SCS & WPAP

Wolf Ranch West
Section 6G
Georgetown, Williamson County, Texas

November 2023

Prepared For:

H4 GEORGETOWN, LP &
H4 Georgetown Phase 1, LLC
129 CANYON VIEW ROAD
GEORGETOWN, TX 78626

Prepared By:

John Pickens
Kimley-Horn and Associates, Inc.
10814 Jollyville Road
Building IV, Suite 200
Austin, TX 78759
TEXAS REGISTRATION #928

STATE OF TEXAS
JOHN A. PICKENS
110631
LICENSED
PROFESSIONAL ENGINEER

Kimley»Horn

11/15/2023

WOLF RANCH WEST SECTION 6G
WATER POLLUTION ABATEMENT AND SEWAGE COLLECTION SYSTEM PLANS

TABLE OF CONTENTS

WATER POLLUTION ABATEMENT PLAN CHECKLIST
ORGANIZED SEWAGE COLLECTION SYSTEM PLAN CHECKLIST

EDWARDS AQUIFER APPLICATION COVER PAGE (TCEQ-20705) 1

GENERAL INFORMATION FORM (TCEQ-0587) AND ATTACHMENTS 2

GEOLOGIC ASSESSMENT FORM (TCEQ-0585) AND ATTACHMENTS 3

ORGANIZED SEWAGE COLLECTION SYSTEM PLAN (TCEQ-0582) AND ATTACHMENTS 4

WATER POLLUTION ABATEMENT PLAN APPLICATION FORM (TCEQ-0584) AND ATTACHMENTS 5

TEMPORARY STORMWATER SECTION (TCEQ-0602) AND ATTACHMENTS 6

PERMANENT STORMWATER SECTION (TCEQ-0600) AND ATTACHMENTS 7

AGENT AUTHORIZATION FORM (TCEQ-0599) 8

APPLICATION FEE FORM (TCEQ-0574) 9

CORE DATA FORM (TCEQ-10400) 10

Organized Sewage Collection System Plan Checklist

X **Edwards Aquifer Application Cover Page (TCEQ-20705)**

X **General Information Form (TCEQ-0587)**

Attachment A - Road Map
Attachment B - USGS / Edwards Recharge Zone Map
Attachment C - Project Description

X **Geologic Assessment Form (TCEQ-0585)**

Attachment A - Geologic Assessment Table (TCEQ-0585-Table)
Comments to the Geologic Assessment Table
Attachment B - Soil Profile and Narrative of Soil Units
Attachment C - Stratigraphic Column
Attachment D - Narrative of Site Specific Geology
Site Geologic Map(s)
Table or list for the position of features' latitude/longitude (if mapped using GPS)

X **Organized Sewage Collection System Plan (TCEQ-0582)**

Attachment A - Engineering Design Report
Attachment B - Justification and Calculations for Deviation in Straight Alignment Without Manholes
Attachment C - Justification for Variance from Manhole Spacing
Attachment D - Explanation of Slopes for Flows Greater Than 10.0 Feet Per Second
Site Plan
Final Plan and Profile Sheets

N/A **Lift Station / Force Main System Application (TCEQ-0624) if applicable**

Attachment A - Engineering Design Report
Site Plan
Final Plan and Profile Sheets

X **Temporary Stormwater Section (TCEQ-0602)**

Attachment A - Spill Response Actions
Attachment B - Potential Sources of Contamination
Attachment C - Sequence of Major Activities
Attachment D - Temporary Best Management Practices and Measures
Attachment E - Request to Temporarily Seal a Feature, if sealing a feature
Attachment F - Structural Practices
Attachment G - Drainage Area Map
Attachment H - Temporary Sediment Pond(s) Plans and Calculations
Attachment I - Inspection and Maintenance for BMPs

Attachment J - Schedule of Interim and Permanent Soil Stabilization Practices

X **Agent Authorization Form (TCEQ-0599), if application submitted by agent**

X **Application Fee Form (TCEQ-0574)**

X **Check Payable to the "Texas Commission on Environmental Quality"**

X **Core Data Form (TCEQ-10400)**

Water Pollution Abatement Plan Checklist

X **Edwards Aquifer Application Cover Page (TCEQ-20705)**

X **General Information Form (TCEQ-0587)**

Attachment A - Road Map
Attachment B - USGS / Edwards Recharge Zone Map
Attachment C - Project Description

X **Geologic Assessment Form (TCEQ-0585)**

Attachment A - Geologic Assessment Table (TCEQ-0585-Table)
Comments to the Geologic Assessment Table
Attachment B - Soil Profile and Narrative of Soil Units
Attachment C - Stratigraphic Column
Attachment D - Narrative of Site Specific Geology
Site Geologic Map(s)
Table or list for the position of features' latitude/longitude (if mapped using GPS)

X **Water Pollution Abatement Plan Application Form (TCEQ-0584)**

Attachment A - Factors Affecting Water Quality
Attachment B - Volume and Character of Stormwater
Attachment C - Suitability Letter from Authorized Agent (if OSSF is proposed)
Attachment D - Exception to the Required Geologic Assessment (if requesting an exception)
Site Plan

X **Temporary Stormwater Section (TCEQ-0602)**

Attachment A - Spill Response Actions
Attachment B - Potential Sources of Contamination
Attachment C - Sequence of Major Activities
Attachment D - Temporary Best Management Practices and Measures
Attachment E - Request to Temporarily Seal a Feature, if sealing a feature
Attachment F - Structural Practices
Attachment G - Drainage Area Map
Attachment H - Temporary Sediment Pond(s) Plans and Calculations
Attachment I - Inspection and Maintenance for BMPs
Attachment J - Schedule of Interim and Permanent Soil Stabilization Practices

X **Permanent Stormwater Section (TCEQ-0600)**

Attachment A - 20% or Less Impervious Cover Waiver, if project is multi-family residential, a school, or a small business and 20% or less impervious cover is proposed for the site
Attachment B - BMPs for Upgradient Stormwater

Attachment C - BMPs for On-site Stormwater
Attachment D - BMPs for Surface Streams
Attachment E - Request to Seal Features (if sealing a feature)
Attachment F - Construction Plans
Attachment G - Inspection, Maintenance, Repair and Retrofit Plan
Attachment H - Pilot-Scale Field Testing Plan, if BMPs not based on Complying with the Edwards Aquifer Rules: Technical Guidance for BMPs
Attachment I -Measures for Minimizing Surface Stream Contamination

X **Agent Authorization Form (TCEQ-0599), if application submitted by agent**

X **Application Fee Form (TCEQ-0574)**

X **Check Payable to the "Texas Commission on Environmental Quality"**

X **Core Data Form (TCEQ-10400)**

`Texas Commission on Environmental Quality

Edwards Aquifer Application Cover Page

Our Review of Your Application

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

Administrative Review

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

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

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

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

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

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

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

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

Technical Review

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

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

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

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

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

Mid-Review Modifications

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

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

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

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

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

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

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

1. Regulated Entity Name: WOLF RANCH WEST SECTION 6G					**2. Regulated Entity No.:**			
3. Customer Name: H4 GEORGETOWN, LP & H4 Georgetown Phase 1 LLC					**4. Customer No.:**			
5. Project Type: **(Please circle/check one)**	New **X**		Modification		Extension		Exception	
6. Plan Type: **(Please circle/check one)**	WPAP **X**	CZP	SCS **X**	UST	AST	EXP	EXT	Technical Clarification	Optional Enhanced Measures
7. Land Use: **(Please circle/check one)**	Residential **X**		Non-residential			**8. Site (acres):**		89.416
9. Application Fee:	$7,350.00		**10. Permanent BMP(s):**			2-BATCH DETENTION PONDS & 1-NATURAL VFS		
11. SCS (Linear Ft.):	1,700		**12. AST/UST (No. Tanks):**			N/A		
13. County:	WILLIAMSON		**14. Watershed:**			SOUTH 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.)	__	__	_1_
Region (1 req.)	__	__	_1_
County(ies)	__	__	_1_
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 _1_Georgetown __Jerrell __Leander __Liberty Hill __Pflugerville __Round Rock

San Antonio Region					
County:	**Bexar**	**Comal**	**Kinney**	**Medina**	**Uvalde**
Original (1 req.)	__	__	__	__	__
Region (1 req.)	__	__	__	__	__
County(ies)	__	__	__	__	__
Groundwater Conservation District(s)	__ Edwards Aquifer Authority __Trinity-Glen Rose	__Edwards Aquifer Authority	__Kinney	__EAA __Medina	__EAA __Uvalde
City(ies) Jurisdiction	__Castle Hills __Fair Oaks Ranch __Helotes __Hill Country Village __Hollywood Park __San Antonio (SAWS) __Shavano Park	__Bulverde __Fair Oaks Ranch __Garden Ridge __New Braunfels __Schertz	NA	__San Antonio ETJ (SAWS)	NA

I certify that to the best of my knowledge, that the application is complete and accurate. This application is hereby submitted to TCEQ for administrative review and technical review. John A. Pickens – Kimley-Horn
Print Name of Customer/Authorized Agent John Pickens 11/15/2023
Signature of Customer/Authorized Agent Date

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

General Information Form

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: John Pickens

Date: November 15, 2023

Signature of Customer/Agent:

STATE OF TEXAS
JOHN A. PICKENS
110631
LICENSED
PROFESSIONAL ENGINEER

11/15/2023

Project Information

1. Regulated Entity Name: Wolf Ranch West Section 6G
2. County: Williamson
3. Stream Basin: South 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: Fred J. Balda
   Entity: H4 Georgetown, LP & H4 Georgetown Phase 1 , LLC
   Mailing Address: 129 Canyon View Road
   City, State: Georgetown, Texas Zip: 78626
   Telephone: 713-516-7964 FAX: ____
   Email Address: carter.DeWalch@hillwood.com

8. Agent/Representative (If any):

   Contact Person: John Pickens
   Entity: Kimley-Horn & Associates, Inc.
   Mailing Address: 10814 Jollyville Road, Building IV, Suite 200
   City, State: Austin, Texas Zip: 78759
   Telephone: 512-720-5466 FAX: _____
   Email Address: john.pickens@kimley-horn.com

9. Project Location:

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

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

    The project site is located on the south side of SH 29 and west side of Southwest Bypass in Georgetown, Texas.

