TCEQ WPAP & SCS APPLICATION

for

SANTA RITA RANCH NEIGHBORHOOD CENTER
WILLIAMSON COUNTY, TEXAS

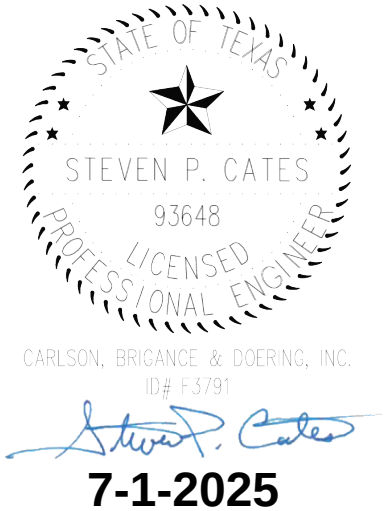
Prepared For:

Santa Rita Commercial, LLC
Attn: James Edward Horne
1700 Cross Creek Lane, Suite 100
Liberty Hill, TX 78642
(512) 502-2050

Prepared By:

Steven P. Cates, P.E.
CARLSON, BRIGANCE & DOERING, INC.
5701 West William Cannon Drive
Austin, Texas 78749
(512) 280-5160
Firm #F3791

Carlson, Brigance & Doering, Inc.
Civil Engineering ◆ Surveying



7-1-2025

CBD No. 5711
July 2025

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Texas Commission on Environmental Quality

Edwards Aquifer Application Cover Page

Our Review of Your Application

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

Administrative Review

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

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

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

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

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

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

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

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

Technical Review

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

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

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

3. We evaluate the application for technical completeness and contact the applicant and agent via Notice of Deficiency (NOD) to request additional information and identify technical deficiencies. There are two deficiency response periods available to the applicant. There are 14 days to resolve deficiencies noted in the first NOD. If a second NOD is issued, there is an additional 14 days to resolve deficiencies. If the response to the second notice is not received, is incomplete or inadequate, or provides new information that is incomplete or inadequate, the application must be withdrawn or will be denied. Please note that because the technical review is underway, whether the application is withdrawn or denied **the application fee will be forfeited**.

4. The program has 90 calendar days to complete the technical review of the application. If the application is technically adequate, such that it complies with the Edwards Aquifer rules, and is protective of the Edwards Aquifer during and after construction, an approval letter will be issued. Construction or other regulated activity may not begin until an approval is issued.

Mid-Review Modifications

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

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

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

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

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

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

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

1. Regulated Entity Name: **Santa Rita Ranch Neighborhood Center**					**2. Regulated Entity No.:**			
3. Customer Name: Santa Rita Commercial, LLC.					**4. Customer No.:604360008**			
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):**		5.82
9. Application Fee:	$3650.00		**10. Permanent BMP(s):**			Wet Basin		
11. SCS (Linear Ft.):	565		**12. AST/UST (No. Tanks):**			N/A		
13. County:	Williamson		**14. Watershed:**			Middle 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 _x_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. Santa Rita KC, LLC / Carlson, Brigance, & Doering, Inc.
Print Name of Customer/Authorized Agent  **7-1-2025** Signature of Customer/Authorized Agent Date

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

General Information Form

Texas Commission on Environmental Quality

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

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

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

Signature

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

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

Date: 07/01/2025

Signature of Customer/Agent:

Project Information

1. Regulated Entity Name: Santa Rita Ranch Neighborhood Center
2. County: Williamson
3. Stream Basin: Middle Fork San Gabriel River
4. Groundwater Conservation District (If applicable): N/A
5. Edwards Aquifer Zone:

   ☒ Recharge Zone
   ☐ Transition Zone

6. Plan Type:

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

7. Customer (Applicant):

Contact Person: James Edward Horne
Entity: Santa Rita Commercial, LLC
Mailing Address: 1700 Cross Creek Lane, Suite 100
City, State: Liberty Hill, TX Zip: 78642
Telephone: 512-502-2050 FAX: _____
Email Address: ed@srraustin.com

8. Agent/Representative (If any):

Contact Person: Steven P. Cates, P.E.
Entity: Carlson, Brigance & Doering, Inc.
Mailing Address: 5701 W. William Cannon Blvd.
City, State: Austin, Texas Zip: 78749
Telephone: 512-280-5160 FAX: 512-280-5165
Email Address: steve@cbdeng.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 the 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.

North of Highway 29, just west of Ronald Reagan Blvd at E. Santa Rita Blvd.

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: 09/01/2025

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.

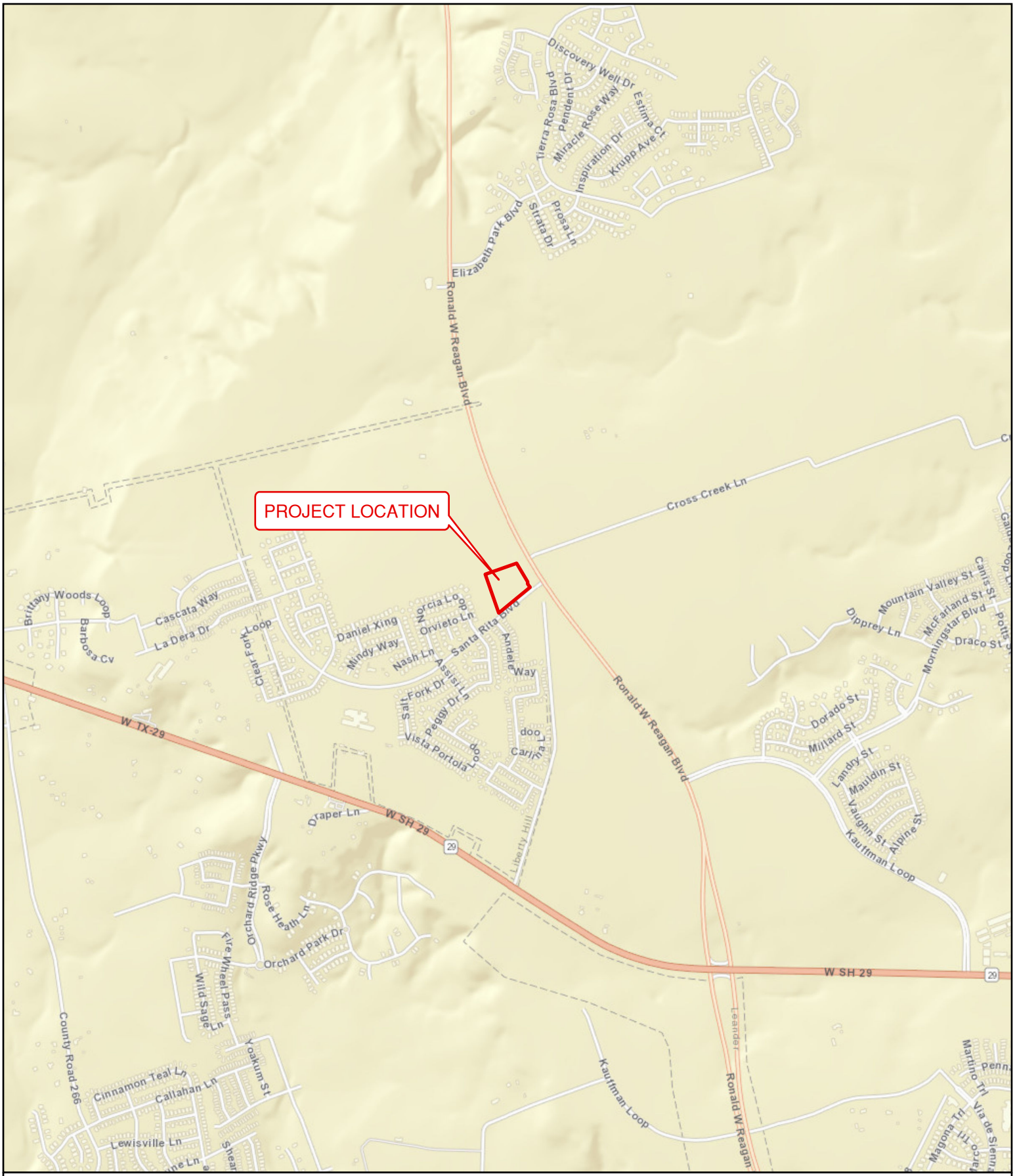
General Information Form
ATTACHMENT A

TCEQ WPAP & SCS APPLICATION

Santa Rita Ranch Neighborhood Center

Williamson County, Texas

ROAD MAP



Santa Rita Ranch

Water Pollution Abatement Plan Map

Leander NE Quadrant

Subject Boundary

N W E S

Carlson, Brigance & Doering, Inc.
Civil Engineering ❖ Surveying

0 1,000 2,000 4,000 Feet

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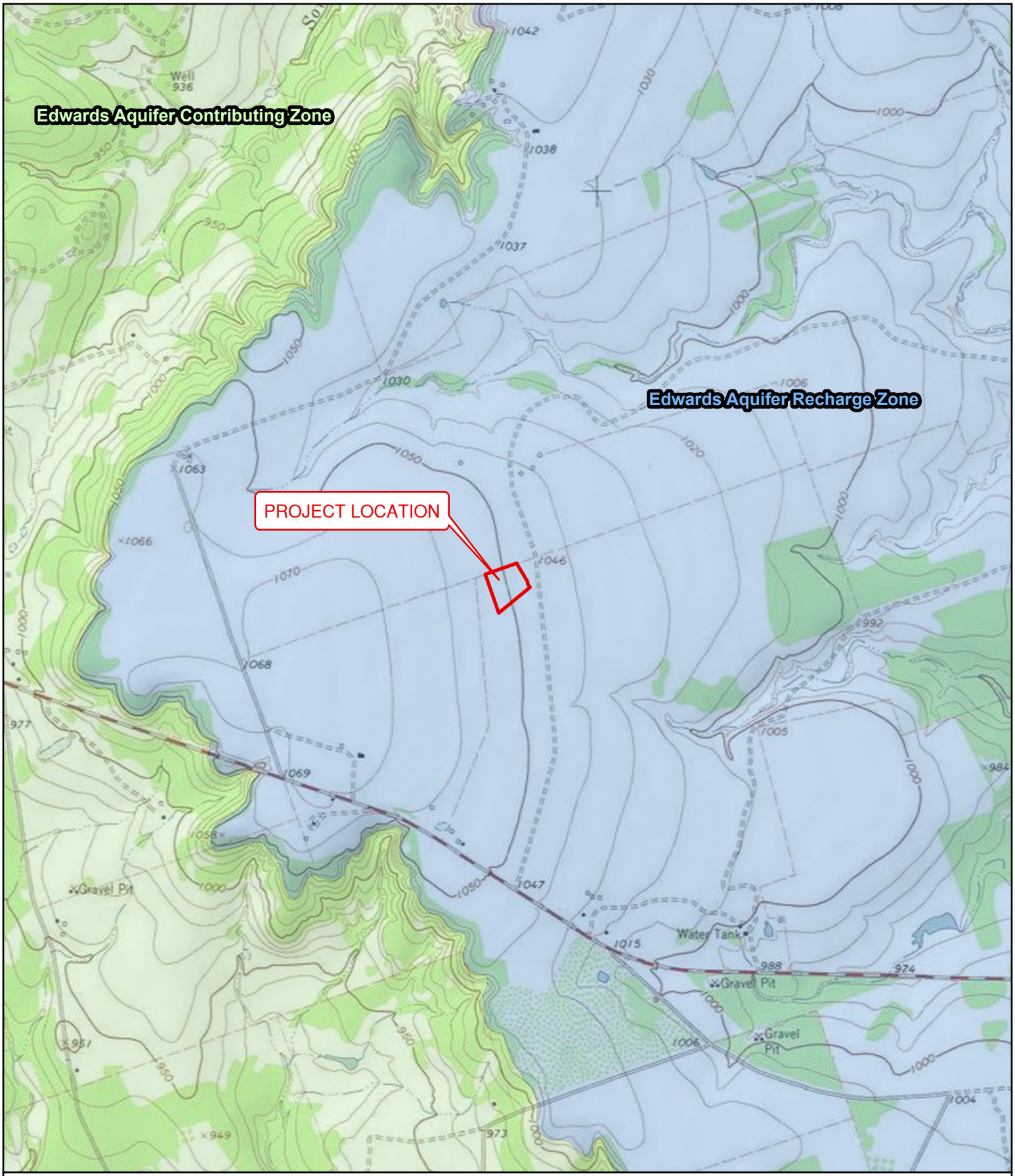
General Information Form
ATTACHMENT B

TCEQ WPAP & SCS APPLICATION

Santa Rita Ranch Neighborhood Center

Williamson County, Texas

USGS / EDWARDS AUQUIFER RECHARGE ZONE MAP



Santa Rita Ranch

Water Pollution Abatement Plan Map

Leander NE Quadrant

Subject Boundary

N

W E

S

0 1,000 2,000 4,000

Feet

Carlson, Brigance & Doering, Inc.

Civil Engineering ❖ Surveying

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General Information Form
ATTACHMENT C

TCEQ WPAP & SCS APPLICATION

Santa Rita Ranch Neighborhood Center

Williamson County, Texas

Project Description:

Santa Rita Ranch Neighborhood Center is a 5.82-acre commercial development with 218 parking spots, including 6 ADA parking spots. The project is located to the North of Santa Rita Boulevard and Santa Rita Ranch MUD 19, Section 15, to the East of Middlebrook Ranch Section 1, and to the West of Ronald Reagan Blvd. The project is located within the City of Liberty Hill ETJ, in Williamson County, Texas. This project includes 0.27 acres of parking lot, 1,370 linear feet of water main line, and 1,162 linear feet of 2" SCH 40 PVC ASTM D1785 wastewater main line.

The proposed wastewater will flow into an existing SCS approved gravity system to the Liberty Hill Wastewater Treatment Plant via the Santa Rita Ranch Phase 4 Lift Station.

The site may have soil imported. The fill material shall consist of crushed limestone, select fill, and topsoil. The fill material will be used to facilitate drainage, roadway construction, revegetation of the property, and to elevate the building foundations.

This project is located within the Edwards Aquifer Recharge Zone. Flows were calculated using the National Resource Conservation hydrologic method. Water Quality will be provided by an existing wet pond, which will be expanded with this development.

Within the 5.82-acre improvement area, approximately 3.51 acres of impervious cover will be installed (60.5% of total project site). The existing Middlebrook Ranch 1 Wet Pond has been designed in accordance with the July 2005 TCEQ RG-348. It has been sized to treat and detain for the existing subdivision and is proposed to be expanded to serve the proposed site.

There are no offsite areas as part of this project.

The proposed use of this site is light retail. Prior to this proposed development, this site has been raw land. There is no previous development to this site.

Horizon™
Environmental Services, Inc.

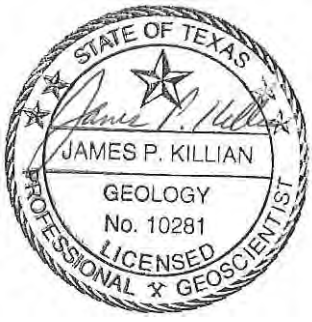
GEOLOGIC ASSESSMENT
SANTA RITA NORTH, C7 RANCH, AND MIDDLEBROOK
WILLIAMSON COUNTY, TEXAS
HJN 130065 GA

PREPARED FOR:

SANTA RITA C7 INVESTMENTS, LLC
AUSTIN, TEXAS

PREPARED BY:

HORIZON ENVIRONMENTAL SERVICES, INC.



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.

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Geologic Assessment

Texas Commission on Environmental Quality

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

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

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

Signature

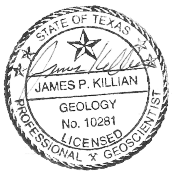
To the best of my knowledge, the responses to this form accurately reflect all information requested concerning the proposed regulated activities and methods to protect the Edwards Aquifer. My signature certifies that I am qualified as a geologist as defined by 30 TAC Chapter 213.

Print Name of Geologist: James Killian Telephone: 512 328-2430

Date: 19 December 2019 Fax: 512 328-1804

Representing: Horizon Environmental Services, Inc. and TBPG Firm Registration No. 50488
(Name of Company and TBPG or TBPE registration number)

Signature of Geologist:



Regulated Entity Name: Santa Rita North, C7 Ranch, and Middlebrook; Williamson County, Texas

Project Information

1. Date(s) Geologic Assessment was performed: 26 June 2014; 2, 7-9, 14, 16, 17, 21, 23, 24, 28-31 July 2014; 4-8, 11, 12, and 15 August 2014
2. Type of Project:

   ☐ WPAP ☐ AST
   ☒ SCS ☐ UST
3. Location of Project:

   ☒ Recharge Zone
   ☐ Transition Zone

☒ Contributing Zone within the Transition Zone

4. ☒ **Attachment A - Geologic Assessment Table**. Completed Geologic Assessment Table (Form TCEQ-0585-Table) is attached.

5. ☒ Soil cover on the project site is summarized in the table below and uses the SCS Hydrologic Soil Groups* (Urban Hydrology for Small Watersheds, Technical Release No. 55, Appendix A, Soil Conservation Service, 1986). If there is more than one soil type on the project site, show each soil type on the site Geologic Map or a separate soils map.

Table 1 - Soil Units, Infiltration Characteristics and Thickness

Soil Name	Group*	Thickness(feet)
BkE - Brackett gravelly clay loam, 3-12% slopes	C	1-4
BkG - Brackett-Rock outcrop Real complex, 8-30% slopes	C	1-2
CfA - Crawford clay, 0-1% slopes	D	1-2
CfB - Crawford clay, 1-3% slopes	D	1-2
DnB - Denton silty clay, 1-3% slopes	D	1-3

** Soil Group Definitions (Abbreviated)*

A. *Soils having a high infiltration rate when thoroughly wetted.*
B. *Soils having a moderate infiltration rate when thoroughly wetted.*
C. *Soils having a slow infiltration rate when thoroughly wetted.*
D. *Soils having a very slow infiltration rate when thoroughly wetted.*

6. ☒ **Attachment B – Stratigraphic Column**. A stratigraphic column showing formations, members, and thicknesses is attached. The outcropping unit, if present, should be at the top of the stratigraphic column. Otherwise, the uppermost unit should be at the top of the stratigraphic column.

7. ☒ **Attachment C – Site Geology**. A narrative description of the site specific geology including any features identified in the Geologic Assessment Table, a discussion of the potential for fluid movement to the Edwards Aquifer, stratigraphy, structure(s), and karst characteristics is attached.

8. ☒ **Attachment D – Site Geologic Map(s)**. The Site Geologic Map must be the same scale as the applicant's Site Plan. The minimum scale is 1": 400'

   Applicant's Site Plan Scale: 1" = 400'

Site Geologic Map Scale: 1" = 400'
Site Soils Map Scale (if more than 1 soil type): 1" = 2300'

9. Method of collecting positional data:

   ☒ Global Positioning System (GPS) technology.
   ☐ Other method(s). Please describe method of data collection: _____

10. ☒ The project site and boundaries are clearly shown and labeled on the Site Geologic Map.

11. ☒ Surface geologic units are shown and labeled on the Site Geologic Map.

12. ☒ Geologic or manmade features were discovered on the project site during the field investigation. They are shown and labeled on the Site Geologic Map and are described in the attached Geologic Assessment Table.

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

13. ☒ The Recharge Zone boundary is shown and labeled, if appropriate.

14. All known wells (test holes, water, oil, unplugged, capped and/or abandoned, etc.): If applicable, the information must agree with Item No. 20 of the WPAP Application Section.

    ☒ There are 14 (#) wells present on the project site and the locations are shown and labeled. (Check all of the following that apply.)
    ☐ The wells are not in use and have been properly abandoned.
    ☒ The wells are not in use and will be properly abandoned.
    ☒ The wells are in use and comply with 16 TAC Chapter 76.
    ☒ There are no wells or test holes of any kind known to exist on the project site.

Administrative Information

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

TABLE 1 – SURFACE SOILS, CON'T.

Soil Units, Infiltration Characteristics & Thickness		
Soil Name	Group*	Thickness (feet)
DnC - Denton silty clay, 3-5% slopes	D	1 - 3
DoC - Doss silty clay, moist, 1-5% slopes	C	2 - 4
EaD - Eckrant cobbly clay, 1-8% slopes	D	0 - 1
EeB - Eckrant extremely stony clay, 0-3% slopes	D	1 – 1.5
ErE - Eckrant-Rock outcrop complex, rolling	D	0 – 1.5
ErG - Eckrant-Rock outcrop complex, hilly	D	0 – 1.5
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 - 3
SuB - Sunev silty clay loam, 1-3% slopes	B	3 - 5

* 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.

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 subject site consists of approximately 2976 acres of mostly undeveloped rangeland, farmland, and woodland that are currently used to raise beef cattle and/or for row crop production in West-Central Williamson County, Texas. The site is divided into 3 separate tracts identified as Santa Rita North (±1472 acres), C7 Ranch (±1100 acres), and Middlebrook (±404 acres). Access to the site is along Ronald Reagan Boulevard, and/or State Highway 29 (Appendix A, Figure 1). One newly developing residential subdivision is present to the west of Ronald Reagan Boulevard within the Middlebrook tract. A second residential development is under construction along the east side of Ronald Reagan Boulevard at Elizabeth Park Road, within a portion of Santa Rita North. No residential developments are currently under construction within C7 Ranch. Surrounding land use is predominantly undeveloped rangeland, farmland, and/or rural residential.

2.2 TOPOGRAPHY AND SURFACE WATER

The subject site is situated on gently to steeply sloping terrain within the North and Middle Forks of the San Gabriel River watershed (Appendix A, Figures 2 and 3). Surface elevations on the subject site vary from a minimum of approximately 840 feet above mean sea level (amsl) along Sowes Branch at the northern site boundary of Santa Rita North to a maximum of approximately 1070 feet amsl at the west side of Middlebrook. Drainage on most of the site occurs primarily by overland sheet flow, in multiple directions based on location, near several unnamed tributaries of the North and Middle Forks of the San Gabriel River.

2.3 EDWARDS AQUIFER ZONE

As shown in Appendix A, Figure 2, most of the subject site (approximately 2392 acres) is found within the Edwards Aquifer Recharge Zone, as mapped by TCEQ Recharge Zone Boundary Maps. However, approximately 584 acres of Santa Rita North is located outside of the recharge zone and is mapped within the Edwards Aquifer Contributing Zone (TCEQ, 2014).

2.4 SURFACE SOILS

Mapping by the Natural Resources Conservation Service (NRCS, 2014) shows approximately 16 soil mapping units within the subject site (Appendix A, Figure 4) associated with the soil series described below.

Brackett gravelly clay loam, 3 to 12% slopes (BkE) occurs within Santa Rita North. This soil has a moderately alkaline, pale brown, clay loam surface layer about 5 inches thick with about 15% cover of limestone fragments that range from 4 to 12 inches in diameter. The subsoil, to 16 inches, is moderately alkaline, pale yellow clay loam with about 5% weakly cemented fine limestone fragments. The underlying layer is very pale brown, interbedded, calcareous loam and limestone. This soil is well-drained, permeability is moderately slow, and available water capacity is very low. Runoff is rapid.

Brackett-Rock outcrop Real complex, 8 to 30% slopes (BkG) occurs within Santa Rita North and consists of hilly to steep Brackett soils and Rock outcrop on uplands. This complex is made up of about 50% Brackett soils, about 25% Rock outcrop, and 25% other soils. Typically, the Brackett soils have a moderately alkaline, grayish-brown, gravelly, silty clay loam surface layer about 4 inches thick. About 60 to 80% of the surface is covered with limestone pebbles, cobbles, stones, and a few boulders. The subsoil, which extends to a depth of about 12 inches, is moderately alkaline, light brownish-gray, gravelly, silty clay loam. The underlying material is interbedded limestone and marl. The Brackett soils are well-drained. Runoff is rapid, and available water capacity is very low. Erosion is a moderate to severe hazard. Rock outcrop consists of narrow horizontal bands and random areas of marl outcrop. Loose cobbles, stones, and boulders are common on the surface.

Crawford clay, 0 to 1% slopes (CfA) occurs along the southwest side of Middlebrook. Typically, the surface layer is neutral, dark grayish-brown clay about 6 inches thick. The layer below that, to 32 inches, is neutral, dark brown clay. The substratum is fractured, whitish limestone. This soil is well-drained, and permeability is very slow. This soil swells when wet and shrinks when dry. Water enters the soil rapidly when the soil is dry and very slowly when the soil is moist. The available water capacity is low, and runoff is slow.

Crawford clay, 1 to 3% slopes (CfB): This gently sloping soil is on footslopes and at the heads of drainageways on uplands at Santa Rita North and C7 Ranch. 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.

Denton silty clay, 1 to 3% slopes (DnB): This soil occurs near Sowes Branch within Santa Rita North. Typically, the upper layer is dark brown, silty clay about 33 inches thick. The layer below that, to 36 inches, is very pale brown, silty clay loam. The underlying material is fractured limestone and limy material. The soil is calcareous and moderately alkaline throughout. It is well-drained and slowly permeable soil. Runoff is medium, and the available water capacity is medium. This soil cracks when dry, and erosion is a slight hazard.

Denton silty clay, 3 to 5% slopes (DnC) occurs on either side of Sowes Branch within Santa Rita North. Typically, the upper layer is dark brown, silty clay about 18 inches thick. The subsoil, to a depth of about 25 inches, is light brown, silty clay. The layer below that, to 32 inches, is pale brown, silty clay loam. The underlying material is limestone interbedded with weathered limestone and limy material. The soil is calcareous and moderately alkaline. This soil is well-drained, and runoff is medium. Permeability is slow. When dry, the soil cracks and water enters the soil rapidly; but, when the soil is wet, water enters it slowly. The available water capacity is medium, and erosion is a moderate hazard.

Doss silty clay, 1 to 5% (DoC). This gently sloping soil occurs on uplands within the northwest corner of Santa Rita North. Typically, this soil has a dark grayish-brown, silty clay surface layer about 9 inches thick. The subsoil, to 19 inches, is brown, silty clay loam. The underlying material is weakly cemented limy earth interbedded with fragments of limestone. This soil is calcareous and moderately alkaline. This soil is well-drained and has a low available water capacity. Permeability is moderately slow, and runoff is medium. Erosion is a moderate hazard.

Eckrant cobbly clay, 1 to 8% slopes (EaD) occurs within Santa Rita North. This soil has a surface layer about 13 inches thick. The upper part is dark grayish-brown, cobbly clay and the lower part is dark brown, cobbly clay. The underlying material is coarsely fractured, indurated limestone. This soil is calcareous and moderately alkaline. The surface has about 50% cover of limestone fragments that are mostly 4 to 8 inches across. This soil is well-drained, permeability is moderately slow, and runoff is rapid. The available water capacity is very low.

Eckrant extremely stony clay, 0 to 3% slopes (EeB) occurs within Middlebrook and Santa Rita North. Typically, this soil has an extremely stony, very dark gray, clay surface layer about 11 inches thick. The underlying material is indurated limestone. About 25% of the surface is covered with fragments of limestone; most are about 6 inches across, but range from 3 inches to 3 feet across and are as much as 10 inches thick. The soil is calcareous, moderately alkaline, and well-drained. Permeability is moderately slow, and surface runoff is rapid. The fragments of limestone on the surface help to prevent erosion. The available water capacity is very low because of the shallowness of the soil and stones in the soil.

Eckrant-Rock outcrop complex, rolling (ErE) occurs within Santa Rita North and consists of Eckrant soils and Rock outcrop located along hills, ridges, and on sides of drainageways on uplands. This complex is made up of about 70% Eckrant soils, 15% Rock outcrop, and 15% other soils. Typically, the surface layer of Eckrant soils is calcareous, moderately alkaline, dark grayish-brown, extremely stony clay about 8 inches thick. The underlying material is fractured, indurated limestone. Fragments of limestone from 6 inches to 2 feet across cover about 35% of the surface. Rock outcrop consists of exposed limestone bedrock in narrow bands within areas of Eckrant soils. Loose cobbles and stones on the surface are common. Permeability is moderately slow, and surface runoff is rapid. The available water capacity is very low.

Eckrant-Rock outcrop complex, hilly (ErG) occurs within the northeast corner of Santa Rita North, consisting of Eckrant soils and Rock outcrop, mostly along major streams where erosion has formed sharp hills, ridges, and ravines. This complex is made up of about 41% Eckrant soils, 38% Rock outcrop, and 21% other soils. Typically, the Eckrant soils have a calcareous, moderately alkaline, extremely stony, dark grayish-brown, silty clay loam surface layer about 11 inches thick. The underlying material is indurated limestone. About 55% of the soil surface is covered with fragments of limestone that are 1 to 6 feet across. Rock outcrop consists of exposed limestone bedrock below the crests of hills and ridges. Loose cobbles and stones on the surface are common. The other soil included in this complex is Doss. The soils are well-drained, permeability is moderately slow, and surface runoff is rapid. The available water capacity is low.

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 heads of drains, and in shallow valleys on uplands throughout the site. 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.

Georgetown clay loam, 0 to 2% slopes (GeB): This nearly level to gently sloping soil is on uplands along the southeast part of C7 Ranch. 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, and surface runoff is medium. The available water capacity is low.

Georgetown stony clay loam, 1 to 3% slopes (GsB). This gently sloping soil occurs within upland areas of Santa Rita North and C7 Ranch. Typically, this soil has a slightly acidic, brown, stony clay loam surface layer about 7 inches thick and few 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.

Sunev silty clay loam, 1 to 3% slopes (SuB) occurs along the stream terraces of Sowes Branch at Santa Rita North. The upper layer is dark grayish-brown, silty clay loam about 18 inches thick. The subsoil, to 52 inches, is light yellowish-brown silty clay loam. The underlying layer, which extends to 60 inches, is reddish-yellow silty clay loam and has many soft masses and concretions of calcium carbonate. This soil is calcareous and moderately alkaline throughout. This soil is well-drained, permeability is moderate, and surface runoff is medium. The available water capacity is moderate, and erosion is a slight hazard (NRCS, 2014).

2.5 GEOLOGY

A review of existing literature shows most of the subject site is underlain by the undifferentiated Edwards Limestone Formation (Ked) (UT-BEG, 2014) with an estimated maximum thickness of about 85 feet at higher elevations located along the east sides of Santa Rita North and C7 Ranch. The Edwards Formation consists mostly of gray to light brownish-gray, thin to medium-bedded, dense dolomite, dolomitic limestone, and limestone.

The Comanche Peak Limestone Formation (Kc) underlies the Edwards and crops out on the steep, north-facing slopes located above Sowes Branch within Santa Rita North. It is approximately 50 feet thick and consists of white, soft, nodular limestone interbedded with marl and calcareous clay.

Underlying the Comanche Peak Limestone is the Walnut Formation (Kw), which crops out along the moderate to gently sloping areas located near Sowes Branch within Santa Rita North. The uppermost 50 ft of the Walnut is named the Keys Valley Marl Member (Kwkv) and consists of cream-colored, fossiliferous marl with some thin interbeds of soft limestone. The Keys Valley Marl is underlain by the Cedar Park Limestone (Kwcp) and Bee Creek Marl (Kwbc) members of the Walnut Formation.

The Upper Member of the Glen Rose Limestone (Kgru) crops out in the northwest corner of Santa Rita North with an estimated thickness of up to 220 feet. It consists of alternating resistant and recessive beds of light gray to yellowish-gray limestone, dolomite, and marl.

An overlying mantle of recent (Quaternary-age) terrace deposits (QTa) occurs throughout most of the Middlebrook tract and at the West-Central part of C7 Ranch with an estimated thickness of less than 10 feet. These deposits consist of clay, silt, sand, and gravel. In addition, thin deposits (less than 10 feet) of terraces along streams (Qt) occur within an unnamed tributary at the South-Central portion of C7 Ranch. Terraces along streams are predominately gravel, sand, silt, and clay. Thickness varies depending on distance from the floodplain source.

The subject site is located several miles west of the Balcones Fault Zone. However, available geologic reports indicate the immediate area has 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 located through a portion of Santa Rita North within the Contributing Zone, trending from southwest to northeast at N25-30°E (UT-BEG, 1995 and 2014). In general, the rock strata beneath the site dip to the east-southeast at approximately 35 to 45 feet per mile.

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 (QTa)	--	Up to 10	Gravel, sand, silt, and clay
Quaternary	--	Terraces along streams (Qt)	--	Up to 10	Gravel, sand, silt, and clay in various proportions, with gravel more prominent in the older, higher terraces
Lower Cretaceous	Edwards Aquifer	Edwards Formation (Ked)	--	85	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)	Keys Valley Marl (Kwkv) Cedar Park Limestone (Kwcp) Bee Cave Marl (Kwbc)	50 40 35	Keys Valley Marl - chalky, soft, white, with marine megafossils; no cave development. Cedar Park Ls - lithologically and faunally similar to Comanche Peak Ls; low to moderate cave development Bee Cave Marl - lithologically and faunally similar to Keys Valley Marl, except Exogyra texana more abundant and ammonites are scarce; low cave development
Lower Cretaceous	Confining Unit	Glen Rose Formation (Kgr)	Upper (Kgru)	220	Alternating resistant and recessive beds of limestone, dolomite, and marl; limestone is aphanitic to fine-grained, hard to soft and marly, light gray to yellowish-gray; dolomite is fine-grained, porous, yellowish-brown; marine megafossils include molluscan steinherns, rudistids, oysters, and echinoids; upper part is relatively thinner bedded, more dolomitic, and less fossiliferous than the lower part; some surface 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 and only 1 well within 0.5 miles from the subject site (TWDB, 2014). However, there was evidence of numerous water wells present during the field investigation. A total of 14 water wells were identified (M-4, M-6 to M-10, M-13, M-14, M-16, M-19, and M-20 to M-23). Approximately 6 of these wells (M-8, M-9, M-10, M-13, M-16, and M-21) appear to be currently unused and/or abandoned. Several recently drilled water wells (M-6, M-7, M-14, M-20, and M-22) were observed during the field investigation. The results of this survey do not preclude the existence of additional unused/abandoned wells at the subject site.

Private water well (No. 5818403) was found within 0.5 miles from the subject site (TWDB, 2014). This water well is reported to have been completed in the Glen Rose Formation (Upper and/or Middle Trinity aquifers) at a total depth of 152 feet and is powered by a windmill for domestic use.

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 with support staff on 26 June 2014; 2, 7 to 9, 14, 16, 17, 21, 23, 24, and 28 to 31 July 2014; 4 to 8, 11, 12, and 15 August 2014. Previous geologic assessments were conducted on portions of the subject site at Santa Rita North by SWCA Environmental Consultants (SWCA, 2006) and J. Jackson Harper, PG Geological and Hydrogeological Consulting (Harper, 2013). SWCA identified approximately 9 geologic features (SF-11 and SF-13 to SF-20) and 1 manmade feature (SF-12, now M-13). Harper identified 1 geologic feature (G-02) and 1 manmade feature (G-01).

A total of 38 natural geologic features (C7 Ranch: C-1 to C-8; Santa Rita North: G-02, SF-11, SF-13 to SF-20, and SR-1 to SR-20) were identified within the subject site. No geologic features were found at Middlebrook. Geologic features at the subject site are prefixed with the following nomenclature: SF, SR, and G for Santa Rita North and C for C7 Ranch.

A total of 25 manmade features (G-01 and M-1 to M-24) were identified at the subject site, 11 of which are stock ponds (G-01, M-1 to M-3, M-5, M-11, M-12, M-15, M-17, M-18, and M-24) and 14 of which are water wells (previously discussed).

Approximately 7 springs (SPG-1 to SPG-7) were identified at the subject site at Santa Rita North within Sowes Branch; however, these springs (discharge features) are located within the

contributing zone of the Edwards Aquifer. No apparent springs were identified within the recharge zone at the subject site. However, the closest spring known to be occupied by a federally listed salamander species is approximately 2.09 miles northeast of the subject site. According to the Texas Parks and Wildlife Department (TPWD) Natural Diversity Database (NDD) data, Walnut Spring, which is located within the North Fork of the San Gabriel River (upstream of Lake Georgetown), is documented habitat for the federally listed Georgetown Salamander species (Eurycea naufragia) (NDD, 2014).

Geologic features at the subject site are described below. 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.

C7 RANCH GEOLOGIC FEATURES

Geologic Feature C-1: Sinkhole measuring approximately 10 feet in diameter x 2.5 feet deep with 2 semi-open drainage portal openings (0.5 and 1 foot in diameter x 1 foot deep) located along its weathered rock/clay 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. This feature has an intermediate infiltration rate and a surface runoff catchment of less than 0.4 acres.

Geologic Feature C-2: Sinkhole measuring approximately 8 feet long x 5 feet wide x 1.5 feet deep with an apparent animal burrow opening amongst loose rocks and soil. No air flow conductivity was noted at the opening. Probing with a steel rod encountered loose to firm clay soil and cobbles about 2.5 feet below the feature's floor. This feature has a low infiltration rate and a surface runoff catchment of less than 0.1 acres.

Geologic Feature C-3: Two solution cavities spaced about 15 feet apart within an open, scattered cactus area. The larger cavity measures approximately 1.8 feet long x 1 foot wide x 1.5 feet deep and the smaller (due west/northwest) measures 0.3 feet in diameter x 1 foot deep. Slight air flow conductivity was noted at the openings. Probing with a steel rod encountered loose cobbles and soil about 2 feet below the feature's floor. This feature has an intermediate infiltration rate and a surface runoff catchment of less than 0.4 acres.

Geologic Feature C-4: Solution cavity in open area measuring approximately 1.5 feet long x 0.5 feet wide x 1 foot deep with smaller open drainage portal openings amongst loose cobbles and soil. Slight air flow conductivity was noted. Probing with a steel rod encountered a snake skin and loose cobbles about 2 feet below the feature's floor. This feature has an intermediate infiltration rate and a surface runoff catchment of less than 0.4 acres.

Geologic Feature C-5: Two small solution cavities spaced about 6 feet apart near a small cedar elm tree. The larger cavity measures approximately 1 foot long x 0.3 feet wide x 1 foot deep and the smaller (due southeast next to the tree trunk) measures 0.3 feet in diameter x 1 foot deep. Slight air flow conductivity was noted at the openings. Probing with a steel rod encountered loose

cobbles and soil about 2 feet below the feature's floor. This feature has an intermediate infiltration rate and a surface runoff catchment of less than 0.4 acres.

Geologic Feature C-6: Solution-enlarged fracture (azimuth:N215°W) measuring approximately 2.5 feet long x 0.5 feet wide x 1 foot deep with smaller semi-open drainage portal openings amongst loose cobbles and soil. No air flow conductivity was noted. Probing with a steel rod encountered firm soil and cobbles about 2 feet below the feature's floor. This feature has a low to intermediate infiltration rate and a surface runoff catchment of less than 0.4 acres.

Geologic Feature C-7: Large upland sinkhole with a cedar elm tree near its center that is covered with grape vines. The sinkhole measures approximately 18 feet in diameter x 4 feet deep with 1 open drainage portal (1 foot long x 0.5 feet wide x 1 foot deep) located along its rock/clay floor. Very slight air flow conductivity was noted at the opening. Probing with a steel rod encountered clay soil and cobbles about 2 feet below the feature's floor. This feature has an intermediate infiltration rate and a surface runoff catchment of less than 0.4 acres.

Geologic Feature C-8: Next to brush thicket, a solution cavity measuring approximately 1 foot in diameter x 1 feet deep that narrows down to a 0.2 feet x 1 foot deep drainage portal opening. Air flow conductivity was noted. Probing with a steel rod encountered loose cobbles/soil about 2 feet below the feature's floor. This feature has an intermediate infiltration rate and a surface runoff catchment of less than 0.4 acres.

SANTA RITA NORTH GEOLOGIC FEATURES

Geologic Feature G-02: This feature has been previously assessed by J. Jackson Harper, PG, as a closed depression measuring approximately 6 feet long x 6 feet wide x 2.5 feet deep resulting from an apparent animal burrow located beneath roots of adjacent oak trees. At the base of the hole, the burrow continued laterally along a soft, thinly bedded, chalky rock layer for a distance of about 1.5 feet before terminating. The burrow contained loose, dry, clayey soil and leaves over weathered, intact limestone. This feature has a very low infiltration rate and was classified as a non-sensitive feature. No protective measures were proposed for this feature (Harper, 2013).

Geologic Feature SF-11: This feature has been previously assessed by SWCA as an unnamed cave within a sinkhole (SWCA, 2006). It measures approximately 12 feet in diameter x 2.5 feet deep and drops into an open portal about 4 feet long x 3 feet wide x 6 feet deep. Two young vultures were observed nesting inside the entrance, which prevented closer investigation. A few semi-open drainage portals were observed along the entrance drop floor amongst rocks, soil, and cobbles. Slight to moderate air flow conductivity was noted near the entrance drop. Based on the presence of air flow conductivity and a very well-defined sinkhole perimeter, the potential for additional subgrade passage is very probable. This feature meets the requirements to be classified as a potential **cave**, based on it being a natural, underground, open space formed by dissolution of limestone that is large enough for an average-sized person to enter. This feature has a high infiltration rate and an apparent surface runoff catchment greater than 1.6 acres.

Geologic Feature SF-13: This feature has been previously assessed by SWCA as a sinkhole (SWCA, 2006). It measures approximately 10 feet in diameter x 2.5 feet deep and has an open drainage portal near its center about 1 foot long x 0.5 feet wide x 4 feet deep. Slight air flow conductivity was noted. This feature has an intermediate infiltration rate and an apparent surface runoff catchment less than 0.4 acres.

Geologic Feature SF-14: This feature has been previously assessed by SWCA as a sinkhole (SWCA, 2006). It measures approximately 6 feet in diameter x 1.5 feet deep with a large boulder and several smaller boulders within the feature. Small semi-open drainage portals were observed amongst the rocks and loose soil about 0.5 feet in diameter x 1 foot deep. Slight air flow conductivity was noted. This feature has an intermediate infiltration rate and an apparent surface runoff catchment less than 0.4 acres.

Geologic Feature SF-15: This feature has been previously assessed by SWCA as 2 small sinkholes that were partially filled with discarded trash (barbed wire and scrap metal) (SWCA, 2006). However, the feature is actually 1 large sinkhole (~50 feet long x 25 feet wide x 3 feet deep) and 1 open solution cavity (~3 feet long x 1.5 feet wide x 6 feet deep) that is located within the sinkhole's catchment area. Near the center of the sinkhole is a partially filled trash area with an open drainage portal about 5 feet long x 3 feet wide x 4 feet deep. Slight to moderate air flow conductivity was noted amongst the trashed portal opening. The solution cavity is located about 20 feet due southeast from the lowest part of the sinkhole with some discarded trash (barbed wire and bottles). It had slight air flow conductivity, and the floor of the cavity appears to slope back towards the sinkhole drainage portal. Based on the presence of air flow conductivity and a very well-defined sinkhole perimeter, the potential for additional subgrade passage is very probable. This feature meets the requirements to be classified as a potential **cave**, based on it being a natural, underground, open space formed by dissolution of limestone that is large enough for an average-sized person to enter. This feature has a high infiltration rate and an apparent surface runoff catchment greater than 3 acres.

Geologic Feature SF-16: This feature has been previously assessed by SWCA as an unnamed cave within a sinkhole that is rimmed with boulders and cobble debris (SWCA, 2006). The sinkhole measures approximately 120 to 130 feet long x 40 to 60 feet wide x 3 to 6 feet deep and funnels into a large, open vertical shaft about 10 feet in diameter x 5 feet deep. Along the west side of the shaft floor is an opening measuring 5 feet long x 4 to 6 feet deep that connects to an apparent low bedding plane void extending about 20 feet (north to south) x 10 feet wide x 3 to 4 feet high. Several internal open drains were observed along the floor at the lowest points of the void. Moderate to strong air flow conductivity was noted along the main shaft opening. This feature meets the requirements to be classified as a **cave**, based on it being a natural underground open space formed by dissolution of limestone that is large enough for an average-sized person to enter. The sinkhole/cave is located in a broader drainage area that appears to have originally drained in excess of 10 acres. An adjacent stock pond (manmade feature M-15) to the northwest/west appears to have impounded half or more of the original drainage area. This cave has a very high infiltration rate and a surface runoff catchment greater than 6 acres.

Geologic Feature SF-17: This feature has been previously assessed by SWCA as a non-karst closed depression (SWCA, 2006). However, an open drainage portal about 0.3 feet in diameter x 1 foot deep was observed within the loose leaves and soil/rock at its lowest point. This feature is identified a sinkhole about 20 feet in diameter x 3 feet deep with an apparent drainage portal. Slight air flow conductivity was noted at the opening. This feature has an intermediate infiltration rate and an apparent surface runoff catchment less than 0.4 acres.

Geologic Feature SF-18: This feature has been previously assessed by SWCA as a solution cavity (SWCA, 2006). It measures approximately 1.5 feet in diameter x 1 foot deep and is located within an exposed slab of limestone about 4 feet x 4 feet. No drainage portals or air flow conductivity were observed along the firm, clay-filled floor. The feature appears to be epikarstic due to surficial weathering processes. This feature has a very low infiltration rate and an apparent surface runoff catchment less than 0.1 acres.

Geologic Feature SF-19: This feature has been previously assessed by SWCA as a sinkhole that has large boulders slumping into it that may have been the result of past ranching activities, such as land clearing (SWCA, 2006). It measures approximately 15 feet long x 12 feet wide x 3 feet deep with several semi-open drainage portals around apparent in-filled (bladed) rocks and boulders. Slight air flow conductivity was noted. This feature has an intermediate infiltration rate and an apparent surface runoff catchment less than 0.4 acres.

Geologic Feature SF-20: This feature has been previously assessed by SWCA as 2 adjacent sinkholes spaced about 15 feet apart (SWCA, 2006). The larger sinkhole measures approximately 15 feet in diameter x 5 feet deep with several semi-open drainage portals amongst solutioned bedrock and/or boulders. The smaller sinkhole measures approximately 10 feet in diameter x 5 feet deep with semi-open drainage portals amongst loose rock and soil. Slight air flow conductivity was noted at both sinkholes. This feature has an intermediate infiltration rate and an apparent surface runoff catchment less than 1 acre.

Geologic Feature SR-1: Small, upland sinkhole measuring approximately 6.5 feet long x 5 feet wide x 1.5 feet deep, rimmed with large rocks, and with a drainage portal opening along the south side about 1.5 feet long x 0.3 feet wide x 1 foot deep. Slight air flow conductivity was noted at the opening. Probing with a steel rod encountered clay soil and cobbles about 2 feet below the feature's floor. This feature has an intermediate infiltration rate and a surface runoff catchment of less than 0.4 acres.

Geologic Feature SR-2: Small, upland sinkhole, located about 20 feet due south of SR-1, measuring approximately 6 feet in diameter x 1.5 feet deep with open drainage portals amongst loose rock and leaves. This feature was lightly excavated, revealing a low bedding plane void about 2 feet long x 0.5 feet high with moderate air flow conductivity noted at the opening. Probing with a steel rod encountered loose clay soil and cobbles about 3 feet down below the feature's floor. This feature has an intermediate infiltration rate and a surface runoff catchment of less than 0.4 acres.

Geologic Feature SR-3: Small, upland sinkhole, located between 2 live oak trees, measuring approximately 6 feet in diameter x 1 foot deep with an open drainage portal amongst

loose rocks and soil. This feature was lightly excavated, revealing a portal about 0.5 feet in diameter x 1 foot deep with slight air flow conductivity. Probing with a steel rod encountered loose clay soil and cobbles about 2 feet down below the feature's floor. This feature has an intermediate infiltration rate and a surface runoff catchment of less than 0.4 acres.

Geologic Feature SR-4: Solution cavity measuring approximately 0.5 feet in diameter x 1 foot deep, in an open area, that narrows down to a 0.2 feet diameter x 1 foot deep drainage portal opening. Slight air flow conductivity was noted. Probing with a steel rod encountered loose cobbles/soil about 2.5 feet below the feature's floor. This feature has an intermediate infiltration rate and a surface runoff catchment of less than 0.4 acres.

Geologic Feature SR-5: Two solution cavities spaced about 8 feet apart in an open area near a cactus patch. Both cavities measure approximately 1 foot in diameter x 1 to 1.5 feet deep. Slight to moderate air flow conductivity was noted at the openings. Probing with a steel rod encountered loose cobbles and soil about 2 feet below the feature's floor. This feature has an intermediate infiltration rate and a surface runoff catchment of less than 0.4 acres.

Geologic Feature SR-6: Solution cavity, near a cedar elm tree, measuring approximately 0.5 feet in diameter x 1.5 feet deep. Slight to moderate air flow conductivity was noted. Probing with a steel rod encountered loose soil and rocks about 2.5 feet below the feature's floor. This feature has an intermediate infiltration rate and a surface runoff catchment of less than 0.4 acres.

Geologic Feature SR-7: Small, upland sinkhole measuring approximately 5 feet in diameter x 1 foot deep, located under a cluster of live oak trees, with a semi-open drainage portal about 0.5 feet in diameter x 1.5 feet deep. Very slight air flow conductivity was noted. Probing with a steel rod encountered loose leaves, cobbles, and soil about 2.5 feet below the feature's floor. This feature has an intermediate infiltration rate and a surface runoff catchment of less than 0.4 acres.

Geologic Feature SR-8: Two solution cavities spaced about 3 feet apart next to a cedar elm tree. The larger cavity measures approximately 0.5 feet in diameter x 1 foot deep and the smaller cavity measures 0.2 feet in diameter x 0.5 feet deep. Slight air flow conductivity was noted at the openings. Probing with a steel rod encountered loose cobbles and soil about 2 feet below the feature's floor. This feature has an intermediate infiltration rate and a surface runoff catchment of less than 0.4 acres.

Geologic Feature SR-9: Small, upland sinkhole measuring approximately 6 feet long x 4 feet wide x 1 foot deep with an open solution cavity drainage portal near the center about 1.5 feet long x 1 foot wide x 2.5 feet deep. Slight air flow conductivity was noted. Probing with a steel rod encountered loose leaves, cobbles, and soil about 3.5 feet below the feature's floor. This feature has an intermediate infiltration rate and a surface runoff catchment of less than 0.4 acres.

Geologic Feature SR-10: Large, upland sinkhole located near a persimmon tree thicket that measures approximately 18 feet long x 15 feet wide x 3 feet deep with 1 open drainage portal (0.5 feet in diameter x 1 foot deep) located along its rock/clay floor. Slight to moderate air flow conductivity was noted at the opening. Probing with a steel rod encountered loose soil and cobbles

about 2 feet below the feature's floor. This feature has an intermediate infiltration rate and a surface runoff catchment of less than 0.5 acres.

Geologic Feature SR-11: Solution cavity located near live oak trees and cactus patch. A large rock covering the cavity was removed to facilitate inspection. This feature measures approximately 2 feet long x 1.5 feet wide x 2.5 feet deep with slight to moderate air flow conductivity. Probing with a steel rod encountered loose soil and rocks about 4 feet below the feature's floor. This feature has an intermediate infiltration rate and a surface runoff catchment of less than 0.4 acres.

Geologic Feature SR-12: Upland sinkhole measuring approximately 10 feet long x 7 feet wide x 2 feet deep with open drainage portals near the center amongst loose cobbles and soil. Slight to moderate air flow conductivity was noted. Probing with a steel rod encountered loose cobbles and soil about 3.5 feet below the feature's floor. This feature has an intermediate infiltration rate and a surface runoff catchment of less than 0.4 acres.

Geologic Feature SR-13: Large, upland sinkhole located amongst scattered mesquite and cedar elm trees. It measures approximately 20 feet long x 10 feet wide x 2.5 feet deep with 2 open drainage portals (1.9 feet long x 0.9 feet wide x 3 feet deep and 0.5 feet in diameter x 1 foot deep) located along its rock/clay floor. Slight air flow conductivity was noted at both openings. Probing with a steel rod encountered firm to loose soil and cobbles about 4 feet below the feature's floor. This feature has an intermediate infiltration rate and a surface runoff catchment of less than 0.5 acres.

Geologic Feature SR-14: Small, upland sinkhole measuring approximately 6 feet long x 4 feet wide x 2.5 feet deep with a semi-open drainage portal near the center about 0.5 feet in diameter x 1 foot deep. No air flow conductivity was noted. Probing with a steel rod encountered firm soil and cobbles about 3 feet below the feature's floor. This feature has an intermediate infiltration rate and a surface runoff catchment of less than 0.4 acres.

Geologic Feature SR-15: Solution cavity, located near the bases of mesquite and persimmon trees, measuring approximately 2.5 feet long x 0.5 feet wide x 1.5 feet deep, with semi-open drainage portals amongst vuggy rock and loose soil. No air flow conductivity was noted. Probing with a steel rod encountered loose to firm soil and rocks about 2.5 feet below the feature's floor. This feature has an intermediate infiltration rate and a surface runoff catchment of less than 0.4 acres.

Geologic Feature SR-16: Solution cavity measuring approximately 1.3 feet long x 0.8 feet wide x 4.5 feet deep within a very small rock sink (3 feet in diameter x 1 foot deep). Slight air flow conductivity was noted. Probing with a steel rod encountered loose soil and rocks about 5 feet below the feature's floor. This feature has an intermediate infiltration rate and a surface runoff catchment of less than 0.4 acres.

Geologic Feature SR-17: Solution cavity about 35 feet due southwest of SR-16. It measures approximately 1.5 feet long x 1 foot wide x 3.5 feet deep within a very small rock sink (3 feet in diameter x 1 foot deep). Slight to moderate air flow conductivity was noted. Probing with a

steel rod encountered loose soil and rocks about 4.5 feet below the feature's floor. This feature has an intermediate infiltration rate and a surface runoff catchment of less than 0.4 acres.

Geologic Feature SR-18: Solution cavity measuring approximately 1 foot long x 0.5 feet wide x 1 foot deep with semi-open drainage portals amongst loose rocks and soil. Slight air flow conductivity was noted. Probing with a steel rod encountered loose soil and rocks about 2 feet below the feature's floor. This feature has an intermediate infiltration rate and a surface runoff catchment of less than 0.4 acres.

Geologic Feature SR-19: Solution cavity measuring approximately 3 feet long x 1.5 feet wide x 1.5 feet deep with semi-open drainage portals amongst loose clay soil and rocks. Slight air flow conductivity was noted. Probing with a steel rod encountered loose soil and rocks about 2 feet below the feature's floor. This feature has an intermediate infiltration rate and a surface runoff catchment of less than 0.4 acres.

Geologic Feature SR-20: Mapped normal fault located in Santa Rita North within the contributing zone of the Edwards Aquifer. This feature has an apparent low infiltration rate and is not located in the recharge zone of the Edwards Aquifer. Therefore, it is a non-sensitive feature that would require no protective measures.

3.0 CONCLUSIONS AND RECOMMENDATIONS

Thirty-eight natural geologic features and 25 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).

Thirty-four geologic features (C-1, C-3 to C-8, SF-11, SF-13 to SF-17, SF-19, SF-20, and SR-1 to SR-19) have 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. However, a larger protective buffer for 3 of these (cave) features (SF-11, SF-15, and SF-16) is recommended to meet the TCEQ guidance for a setback for each cave with an undetermined subsurface footprint. The cave footprint is assumed to extend 150 feet in all directions from the surface opening(s) and then a protective buffer zone extending an additional 50 feet in all directions from the footprint is applied, plus each cave's watershed catchment up to 200 feet from the footprint. Caves with a known subsurface footprint (i.e., surveyed/mapped) include a protective buffer zone extending an additional 50 feet in all directions from the footprint, plus each cave's watershed catchment up to 200 feet from the footprint.

Four geologic features (C-2, G-02, SF-18, and SR-20) 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.

All of the manmade features (G-01 and M-1 to M-24) 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.

Additionally, no springs were identified within the recharge zone of the subject site that would require protection or mitigation pursuant to the City of Georgetown Edwards Aquifer Recharge Zone Water Quality Ordinance No. 2013-59. However, several streams were identified within the recharge zone of the subject site that would require protection per the City of Georgetown's ordinance.

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 part of the subject 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 the potential for the void(s) to provide meaningful recharge to the Edwards Aquifer.

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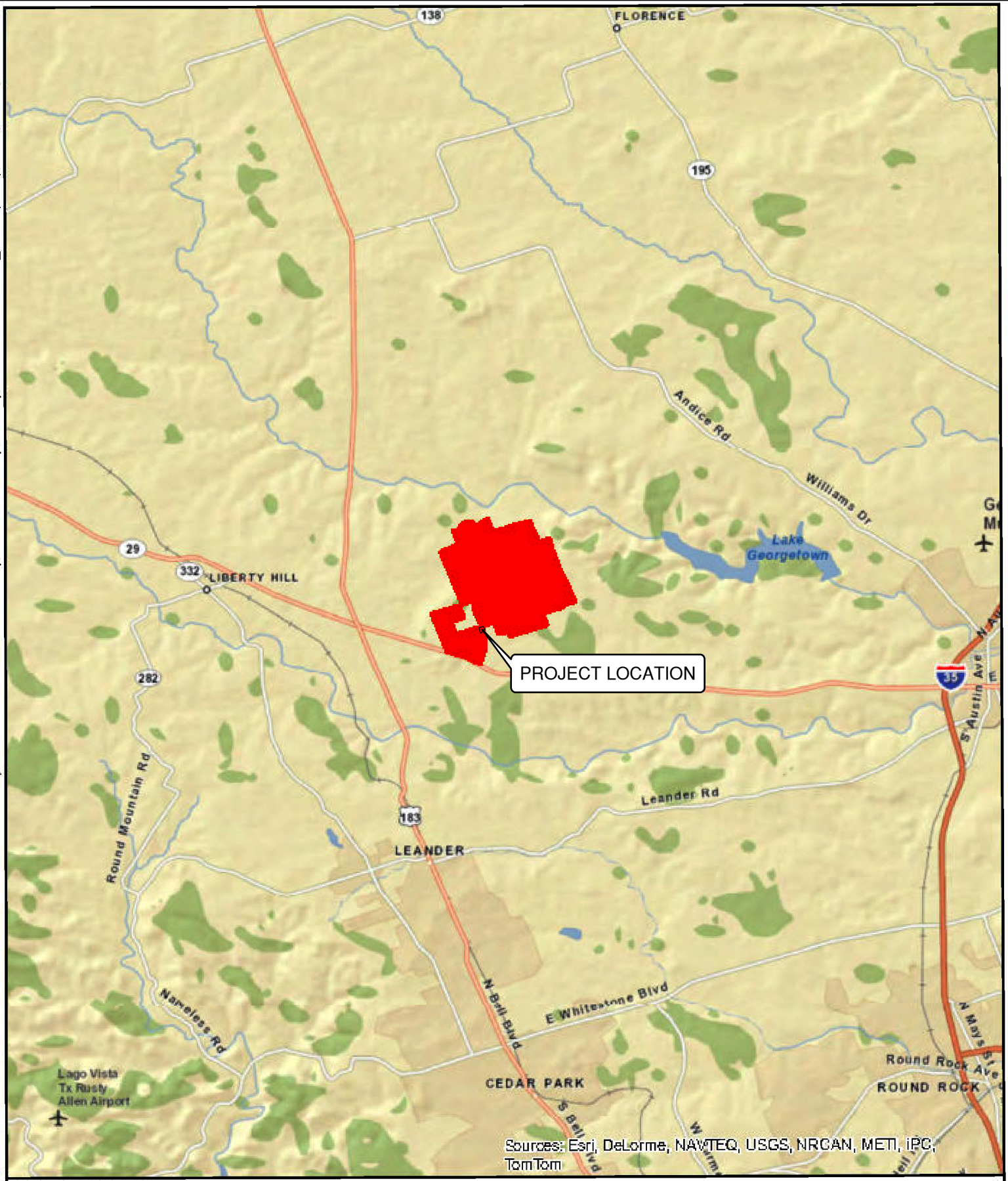
APPENDIX A

PROJECT FIGURES



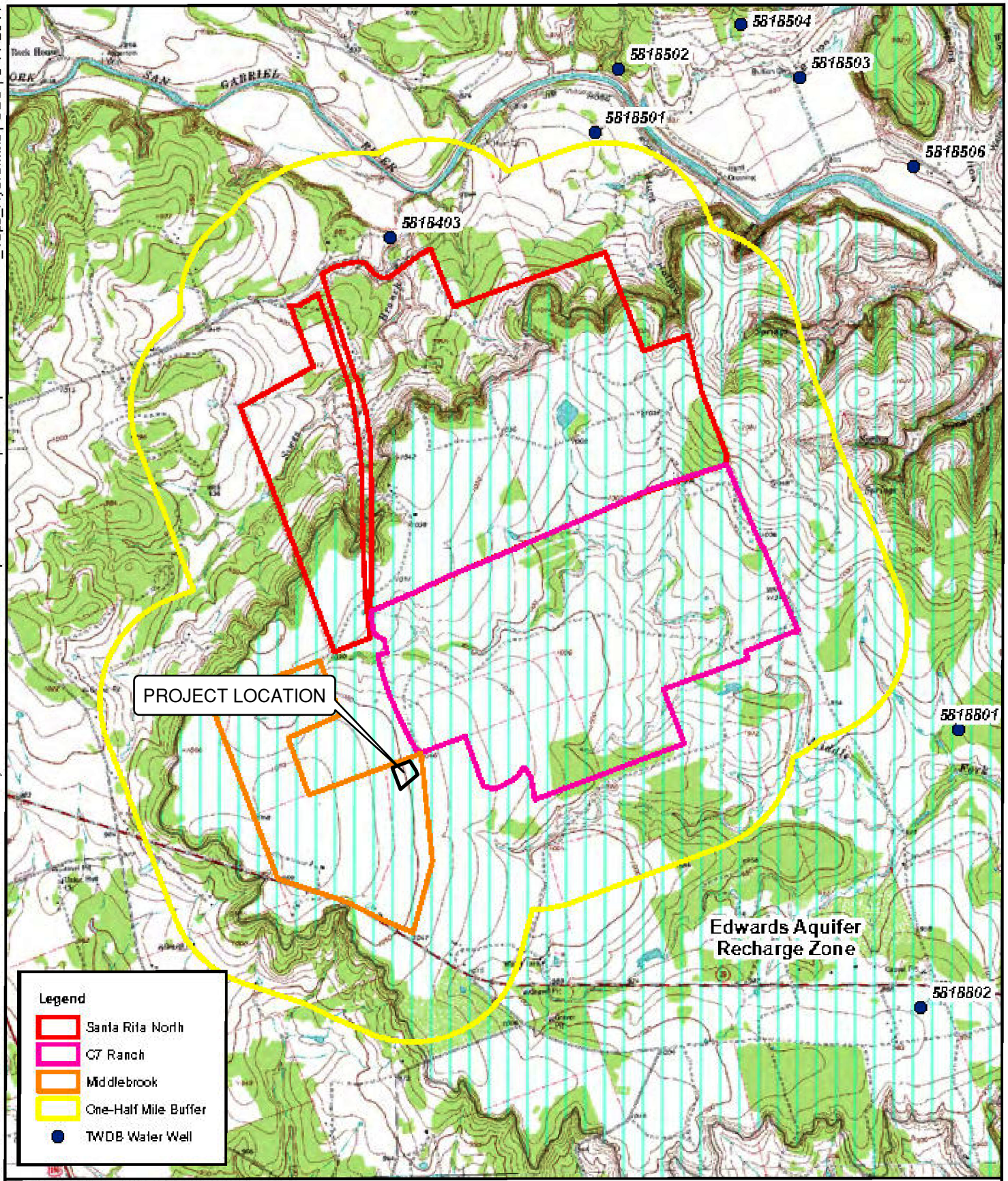
MAP SOURCE: ESRI, 2012.

