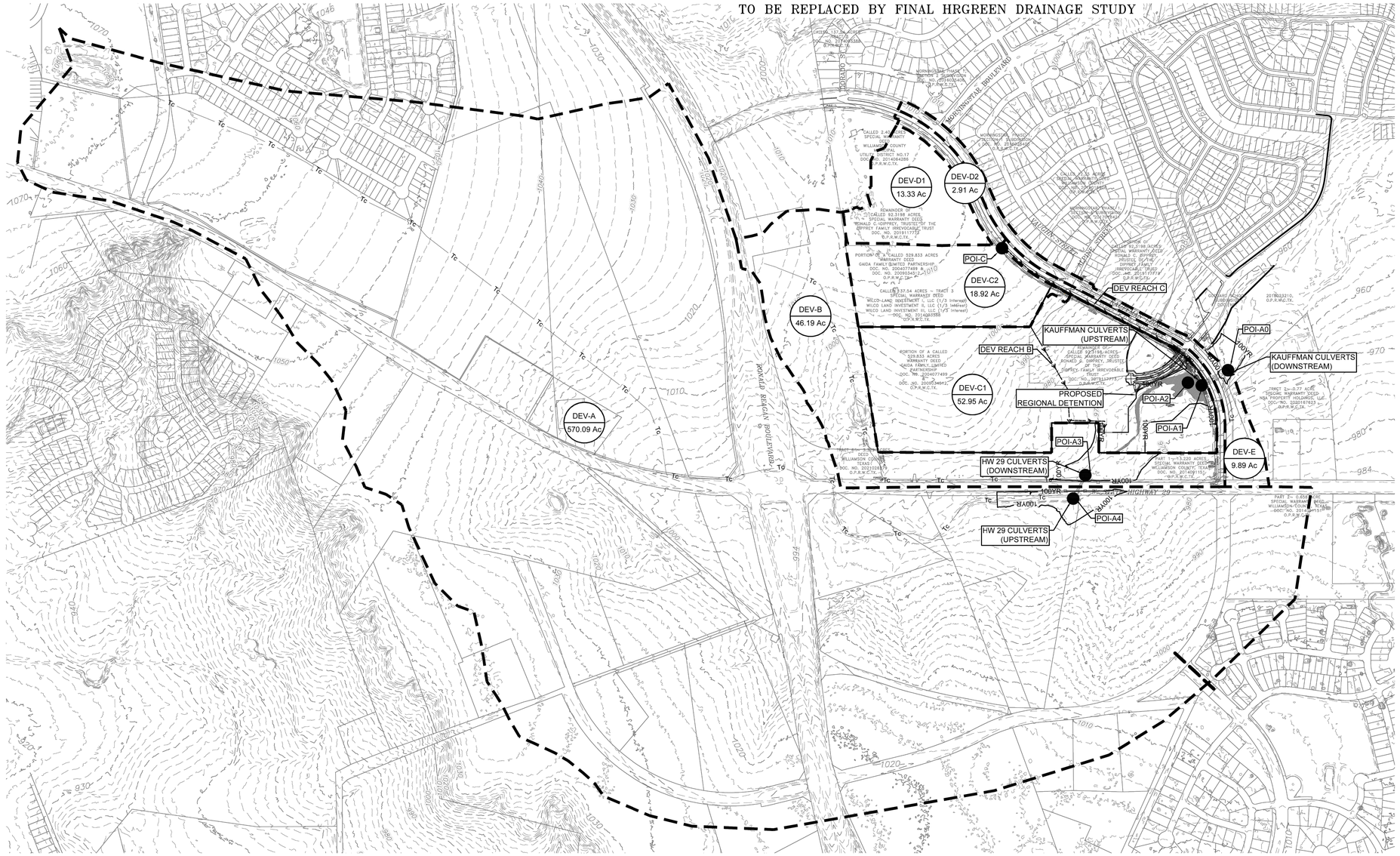
PRE DEVELOPED DRAINAGE AREA MAP
12 OAKS VILLAGE PHASE 1
SPINE INFRASTRUCTURE PLANS
LIBERTY HILL, TEXAS

DESIGNED BY: XG/AA
DRAWN BY: CB
CHECKED BY: XG
APPROVED BY: XG

SHT. 10 OF 33

P:\New Growth\2302047.0000 - 12 Oaks Spine Infrastructure_Phase 1\02_ACAD\10_Const. Plans\EXISTING DRAINAGE MAP.dwg, tristo, June 16, 2023, 4:41 PM, cbarrett

DRAINAGE SHEETS BY OTHERS FOR REFERENCE ONLY
TO BE REPLACED BY FINAL HRGREEN DRAINAGE STUDY



0 400' 800'
SCALE: 1" = 400'

LEGEND

- EXISTING MINOR CONTOUR
- EXISTING MAJOR CONTOUR
- PROPOSED MINOR CONTOUR
- PROPOSED MAJOR CONTOUR
- FLOW ARROW
- SWALE
- CALCULATED 100-YEAR PROPOSED FLOOD PLAIN
- TIME OF CONCENTRATION
- REACH
- PROPOSED DRAINAGE BOUNDARY
- STORM DRAIN LINE
- DA-1 xx.xx ac — PROPOSED DRAINAGE LABEL
- POI A — POINT OF INTEREST

12 Oaks Regional Pond : Elevation-Area-Storage

Elevation	Area (sf)	Area (ac)	Total Storage (cf)	Total Storage (Ac-Ft)
962.10	0	0.0000	0	0
963.00	101,852	2.3382	30,556	0.70
964.00	148,475	3.4085	154,989	3.56
965.00	176,573	4.0536	317,310	7.28
966.00	202,983	4.6599	506,934	11.64
967.00	240,965	5.5318	728,637	16.73
968.00	272,966	6.2664	985,436	22.62
969.00	299,047	6.8652	1,271,344	29.19
970.00	327,308	7.5140	1,584,415	36.37
971.00	359,650	8.2564	1,927,767	44.26

Kauffman Loop Culverts Proposed Water Surface Elevation

Storm	WSE
2-YR	965.22
10-YR	966.17
25-YR	968.26
100-YR	969.83

Routing Analysis Inputs - Proposed Conditions

Drainage Areas		Land Use		TOC Calculation Table	HEC-HMS Inputs		
Contributing Area	Area (ac)	Curve Number	Total Impervious Cover (ac)	TOC (min)	Area (sq. mi.)	Impervious Cover (%)	Lag Time
DEV-A	570.09	80	77.20	101.46	0.89076	13.54%	60.88
DEV-B	46.19	80	4.64	49.53	0.07218	10.05%	29.72
DEV-C1	52.95	80	42.36	5.00	0.08273	80.00%	3.00
DEV-C2	18.92	80	15.13	5.00	0.02956	80.00%	3.00
DEV-D1	13.33	80	8.67	5.00	0.02083	65.00%	3.00
DEV-D2	2.91	80	0.89	5.00	0.00455	30.65%	3.00
DEV-E	9.89	80	4.47	15.11	0.01545	45.20%	9.06

Time of Concentration Calculations - Proposed Conditions

Contributing Area	Sheet Flow					Shallow Concentrated Flow (Unpaved)				Total Tc (min)
	Length	Delta (ft)	Slope (ft/ft)	Roughness Coefficient	T_{sheet}	Length (ft)	Delta (ft)	Slope (ft/ft)	$T_{unpaved}$	T_c (min)
DEV-A	100	0.5	0.0050	0.24	22.39	8478.0	104	0.0123	78.07	101.46
DEV-B	100	0.65	0.0065	0.24	20.16	3362.0	47.0	0.0140	29.37	49.53
DEV-C1										5.00
DEV-C2										5.00
DEV-D1										5.00
DEV-D2										5.00
DEV-E	100	3.1	0.0310	0.24	10.79	692.0	19	0.0275	4.31	15.11

Reach Lag Calculations

Reach Name	Length (ft)	Velocity (ft/s)	T_c (min)	Lag Time (min)
DEV R-C	1130	4.50	4.19	2.51
DEV R-D	1754	4.50	6.50	3.90

Proposed Hydrology Summary

Key Analysis Point	Peak Flow (cfs)			
	A14 Q_2	A14 Q_{10}	A14 Q_{25}	A14 Q_{100}
POI-A4	511	948	1,258	1,787
POI-A3	542	1,007	1,338	1,902
POI-A2	564	1,051	1,399	2,000
POI-A1	554	1,056	1,395	1,971
POI-A0	557	1,061	1,403	1,983

Summary Table: Existing vs. Proposed

Analysis Point	Pre-Developed Peak Flow (cfs)				Developed Peak Flow (cfs)				Δ Peak Flow (cfs)			
	A14 Q_2	A14 Q_{10}	A14 Q_{25}	A14 Q_{100}	A14 Q_2	A14 Q_{10}	A14 Q_{25}	A14 Q_{100}	A14 Q_2	A14 Q_{10}	A14 Q_{25}	A14 Q_{100}
POI-A4	511	948	1,258	1,787	511	948	1,258	1,787	0	0	0	0
POI-A3	544	1,011	1,343	1,910	542	1,007	1,338	1,902	-2	-4	-5	-8
POI-A2	585	1,093	1,455	2,075	564	1,051	1,399	2,000	-21	-42	-56	-75
POI-A1	590	1,104	1,470	2,098	554	1,056	1,395	1,971	-36	-48	-75	-127
POI-A0	594	1,111	1,480	2,114	557	1,061	1,403	1,983	-37	-50	-77	-131

PROPOSED DRAINAGE AREA MAP BY OTHERS

SHEET 17 OF 32

NO.	REVISION	BY	DATE

811 Know what's below. Call before you dig.

6509 HIGHWAY 290 WEST
SUITE 150
AUSTIN, TX 78735
512.872.6696
HRGREEN.COM
TBPE NO: 16384
TBPLS NO: 10194101
HRGreen
DEVELOPMENT TX

XAVIER GARZA-ROBLEDO
135174
LICENSED PROFESSIONAL ENGINEER
STATE OF TEXAS
06/16/2025

DEVELOPED DRAINAGE AREA MAP
12 OAKS VILLAGE
PHASE 1
SPINE INFRASTRUCTURE PLANS
LIBERTY HILL, TEXAS

DESIGNED BY: XG/AA
DRAWN BY: CB
CHECKED BY: XG
APPROVED BY: XG

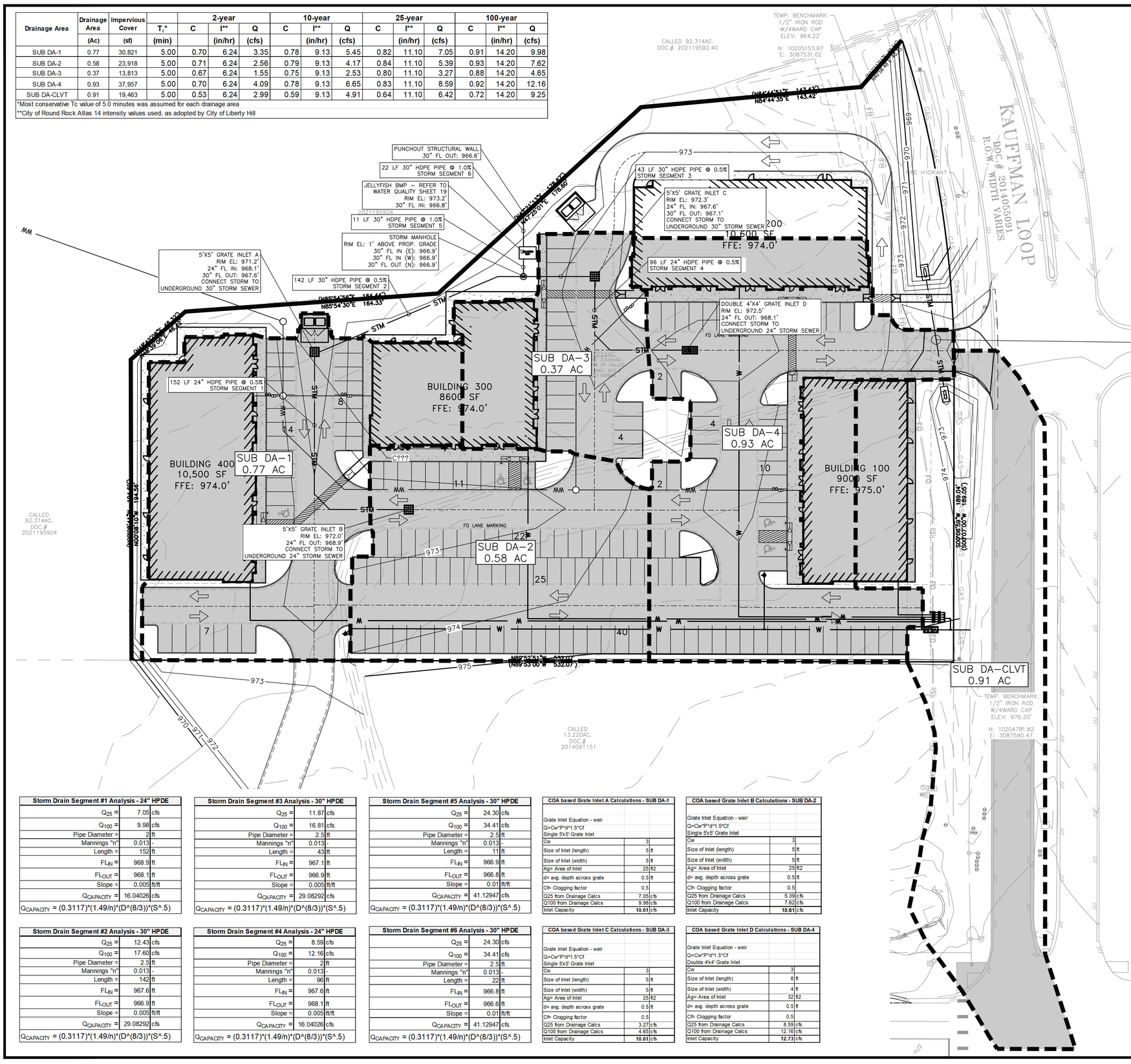
SHT. 11 OF 33

P:\New Growth\2020\47.0000 - 12 Oaks Spine Infrastructure_Phase 1\02_ACAD\10_Const. Plans\PROPOSED DRAINAGE.dwg, PRDA, June 16, 2025, 4:42 PM, cbarrett

Drainage Area	Drainage Area	Impervious Cover		2-year			10-year			25-year			100-year		
	(Ac)	(sf)	T_c* (min)	C	I** (in/hr)	Q (cfs)	C	I** (in/hr)	Q (cfs)	C	I** (in/hr)	Q (cfs)	C	I** (in/hr)	Q (cfs)
SUB DA-1	0.77	30,821	5.00	0.70	6.24	3.35	0.78	9.13	5.45	0.82	11.10	7.05	0.91	14.20	9.98
SUB DA-2	0.58	23,918	5.00	0.71	6.24	2.56	0.79	9.13	4.17	0.84	11.10	5.39	0.93	14.20	7.62
SUB DA-3	0.37	13,813	5.00	0.67	6.24	1.55	0.75	9.13	2.53	0.80	11.10	3.27	0.88	14.20	4.65
SUB DA-4	0.93	37,957	5.00	0.70	6.24	4.09	0.78	9.13	6.65	0.83	11.10	8.59	0.92	14.20	12.16
SUB DA-CLVT	0.91	19,463	5.00	0.53	6.24	2.99	0.59	9.13	4.91	0.64	11.10	6.42	0.72	14.20	9.25

*Most conservative Tc value of 5.0 minutes was assumed for each drainage area

**City of Round Rock Atlas 14 intensity values used, as adopted by City of Liberty Hill



Storm Drain Analysis - 18" R.C.P		
Q_{25} =	6.42	cfs
Q_{100} =	9.25	cfs
Pipe Diameter =	1.5	ft
Mannings "n"	0.012	-
Length =	90.0	ft
FL_{IN} =	972.0	-
FL_{OUT} =	969.0	-
Slope =	0.033	ft/ft
$Q_{CAPACITY}$ =	20.8	cfs

$Q_{CAPACITY}$ = (0.3117)*(1.49/n)*(D^(8/3))*(S^.5)

Storm Drain Segment #1 Analysis - 24" HPDE		
Q_{25} =	7.05	cfs
Q_{100} =	9.98	cfs
Pipe Diameter =	2	ft
Mannings "n"	0.013	-
Length =	152	ft
FL_{IN} =	968.9	ft
FL_{OUT} =	968.1	ft
Slope =	0.005	ft/ft
$Q_{CAPACITY}$ =	16.04026	cfs

$Q_{CAPACITY}$ = (0.3117)*(1.49/n)*(D^(8/3))*(S^.5)

Storm Drain Segment #2 Analysis - 30" HPDE		
Q_{25} =	12.43	cfs
Q_{100} =	17.60	cfs
Pipe Diameter =	2.5	ft
Mannings "n"	0.013	-
Length =	142	ft
FL_{IN} =	967.6	ft
FL_{OUT} =	966.9	ft
Slope =	0.005	ft/ft
$Q_{CAPACITY}$ =	29.08292	cfs

$Q_{CAPACITY}$ = (0.3117)*(1.49/n)*(D^(8/3))*(S^.5)

Storm Drain Segment #3 Analysis - 30" HPDE		
Q_{25} =	11.87	cfs
Q_{100} =	16.81	cfs
Pipe Diameter =	2.5	ft
Mannings "n"	0.013	-
Length =	43	ft
FL_{IN} =	967.1	ft
FL_{OUT} =	966.9	ft
Slope =	0.005	ft/ft
$Q_{CAPACITY}$ =	29.08292	cfs

$Q_{CAPACITY}$ = (0.3117)*(1.49/n)*(D^(8/3))*(S^.5)

Storm Drain Segment #4 Analysis - 24" HPDE		
Q_{25} =	8.59	cfs
Q_{100} =	12.16	cfs
Pipe Diameter =	2	ft
Mannings "n"	0.013	-
Length =	96	ft
FL_{IN} =	967.6	ft
FL_{OUT} =	968.1	ft
Slope =	0.005	ft/ft
$Q_{CAPACITY}$ =	16.04026	cfs

$Q_{CAPACITY}$ = (0.3117)*(1.49/n)*(D^(8/3))*(S^.5)

Storm Drain Segment #5 Analysis - 30" HPDE		
Q_{25} =	24.30	cfs
Q_{100} =	34.41	cfs
Pipe Diameter =	2.5	ft
Mannings "n"	0.013	-
Length =	11	ft
FL_{IN} =	966.9	ft
FL_{OUT} =	966.8	ft
Slope =	0.01	ft/ft
$Q_{CAPACITY}$ =	41.12947	cfs

$Q_{CAPACITY}$ = (0.3117)*(1.49/n)*(D^(8/3))*(S^.5)

Storm Drain Segment #6 Analysis - 30" HPDE		
Q_{25} =	24.30	cfs
Q_{100} =	34.41	cfs
Pipe Diameter =	2.5	ft
Mannings "n"	0.013	-
Length =	22	ft
FL_{IN} =	966.8	ft
FL_{OUT} =	966.6	ft
Slope =	0.01	ft/ft
$Q_{CAPACITY}$ =	41.12947	cfs

$Q_{CAPACITY}$ = (0.3117)*(1.49/n)*(D^(8/3))*(S^.5)

COA based Grate Inlet A Calculations - SUB DA-1		
Grate Inlet Equation - weir		
Q=Cw*P*d^1.5*Cf		
Single 5'x5' Grate Inlet		
Cw	3	
Size of Inlet (length)	5	ft
Size of Inlet (width)	5	ft
Ag= Area of Inlet	25	ft2
d= avg. depth across grate	0.5	ft
Cf= Clogging factor	0.5	
Q25 from Drainage Calcs	7.05	cfs
Q100 from Drainage Calcs	9.98	cfs
Inlet Capacity	**10.61**	cfs

COA based Grate Inlet B Calculations - SUB DA-2		
Grate Inlet Equation - weir		
Q=Cw*P*d^1.5*Cf		
Single 5'x5' Grate Inlet		
Cw	3	
Size of Inlet (length)	5	ft
Size of Inlet (width)	5	ft
Ag= Area of Inlet	25	ft2
d= avg. depth across grate	0.5	ft
Cf= Clogging factor	0.5	
Q25 from Drainage Calcs	5.39	cfs
Q100 from Drainage Calcs	7.62	cfs
Inlet Capacity	**10.61**	cfs

COA based Grate Inlet C Calculations - SUB DA-3		
Grate Inlet Equation - weir		
Q=Cw*P*d^1.5*Cf		
Single 5'x5' Grate Inlet		
Cw	3	
Size of Inlet (length)	5	ft
Size of Inlet (width)	5	ft
Ag= Area of Inlet	25	ft2
d= avg. depth across grate	0.5	ft
Cf= Clogging factor	0.5	
Q25 from Drainage Calcs	3.27	cfs
Q100 from Drainage Calcs	4.65	cfs
Inlet Capacity	**10.61**	cfs

COA based Grate Inlet D Calculations - SUB DA-4		
Grate Inlet Equation - weir		
Q=Cw*P*d^1.5*Cf		
Double 4'x4' Grate Inlet		
Cw	3	
Size of Inlet (length)	8	ft
Size of Inlet (width)	4	ft
Ag= Area of Inlet	32	ft2
d= avg. depth across grate	0.5	ft
Cf= Clogging factor	0.5	
Q25 from Drainage Calcs	8.59	cfs
Q100 from Drainage Calcs	12.16	cfs
Inlet Capacity	**12.73**	cfs

IF DRAWING BAR DOES NOT MEASURE 2" THIS PRINT IS NOT TO SCALE

0 15' 30' 60'

SCALE: 1" = 30'

STATE OF TEXAS
NICHOLAS R. SANDLIN
124404
LICENSED PROFESSIONAL ENGINEER
9/5/2023

STORM LEGEND

- PROPOSED PROPERTY/ PROJECT BOUNDARY LINE
- EXISTING R.O.W./PROPERTY LINE
- EXISTING EASEMENT LINE
- PROPOSED CURB & GUTTER
- DRAINAGE AREA BOUNDARY
- SUB DA-X XX.XX AC — DRAINAGE AREA DESIGNATION AND AREA DRAINED
- FLOW ARROW
- TIME OF CONCENTRATION LINE (SHEET FLOW)
- TIME OF CONCENTRATION LINE (SHALLOW CONCENTRATED FLOW)
- EXISTING CONTOURS (750)
- PROPOSED CONTOURS (750)

NOTES:

1. PIPES TO BE CONSTRUCTED AS SPECIFIED BY THE OWNER AND/OR ENGINEER. ALL JOINTS, BENDS, AND STRUCTURES ARE TO BE SUITABLE TO THE PIPE USED AND BEDDING SHALL BE AS PER MANUFACTURER'S SPECIFICATIONS.
2. ALL STORMWATER WYES, BENDS, AND PIPE SIZE TRANSITIONS SHALL BE PREFABRICATED.
3. RATIONAL METHOD WITH COMPOSITE RUNOFF COEFFICIENT UTILIZED FOR SUB DRAINAGE AREA CALCULATIONS.

WARNING !!!! CONTRACTOR TO FIELD VERIFY ALL EXIST. UTILITIES VERTICALLY AND HORIZONTALLY PRIOR TO CONSTRUCTION. THE CONTRACTOR IS TO CONTACT ENGINEER IF ANY EXISTING UTILITY INFORMATION DIFFERS FROM DATA SHOWN IN THE PLANS. CALL 811 BEFORE YOU DIG.

SANDLIN SERVICES, LLC
ENGINEERING | CONSULTING
TBPELS FIRM #21356
4501 WHISPERING VALLEY DRIVE UNIT 27 AUSTIN, TX 78727

STORM SEWER DRAINAGE AREA MAP

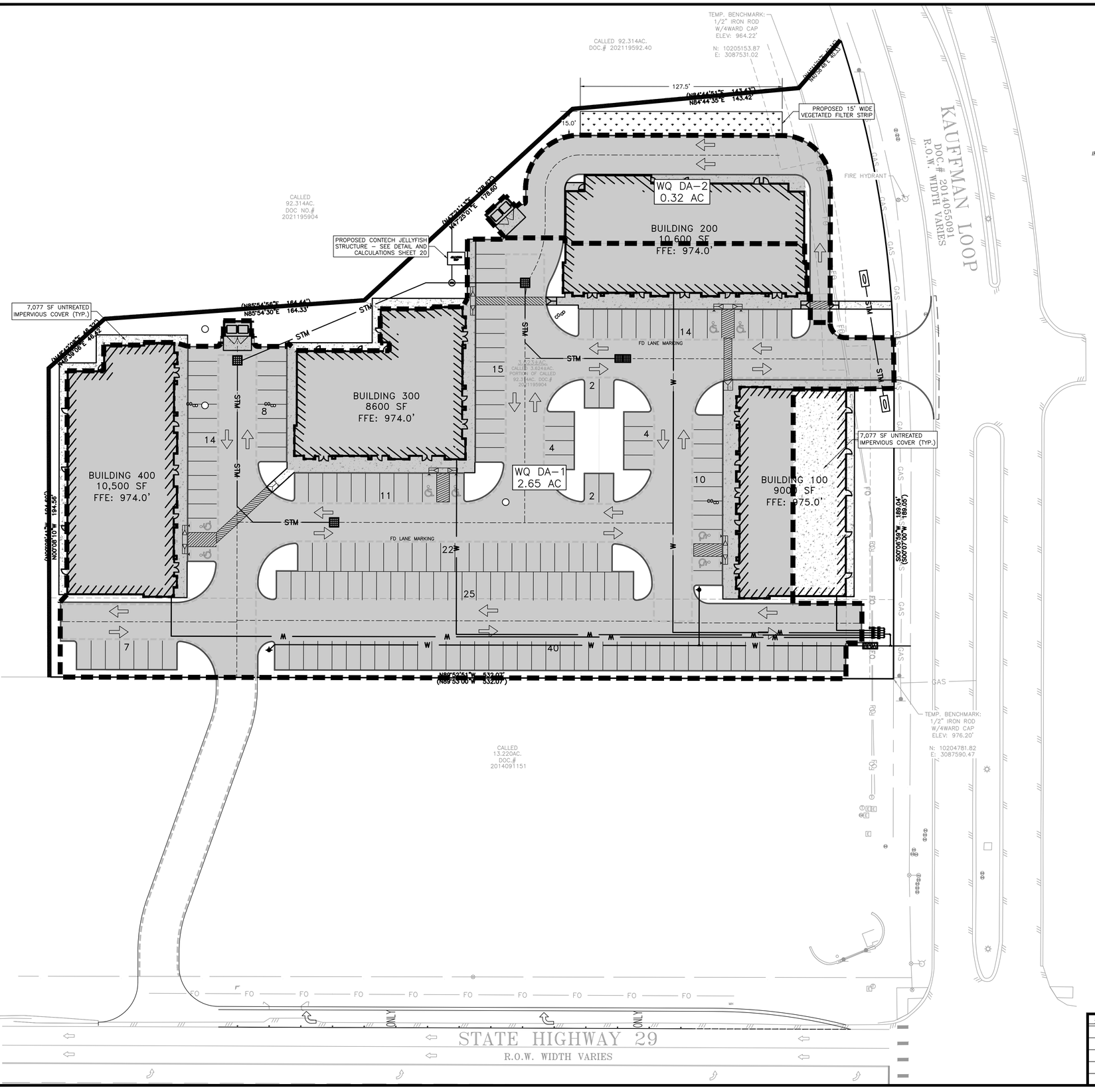
PROJECT CASE: XXXXXXX

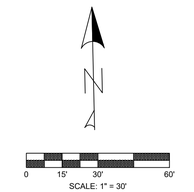
TWELVE OAKS

#	REVISION DESCRIPTION	SIGNATURE	DATE

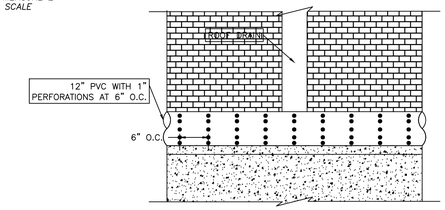
SHEET 18 OF 32

G:\Shared drives\Sandlin Services LLC\Sandlin Services Projects\Land Development Division\01-0089-003 Twelve Oaks\CAD\Construction Sheets\S 120 SSP.dwg-STORM SEWER DRAINAGE AREA MAP Plotted Sep 06, 2023 at 2:28pm by Scott | Last Saved by: Scott

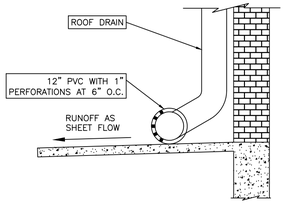




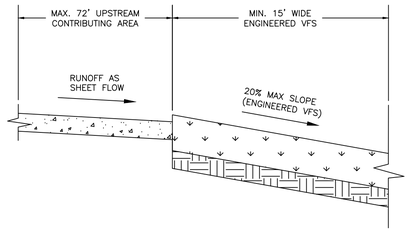
IF DRAWING BAR DOES NOT MEASURE 2" THIS PRINT IS NOT TO SCALE



ROOF DRAIN CONNECTION – FRONT VIEW
(NTS)



ROOF DRAIN CONNECTION – SIDE VIEW
(NTS)



VEGETATIVE FILTER STRIP DETAIL
(NTS)

WARNING !!!! CONTRACTOR TO FIELD VERIFY ALL EXIST. UTILITIES VERTICALLY AND HORIZONTALLY PRIOR TO CONSTRUCTION. THE CONTRACTOR IS TO CONTACT ENGINEER IF ANY EXISTING UTILITY INFORMATION DIFFERS FROM DATA SHOWN IN THE PLANS. CALL 811 BEFORE YOU DIG.

STATE OF TEXAS
NICHOLAS R. SANDLIN
124404
LICENSED
PROFESSIONAL ENGINEER
9/5/2023

ENGINEERING | CONSULTING
SANDLIN
SERVICES, LLC
TBPELS FIRM #21356
4501 WHISPERING VALLEY DRIVE UNIT 27 AUSTIN, TX 78727

WATER QUALITY PLAN

PROJECT CASE: XXXXXXX

TWELVE OAKS

#	REVISION DESCRIPTION	SIGNATURE	DATE

SHEET 19 OF 32

G:\Shared drives\Sandlin Services LLC\Sandlin Services Projects\Land Development Division\01-0069-003 Twelve Oaks\CAD\Construction Sheets\S 120 WQP.dwg-WATER QUALITY PLAN Plotted Sep 06, 2023 at 2:28pm by Scott | Last Saved by: Scott

Texas Commission on Environmental Quality

TSS Removal Calculations 04-20-2009

Project Name: Twelve Oaks
Date Prepared: 8/31/2023

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 * =	3.62	acres
Predevelopment impervious area within the limits of the plan * =	0.00	acres
Total post-development impervious area within the limits of the plan* =	2.92	acres
Total post-development impervious cover fraction * =	0.81	
P =	32	inches
$L_{M\ TOTAL\ PROJECT}$ =	2544	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

2. Drainage Basin Parameters (This information should be provided for each basin):

Drainage Basin/Outfall Area No. = 1 "WQ DA-1"

Total drainage basin/outfall area =	2.65	acres
Predevelopment impervious area within drainage basin/outfall area =	0.00	acres
Post-development impervious area within drainage basin/outfall area =	2.62	acres
Post-development impervious fraction within drainage basin/outfall area =	0.99	
$L_{M\ THIS\ BASIN}$ =	2278	lbs.

3. Indicate the proposed BMP Code for this basin.

Proposed BMP = Contech StormFilter
Removal efficiency = 86 percent

Aqualogic Cartridge Filter
Bioretention
Contech StormFilter
Constructed Wetland
Extended Detention
Grassy Swale
Retention / Irrigation
Sand Filter
Stormceptor
Vegetated Filter Strips
Vortechs
Wet Basin
Wet Vault

4. Calculate Maximum TSS Load Removed (L_R) for this Drainage Basin by the selected BMP Type.

RG-348 Page 3-33 Equation 3.7: L_R = (BMP efficiency) x P x (A_I x 34.6 + A_P x 0.54)

where:
A_C = Total On-Site drainage area in the BMP catchment area
A_I = Impervious area proposed in the BMP catchment area
A_P = Pervious area remaining in the BMP catchment area
L_R = TSS Load removed from this catchment area by the proposed BMP

A_C =	2.65	acres
A_I =	2.62	acres
A_P =	0.03	acres
L_R =	2493	lbs

5. Calculate Fraction of Annual Runoff to Treat the drainage basin / outfall area

Desired $L_{M\ THIS\ BASIN}$ = 2278 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 =	0.81	
On-site Water Quality Volume =	13960	cubic feet

Calculations from RG-348 — Pages 3-36 to 3-37

Off-site area draining to BMP =	0.00	acres
Off-site Impervious cover draining to BMP =	0.00	acres
Impervious fraction of off-site area =	0	
Off-site Runoff Coefficient =	0.00	
Off-site Water Quality Volume =	0	cubic feet
Storage for Sediment =	2792	
Total Capture Volume (required water quality volume(s) x 1.20) =	16752	cubic feet

Texas Commission on Environmental Quality

TSS Removal Calculations 04-20-2009

Project Name: Twelve Oaks
Date Prepared: 8/31/2023

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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 * =	3.62	acres
Predevelopment impervious area within the limits of the plan * =	0.00	acres
Total post-development impervious area within the limits of the plan* =	2.92	acres
Total post-development impervious cover fraction * =	0.81	
P =	32	inches
$L_{M\ TOTAL\ PROJECT}$ =	2544	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

2. Drainage Basin Parameters (This information should be provided for each basin):

Drainage Basin/Outfall Area No. = 2 "WQ DA-2"

Total drainage basin/outfall area =	0.32	acres
Predevelopment impervious area within drainage basin/outfall area =	0.00	acres
Post-development impervious area within drainage basin/outfall area =	0.31	acres
Post-development impervious fraction within drainage basin/outfall area =	0.97	
$L_{M\ THIS\ BASIN}$ =	266	lbs.

3. Indicate the proposed BMP Code for this basin.

Proposed BMP = Vegetated Filter Strips
Removal efficiency = 85 percent

Aqualogic Cartridge Filter
Bioretention
Contech StormFilter
Constructed Wetland
Extended Detention
Grassy Swale
Retention / Irrigation
Sand Filter
Stormceptor
Vegetated Filter Strips
Vortechs
Wet Basin
Wet Vault

4. Calculate Maximum TSS Load Removed (L_R) for this Drainage Basin by the selected BMP Type.

RG-348 Page 3-33 Equation 3.7: L_R = (BMP efficiency) x P x (A_I x 34.6 + A_P x 0.54)

where:
A_C = Total On-Site drainage area in the BMP catchment area
A_I = Impervious area proposed in the BMP catchment area
A_P = Pervious area remaining in the BMP catchment area
L_R = TSS Load removed from this catchment area by the proposed BMP

A_C =	0.32	acres
A_I =	0.31	acres
A_P =	0.01	acres
L_R =	288	lbs

5. Calculate Fraction of Annual Runoff to Treat the drainage basin / outfall area

Desired $L_{M\ THIS\ BASIN}$ = 266 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 =	0.79	
On-site Water Quality Volume =	1811	cubic feet

STATE OF TEXAS
NICHOLAS R. SANDLIN
124404
LICENSED
PROFESSIONAL ENGINEER
9/5/2023

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SERVICES, LLC
TBPELS FIRM #21356
4501 WHISPERING VALLEY DRIVE UNIT 27 AUSTIN, TX 78727

WATER QUALITY DETAILS
(1 OF 2)

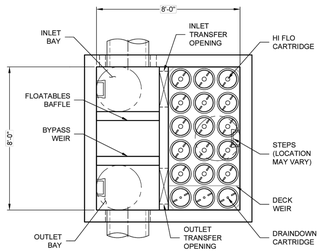
PROJECT CASE: XXXXXXX

TWELVE OAKS

#	REVISION DESCRIPTION	SIGNATURE	DATE

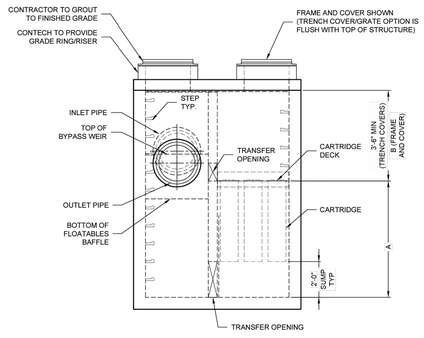
SHEET 20 OF 32

G:\Shared drives\Sandlin Services LLC\Sandlin Services Projects\Land Development Division\01-0089-003 Twelve Oaks\CAD\Construction Sheets\S 120 WQP.dwg-WATER QUALITY DETAILS (1 OF 2) Plotted Sep 06, 2023 at 2:28pm by Scott | Last Saved by: Scott



PLAN VIEW

(TOP SLAB NOT SHOWN FOR CLARITY)



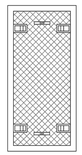
ELEVATION VIEW

JELLYFISH DESIGN NOTES

JELLYFISH TREATMENT CAPACITY IS A FUNCTION OF THE CARTRIDGE LENGTH AND THE NUMBER OF CARTRIDGES. THE STANDARD PEAK DIVERSION STYLE WITH PRECAST TOP SLAB IS SHOWN. ALTERNATE OFFLINE VAULT AND/OR SHALLOW ORIENTATIONS ARE AVAILABLE. PEAK CONVEYANCE CAPACITY TO BE DETERMINED BY ENGINEER OF RECORD

CARTRIDGE SELECTION				
CARTRIDGE LENGTH	54"	40"	27"	15"
OUTLET INVERT TO STRUCTURE INVERT (A)	6'-6"	5'-4"	4'-3"	3'-3"
FLOW RATE HI-FLO / DRAINDOWN (CFS) (PER CART)	0.178 / 0.089	0.133 / 0.067	0.089 / 0.045	0.049 / 0.025
MAX. TREATMENT (CFS)	2.94	2.21	1.47	0.81
DECK TO INSIDE TOP (MIN) (B)	5.00	4.00	4.00	4.00

FRAME AND COVER
(DIAMETER VARIES)
N.T.S.