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: 01/20/2024

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:

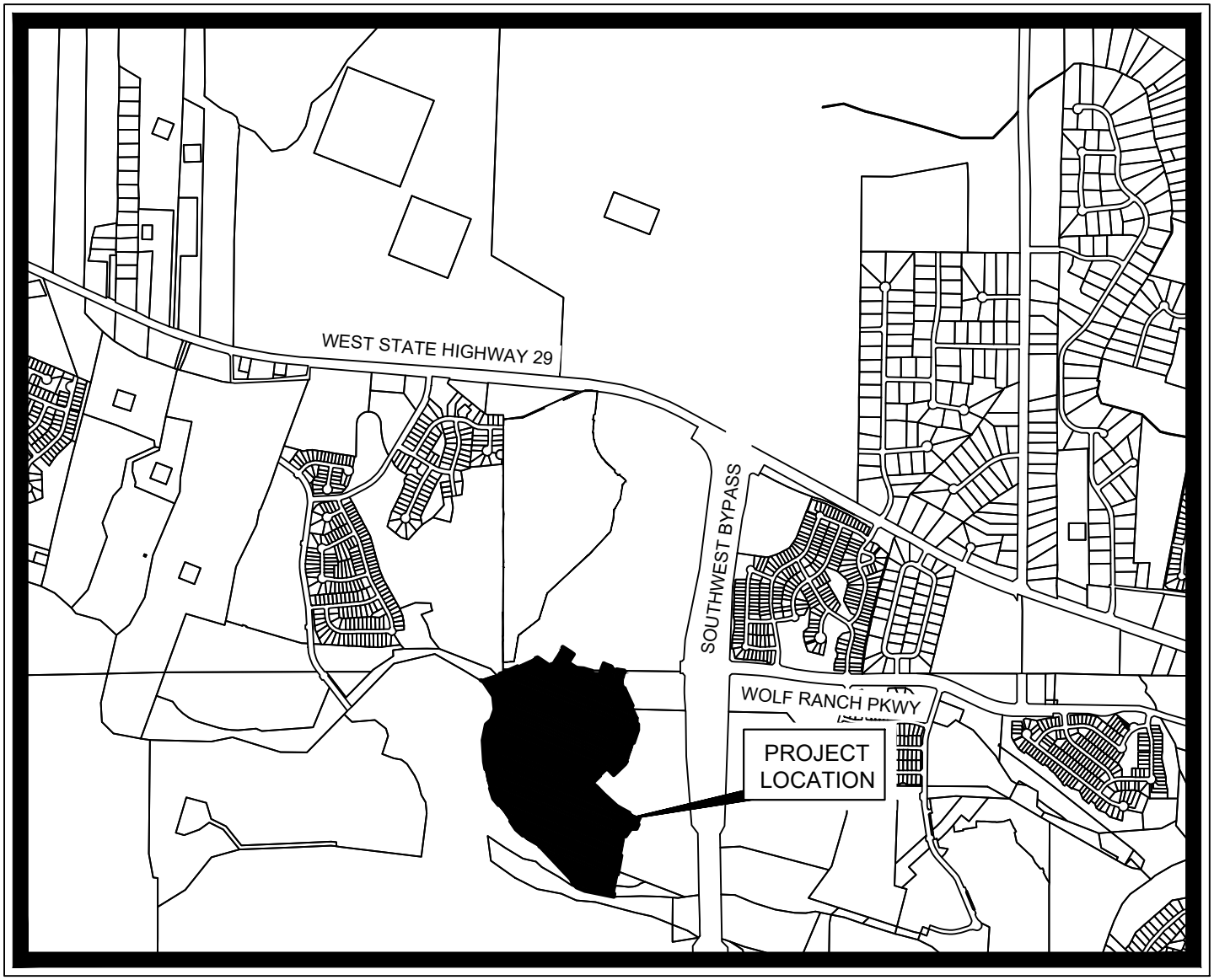
- ☐ TCEQ cashier
- ☒ Austin Regional Office (for projects in Hays, Travis, and Williamson Counties)
- ☐ San Antonio Regional Office (for projects in Bexar, Comal, Kinney, Medina, and Uvalde Counties)

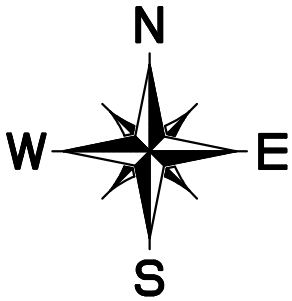
20. ☒ Submit one (1) original and one (1) copy of the application, plus additional copies as needed for each affected incorporated city, groundwater conservation district, and county in which the project will be located. The TCEQ will distribute the additional copies to these jurisdictions. The copies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

ATTACHMENT A—ROAD MAP

ATTACHMENT A





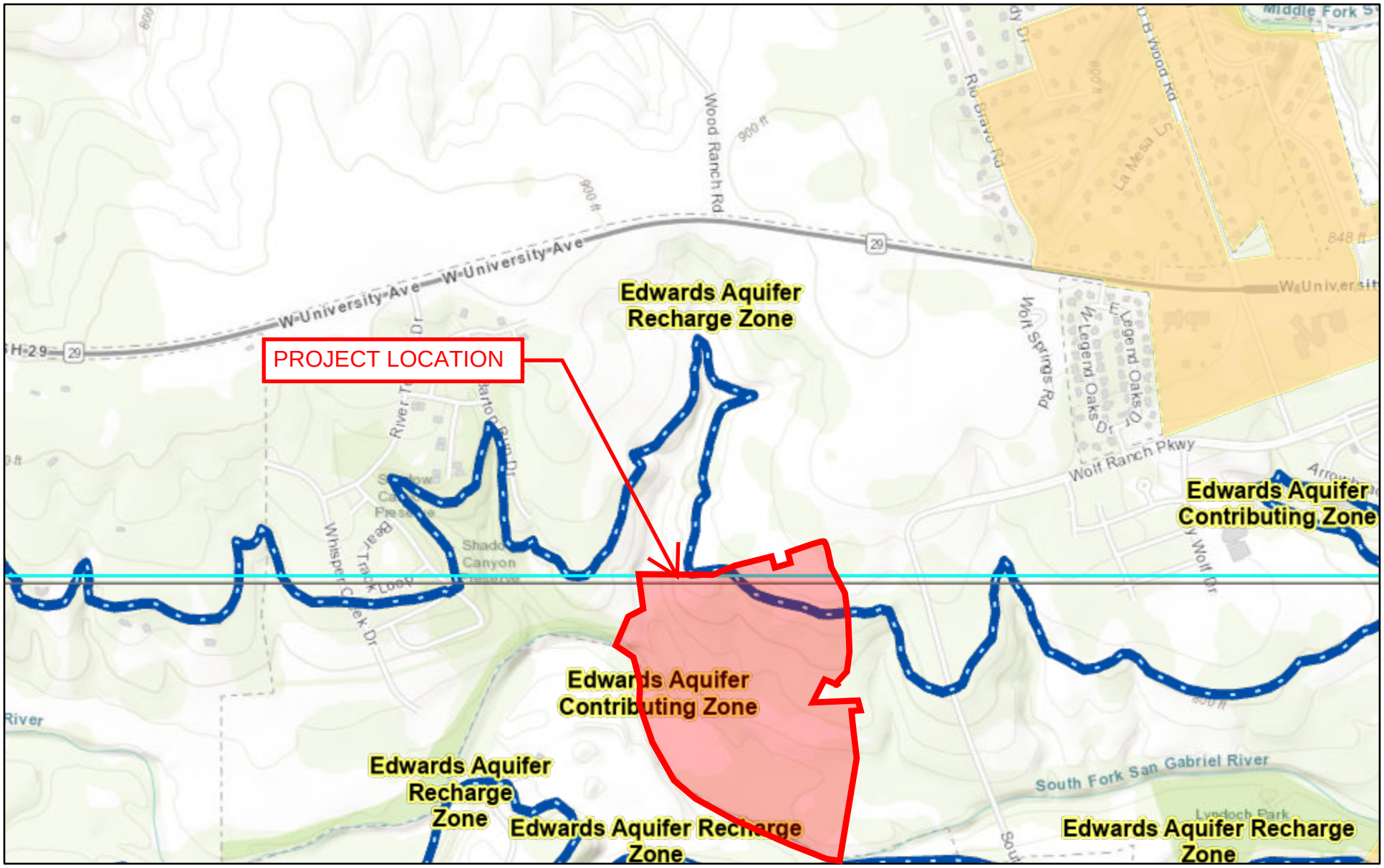
VICINITY MAP

SCALE: 1" = 2,000'

ATTACHMENT B—USGS QUADRANGLE MAP

ATTACHMENT B

Edwards Aquifer Viewer Custom Print



6/9/2022, 3:45:22 PM

1:18,056

0 0.13 0.25 0.5 mi

0 0.2 0.4 0.8 km

Edwards Aquifer Label

Edwards Aquifer Boundary

Edwards Aquifer Boundary central line

City/Place

TX Counties

7.5 Minute Quad Grid

TCEQ_EDWARDS_OFFICIAL_MAPS

Sources: Esri, HERE, Garmin, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri

Web AppBuilder for ArcGIS

City of Austin, County of Williamson, Texas Parks & Wildlife, Esri, HERE, Garmin, GeoTechnologies, Inc., USGS, METI/NASA, EPA, USDA | TCEQ |

ATTACHMENT C—PROJECT DESCRIPTION

The development is located on the south of SH 29 and west of Southwest Bypass Just south of Wolf Ranch Section 7 (Under Construction) in Georgetown Texas, Williamson County. This Water Pollution Abatement Plan (WPAP) application and Organized Sewage Collection System (SCS) application covers Wolf Ranch West Section 6G, an 89.4-acre single family section within the Wolf Ranch master planned community.