0 1.5 3
Miles

Horizon Environmental Services, Inc.

APPENDIX A, FIGURE 1

VICINITY MAP
SANTA RITA NORTH, MIDDLEBROOK, AND C7 RANCH
LIBERTY HILL,
WILLIAMSON COUNTY, TEXAS



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

0 1,675 3,350
Feet

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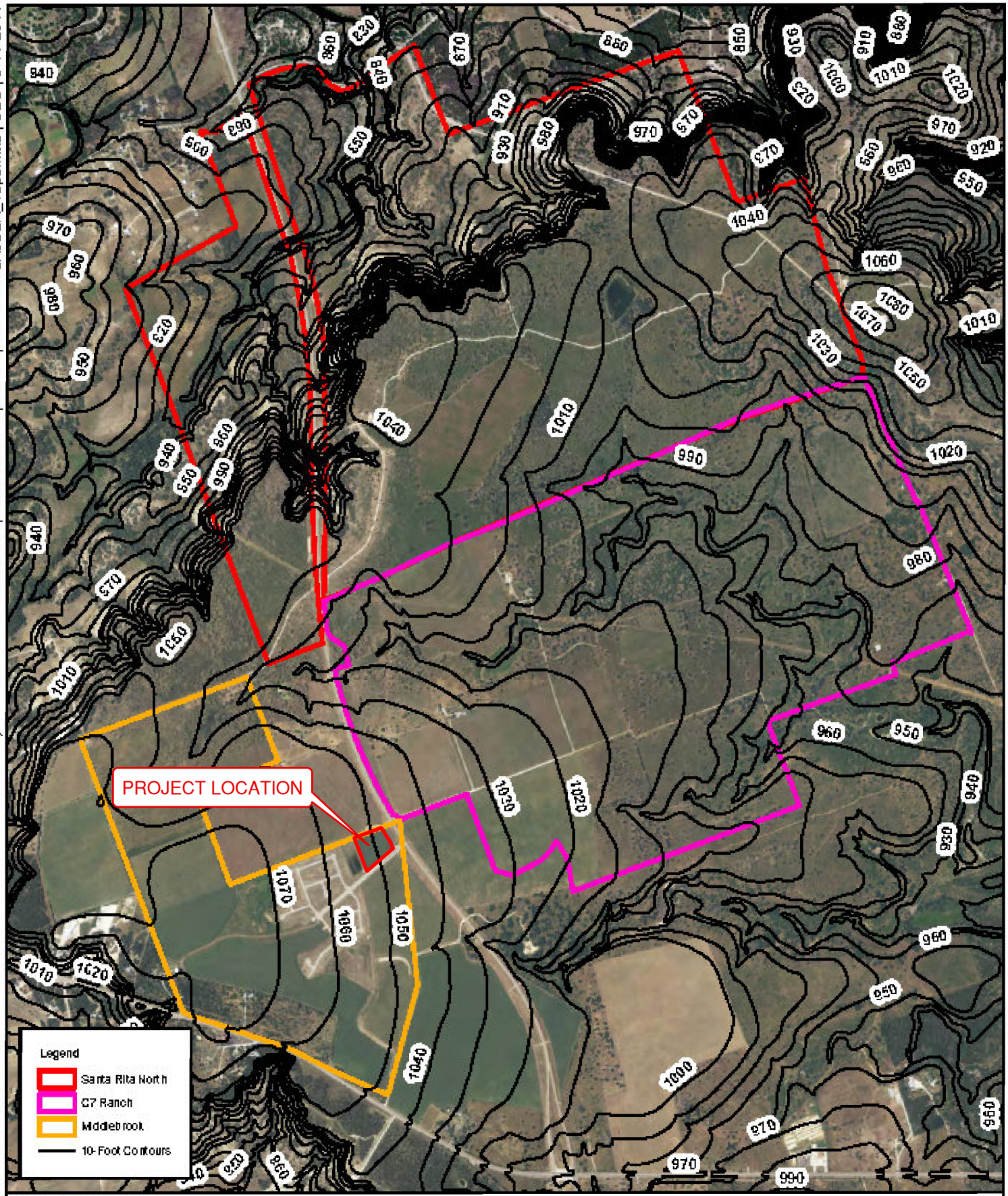
APPENDIX A, FIGURE 2

TOPOGRAPHY AND
HYDROGEOLOGY MAP
SANTA RITA NORTH, MIDDLEBROOK,
AND C7 RANCH
LIBERTY HILL,
WILLIAMSON COUNTY, TEXAS

R:\Proj\2013\130065 - C7 Ranch\Graphics\GA\GA Report Graphics\130065A03GA_Topo.mxd | CEC | 8-14-2014



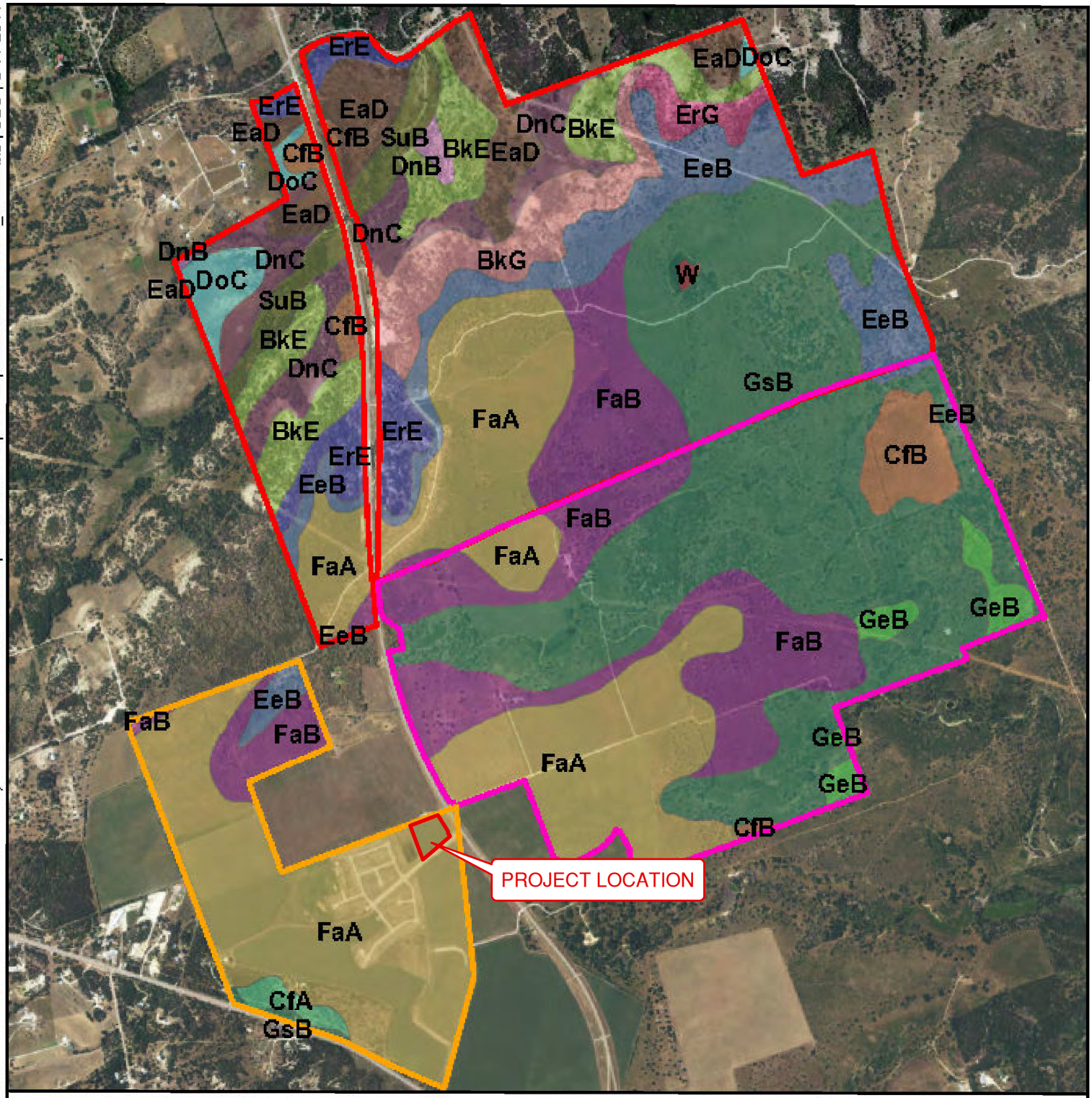
MAP SOURCE: USDA, 2012.

0 1,100 2,200
Feet

Horizon Environmental Services, Inc.

APPENDIX A, FIGURE 3

SITE TOPOGRAPHY MAP
SANTA RITA NORTH, MIDDLEBROOK, AND C7 RANCH
LIBERTY HILL,
WILLIAMSON COUNTY, TEXAS



Legend

- Middlebrook
- C7 Ranch
- Santa Rita North
- Brackett gravelly clay loam, 3-12% slopes (BkE)
- Brackett-Rock outcrop Real complex, 3-30% slopes (BkG)
- Crawford clay, 0-1% slopes (CfA)
- Crawford clay, 1-3% slopes (CfB)
- Denton silty clay, 1-3% slopes (DnB)
- Denton silty clay, 3-5% slopes (DnC)
- Doss silty clay, moist, 1-5% slopes (DoC)
- Eckrant cobbly clay, 1-8% slopes (EaD)
- Eckrant extremely stony clay, 0-3% slopes (EeB)
- Eckrant-Rock outcrop complex, rolling (ErE)
- Eckrant-Rock outcrop complex, hilly (ErG)
- Fairlie clay, 0-1% slopes (FaA)
- Fairlie clay, 1-2% slopes (FaB)
- Georgetown clay loam, 0-2% slopes (GeB)
- Georgetown stony clay loam, 1-3% slopes (GsB)
- Sunev silty clay loam, 1-3% slopes (SuB)
- Water

MAP SOURCE: USDA, 2012; NRCS, 2014.

0 1,150 2,300
Feet

Horizon Environmental Services, Inc.

APPENDIX A, FIGURE 4

SURFACE SOILS MAP
SANTA RITA NORTH, MIDDLEBROOK, AND C7 RANCH
LIBERTY HILL,
WILLIAMSON COUNTY, TEXAS

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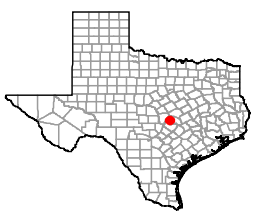
Geologic Unit	Hydrologic Unit	Approx. Thickness at Project Site (ft)	Elevation (ft msl)	Depth (ft)
			1070	0
Terraces (QTa) and Terraces along streams (Qt)	-	10	1060	10
Edwards Formation (Ked)	Edwards Aquifer	85	975	95
Comanche Peak Formation (Kc)		50	925	145
Keys Valley Marl (KwKv)	Confining Unit	50	875	195
Cedar Park Limestone (Kwcp)		40	835	235
Bee Cave Marl (Kwbc)		35	800	270
Upper Glen Rose Limestone (Kgru)		220	580	490

Note: Unit elevation and thickness given with respect to a ground surface elevation of 1070 ft on the southwestern corner of the project site.

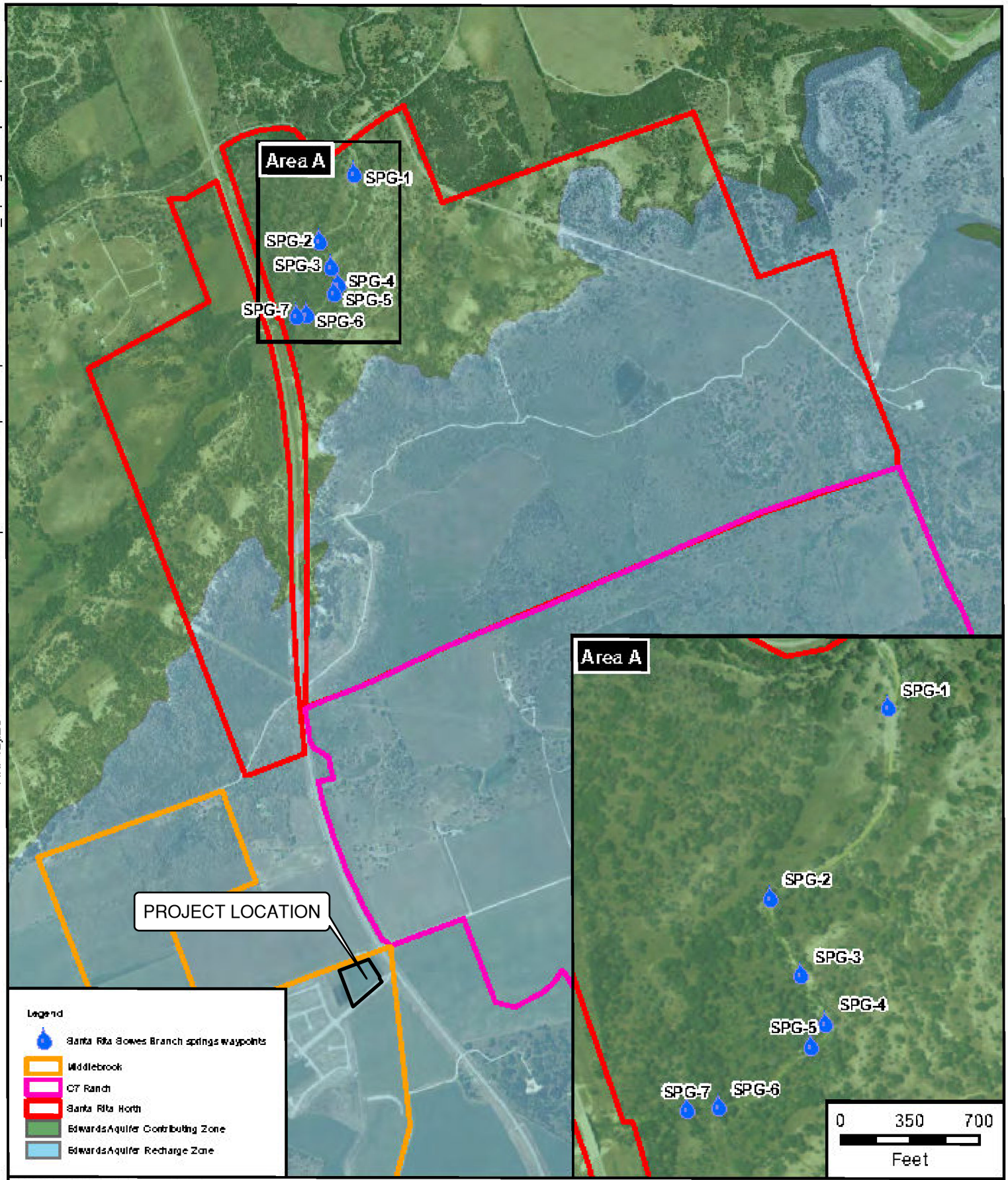
Horizon Environmental Services, Inc.

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



APPENDIX A, FIGURE 5

STRATIGRAPHIC COLUMN
SANTA RITA NORTH, MIDDLEBROOK, AND C7 RANCH
LIBERTY HILL,
WILLIAMSON COUNTY, TEXAS



JAMES P. KILLIAN
GEOLOGY
No. 10291
LICENSED
PROFESSIONAL GEOSCIENTIST

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Environmental Services, Inc.

APPENDIX A, FIGURE 6

SANTA RITA SPRINGS MAP
SANTA RITA NORTH, MIDDLEBROOK,
AND C7 RANCH
LIBERTY HILL,
WILLIAMSON COUNTY, TEXAS

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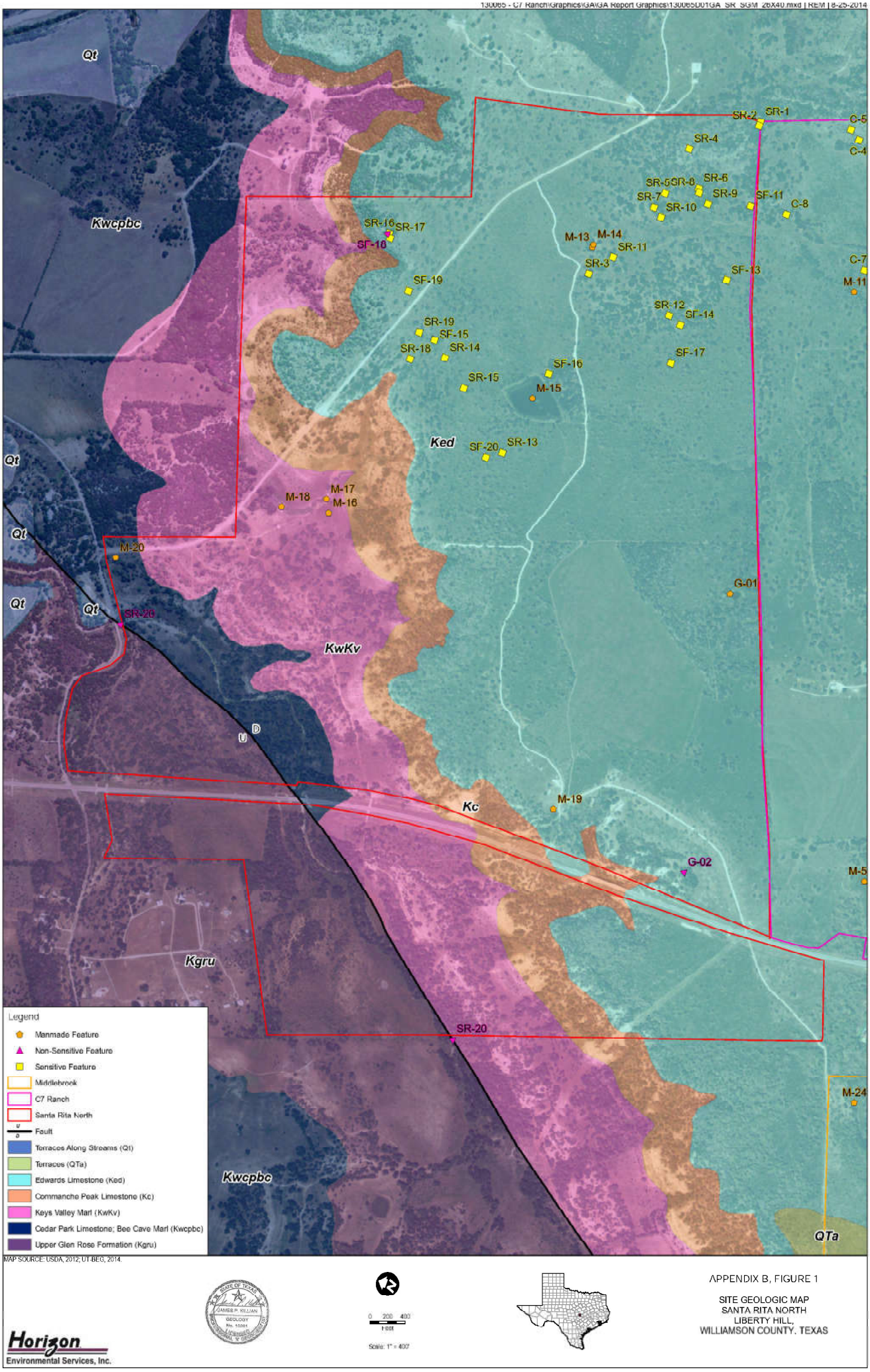
Environmental Services, Inc.

APPENDIX B

SITE GEOLOGIC MAP


130065 - C7 Ranch\Graphics\GA\GA Report Graphics\130065D01GA_SR_SGM_26X40.mxd | REM | 8-25-2014
Qt
Kwcpbc
Ked
KwKv
Kc
Kgru
QTa
SR-1
SR-2
SR-3
SR-4
SR-5
SR-6
SR-7
SR-8
SR-9
SR-10
SR-11
SR-12
SR-13
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SF-17
SF-19
SF-20
C-4
C-5
C-7
C-8
M-5
M-11
M-13
M-14
M-15
M-16
M-17
M-18
M-19
M-20
M-24
G-01
G-02
Legend
Manmade Feature
Non-Sensitive Feature
Sensitive Feature
Middlebrook
C7 Ranch
Santa Rita North
Fault
Terraces Along Streams (Qt)
Terraces (QTa)
Edwards Limestone (Ked)
Commanche Peak Limestone (Kc)
Keys Valley Marl (KwKv)
Cedar Park Limestone; Bee Cave Marl (Kwcpbc)
Upper Glen Rose Formation (Kgru)
MAP SOURCE: USDA, 2012; UT-BEG, 2014.
JAMES P. KILLIAN
GEOLOGY
0 200 400
Feet
Scale: 1" = 400'
Horizon
Environmental Services, Inc.
APPENDIX B, FIGURE 1
SITE GEOLOGIC MAP
SANTA RITA NORTH
LIBERTY HILL,
WILLIAMSON COUNTY, TEXAS

130065 - C7 Ranch\Graphics\GA\GA Report Graphics\130065D02GA_C7_MB_SGM_26X40.mxd | REM | 8-25-2014

SR-1 SR-2 SR-4 SR-5 SR-6 SR-7 SR-8 SR-9 SR-10 SR-11 SR-12 SF-11 SF-13 SF-14 SF-17 C-3 C-4 C-5 C-6 C-7 C-8 M-8 M-9 M-10 M-11 M-12 M-14 C-1 C-2 Qt Ked Kc QTa KwKv M-1 M-2 M-3 M-4 M-5 M-6 M-7 M-21 M-22 M-23 M-24 G-01 G-02 PROJECT LOCATION

Legend

- Manmade Feature
- Non-Sensitive Feature
- Sensitive Feature
- Middlebrook
- C7 Ranch
- Santa Rita North
- Fault (U / D)
- Terraces Along Streams (Qt)
- Terraces (QTa)
- Edwards Limestone (Ked)
- Commanche Peak Limestone (Kc)
- Keys Valley Marl (KwKv)
- Cedar Park Limestone; Bee Cave Marl (Kwcpbc)
- Upper Glen Rose Formation (Kgru)

MAP SOURCE: USDA, 2012; UT-BEG, 2014.

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

0 200 400 Feet

Scale: 1" = 400'

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APPENDIX B, FIGURE 2

SITE GEOLOGIC MAP
C7 RANCH AND MIDDLEBROOK
LIBERTY HILL,
WILLIAMSON COUNTY, TEXAS

Horizon
Environmental Services, Inc.

APPENDIX C

SITE GEOLOGIC ASSESSMENT TABLE

GEOLOGIC ASSESSMENT TABLE

PROJECT NAME: 2976-ac Santa Rita North, C7 Ranch, Middlebrook, Williamson Co., TX

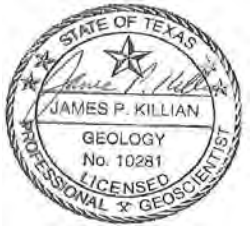
LOCATION			FEATURE CHARACTERISTICS											EVALUATION			PHYSICAL SETTING		
1A	1B *	1C*	2A	2B	3	4			5	5A	6	7	8A	8B	9	10		11		12
FEATURE ID	LATITUDE	LONGITUDE	FEATURE TYPE	POINTS	FORMATION	DIMENSIONS (FEET)			TREND (DEGREES)	DOM	DENSITY (NO/FT)	APERTURE (FEET)	INFILL	RELATIVE INFILTRATION RATE	TOTAL	SENSITIVITY		CATCHMENT AREA (ACRES)		TOPOGRAPHY
						X	Y	Z		10						<40	≥40	<1.6	≥1.6	
C-1	30.658391	-97.816697	SH	20	Ked	10	10	2.5	--	0	--		C,F,O	25	45		X	X		Hillside
C-2	30.658554	-97.816288	SH	20	Ked	3	1.5	1.5	--	0	--		C,F,O	18	38	X		X		Hillside
C-3	30.666383	-97.809982	SC	20	Ked	1.8	1	1.5	--	0	--		C,F,O	30	50		X	X		Hillside
C-4	30.66883	-97.811714	SC	20	Ked	1.5	0.5	1	--	0	--		C,F,O	30	50		X	X		Hillside
C-5	30.669181	-97.809834	SC	20	Ked	1	0.3	1	--	0	--		C,F,O	28	48		X	X		Hillside
C-6	30.664682	-97.809834	SF	20	Ked	2.5	0.5	1	--	0	--		C,F,O	20	40		X	X		Hillside
C-7	30.667255	-97.816043	SH	20	Ked	18	18	4	--	0	--		C,F,O	30	50		X	X		Hillside
C-8	30.670156	-97.815144	SC	20	Ked	1	1	1	--	0	--		C,F,O	30	50		X	X		Hillside
G-02	30.666026	-97.838744	CD	5	Ked	6	6	2.5	--	0	--		C,F,O	10	15	X		X		Hillside
SF-11	30.671298	-97.815299	SH/C	30	Ked	12	12	8.5	--	0	--		C,F,O	45	75		X		X	Hillside
SF-13	30.671193	-97.81813	SH	20	Ked	10	10	2.5	--	0	--		C,F,O	30	50		X	X		Hillside

* DATUM: State Plane Texas Central

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

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

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



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Sheet ___1___ of __6____

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

GEOLOGIC ASSESSMENT TABLE

PROJECT NAME: 2976-ac Santa Rita North, C7 Ranch, Middlebrook, Williamson Co., TX

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						X	Y	Z		10						<40	>40	<1.6	>1.6	
SF-14	30.67206	-97.820227	SH	20	Ked	6	6	1.5	--	0	--		C,F,O	30	50		X	X		Hillside
SF-15	30.679111	-97.823843	SH/C	30	Ked	50	25	7	--	0	--		C,F,O	35	65		X		X	Hilltop
SF-16	30.675387	-97.823553	SH/C	30	Ked	130	60	11	--	0	--		C,F,O	65	95		X		X	Hilltop
SF-17	30.671916	-97.821637	SH	20	Ked	20	20	3	--	0	--		C,F,O	28	48		X	X		Hillside
SF-18	30.691678	-97.820842	SC	20	Ked	1.5	1.5	1	--	0	--		C,F,O	10	30	X		X		Hillside
SF-19	30.680412	-97.822505	SC	20	Ked	15	12	3	--	0	--		C,F,O	35	55		X	X		Hillside
SF-20	30.676327	-97.827169	SH	20	Ked	15	15	5	--	0	--		C,F,O	35	55		X	X		Hillside
SR-1	30.671914	-97.812342	SH	20	Ked	6.5	5	1.5	--	0	--		C,F,O	25	45		X	X		Hillside
SR-2	30.67192	-97.812485	SH	20	Ked	6	6	1.5	--	0	--		C,F,O	35	55		X	X		Hillside
SR-3	30.675314	-97.819649	SH	20	Ked	6	6	1	--	0	--		C,F,O	25	45		X	X		Hillside
SR-4	30.673724	-97.814153	SC	20	Ked	0.5	0.5	1	--	0	--		C,F,O	25	45		X	X		Hillside

* DATUM: State Plane Texas Central

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

8A INFILLING	
N	None, exposed bedrock
C	Coarse - cobbles, breakdown, sand, gravel
O	Loose or soft mud or soil, organics, leaves, sticks, dark colors
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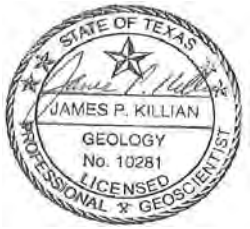
12 TOPOGRAPHY
Cliff, Hilltop, Hillside, Drainage, Floodplain, Streambed



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

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						X	Y	Z		10						<40	>40	<1.6	>1.6	
SR-5	30.673941	-97.815961	SC	20	Ked	1	1	1.5	--	0	--		C,F,O	30	50		X	X		Hillside
SR-6	30.673001	-97.815382	SC	20	Ked	0.5	0.5	1.5	--	0	--		C,F,O	30	50		X	X		Hillside
SR-7	30.674121	-97.816575	SH	20	Ked	5	5	1	--	0	--		C,F,O	22	42		X	X		Hillside
SR-8	30.672952	-97.815509	SC	20	Ked	0.5	0.5	1	--	0	--		C,F,O	25	45		X	X		Hillside
SR-9	30.672567	-97.81578	SH	20	Ked	6	4	1	--	0	--		C,F,O	30	50		X	X		Hillside
SR-10	30.673796	-97.816829	SH	20	Ked	18	15	3	--	0	--		C,F,O	35	55		X	X		Hillside
SR-11	30.674772	-97.818781	SC	20	Ked	2	1.5	2.5	--	0	--		C,F,O	40	60		X	X		Hillside
SR-12	30.672494	-97.820046	SH	20	Ked	10	7	2	--	0	--		C,F,O	30	50		X	X		Hillside
SR-13	30.675893	-97.826807	SH	20	Ked	20	10	2.5	--	0	--		C,F,O	28	48		X	X		Hillside
SR-14	30.678613	-97.824318	SH	20	Ked	6	4	2.5	--	0	--		C,F,O	25	45		X	X		Hilltop
SR-15	30.677735	-97.825099	SC	20	Ked	2.5	0.5	1.5	--	0	--		C,F,O	22	42		X	X		Hilltop

* DATUM: State Plane Texas Central

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

8A INFILLING	
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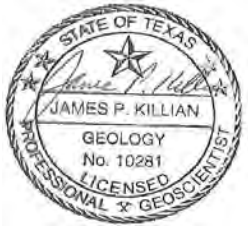
12 TOPOGRAPHY
Cliff, Hilltop, Hillside, Drainage, Floodplain, Streambed



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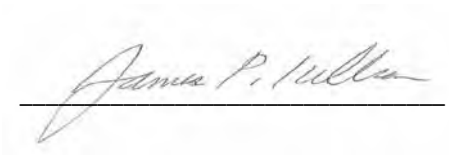

Sheet ___3___ of __6____

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

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						X	Y	Z		10						<40	>40	<1.6	>1.6	
SR-16	30.681607	-97.820807	SC	20	Ked	1.3	0.8	4.5	--	0	--		C,F,O	35	55		X	X		Hilltop
SR-17	30.681526	-97.820942	SC	20	Ked	1.5	1	3.5	--	0	--		C,F,O	35	55		X	X		Hilltop
SR-18	30.679626	-97.8248	SC	20	Ked	1	0.5	1	--	0	--		C,F,O	25	45		X	X		Hilltop
SR-19	30.679644	-97.823785	SC	20	Ked	3	1.5	1.5	--	0	--		C,F,O	28	48		X	X		Hilltop
SR-20	30.685264	-97.837461	F	20	Kgru/Kw	5776	75	>100	--	0	--		C,F,O	15	35	X		X		Hilltop
G-01	30.667687	-97.828721	MB	30	Ked	184	180	6	--	0	--		F	5	35	X		X		Drainage
M-1	30.654518	-97.818719	MB	30	Ked	100	75	6	--	0	--		F	5	35	X		X		Drainage
M-2	30.660492	-97.830379	MB	30	Ked	200	100	6	--	0	--		F	5	35	X		X		Drainage
M-3	30.65993	-97.831945	MB	30	Ked	400	60	6	--	0	--		F	5	35	X		X		Drainage
M-4	30.657995	-97.833944	MB	30	Ked	0.3	0.3	--	--	0	--		X	5	35	X		X		Hillside
M-5	30.660606	-97.83676	MB	30	Ked	400	200	6	--	0	--		F	5	35	X		X		Drainage

* DATUM: State Plane Texas Central

2A TYPE	TYPE	2B POINTS
C	Cave	30
SC	Solution cavity	20
SF	Solution-enlarged fracture(s)	20
F	Fault	20
O	Other natural bedrock features	5
MB	Manmade feature in bedrock	30
SW	Swallow hole	30
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8A INFILLING	
N	None, exposed bedrock
C	Coarse - cobbles, breakdown, sand, gravel
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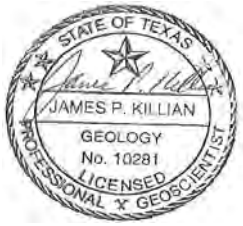
V	Vegetation. Give details in narrative description
FS	Flowstone, cements, cave deposits
X	Other materials

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



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						X	Y	Z		10						<40	>40	<1.6	>1.6	
M-6	30.65973	-97.836782	MB	30	Ked	0.5	0.5	--	--	0	--		X	5	35	X		X		Hillside
M-7	30.659633	-97.836189	MB	30	Ked	0.5	0.5	--	--	0	--		X	5	35	X		X		Hillside
M-8	30.666906	-97.810477	MB	30	Ked	0.5	0.5	--	--	0	--		X	5	35	X		X		Hillside
M-9	30.666978	-97.810644	MB	30	Ked	0.7	0.7	--	--	0	--		X	5	35	X		X		Hillside
M-10	30.663087	-97.808239	MB	30	Ked	0.5	0.5	--	--	0	--		X	5	35	X		X		Hillside
M-11	30.667335	-97.816923	MB	30	Ked	50	50	3	--	0	--		F	5	35	X		X		Drainage
M-12	30.663011	-97.814184	MB	30	Ked	100	70	6	--	0	--		F	5	35	X		X		Drainage
M-13	30.6755	-97.818701	MB	30	Ked	0.5	0.5	--	--	0	--		X	5	35	X		X		Hilltop
M-14	30.675505	-97.818599	MB	30	Ked	0.5	0.5	--	--	0	--		X	5	35	X		X		Hilltop
M-15	30.675615	-97.824592	MB	30	Ked	350	200	6	--	0	--		C,F	5	35	X		X		Drainage
M-16	30.68035	-97.831044	MB	30	Kwkv	0.5	0.5	--	--	0	--		X	5	35	X		X		Hillside

* DATUM: State Plane Texas Central

2A TYPE	TYPE	2B POINTS
C	Cave	30
SC	Solution cavity	20
SF	Solution-enlarged fracture(s)	20
F	Fault	20
O	Other natural bedrock features	5
MB	Manmade feature in bedrock	30
SW	Swallow hole	30
SH	Sinkhole	20
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8A INFILLING	
N	None, exposed bedrock
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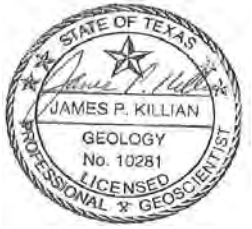

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M-17	30.680562	-97.830596	MB	30	Kwkv	200	100	6	--	0	--		F	5	35	X		X		Hillside
M-18	30.681799	-97.831428	MB	30	Kwkv	50	50	6	--	0	--		F	5	35	X		X		Hillside
M-19	30.670528	-97.838242	MB	30	Ked	0.5	0.5	--	--	0	--		X	5	35	X		X		Hilltop
M-20	30.686109	-97.835242	MB	30	Kwcpbc	0.5	0.5	--	--	0	--		X	5	35	X		X		Hilltop
M-21	30.643785	-97.840569	MB	30	Qta/Ked	0.5	0.5	--	--	0	--		X	5	35	X		X		Hillside
M-22	30.645662	-97.842722	MB	30	Qta/Ked	0.5	0.5	--	--	0	--		X	5	35	X		X		Hilltop
M-23	30.645795	-97.844327	MB	30	Qta/Ked	0.5	0.5	--	--	0	--		X	5	35	X		X		Hilltop
M-24	30.658504	-97.844387	MB	30	Ked	390	160	6	--	0	--		F	5	35	X		X		Drainage

* DATUM: State Plane Texas Central

2A TYPE	TYPE	2B POINTS
C	Cave	30
SC	Solution cavity	20
SF	Solution-enlarged fracture(s)	20
F	Fault	20
O	Other natural bedrock features	5
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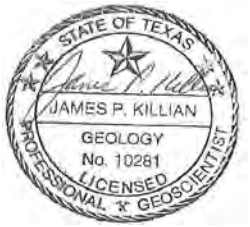

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Sheet ___6___ of __6____

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

Horizon
Environmental Services, Inc.

APPENDIX D

SITE PHOTOGRAPHS

PHOTO 1
View of geologic feature C-1 (sinkhole), facing down

PHOTO 2
View of geologic feature C-2 (sinkhole), facing east

PHOTO 3
View of geologic feature C-3 (2 solution cavities at upper left and lower right), facing southeast

PHOTO 4
View of geologic feature C-4 (solution cavity), facing northwest

Horizon
Environmental Services, Inc.

PHOTO 5
View of geologic feature C-5, facing south
(2 solution cavities by tree and white paper),

PHOTO 6
View of geologic feature C-6, facing northwest
(solution-enlarged fracture)

PHOTO 7
View of geologic feature C-7, facing northwest
(sinkhole under grape arbor)

PHOTO 8
View of geologic feature C-8, facing southeast
(solution cavity in front of brush)

Horizon
Environmental Services, Inc.

PHOTO 9
View of geologic feature SF-11 (sinkhole/cave), facing northeast

PHOTO 10
View of entrance drop of SF-11 (cave) with young vultures inside, facing down

PHOTO 11
View of geologic feature SF-13 (sinkhole), facing southeast

PHOTO 12
View of geologic feature SF-14 (sinkhole), facing north

Horizon
Environmental Services, Inc.

PHOTO 13
View along south side of geologic feature SF-15, facing north (large sinkhole with solution cavity/potential cave)

PHOTO 14
View looking down open solution cavity at SF-15

PHOTO 15
View along north side of SF-15, facing south

PHOTO 16
View along south side of SF-16, facing north (very large sinkhole/cave)

Horizon
Environmental Services, Inc.

PHOTO 17
View along north side of geologic feature SF-16, facing south

PHOTO 18
View open vertical shaft drop near center of SF-16, facing southwest

PHOTO 19
Another view of shaft drop/cave entrance near center of SF-16, facing down

PHOTO 20
View of geologic feature SF-17 (sinkhole), facing north

Horizon
Environmental Services, Inc.

PHOTO 21
View of geologic feature SF-18 (solution cavity), facing south

PHOTO 22
View of geologic feature SF-19 (sinkhole), facing north

PHOTO 23
View of geologic feature SF-20, facing southeast (2 closely spaced sinkholes)

PHOTO 24
View of geologic feature SR-1 (sinkhole), facing south

Horizon
Environmental Services, Inc.

PHOTO 25
View of geologic feature SR-2 (sinkhole), facing down

PHOTO 26
View of geologic feature SR-3, facing north (sinkhole between oak trees)

PHOTO 27
View of geologic feature SR-4 (solution cavity), facing north

PHOTO 28
View of geologic feature SR-5, facing north (2 solution cavities)

Horizon
Environmental Services, Inc.

PHOTO 29
View of geologic feature SR-6 (solution cavity), facing south

PHOTO 30
View of geologic feature SR-7 (sinkhole), facing southeast

PHOTO 31
View of geologic feature SR-8, facing east (2 closely spaced solution cavities)

PHOTO 32
View of geologic feature SR-9 (sinkhole), facing south

PHOTO 33
View of geologic feature SR-10 (large sinkhole), facing southwest

PHOTO 34
View of geologic feature SR-11 (solution cavity), facing northeast

PHOTO 35
View of geologic feature SR-12 (sinkhole), facing southeast

PHOTO 36
View of geologic feature SR-13 (large sinkhole), facing southwest

Horizon
Environmental Services, Inc.

PHOTO 37
View of geologic feature SR-14 (sinkhole), facing northeast

PHOTO 38
View of geologic feature SR-15 (solution cavity), facing west

PHOTO 39
View of geologic feature SR-16 (solution cavity), facing down

PHOTO 40
View of geologic feature SR-17 (solution cavity), facing south

Horizon
Environmental Services, Inc.

PHOTO 41

View of geologic feature SR-18 (solution cavity), facing south

PHOTO 42

View of geologic feature SR-19 (solution cavity), facing east

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: Steven P. Cates, P.E.

Date: 07/01/2025

Signature of Customer/Agent:

Regulated Entity Name: Santa Rita Ranch Neighborhood Center

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):5.8

3. Estimated projected population:100

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	32,262.5	÷ 43,560 =	0.74
Parking	109,494.5	÷ 43,560 =	2.5
Other paved surfaces	11,909	÷ 43,560 =	0.27
Total Impervious Cover	153,666	÷ 43,560 =	3.51

Total Impervious Cover 3.51 **÷ Total Acreage** 5.8 **X 100 =** 60.5**% 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	280 Gallons/day
_____% Industrial	_____Gallons/day
_____% Commingled	_____Gallons/day

TOTAL gallons/day 9,800

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 11/11/2019.

☐ 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 Liberty Hill Wastewater (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" = 50'.

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 MAP #48491C0275E, dated 9/26/2008

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

ATTACHMENT A

TCEQ WPAP & SCS APPLICATION

Santa Rita Ranch Neighborhood Center

Williamson County, Texas

Factors Affecting Water Quality:

During Construction

Non-Stormwater Discharges: The Following non-stormwater discharges may occur from the site during the construction period:

- Utility water line flushing during the initial line testing must use uncontaminated water that is not hyperchlorinated.
- Pavement wash waters (where no spills or leaks of toxic or hazardous materials have occurred)
- Groundwater (from dewatering of excavation) must be uncontaminated.
- Water used to wash vehicles or control dust must be accomplished using potable water without detergents.

All non-stormwater discharge will be directed to the temporary Erosion and Sedimentation Controls (Best Management Practices) to remove any suspended solids contained therein.
Stormwater during construction will remove loose material and transport it downstream.

Post Construction

Non-stormwater discharges after construction has been completed which can affect water quality include:

- Fertilizers and pesticides
- Household chemicals
- Pet Waste
- Used oil
- Car washing
- Mulching
- Sediment

Post Construction stormwater discharges typically transport sediment in the form of dirt and dust accumulated on the streets and other impervious flatwork, rooftops, and sediment from erosion of grassy areas. That material will be transported through the storm sewer system to the wet basins, where most of the pollutants will be removed.

Water Pollution Abatement Plan Application

ATTACHMENT B

TCEQ WPAP & SCS APPLICATION

Santa Rita Ranch Neighborhood Center

Williamson County, Texas

Volume and Character of Stormwater:

Existing and developed hydrology models were created in HEC-HMS, v.4.8. A 24-hour frequency storm was applied to the meteorological models for the 2, 10, 25, and 100-year storm events. The model was run over a 24-hour period with a computational time interval of 1 minute. Subbasins utilized an SCS Curve Number Loss Method and SCS Unit Hydrograph Transform Method. Reaches utilized either a Muskingum-Cunge or Lag Routing Method. See below for specific model input data.

Meteorological Model

Frequency storms with the following parameters were used to model storm events:

HEC-HMS Meteorological Model Parameters

Probability	2-yr = 50%, 10-yr = 10%, 25-100-yr = Other
Input Type	Partial Duration
Output Type	Annual Duration (only applicable for 2-10-yr)
Intensity Duration	5 Minutes
Storm Duration	1 Day
Intensity Position	50%
Storm Area	(Blank if less than 10 mi²)
Curve	Uniform for all subbasins

Partial-duration precipitation depths are per the Depth-Duration-Frequency Estimates for the San Gabriel River Zone in Williamson County, Texas, according to NOAA Atlas 14, Volume 11, Version 2. See the table below:

Precipitation Depths (in) per Recurrence Interval

Duration	2-YR	10-YR	25-YR	100-YR
5-min	0.51	0.757	0.921	1.19
15-min	1.02	1.51	1.84	2.37
60-min	1.88	2.79	3.4	4.39
2-hr	2.3	3.55	4.43	5.98
3-hr	2.55	4.02	5.09	7.06
6-hr	2.98	4.81	6.18	8.75
12-hr	3.44	5.54	7.12	10.1
24-hr	3.94	6.3	8.04	11.2

Land Use & Curve Numbers

In existing conditions, the soils are primarily hydrologic soil group D, as per the USDA Web Soil Survey. The soils map and data have been included in Appendix B. The curve numbers were selected from Urban

Hydrology for Small Watersheds[1] based on hydrologic soil groups and aerial maps. See table below. Curve numbers were assessed independently from impervious cover.

Runoff Curve Numbers

Cover Type	Hydrologic Condition	Hydrologic Soil Group	Curve Number
Pasture	Good	D	80
Woods-grass combination	Good	D	79
Meadow	Good	D	78

Existing impervious cover was determined from aerial imagery. Proposed impervious cover was estimated from the proposed and anticipated future layout using TCEQ assumptions for residential tracts. Impervious cover was calculated as a percent of the total drainage basin. Curve number and impervious cover percents were loss inputs for subbasins in the model.

Time of Concentration

All time of concentration calculations were generated using SCS methodology provided in Urban Hydrology for Small Watersheds[2] for sheet, shallow concentrated, and channel flow. A maximum of 100 feet was used for sheet flow calculations. Lag times were calculated as 60 percent of the time of concentration. Lag times were transform inputs for subbasins and reaches in the model. Times of concentration for future developed drainage areas were approximated based on assumed basin size.

Reaches

Reaches representing the Middle Fork San Gabriel River were modeled using the Muskingum-Cunge routing method with 8-point cross-sections. In developed conditions, reaches contributing to the Middle Fork were modeled with the Lag method.

Reservoirs

All reservoirs were modeled using outflow structures with an elevation-storage method. Initial conditions were elevations set to the bottom of pond elevation for batch detention facilities. The model assumed no tailwater condition. Future batch detention ponds were modeled with a generic stage-storage and outflow spillways assigned to the assumed water quality volume elevation.

[1] Natural Resources Conservation Service, Conservation Engineering Division. 1986. Urban Hydrology for Small Watersheds. Technical Release 55. U.S. Department of Agriculture. https://www.nrcs.usda.gov/Internet/FSE_DOCUMENTS/stelprdb1044171.pdf
[2] Ibid.

Temporary Stormwater Section
ATTACHMENT A

TCEQ WPAP & SCS APPLICATION

Santa Rita Ranch Neighborhood Center

Williamson County, Texas

Spill Response Actions:

1. Contain the spill.
2. Immediately stake off area.
3. Notify Hazardous Material team (if necessary); notify TCEQ:
   (512) 339-2929 or Emergency # 1-800-832-8224
4. Take necessary steps to clean up, i.e. notify remediation contractor if large spill, or small spills will be cleaned by the construction contractor.

All site personnel will be made aware of the manufactures' recommended methods for spill cleanup, and the location of the information and cleanup supplies.

Spills will be reported according to the Reportable Quantity, attached on the following page.

Materials and equipment necessary for spill cleanup will be kept onsite in an accessible location known to site personnel.

All Spills will be cleaned up immediately upon discovery. Any spill of hydrocarbons or hazardous substances greater than 25 gallons will require notification to the fire Department Hazardous Materials Team and TCEQ. As with all spills, an effort shall be made to prevent material from entering surface streams and storm drains by using rock or earth berms to contain the material.

Kind of spill	Where discharged	Reportable quantity	Rule, statute, or responsible agency
Hazardous substance	onto land	"Final RQ" in Table 302.4 in 40 CFR 302.4 (PDF)	30 TAC 327
	into water	"Final RQ" or 100 lbs, whichever is **less**	
Any oil	coastal waters	as required by the Texas General Land Office	Texas General Land Office
Crude oil, oil that is neither a petroleum product nor used oil	onto land	210 gallons (five barrels)	30 TAC 327
	directly into water	enough to create a sheen	
Petroleum product, used oil	onto land, from an exempt PST facility	210 gallons (five barrels)	30 TAC 327
	onto land, or onto land from a non-exempt PST facility	25 gallons	
	directly into water	enough to create a sheen	
Associated with the exploration, development and production of oil, gas, or geothermal resources	under the jurisdiction of the Railroad Commission of Texas	as required by the Railroad Commission of Texas	Railroad Commission of Texas
Industrial solid waste or other substances	into water	100 lbs	30 TAC 327
From petroleum storage tanks, underground or aboveground	into water	enough to create a sheen on water	30 TAC 334.75-81
From petroleum storage tanks, underground or aboveground	onto land	25 gallons or equal to the RQ under 40 CFR 302	30 TAC 327
Other substances that may be useful or valuable and are not ordinarily considered to be waste, but will cause pollution if discharged into water in the state	into water	100 lbs	30 TAC 327

1.4.16 Spill Prevention and Control

The objective of this section is to describe measures to prevent or reduce the discharge of pollutants to drainage systems or watercourses from leaks and spills by reducing the chance for spills, stopping the source of spills, containing and cleaning up spills, properly disposing of spill materials, and training employees.
The following steps will help reduce the stormwater impacts of leaks and spills:

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 clean up 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: https://www.tceq.texas.gov/response/spills

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 run on 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.
(3) Always use secondary containment, such as a drain pan, when fueling to catch spills/ leaks.

Temporary Stormwater Section
ATTACHMENT B

TCEQ WPAP & SCS APPLICATION

Santa Rita Ranch Neighborhood Center

Williamson County, Texas

Potential Sources of Contamination:

Gasoline, Diesel, and Hydraulic Fluid from construction equipment,
Asphalt products,
Construction Materials,
Trash and Debris,
Paint,
Concrete,
Gypsum from sheet rock,
Sediment.

All materials shall be hauled in a manner consistent with the manufacturer's recommendations. Disposal of waste material shall be in conformance with all state and local laws

Temporary Stormwater Section
ATTACHMENT C

TCEQ WPAP & SCS APPLICATION

Santa Rita Ranch Neighborhood Center

Williamson County, Texas

Sequence of Major Activities:

1. Install and maintain Erosion Control and Tree Protection per the Approved Plans and specifications prior to any clearing and grubbing, grading, excavating, etc... Notify Construction Inspection Division when installed.

2. Prior to beginning construction, the owner or his representative shall hold a Pre-Construction Conference between TCEQ, Williamson County, Contractor, and any other affected parties. Notify TCEQ at least 48 hours prior to the time of the conference and 48 hours prior to beginning construction. Prior to Pre-Construction Conference.

3. Hold Pre-Construction Conference with contractor, TCEQ, EV Inspector, Engineer, and owner or his representative.

4. Rough grade roadway.
   (Estimate of disturbed area = 2.5 ac)

5. Begin installation of storm sewer. Upon completion, restore as much disturbed areas as possible, particularly channels and large open areas. (Estimate of disturbed area = 0.58 ac)

6. Regrade streets to subgrade (Estimate of disturbed area = 2.5 ac)

7. Ensure that all underground utility crossings are completed. Lay first course base material on all streets. (0.58 ac)

8. Install curb and gutter. (Estimate of disturbed area = 0.062 ac)

9. Place concrete for common area 4’ sidewalk. (Estimate of disturbed area = 0.27 ac)

10. Lay final base course on all streets. (2.5 ac)

11. Lot grading. (Estimate of disturbed area = 3.05 ac)

12. Lay asphalt. (2.5 ac)

13. Clean site and revegetate all disturbed area according to the plans and specifications. Stabilization measures should include seeding and/or mulching.

14. Complete permanent erosion control and restoration of site vegetation.

15. Project Engineer to provide a written concurrence letter, and scheduling final inspection with EV Inspector, prior to the removal of erosion controls.

16. Remove and dispose of temporary erosion/sedimentation control measures.

17. Complete any necessary final dress up of areas disturbed by Item 16.

18. Conduct a final inspection and complete all punch list items.

Clearing and grubbing under a development permit, solely for the purpose of surveying and soil exploration, shall be a hand-cutting or blade-up operation.

11. Lot grading. (Estimate of disturbed area = 3.05 ac)

12. Lay asphalt. (2.5 ac)

13. Clean site and revegetate all disturbed area according to the plans and specifications. Stabilization measures should include seeding and/or mulching.

14. Complete permanent erosion control and restoration of site vegetation.

15. Project Engineer to provide a written concurrence letter, and scheduling final inspection with EV Inspector, prior to the removal of erosion controls.

16. Remove and dispose of temporary erosion/sedimentation control measures.

17. Complete any necessary final dress up of areas disturbed by Item 16.

18. Conduct a final inspection and complete all punch list items.

Clearing and grubbing under a development permit, solely for the purpose of surveying and soil exploration, shall be a hand-cutting or blade-up operation.

Temporary Stormwater Section
ATTACHMENT D

TCEQ WPAP & SCS APPLICATION

Santa Rita Ranch Neighborhood Center

Williamson County, Texas

Temporary Best Management Practices and Measures:

Install temporary erosion control measures, stabilized construction entrance, concrete washout area, inlet protection, and tree protection according to the plans and specifications prior to any clearing and grubbing, grading, excavating, etc. Upgradient stormwaters during construction crossing disturbed areas will be filtered utilizing standard Best Management Practices, such as erosion logs and silt fences, prior to leaving the site. The silt fences will be placed along down gradient areas of the site to prevent any sediment from entering storm sewers or surface streams.

There are no Geological features on this site. Silt fences will be placed along the downgradient areas of the site to prevent stormwater, from the disturbed areas, from draining to any offsite geological features.

Temporary Stormwater Section
ATTACHMENT F

TCEQ WPAP & SCS APPLICATION

Santa Rita Ranch Neighborhood Center

Williamson County, Texas

Structural Practices:

For areas that will have more than 10 acres within a common drainage area disturbed at one time, a combination of temporary BMPs and measures will be used to protect down slope and side slope boundaries of the construction area. For areas that will have less than 10 acres within a common drainage area disturbed at one time, a combination of a sediment basin and other erosion control measures, such as silt fences and rock berms, will be provided. For any areas not draining to sediment ponds, silt fences shall be provided.

Structural erosion control and pollution prevention practices shall be implemented to limit runoff discharge of pollutants from exposed soils. The structural practices utilized include:

Silt Fence

- Barrier consisting of geotextile fabric supported by metal posts to prevent soil and sediment loss from a site.
    1) Silt fence material should be polypropylene, polyethylene or polyamide woven or nonwoven fabric. The fabric width should be 36 inches, with a minimum unit weight of 4.5 oz/yd, mullen burst strength exceeding 190 lb/in2 , ultraviolet stability exceeding 70%, and minimum apparent opening size of U.S. Sieve No. 30.
    2) Fence posts should be made of hot rolled steel, at least 4 feet long with Tee or Ybar cross section, surface painted or galvanized, minimum nominal weight 1.25 lb/ft2 , and Brindell hardness exceeding 140.
    3) Woven wire backing to support the fabric should be galvanized 2” x 4” welded wire, 12 gauge minimum.

Fiber Rolls

- Placed at the toe and on the face of slopes to intercept runoff, reduce its flow velocity, release the runoff as sheet flow, and provide removal of sediment from the runoff.
    1) Core material: Core material should be biodegradable or recyclable. Material may be compost, mulch, aspen wood fibers, chipped site vegetation, agricultural rice or wheat straw, coconut fiber, 100% recyclable fibers, or similar materials.
    2) Containment Mesh: Containment mesh should be 100% biodegradable, photodegradable or recyclable such as burlap, twine, UV photodegradable plastic, polyester, or similar material. When the fiber role will remain in place as part of a vegetative system use biodegradable or photodegradable mesh. For temporary installation recyclable mesh is recommended.

Stabilized Construction Entrance

- Stabilized pad of crushed stone located at any point traffic will be entering or leaving the construction site from a public right-of-way, street, alley, sidewalk or parking area.

1) The aggregate should consist of 4 to 8 inch washed stone over a stable foundation as specified in the plan.
2) The aggregate should be placed with a minimum thickness of 8 inches.
3) The geotextile fabric should be designed specifically for use as a soil filtration media with an approximate weight of 6 oz/yd2 , a mullen burst rating of 140 lb/in2 , and an equivalent opening size greater than a number 50 sieve.
4) If a washing facility is required, a level area with a minimum of 4 inch diameter washed stone or commercial rack should be included in the plans. Divert wastewater to a sediment trap or basin.

Inlet Protection

- Filter barrier protection installed around stormwater inlets that provide protection against silt transport or accumulation in storm sewer systems.
    1) Filter fabric should be a nylon reinforced polypropylene fabric which meets the following minimum criteria: Tensile Strength, 90 lbs.; Puncture Rating, 60 lbs.; Mullen Burst Rating, 280 psi; Apparent Opening Size, U.S. Sieve No. 70.
    2) Posts for fabric should be 2” x 4” pressure treated wood stakes or galvanized steel, tubular in cross-section or they may be standard fence “T” posts.
    3) Concrete blocks should be standard 8” x 8” x 16” concrete masonry units.
    4) Wire mesh should be standard hardware cloth or comparable wire mesh with an opening size not to exceed 1/2 inch.

Concrete Washout

- Prevent or reduce the discharge of pollutants to stormwater from concrete waste by conducting washout offsite, performing washout in a designated area, and training employees and subcontractors.
    1) Plastic lining material should be a minimum of 10 mil in polyethylene sheeting and should be free of holes, tears, or other defects that compromise the impermeability of the material.

Temporary Sediment Basin

- Intercepts sediment-laden runoff and trap the sediment in order to protect drainage ways, properties and rights of way downstream.
    1) Riser should be corrugated metal or reinforced concrete pipe or box and should have watertight fittings or end to end connections of sections.
    2) An outlet pipe of corrugated metal or reinforced concrete should be attached to the riser and should have positive flow to a stabilized outlet on the downstream side of the embankment.
    3) An anti-vortex device and rubbish screen should be attached to the top of the riser and should be made of polyvinyl chloride or corrugated metal.