24" TRENCH COVER
(LENGTH VARIES)
N.T.S.

SITE SPECIFIC DATA REQUIREMENTS

STRUCTURE ID	*
WATER QUALITY FLOW RATE (cfs)	*
PEAK FLOW RATE (cfs)	*
RETURN PERIOD OF PEAK FLOW (yrs)	*
# OF CARTRIDGES REQUIRED (HF / DD)	*
CARTRIDGE LENGTH	*

PIPE DATA:	I.E.	MAT'L	DIA	SLOPE %	HGL
INLET #1	*	*	*	*	*
INLET #2	*	*	*	*	*
OUTLET	*	*	*	*	*

SEE GENERAL NOTES 6-7 FOR INLET AND OUTLET HYDRAULIC AND SIZING REQUIREMENTS.

RIM ELEVATION	*

ANTI-FLOTATION BALLAST	WIDTH	HEIGHT
	*	*

NOTES/SPECIAL REQUIREMENTS:

* PER ENGINEER OF RECORD

GENERAL NOTES:
1. CONTECH TO PROVIDE ALL MATERIALS UNLESS NOTED OTHERWISE.
2. FOR SITE SPECIFIC DRAWINGS WITH DETAILED STRUCTURE DIMENSIONS AND WEIGHT, PLEASE CONTACT YOUR CONTECH ENGINEERED SOLUTIONS REPRESENTATIVE. www.ContechES.com
3. JELLYFISH WATER QUALITY STRUCTURE SHALL BE IN ACCORDANCE WITH ALL DESIGN DATA AND INFORMATION CONTAINED IN THIS DRAWING. CONTRACTOR TO CONFIRM STRUCTURE MEETS REQUIREMENTS OF PROJECT.
4. STRUCTURE SHALL MEET AASHTO HS-20 OR PER APPROVING JURISDICTION REQUIREMENTS, WHICHEVER IS MORE STRINGENT, ASSUMING EARTH COVER OF 0' - 10', AND GROUNDWATER ELEVATION AT, OR BELOW, THE OUTLET PIPE INVERT ELEVATION. ENGINEER OF RECORD TO CONFIRM ACTUAL GROUNDWATER ELEVATION. CASTINGS SHALL MEET AASHTO M306 LOAD RATING AND BE CAST WITH THE CONTECH LOGO.
5. STRUCTURE SHALL BE PRECAST CONCRETE CONFORMING TO ASTM C-857, ASTM C-918, AND AASHTO LOAD FACTOR DESIGN METHOD.
6. OUTLET PIPE INVERT IS EQUAL TO THE CARTRIDGE DECK ELEVATION.
7. THE OUTLET PIPE DIAMETER FOR NEW INSTALLATIONS IS RECOMMENDED TO BE ONE PIPE SIZE LARGER THAN THE INLET PIPE AT EQUAL OR GREATER SLOPE.
8. NO PRODUCT SUBSTITUTIONS SHALL BE ACCEPTED UNLESS SUBMITTED 10 DAYS PRIOR TO PROJECT BID DATE, OR AS DIRECTED BY THE ENGINEER OF RECORD.

INSTALLATION NOTES
A. ANY SUB-BASE, BACKFILL DEPTH, AND/OR ANTI-FLOTATION PROVISIONS ARE SITE-SPECIFIC DESIGN CONSIDERATIONS AND SHALL BE SPECIFIED BY ENGINEER OF RECORD.
B. CONTRACTOR TO PROVIDE EQUIPMENT WITH SUFFICIENT LIFTING AND REACH CAPACITY TO LIFT AND SET THE STRUCTURE.
C. CONTRACTOR WILL INSTALL AND LEVEL THE STRUCTURE, SEALING THE JOINTS, LINE ENTRY AND EXIT POINTS (NON-SHRINK GROUT WITH APPROVED WATERSTOP OR FLEXIBLE BOOT).
D. CARTRIDGE INSTALLATION, BY CONTECH, SHALL OCCUR ONLY AFTER SITE HAS BEEN STABILIZED AND THE JELLYFISH UNIT IS CLEAN AND FREE OF DEBRIS. CONTACT CONTECH TO COORDINATE CARTRIDGE INSTALLATION WITH SITE STABILIZATION.

Jellyfish® Filter

THIS PRODUCT MAY BE PROTECTED BY ONE OR MORE OF THE FOLLOWING U.S. PATENT NO. 8,287,726; 8,221,618; US 8,123,930; OTHER INTERNATIONAL PATENTS PENDING

CONTECH ENGINEERED SOLUTIONS LLC
www.ContechES.com
9025 Centre Pointe Dr., Suite 400, West Chester, OH 45069
800-338-1122 513-645-7000 513-645-7993 FAX

JELLYFISH JFPD0808
STANDARD DETAIL
PEAK DIVERSION CONFIGURATION

Contech Engineered Solutions Calculations for Texas Commission on Environmental Quality
TSS Removal Calculations

Project Name: Twelve Oaks
Date Prepared: 9/6/2023

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 * =	**3.62**	acres
Predevelopment impervious area within the limits of the plan * =	**0.00**	acres
Total post-development impervious area within the limits of the plan* =	**2.92**	acres
Total post-development impervious cover fraction * =	**0.81**	
P =	**32**	inches
$L_{M\ TOTAL\ PROJECT}$ =	**9544**	lbs.
Number of drainage basins / outfalls areas leaving the plan area =	**2**	

2. Drainage Basin Parameters (This information should be provided for each basin):

Drainage Basin/Outfall Area No. = WQ DA-1

Total drainage basin/outfall area =	**2.65**	acres
Predevelopment impervious area within drainage basin/outfall area =	**0.00**	acres
Post-development impervious area within drainage basin/outfall area =	**2.62**	acres
Post-development impervious fraction within drainage basin/outfall area =	**0.99**	
$L_{M\ THIS\ BASIN}$ =	**2278**	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:
L_R = (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 =	**2.65**	acres
A_I =	**2.62**	acres
A_P =	**0.03**	acres
L_R =	**2493**	lbs.

5. Calculate Fraction of Annual Runoff to Treat the drainage basin / outfall area

Desired $L_{M\ THIS\ BASIN}$ =	**2278**	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
Rainfall Intensity =	**1.15**	inches per hour
Effective Area =	**2.36**	acres
Cartridge Length =	**54**	inches
Peak Treatment Flow Required =	**2.73**	cubic feet per second

Calculations from RG-348
Pages Section 3.2.22

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

STATE OF TEXAS
NICHOLAS R. SANDLIN
124404
LICENSED
PROFESSIONAL ENGINEER
9/5/2023

WARNING !!!! CONTRACTOR TO FIELD VERIFY ALL EXIST. UTILITIES VERTICALLY AND HORIZONTALLY PRIOR TO CONSTRUCTION. THE CONTRACTOR IS TO CONTACT ENGINEER IF ANY EXISTING UTILITY INFORMATION DIFFERS FROM DATA SHOWN IN THE PLANS. CALL 811 BEFORE YOU DIG.

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SANDLIN SERVICES, LLC
TBPELS FIRM #21356
4501 WHISPERING VALLEY DRIVE UNIT 27 AUSTIN, TX 78727

WATER QUALITY DETAILS (2 OF 2)

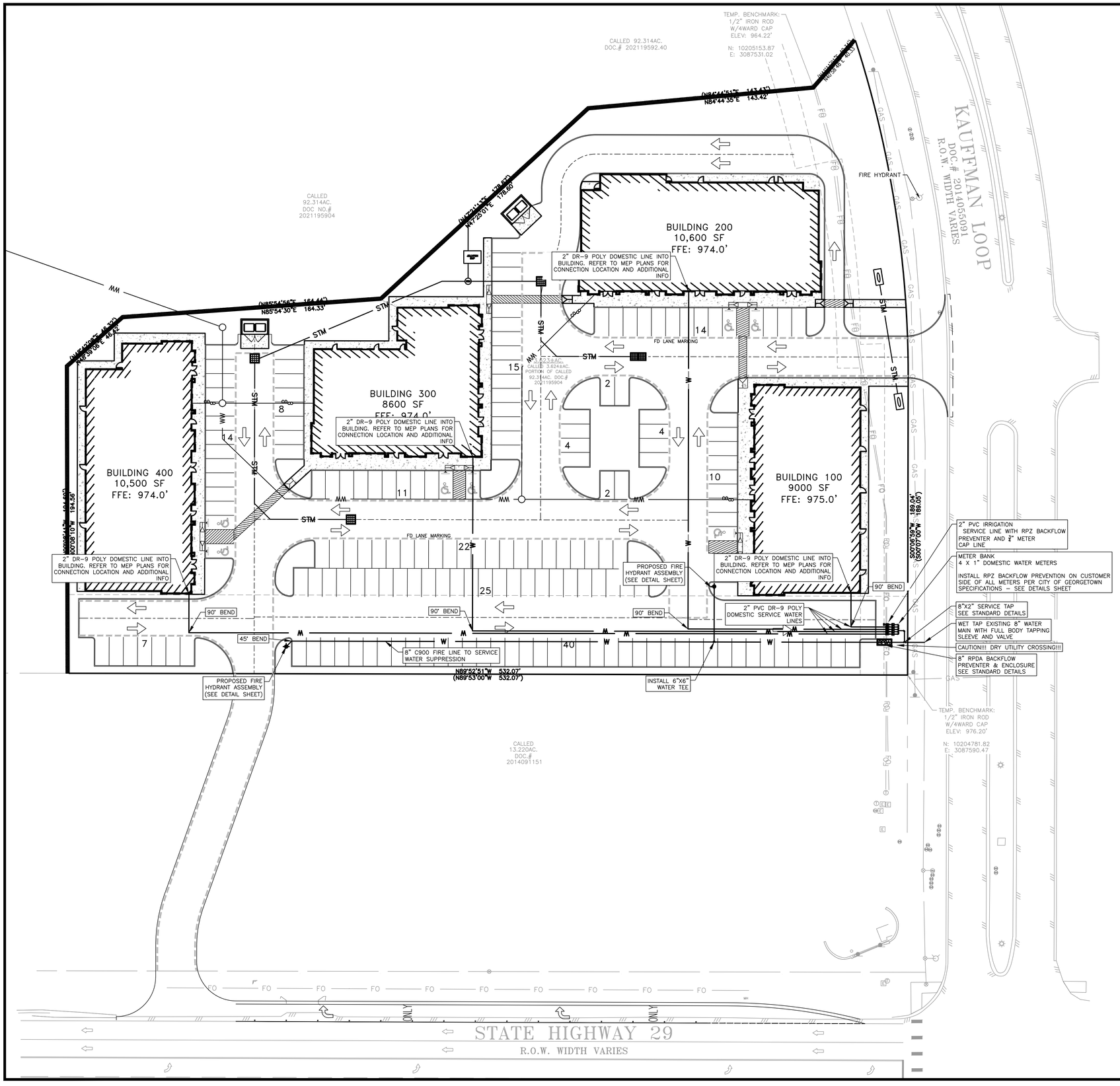
PROJECT CASE: XXXXXXX

TWELVE OAKS

#	REVISION DESCRIPTION	SIGNATURE	DATE

SHEET 21 OF 32

G:\Shared drives\Sandlin Services LLC\Sandlin Services Projects\Land Development Division\01-0089-003 Twelve Oaks\CAD\Construction Sheets\S 120 WQP.dwg-WATER QUALITY DETAILS (2 OF 2) Plotted Sep 06, 2023 at 4:14pm by Scott | Last Saved by: Scott
I:\COMMON\CAD\TREATMENT\13 JELLYFISH FILTER\#8 STANDARD DRAWINGS\JFPD0808-STL NEW.DWG 1/29/2018 10:10 AM



9/5/2023

STATE OF TEXAS
NICHOLAS R. SANDLIN
124404
LICENSED
PROFESSIONAL ENGINEER

UTILITY LEGEND

- PROPOSED PROPERTY/ PROJECT BOUNDARY LINE
- EXISTING R.O.W./PROPERTY LINE
- EXISTING EASEMENT LINE
- PROPOSED CURB & GUTTER
- EXISTING CONTOURS (750)
- PROPOSED CONTOURS (750)
- EX. WATER LINE (W) / PR. WATER LINE (W)
- EX. WASTEWATER (WW) / PR. WASTEWATER (WW)
- EX. STORM SEWER LINE (STM) / PR. STORM SEWER LINE (STM)
- EX. FIRE HYDRANT / PR. FIRE HYDRANT
- EX. WATER METER (WM) / PR. WATER METER
- EX. WASTEWATER MANHOLE (WW) / PR. WASTEWATER MANHOLE
- FITTINGS AS NOTED
- FLOW ARROW
- GATE VALVE AS NOTED
- ELECTRIC TRANSFORMER (T)
- WW CLEAN OUT
- UTILITY POLE
- BACK FLOW PREVENTER (BFP)
- FIRE LINE (F)
- EXISTING TREE (TO REMAIN) (100)
- EXISTING TREE (TO BE REMOVED) (100)

UTILITY NOTES:

ALL NON-CITY INFRASTRUCTURE (INCLUDING BUT NOT LIMITED TO GAS, ELECTRIC, CABLE, AND TELECOMMUNICATIONS) SHALL TRAVERSE UNDERNEATH CITY INFRASTRUCTURE (INCLUDED BUT NOT LIMITED TO WATERLINES, WASTEWATER LINES, AND STORMWATER LINES) WITH A MINIMUM OUTSITE-TO-OUTSIDE CLEARANCE OF 18". WHERE NON-CITY INFRASTRUCTURE WOULD HAVE TO BE PLACED AT A DEPTH OF 8' OR GREATER TO MEET THE PRECEDING REQUIREMENT, TRAVERSING ABOVE THE CITY INFRASTRUCTURE MAY BE ALLOWED, SUBJECT TO APPROVAL OF THE DEVELOPMENT SERVICES ENGINEERING REVIEWER, BUT ONLY IN CONFORMANCE WITH CROSS-SECTIONS, PROFILES, AND OR OTHER DETAILED INFORMATION INCORPORATED IN THESE PLANS.

WARNING
CONTRACTOR TO VERIFY ALL EXISTING UTILITIES VERTICALLY AND HORIZONTALLY PRIOR TO CONSTRUCTION. CONTRACTOR TO NOTIFY THE ENGINEER IMMEDIATELY OF ANY DISCREPANCIES.

IMPORTANT
A MINIMUM 24" SEPARATION DISTANCE IS REQUIRED AT ALL WATER AND WASTEWATER CROSSINGS. CENTER ONE JOINT OF WATER PIPE AT EACH CROSSING.

IMPORTANT
WHERE A NINE FOOT SEPARATION DISTANCE BETWEEN WATER AND WASTEWATER CANNOT BE ACHIEVED, PVC WITH MINIMUM PRESSURE RATING OF 150 PSI SHALL BE USED, A MINIMUM SEPARATION DISTANCE OF 6 INCHES BETWEEN OUTSIDE DIAMETERS OF PIPES SHALL BE ACHIEVED, WASTEWATER SHALL BE BELOW WATER, AND JOINTS SHALL BE LOCATED AS FAR AS POSSIBLE FROM THE INTERSECTION, IN ACCORDANCE WITH TAC TITLE 30 217.53(d)(3)(B)(i).

NOTES:

1. ON-SITE WASTEWATER AND WATER IMPROVEMENTS ARE PRIVATE. NINE (9) L.U.E. ARE SHOWN WITH THIS PLAN (OF 72 LUE)
2. PIPE FITTINGS SHALL BE JOINT-RESTRAINED.
3. FITTINGS SHALL HAVE THRUST BLOCKING.
4. FIRE LEADS SHALL BE DUCTILE IRON AND HAVE NO BENDS
5. A 3' CLEAR SPACE SHALL BE MAINTAINED AROUND THE CIRCUMFERANCE OF FIRE HYDRANTS EXCEPT AS OTHERWISE REQUIRED OR APPROVED.
6. TYPE OF CONSTRUCTION: V-B
7. ALL WASTEWATER MANHOLES OUTSIDE OF PAVED AREAS TO BE BOLTED

Water Utility Requirements		
Living Unit Equivalent (LUE) =	13.0 LUE	REF: 1 LUE per 3000SF Medical Office/Clinic
Standard Population Factor =	3.50 people/LUE	
Population =	45.46 people	
COA Peak day demand =	530 gal/person/day	REF: COA UCM 2.9.2 (A)
COA Peak hour demand =	900 gal/person/day	REF: COA UCM 2.9.2 (A)
Domestic Water Demand for Development		
Peak Day =	16.73 gpm	
Peak Hour =	28.41 gpm	

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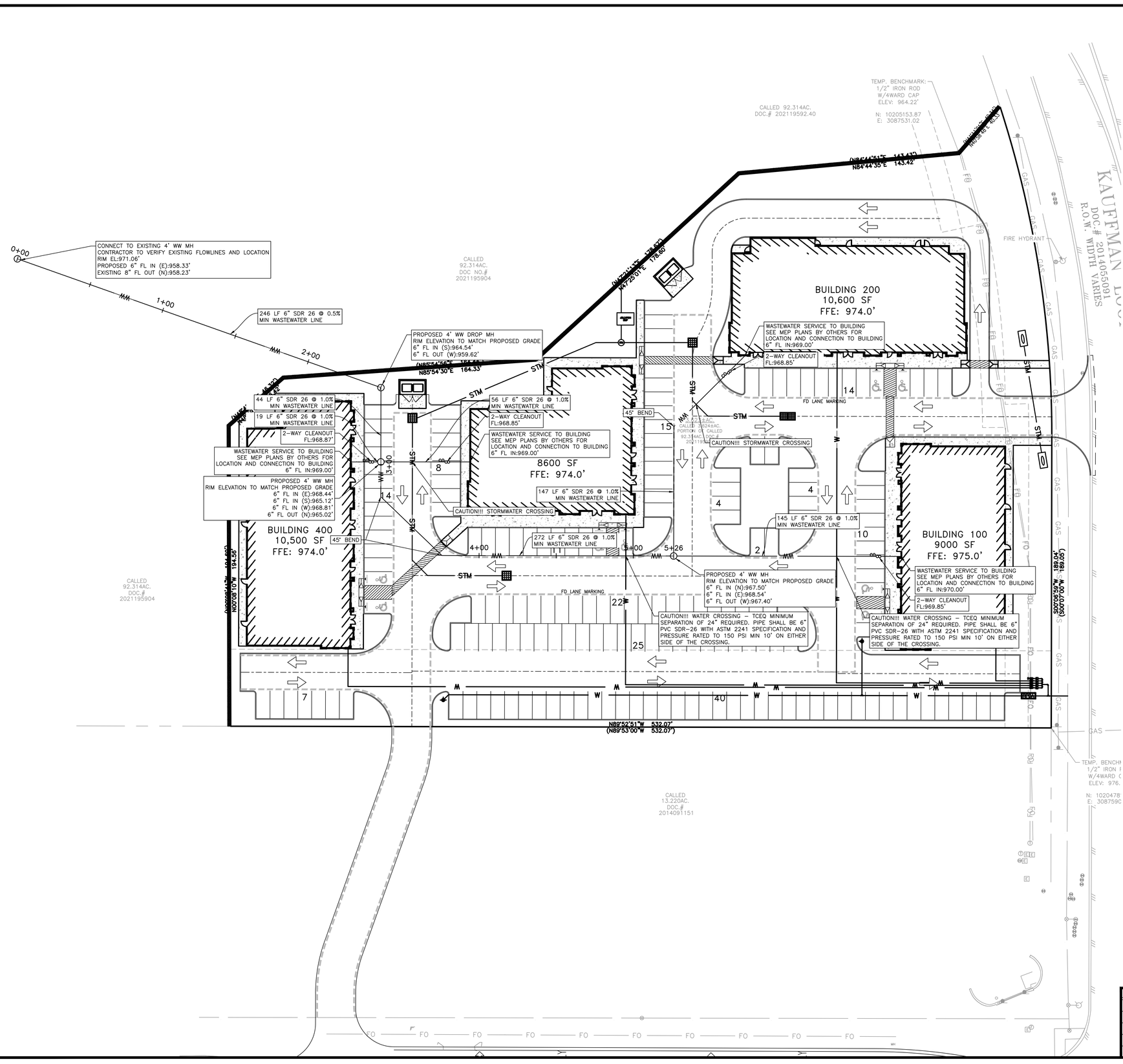
WATER DISTRIBUTION PLAN

PROJECT CASE: XXXXXXX

TWELVE OAKS

#	REVISION DESCRIPTION	SIGNATURE	DATE

G:\Shared drives\Sandlin Services LLC\Sandlin Services Projects\Land Development Division\01-0089-003 Twelve Oaks\CAD\Construction Sheets\S 120 WTR.dwg-WATER DISTRIBUTION PLAN Plotted Sep 06, 2023 at 2:29pm by Scott | Last Saved by: Scott



N

0 15' 30' 60'

SCALE: 1" = 30'

IF DRAWING BAR DOES NOT MEASURE 2" THIS PRINT IS NOT TO SCALE

STATE OF TEXAS
NICHOLAS R. SANDLIN
124404
LICENSED PROFESSIONAL ENGINEER
9/5/2023

UTILITY LEGEND

- PROPOSED PROPERTY/ PROJECT BOUNDARY LINE
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- EXISTING EASEMENT LINE
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- EXISTING CONTOURS / PROPOSED CONTOURS
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TEXAS 811 BEFORE YOU DIG

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WASTEWATER COLLECTION PLAN

PROJECT CASE: XXXXXXX

TWELVE OAKS

#	REVISION DESCRIPTION	SIGNATURE	DATE

SHEET 23 OF 32

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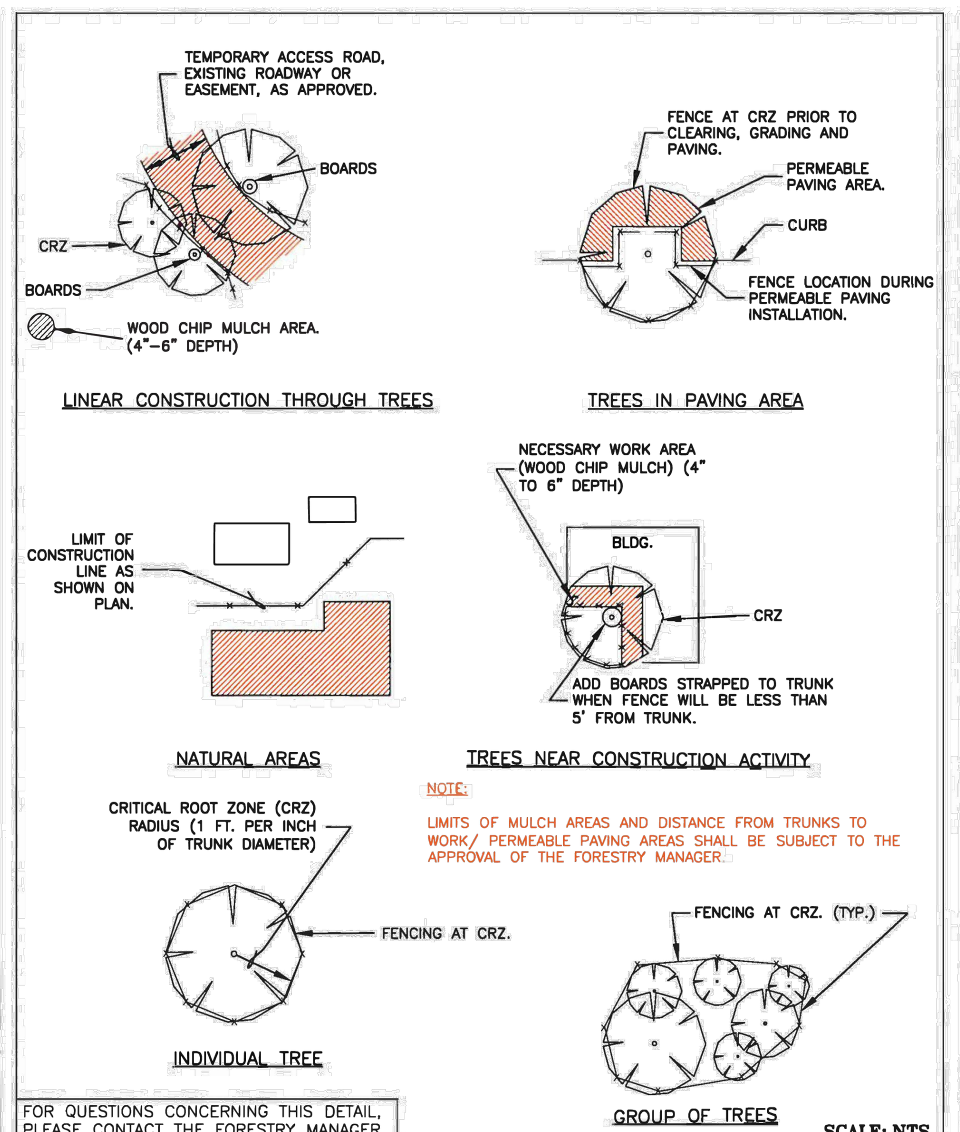
1. ALL TREES NOT LOCATED WITHIN THE LIMITS OF CONSTRUCTION AND OUTSIDE OF DISTURBED AREAS SHALL BE PRESERVED. THE CONTRACTOR IS RESPONSIBLE FOR PROTECTING ALL TREES TO BE PRESERVED FROM HIS ACTIVITIES.
2. ALL TREES SHOWN TO BE RETAINED ON THE PLANS, SHALL BE PROTECTED DURING CONSTRUCTION WITH FENCING. SEE: TREE PROTECTION TREE WELLS (EC-02), TREE PROTECTION TREE LOCATION (EC-03) AND TREE PROTECTION FENCE-CHAIN LINK (EC-04).
3. TREE PROTECTION FENCES SHALL BE ERECTED ACCORDING TO CITY STANDARDS FOR TREE PROTECTION, INCLUDING TYPES OF FENCING AND SIGNAGE.
4. TREE PROTECTION FENCES SHALL BE INSTALLED PRIOR TO THE COMMENCEMENT OF ANY SITE PREPARATION WORK (CLEARING, GRUBBING, OR GRADING) AND SHALL BE MAINTAINED THROUGHOUT ALL PHASES OF THE CONSTRUCTION PROJECT.
5. EROSION AND SEDIMENTATION CONTROL BARRIERS SHALL BE INSTALLED OR MAINTAINED IN A MANNER WHICH DOES NOT RESULT IN SOIL BUILD-UP WITHIN TREE DRIPLINES.
6. FENCES SHALL COMPLETELY SURROUND THE TREE, OR CLUSTERS OF TREES, LOCATED AT THE OUTERMOST LIMITS OF THE TREE BRANCHES (DRIPLINE) OR CRITICAL ROOT ZONE (CRZ), WHICHEVER IS GREATER; AND SHALL BE MAINTAINED THROUGHOUT THE CONSTRUCTION PROJECT IN ORDER TO PREVENT THE FOLLOWING:
   - 6A. SOIL COMPACTION IN CRZ AREA RESULTING FROM VEHICULAR TRAFFIC OR STORAGE OF EQUIPMENT OR MATERIAL.
   - 6B. CRZ DISTURBANCES DUE TO GRADE CHANGES (GREATER THAN 6 INCHES CUT OR FILL) OR TRENCHING NOT REVIEWED AND AUTHORIZED BY THE FORESTRY MANAGER.
   - 6C. WOUNDS TO EXPOSED ROOTS, TRUNK, OR LIMBS BY MECHANICAL EQUIPMENT
   - 6D. OTHER ACTIVITIES DETRIMENTAL TO TREES SUCH AS CHEMICAL STORAGE, CONCRETE TRUCK CLEANING, AND FIRES.
7. EXCEPTIONS TO INSTALLING TREE FENCES AT THE TREE DRIPLINES OR CRZ, WHICHEVER IS GREATER, MAY BE PERMITTED IN THE FOLLOWING CASES:
   - 7A. WHERE THERE IS TO BE AN APPROVED GRADE CHANGE, IMPERMEABLE PAVING SURFACE, OR TREE WELL;
   - 7B. WHERE PERMEABLE PAVING IS TO BE INSTALLED, ERECT THE FENCE AT THE OUTER LIMITS OF THE PERMEABLE PAVING AREA.
   - 7C. WHERE TREES ARE CLOSE TO PROPOSED BUILDINGS, ERECT THE FENCE NO CLOSER THAN 6 FEET TO THE BUILDING.
   - 7D. WHERE THERE ARE SEVERE SPACE CONSTRAINTS DUE TO TRACT SIZE, OR OTHER SPECIAL REQUIREMENTS, CONTACT THE FORESTRY MANAGER TO DISCUSS ALTERNATIVES.
8. WHERE ANY OF THE ABOVE EXCEPTIONS RESULT IN A FENCE THAT IS CLOSER THAN 5 FEET TO A TREE TRUNK, THE TRUNK SHALL BE PROTECTED BY STRAPPED-ON PLANKING TO A HEIGHT OF 8 FEET (OR TO THE LIMITS OF LOWER BRANCHING) IN ADDITION TO THE REDUCED FENCING PROVIDED.
9. WHERE ANY OF THE ABOVE EXCEPTIONS RESULT IN AREAS OF UNPROTECTED ROOT ZONES UNDER THE DRIPLINE OR CRZ, WHICHEVER IS GREATER, THOSE AREAS SHOULD BE COVERED WITH 4 INCHES OF ORGANIC MULCH TO MINIMIZE SOIL COMPACTION.
10. ALL GRADING WITHIN CRZ AREAS SHALL BE DONE BY HAND OR WITH SMALL EQUIPMENT TO MINIMIZE ROOT DAMAGE. PRIOR TO GRADING, RELOCATE PROTECTIVE FENCING TO 2 FEET BEHIND THE GRADE CHANGE AREA.
11. ANY ROOTS EXPOSED BY CONSTRUCTION ACTIVITY SHALL BE PRUNED FLUSH WITH THE SOIL AND BACKFILLED WITH GOOD QUALITY TOP SOIL WITHIN TWO DAYS. IF EXPOSED ROOT AREAS CANNOT BE BACKFILLED WITHIN 2 DAYS, AN ORGANIC MATERIAL WHICH REDUCES SOIL TEMPERATURE AND MINIMIZES WATER LOSS DUE TO EVAPORATION SHALL BE PLACED TO COVER THE ROOTS UNTIL BACKFILL CAN OCCUR.
12. PRIOR TO EXCAVATION OR GRADE CUTTING WITHIN TREE DRIPLINES, A CLEAN CUT SHALL BE MADE BETWEEN THE DISTURBED AND UNDISTURBED ROOT ZONES WITH A ROCK SAW OR SIMILAR EQUIPMENT, IN A LOCATION AND TO A DEPTH APPROVED BY THE FORESTRY MANAGER, TO MINIMIZE DAMAGE TO REMAINING ROOTS.
13. TREES MOST HEAVILY IMPACTED BY CONSTRUCTION ACTIVITIES WILL BE WATERED DEEPLY ONCE A WEEK DURING PERIODS OF HOT, DRY WEATHER. TREE CROWNS ARE TO BE SPRAYED WITH WATER PERIODICALLY TO REDUCE DUST ACCUMULATION ON LEAVES.
14. WHEN INSTALLING CONCRETE ADJACENT TO THE ROOT ZONE OF A TREE, A PLASTIC VAPOR BARRIER SHALL BE PLACED BEHIND THE CONCRETE TO PROHIBIT LEACHING OF LIME INTO THE CRZ.
15. ANY TRENCHING REQUIRED FOR THE INSTALLATION OF LANDSCAPE IRRIGATION SHALL BE PLACED AS FAR FROM EXISTING TREE TRUNKS AS POSSIBLE.
16. NO LANDSCAPE TOPSOIL DRESSING GREATER THAN FOUR (4) INCHES SHALL BE PERMITTED WITHIN THE DRIPLINE OR CRZ OF TREES, WHICHEVER IS GREATER. NO TOPSOIL IS PERMITTED ON ROOT FLARES OF ANY TREE.
17. PRUNING TO PROVIDE CLEARANCE FOR STRUCTURES, VEHICULAR TRAFFIC, AND CONSTRUCTION EQUIPMENT SHALL TAKE PLACE BEFORE CONSTRUCTION BEGINS. ALL PRUNING MUST BE DONE ACCORDING TO CITY STANDARDS AND AS OUTLINED IN LITERATURE PROVIDED BY THE INTERNATIONAL SOCIETY OF ARBORICULTURE (ISA PRUNING TECHNIQUES).
18. ALL OAK TREE CUTS, INTENTIONAL OR UNINTENTIONAL, SHALL BE SEALED WITH AN APPROVED PRUNING SEALER IMMEDIATELY (WITHIN 10 MINUTES). PRUNING SEAL OR TREE PAINT MUST BE KEPT ON SITE AT ALL TIMES.
19. THE FORESTRY MANAGER HAS THE AUTHORITY TO REQUIRE ADDITIONAL TREE PROTECTION BEFORE OR DURING CONSTRUCTION.
20. TREES APPROVED FOR REMOVAL SHALL BE REMOVED IN A MANNER WHICH DOES NOT IMPACT TREES TO BE PRESERVED. REFER TO THE CITY OF ROUND ROUND ROCK TREE TECHNICAL MANUAL FOR APPROPRIATE REMOVAL METHODS.
21. PRIOR TO CONSTRUCTION, ALL LOWER TREE LIMBS OVER ROADWAYS MUST BE PRUNED TO A HEIGHT OF 14 FEET USING THE TECHNIQUES DESCRIBED IN THE CITY OF ROUND ROCK TREE TECHNICAL MANUAL.
22. DEVIATIONS FROM THE ABOVE NOTES MAY BE CONSIDERED ORDINANCE VIOLATIONS IF THERE IS NON COMPLIANCE OR IF A TREE SUSTAINS DAMAGE AS A RESULT.

FOR QUESTIONS CONCERNING THIS DETAIL, PLEASE CONTACT THE FORESTRY MANAGER.