This section includes the development of 116 single family homes and is located in the Edwards Aquifer Recharge and Contributing Zones. The project includes the construction of ±6,950 linear feet of public roadway, ±7,050 linear feet of 18" to 48" storm sewer, ±6,810 linear feet of 8" water line, and ±5,755 linear feet of 8" gravity wastewater within the Section 6G boundary. The limits of construction for this phase is 89.4 acres. This section is a part of the proposed larger Wolf Ranch Master Planned Community.

A portion of the site is located in the Edwards Aquifer Recharge Zone and a portion in the Edwards Aquifer Contributing Zone. The SCS covers the wastewater for Wolf Ranch West Section 6G to the first manhole outside of the Edwards Aquifer Recharge zone. The wastewater from Section 6G will gravity flow to an existing wastewater line constructed with Wolf Ranch West Section 8, Phase 1 and to a wastewater line that is under construction with Wolf Ranch Section 4G, in which both connect to the San Gabriel wastewater interceptor, and ultimately is treated at the City of Georgetown San Gabriel Wastewater Treatment Plant.

This WPAP covers the storm water generated by Wolf Ranch West 6G. The storm water from this Section will be treated in 3 different locations. The site will be treated by 2-proposed batch detention water quality ponds, and 1- proposed natural vegetative filter strip.

The 2-proposed batch detention water quality ponds as well as the 1-proposed filter strip were designed to accommodate the respective impervious cover and serve as the Permanent Best Management Practice (BMP) for the remainder of the site.

A SWPPP will also be filed with TCEQ per the requirements of the TPDES program for Wolf Ranch West Section 6G.

This site may possibly utilize imported fill material. That material shall consist of crushed limestone, select fill, and topsoil. The fill material will be used to facilitate drainage, roadway construction, and re-vegetation of the property and to elevate the building foundations.

All sensitive features and buffers are shown and labeled on the construction plans as per the Geological Assessment.

Horizon™
Environmental Services, Inc.

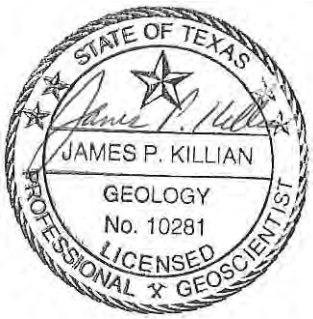
GEOLOGIC ASSESSMENT
767 ACRES – WOLF RANCH PROPERTIES
STATE HIGHWAY 29 WEST
GEORGETOWN, WILLIAMSON COUNTY, TEXAS
HJN 130219 GA

PREPARED FOR:

HILLWOOD COMMUNITIES
DALLAS, TEXAS

PREPARED BY:

HORIZON ENVIRONMENTAL SERVICES, INC.



NOVEMBER 2013

Updated Hillwood Wolf Ranch GA.docx

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.

TABLE OF CONTENTS

SECTION **PAGE**

LIST OF TABLES iii

LIST OF APPENDICES iii

TCEQ GEOLOGIC ASSESSMENT FORM 1
PROJECT INFORMATION 1
ADMINISTRATIVE INFORMATION 3

ADDITIONAL COMMENTS 4

1.0 INTRODUCTION AND METHODOLOGY 4

2.0 ENVIRONMENTAL SETTING 4
2.1 LAND USE 4
2.2 TOPOGRAPHY AND SURFACE WATER 5
2.3 EDWARDS AQUIFER ZONE 5
2.4 SURFACE SOILS 5
2.5 GEOLOGY 7
2.6 WATER WELLS 8
2.7 GEOLOGIC AND MANMADE FEATURES 9

3.0 CONCLUSIONS AND RECOMMENDATIONS 18

4.0 REFERENCES 20

LIST OF TABLES

TABLE		PAGE
1	SURFACE SOILS	1
2	GEOLOGIC STRATIGRAPHIC COLUMN	8

LIST OF APPENDICES

APPENDIX	
A	PROJECT FIGURES
B	SITE GEOLOGIC MAP
C	GEOLOGIC ASSESSMENT TABLE
D	SITE PHOTOGRAPHS

Horizon
Environmental Services, Inc.

TCEQ GEOLOGIC ASSESSMENT FORM

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

REGULATED ENTITY NAME: 767 acres – Wolf Ranch Properties;
SH 29 West Georgetown, Williamson County, Texas

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

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

PROJECT INFORMATION

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

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

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

TABLE 1 – SURFACE SOILS

Soil Units, Infiltration Characteristics & Thickness		
Soil Name	Group*	Thickness (feet)
Brackett gravelly clay loam, 3 to 16% slopes (BkE)	C	1 - 2
Eckrant cobbly clay, 1 to 8% slopes (EaD)	D	0.5 - 1
Eckrant extremely stony clay, 0 to 3% slopes (EeB)	D	0.5 - 1
Eckrant-Rock outcrop complex, rolling (ErE)	D	0.5 - 1
Eckrant-Rock outcrop complex, hilly (ErG)	D	0.5 - 1
Georgetown stony clay loam, 1 to 3% slopes (GsB)	D	2 - 4

* 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.

Oakalla soils, 0 to 1% channeled (Oc)	B	5 - 7
Sunev silty clay loam, 1 to 3% slopes (SuB)	B	9 - 11

3. X A **STRATIGRAPHIC COLUMN** is attached at the end of this form in the additional comments section and shows formations, members, and thicknesses. The outcropping unit should be at the top of the stratigraphic column (Appendix A, Figure 5).

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

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

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

Applicant's Site Plan Scale 1" = 200'
Site Geologic Map Scale 1" = 200'
Site Soils Map Scale (if more than 1 soil type) 1" = 1800'

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

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

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

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

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

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

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

Horizon
Environmental Services, Inc.

X There are 3 (#) wells and 0 test wells present on the project site, and the locations are shown and labeled. (Check all of the following that apply.)

- _ The test well is not in use and has been properly abandoned.
- X 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.

ADMINISTRATIVE INFORMATION

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

Date(s) Geologic Assessment was performed:

8 to 11, 17, 18, 22 to 25 October and 26 November 2013
Date(s)

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

For Horizon Environmental Services, Inc.

James Killian, PG[1]
Print Name of Geologist

(512) 328-2430, Ext. 112
Telephone

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

(512) 328-2633
Fax

Signature of Geologist

27 November 2013
Date

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

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

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

[1] Registered Professional Geologist, State of Texas

TCEQ GEOLOGIC ASSESSMENT
ADDITIONAL COMMENTS

1.0 INTRODUCTION AND METHODOLOGY

This report and the planned abatement measures are intended to fulfill Texas Commission on Environmental Quality (TCEQ) reporting requirements (TCEQ, 1999). This geologic assessment includes a review of the site for potential aquifer recharge and documentation of general geologic characteristics for the subject property. 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 property is undeveloped rangeland and/or woodland currently used for wildlife management. It consists of 4 separate tracts, totaling approximately 767 acres, located west of Georgetown, Williamson County, Texas along either side of State Highway (SH) 29 West (Appendix A, Figures 1 and 2). Five rural homesteads are located within the subject property, 4 of which are located throughout tract 1, and 1 abandoned homestead that is located near SH 29 in tract 3. Local electrical, sewer, and water utilities were observed along portions of the subject property. Surrounding land use consists of residential, undeveloped, and commercial properties. A privately owned golf course (Georgetown Country Club) is situated

along the Middle Fork of the San Gabriel River that divides part of tract 1. Additionally, Texas Crushed Stone Company operates 2 active (open pit) limestone quarries located immediately northwest and south of tract 2.

2.2 TOPOGRAPHY AND SURFACE WATER

The subject property is situated on gently to steeply sloping terrain along the Middle and South Forks of the San Gabriel River watershed (Appendix A, Figures 3A to 3C and 4A to 4D). Surface elevations vary from a minimum of approximately 700 feet above mean sea level (amsl) at the southeast boundary of tract 1 to a maximum of approximately 910 feet amsl at the northwest corner of tract 3. In general, slopes vary greatly depending on their proximity to the San Gabriel River and/or its surrounding tributaries.

Surface drainage occurs primarily by overland sheet flow into the Middle and South Forks of the San Gabriel River, which eventually converge into the San Gabriel River, located farther to the east. In addition, several unnamed intermittent tributaries located along portions of the subject property drain into the Middle and South Forks of the San Gabriel River.

2.3 EDWARDS AQUIFER ZONE

As shown in Appendix A, Figures 3A to 3C, approximately 686 acres of the subject property are found within the Edwards Aquifer Recharge Zone, as mapped by the TCEQ Recharge Zone Boundary Maps. However, select portions (about 81 acres near the South Fork of the San Gabriel River and its tributaries) are located outside of the recharge zone and mapped within the Edwards Aquifer Contributing Zone (TCEQ, 2013).

2.4 SURFACE SOILS

Mapping by the Natural Resources Conservation Service (NRCS, 2013) shows a total of 8 soil mapping units within the subject property (Appendix A, Figure 5) associated with soil series, as described below.

Brackett gravelly clay loam (BkE) occurs along an unnamed tributary of tract 2. 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.

Eckrant cobbly clay (EaD) is situated at the head of an unnamed tributary within the southwest corner of tract 4. 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 (EeB) occurs mostly in the southern property tracts (2 to 4) along nearly level to gently sloping broad ridges and shallow valleys of uplands. 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 limestone fragments, ranging from 3 inches to 3 feet across and as much as 10 inches thick. The soil is calcareous and moderately alkaline. This soil is well-drained, permeability is moderately slow, and surface runoff is rapid. The available water capacity is very low.

Eckrant-Rock outcrop complex, rolling (ErE) is located throughout most of the subject property. It 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. The other soils included in this complex are Doss, Denton, and Georgetown. Permeability is moderately slow and surface runoff is rapid. The available water capacity is very low.

Eckrant-Rock outcrop complex, hilly (ErG) occurs primarily within tract 1, 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 crest 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.

Georgetown stony clay loam (GsB) is situated within tracts 1 and 4 on higher parts of uplands. This soil has a slightly acid, brown stony clay loam surface layer about 7 inches thick and few to common stones on or near the surface. The subsoil, which extends down to a depth of about 35 inches, is neutral, reddish-brown clay in the upper part and slightly acid, 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 acid, and erosion hazards range to slight.