Rock Berm

- Serve as a check dam in areas of concentrated flow, to intercept sediment-laden runoff, detain the sediment and release the water in sheet flow.
    1) The berm structure should be secured with a woven wire sheathing having maximum opening of 1 inch and a minimum wire diameter of 20 gauge galvanized and should be secured with shoat rings.
    2) Clean, open graded 3- to 5-inch diameter rock should be used, except in areas where high velocities or large volumes of flow are expected, where 5- to 8-inch diameter rocks may be used.

Temporary Stormwater Section
ATTACHMENT G

TCEQ WPAP & SCS APPLICATION

Santa Rita Ranch Neighborhood Center

Williamson County, Texas

Drainage Area Map:

An overall drainage area map is included within the plan set submitted with this application.

Temporary Stormwater Section
ATTACHMENT H

TCEQ WPAP & SCS APPLICATION

Santa Rita Ranch Neighborhood Center

Williamson County, Texas

Inspection and Maintenance for Best Management Practices:

The Best Management Practices installed during construction will be maintained in accordance with the requirements of the EPA's NPDES/TPDES storm water pollution prevention program (SWPPP). The following maintenance procedures shall be followed until permanent stabilization is complete.

Silt Fence

a. Inspect weekly or after each rainfall event and repair or replacement shall be made promptly as needed.
b. Silt Fence shall be removed when the site is completely stabilized so as to not block or impede storm flow or drainage.
c. Accumulated silt shall be removed when it reaches a depth of 6 inches. The Silt shall be disposed of on an approved site and in such a manner that will not contribute to additional siltation.

Fiber Rolls

a. Inspect prior to forecast rain, daily during extended rain events, after rain events, and weekly.
b. Repair of replace split, torn, unraveling, or slumping fiber rolls.
c. If the fiber roll is used as a sediment capture device, or as an erosion control device to maintain sheet flows, sediment that accumulates behind the role shall be periodically removed tin order to maintain its effectiveness. Sediment shall be removed when the accumulation reaches one-half the designated sediment storage depth, usually one-half the distance between the top of the fiber roll and the adjacent ground surface. Sediment removed during maintenance may be incorporated into earthwork on the site or disposed of at an appropriate location.

Stabilized Construction Entrance

a. The entrance shall be maintained in a condition that will prevent tracking or flowing of sediment onto a public roadway. This may require periodic top dressing with additional stone as conditions demand, as well as repair and clean out of any devices used to trap sediment.
b. Entrance must be properly graded to incorporate a drain swale or similar measure to prevent runoff from leaving the construction site.

Inlet Protection

a. Inspection shall be made weekly or after each rainfall event and replacement or repair shall be made promptly as needed.
b. Accumulated silt shall be removed when it reaches a depth of 6 inches. The Silt shall be disposed of on an approved site and in such a manner that will not contribute to additional siltation
c. The dyke shall be removed when the site is completely stabilized so as to not block or impede storm flow or drainage.

Temporary Sediment Basins

a. Inspection shall be made weekly or after each rainfall event. Check the embankment spillways, and outlet for erosion damage, and inspect the embankment for piping and settlement. Repair should be made promptly as needed.
b. Trash and other debris should be removed after each rainfall event to prevent clogging of the outlet structure.
c. Accumulated silt should be removed and the basin should be regraded to its original dimensions at such point that the capacity of the impoundment has been reduced to 75% of its storage capacity.
d. The removed sediment should be stockpiled or redistributed in areas that are protected from erosion.

Concrete Washout

a. Inspection shall be made daily or after each rainfall event to check for leaks, identify any plastic linings and sidewalls which have been damaged by construction activities.
b. When the washout container is filled over 75 % of its capacity, the washwater should be vacuumed off or allowed to evaporate to avoid overflows. When the remaining cementitious solids have hardened, they should be removed and recycled.
c. Damages to the container should be repaired promptly and as needed.
d. Before heavy rains, the washout containers liquid level should be lowered or the container should be covered to avoid an overflow during the rain event.

The owner shall hire an E&S compliance company to inspect E&S measures and keep reports of onsite inspections with deficiencies and solutions.

Temporary Stormwater Section
ATTACHMENT I

TCEQ WPAP & SCS APPLICATION

Santa Rita Ranch Neighborhood Center

Williamson County, Texas

Schedule of Interim and Permanent Soil Stabilization Practices:

Soil Stabilization for all disturbed areas shall be accomplished by hydraulic planting. Following is an outline to accomplish the required stabilization.

1. Preparing Seed Bed. After the designated areas have been rough graded to the lines, grades and typical sections indicated in the Drawings or as provided for in other items of this contract and for any other soil area disturbed by the construction, a suitable seedbed shall be prepared. The seedbed shall consist of a minimum of either 4 inches (100 millimeters) of approved topsoil or 4 inches (100 millimeters) of approved salvaged topsoil, cultivated and rolled sufficiently to enhance the soil to a state of good health, when the soil particles on the surface are small enough and lie closely enough together to prevent the seed from being covered too deeply for optimum germination. The optimum depth for seeding shall be 114 inch (6 millimeters). Water shall be gently applied as required to prepare the seedbed prior to the planting operation either by broadcast seeding or hydraulic planting. Bare soils should be seeded or otherwise stabilized within 14 calendar days after final grading or where construction activity has temporarily ceased for more than 21 days. Seeding shall be performed in accordance with the requirements hereinafter described.

2. Watering. All watering shall comply with Santa Rita Ranch Rules and Regulations. Broadcast seeded areas shall immediately be watered with a minimum of 5 gallons of water per square yard (22.5 liters of water per square meter) or as needed and in the marmer and quantity as directed by the Engineer or designated representative. Hydraulic seeded areas and native grass seeded areas shall be watered commencing after the tackifier has dried with a minimum of 5 gallons of water per square yard (22.5 liters of water per square meter) or as needed to keep the seedbed in a wet condition favorable for the growth of grass. Watering applications shall constantly maintain the seedbed in a wet condition favorable for the growth of grass. Watering shall continue until the grass is uniformly 1 1/2 inches (40 mm) in height and accepted by the Engineer or designated representative. Watering can be postponed immediately after a 1/2 inch (12.5 mm) or greater rainfall on the site but shall be resumed before the soil dries out.

3. Hydraulic Planting. The seedbed shall be prepared as specified above and hydraulic planting equipment, which is capable of placing all materials in a single operation, shall be used.

March 1 to September 15

Hydraulic planting mixture and minimum rate of application pounds per 1000 square feet (kilograms per 100 square meters):

<table>
<tr><td colspan="4">Planting Mixture</td></tr>
<tr><td rowspan="2">Hulled Bermuda Seed (PLS=0.83)</td><td colspan="2">Fiber Mulch</td><td rowspan="2">Soil Tackifier</td></tr>
<tr><td>Cellulose</td><td>Wood</td></tr>
<tr><td rowspan="4">1 lbs/1000 ft2
(0.5 kgs/100 m2)</td><td rowspan="2">45.9 Lbs/1000 ft2
(22.5 kgs/100m2)</td><td></td><td rowspan="2">1.4 lbs/1000 ft2
(0.7 kgs/100 m2)</td></tr>
<tr><td></td></tr>
<tr><td></td><td rowspan="2">57.4 lbs/1000 ft2
(28.01 kgs/100 m2)</td><td rowspan="2">1.5 lbs/1000 ft2
(0.75 kgs/100 m2)</td></tr>
<tr><td></td></tr>
</table>

September 15 to March 1

Add 1.5 pounds per 1000 square feet (0.75 kgs/ 100 m@) of cool season cover crop (see table 1) to above mixture. The fertilizer shall conform to City of Austin Standard Specification Item No. 606S, “Fertilizer”.

Table 1 : Cool Season Cover Crop

Common Name	Botanical Name	Application rates	
		Lbs/1000 feet^2	Kg/ 100 meter^2
Wheat	Triticum aestivum	0.5	0.25
Oats	Avena sativa	0.5	0.25
Cereal Rye Grain	Secale cereal	0.5	0.25
Total Cool Season Cover Crop Seeding Rate		1.5	0.75
Total Cool Season Seeding Rate (Grass Wildflowers, & Cover Crop)		4.5	2.25

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: Steven P. Cates, P.E.

Date: 07/01/2025

Signature of Customer/Agent

Regulated Entity Name: Santa Rita Ranch Neighborhood Center

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
ATTACHMENT B

TCEQ WPAP & SCS APPLICATION

Santa Rita Ranch Neighborhood Center

Williamson County, Texas

Best Management Practices for Upgradient Stormwater:

Any upgradient stormwater will flow into area inlets and be piped to existing Middlebrook Ranch 1 Wet Pond, which has been sized to treat and detain for the existing subdivision, and is proposed to be expanded to serve the proposed site.

Permanent Stormwater Section
ATTACHMENT C

TCEQ WPAP & SCS APPLICATION

Santa Rita Ranch Neighborhood Center

Williamson County, Texas

Best Management Practices for On-site Stormwater:

Stormwater runoff from Santa Rita Ranch Neighborhood Center Drainage Areas A through C will sheet flow across pavement, be captured in area inlets, and piped into existing Middlebrook Ranch Section 1 Wet Pond, which is proposed to be expanded with this development. Drainage Area D2 Stormwater runoff shall flow overland and be captured in a proposed culvert which flows into Drainage Area D1. Drainage Area D1 shall flow overland into a proposed channel which flows into an existing culvert. The combined flow of Drainage Areas D1 and D2 shall be piped through this existing culvert, into an existing channel.

TCEQ project and drainage area maps are provided in the included construction plans. TCEQ TSS removal calculations are provided in Appendix A of this application. TCEQ WPAP & SCS approval letters are provided in Appendix B.

Permanent Stormwater Section
ATTACHMENT D

TCEQ WPAP & SCS APPLICATION

Santa Rita Ranch Neighborhood Center

Williamson County, Texas

Best Management Practices for Surface Stream Stormwater:

The majority of stormwater runoff in developed sections will sheet flow across lawns and roofs, be captured in gutters and curb/area inlets, and piped into the wet pond. Discharge from the pond will be released into an existing storm sewer system that discharges along Ronald Reagan Boulevard. No floodplain exists on this site per the National Flood Insurance Program (NFIP) Map # 48491C0275E, dated September 26, 2008.

Permanent Stormwater Section
ATTACHMENT F

TCEQ WPAP & SCS APPLICATION

Santa Rita Ranch Neighborhood Center

Williamson County, Texas

Construction Plans:

Construction Plans for the erosion and sedimentation control measures proposed with this development are included at the end of this report.

Permanent Stormwater Section
ATTACHMENT G

TCEQ WPAP & SCS APPLICATION

Santa Rita Ranch Neighborhood Center

Williamson County, Texas

Inspection, Maintenance, Repair and Retrofit Plan:

Maintenance Guidelines for Wet Basins

Wet Basins
The wet basin (pond) is a facility that removes sediment, organic nutrients, and trace metals from stormwater runoff. This is accomplished by detaining stormwater using an in-line permanent pool or pond resulting in settling of pollutants. The wet basin is similar to an extended detention basin, except that a permanent volume of water is incorporated into the design. Biological processes occurring in the permanent pool aid in reducing the amount of soluble nutrients present in the water. Wet basins also offer flood-control benefits. Because they are designed with permanent pools, wet basins can also have recreational and aesthetic benefits.

These facilities may vary in appearance from natural ponds to enlarged, bermed (manmade) sections of drainage systems and may function as online or offline facilities, although offline configuration is preferable. Offline designs can prevent scour and other damage to the wet pond and minimize costly outflow structure elements needed to accommodate extreme runoff events.
During storm events, runoff inflows displace part or all of the existing basin volume and are retained and treated in the facility until the next storm event. The pollutant removal mechanisms are settling of solids, wetland plant uptake, and microbial degradation. When the wet basin is adequately sized, pollutant removal performance can be excellent. Wet basins also help provide erosion protection for the receiving channel by limiting peak flows during larger storm events.

Design Criteria

Facility Sizing
The basin should be sized to hold the permanent pool as well as the required water quality volume. This water quality volume should be increased by a factor of 20% to accommodate reductions in the available storage volume due to deposition of solids in the time between full-scale maintenance activities. The volume of the permanent pool should equal the water quality volume (i.e., when full the facility holds twice the water quality volume).

Pond Configuration
The wet basin should be configured as a two-stage facility with a sediment forebay and a main pool. The basins should be wedge-shaped, narrowest at the inlet and widest at the outlet if possible. The minimum length to width ratio should be 1.0. Higher ratios are recommended.

Pond Side Slopes
Side slopes of the basin should be 3:1 (H:V) or flatter for grass stabilized slopes. Slopes steeper than 3:1 should be stabilized with an appropriate slope stabilization practice.

Pond Configuration

The wet basin should be configured as a two-stage facility with a sediment forebay and a main pool. The basins should be wedge-shaped, narrowest at the inlet and widest at the outlet if possible. The minimum length to width ratio should be 1.0. Higher ratios are recommended.

Pond Side Slopes

Side slopes of the basin should be 3:1 (H:V) or flatter for grass stabilized slopes. Slopes steeper than 3:1 should be stabilized with an appropriate slope stabilization practice.

Sediment Forebay

A sediment forebay is required to isolate gross sediments as they enter the facility and to simplify sediment removal. The sediment forebay should consist of a separate cell formed by an earthen berm, gabion, or loose riprap wall. The forebay should be sized to contain 15 to 25% of the permanent

pool volume and should be at least 3 feet deep. Exit velocities from the forebay should not be erosive. Direct maintenance access should be provided to the forebay. The bottom of the forebay may be hardened to make sediment removal easier. A fixed vertical sediment depth marker should be installed in the forebay to measure sediment accumulation.

Outflow Structure

A low flow orifice should be provided that will drain the water quality volume in a minimum of 24 hours. The facility should have a separate drain pipe with a manual valve that can completely or partially drain the pond for maintenance purposes. To allow for possible sediment accumulation, the submerged end of the pipe should be protected, and the drain pipe should be sized one pipe schedule higher than the calculated diameter needed to drain the pond within 24 hours. The valve should be located at a point where it can be operated in a safe and convenient manner.

For online facilities, the principal and emergency spillways must be sized to provide 1.0 foot of freeboard during the 25-year event and to safely pass the 100- year flood. The embankment should be designed in accordance with all relevant specifications for small dams.

Splitter Box

When the pond is designed as an offline facility, a splitter structure is used to isolate the water quality volume. The splitter box, or other flow diverting approach, should be designed to convey the 25-year event while providing at least 1.0 foot of freeboard along pond side slopes. ***Vegetation*** – A plan should be prepared that indicates how aquatic and terrestrial areas will be vegetatively stabilized. Wetland vegetation elements may be placed along an aquatic bench around the perimeter, but is not required. The optimal elevation for planting of wetland vegetation is within 6 inches vertically of the normal pool elevation.

Erosion Protection at the Outfall

For online facilities, special consideration should be given to the facility's outfall location. Flared pipe end sections that discharge at or near the stream invert are preferred. The channel immediately below the pond outfall should be modified to conform to natural dimensions, and lined with large riprap

placed over filter cloth. Energy dissipation should be used to reduce flow velocities from the primary spillway to non-erosive velocities.

Safety Considerations

Safety is provided either by fencing of the facility or by managing the contours of the pond to eliminate dropoffs and other hazards. Earthen side slopes should not exceed 3:1 (H:V). Landscaping can be used to impede access to the facility if desired. The primary spillway opening should not permit access by small children. Outfall pipes more than 48 inches in diameter should be fenced.

Depth of the Permanent Pool

The permanent pool should be no deeper than 8 feet and should average 4-6 feet deep.

Fish

To minimize problems with mosquitoes, *Gambusia affinis* (mosquito fish) or other similar native species should be stocked at a minimum initial density of 200 individuals per surface acre.

Aeration

The performance and appearance of a constructed wetland may be improved by providing aeration of the permanent pool; however, this is not a requirement.

A common sign of failure of some BMPs is standing water long after the rain event ends. This is especially true in sand filters, dry extended detention basins, and retention basins. In addition, wet ponds may also need to be drained for maintenance purposes. The water in each of these systems can be pumped into the storm drain conveyance system downstream of the BMP as long as it has been at least 48 hours since the last rain event. This delay usually provides sufficient time for most of the pollutants to settle out of the standing water; however, the discharge of sediment laden water is not allowed at any time

Routine Maintenance

Mowing

The side-slopes, embankment, and emergency spillway of the basin should be mowed at least twice a year to prevent woody growth and control weeds.

Inspections

Wet basins should be inspected at least twice a year (once during or immediately following wet weather) to evaluate facility operation. When possible, inspections should be conducted during wet weather to determine if the basin is functioning properly. There are many functions and characteristics of these BMPs that should be inspected. The embankment should be checked for subsidence, erosion, leakage, cracking, and tree growth. The condition of the emergency spillway should be checked. The inlet, barrel, and outlet should be inspected for clogging. The adequacy of upstream and downstream channel erosion protection measures should be checked. Stability of the side slopes should be checked. Modifications to the basin structure and contributing watershed should be evaluated. During semi-annual inspections, replace any dead or displaced vegetation. Replanting of various species of wetland vegetation may be required at first, until a viable mix of species is established. Cracks, voids and

undermining should be patched/filled to prevent additional structural damage. Trees and root systems should be removed to prevent growth in cracks and joints that can cause structural damage. The inspections should be carried out with as-built pond plans in hand.

Debris and Litter Removal

As part of periodic mowing operations and inspections, debris and litter should be removed from the surface of the basin. Particular attention should be paid to floatable debris around the riser, and the outlet should be checked for possible clogging.

Erosion Control

The basin side slopes, emergency spillway, and embankment all may periodically suffer from slumping and erosion. Corrective measures such as regrading and revegetation may be necessary. Similarly, the riprap protecting the channel near the outlet may need to be repaired or replaced.

Nuisance Control

Most public agencies surveyed indicate that control of insects, weeds, odors, and algae may be needed in some ponds. Nuisance control is probably the most frequent maintenance item demanded by local residents. If the ponds are properly sized and vegetated, these problems should be rare in wet ponds except under extremely dry weather conditions. Twice a year, the facility should be evaluated in terms of nuisance control (insects, weeds, odors, algae, etc.). Biological control of algae and mosquitoes using fish such as fathead minnows is preferable to chemical applications.

Non-routine maintenance

Structural Repairs and Replacement

Eventually, the various inlet/outlet and riser works in the wet basin will deteriorate and must be replaced. Some public works experts have estimated that corrugated metal pipe (CMP) has a useful life of about 25 yr, while concrete barrels and risers may last from 50 to 75 yr. The actual life depends on the type of soil, pH of runoff, and other factors. Polyvinyl chloride (PVC) pipe is a corrosion resistant alternative to metal and concrete pipes. Local experience typically determines which materials are best suited to the site conditions. Leakage or seepage of water through the embankment can be avoided if the embankment has been constructed of impermeable material, has been compacted, and if anti-seep collars are used around the barrel. Correction of any of these design flaws is difficult.

Sediment Removal

Wet ponds will eventually accumulate enough sediment to significantly reduce storage capacity of the permanent pool. As might be expected, the accumulated sediment can reduce both the appearance and pollutant removal performance of the pond. Sediment accumulated in the sediment forebay area should be removed from the facility every two years to prevent accumulation in the permanent pool. Dredging of the permanent pool should occur at least every 20 years, or when accumulation of sediment impairs functioning of the outlet structure.

Harvesting

Non-routine maintenance

Structural Repairs and Replacement

Eventually, the various inlet/outlet and riser works in the wet basin will deteriorate and must be replaced. Some public works experts have estimated that corrugated metal pipe (CMP) has a useful life of about 25 yr, while concrete barrels and risers may last from 50 to 75 yr. The actual life depends on the type of soil, pH of runoff, and other factors. Polyvinyl chloride (PVC) pipe is a corrosion resistant alternative to metal and concrete pipes. Local experience typically determines which materials are best suited to the site conditions. Leakage or seepage of water through the embankment can be avoided if the embankment has been constructed of impermeable material, has been compacted, and if anti-seep collars are used around the barrel. Correction of any of these design flaws is difficult.

Sediment Removal

Wet ponds will eventually accumulate enough sediment to significantly reduce storage capacity of the permanent pool. As might be expected, the accumulated sediment can reduce both the appearance and pollutant removal performance of the pond. Sediment accumulated in the sediment forebay area should be removed from the facility every two years to prevent accumulation in the permanent pool. Dredging of the permanent pool should occur at least every 20 years, or when accumulation of sediment impairs functioning of the outlet structure.

Harvesting

If vegetation is present on the fringes or in the pond, it can be periodically harvested and the clippings removed to provide export of nutrients and to prevent the basin from filling with decaying organic matter.

Ultimately, these facilities will be owned, operated and maintained by the proposed Williamson County MUD No. 19. Until the ownership of facilities is transferred to the MUD, Santa Rita Commercial, LLC. will be responsible for maintenance of these facilities in accordance with the above stated requirements.

Acknowledged by:

James Edward Horne
Santa Rita Commercial, LLC.

BMP DESIGN FIRM INFORMATION

Carlson, Brigance & Doering, Inc.
Mr. Steven P. Cates, P.E.
Phone: (512) 280-5160
5501 West William Cannon
Austin, TX 78749

STATE OF TEXAS
STEVEN P. CATES
93648
LICENSED
PROFESSIONAL ENGINEER
CARLSON, BRIGANCE & DOERING, INC.
ID# F-3791

The above Inspection, Maintenance, Repair, and Retrofit Plan has been prepared by the undersigned Engineer, and I hereby certify that the above Plan conforms with the minimum requirements of the TCEQ Technical Guidance on Best Management Practices, RG-348.

7-1-2025

Steven P. Cates, P.E. Date

Permanent Stormwater Section

ATTACHMENT I

TCEQ WPAP & SCS APPLICATION

Santa Rita Ranch Neighborhood Center

Williamson County, Texas

Measures for Minimizing Surface Stream Contamination:

The development minimizes surface stream contamination by maintaining the naturally occurring sheet flow across the lots. Drainage from this development will be directed towards a wet pond which will reduce the developed flow rate to below predeveloped flow rates. There are no surface streams within this site.

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: Santa Rita Ranch Neighborhood Center

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: James Edward Horne
   Entity: Santa Rita Commercial, LLC.
   Mailing Address: 1700 Cross Creek Lane, Suite 100
   City, State: Liberty Hill, Texas Zip: 78642
   Telephone: 512-502-2050 Fax: _____
   Email Address: ed@srraustin.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: Steven P. Cates, P.E.
   Texas Licensed Professional Engineer's Number: 93648
   Entity: Carlson, Brigance, and Doering, Inc.
   Mailing Address: 5701 W. William Cannon Dr.
   City, State:Austin, Texas Zip: 78749
   Telephone:512-280-5160 Fax:512-280-5165

Email Address:steve@cbdeng.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	280 gallons/day
_____% Industrial	_____ gallons/day
_____% Commingled	_____ gallons/day

Total gallons/day: 9,800

6. Existing and anticipated infiltration/inflow is 0 gallons/day. This will be addressed by: SCH 40 PVC with gasketed joints.

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 this application, 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)*
-	-	-	-
-	-	-	-
-	-	-	-
-	-	-	-
-	-	-	-

Total Linear Feet: All private service laterals.

(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 Liberty Hill Wastewater (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	22 Of 27	8+00.75	CO
A	22 Of 27	10+87.29	CO
B	22 Of 27	0+48.57	CO
	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" = 20'.

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*
WWLN A	5+59.79	CROSSING		4.2'
		CROSSING		
		CROSSING		
		CROSSING		
		CROSSING		
		CROSSING		
		CROSSING		

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*

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]**	N/A of N/A
Manhole, showing inverts comply with 30 TAC §217.55(l)(2) **[Required]**	24 of 27
Alternate method of joining lateral to existing SCS line for potential future connections **[Required]**	24 of 27
Typical trench cross-sections **[Required]**	24 of 27
Bolted manholes **[Required]**	24 of 27
Sewer Service lateral standard details **[Required]**	24 of 27
Clean-out at end of line **[Required, if used]**	24 of 27
Baffles or concrete encasement for shock/erosion protection **[Required, if flow velocity of any section of pipe >10 fps]**	N/A of N/A
Detail showing Wastewater Line/Water Line Crossing **[Required, if crossings are proposed]**	22 of 27
Mandrel detail or specifications showing compliance with 30 TAC §217.57(b) and (c) **[Required, if Flexible Pipe is used]**	N/A of N/A

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

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: 09/01/2025

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: Steven P. Cates, P.E.

Date: 07/01/2025

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)

Santa Rita Ranch
Neighborhood Center

E-One Low Pressure Design Report

Prepared by:

Steven P. Cates, P.E.
Carlson, Brigance & Doering, Inc.
5701 W. William Cannon
Austin, Texas 78749
(512)-280-5160
Firm # F3791

Prepared for:

K29 1941 Investments, LP
Attn: James Edward Horne
7143 Valburn Drive
Austin, Texas 78731

7-2-2025

July, 2025
CBD No. 5711

Santa Rita Ranch
Neighborhood Center

E-One Low Pressure Design Report

TABLE OF CONTENTS

Santa Rita Ranch
Neighborhood Center

E-One Low Pressure Design Report

I. GENERAL

Santa Rita Ranch Neighborhood Center is an 5.73 acre commercial development that is composed of multiple commercial pad sites. The project is located to the north of Santa Rita Ranch Boulevard, and East of Ronald Reagan Boulevard. The project is located within the City of Liberty Hill ETJ, in Williamson County, Texas. This project includes approximately 1,141 linear feet of SDR 21 PVC force main.

Wastewater service is provided by e one's grinder can & low pressure system flowing to a proposed manhole at the end of the system that will connect to an existing SCS approved gravity system routed to Liberty Hill Wastewater Treatment plant. The existing SCS was approved with Santa Rita Boulevard Improvements (EAPP #11001824 (WPAP) and 1106766 (SCS)).

Flow was calculated using City of Round Rock design criteria based on (280 gallons per LUE) based on 3 people per LUE, 93.3 gpd/person, for residential use.

II. DESCRIPTION OF PROPOSED SYSTEM

The gravity mains and manholes meet the TCEQ requirements of Chapter 217. All the gravity mains with this project are PVC SDR-26. All of the Force Mains are PVC SDR-21. The construction plans consist of the following:

Linear Feet	Pipe Material	National Standard Specification for Pipe
1141	PVC SDR-21	ASTM D2241

The low pressure system is designed to provide a velocity of at least 2 feet per second. Additionally, the system is designed to ensure that, with pipes flowing full, the velocities will be less than 10 feet per second.

Pipe Diameter: 2"

The plans and specifications, which describe the project identified in the report, are in compliance with all the requirements of Chapter 217. Refer to the calculations at the end of the report for all the analysis for flows & deflection.

Santa Rita Ranch
Neighborhood Center

E-One Low Pressure Design Report

VI. Pipe Sizing, Branch Analysis, and Accumulated Retention Time

Zone Number	Connects to Zone	Number of Pumps in Zone	Accum Pumps in Zone	Gals/day per Pump	Max Flow Per Pump (gpm)	Max Sim Ops	Max Flow (GPM)	Pipe Size (inches)	Max Velocity (FPS)	Length of Main this Zone	Friction Loss Factor (ft/100 ft)	Friction Loss This Zone	Accum Fric Loss (feet)	Max Main Elevation	Minimum Pump Elevation	Static Head (feet)	Total Dynamic Head (ft)
This spreadsheet was calculated using pipe diameters for:						SDR21PVC			Friction loss calculations were based on a Constant for inside roughness "C" of:								150
1	3	2	2	280	11	2	22	2	2.12	524	0.73	3.82	12.58	1055	1054	1	13.58
2	3	2	2	280	11	2	22	2	2.12	49	0.73	0.36	9.12	1055	1053	2	11.12
3	3	0	4	280	11	3	33	2	2.92	568	1.54	8.76	8.76	1055	1053	2	10.76

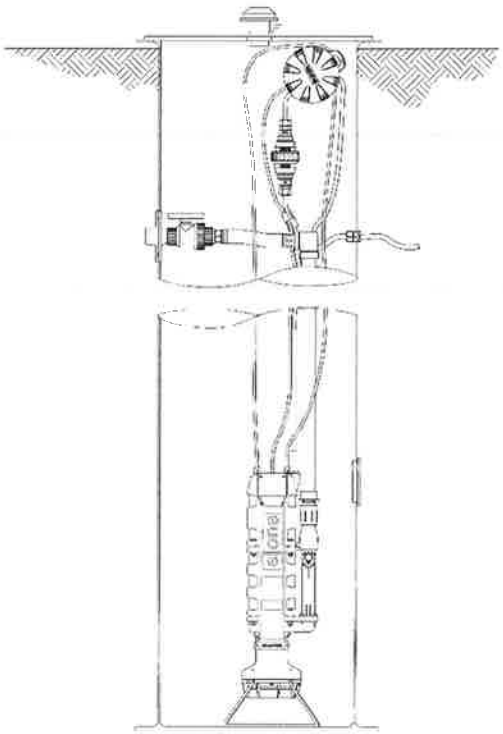
Santa Rita Ranch
Neighborhood Center

E-One Low Pressure Design Report

VII. E-One Gatorgrinder pump specifications

E/ONE EXTREME SERIES

gatorgrinder™



G-Series Gatorgrinder Grinder Pump Station with Wired Level Sensor

Typical Specifications

Semi-Positive Displacement Type Grinder Pump Stations

SECTION: GRINDER PUMP STATIONS

1.0 GENERAL

1.01 GENERAL DESCRIPTION: The **MANUFACTURER** shall furnish complete grinder pump station(s), consisting of a grinder pump, a tank constructed of fiberglass, NEMA 6P electrical quick disconnect, pump removal system, discharge piping assembly/shut-off valve, anti-siphon valve/check valve, electrical alarm panel and all necessary internal wiring and controls. All components and materials shall be in accordance with Section 2.0 of this product specification. For ease of serviceability, all pump motor/grinder units shall be of like type and horsepower throughout the system.

1.02 SHOP DRAWINGS: After receipt of notice to proceed, the **MANUFACTURER** shall furnish a minimum of six sets of shop drawings detailing the equipment to be furnished including dimensional data and materials of construction. The **ENGINEER** shall promptly review this data, and return two copies as accepted, or with requested modifications. Upon the **ENGINEER'S** acceptance of the shop drawings and the **MANUFACTURER'S** receipt of notice to proceed, the **MANUFACTURER** shall begin fabrication of the equipment.

1.03 MANUFACTURER: Grinder pump stations, complete with all appurtenances, form an integral system, and as such, shall be supplied by one grinder pump station manufacturer. The **CONTRACTOR** shall be responsible for the satisfactory operation of the entire system. The equipment specified shall be a product of a company experienced in the design and manufacture of grinder pumps for specific use in low pressure sewage systems. The company shall submit detailed installation and user instructions for its product, submit evidence of an established service program including complete parts and service manuals, and be responsible for maintaining a continuing inventory of grinder pump replacement parts. The **MANUFACTURER** shall provide, upon request, a reference and contact list from ten of its largest contiguous grinder pump installations of the type of grinder pumps described within this specification.

The **MANUFACTURER** of the grinder pump station shall be Environment One Corporation (or Proposed Alternate).

Attention is directed to the fact that the drawings and overall system design are based on a particular piece of equipment from a particular manufacturer. These specifications are intended to provide guidelines for standard equipment of a recognized manufacturer who already meets all the requirements of this specification.

1.03a ALTERNATE EQUIPMENT: In the event that the **CONTRACTOR** or another supplier proposes an Alternate to the specified **MANUFACTURER**, the **ENGINEER** recognizes that it will be difficult to conform to certain details of this Specification due to different manufacturing techniques or grinder pump station designs. If proposing an Alternate, the **CONTRACTOR** (supplier) must submit, no less than 15 business days in advance of the bid date, a complete description of any changes that will be necessary to the system design, a complete submittal package as outlined in Section 1.02 SUBMITTALS, a system hydraulic analysis based on the proposed pump, (including pipe sizes, flows, velocities, retention times and number and location of recommended valves and cleanouts, if any) a list of exceptions to this specification, and demonstration of compliance to Section 1.04 EXPERIENCE CLAUSE of this specification. The **CONTRACTOR** (supplier) must also complete the Manufacturer Disclosure Statement found at the end of this specification. This information must be submitted to the **ENGINEER** for pre-approval of the alternate equipment being proposed and determination of compliance with these contract documents. If the equipment differs

materially or differs from the dimensions given on the drawings, the **CONTRACTOR** (supplier) shall submit complete drawings showing elevations, dimensions, or any necessary changes to the Contract Documents for the proposed equipment and its installation. Pre-approval, if granted, will be provided in writing by the **ENGINEER** to the **CONTRACTOR** (supplier) at least five business days in advance of the bid date. If the **ENGINEER'S** approval is obtained for Alternate Equipment, the **CONTRACTOR** (supplier) must make any needed changes in the structures, system design, piping or electrical systems necessary to accommodate the proposed equipment at the expense of the **CONTRACTOR** (supplier).

1.04 **EXPERIENCE CLAUSE:** The equipment furnished hereunder shall be the product of a company experienced in the design and manufacture of grinder pumps specifically designed for use in low pressure systems. All manufacturers proposing equipment for this project shall have at least 10 years of experience in the design and manufacture of units of identical size(s) and performance to the specified units. All manufacturers proposing equipment for this project must also have not less than 500 successful installations of low pressure sewer systems utilizing grinder pumps of like type to the grinder pumps specified herein. An installation is defined as a minimum of 25 pumps discharging into a common force main which forms a low pressure sewer system. The **CONTRACTOR** (supplier) proposing alternate equipment shall also submit, as part of the bid schedule, an installation list with contact person(s), phone number(s) and date(s) of installation of at least 10 installations of the type of pump specified herein that have been in operation for at least 10 years.

In lieu of this experience clause, the **CONTRACTOR** (supplier) of alternate equipment will be required to submit a 5-year performance bond for 100 percent of the stipulated cost of the equipment as bid and as shown in the bid schedule. This performance bond will be used to guarantee the replacement of the equipment in the event that it fails within the bond period.

1.05 **OPERATING CONDITIONS**: The pumps shall be capable of delivering 15 GPM against a rated total dynamic head of 0 feet (0 PSIG), 11 GPM against a rated total dynamic head of 92 feet (40 PSIG), and 7.8 GPM against a rated total dynamic head of 185 feet (80 PSIG). The pump(s) must also be capable of operating at negative total dynamic head without overloading the motor(s). Under no conditions shall in-line piping or valving be allowed to create a false apparent head.

1.06 **WARRANTY**: The grinder pump **MANUFACTURER** shall provide part(s) and labor warranty on the complete station and accessories, including, but not limited to, the panel for a period of 12 months after notice of **OWNER'S** acceptance, but no greater than 15 months after receipt of shipment. Any manufacturing defects found during the warranty period will be reported to the **MANUFACTURER** by the **OWNER** and will be corrected by the **MANUFACTURER** at no cost to the **OWNER**.

1.07 **WARRANTY PERFORMANCE CERTIFICATION**: As a bid certification requirement, each bidder shall provide with their bid schedule a Warranty Performance Certification statement executed by the most senior executive officer of the grinder pump **MANUFACTURER**, which certifies a minimum of a 12 month warranty. They must further detail any exclusions from the warranty or additional cost items required to maintain the equipment in warrantable condition, including all associated labor and shipping fees, and certify that the **MANUFACTURER** will bear **all** costs to correct any original equipment deficiency for the effective period of the warranty. All preventive maintenance type requirements shall be included in this form as exclusions. These requirements include, but are not limited to, unjamming of grinder mechanism, periodic motor maintenance, and periodic cleaning of liquid level controls. Should the **CONTRACTOR** (supplier) elect to submit a performance bond in lieu of the experience clause outlined above, this Warranty

Performance Certification shall also be used as a criterion to evaluate the **CONTRACTOR'S** (supplier's) performance over the warranty period. A Warranty Performance Certification form is included with the bid schedule and must be completed and submitted as part of the bid package. Bids with incomplete forms or missing forms will be considered nonresponsive.

2.0 PRODUCT

2.01 **PUMP**: The pump shall be a custom designed, integral, vertical rotor, motor driven, solids handling pump of the **progressing cavity type** with a single mechanical seal. Double radial O-ring seals are required at all casting joints to minimize corrosion and create a protective barrier. All pump castings shall be cast iron, fully epoxy coated to 8-10 mil Nominal dry thickness, wet applied. The rotor shall be through-hardened, highly polished, precipitation hardened stainless steel. The stator shall be of a specifically compounded ethylene propylene synthetic elastomer. The material shall be suitable for domestic wastewater service. Its physical properties shall include high tear and abrasion resistance, grease resistance, water and detergent resistance, temperature stability, excellent aging properties, and outstanding wear resistance. Buna-N is not acceptable as a stator material because it does not exhibit the properties as outlined above and required for wastewater service.

2.02 **GRINDER**: The grinder shall be placed immediately below the pumping elements and shall be direct-driven by a single, one-piece motor shaft. The grinder impeller assembly shall be securely fastened to the pump motor shaft by means of a threaded connection attaching the grinder impeller to the motor shaft. Attachment by means of pins or keys will not be acceptable. The grinder shall be of the rotating type with a stamped stainless steel shredder ring assembly spaced in accurate, close annular alignment with the driven impeller assembly, which shall carry two hardened, 400 Series steel cutter bars.

This assembly shall be dynamically balanced and operate without objectionable noise or vibration over the entire range of recommended operating pressures. The grinder shall be constructed so as to minimize clogging and jamming under all normal operating conditions including starting. Sufficient vortex action shall be created to scour the tank free of deposits or sludge banks which would impair the operation of the pump. These requirements shall be accomplished by the following, in conjunction with the pump:

1. The grinder shall be positioned in such a way that solids are fed in an upward flow direction.

2. The maximum flow rate through the cutting mechanism must not exceed 4 feet per second. This is a critical design element to minimize jamming and as such must be adhered to.

3. The inlet shroud shall have a diameter of no less than 5 inches. Inlet shrouds that are less than 5 inches in diameter will not be accepted due to their inability to maintain the specified 4 feet per second maximum inlet velocity which by design prevents unnecessary jamming of the cutter mechanism and minimizes blinding of the pump by large objects that block the inlet shroud.

4. The impeller mechanism must rotate at a nominal speed of no greater than 1800 rpm.

The grinder shall be capable of reducing all components in normal domestic sewage, including a reasonable amount of "foreign objects," such as paper, wood, plastic, glass,

wipes, rubber and the like, to finely-divided particles which will pass freely through the passages of the pump and the 1-1/4" diameter stainless steel discharge piping.

2.03 **ELECTRIC MOTOR**: As a maximum, the motor shall be a 1 HP, 1725 RPM, 240 Volt 60 Hertz, 1 Phase, capacitor start, ball bearing, air-cooled induction type with Class F installation, low starting current not to exceed 30 amperes and high starting torque of 8.4 foot pounds. The motor shall be press-fit into the casting for better heat transfer and longer winding life. Inherent protection against running overloads or locked rotor conditions for the pump motor shall be provided by the use of an automatic-reset, integral thermal overload protector incorporated into the motor. This motor protector combination shall have been specifically investigated and listed by Underwriters Laboratories, Inc., for the application. Non-capacitor start motors or permanent split capacitor motors will not be accepted because of their reduced starting torque and consequent diminished grinding capability. The wet portion of the motor armature must be 300 Series stainless steel. To reduce the potential of environmental concerns, the expense of handling and disposing of oil, and the associated maintenance costs, oil-filled motors will not be accepted.

2.04 **MECHANICAL SEAL**: The pump/core shall be provided with a mechanical shaft seal to prevent leakage between the motor and pump. The seal shall have a stationary ceramic seat and carbon rotating surface with faces precision lapped and held in position by a stainless steel spring.

2.05 **TANK: Fiberglass Construction.** The tank shall be a wetwell design consisting of a single wall, laminated fiberglass construction. The resin used shall be of a commercial grade suitable for the environment. The reinforcing material shall be a commercial grade of glass fiber capable of bonding with the selected resin. The inner surface shall have a smooth finish and be free of cracks and crazing. The exterior tank surface shall be relatively smooth with no exposed fiber or sharp projections present.

The tank wall and bottom shall be of sufficient thickness and construction to withstand the imposed loading due to saturated soil at the specified burial depth for each available tank height. All station components must function normally when exposed to the external soil and hydrostatic pressures developed at the specified burial depth. The tank bottom shall be reinforced with a fiberglass plate extending beyond the tank walls to support concrete anchoring, as required, to prevent flotation.

The tank shall have a stainless steel discharge bulkhead which terminates outside the tank wall with a 1-1/4" female pipe thread. The discharge bulkhead shall be factory installed and warranted by the manufacturer to be watertight. The tank shall be furnished with a field installed EPDM grommet to accept a 4.50" OD (4" DWV or SCH 40) inlet pipe. The power and control cable shall connect to the pump by means of the provided NEMA 6P electrical quick disconnect (EQD) and shall enter the tank through a field installed watertight strain relief connector supplied by the manufacturer. An electrical junction box shall not be permitted in the tank. Installation of the inlet grommet and cable strain relief shall require field penetration of the tank wall by the installing party. The tank shall also be vented to prevent sewage gases from accumulating inside the tank by means of a factory-provided, field-installed mushroom vent. The station cover shall be factory drilled to accept the mushroom vent. The tank and stainless steel discharge bulkhead shall be factory-tested to be watertight.

Consult the contract drawings for station tank sizes (diameter and height).

2.06 **DISCHARGE AND DISCONNECT VALVE:** The pump discharge piping components shall be 1-1/4" IPS and consist of PVC pipe fittings, a PVC ball valve, rated at 235 psi

WOG, with integral union to facilitate piping disconnect. Installation of the pump discharge piping shall require field assembly by the installing party.

2.07 **ELECTRICAL QUICK DISCONNECT:** The grinder pump core shall include a factory-installed NEMA 6P electrical quick disconnect (EQD) for all power and control functions. The EQD will be supplied with 32', 25' of useable electrical supply cable (ESC) to connect to the alarm panel. The EQD shall require no tools for assembly, seal against water before the electrical connection is made, and include radial seals to assure a watertight seal regardless of tightening torque. Plug-type connections of the power cable onto the pump housing will not be acceptable due to the potential for leaks and electrical shorts. Junction boxes are not acceptable due to the large number of potential leak points. The EQD shall be so designed to be conducive to field wiring as required.

2.08 **CHECK VALVE**: The pump discharge shall be equipped with a factory installed, gravity operated, flapper-type integral check valve built into the discharge piping. The check valve will provide a full-ported passageway when open, and shall introduce a friction loss of less than 6 inches of water at maximum rated flow. Moving parts will be made of a 300 Series stainless steel and fabric reinforced synthetic elastomer to ensure corrosion resistance, dimensional stability, and fatigue strength. A nonmetallic hinge shall be an integral part of the flapper assembly providing a maximum degree of freedom to assure seating even at a very low back-pressure. The valve body shall be an injection molded part made of an engineered thermoplastic resin. The valve shall be rated for continuous operating pressure of 235 psi. Ball type check valves are unacceptable due to their limited sealing capacity in slurry applications.

2.09 **ANTI-SIPHON VALVE**: The pump discharge shall be equipped with a factory-installed, gravity-operated, flapper-type integral anti-siphon valve built into the discharge piping. Moving parts will be made of 300 Series stainless steel and fabric-reinforced synthetic elastomer to ensure corrosion resistance, dimensional stability, and fatigue strength. A nonmetallic hinge shall be an integral part of the flapper assembly, providing a maximum degree of freedom to ensure proper operation even at a very low pressure. The valve body shall be injection-molded from an engineered thermoplastic resin. Holes or ports in the discharge piping are not acceptable anti-siphon devices, due to their tendency to clog from the solids in the slurry being pumped. Anti-siphon port diameter shall be no less than 60% of the inside diameter of the pump discharge piping.

2.10 **CORE UNIT:** The grinder pump station shall have an easily removable core assembly containing pump, motor, grinder, all motor controls, check valve, anti-siphon valve, electrical quick disconnect and wiring. The watertight integrity of the core unit shall be established by a 100% factory test at a minimum of 5 PSIG.

2.11 **CONTROLS**: All necessary motor starting controls shall be located in the cast iron enclosure of the core unit secured by stainless steel fasteners. Locating motor starting controls in a plastic enclosure is not acceptable. The wastewater level sensing controls shall be housed in a separate enclosure from the motor starting controls. The level sensor housing must be sealed via a radial type seal; solvents or glues are not acceptable. The level sensing control housing must be integrally attached to pump assembly so that it may be removed from the station with the pump and in such a way as to minimize the potential for the accumulation of grease and debris accumulation, etc. The level sensing housing must be a high-impact thermoplastic copolymer over-molded with a thermo plastic elastomer. The use of PVC for the level sensing housing is not acceptable.

Non-fouling wastewater level controls for controlling pump operation shall be accomplished by monitoring the pressure changes in an integral air column connected to a pressure switch. The air column shall be integrally molded from a thermoplastic elastomer suitable for use in wastewater and with excellent impact resistance. The air column shall have only a single connection between the water level being monitored and the pressure switch. Any connections are to be sealed radially with redundant O-rings. The level detection device shall have no moving parts in direct contact with the wastewater and shall be integral to the pump core assembly in a single, readily-exchanged unit. Depressing the push to run button must operate the pump even with the level sensor housing removed from the pump.

All fasteners throughout the assembly shall be 300 Series stainless steel. High-level sensing will be accomplished in the manner detailed above by a separate air column sensor and pressure switch of the same type. Closure of the high-level sensing device will energize an alarm circuit as well as a redundant pump-on circuit. For increased reliability, pump ON/OFF and high-level alarm functions shall not be controlled by the same switch. Float switches of any kind, including float trees, will not be accepted due to the periodic need to maintain (rinsing, cleaning) such devices and their tendency to malfunction because of incorrect wiring, tangling, grease buildup, and mechanical cord fatigue. To assure reliable operation of the pressure switches, each core shall be equipped with a factory installed equalizer diaphragm that compensates for any atmospheric pressure or temperature changes. Tube or piping runs outside of the station tank or into tank-mounted junction boxes providing pressure switch equalization will not be permitted due to their susceptibility to condensation, kinking, pinching, and insect infestation. The grinder pump will be furnished with a 6 conductor 14 gauge, type SJOW cable, pre-wired and watertight to meet UL requirements with a **FACTORY INSTALLED** NEMA 6P EQD half attached to it.

2.12 STAINLESS STEEL CURB STOP/CHECK VALVE ASSEMBLY (UNI-LATERAL): The curb stop shall be pressure-tight in both directions. The ball valve actuator shall include position stop features at the fully opened and closed positions. The curb stop/check valve assembly shall be designed to withstand a working pressure of 235 psi.

The stainless steel check valve shall be integral with the curb stop valve. The check valve will provide a full-ported 1-1/4" passageway and shall introduce minimal friction loss at maximum rated flow. The flapper hinge design shall provide a maximum degree of freedom and ensure seating at low back pressure.

Engineered Thermoplastic Fittings – All plastic fitting components are to be in compliance with applicable ASTM standards.

All pipe connections shall be made using compression fitting connections including a Buna-N O-ring for sealing to the outside diameter of the pipe. A split-collet locking device shall be integrated into all pipe connection fittings to securely restrain the pipe from hydraulic pressure and external loading caused by shifting and settling.

Curb Boxes – Curb boxes shall be constructed of ABS, conforming to ASTM-D 1788. Lid top casting shall be cast iron, conforming to ASTM A-48 Class 25, providing magnetic detectability, and be painted black. All components shall be inherently corrosion-resistant to ensure durability in the ground. Curb boxes shall provide height adjustment downward (shorter) from their nominal height.

High Density Polyethylene Pipe (Supplied by others) – Pipe shall be have a working pressure of 160 psi minimum and shall be classified SDR per ASTM D 3035.

Pipe Dimensions – The SDR (Standard Dimension Ratio) of the pipe supplied shall be as specified by the **SPECIFYING ENGINEER**. SDR 7, 9 and 11 fittings are available from the **MANUFACTURER**.

Factory Test – The stainless steel, combination curb stop/check valve component shall be 100 percent hydrostatically tested to 150 psi in the factory.

Construction Practices – Pipe shall be stored on clean, level ground to prevent undue scratching or gouging of the pipe. If the pipe must be stacked for storage, such stacking should be in accordance with the pipe manufacturer's recommendations. The pipe should be handled in such a manner that it is not damaged by being dragged over sharp objects or cut by chokers or lifting equipment.

Segments of pipe having cuts or gouges in excess of 10 percent of the wall thickness of the pipe shall be cut out and removed. The undamaged portions of the pipe shall be rejoined using the butt fusion joining method. Sections of polyethylene pipe should be joined into continuous lengths on the job site above ground. The joining method shall be the butt-fusion method and shall be performed in strict accordance with the pipe manufacturer's recommendations. The butt-fusion equipment used in the joining procedure shall be capable of meeting all conditions recommended by the pipe manufacturer, including, but not limited to, fusion temperature, alignment, and fusion pressure.

Fused segments of pipe shall be handled so as to avoid damage to the pipe. When lifting fused sections of pipe, chains or cable-type chokers should be avoided. Nylon slings are preferred. Spreader bars should be used when lifting long, fused sections. Care should be exercised to avoid cutting or gouging the pipe.

Installation – Assemble the compression fittings according to the fitting manufacturer's recommendations.

The trench and trench bottom should be constructed in accordance with ASTM D 2321. Embedment materials should be Class I, Class II or Class III materials as defined in ASTM D 2321. The use of Class IV and/or Class V materials for embedment is not recommended and should be allowed only with the approval of the **SPECIFYING ENGINEER**. Bedding of the pipe should be performed in accordance with ASTM D 2321. Compaction should be as specified in ASTM D 2321. Deviations from the specified compaction shall be approved by the **SPECIFYING ENGINEER**.

Haunching and initial backfill should be as specified in ASTM D 2321 using Class I, Class II or Class III materials. Materials used and compaction shall be as specified by the **SPECIFYING ENGINEER**. In cases where a compaction of 85 percent Standard Proctor Density is not attainable, the **SPECIFYING ENGINEER** may wish to increase the SDR of the pipe to provide adequate stiffness. ASTM D 2321 sections titled "Minimum Cover for Load Application," "Use of Compaction Equipment" and "Removal of Trench Protection" should apply unless directed otherwise by the **SPECIFYING ENGINEER**.

2.13 ALARM PANEL: Each grinder pump station shall include a NEMA 3R, alarm panel suitable for wall or pole mounting. The NEMA 3R enclosure shall be manufactured of corrosion resistant thermoplastic and be furnished with a hinged cover and padlock.

For each core, the panel shall contain one 15 amp, double pole circuit breaker for the power circuit and one 15 amp single pole circuit breaker for the alarm circuit. The alarm panel shall include a visual high-level alarm indicator. The visual alarm lamp shall be inside a red fluted lens mounted to the top of the enclosure in such a manner as to maintain NEMA 3R rating. The alarm sequence is to be as follows:

1. When liquid level in the tank rises above the alarm level, the contacts on the alarm pressure switch will close and the visual alarm will illuminate on the control panel.

2. The visual alarm will remain illuminated until the sewage level in the tank drops below the "off" setting of the alarm pressure switch.

2.14 **SERVICEABILITY**: The grinder pump core, including level sensor assembly, shall have two lifting hooks complete with lift-out harness connected to its top housing to facilitate easy core removal when necessary. The level sensor assembly must be easily removed from the pump assembly for service or replacement. All mechanical and electrical connections must provide easy disconnect capability for core unit removal and installation. Each EQD half must include a water-tight cover to protect the internal electrical pins while the EQD is unplugged. All motor control components shall be mounted on a readily replaceable bracket for ease of field service.

2.15 **SAFETY**: The grinder pump shall be free from electrical and fire hazards as required in a residential environment. As evidence of compliance with this requirement, the completely assembled and wired grinder pump station shall be listed by Underwriters Laboratories, Inc., to be safe and appropriate for the intended use. UL listing of components of the station, or third-party testing to UL standard are not acceptable.

The grinder pump shall meet accepted standards for plumbing equipment for use in or near residences, shall be free from noise, odor, or health hazards, and shall have been tested by an independent laboratory to certify its capability to perform as specified in either individual or low pressure sewer system applications. As evidence of compliance with this requirement, the grinder pump shall bear the seal of NSF International. Third-party testing to NSF standard is not acceptable.

3.0 EXECUTION

3.01 **FACTORY TEST**: Each grinder pump shall be submerged and operated for 1.5 minutes (minimum). Included in this procedure will be the testing of all ancillary components such as, the anti-siphon valve, check valve, discharge assembly and each unit's dedicated level controls and motor controls. All factory tests shall incorporate each of the above listed items. Actual appurtenances and controls which will be installed in the field shall be particular to the tested pump only. A common set of appurtenances and controls for all pumps is not acceptable. Certified test results shall be available upon request showing the operation of each grinder pump at two different points on its curve. Additional validation tests include: integral level control performance, continuity to ground and acoustic tests of the rotating components.

The **ENGINEER** reserves the right to inspect such testing procedures with representatives of the **OWNER,** at the **GRINDER PUMP MANUFACTURER'S** facility.

3.02 **CERTIFIED SERVICE PROGRAM:** The grinder pump **MANUFACTURER** shall provide a program implemented by the **MANUFACTURER'S** personnel as described in this specification to certify the service company as an authorized serviced center. As evidence of this, the **MANUFACTURER** shall provide, when requested, sufficient evidence that they have maintained their own service department for a minimum of 30 years and currently employ a minimum of five employees specifically in the service department.

As part of this program, the **MANUFACTURER** shall evaluate the service technicians as well as the service organization annually. The service company will be authorized by the

MANUFACTURER to make independent warranty judgments. The areas covered by the program shall include, as a minimum:

1. Pump Population Information — The service company will maintain a detailed database for the grinder pumps in the territory that tracks serial numbers by address.

2. Inventory Management — The service company must maintain an appropriate of level inventory (pumps, tanks, panels, service parts, etc.) including regular inventory review and proper inventory labeling. Service technicians will also maintain appropriate parts inventory and spare core(s) on service vehicles.

3. Service Personnel Certification — Service technicians will maintain their level-specific certification annually. The certifications are given in field troubleshooting, repair, and training.

4. Service Documentation and Records — Start up sheets, service call records, and customer feedback will be recorded and available by the service company.

5. Shop Organization — The service company will keep its service shop organized and pumps will be tagged with site information at all times. The shop will have all required equipment, a test tank, and cleaning tools necessary to service pumps properly.

3.03 **DELIVERY**: All grinder pump core units, including level controls, will be delivered to the job site 100 percent completely assembled, including testing, ready for installation. Grinder pump cores will be shipped separately from the tanks. Installing the cores and discharge piping into the tanks is the only assembly step required and allowed due to the workmanship issues associated with other on-site assembly. Grinder pump cores must be boxed for ease of handling.

3.04 **INSTALLATION:** Earth excavation and backfill are specified under SITE WORK, but are also to be done as a part of the work under this section, including any necessary sheeting and bracing.

The **CONTRACTOR** shall be responsible for handling ground water to provide a firm, dry subgrade for the structure, and shall guard against flotation or other damage resulting from general water or flooding.

The grinder pump stations shall not be set into the excavation until the installation procedures and excavation have been approved by the **ENGINEER**.

Remove packing material. User's instructions MUST be given to the **OWNER**. Hardware supplied with the unit, if required, will be used at installation. The basin will be supplied with a standard 4" inlet grommet (4.50" OD) for connecting the incoming sewer line. Appropriate inlet piping must be used. The basin may not be dropped, rolled or laid on its side for any reason.

Installation shall be accomplished so that 1 inch to 4 inches of accessway, below the bottom of the lid, extends above the finished grade line. The finished grade shall slope away from the unit. The diameter of the excavated hole must be large enough to allow for the concrete anchor.

A 6" inch (minimum) layer of naturally rounded aggregate, clean and free flowing, with particle size of not less than 1/8" or more than 3/4" shall be used as bedding material under each unit.

A concrete anti-flotation collar, as detailed on the drawings, and sized according to the manufacturer's instructions, shall be required and shall be pre-cast to the grinder pump or poured in place. Each grinder pump station with its pre-cast anti-flotation collar shall have a minimum of three lifting eyes for loading and unloading purposes.

If the concrete is poured in place, the unit shall be leveled, and filled with water, to the bottom of the inlet, to help prevent the unit from shifting while the concrete is being poured. The concrete must be manually vibrated to ensure there are no voids. If it is necessary to pour the concrete to a level higher than the inlet piping, an 8" sleeve is required over the inlet prior to the concrete being poured.

The **CONTRACTOR** will provide and install a 4-foot piece of 4-inch SCH 40 PVC pipe with water tight cap, to stub-out the inlet for the property owners' installation contractor, as depicted on the contract drawings.

E/One requires that an E/One Uni-Lateral assembly (E/One part number NB0184PXX or NC0193GXX) or E/One Redundant Check Valve (E/One part number PC0051GXX) be installed in the pipe lateral outside the home between the pump discharge and the street main on all installations.

The electrical enclosure shall be furnished, installed and wired to the grinder pump station by the **CONTRACTOR**. An alarm device is required on every installation, there shall be NO EXCEPTIONS. It will be the responsibility of the **CONTRACTOR** and the **ENGINEER** to coordinate with the individual property owner(s) to determine the optimum location for the alarm panel.

The **CONTRACTOR** shall mount the alarm device in a conspicuous location, as per national and local codes. The alarm panel will be connected to the grinder pump station by a length of 6-conductor type TC cable as shown on the contract drawings. The power and alarm circuits must be on separate power circuits. The grinder pump stations will be provided with 32 feet, 25 feet of useable, electrical supply cable to connect the station to the alarm panel. This cable shall be supplied with a **FACTORY INSTALLED** EQD half to connect to the mating EQD half on the core.

3.05 BACKFILL REQUIREMENTS: Proper backfill is essential to the long-term reliability of any underground structure. Several methods of backfill are available to produce favorable results with different native soil conditions. The most highly recommended method of backfilling is to surround the unit to grade using Class I or Class II backfill material as defined in ASTM 2321. Class 1A and Class 1B are recommended where frost heave is a concern, Class 1B is a better choice when the native soil is sand or if a high, fluctuating water table is expected. Class 1, angular crushed stone offers an added benefit in that it doesn't need to be compacted.

Class II, naturally rounded stone, may require more compactive effort, or tamping, to achieve the proper density. If the native soil condition consists of clean compactible soil, with less than 12 percent fines, free of ice, rocks, roots and organic material, it may be an acceptable backfill. Soil must be compacted in lifts not to exceed one foot to reach a final Proctor Density of between 85 percent and 90 percent. Heavy, non-compactible clays and silts are not suitable backfill for this or any underground structure such as inlet or discharge lines.

If you are unsure of the consistency of the native soil, it is recommended that a geotechnical evaluation of the material is obtained before specifying backfill.

Another option is the use of a flowable fill (i.e., low slump concrete). This is particularly attractive when installing grinder pump stations in augured holes where tight clearances make it difficult to assure proper backfilling and compaction with dry materials. Flowable fills should not be dropped more than four feet from the discharge to the bottom of the hole to avoid separation of the constituent materials.

Backfill of clean native earth, free of rocks, roots, and foreign objects shall be thoroughly compacted in lifts not exceeding 12" to a final Proctor Density of not less than 85 percent. Improper backfilling may result in damaged accessways. The grinder pump station shall be installed at a minimum depth from grade to the top of the 1 1/4" discharge line to assure maximum frost protection. The finish grade line shall be 1" to 4" below the bottom of the lid; final grade shall slope away from the grinder pump station.

All restoration will be the responsibility of the **CONTRACTOR**. Per unit costs for this item shall be included in the **CONTRACTOR'S** bid price for the individual grinder pump stations. The properties shall be restored to their original condition in all respects, including, but not limited to, curb and sidewalk replacement, landscaping, loaming and seeding, and restoration of the traveled ways, as directed by the **ENGINEER**.

3.06 **START-UP AND FIELD TESTING**: The **MANUFACTURER** shall provide the services of qualified factory trained technician(s) who shall inspect the placement and wiring of each station, perform field tests as specified herein, and instruct the **OWNER'S** personnel in the operation and maintenance of the equipment before the stations are accepted by the **OWNER**.