SCALE: NTS

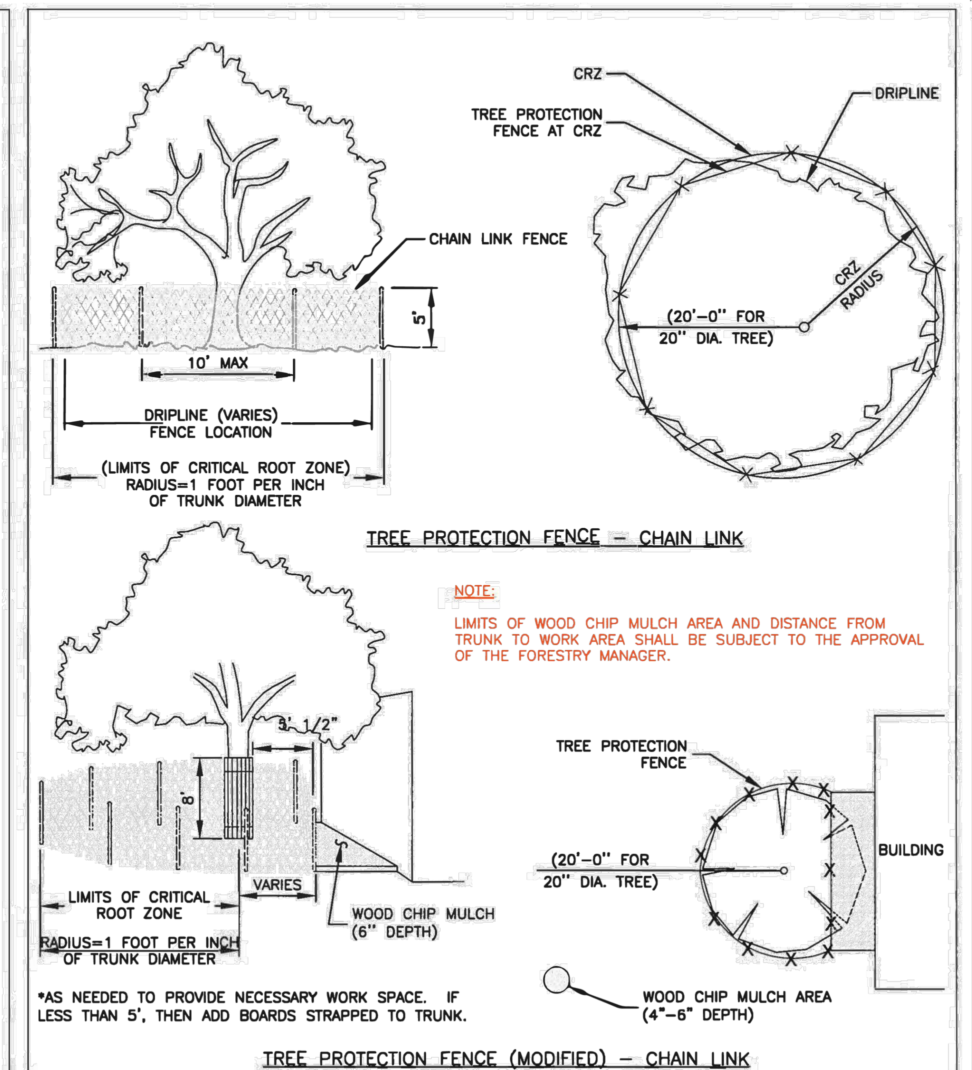
RECORD SIGNED COPY ON FILE — APPROVED — 01-28-21 DATE	CITY OF ROUND ROCK	DRAWING NO: EC-01 SHEET 1 of 1
THE ARCHITECT/ENGINEER ASSUMES RESPONSIBILITY FOR THE APPROPRIATE USE OF THIS DETAIL. (NOT TO SCALE)	TREE PROTECTION NOTES	ROUND ROCK TEXAS



FOR QUESTIONS CONCERNING THIS DETAIL, PLEASE CONTACT THE FORESTRY MANAGER.

SCALE: NTS

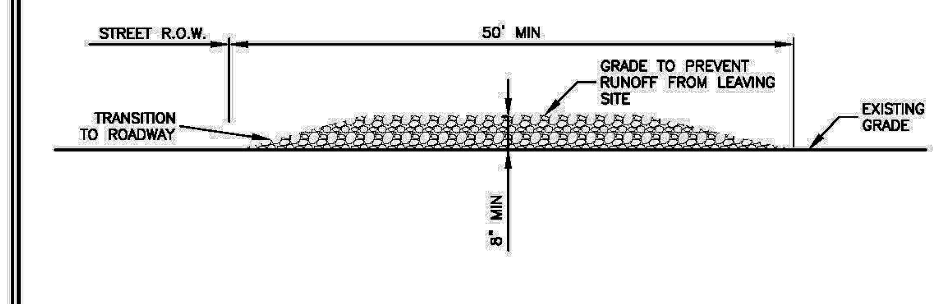
RECORD SIGNED COPY ON FILE — APPROVED — 01-28-21 DATE	CITY OF ROUND ROCK	DRAWING NO: EC-03 SHEET 1 of 1
THE ARCHITECT/ENGINEER ASSUMES RESPONSIBILITY FOR THE APPROPRIATE USE OF THIS DETAIL. (NOT TO SCALE)	TREE PROTECTION FENCE LOCATIONS	ROUND ROCK TEXAS



FOR QUESTIONS CONCERNING THIS DETAIL, PLEASE CONTACT THE FORESTRY MANAGER.

SCALE: NTS

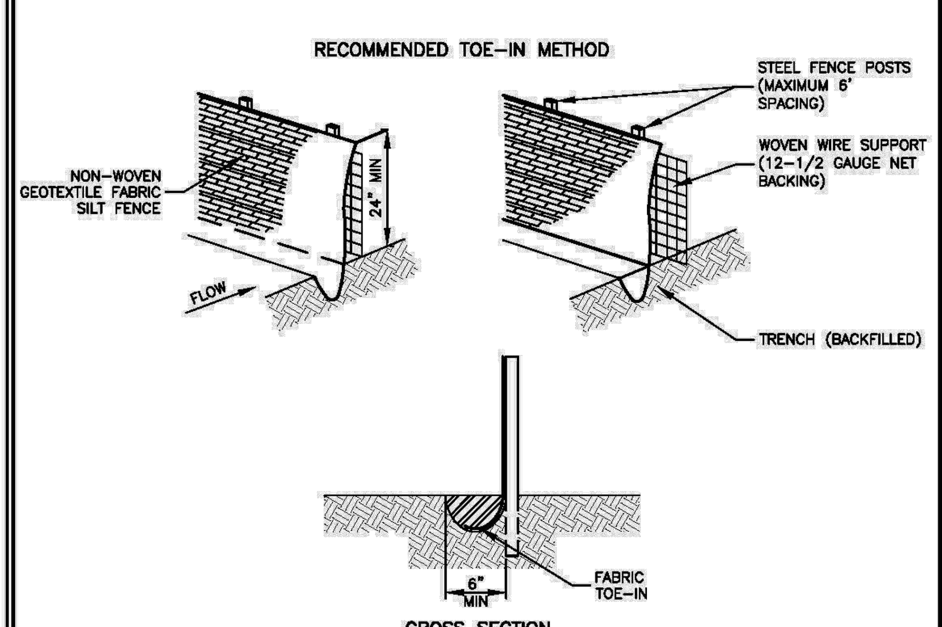
RECORD SIGNED COPY ON FILE — APPROVED — 01-28-21 DATE	CITY OF ROUND ROCK	DRAWING NO: EC-04 SHEET 1 of 1
THE ARCHITECT/ENGINEER ASSUMES RESPONSIBILITY FOR THE APPROPRIATE USE OF THIS DETAIL. (NOT TO SCALE)	TREE PROTECTION FENCE CHAIN LINK	ROUND ROCK TEXAS



NOTES:

1. STONE SIZE SHALL BE 3" – 8" OPEN GRADED ROCK.
2. THICKNESS OF CRUSHED STONE PAD TO BE NOT LESS THAN 8".
3. LENGTH SHALL BE A MINIMUM OF 50' FROM ACTUAL ROADWAY, AND WIDTH NOT LESS THAN FULL WIDTH OF INGRESS/EGRESS.
4. ENTRANCE SHALL BE PROPERLY GRADED TO PREVENT RUNOFF FROM LEAVING THE CONSTRUCTION SITE.
5. THE ENTRANCE SHALL BE MAINTAINED IN A CONDITION WHICH WILL PREVENT TRACKING OR FLOWING OF SEDIMENT ONTO PUBLIC RIGHTS OF WAY. ALL SEDIMENT SPILLED, DROPPED, WASHED OR TRACKED ONTO PUBLIC RIGHTS OF WAY MUST BE REMOVED IMMEDIATELY BY CONTRACTOR.
6. AS NECESSARY, WHEELS MUST BE CLEANED TO REMOVE SEDIMENT PRIOR TO ENTRANCE ONTO PUBLIC RIGHT OF WAY. WHEN WASHING IS REQUIRED, IT SHALL BE DONE ON AN AREA STABILIZED WITH CRUSHED STONE WHICH DRAINS INTO AN APPROVED SEDIMENT TRAP OR SEDIMENT BASIN. ALL SEDIMENT SHALL BE PREVENTED FROM ENTERING ANY STORM DRAIN, DITCH OR WATERCOURSE USING APPROVED METHODS.

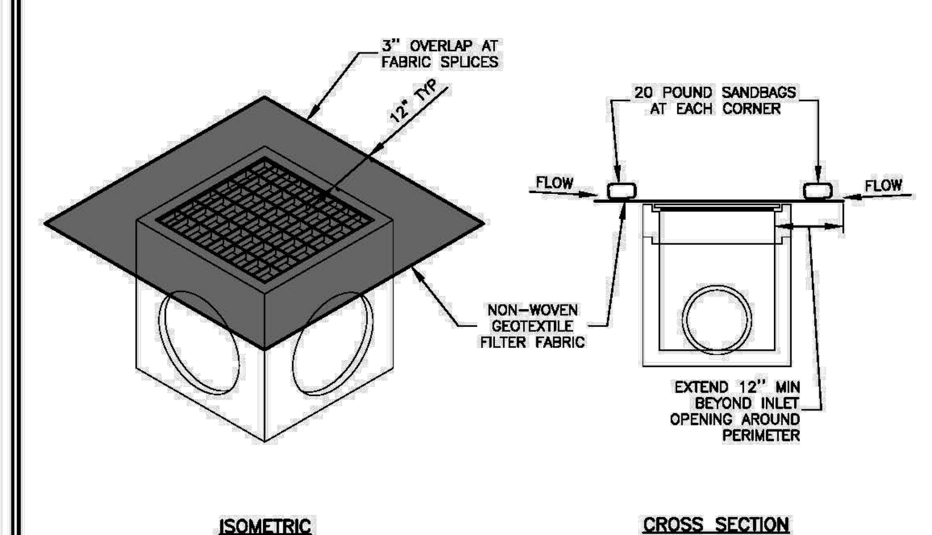
RECORD SIGNED COPY ON FILE AT PUBLIC WORKS — APPROVED — 03-25-11 DATE	CITY OF ROUND ROCK	DRAWING NO: EC-09
THE ARCHITECT/ENGINEER ASSUMES RESPONSIBILITY FOR THE APPROPRIATE USE OF THIS DETAIL. (NOT TO SCALE)	STABILIZED CONSTRUCTION ENTRANCE DETAIL	ROUND ROCK, TEXAS PURPOSE. PASSION. PROSPERITY.



NOTES:

1. STEEL POSTS WHICH SUPPORT THE SILT FENCE SHALL BE INSTALLED ON A SLIGHT ANGLE TOWARD THE ANTICIPATED RUNOFF SOURCE. POST MUST BE EMBEDDED A MIN. OF ONE (1') FOOT.
2. THE TOE OF THE SILT FENCE SHALL BE TRENCHED IN WITH A SPADE OR MECHANICAL TRENCHER, SO THAT THE DOWNSLOPE FACE OF THE TRENCH IS FLAT AND PERPENDICULAR TO THE LINE OF FLOW. WHERE FENCE CANNOT BE TRENCHED IN (E.G. PAVEMENT) WEIGHT FABRIC FLAP WITH WASHED GRAVEL ON UPHILL SIDE TO PREVENT FLOW UNDER FENCE.
3. THE TRENCH MUST BE A MINIMUM OF 6 INCHES DEEP AND 6 INCHES WIDE TO ALLOW FOR THE SILT FENCE FABRIC TO BE LAID IN THE GROUND AND BACKFILLED WITH COMPACTED MATERIAL.
4. SILT FENCE SHALL BE SECURELY FASTENED TO EACH STEEL SUPPORT POST OR TO WOVEN WIRE, WHICH IN TURN IS SECURELY FASTENED TO THE STEEL FENCE POSTS.
5. INSPECTION SHALL BE MADE WEEKLY OR AFTER EACH RAINFALL EVENT AND REPAIR OR REPLACEMENT SHALL BE MADE PROMPTLY AS NEEDED.
6. SILT FENCE SHALL BE REMOVED WHEN THE SITE IS COMPLETELY STABILIZED SO AS NOT TO BLOCK OR IMPEDE STORM FLOW OR DRAINAGE.
7. ACCUMULATED SILT SHALL BE REMOVED WHEN IT REACHES A DEPTH OF 6 INCHES. THE SILT SHALL BE DISPOSED OF IN AN APPROVED SITE AND IN SUCH A MANNER AS TO NOT CONTRIBUTE TO ADDITIONAL SILTATION.
8. SILT FENCE SHALL BE REMOVED AS SOON AS THE SOURCE OF SEDIMENT IS STABILIZED

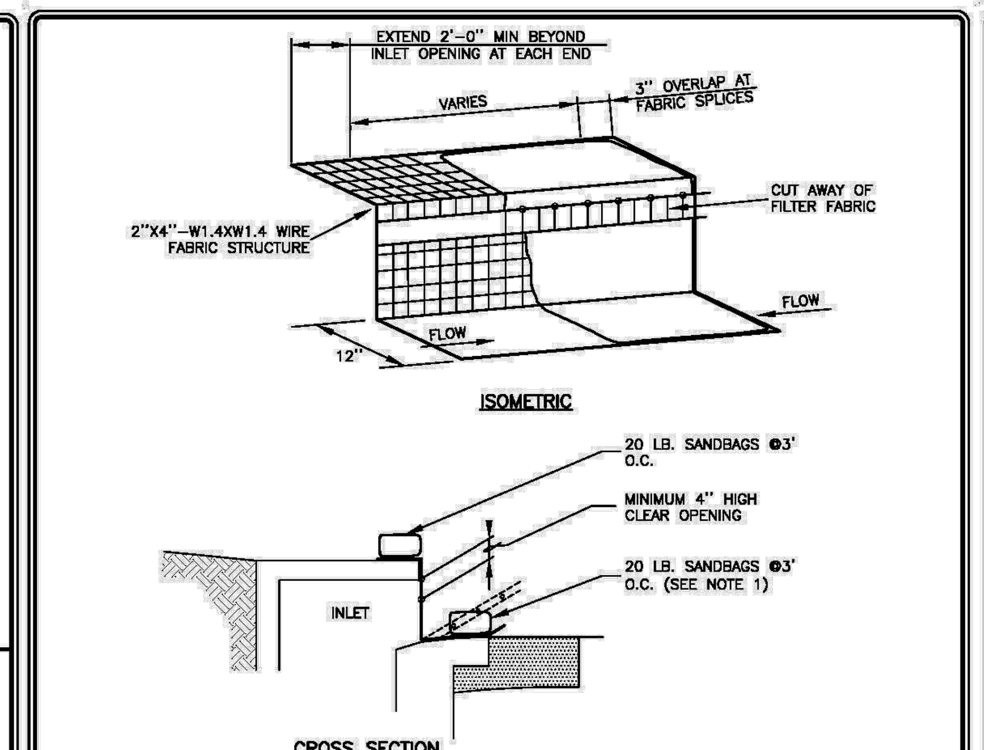
RECORD SIGNED COPY ON FILE AT PUBLIC WORKS — APPROVED — 03-25-11 DATE	CITY OF ROUND ROCK	DRAWING NO: EC-10
THE ARCHITECT/ENGINEER ASSUMES RESPONSIBILITY FOR THE APPROPRIATE USE OF THIS DETAIL. (NOT TO SCALE)	SILT FENCE DETAIL	ROUND ROCK, TEXAS PURPOSE. PASSION. PROSPERITY.



NOTES:

1. DAILY INSPECTION SHALL BE MADE BY THE CONTRACTOR AND SILT ACCUMULATION MUST BE REMOVED WHEN DEPTH REACHES 2".
2. CONTRACTOR SHALL MONITOR THE PERFORMANCE OF INLET PROTECTION DURING EACH RAINFALL EVENT AND IMMEDIATELY CLEAN THE INLET PROTECTION IF EXCESSIVE PONDING OCCURS.
3. INLET PROTECTIONS SHALL BE REMOVED AS SOON AS THE SOURCE OF SEDIMENT IS STABILIZED.

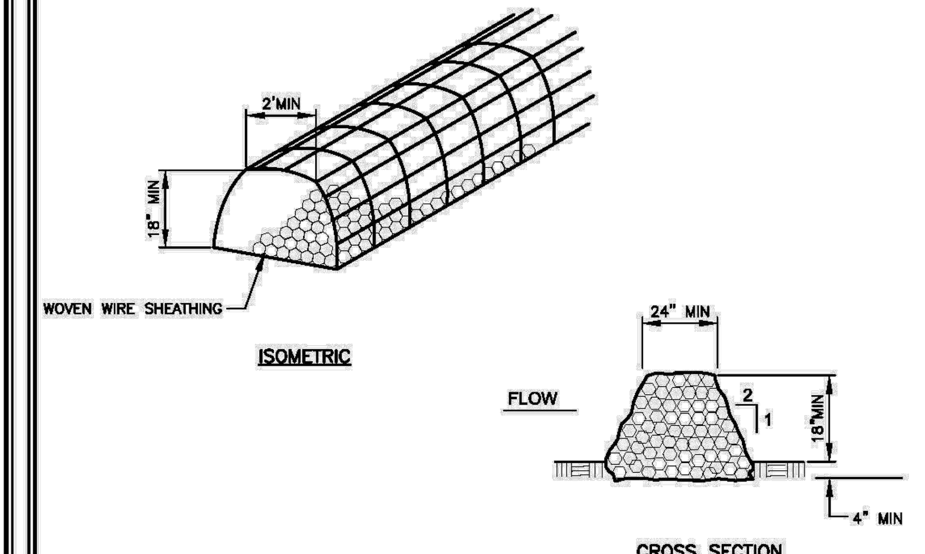
RECORD SIGNED COPY ON FILE AT PUBLIC WORKS — APPROVED — 03-25-11 DATE	CITY OF ROUND ROCK	DRAWING NO: EC-15
THE ARCHITECT/ENGINEER ASSUMES RESPONSIBILITY FOR THE APPROPRIATE USE OF THIS DETAIL. (NOT TO SCALE)	AREA INLET PROTECTION DETAIL	ROUND ROCK, TEXAS PURPOSE. PASSION. PROSPERITY.



NOTES:

1. WHERE MINIMUM CLEARANCES CAUSE TRAFFIC TO DRIVE IN THE GUTTER, THE CONTRACTOR MAY SUBSTITUTE A 1" X 4" BOARD SECURED WITH CONCRETE NAILS 3' O.C. NAILED INTO THE GUTTER IN LIEU OF SANDBAGS TO HOLD THE FILTER DIKE IN PLACE. UPON REMOVAL, CLEAN ANY DIRT/DEBRIS FROM NAILING LOCATIONS, APPLY CHEMICAL SANDING AGENT AND APPLY NON-SHRINK GROUT FLUSH WITH SURFACE OF GUTTER.
2. A SECTION OF FILTER FABRIC SHALL BE REMOVED AS SHOWN ON THIS DETAIL OR AS DIRECTED BY THE ENGINEER OR DESIGNATED REPRESENTATIVE. FABRIC MUST BE SECURED TO WIRE BACKING WITH CLIPS OR HOG RINGS AT THIS LOCATION.
3. DAILY INSPECTION SHALL BE MADE BY THE CONTRACTOR AND SILT ACCUMULATION MUST BE REMOVED WHEN DEPTH REACHES 2".
4. CONTRACTOR SHALL MONITOR THE PERFORMANCE OF INLET PROTECTION DURING EACH RAINFALL EVENT AND IMMEDIATELY REMOVE THE INLET PROTECTIONS IF THE STORM-WATER BEGINS TO OVERTOP THE CURB.
5. INLET PROTECTIONS SHALL BE REMOVED AS SOON AS THE SOURCE OF SEDIMENT IS STABILIZED.

RECORD SIGNED COPY ON FILE AT PUBLIC WORKS — APPROVED — 03-25-11 DATE	CITY OF ROUND ROCK	DRAWING NO: EC-14
THE ARCHITECT/ENGINEER ASSUMES RESPONSIBILITY FOR THE APPROPRIATE USE OF THIS DETAIL. (NOT TO SCALE)	CURB INLET PROTECTION DETAIL	ROUND ROCK, TEXAS PURPOSE. PASSION. PROSPERITY.

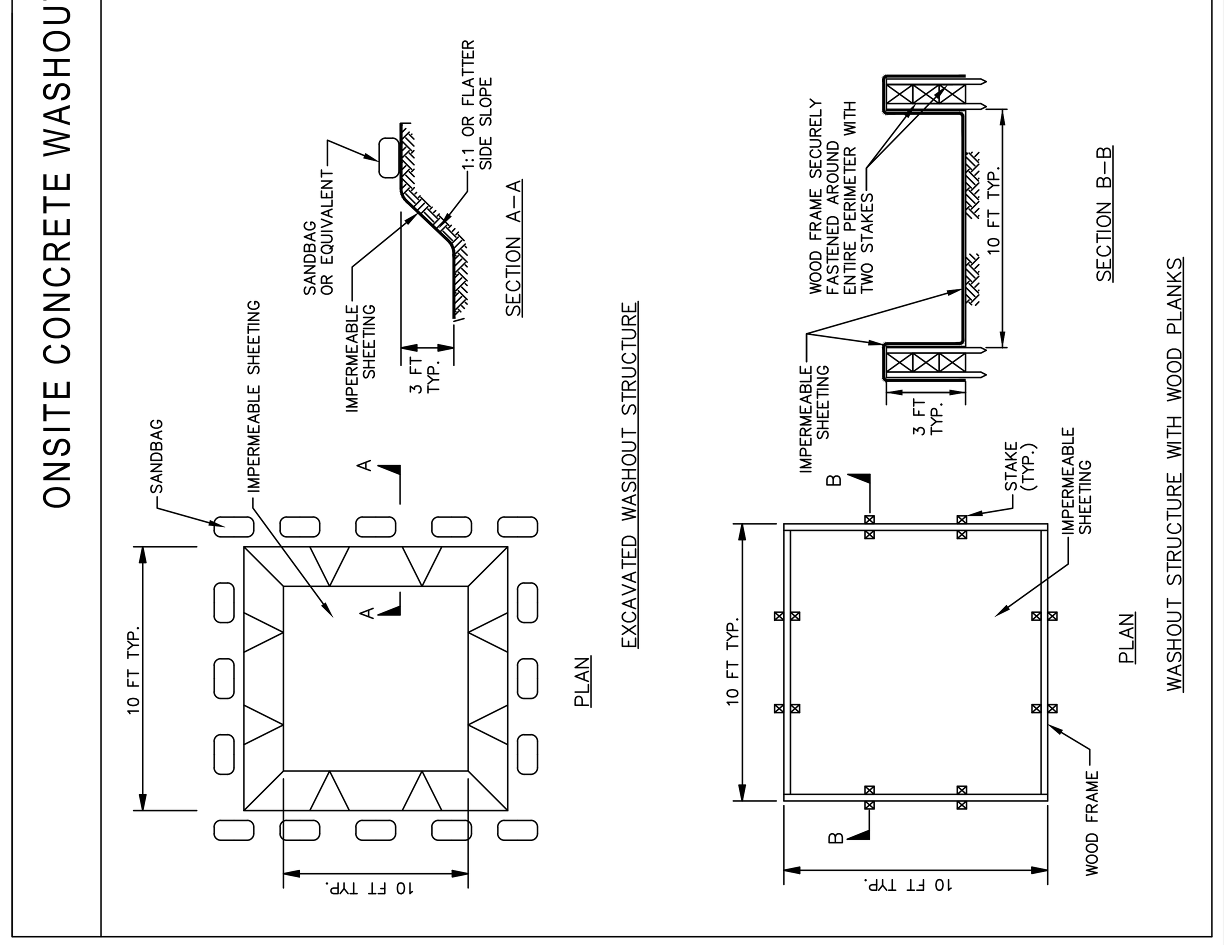


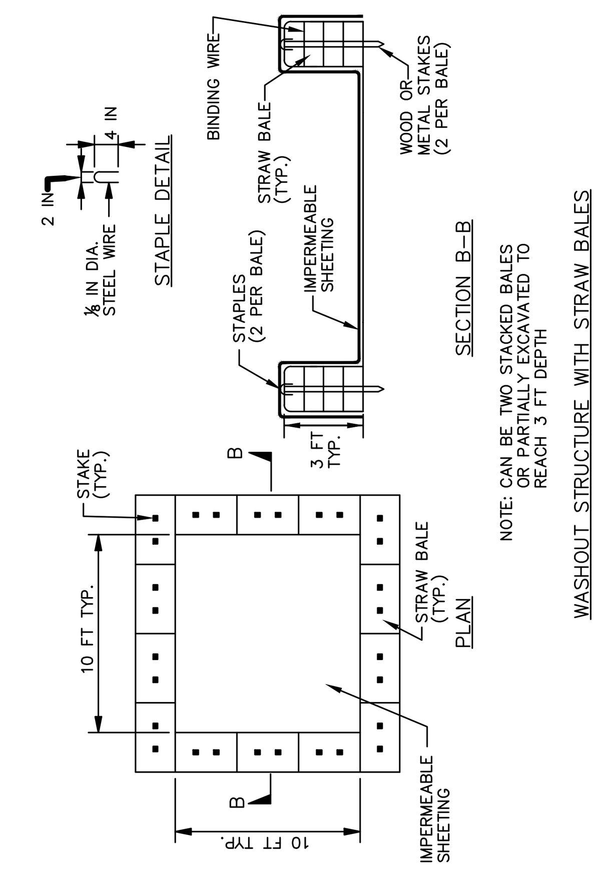
NOTES:

1. USE ONLY OPEN GRADED ROCK (3 to 5") DIAMETER FOR ALL CONDITIONS.
2. THE ROCK BERM SHALL BE SECURED WITH A WOVEN WIRE SHEATHING HAVING MAXIMUM 1" OPENING AND MINIMUM WIRE DIAMETER OF 20 GAUGE.
3. THE ROCK BERM SHALL BE INSPECTED DAILY OR AFTER EACH RAIN, AND THE STONE AND/ OR FABRIC CORE-WOVEN SHEATHING SHALL BE REPLACED WHEN THE STRUCTURE CEASES TO FUNCTION AS INTENDED, DUE TO SEDIMENT ACCUMULATION AMONG THE ROCKS, WASHOUT, CONSTRUCTION TRAFFIC DAMAGE, ETC.
4. IF SEDIMENT REACHES A DEPTH OF 6", THE SEDIMENT SHALL BE REMOVED AND DISPOSED OF ON AN APPROVED SITE AND IN A MANNER THAT WILL NOT CREATE A SEDIMENTATION PROBLEM.
5. WHEN THE SITE IS COMPLETELY STABILIZED, THE BERM AND ACCUMULATED SEDIMENT SHALL BE REMOVED AND DISPOSED OF IN AN APPROVED MANNER.

RECORD SIGNED COPY ON FILE AT PUBLIC WORKS — APPROVED — 03-25-11 DATE	CITY OF ROUND ROCK	DRAWING NO: EC-12
THE ARCHITECT/ENGINEER ASSUMES RESPONSIBILITY FOR THE APPROPRIATE USE OF THIS DETAIL. (NOT TO SCALE)	ROCK BERM DETAIL	ROUND ROCK, TEXAS PURPOSE. PASSION. PROSPERITY.

ONSITE CONCRETE WASHOUT STRUCTURE





NOTE: CAN BE TWO STACKED BALES OR PARTIALLY EXCAVATED TO REACH 3 FT DEPTH

WASHOUT STRUCTURE WITH STRAW BALES

CONSTRUCTION SPECIFICATIONS

1. LOCATE WASHOUT STRUCTURE A MINIMUM OF 50 FEET AWAY FROM OPEN CHANNELS, STORM DRAIN INLETS, SENSITIVE AREAS, WETLANDS, BUFFERS AND WATER COURSES AND AWAY FROM CONSTRUCTION TRAFFIC.
2. SIZE WASHOUT STRUCTURE FOR VOLUME NECESSARY TO CONTAIN WASH WATER AND SOLIDS AND MAINTAIN AT LEAST 4 INCHES OF FREEBOARD. TYPICAL DIMENSIONS ARE 10 FEET X 10 FEET X 3 FEET DEEP.
3. PREPARE SOIL BASE FREE OF ROCKS OR OTHER DEBRIS THAT MAY CAUSE TEARS OR HOLES IN THE LINER. FOR LINER, USE 10 MIL OR THICKER UV RESISTANT, IMPERMEABLE SHEETING, FREE OF HOLES AND TEARS OR OTHER DEFECTS THAT COMPROMISE IMPERMEABILITY OF THE MATERIAL.
4. PROVIDE A SIGN FOR THE WASHOUT IN CLOSE PROXIMITY TO THE FACILITY.
5. KEEP CONCRETE WASHOUT STRUCTURE WATER TIGHT. REPLACE IMPERMEABLE LINER IF DAMAGED (E.G., RIPPED OR PUNCTURED). EMPTY OR REPLACE WASHOUT STRUCTURE THAT IS 75 PERCENT FULL, AND DISPOSE OF ACCUMULATED MATERIAL PROPERLY. DO NOT REUSE PLASTIC LINER. WET-VACUUM STORED LIQUIDS THAT HAVE NOT EVAPORATED AND DISPOSE OF IN AN APPROVED MANNER. PRIOR TO FORECASTED RAINSTORMS, REMOVE LIQUIDS OR COVER STRUCTURE TO PREVENT OVERFLOWS. REMOVE HARDENED SOLIDS, WHOLE OR BROKEN UP, FOR DISPOSAL OR RECYCLING. MAINTAIN RUNOFF DIVERSION AROUND EXCAVATED WASHOUT STRUCTURE UNTIL STRUCTURE IS REMOVED.

STATE OF TEXAS — NICHOLAS R. SANDLIN — 124404 — LICENSED PROFESSIONAL ENGINEER — 9/5/2023

WARNING !!!! CONTRACTOR TO FIELD VERIFY ALL EXIST. UTILITIES VERTICALLY AND HORIZONTALLY PRIOR TO CONSTRUCTION. THE CONTRACTOR IS TO CONTACT ENGINEER IF ANY EXISTING UTILITY INFORMATION DIFFERS FROM DATA SHOWN IN THE PLANS. CALL 811 BEFORE YOU DIG.

SANDLIN SERVICES, LLC — ENGINEERING | CONSULTING
TBPELS FIRM #21356
4501 WHISPERING VALLEY DRIVE UNIT 27 AUSTIN, TX 78727

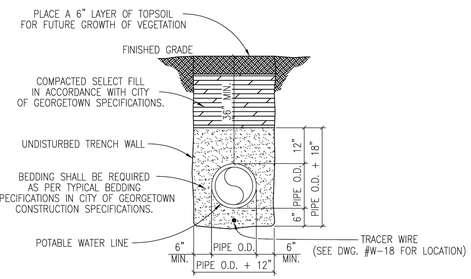
EROSION CONTROL DETAILS

PROJECT CASE: XXXXXXX

TWELVE OAKS

#	REVISION DESCRIPTION	SIGNATURE	DATE

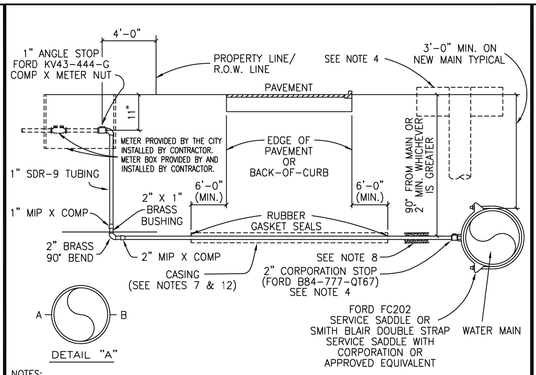
G:\Shared drives\Sandlin Services LLC\Sandlin Services Projects\Land Development Division\01-0089-003 Twelve Oaks\CAD\Construction Sheets\S 120 DTL.dwg–EROSION CONTROL DETAILS Plotted Sep 06, 2023 at 2:29pm by Scott | Last Saved by: Scott



TRENCH WIDTHS
*PIPE LESS THAN 20" DIAMETER
1'-0" + PIPE O.D.
*20" DIAMETER PIPE AND LARGER
2'-0" + PIPE O.D.

The Architect/Engineer assumes responsibility for appropriate use of this standard.

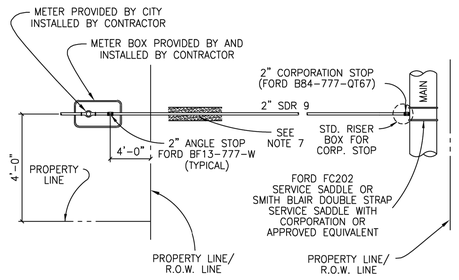
REVISION NOTE: ADOPTED 6/21/2006
CITY OF GEORGETOWN
CONSTRUCTION STANDARDS AND DETAILS
TRENCH AND EMBEDMENT DETAIL UNDER NON-PAVED AREAS
DRAWING NAME: W02
SCALE: NTS | DATE: 1/2003
DRAWN BY: MRS | APPROVED BY: TRB



NOTES:
1. SUCCESSIVE TAPS INTO THE WATER MAIN SHALL BE SPACED A MINIMUM OF 18" OFFSET AND AT THE CENTERLINE AS SHOWN ON DETAIL "A".
2. WHERE NO SIDEWALK EXISTS, METER BOXES SHALL BE SET TO CONFORM TO FINISHED GRADE.
3. AUTHORIZED SERVICE LINE MATERIAL: POLYETHYLENE TUBING SHALL BE SDR-9. CLASS 200, SDR TUBING SHALL HAVE STAINLESS STEEL STIFFENERS.
4. ROTATE THE CORPORATION STOP SO THAT THE OPERATING NUT IS ACTUATED FROM THE VERTICAL POSITION RATHER THAN THE HORIZONTAL. SEE STD. RISER FOR CORP. STOP DETAIL, (DWG # W08).
5. SERVICE LINES SHALL BE CONTINUOUS FROM CORPORATION STOP TO CORPORATION STOP WITH NO FITTINGS IN BETWEEN.
6. SERVICE CASING SHALL NOT BE INSTALLED BY WATER JETTING UNDER ROADWAY.
7. CASING REQUIRED FOR ALL PAVEMENT CROSSINGS. 4" SDR-26 REQUIRED FOR OPEN-CUT. STEEL CASING PIPE REQUIRED FOR JACK AND BORE. LIMITS OF CASING SHOULD EXTEND SIX FEET BEYOND THE EDGE OF PAVEMENT OR BACK-OF-CURB.
8. BEDDING MATERIAL AS PER CITY OF GEORGETOWN CONSTRUCTION SPECIFICATIONS.
9. ANY VARIATIONS ON FITTINGS MUST BE APPROVED BY THE CITY ENGINEER.
10. METER BOX TO BE CAPABLE OF HOUSING ITRON AUTOMATIC METER READING DEVICE. USE DFW-PLASTICS, INC. PART NO. 1200.SBAMR OR APPROVED EQUAL.
11. ALL SERVICE LINES SHALL BE PLACED 90° PERPENDICULAR TO THE ROADWAY. SEE DETAIL W23.
12. CASING SHALL EXTEND OUT TO WITHIN 4' INSIDE OF THE R.O.W. LINE, ON BOTH SIDES.

The Architect/Engineer assumes responsibility for appropriate use of this standard.