Oakalla soils, channeled (Oc) occur primarily along the bottomlands of the Middle Fork of the San Gabriel River within tract 1. The surface layer is dark brown loam about 7 inches thick, followed by a dark brown clay loam layer about 16 inches thick. The underlying layer, to 66 inches, is dark brown sandy clay loam. This soil is calcareous and moderately alkaline. The available water capacity is high.

Sunev silty clay loam (SuB) occurs primarily along gently sloping stream terraces of the subject property. 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, 2013).

2.5 GEOLOGY

A review of existing geologic literature shows that the subject property is predominately underlain by the undifferentiated Edwards Limestone Formation (Ked) Bureau of Economic Geology (UT-BEG, 1995), with an estimated maximum thickness of up to 100 feet at higher surface elevations (Appendix A, Figure 6, and Appendix B, Figures 1A to 1C). The Comanche Peak Limestone (Kc) crops out in select portions of the subject property, typically at lower surface elevations situated along the South and Middle Forks of the San Gabriel River and its tributaries (tracts 1, 2, and 4). Underlying the Comanche Peak Limestone is the Walnut Formation (Kwa). In general, the rock strata beneath the subject property dip to the east-southeast at about 10 to 30 feet per mile.

Additionally, recent (Quaternary-age) floodplain deposits (alluvium [Qal]) consisting of clay, silt, sand, and gravel occur within both forks of the San Gabriel River (tracts 1 and 4). Fluviatile terrace deposits (Qt) consist of gravel, sand, silt, and clay in various proportions, with gravel more prominent in the older, higher terraces; dolomite, limestone, and chert from the Edwards Plateau; and sand that is mostly quartz (UT-BEG, 1995). These deposits occur primarily along the sides of the South Fork of the San Gabriel River (tracts 2 and 4).

The subject property is located about 1 mile west of the Balcones Fault Zone and available geologic reports indicate that the immediate area has not been affected by geologically inactive, normal faulting. A normal fault is an inclined fault in which the hanging wall appears to have slipped downward relative to the footwall. The nearest mapped fault is located about 1 mile east of the subject property and strikes N10-15°E (UT-BEG, 1995).

Table 2 (below) depicts the stratigraphic relationship and approximate thicknesses of the uppermost geologic unit found at the subject property.

TABLE 2 – GEOLOGIC STRATIGRAPHIC COLUMN

Geologic Period	Hydrologic Unit	Geologic Unit	Geologic Member	Approximate Thickness (feet)	Description
Lower Cretaceous	Edwards Aquifer	Edwards Formation (Ked)	--	Up to 100	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. Moderate to high cave development.
Lower Cretaceous	Edwards Aquifer	Comanche Peak Formation (Kc)	--	60	Gray to very light brown, fine-grained, nodular limestone, marly limestone, and marl. No cave development.
Lower Cretaceous	Confining Unit	Walnut Formation (Kwa)	--	175	Composed of 4 thinly bedded limestone and marl members (Keys Valley Marl, Cedar Park Limestone, Bee Cave Marl, and Bull Creek Limestone). Low cave development.

2.6 WATER WELLS

A search was made for water wells on and within 0.5 miles of the subject property. A review of the records of the TCEQ and the Texas Water Development Board (TWDB) revealed no water wells at the subject property. However, there was evidence of water wells present during the field investigation. Three unused private water wells were found, including 2 cased wells (M-6 and M-11) in tracts 3 and 1, respectively, and an old, apparently collapsed (hand-dug) well (M-5) in tract 3 behind an abandoned homestead. The results of this survey do not preclude the existence of additional unused/abandoned wells.

Five documented water wells were found within 0.5 miles from the subject property (TWDB, 2013). Three of these water wells are reported to be test holes that were completed in the Edwards Formation at total depths ranging from 105 to 134 feet. The fourth water well (No. 5819706) is reported to have been completed in the Glen Rose Formation (Upper and/or Middle Trinity aquifers) at a total depth of 898 feet. The fifth water well (No. 5819822) is reported to be a natural groundwater spring and is not a water well. Appendix A, Figures 3A to 3C, show the water well/spring locations.

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

A field survey of the subject property was conducted by a licensed Horizon geologist with support staff on 8 to 11, 17, 18, and 22 to 25 October 2013. A total of 32 natural geologic features (F-1 to F-22, F-22A, and F-23 to F-31) were identified and are further described below. In addition, 3 natural geologic features (NF-7 [F-32], NF-5 [F-33], and NF-1 [F-34]) have been included in this survey from previous investigation(s) for proposed roadway alignment of Wolf Ranch Parkway conducted by HDR Engineering, Inc. and SWCA Environmental Consultants in December 2010.

A total of 12 manmade features (M-1 to M-12) were found at the subject property. Three manmade features (M-1 to M-3) in tract 4 were identified as sanitary sewer manholes. These manholes and their associated underground sewer line(s) are maintained by the City of Georgetown and appeared to be in good working condition. Manmade feature M-4 is a borrow pit (about 200 feet long x 120 feet wide x 20 feet deep) located in the northwest corner of tract 3 and has apparently been partially filled in with boulders, rubble, dirt fill, and scattered inert waste debris (e.g., wood, tin, etc.). Three manmade features (M-5, M-6, and M-11) identified as unused, private water wells (previously described) were found at the subject property (tracts 1 and 3). Four manmade features (M-7 to M-10) in tract 1 are part of an existing storm water retention pond system, also maintained by the City of Georgetown. The last manmade feature (M-12) is a large stock pond within an unnamed tributary of the South Fork of the San Gabriel River (southwest corner of tract 2).

Geologic Feature F-1 (tract 4): Solution-enlarged fracture (azimuth: N280ºW) measuring approximately 4 feet long x 1 foot wide x 2.5 feet deep with apparent drainage portal openings amongst loose, in-filled rocks. Very slight air flow conductivity was noted. After limited hand excavation, probing with a steel rod encountered additional small rocks and/or cobbles down about 3.5 to 4 feet below the surface. This feature has an intermediate infiltration rate and a surface runoff catchment of less than 0.25 acres.

Geologic Feature F-2 (tract 4): Upland sinkhole measuring approximately 15 feet in diameter x 3 feet deep with open drainage portal measuring 7 feet long x 4.5 feet wide x 4 feet deep near center of sink. Air flow conductivity was noted. A low (1 to 3 feet high), bedding plane void appears to extend for over 15 feet to the west, north, and east from the entrance drop. This void area 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. This cave appears to have been previously excavated based on the presence of dirt/rock piles located on the surface, immediately to the southwest. In addition, old flagging tape attached to tree limbs was observed near the entrance. Inside the cave, the

floor consists of thick, dry to moist, very dark gray to black clay and loose rocks and appears to slope down toward the east, for about 10 feet from the entrance, into an apparent internal drain of unknown extent. This cave has a high infiltration rate and a surface runoff catchment of less than 1.7 acres.

Geologic Feature F-3 (tract 4): Solution cavity measuring approximately 1.5 feet in diameter x 1.5 feet deep. This feature is clay-filled with no apparent drainage portals or air flow conductivity. Probing with a steel rod encountered firmer clay soil and cobbles about 2 to 2.5 feet below the surface. The feature appears to have been previously excavated based on the presence of small dirt/rock piles located on the surface, immediately to the south. In addition, old flagging tape attached to tree limbs was observed near the opening. This feature has a low infiltration rate and a surface runoff catchment of less than 0.1 acres.

Geologic Feature F-4 (tract 4): Two small solution cavities spaced about 2 feet apart near the base of a small cedar elm tree. One solution cavity measures approximately 0.4 feet long x 0.2 feet wide x 1.5 feet deep with an apparent drainage portal. Slight air flow conductivity was noted. The second cavity measures approximately 0.4 feet long x 0.2 feet wide x 0.5 feet deep with no apparent drainage portal or air flow conductivity. Probing with a steel rod encountered firmer clay soil/rocks about 1.5 feet below the surface. This feature has an intermediate infiltration rate and a surface runoff catchment of less than 0.25 acres.

Geologic Feature F-5 (tract 3): Large upland sinkhole measuring approximately 25 feet in diameter x 4 feet deep next to a big live oak tree. Within the center of the sinkhole is an open drainage portal measuring about 8 feet long x 2.5 feet wide x 1.5 feet deep. Strong air flow conductivity was noted. A low (1 to 4 feet high) bedding plane void room appears to extend from the opening in a west-to-south direction for about 30 feet. At the southwest end of this room is a headwall with an underlying, low opening which leads into a larger, open room about 100 feet long x 60 feet wide x 3 to 8 feet high. 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. According to available records, this cave was previously discovered in 1991 and has been officially named **Lobo's Lair Cave** (TPWD, 2013). Inside the cave, the floor areas consist of loose rock and thin, dry to moist, black and red clay. An apparent large internal drain of unknown extent is located within the cave's largest room. At the back of the cave is an upper room with an open connection (skylight) leading back up to the surface that measures about 3 feet long x 2.5 feet wide x 6 feet deep. This cave has a very high infiltration rate and a surface runoff catchment of less than 1.7 acres.

Geologic Feature F-6 (tract 3): Solution cavity measuring approximately 3 feet long x 2 feet wide x 1.5 feet deep with no apparent drainage portal openings or air flow conductivity. Probing with a steel rod encountered clay soil and cobbles about 2.5 feet below the feature's floor. This feature appears to have been previously excavated based on the presence of small dirt/rock piles located on the immediate surrounding surface. In addition, old flagging tape attached to bushes/tree limbs was observed near the feature. This feature has a low infiltration

rate and a surface runoff catchment of less than 0.1 acres. Additionally, there is a large, non-karst, closed depression located about 10 feet north of the solution cavity feature that measures 18 feet in diameter x 2 feet deep with a thick, dense, reddish-brown clay floor. Probing with a steel rod encountered firm clay soil and cobbles about 2 feet below the feature's floor, and no internal drainage portals/pathways were found along the extent of its floor.