All equipment and materials necessary to perform testing shall be the responsibility of the **INSTALLING CONTRACTOR.** This includes, as a minimum, a portable generator and power cable (if temporary power is required), water in each basin (filled to a depth sufficient to verify the high level alarm is operating), and opening of all valves in the system. These steps shall be completed prior to the qualified factory trained technician(s) arrival on site.

The services of a trained factory-authorized technician shall be provided at a rate of 40 hours for every 100 grinder pump stations supplied.

Upon completion of the installation, the authorized factory technician(s) will perform the following test on each station:

1. Make certain the discharge shut-off valve in the station is fully open.

2. Turn ON the alarm power circuit and verify the alarm is functioning properly.

3. Turn ON the pump power circuit. Initiate the pump operation to verify automatic "on/off" controls are operative. The pump should immediately turn ON.

4. Consult the manufacturer's service manual for detailed start-up procedures.

Upon completion of the start-up and testing, the **MANUFACTURER** shall submit to the **ENGINEER** the start-up authorization form describing the results of the tests performed for each grinder pump station. Final acceptance of the system will not occur until authorization forms have been received for each pump station installed and any installation deficiencies corrected.

4.0 OPERATION AND MAINTENANCE

4.01 **SPARE CORE:** The **MANUFACTURER** will supply one spare grinder pump core for every 50 grinder pump stations installed or portion thereof, complete with all operating controls level sensors, check valve, anti-siphon valve, pump/motor unit and grinder.

4.02 **MANUALS:** The **MANUFACTURER** shall supply four copies of operation and maintenance manuals to the **OWNER**, and one copy to the **ENGINEER**.

END OF SECTION

Santa Rita Ranch
Neighborhood Center

E-One Low Pressure Design Report

VIII. E-One Sentry Alarm specifications

E/ONE EXTREME SERIES

E/One Sentry™

Alarm Panel — Protect Package

Description

The E/One Sentry panels are custom designed for use with Environment One grinder pump stations. They can be configured to meet the needs of your application, from basic alarm indication to advanced warning of pending service requirements.

E/One Sentry panels are supplied with audible and visual high level alarms. They are easily installed in accordance with relevant national and local codes. Standard panels are approved by UL, CSA, CE and NSF to ensure high quality and safety.

The panel features a corrosion-proof, NEMA 4X-rated, thermoplastic enclosure. A padlock is provided to prevent unauthorized entry (safety front).

Standard Features

Includes all features of the basic configuration of the E/One Sentry panel, including circuit breakers, 240 or 120 VAC service, terminal blocks and ground lugs, audible alarm with manual silence, manual run feature and run indicator, redundant "Start" function with high level alarm, safety front, conformal-coated board, overload protection, as well as:

Trouble indication that shuts down the pump temporarily in the event of an unacceptable operating condition, including:

- Brownout conditions with the electrical power supply
- System over-pressure condition such as with a closed valve
- Run-dry operation of the pump

Inner cover (dead front)

Contact group — dry and Remote Sentry

Optional Features

Hour meter

Generator receptacle with auto transfer

GFCI

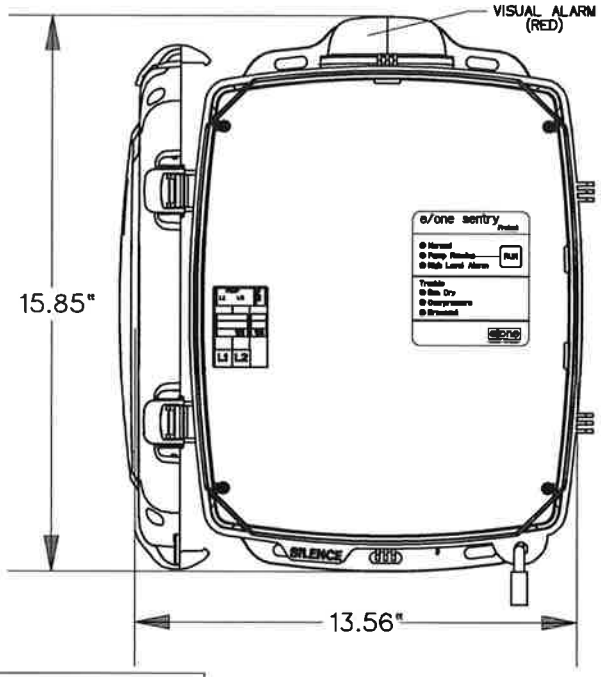
Main service disconnect

Please consult factory for special applications.

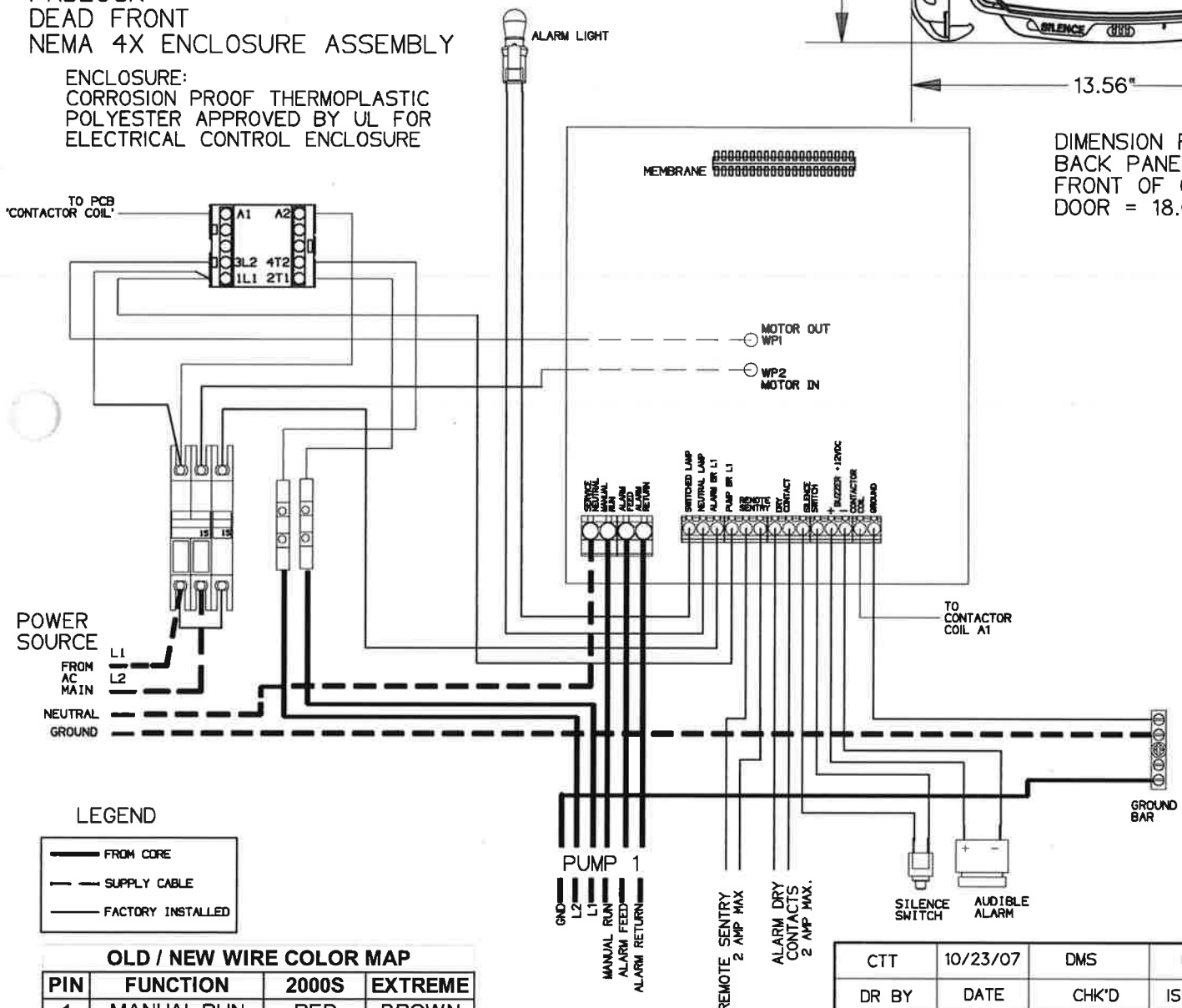
SENTRY PROTECT SIMPLEX

REDUNDANT RUN (HIGH LEVEL)
INTERNAL VISUAL & AUDIBLE ALARM
REMOTE SENTRY DRY CONTACTS FOR
OPTIONAL POWER LOSS HIGH LEVEL
ALARM (POWER LOSS ALARM FOR WIRELESS)
MANUAL ALARM SILENCE
MANUAL RUN
STATUS LED'S: NORMAL, PUMP RUNNING, HIGH LEVEL
TROUBLE LED'S: RUN DRY, OVERPRESSURE, BROWNOUT
DRY CONTACTS
CONFORMAL COATED CIRCUIT BOARD (BOTH SIDES)
PADLOCK
DEAD FRONT
NEMA 4X ENCLOSURE ASSEMBLY

ENCLOSURE:
CORROSION PROOF THERMOPLASTIC POLYESTER APPROVED BY UL FOR ELECTRICAL CONTROL ENCLOSURE



DIMENSION FROM BACK PANEL TO FRONT OF OPEN DOOR = 18.02"



LEGEND

- FROM CORE
- SUPPLY CABLE
- FACTORY INSTALLED

OLD / NEW WIRE COLOR MAP

PIN	FUNCTION	2000S	EXTREME
1	MANUAL RUN	RED	BROWN
2	L1	BLACK	RED
3	L2	WHITE	BLACK
4	GND	GREEN	GRN/YEL
5	ALARM FEED	ORANGE	YELLOW
6	ALARM RETURN	BLUE	BLUE

CONTROL CABLE:
TYPE TC: DIRECT BURIAL, SIX CONDUCTOR

CE

LR26266 LISTED 506D

CTT	10/23/07	DMS	B	06/23/11
DR BY	DATE	CHK'D	ISSUE	DATE

e/one SEWER SYSTEMS

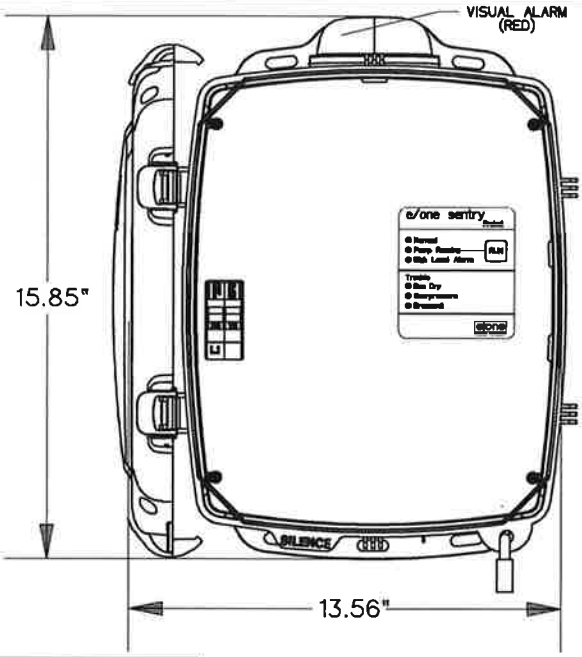
SENTRY SIMPLEX PROTECT PANEL, 240V 60Hz DOUBLE POLE POWER

NA0075P03

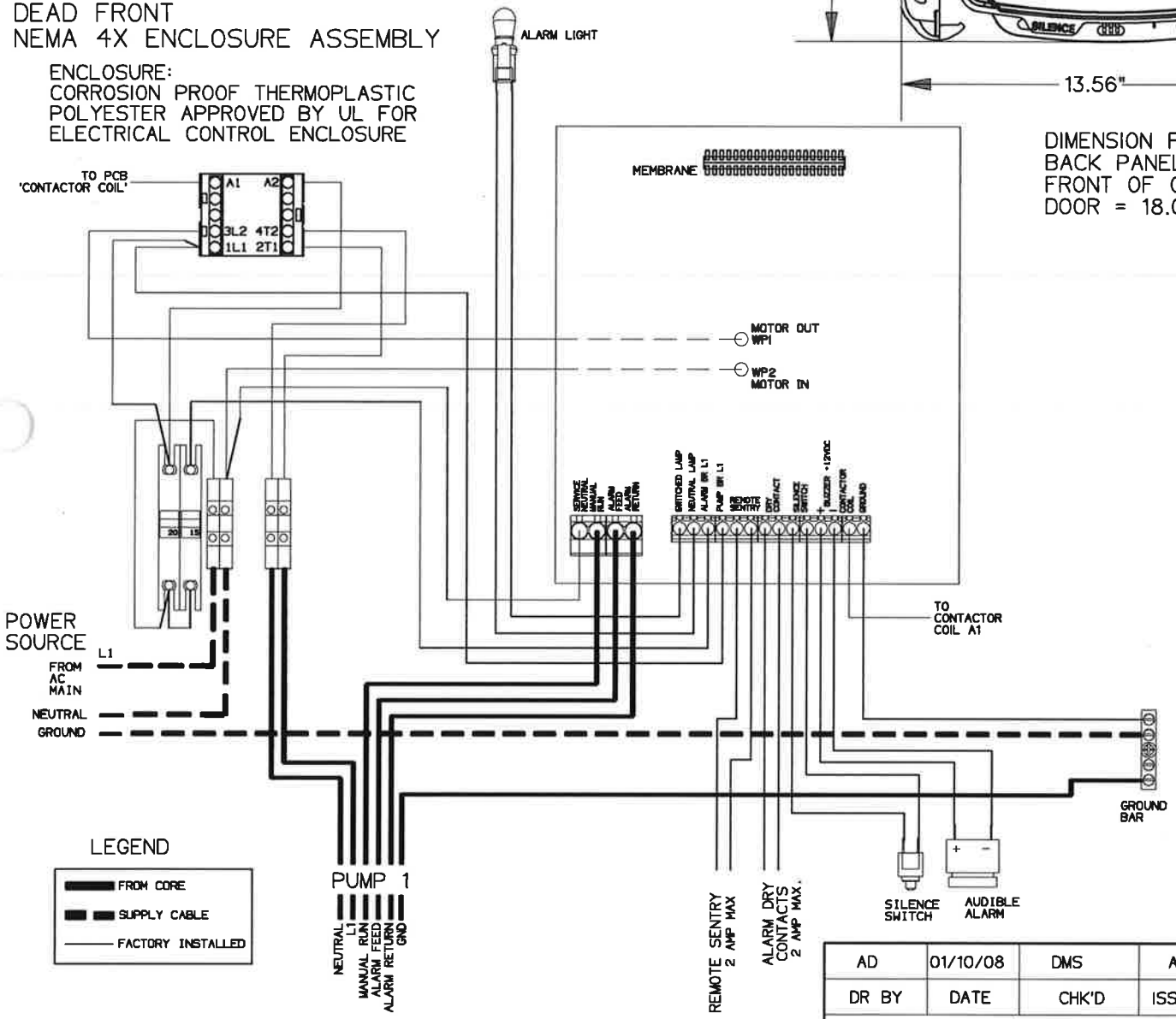
SENTRY PROTECT SIMPLEX

REDUNDANT RUN (HIGH LEVEL)
EXTERNAL VISUAL & AUDIBLE ALARM
REMOTE SENTRY DRY CONTACTS FOR
OPTIONAL POWER LOSS HIGH LEVEL
ALARM (POWER LOSS ALARM FOR WIRELESS)
MANUAL ALARM SILENCE
MANUAL RUN
STATUS LED'S: NORMAL, PUMP RUNNING, HIGH LEVEL
TROUBLE LED'S: RUN DRY, OVERPRESSURE, BROWNOUT
DRY CONTACTS
CONFORMAL COATED CIRCUIT BOARD (BOTH SIDES)
PADLOCK
DEAD FRONT
NEMA 4X ENCLOSURE ASSEMBLY

ENCLOSURE:
CORROSION PROOF THERMOPLASTIC POLYESTER APPROVED BY UL FOR ELECTRICAL CONTROL ENCLOSURE



DIMENSION FROM BACK PANEL TO FRONT OF OPEN DOOR = 18.02"



OLD / NEW WIRE COLOR MAP

PIN	FUNCTION	2000S	EXTREME
1	MANUAL RUN	RED	BROWN
2	L1	BLACK	RED
3	NEUTRAL	WHITE	BLACK
4	GND	GREEN	GRN/YEL
5	ALARM FEED	ORANGE	YELLOW
6	ALARM RETURN	BLUE	BLUE

CONTROL CABLE:
TYPE TC: DIRECT BURIAL, SIX CONDUCTOR

AD	01/10/08	DMS	A	06/23/11
DR BY	DATE	CHK'D	ISSUE	DATE

e/one SEWER SYSTEMS

SENTRY PROTECT PANEL SIMPLEX
120V SINGLE POLE POWER

NA0075P04

Texas Commission on Environmental Quality

TSS Removal Calculations 04-20-2009

Project Name: **SANTA RITA RANCH NEIGHBORHOOD CENTER**
Date Prepared: **June 26, 2025**

1. The Required Load Reduction for the total project:

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 * =	**53.41**	acres
Predevelopment impervious area within the limits of the plan * =	**0.00**	acres
Total post-development impervious area within the limits of the plan * =	**25.95**	acres
Total post-development impervious cover fraction * =	**0.49**	
P =	**32**	inches
$L_{M\ TOTAL\ PROJECT}$ =	**22587**	lbs.

Number of drainage basins / outfalls areas leaving the plan area = **3**

2. Drainage Basin Parameters (This information should be provided for each basin):

Drainage Basin/Outfall Area No. = **1**

Total drainage basin/outfall area =	**53.41**	acres
Predevelopment impervious area within drainage basin/outfall area =	**0.00**	acres
Post-development impervious area within drainage basin/outfall area =	**25.95**	acres
Post-development impervious fraction within drainage basin/outfall area =	**0.49**	
$L_{M\ THIS\ BASIN}$ =	**22587**	lbs.

3. Indicate the proposed BMP Code for this basin.

Proposed BMP = **Wet Basin**
Removal efficiency = **93** percent

4. Calculate Maximum TSS Load Removed (L_R) for this Drainage Basin by the selected BMP Type.

RG-348 Page 3-33 Equation 3.7: $L_R = (\text{BMP efficiency}) \times P \times (A_I \times 34.6 + A_P \times 0.54)$

where:

A_C = Total On-Site drainage area in the BMP catchment area
A_I = Impervious area proposed in the BMP catchment area
A_P = Pervious area remaining in the BMP catchment area
L_R = TSS Load removed from this catchment area by the proposed BMP

A_C =	**50.52**	acres
A_I =	**23.98**	acres
A_P =	**26.54**	acres
L_R =	**25119**	lbs

5. Calculate Fraction of Annual Runoff to Treat the drainage basin / outfall area

F = **0.90**

6. Calculate Capture Volume required by the BMP Type for this drainage basin / outfall area.

Rainfall Depth =	**1.70**	inches
Post Development Runoff Coefficient =	**0.34**	
On-site Water Quality Volume =	**107223**	cubic feet
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 =	**21445**	
Total Capture Volume (required water quality volume(s) x 1.20) =	**128667**	cubic feet

11. Wet Basins

Required capacity of Permanent Pool =	**128667**	cubic feet
Required capacity at WQV Elevation =	**235890**	cubic feet

CARLSON, BRIGANCE & DOERING, INC.
ID# F3791

7-1-2025

Project & Drainage Areas - Impervious Cover per Section

Sections	TCEQ Project Area Per Section							Onsite Drainage Basin to BMP Per Section					
Contributing Sections	Project Area (ac)	Required TSS Removal (lbs)	# Lots	Impervious Areas (ac)				Drainage Basin (ac)	# Lots	Impervious Areas (ac)			
				Lots	ROW	Misc.	Total			Lots	ROW	Misc.	Total
SANTA RITA BLVD - DETENTION POND 1													
MIDDLE BROOK SEC 1	48.13	19088	0	0.00	0.00	19.96	19.96	45.24	0.0	0.00	0.00	19.96	19.96
SANTA RITA RANCH NEIGHBORHOOD CENTER	5.28	3499	0	0.00	0.00	4.02	4.02	5.28	0.0	0.00	0.00	4.02	4.02

BMP Treatment Requirements

Project Area			Drainage Basin						BMP Treatment Provided	
			Onsite		Offsite		Total		Total Capture Volume (cf)	
Total (ac)	Impv Area (ac)	Required TSS Removal (lbs)	Total (ac)	Impv Area (ac)	Total (ac)	Impv Area (ac)	Total (ac)	Impv Area (ac)	Required	Provided
MIDDLE BROOK SEC 1										
48.13	21.93	19,088	50.52	23.98	0.00	0.00	50.52	23.98	128,667	129,060
NTA RITA RANCH NEIGHBORHOOD CENT										
5.28	4.02	3,499								
TOTAL										
53.41	25.95	22,587								

Stage-Storage

Stage	Area (sf)	Area (ac)	Incremental Storage (cf)	Cumulative Storage (cf)	Cumulative Storage (ac-ft)
1043.50	0	0.00	0	0	0.000
1044.00	2,239	0.05	560	560	0.013
1045.00	10,496	0.24	6,368	6,927	0.159
1046.00	19,957	0.46	15,227	22,154	0.509
1047.00	25,585	0.59	22,771	44,925	1.031
1047.75	27,281	0.63	19,825	64,750	1.486
1048.00	64,564	1.48	11,481	76,230	1.750
1048.75	66,590	1.53	49,183	125,413	2.879
1049.00	73,329	1.68	17,490	142,903	3.281
1050.00	95,924	2.20	84,627	227,529	5.223
1050.09	97,627	2.24	8,710	236,239	5.423

Permanent Pool Elevation (WQV)

CARLSON, BRIGANCE & DOERING, INC.
ID# F3791

7-1-2025

TEXAS COMMISSION ON ENVIRONMENTAL QUALITY

Protecting Texas by Reducing and Preventing Pollution

January 19, 2007

Mr. William T. Gunn
Middlebrook Group, Ltd.
6836 Bee Cave Road, Suite 400
Austin, Texas 78746

Re: Edwards Aquifer, Williamson County
NAME OF PROJECT: Middle Brook Section 1 and 2; West of Ronald Reagan Boulevard and South of Cross Creek Lane; Texas
TYPE OF PLAN: Request for Approval of a Water Pollution Abatement Plan (WPAP); 30 Texas Administrative Code (TAC) Chapter 213 Edwards Aquifer
Edwards Aquifer Protection Program ID No. 06112201

Dear Mr. Gunn:

The Texas Commission on Environmental Quality (TCEQ) has completed its review of the WPAP application for the referenced project submitted to the Austin Regional Office by Randall Jones Engineering, Inc. on behalf of Middlebrook Group, Ltd. on November 22, 2006. Final review of the WPAP submittal was completed after additional material was received on January 3, 2007. As presented to the TCEQ, the Temporary and Permanent Best Management Practices (BMPs) and construction plans were prepared by a Texas Licensed Professional Engineer to be in general compliance with the requirements of 30 TAC Chapter 213. These planning materials were sealed, signed, and dated by a Texas Licensed Professional Engineer. Therefore, based on the engineer's concurrence of compliance, the planning materials for construction of the proposed project and pollution abatement measures are hereby approved subject to applicable state rules and the conditions in this letter. The applicant or a person affected may file with the chief clerk a motion for reconsideration of the executive director's final action on this Edwards Aquifer protection plan. A motion for reconsideration must be filed no later than 23 days after the date of this approval letter. *This approval expires two (2) years from the date of this letter unless, prior to the expiration date, more than 10 percent of the construction has commenced on the project or an extension of time has been requested.*

PROJECT DESCRIPTION

The project includes the construction of 80 homes in Section 1 and 72 homes in Section 2. The project will also include associated streets, utilities and drainage improvements. The project area

is 28.1 acres for Section 1 and 22.9 acres for Section 2. The impervious cover will be 23.5 acres (46.0 percent of the total 51 acres). The construction of an amenity center is not included in this WPAP. Two water quality wet basins will be constructed to treat stormwater runoff. Wastewater will be conveyed to the Liberty Hill Wastewater System owned by the Lower Colorado River Authority.

PERMANENT POLLUTION ABATEMENT MEASURES

Two wet basins (ponds) will be constructed to treat stormwater runoff. Pond 1 will drain 48.3 acres. The sediment forebay will store 35,495 cubic feet and the permanent pool will store 149,539 cubic feet. An additional 100,129 cubic feet of water quality volume will be provided on top of the permanent pool elevation. Pond 2 will drain 68.52 acres. It will have two sediment forebays that will store 39,508 cubic feet and 24,106 cubic feet. The permanent pool will store 186,228 cubic feet. An additional 306,547 cubic feet of water quality volume will be provided on top of the permanent pool elevation. Additional volume will be detained in both ponds for flood control. Both wet basins will have an impervious clay liner. The approved measures meet the required 80 percent removal of the increased load in total suspended solids caused by the project.

GEOLOGY

According to the geologic assessment for the entire Middle Brook Subdivision, recent alluvium deposits cover the site. The geologic assessment identified ten features. Only two of the features were naturally occurring and these were rated not sensitive. The only sensitive feature identified in the assessment was a water well called F-10. The well is not within the limits of construction for Sections 1 and 2. The Austin Regional Office site investigation of January 11, 2007, revealed that the site is generally as described by the geologic assessment.

SPECIAL CONDITIONS

I. Intentional discharges of sediment laden stormwater during construction are not allowed. If dewatering excavated areas and/or areas of accumulated stormwater becomes necessary, the discharge shall be filtered through appropriately selected temporary best management practices. These may include vegetative filter strips, sediment traps, rock berms, silt fence rings, etc.

II. This approval does not authorize the installation of temporary aboveground storage tanks on this project. If the contractor desires to install a temporary aboveground storage tank for use during construction, an application to modify this approval must be submitted and approved prior to installation. The application must include information related to tank location and spill containment. Refer to Standard Condition No. 4 below.

STANDARD CONDITIONS

1. Pursuant to Chapter 7 Subchapter C of the Texas Water Code, any violations of the requirements in 30 TAC Chapter 213 may result in administrative penalties.

Prior to Commencement of Construction:

2. Within 60 days of receiving written approval of an Edwards Aquifer protection plan, the applicant must submit to the Austin Regional Office, proof of recordation of notice in the county deed records, with the volume and page number(s) of the county deed records of the county in which the property is located. A description of the property boundaries shall be included in the deed recordation in the county deed records. A suggested form (Deed Recordation Affidavit, TCEQ-0625) that you may use to deed record the approved WPAP is enclosed.

3. All contractors conducting regulated activities at the referenced project location shall be provided a copy of this notice of approval. At least one complete copy of the approved WPAP and this notice of approval shall be maintained at the project location until all regulated activities are completed.

4. Modification to the activities described in the referenced WPAP application following the date of approval may require the submittal of a plan to modify this approval, including the payment of appropriate fees and all information necessary for its review and approval prior to initiating construction of the modifications.

5. The applicant must provide written notification of intent to commence construction, replacement, or rehabilitation of the referenced project. Notification must be submitted to the Austin Regional Office no later than 48 hours prior to commencement of the regulated activity. Written notification must include the date on which the regulated activity will commence, the name of the approved plan and ID number for the regulated activity, and the name of the prime contractor with the name and telephone number of the contact person. The executive director will use the notification to determine if the approved plan is eligible for an extension.

6. Temporary erosion and sedimentation (E&S) controls, i.e., silt fences, rock berms, stabilized construction entrances, or other controls described in the approved WPAP, must be installed prior to construction and maintained during construction. Temporary E&S controls may be removed when vegetation is established and the construction area is stabilized. The water quality pond shall be used as a sedimentation basin during construction. The TCEQ may monitor stormwater discharges from the site to evaluate the adequacy of temporary E&S

control measures. Additional controls may be necessary if excessive solids are being discharged from the site.

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

During Construction:

8. During the course of regulated activities related to this project, the applicant or agent shall comply with all applicable provisions of 30 TAC Chapter 213, Edwards Aquifer. The applicant shall remain responsible for the provisions and conditions of this approval until such responsibility is legally transferred to another person or entity.

9. If any sensitive feature (caves, solution cavities, sink holes, etc.) is discovered during construction, all regulated activities near the feature must be suspended immediately. The applicant or his agent must immediately notify the Austin Regional Office of the discovery of the feature. Regulated activities near the feature may not proceed until the executive director has reviewed and approved the methods proposed to protect the feature and the aquifer from potentially adverse impacts to water quality. The plan must be sealed, signed, and dated by a Texas Licensed Professional Engineer.

10. No wells exist on the project. All water wells, including injection, dewatering, and monitoring wells must be in compliance with the requirements of the Texas Department of Licensing and Regulation under Title 16 TAC Chapter 76 (relating to Water Well Drillers and Pump Installers) and all other locally applicable rules, as appropriate.

11. If sediment escapes the construction site, the sediment must be removed at a frequency sufficient to minimize offsite impacts to water quality (e.g., fugitive sediment in street being washed into surface streams or sensitive features by the next rain). Sediment must be removed from sediment traps or sedimentation ponds not later than when design capacity has been reduced by 50 percent. Litter, construction debris, and construction chemicals shall be prevented from becoming stormwater discharge pollutants.

12. The following records shall be maintained and made available to the executive director upon request: the dates when major grading activities occur, the dates when construction activities temporarily or permanently cease on a portion of the site, and the dates when stabilization measures are initiated.

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

After Completion of Construction:

14. 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 Austin Regional Office within 30 days of site completion.

15. The applicant shall be responsible for maintaining the permanent BMPs after construction until such time as the maintenance obligation is either assumed in writing by another entity having ownership or control of the property (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. The regulated entity shall then be responsible for maintenance until another entity assumes such obligations in writing or ownership is transferred. A copy of the transfer of responsibility must be filed with the executive director through the Austin Regional Office within 30 days of the transfer. A copy of the transfer form (TCEQ-10263) is enclosed.

16. Upon legal transfer of this property, the new owner(s) is required to comply with all terms of the approved Edwards Aquifer protection plan. If the new owner intends to commence any new regulated activity on the site, a new Edwards Aquifer protection plan that specifically addresses the new activity must be submitted to the executive director. Approval of the plan for the new regulated activity by the executive director is required prior to commencement of the new regulated activity.

17. An Edwards Aquifer protection plan approval or extension will expire and no extension will be granted if more than 50 percent of the total construction has not been completed within ten years from the initial approval of a plan. A new Edwards Aquifer protection plan must be submitted to the Austin Regional Office with the appropriate fees for review and approval by the executive director prior to commencing any additional regulated activities.

18. At project locations where construction is initiated and abandoned, or not completed, the site shall be returned to a condition such that the aquifer is protected from potential contamination.

If you have any questions or require additional information, please contact Ms. Heather L. Beatty, P.G. of the Edwards Aquifer Protection Program of the Austin Regional Office at (512)339-2929.

Sincerely,

Glenn Shankle
Executive Director
Texas Commission on Environmental Quality

GS/hlb

Enclosures: Deed Recordation Affidavit, Form TCEQ-0625
Change in Responsibility for Maintenance on Permanent BMPs-Form TCEQ-10263

cc: Mr. Craig Stowell, P.E., Randall Jones Engineering, Inc.
The Honorable Dan A. Gattis, County Judge, Williamson County
Mr. Paulo C. Pinto, B.S., R.S., Director of Environmental Services, Williamson County & Cities Health District
Central Records, TCEQ Information Resources Division, Austin

Agent Authorization Form
For Required Signature
Edwards Aquifer Protection Program
Relating to 30 TAC Chapter 213
Effective June 1, 1999

I James Edward Horne,
Print Name

Vice President,
Title - Owner/President/Other

of Santa Rita Commercial LLC,
Corporation/Partnership/Entity Name

have authorized Steven P. Cates, P.E.
Print Name of Agent/Engineer

of Carlson, Brigance & Doering, Inc.
Print Name of Firm

to represent and act on the behalf of the above named Corporation, Partnership, or Entity for the purpose of preparing and submitting this plan application to the Texas Commission on Environmental Quality (TCEQ) for the review and approval consideration of regulated activities.

I also understand that:

1. The applicant is responsible for compliance with 30 Texas Administrative Code Chapter 213 and any condition of the TCEQ's approval letter. The TCEQ is authorized to assess administrative penalties of up to $10,000 per day per violation.

2. For those submitting an application who are not the property owner, but who have the right to control and possess the property, additional authorization is required from the owner.

3. Application fees are due and payable at the time the application is submitted. The application fee must be sent to the TCEQ cashier or to the appropriate regional office. The application will not be considered until the correct fee is received by the commission.

4. A notarized copy of the Agent Authorization Form must be provided for the person preparing the application, and this form must accompany the completed application.

5. No person shall commence any regulated activity on the Edwards Aquifer Recharge Zone, Contributing Zone or Transition Zone until the appropriate application for the activity has been filed with and approved by the Executive Director.

SIGNATURE PAGE:

Applicant's Signature

6/30/25
Date

THE STATE OF TEXAS §

County of WILLIAMSON §

BEFORE ME, the undersigned authority, on this day personally appeared JAMES EDWARD HORNE 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 30 day of June, 2025.

NOTARY PUBLIC

REGINA SPURLOCK
Typed or Printed Name of Notary

MY COMMISSION EXPIRES: Sept. 4, 2026

NOTARY PUBLIC STATE OF TEXAS
REGINA DIANE SPURLOCK
Notary ID #7770067
My Commission Expires
September 4, 2026

Application Fee Form

Texas Commission on Environmental Quality
Name of Proposed Regulated Entity: Santa Rita Ranch Neighborhood Center
Regulated Entity Location: North of Santa Rita Boulevard , West of Ronald Regan Boulevard.
Name of Customer: Santa Rita Commercial, LLC.
Contact Person: James Edward Horne Phone: 512-280-5160
Customer Reference Number (if issued):CN 604360008
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	5.82 Acres	$ 3,000.00
Sewage Collection System	565 L.F.	$ 650.00
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: **7-1-2025**

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

TCEQ Core Data Form

TCEQ Use Only

For detailed instructions regarding completion of 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 604360008		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:*

Santa Rita Commercial, LLC

7. TX SOS/CPA Filing Number	8. TX State Tax ID (11 digits)	9. Federal Tax ID (9 digits)	10. DUNS Number *(if applicable)*
800901906	32034201288	203420128	N/A

11. Type of Customer: ☒ Corporation ☐ Individual Partnership: ☐ General ☐ Limited

Government: ☐ City ☐ County ☐ Federal ☐ State ☐ Other ☐ Sole Proprietorship ☐ Other:

12. Number of Employees
☒ 0-20 ☐ 21-100 ☐ 101-250 ☐ 251-500 ☐ 501 and higher

13. Independently Owned and Operated?
☐ Yes ☒ No

14. Customer Role (Proposed or Actual) – *as it relates to the Regulated Entity listed on this form. Please check one of the following:*

☐ Owner ☐ Operator ☒ Owner & Operator

☐ Occupational Licensee ☐ Responsible Party ☐ Voluntary Cleanup Applicant ☐ Other:

15. Mailing Address:

1700 Cross Creek Lane

Suite 100

City	State	ZIP	ZIP + 4
Liberty Hill	TX	78642	

16. Country Mailing Information *(if outside USA)*

17. E-Mail Address *(if applicable)*

ed@srraustin.com

18. Telephone Number	19. Extension or Code	20. Fax Number *(if applicable)*
(512) 502-2050		( ) -

SECTION III: Regulated Entity Information

21. General Regulated Entity Information *(If 'New Regulated Entity" is selected below this form should be accompanied by a permit application)*

☒ 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 Agency 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.)*

Santa Rita Ranch Neighborhood Center

23. Street Address of the Regulated Entity: *(No PO Boxes)*								
	City		**State**		**ZIP**		**ZIP + 4**	
24. County								

Enter Physical Location Description if no street address is provided.

25. Description to Physical Location:	North of Santa Rita Boulevard, East of Middlebrook Ranch Sec. 1 and West of Ronald Reagan Blvd.

26. Nearest City	**State**	**Nearest ZIP Code**

27. Latitude (N) In Decimal:	30.652519	**28. Longitude (W) In Decimal:**	97.837028

Degrees	Minutes	Seconds	Degrees	Minutes	Seconds
30	39	9.07	97	50	13.30

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)
1521		236115	

33. What is the Primary Business of this entity? *(Do not repeat the SIC or NAICS description.)*

Single Family Residential Development

34. Mailing Address:	**Santa Rita Commercial, LLC**							
	1700 Cross Creek Lane, Suite 100							
	City	**Liberty Hill**	**State**	**TX**	**ZIP**	**78642**	**ZIP + 4**	

35. E-Mail Address:	**ed@srraustin.com**

36. Telephone Number	**37. Extension or Code**	**38. Fax Number** *(if applicable)*
(512) 502-2050		**( ) -**

39. TCEQ Programs and ID Numbers Check all Programs and write in the permits/registration numbers that will be affected by the updates submitted on this form. See the Core Data Form instructions for additional guidance.

☐ Dam Safety	☐ Districts	☐ Edwards Aquifer	☐ Emissions Inventory Air	☐ Industrial Hazardous Waste
☐ Municipal Solid Waste	☐ New Source Review Air	☐ OSSF	☐ Petroleum Storage Tank	☐ PWS
☐ Sludge	☒ Storm Water	☐ Title V Air	☐ Tires	☐ Used Oil
☐ Voluntary Cleanup	☐ Waste Water	☐ Wastewater Agriculture	☐ Water Rights	☐ Other:

SECTION IV: Preparer Information

40. Name:	Steven P. Cates, P.E.	**41. Title:**	Senior Project Engineer

42. Telephone Number	**43. Ext./Code**	**44. Fax Number**	**45. E-Mail Address**
(512) 280-5160		(512) 280-5165	steve@cbdeng.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:	Carlson, Brigance & Doering, Inc.	**Job Title:**	Senior Project Engineer
Name*(In Print)* **:**	Steven P. Cates	**Phone:**	(512) 280-5160
Signature:		**Date:**	07/01/2025

OCE-ENGINEERING.CTB

SANTA RITA RANCH NEIGHBORHOOD CENTER

GRADING, DRAINAGE, AND UTILITIES

WILLIAMSON COUNTY, TEXAS CONSTRUCTION PLANS

ALL RESPONSIBILITY FOR THE ADEQUACY OF THESE PLANS REMAINS WITH THE ENGINEER WHO PREPARED IN ACCEPTING THESE PLANS, WILLIAMSON COUNTY MUST RELY UPON THE ADEQUACY OF THE WORK OF THE DESIGN ENGINEER.

THESE WATER SYSTEM PLANS WERE PREPARED, SEALED, SIGNED AND DATED BY A TEXAS LICENSED PROFESSIONAL ENGINEER. THEREFORE BASED ON THE ENGINEER'S CONCURRENCE OF COMPLIANCE, THE CONSTRUCTION PLANS FOR CONSTRUCTION OF THE PROPOSED PROJECT ARE HEREBY APPROVED SUBJECT TO STANDARD CONSTRUCTION SPECIFICATIONS AND DETAILS MANUAL AND ALL OTHER APPLICABLE CITY, STATE AND FEDERAL REQUIREMENTS AND CODES.

SUBMITTED BY:

7-2-2025

STEVEN P. CATES, P.E. *DATE*
REGISTERED PROFESSIONAL ENGINEER No. 93648

REVIEWED FOR COMPLIANCE WITH COUNTY REQUIREMENTS (WCSR 2021B):

WILLIAMSON COUNTY CERTIFICATE OF COMPLIANCE PERMIT NUMBER

WILLIAMSON COUNTY DRIVEWAY PERMIT NUMBERS *DATE*

WILLIAMSON COUNTY M.U.D. #19H *DATE*

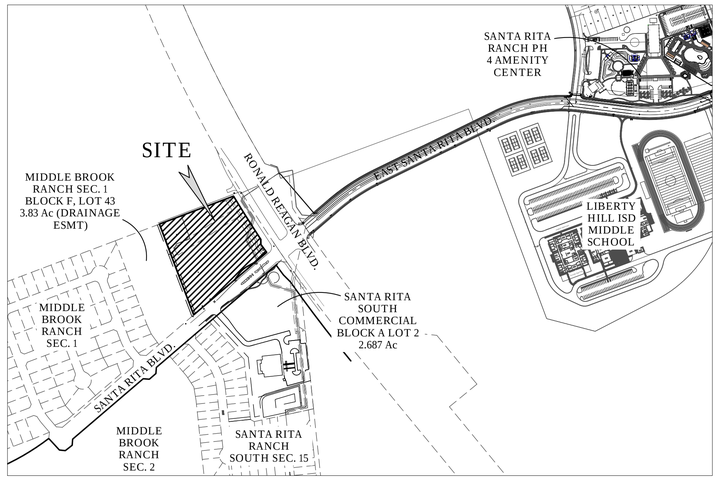
ACCEPTED FOR CONSTRUCTION (PROJECT):

CITY OF GEORGETOWN (WATER SYSTEM ONLY) *DATE*

JAMES HERRERA, INTERIM PUBLIC WORKS DIRECTOR (WASTEWATER SYSTEM PLAN) *DATE*

MIKE ETIENNE, DEPUTY CITY MANAGER (WASTEWATER SYSTEM PLAN) *DATE*

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.



LOCATION MAP
N.T.S.

SHEET INDEX

OWNER:

SANTA RITA COMMERCIAL LLC
8200 N MOPAC STE 300
AUSTIN, TX 78759

RONALD REAGAN BLVD,
LIBERTY HILL, TX 78642
TOTAL ACREAGE: 5.284

ENGINEER & SURVEYOR:
CARLSON, BRIGANCE & DOERING, INC.
5501 WEST WILLIAM CANNON DRIVE
AUSTIN, TEXAS 78749
(512) 280–5160 phone
(512) 280–5165 fax

THE CONTRACTOR SHALL OBTAIN A "NOTICE OF PROPOSED INSTALLATION OF UTILITY LINE" PERMIT FROM WILLIAMSON 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 WILLIAMSON COUNTY COMMISSIONERS COURT IF ANY ROAD CLOSURE IS INVOLVED.

TEXAS CALL BEFORE YOU DIG ONE CALL SYSTEM 1–800–245–4545

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

DESIGNED BY: NAME | DRAFTED BY: NAME

DATE | REVISION

Carlson, Brigance & Doering, Inc.
Civil Engineering ◆ Surveying
FIRM ID #F3791
Main Office: 5501 West William Cannon Dr. Austin, Texas 78749 Phone No. (512) 280-5160
North Office: 12129 RR 620 N., Ste. 600 Austin, Texas 78750 www.cbdeng.com

SHEET NAME: COVER
JOB NAME: SANTA RITA RANCH NEIGHBORHOOD CENTER
PROJECT: SITE DEVELOPMENT PLAN

STATE OF TEXAS
STEVEN P. CATES
93648
LICENSED PROFESSIONAL ENGINEER
CARLSON, BRIGANCE & DOERING, INC.
ID# F3791
7-2-2025

DATE: JULY 2025
JOB NUMBER: 5711
SHEET: 1 OF 27

FILE PATH:J:\ACAD\5711\dwg\5711 - COVER.dwg - Jul 02, 2025 - 7:06am

CONSTRUCTION SEQUENCING

1. GENERAL CONTRACTOR TO INSTALL AND MAINTAIN EROSION CONTROLS AND TREE PROTECTION PER APPROVED PLANS.
2. HOLD PRE-CONSTRUCTION CONFERENCE. PROVIDE 72 HOUR NOTIFICATION TO THE OWNER, THE DESIGN ENGINEER, THE CONTRACTOR AND SUBCONTRACTORS, THE M.U.D. ENGINEER (512) 836-4817, THE CITY OF LIBERTY HILL (512) 778-5449, (WAYNE BONNET, DIRECTOR OF PUBLIC WORKS), WILLIAMSON COUNTY INSPECTIONS SUPERVISOR, GEORGE MAYFIELD (512) 943-3324, AND THE CITY OF GEORGETOWN UTILITY SYSTEM (512)930-3640. SEE WILLIAMSON COUNTY SUBDIVISION REGULATIONS CONSTRUCTION-GENERAL NOTE #1 ON THIS SHEET.
3. ROUGH CUT ALL REQUIRED OR NECESSARY PONDS. EITHER THE PERMANENT OUTLET STRUCTURE OR A TEMPORARY OUTLET MUST BE CONSTRUCTED PRIOR TO DEVELOPMENT OF ANY EMBANKMENT OR EXCAVATION THAT LEADS TO PONDING CONDITIONS. THE OUTLET SYSTEM MUST CONSIST OF A LOW-LEVEL OUTLET AND AN EMERGENCY OVERFLOW. THE OUTLET SYSTEM SHALL BE PROTECTED FROM EROSION AND SHALL BE MAINTAINED THROUGHOUT THE COURSE OF CONSTRUCTION UNTIL FINAL RESTORATION IS ACHIEVED.
4. ROUGH GRADE STREETS. NO DEVELOPMENT OF EMBANKMENT WILL BE PERMITTED AT THIS TIME. ONCE STREETS ARE ROUGH CUT, THE GEOTECHNICAL ENGINEER IS TO FIELD VERIFY PAVEMENT DESIGN IS APPROPRIATE, AND MODIFY RECOMMENDATIONS ACCORDINGLY.
5. INSTALL ALL UTILITIES TO BE LOCATED UNDER THE PROPOSED PAVEMENT.
6. BEGIN INSTALLATION OF STORM SEWER LINES. UPON COMPLETION, RESTORE AS MUCH DISTURBED AREA AS MUCH AS POSSIBLE, PARTICULARLY CHANNELS AND LARGE OPEN AREAS.
7. REGRADE STREETS TO SUBGRADE.
8. INSURE THAT ALL UNDERGROUND UTILITY CROSSINGS ARE COMPLETED. LAY FIRST COURSE BASE MATERIAL ON ALL STREETS.
9. INSTALL CURB AND GUTTER.
10. LAY FINAL BASE COURSE ON ALL STREETS.
11. LAY ASPHALT.
12. COMPLETE ALL UNDERGROUND INSTALLATIONS WITHIN THE R.O.W.
13. COMPLETE PERMANENT EROSION CONTROL AND RESTORATION OF SITE VEGETATION.
14. THE PROJECT ENGINEER INSPECTS JOB AND WRITES CONCURRENCE LETTER TO THE CITY. FINAL INSPECTION IS SCHEDULED UPON RECEIPT OF LETTER. FINAL INSPECTION WITH THE M.U.D. ENGINEER, EV INSPECTOR, THE CITY OF LIBERTY HILL, WILLIAMSON COUNTY, AND THE CITY OF GEORGETOWN PRIOR TO THE REMOVAL OF EROSION CONTROLS.
15. REMOVE AND DISPOSE OF TEMPORARY EROSION CONTROLS. TREE PROTECTION SHALL BE REQUIRED TO BE MAINTAINED AND REMAIN IN PLACE FOR EACH RESIDENTIAL LOT THROUGH RECEIPT OF THE CONCURRENCE LETTER TO THE RESIDENTIAL CERTIFICATE OF OCCUPANCY.
16. COMPLETE ANY NECESSARY FINAL DRESS UP OF AREAS DISTURBED BY ITEM 15.

GEORGETOWN UTILITY SYSTEMS GENERAL NOTES:

1. THESE CONSTRUCTION PLANS WERE PREPARED, SEALED AND DATED BY A TEXAS LICENSED PROFESSIONAL ENGINEER. THEREFORE BASED ON THE ENGINEER'S CONCURRENCE OF COMPLIANCE, THE CONSTRUCTION PLANS FOR CONSTRUCTION OF THE PROPOSED PROJECT ARE HEREBY APPROVED SUBJECT TO THE STANDARD CONSTRUCTION SPECIFICATIONS AND DETAILS MANUAL AND ALL OTHER APPLICABLE CITY, STATE AND FEDERAL REQUIREMENTS AND CODES.
2. THIS PROJECT IS SUBJECT TO ALL CITY STANDARD SPECIFICATIONS AND DETAILS IN EFFECT AT THE TIME OF SUBMITTAL OF THE PROJECT OF THE CITY.
3. THE SITE CONSTRUCTION PLANS SHALL MEET ALL REQUIREMENTS OF THE APPROVED SITE PLAN.
4. PRIVATE WATER SYSTEM FIRE LINES SHALL BE TESTED BY THE CONTRACTOR TO 200 PSI FOR 2 HOURS.
5. PRIVATE WATER SYSTEM FIRE LINES SHALL BE DUCTILE IRON PIPING FROM THE WATER MAIN TO THE BUILDING SPRINKLER SYSTEM, AND 200 PSI C900 PVC FOR ALL OTHERS.
6. PUBLIC WATER SYSTEM MAINS SHALL BE 150 PSI C900 PVC AND TESTED BY THE CONTRACTOR AT 150 PSI FOR 4 HOURS.
7. ALL BENDS AND CHANGES IN DIRECTION ON WATER MAINS SHALL BE RESTRINED AND THRUST BLOCKED.
8. LONG FIRE HYDRANT LEADS SHALL BE RESTRAINED.
9. ALL WATER LINES ARE TO BE BACTERIA TESTED BY THE CONTRACTOR ACCORDING TO THE CITY STANDARDS AND SPECIFICATIONS.
10. WATER AND SEWER MAIN CROSSINGS SHALL MEET ALL REQUIREMENTS OF THE TCEQ AND THE CITY.
11. A MAINTENANCE BOND IS REQUIRED TO BE SUBMITTED TO THE CITY PRIOR TO ACCEPTANCE OF THE PUBLIC IMPROVMENTS. THIS BOND SHALL BE ESTABLISHED FOR 2 YEARS IN THE AMOUNT OF 10% OF THE COST OF THE PUBLIC IMPROVEMENTS AND SHALL FOLLOW THE CITY FORMAT.
12. RECORD DRAWINGS OF THE PUBLIC IMPROVMENTS SHALL BE SUBMITTED TO THE CITY BY THE DESIGN ENGINEER PRIOR TO ACCEPTACNE OF THE PROJECT. THESE DRAWINGS SHALL BE SUBMITTED AS A PDF (300P DPI) ON A FLASH DRIVE, OR BY A CLOUD SOURCE.

STREET AND DRAINAGE NOTES:

1. ROADWAY CONSTRUCTION SHALL BE IN ACCORDANCE WITH CURRENT "WILLIAMSON COUNTY SUBDIVISION REGULATIONS," AS APPLICABLE.
2. ALL MATERIALS SHALL BE SAMPLED AND TESTED BY AN INDEPENDENT TESTING LABORATORY IN ACCORDANCE WITH THE CONSTRUCTION DOCUMENTS APPROVED BY THE COUNTY ENGINEER. THE OWNER SHALL PAY FOR ALL TESTING SERVICES AND SHALL FURNISH THE COUNTY ENGINEER WITH CERTIFIED COPIES OF THESE TEST RESULTS. ANY RETESTING SHALL BE PAID FOR BY THE CONTRACTOR. THE COUNTY ENGINEER MUST APPROVE THE TEST RESULTS PRIOR TO CONSTRUCTING THE NEXT COURSE OF THE ROADWAY STRUCTURE. ANY MATERIAL WHICH DOES NOT MEET THE MINIMUM REQUIRED TEST SPECIFICATIONS SHALL BE REMOVED AND RECOMPACTED OR REPLACED UNLESS ALTERNATIVE REMEDIAL ACTION IS APPROVED IN WRITING FROM THE COUNTY ENGINEER.
3. BACKFILL BEHIND THE CURB SHALL BE COMPACTED TO OBTAIN A MINIMUM OF 95% MAXIMUM DENSITY TO WITHIN 3" OF TOP OF CURB. MATERIAL USED SHALL BE PRIMARILY GRANULAR WITH NO ROCKS LARGER THAN 6" IN THE GREATEST DIMENSION. THE REMAINING 3" SHALL BE CLEAN TOPSOIL FREE FROM ALL CLODS AND SUITABLE FOR SUSTAINING PLANT LIFE.
4. DEPTH OF COVER FOR ALL CROSSINGS UNDER PAVEMENT INCLUDING GAS, ELECTRIC, TELEPHONE, CABLE TV, WATER SERVICES, ETC., SHALL BE A MINIMUM OF 30" BELOW SUBGRADE.
5. STREET RIGHTS-OF-WAY SHALL BE GRADED AT A SLOPE OF 1/4" PER FOOT TOWARD THE CURB UNLESS OTHERWISE INDICATED. HOWEVER, IN NO CASE SHALL THE WIDTH OF RIGHT-OF-WAY AT 1/4" PER FOOT SLOPE BE LESS THAN 10 FEET UNLESS A SPECIFIC REQUEST FOR AN ALTERNATE GRADING SCHEME IS MADE TO AND ACCEPTED BY THE COUNTY ENGINEER. BARRICADES BUILT TO WILLIAMSON COUNTY STANDARDS SHALL BE CONSTRUCTED ON ALL DEAD-END STREETS AND AS NECESSARY DURING CONSTRUCTION TO MAINTAIN JOB AND PUBLIC SAFETY.
6. ALL R.C.P. SHALL BE MINIMUM CLASS III, UNLESS OTHERWISE NOTED.
7. THE PREPARATION OF SUBGRADE SHALL FOLLOW GOOD ENGINEERING PRACTICES AS DIRECTED BY THE COUNTY ENGINEER AND IN CONJUNCTION WITH THE OUTLINED IN THE GEOTECHNICAL REPORT BY MLA LABS, INC., DATED JAN 14, 2022. THE PAVING SECTIONS ARE TO BE CONSTRUCTED AS FOLLOWS:

RECOMMENDATIONS PAVEMENT THICKNESS SECTIONS

Street Classification	Subgrade Material	Hot Mix Asphaltic Concrete, in	Crushed Limestone Base, in	Lime Stabilized Subgrade, in
Parking Lot	Limestone	2.0	8	—
	Subgrade PI < 20	2.0	12	—
	Subgrade 20 < PI < 35	2.0	12	8*

Notes:
1. * Where the subgrade is comprised of limestone or low PI clay (PI < 20), lime stabilization may be omitted.
2. The surface clay must first be tested for sulfate reaction and a mix design should be completed to determine the proper lime content, lime bype, mixing procedure and curing conditions required.
3. The subgrade improvement should be extended 3 feet beyond the back of the curb line.
4. These pavement thickness designs are intended to transfer the load from the anticipated traffic conditions.
5. The responsibility of assigning street classification to the streets in this project is left to the civil engineer.
6. If pavement designs other than those listed above are desired, please contact MLA Geotehnical.

THE GEOTECHNICAL ENGINEER SHALL INSPECT THE SUBGRADE FOR COMPLIANCE WITH THE DESIGN ASSUMPTIONS MADE DURING PREPARATION OF THE SOILS REPORT. ANY ADJUSTMENTS THAT ARE REQUIRED SHALL BE MADE THROUGH REVISION OF THE CONSTRUCTION PLANS.

8. WHERE PI'S ARE OVER 20, SUBGRADES MUST BE STABILIZED UTILIZING A METHOD ACCEPTABLE TO THE COUNTY ENGINEER. THE GEOTECHNICAL ENGINEER SHALL RECOMMEND AN APPROPRIATE SUBGRADE STABILIZATION IF SULFATES ARE DETERMINED TO BE PRESENT. SEE THE GEOTECHNICAL REPORT FOR DESIGN GUIDES FOR DIFFERENT PI VALUES.
9. CONTRACTOR IS TO AVOID INSTALLATION OF IRRIGATION, PLANTINGS, SILT FENCE, ETC. IN THE SUBGRADE IMPROVEMENT EXTENDED BEHIND THE CURB.

CITY OF LIBERTY HILL GENERAL NOTES (REVISED JUNE 10, 2024):

1. ALL CONSTRUCTION OF THE WASTEWATER SYSTEM SHALL BE IN ACCORDANCE WITH THE CITY OF ROUND ROCK STANDARD SPECIFICATIONS MANUAL.
2. ANY EXISTING UTILITIES, PAVEMENT, CURBS, SIDEWALKS, STRUCTURES, TREES, ETC., (NOT PLANNED FOR DESTRUCTION OR REMOVAL) THAT ARE DAMAGED OR REMOVED, SHALL BE REPAIRED, OR REPLACED, AT THE CONTRACTOR'S EXPENSE.
3. THE CONTRACTOR SHALL VERIFY ALL DEPTHS AND LOCATIONS OF EXISTING UTILITIES PRIOR TO ANY CONSTRUCTION ACTIVITIES. ANY DISCREPANCIES WITH THE CONSTRUCTION PLANS FOUND IN THE FIELD SHALL IMMEDIATELY BE BROUGHT TO THE ATTENTION OF THE ENGINEER WHO SHALL BE RESPONSIBLE FOR REVISING THE PLANS AS APPROPRIATE. FAILURE TO COMPLETE THIS STEP PRIOR TO COMMENCEMENT OF CONSTRUCTION MAY RESULT IN SIGNIFICANT DELAYS AND/OR EXPENDITURES FOR WHICH THE CITY SHALL NOT BE HELD LIABLE.
4. MANHOLE FRAMES, COVERS, VALVES, CLEANOUTS, ETC. SHALL BE RAISED TO FINISHED GRADE PRIOR TO FINAL PAVING CONSTRUCTION.
5. THE CONTRACTOR SHALL GIVE THE CITY OF LIBERTY HILL PLANNING AND DEVELOPMENT DEPARTMENT 48 HOURS' NOTICE BEFORE BEGINNING EACH PHASE OF CONSTRUCTION BY BOTH CALLING (512) 548-5519 AND EMAILING planning@libertyhilltx.gov
6. ALL AREAS DISTURBED OR EXPOSED DURING CONSTRUCTION SHALL BE REVEGETATED IN ACCORDANCE WITH THE PLANS AND SPECIFICATIONS. THIS INCLUDES ANY AREAS LOCATED OUTSIDE OF THE DEFINED LIMITS OF CONSTRUCTION (LOC), IN RIGHTS-OF-WAY (ROW), OR LOCATED ON ADJACENT PROPERTIES. REVEGETATION OF ALL DISTURBED OR EXPOSED AREAS SHALL CONSIST OF SODDING OR SEEDING, AT THE CONTRACTOR'S OPTION. HOWEVER, THE TYPE OF REVEGETATION MUST EQUAL OR EXCEED THE TYPE OF VEGETATION PRESENT BEFORE CONSTRUCTION.
7. PRIOR TO ANY CONSTRUCTION, THE ENGINEER SHALL CONVENE A PRECONSTRUCTION CONFERENCE BETWEEN THE CITY OF LIBERTY HILL, HIMSELF, THE CONTRACTOR, OTHER UTILITY COMPANIES, ANY AFFECTED PARTIES, AND ANY OTHER ENTITY THE CITY OR ENGINEER MAY REQUIRE.
8. THE ENGINEER SHALL FURNISH THE CITY OF LIBERTY HILL WITH ACCURATE "AS-BUILT" DRAWINGS FOLLOWING THE COMPLETION OF ALL CONSTRUCTION. THE CONTRACTOR AND THE ENGINEER SHALL KEEP ACCURATE RECORDS OF ALL CONSTRUCTION THAT DEVIATES FROM THE PLANS. THESE "AS-BUILT" DRAWINGS SHALL MEET ALL APPLICABLE REQUIREMENTS TO THE SATISFACTION OF THE CITY ENGINEER PRIOR TO FINAL SITE INSPECTION APPROVAL. CHANGES TO APPROVED, CONSTRUCTION-STAMPED PLANS SHALL REQUIRE AN APPROVED SITE PLAN OR STORMWATER PERMIT AMENDMENT THAT IS APPROVED BY THE CITY PRIOR TO FIELD USE.
9. THE CITY OF LIBERTY HILL SHALL NOT BE PETITIONED FOR ACCEPTANCE UNTIL ALL NECESSARY EASEMENT DOCUMENTS HAVE BEEN SIGNED AND RECORDED.
10. WHEN CONSTRUCTION IS BEING CARRIED OUT WITHIN EASEMENTS, THE CONTRACTOR SHALL CONFINE CONTRACTOR'S WORK TO WITHIN THE PERMANENT AND ANY TEMPORARY EASEMENTS. PRIOR TO FINAL ACCEPTANCE, THE CONTRACTOR SHALL BE RESPONSIBLE FOR REMOVING ALL TRASH AND DEBRIS WITHIN THE PERMANENT AND TEMPORARY EASEMENTS. CLEANUP SHALL BE TO THE SATISFACTION OF THE CITY ENGINEER AND/OR DIRECTOR OF PUBLIC WORKS.
11. PRIOR TO ANY CONSTRUCTION, THE CONTRACTOR SHALL APPLY FOR AND SECURE ALL PROPER PERMITS FROM THE APPROPRIATE AUTHORITIES.