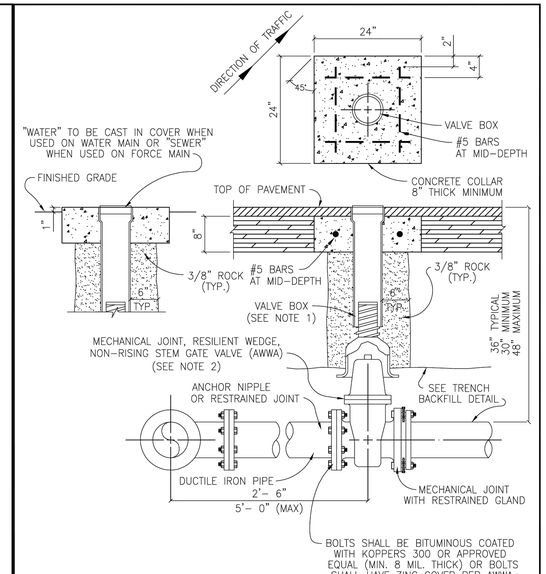
REVISION NOTE: ADOPTED 01/23/2013
CITY OF GEORGETOWN
CONSTRUCTION STANDARDS AND DETAILS
TYPICAL WATER SERVICE-ELEVATION
DRAWING NAME: W03
SCALE: NTS | DATE: 1/2013
DRAWN BY: – | APPROVED BY: MH



NOTES:
1. AUTHORIZED SERVICE LINE MATERIAL: POLYETHYLENE TUBING SHALL BE SDR-9. CLASS 200, SDR TUBING SHALL HAVE STAINLESS STEEL STIFFENERS.
2. ANGLE STOP SHALL BE 1" MINIMUM.
3. 1" ANGLE STOPS WITH 3/4" VALVES SHALL NOT BE PERMITTED.
4. MULTIPLE SERVICE/METER INSTALLATIONS OF MORE THAN 4 METERS PER SERVICE AND SERVICE LINES LARGER THAN 2" IN DIAMETER SHALL BE HANDLED ON AN INDIVIDUAL BASIS.
5. ANGLE STOPS 1 1/2" AND 2" IN SIZE SHALL BE PROVIDED WITH BOTH A LOCKING CAP AND METER FLANGE.
6. ANGLE STOPS SHALL BE INSTALLED 8" BELOW FINISHED GRADE AND MARKED WITH A 2" X 2" X 48" TREATED WOOD STAKE, PAINTED BLUE.
7. BEDDING MATERIAL AS PER CITY OF GEORGETOWN CONSTRUCTION SPECIFICATIONS.
8. CASING REQUIREMENTS FOR SERVICE LINES CROSSING ROADWAYS SEE DETAIL W-03 NOTE #7.
9. ANY VARIATIONS ON FITTINGS MUST BE APPROVED BY THE CITY ENGINEER.
10. ALL SERVICE LINES SHALL BE PLACED 90° PERPENDICULAR TO THE ROADWAY.

The Architect/Engineer assumes responsibility for appropriate use of this standard.

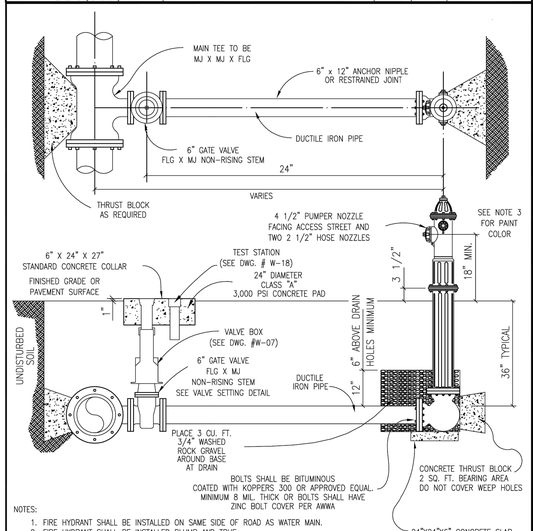
REVISION NOTE: ADOPTED 01/23/2013
CITY OF GEORGETOWN
CONSTRUCTION STANDARDS AND DETAILS
SINGLE WATER SERVICE PLAN
DRAWING NAME: W04
SCALE: NTS | DATE: 1/2013
DRAWN BY: – | APPROVED BY: MH



NOTES:
1. VALVE BOX SHALL BE 5 1/4" CAST IRON ADJUSTABLE HAVING AN ADJUSTABLE RANGE OF + OR – 6 INCHES FROM INSTALLED FINISH GRADE.
2. ACCEPTABLE GATE VALVES ARE:
   A. AMERICAN FLOW CONTROL – SERIES 2500
   B. MUELLER – 2360 SERIES
   C. CLOW

The Architect/Engineer assumes responsibility for appropriate use of this standard.

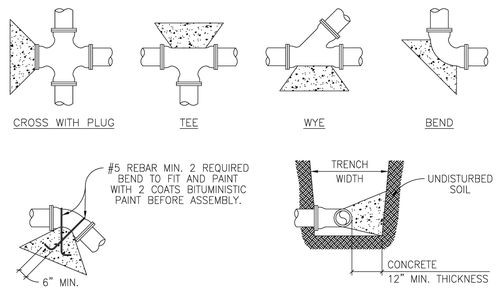
REVISION NOTE: ADOPTED 6/21/2006
CITY OF GEORGETOWN
CONSTRUCTION STANDARDS AND DETAILS
TYPICAL VALVE SETTING
DRAWING NAME: W07
SCALE: NTS | DATE: 1/2003
DRAWN BY: MRS | APPROVED BY: TRB



NOTES:
1. FIRE HYDRANT SHALL BE INSTALLED ON SAME SIDE OF ROAD AS WATER MAIN.
2. FIRE HYDRANT SHALL BE INSTALLED PLUMB AND TRUE.
3. ALL FIRE HYDRANT EXTERIORS SHALL BE FACTORY PRIMED AND PAINTED SILVER USING A HIGH GRADE ENAMEL.
4. HEEL AND THRUST BLOCKS TO REST IN UNDISTURBED SOIL.
5. THE ONLY FIRE HYDRANTS ACCEPTABLE ARE:
   A. KENNEDY – K81
   B. AMERICAN DARLING – B84B
   C. CLOW MEDALLION
6. DOUBLE BLUE REFLECTOR "HYE-LITES" BRAND, MANUFACTURED BY PAVEMENT MARKERS INC. TO BE INSTALLED AT CENTERLINE OF STREET PERPENDICULAR TO HYDRANT.
7. ALL METALLIC PIPES AND FITTINGS SHALL BE WRAPPED WITH 8 MILL. POLYETHELENE FILM.

The Architect/Engineer assumes responsibility for appropriate use of this standard.

REVISION NOTE: ADOPTED 6/21/2006
CITY OF GEORGETOWN
CONSTRUCTION STANDARDS AND DETAILS
TYPICAL FIRE HYDRANT INSTALLATION
DRAWING NAME: W10
SCALE: NTS | DATE: 1/2003
DRAWN BY: MRS | APPROVED BY: TRB



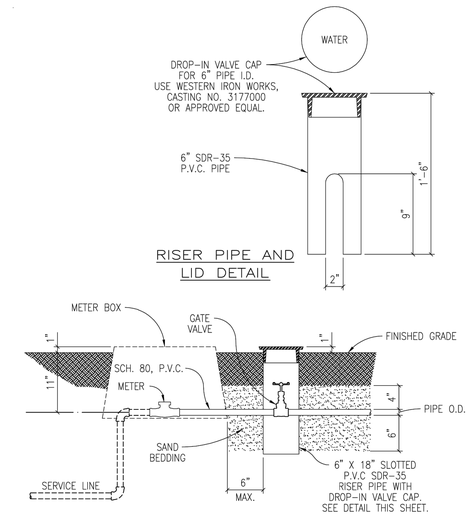
ALL THRUST BLOCKS SHALL BE FORMED. LAID FORMS SHALL BE INSPECTED BY THE CITY OF GEORGETOWN PRIOR TO THE POURING OF CONCRETE AND SHALL ALSO BE INSPECTED BY THE CITY OF GEORGETOWN PRIOR TO COVERING. TYPICAL LOCATIONS WHICH REQUIRE CONCRETE REACTION (THRUST) BLOCKS, FOR PRESSURE MAINS FOUR INCHES (4") AND GREATER. CONCRETE SHALL HAVE 2,500 P.S.I. MINIMUM STRENGTH AT TWENTY EIGHT (28) DAYS AND BEAR AGAINST UNDISTURBED STABLE SOILS, AREA OF CONTACT SHALL BE GOVERNED BY PIPE SIZE, MAXIMUM PRESSURE IN PIPE, AND BEARING CAPACITY OF SOIL. PROTECT FITTINGS, BOLTS, ETC. BY COVERING WITH VISQUEEN OR OTHER ACCEPTABLE MATERIAL. CONCRETE SHALL BE A MINIMUM OF TWELVE INCHES (12") THICK.

PIPE SIZE	THRUST BLOCK AREA REQUIRED	PIPE SIZE	THRUST BLOCK AREA REQUIRED	REMARKS
4"	2.0 SQ. FT.	18"	30.0 SQ. FT.	VALUES ARE FOR 90° BENDS, BASED ON 2000 P.S.F. SAFE BEARING LOAD AND PIPE PRESSURE OF 150 P.S.I. PLUS 33% SAFETY FACTOR FOR OTHER SOILS AND PRESSURES, THE AREA REQUIRED IS IN DIRECT PROPORTION.
6"	4.0 SQ. FT.	20"	37.0 SQ. FT.	
8"	6.6 SQ. FT.	24"	53.0 SQ. FT.	
10"	10.0 SQ. FT.	27"	80.0 SQ. FT.	
12"	14.0 SQ. FT.	30"	98.0 SQ. FT.	
14"	18.0 SQ. FT.	36"	127.0 SQ. FT.	
16"	24.0 SQ. FT.			

* THE ENGINEER OF RECORD SHALL CALCULATE THE SIZE OF THE DEADMAN REQUIRED AS WELL AS ANY INSTALLATION WHICH IS NOT COVERED BY THE ABOVE.

The Architect/Engineer assumes responsibility for appropriate use of this standard.

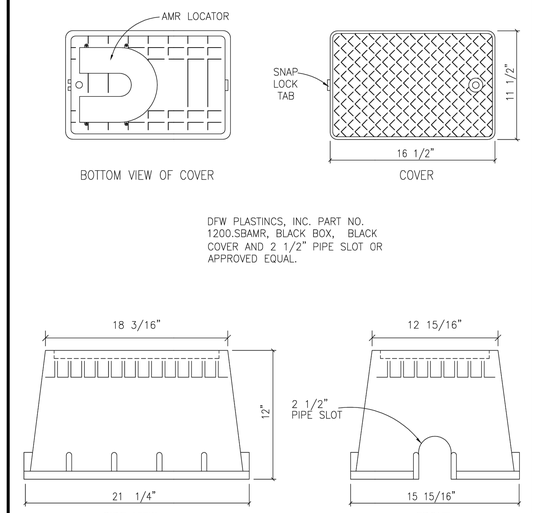
REVISION NOTE: ADOPTED 6/21/2006
CITY OF GEORGETOWN
CONSTRUCTION STANDARDS AND DETAILS
TYPICAL THRUST BLOCKS FOR WATER AND FORCE MAIN
DRAWING NAME: W11
SCALE: NTS | DATE: 1/2003
DRAWN BY: MRS | APPROVED BY: TRB



NOTES:
1. GATE VALVE SHALL BE A HAMMOND IB645, CLASS 125, BRONZE GATE, SCREWED BONNET, NON-RISING STEM, SOLID WEDGE DISC WITH THREADED ENDS OR APPROVED EQUAL.
2. DROP-IN VALVE CAP SHALL BE CAST WITH THE WORD "WATER" ON TOP.
3. USE SCHEDULE 80, M.I.P. ADAPTER AS REQUIRED.

The Architect/Engineer assumes responsibility for appropriate use of this standard.

REVISION NOTE: ADOPTED 6/21/2006
CITY OF GEORGETOWN
CONSTRUCTION STANDARDS AND DETAILS
CUSTOMER'S CUT-OFF
DRAWING NAME: W20
SCALE: NTS | DATE: 1/2003
DRAWN BY: MRS | APPROVED BY: TRB



The Architect/Engineer assumes responsibility for appropriate use of this standard.

REVISION NOTE: ADOPTED 6/21/2006
CITY OF GEORGETOWN
CONSTRUCTION STANDARDS AND DETAILS
METER BOX (NON-TRAFFIC AREAS)
DRAWING NAME: W23
SCALE: NTS | DATE: 1/2003
DRAWN BY: MRS | APPROVED BY: TRB

STATE OF TEXAS
NICHOLAS R. SANDLIN
124404
LICENSED
PROFESSIONAL ENGINEER
9/5/2023

WARNING !!!! CONTRACTOR TO FIELD VERIFY ALL EXIST. UTILITIES VERTICALLY AND HORIZONTALLY PRIOR TO CONSTRUCTION. THE CONTRACTOR IS TO CONTACT ENGINEER IF ANY EXISTING UTILITY INFORMATION DIFFERS FROM DATA SHOWN IN THE PLANS. CALL 811 BEFORE YOU DIG.

ENGINEERING | CONSULTING
SANDLIN
SERVICES, LLC
TBPELS FIRM #21356
4501 WHISPERING VALLEY DRIVE UNIT 27 AUSTIN, TX 78727

UTILITY DETAILS (1 OF 3)

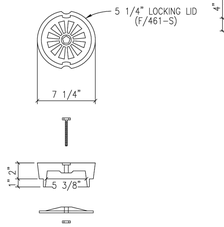
PROJECT CASE: XXXXXXX

TWELVE OAKS

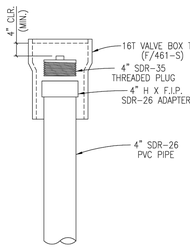
#	REVISION DESCRIPTION	SIGNATURE	DATE

SHEET 25 OF 32

G:\Shared drives\Sandlin Services LLC\Sandlin Services Projects\Land Development Division\01-0089-003 Twelve Oaks\CAD\Construction Sheets\S 120 DTL.dwg-UTILITY DETAILS (1 OF 3) Plotted Sep 06, 2023 at 2:29pm by Scott | Last Saved by: Scott



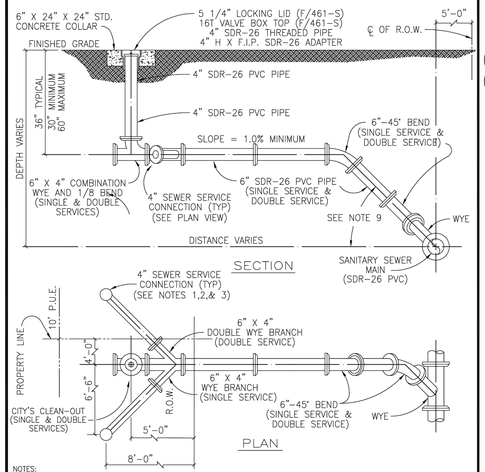
5 1/4" LOCKING LID
(F/461-S)



SEWER CLEAN-OUT
CITY OF GEORGETOWN
(RESIDENTIAL SERVICE)

The Architect/Engineer assumes responsibility for appropriate use of this standard.

CITY OF GEORGETOWN CONSTRUCTION STANDARDS AND DETAILS	REVISION NOTE: ADOPTED 6/21/2006
SEWER CLEAN-OUT DETAIL	DRAWING NAME: WW12
	SCALE: NTS · DATE: 1/2003 · DRAWN BY: MRS · APPROVED BY: TRB

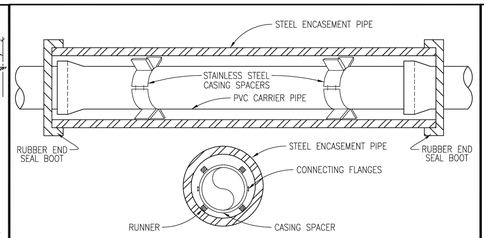


NOTES:

1. SERVICE CONNECTION RISERS SHALL TERMINATE 8' INSIDE THE PROPETY LINE.
2. THE END OF EACH SERVICE CONNECTION RISER SHALL BE EXTENDED 12" ABOVE FINISH GRADE.
3. EACH SERVICE CONNECTION SHALL BE PLUGGED WATER-TIGHT WITH AN APPROVED CAP OR PLUG.
4. FOR P.V.C. INSTALLATIONS, CONNECT TO EXISTING "BELL END" AND CONNECT OPPSITE END WITH P.V.C. TO P.V.C. KNOCK ON SLEEVE.
5. SOLIDLY TAMP BACKFILL AT LEAST ONE FOOT (1'-0") ABOVE TOP OF PIPE. SERVICES UNDER PAVED AREAS SHALL BE BACKFILLED TO THE SAME SPECIFICATIONS AS SHOWN ON PAVEMENT REPLACEMENT DETAIL.
6. CONTRACTOR SHALL MARK ON A CLEAN SET OF PLANS THE FINAL STATIONING OR DISTANCE AND DIRECTION FROM MANHOLE TO EACH SERVICE LATERAL AND GIVE TO ENGINEER FOR RECORD DRAWING PURPOSES.
7. ANY DEVIATION FROM THESE METHODS MUST BE APPROVED BY THE CITY OF GEORGETOWN ENGINEERING DEPARTMENT.
8. SERVICE LINE MATERIAL SHALL BE P.V.C., SDR-26.
9. SEWER SERVICE SLOPE TO BE 45° OFF CENTERLINE OF MAIN.

The Architect/Engineer assumes responsibility for appropriate use of this standard.

CITY OF GEORGETOWN CONSTRUCTION STANDARDS AND DETAILS	REVISION NOTE: ADOPTED 6/21/2006
SEWER SERVICE CONNECTIONS	DRAWING NAME: WW13
	SCALE: NTS · DATE: 1/2003 · DRAWN BY: MRS · APPROVED BY: TRB



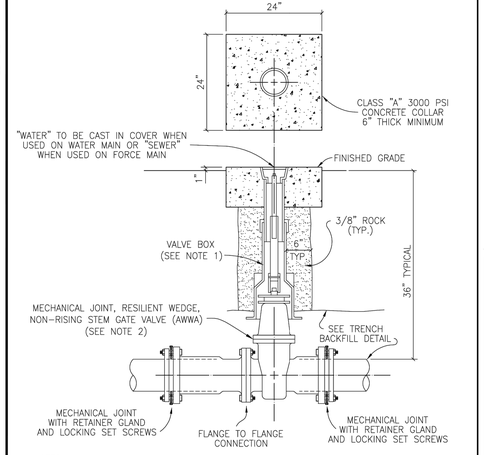
NOTES:

1. CASING SPACERS SHALL BE BOLT ON STYLE WITH A SHELL MADE IN TWO SECTIONS OF HEAVY T-304 STAINLESS STEEL. CONNECTING FLANGES SHALL BE RIBBED FOR EXTRA STRENGTH. CASING SPACERS SHALL BE MADE BY CASCADE WATERWORKS MFG. CO. OR APPROVED EQUAL.
2. CASING SPACERS SHALL HAVE RUNNERS MADE OF ULTRA HIGH MOLECULAR WEIGHT POLYMER, WITH A MINIMUM HEIGHT OF 2 INCHES.
3. DO NOT USE WEDGES BETWEEN TOP OF PVC CARRIER PIPE AND INSIDE OF CASING TO KEEP PVC FROM MOVING.
4. PRIOR TO INSERTING PVC CARRIER PIPE, ANY WATER SHOULD BE PUMPED OUT OF THE CASING PIPE SO THAT NO MORE THAN A FEW INCHES OF WATER REMAINS.
5. SPACERS WILL BE REQUIRED WITHIN AT LEAST 3 FEET FROM BOTH OPENINGS OF THE ENCASEMENT PIPE AND SPACED NO GREATER THAN 6 FEET THROUGHOUT THE ENCASEMENT PIPE.
6. ENCASEMENT PIPE SHALL BE SMOOTH STEEL 35,000 PSI YIELD STRENGTH WITH THICKNESS ACCORDING TO THE FOLLOWING TABLE:
7. WHEN CASING IS REQUIRED UNDER PAVEMENT WITHIN THE R.O.W., THE CASING SHALL EXTEND OUT TO WITHIN 4' INSIDE OF THE R.O.W. LINE, ON BOTH SIDES.
8. ALL JOINTS SHALL BE RESTRAINED ON PVC CARRIER PIPE.

PIPE SIZE-CARRIER (DIAMETER)	PIPE SIZE-CASING (DIAMETER)(MIN.)	MINIMUM PIPE THICKNESS (INCHES)	
6"	16"		
8"	18"	1/4	0.2500
10"	20"	5/16	0.3125
12" – 14"	24"	3/8	0.3750
16" – 18"	30"	7/16	0.4375
20"	36"	1/2	0.5000
24"	42"	1/2	0.5000
30"	48"	1/2	0.5000

The Architect/Engineer assumes responsibility for appropriate use of this standard.

CITY OF GEORGETOWN CONSTRUCTION STANDARDS AND DETAILS	REVISION NOTE: ADOPTED 6/21/2006
INSTALLATION OF P.V.C. PIPE THROUGH CASING	DRAWING NAME: W14
	SCALE: NTS · DATE: 1/2003 · DRAWN BY: MRS · APPROVED BY: TRB

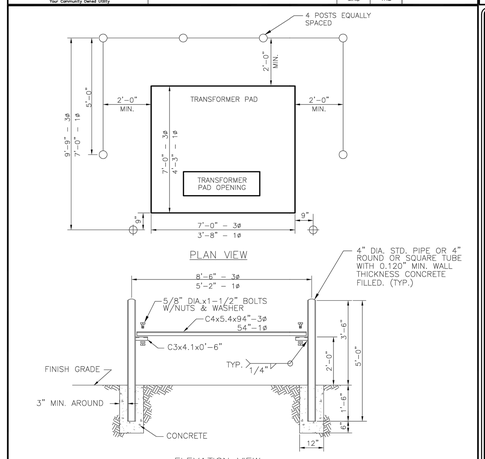


NOTES:

1. SEE VALVE SETTING DETAIL, DWG. #W-07.
2. ACCEPTABLE GATE VALVES ARE:
   A. MUELLER – 2360 SERIES
   B. CLOW

The Architect/Engineer assumes responsibility for appropriate use of this standard.

CITY OF GEORGETOWN CONSTRUCTION STANDARDS AND DETAILS	REVISION NOTE: ADOPTED 6/21/2006
INLINE VALVE INSTALLATION	DRAWING NAME: W21
	SCALE: NTS · DATE: 1/2003 · DRAWN BY: MRS · APPROVED BY: TRB

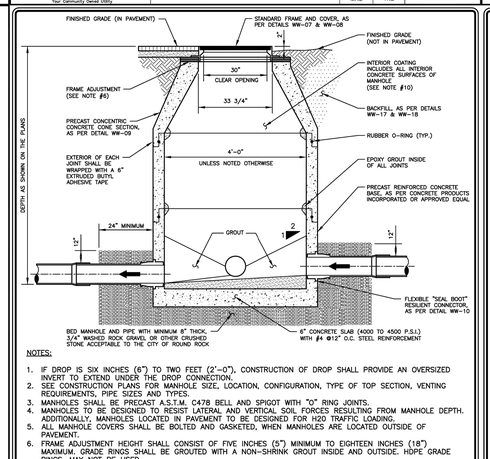


NOTES:

1. IF A BUILDING IS USED AS ANY PORTION OF THIS GUARD, THE TRANSFORMER PAD SHALL BE SO LOCATED THAT THE PAD SIDE OR SIDES ADJACENT TO THE SURFACE OF THE BUILDING SHALL HAVE A CLEARANCE OF NOT LESS THAN 5 FEET. FOR TRANSFORMERS 750 KVA AND ABOVE CONTACT GEORGETOWN UTILITY SERVICES ABOUT SPECIAL CLEARANCE REQUIREMENTS.
2. 10'-0" CLEARANCE SHALL BE PROVIDED IN FRONT OF THE EQUIPMENT TO PERMIT HOT STICK OPERATION.

The Architect/Engineer assumes responsibility for appropriate use of this standard.

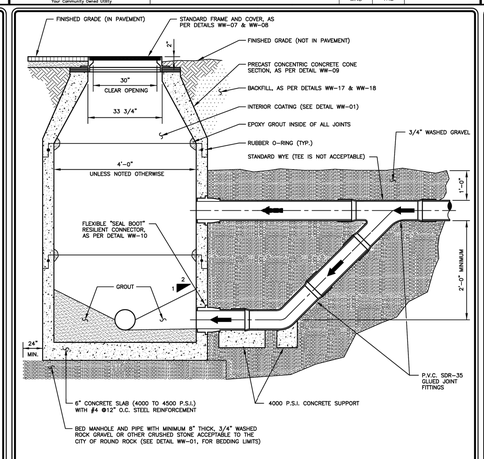
CITY OF GEORGETOWN CONSTRUCTION STANDARDS AND DETAILS	REVISION NOTE: ADOPTED 6/21/2006
PROTECTIVE BOLLARD INSTALLATION FOR PADMOUNT XFMRS, JUNCTION BOXES AND SWITCHGEAR	DRAWING NAME: UGPB1.1
	SCALE: NTS · DATE: 7/05 · DRAWN BY: JWL · APPROVED BY: MRM



NOTES:

1. IF DROP IS SIX INCHES (6") TO TWO FEET (2'-0"), CONSTRUCTION OF DROP SHALL PROVIDE AN OVERSIZED INVERT TO EXTEND UNDER THE DROP CONNECTION.
2. SEE CONSTRUCTION PLANS FOR MANHOLE SIZE, LOCATION, CONFIGURATION, TYPE OF TOP SECTION, VENTING REQUIREMENTS, PIPE SIZES AND TYPES.
3. MANHOLES SHALL BE PRECAST A.S.T.M. C478 BELL AND SPIGOT WITH "O" RING JOINTS.
4. MANHOLES TO BE DESIGNED TO RESIST LATERAL AND VERTICAL SOIL FORCES RESULTING FROM MANHOLE DEPTH. ADDITIONALLY, MANHOLES LOCATED IN PAVEMENT TO BE DESIGNED FOR H20 TRAFFIC LOADING.
5. ALL MANHOLE COVERS SHALL BE BOLTED AND GASKETED, WHEN MANHOLES ARE LOCATED OUTSIDE OF PAVEMENT.
6. FRAME ADJUSTMENT HEIGHT SHALL CONSIST OF FIVE INCHES (5") MINIMUM TO EIGHTEEN INCHES (18") MAXIMUM. GRADE RINGS SHALL BE GROUTED WITH A NON-SHRINK GROUT INSIDE AND OUTSIDE. HDPE GRADE RINGS, MAY NOT BE USED.
7. FOR MANHOLES TO BE VENTED, SEE DETAILS WW-05 AND WW-06.
8. A FLOW CHANNEL SHALL BE CONSTRUCTED INSIDE MANHOLE TO DIRECT INFLUENT INTO THE FLOW STREAM. ALL P.V.C. PIPE SHALL BE REMOVED FROM INVERT.
9. BASE SECTION SHALL BE DESIGNED FOR H20 LOADING, PLUS EARTH LOAD AT 130 PCF.
10. ENTIRE INTERIOR CONCRETE SURFACES OF WASTEWATER MANHOLES TO BE COATED WITH RAVEN 405, SPRAYWALL, OR APPROVED EQUAL, (WITH A UNIFORM THICKNESS OF 124 MILS AND A MINIMUM THICKNESS OF 100 MILS, APPLIED AFTER MANHOLE HAS PASSED THE VACUUM TEST). FOR REHABILITATING MANHOLES 1/2" MINIMUM THICKNESS CALCIUM ALUMINATE CEMENTITIOUS COATING AND OTHER INTERIOR SURFACES MAY BE COATED IF RECOMMENDED BY COATING MANUFACTURER. (IN LIEU OF INTERIOR COATINGS NEW PRECAST MANHOLES CONTAINING CONSHIELD WILL BE ACCEPTED PROVIDING THE MANUFACTURER STENCILS "CONSHIELD" ON THE INSIDE AND OUTSIDE OF ALL MANHOLE SECTIONS.)

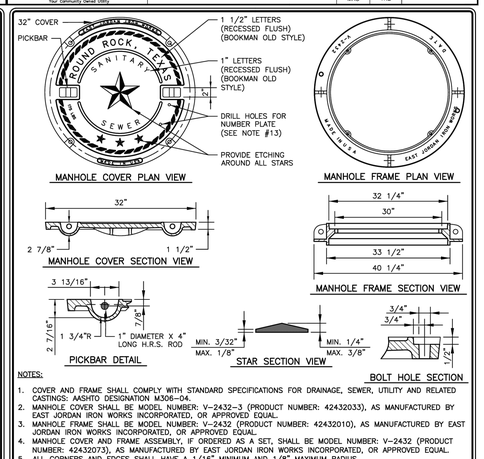
RECORD SIGNED COPY ON FILE AT U&ES DEPARTMENT	CITY OF ROUND ROCK	DRAWING NO: WW-01
APPROVED 03-01-18 DATE	PRECAST CONCRETE WASTEWATER MANHOLE DETAIL	ROUND ROCK TEXAS
THE ARCHITECT/ENGINEER ASSUMES RESPONSIBILITY FOR THE APPROPRIATE USE OF THIS DETAIL. (NOT TO SCALE)		



NOTES:

1. SEE NOTES #2 THROUGH #10 ON DETAIL WW-01.
2. DROP CONNECTIONS SHALL BE REQUIRED WHENEVER AN INFLUENT SEWER IS LOCATED MORE THAN TWO FEET (2'-0") ABOVE THE MAIN INVERT CHANNEL.
3. WHEN P.V.C. PIPE IS USED IN SANITARY SEWER LINES, SOLVENT TYPE JOINT P.V.C. FITTINGS TO BE UTILIZED IN THE DROP ASSEMBLY ONLY. FITTINGS TO BE P.V.C. SDR-35 WITH TWO PART WATER RESISTANT GLUE AT ALL JOINTS.

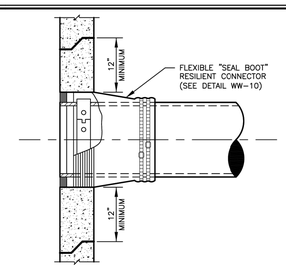
RECORD SIGNED COPY ON FILE AT U&ES DEPARTMENT	CITY OF ROUND ROCK	DRAWING NO: WW-02
APPROVED 03-01-18 DATE	PRECAST CONCRETE WASTEWATER MANHOLE WITH DROP CONNECTION DETAIL	ROUND ROCK TEXAS
THE ARCHITECT/ENGINEER ASSUMES RESPONSIBILITY FOR THE APPROPRIATE USE OF THIS DETAIL. (NOT TO SCALE)		



NOTES:

1. COVER AND FRAME SHALL COMPLY WITH STANDARD SPECIFICATIONS FOR DRAINAGE, SEWER, UTILITY AND RELATED CASTINGS: AASHTO DESIGNATION M306-04.
2. MANHOLE COVER SHALL BE MODEL NUMBER: V-2432-3 (PRODUCT NUMBER: 42432033), AS MANUFACTURED BY EAST JORDAN IRON WORKS INCORPORATED, OR APPROVED EQUAL.
3. MANHOLE FRAME SHALL BE MODEL NUMBER: V-2432 (PRODUCT NUMBER: 42432010), AS MANUFACTURED BY EAST JORDAN IRON WORKS INCORPORATED, OR APPROVED EQUAL.
4. MANHOLE COVER AND FRAME ASSEMBLY, IF ORDERED AS A SET, SHALL BE MODEL NUMBER: V-2432 (PRODUCT NUMBER: 42432073), AS MANUFACTURED BY EAST JORDAN IRON WORKS INCORPORATED, OR APPROVED EQUAL.
5. ALL CORNERS AND EDGES SHALL HAVE A 1/16" MINIMUM AND 1/8" MAXIMUM RADIUS.
6. MANHOLE COVERS SHALL BE CAST WITH TWO 1" DIAMETER STEEL PICKBARS.
7. MANHOLE COVER WEIGHT SHALL BE 175 LBS. FOR DUCTILE IRON. WEIGHT SHALL BE CAST ON BOTH TOP AND BOTTOM OF COVER.
8. MANUFACTURER SHALL CERTIFY THAT EACH MANHOLE COVER MEETS HS-20 LOADING.
9. FILLETS SHALL BE 1/4" RADIUS UNLESS OTHERWISE SPECIFIED.
10. MANUFACTURER SHALL REMOVE EXCESS IRON AND MACHINE FINISH SEATING SURFACES TO NOTED DIMENSIONS.
11. COVER SHALL BE DIPPED IN A WATER-BASED ASPHALTIC COATING, PRIOR TO SHIPMENT FROM FOUNDRY.
12. BOLTS SHALL BE 5/8"–11NC X 2" LONG HEX STAINLESS STEEL WITH WASHER.
13. MANUFACTURER SHALL DRILL 2–3/16" X 1/2" DEEP HOLES FOR A MANHOLE NUMBER PLATE TO BE PROVIDED BY THE CITY OF ROUND ROCK. THE TOP HOLE SHALL BE DRILLED 1" O.C. FROM THE BOTTOM OF THE PICKBAR AND THE BOTTOM HOLE SHALL BE DRILLED 4" O.C. FROM THE TOP HOLE.

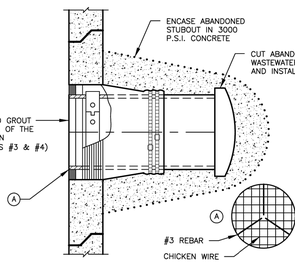
RECORD SIGNED COPY ON FILE AT U&ES DEPARTMENT	CITY OF ROUND ROCK	DRAWING NO: WW-07
APPROVED 03-01-18 DATE	BOLTED WASTEWATER MANHOLE COVER AND FRAME DETAIL	ROUND ROCK TEXAS
THE ARCHITECT/ENGINEER ASSUMES RESPONSIBILITY FOR THE APPROPRIATE USE OF THIS DETAIL. (NOT TO SCALE)		



NOTES:

1. EXISTING MANHOLES TO BE VACUUM TESTED PRIOR TO ANY CONNECTIONS.
2. NEW CONNECTIONS TO HAVE MINIMUM VERTICAL AND HORIZONTAL SEPARATION OF 12" ON THE OUTSIDE FACE OF THE MANHOLE FROM ANY EXISTING PENETRATIONS AND/OR MANHOLE JOINTS.
3. CONNECTIONS MADE INTO EXISTING MANHOLES ARE TO BE CORED AND NOT DRILLED/CHISELED.
4. CUT, SHAPE AND SLOPE NEW INVERT CHANNEL IN THE EXISTING CONCRETE BENCH FOR SMOOTH FLOW FROM THE NEW WASTEWATER CONNECTION.
5. EXISTING MANHOLES TO BE RECOATED AFTER ANY NEW WASTEWATER CONNECTION IS ADDED.

NEW CONNECTIONS TO EXISTING WASTEWATER MANHOLES



NOTES:

1. THIS DETAIL IS INTENDED FOR WASTEWATER MANHOLES THAT WILL REMAIN IN SERVICE. FOR WASTEWATER MANHOLES THAT ARE TO BE ABANDONED, REFERENCE DETAIL WW-15.
2. WASTEWATER MANHOLE TO BE RECOATED AFTER GROUT IS INSTALLED.
3. BLOCK THE INLET OF THE MANHOLE WITH CHICKEN WIRE AND 3–#3 REBAR. GROUT THE INSIDE OF THE MANHOLE FLUSH WITH THE MANHOLE WALL.
4. CONNECTIONS 24" AND LARGER REQUIRE BRICK BLOCKING TO BE INSTALLED PRIOR TO GROUTING.

ABANDONMENT OF CONNECTIONS TO EXISTING WASTEWATER MANHOLES

RECORD SIGNED COPY ON FILE AT U&ES DEPARTMENT	CITY OF ROUND ROCK	DRAWING NO: WW-21
APPROVED 03-01-18 DATE	EXISTING WASTEWATER MANHOLE CONNECTION DETAIL	ROUND ROCK TEXAS
THE ARCHITECT/ENGINEER ASSUMES RESPONSIBILITY FOR THE APPROPRIATE USE OF THIS DETAIL. (NOT TO SCALE)		

STATE OF TEXAS
NICHOLAS R. SANDLIN
124404
LICENSED
PROFESSIONAL ENGINEER
9/5/2023

TEXAS 811 BEFORE YOU DIG

WARNING !!!! CONTRACTOR TO FIELD VERIFY ALL EXIST. UTILITIES VERTICALLY AND HORIZONTALLY PRIOR TO CONSTRUCTION. THE CONTRACTOR IS TO CONTACT ENGINEER IF ANY EXISTING UTILITY INFORMATION DIFFERS FROM DATA SHOWN IN THE PLANS. CALL 811 BEFORE YOU DIG.