Geologic Feature F-7 (about 60 feet west/southwest of Feature F-6; adjacent to tract 3): Large upland sinkhole measuring approximately 25 feet in diameter x 3 to 4 feet deep. Within the center of the sinkhole is a live oak tree that has a large taproot extending into an open drainage portal measuring about 8 feet long x 5 feet wide x 5 feet deep. Additional rock-choked drainage portals occur along the south side of the opening. Air flow conductivity was noted. A low (1 to 3.5 feet high) bedding plane void room appears to extend from the opening in an eastern direction for over 40 feet. At the east end of this room is an internal drain of unknown extent. 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. According to available records, this cave was previously discovered in 1991 and has been officially named **Wolf's Rattlesnake Cave** (TPWD, 2013). Inside the cave, the floor areas consist of dry to moist black clay and loose rocks. This cave has a very high infiltration rate and a surface runoff catchment of less than 1.7 acres.

Geologic Feature F-8 (tract 3): Solution cavity measuring approximately 3 feet long x 2 feet wide x 2.5 feet deep with apparent drainage portal openings amongst loose, in-filled rocks and dark gray clay. Slight air flow conductivity was noted. After limited hand excavation, probing with a steel rod encountered additional small rocks and/or cobbles down about 5 feet below the surface. This feature has an intermediate infiltration rate and a surface runoff catchment of less than 0.25 acres.

Geologic Feature F-9: Large upland sinkhole measuring approximately 30 feet long x 20 feet wide x 3 feet deep within a wooded area. Near the middle of the sinkhole are two open drainage portals, the larger measuring about 7 feet in diameter x 4 feet deep and the smaller measuring 3 feet in diameter x 8 feet deep. Air flow conductivity was noted only at the smaller, but deeper drainage portal opening. This feature appears to have been previously excavated based on the presence of large dirt/rock piles located on the surface near both openings. In addition, a blue tarp was partially draped over the top of the smaller (vertical) opening. At the base of the smaller opening, a low (1 to 4 feet high) bedding plane void room appears to extend in a northeast-to-southeast direction for over 40 to 60 feet. At the east end of this room is an internal drain of unknown extent that had incised scour marks along the clay/rock floor that leads back upslope to where the larger portal opening on the surface is located. Another room that trends farther to the northeast (at least 35 feet long x 10 feet wide; unknown full extent) with higher ceiling heights was visible through a low crawlway at the north side of the bedding plane room. 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. According to available records, this sink/cave was previously

discovered and has been officially named **Wolf's Algorita Sink** (TSS, 2013). Inside the cave, the floor areas consist of loose rock and thin, dry to moist, black and red clay. This cave has a high infiltration rate and a surface runoff catchment of less than 1.7 acres.

Geologic Feature F-10 (tract 3): Solution cavity measuring approximately 1 foot long x 0.5 feet wide x 2 feet deep within a small sinkhole (6 feet long x 7 feet wide x 2 feet deep) with apparent drainage portal openings amongst loose, in-filled rocks and dark gray clay. Slight air flow conductivity was noted. After limited hand excavation, probing with a steel rod encountered additional small rocks and/or cobbles down about 3 feet below the surface. This feature has an intermediate infiltration rate and a surface runoff catchment of less than 0.25 acres.

Geologic Feature F-11 (tract 3): Very large upland sinkhole measuring approximately 60 feet long x 45 feet wide x 4 to 7 feet deep containing a large cedar elm tree and small trees/brush. Along the north central side of the sinkhole is a partially rimmed edge of exposed bedrock (about 80 to 100 feet long) with multiple drainage portal openings. Two of the largest openings are spaced about 40 to 50 feet apart and measure approximately 7 feet long x 5 feet wide x 3 feet deep and 8 feet long x 2 feet high. Strong air flow conductivity was noted at each opening. Multiple bedding plane void rooms and/or passages ranging from 1 to 7 feet high appeared to extend in a general west-to-southeast direction from the openings. Two large internal drains are present about 40 feet and 80 feet due north/northeast from the larger opening. Another internal drain appears to be present at the west interior side based on floor slopes observed from the smaller opening entrance. 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. According to available records, this cave was previously discovered in 1983 and has been officially named **Wolf Cave** (TSS, 2013). Inside the cave, the floor areas consist of loose rock and thin, dry to moist, black and red clay. This cave has a very high infiltration rate and a surface runoff catchment of less than 2 acres.

Geologic Feature F-12 (tract 3): Upland sinkhole measuring approximately 15 feet in diameter x 3 feet deep with a partially open (rock-choked) drainage portal measuring 4 feet long x 3.5 feet wide x 3 feet deep near center of sink. A second, smaller drainage portal (solution-enlarged fracture) about 1 foot x 0.4 feet wide x 2 feet deep is located about 10 feet upslope of the larger portal. Air flow conductivity was noted at both openings. This feature has a high infiltration rate and a surface runoff catchment of less than 0.25 acres.

Geologic Feature F-13 (tract 3): Very large upland sinkhole measuring approximately 60 feet long x 50 feet wide x 4 to 7 feet deep with an open drainage portal measuring 7 feet long x 4 feet wide x 7 feet deep near the center of sink. Very strong air flow conductivity was noted when standing above this area. The drainage portal drops another 10 feet, at a 35 degree angle, to an area that has been blocked off by in-filled rocks. On 14 November 2013, Horizon staff excavated feature F-13 with a backhoe down to the lower, in-filled rock area; however, further entry was not possible due to very large rocks blocking the passage. Based on the

presence of excessive air flow conductivity, the potential for additional subgrade passage is very probable. 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. A large pecan tree is located immediately east of the sink edge and an unused private water well (M-6) is located to the south of this feature, about 60 to 70 feet away. According to available records, this sink/cave was previously discovered and has been officially named **Wolf's Pecan Sink** (TSS, 2013). This cave has a very high infiltration rate and a surface runoff catchment of less than 2 acres.

Geologic Feature F-14 (tract 1): Small solution cavity with visible groundwater discharge (spring) located along the side of an unnamed tributary to the Middle Fork of the San Gabriel River. This feature has a very slow discharge rate from an opening that measures about 0.4 feet in diameter x 2 feet long. No air flow conductivity was noted. This spring is classified as a discharge geologic feature and does not have an infiltration rate or surface runoff catchment. It apparently was used to water livestock based on the presence of a nearby (concrete) watering trough and piping from the trough to a small concreted trap at the head of the spring.

Geologic Feature F-15 (tract 1): Upland sinkhole measuring approximately 20 feet in diameter x 2 feet deep within a Texas persimmon/dead cedar thicket. Near the center of this sinkhole is an open drainage portal (solution-enlarged fracture [azimuth: N65ºE]) measuring approximately 8 feet long x 2 feet wide x over 27 feet deep. The opening had been covered with cedar posts to keep livestock from falling into it. After removing some of these posts from the opening, air flow conductivity was noted. 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. Due to the feature's smooth walls and narrowing width at about 13 feet below grade, entry was not possible to determine if additional subgrade passages are present. This cave has a high infiltration rate and a surface runoff catchment of less than 1.7 acres.

Geologic Feature F-16 (tract 1): Solution-enlarged fracture (azimuth: N70ºE) measuring approximately 4 feet long x 1.8 feet wide x 15 feet deep. Slight air flow conductivity was noted. Due to the feature's smooth walls and vertical depth, entry was not possible during the survey to determine if additional subgrade passages were present. (Climbing gear is required.) On 14 November 2013, Horizon staff rigged a cable ladder and were able to enter into a large horizontal bedding plane void (~120 feet long x 20 feet wide x 3 to 4 feet high) at the base of the entrance drop that extends to the southwest for approximately 20 feet and to the northeast for approximately 100 feet. 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. Inside the cave, the floor areas consist of loose rock and thin to thick, moist, black and red clay. This cave has a high infiltration rate and a surface runoff catchment of less than 1.7 acres.

Geologic Feature F-17 (tract 1): Upland sinkhole measuring approximately 12 feet long x 10 feet wide x 2 feet deep with a clay-filled solution cavity about 2 feet long x 1 foot wide x 1 foot deep near the center of sink. No air flow conductivity was noted and the cavity had no apparent drainage portals. Some of the solution cavity had been dug into by an animal. Probing with a steel rod encountered firmer clay soil/rocks about 3 feet below the surface. This feature has a low infiltration rate and a surface runoff catchment of less than 0.1 acres.

Geologic Feature F-18 (tract 1): Large upland sinkhole measuring approximately 30 feet long x 20 feet wide x 4 feet deep within a wooded area. Near the middle of the sinkhole are several small (2 to 6 inches), open drainage portals amongst loose rocks and old household trash debris (e.g., tin cans, bottles, etc.). Strong air flow conductivity was noted at most of the portals and even around some of the buried trash debris. This feature, in its present condition, does not meet the requirements to be classified as a cave; however, a very high probability exists based on the air flow conductivity and overall size of the sinkhole, without massive amounts of in-filled fine material. On 13 November 2013, Horizon staff excavated down about 7 feet near the center of the sinkhole using a backhoe and discovered a small horizontal bedding plane room (~ 20 feet long x 10 feet wide x 2 to 3 feet high) along the west side of the entrance drop. At the west side of this room is a headwall with an underlying low opening that leads into a larger bedding plane void room about 35 feet long x 25 feet wide x 0.5 to 2.5 feet high. Along the west side of this lower room is an upper bedding plane void that could not be entered, which is about 15 feet wide x 2.5 feet high x at least 10 feet long (unknown southwest extent). 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. This cave has a high infiltration rate and a surface runoff catchment of less than 1.7 acres.

Geologic Feature F-19 (tract 1): Upland sinkhole measuring approximately 20 feet long x 12 feet wide x 2 feet deep with large rocks and a semi-open (clay and rock) drainage portal measuring about 0.3 feet in diameter x 1 foot deep near the north central part of sink. Very slight air flow conductivity was noted. This feature has an intermediate infiltration rate and a surface runoff catchment of less than 0.25 acres.