13. AVAILABLE PERMANENT BENCHMARKS WITH VERTICAL DATUM INFORMATION THAT MAY BE UTILIZED FOR THE CONSTRUCTION OF THIS PROJECT ARE DESCRIBED AS FOLLOWS:

BENCHMARKS:

Point #	DESCRIPTION	ELEVATION	NORTHING	EASTING
55004	MAG NAIL SET ON TRANSFORMER PAD AT NE CORNER OF E. SANTA RITA BLVD. AND SINGING DOVE WAY	1,020.29	10,210,674.0710	3,084,333.0300
55006	MAG NAIL SET ON TOP OF CURB ON THE NORTH SIDE OF E. SANTA RITA BLVD. EAST OF MIRA MESA DRIVE	1,002.99	10,211,255.7040	3,085,781.6710

15. 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 ON THE ADEQUACY OF THE WORK OF THE DESIGN ENGINEER.
16. CONTRACTORS ON SITE SHALL HAVE AN APPROVED SET OF PLANS AT ALL TIMES. FAILURE TO HAVE AN APPROVED SET MAY RESULT IN A STOP WORK ORDER.

TRENCH SAFETY NOTES:

1. IN ACCORDANCE WITH THE LAWS OF THE STATE OF TEXAS AND THE U. S. OCCUPATIONAL SAFETY AND HEALTH ADMINISTRATION REGULATIONS, ALL TRENCHES OVER 5 FEET IN DEPTH, IN EITHER HARD AND COMPACT OR SOFT AND UNSTABLE SOIL SHALL BE SLOPED, SHORED, SHEETED, BRACED OR OTHERWISE SUPPORTED. FURTHERMORE, ALL TRENCHES LESS THAN 5 FEET IN DEPTH SHALL ALSO BE EFFECTIVELY PROTECTED WHEN HAZARDOUS GROUND MOVEMENT MAY BE EXPECTED. TRENCH SAFETY SYSTEMS TO BE UTILIZED FOR THIS PROJECT SHALL BE PROVIDED AS PART OF A PACKAGE REQUIRED PRIOR TO THE PRE-CONSTRUCTION MEETING AND ANY CONSTRUCTION ACTIVIITES.
2. IN ACCORDANCE WITH THE U. S. OCCUPATIONAL SAFETY AND HEALTH ADMINISTRATION REGULATIONS, WHEN PERSONS ARE IN TRENCHES 4-FEET DEEP OR MORE, ADEQUATE MEANS OF EXIT, SUCH AS A LADDER OR STEPS, MUST BE PROVIDED AND LOCATED SO AS TO REQUIRE NO MORE THAN 25 FEET OF LATERAL TRAVEL.
3. IF TRENCH SAFETY SYSTEM DETAILS WERE NOT PROVIDED IN THE PLANS BECAUSE TRENCHES WERE ANTICIPATED TO BE LESS THAN 5 FEET IN DEPTH AND DURING CONSTRUCTION IT IS FOUND THAT TRENCHES ARE IN FACT 5 FEET OR MORE IN DEPTH OR TRENCHES LESS THAN 5 FEET IN DEPTH ARE IN AN AREA WHERE HAZARDOUS GROUND MOVEMENT IS EXPECTED, ALL CONSTRUCTION SHALL CEASE, THE TRENCHED AREA SHALL BE BARRICADED AND THE ENGINEER NOTIFIED IMMEDIATELY. CONSTRUCTION SHALL NOT RESUME UNTIL APPROPRIATE TRENCH SAFETY SYSTEM DETAILS, AS DESIGNED BY A PROFESSIONAL ENGINEER IN THE STATE OF TEXAS, ARE SUBMITTED TO THE CITY OF LIBERTY HILL FOR REVIEW AND APPROVAL.

TRAFFIC MARKING NOTES:

1. ANY METHODS, STREET MARKINGS AND SIGNAGE NECESSARY FOR WARNING MOTORISTS, WARNING PEDESTRIANS OR DIVERTING TRAFFIC DURING CONSTRUCTION SHALL CONFORM TO THE TEXAS MANUAL OF UNIFORM TRAFFIC CONTROL DEVICES FOR STREETS AND HIGHWAYS, LATEST EDITIONS.
2. ALL PAVEMENT MARKINGS, MARKERS, PAINT, TRAFFIC BUTTONS, TRAFFIC CONTROLS AND SIGNS SHALL BE INSTALLED IN ACCORDANCE WITH THE TEXAS DEPARTMENT OF TRANSPORTATION STANDARD SPECIFICATIONS FOR CONSTRUCTION OF HIGHWAYS, STREETS AND BRIDGES AND, THE TEXAS MANUAL OF UNIFORM TRAFFIC CONTROL DEVICES FOR STREETS AND HIGHWAYS, LATEST EDITIONS.

EROSION AND SEDIMENTATION CONTROL NOTES:

1. EROSION CONTROL MEASURES, SITE WORK AND RESTORATION WORK SHALL BE IN ACCORDANCE WITH THE CITY OF LIBERTY HILL UNIFIED DEVELOPMENT CODE.
2. ALL SLOPES SHALL BE SODDED OR SEEDED WITH APPROVED GRASS, GRASS MIXTURES OR GROUND COVER SUITABLE TO THE AREA AND SEASON IN WHICH THEY ARE APPLIED.
3. SILT FENCES, ROCK BERMS, SEDIMENTATION BASINS AND SIMILARLY RECOGNIZED TECHNIQUES AND MATERIALS SHALL BE EMPLOYED DURING CONSTRUCTION TO PREVENT POINT SOURCE SEDIMENTATION LOADING OF DOWNSTREAM FACILITIES. INSTALLATION AND CONDITION SHALL BE REGULARLY INSPECTED BY THE CITY OF LIBERTY HILL FOR EFFECTIVENESS. ADDITIONAL MEASURES MAY BE REQUIRED IF, IN THE OPINION OF THE CITY ENGINEER, THEY ARE WARRANTED.
4. ALL TEMPORARY EROSION CONTROL MEASURES SHALL NOT BE REMOVED UNTIL REVEGETATION HAS BEEN ESTABLISHED AND APPROVAL RECEIVED FROM THE CITY OF LIBERTY HILL. IT SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR TO MAINTAIN ALL TEMPORARY EROSION CONTROL STRUCTURES AND TO REMOVE EACH STRUCTURE AS APPROVED BY THE ENGINEER.
5. ALL MUD, DIRT, ROCKS, DEBRIS, ETC., SPILLED, TRACKED OR OTHERWISE DEPOSITED ON EXISTING PAVED STREETS, DRIVES AND AREAS USED BY THE PUBLIC SHALL BE CLEANED UP IMMEDIATELY.

WILLIAMSON COUNTY SUBDIVISION REGULATIONS
APPENDIX B

ADOPTED AND EFFECTIVE AS OF JUNE 22, 2021

B4 – CONSTRUCTION – GENERAL

B4.1 A PRECONSTRUCTION MEETING SHALL BE SCHEDULED PRIOR TO THE START OF CONSTRUCTION. THE DESIGN ENGINEER, OWNER, CONTRACTOR, SUBCONTRACTORS, AND COUNTY ENGINEER SHALL ATTEND THIS MEETING. ALL ROADS ARE TO BE CONSTRUCTED IN ACCORDANCE WITH THE CONSTRUCTION DOCUMENTS AS APPROVED BY THE COUNTY ENGINEER AND IN ACCORDANCE WITH THE SPECIFICATIONS FOUND IN THE CURRENT VERSION OF THE "TEXAS DEPARTMENT OF TRANSPORTATION MANUAL STANDARD SPECIFICATIONS FOR CONSTRUCTION OF HIGHWAYS, STREETS, AND BRIDGES" UNLESS OTHERWISE STATED ON THE CONSTRUCTION DOCUMENTS APPROVED BY THE COUNTY ENGINEER.

B4.2 ALL MATERIALS SHALL BE SAMPLED AND TESTED BY AN INDEPENDENT TESTING LABORATORY IN ACCORDANCE WITH THE CONSTRUCTION DOCUMENTS APPROVED BY THE COUNTY ENGINEER. THE OWNER SHALL PAY FOR ALL TESTING SERVICES AND SHALL FURNISH THE COUNTY ENGINEER WITH CERTIFIED COPIES OF THESE TEST RESULTS. THE COUNTY ENGINEER MUST APPROVE THE TEST RESULTS PRIOR TO CONSTRUCTING THE NEXT COURSE OF THE ROADWAY STRUCTURE. ANY MATERIAL WHICH DOES NOT MEET THE MINIMUM REQUIRED TEST SPECIFICATIONS SHALL BE REMOVED AND RECOMPACTED OR REPLACED UNLESS ALTERNATIVE REMEDIAL ACTION IS APPROVED IN WRITING FROM THE COUNTY ENGINEER.

B4.3 EXCEPT FOR ELECTRICAL LINES, ALL UNDERGROUND NONFERROUS UTILITIES WITHIN A RIGHT-OF-WAY OR EASEMENT MUST BE ACCOMPANIED BY FERROUS METAL LINES TO AID IN TRACING THE LOCATION OF SAID UTILITIES THROUGH THE USE OF A METAL DETECTOR.

B4.4 ALL PAVEMENTS ARE TO BE DESIGNED BY A REGISTERED PROFESSIONAL ENGINEER. THE DESIGN SHALL BE BASED ON A 20-YEAR DESIGN LIFE AND IN CONJUNCTION WITH RECOMMENDATIONS BASED UPON A SOILS REPORT OF SAMPLES TAKEN ALONG THE PROPOSED ROADWAYS. TEST BORINGS SHALL BE PLACED AT A MAXIMUM SPACING OF 500 FEET OR OTHER SAMPLING FREQUENCY APPROVED BY THE COUNTY ENGINEER BASED ON RECOMMENDATIONS PROVIDED BY THE GEOTECHNICAL ENGINEER. BORINGS SHALL BE TO A DEPTH OF TEN FT OR, IF SOLID ROCK IS ENCOUNTERED, ONE FT BELOW NON-FRACTURED ROCK. THE SOILS REPORT AND PAVEMENT DESIGN SHALL BE SUBMITTED TO THE COUNTY ENGINEER FOR REVIEW. THE PAVEMENT DESIGN MUST BE APPROVED BY THE COUNTY ENGINEER PRIOR TO OR CONCURRENTLY WITH THE REVIEW AND APPROVAL OF THE CONSTRUCTION PLANS. IN ADDITION TO THE BASIS OF THE PAVEMENT DESIGN, THE SOILS REPORT SHALL CONTAIN THE RESULTS OF SAMPLED AND TESTED SUBGRADE FOR PLASTICITY INDEX.

B5 – SUBGRADE

B5.1 THE PREPARATION OF THE SUBGRADE SHALL FOLLOW GOOD ENGINEERING PRACTICES AS DIRECTED BY THE COUNTY ENGINEER IN CONJUNCTION WITH RECOMMENDATIONS OUTLINED IN THE GEOTECHNICAL REPORT. WHEN THE PLASTICITY INDEX (PI) IS GREATER THAN 20, A SUFFICIENT AMOUNT OF LIME SHALL BE ADDED AS DESCRIBED IN ITEM 260 OF THE CURRENT EDITION OF THE TXDOT STANDARD SPECIFICATIONS FOR CONSTRUCTION UNTIL THE PI IS LESS THAN 20. IF THE ADDITION OF LIME AS DESCRIBED IN ITEM 260 IS NOT FEASIBLE, AN ALTERNATE STABILIZING DESIGN SHALL BE PROPOSED AND SUBMITTED TO THE COUNTY ENGINEER FOR APPROVAL. THE SUBGRADE SHALL BE PREPARED AND COMPACTED TO ACHIEVE A DRY DENSITY PER TXDOT ITEM 132. IN ADDITION, PROOF ROLLING MAY BE REQUIRED BY THE COUNTY ENGINEER.

B5.2 IF LIME IS NECESSARY, THEN A SUFFICIENT AMOUNT OF LIME SHALL BE ADDED, AS DESCRIBED IN ITEM 260 OF THE CURRENT EDITION OF THE TXDOT STANDARD SPECIFICATIONS FOR CONSTRUCTION TO PROPERLY STABILIZE SUBGRADE. THE USE OF HYDRATED LIME OR LIME SLURRY IS APPROVED; HOWEVER, THE USE OF PELLETIZED LIME IS NOT APPROVED.

B5.3 PRIOR TO LIME STABILIZATION, A SULFATE TEST OF IN SITU SOILS SHALL BE PERFORMED BY DEVELOPER TO CONFIRM THE APPROPRIATE MEANS AND METHODS OF STABILIZATION. PROVIDE SULFATE TEST TO COUNTY ENGINEER PRIOR TO STABILIZATION.

B5.4 ANY VARIATION TO THE COUNTY'S STABILIZATION REQUIREMENTS MUST BE APPROVED BY THE COUNTY ENGINEER.

B5.5 THE SUBGRADE SHALL BE PREPARED AND COMPACTED TO ACHIEVE A DRY DENSITY PER TXDOT ITEM 132. IN ADDITION, PROOF ROLLING MAY BE REQUIRED BY THE COUNTY ENGINEER.

B5.6 THE SUBGRADE SHALL BE INSPECTED AND APPROVED BY AN INDEPENDENT TESTING LABORATORY AND A CERTIFIED COPY OF ALL INSPECTION REPORTS FURNISHED TO THE COUNTY ENGINEER. THE COUNTY ENGINEER MUST APPROVE THE REPORT PRIOR TO APPLICATION OF THE BASE MATERIAL. ALL DENSITY TEST REPORTS SHALL INCLUDE A COPY OF THE WORK SHEET SHOWING THE PERCENTAGE OF THE MAXIMUM DRY (PROCTOR) DENSITY. THE NUMBER AND LOCATION OF ALL SUBGRADE TESTS SHALL BE DETERMINED BY THE COUNTY ENGINEER.

B6 – BASE MATERIAL

B6.1 BASE MATERIAL SHALL CONFORM TO ITEM 247 OF THE CURRENT EDITION OF THE TXDOT STANDARD SPECIFICATIONS FOR CONSTRUCTION, "FLEXIBLE BASE". THE BASE MATERIAL SHALL BE TYPE A GRADE 4, OR AS APPROVED BY THE COUNTY ENGINEER. GRADE 4 MATERIAL SHALL CONFORM TO THE REQUIREMENTS OF TABLE B6.1

MASTER GRADATION SIEVE SIZE	CUMULATIVE % RETAINED
2 1/2"	-
1 3/4"	0
7/8"	10% – 35%
3/8"	30% – 65%
#4	45% – 75%
#40	70% – 90%
#200	87% – 95%

B6.2 EACH LAYER OF BASE COURSE SHALL BE TESTED FOR IN-PLACE DRY DENSITY AND MEASURED FOR COMPACTED THICKNESS. THE NUMBER AND LOCATION OF ALL BASE TEST SAMPLES SHALL BE DETERMINED BY THE COUNTY ENGINEER.

B6.3 THE BASE SHALL BE PREPARED AND COMPACTED TO ACHIEVE A MINIMUM OF 100% OF THE MAXIMUM (PROCTOR) DRY DENSITY OR AS APPROVED BY THE COUNTY ENGINEER UPON RECOMMENDATION BY THE TESTING LABORATORY. THE MAXIMUM LIFT SHALL NOT EXCEED SIX INCHES. THE BASE MUST BE INSPECTED AND APPROVED BY AN INDEPENDENT TESTING LABORATORY AND A CERTIFIED COPY OF THE TEST RESULTS FURNISHED TO THE COUNTY ENGINEER FOR APPROVAL. PRIOR TO THE PLACEMENT OF THE FIRST LIFT OF BASE, THE STOCKPILE SHALL BE TESTED FOR THE SPECIFICATIONS FOUND IN ITEM 247 TABLE 1 AND THE RESULT FURNISHED TO THE COUNTY ENGINEER FOR APPROVAL.

B7 – BITUMINOUS PAVEMENT

B7.1 URBAN ROADS REQUIRE A MINIMUM 2 INCH WEARING SURFACE OF HMAC TYPE D. THE MIX SHALL BE FROM A TXDOT CERTIFIED PLANT AND THE MIX DESIGN SHALL BE SUBMITTED TO THE COUNTY ENGINEER FOR APPROVAL PRIOR TO PLACEMENT OF THE MATERIAL.

B7.2 IF PROVIDING MIXTURE TYPE C OR D, USE PERFORMANCE GRADE (PG) BINDER 70-22. PROVIDE PG BINDER THAT DOES NOT CONTAIN RECYCLED ENGINE OIL BOTTOMS (REOBS) OR POLY PHOSPHORIC ACID (PPA). RECYCLED ASPHALT PAVEMENT (RAP) IS NOT PERMITTED FOR USE AS A COMPONENT OF THE HMACP. THE CONTRACTOR IS ALSO NOT PERMITTED THE USE RECYCLED ASPHALT SHINGLES (RAS) AS A COMPONENT OF THE HMACP.

B7.3 IF PROVIDING MIXTURE TYPE B, USE PG BINDER 64-22. PROVIDE PG BINDERS THAT DO NOT CONTAIN REOBS OR PPA. FOR SUBSURFACE COURSE TYPE B, THE USE OF TWENTY PERCENT (20%) RAP IS PERMITTED IN THE MIX DESIGN. THE CONTRACTOR IS NOT PERMITTED TO USE RAS AS A COMPONENT OF THE HMACP.

B7.4 TARGET LABORATORY MOLDED DENSITY IS 96.5% FOR ALL MIXTURES WITHOUT RAP AND WHEN USING A TEXAS GYRATORY COMPACTOR (TGC) FOR DESIGNING THE MIXTURE. WHEN USING SUPERPAVE GYRATORY COMPACTOR (SGC) TO DESIGN MIXTURES, SUBMIT THE SGC MIX DESIGN TO THE ENGINEER FOR APPROVAL.

B7.5 ALL MIXTURES MUST MEET THE HAMBURG REQUIREMENT AS STATED IN THE TABLE BELOW.

HIGH-TEMPERATURE BINDER GRADE	TEST METHOD	MINIMUM # OF PASSES @ 0.5" RUT DEPTH (TESTED @ 122°F)
PG 64 OR LOWER	TEX-242-F	7,000
PG 70	TEX-242-F	15,000
PG-76 OR HIGHER	TEX-242-F	20,000

* THE COUNTY ENGINEER MAY ACCEPT HAMBURG WHEEL TEST RESULTS FOR PRODUCTION AND PLACEMENT IF NO MORE THAN 1OF THE 5 MOST RECENT TESTS IS BELOW THE SPECIFIED NUMBER OF PASSES AND THE FAILING TEST IS NO MORE THAN 2,000 PASSES BELOW THE SPECIFIED NUMBER OF PASSES.

B7.6 SUBMIT ANY PROPOSED ADJUSTMENTS OR CHANGES TO A JOB MIX FORMULA TO THE COUNTY ENGINEER BEFORE PRODUCTION OF THE NEW JOB MIX FORMULA.

B7.7 UNLESS OTHERWISE APPROVED, PROVIDE TYPE B MIXTURES THAT HAVE NO LESS THAN 4.5% ASPHALT BINDER, AND TY C AND D MIXTURES WITH NO LESS THAN 4.7% BINDER.

B7.8 FOR MIXTURE DESIGN VERIFICATION, PROVIDE THE ENGINEER WITH TWO 5-GALLON BUCKETS OF EACH AGGREGATE STOCKPILE TO BE USED ON THE PROJECT AND THREE GALLONS OF EACH PG BINDER TO BE USED ON THE PROJECT. ALSO PROVIDE SUFFICIENT QUANTITIES OF ANY OTHER ADDITIVES THAT WILL BE USED IN THE HMA MIXTURE. THIS MUST BE DONE PRIOR TO APPROVAL OF THE MIX DESIGN, UNLESS ALREADY PERFORMED WITHIN A ONE-YEAR TIME PERIOD.

B7.9 PRIOR TO ALLOWING PRODUCTION OF THE TRIAL BATCH, THE ENGINEER WILL USE THE MATERIALS PROVIDED BY THE CONTRACTOR TO PERFORM THE FOLLOWING TESTS TO VERIFY THE HMA MIXTURE DESIGN.
1. INDIRECT TENSILE TEST IN ACCORDANCE WITH TEX-226-F
2. HAMBURG WHEEL TEST IN ACCORDANCE WITH TEX-242-F
3. OVERLAY TEST IN ACCORDANCE WITH TEX-248-F
4. CANTABRO TEST IN ACCORDANCE WITH TEX-245-F

FOR MIXTURES DESIGNED WITH A TEXAS GYRATORY COMPACTOR (TGC), THE ENGINEER MAY REQUIRE THAT THE TARGET LABORATORY MOLDED DENSITY BE RAISED TO NO MORE THAN 97.5% OR MAY LOWER THE DESIGN NUMBER OF GYRATIONS TO NO LESS THAN 35 FOR MIXTURES DESIGNED WITH AN SGC IF ANY OF THE FOLLOWING CONDITIONS EXIST.
1. THE INDIRECT TENSILE TEST RESULTS IN A VALUE GREATER THAN 200 PSI
2. THE HAMBURG WHEEL TEST RESULTS IN A VALUE LESS THAN 3.0 MM
3. THE OVERLAY TEST RESULTS IN A VALUE LESS THAN 100 CYCLES
4. THE CANTABRO TEST RESULTS IN A VALUE OF MORE THAN 20% LOSS

IN LIEU OF, OR IN ADDITION TO EVALUATING THE MIXTURE DESIGN PRIOR TO ALLOWING A TRIAL BATCH TO BE PRODUCED, THE ENGINEER MAY ALSO EVALUATE THE MIXTURE PRODUCED DURING THE TRIAL BATCH FOR COMPLIANCE WITH THE 4 TESTS LISTED ABOVE.

B7.10 CONTRACTOR'S QUALITY CONTROL (CQC) TEST REPORTS SHALL BE SUBMITTED TO THE COUNTY ENGINEER ON A DAILY BASIS. AS A MINIMUM, DAILY CQC TESTING ON THE PRODUCED MIX SHALL INCLUDE: SIEVE ANALYSIS TEX-200-F, ASPHALT CONTENT TEX-236-F, HVEEM STABILITY TEX-208-F, LABORATORY COMPACTED DENSITY TEX-207-F, AND MAXIMUM SPECIFIC GRAVITY TEX-227-F. THE NUMBER AND LOCATION OF ALL HMAC TESTS SHALL BE DETERMINED BY THE COUNTY ENGINEER WITH A MINIMUM OF THREE, 6-INCH DIAMETER FIELD CORES SECURED AND TESTED BY THE CONTRACTOR FROM EACH DAY'S PAVING. EACH HMAC COURSE SHALL BE TESTED FOR IN-PLACE DENSITY, BITUMINOUS CONTENT AND AGGREGATE GRADATION, AND SHALL BE MEASURED FOR COMPACTED THICKNESS. THE NUMBER AND LOCATION OF ALL HMAC TEST SAMPLES SHALL BE DETERMINED BY THE COUNTY ENGINEER.

B7.11 RURAL ROADS MAY USE EITHER THE SPECIFICATIONS FOUND IN SECTION B7.1 OR A TWO-COURSE SURFACE IN ACCORDANCE WITH ITEM 316, TREATMENT WEARING SURFACE, OF THE CURRENT EDITION OF THE TXDOT STANDARD SPECIFICATIONS FOR CONSTRUCTION. THE TYPE AND RATE OF ASPHALT AND AGGREGATE SHALL BE INDICATED ON THE PLANS AS A BASIS OF ESTIMATE AND SHALL BE DETERMINED AT THE PRECONSTRUCTION CONFERENCE. AGGREGATE USED IN THE MIX SHALL BE ON THE TXDOT QUALITY MONITORING SCHEDULE. AGGREGATE SHALL BE TYPE B GRADE 4. GRADATION TESTS SHALL BE REQUIRED FOR EACH 300 CUBIC YARDS OF MATERIAL PLACED WITH A MINIMUM OF TWO TESTS PER EACH GRADE PER EACH PROJECT. TEST RESULTS SHALL BE REVIEWED BY THE COUNTY ENGINEER PRIOR TO APPLICATION OF THE MATERIAL.

B8 – CONCRETE PAVEMENT

B8.1 IN LIEU OF BITUMINOUS PAVEMENT, PORTLAND CEMENT CONCRETE PAVEMENT MAY BE USED. IN SUCH CASES, THE PAVEMENT THICKNESS SHALL BE A MINIMUM OF 9 INCHES OF CONCRETE, AND SHALL BE JOINTED AND REINFORCED IN ACCORDANCE WITH THE DETAIL INCLUDED IN APPENDIX J. THE MIX SHALL BE FROM A TXDOT CERTIFIED PLANT. THE MIX DESIGN SHALL BE SUBMITTED TO THE COUNTY ENGINEER FOR APPROVAL PRIOR TO PLACEMENT OF THE MATERIAL.

B9 – CONCRETE – GENERAL

B9.1 UNLESS OTHERWISE SPECIFIED, CONCRETE SHALL BE IN ACCORDANCE WITH ITEM 421 OF THE CURRENT EDITION OF THE TXDOT STANDARD SPECIFICATIONS FOR CONSTRUCTION AND BE PLACED IN ACCORDANCE WITH THE APPLICABLE ITEM.

B9.2 ALL CONCRETE SHALL BE TESTED FOR COMPRESSIVE STRENGTH. ONE SET OF THREE CONCRETE TEST CYLINDERS SHALL BE MOLDED FOR EVERY 50 CUBIC YARDS OF CONCRETE PLACED FOR EACH CLASS OF CONCRETE PER DAY, OR AT ANY OTHER INTERVAL AS DETERMINED BY THE COUNTY ENGINEER. A SLUMP TEST SHALL BE REQUIRED WITH EACH SET OF TEST CYLINDERS. ONE CYLINDER SHALL BE TESTED FOR COMPRESSIVE STRENGTH AT AN AGE OF SEVEN DAYS AND THE REMAINING TWO CYLINDERS SHALL BE TESTED AT 28 DAYS OF AGE.

B10 – ROAD NAMES, SIGNS AND MARKERS

B10.1 ALL ROADS SHALL BE NAMED, WITH PRIOR APPROVAL FOR SAID NAME FROM THE WILLIAMSON COUNTY 911 ADDRESSING COORDINATOR. ROADS MUST BE NAMED IN A MANNER TO AVOID CONFUSION IN IDENTIFICATION. ROADS THAT ARE EXTENSIONS OF EXISTING ROADS MUST CARRY THE NAMES OF THOSE IN EXISTENCE. ROADS THAT ARE NOT CONTINUOUS, OR WHICH HAVE 90 DEGREE TURNS, SHALL HAVE DIFFERENT NAMES. THE OWNER SHALL PROVIDE THE COORDINATOR WITH TWO DIGITAL FILES OF THE PLAT. ONE FILE SHALL BE IN AN ADOBE .PDF FORMAT, AND THE OTHER FILE SHALL BE IN AN AUTOCAD .DWG FORMAT GEOREFERENCED TO NAD 1983 STATE PLANE GRID COORDINATE SYSTEM, TEXAS CENTRAL ZONE (4203), WITH DRAWING UNITS OF US FEET. THE ROAD NAMES SHALL BE DISPLAYED ON STANDARD INTERSECTION ROAD MARKER SIGNS ERECTED BY THE OWNER IN COMPLIANCE WITH THE TXMUTCD "STREET NAME SIGNS" AND AT THE LOCATIONS AS INDICATED ON THE CONSTRUCTION PLANS.

B10.2 TRAFFIC CONTROL SIGNS (SUCH AS STOP, YIELD, AND SPEED LIMIT SIGNS) SHALL BE INSTALLED BY THE OWNER OF SAID SUBDIVISION IN COMPLIANCE WITH THE LATEST VERSION OF THE TXMUTCD AND AT THE LOCATIONS AS INDICATED ON THE APPROVED CONSTRUCTION PLANS. OTHER TRAFFIC CONTROL SIGNS, AS SHOWN ON THE CONSTRUCTION PLANS, SHALL BE INSTALLED TO INDICATE ANY UNUSUAL TRAFFIC OR ROAD HAZARD OR CONDITIONS THAT MAY EXIST. ALL TRAFFIC CONTROL DEVICES SHALL BE PLACED IN COMPLIANCE WITH LATEST VERSION OF THE TXMUTCD AND THE CONSTRUCTION COST SHALL BE BORNE BY THE OWNER.

B11 – DRAINAGE AND FLOOD CONTROL

B11.1 STORMWATER MANAGEMENT CONTROLS SHALL BE DESIGNED, CONSTRUCTED, AND MAINTAINED TO RESTRICT THE RATE OF DRAINAGE FROM THE PLATTED AREA TO THE RATE OF DRAINAGE OF THE LAND IN ITS EXISTING CONDITION. WHEN A DEVELOPMENT SHALL HAVE SEVERAL SECTIONS, STORMWATER MANAGEMENT CONTROLS FOR THE ULTIMATE DEVELOPED AREA SHALL BE CONSTRUCTED IF NOT LOCATED IN THE FIRST PLATTED SECTION. STORMWATER MANAGEMENT CONTROLS ARE TO BE DESIGNED BY A PROFESSIONAL ENGINEER USING A BASIS OF A 2, 10, 25, AND 100-YEAR STORM. IF PROPOSED DEVELOPMENT IS DETENTION EXEMPT, A DETENTION EXEMPTION LETTER, REQUESTING THE DETENTION EXEMPTION TO BE UTILIZED, SHALL BE PROVIDED IN PLACE OF A DRAINAGE REPORT AND THE PLAT SHALL CONTAIN A CORRESPONDING PLAT NOTE FROM APPENDIX C12.

B11.2 THE PROPOSED TIME OF CONCENTRATIONS AND LAND COVER ROUGHNESS N-VALUES, USED TO CALCULATE TIME OF CONCENTRATION, SHOULD BE CONSISTENT FROM EXISTING TO PROPOSED CONDITIONS.

B11.3 WHEN CALCULATING PEAK FLOWS, THE RUNOFF CURVE NUMBER SHALL REMAIN THE SAME BETWEEN EXISTING AND PROPOSED CONDITIONS, USING THE ASSUMPTION OF RAW (UNDEVELOPED) LAND WITH NO IMPERVIOUS COVER. THE EXISTING AND PROPOSED PERCENTAGE OF IMPERVIOUS COVER SHALL BE INPUT INDIVIDUALLY FOR EACH CONDITION. FOR THE PROPOSED CONDITIONS, THE MAXIMUM POTENTIAL PERCENTAGE OF IMPERVIOUS COVER SHALL BE USED.

B11.4 DETENTION VOLUME SHALL BE SIZED BY COMPARING THE EXISTING PEAK RUNOFF PRODUCED BY THE SITE VERSUS THE PROPOSED PEAK RUNOFF PRODUCED BY THE SITE, FOR THE 2, 10, 25 AND 100-YEAR FREQUENCY RAINFALL EVENT. METHODS USED TO ANALYZE THE PRE AND POST DEVELOPMENT CONDITIONS SHOULD FOCUS ON THE PROPOSED CHANGES IN IMPERVIOUS COVER AND TIME OF CONCENTRATION ASSOCIATED WITH DEVELOPMENT OF THE SITE. THE POINTS OF ANALYSIS MUST BE CONSISTENT BETWEEN EXISTING AND PROPOSED SCENARIOS FOR A DIRECT AND ACCURATE ASSESSMENT OF IMPACTS. THE TIMING OF HYDROGRAPHS MAY NOT BE USED TO DEMONSTRATE A DECREASE OF PROPOSED PEAK FLOWS FROM THE DEVELOPED SITE.

B11.5 FOR DETENTION DESIGN, NOAA ATLAS 14 PRECIPITATION VALUES SHALL BE TAKEN FROM THE WILLIAMSON COUNTY RAINFALL ZONES FOR A 24-HOUR DURATION STORM. THESE ZONES AND RAINFALL DATA CAN BE FOUND IN EXHIBIT 2 AND THE ASSOCIATED TABLES.

B11.6 FOR DETENTION DESIGN, MAJOR CHANNEL DESIGN AND ANALYSIS, DETERMINATION OF PEAK FLOW RATES FOR FLOODPLAIN MODELING, AND HYDROLOGIC CHANNEL ROUTING, THE U.S. ARMY CORPS OF ENGINEERS HEC-HMS SOFTWARE IS RECOMMENDED. NOAA ATLAS 14 RAINFALL, PER EXHIBIT 2 – RAINFALL DATA, SHALL BE UTILIZED FOR ALL HYDROLOGIC ANALYSES. IF HEC-HMS IS NOT UTILIZED, THE FULL MODEL INPUT AND OUTPUT SHALL BE PROVIDED INCLUDING STRUCTURE AND OUTLET DETAILS AS MODELED.

B11.7 IMPERVIOUS COVER ASSUMPTIONS MUST BE CLEARLY STATED WITHIN THE DRAINAGE REPORT.

B11.8 FOR FLOODPLAIN STUDIES, MAJOR CHANNEL DESIGN AND ANALYSIS, AND DETERMINATION OF FINISHED FLOOR ELEVATIONS, THE U.S. ARMY CORPS OF ENGINEERS HEC-RAS SOFTWARE MUST BE UTILIZED.

B11.9 DRAINAGE CALCULATIONS AND DESIGN SHALL BE MADE USING THE LATEST EDITION OF THE CITY OF AUSTIN'S DRAINAGE CRITERIA MANUAL EXCEPT WHERE OTHERWISE SPECIFIED IN THE REGULATIONS HEREIN, OR OTHER METHODS SATISFACTORY TO THE COUNTY ENGINEER. ALL DATA AND CALCULATIONS MUST BE PRESENTED TO THE COUNTY ENGINEER AS PART OF THE CONSTRUCTION PLANS OR DRAINAGE REPORT. THE FOLLOWING REQUIREMENTS SHALL BE INCORPORATED INTO THE DESIGN:

B11.9.1 BRIDGES AND CROSS DRAINAGE STRUCTURES FOR ARTERIAL, COLLECTOR, AND LOCAL ROADS SHALL BE DESIGNED TO CONVEY THE 25-YEAR STORM WITHOUT OVERTOPPING THE FACILITY.

B11.9.2 ALL LONGITUDINAL DRAINAGE STRUCTURES SHALL BE DESIGNED TO CONVEY THE 10-YEAR STORM.

B11.10 ALL DRAINAGE STRUCTURES AND APPURTENANCES SHALL BE DESIGNED BY A REGISTERED PROFESSIONAL ENGINEER. A PROFILE SHALL BE SHOWN IN THE CONSTRUCTION PLANS FOR ALL DRAINAGE STRUCTURES. EACH PROFILE SHALL SHOW THE DESIGN FLOW, VELOCITY, INVERT ELEVATIONS, AND THE HYDRAULIC GRADE LINE.

B11.11 THE USE OF THERMOPLASTIC PIPES (INCLUDING BUT NOT LIMITED TO POLY VINYL CHLORIDE (PVC) PIPE, HIGH DENSITY POLYETHYLENE PIPE (HDPE), POLYPROPYLENE PIPE, ETC.) IS SPECIFICALLY PROHIBITED FROM USE FOR CROSS DRAINAGE, PARALLEL DRAINAGE, STORM DRAINS AND ALL OTHER STORMWATER CONVEYANCE WITHIN THE RIGHT OF WAY AND/OR EASEMENTS IN CONNECTION WITH DRAINING OR PROTECTING THE ROAD SYSTEM.

B11.12 ALL PIPE USED FOR CROSS DRAINAGE, PARALLEL DRAINAGE, STORM DRAINS, AND ALL OTHER STORM WATER CONVEYANCES WITHIN THE RIGHT OF WAY AND/OR EASEMENTS IN CONNECTION WITH DRAINING OR PROTECTING THE ROAD SYSTEM SHALL BE DESIGNED AND CONSTRUCTED WITH THE CRITERIA IN TABLE B11.12 (PIPE CRITERIA). CAST-IN-PLACE IS PROHIBITED WITHOUT PRIOR APPROVAL FROM COUNTY ENGINEER. PIPES MUST HAVE A MINIMUM INTERIOR DIAMETER OF 18" OR EQUIVALENT.

B11.15 DRIVEWAY CULVERTS SHALL HAVE A MINIMUM INTERIOR DIAMETER OF 18" OR EQUAL AND A MINIMUM LENGTH OF 22 FEET AND SHALL INCLUDE A CONCRETE APRON SAFETY END TREATMENT IN ACCORDANCE WITH CURRENT TXDOT SAFETY END TREATMENT STANDARDS. LARGER OR LONGER CULVERTS SHALL BE INSTALLED IF NECESSARY, TO ACCOMMODATE DRAINAGE BASED UPON A 10-YEAR FLOW FREQUENCY.

B11.16 AT SOME POINT WITHIN THE FIRST TEN FEET FROM THE EDGE OF THE ROADWAY GUTTER, THE ENTIRE WIDTH OF A DRIVEWAY SHALL HAVE THE SAME OR GREATER ELEVATION AS THE TOP OF THE CURB AT THE EDGE OF THE ROADWAY.

B11.17 MAINTENANCE RESPONSIBILITY FOR DRAINAGE WILL NOT TO 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.

B11.18 EASEMENTS SHALL BE PROVIDED, WHERE NECESSARY, FOR ALL DRAINAGE COURSES AND IDENTIFIED FLOODPLAINS IN AND ACROSS PROPERTY TO BE PLATTED. THE LOCATION AND WIDTH SHALL BE SHOWN ON THE PLAT AND MARKED "DRAINAGE EASEMENT" OR "DRAINAGE AND UNDERGROUND UTILITIES EASEMENT". IN GENERAL, A "DRAINAGE EASEMENT" SHALL BE A MINIMUM OF 20 FEET IN WIDTH AND A "DRAINAGE AND UNDERGROUND UTILITIES EASEMENT" SHALL BE A MINIMUM OF 30 FEET IN WIDTH.

B11.19 ALL ROADSIDE DITCHES SHALL HAVE A MINIMUM DEPTH, AS MEASURED FROM THE EDGE OF THE ROAD PAVEMENT, EQUAL TO THE DIAMETER OF THE DRIVEWAY CULVERT PIPE(S) PLUS NINE INCHES, AND A BOTTOM WIDTH EQUAL TO THE DIAMETER OF THE DRIVEWAY CULVERT PIPE(S). THE SIDE SLOPES OF THE DITCHES ARE TO BE 3:1 OR FLATTER, EXCEPT AT PARALLEL CULVERTS WHICH SHALL BE 4:1 OR FLATTER TO ACCOMMODATE A STANDARD SAFETY END TREATMENT.

B11.20 WHERE ALL LOTS ARE 2 ACRES OR MORE AND EXEMPT FROM DETENTION, ROADSIDE DITCHES MAY BE ELIMINATED WITHIN A RURAL SUBDIVISION PROVIDED THAT THE ROAD HAS 18-INCH RIBBON CURBS, THE ROADWAY SURFACE HAS AN ADEQUATE CROSS SLOPE, AND THE OVERALL DRAINAGE PATTERNS THROUGHOUT THE SUBDIVISION REMAIN AS IN AN UNDEVELOPED STATE. IF INTERNAL SUBDIVISION ROADWAYS ARE PROPOSED WITHIN A NATURAL DRAINAGE PATTERN OR SHEET FLOW SUBDIVISION, A TYPICAL SECTION IS REQUIRED WITHIN CONSTRUCTION PLANS REQUIRING THE CONTRACTOR TO INSURE A MINIMUM 1.5" DROP ON FINISHED GRADE, WITH GRASS OR OTHER LAND COVER, FROM THE BACK OF CURB TO THE SHOULDER ON THE DOWNSLOPE SIDE OF ALL SHEET FLOW STREET SECTIONS, TO INSURE POSITIVE DRAINAGE FROM THE ROADWAY. IT IS THE PROPERTY OWNER'S RESPONSIBILITY TO ENSURE TOP OF GRASS AND OTHER LANDSCAPING ALONG RIBBON CURB, ON THE DOWNSLOPE SIDE OF THE ROADWAY, DOES NOT OBSTRUCT OR REDIRECT FLOW WITHIN THE RIGHT-OF-WAY.

B11.21 STORMWATER MANAGEMENT CONTROLS AND INFRASTRUCTURE, INCLUDING BUT NOT LIMITED TO DETENTION AND WATER QUALITY PONDS, SHALL NOT BE LOCATED WITHIN THE RIGHT-OF-WAY NOR ANY ROADWAY EASEMENTS. STORMWATER MANAGEMENT CONTROLS SHALL BE CONTAINED WITHIN A SEPARATE LOT OR EASEMENT FOR DRAINAGE, DETENTION OR WATER QUALITY PURPOSES AND DEDICATED TO THE ENTITY THAT WILL BE RESPONSIBLE FOR THEIR MAINTENANCE. NO PORTION OF ANY STORMWATER MANAGEMENT CONTROLS INCLUDING BUT NOT LIMITED TO WALLS, IMPOUNDMENT STRUCTURES, INLET/OUTLET STRUCTURES, UNDERGROUND VAULTS OR LEVEL SPREADERS SHALL BE PHYSICALLY CONNECTED TO THE ROADWAY, ROADWAY EMBANKMENT OR THE CROSS-DRAINAGE SYSTEM THAT DRAINS THE ROADWAY. THE ROADWAY EMBANKMENT SHALL NOT BE USED FOR THE DUAL PURPOSE OF TEMPORARILY OR PERMANENTLY IMPOUNDING WATER FOR STORMWATER MANAGEMENT OR DETENTION PURPOSES.

DESIGNED BY: NAME	DRAFTED BY: NAME

DATE

REVISION

Carlson, Brigance & Doering, Inc.
Civil Engineering ◆ Surveying
FIRM ID #F3791
Main Office
5501 West William Cannon Dr.
Austin, Texas 78749
Phone No. (512) 280-5160
North Office
12129 RR 620 N., Ste. 600
Austin, Texas 78750
www.cbdeng.com

SHEET NAME: GENERAL NOTES (1 OF 2)

JOB NAME: SANTA RITA RANCH NEIGHBORHOOD CENTER

PROJECT: SITE DEVELOPMENT PLAN

STEVEN P. CATES
93648

CARLSON, BRIGANCE & DOERING, INC.
ID# F3791

7-2-2025

DATE
JULY 2025

JOB NUMBER
5711

SHEET
2 OF 27

TEXAS COMMISSION ON ENVIRONMENTAL QUALITY
WATER POLLUTION ABATEMENT PLAN
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 (ED), 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 (TAC), 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 ED, 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, TAC, 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 ED'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, TAC § 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 ED TO ANY PART OF TITLE 30 TAC, CHAPTERS 213 AND 217, OR ANY OTHER TCEQ APPLICABLE REGULATION

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.

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.

TCEQ-0592 (REV. JULY 15, 2015)

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.

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 XX- XX F XX

    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: THERE SHALL BE NO CURVATURE OF SANITARY SEWER LINE PIPES.

    IF PIPE FLEXURE IS PROPOSED, THE FOLLOWING METHOD OF PREVENTING DEFLECTION OF THE JOINT MUST BE USED: THERE SHALL BE NO FLEXURE OF SANITARY SEER LINE PIPES.

    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.

    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).~~ (NOT APPLICABLE)

    THE PRIVATE SERVICE LATERAL STUB-OUTS MUST BE INSTALLED AS SHOWN ON THE PLAN AND PROFILE SHEETS ON PLAN SHEET XX_ OF _XX_ AND MARKED AFTER BACKFILLING AS SHOWN IN THE DETAIL ON PLAN SHEET _XX_ OF XX.

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	0.8550
8	454	298	1.5200
10	567	239	2.3740
12	680	199	3.4190
15	850	159	5.3420
18	1020	133	7.6930
21	1190	114	10.4710
24	1360	100	13.6760
27	1530	88	17.3090
30	1700	80	21.3690
33	1870	72	25.8560

(D) AN OWNER MAY STOP A TEST IF NO PRESSURE LOSS HAS OCCURRED DURING THE FIRST 25% OF THE CALCULATED TESTING TIME. 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.

(E) 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.

(F) 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.

1. 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.

2. 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.

TCEQ-0596 (REV. JULY 15, 2015)

DESIGNED BY: NAME
DRAFTED BY: NAME
DATE
REVISION

Carlson, Brigance & Doering, Inc.
Civil Engineering ◆ Surveying
FIRM ID #F3791

Main Office
5501 West William Cannon Dr.
Austin, Texas 78749
Phone No. (512) 280-5160

North Office
12129 RR 620 N., Ste. 600
Austin, Texas 78750
www.cbdeng.com

SHEET NAME: GENERAL NOTES (2 OF 2)
JOB NAME: SANTA RITA RANCH NEIGHBORHOOD CENTER
PROJECT: SITE DEVELOPMENT PLAN

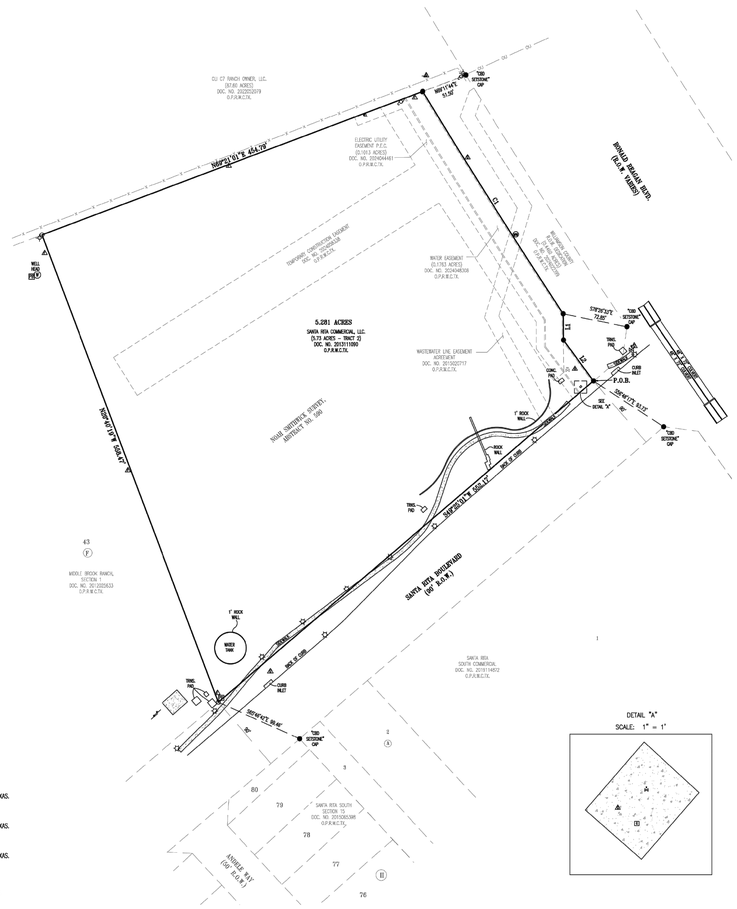
STEVEN P. CATES
93648
CARLSON, BRIGANCE & DOERING, INC.
ID# F3791
Steven P. Cates
7-2-2025

DATE
JULY 2025

JOB NUMBER
5711

SHEET
3 OF 27

FILE PATH:J:\AC3D\5711\dwg\5711 - GENERAL NOTES.dwg - Jul 01, 2025 - 2:26pm



LAND TITLE SURVEY OF 5.281 ACRES OF LAND SITUATED IN THE NOAH SMITHWICK SURVEY, ABSTRACT NUMBER 590, WILLIAMSON COUNTY, TEXAS, BEING ALL OF A CALLED 5.73 ACRE TRACT (TRACT 2) CONVEYED TO SANTA RITA COMMERCIAL, LLC. BY DEED RECORDED IN DOCUMENT NUMBER 2013111090, OFFICIAL PUBLIC RECORDS, WILLIAMSON COUNTY, TEXAS, SAVE AND EXCEPT A CALLED 0.4460 ACRE TRACT CONVEYED TO WILLIAMSON COUNTY, TEXAS FOR RIGHT-OF-WAY PURPOSES BY DEED RECORDED IN DOCUMENT NUMBER 2024022399, OFFICIAL PUBLIC RECORDS, WILLIAMSON COUNTY, TEXAS.

SCALE: 1" = 50'

LEGEND

●	CAPPED 1/2" IRON ROD FOUND STAMPED "WILLIAMSON COUNTY" (UNLESS NOTED)
○	CAPPED 1/2" CAPPED IRON ROD SET STAMPED "CBD SETSTONE"
P.O.B.	POINT OF BEGINNING
TRNS.	TRANSFORMER
●	GUY POLE
○	POWER POLE
—o—	SIGN
☼	LIGHT POLE
△F	BURIED FIBER OPTIC CABLE
⋈	GAS VALVE
△G	GAS LINE MARKER
G	GAS TEST STATION
⋈	WATER VALVE
Ⓦ	WATER WELL
WW	WASTEWATER MANHOLE
⌖	TELEPHONE PEDESTAL
— OU —	OVERHEAD ELECTRIC LINE
—x—	WIRE FENCE
PB	ELECTRIC PULL BOX
▨	CONCRETE
O.P.R.W.C.TX.	OFFICIAL PUBLIC RECORDS OF WILLIAMSON COUNTY, TEXAS

Line Table

Line #	Direction	Length
L1	S00°37'16"E	29.32
L2	S36°24'47"E	56.89

Curve Table

Curve #	Length	Radius	DELTA	Chord Direction	Chord Length
C1	293.94	8150.00	2°03'59"	S32°14'55"E	293.92

TO: SANTA RITA COMMERCIAL, LLC, AND TITLE RESOURCES GUARANTY COMPANY
ACCORDING TO TITLE COMMITMENT GF NO. 2509621–COM EFFECTIVE DATE: MARCH 12, 2025

THIS PROPERTY IS SUBJECT TO THE FOLLOWING:

j. TERMS, CONDITIONS, AND STIPULATIONS IN THE AGREEMENT:
RECORDED: DOCUMENT NO. 2006035816, OFFICIAL PUBLIC RECORDS, WILLIAMSON COUNTY, TEXAS.
TYPE: CONSENT AND DEVELOPMENT AGREEMENT

k. TERMS, CONDITIONS, AND STIPULATIONS IN THE AGREEMENT:
RECORDED: DOCUMENT NO. 2015020717, OFFICIAL PUBLIC RECORDS, WILLIAMSON COUNTY, TEXAS.
TYPE: WASTEWATER LINE EASEMENT AGREEMENT

n. EASEMENT:
RECORDED: DOCUMENT NO. 2024044461, OFFICIAL PUBLIC RECORDS, WILLIAMSON COUNTY, TEXAS.
TO: PEDERNALES ELECTRIC COOPERATIVE, INC.
PURPOSE: ELECTRIC UTILITY

o. EASEMENT:
RECORDED: DOCUMENT NO. 2024048308, OFFICIAL PUBLIC RECORDS, WILLIAMSON CITY, TEXAS
TO: CITY OF GEORGETOWN
PURPOSE: WATER LINE

p. TERMS, CONDITIONS, AND STIPULATIONS IN THE TEMPORARY CONSTRUCTION EASEMENT AGREEMENT:
RECORDED: DOCUMENT NO. 2024058338, OFFICIAL PUBLIC RECORDS, WILLIAMSON COUNTY, TEXAS.

q. INCLUSION WITHIN THE WILLIAMSON COUNTY MUD NO. 19.

THIS PROPERTY IS NOT SUBJECT TO THE FOLLOWING:

a. EASEMENT:
RECORDED: VOLUME 582, PAGE 514, DEED RECORDS, WILLIAMSON COUNTY, TEXAS.
TO: THE UNITED STATES OF AMERICA
PURPOSE: OVERFLOW, FLOOD AND SUBMERGE

b. EASEMENT:
RECORDED: VOLUME 582, PAGE 518, DEED RECORDS, WILLIAMSON COUNTY, TEXAS.
TO: THE UNITED STATES OF AMERICA
PURPOSE: RIGHT–OF–WAY

c. EASEMENT:
RECORDED: VOLUME 582, PAGE 525, DEED RECORDS, WILLIAMSON COUNTY, TEXAS.
TO: THE UNITED STATES OF AMERICA
PURPOSE: DRAINAGE DITCH

d. EASEMENT:
RECORDED: VOLUME 939, PAGE 306, DEED RECORDS, WILLIAMSON COUNTY, TEXAS.
TO: CHISHOLM TRAIL WSC
PURPOSE: WATER PIPELINE

e. EASEMENT:
RECORDED: DOCUMENT NO. 9743610, OFFICIAL RECORDS, WILLIAMSON COUNTY, TEXAS.
TO: CHISHOLM TRAIL SPECIAL UTILITY DISTRICT
PURPOSE: WATER LINES

f. EASEMENT:
RECORDED: DOCUMENT NO. 2007098343, OFFICIAL PUBLIC RECORDS, WILLIAMSON COUNTY, TEXAS.
TO: PEDERNALES ELECTRIC COOPERATIVE, INC.
PURPOSE: ELECTRIC UTILITY

g. EASEMENT:
RECORDED: DOCUMENT NO. 2009009610, OFFICIAL PUBLIC RECORDS, WILLIAMSON COUNTY, TEXAS.
TO: CHISHOLM TRAIL SPECIAL UTILITY DISTRICT
PURPOSE: WATER LINE

h. TERMS, CONDITIONS, AND STIPULATIONS IN THE ORDINANCE:
RECORDED: DOCUMENT NO. 2005053406, OFFICIAL PUBLIC RECORDS, WILLIAMSON COUNTY, TEXAS.
TYPE:ORDINANCE NO. 05–0–41

i. TERMS, CONDITIONS, AND STIPULATIONS IN THE ORDINANCE:
RECORDED: DOCUMENT NO. 2005077355, OFFICIAL PUBLIC RECORDS, WILLIAMSON COUNTY, TEXAS.
ORDINANCE NO. 05–0–27

l. EASEMENT:
RECORDED: DOCUMENT NO. 2018079583, OFFICIAL PUBLIC RECORDS, WILLIAMSON COUNTY, TEXAS.
TO: PEDERNALES ELECTRIC COOPERATIVE, INC.
PURPOSE: ELECTRIC UTILITY

m. TERMS, CONDITIONS, AND STIPULATIONS IN THE WATER LINE EASEMENT AGREEMENT:
RECORDED: DOCUMENT NO. 2019017258, OFFICIAL PUBLIC RECORDS, WILLIAMSON COUNTY, TEXAS.

SURVEYOR'S CERTIFICATION:

TO: SANTA RITA COMMERCIAL, LLC AND TITLE RESOURCES GUARANTY COMPANY

I, THE UNDERSIGNED, DO HEREBY CERTIFY THAT THIS SURVEY WAS THIS DAY MADE ON THE GROUND OF THE PROPERTY LEGALLY DESCRIBED HEREON AND IS CORRECT, AND THAT THERE ARE NO DISCREPANCIES, CONFLICTS, SHORTAGES IN AREA, BOUNDARY LINE CONFLICTS, ENCROACHMENTS, OVERLAPPING OF IMPROVEMENTS, VISIBLE UTILITY EASEMENTS OR ROADWAYS, EXCEPT AS SHOWN HEREON AND THAT SAID PROPERTY HAS ACCESS TO AND FROM A DEDICATED ROADWAY EXCEPT AS SHOWN HEREON. NO PORTION OF THE LEGALLY DESCRIBED PROPERTY IS WITHIN A SPECIAL FLOOD HAZARD AREA AS DESIGNATED BY THE DEPARTMENT OF HOUSING AND URBAN DEVELOPMENT FEDERAL INSURANCE ADMINISTRATION FLOOD HAZARD BOUNDARY MAP NUMBER 48491C0275E, WILLIAMSON COUNTY, TEXAS, DATED SEPTEMBER 26, 2008.