ENGINEERING | CONSULTING
SANDLIN
SERVICES, LLC
TBPELS FIRM #21356
4501 WHISPERING VALLEY DRIVE UNIT 27 AUSTIN, TX 78727

UTILITY DETAILS (2 OF 3)

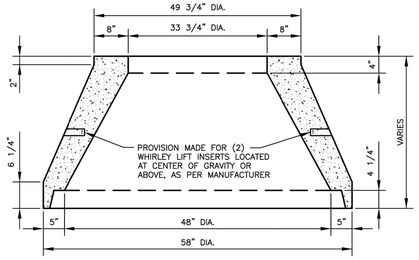
PROJECT CASE: XXXXXXX

TWELVE OAKS

#	REVISION DESCRIPTION	SIGNATURE	DATE

SHEET 26 OF 32

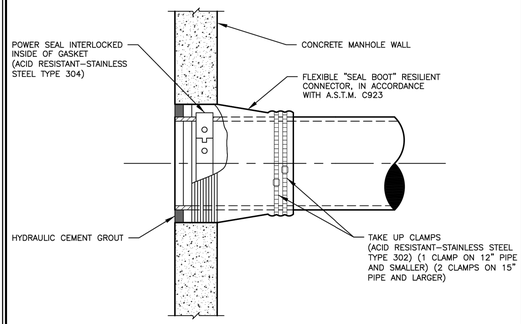
G:\Shared drives\Sandlin Services LLC\Sandlin Services Projects\Land Development Division\01-0089-003 Twelve Oaks\CAD\Construction Sheets\S 120 DTL.dwg-UTILITY DETAILS (2 OF 3) Plotted Sep 06, 2023 at 2:29pm by Scott | Last Saved by: Scott



NOTE:

CONCENTRIC CONCRETE CONE SECTION SHALL BE MANUFACTURED USING 4000 TO 4500 P.S.I. CONCRETE, 28 DAY STRENGTH AND IN ACCORDANCE WITH A.S.T.M. C478, AS MANUFACTURED BY CONCRETE PRODUCTS INCORPORATED, OR APPROVED EQUAL.

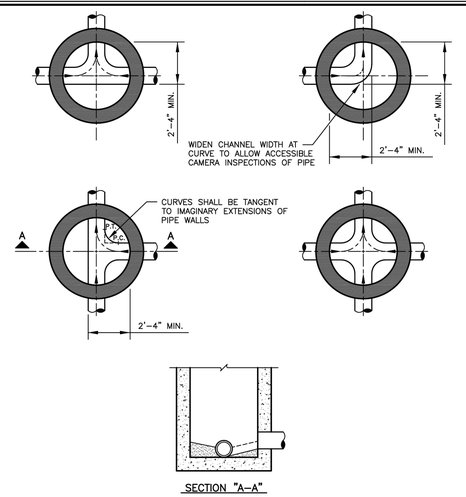
RECORD SIGNED COPY ON FILE AT U&ES DEPARTMENT	CITY OF ROUND ROCK	DRAWING NO: WW–09
APPROVED 03–01–18 DATE	PRECAST 48" CONCENTRIC CONCRETE CONE SECTION DETAIL	ROUND ROCK TEXAS
THE ARCHITECT/ENGINEER ASSUMES RESPONSIBILITY FOR THE APPROPRIATE USE OF THIS DETAIL. (NOT TO SCALE)		



NOTE:

1. FLEXIBLE "SEAL BOOT" RESILIENT CONNECTOR TO BE A MINIMUM OF 12 INCHES (12") FROM A MANHOLE JOINT.

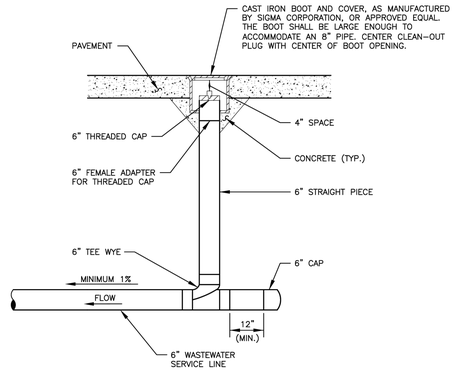
RECORD SIGNED COPY ON FILE AT U&ES DEPARTMENT	CITY OF ROUND ROCK	DRAWING NO: WW–10
APPROVED 03–01–18 DATE	FLEXIBLE "SEAL BOOT" RESILIENT CONNECTOR DETAIL	ROUND ROCK TEXAS
THE ARCHITECT/ENGINEER ASSUMES RESPONSIBILITY FOR THE APPROPRIATE USE OF THIS DETAIL. (NOT TO SCALE)		



NOTES:

1. MINIMUM DROP FROM INLET TO OUTLET OF MANHOLE IS 0.1 FEET AND MAXIMUM DROP IS 2 FEET, UNLESS SPECIAL APPROVAL IS OBTAINED FROM THE CITY OF ROUND ROCK.
2. INVERT CHANNELS TO BE CONSTRUCTED FOR SMOOTH FLOW WITH NO OBSTRUCTIONS.
3. SPILLWAYS SHALL BE CONSTRUCTED BETWEEN PIPES WITH DIFFERENT INVERT ELEVATIONS PROVIDING FOR SMOOTH FLOW.
4. CHANNELS FOR FUTURE CONSTRUCTIONS, SHALL BE CONSTRUCTED WITH PIPE EXTENDING 3" BEYOND EXTERIOR OF MANHOLE WALL, WITH GLUED PLUG.
5. SLOPE MANHOLE BENCH AT 2:1 SLOPE FROM MANHOLE WALL TO CHANNEL.
6. INVERT CHANNEL SHALL BE A MINIMUM OF 1/2 THE DIAMETER OF THE LARGEST PIPE OR FOUR INCHES (4") DEEP.

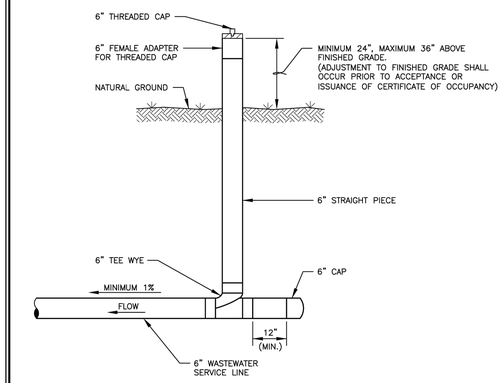
RECORD SIGNED COPY ON FILE AT U&ES DEPARTMENT	CITY OF ROUND ROCK	DRAWING NO: WW–11
APPROVED 03–01–18 DATE	WASTEWATER FLOW PATTERNS FOR INVERT CHANNELS DETAIL	ROUND ROCK TEXAS
THE ARCHITECT/ENGINEER ASSUMES RESPONSIBILITY FOR THE APPROPRIATE USE OF THIS DETAIL. (NOT TO SCALE)		



NOTES:

1. ALL PIPE TO BE SDR 26.
2. ALL FITTINGS TO BE SDR 35 SOLVENT WELD FITTINGS.

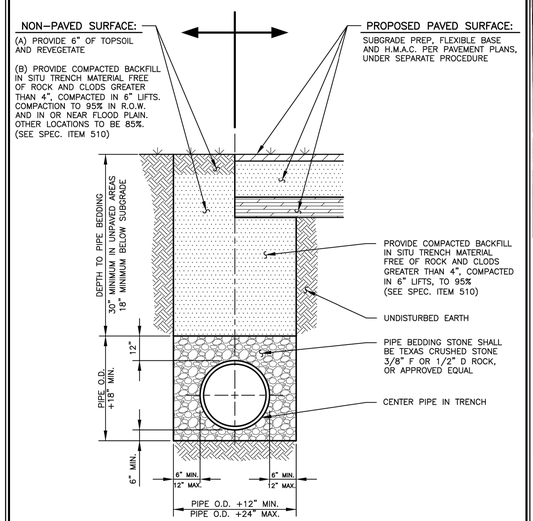
RECORD SIGNED COPY ON FILE AT U&ES DEPARTMENT	CITY OF ROUND ROCK	DRAWING NO: WW–13
APPROVED 03–01–18 DATE	WASTEWATER SERVICE CLEAN–OUT DETAIL (PAVED SURFACE)	ROUND ROCK TEXAS
THE ARCHITECT/ENGINEER ASSUMES RESPONSIBILITY FOR THE APPROPRIATE USE OF THIS DETAIL. (NOT TO SCALE)		



NOTES:

1. ALL PIPE TO BE SDR 26.
2. ALL FITTINGS TO BE SDR 35 SOLVENT WELD FITTINGS.

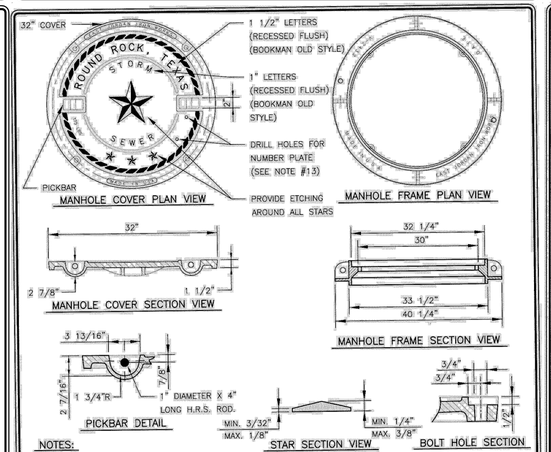
RECORD SIGNED COPY ON FILE AT U&ES DEPARTMENT	CITY OF ROUND ROCK	DRAWING NO: WW–14
APPROVED 03–01–18 DATE	WASTEWATER SERVICE CLEAN–OUT DETAIL (NON–PAVED SURFACE)	ROUND ROCK TEXAS
THE ARCHITECT/ENGINEER ASSUMES RESPONSIBILITY FOR THE APPROPRIATE USE OF THIS DETAIL. (NOT TO SCALE)		



NOTE:

ALL TRENCHING AND TRENCH SAFETY SHALL COMPLY WITH APPLICABLE FEDERAL, STATE AND LOCAL REGULATIONS.

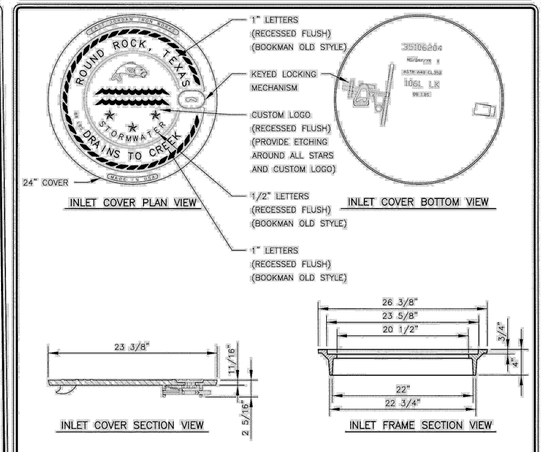
RECORD SIGNED COPY ON FILE AT U&ES DEPARTMENT	CITY OF ROUND ROCK	DRAWING NO: WW–18
APPROVED 03–01–18 DATE	WASTEWATER LINE BEDDING AND SURFACE REPAIR DETAIL (NON–PAVED & PROPOSED PAVED SURFACE)	ROUND ROCK TEXAS
THE ARCHITECT/ENGINEER ASSUMES RESPONSIBILITY FOR THE APPROPRIATE USE OF THIS DETAIL. (NOT TO SCALE)		



NOTES:

1. COVER AND FRAME SHALL COMPLY WITH STANDARD SPECIFICATIONS FOR DRAINAGE, SEWER, UTILITY AND RELATED CASTINGS, AASHTO DESIGNATION M306–04.
2. MANHOLE COVER SHALL BE MODEL NUMBER: P–2432–3 (PRODUCT NUMBER #24320332), AS MANUFACTURED BY EAST JORDAN IRON WORKS, INCORPORATED, OR APPROVED EQUAL.
3. MANHOLE FRAME SHALL BE MODEL NUMBER: V–2432 (PRODUCT NUMBER #24320170), AS MANUFACTURED BY EAST JORDAN IRON WORKS, INCORPORATED, OR APPROVED EQUAL.
4. MANHOLE COVER AND FRAME ASSEMBLY, IF ORDERED AS A SET, SHALL BE MODEL NUMBER: V–2432 (PRODUCT NUMBER: #24320272), AS MANUFACTURED BY EAST JORDAN IRON WORKS, INCORPORATED, OR APPROVED EQUAL.
5. ALL CORNERS AND EDGES SHALL HAVE A 1/16" MINIMUM AND 1/8" MAXIMUM RADIUS.
6. MANHOLE COVERS SHALL BE CAST WITH TWO 1" DIAMETER STEEL PICKBARS.
7. MANHOLE COVER WEIGHT SHALL BE 125 LBS. FOR DUCTILE IRON. WEIGHT SHALL BE CAST ON BOTH TOP AND BOTTOM OF COVER.
8. MANUFACTURER SHALL CERTIFY THAT EACH MANHOLE COVER MEETS HS–20 LOADING.
9. FILLETS SHALL BE 1/4" RADIUS UNLESS OTHERWISE SPECIFIED.
10. MANUFACTURER SHALL REMOVE EXCESS IRON AND MACHINE FINISH SEATING SURFACES TO NOTED DIMENSIONS.
11. COVER SHALL BE DIPPED IN A WATER–BASED ASPHALTIC COATING, PRIOR TO SHIPMENT FROM FOUNDRY.
12. BOLTS SHALL BE 5/8"–11NC X 2" LONG HEX STAINLESS STEEL WITH WASHERS.
13. MANUFACTURER SHALL DRILL 2–3/16"X1/2" DEEP HOLES FOR A MANHOLE NUMBER PLATE TO BE PROVIDED BY THE CITY OF ROUND ROCK.
THE TOP HOLE SHALL BE DRILLED 1" O.C. FROM THE BOTTOM OF THE PICKBAR AND THE BOTTOM HOLE SHALL BE DRILLED 4" O.C. FROM THE TOP HOLE.

RECORD SIGNED COPY ON FILE AT PUBLIC WORKS	CITY OF ROUND ROCK	DRAWING NO: DR–05
APPROVED 08–09–05 DATE	BOLTED STORMSEWER MANHOLE COVER AND FRAME DETAIL	ROUND ROCK TEXAS
THE ARCHITECT/ENGINEER ASSUMES RESPONSIBILITY FOR THE APPROPRIATE USE OF THIS DETAIL.		



NOTES:

1. COVER AND FRAME SHALL COMPLY WITH STANDARD SPECIFICATIONS FOR DRAINAGE, SEWER, UTILITY AND RELATED CASTINGS, AASHTO DESIGNATION M306–04.
2. INLET COVER SHALL BE MODEL NUMBER 106L (X) (PRODUCT NUMBER: 35105204), AS MANUFACTURED BY EAST JORDAN IRON WORKS, INCORPORATED, OR APPROVED EQUAL.
3. INLET FRAME SHALL BE MODEL NUMBER: 106L(X) (PRODUCT NUMBER: 35206004), AS MANUFACTURED BY EAST JORDAN IRON WORKS, INCORPORATED, OR APPROVED EQUAL.
4. INLET COVER AND FRAME ASSEMBLY, IF ORDERED AS A SET, SHALL BE MODEL NUMBER: 106L–6 LX (PRODUCT NUMBER: 35506204), AS MANUFACTURED BY EAST JORDAN IRON WORKS, INCORPORATED, OR APPROVED EQUAL.
5. ALL CORNERS AND EDGES SHALL HAVE A 1/16" MINIMUM AND 1/8" MAXIMUM RADIUS.
6. INLET COVER WEIGHT SHALL BE 88 LBS. FOR DUCTILE IRON. WEIGHT SHALL BE CAST ON BOTH TOP AND BOTTOM OF COVER.
7. FILLETS SHALL BE 1/4" RADIUS UNLESS OTHERWISE SPECIFIED.
8. MANUFACTURER SHALL REMOVE EXCESS IRON AND MACHINE FINISH SEATING SURFACES TO NOTED DIMENSIONS.
9. INLET COVER SHALL BE DIPPED IN A WATER–BASED ASPHALTIC COATING, PRIOR TO SHIPMENT FROM FOUNDRY.

RECORD SIGNED COPY ON FILE AT PUBLIC WORKS	CITY OF ROUND ROCK	DRAWING NO: DR–07
APPROVED 09–13–05 DATE	STORM SEWER INLET COVER AND FRAME DETAIL	ROUND ROCK TEXAS
THE ARCHITECT/ENGINEER ASSUMES RESPONSIBILITY FOR THE APPROPRIATE USE OF THIS DETAIL.		

STATE OF TEXAS
NICHOLAS R. SANDLIN
124404
LICENSED
PROFESSIONAL ENGINEER
9/5/2023

TEXAS 811 811 BEFORE YOU DIG

WARNING !!!! CONTRACTOR TO FIELD VERIFY ALL EXIST. UTILITIES VERTICALLY AND HORIZONTALLY PRIOR TO CONSTRUCTION. THE CONTRACTOR IS TO CONTACT ENGINEER IF ANY EXISTING UTILITY INFORMATION DIFFERS FROM DATA SHOWN IN THE PLANS. CALL 811 BEFORE YOU DIG.

ENGINEERING | CONSULTING
SANDLIN
SERVICES, LLC
TBPELS FIRM #21356
4501 WHISPERING VALLEY DRIVE UNIT 27 AUSTIN, TX 78727

UTILITY DETAILS (3 OF 3)

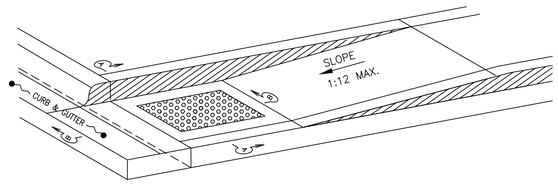
PROJECT CASE: XXXXXXX

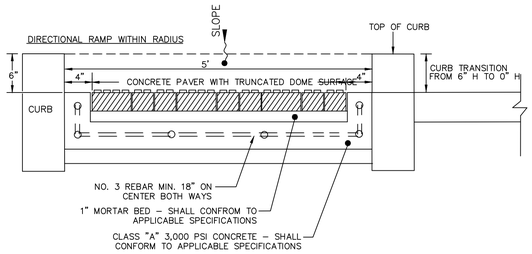
TWELVE OAKS

#	REVISION DESCRIPTION	SIGNATURE	DATE

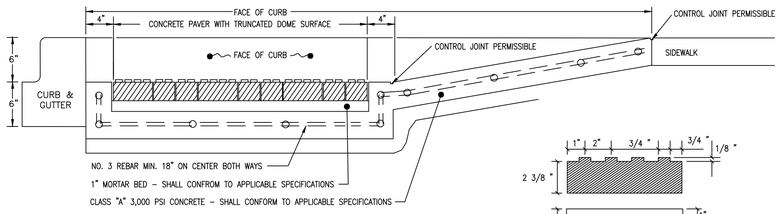
SHEET 26 OF 32

G:\Shared drives\Sandlin Services LLC\Sandlin Services Projects\Lond Development Division\01–0089–003 Twelve Oaks\CAD\Construction Sheets\S 120 DTL.dwg–UTILITY DETAILS (3 OF 3) Plotted: Sep 06, 2023 at 2:29pm by: Scott | Last Saved by: Scott





SECTION A–A
NOT TO SCALE



SECTION B–B
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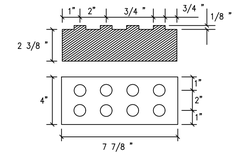
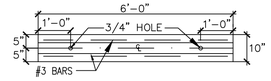
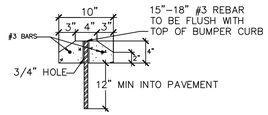


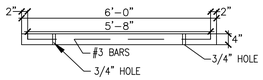
CONCRETE PAVER WITH TRUNCATED DOME SURFACE
NOT TO SCALE



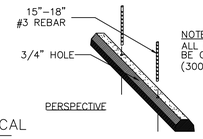
PLAN



CROSS SECTION

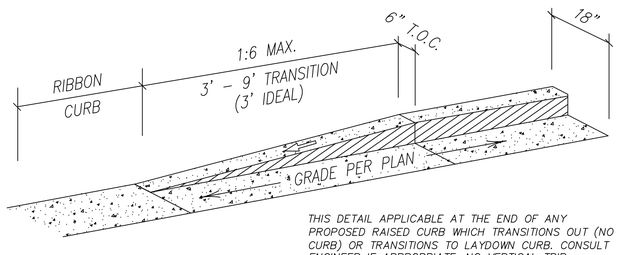


LONGITUDINAL SECTION



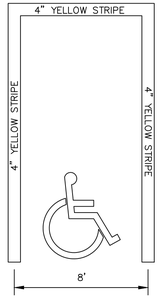
PERSPECTIVE

WHEEL STOP, TYPICAL
NOT TO SCALE

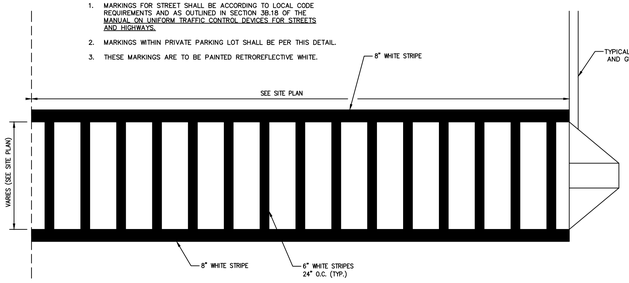


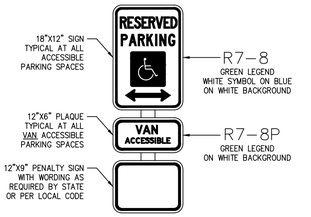
THIS DETAIL APPLICABLE AT THE END OF ANY PROPOSED RAISED CURB WHICH TRANSITIONS OUT (NO CURB) OR TRANSITIONS TO LAYDOWN CURB. CONSULT ENGINEER IF APPROPRIATE. NO VERTICAL TRIP HAZARDS PERMITTED. PAINT FACE OF TRANSITION CONTRASTING COLOR IN PEDESTRIAN AREAS, OR AS INSTRUCTED BY ADA/TDLR CONSULTANT.

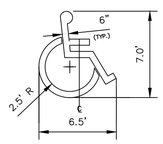
RIBBON/RAISED CURB TRANSITION
NOT TO SCALE



TYPICAL ACCESSIBLE STALL STRIPING





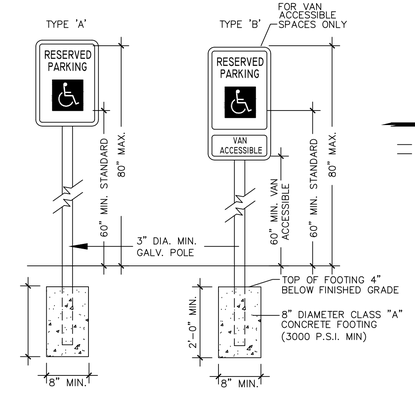


ACCESSIBLE PARKING SYMBOL
LOCATE AT EDGE OF PARKING SPACE UNLESS ACCOMPANIED BY "VAN" LETTERING

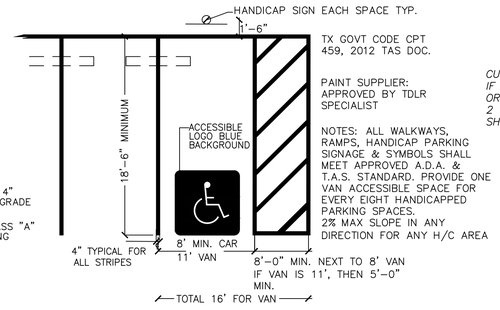
PEDESTRIAN RAMPS GENERAL NOTES

ALL SIDEWALKS WILL BE DOWELED INTO EXISTING SIDEWALKS,
1. DRIVEWALKS, DRIVEWAYS, INLET BOXES, RETAINING WALLS, ETC. %%UALL SLOPES ARE MAXIMUM ALLOWABLE%%U. FLATTER SLOPES THAT WILL
2. STILL DRAIN PROPERLY ARE ENCOURAGED. ALL CONCRETE SURFACES SHALL RECEIVE A LIGHT BROOM FINISH UNLESS
3. NOTED OTHERWISE IN THE PLANS. FOR PURPOSES OF WARNING, THE CURB RAMPS SHALL HAVE A LIGHT
4. REFLECTIVE VALUE AND TEXTURE THAT SIGNIFICANTLY CONTRASTS WITH THAT OF ADJOINING PEDESTRIAN ROUTES. TEXTURES MAY CONSIST OF PAVERS WITH TRUNCATED DOMED SURFACES
5. OR GROOVES. TEXTURES ARE REQUIRED TO BE DETECTABLE UNDERFOOT. SURFACES THAT WOULD ALLOW WATER TO ACCUMULATE ARE PROHIBITED. COLOR CONTRAST, FOR EXAMPLE, CAN BE ACCOMPLISHED WITH COLORED
6. CONCRETE PAVERS THAT HAVE TRUNCATED DOMES OR BY COLORED STAINED CONCRETE WITH GROOVES, EITHER OF WHICH WOULD PROVIDE A CONTRAST WITH TYPICALLY LIGHT COLORED CONCRETE. ADDITIONAL INFORMATION ON CURB RAMP LOCATION, DESIGN, VISIBILITY
7. AND TEXTURE MAY BE FOUND IN THE CURRENT EDITION OF THE TEXAS ACCESSIBILITY STANDARDS (TAS) PREPARED AND ADMINISTERED BY THE TEXAS DEPARTMENT OF LICENSING AND REGULATION (TDLR). RAISED MEDIANS SEPARATE OPPOSING DIRECTIONS OF TRAFFIC AND
8. PROVIDE A REFUGE AREA FOR PEDESTRIANS IF THEY ARE UNABLE TO CROSS THE ENTIRE ROADWAY IN THE ALLOTTED SIGNAL PHASE. TO SERVE AS A REFUGE AREA, THE MEDIAN SHOULD BE A MINIMUM OF 4 FEET WIDE. MEDIANS SHOULD BE DESIGNED TO PROVIDE ACCESSIBLE PASSAGE OVER OR THROUGH THEM.

ALL SIDEWALK PLANS AND DETAILS SHALL BE SUBMITTED AND APPROVED BY THE TEXAS DEPARTMENT OF LICENSING AND REGUALTION (TDLR).
9. ANY PART OF THE ACCESSIBLE ROUTE WITH A SLOPE GRATER THAN 1:20
10. (5 %) SHALL BE CONSIDERED A RAMP. IF A RAMP HAS A RISE GREATER THAN 6 INCHES OR A HORIZONTAL PROJECTION GREATER THAN 72 INCHES, THEN IT SHALL HAVE HANDRAILS ON BOTH SIDES. THE ONLY EXCEPTION IS AT CURB RAMPS. HANDRAILS ARE NOT REQUIRED ON CURB RAMPS. CURB RAMPS SHALL BE PROVIDED WHERE EVER AN ACCESSIBLE ROUTE CROSSES (PENETRATES) A CURB. CURB RAMPS ARE GENERALLY INTERPRETED AS ONLY THE PORTION TYING DIRECTLY INTO THE ROADWAY. TRAFFIC SIGNAL OR ILLUMINATION POLES, GROUND BOXES, CONTROLLER
11. BOXES, SIGNS, DRAINAGE FACILITIES AND OTHER ITEMS SHALL BE PLACED SO NOT TO OBSTRUCT THE ACCESSIBLE ROUTE.
12. CONCRETE PAVER UNITS SHALL MEET ALL REQUIREMENTS OF ASTM C–936, C–33, AND SHALL BE LAID IN A TWO BY TWO UNIT BASKET WEAVE PATTERN, UNLESS SHOWN OTHERWISE IN THE PLANS.
13. CONCRETE PAVER UNIT SHALL HAVE A TRUNCATED DOME TOP SURFACE FOR DETECTABLE WARNING TO PEDESTRIANS.
14. CONCRETE PAVER UNIT COLOR FOR THE RAMP SHALL BE A CONTRASTING COLOR TO THE ADJACENT SURFACES. THE COLOR OF THE CONCRETE PAVER UNITS SHALL BE SHOWN ELSEWHERE IN THE PLANS. (ADJACENT SURFACES INCLUDE SIDE FLARES).
15. CONCRETE PAVER UNITS SHALL BE SAW CUT ONLY AND ANY CUT UNIT SHALL BE NOT LESS THAN 25 PERCENT OF A FULL UNIT.

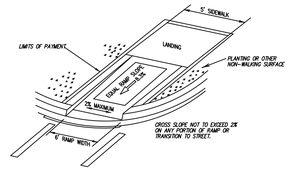


ACCESSIBLE PARKING SIGN, TYPICAL
NOT TO SCALE



PARKING STRIPES, TYPICAL
NOT TO SCALE

CURB NOTES:
IF AREA 1 IS A LEVEL LANDING OR RAMP AREA, THEN USE AREA 2 CURB TRANSITION DETAIL THIS SHEET



NOTES:
1. SEE SITE PLAN FOR TOTAL LAYOUT.
2. THESE DETAILS ARE FOR REFERENCE AND DIMENSION CONTROL ONLY.
3. ALL DIMENSIONS ARE TO ℄ OF STRIPE UNLESS OTHERWISE INDICATED.
4. ALL COLORS AS SHOWN OR AS SPECIFIED BY LOCAL CODES.

STATE OF TEXAS
NICHOLAS R. SANDLIN
124404
LICENSED PROFESSIONAL ENGINEER
9/5/2023

WARNING !!!! CONTRACTOR TO FIELD VERIFY ALL EXIST. UTILITIES VERTICALLY AND HORIZONTALLY PRIOR TO CONSTRUCTION. THE CONTRACTOR IS TO CONTACT ENGINEER IF ANY EXISTING UTILITY INFORMATION DIFFERS FROM DATA SHOWN IN THE PLANS. CALL 811 BEFORE YOU DIG.

SANDLIN
ENGINEERING | CONSULTING
SERVICES, LLC
TBPELS FIRM #21356
4501 WHISPERING VALLEY DRIVE UNIT 27 AUSTIN, TX 78727

CONSTRUCTION DETAILS (1 OF 3)

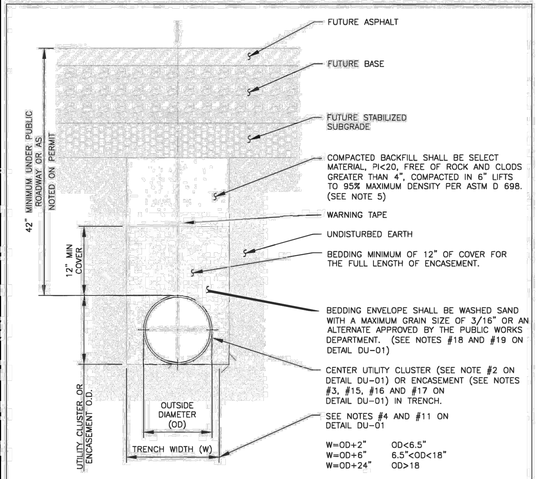
PROJECT CASE: XXXXXXX

TWELVE OAKS

#	REVISION DESCRIPTION	SIGNATURE	DATE

SHEET 27 OF 32

G:\Shared drives\Sandlin Services LLC\Sandlin Services Projects\Land Development Division\01-0089-003 Twelve Oaks\CAD\Construction Sheets\S 120 DTL.dwg-CONSTRUCTION DETAILS (1 OF 3) Plotted Sep 06, 2023 at 2:29pm by Scott | Last Saved by: Scott

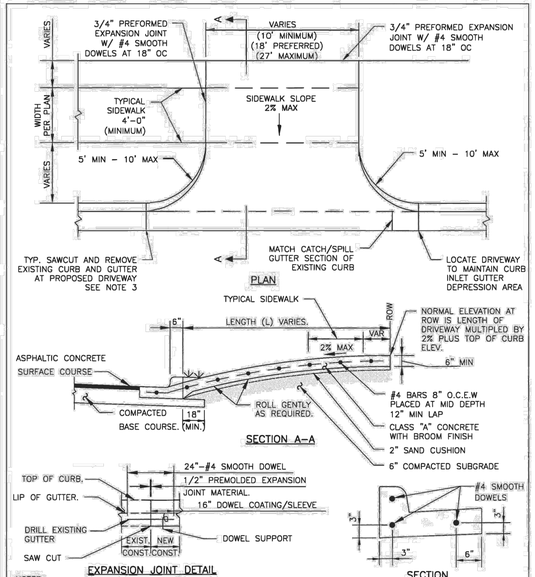


NOTES:

1. THIS DETAIL IS APPLICABLE WHERE FUTURE PAVEMENT IS SCHEDULED TO BE INSTALLED WITHIN TWO YEARS.
2. ALL TRENCH SAFETY SHALL COMPLY WITH APPLICABLE FEDERAL, STATE AND LOCAL REGULATIONS.
3. ENCASEMENT MUST EXTEND 10' PAST THE PROPOSED BACK OF CURB.
4. WORK ON INSTALLATION MUST BE COMPLETE THROUGH CLEAN UP BEFORE WORK RELATED TO PAVEMENT INSTALLATION IS SCHEDULED TO START, EXCEPT IN THE CASES THAT THE ROAD CONTRACTOR HAS AGREED TO ROUGH CUT BEFORE UTILITY TRENCHING OR THE SAME CONTRACTOR IS PERFORMING BOTH UTILITY AND ROAD WORK.
5. SPOILS MAY BE USED IF THEY MEET SELECT MATERIAL STANDARDS. THE INSPECTOR MAY STOP BACKFILL OPERATIONS UNTIL THE CONTRACTOR OBTAINS LAB TEST RESULTS IF THERE IS ANY QUESTION OF ACCEPTABILITY.
6. FOR ADDITIONAL GENERAL NOTES, SEE DETAIL DU-01.

SCALE: NTS

RECORD SIGNED COPY ON FILE	CITY OF ROUND ROCK	DRAWING NO: DU-04
APPROVED 01-28-21 DATE	PROPOSED PAVEMENT AREA TRENCH (PPAT) DETAIL	SHEET 1 of 1
THE ARCHITECT/ENGINEER ASSUMES RESPONSIBILITY FOR THE APPROPRIATE USE OF THIS DETAIL.		ROUND ROCK TEXAS

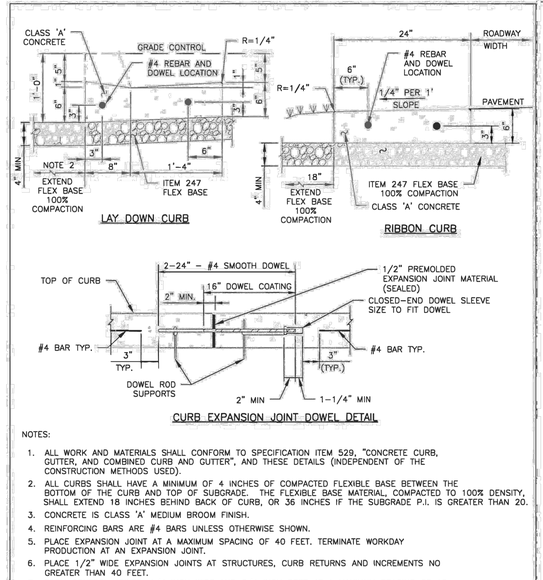


NOTES:

1. PLACE 3/4 INCH EXPANSION JOINTS AT LOCATIONS SHOWN OR AS DIRECTED BY THE ENGINEER.
2. FORM CONTROL JOINTS 1/4 INCH WIDE AND 3/4 INCH DEEP AT A MAXIMUM SPACING OF 10'. ROUND JOINT EDGES TO A MINIMUM 1/4" RADIUS.
3. IF THE NEAREST EXISTING EXPANSION JOINT IS 5 FEET OR LESS FROM THE DRIVEWAY RADIUS, THEN REMOVE AND REPLACE CURB AND GUTTER TO THE NEAREST EXPANSION JOINT.