Geologic Feature F-20 (tract 1): Solution cavity measuring approximately 0.7 feet in diameter x 2 feet deep with an apparent drainage portal opening amongst loose, in-filled rocks and dark gray clay. Slight air flow conductivity was noted. After limited hand excavation, probing with a steel rod encountered additional small rocks and/or cobbles down about 3 feet below the surface. This feature has an intermediate infiltration rate and a surface runoff catchment of less than 0.25 acres.

Geologic Feature F-21 (tract 2): Two small solution cavities spaced about 8 feet apart. The larger cavity measures approximately 0.8 feet long x 0.6 feet wide x 1 foot deep with clay floor. The smaller cavity measures approximately 0.5 feet long x 0.2 feet wide x 1.5 feet deep with an apparent drainage portal amongst loose, in-filled rocks and dark gray clay. Slight

air flow conductivity was noted only at the smaller cavity. After limited hand excavation, probing with a steel rod encountered additional small rocks and/or cobbles down about 2 feet below the surface. This feature has an intermediate infiltration rate and a surface runoff catchment of less than 0.25 acres.

Geologic Feature F-22 (tract 2): Solution-enlarged fracture (azimuth: N85ºE) measuring approximately 2 feet long x 0.5 feet wide x 5 feet deep within a small sinkhole (8 feet in diameter x 2 feet deep) with apparent drainage portal openings amongst loose, in-filled rocks and dark gray clay. Slight air flow conductivity was noted. After limited hand excavation, probing with a steel rod encountered additional small rocks and/or cobbles down about 6 feet below the surface. This feature has an intermediate infiltration rate and a surface runoff catchment of less than 0.25 acres.

Geologic Feature F-22A (tract 2): Solution cavity about 35 feet south-southeast of F-22 that measures approximately 1 foot long x 0.3 feet wide x 2.5 feet deep with apparent drainage portal opening amongst loose, in-filled rocks and dark gray clay. Slight air flow conductivity was noted. After limited hand excavation, probing with a steel rod encountered additional small rocks and/or cobbles down about 3.5 feet below the surface. This feature has an intermediate infiltration rate and a surface runoff catchment of less than 0.25 acres.

Geologic Feature F-23 (tract 2): Solution cavity by Texas persimmon trees measuring approximately 1.5 feet long x 0.7 feet wide x 3 feet deep with apparent drainage portal opening amongst loose, in-filled rocks and dark gray clay. Slight air flow conductivity was noted. After limited hand excavation, probing with a steel rod encountered additional small rocks and/or cobbles down about 4 feet below the surface. This feature has an intermediate infiltration rate and a surface runoff catchment of less than 0.25 acres.

Geologic Feature F-24 (tract 2): Small sinkhole measuring approximately 6 feet long x 5 feet wide x 2 feet deep with a clay-filled small solution cavity near center of sink. No air flow conductivity was noted. After limited hand excavation, probing with a steel rod encountered additional clay/small rocks and cobbles down about 3 feet below the surface. This feature has a low infiltration rate and a surface runoff catchment of less than 0.1 acres.

Geologic Feature F-25 (tract 2): Two small solution cavities with visible groundwater discharge (spring) located along the side of an unnamed tributary to the South Fork of the San Gabriel River. This feature had a slow to moderate discharge rate from openings that measure, on average, about 0.3 feet high x 2.5 feet long. No air flow conductivity was noted. This spring is classified as a discharge geologic feature and does not have an infiltration rate or surface runoff catchment.

Geologic Feature F-26 (tract 2): Solution cavity measuring approximately 1 foot long x 0.7 feet wide x 1.2 feet deep with no apparent drainage portal openings or air flow conductivity. Probing with a steel rod encountered clay soil and cobbles about 2 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 F-27 (tract 2): Upland sinkhole measuring approximately 12 feet long x 10 feet wide x 2 feet deep along the side of a narrow drainage swale in a wooded area about 100 feet south of SH 29. Near the east side of the sinkhole was a very small (0.3 feet in diameter x 1 foot deep) drainage portal amongst loose rocks and leaf litter. Air flow conductivity was noted at this portal. On 13 November 2013, Horizon staff excavated Feature F-27 down to bedrock (~7 feet below the surface) with a backhoe. A small void measuring about 3 feet wide x 1 foot high was found approximately 4.5 feet below surface grade along the southwest side that extended about 5 feet horizontally. However, no open drainage portals or air flow conductivity was found within this void area. Probing with a steel rod encountered additional densely packed dark gray clay soil within the floor of this void area. Based on the results of the excavation, this feature has a low infiltration rate and minimal catchment (<0.1 acres) area for surface water runoff. All material was placed back into subject excavated area.

Geologic Feature F-28 (tract 2): Large upland sinkhole measuring approximately 30 feet long x 15 feet wide x 2 feet deep in a thickly wooded area. Within the north central part of the sinkhole is an open drainage portal (solutioned-enlarged fracture; azimuth: N330ºW) measuring about 3 feet long x 1.8 feet wide x 3.5 feet deep. Air flow conductivity was noted. A low (1 to 3 feet high) bedding plane void room extends from the opening in a northeast to east direction for about 15 feet. At the north side of this room is a headwall with an underlying, low opening that leads into a larger bedding plane void room about 40 feet long x 35 feet wide x 0.5 to 2.5 feet high. Additionally, several smaller (0.2 to 0.4 feet in diameter x 2 feet deep) drainage portals occur up on the surface along the southeast part of the sinkhole. These surface drainage portals appear to connect into the underlying subgrade void passages. 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. Inside the cave, the floor areas consist of loose rock and thin to thick, dry to moist, black and red clay. This cave has a very high infiltration rate and a surface runoff catchment of less than 1.7 acres.

Geologic Feature F-29 (tract 2): Large upland sinkhole measuring approximately 30 feet long x 25 feet wide x 4 feet deep with 2 semi-open (clay and rock) drainage portals on opposite sides (east and west) measuring about 2 feet long x 1.5 feet wide x 1.5 feet deep and 1.5 feet long x 1 foot wide x 1 foot deep. Slight air flow conductivity was noted. Most of the sinkhole has thick amounts of in-filled clay/cobbles and Texas persimmon trees upslope along the edge. This feature has an intermediate infiltration rate and a surface runoff catchment of less than 0.25 acres.

Geologic Feature F-30 (tract 2): Large upland sinkhole measuring approximately 40 feet long x 35 feet wide x 3 to 4 feet deep with an open drainage portal measuring 5 feet long x 2.5 feet wide x 6 feet deep near the center of sink. Air flow conductivity was noted. Sections of

cattle panel fencing were erected around the perimeter of this portal to keep out livestock. The drainage portal extends toward the southeast in a low, small room about 8 feet long x 4 feet wide x 3 feet high. From this room, a low (1 to 1.5 feet high) crawlway curves toward the east-northeast for another 32 feet where massive amounts of in-filled clay have invaded the area and prevent further entry. Very low (0.5 feet high) bedding plane voids continue off to the east/northeast for an unknown extent. Inside, a large, apparent drain could be seen in the floor about 10 feet to the north. 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. According to available records, this sink/cave was previously discovered and has been officially named **Grape Arbor Sink** (TSS, 2013). This cave has a high infiltration rate and a surface runoff catchment of less than 2 acres.

Geologic Feature F-31 (tract 2): Solution cavity measuring approximately 1 foot long x 0.8 feet wide x 1.5 feet deep within a small sinkhole (4 feet long x 3 feet wide x 2.5 feet deep) with apparent drainage portal openings amongst loose, in-filled rocks and dark gray clay. Slight air flow conductivity was noted. After limited hand excavation, probing with a steel rod encountered additional small rocks and/or cobbles down about 3 feet below the surface. This feature has an intermediate infiltration rate and a surface runoff catchment of less than 0.25 acres.

Geologic Feature F-32 (NF-7; tract 4): Previously excavated solution cavity measuring approximately 4 feet long x 2 feet wide x 8 feet deep within small sinkhole about 7 feet in diameter x 1 foot deep. A brown tarp was lying partially inside the feature. Upon entry, a void occurs to the south about 4 feet long x 3 feet wide x 3 feet high. Slight air flow conductivity was noted from a smaller void (3 inches high x 6 inches wide) located along the floor's east side that appears to extend horizontally about 8 feet. This open area appears to function as the feature's primary drainage portal. This feature has an intermediate infiltration rate and a surface runoff catchment of less than 0.25 acres.

Geologic Feature F-33 (NF-5; tract 4): Previously excavated solution cavity measuring approximately 3 feet long x 2 feet wide x 4.5 feet deep with no apparent drainage portals, horizontal bedding plane voids, or air flow conductivity. A green tarp was lying inside one side of feature and excavated spoil piles are present immediately west of the opening. Probing with a steel rod encountered clay soil and cobbles about 6 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 F-34 (NF-1; tract 4): Small solution cavity measuring approximately 2 feet long x 1 foot wide x 2 feet deep that narrows down to 0.3 feet in diameter with clay-filled floor. No air flow conductivity was noted. Old pink flagging was present on nearby trees. Probing with a steel rod encountered clay soil and cobbles about 3 feet below the feature's floor. This feature has a low infiltration rate and a surface runoff catchment of less than 0.1 acres.

Maps detailing site geology and the location of geologic and manmade features are provided in Appendix B (Figures 1A to 1C). Further information pertaining to the geologic and manmade features is provided in the Geologic Assessment Table (Appendix C). Photographs of the geologic features and select manmade features are also provided in Appendix D.

3.0 CONCLUSIONS AND RECOMMENDATIONS

A total of 35 natural geologic features and 12 manmade features were identified at the subject property. All of these 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 grades 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).

Twenty-five geologic features (F-1, F-2, F-4, F-5, F-7 to F-13, F-15, F-16, F-18 to F-22, F-22A, F-23, and F-28 to F-32) have been evaluated as sensitive for groundwater recharge capability and would therefore require TCEQ protective setback buffers. In general, a protective buffer encompassing sensitive features is recommended to meet the TCEQ guidance for a setback of at least 50 feet in all directions from each feature's areal extent (perimeter), plus each feature's watershed catchment up to 200 feet from the perimeter of each feature. However, a larger protective buffer for 11 of these (cave) features (F-2, F-5, F-7, F-9, F-11, F-13, F-15, F-16, F-18, F-28, and F-30) is recommended to meet the TCEQ guidance for a setback for features identified as caves. Caves with an unknown subsurface footprint are 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.