FIELD WORK COMPLETED: APRIL 16, 2025
DATE OF SURVEY: MAY 23, 2025

5/28/25

ERIC J. DANNHEIM, RPLS# 6075
CARLSON, BRIGANCE AND DOERING, INC.
5501 WEST WILLIAM CANNON
AUSTIN, TEXAS 78749
(512) 280–5160
EDANNHEIM@CBDENG.COM

ERIC J. DANNHEIM
6075

BEARING BASIS: TEXAS COORDINATE SYSTEM OF 1983, CENTRAL ZONE (4203)

Carlson, Brigance & Doering, Inc.
FIRM ID #F3791 ◆ REG. # 10024900
Civil Engineering ◆ Surveying
5501 West William Cannon ◆ Austin, Texas 78749
Phone No. (512) 280-5160 ◆ Fax No. (512) 280-5165

J:\AC3D\5012\Survey\TITLE SURVEY – 5.281 ACRES – SANTA RITA COMMERCIAL

DESIGNED BY: NAME	DRAFTED BY: NAME

DATE	REVISION

Carlson, Brigance & Doering, Inc.
Civil Engineering ◆ Surveying
FIRM ID #F3791
Main Office
5501 West William Cannon Dr.
Austin, Texas 78749
Phone No. (512) 280-5160
North Office
12129 RR 620 N., Ste. 600
Austin, Texas 78750
www.cbdeng.com

SHEET NAME: PLAT
JOB NAME: SANTA RITA RANCH NEIGHBORHOOD CENTER
PROJECT: SITE DEVELOPMENT PLAN

STEVEN P. CATES
93648

CARLSON, BRIGANCE & DOERING, INC.
ID# F3791
Steven P. Cates
7-2-2025

DATE
JULY 2025

JOB NUMBER
5711

SHEET
---- OF 27

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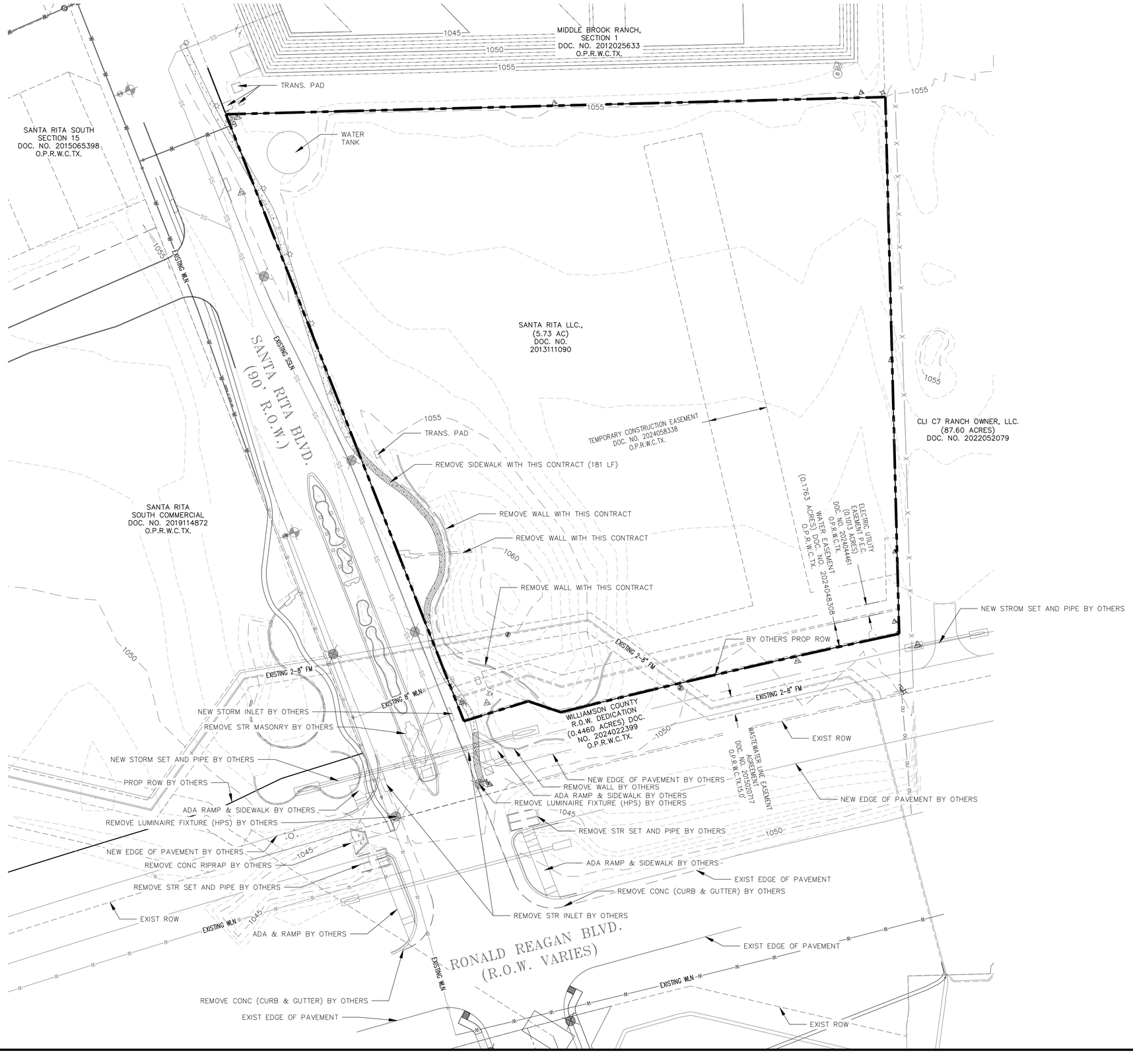

LEGEND

- CAPPED 1/2" IRON ROD FOUND STAMPED "WILLIAMSON COUNTY" (UNLESS NOTED)
- CAPPED 1/2" CAPPED IRON ROD SET STAMPED "CBD SETSTONE"
- P.O.B. POINT OF BEGINNING
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- GAS TEST STATION
- WATER VALVE
- WATER WELL
- WASTEWATER MANHOLE
- TELEPHONE PEDESTAL
- OU OVERHEAD ELECTRIC LINE
- X WIRE FENCE
- PB ELECTRIC PULL BOX
- CONCRETE
- O.P.R.W.C.TX. OFFICIAL PUBLIC RECORDS OF WILLIAMSON COUNTY, TEXAS

0 40' 80'

SCALE: 1" = 40'

DESIGNED BY: NAME	DRAFTED BY: NAME

DATE

REVISION

Carlson, Brigance & Doering, Inc.
Civil Engineering ◆ Surveying
FIRM ID #F3791
Main Office: 5501 West William Cannon Dr. Austin, Texas 78749 Phone No. (512) 280-5160
North Office: 12129 RR (620 N., Ste. 600) Austin, Texas 78750 www.cbdeng.com

SHEET NAME: EXISTING CONDITIONS AND DEMOLITION PLAN

JOB NAME: SANTA RITA RANCH NEIGHBORHOOD CENTER

PROJECT: SITE DEVELOPMENT PLAN

STATE OF TEXAS
STEVEN P. CATES
93648
LICENSED PROFESSIONAL ENGINEER

CARLSON, BRIGANCE & DOERING, INC. ID# F3791

7-2-2025

DATE JULY 2025

JOB NUMBER 5711

SHEET 5 OF 27

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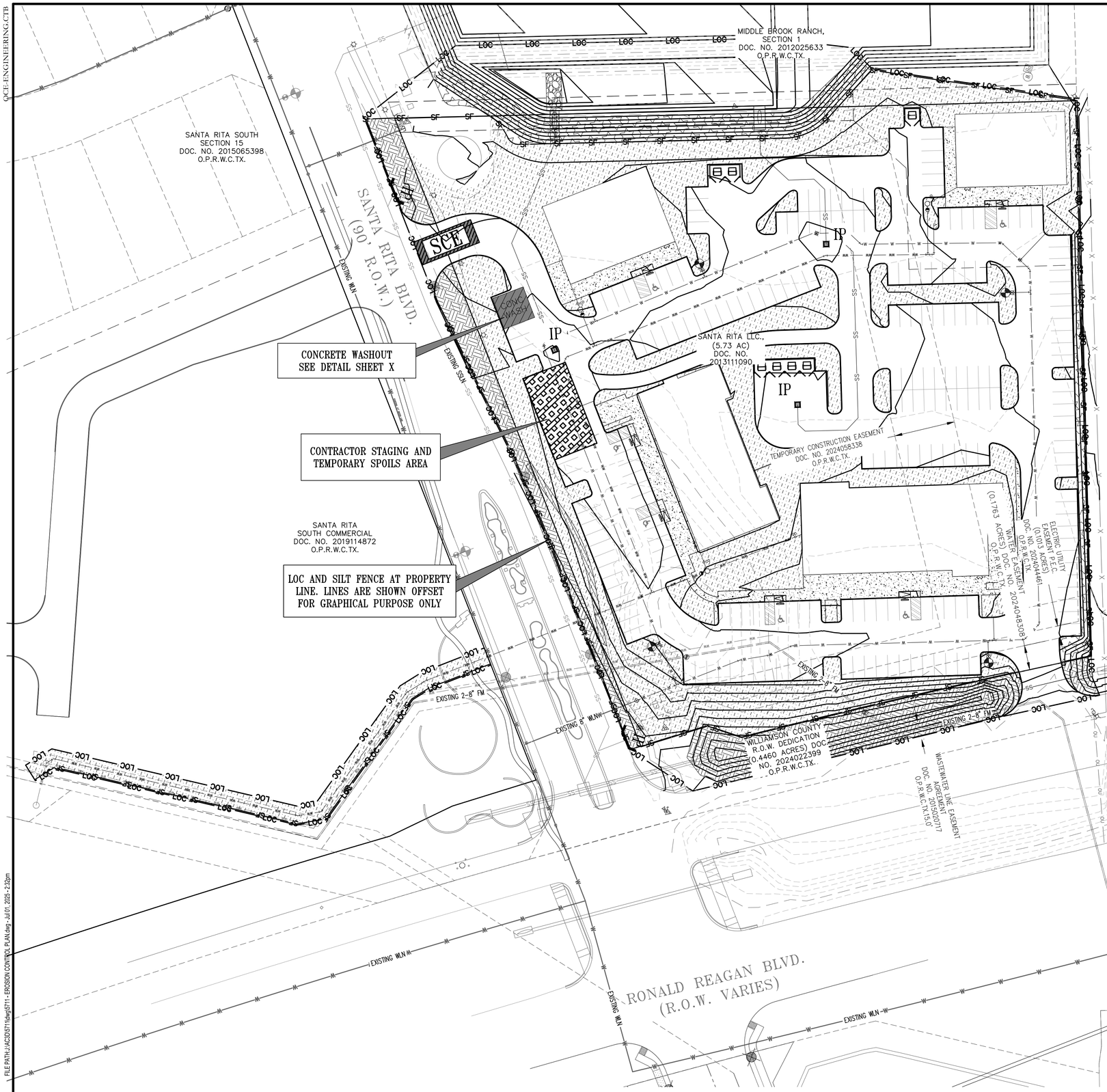

LEGEND

SF	SILT FENCE
JH	SILT FENCE J-HOOK
LOC	LIMITS OF CONSTRUCTION
IP	INLET PROTECTION
SCE	STABILIZED CONSTRUCTION ENTRANCE
	SEEDING & TOPSOIL (PERMANENT) WITHIN THE ROW ONLY
	ROLLED EROSION CONTROL MATTING, SEEDING & TOPSOIL (PERMANENT) FOR SLOPES 5:1 & STEEPER
	SEEDING & TOPSOIL (PERMANENT) FOR EASEMENTS, OPEN SPACE LOTS, AND VEGETATIVE FILTER STRIPS ON ALL SLOPES FLATTER THAN 5:1

NOTES:

1. EROSION CONTROL MEASURES, SITE WORK AND RESTORATION WORK SHALL BE IN ACCORDANCE WITH THE CITY OF ROUND ROCK EROSION AND SEDIMENTATION CONTROL ORDINANCE.
2. ALL SLOPES SHALL BE SODDED OR SEEDED WITH APPROVED GRASS, GRASS MIXTURES OR GROUND COVER SUITABLE TO THE AREA AND SEASON IN WHICH THEY ARE APPLIED.
3. SILT FENCES, ROCK BERMS, SEDIMENTATION BASINS AND SIMILARLY RECOGNIZED TECHNIQUES AND MATERIALS SHALL BE EMPLOYED DURING CONSTRUCTION TO PREVENT POINT SOURCE SEDIMENTATION LOADING OF DOWNSTREAM FACILITIES. SUCH INSTALLATION SHALL BE REGULARLY INSPECTED BY THE CITY OF ROUND ROCK FOR EFFECTIVENESS. ADDITIONAL MEASURES MAY BE REQUIRED IF, IN THE OPINION OF THE CITY ENGINEER, THEY ARE WARRANTED.
4. ALL TEMPORARY EROSION CONTROL MEASURES SHALL NOT BE REMOVED UNTIL FINAL INSPECTION AND APPROVAL OF THE PROJECT BY THE ENGINEER. IT SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR TO MAINTAIN ALL TEMPORARY EROSION CONTROL STRUCTURES AND TO REMOVE EACH STRUCTURE AS APPROVED BY THE ENGINEER.
5. ALL MUD, DIRT, ROCKS, DEBRIS, ETC., SPILLED, TRACKED OR OTHERWISE DEPOSITED ON EXISTING PAVED STREETS, DRIVES AND AREAS USED BY THE PUBLIC SHALL BE CLEANED UP IMMEDIATELY.
6. ALL DISTURBED AREA SHALL BE SODDED/REVEGETATED.

LIMIT OF CONSTRUCTION - 281790 SF/ 6.47 ACRES
SILT FENCE - 2336 LF
INLET PROTECTION- 3 ONSITE (NEW) , 2 OFFSITE (STREET EXISTING)
STABILIZED CONSTRUCTION ENTRANCE - 1
CONCRETE WASHOUT - 1

DESIGNED BY: NAME | DRAFTED BY: NAME

DATE

REVISION

Carlson, Brigance & Doering, Inc.
Civil Engineering ◆ Surveying
FIRM ID #F3791
Main Office: 5501 West William Cannon Dr. Austin, Texas 78749 Phone No. (512) 280-5160
North Office: 12129 RR 620 N., Ste. 600 Austin, Texas 78750 www.cbdeng.com

SHEET NAME: EROSION CONTROL PLAN

JOB NAME: SANTA RITA RANCH NEIGHBORHOOD CENTER

PROJECT: SITE DEVELOPMENT PLAN

STATE OF TEXAS
STEVEN P. CATES
93648
LICENSED PROFESSIONAL ENGINEER
CARLSON, BRIGANCE & DOERING, INC.
ID# F3791
7-2-2025

DATE JULY 2025

JOB NUMBER 5711

SHEET 6 OF 27

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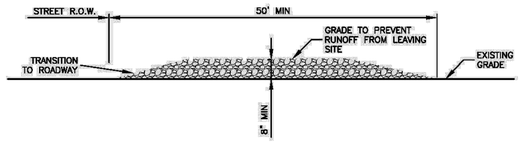
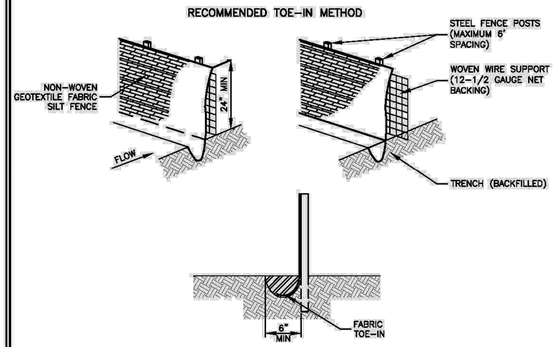


CROSS SECTION

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	CITY OF ROUND ROCK	DRAWING NO: EC-09
APPROVED 03-25-11 DATE	STABILIZED CONSTRUCTION ENTRANCE DETAIL	ROUND ROCK, TEXAS
THE ARCHITECT/ENGINEER ASSUMES RESPONSIBILITY FOR THE APPROPRIATE USE OF THIS DETAIL. (NOT TO SCALE)		

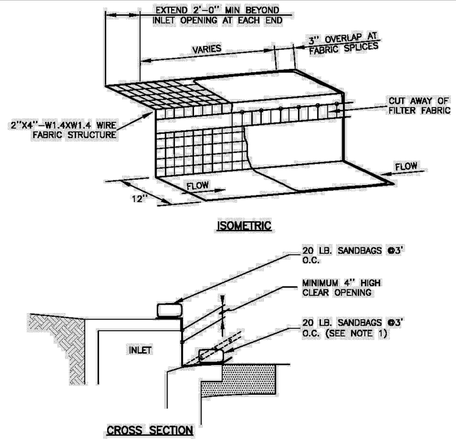


CROSS SECTION

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	CITY OF ROUND ROCK	DRAWING NO: EC-10
APPROVED 03-25-11 DATE	SILT FENCE DETAIL	ROUND ROCK, TEXAS
THE ARCHITECT/ENGINEER ASSUMES RESPONSIBILITY FOR THE APPROPRIATE USE OF THIS DETAIL. (NOT TO SCALE)		

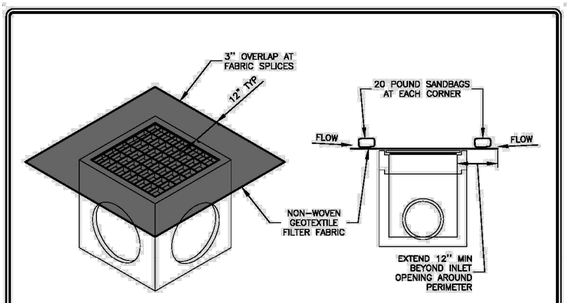


CROSS SECTION

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	CITY OF ROUND ROCK	DRAWING NO: EC-14
APPROVED 03-25-11 DATE	CURB INLET PROTECTION DETAIL	ROUND ROCK, TEXAS
THE ARCHITECT/ENGINEER ASSUMES RESPONSIBILITY FOR THE APPROPRIATE USE OF THIS DETAIL. (NOT TO SCALE)		



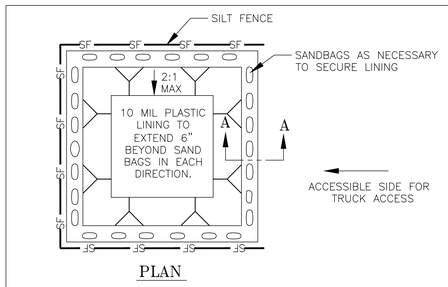
ISOMETRIC

CROSS SECTION

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	CITY OF ROUND ROCK	DRAWING NO: EC-15
APPROVED 03-25-11 DATE	AREA INLET PROTECTION DETAIL	ROUND ROCK, TEXAS
THE ARCHITECT/ENGINEER ASSUMES RESPONSIBILITY FOR THE APPROPRIATE USE OF THIS DETAIL. (NOT TO SCALE)		

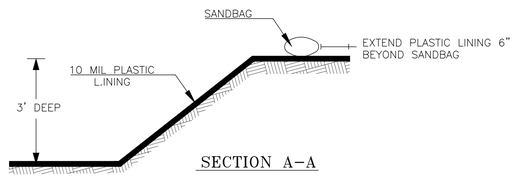


PLAN

NOTE: SIZE VARIES BASED ON ANTICIPATED VOLUME OF CONCRETE TO BE PLACED. MINIMUM SIZE 8'X8' BOTTOM.

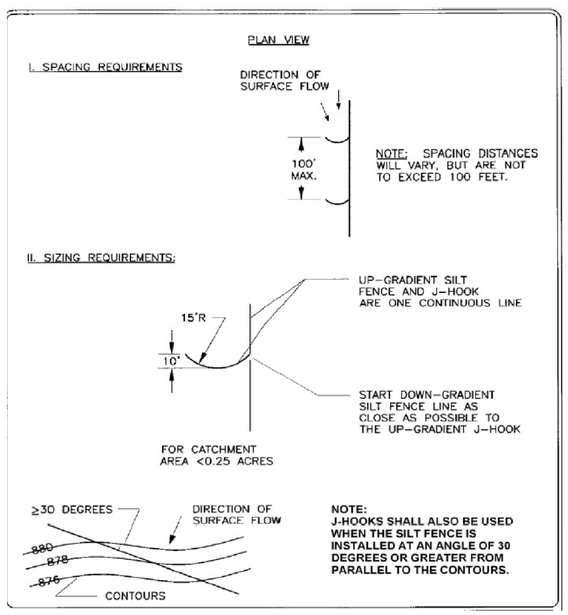
CONCRETE WASHOUT AREA NOTES:

1. WASHOUT SHALL BE INSTALLED PRIOR TO PLACING ANY CONCRETE ON-SITE.
2. INSTALL DIRECTIONAL SIGNS AS NECESSARY TO INDICATE WASHOUT LOCATION TO CONCRETE SUPPLY VEHICLES.
3. WASHOUT SHALL BE INSPECTED WEEKLY AND AFTER RAIN EVENTS IN ACCORDANCE WITH SWPPP.
4. CONTRACTOR TO MAINTAIN, REPAIR, ENLARGE OR RELOCATE WASHOUT AS NECESSARY TO MEET PROJECT REQUIREMENTS.
5. WHEN NECESSARY DURING CONSTRUCTION, OR AT THE COMPLETION OF ALL CONSTRUCTION, CONCRETE SHALL BE REMOVED AND LAWFULLY DISPOSED OF AND THE WASHOUT AREA FILLED WITH COMPACTED SELECT FILL.
6. CONCRETE WASHOUT SHALL NOT BE LOCATED WITHIN 50' OF STORM INLET, DITCH, OR SUBSURFACE DRAINAGE SYSTEM.



SECTION A-A

CONCRETE WASHOUT DETAIL
N.T.S



DESIGNED BY: NAME | DRAFTED BY: NAME

DATE | REVISION

Carlson, Brigance & Doering, Inc.
Civil Engineering ◆ Surveying
FIRM ID #F3791
Main Office: 5501 West William Cannon Dr. Austin, Texas 78749 Phone No. (512) 280-5160
North Office: 12129 RR 620 N., Ste. 600 Austin, Texas 78750 www.cbdeng.com

SHEET NAME: ----
JOB NAME: SANTA RITA RANCH NEIGHBORHOOD CENTER
PROJECT: SITE DEVELOPMENT PLANS

STATE OF TEXAS
STEVEN P. CATES
93648
LICENSED PROFESSIONAL ENGINEER
CARLSON, BRIGANCE & DOERING, INC.
ID# F3791
7-2-2025

DATE: JULY 2025
JOB NUMBER: 5711
SHEET: ---- OF 27

FILE PATH: J:\AC\2057\11\dwg\5711-EROSION CONTROL DETAILS.dwg - Jul 01, 2025 - 2:32pm

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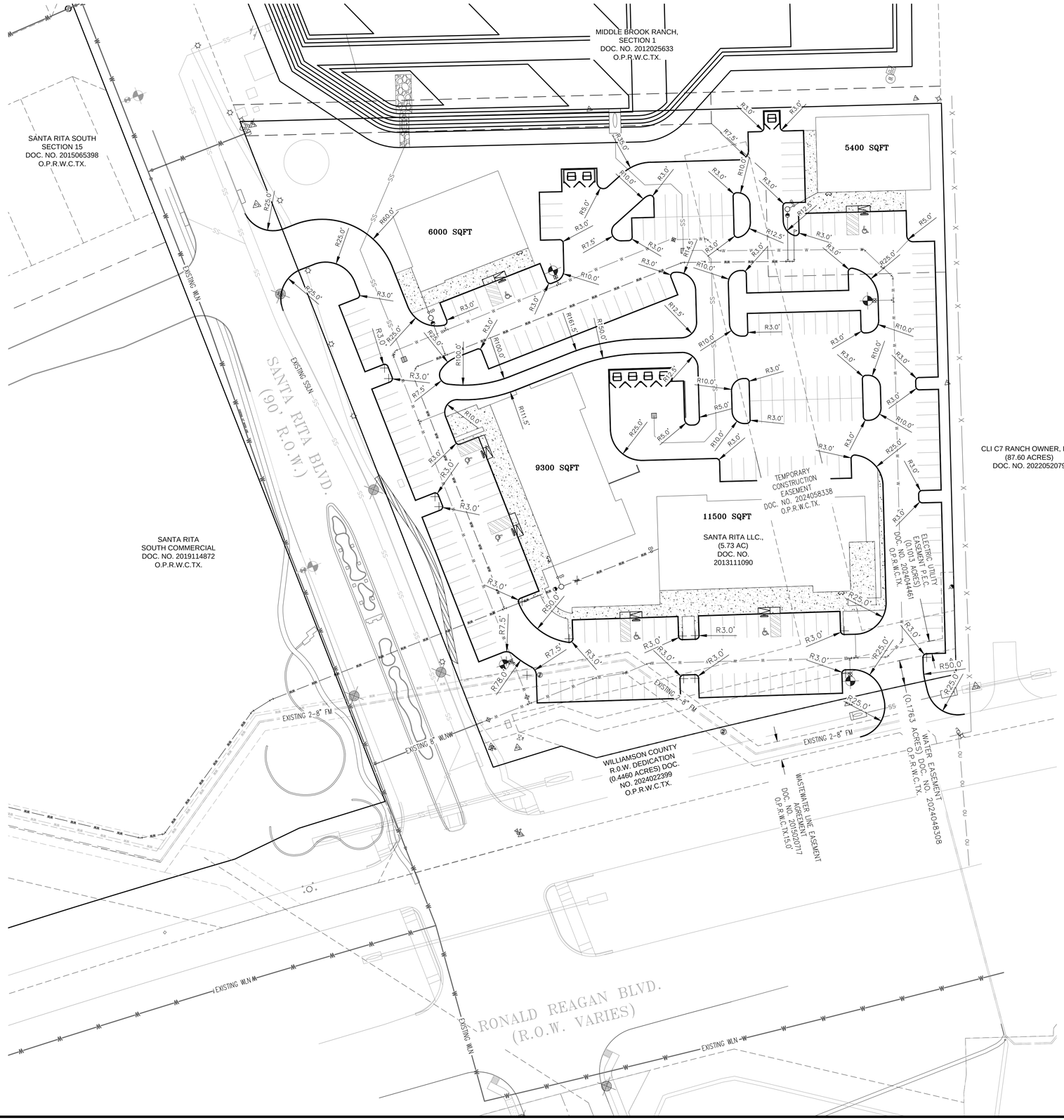

SCALE: 1" = 40'

NOTES:

1. APPROVAL OF THIS SITE PLAN DOES NOT INCLUDE BUILDING AND FIRE CODE APPROVAL NOR BUILDING PERMIT APPROVAL.
2. ALL DIMENSIONS ARE TO FACE OF CURB UNLESS OTHERWISE STATED.
3. ALL WASTE RECEPTACLES MUST BE SCREENED.
4. A KNOX BOX SHALL BE INSTALLED A THE MAIN ENTRY GATE TO THIS MAINTENANCE FACILITY FOR EMERGENCY ACCESS. ALL OTHER ENTRANCES WILL ALSO HAVE KNOX BOX ENTRY.
5. FOR DRIVEWAY CONSTRUCTION: THE OWNER IS RESPONSIBLE FOR ALL COSTS FOR RELOCATION OF, OR DAMAGE TO UTILITIES.
6. REFER TO PLANS BY OTHERS FOR DETAILED SITE AMENITY PLANS. SITE AMENITIES ARE REFLECTED GRAPHICALLY ONLY AND SHOULD NOT BE USED FOR CONSTRUCTION LAYOUT.
7. REFER TO ARCHITECTURAL PLANS FOR EXACT BUILDING DIMENSIONS AND LOCATIONS OF DOORS, STOOPS, RAMPS AND OTHER FEATURES. BUILDINGS ON THIS SHEET ARE REPRESENTED ILLUSTRATIVELY ONLY.
8. ALL SITE UTILITY LINES ARE PROPOSED TO BE LOCATED UNDERGROUND.
9. EXTERIOR LIGHTING SHALL BE SHIELDED SUCH THAT THE LIGHT SOURCE IS NOT DIRECTLY VISIBLE FROM THE PUBLIC ROW OR ADJACENT RESIDENTIAL DISTRICTS OR USES AT THE PROPERTY LINE. UNSHIELDED "WALL PACK" LIGHTING IS NOT PROPOSED.
10. AIR CONDITIONING UNITS ARE NOT PROPOSED FORWARD THE FRONT WALL OF THE BUILDING.
11. THE DEVELOPER AND SUBSEQUENT OWNERS OF THE LANDSCAPED PROPERTY, OR THE MANAGER OR AGENT OF THE OWNER, SHALL BE RESPONSIBLE FOR THE MAINTENANCE OF ALL LANDSCAPE AREAS. SAID AREAS SHALL BE MAINTAINED SO AS TO PRESENT A HEALTHY, NEAT AND ORDERLY APPEARANCE AT ALL TIMES AND SHALL BE KEPT FREE OF REFUSE AND DEBRIS. ALL PLANTED AREAS SHALL BE PROVIDED WITH AN AUTOMATIC IRRIGATION SYSTEM AND WATERED AS NECESSARY TO ENSURE CONTINUOUS HEALTHY GROWTH AND DEVELOPMENT. MAINTENANCE SHALL INCLUDE THE REPLACEMENT OF ALL DEAD PLANT MATERIAL IF THAT MATERIAL WAS USED TO MEET THE REQUIREMENTS OF THE LANDSCAPE ORDINANCE.
12. ALL DISTURBED AREAS AND ROW WILL BE RE-VEGETATED BY THE DEVELOPER
13. ALL INVASIVE SPECIES SHALL BE REMOVED FROM THE PROPERTY.
14. NO MORE THAN 50% OF THE SAME SPECIES MAY BE PLANTED TO MEET THE TREE PLANTING REQUIREMENTS

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DATE | REVISION

Carlson, Brigance & Doering, Inc.
Civil Engineering ◆ Surveying
FIRM ID #F3791
Main Office: 5501 West William Cannon Dr. Austin, Texas 78749 Phone No. (512) 280-5160
North Office: 12129 RR 620 N., Ste. 600 Austin, Texas 78750 www.cbdeng.com

SHEET NAME: SITE PLAN

JOB NAME: SANTA RITA RANCH NEIGHBORHOOD CENTER

PROJECT: SITE DEVELOPMENT PLAN

STATE OF TEXAS
STEVEN P. CATES
93648
LICENSED PROFESSIONAL ENGINEER

CARLSON, BRIGANCE & DOERING, INC.
ID# F3791

7-2-2025

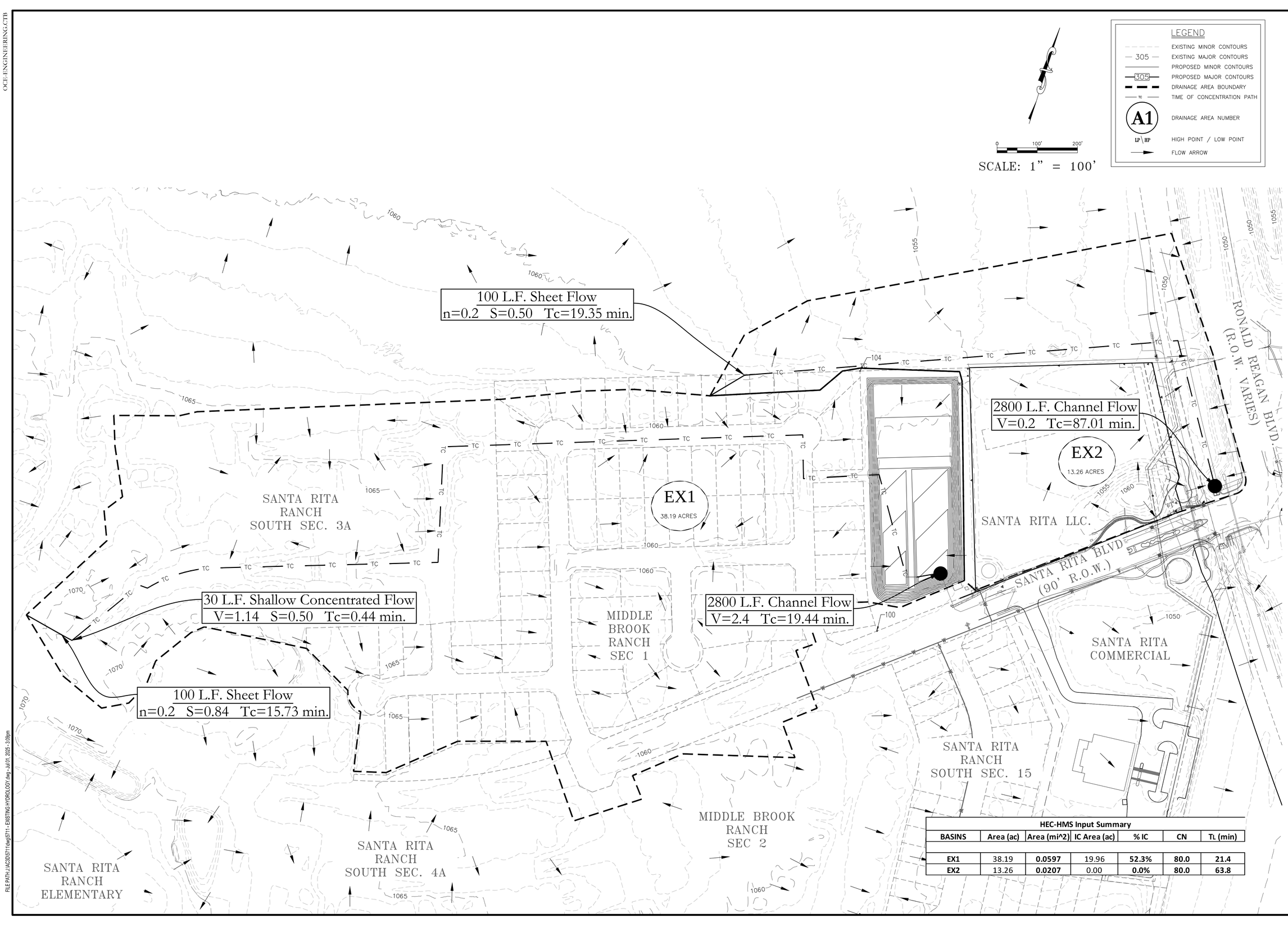
DATE: JULY 2025

JOB NUMBER: 5711

SHEET: 8 OF 27

FILE PATH: J:\ACAD\5711\dwg\5711- SITE PLAN.dwg - Jul 01, 2025 - 2:33pm

OCE-ENGINEERING.CTB



HEC-HMS Input Summary

BASINS	Area (ac)	Area (mi^2)	IC Area (ac)	% IC	CN	TL (min)
EX1	38.19	0.0597	19.96	52.3%	80.0	21.4
EX2	13.26	0.0207	0.00	0.0%	80.0	63.8

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Main Office: 5501 West William Cannon Dr. Austin, Texas 78749 Phone No. (512) 280-5160
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SHEET NAME: EXISTING HYDROLOGY MAP

JOB NAME: SANTA RITA RANCH NEIGHBORHOOD CENTER

PROJECT: SITE DEVELOPMENT PLAN

STATE OF TEXAS
STEVEN P. CATES
93648
LICENSED PROFESSIONAL ENGINEER
CARLSON, BRIGANCE & DOERING, INC.
ID# F3791
7-2-2025

DATE JULY 2025

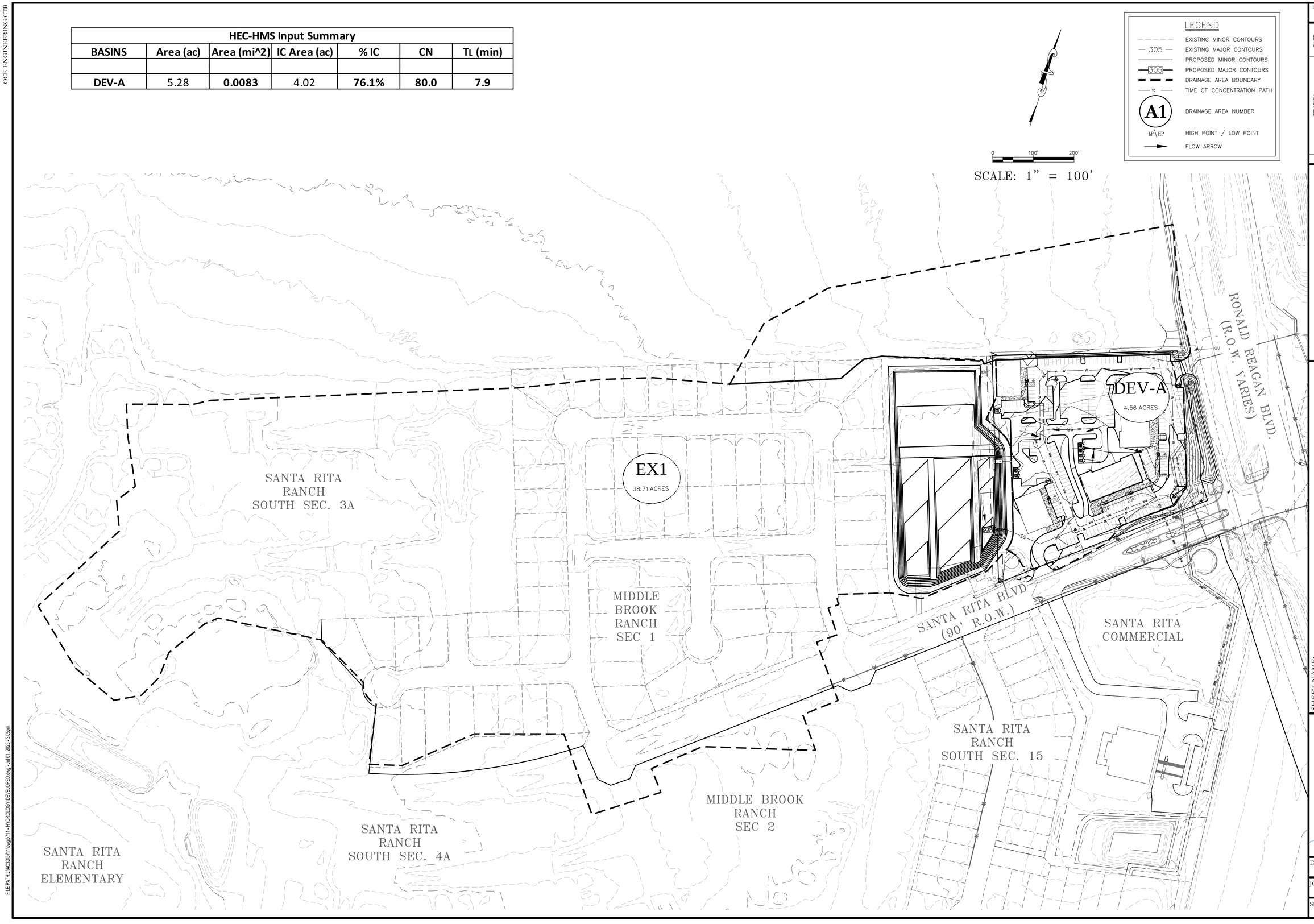
JOB NUMBER 5711

SHEET 9 OF 27

FILE PATH: J:\ACD\5711\dwg\5711 - EXISTING HYDROLOGY.dwg - Jul 01, 2025 - 3:09pm

OCE-ENGINEERING.CTB

HEC-HMS Input Summary						
BASINS	**Area (ac)**	**Area (mi^2)**	**IC Area (ac)**	**% IC**	**CN**	**TL (min)**
DEV-A	5.28	**0.0083**	4.02	**76.1%**	**80.0**	**7.9**



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REVISION

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Main Office: 5501 West William Cannon Dr. Austin, Texas 78749 Phone No. (512) 280-5160
North Office: 12129 RR 620 N., Ste. 600 Austin, Texas 78750 www.cbdeng.com

SHEET NAME: HYDROLOGY DEVELOPED MAP

JOB NAME: SANTA RITA RANCH NEIGHBORHOOD CENTER

PROJECT: SITE DEVELOPMENT PLAN

STATE OF TEXAS
STEVEN P. CATES
93648
LICENSED PROFESSIONAL ENGINEER
CARLSON, BRIGANCE & DOERING, INC.
ID# F3791
7-2-2025

DATE JULY 2025

JOB NUMBER 5711

SHEET 10 OF 27

FILE PATH: J:\ACAD\5711\dwg\5711 - HYDROLOGY DEVELOPED.dwg - Jul 01, 2025 - 3:45pm

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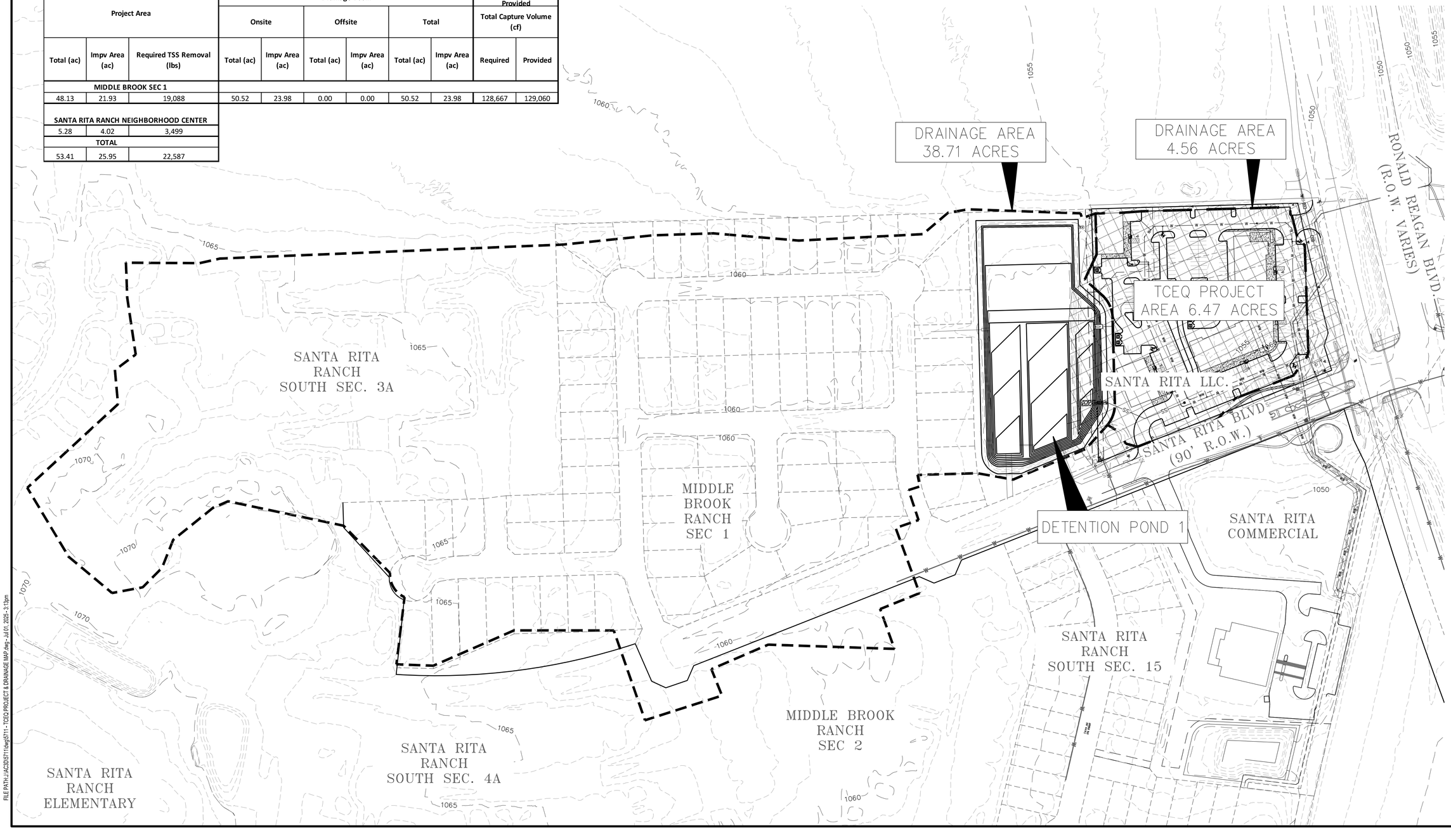
Project & Drainage Areas - Impervious Cover per Section

Sections	TCEQ Project Area Per Section							Onsite Drainage Basin to BMP Per Section					
Contributing Sections	Project Area (ac)	Required TSS Removal	# Lots	Impervious Areas (ac)				Drainage Basin (ac)	# Lots	Impervious Areas (ac)			
				Lots	ROW	Misc.	Total			Lots	ROW	Misc.	Total
SANTA RITA BLVD - DETENTION POND 1													
MIDDLE BROOK SEC 1	48.13	19088	0	0.00	0.00	19.96	19.96	45.24	0.0	0.00	0.00	19.96	19.96
SANTA RITA RANCH NEIGHBORHOOD CENTER	5.28	3499	0	0.00	0.00	4.02	4.02	5.28	0.0	0.00	0.00	4.02	4.02

BMP Treatment Requirements

Project Area			Drainage Basin						BMP Treatment Provided	
			Onsite		Offsite		Total		Total Capture Volume (cf)	
Total (ac)	Impv Area (ac)	Required TSS Removal (lbs)	Total (ac)	Impv Area (ac)	Total (ac)	Impv Area (ac)	Total (ac)	Impv Area (ac)	Required	Provided
MIDDLE BROOK SEC 1										
48.13	21.93	19,088	50.52	23.98	0.00	0.00	50.52	23.98	128,667	129,060
SANTA RITA RANCH NEIGHBORHOOD CENTER										
5.28	4.02	3,499								
TOTAL										
53.41	25.95	22,587								



0 100' 200'

SCALE: 1" = 100'

LEGEND

TCEQ PROJECT AREA BOUNDARY

DRAINAGE BOUNDARY LINE

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REVISION

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North Office: 12129 RR 620 N., Ste. 600 Austin, Texas 78750 www.cbdeng.com

SHEET NAME: TCEQ PROJECT AND DRAINAGE MAP

JOB NAME: SANTA RITA RANCH NEIGHBORHOOD CENTER

PROJECT: SITE DEVELOPMENT PLAN

STATE OF TEXAS
STEVEN P. CATES
93648
LICENSED PROFESSIONAL ENGINEER

CARLSON, BRIGANCE & DOERING, INC.
ID# F3791

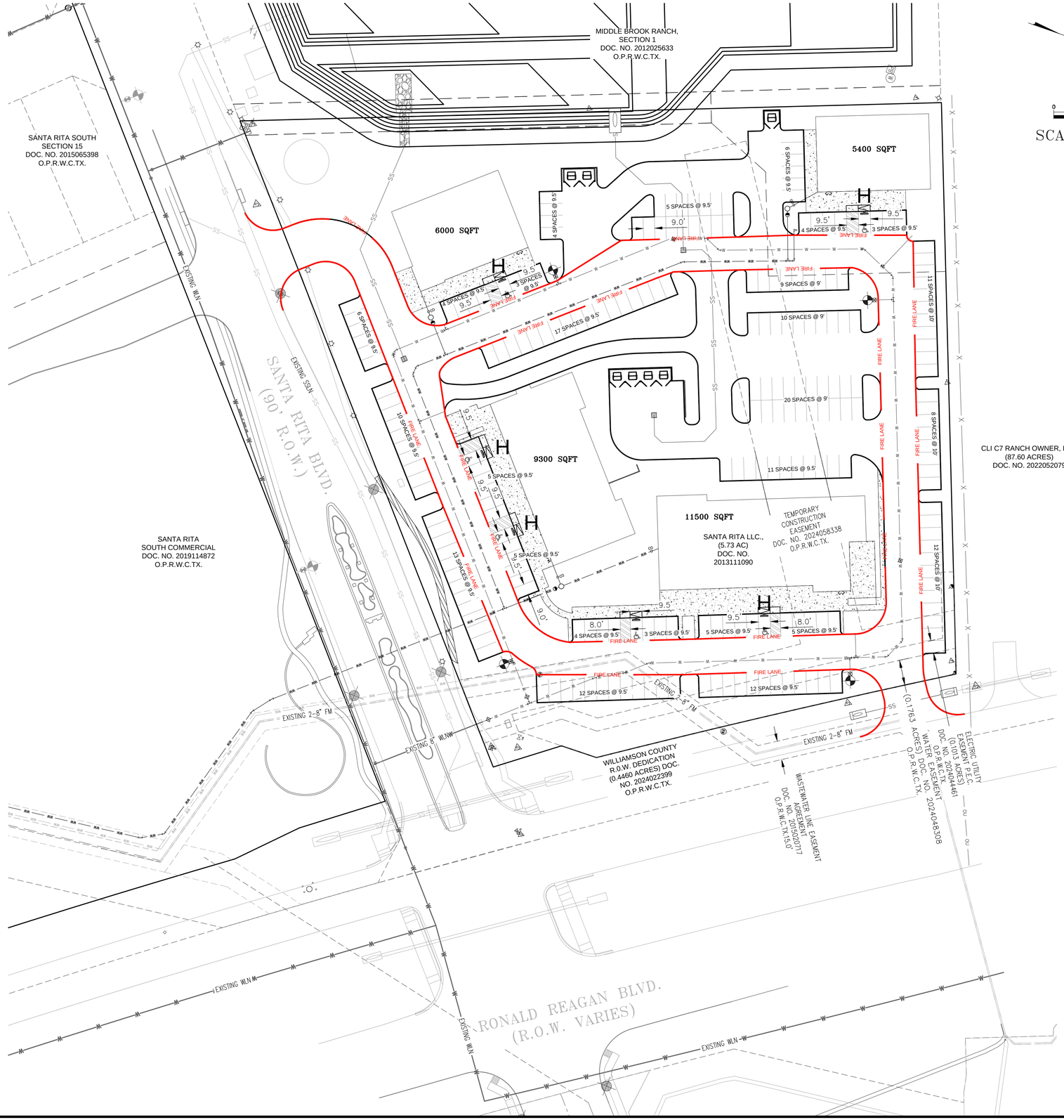
7-2-2025

DATE JULY 2025

JOB NUMBER 5711

SHEET 11 OF 27

FILE PATH: J:\ACSD\5711\dwg\5711 - TCEQ PROJECT & DRAINAGE MAP.dwg - Jul 01, 2025 - 3:13pm



SCALE: 1" = 40'

0 40' 80'

SITE PLAN LEGEND

- 4" WHITE STRIPING
- H — HANDICAPPED PARKING SIGN
- CONCRETE WALK
- FIRE LANE — FIRE LANE STRIPING

SYMBOLS MAY BE EXAGGERATED FOR CLARIFICATION PURPOSES

TRAFFIC MARKING NOTES:

1. ANY METHODS, STREET MARKINGS AND SIGNAGE NECESSARY FOR WARNING MOTORISTS, WARNING PEDESTRIANS OR DIVERTING TRAFFIC DURING CONSTRUCTION SHALL CONFORM TO THE TEXAS MANUAL OF UNIFORM TRAFFIC CONTROL DEVICES FOR STREETS AND HIGHWAYS, LATEST EDITION.
2. ALL PAVEMENT MARKINGS, MARKERS, PAINT, TRAFFIC BUTTONS, TRAFFIC CONTROLS AND SIGNS SHALL BE INSTALLED IN ACCORDANCE WITH THE TEXAS DEPARTMENT OF TRANSPORTATION STANDARD SPECIFICATIONS FOR CONSTRUCTION OF HIGHWAYS, STREETS AND BRIDGES AND, THE TEXAS MANUAL OF UNIFORM TRAFFIC CONTROL DEVICES FOR STREETS AND HIGHWAYS, LATEST EDITIONS.

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SHEET NAME: SIGNAGE AND STRIPING PLAN

JOB NAME: SANTA RITA RANCH NEIGHBORHOOD CENTER

PROJECT: SITE DEVELOPMENT PLAN

STATE OF TEXAS
STEVEN P. CATES
93648
LICENSED PROFESSIONAL ENGINEER

CARLSON, BRIGANCE & DOERING, INC.
ID# F3791

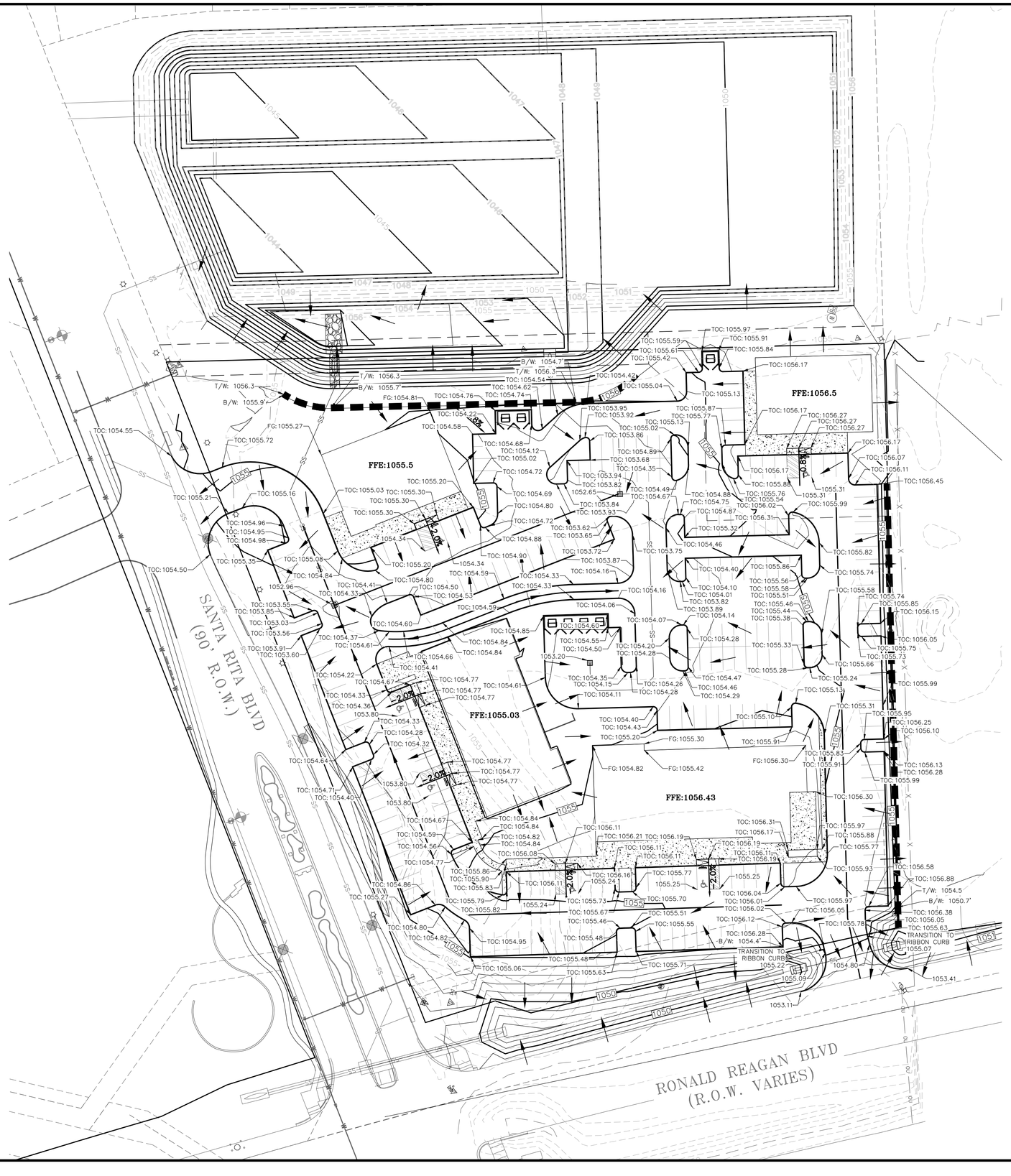
7-2-2025

DATE: JULY 2025

JOB NUMBER: 5711

SHEET: 12 OF 27

FILE PATH: J:\ACD\5711\dwg\5711 - SIGN AND STRIPING.dwg - Jul 02, 2025 - 7:17am



SCALE: 1" = 40'

LEGEND

- EXISTING MAJOR CONTOUR (936)
- EXISTING MINOR CONTOUR
- PROPOSED MAJOR CONTOUR (936)
- PROPOSED MINOR CONTOUR
- FLOW ARROW
- RETAINING WALL
- T/W TOP OF WALL
- B/W BOTTOM OF WALL
- TOC TOP OF CURB
- FFE FINISH FLOOR ELEVATION
- FG FINISH GRADE

WALLS		
	QUANTITY	UNIT
DRY STACK	1817	FF

CUT-FILLS ANALYSIS		
	QUANTITY	UNIT
CUT	8884	CY
FILL	17667	CY
NET FILL	8783	CY

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SHEET NAME: GRADING PLAN

JOB NAME: SANTA RITA RANCH NEIGHBORHOOD CENTER

PROJECT: SITE DEVELOPMENT PLAN

STATE OF TEXAS
STEVEN P. CATES
93648
LICENSED PROFESSIONAL ENGINEER
CARLSON, BRIGANCE & DOERING, INC.
ID# F3791
7-2-2025

DATE JULY 2025

JOB NUMBER 5711

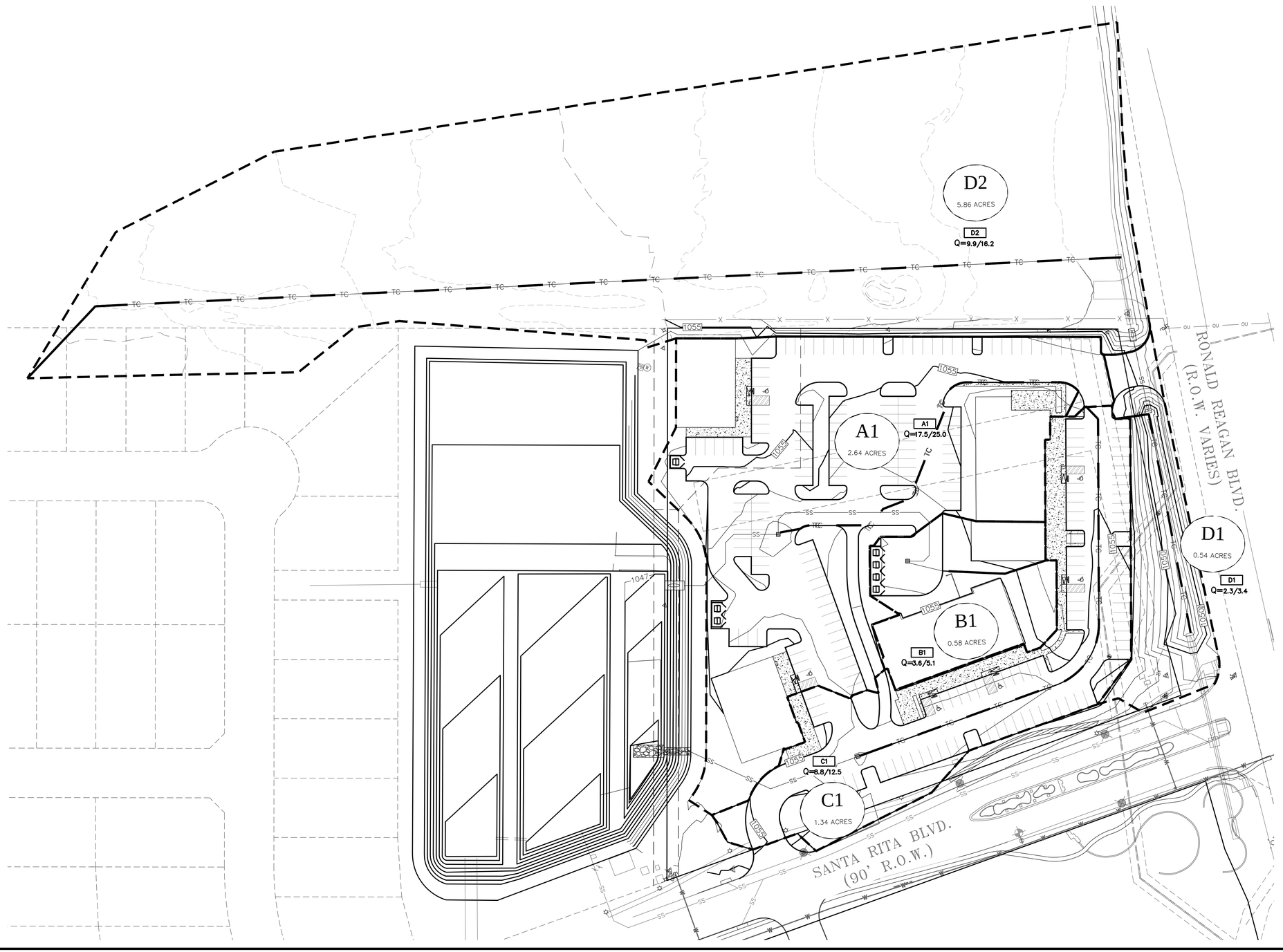
SHEET 13 OF 27

OCE-ENGINEERING.CTB

FILE PATH: J:\ACD\5711\dwg\5711 - DRAINAGE.dwg - Jul 01, 2025 - 2:45pm

LEGEND

- EXISING MINOR CONTOURS
- 305 EXISTING MAJOR CONTOURS
- PROPOSED MINOR CONTOURS
- 305 PROPOSED MAJOR CONTOURS
- DRAINAGE AREA BOUNDARY
- TC TIME OF CONCENTRATION PATH
- A1 / ##### ACRES — DRAINAGE AREA NUMBER
- LP \ HP — HIGH POINT / LOW POINT
- FLOW ARROW



0 50' 100'

SCALE: 1" = 50'

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SHEET NAME: DRAINAGE PLAN

JOB NAME: SANTA RITA RANCH NEIGHBORHOOD CENTER

PROJECT: SITE DEVELOPMENT PLAN

STATE OF TEXAS
STEVEN P. CATES
93648
LICENSED PROFESSIONAL ENGINEER

CARLSON, BRIGANCE & DOERING, INC.
ID# F3791

7-2-2025

DATE JULY 2025

JOB NUMBER 5711

SHEET 14 OF 27

Area No.	Area (Acre)	T_C (Min.)	Perv. (%)	Imperv. (%)	C 10	C 25	C 100	I_{10} In/Hr	I_{25} In/Hr	I_{100} In/Hr	Q_{10} CFS	Q_{25} CFS	Q_{100} CFS	C10*A	C25*A	C100*A	AREA NO.
A1	**2.64**	**10**	22	78	0.71	0.76	0.84	7.26	8.78	11.23	13.6	17.5	25.0	**1.87**	**2.00**	**2.22**	**A1**
B1	**0.58**	**10**	33	67	0.66	0.70	0.79	7.26	8.78	11.23	2.8	3.6	5.1	**0.38**	**0.41**	**0.46**	**B1**
C1	**1.34**	**10**	20	80	0.70	0.75	0.83	7.26	8.78	11.23	6.8	8.8	12.5	**0.94**	**1.00**	**1.11**	**C1**
D1	**0.54**	**10**	88	12	0.45	0.49	0.56	7.26	8.78	11.23	1.8	2.3	3.4	**0.24**	**0.26**	**0.30**	**D1**
D2	**5.86**	**26**	100	0	0.25	0.29	0.36	4.76	5.84	7.67	7.0	9.9	16.2	**1.47**	**1.70**	**2.11**	**D2**

AREA NO.			Junction (JC) or	ADD Tc	AREAS	T_C	C_{10}*A	C_{25}*A	C_{100}*A	I_{10}	I_{25}	I_{100}	Q_{10}	Q_{25}	Q_{100}
1st / Junc.#	2nd / Junc.#	3rd	End of Line (X)	(min)	COMBINED	(Min.)				In/Hr	In/Hr	In/Hr	CFS	CFS	CFS
B1	**A1**		**X**		**A1-B1**	**10**	**2.25**	**2.41**	**2.68**	**7.26**	**8.78**	**11.23**	**16.3**	**21.1**	**30.1**
C1			**X**			**10**	**3.19**	**3.41**	**3.80**	**7.26**	**8.78**	**11.23**	**23.1**	**29.9**	**42.6**
D2	**D1**		**X**		**D1-D2**	**26**	**1.71**	**1.96**	**2.41**	**4.76**	**5.84**	**7.67**	**8.1**	**11.5**	**18.5**