SCALE: NTS

RECORD SIGNED COPY ON FILE	CITY OF ROUND ROCK	DRAWING NO: ST-02
APPROVED 01-28-21 DATE	CONCRETE DRIVEWAY DETAIL TYPE I RESIDENTIAL	SHEET 1 of 1
THE ARCHITECT/ENGINEER ASSUMES RESPONSIBILITY FOR THE APPROPRIATE USE OF THIS DETAIL.		ROUND ROCK TEXAS

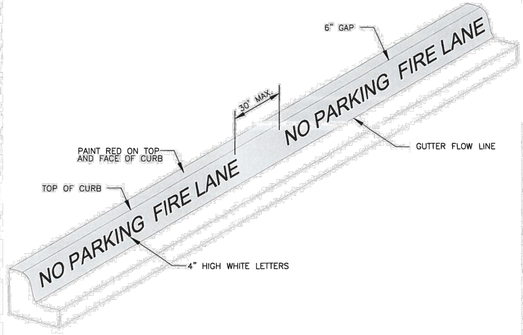


NOTES:

1. ALL WORK AND MATERIALS SHALL CONFORM TO SPECIFICATION ITEM 529, "CONCRETE CURB, GUTTER, AND COMBINED CURB AND GUTTER", AND THESE DETAILS (INDEPENDENT OF THE CONSTRUCTION METHODS USED).
2. ALL CURBS SHALL HAVE A MINIMUM OF 4 INCHES OF COMPACTED FLEXIBLE BASE BETWEEN THE BOTTOM OF THE CURB AND TOP OF SUBGRADE. THE FLEXIBLE BASE MATERIAL, COMPACTED TO 100% DENSITY, SHALL EXTEND 18 INCHES BEHIND BACK OF CURB, OR 36 INCHES IF THE SUBGRADE P.I. IS GREATER THAN 20.
3. CONCRETE IS CLASS 'A' MEDIUM BROOM FINISH.
4. REINFORCING BARS ARE #4 BARS UNLESS OTHERWISE SHOWN.
5. PLACE EXPANSION JOINT AT A MAXIMUM SPACING OF 40 FEET. TERMINATE WORKDAY PRODUCTION AT AN EXPANSION JOINT.
6. PLACE 1/2" WIDE EXPANSION JOINTS AT STRUCTURES, CURB RETURNS AND INCREMENTS NO GREATER THAN 40 FEET.
7. FORM CONTROL JOINTS, 1/4 INCH WIDE AND 3/4 INCH DEEP AT A MAXIMUM SPACING OF 10 FEET. WHEN CURB ABUTS CONCRETE PAVEMENT, MATCH PAVEMENT JOINT SPACING.
8. ROUND EXPOSED EDGES AND JOINTS TO A 1/4 INCH RADIUS.
9. COAT 16 INCHES OF 24 INCH LONG DOWELS WITH GREASE OR APPROVED DEBONDING LUBRICANT, INSTALL DOWEL CAP ON LUBRICATED END OF THE DOWELS.

SCALE: NTS

RECORD SIGNED COPY ON FILE	CITY OF ROUND ROCK	DRAWING NO: ST-05
APPROVED 01-28-21 DATE	LAYDOWN AND RIBBON CURB DETAIL (WITH EXPANSION JOINT DOWEL DETAIL)	SHEET 1 of 1
THE ARCHITECT/ENGINEER ASSUMES RESPONSIBILITY FOR THE APPROPRIATE USE OF THIS DETAIL.		ROUND ROCK TEXAS

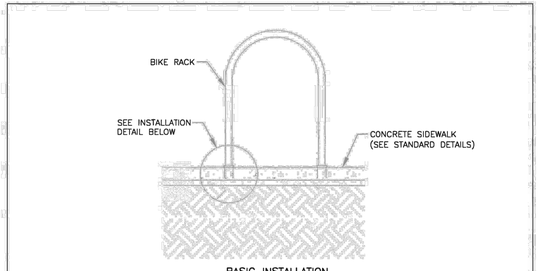


NOTES:

FIRE LANE STRIPING TO BE 6" WIDE RED PAINT WITH "NO PARKING FIRE LANE" IN 4" TALL WHITE LETTERS. WORDING MAY NOT BE SPACED GREATER THAN 30' APART. STRIPING TO BE PAINTED ON THE FACE OF CURB WHEN PRESENT AND PAINTED FLAT ON THE PARKING SURFACE WHEN IT IS NOT.

SCALE: NTS

RECORD SIGNED COPY ON FILE	CITY OF ROUND ROCK	DRAWING NO: ST-16
APPROVED 01-28-21 DATE	FIRE LANE MARKING DETAIL	SHEET 1 of 1
THE ARCHITECT/ENGINEER ASSUMES RESPONSIBILITY FOR THE APPROPRIATE USE OF THIS DETAIL.		ROUND ROCK TEXAS



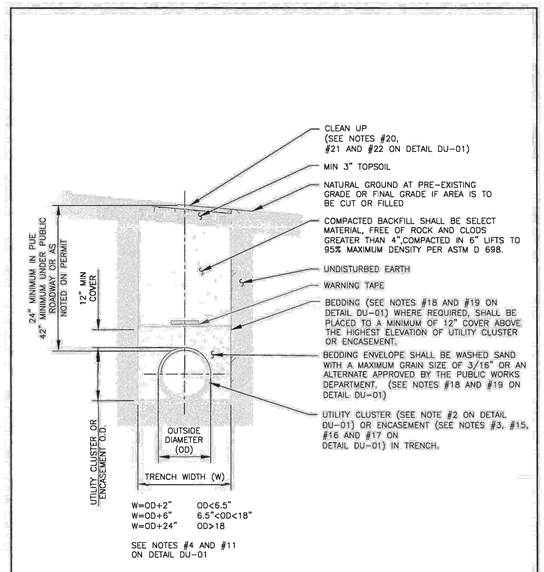
GENERAL NOTES:

1. RACKS SHALL COMPLY WITH CITY STANDARD DETAIL ST-19 OR ST-20.
2. RACK PLACEMENT SHALL BE AS SHOWN ON THE DRAWINGS.

*TO PREVENT THEFT OF BICYCLE RACK OR BIKES, EXPOSED BOLTS MUST BE DEFORMED AND NUTS RE-TIGHTENED TO PREVENT THEM FROM BEING EASILY UNTHREADED. NUTS SHOULD BE TESTED TO ENSURE THAT THEY CANNOT BE EASILY REMOVED AFTER DEFORMATION.

SCALE: NTS

RECORD SIGNED COPY ON FILE	CITY OF ROUND ROCK	DRAWING NO: ST-22
APPROVED 01-28-21 DATE	BICYCLE RACK INSTALLATION IN CONCRETE SIDEWALK-ALTERNATE 1	SHEET 1 of 1
THE ARCHITECT/ENGINEER ASSUMES RESPONSIBILITY FOR THE APPROPRIATE USE OF THIS DETAIL.		ROUND ROCK TEXAS



FOR ADDITIONAL GENERAL NOTES, SEE DETAIL DU-01

SCALE: NTS

RECORD SIGNED COPY ON FILE	CITY OF ROUND ROCK	DRAWING NO: DU-02
APPROVED 01-28-21 DATE	UNPAVED AREA TRENCH (UAT) DETAIL	SHEET 1 of 1
THE ARCHITECT/ENGINEER ASSUMES RESPONSIBILITY FOR THE APPROPRIATE USE OF THIS DETAIL.		ROUND ROCK TEXAS

STATE OF TEXAS
NICHOLAS R. SANDLIN
124404
LICENSED
PROFESSIONAL ENGINEER
9/5/2023

WARNING !!!! CONTRACTOR TO FIELD VERIFY ALL EXIST. UTILITIES VERTICALLY AND HORIZONTALLY PRIOR TO CONSTRUCTION. THE CONTRACTOR IS TO CONTACT ENGINEER IF ANY EXISTING UTILITY INFORMATION DIFFERS FROM DATA SHOWN IN THE PLANS. CALL 811 BEFORE YOU DIG.

ENGINEERING | CONSULTING
SANDLIN SERVICES, LLC
TBPELS FIRM #21356
4501 WHISPERING VALLEY DRIVE UNIT 27 AUSTIN, TX 78727

CONSTRUCTION DETAILS (2 OF 3)

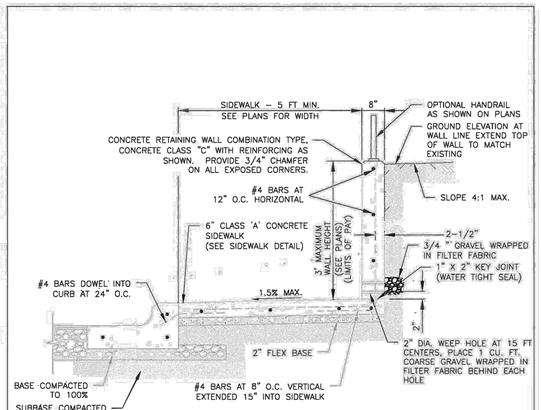
PROJECT CASE: XXXXXXX

TWELVE OAKS

#	REVISION DESCRIPTION	SIGNATURE	DATE

SHEET 28 OF 32

G:\Shared drives\Sandlin Services LLC\Sandlin Services Projects\Land Development Division\01-0089-003 Twelve Oaks\CAD\Construction Sheets\S 120 DTL.dwg-CONSTRUCTION DETAILS (2 OF 3) Plotted Sep 06, 2023 at 2:30pm by Scott | Last Saved by: Scott



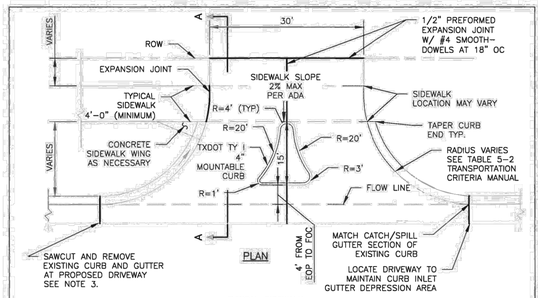
CONCRETE RETAINING WALL – COMBINATION TYPE

NOTES:

1. IN LOCATIONS WHERE WALL HEIGHT DOES NOT EXCEED 1 FT., THE WEEP HOLES CAN BE OMITTED.
2. JOINTS IN WALL SHALL MATCH JOINTS IN SIDEWALK.
3. WALL ENDS SHALL BE CHAMFERED.
4. EXPOSED FACE OF WALL SHALL HAVE FORM LINER FINISH IF SHOWN ON THE PLANS.
5. REINFORCING STEEL TO BE GRADE 60.
6. CONCRETE FOR WALL SHALL BE ITEM 421 CLASS 'C', 3,600 PSI AT 28 DAYS.
7. WALL TO BE CONSTRUCTED PER ITEM 423 "RETAINING WALLS" & ITEM 420 "CONCRETE SUBSTRUCTURES".
8. HANDRAIL POSTS SHALL BE GROUTED INTO SLEEVES THAT ARE CAST IN CONCRETE WALL.

SCALE: NTS

RECORD SIGNED COPY ON FILE	CITY OF ROUND ROCK	DRAWING NO: ST-08 SHEET 1 of 1
APPROVED 01-28-21 DATE	SHORT WALL DETAIL	ROUND ROCK TEXAS
THE ARCHITECT/ENGINEER ASSUMES RESPONSIBILITY FOR THE APPROPRIATE USE OF THIS DETAIL.		



EXPANSION JOINT DETAIL

NOTES:

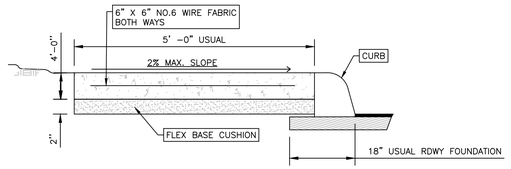
1. PLACE 1/2 INCH EXPANSION JOINTS AT LOCATIONS SHOWN OR AS DIRECTED BY THE ENGINEER.
2. FORM CONTROL JOINTS 1/4 INCH WIDE AND 3/4 INCH DEEP AT A MAXIMUM SPACING OF 10'. ROUND JOINT EDGES TO A MINIMUM 1/4" RADIUS.
3. IF THE NEAREST EXISTING EXPANSION JOINT IS 5 FEET OR LESS FROM THE DRIVEWAY RADIUS, THEN REMOVE AND REPLACE CURB AND GUTTER TO THE NEAREST EXPANSION JOINT. SAWCUT BETWEEN EXISTING CURB/ASPHALT SO THAT NO DAMAGE OCCURS TO EXISTING ROADWAY.
4. PROPER CHAIRS SHALL BE USED TO SUPPORT STEEL REINFORCEMENT.

SCALE: NTS

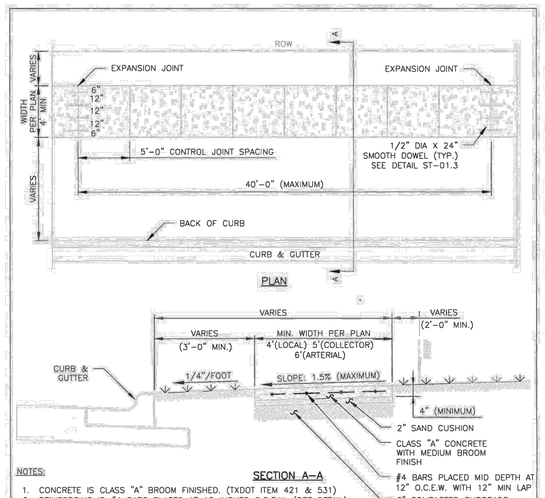
RECORD SIGNED COPY ON FILE	CITY OF ROUND ROCK	DRAWING NO: ST-03.2 SHEET 2 of 2
APPROVED 01-28-21 DATE	CONCRETE DRIVEWAY DETAIL TYPE II COMMERCIAL WITH ISLAND	ROUND ROCK TEXAS
THE ARCHITECT/ENGINEER ASSUMES RESPONSIBILITY FOR THE APPROPRIATE USE OF THIS DETAIL.		

TYPICAL SIDEWALK SECTION FOR PRIVATE SIDEWALKS

N.T.S.



PUBLIC SIDEWALKS TO FOLLOW STANDARD CORR DETAIL AS SHOWN

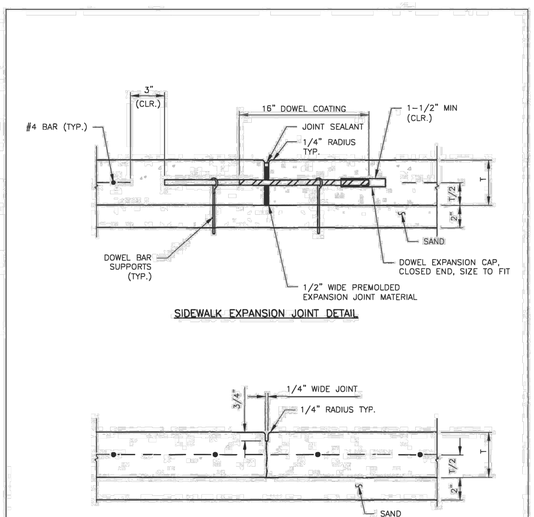


NOTES:

1. CONCRETE IS CLASS "A" BROOM FINISHED. (TXDOT ITEM 421 & 531)
2. REINFORCING IS #4 BARS PLACED AT 12 INCHES O.C.E.W. (SEE DETAIL) DO NOT USE W.W.F (WELDED WIRE FABRIC)
3. PLACE EXPANSION JOINT AT A MAXIMUM SPACING OF 40 FEET. TERMINATE WORKDAY PRODUCTION AT AN EXPANSION JOINT.
4. PLACE 1/2 INCH WIDE EXPANSION MATERIAL WHERE SIDEWALK ABUTS AN EXISTING STRUCTURE, DRIVEWAY, OR OBSTRUCTION PROTRUDING THROUGH THE SIDEWALK.
5. FORM CONTROL JOINTS, 1/4 INCH WIDE AND 3/4 INCH DEEP AT A MAXIMUM SPACING OF 5 FEET. JOINT SPACING SHALL BE PROPORTIONAL TO WIDTH OF SIDEWALK.
6. ROUND OUTER EDGES AND JOINTS TO A 1/4 INCH RADIUS
7. CONSTRUCT CURB RAMPS IN ACCORDANCE WITH TXDOT STANDARD "PEDESTRIAN FACILITIES CURB RAMPS".
8. WHEN SIDEWALK IS A DESIGNATED SHARED USE PATH, CURB RAMP CLEAR WIDTH SHALL MATCH THE WIDTH OF THE SHARED USE PATH.
9. SIDEWALKS SHALL BE CONSTRUCTED PER CURRENT ADA STANDARDS.
10. SIDEWALKS WITHIN 3'–0" OF CURB SHALL BE A MINIMUM OF 5 FEET WIDE.

SCALE: NTS

RECORD SIGNED COPY ON FILE	CITY OF ROUND ROCK	DRAWING NO: ST-01.1 SHEET 1 of 3
APPROVED 01-28-21 DATE	SIDEWALK DETAIL	ROUND ROCK TEXAS
THE ARCHITECT/ENGINEER ASSUMES RESPONSIBILITY FOR THE APPROPRIATE USE OF THIS DETAIL.		



SIDEWALK EXPANSION JOINT DETAIL

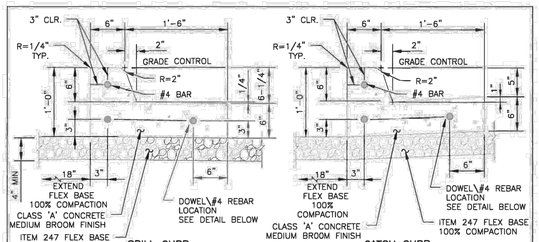
CONTROL JOINT DETAIL

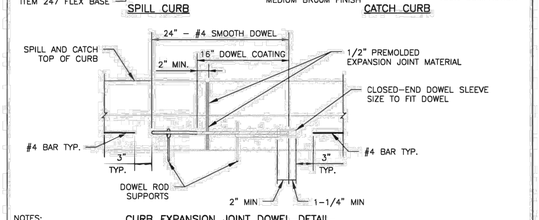
NOTES:

1. SIDEWALKS SHALL BE CONSTRUCTED PER CURRENT ADA STANDARDS.
2. PROPER CHAIRS SHALL BE USED TO SUPPORT THE STEEL REINFORCEMENT.

SCALE: NTS

RECORD SIGNED COPY ON FILE	CITY OF ROUND ROCK	DRAWING NO: ST-01.3 SHEET 3 of 3
APPROVED 01-28-21 DATE	SIDEWALK & SHARED USE PATH DETAIL	ROUND ROCK TEXAS
THE ARCHITECT/ENGINEER ASSUMES RESPONSIBILITY FOR THE APPROPRIATE USE OF THIS DETAIL.		





CURB EXPANSION JOINT DOWEL DETAIL

NOTES:

1. ALL WORK AND MATERIALS SHALL CONFORM TO SPECIFICATION ITEM 529, "CONCRETE CURB, GUTTER, AND COMBINED CURB AND GUTTER", AND THESE DETAILS (INDEPENDENT OF THE CONSTRUCTION METHODS USED)
2. ALL CURBS SHALL HAVE A MINIMUM OF 4 INCHES OF COMPACTED FLEXIBLE BASE BETWEEN THE BOTTOM OF THE CURB AND TOP OF SUBGRADE. THE FLEXIBLE BASE MATERIAL, COMPACTED TO 100% DENSITY, SHALL EXTEND 18 INCHES BEHIND BACK OF CURB, OR 36 INCHES IF THE SUBGRADE P.I. IS GREATER THAN 20.
3. CONCRETE IS CLASS "A" MEDIUM BROOM FINISH.
4. REINFORCING BARS ARE #4 BARS UNLESS OTHERWISE SHOWN.
5. PLACE EXPANSION JOINT AT A MAXIMUM SPACING OF 40 FEET. TERMINATE WORKDAY PRODUCTION AT AN EXPANSION JOINT.
6. PLACE 1/2" WIDE EXPANSION JOINTS AT STRUCTURES, CURB RETURNS AND INCREMENTS NO GREATER THAN 40 FEET.
7. FORM CONTROL JOINTS, 1/4 INCH WIDE AND 3/4 INCH DEEP AT A MAXIMUM SPACING OF 10 FEET. WHEN CURB ABUTS CONCRETE PAVEMENT, MATCH PAVEMENT JOINT SPACING.
8. ROUND EXPOSED EDGES AND JOINTS TO A 1/4 INCH RADIUS.
9. COAT 16 INCHES OF 24 INCH LONG DOWELS WITH GREASE OR APPROVED DEBONDING LUBRICANT, INSTALL DOWEL CAP ON LUBRICATED END OF THE DOWELS.

SCALE: NTS

RECORD SIGNED COPY ON FILE	CITY OF ROUND ROCK	DRAWING NO: ST-06 SHEET 1 of 1
APPROVED 01-28-21 DATE	SPILL AND CATCH CURB DETAIL (WITH CURB EXPANSION JOINT DOWEL DETAIL)	ROUND ROCK TEXAS
THE ARCHITECT/ENGINEER ASSUMES RESPONSIBILITY FOR THE APPROPRIATE USE OF THIS DETAIL.		

STATE OF TEXAS
NICHOLAS R. SANDLIN
124404
LICENSED PROFESSIONAL ENGINEER
9/5/2023

TEXAS 811 BEFORE YOU DIG

WARNING !!!! CONTRACTOR TO FIELD VERIFY ALL EXIST. UTILITIES VERTICALLY AND HORIZONTALLY PRIOR TO CONSTRUCTION. THE CONTRACTOR IS TO CONTACT ENGINEER IF ANY EXISTING UTILITY INFORMATION DIFFERS FROM DATA SHOWN IN THE PLANS. CALL 811 BEFORE YOU DIG.

ENGINEERING | CONSULTING
SANDLIN SERVICES, LLC
TBPELS FIRM #21356
4501 WHISPERING VALLEY DRIVE UNIT 27 AUSTIN, TX 78727

CONSTRUCTION DETAILS (3 OF 3)

PROJECT CASE: XXXXXXX

TWELVE OAKS

#	REVISION DESCRIPTION	SIGNATURE	DATE

SHEET 29 OF 32

G:\Shared drives\Sandlin Services LLC\Sandlin Services Projects\Land Development Division\01-0069-003 Twelve Oaks\CAD\Construction Sheets\S 120 DTL.dwg-CONSTRUCTION DETAILS (3 OF 3) Plotted Sep 06, 2023 at 2:30pm by Scott | Last Saved by: Scott

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DATE:
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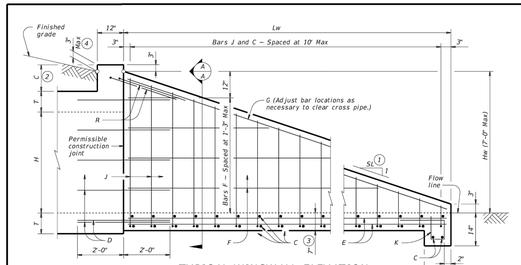
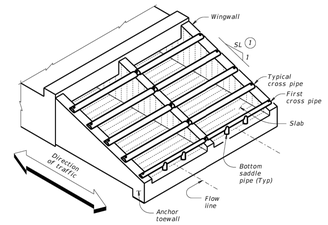


TYPICAL WINGWALL ELEVATION

(Cross pipes not shown for clarity.)



ISOMETRIC VIEW OF TYPICAL INSTALLATION

(Showing bolted anchor option.)

WING DIMENSION CALCULATIONS:

Hw = H + T + C − 0.250'
Lw = (Hw − 0.250') (SL)

For cast-in-place culverts:
Atw = (N) (S) + (N + 1) (U)
For precast culverts:
Atw = (N) (2u + S) + (N − 1) (0.500)

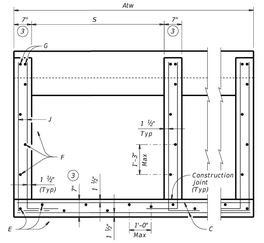
Total Wingwall Area (SF):
= (0.5) (Hw + 0.250') (Lw) (N − 1)
Total Concrete Volume (CY)
= ([Wingwall Area] (0.583') +
(Lw) (Atw) (0.583') +
(Atw) (1.000') (1.167' − 0.583')) ÷ (27)
Total Reinforcing (Lb)
= (1.55) ([Lw) (Atw) +
(4.43) (Atw) +
(K) (Hw) (N + 1) (Lw)

C = Height of curb above top of top slab (feet)
Hw = Height of wingwall (feet)
K = Constant value for use in formulas

Slope SL:1	K
6:1	10.41

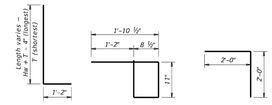
Atw = Anchor toewall length (feet)
Lw = Length of wingwall (feet)
N = Number of culvert barrels
SL:1 = Side slope ratio (horizontal : 1 vertical)

See applicable box culvert standard for *H, S, T,* and *U* values.



SECTION A-A

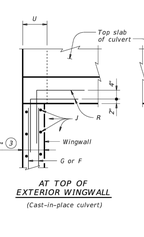
(Showing typical wingwall and wing slab reinforcing. Pipe runners not shown for clarity.)



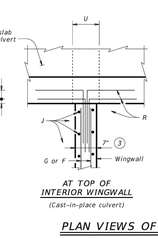
BARS J | BARS K (Length = 4'-3") | BARS R

TABLE OF REINFORCING BAR SIZES AND SPACING

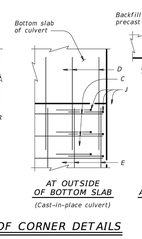
Bar	Size	Spacing
C	#4	10" Max
D	#4	Match F and E
E	#4	1'- 0" Max
F	#4	1'- 3" Max
G	#6	As shown
J	#4	10" Max
K	#4	1'- 0" Max
R	#4	As shown



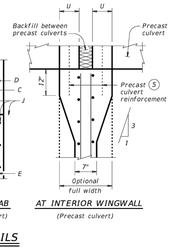
AT TOP OF EXTERIOR WINGWALL (Cast-in-place culvert)



AT TOP OF INTERIOR WINGWALL (Cast-in-place culvert)



AT OUTSIDE OF BOTTOM SLAB (Cast-in-place culvert)



AT INTERIOR WINGWALL (Precast culvert)

PLAN VIEWS OF CORNER DETAILS

MATERIAL NOTES:

Provide Grade 60 reinforcing steel.
Provide galvanized reinforcing steel if required elsewhere in the plans. Adjust reinforcing as necessary to provide a minimum clear cover of 1½".
Provide Class "C" concrete (f'c = 3,600 psi).
Provide pipe runners, cross pipes, and anchor pipes meeting the requirements of ASTM A53 (Type E or S, Gr B), ASTM A500 Gr B, or API 5L|X52.
Provide ASTM A307 bolts.
Galvanize all steel components, except the concrete reinforcing, unless required elsewhere in the plans, after fabrication.
Repair galvanizing damaged during transport or construction in accordance with Item 445, "Galvanizing."

GENERAL NOTES:

Designed according to AASHTO LRFD Bridge Design Specifications.
The safety end treatments shown herein are intended for use in those installations where out of control vehicles are likely to traverse the openings approximately perpendicular to the cross pipes.
Cross pipes are designed for a traversing load of 10,000 pounds at yield as recommended by Research Report 280-2F, "Safety Treatment of Roadside Parallel-Drainage Structures", Texas Transportation Institute, March 1981.
The quantities for concrete, reinforcing steel, and cross pipes resulting from the formulas given herein are for Contractor's information only.
See the Box Culvert Supplement (BCS) standard sheet for additional dimensions and information.
Alternate design drawings bearing the seal of a professional engineer will be acceptable for precast construction of the safety end treatments.

Cover dimensions are clear dimensions, unless noted otherwise. Reinforcing dimensions are out-to-out of bars.

SHEET 1 OF 2

Texas Department of Transportation | Bridge Division Standard

SAFETY END TREATMENT
FOR BOX CULVERTS (MAXIMUM Hw = 7'-0") TYPE I ~ PARALLEL DRAINAGE
SETB-PD

FILE: CD-SETBPD-22.dgn	DN: GAF	CK: CAT	DW: TxDOT	CK: TxDOT
©TxDOT February 2020	CONT	SECT	JOB	HIGHWAY
REVISIONS				
06-2022 ~ Wing dimensions	DIST	COUNTY		SHEET NO.

(1) Provide 6:1 or flatter slope.

(2) 0" Min to 5'-0" Max. Estimated curb heights are shown elsewhere in the plans. For structures without railing and curbs taller than 1'-0", refer to Extended Curb Details the Extended Curb Details (ECD) standard sheet.

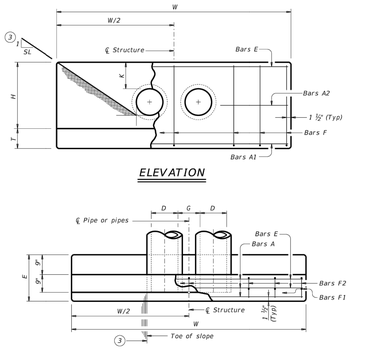
(3) Wingwall and slab thicknesses may be the same as the adjacent culvert wall and slab thicknesses (7" Minimum). If thicknesses greater than the minimum (7") are used, no changes will be made in quantities and no additional compensation will be allowed.

(4) For vehicle safety, reduce height, if necessary, to provide a maximum 3" projection above finished grade. No changes will be made in quantities and no additional compensation will be allowed for this work.

(5) For culverts with C = 0', the precast culvert reinforcing may extend 1'-0" minimum into wingwall. Wingwall bars D and R may be omitted. Otherwise, refer to the Wingwall Connection detail on the Box Culvert Precast Miscellaneous Details (SCP-MD) standard sheet.

TABLE OF VARIABLE DIMENSIONS (5) AND QUANTITIES FOR ONE HEADWALL

Slope (6:1 / 4:1 / 3:1 / 2:1)	Dia of Pipe (D)	Values for One Pipe: W	Reinf (Lbs) (1)	Conc (CY) (2)	Values To Be Added for Each Add'l Pipe: W	Reinf (Lbs) (1)	Conc (CY) (2)
6:1	12"	9' − 0"	122	1.1	1' − 9"	15	0.2
	15"	10' − 3"	136	1.3	2' − 2"	16	0.2
	18"	11' − 6"	163	1.5	2' − 8"	19	0.3
	21"	12' − 9"	200	1.8	3' − 1"	31	0.4
	24"	14' − 0"	217	2.1	3' − 7"	34	0.4
	27"	15' − 3"	254	2.4	3' − 11"	37	0.5
	30"	16' − 6"	272	2.7	4' − 4"	40	0.6
	33"	17' − 9"	314	3.1	4' − 8"	43	0.6
	36"	19' − 0"	371	3.9	5' − 1"	46	0.8
	42"	21' − 6"	442	4.9	5' − 10"	52	1.0
	48"	25' − 0"	569	6.4	6' − 7"	59	1.3
	54"	27' − 6"	701	7.5	7' − 6"	82	1.6
	60"	30' − 0"	794	8.8	8' − 3"	90	1.8
	66"	32' − 6"	894	10.2	8' − 9"	96	2.0
	72"	35' − 0"	1,055	11.7	9' − 4"	103	2.3
4:1	12"	13' − 0"	175	1.6	1' − 9"	14	0.2
	15"	14' − 9"	193	1.9	2' − 2"	17	0.2
	18"	16' − 6"	228	2.2	2' − 8"	19	0.3
	21"	18' − 3"	299	2.6	3' − 1"	31	0.4
	24"	20' − 0"	323	3.0	3' − 7"	33	0.4
	27"	21' − 9"	371	3.5	3' − 11"	37	0.5
	30"	23' − 6"	415	4.0	4' − 4"	40	0.5
	33"	25' − 3"	469	4.6	4' − 8"	43	0.6
	36"	27' − 0"	556	5.7	5' − 1"	46	0.8
	42"	30' − 6"	675	7.1	5' − 10"	52	1.0
	48"	35' − 6"	837	9.2	6' − 7"	59	1.3
	54"	39' − 0"	1,015	11.0	7' − 6"	84	1.6
	60"	42' − 6"	1,171	12.9	8' − 3"	91	1.8
	66"	46' − 0"	1,298	14.9	8' − 9"	98	2.0
	72"	49' − 6"	1,561	17.1	9' − 4"	103	2.3
3:1	12"	17' − 0"	229	2.0	1' − 9"	15	0.2
	15"	19' − 3"	266	2.4	2' − 2"	17	0.2
	18"	21' − 6"	308	2.9	2' − 8"	19	0.3
	21"	23' − 9"	382	3.5	3' − 1"	31	0.3
	24"	26' − 0"	430	3.9	3' − 7"	34	0.4
	27"	28' − 3"	486	4.7	3' − 11"	37	0.5
	30"	30' − 6"	539	5.2	4' − 4"	40	0.6
	33"	32' − 9"	603	6.0	4' − 8"	42	0.6
	36"	35' − 0"	738	7.5	5' − 1"	47	0.8
	42"	39' − 6"	881	9.3	5' − 10"	52	1.0
	48"	46' − 0"	1,102	12.1	6' − 7"	61	1.3
	54"	50' − 6"	1,364	14.4	7' − 6"	84	1.6
	60"	55' − 0"	1,547	16.9	8' − 3"	91	1.8
	66"	59' − 6"	1,741	19.5	8' − 9"	98	2.0
	72"	64' − 0"	2,077	22.4	9' − 4"	102	2.3
2:1	12"	25' − 0"	336	3.0	1' − 9"	14	0.2
	15"	28' − 3"	384	3.6	2' − 2"	17	0.2
	18"	31' − 6"	452	4.2	2' − 8"	19	0.3
	21"	34' − 9"	581	5.1	3' − 1"	31	0.4
	24"	38' − 0"	644	5.8	3' − 7"	34	0.4
	27"	41' − 3"	737	6.9	3' − 11"	37	0.5
	30"	44' − 6"	807	7.7	4' − 4"	39	0.6
	33"	47' − 9"	912	8.9	4' − 8"	44	0.6
	36"	51' − 0"	1,108	11.0	5' − 1"	48	0.8
	42"	57' − 6"	1,318	13.7	5' − 10"	54	1.0
	48"	67' − 0"	1,682	17.9	6' − 7"	59	1.3
	54"	73' − 6"	2,072	21.3	7' − 6"	83	1.6
	60"	80' − 0"	2,351	24.9	8' − 3"	89	1.8
	66"	86' − 6"	2,643	28.9	8' − 9"	96	2.0
	72"	93' − 0"	3,121	33.1	9' − 4"	101	2.3



ELEVATION

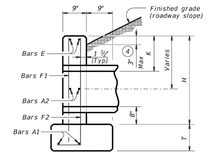
PLAN OF NON-SKEWED PIPES

TABLE OF CONSTANT DIMENSIONS

Dia of Pipe (D)	G	K (5)	H	T	E
12"	0' − 9"	1' − 0"	2' − 8"	0' − 9"	1' − 9"
15"	0' − 11"	1' − 0"	2' − 11"	0' − 9"	1' − 9"
18"	1' − 2"	1' − 0"	3' − 2"	0' − 9"	1' − 9"
21"	1' − 4"	1' − 0"	3' − 5"	0' − 9"	2' − 0"
24"	1' − 7"	1' − 0"	3' − 8"	0' − 9"	2' − 0"
27"	1' − 8"	1' − 0"	3' − 11"	0' − 9"	2' − 3"
30"	1' − 10"	1' − 0"	4' − 2"	0' − 9"	2' − 3"
33"	1' − 11"	1' − 0"	4' − 5"	0' − 9"	2' − 6"
36"	2' − 1"	1' − 0"	4' − 8"	1' − 0"	2' − 6"
42"	2' − 4"	1' − 0"	5' − 2"	1' − 0"	2' − 9"
48"	2' − 7"	1' − 3"	5' − 11"	1' − 0"	3' − 0"
54"	3' − 0"	1' − 3"	6' − 5"	1' − 0"	3' − 3"
60"	3' − 3"	1' − 3"	6' − 11"	1' − 0"	3' − 6"
66"	3' − 3"	1' − 3"	7' − 5"	1' − 0"	3' − 9"
72"	3' − 4"	1' − 3"	7' − 11"	1' − 0"	4' − 0"

TABLE OF REINFORCING STEEL (6)

Bar	Size	Spa	No.
A1	#5	~	2
A2	#5	1' - 6"	~
E	#5	~	2
F	#5	1' - 0"	~



SECTION AT CENTER OF PIPE

BARS F2

(1) Total quantities include one 3'-1" lap for bars over 60' in length.

(2) Quantities shown are for concrete pipe and will increase slightly for metal pipe installations.

(3) Indicated slope is perpendicular to centerline pipe or pipes.

(4) For vehicle safety, construct curbs no more than 3" above finished grade. Reduce curb heights, if necessary, to meet these requirements. No changes will be made in quantities and no additional compensation will be allowed for this work.

(5) Dimensions shown are usual and maximum.

(6) Quantities shown are for one structure end only (one headwall).

MATERIAL NOTES:
Provide Grade 60 reinforcing steel.
Provide Class C concrete (f'c = 3,600 psi).

GENERAL NOTES:
Designed according to AASHTO LRFD Bridge Design Specifications.
Do not mount bridge rails of any type directly to these culvert headwalls.
This standard may not be used for wall heights, H, exceeding the values shown.

Cover dimensions are clear dimensions, unless noted otherwise. Reinforcing dimensions are out-to-out of bars.