The 10 remaining geologic features (F-3, F-6, F-14, F-17, F-24 to F-27, F-33, and F-34) 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 F-3, F-6, F-17, F-24, F-26, and F-27 other than the placement of compactable, fine-grained soil, in appropriate lifts, to bring the ground surface to proposed grade for subject property development. Features F-14 and F-25 are active groundwater discharge features (springs) and the placement of compactable fill over these is not recommended. Additionally, all of the manmade features have been evaluated as non-sensitive for groundwater recharge capability and would therefore not require TCEQ protective setback buffers.

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

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

4.0 REFERENCES

(CAPCOG) Capital Area Council of Governments. *Data, Maps, and Reports.* Contours 10 Foot Merge. <http://www.capcog.org/data-maps-and-reports/geospatial-data/>. Accessed 29 October 2013.

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

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

_____. US Department of Agriculture, Natural Resources Conservation Service. 2013. Web Soil Survey, <http://websoilsurvey.nrcs.usda.gov/app/WebSoilSurvey.aspx>. Accessed 29 October 2013.

(TCEQ) Texas Commission on Environmental Quality. *Complying with the Edwards Aquifer Rules: Administrative Guidance,* Revised August 1999.

_____. Instructions to Geologists for completing Geologic Assessments within the Edwards Aquifer Recharge Zone, Revised October 2004.

_____. Edwards Aquifer Protection Program. Edwards Aquifer Viewer, <http://gis3.tceq.state.tx.us/website/iredwards2/ viewer.htm>. Accessed 29 October 2013.

(TPWD) Texas Parks and Wildlife Department. Natural Diversity Database, T/E and Rare Species Elemental Occurrences. Wildlife Division, Habitat Assessment Program, Austin, Texas. 14 October 2013.

(TSS) (TSS) Texas Speleological Society. *(Cave or Property Name)* Data Search. Editor *Andy Gluescamp, Ph.D.* Data Search: November 2013.

(TWDB) Texas Water Development Board. Water Information Integration and Dissemination System. TWDB Groundwater Database (ArcIMS), <http://wiid.twdb.state.tx.us/ims/ wwm_drl/viewer.htm?DISCL=1&>. Accessed 29 October 2013.

(USGS) US Geological Survey. 7.5-minute series topographic maps, Georgetown, Texas, quadrangle, 1982.

_____. 7.5-minute series topographic maps, Round Rock, Texas, quadrangle, 1987.

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

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

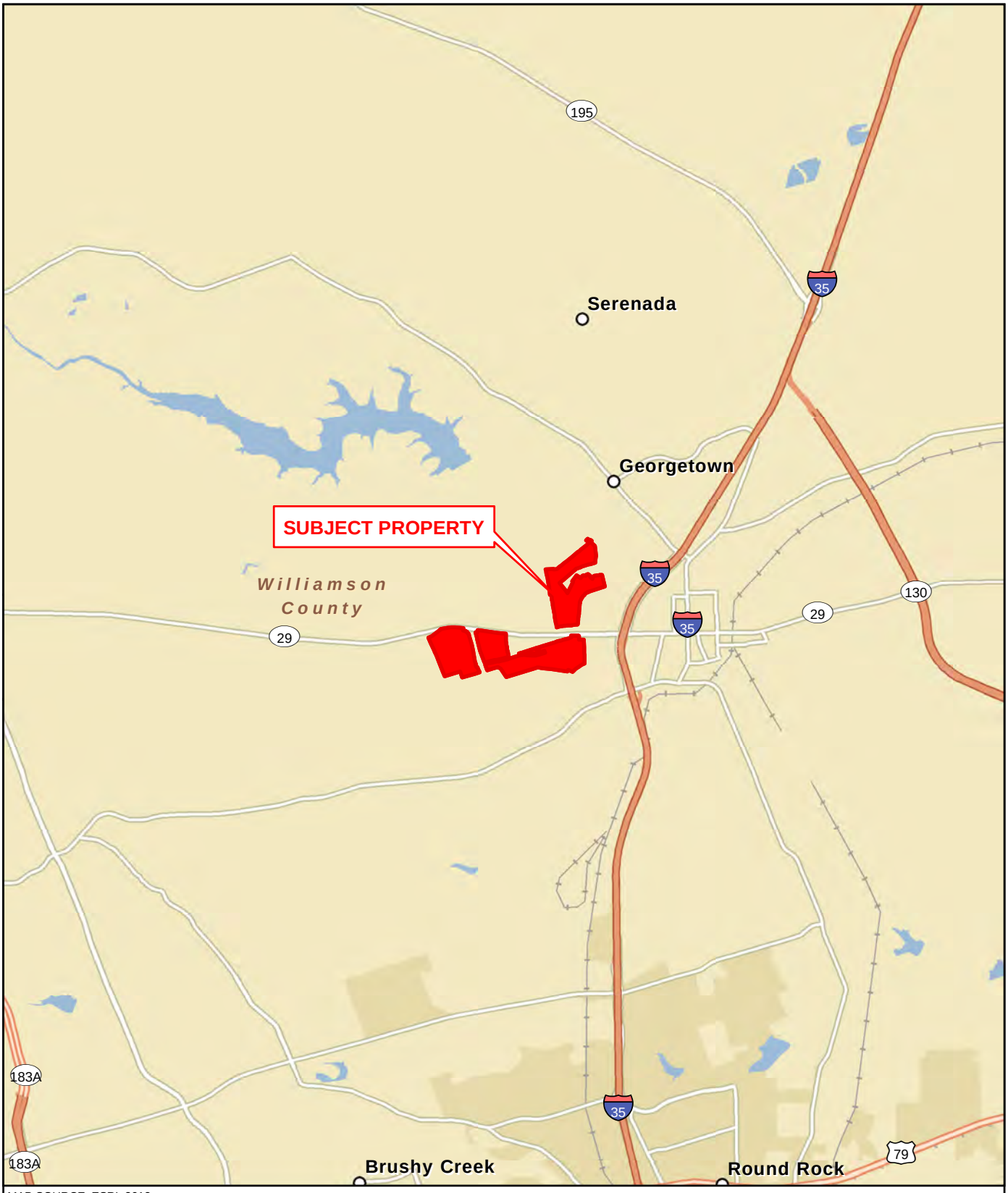
(Werchan et al.) Werchan, L. E., and J. L. Coker. Soil survey of Williamson County, Texas. Soil Conservation Service, US Department of Agriculture, Washington, D.C. 1983.

Horizon
Environmental Services, Inc.

APPENDIX A

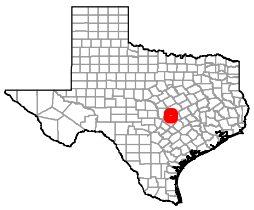
PROJECT FIGURES

130219 - Hillwood Wolf Ranch\Graphics\GA Graphics\130219A01GA_Vicinity.mxd | REM | 10-29-2013



MAP SOURCE: ESRI, 2012.

0 1 2
Miles

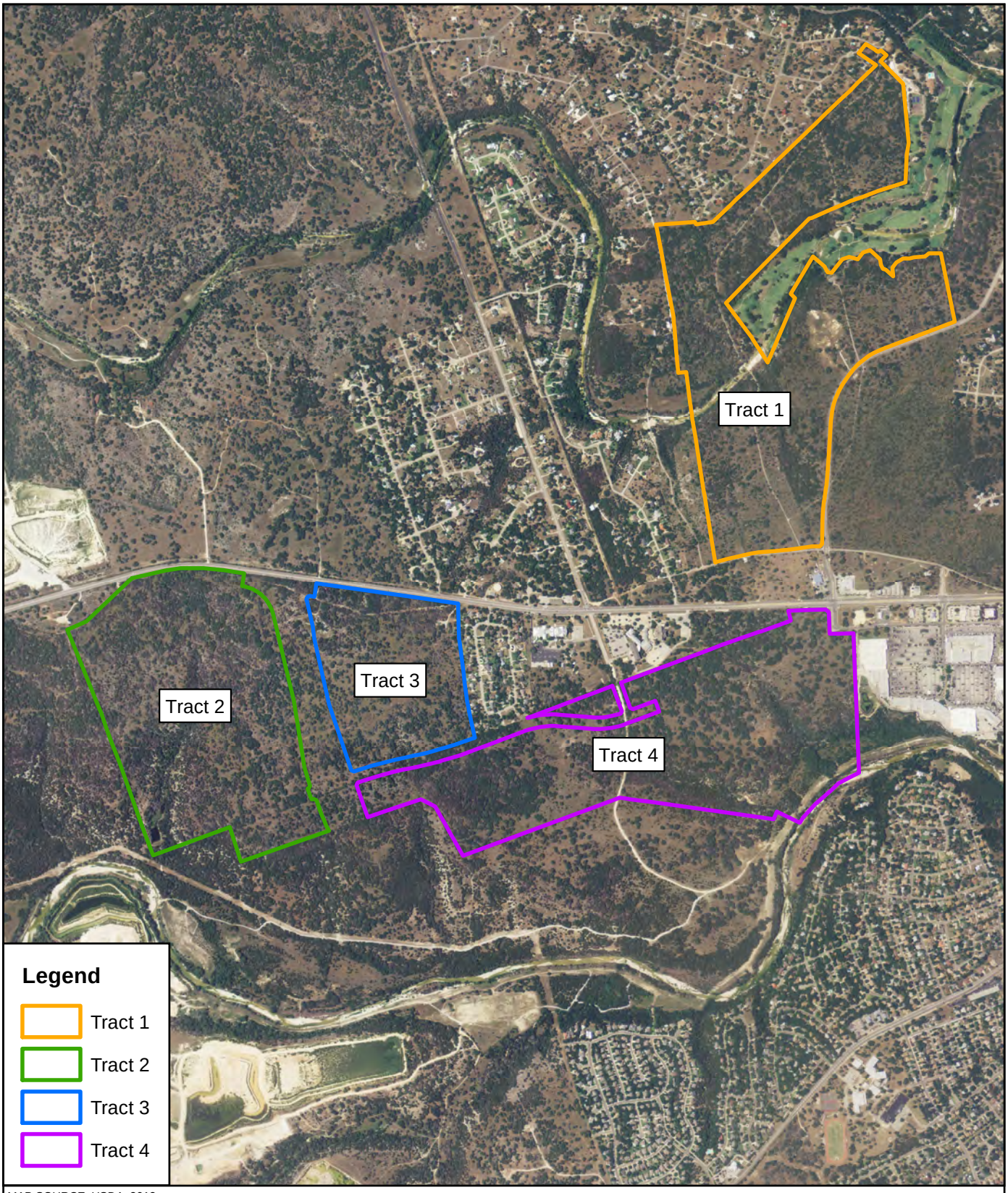


Horizon Environmental Services, Inc.