GRATE INLET CALCULATION TABLE									*Orifice*		*Weir*				*25-year Storm*		*100-year Storm*	
Inlet Name	Design Q_{25} (CFS)	Design Q_{100} (CFS)	Inlet Size (width)	Inlet Size (Length)	Clogging Factor	Grate Factor	A_g (sq. ft.)	P* (ft)	h_{25}	h_{100}	h_{25}	h_{100}	Allowable h_{25} (ft)	Allowable h_{100} (ft)	Inlet Capacity (Orifice), Qmax (CFS)	Inlet Capacity (Weir), Qmax (CFS)	Inlet Capacity (Orifice), Qmax (CFS)	Inlet Capacity (Weir), Qmax (CFS)
A1	17.5	25.0	4	4	0.5	0.746	6.0	11.9	0.298	0.608	0.62	0.79	0.5	0.65	22.68	12.66	25.86	18.77
B1	3.6	5.1	4	4	0.5	0.746	6.0	11.9	0.013	0.025	0.22	0.27	0.5	0.65	22.68	12.66	25.86	18.77
C1	8.8	12.5	3	3	0.5	0.746	3.4	9.0	0.238	0.48	0.48	0.60	0.5	0.65	12.76	9.50	14.55	14.07

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Civil Engineering ◆ Surveying
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Main Office: 5501 West William Cannon Dr. Austin, Texas 78749 Phone No. (512) 280-5160
North Office: 12129 RR 620 N., Ste. 600 Austin, Texas 78750 www.cbdeng.com

SHEET NAME: DRAINAGE CALCULATIONS

JOB NAME: SANTA RITA RANCH NEIGHBORHOOD CENTER

PROJECT: SITE DEVELOPMENT PLAN

STATE OF TEXAS
STEVEN P. CATES
93648
LICENSED PROFESSIONAL ENGINEER
CARLSON, BRIGANCE & DOERING, INC.
ID# F3791
7-2-2025

DATE: JULY 2025

JOB NUMBER: 5711

SHEET: 15 OF 27

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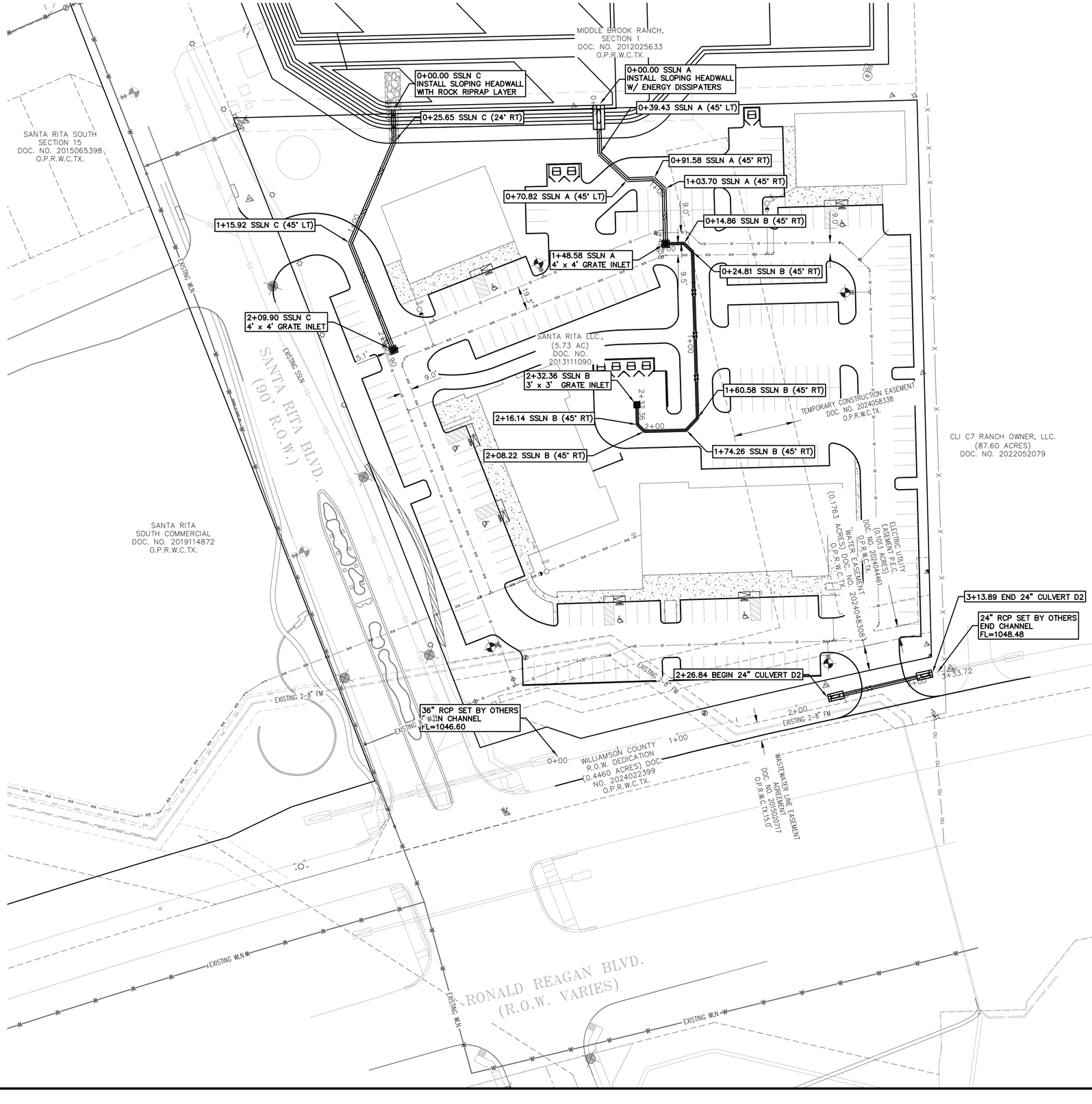
FILE PATH:J:\ACD\ST1\dwg\ST1 - DRAINAGE.dwg - Jul 01, 2025 - 2:45pm

OCE-STORM.CTB



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DATE | REVISION

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Main Office: 5501 West William Cannon Dr. Austin, Texas 78749 Phone No. (512) 280-5160
North Office: 12129 RR 620 N., Ste. 600 Austin, Texas 78750 www.cbdeng.com

SHEET NAME: OVERALL STORM

JOB NAME: SANTA RITA RANCH NEIGHBORHOOD CENTER

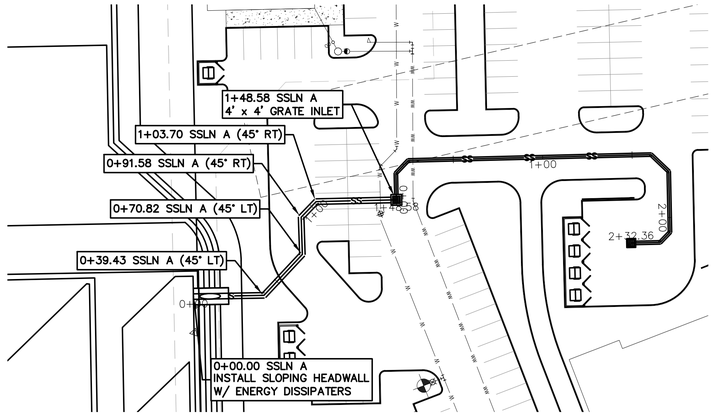
PROJECT: SITE DEVELOPMENT PLAN

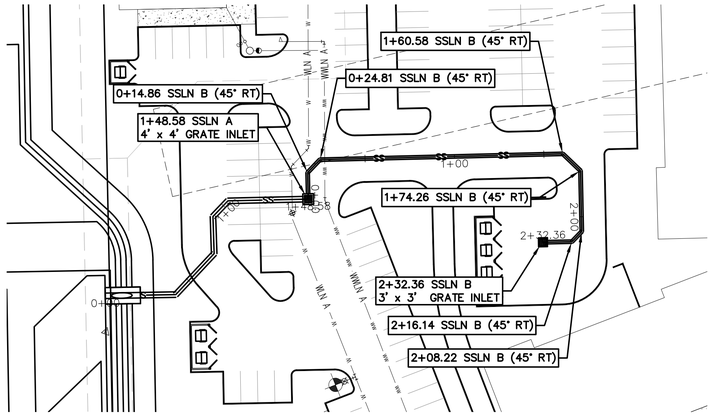
STATE OF TEXAS
STEVEN P. CATES
93648
LICENSED PROFESSIONAL ENGINEER
CARLSON, BRIGANCE & DOERING, INC.
ID# F3791
7-2-2025

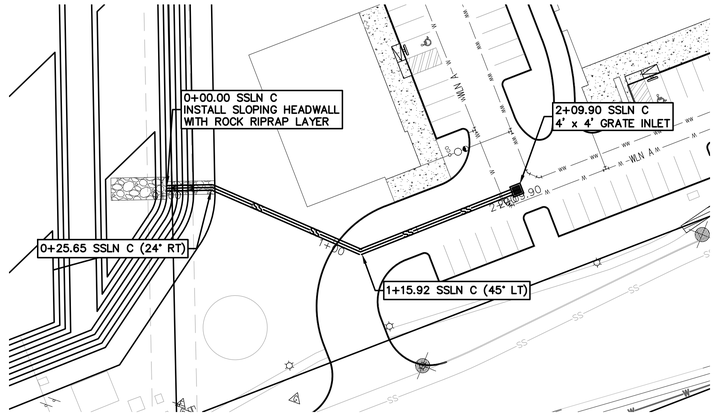
DATE: JULY 2025

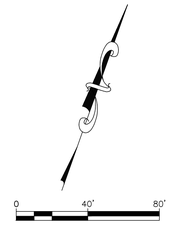
JOB NUMBER: 5711

SHEET: 16 OF 27





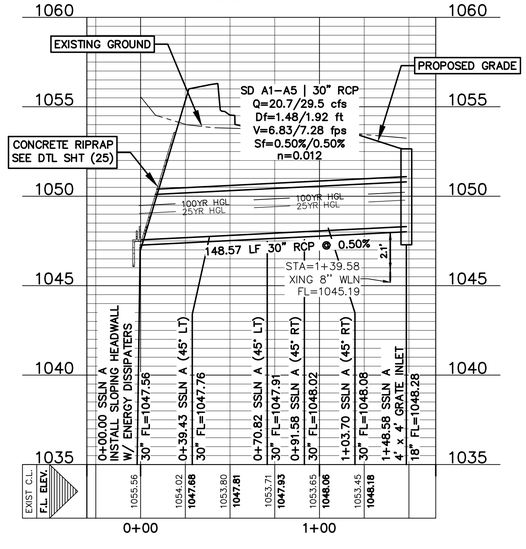




SCALE: 1" = 40'

PROFILE SCALE
HORIZ. 1" = 40'
VERT. 1" = 4'

SSLN A



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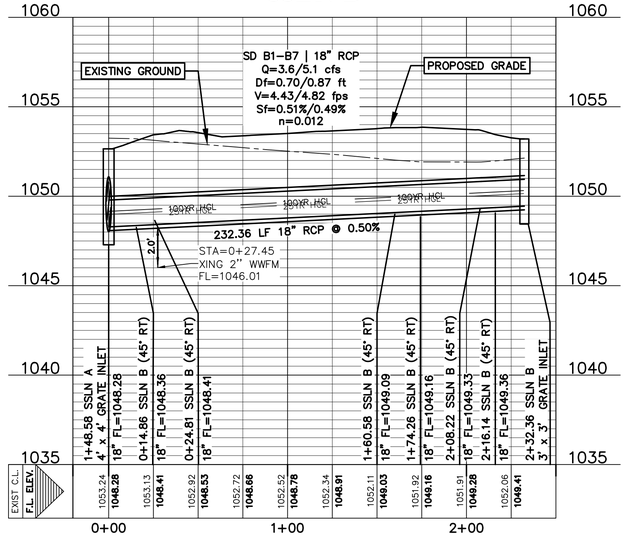

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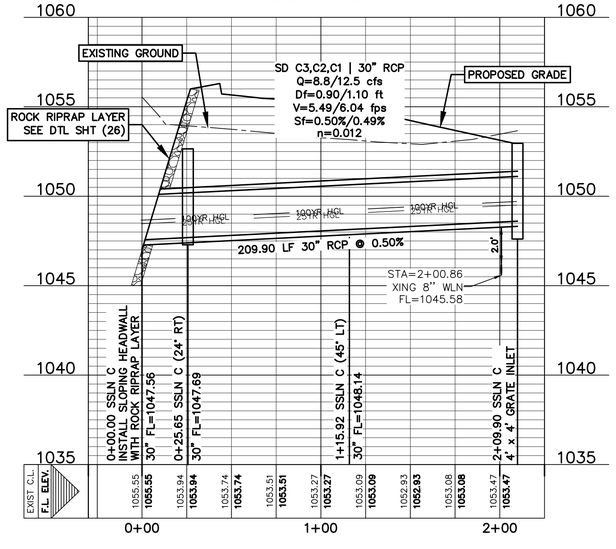

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REVISION	

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Civil Engineering ◆ Surveying
FIRM ID #F3791
Main Office
5501 West William Cannon Dr.
Austin, Texas 78749
Phone No. (512) 280-5160
North Office
12129 RR 620 N., Ste. 600
Austin, Texas 78750
www.cbdeng.com

SHEET NAME: SSLN A, B, AND C

JOB NAME: SANTA RITA RANCH NEIGHBORHOOD CENTER

PROJECT: SITE DEVELOPMENT PLAN

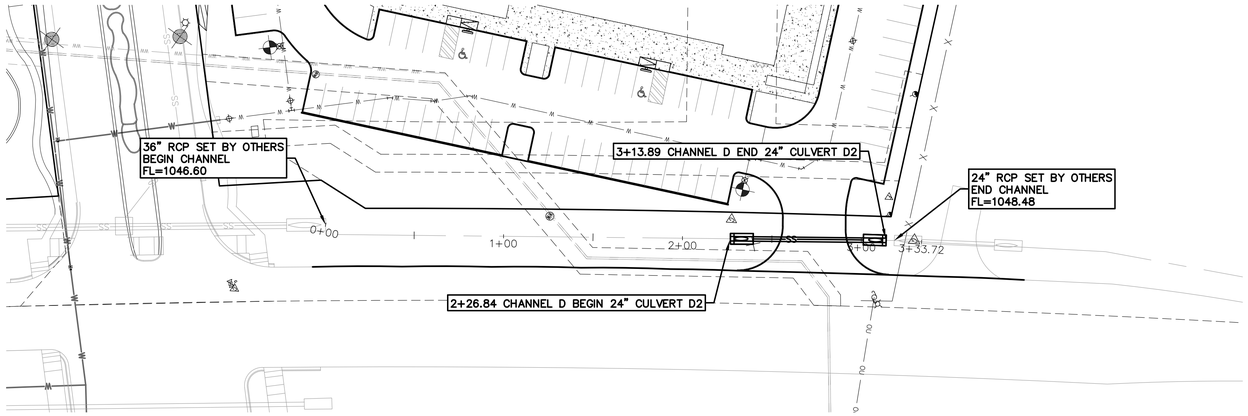
STATE OF TEXAS
STEVEN P. CATES
93648
LICENSED PROFESSIONAL ENGINEER
CARLSON, BRIGANCE & DOERING, INC.
BJF F3791
7-2-2025

DATE: JULY 2025

JOB NUMBER: 5711

SHEET: 17 OF 27

OCE-STORM.CTB



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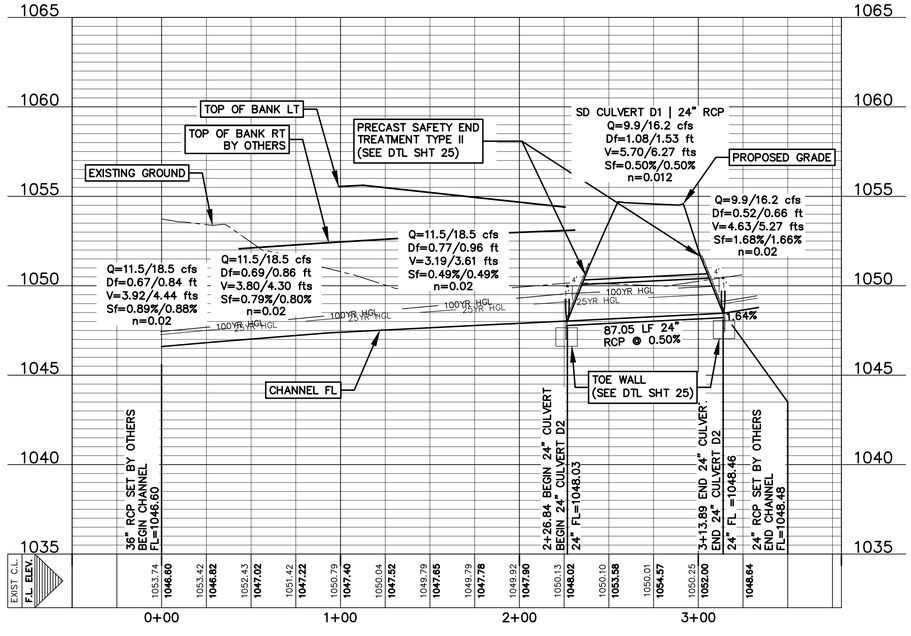
SCALE: 1" = 40'

PROFILE SCALE
HORIZ. 1" = 40'
VERT. 1" = 4'

CHANNEL D



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DATE

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Civil Engineering ◆ Surveying
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Main Office
5501 West William Cannon Dr.
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Phone No. (512) 280-5160
North Office
12129 RR 620 N., Ste. 600
Austin, Texas 78750
www.cbdeng.com

SHEET NAME: CHANNEL D

JOB NAME: SANTA RITA RANCH NEIGHBORHOOD CENTER

PROJECT: SITE DEVELOPMENT PLAN

STATE OF TEXAS
STEVEN P. CATES
93648
LICENSED
PROFESSIONAL ENGINEER

CARLSON, BRIGANCE & DOERING, INC.
ID# F3791

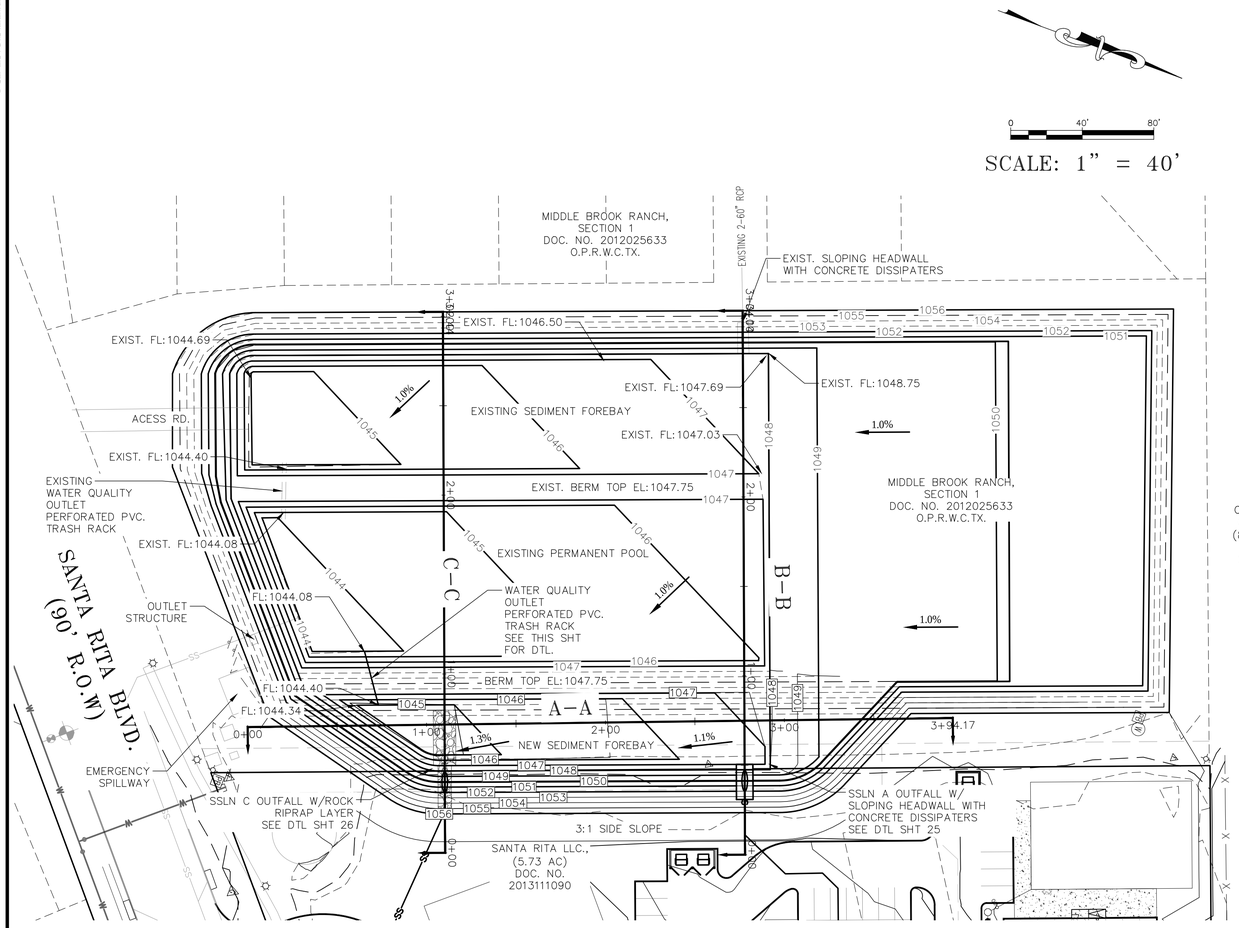
7-2-2025

DATE JULY 2025

JOB NUMBER 5711

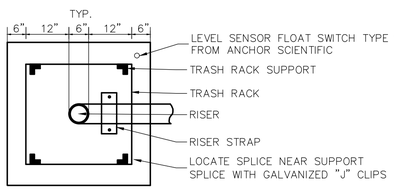
SHEET 18 OF 27

FILE PATH:J:\ACD\5711\dwg\5711-STORM.dwg - Jul 02, 2025 - 8:45am



CLI C7 RANCH OWNER, LLC. (87.60 ACRES) DOC. NO. 2022052079

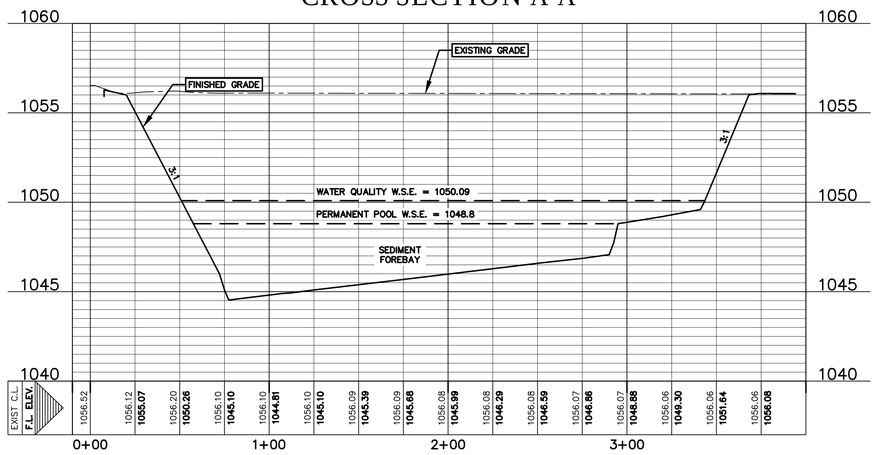
SIDE VIEW OF RISER



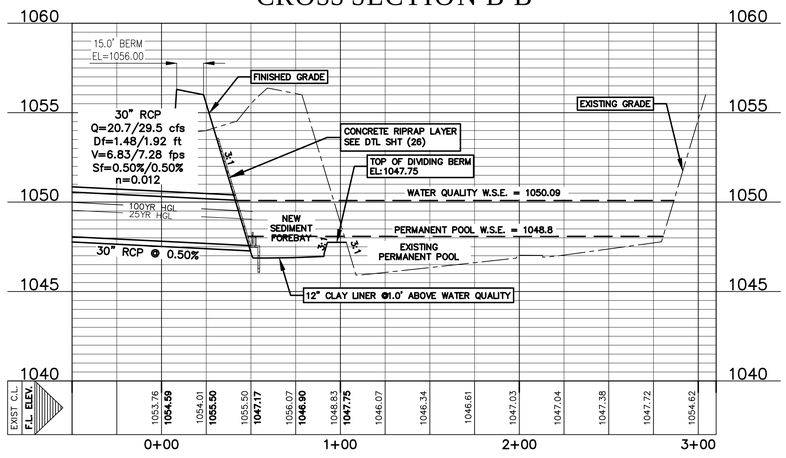
TOP VIEW OF RISER (SQUARE DESIGN)
TYPICAL RISER DESIGN FOR PONDS WITH EARTHEN BERMS

OUTFLOW RISER DETAIL
N.T.S.

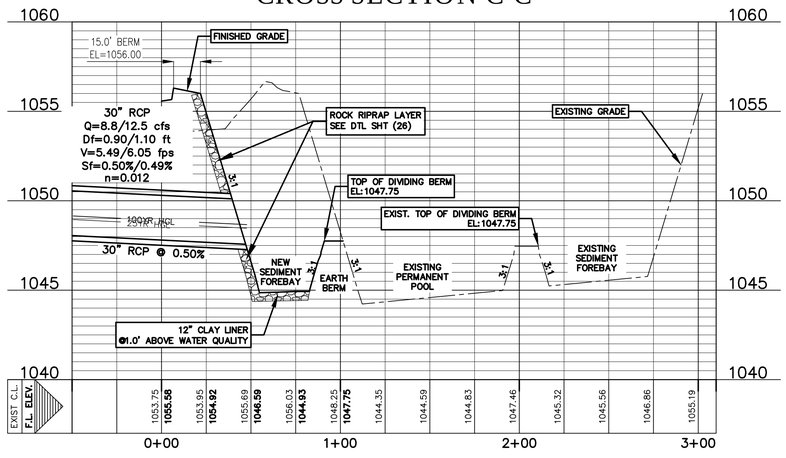
CROSS SECTION A-A



CROSS SECTION B-B



CROSS SECTION C-C



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DATE	
REVISION	

Carlson, Brigance & Doering, Inc.
Civil Engineering ◆ Surveying
FIRM ID #F3791
Main Office: 5501 West William Cannon Dr. Austin, Texas 78749 Phone No. (512) 280-5160
North Office: 12129 RR (620 N.), Ste. 600 Austin, Texas 78750 www.cbdeng.com

SHEET NAME: DETENTION POND PLAN AND PROFILES
JOB NAME: SANTA RITA RANCH NEIGHBORHOOD CENTER
PROJECT: SITE DEVELOPMENT PLAN

STATE OF TEXAS
STEVEN P. CATES
93648
LICENSED PROFESSIONAL ENGINEER
CARLSON, BRIGANCE & DOERING, INC. ID# F3791
7-2-2025

DATE JULY 2025
JOB NUMBER 5711
SHEET 19 OF 27

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Texas Commission on Environmental Quality

TSS Removal Calculations 04-20-2009

Project Name: SANTA RITA RANCH NEIGHBORHOOD CENTER
Date Prepared: June 26, 2025

1. The Required Load Reduction for the total project:

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 * =	53.41	acres
Predevelopment impervious area within the limits of the plan * =	0.00	acres
Total post-development impervious area within the limits of the plan* =	25.95	acres
Total post-development impervious cover fraction * =	0.49	
P =	32	inches
$L_{M\ TOTAL\ PROJECT}$ =	22587	lbs.
Number of drainage basins / outfalls areas leaving the plan area =	3	

2. Drainage Basin Parameters (This information should be provided for each basin):

Drainage Basin/Outfall Area No. =	1	
Total drainage basin/outfall area =	53.41	acres
Predevelopment impervious area within drainage basin/outfall area =	0.00	acres
'ost-development impervious area within drainage basin/outfall area =	25.95	acres
-development impervious fraction within drainage basin/outfall area =	0.49	
$L_{M\ THIS\ BASIN}$ =	22587	lbs.

3. Indicate the proposed BMP Code for this basin.

Proposed BMP =	Wet Basin	
Removal efficiency =	93	percent

4. Calculate Maximum TSS Load Removed (L_R) for this Drainage Basin by the selected BMP Type.

RG-348 Page 3-33 Equation 3.7: L_R = (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 =	50.52	acres
A_I =	23.98	acres
A_P =	26.54	acres
L_R =	25119	lbs

5. Calculate Fraction of Annual Runoff to Treat the drainage basin / outfall area

F = **0.90**

6. Calculate Capture Volume required by the BMP Type for this drainage basin / outfall area.

Rainfall Depth =	1.70	inches
Post Development Runoff Coefficient =	0.34	
On-site Water Quality Volume =	107223	cubic feet
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 =	21445	
Total Capture Volume (required water quality volume(s) x 1.20) =	128667	cubic feet

11. Wet Basins

Required capacity of Permanent Pool =	128667	cubic feet
Required capacity at WQV Elevation =	235890	cubic feet

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FIRM ID #F3791
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5501 West William Cannon Dr.
Austin, Texas 78749
Phone No. (512) 280-5160
North Office
12129 RR 620 N., Ste. 600
Austin, Texas 78750
www.cbdeng.com

SHEET NAME: DETENTION POND CALCULATIONS
JOB NAME: SANTA RITA RANCH NEIGHBORHOOD CENTER
PROJECT: SITE DEVELOPMENT PLAN

STATE OF TEXAS
STEVEN P. CATES
93648
LICENSED
PROFESSIONAL ENGINEER
CARLSON, BRIGANCE & DOERING, INC.
ID# F3791
7-2-2025

DATE
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5711
SHEET
20 OF 27

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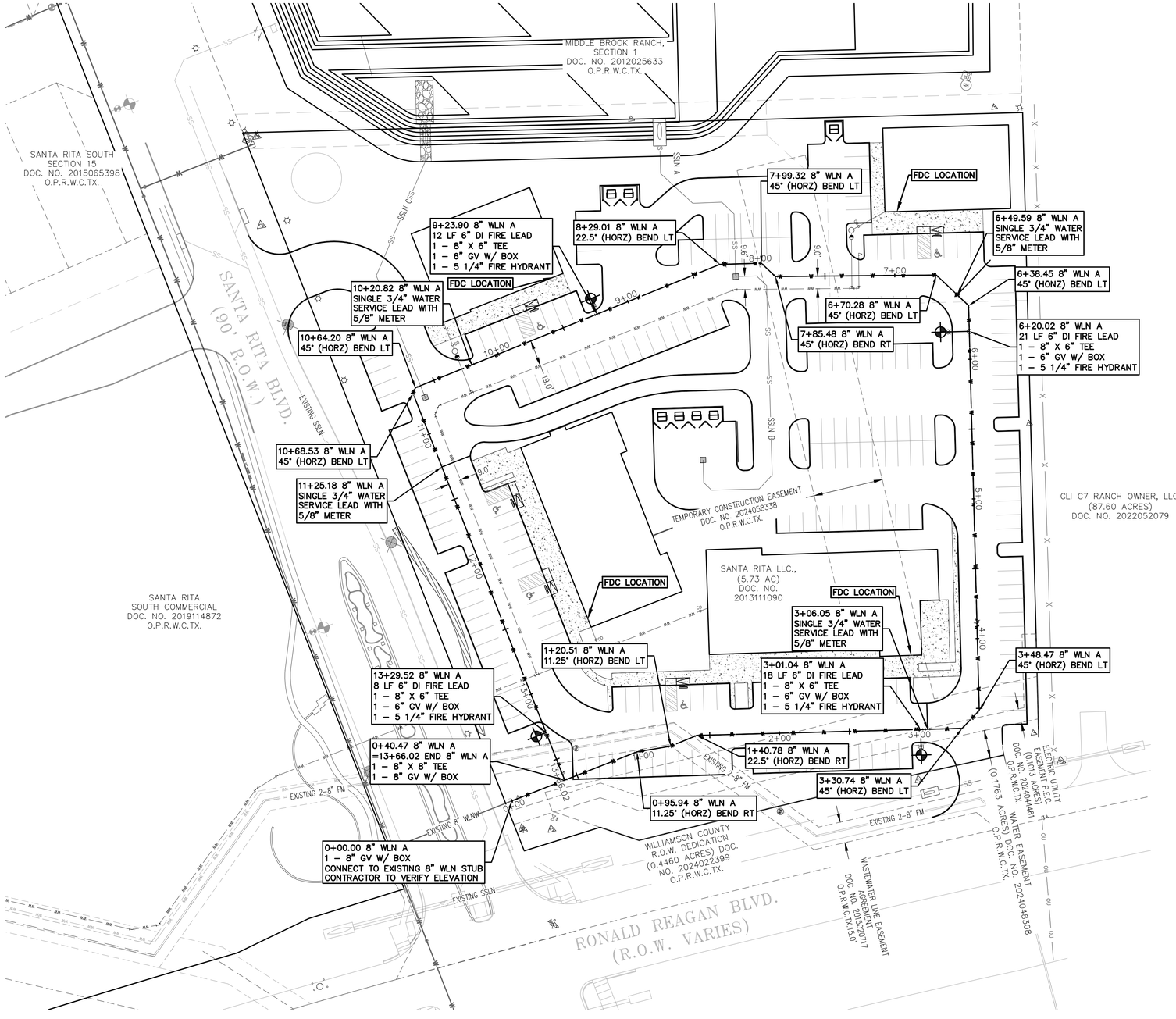

WATER LEGEND

- PROPOSED SINGLE SERVICE
- PROPOSED DOUBLE SERVICE
- EXISTING MANHOLE
- PROPOSED FIRE HYDRANT
- PROPOSED G.V. & BOX
- EXISTING FIRE HYDRANT
- EXISTING G.V. & BOX
- BLUE REFLECTOR
- EXISTING STUB
- PROPOSED AUTOMATIC AIR RELEASE VALVE

PIPE RESTRAINT CHART	
BEND ANGLE 8" PVC	
Horizontal Bends	
11.25°	3'
22.5°	6'
45°	12'
Vertical Bends	
11.25° Upper	8'
11.25° Lower	2'
22.5° Upper	16'
22.5° Lower	4'
45° Upper	32'
45° Lower	8'

Note: All joints within the above lengths from fittings must be restrained.

0 40' 80'

SCALE: 1" = 40'

NOTES:

1.) ALL ONSITE UTILITY MATERIALS AND WORK SHALL CONFORM TO THE CURRENT PLUMBING CODE.

2.) ALL WATER LINES MUST BE CONSTRUCTED IN COMPLIANCE WITH TCEQ RULE 30 TAC SEC. 290.44 RELATED TO WATER DISTRIBUTION LINES. WATER LINES SHALL HAVE A MINIMUM 9' SEPARATION FROM SEWER MAINS. WHERE 9 FEET SEPARATION CANNOT BE ACHEIVED CONTRACTOR MUS FOLLOW 290.44(e)(4)(A).

3.) PRESSURE REDUCING VALVES SHALL BE INSTALLED ON THE PROPERTY OWNERS SIDE OF THE WATER METER WHERE SERVICE PRESSURE IS 80 psi OR GREATER

4.) FIRE HYDRANTS SPACED MAX. OF 500

5.) FIRE HYDRANTS MUST BE INSTALLED WITH THE CENTER OF THE FIVE (5) INCH STEAMER OPENING AT LEAST 18 INCHES ABOVE FINISHED GRADE. THE FIVE(5) INCH OPENING MUST FACE THE STREET AND MUST BE TOTALLY UNOBSTRUCTED TO THE STREET. FIRE HYDRANT DESIGN SHELL BE 2–2.5" NST OUTLETS, 1–5" STORZ CONNECTION WITH A CAP TO INCLUDE A HEX NUT TO FIT A HYDRANT WRENCH ALONG WITH A REFLECTIVE BAND. THE FIRE HYDRANT SHALL BE PANTED SILVER IN COLOR AND DESIGNATED BY BLUE REFLECTOR IN THE CENTER OF THE ROAD.

6.) ALL WATER LINES SHALL BE CONSTRUCTED WITH AWWA C–900 DR18 UNLESS OTHERWISE SPECIFIED.

7.) WATERLINE TO BE INSTALLED WITH A MAX 1° JOINT DEFLECTION THROUGH ALL CURVES

THE LOCATION OF ALL EXISTING UNDERGROUND UTILITIES ARE SHOWN IN APPROXIMATE LOCATIONS ONLY. THE CONTRACTOR SHALL DETERMINE THE EXACT LOCATION OF ALL EXISTING UTILITIES BEFORE COMMENCING WORK. THE CONTRACTOR WILL AGREE TO BE FULLY RESPONSIBLE FOR ANY AND ALL DAMAGES WHICH MIGHT BE INCURRED BY THEIR FAILURE TO EXACTLY LOCATE AND PRESERVE ANY AND ALL UNDERGROUND UTILITIES, STRUCTURES OR FACILITIES. CONTRACTOR SHALL NOTIFY ENGINEER OF ANY DISCREPANCIES 24 – HOURS PRIOR TO COMMENCING CONSTRUCTION.

DESIGNED BY: NAME	DRAFTED BY: NAME

DATE

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FIRM ID #F3791
Main Office: 5501 West William Cannon Dr. Austin, Texas 78749 Phone No. (512) 280-5160
North Office: 12129 RR 620 N., Ste. 600 Austin, Texas 78750 www.cbdeng.com

SHEET NAME: OVERALL WATER DISTRIBUTION PLAN

JOB NAME: SANTA RITA RANCH NEIGHBORHOOD CENTER

PROJECT: SITE DEVELOPMENT PLAN

STATE OF TEXAS
STEVEN P. CATES
93648
LICENSED PROFESSIONAL ENGINEER

CARLSON, BRIGANCE & DOERING, INC.
ID# F3791

7-2-2025

DATE JULY 2025

JOB NUMBER 5711

SHEET 21 OF 27

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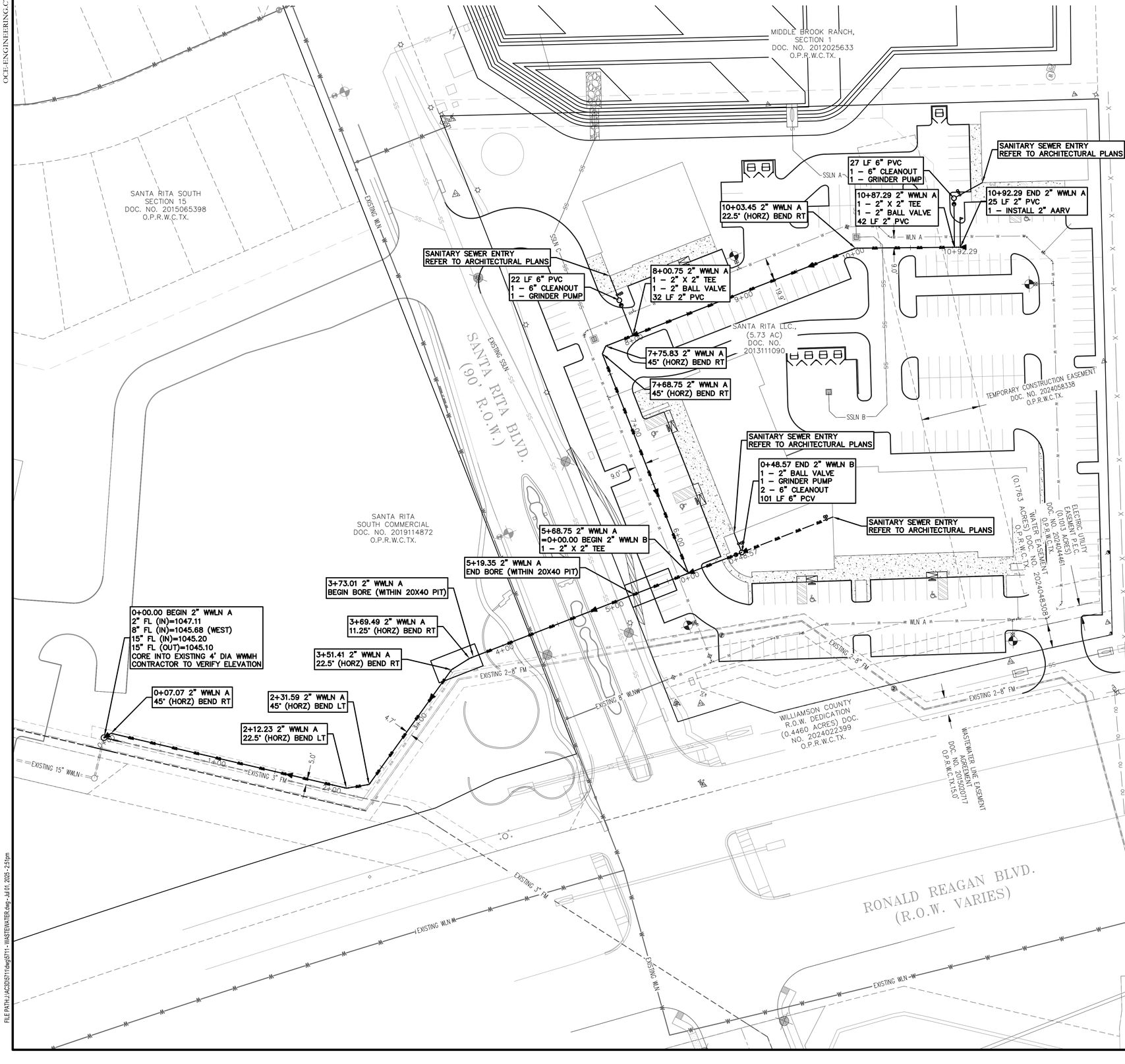


LEGEND

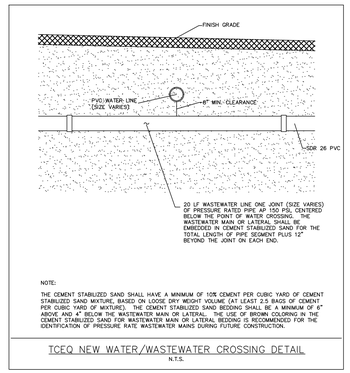
- GRINDER PUMP
- EXISTING MANHOLE
- CLEANOUT
- BALL VALVE
- FLOW DIRECTION ARROW
- 940 EXISTING MAJOR CONTOUR
- EXISTING MMINOR CONTOUR

WASTEWATER NOTES

1. ALL STREETS ARE TO BE BUILT TO SUB-GRADE PRIOR TO UTILITY INSTALLATION.
2. ALL GRAVITY WASTEWATER PIPE SHALL BE GREEN PVC (ASTM D2241 OR D3034, SDR-26), UNLESS OTHERWISE NOTED. PIPE SHALL BE GREEN IN COLOR.
3. ALL WASTEWATER FORCE MAIN SHALL BE SDR 21 PVC PIPE, GREEN IN COLOR, WITH DUCTILE IRON FITTINGS INSTALLED WITH A MINIMUM 42" OF COVER.
4. WARNING TAPE SHALL BE PLACED IN THE TRENCHES OF THE FORCE MAIN PIPE. THE WARNING TAPE MUST BEAR THE LABEL "PRESSURIZED WASTEWATER" CONTINUOUSLY REPEATED IN AT LEAST 11.5 INCH TALL LETTERS.
5. ALL FORCE MAIN BENDS, 22.5° AND GREATER REQUIRE THRUST BLOCKING PER DETAIL W11 ON SHEET 24. ALL PIPE LESS THAN 4" SHALL USE THE 4" SPECIFICATION.
6. THE CONTRACTOR SHALL CONTACT THE CITY OF LIBERTY HILL INSPECTOR @ 512-778-5449 TO COORDINATE UTILITY TIE-INS AND NOTIFY HIM AT LEAST 48 HOURS PRIOR TO CONNECTING EXISTING LINES.
7. CONTRACTOR SHALL FIELD LOCATE AND VERIFY THE HORIZONTAL AND VERTICAL LOCATION OF ANY PROPOSED CITY OF LIBERTY HILL UTILITY CONNECTION PRIOR TO CONSTRUCTION. NO CONNECTION OR MODIFICATION TO AN EXISTING CITY OF LIBERTY HILL UTILITY SHALL BE MADE WITHOUT THE PRESENCE OF A CITY OF LIBERTY HILL REPRESENTATIVE.
8. ALL MANHOLES TO HAVE 0.1' DROP ACROSS MANHOLE.
9. ALL MANHOLES ARE 48" DIA. MANHOLE, UNLESS NOTED OTHERWISE.
10. ALL MANHOLES SHALL BE CONCRETE WITH CAST IRON RING AND COVER. ALL MANHOLES LOCATED OUTSIDE OF THE PAVEMENT SHALL HAVE BOLTED COVERS AND GASKETED COVERS AND HAVE RIM ELEVATIONS 6" MIN. ABOVE FINISHED GADE. TAPPING OF FIBERGLASS MANHOLES SHALL NOT BE ALLOWED.
11. FOR ALL MANHOLES SHOWING RESIDENTIAL CONNECTIONS, NO CORING OF MANHOLE SHALL BE ALLOWED TO MAKE THESE CONNECTIONS. MANHOLES SHALL BE ORDERED AND DELIVERED WITH THE CONNECTIONS AND INVERTS SHOWN ON THE PLANS.
12. ALL MANHOLES SHALL BE LINED WITH RAVEN LINING SYSTEMS RAVEN 405 OR APPROVED EQUAL.
13. ALL WASTEWATER SERVICES MUST HAVE 2' MINIMUM SEPARATION FROM WATER LINES.
14. THE CONTRACTOR, AT CONTRACTOR'S EXPENSE, SHALL PERFORM QUALITY TESTING FOR ALL WASTEWATER PIPE INSTALLED AND PRESSURE PIPE HYDROSTATIC TESTING OF ALL LINES CONSTRUCTED AND SHALL PROVIDE ALL EQUIPMENT (INCLUDING PUMPS AND GUAGES), SUPPLIES AND LABOR NECESSARY TO PERFORM THE TESTS. QUALITY AND PRESSURE TESTING SHALL BE MONITORED BY THE CITY OF LIBERTY HILL PERSONNEL.
15. THE CONTRACTOR SHALL COORDINATE TESTING WITH THE CITY OF LIBERTY HILL INSPECTOR AND PROVIDE NO LESS THAN 24 HOURS NOTICE PRIOR TO PERFORMING STERILIZATION, QUALITY TESTING, OR PRESSURE TESTING.
16. CONTACT THE CITY OF LIBERTY HILL WATER & WASTEWATER SUPERINTENDENT @ 512-778-5449 FOR ASSISTANCE IN OBTAINING EXISTING WASTEWATER LOCATIONS.
17. SAND, AS DESCRIBED IN SPECIFICATION ITEM 510 PIPE, SHALL NOT BE USED AS BEDDING FOR WATER AND WASTEWATER LINES. ACCEPTABLE BEDDING MATERIALS ARE PIPE BEDDING STONE, PEA GRAVEL AND IN LIEU OF SAND, A NATURALLY OCCURRING OR MANUFACTURED STONE MATERIAL CONFORMING TO ATSM C33 FOR STONE QUALITY AND MEETING THE FOLLOWING GRADATION SPECIFICATION:

SIEVE SIZE BY WEIGHT	PERCENT RETAINED
1"	0
3/8"	0-2
#4	40-85
#10	95-100

18. THE CONTRACTOR IS HEREBY NOTIFIED THAT CONNECTION TO, SHUTTING DOWN, OR TERMINATING EXISTING UTILITY LINES MAY HAVE TO OCCUR AT OFF-PEAK HOURS. SUCH HOURS ARE USUALLY OUTSIDE NORMAL WORKING HOURS AND POSSIBLY BETWEEN 12AM AND 6AM.
19. ALL WASTEWATER CONSTRUCTION SHALL BE IN ACCORDANCE WITH THE TEXAS COMMISSION ON ENVIRONMENTAL QUALITY (TCEQ) REGULATIONS, 30 TAC CHAPTER 213 AND 317, AS APPLICABLE. WHENEVER TCEQ AND CITY OF LIBERTY HILL SPECIFICATIONS CONFLICT, THE MORE STRINGENT SHALL APPLY.



TCEQ NEW WATER/WASTEWATER CROSSING DETAIL
N.T.S.

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DESIGNED BY: NAME	DRAFTED BY: NAME

DATE

REVISION

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Civil Engineering ◆ Surveying
FIRM ID #F3791
Main Office: 5501 West William Cannon Dr. Austin, Texas 78749 Phone No. (512) 280-5160
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SHEET NAME: OVERALL WASTEWATER COLLECTION PLAN

JOB NAME: SANTA RITA RANCH NEIGHBORHOOD CENTER

PROJECT: SITE DEVELOPMENT PLAN

STATE OF TEXAS
STEVEN P. CATES
93648
LICENSED PROFESSIONAL ENGINEER

CARLSON, BRIGANCE & DOERING, INC.
ID# F3791

7-2-2025

DATE JULY 2025

JOB NUMBER 5711

SHEET 22 OF 27

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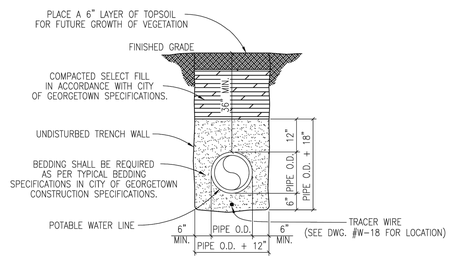
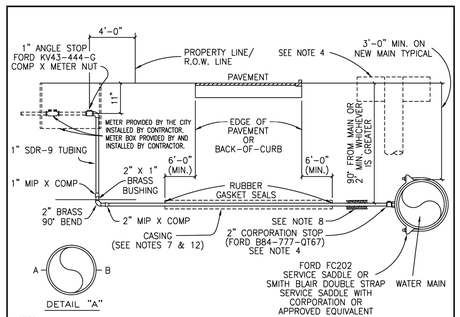


TRENCH WIDTHS

*PIPE LESS THAN 20" DIAMETER
1'-0" + PIPE O.D.
*20" DIAMETER PIPE AND LARGER
2'-0" + PIPE O.D.

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

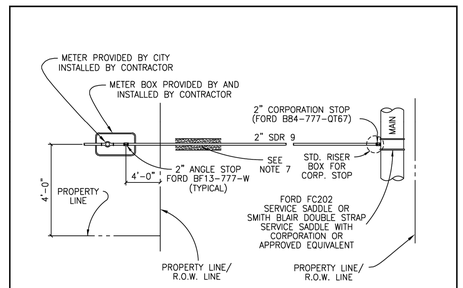
	CITY OF GEORGETOWN CONSTRUCTION STANDARDS AND DETAILS TRENCH AND EMBEDMENT DETAIL UNDER NON-PAVED AREAS	REVISION NOTE: ADOPTED 6/21/2006 DRAWING NAME: W02 SCALE: NTS DATE: 1/2003 DRAWN BY: MRS APPROVED BY: TRB



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.

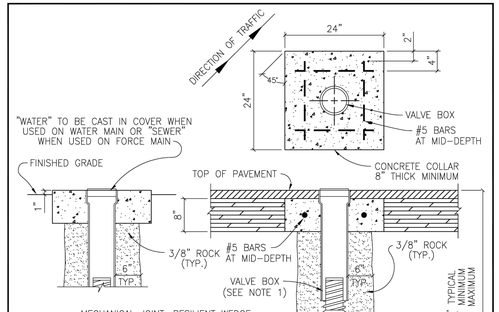
	CITY OF GEORGETOWN CONSTRUCTION STANDARDS AND DETAILS TYPICAL WATER SERVICE-ELEVATION	REVISION NOTE: ADOPTED 01/23/2013 DRAWING NAME: W03 SCALE: NTS DATE: 1/2013 DRAWN BY: – APPROVED BY: MH



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.

	CITY OF GEORGETOWN CONSTRUCTION STANDARDS AND DETAILS SINGLE WATER SERVICE PLAN	REVISION NOTE: ADOPTED 01/23/2013 DRAWING NAME: W04 SCALE: NTS DATE: 1/2013 DRAWN BY: – APPROVED BY: MH

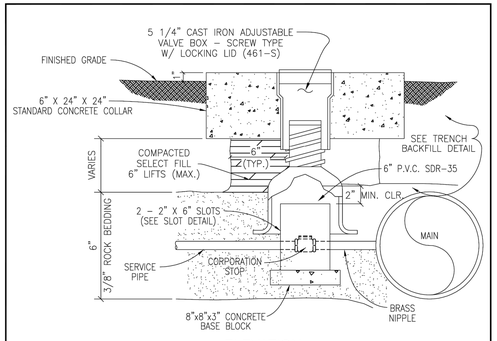


NOTES:

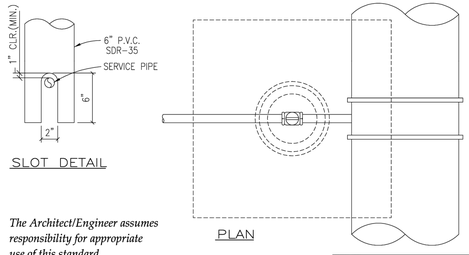
1. VALVE BOX SHALL BE 5 1/4" CAST IRON ADJUSTABLE HAVING AN ADJUSTABLE RANGE OF + OR – 6 INCHES FROM INSTALLED FINISH GRADE.
2. ACCEPTABLE GATE VALVES ARE:
   A. AMERICAN FLOW CONTROL – SERIES 2500
   B. MUELLER – 2360 SERIES
   C. CLOW

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

	CITY OF GEORGETOWN CONSTRUCTION STANDARDS AND DETAILS TYPICAL VALVE SETTING	REVISION NOTE: ADOPTED 6/21/2006 DRAWING NAME: W07 SCALE: NTS DATE: 1/2003 DRAWN BY: MRS APPROVED BY: TRB



ELEVATION

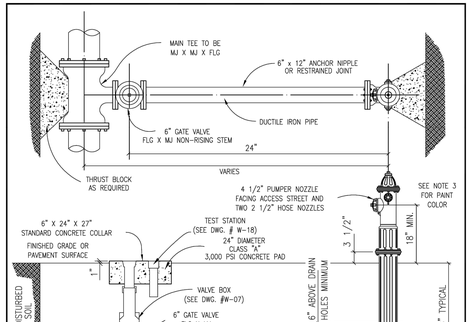


SLOT DETAIL

PLAN

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

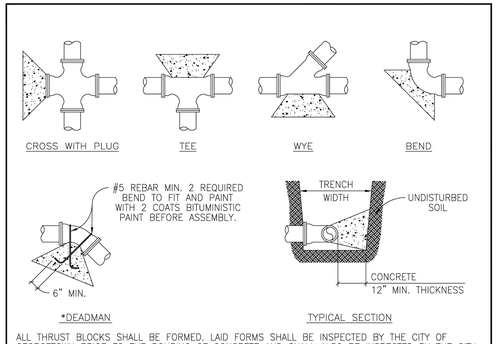
	CITY OF GEORGETOWN CONSTRUCTION STANDARDS AND DETAILS STANDARD RISER BOX FOR CORPORATION STOP	REVISION NOTE: ADOPTED 6/21/2006 DRAWING NAME: W08 SCALE: NTS DATE: 1/2003 DRAWN BY: MRS APPROVED BY: TRB



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 MIL. POLYETHELENE FILM.

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

	CITY OF GEORGETOWN CONSTRUCTION STANDARDS AND DETAILS TYPICAL FIRE HYDRANT INSTALLATION	REVISION NOTE: ADOPTED 6/21/2006 DRAWING NAME: W10 SCALE: NTS DATE: 1/2003 DRAWN BY: MRS APPROVED BY: TRB



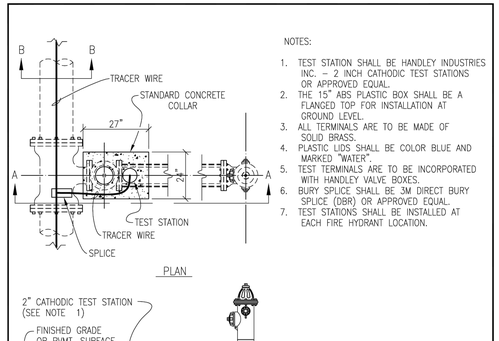
ALL THRUST BLOCKS SHALL BE FORMED. LAID FORMS SHALL BE INSPECTED BY THE CITY OF GEORGETOWN PRIOR TO THE POURING OF CONCRETE AND SHALL ALSO BE INSPECTED BY THE CITY OF GEORGETOWN PRIOR TO COVERING. TYPICAL LOCATIONS WHICH REQUIRE CONCRETE REACTION (THRUST) BLOCKS, FOR PRESSURE MAINS FOUR INCHES (4") AND 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.	
6"	4.0 SQ. FT.	20"	37.0 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.
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.

	CITY OF GEORGETOWN CONSTRUCTION STANDARDS AND DETAILS TYPICAL THRUST BLOCKS FOR WATER AND FORCE MAIN	REVISION NOTE: ADOPTED 6/21/2006 DRAWING NAME: W11 SCALE: NTS DATE: 1/2003 DRAWN BY: MRS APPROVED BY: TRB



NOTES:
1. TEST STATION SHALL BE HANDLEY INDUSTRIES INC. – 2 INCH CATHODIC TEST STATIONS OR APPROVED EQUAL.
2. THE 15" ABS PLASTIC BOX SHALL BE A FLANGED TOP FOR INSTALLATION AT GROUND LEVEL.
3. ALL TERMINALS ARE TO BE MADE OF SOLID BRASS.
4. PLASTIC LIDS SHALL BE COLOR BLUE AND MARKED "WATER".
5. TEST TERMINALS ARE TO BE INCORPORATED WITH HANDLEY VALVE BOXES.
6. BURY SPLICE SHALL BE 3M DIRECT BURY SPLICE (DBR) OR APPROVED EQUAL.
7. TEST STATIONS SHALL BE INSTALLED AT EACH FIRE HYDRANT LOCATION.

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

	CITY OF GEORGETOWN CONSTRUCTION STANDARDS AND DETAILS TRACER WIRE INSTALLATION AND TEST STATION LOCATION	REVISION NOTE: ADOPTED 6/21/2006 DRAWING NAME: W18 SCALE: NTS DATE: 1/2003 DRAWN BY: MRS APPROVED BY: TRB

DESIGNED BY: NAME | DRAFTED BY: NAME

DATE

REVISION

Carlson, Brigance & Doering, Inc.
Civil Engineering ◆ Surveying
Main Office: 5501 West William Cannon Dr. Austin, Texas 78749
North Office: 12129 RR (620 N.) Ste. 600 Austin, Texas 78750
Phone No. (512) 280-5160
www.cbdeng.com
FIRM ID #F3791

SHEET NAME: WATER DETAILS

JOB NAME: SANTA RITA RANCH NEIGHBORHOOD CENTER

PROJECT: SITE DEVELOPMENT PLAN

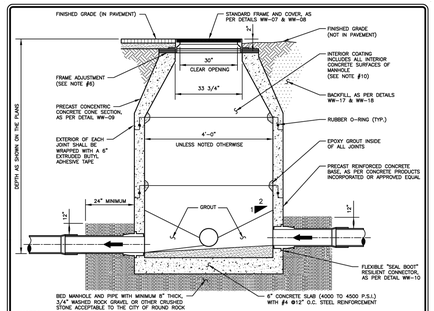
STATE OF TEXAS
STEVEN P. CATES
93648
LICENSED PROFESSIONAL ENGINEER
CARLSON, BRIGANCE & DOERING, INC.
ID# F3791
7-2-2025

DATE: JULY 2025

JOB NUMBER: 5711

SHEET: 22 OF 27

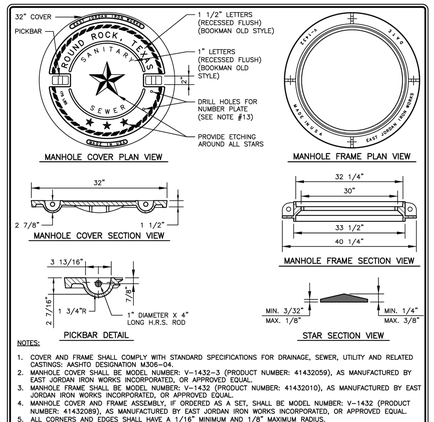
FILE PATH: J:\ACDS\5711\dwg\5711 - WATER DETAILS.dwg - Jul 01, 2025 - 2:51pm



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 DONSHIELD WILL BE ACCEPTED PROVIDING THE MANUFACTURER STENCILS "DONSHIELD" ON THE INSIDE AND OUTSIDE OF ALL MANHOLE SECTIONS.)