Texas Department of Transportation | Bridge Division Standard

CONCRETE HEADWALLS
WITH PARALLEL WINGS FOR NON-SKEWED PIPE CULVERTS
CH-PW-0

FILE: CD-CH-PW0-20.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
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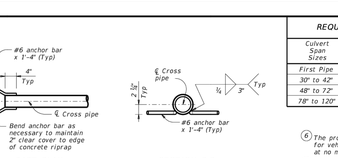
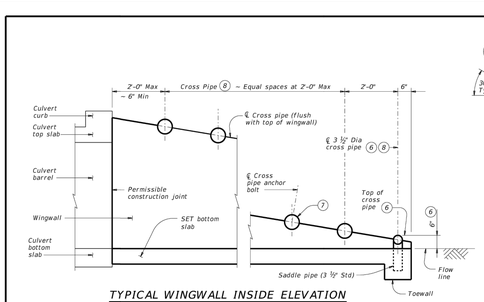
REVISIONS				
	DIST	COUNTY		SHEET NO.



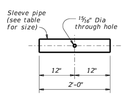
PART PLAN | SECTION B-B

OPTIONAL ANCHOR BAR DETAILS



TYPICAL WINGWALL INSIDE ELEVATION

(Showing installation of cross pipes.)



SLEEVE PIPE DETAILS (9)

REQUIRED PIPE SIZES (8)

Culvert Span Sizes	Cross Pipe Size	Sleeve Pipe Size (9)
First Pipe	3 ½" STD	2 ½" STD
30" to 42"	4" STD	3" STD
48" to 72"	5" STD	4" STD
78" to 120"	6" STD	5" STD

STANDARD PIPE SIZES

Pipe Size	Pipe O.D.	Pipe I.D.
2 ½" STD	2.875"	2.469"
3" STD	3.500"	3.068"
3 ½" STD	4.000"	3.548"
4" STD	4.500"	4.026"
5" STD	5.563"	5.047"
6" STD	6.625"	6.065"

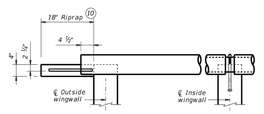
(6) The proper installation of the first cross pipe is critical for vehicle safety. Place the top of the first cross pipe at no more than 6" above the flow line.

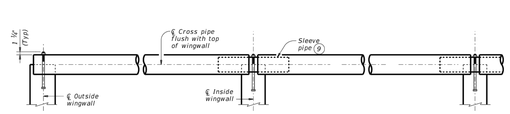
(7) Always install the third cross pipe from the bottom of the culvert using a bolted connection. Take care to ensure that concrete does not flow into this cross pipe so as to permit disassembly of the bolted connection to allow cleanout access.

(8) Provide cross pipes and sleeve pipes (if required) as shown in the Required Pipe Sizes table. Provide 3 1#2" saddle pipes for the 3 1#2" first cross pipe.

(9) At Contractor's option, make the cross pipe continuous across the inside wingwalls. If this option is selected, omit the sleeve pipe and make a 15#16" diameter throughhole in the cross pipe to accept the anchor bolt at the centerline of each interior wingwall.

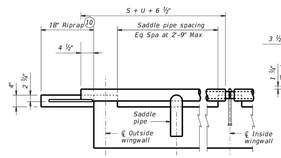
(10) Provide riprap when using the Optional Anchor Bar details. Riprap is included in the bid price for Safety End Treatment. Provide riprap in accordance with Item 432, "Riprap."

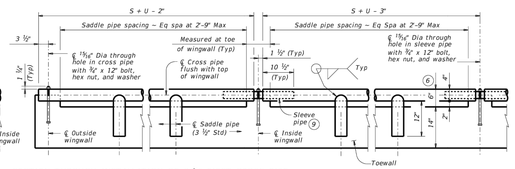




SECTION THROUGH INSTALLATION OF TYPICAL FULL CROSS PIPE

(Anchor details and dimensions are similar to those shown below in Section Through Installation of 3 ½" First Cross Pipe detail.)





SECTION THROUGH INSTALLATION OF 3 ½" FIRST CROSS PIPE

OUTSIDE CULVERT BARREL WITH OPTIONAL ANCHOR BARS & RIPRAP | OUTSIDE CULVERT BARREL WITH BOLTED ANCHOR | INSIDE CULVERT BARREL

CROSS PIPE INSTALLATION DETAILS

SHEET 2 OF 2

Texas Department of Transportation | Bridge Division Standard

SAFETY END TREATMENT
FOR BOX CULVERTS (MAXIMUM Hw = 7'-0") TYPE I ~ PARALLEL DRAINAGE
SETB-PD

FILE: CD-SETBPD-22.dgn	DN: GAF	CK: CAT	DW: TxDOT	CK: TxDOT
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REVISIONS				
06-2022 ~ Wing dimensions	DIST	COUNTY		SHEET NO.

WARNING !!!! CONTRACTOR TO FIELD VERIFY ALL EXIST. UTILITIES VERTICALLY AND HORIZONTALLY PRIOR TO CONSTRUCTION. THE CONTRACTOR IS TO CONTACT ENGINEER IF ANY EXISTING UTILITY INFORMATION DIFFERS FROM DATA SHOWN IN THE PLANS. CALL 811 BEFORE YOU DIG.

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SANDLIN
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TBPELS FIRM #21356
4501 WHISPERING VALLEY DRIVE UNIT 27 AUSTIN, TX 78727

TXDOT DETAILS (1 OF 3)

PROJECT CASE: XXXXXXX

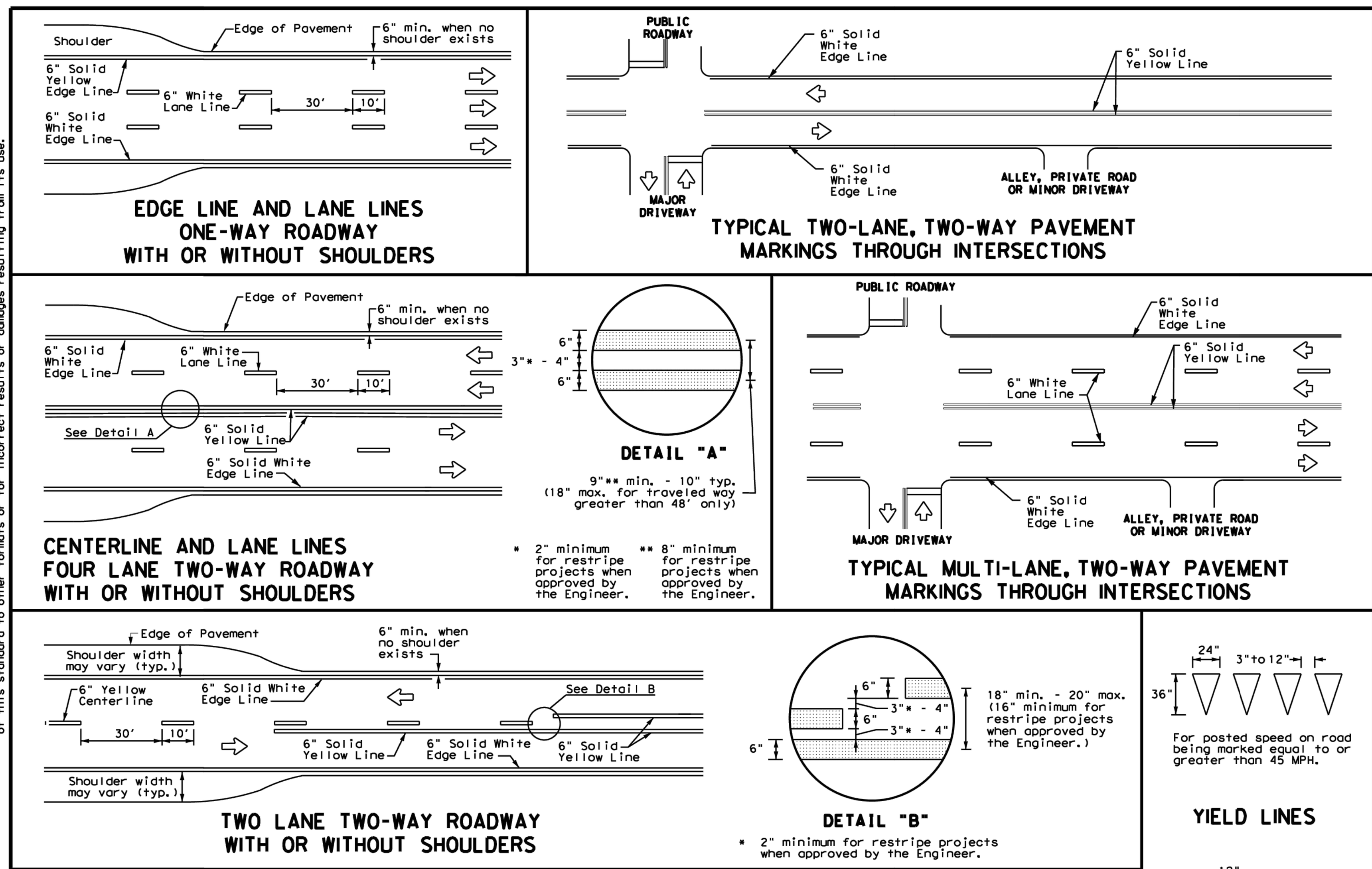
TWELVE OAKS

#	REVISION DESCRIPTION	SIGNATURE	DATE

SHEET 30 OF 32

STATE OF TEXAS
NICHOLAS R. SANDLIN
124404
LICENSED
PROFESSIONAL ENGINEER
9/5/2023

G:\Shared drives\Sandlin Services LLC\Sandlin Services Projects\Land Development Division\01-0089-003 Twelve Oaks\CAD\Construction Sheets\S 120 DTL.dwg-TXDOT DETAILS (1 OF 3) Plotted Sep 06, 2023 at 2:30pm by Scott | Last Saved by: Scott



EDGE LINE AND LANE LINES ONE-WAY ROADWAY WITH OR WITHOUT SHOULDERS

TYPICAL TWO-LANE, TWO-WAY PAVEMENT MARKINGS THROUGH INTERSECTIONS

CENTERLINE AND LANE LINES FOUR LANE TWO-WAY ROADWAY WITH OR WITHOUT SHOULDERS

DETAIL "A"

TYPICAL MULTI-LANE, TWO-WAY PAVEMENT MARKINGS THROUGH INTERSECTIONS

TWO LANE TWO-WAY ROADWAY WITH OR WITHOUT SHOULDERS

DETAIL "B"

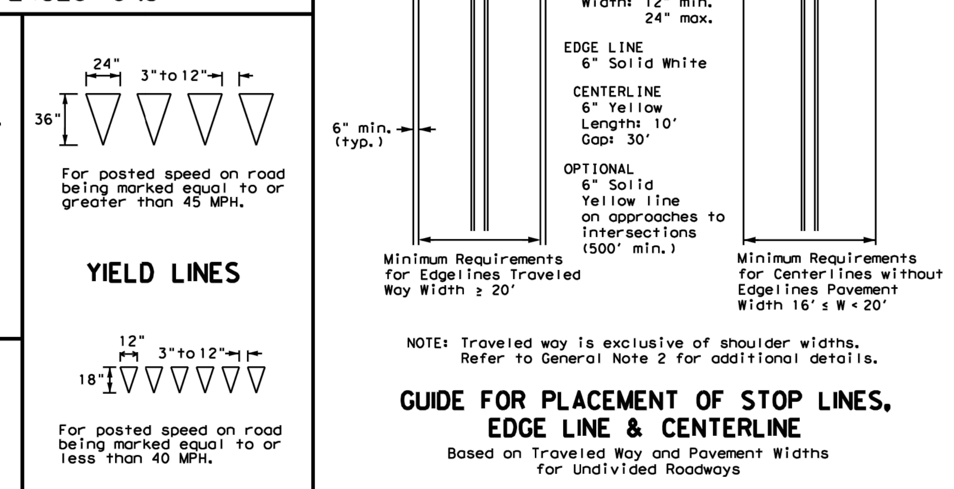
* 2" minimum for restripe projects when approved by the Engineer.

GENERAL NOTES

1. Edge line striping shall be as shown in the plans or as directed by the Engineer. The edge line should not be placed less than 6 inches from the edge of pavement. This distance may vary due to pavement raveling or other conditions. Edge lines are not required in curb and gutter sections of roadways.
2. The traveled way includes only that portion of the roadway used for vehicular travel. It does not include the parking lanes, sidewalks, berms and shoulders. The traveled ways shall be measured from the center of edge line to the center of edge line of a two lane roadway.

MATERIAL SPECIFICATIONS	
PAVEMENT MARKERS (REFLECTORIZED)	DMS-4200
EPOXY AND ADHESIVES	DMS-6100
BITUMINOUS ADHESIVE FOR PAVEMENT MARKERS	DMS-6130
TRAFFIC PAINT	DMS-8200
HOT APPLIED THERMOPLASTIC	DMS-8220
PERMANENT PREFABRICATED PAVEMENT MARKINGS	DMS-8240

All pavement marking materials shall meet the required Departmental Material Specifications as specified by the plans.



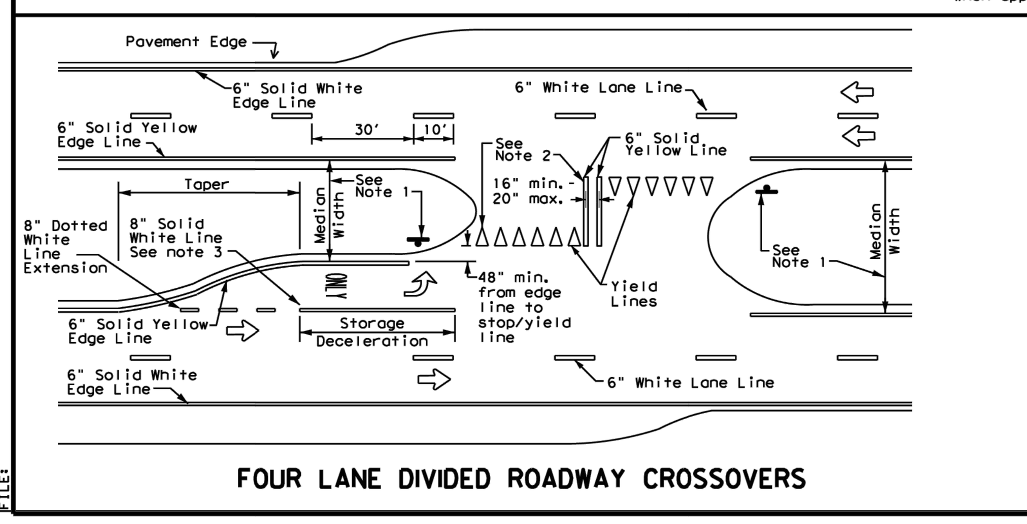
YIELD LINES

For posted speed on road being marked equal to or greater than 45 MPH.

For posted speed on road being marked equal to or less than 40 MPH.

GUIDE FOR PLACEMENT OF STOP LINES, EDGE LINE & CENTERLINE

Based on Traveled Way and Pavement Widths for Undivided Roadways



FOUR LANE DIVIDED ROADWAY CROSSOVERS

NOTES

1. Where divided highways are separated by median widths at the median opening itself of 30 feet or more, median openings shall be signed as two separate intersections. Each median opening has two width measurements, with one measurement for each approach. The narrow median width will be the controlling width to determine if signs are required. Yield signs are the typical intersection control. Stop signs and stop bars are optional as determined by the Engineer.
2. Install median striping (double yellow centerlines and stop lines/yield lines) when a 50' or greater median centerline can be placed. Stop lines shall only be used with stop signs. Yield lines shall only be used with yield signs.
3. Length of turn bays, including taper, deceleration, and storage lengths shall be as shown on the plans or as directed by the Engineer.

Texas Department of Transportation — Traffic Safety Division Standard

TYPICAL STANDARD PAVEMENT MARKINGS

PM(1)-22

FILE: pm1-22.dgn | DN: | CK: | DW: | CK:
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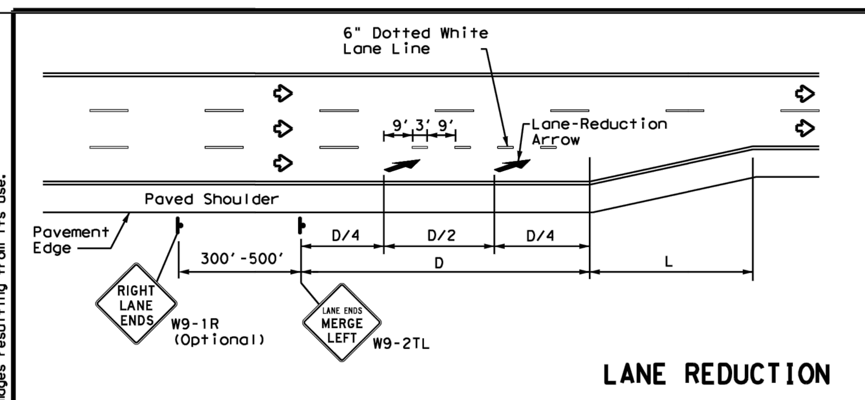
REVISIONS 11-78 8-00 6-20 / 8-95 3-03 12-22 / 5-00 2-12 | DIST | COUNTY | SHEET NO.
22A



LANE REDUCTION

NOTES

1. Lane reduction pavement markings are used where the number of through lanes is reduced because of narrowing of the roadway or because of a section of on-street parking in what would otherwise be a through lane. For Texas Super 2 Passing Lanes, see TS2(PL) standard sheets.
2. On divided highways, an additional RIGHT LANE ENDS (W9-1R) sign may be installed in the median aligned with the W9-1R sign on the right side of the highway.
3. Lane reduction arrows are required for speeds of 45 mph or greater. An optional third lane reduction arrow may be added based on engineering judgement. If used, the optional third lane reduction arrow should be centered between the first and last lane reduction arrows.
4. For lane reductions on Freeways and Expressways, signing shall conform to the TxDOT Freeway Signing Handbook.

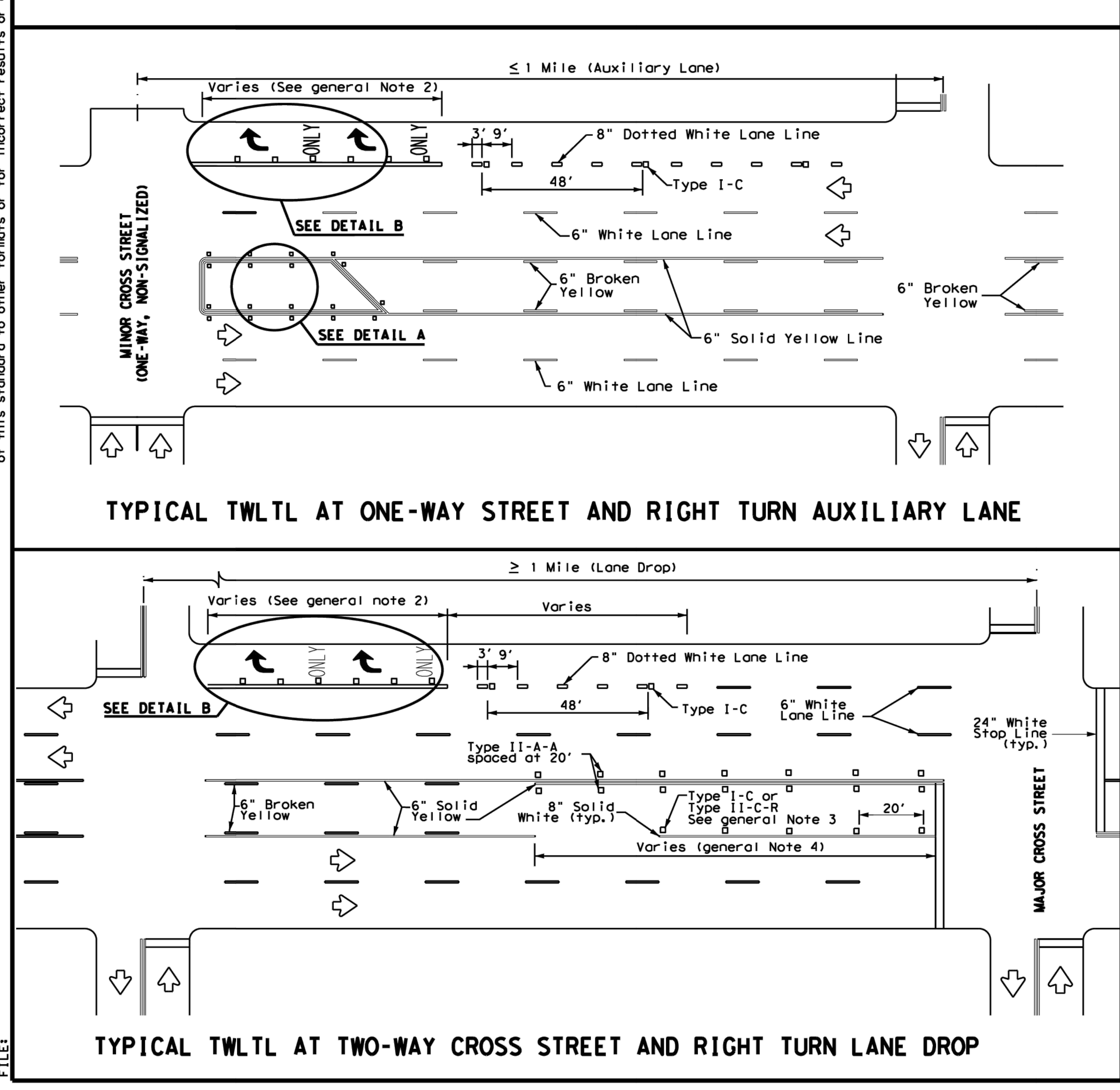
ADVANCED WARNING SIGN DISTANCE (D)		
Posted Speed	D (ft)	L (ft)
30 MPH	460	$L = \frac{WS^2}{60}$
35 MPH	565	
40 MPH	670	
45 MPH	775	L=WS
50 MPH	885	
55 MPH	990	
60 MPH	1,100	
65 MPH	1,200	
70 MPH	1,250	
75 MPH	1,350	

GENERAL NOTES

1. Lane use word and arrow markings shall be used where through lanes approaching an intersection become mandatory turn lanes. Lane use word and arrow markings should be used in auxiliary lanes of substantial length. Lane use arrow markings or word and arrow markings may be used in other lanes and turn bays for emphasis. Details for words and arrows are as shown in the Standard Highway Sign Designs for Texas.
2. When lane-use words and arrow markings are used, two sets of arrows should be used if the length of the bay is greater than 180 feet. When a single lane use arrow or word and arrow marking is used for a short turn lane, it should be located at or near the upstream end of the full-width turn lane.
3. Use raised pavement marker Type I-C with undivided highways, flush medians and two way left turn lanes. Use raised pavement marker Type II-C-R with divided highways and raised medians.
4. Length of turn bays, including taper, deceleration, and storage lengths shall be as shown on the plans or as directed by the Engineer. See Chapter 3 of the Roadway Design Manual for additional information on turning lanes or storage lengths.

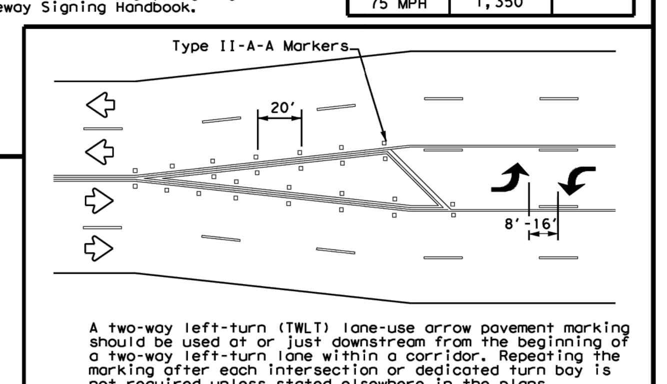
MATERIAL SPECIFICATIONS	
PAVEMENT MARKERS (REFLECTORIZED)	DMS-4200
EPOXY AND ADHESIVES	DMS-6100
BITUMINOUS ADHESIVE FOR PAVEMENT MARKERS	DMS-6130
TRAFFIC PAINT	DMS-8200
HOT APPLIED THERMOPLASTIC	DMS-8220
PERMANENT PREFABRICATED PAVEMENT MARKINGS	DMS-8240

All pavement marking materials shall meet the required Departmental Material Specifications as specified by the plans.



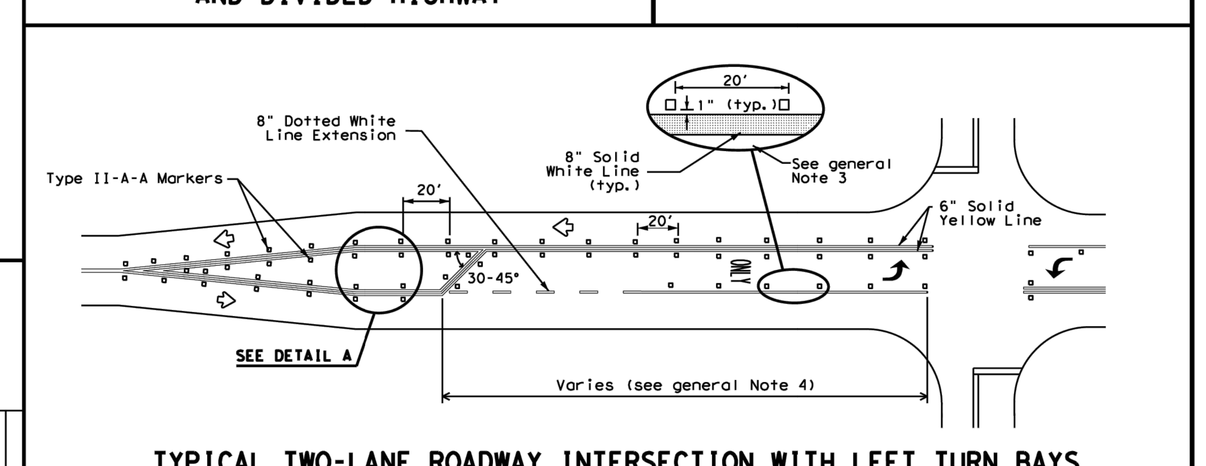
TYPICAL TWLTL AT ONE-WAY STREET AND RIGHT TURN AUXILIARY LANE

TYPICAL TWLTL AT TWO-WAY CROSS STREET AND RIGHT TURN LANE DROP

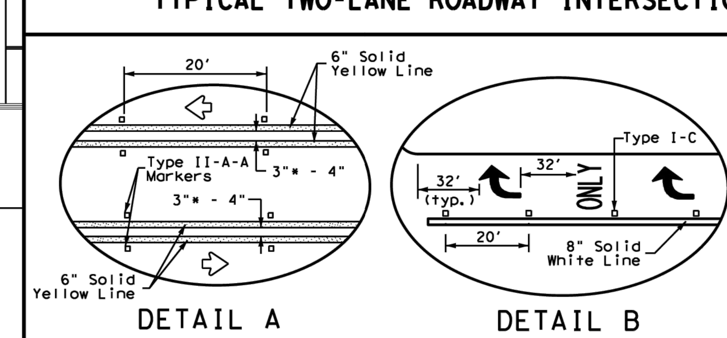


A two-way left-turn (TWLTL) lane-use arrow pavement marking should be used at or just downstream from the beginning of a two-way left-turn lane within a corridor. Repeating the marking after each intersection or dedicated turn bay is not required unless stated elsewhere in the plans.

TYPICAL TRANSITION FOR TWLTL AND DIVIDED HIGHWAY



TYPICAL TWO-LANE ROADWAY INTERSECTION WITH LEFT TURN BAYS



DETAIL A

DETAIL B

* 2" minimum allowed for restripe projects when approved by the Engineer.

Texas Department of Transportation — Traffic Safety Division Standard

TWO-WAY LEFT TURN LANES, RURAL LEFT TURN BAYS, AND LANE REDUCTION PAVEMENT MARKINGS

PM(3)-22

FILE: pm3-22.dgn | DN: | CK: | DW: | CK:
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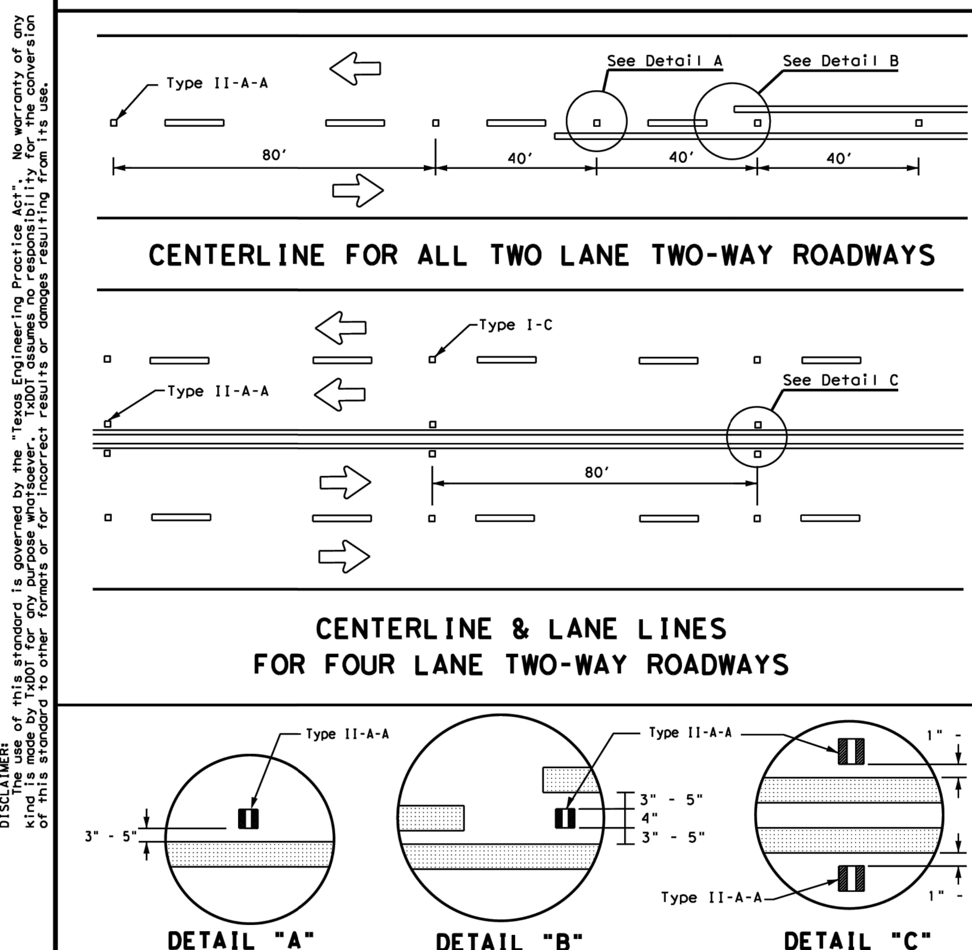
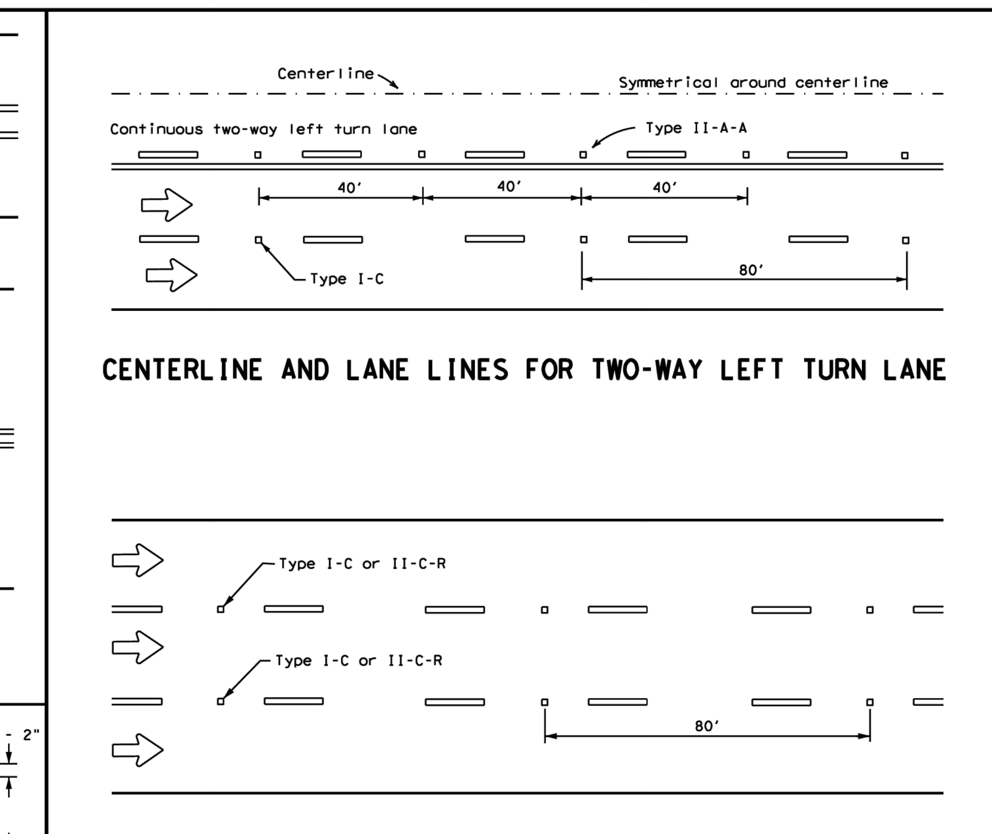
REFLECTIVE RAISED PAVEMENT MARKERS FOR VEHICLE POSITIONING GUIDANCE



CENTERLINE FOR ALL TWO LANE TWO-WAY ROADWAYS

CENTERLINE & LANE LINES FOR FOUR LANE TWO-WAY ROADWAYS

DETAIL "A" — DETAIL "B" — DETAIL "C"



CENTERLINE AND LANE LINES FOR TWO-WAY LEFT TURN LANE

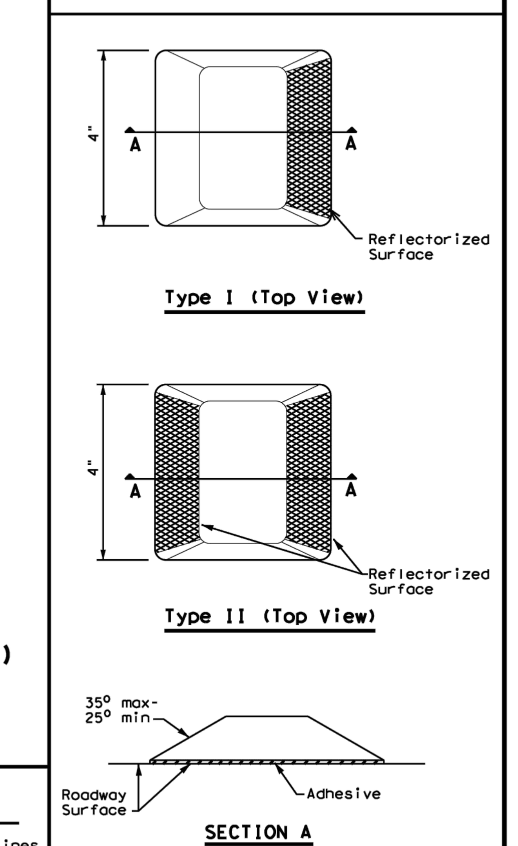
LANE LINES FOR ONE-WAY ROADWAY (NON-FREEWAY FACILITIES)

Raised pavement markers Type II-C-R shall have clear face toward normal traffic and red face toward wrong-way traffic.

See Note 3.

MATERIAL SPECIFICATIONS	
PAVEMENT MARKERS (REFLECTORIZED)	DMS-4200
EPOXY AND ADHESIVES	DMS-6100
BITUMINOUS ADHESIVE FOR PAVEMENT MARKERS	DMS-6130
TRAFFIC PAINT	DMS-8200
HOT APPLIED THERMOPLASTIC	DMS-8220
PERMANENT PREFABRICATED PAVEMENT MARKINGS	DMS-8240

All pavement marking materials shall meet the required Departmental Material Specifications as specified by the plans.