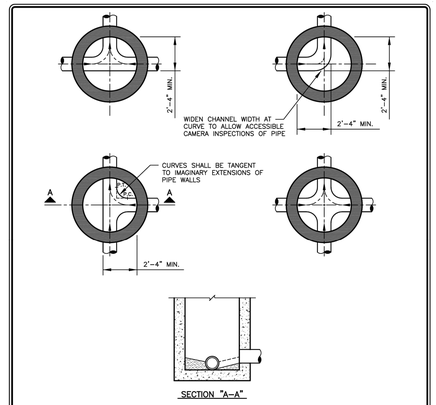
RECORD SIGNED COPY ON FILE AT U&ES DEPARTMENT	CITY OF ROUND ROCK	DRAWING NO: WW-01
APPROVED 03-01-18 DATE	PRECAST CONCRETE WASTEWATER MANHOLE DETAIL	ROUND ROCK TEXAS
THE ARCHITECT/ENGINEER ASSUMES RESPONSIBILITY FOR THE APPROPRIATE USE OF THIS DETAIL. (NOT TO SCALE)		



NOTES:

1. 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-1432-3 (PRODUCT NUMBER: 41432059), AS MANUFACTURED BY EAST JORDAN IRON WORKS INCORPORATED, OR APPROVED EQUAL.
3. MANHOLE FRAME SHALL BE MODEL NUMBER: V-1432 (PRODUCT NUMBER: 41432010), 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-1432 (PRODUCT NUMBER: 41432089), 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. 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.

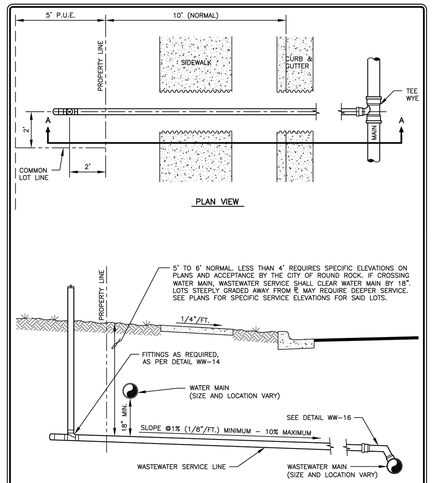
RECORD SIGNED COPY ON FILE AT U&ES DEPARTMENT	CITY OF ROUND ROCK	DRAWING NO: WW-08
APPROVED 03-01-18 DATE	NON-BOLTED WASTEWATER MANHOLE COVER AND FRAME DETAIL	ROUND ROCK TEXAS
THE ARCHITECT/ENGINEER ASSUMES RESPONSIBILITY FOR THE APPROPRIATE USE OF THIS DETAIL. (NOT TO SCALE)		



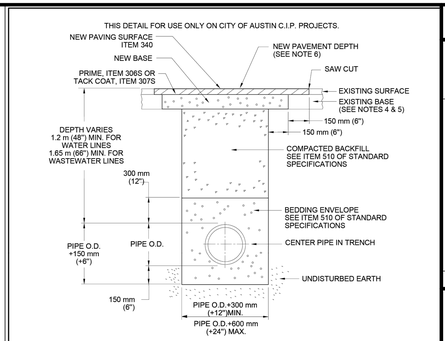
NOTES:

1. 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)		



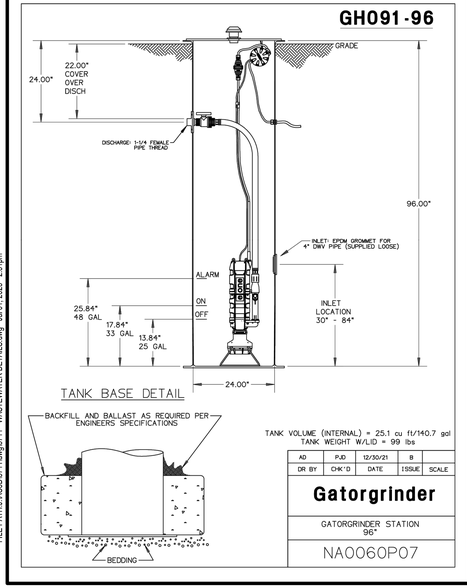
RECORD SIGNED COPY ON FILE AT U&ES DEPARTMENT	CITY OF ROUND ROCK	DRAWING NO: WW-12
APPROVED 03-01-18 DATE	WASTEWATER SERVICE DETAIL	ROUND ROCK TEXAS
THE ARCHITECT/ENGINEER ASSUMES RESPONSIBILITY FOR THE APPROPRIATE USE OF THIS DETAIL. (NOT TO SCALE)		



NOTES:

1. THE EXISTING PAVING SURFACE SHALL BE SAW CUT IN A STRAIGHT LINE A MINIMUM OF 300 mm (12") WIDER THAN THE UNDISTURBED SIDES OF THE TRENCH, SYMETRICAL ABOUT THE CENTER LINE OF THE EXCAVATION.
2. ANY CONCRETE PAVING SHALL BE SAW CUT 150 mm (6") WIDER THAN UNDISTURBED SIDES OF EXCAVATION.
3. IF EXCAVATION AREA IS OPEN FOR TEMPORARY PUBLIC USE, THE SURFACE SHALL BE MAINTAINED LEVEL WITH ADJACENT RIDING SURFACE WITH COLD MIX OR TEMPORARY HOT MIX ASPHALTIC CONCRETE.
4. ROAD BASE AND SURFACE MATERIALS IN THE TRENCH CUT SHALL BE REPLACED IN KIND OF EQUAL THICKNESS, OR MINIMUM BASE THICKNESS OF 250 mm (10"), WHICHEVER IS GREATER.
5. ALL DAMAGED AREAS OF PAVEMENT OUTSIDE THE TRENCH CUT SHALL BE REMOVED AND REPLACED WITH MINIMUM OF 200 mm (8") OF BASE OR MATCH EXISTING THICKNESS, WHICHEVER IS GREATER.
6. SURFACE PAVEMENT SHALL BE OF THE KIND AND THICKNESS AS EXISTING, OR MINIMUM 50 mm (2"), WHICHEVER IS GREATER.

CITY OF AUSTIN WATER AND WASTEWATER UTILITY	TYPICAL TRENCH WITH PAVED SURFACE
RECORD COPY SIGNED BY LEON BARBA 8/19/02 ADOPTED	THE ENGINEER/ARCHITECT ASSUMES RESPONSIBILITY FOR APPROPRIATE USE OF THIS STANDARD. MODIFICATIONS TO THIS STANDARD ARE PROHIBITED. STANDARD NO. 510S-3 1 OF 1



TANK VOLUME (INTERNAL) = 25.1 cu ft/140.7 gal
TANK WEIGHT W/LID = 99 lbs

AD	PJD	12/30/21	B	
DR BY	CHK'D	DATE	ISSUE	SCALE

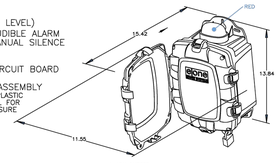
Gatorgrinder

GATORGRINDER STATION 96"

NA0060P07

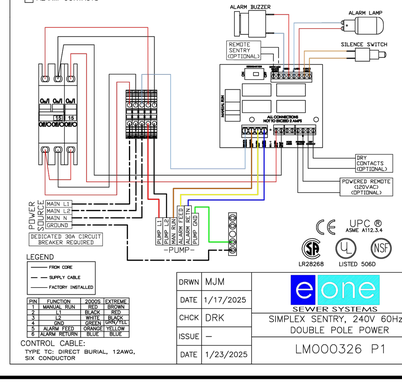
SIMPLEX SENTRY

REDUNDANT RUN (HIGH LEVEL)
EXTERNAL VISUAL & AUDIBLE ALARM
EXTERNAL LATCHING MANUAL SILENCE
MANUAL RUN
PUMP RUN INDICATOR
CONFORMAL COATED CIRCUIT BOARD
PADLOCK
NEMA 4X ENCLOSURE ASSEMBLY
CORROSION PROOF THERMOPLASTIC POLYESTER APPROVED BY UL FOR ELECTRICAL CONTROL ENCLOSURE



OPTIONS:

☐ ALARM CONTACTS



LEGEND

	FROM CDM
	SUPPLY CABLE
	FACTORY INSTALLED

PIN	FUNCTION	AWG	COLOR
1	MANUAL RUN	#22	BROWN
2	L1	BLACK	RED
3	L2	WHITE	ORANGE
4	GND	BARE	GRN/YEL
5	ALARM FEED	ORANGE	YELLOW
6	ALARM RETURN	BLUE	BLUE

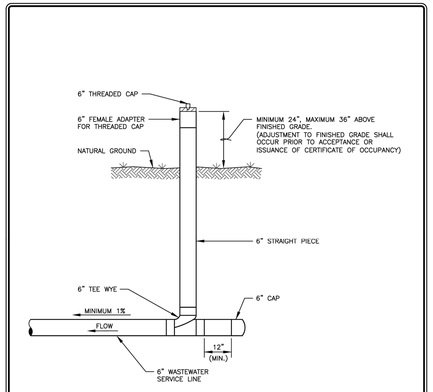
CONTROL CABLE:
TYPE TC, DIRECT BURIAL, 12AWG, SIX CONDUCTOR

DRWN	MJM
DATE	1/17/2025
CHCK	DRK
ISSUE	–
DATE	1/23/2025

eone SEWER SYSTEMS

SIMPLEX SENTRY, 240V 60Hz. DOUBLE POLE POWER

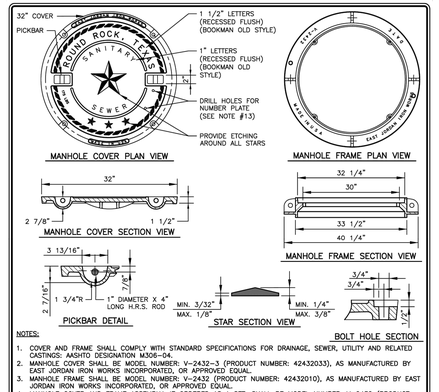
LM000326 P1



NOTES:

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

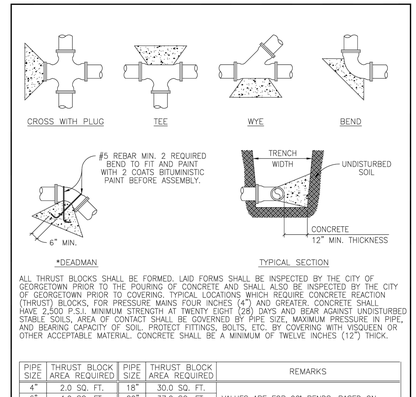
RECORD SIGNED COPY ON FILE AT U&ES DEPARTMENT	CITY OF ROUND ROCK	DRAWING NO: WW-14
APPROVED 03-01-18 DATE	WASTEWATER SERVICE CLEAN-OUT DETAIL (NON-PAVED SURFACE)	ROUND ROCK TEXAS
THE ARCHITECT/ENGINEER ASSUMES RESPONSIBILITY FOR THE APPROPRIATE USE OF THIS DETAIL. (NOT TO SCALE)		



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)		



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.	
6"	4.0 SQ. FT.	20"	37.0 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.
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.

CITY OF GEORGETOWN CONSTRUCTION STANDARDS AND DETAILS	REVISION NOTE: ADOPTED 6/21/2006
TYPICAL THRUST BLOCKS FOR WATER AND FORCE MAIN	SHEET NAME: W11
	SCALE: NTS DATE: 1/1/2003
	DRAWN BY: MPS APPROVED BY: TRD

DESIGNED BY: NAME | DRAFTED BY: NAME

DATE	REVISION

Carlson, Brigance & Doering, Inc.
Civil Engineering ◆ Surveying
FIRM ID #F3791
Main Office: 5501 West William Cannon Dr. Austin, Texas 78749
North Office: 12129 RR (620 N.), Ste. 600 Austin, Texas 78750
Phone No.: (512) 280-5160
www.cbdengr.com

SHEET NAME: WASTEWATER DETAILS

JOB NAME: SANTA RITA RANCH NEIGHBORHOOD CENTER

PROJECT: SITE DEVELOPMENT PLAN

STATE OF TEXAS
STEVEN P. CATES
93648
LICENSED PROFESSIONAL ENGINEER

CARLSON, BRIGANCE & DOERING, INC.
ID# F3791

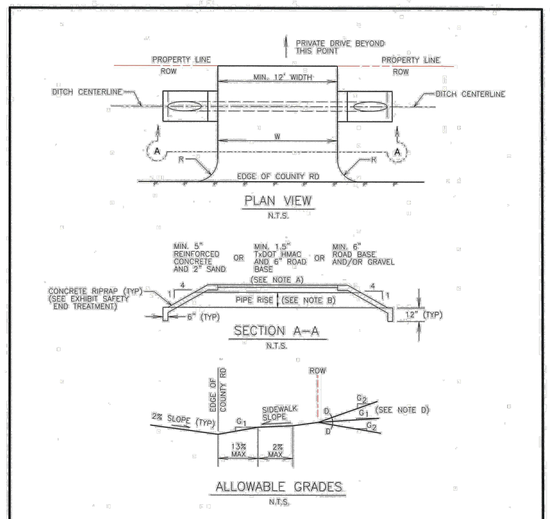
7-2-2025

DATE: JULY 2025

JOB NUMBER: 5711

SHEET 24 OF 27

FILE PATH:J:\ACDS\5711\dwg\5711- WASTEWATER DETAILS.dwg - Jul 01, 2025 - 2:51pm



NOTES:
A) MATERIAL DEPTHS SHOWN ABOVE ARE RECOMMENDED.

B) INSTALL CULVERT PIPE TO MATCH DITCH CENTERLINE AND FLOWLINE.

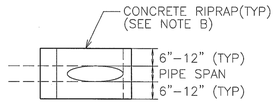
C) ENGINEERED DRAWINGS MUST BE SUBMITTED FOR MULTIFAMILY OR COMMERCIAL/INDUSTRIAL DRIVEWAYS.

D) WHILE THE PROPERTY OWNER REMAINS RESPONSIBLE FOR GRADE BREAKS WITHIN PRIVATE PROPERTY, THE FIRE DEPARTMENT SHOULD BE CONSULTED WHERE THE DRIVEWAY IS ESSENTIAL TO EMERGENCY VEHICLE ACCESS. "D" IS THE ALGEBRAIC DIFFERENCE OF "G2" AND "G1" AND SHOULD NOT EXCEED THE MAXIMUM PERCENT STATED IN THE TABLES FOR DRIVEWAY CRITERIA.

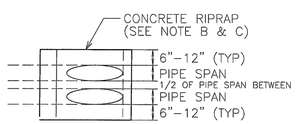
WILLIAMSON COUNTY DEPT. OF INFRASTRUCTURE

EXHIBIT
DRIVEWAY WITH CULVERT PIPE

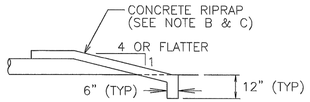
Revised: 11/22/21



PLAN VIEW – SINGLE PIPE
N.T.S.



PLAN VIEW – MULTIPLE PIPES
N.T.S.



ELEVATION VIEW
N.T.S.

NOTES:
A) PIPE SIZE TO BE DETERMINED OR AS APPROVED BY WILLIAMSON COUNTY.

B) CONCRETE RIPRAP SHALL BE NORMAL 4" THICK REINFORCED WITH MIN. 6x6x1.4x1.4 WELDED WIRE MESH IN ACCORDANCE WITH CURRENT TxDOT SAFETY END TREATMENT STANDARDS.

C) SPECIAL CONDITIONS MAY APPLY TO ARCH PIPES LARGER THAN DES. 4 OR ROUND PIPES LARGER THAN 30" IN DIAMETER IN ACCORDANCE WITH CURRENT TxDOT SAFETY END TREATMENT STANDARDS.

D) ENGINEERED DRAWINGS MUST BE SUBMITTED FOR MULTIFAMILY OR COMMERCIAL/INDUSTRIAL DRIVEWAYS.

WILLIAMSON COUNTY DEPT. OF INFRASTRUCTURE

EXHIBIT
SAFETY END TREATMENT FOR DRIVEWAY CULVERT

Revised: 11/22/21

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:

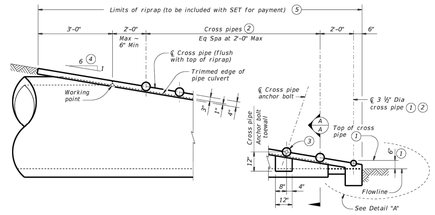
CROSS PIPE LENGTHS AND REQUIRED PIPE SIZES (2)

Corrugated Metal Pipe (CMP) Culverts

Design	Conc Riprap (CY) (6)	Pipe Culvert Span	Pipe Culvert Rise	Pipe Culvert Spa – G	Single Barrel – G1	Multi-Barrel – G1	G2	Conditions for Use of Cross Pipes	Cross Pipe Sizes
1	0.6	17"	13"	1'-0"	N/A	2'-8"	2'-5"	3 or more pipe culverts	3" Std (3.500" O.D.)
2	0.7	21"	15"	1'-2"	N/A	3'-1"	2'-11"		
3	0.9	28"	20"	1'-5"	N/A	3'-9"	3'-9"	3 or more pipe culverts	3 ½" Std (4.000" O.D.)
4	1.0	35"	24"	1'-8"	4'-4"	4'-6"	4'-7"	All pipe culverts	4" Std (4.500" O.D.)
5	1.2	42"	29"	1'-11"	4'-11"	5'-2"	5'-5"		
6	1.4	49"	33"	2'-2"	5'-6"	5'-11"	6'-3"	All pipe culverts	5" Std (5.563" O.D.)
7	1.6	57"	38"	2'-5"	6'-2"	6'-8"	7'-2"		
8	1.8	64"	43"	2'-10"	6'-9"	7'-6"	8'-2"		
9	1.9	71"	47"	3'-2"	7'-4"	8'-3"	9'-1"		

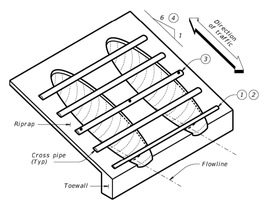
Reinforced Concrete Pipe (RCP) Culverts

Design	Conc Riprap (CY) (6)	Pipe Culvert Span	Pipe Culvert Rise	Pipe Culvert Spa – G	Single Barrel – G1	Multi-Barrel – G1	G2	Conditions for Use of Cross Pipes	Cross Pipe Sizes
1	0.6	22"	13 ½"	1'-0"	N/A	3'-1"	2'-10"	3 or more pipe culverts	3" Std (3.500" O.D.)
2	0.7	26"	15 ½"	1'-2"	N/A	3'-6"	3'-4"		
3	0.9	28 ½"	18"	1'-5"	N/A	3'-10"	3'-9 ½"	3 or more pipe culverts	3 ½" Std (4.000" O.D.)
4	1.0	36 ¼"	22 ½"	1'-8"	4'-5"	4'-7"	4'-8 ½"	All pipe culverts	4" Std (4.500" O.D.)
5	1.2	43 ¾"	26 ¾"	1'-11"	5'-1"	5'-4"	5'-6 ¾"		
6	1.4	51 ½"	31 ¾"	2'-2"	5'-8"	6'-1"	6'-5 ½"	All pipe culverts	5" Std (5.563" O.D.)
7	1.6	58 ½"	36"	2'-5"	6'-4"	6'-10"	7'-3 ½"		
8	1.8	63"	40"	2'-10"	6'-10"	7'-7"	8'-3"		
9	1.9	73"	45"	3'-2"	7'-6"	8'-5"	9'-3"		

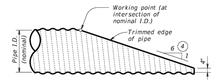


SIDE ELEVATION OF CAST-IN-PLACE CONCRETE

(Showing reinforced concrete pipe (RCP) culvert. Details of corrugated metal pipe (CMP) culvert are similar. pipe runners not shown for clarity.)



ISOMETRIC VIEW OF TYPICAL INSTALLATION



SIDE ELEVATION OF TYPICAL PIPE CULVERT MITER

(Showing corrugated metal pipe (CMP) culvert. Details at reinforced concrete cipe (RCP) culvert are similar.)

1. The proper installation of the first cross pipe is critical for vehicle safety. Place the top of the first cross pipe no more than 6" above the flow line.
2. Provide cross pipes, except the first bottom pipe, of the size shown in the table. Provide a 3 1#2" standard pipe (4" O.D.) for the first bottom pipe.
3. Install the third Cross Pipe from the bottom of the culvert using a bolted connection. Ensure that riprap concrete does not flow into the cross pipe so as to permit disassembly of the bolted connection to allow cleanout access. At the Contractor's option, install all other cross pipes using the bolted connection details.
4. Match cross slope as shown elsewhere in the plans. Cross slope of 6:1 or flatter is required for vehicle safety.
5. Riprap placed beyond the limits shown will be paid as concrete riprap in accordance with Item 432, "Riprap".
6. Quantities shown are for one end of one pipe culvert. For multiple Pipe Culverts, quantities will need to be adjusted. Riprap quantities are for Contractor's information only.

MATERIAL NOTES:
Synthetic fibers listed on the "Fibers for Concrete" Material Producer List (MPL) may be used in lieu of steel reinforcing in riprap concrete unless noted otherwise.
Provide cross pipes that meet the requirements of ASTM A53 (Type E or S, Gr B), ASTM A500 Gr B, or API 5LX52.
Provide ASTM A307 bolts and nuts.
Galvanize all steel components, except concrete reinforcing, after fabrication. Repair galvanizing damaged during transport or construction in accordance with the specifications.

GENERAL NOTES:
Pipe runners 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.
Safety end treatments (SET) shown herein are intended for use in those installations where out of control vehicles are likely to traverse the openings approximately perpendicular to the Pipe Runners.
Construct concrete riprap and all necessary inverts in accordance with the requirements of Item 432, "Riprap".
Payment for riprap and toewall is included in the price bid for each safety end treatment.

NOTE: All cross pipes, calculations, and dimensions are based on the pipe culverts mitered as shown in this detail. Alternate styles of mitered ends will require that appropriate adjustments be made to the values presented on this standard.

SIDE ELEVATION OF TYPICAL PIPE CULVERT MITER

(Showing corrugated metal pipe (CMP) culvert. Details at reinforced concrete cipe (RCP) culvert are similar.)

SHEET 1 OF 2

Texas Department of Transportation | Bridge Division Standard

SAFETY END TREATMENT
FOR DESIGN 1 TO 9
ARCH PIPE CULVERTS
TYPE II – PARALLEL DRAINAGE

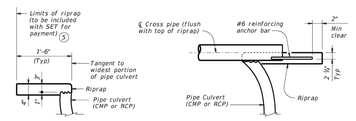
SETP-PD-A

FILE:	setpaae-20.dgn	DN: CAF	CK: TxDOT	DW: JRP	CK: CAF
©TxDOT	February 2020	CONT	SECT	JOB	HIGHWAY
REVISIONS		DIST	COUNTY		SHEET NO.

DESIGNED BY: NAME
DRAFTED BY: NAME
DATE
REVISION

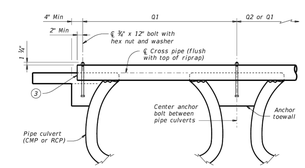
Carlson, Brigance & Doering, Inc.
Civil Engineering ◆ Surveying
Main Office: 5501 West William Cannon Dr. Austin, Texas 78749
North Office: 12129 RR 620 N., Ste. 600 Austin, Texas 78750
Phone No.: (512) 280-5160
FIRM ID #F3791
www.cbdengr.com

SHEET NAME: CONSTRUCTION DETAILS (1 OF 3)
JOB NAME: SANTA RITA RANCH NEIGHBORHOOD CENTER
PROJECT: SITE DEVELOPMENT PLAN



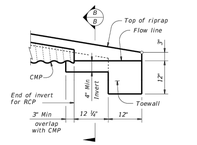
SHOWING TYPICAL PIPE CULVERT AND RIPRAP

SHOWING CROSS PIPE WITH ANCHOR BAR



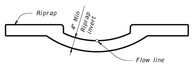
SHOWING CROSS PIPE WITH BOLTED ANCHOR

SECTION A-A



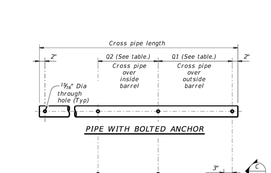
DETAIL "A"

(Showing invert with corrugated metal pipe (CMP) culvert. Reinforced concrete pipe (RCP) culvert details are similar. Cross pipes not shown for clarity.)



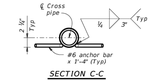
SECTION B-B

(Cross pipes not shown for clarity.)



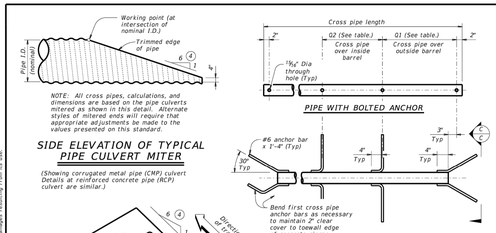
PIPE WITH BOLTED ANCHOR

PIPE WITH ANCHOR BARS



SECTION C-C

CROSS PIPE DETAILS



SIDE ELEVATION OF TYPICAL PIPE CULVERT MITER

(Showing corrugated metal pipe (CMP) culvert Details at reinforced concrete pipe (RCP) culvert are similar.)

CROSS PIPE LENGTHS, REQUIRED PIPE SIZES, AND RIPRAP QUANTITIES (2)

Nominal Culvert I.D.	Conc Riprap (CY) (6)	Pipe Culvert Spa – G	Single Barrel – G1	Multi-Barrel – G1	G2	Conditions for Use of Cross Pipes	Cross Pipe Sizes
12"	0.6	0'-9"	N/A	2'-1"	1'-9"	3 or more pipe culverts	3" Std (3.500" O.D.)
15"	0.7	0'-11"	N/A	2'-5"	2'-2"		
18"	0.8	1'-2"	N/A	2'-10"	2'-8"		
21"	0.9	1'-4"	N/A	3'-2"	3'-1"		
24"	0.9	1'-7"	N/A	3'-6"	3'-7"		
27"	1.0	1'-8"	N/A	3'-10"	3'-11"	3 or more pipe culverts	3 ½" Std (4.000" O.D.)
30"	1.1	1'-10"	N/A	4'-2"	4'-4"	2 or more pipe culverts	
33"	1.2	1'-11"	4'-2"	4'-5"	4'-8"	All pipe culverts	
36"	1.3	2'-1"	4'-5"	4'-9"	5'-1"	All pipe culverts	4" Std (4.500" O.D.)
42"	1.5	2'-4"	4'-11"	5'-5"	5'-10"		
48"	1.7	2'-7"	5'-5"	6'-0"	6'-7"	All pipe culverts	5" Std (5.563" O.D.)
54"	2.0	3'-0"	5'-11"	6'-9"	7'-6"		
60"	2.2	3'-3"	6'-5"	7'-4"	8'-3"		
66"	2.4	3'-3"	6'-11"	7'-10"	8'-9"		
72"	2.7	3'-4"	7'-5"	8'-5"	9'-4"		

1. The proper installation of the first cross pipe is critical for vehicle safety. Place the top of the first cross pipe no more than 6" above the flow line.
2. Provide cross pipes, except the first bottom pipe, of the size shown in the table. Provide a 3 1#2" standard pipe (4" O.D.) for the first bottom pipe.
3. Install the third cross pipe from the bottom of the culvert using a bolted connection. Ensure that riprap concrete does not flow into the cross pipe so as to permit disassembly of the bolted connection to allow cleanout access. At the Contractor's option, install all other cross pipes using the bolted connection details.
4. Match cross slope as shown elsewhere in the plans. Cross slope of 6:1 or flatter is required for vehicle safety.
5. Riprap placed beyond the limits shown will be paid for as concrete riprap in accordance with Item 432, "Riprap".
6. Quantities shown are for one end of one reinforced concrete pipe (RCP) culvert. For multiple pipe culverts or for corrugated metal pipe (CMP) culverts, quantities will need to be adjusted. Riprap quantities are for contractor's information only.

MATERIAL NOTES:
Synthetic fibers listed on the "Fibers for Concrete" Material Producer List (MPL) may be used in lieu of steel reinforcing in riprap concrete unless noted otherwise.
Provide cross pipes that meet the requirements of ASTM A53 (Type E or S, Gr B), ASTM A500 (Gr B), or API 5L X52.
Provide ASTM A307 bolts and nuts.
Galvanize all steel components, except concrete reinforcing, after fabrication. Repair galvanizing damaged during transport or construction in accordance with the specifications.

GENERAL NOTES:
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.
Safety end treatments (SET) 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.
Construct concrete riprap and all necessary inverts in accordance with the requirements of Item 432, "Riprap".
Payment for riprap and toewall is included in the Price Bid for each Safety End Treatment.

SIDE ELEVATION OF CAST-IN-PLACE CONCRETE

(Showing reinforced concrete pipe (RCP) culvert. Details at corrugated metal pipe (CMP) culvert are similar.)

DETAIL "A"

(Showing invert with corrugated metal pipe (CMP) culvert. Reinforced concrete pipe (RCP) culvert details are similar. Cross pipes not shown for clarity.)

SECTION B-B

(Cross pipes not shown for clarity.)

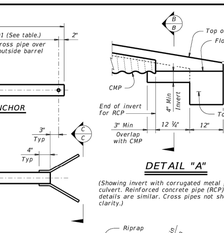
PIPE WITH BOLTED ANCHOR

PIPE WITH ANCHOR BARS

SECTION C-C

CROSS PIPE DETAILS

ISOMETRIC VIEW OF TYPICAL INSTALLATION



SHOWING TYPICAL PIPE CULVERT AND RIPRAP

SHOWING CROSS PIPE WITH ANCHOR BAR

SHOWING CROSS PIPE WITH BOLTED ANCHOR

SECTION A-A

SHEET 2 OF 2

Texas Department of Transportation | Bridge Division Standard

SAFETY END TREATMENT
FOR 12" DIA TO 72" DIA
PIPE CULVERTS
TYPE II – PARALLEL DRAINAGE

SETP-PD

FILE:	setpaste-20.dgn	DN: CAF	CK: CAF	DW: JRP	CK: CAF
©TxDOT	February 2020	CONT	SECT	JOB	HIGHWAY
REVISIONS		DIST	COUNTY		SHEET NO.

STATE OF TEXAS
STEVEN P. CATES
93648
LICENSED PROFESSIONAL ENGINEER

CARLSON, BRIGANCE & DOERING, INC.
ID# F3791

7-2-2025

DATE
JULY 2025

JOB NUMBER
5711

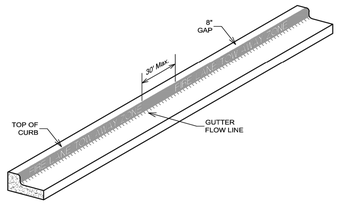
SHEET
25 OF 27

FILE PATH: J:\ACSD\5711\dwg\5711-CONSTRUCTION DETAILS.dwg - Jul 01, 2025 - 2:52pm

Williamson County Emergency Services District No. 4

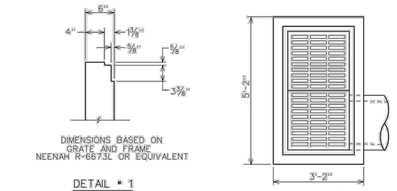
Fire Lane Detail

NOTES:
FIRE LANE STRIPING TO BE 6" WIDE RED PAINT WITH "FIRE LANE TOW AWAY ZONE" 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.



FIRE LANE STRIPING DETAIL
not to scale

ENGINEER	DATE	DRAWN BY	PROJECT NO.	DRAWING NO.
FRANK T. PHELAN, P.E.	04 - 28 - 19	JJD	01	1 OF 1



REINFORCING STEEL SCHEDULE					
BAR	QTY	SIZE	SPACING	LENGTH	WEIGHT
A	4	4	12"	6'-8"	18
B	16	4	12"	3'-0"	32
C	8	4	12"	2'-10"	15
D	4	4	12"	5'-2"	14
E	4	5	12"	2'-10"	12
TOTAL WEIGHT---91 LB.					

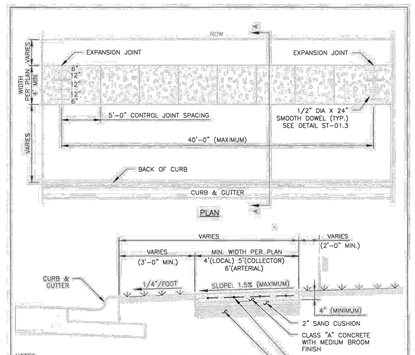
CITY OF AUSTIN
DEPARTMENT OF WATERSHED PROTECTION AND DEVELOPMENT REVIEW

STANDARD DROP INLET

RECORD COPY SIGNED BY ALLEN BRECHER — 5/24/88 ADOPTED

THE ARCHITECT/ENGINEER ASSUMES RESPONSIBILITY FOR APPROPRIATE USE OF THIS STANDARD.

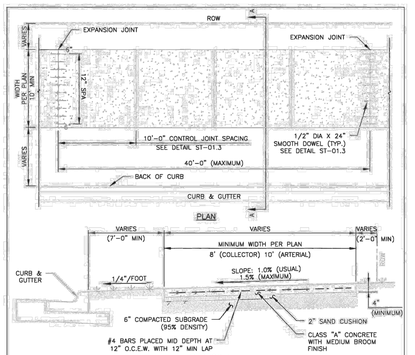
STANDARD NO. 508-11



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

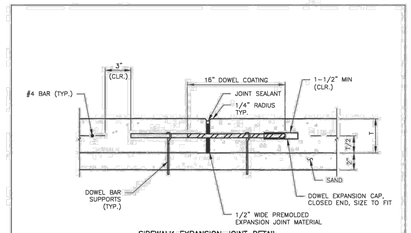
RECORD SIGNED COPY ON FILE APPROVED 01-28-21 DATE	CITY OF ROUND ROCK	DRAWING NO: ST-01.1 SHEET 1 of 3
THE ARCHITECT/ENGINEER ASSUMES RESPONSIBILITY FOR THE APPROPRIATE USE OF THIS DETAIL.	SIDEWALK DETAIL	ROUND ROCK TEXAS



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 10 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.

SCALE: NTS

RECORD SIGNED COPY ON FILE APPROVED 01-28-21 DATE	CITY OF ROUND ROCK	DRAWING NO: ST-01.2 SHEET 2 of 3
THE ARCHITECT/ENGINEER ASSUMES RESPONSIBILITY FOR THE APPROPRIATE USE OF THIS DETAIL.	SHARED USE PATH DETAIL	ROUND ROCK TEXAS



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 APPROVED 01-28-21 DATE	CITY OF ROUND ROCK	DRAWING NO: ST-01.3 SHEET 3 of 3
THE ARCHITECT/ENGINEER ASSUMES RESPONSIBILITY FOR THE APPROPRIATE USE OF THIS DETAIL.	SIDEWALK & SHARED USE PATH DETAIL	ROUND ROCK TEXAS

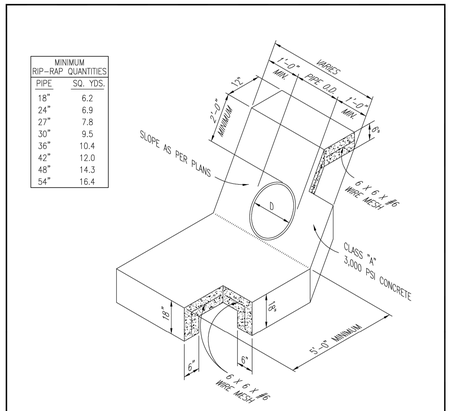
DESIGNED BY: NAME	DRAFTED BY: NAME
DATE	
REVISION	

Carlson, Brigance & Doering, Inc.
Civil Engineering ◆ Surveying
FIRM ID #F3791
5501 West William Cannon Dr. 12129 RR (620 N.) Ste. 600
Austin, Texas 78749 Austin, Texas 78750
Phone No. (512) 280-5160 www.cbdeng.com

SHEET NAME: CONSTRUCTION DETAILS (2 OF 3)

JOB NAME: SANTA RITA RANCH NEIGHBORHOOD CENTER

PROJECT: SITE DEVELOPMENT PLAN

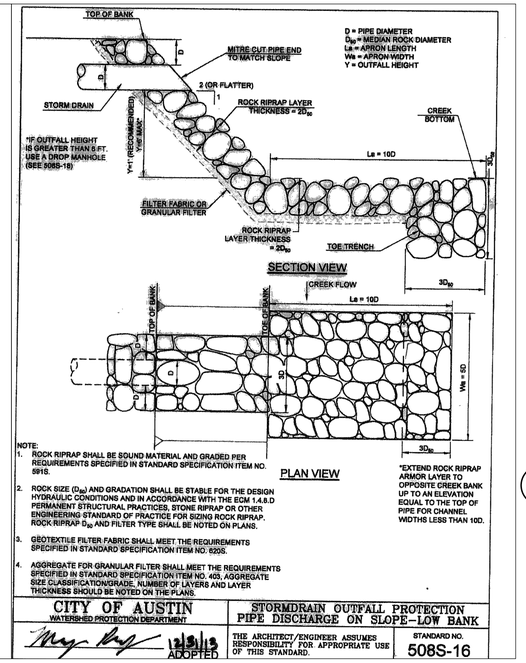


NOTES:
1. WHEN HEADWALLS AND WINGWALLS ARE REQUIRED, THEY SHALL CONFORM TO THE TEXAS DEPARTMENT OF TRANSPORTATION STANDARDS, OR AS DIRECTED BY THE CITY.
2. ENERGY DISSIPATERS SHALL BE REQUIRED IF PIPE VELOCITY IS GREATER THAN 5.0 F.P.S. OR AS DIRECTED BY THE CITY OF GEORGETOWN.
3. SUPPORT REINFORCING WIRE MESH REQUIRED AS SUPPORT FOR APPROACH SLAB AND SHALL BE SUPPORTED BY REBAR CHAIRS OR OTHER APPROVED METHODS.

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

CITY OF GEORGETOWN
CONSTRUCTION STANDARDS AND DETAILS
TYPICAL CONCRETE RIP-RAP AT PIPE

REVISION NOTE: ADOPTED 6/21/2006
DRAWING NAME: SD19
SCALE: NTS | DATE: 1/2003
DRAWN BY: MRS | APPROVED BY: TRB



D = PIPE DIAMETER
D_{50} = MEDIAN ROCK DIAMETER
La = APRON LENGTH
Wa = APRON WIDTH
Y = OUTFALL HEIGHT

NOTE:
1. ROCK RIPRAP SHALL BE SOUND MATERIAL AND GRADED PER REQUIREMENTS SPECIFIED IN STANDARD SPECIFICATION ITEM NO. 591S.
2. ROCK SIZE (D_{50}) AND GRADATION SHALL BE STABLE FOR THE DESIGN HYDRAULIC CONDITIONS AND IN ACCORDANCE WITH THE ECM 1.4.6.D PERMANENT STRUCTURAL PRACTICES, STONE RIPRAP OR OTHER ENGINEERING STANDARD OF PRACTICE FOR SIZING ROCK RIPRAP. ROCK RIPRAP D_{50} AND FILTER TYPE SHALL BE NOTED ON PLANS.
3. GEOTEXTILE FILTER FABRIC SHALL MEET THE REQUIREMENTS SPECIFIED IN STANDARD SPECIFICATION ITEM NO. 620S.
4. AGGREGATE FOR GRANULAR FILTER SHALL MEET THE REQUIREMENTS SPECIFIED IN STANDARD SPECIFICATION ITEM NO. 403, AGGREGATE SIZE CLASSIFICATION/GRADE, NUMBER OF LAYERS AND LAYER THICKNESS SHOULD BE NOTED ON THE PLANS.
*EXTEND ROCK RIPRAP ARMOR LAYER TO OPPOSITE CREEK BANK UP TO AN ELEVATION EQUAL TO THE TOP OF PIPE FOR CHANNEL WIDTHS LESS THAN 10D.

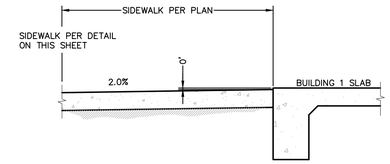
CITY OF AUSTIN
WATERSHED PROTECTION DEPARTMENT

STORMDRAIN OUTFALL PROTECTION PIPE DISCHARGE ON SLOPE-LOW BANK

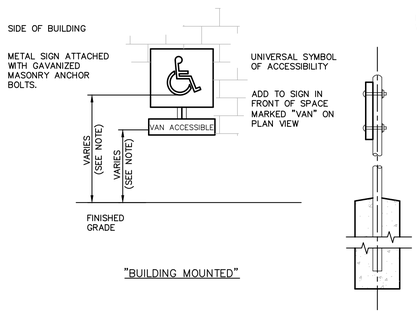
12/3/13 ADOPTED

THE ARCHITECT/ENGINEER ASSUMES RESPONSIBILITY FOR APPROPRIATE USE OF THIS STANDARD.

STANDARD NO. 508S-16

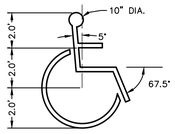


1 SIDEWALK AT BUILDING ENTRANCE
SCALE: 1" = 2'



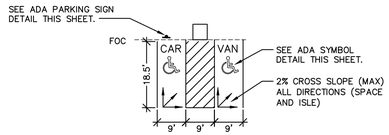
NOTE: THE HEIGHT FROM FINISHED GRADE TO EITHER THE LOWEST SYMBOL OR THE LOWEST LETTERING MUST BE A MINIMUM OF 60 INCHES. SIGN CONTENTS AND HEIGHT REQUIREMENTS ALSO APPLY TO WALL MOUNTED SIGNAGE.

2 ADA PARKING SIGN
SCALE: N.T.S. (POLE OR WALL MOUNTED)



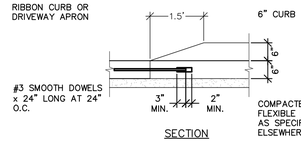
PROVIDE PAINTED WHEELCHAIR SYMBOL AT EACH DESIGNATED HANDICAP PARKING STALL. CENTER SYMBOL IN STALL.
ALL LINES ARE 5" WIDE.

3 ADA SYMBOL
SCALE: N.T.S.



WARNING!! EXCEEDING 2 PERCENT SLOPE IN ANY DIRECTION COULD BE CAUSE FOR REJECTION OF SPACE. CONTRACTOR IS TO VERIFY SPOT ELEVATIONS PRIOR TO CONSTRUCTION AND ENSURE 2% IS NOT EXCEEDED.

4 TYPICAL ADA PARKING SPACE
SCALE: N.T.S.



5 CURB TERMINATION
SCALE: 1" = 2'

STATE OF TEXAS
STEVEN P. CATES
93648
LICENSED PROFESSIONAL ENGINEER
CARLSON, BRIGANCE & DOERING, INC.
ID# F3791
7-2-2025

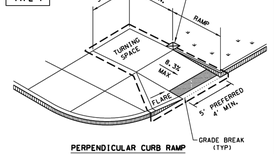
DATE: JULY 2025

JOB NUMBER: 5711

SHEET: 26 OF 27

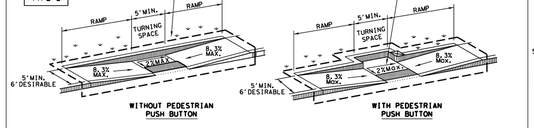
FILE PATH: J:\CSD\5711\dwg\5711 - CONSTRUCTION DETAILS.dwg - Jul 01, 2025 - 2:52pm

TYPE 1



PERPENDICULAR CURB RAMP

TYPE 2

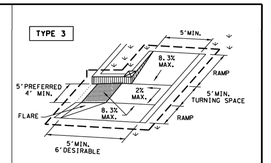


WITHOUT PEDESTRIAN PUSH BUTTON

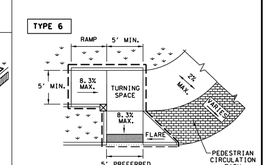
WITH PEDESTRIAN PUSH BUTTON

PARALLEL CURB RAMP

TYPE 3

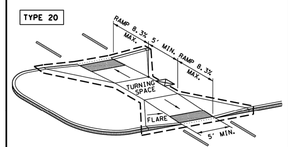


TYPE 6



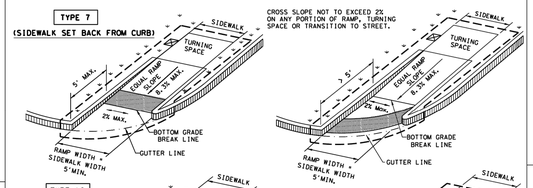
COMBINATION CURB RAMPS

TYPE 20

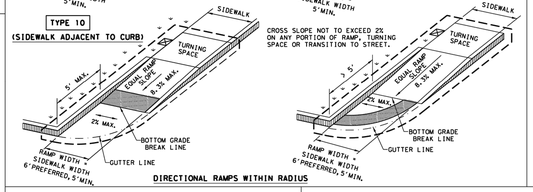


CURB RAMPS AT MEDIAN ISLANDS

TYPE 7
(SIDEWALK SET BACK FROM CURB)

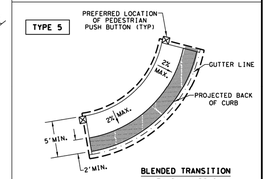


TYPE 10
(SIDEWALK ADJACENT TO CURB)



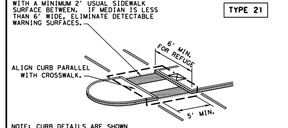
DIRECTIONAL RAMPS WITHIN RADIUS

TYPE 5



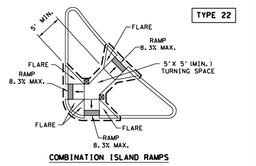
BLENDED TRANSITION
(FLUSH LANDING)

TYPE 21

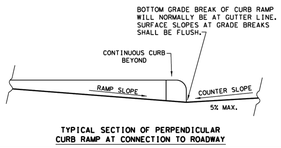


NOTE: CURB DETAILS ARE SHOWN ELSEWHERE IN THE PLANS.

TYPE 22



COMBINATION ISLAND RAMPS



TYPICAL SECTION OF PERPENDICULAR CURB RAMP AT CONNECTION TO ROADWAY

NOTES / LEGEND:

SEE GENERAL NOTES ON SHEET 2 OF 4 FOR MORE INFORMATION.

DENOTES PLANTING OR NON-WALKING SURFACE NOT PART OF PEDESTRIAN CIRCULATION PATH.

DETECTABLE WARNING SURFACE

DENOTES PREFERRED LOCATION OF PEDESTRIAN PUSH BUTTON IF APPLICABLE.

GUTTER LINE

GRADE BREAK

RAMP LIMITS OF PAYMENT

SHEET 1 OF 4

Texas Department of Transportation — Design Division Standard

PEDESTRIAN FACILITIES CURB RAMPS

PED-18

FILE: ped18	DN:TxDOT	CK:	DW:	CK:
© TxDOT: MARCH, 2002	CONT	SECT	JOB	HIGHWAY
REVISIONS	DIST	COUNTY		SHEET NO.

REVISED 08.2005
REVISED 05.2012
REVISED 07.2014

DATE:
FILE:

GENERAL NOTES

CURB RAMPS

1. Install a curb ramp or blended transition at each pedestrian street crossing.
2. All slopes shown are maximum allowable. Cross slopes of 1.5% and lesser running should be used. Adjust curb ramp length or grade of approach sidewalks as directed.
3. Maximum allowable cross slope on sidewalk and curb ramp surfaces is 2%.
4. The minimum sidewalk width is 5'. Where the sidewalk is adjacent to the back of curb, a 6' sidewalk width is desirable. Where a 5' sidewalk cannot be provided due to site constraints, sidewalk width may be reduced to 4' for short distances. 5'x 5' passing areas at intervals not to exceed 200' are required.
5. Turning Spaces shall be 5'x 5' minimum. Cross slope shall be maximum 2%.
6. Clear space at the bottom of curb ramps shall be a minimum of 4'x 4' wholly contained within the crosswalk and wholly outside the parallel vehicular travel path.
7. Provide flared sides where the pedestrian circulation path crosses the curb ramp. Flared sides shall be sloped at 10% maximum, measured parallel to the curb. Returned curbs may be used only where pedestrians would not normally walk across the ramp, either because the adjacent surface is planted, substantially obstructed, or otherwise protected.
8. Additional information on curb ramp location, design, light reflective value and texture may be found in the latest draft of the Proposed Guidelines for Pedestrian Facilities in the Public Right of Way (PROWAG) as published by the U.S. Architectural and Transportation Barriers Compliance Board (Access Board).
9. To serve as a pedestrian refuge area, the median should be a minimum of 6' wide, measured from back of curbs. Medians should be designed to provide accessible passage over or through them.
10. Small channelization islands, which do not provide a minimum 5'x 5' landing at the top of curb ramps, shall be cut through level with the surface of the street.
11. Crosswalk dimensions, crosswalk markings and stop bar locations shall be as shown elsewhere in the plans. At intersections where crosswalk markings are not required, curb ramps shall align with theoretical crosswalks unless otherwise directed.
12. Provide curb ramps to connect the pedestrian access route at each pedestrian street crossing. Handrails are not required on curb ramps.
13. Curb ramps and landings shall be constructed and paid for in accordance with Item 531 "Sidewalks".
14. Place concrete at a minimum depth of 5" for ramps, flares and landings, unless otherwise directed.
15. Furnish and install No. 3 reinforcing steel bars at 18" o.c. both ways, unless otherwise directed.
16. Provide a smooth transition where the curb ramps connect to the street.
17. Curbs shown on sheet 1 within the limits of payment are considered part of the curb ramp for payment, whether it is concrete curb, gutter, or combined curb and gutter.
18. Existing features that comply with applicable standards may remain in place unless otherwise shown on the plans.

DETECTABLE WARNING MATERIAL

19. Curb ramps must contain a detectable warning surface that consists of raised truncated domes complying with PROWAG. The surface must contrast visually with adjoining surfaces, including side flares. Furnish and install an approved cast-in-place dark brown or dark red detectable warning surface material adjacent to uncolored concrete, unless specified elsewhere in the plans.
20. Detectable Warning Materials must meet TxDOT Departmental Materials Specification DMS 4350 and be listed on the Material Producer List. Install products in accordance with manufacturer's specifications.
21. Detectable warning surfaces must be firm, stable and slip resistant.
22. Detectable warning surfaces shall be a minimum of 24 inches in depth in the direction of pedestrian travel, and extend the full width of the curb ramp or landing where the pedestrian access route enters the street.
23. Detectable warning surfaces shall be located so that the edge nearest the curb line is at the back of curb and neither end of that edge is greater than 5 feet from the back of curb. Detectable warning surfaces may be curved along the corner radius.
24. Shaded areas on Sheet 1 of 4 indicate the approximate location for the detectable warning surface for each curb ramp type.

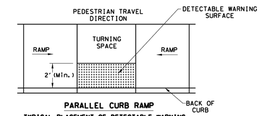
DETECTABLE WARNING PAVERS (IF USED)

25. Furnish detectable warning paver units meeting all requirements of ASTM C-936, C-33. Lay in a two by two unit basket weave pattern or as directed.
26. Lay full-size units first followed by closure units consisting of at least 25 percent (25%) of a full unit. Cut detectable warning paver units using a power saw.

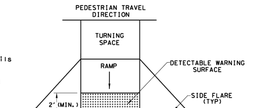
SIDEWALKS

27. Provide clear ground space at operable parts, including pedestrian push buttons. Operable parts shall be placed within unobstructed reach range specified in PROWAG section R406.
28. Place traffic signal or illumination poles, ground boxes, controller boxes, signs, drainage facilities and other items so as not to obstruct the pedestrian access route or clear ground space.
29. Street grades and cross slopes shall be as shown elsewhere in the plans.
30. Changes in level greater than 1/4 inch are not permitted.
31. The least possible grade should be used to maximize accessibility. The running slope of sidewalks and crosswalks within the public right of way may follow the grade of the parallel roadway. Where a continuous grade greater than five percent (5%) must be provided, handrails may be desirable to improve accessibility. Handrails may also be needed to protect pedestrians from potentially hazardous conditions. If provided, handrails shall comply with PROWAG R409.
32. Handrail extensions shall not protrude into the usable landing area or into intersecting pedestrian routes.
33. Driveways and turnouts shall be constructed and paid for in accordance with Item "Intersections, Driveways and Turnouts". Sidewalks shall be constructed and paid for in accordance with Item, "Sidewalks".
34. Sidewalk details are shown elsewhere in the plans.

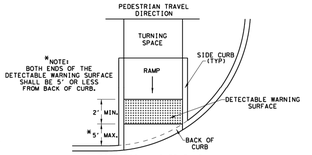
DETECTABLE WARNING SURFACE DETAILS



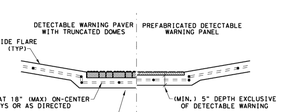
PARALLEL CURB RAMP
TYPICAL PLACEMENT OF DETECTABLE WARNING SURFACE ON LANDING AT STREET EDGE.



PERPENDICULAR CURB RAMP
TYPICAL PLACEMENT OF DETECTABLE WARNING SURFACE ON SLOPING RAMP RUN.



DIRECTIONAL CURB RAMP
TYPICAL PLACEMENT OF DETECTABLE WARNING SURFACE ON SLOPING RAMP RUN.



SECTION VIEW DETAIL
CURB RAMP AT DETECTIBLE WARNINGS

SHEET 2 OF 4

Texas Department of Transportation — Design Division Standard

PEDESTRIAN FACILITIES CURB RAMPS

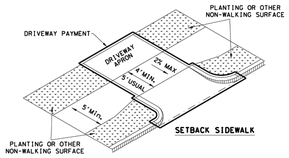
PED-18

FILE: ped18	DN:TxDOT	CK:	DW:	CK:
© TxDOT: MARCH, 2002	CONT	SECT	JOB	HIGHWAY
REVISIONS	DIST	COUNTY		SHEET NO.

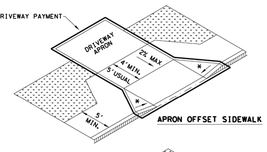
REVISED 08.2005
REVISED 05.2012
REVISED 07.2014

DATE:
FILE:

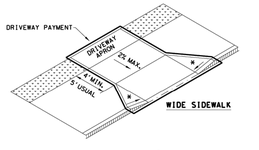
SIDEWALK TREATMENT AT DRIVEWAYS



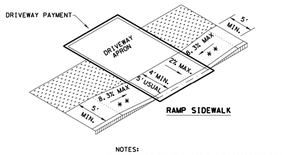
SETBACK SIDEWALK



APRON OFFSET SIDEWALK



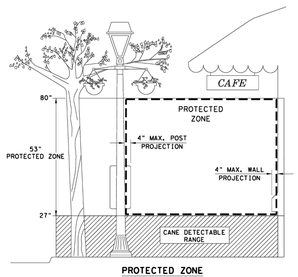
WIDE SIDEWALK



RAMP SIDEWALK

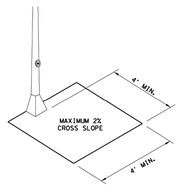
NOTES:
* WHERE DRIVEWAYS CROSS THE PEDESTRIAN ROUTE, SIDES SHALL BE FLARED AT 10% MAX SLOPE.

** IF CURB HEIGHT IS GREATER THAN 6 INCHES, USE GRADE LESS THAN OR EQUAL TO 5%, HANDRAIL AND DETECTABLE WARNING ARE NOT REQUIRED.

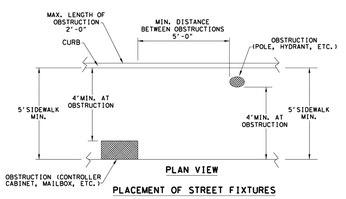


PROTECTED ZONE

NOTE: IN PEDESTRIAN CIRCULATION AREA, MAXIMUM 4" PROJECTION FOR POST OR WALL MOUNTED OBJECTS BETWEEN 27" AND 80" ABOVE THE SURFACE.

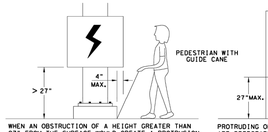


CLEAR SPACE ADJACENT TO PEDESTRIAN PUSH BUTTON



PLAN VIEW
PLACEMENT OF STREET FIXTURES

NOTE: ITEMS NOT INTENDED FOR PUBLIC USE. MINIMUM 4' X 4' CLEAR GROUND SPACE REQUIRED AT PUBLIC USE FIXTURES.



WHEN AN OBSTRUCTION OF A HEIGHT GREATER THAN 27" FROM THE SURFACE WOULD CREATE A PROTRUSION OF MORE THAN 4" INTO THE PEDESTRIAN CIRCULATION AREA, CONSTRUCT ADDITIONAL CURB OR FOUNDATION AT THE BOTTOM TO PROVIDE A MAXIMUM 4" OVERHANG.

PROTRUDING OBJECTS OF A HEIGHT ≤27" ARE DETECTABLE BY CANE AND DO NOT REQUIRE ADDITIONAL TREATMENT.

DETECTION BARRIER FOR VERTICAL CLEARANCE < 80"

SHEET 3 OF 4

Texas Department of Transportation — Design Division Standard

PEDESTRIAN FACILITIES CURB RAMPS

PED-18

FILE: ped18	DN:TxDOT	CK:	DW:	CK:
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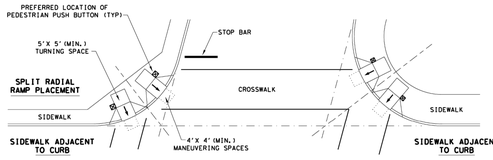
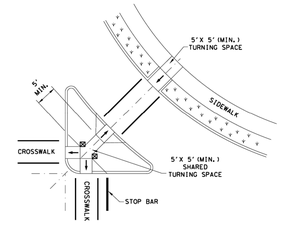
REVISED 07.2014

DATE:
FILE:

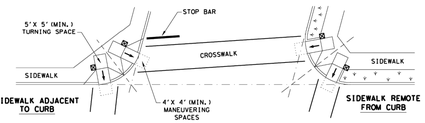
TYPICAL CROSSING LAYOUTS
SEE SHEET 1 OF 4 FOR DETAILS AND DIMENSIONS



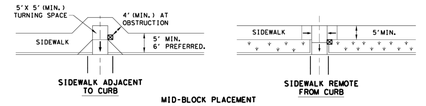
SKEWED INTERSECTION WITH "LARGE" RADIUS



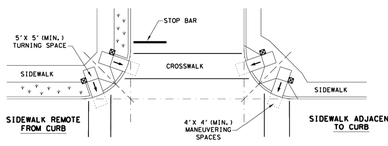
AT INTERSECTION W/FREE RIGHT TURN & ISLAND



SKEWED INTERSECTION WITH "SMALL" RADIUS



MID-BLOCK PLACEMENT PERPENDICULAR RAMPS



NORMAL INTERSECTION WITH "SMALL" RADIUS

LEGEND:

SHOWS DOWNWARD SLOPE.

DENOTES PREFERRED LOCATION OF PEDESTRIAN PUSH BUTTON (IF APPLICABLE).

DENOTES PLANTING OR NON-WALKING SURFACE NOT PART OF PEDESTRIAN CIRCULATION PATH.

SHEET 4 OF 4

Texas Department of Transportation — Design Division Standard

PEDESTRIAN FACILITIES CURB RAMPS

PED-18

FILE: ped18	DN:TxDOT	CK:	DW:	CK:
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REVISED 07.2014

DESIGNED BY: NAME
DRAFTED BY: NAME
DATE
REVISION

Carlson, Brigance & Doering, Inc.
Civil Engineering ◆ Surveying
FIRM ID #F3791
Main Office:
5501 West William Cannon Dr.
Austin, Texas 78749
Phone No.: (512) 280-5160
North Office:
12129 RR (620 N.) Ste. 600
Austin, Texas 78750
www.cbdeng.com

SHEET NAME: CONSTRUCTION DETAILS (3 OF 3)
JOB NAME: SANTA RITA RANCH NEIGHBORHOOD CENTER
PROJECT: SITE DEVELOPMENT PLAN

STATE OF TEXAS
STEVEN P. CATES
93648
LICENSED PROFESSIONAL ENGINEER
CARLSON, BRIGANCE & DOERING, INC.
ID# F3791
7-2-2025

DATE: JULY 2025
JOB NUMBER: 5711
SHEET: 27 OF 27

FILE PATH: J:\ACDSDT\11\dwg\5711-CONSTRUCTION DETAILS.dwg - Jul 01, 2025 - 2:52pm