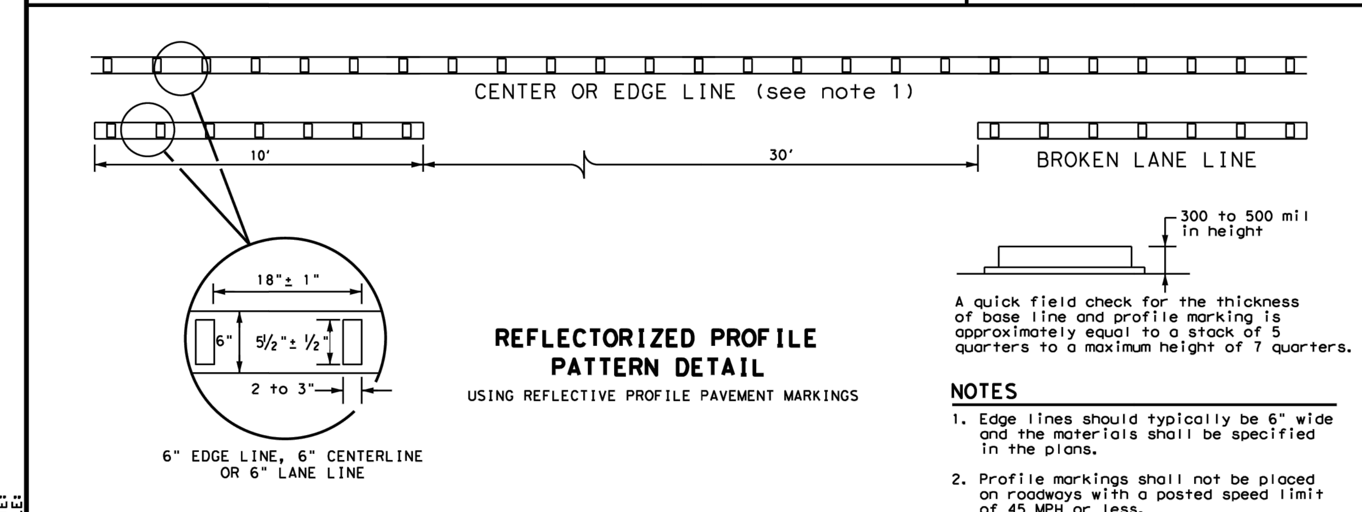


Type I (Top View)

Type II (Top View)

SECTION A

RAISED PAVEMENT MARKERS



REFLECTORIZED PROFILE PATTERN DETAIL

USING REFLECTIVE PROFILE PAVEMENT MARKINGS

A quick field check for the thickness of base line and profile marking is approximately equal to a stack of 5 quarters to a maximum height of 7 quarters.

NOTES

1. Edge lines should typically be 6" wide and the materials shall be specified in the plans.
2. Profile markings shall not be placed on roadways with a posted speed limit of 45 MPH or less.

GENERAL NOTES

1. All raised pavement markers placed along broken lines shall be placed in line with and midway between the stripes.
2. On concrete pavements the raised pavement markers should be placed to one side of the longitudinal joints.
3. Use raised pavement marker Type I-C with undivided roadways, flush medians and two way left turn lanes. Use raised pavement marker Type II-C-R with divided highways and raised medians.

Texas Department of Transportation — Traffic Safety Division Standard

POSITION GUIDANCE USING RAISED MARKERS RELECTORIZED PROFILE MARKINGS

PM(2)-22

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22B

STATE OF TEXAS — NICHOLAS R. SANDLIN — 124404 — LICENSED PROFESSIONAL ENGINEER — 9/5/2023

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SANDLIN SERVICES, LLC — ENGINEERING | CONSULTING

TBPELS FIRM #21356
4501 WHISPERING VALLEY DRIVE UNIT 27 AUSTIN, TX 78727

TXDOT DETAILS (2 OF 3)

PROJECT CASE: XXXXXXX

TWELVE OAKS

#	REVISION DESCRIPTION	SIGNATURE	DATE

SHEET 31 OF 32

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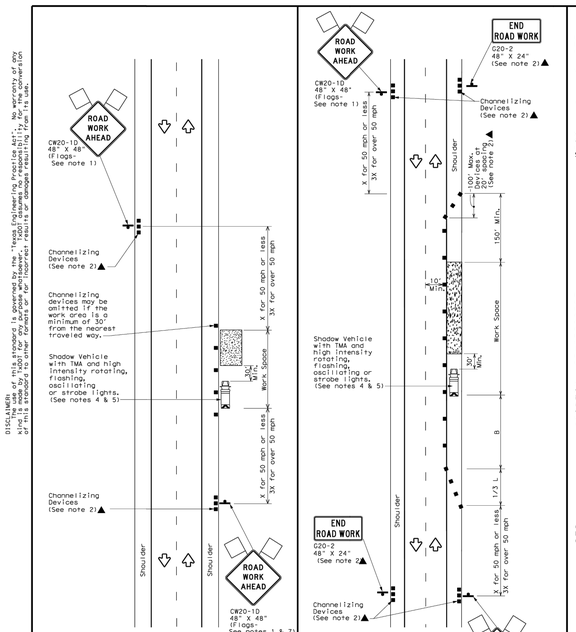
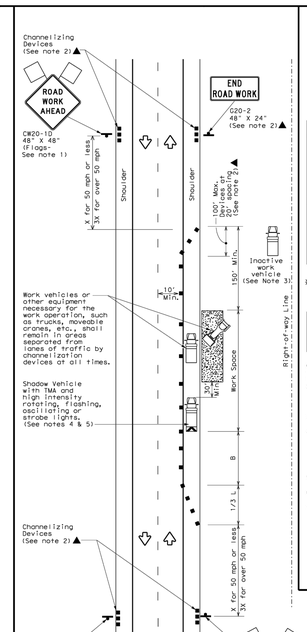


TCP (1-1a)

WORK SPACE NEAR SHOULDER
Conventional Roads

TCP (1-1b)

WORK SPACE ON SHOULDER
Conventional Roads



TCP (1-1c)

WORK VEHICLES ON SHOULDER
Conventional Roads

LEGEND			
	Type 3 Barricade	■ ■	Channelizing Devices
	Heavy Work Vehicle		Truck Mounted Attenuator (TMA)
	Trailer Mounted Flashing Arrow Board	(M)	Portable Changeable Message Sign (PCMS)
	Sign		Traffic Flow
	Flag		Flagger

Posted Speed *	Formula	Minimum Desirable Taper Lengths ** 10' Offset	11' Offset	12' Offset	Suggested Maximum Spacing of Channelizing Devices On a Taper	On a Tangent	Minimum Sign Spacing "X" Distance	Suggested Longitudinal Buffer Space "B"
30	L= WS²/60	150'	165'	180'	30'	60'	120'	90'
35		205'	225'	245'	35'	70'	160'	120'
40		265'	295'	320'	40'	80'	240'	155'
45		450'	495'	540'	45'	90'	320'	195'
50		500'	550'	600'	50'	100'	400'	240'
55	L=WS	550'	605'	660'	55'	110'	500'	295'
60		600'	660'	720'	60'	120'	600'	350'
65		650'	715'	780'	65'	130'	700'	410'
70		700'	770'	840'	70'	140'	800'	475'
75		750'	825'	900'	75'	150'	900'	540'

* Conventional Roads Only
** Taper lengths have been rounded off.
L=Length of Taper(FT) W=Width of Offset(FT) S=Posted Speed(MPH)

TYPICAL USAGE				
MOBILE	SHORT DURATION	SHORT TERM STATIONARY	INTERMEDIATE TERM STATIONARY	LONG TERM STATIONARY
		✓		

GENERAL NOTES
1. Flags attached to signs where shown are REQUIRED.
2. All traffic control devices illustrated are REQUIRED, except those denoted with the triangle symbol may be omitted when stated elsewhere in the plans, or for routine maintenance work, when approved by the Engineer.
3. Inactive work vehicles or other equipment should be parked near the right-of-way line and not parked on the paved shoulder.
4. A Shadow Vehicle with a TMA should be used anytime it can be positioned 30 to 100 feet in advance of the area of crew exposure without adversely affecting the performance or quality of the work. If workers are no longer present but road or work conditions require the traffic control to remain in place, Type 3 Barricades or other channelizing devices may be substituted for the Shadow Vehicle and TMA.
5. Additional Shadow Vehicles with TMAs may be positioned off the paved surface, next to those shown in order to protect wider work spaces.
6. See TCP(5-1) for shoulder work on divided highways, expressways and freeways.
7. CW21-5 "SHOULDER WORK" signs may be used in place of CW20-1D "ROAD WORK AHEAD" signs for shoulder work on conventional roadways.

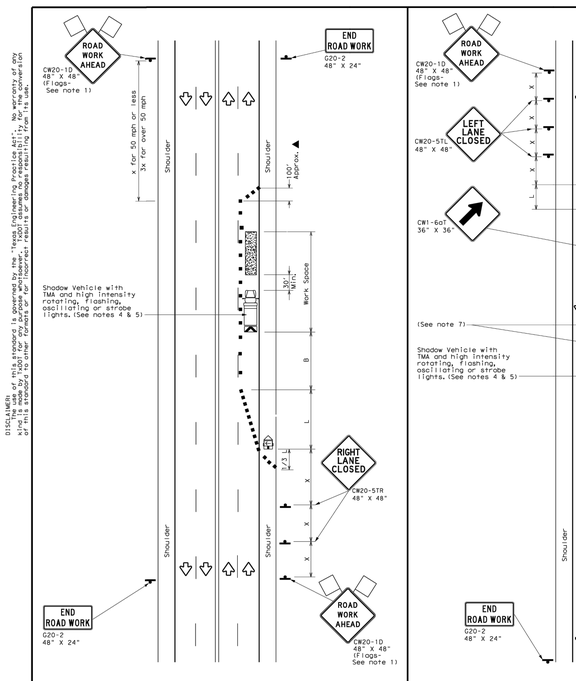
Texas Department of Transportation | Traffic Operations Division Standard

TRAFFIC CONTROL PLAN
CONVENTIONAL ROAD SHOULDER WORK

TCP(1-1)-18

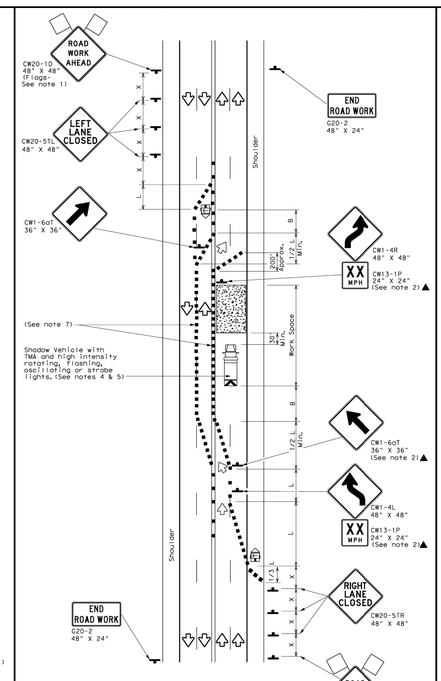
FILE:	tcp1-1-18.dgn	DN:	CK:	DW:	CK:
©TxDOT	December 1985	CONT	SECT	JOB	HIGHWAY
REVISIONS					
2-94 4-98		DIST	COUNTY		SHEET NO.
8-95 2-12					
1-97 2-18					

7.5A



TCP (1-4a)

ONE LANE CLOSED



TCP (1-4b)

TWO LANES CLOSED

LEGEND			
	Type 3 Barricade	■ ■	Channelizing Devices
	Heavy Work Vehicle		Truck Mounted Attenuator (TMA)
	Trailer Mounted Flashing Arrow Board	(M)	Portable Changeable Message Sign (PCMS)
	Sign		Traffic Flow
	Flag		Flagger

Posted Speed *	Formula	Minimum Desirable Taper Lengths ** 10' Offset	11' Offset	12' Offset	Suggested Maximum Spacing of Channelizing Devices On a Taper	On a Tangent	Minimum Sign Spacing Distance	Suggested Longitudinal Buffer Space "B"
30	L= WS²/60	150'	165'	180'	30'	60'	120'	90'
35		205'	225'	245'	35'	70'	160'	120'
40		265'	295'	320'	40'	80'	240'	155'
45		450'	495'	540'	45'	90'	320'	195'
50		500'	550'	600'	50'	100'	400'	240'
55	L=WS	550'	605'	660'	55'	110'	500'	295'
60		600'	660'	720'	60'	120'	600'	350'
65		650'	715'	780'	65'	130'	700'	410'
70		700'	770'	840'	70'	140'	800'	475'
75		750'	825'	900'	75'	150'	900'	540'

* Conventional Roads Only
** Taper lengths have been rounded off.
L=Length of Taper(FT) W=Width of Offset(FT) S=Posted Speed(MPH)

TYPICAL USAGE				
MOBILE	SHORT DURATION	SHORT TERM STATIONARY	INTERMEDIATE TERM STATIONARY	LONG TERM STATIONARY
		✓		

GENERAL NOTES
1. Flags attached to signs where shown are REQUIRED.
2. All traffic control devices illustrated are REQUIRED, except those denoted with the triangle symbol may be omitted when stated elsewhere in the plans, or for routine maintenance work, when approved by the Engineer.
3. The CW20-1D "ROAD WORK AHEAD" sign may be repeated if the visibility of the work zone is less than 1500 feet.
4. A Shadow Vehicle with a TMA should be used anytime it can be positioned 30 to 100 feet in advance of the area of crew exposure without adversely affecting the performance or quality of the work. If workers are no longer present but road or work conditions require the traffic control to remain in place, Type 3 Barricades or other channelizing devices may be substituted for the Shadow Vehicle and TMA.
5. Additional Shadow Vehicles with TMAs may be positioned off the paved surface, next to those shown in order to protect wider work spaces.

TCP (1-4a)

6. If this TCP is used for a left lane closure, CW20-5TL "LEFT LANE CLOSED" signs shall be used and channelizing devices shall be placed on the centerline where needed to protect the work space from opposing traffic with the arrow panel placed in the closed lane near the end of the merging taper.

TCP (1-4b)

7. Where traffic is directed over a yellow centerline, channelizing devices which separate two-way traffic should be spaced on tapers at 20' or 15' if posted speeds are 35 mph or slower, and for tangent sections, at 1/2S where S is the speed in mph. This tighter device spacing is intended for the areas of conflicting markings, not the entire work zone.

Texas Department of Transportation | Traffic Operations Division Standard

TRAFFIC CONTROL PLAN
LANE CLOSURES ON MULTILANE CONVENTIONAL ROADS

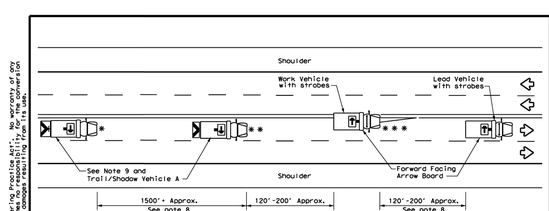
TCP(1-4)-18

FILE:	tcp1-4-18.dgn	DN:	CK:	DW:	CK:
©TxDOT	December 1985	CONT	SECT	JOB	HIGHWAY
REVISIONS					
2-94 4-98		DIST	COUNTY		SHEET NO.
8-95 2-12					
1-97 2-18					

7.5A

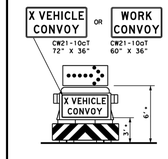
DISCLAIMER:
The use of this standard is governed by the "Texas Engineering Practice Act". No warranty of any kind is made by TxDOT for any purpose whatsoever. TxDOT assumes no responsibility for the conversion of this standard to other formats or for incorrect results or damages resulting from its use.

DATE:
FILE:

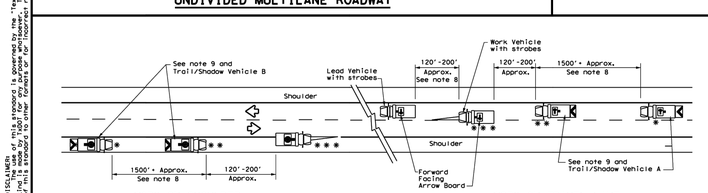


TCP (3-1a)

UNDIVIDED MULTILANE ROADWAY

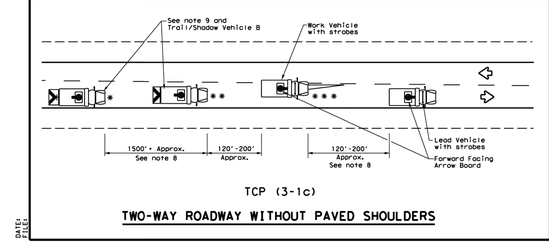


TRAIL/SHADOW VEHICLE A
with RIGHT Directional display Flashing Arrow Board



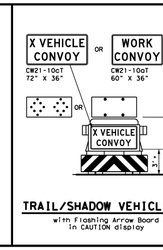
TCP (3-1b)

TWO-WAY ROADWAY WITH PAVED SHOULDERS

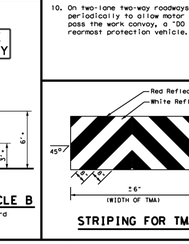


TCP (3-1c)

TWO-WAY ROADWAY WITHOUT PAVED SHOULDERS



TRAIL/SHADOW VEHICLE B
with Flashing Arrow Board in CAUTION display



STRIPING FOR TMA

LEGEND			
*	Trail Vehicle	ARROW BOARD DISPLAY	
**	Shadow Vehicle		
***	Work Vehicle		RIGHT Directional
	Heavy Work Vehicle		LEFT Directional
	Truck Mounted Attenuator (TMA)		Double Arrow
	Traffic Flow		CAUTION (Alternating Diamond or 4 Corner Flash)

TYPICAL USAGE				
MOBILE	SHORT DURATION	SHORT TERM STATIONARY	INTERMEDIATE TERM STATIONARY	LONG TERM STATIONARY
		✓		

GENERAL NOTES
1. TRAIL, SHADOW, and LEAD vehicles shall be equipped with arrow boards as illustrated. When a LEAD vehicle is not used the WORK vehicle must be equipped with an arrow board. The Engineer will determine if the LEAD VEHICLE and/or TRAIL VEHICLE are required based on prevailing roadway conditions, traffic volume, and sight distance restrictions.
2. The use of amber high intensity rotating, flashing, oscillating, or strobe lights on vehicles are required. Blue high intensity rotating, flashing, oscillating or strobe lights when mounted on the driver's side of the vehicle may be operated simultaneously with the amber beacons or strobe lights.
3. The use of truck mounted attenuators (TMA) on the SHADOW VEHICLE and TRAIL VEHICLE are required.
4. Reflective sheeting on the rear of the TMA shall meet or exceed the reflectivity and color requirements of DEPARTMENTAL MATERIAL SPECIFICATION DMS 8300, type A.
5. Flashing arrow boards shall be Type B or Type C as per the Barricade and Construction (BC) standards. The board shall be controlled from inside the vehicle.
6. Each vehicle shall have two-way radio communication capability.
7. When work convoys must change lanes, the TRAIL VEHICLE should change lanes first to shadow the other convoy vehicles.
8. Vehicle spacing between the TRAIL VEHICLE and the SHADOW VEHICLE will vary depending on sight distance restrictions. Motorists approaching the work convoy should be able to see the TRAIL VEHICLE in time to slow down and/or change lanes as they approach the TRAIL VEHICLE. Vehicle spacing between the WORK VEHICLE and SHADOW VEHICLE and vehicle spacing between WORK VEHICLE and LEAD VEHICLE may vary according to terrain, work activity and other factors.
9. "X VEHICLE CONVOY" (CW21-10aT) or "WORK CONVOY" (CW21-10aT) signs shall be used on TRAIL VEHICLES and SHADOW VEHICLES as shown. As an option 48" X 48" diamond shaped "WORK CONVOY"(CW21-10T) or "X VEHICLE CONVOY" (CW21-10aT) signs may be used where adequate mounting space exists. When used, the X VEHICLE CONVOY sign shall have the number of the convoy vehicles displayed on the sign in the number designation "X" location. The "X VEHICLE CONVOY" sign shall not be used on the SHADOW VEHICLE if a TRAIL VEHICLE is used.
10. On two-lane two-way roadways, the work and protection vehicles should pull over periodically to allow motor vehicle traffic to pass. If motorists are not allowed to pass the work convoy, a "DO NOT PASS" (R4-1) sign should be placed on the back of the rearmost protection vehicle.

Texas Department of Transportation | Traffic Operations Division Standard

TRAFFIC CONTROL PLAN
MOBILE OPERATIONS UNDIVIDED HIGHWAYS

TCP(3-1)-13

FILE:	tcp3-1.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT	December 1985	CONT	SECT	JOB	HIGHWAY
REVISIONS					
2-94 4-98		DIST	COUNTY		SHEET NO.
8-95 7-13					
1-97					

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G:\Shared drives\Sandlin Services LLC\Sandlin Services Projects\Land Development Division\01-0089-003 Twelve Oaks\CAD\Construction Sheets\S 120 DTL.dwg-TXDOT DETAILS (3 OF 3) Plotted Sep 06, 2023 at 2:30pm by Scott | Last Saved by: Scott

STATE OF TEXAS
NICHOLAS R. SANDLIN
124404
LICENSED
PROFESSIONAL ENGINEER
9/5/2023

WARNING !!!! CONTRACTOR TO FIELD VERIFY ALL EXIST. UTILITIES VERTICALLY AND HORIZONTALLY PRIOR TO CONSTRUCTION. THE CONTRACTOR IS TO CONTACT ENGINEER IF ANY EXISTING UTILITY INFORMATION DIFFERS FROM DATA SHOWN IN THE PLANS. CALL 811 BEFORE YOU DIG.

ENGINEERING | CONSULTING
SANDLIN
SERVICES, LLC

TBPELS FIRM #21356
4501 WHISPERING VALLEY DRIVE UNIT 27 AUSTIN, TX 78727

TXDOT DETAILS (3 OF 3)

PROJECT CASE: XXXXXXX

TWELVE OAKS

#	REVISION DESCRIPTION	SIGNATURE	DATE

SHEET 32 OF 32

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Permanent Stormwater Section (TCEQ-0600)

Attachment G: Inspection, Maintenance, Repair and Retrofit Plan

Recommended Maintenance Guidelines for Jellyfish Filter BMP

The Jellyfish Filter is approved for inclusion in "Complying with the Edwards Aquifer Rules Technical Guidance on Best Management Practices" (Revised July 5, 2005).

General

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 a relatively low driving head.

Each lightweight Jellyfish Filter cartridge consists of multiple detachable membrane-encased filter elements ("filtration tentacles") attached to a cartridge head plate.

Limiting requirements for the Jellyfish Filter are as follows:

- Typically requires 18 inches of drop across the system (can be as low as 9 inches)
- Requires regular (minimum annually) inspection and/or maintenance.

The Jellyfish Filter shall be per the specification as described in the detail provided in the construction plans. The owner shall operate the Jellyfish Filter per the guidelines in the Jellyfish Filter Owner's Manual.

Maintenance

The primary purpose of the Jellyfish Filter Is to capture and remove pollutants from stormwater runoff. As with any filtration system, captured pollutants must be removed to maintain the filter's maximum treatment performance. Regular inspection and maintenance are required to ensure the proper functioning of the system. Maintenance frequencies and requirements of the Jellyfish Filter are site-specific and vary depending on pollutant loading.

Maintenance activities typically include some combination of the following:

- Removal of sediment for depths 12 inches or greater or every 3 years (whichever occurs first)
- Removal of oil floatable trash, and debris
- Deck cleaned and free from sediment

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- Rinsing and re-installing the filter cartridges every 12 months at minimum or as required based on the most recent inspection results (whichever occurs first)
- Replace filter cartridge tentacles, as needed
- Replace or repair damages or missing components

The unit maintenance and cleaning must be performed annually at a minimum as described here and as outlined in the Jellyfish Filter Owner's Manual. Additionally, the unit is required to be cleaned immediately after an oil, fuel, or chemical spill and is recommended to be cleaned after a major runoff event. The Jellyfish Filter should be inspected and maintained by professional vacuum cleaning service providers with experience in the maintenance of underground tanks, sewers, and catch basins. Only professional service providers trained in confined space entry procedures should enter the vessel.

Filter cartridges should be tested for an adequate flow rate every 12 months and cleaned, re-commissioned, or replaced if necessary. An annual backflush must be performed on a single draindown cartridge using a Jellyfish Cartridge Backflush Pipe as described in the Jellyfish Filter Owner's Manual. If the time required to drain 14 gallons of backflush water from the Backflush Pipe (from the top of pipe to the top of the open flapper valve) exceeds 15 seconds, it is recommended to perform a manual backflush on each of the cartridges. After the manual backflush, the draindown test should be repeated on a single cartridge to determine if the cartridge can drain 14 gallons of water in 15 seconds. If the cartridge still does not achieve the design flow rate, it must be replaced.

External rinsing of the cartridge is performed by removing the cartridge from the cartridge deck and externally rinsing the filtration tentacles using a low-pressure water sprayer, as described in the Jellyfish Filter Owner's Manual. If this procedure is performed within the structure, the cartridge or individual filtration tentacles should be rinsed while safely suspended over the maintenance access wall opening in the cartridge deck, such that rinse water flows into the lower chamber of the Jellyfish Filter. If the rinsing procedure is performed outside the structure, the cartridge or individual filtration tentacles should be rinsed in a suitable basin such as a plastic barrel or tub, and rinse water subsequently poured into the maintenance access wall opening in the cartridge deck. Sediment is subsequently removed from the lower chamber by standard vacuum service.

Inspections
Inspection activities are typically conducted from the surface and include:

- Observe if standing water is present.
- Observe if there is any physical damage to the deck or cartridge lids.
- Observe the amount of debris in the maintenance access wall or inlet bay for vault systems.

Post-construction inspection is required prior to placing the Jellyfish Filter into service. All construction debris or construction-related sediment within the device must be removed, and any damage to system components repaired. Inspection should be performed every 4 months during the first year (12 months) of operation to accurately assess the sediment and floatable pollutant accumulation, and to ensure that the automatic backwash feature is functioning properly. After the first year of operation, inspection shall occur on an annual basis at a minimum. Additional inspections are required to be performed immediately after an upstream oil, fuel or other chemical spill and are recommended to occur after each major storm event.

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Record Keeping

Maintenance and inspection records should be kept on file by the Owner of the permanent BMPs for a period of at least three (3) years. Repair and retrofit records should be kept on file by the Owner of the permanent BMPs for a period of at least five (5) years.

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General Owner Responsibility

The OWNER or SUBSEQUENT OWNER shall bear all expenses for the operation and maintenance of this Permanent Water Quality Control (PWQC) system including but not limited to all general maintenance activities needed to keep this system in proper operation condition. If this system is abused or not maintained, then it may contribute to malfunction of the storm water system. All designated PWQC areas shall remain free of construction, development, and encroachments.

You as the OWNER of this property have a responsibility to provide any SUBSEQUENT OWNER or your real estate agent with a copy of this Best Management Practices (BMP) Maintenance Plan if this facility is sold so that the BMPs can be properly maintained and operated. The same rights, duties, and responsibilities borne by the current OWNER shall be borne by each subsequent OWNER.

An amended copy of this document will be provided to the TCEQ within thirty (30) days of any changes in the following information:

Responsible Party for Maintenance:	Twelve Oaks Professional Park Commercial LP
Address:	14205 N Mopac Expy, STE 450
City, State, Zip:	Austin, TX 78728
Telephone Number:	281-467-7422

OWNER ACKNOWLEDGEMENT AND ACCEPTANCE:

TWELVE OAKS PROFESSIONAL PARK

Charbel Dahdah
Print Name

Managing Member
Title

DocuSigned by:
Charbel Dahdah
A058420F30704EC...
Signature

9/5/2023
Date

PREPARED AND CERTIFIED BY ENGINEER:

Nick Sandlin, P.E.

9/5/2023
Date

Permanent Stormwater Section
(TCEQ-0600)

Attachment H:
Pilot-Scale Field Testing Plan (if proposed)
(NOT APPLICABLE)

A pilot-scale field testing plan is not applicable. All BMP design and calculations are based on and comply with Edwards Aquifer Technical Guidance for Edwards Aquifer Rules (RG-348, revised July 2005).

Permanent Stormwater Section
(TCEQ-0600)

Attachment I:
Measures for Minimizing Surface Stream Contamination

No surface streams flow across the property. Drainage is generally to the east-northeast to the proposed Regional Detention Pond, that would eventually drain to the Middle Fork San Gabriel River, approximately one mile east of the site. Flows from the Jellyfish Filter flow to the 12 Oaks Village regional Detention Pond.

Agent Authorization Form
(TCEQ-0599)

Agent Authorization Form
For Required Signature
Edwards Aquifer Protection Program
Relating to 30 TAC Chapter 213
Effective June 1, 1999

I Charbel Dahdah,
Print Name

Manager/Member,
Title - Owner/President/Other

of TWELVE OAKS PROFESSIONAL PARK COMMERCIAL LP,
Corporation/Partnership/Entity Name

have authorized NICK SANDLIN, P.E.
Print Name of Agent/Engineer

of SANDLIN SERVICES, LLC
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

08.25.2023
Date

THE STATE OF Texas §

County of Travis §

BEFORE ME, the undersigned authority, on this day personally appeared Charbel Dahdah 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 25th day of August 2023.

NOTARY PUBLIC

AMBER LANGSTON
MY COMMISSION EXPIRES
02/26/2024
NOTARY ID: 13055799-4

Amber Langston
Typed or Printed Name of Notary

MY COMMISSION EXPIRES: 02/26/2024

Application Fee Form
(TCEQ-0574)

Application Fee Form

Texas Commission on Environmental Quality

Name of Proposed Regulated Entity: TWELVE OAKS PROFESSIONAL PARK

Regulated Entity Location: NW CORNER OF SH 29 & KAUFFMAN LOOP, GEORGETOWN, TX , 78642

Name of Customer: TWELVE OAKS PROFESSIONAL PARK COMMERCIAL LP

Contact Person: Charbel Dahdah Phone: 281-467-7422

Customer Reference Number (if issued):CN _____

Regulated Entity Reference Number (if issued):RN _____

Austin Regional Office (3373)

☐ Hays ☐ Travis ☒ Williamson

San Antonio Regional Office (3362)

☐ Bexar ☐ Medina ☐ Uvalde

☐ Comal ☐ Kinney

Application fees must be paid by check, certified check, or money order, payable to the **Texas Commission on Environmental Quality**. Your canceled check will serve as your receipt. **This form must be submitted with your fee payment**. This payment is being submitted to:

☒ Austin Regional Office

☐ Mailed to: TCEQ - Cashier
Revenues Section
Mail Code 214
P.O. Box 13088
Austin, TX 78711-3088

☐ San Antonio Regional Office

☐ Overnight Delivery to: TCEQ - Cashier
12100 Park 35 Circle
Building A, 3rd Floor
Austin, TX 78753
(512)239-0357

Site Location (Check All That Apply):

☒ Recharge Zone ☐ Contributing Zone ☐ Transition Zone

Type of Plan	***Size***	***Fee Due***
Water Pollution Abatement Plan, Contributing Zone Plan: One Single Family Residential Dwelling	Acres	$
Water Pollution Abatement Plan, Contributing Zone Plan: Multiple Single Family Residential and Parks	Acres	$
Water Pollution Abatement Plan, Contributing Zone Plan: Non-residential	3.62 Acres	$ 4,000
Sewage Collection System	526 L.F.	$ 263
Lift Stations without sewer lines	Acres	$
Underground or Aboveground Storage Tank Facility	Tanks	$
Piping System(s)(only)	Each	$
Exception	Each	$
Extension of Time	Each	$

Signature: _____ Date: 9/5/2023

Application Fee Schedule

Texas Commission on Environmental Quality
Edwards Aquifer Protection Program 30 TAC Chapter 213 (effective 05/01/2008)

Water Pollution Abatement Plans and Modifications

Contributing Zone Plans and Modifications

Project	*Project Area in Acres*	*Fee*
One Single Family Residential Dwelling	< 5	$650
Multiple Single Family Residential and Parks	< 5 5 < 10 10 < 40 40 < 100 100 < 500 ≥ 500	$1,500 $3,000 $4,000 $6,500 $8,000 $10,000
Non-residential (Commercial, industrial, institutional, multi-family residential, schools, and other sites where regulated activities will occur)	< 1 1 < 5 5 < 10 10 < 40 40 < 100 ≥ 100	$3,000 $4,000 $5,000 $6,500 $8,000 $10,000

Organized Sewage Collection Systems and Modifications

Project	*Cost per Linear Foot*	*Minimum Fee-Maximum Fee*
Sewage Collection Systems	$0.50	$650 - $6,500

Underground and Aboveground Storage Tank System Facility Plans and Modifications

Project	*Cost per Tank or Piping System*	*Minimum Fee-Maximum Fee*
Underground and Aboveground Storage Tank Facility	$650	$650 - $6,500

Exception Requests

Project	*Fee*
Exception Request	$500

Extension of Time Requests

Project	***Fee***
Extension of Time Request	$150

Check Payable to the "Texas Commission on Environmental Quality"

Core Data Form
(TCEQ-10400)

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		**RN**

SECTION II: Customer Information

4. General Customer Information	**5. Effective Date for Customer Information Updates** (mm/dd/yyyy)	
☒ New Customer ☐ Update to Customer Information ☐ Change in Regulated Entity Ownership ☐ Change in Legal Name (Verifiable with the Texas Secretary of State or Texas Comptroller of Public Accounts)		
The Customer Name submitted here may be updated automatically based on what is current and active with the Texas Secretary of State (SOS) or Texas Comptroller of Public Accounts (CPA).		
6. Customer Legal Name *(If an individual, print last name first: eg: Doe, John)*		*If new Customer, enter previous Customer below:*
TWELVE OAKS PROFESSIONAL PARK COMMERCIAL LP		

7. TX SOS/CPA Filing Number	**8. TX State Tax ID** (11 digits)	**9. Federal Tax ID** (9 digits)	**10. DUNS Number** *(if applicable)*
804811306	32087223320		

11. Type of Customer:	☐ Corporation	☐ Individual	Partnership: ☐ General ☒ Limited
Government: ☐ City ☐ County ☐ Federal ☐ Local ☐ State ☐ Other		☐ Sole Proprietorship	☐ Other:

12. Number of Employees	**13. Independently Owned and Operated?**
☒ 0-20 ☐ 21-100 ☐ 101-250 ☐ 251-500 ☐ 501 and higher	☒ **Yes** ☐ **No**

14. Customer Role (Proposed or Actual) – *as it relates to the Regulated Entity listed on this form. Please check one of the following*

☐ Owner ☐ Operator ☒ Owner & Operator ☐ Other:
☐ Occupational Licensee ☐ Responsible Party ☐ VCP/BSA Applicant

15. Mailing Address:	14205 N.MOPAC EXPRESSWAY, SUITE 450						
	City	AUSTIN	**State**	TX	**ZIP**	78728	**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.)*

TWELVE OAKS PROFESSIONAL PARK

23. Street Address of the Regulated Entity: ***(No PO Boxes)***	2021 Kauffman Loop							
	City	LIBERTY HILL	**State**	TX	**ZIP**	78642	**ZIP + 4**	
24. County	WILLIAMSON							

If no Street Address is provided, fields 25-28 are required.

25. Description to Physical Location:	NW CORNER OF SH29 & KAUFFMAN LOOP				
26. Nearest City			**State**		**Nearest ZIP Code**
LIBERTY HILL			TX		78642

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:	30.638132°		**28. Longitude (W) In Decimal:**	-97.818870°	
Degrees	Minutes	Seconds	Degrees	Minutes	Seconds
30	38	17.2752	97	49	7.932

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)
9111		921110	

33. What is the Primary Business of this entity? *(Do not repeat the SIC or NAICS description.)*

Office Park

34. Mailing Address:	**14205 N.MOPAC EXPRESSWAY, SUITE 450**							
	City		**State**		**ZIP**		**ZIP + 4**	
35. E-Mail Address:								

36. Telephone Number	**37. Extension or Code**	**38. Fax Number** *(if applicable)*
( ) -		( ) -

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
		11003588 approved 7/21/2023 (Related to overall subdivision)		
☐ 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:	NICK SANDLIN, P.E.	**41. Title:**	PROFESSIONAL ENGINEER

42. Telephone Number	**43. Ext./Code**	**44. Fax Number**	**45. E-Mail Address**
(806 **)** 679-7303		**( )** -	nick@sandlinservices.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:	SANDLIN SERVICES, LLC	**Job Title:**	PRINCIPAL AND PROFESSIONAL ENGINEER
Name *(In Print):*	NICK SANDLIN, P.E.	**Phone:**	**(** 806 **)** 679- **7303**
Signature:		**Date:**	9/5/23