APPENDIX A, FIGURE 1

VICINITY MAP
767-ACRE HILLWOOD
WOLF RANCH
GEORGETOWN,
WILLIAMSON COUNTY, TEXAS

130219 - Hillwood Wolf Ranch\Graphics\GA Graphics\130219A02GA_Overall.mxd | REM | 10-29-2013



MAP SOURCE: USDA, 2012.

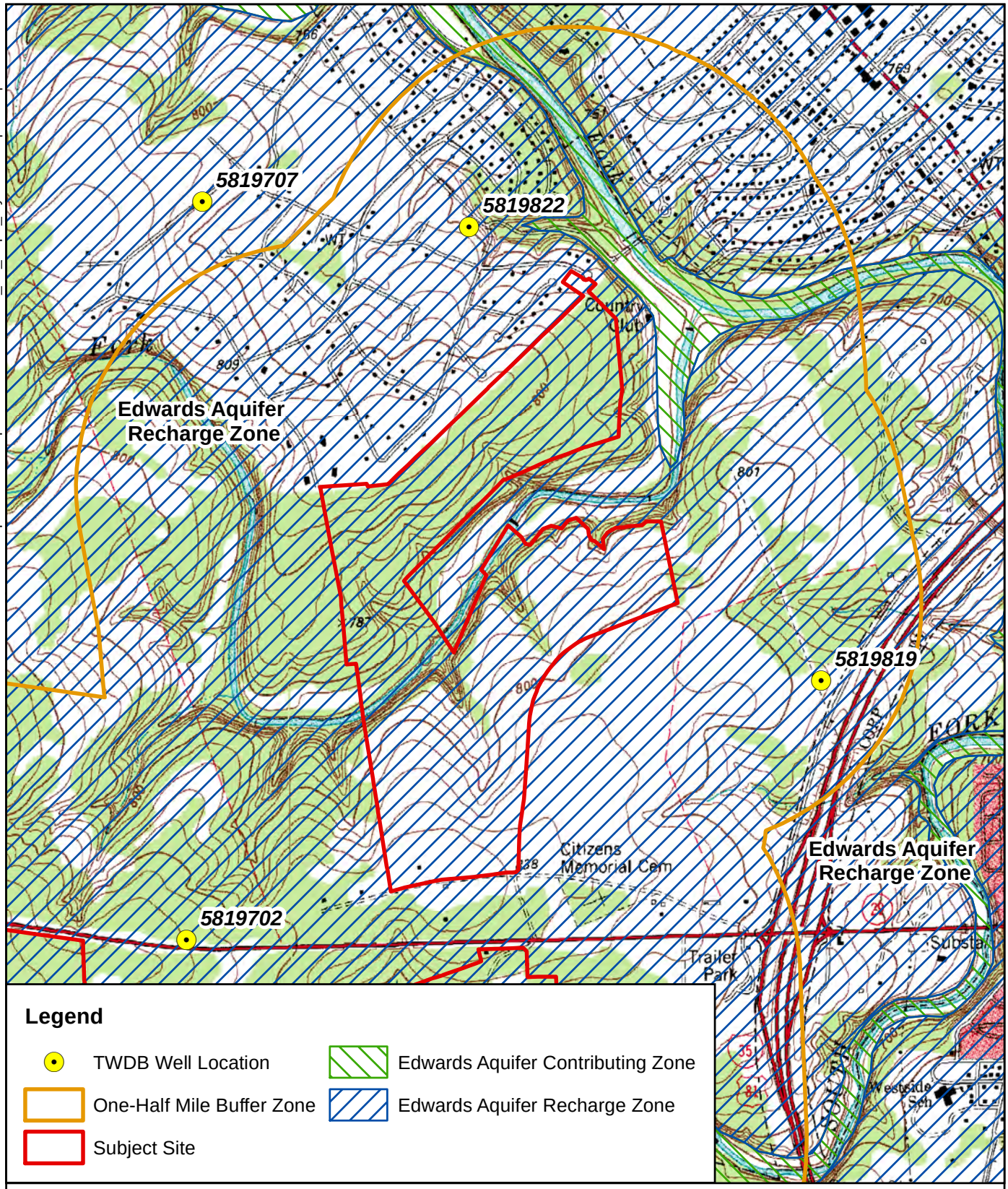
0 900 1,800
Feet

Horizon Environmental Services, Inc.

APPENDIX A, FIGURE 2

OVERALL PROPERTY MAP
TRACTS 1, 2, 3 AND 4
767-ACRE HILLWOOD WOLF RANCH
GEORGETOWN,
WILLIAMSON COUNTY, TEXAS

130219 - Hillwood Wolf Ranch\Graphics\GA Graphics\130219A03GA_T1_Topo_Hydro.mxd | REM | 10-29-2013



MAP SOURCE: USGS, 1982 AND 1987; TCEQ, 2013; AND TWDB, 2013.

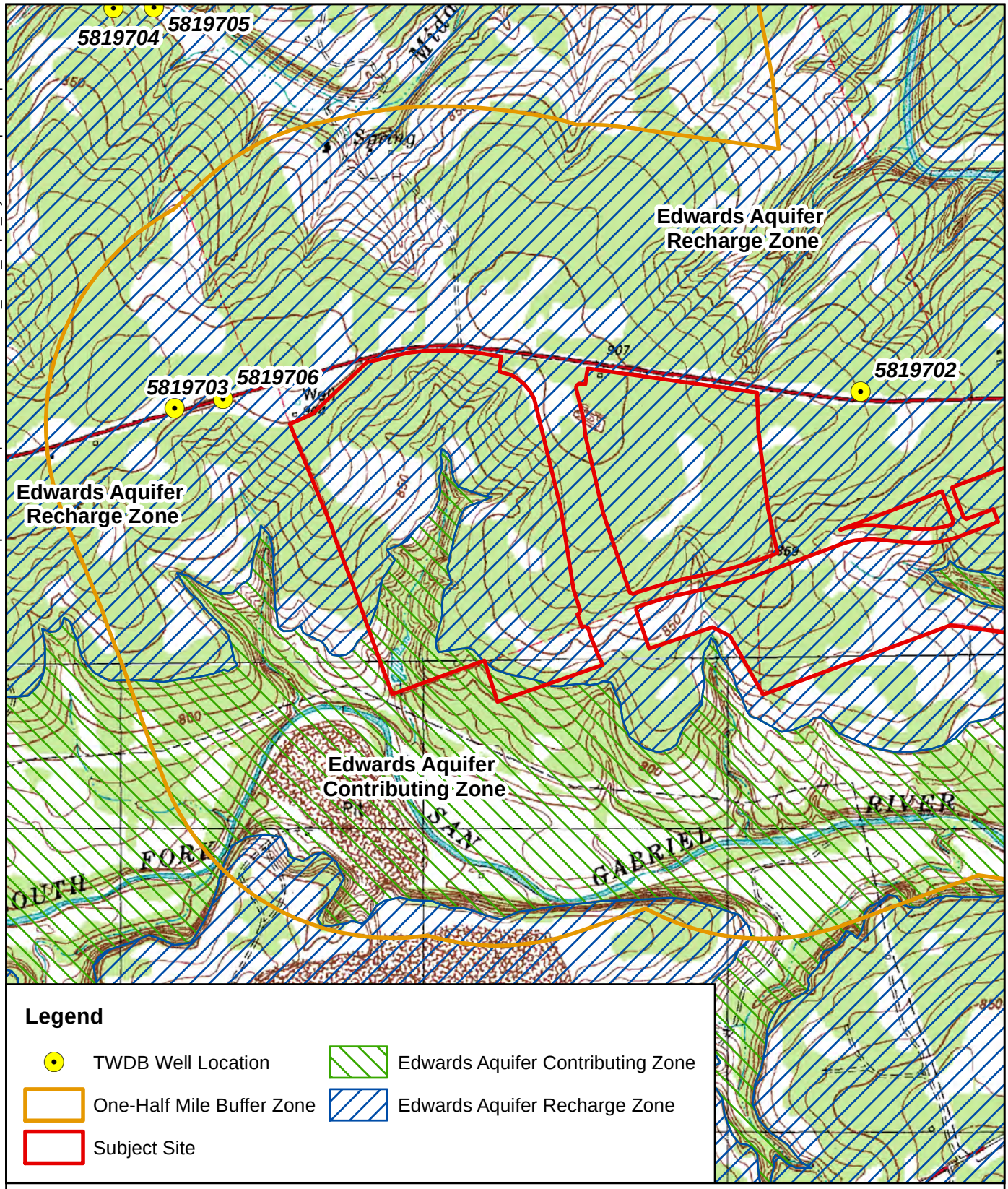
0 750 1,500
Feet

Horizon Environmental Services, Inc.

APPENDIX A, FIGURE 3A

TOPOGRAPHY AND
HYDROGEOLOGY MAP
TRACT 1
767-ACRE HILLWOOD WOLF RANCH
GEORGETOWN,
WILLIAMSON COUNTY, TEXAS

130219 - Hillwood Wolf Ranch\Graphics\GA Graphics\130219A04GA_T2-3_Topo_Hydro.mxd | REM | 10-29-2013



MAP SOURCE: USGS, 1982 AND 1987; TCEQ, 2013; AND TWDB, 2013.

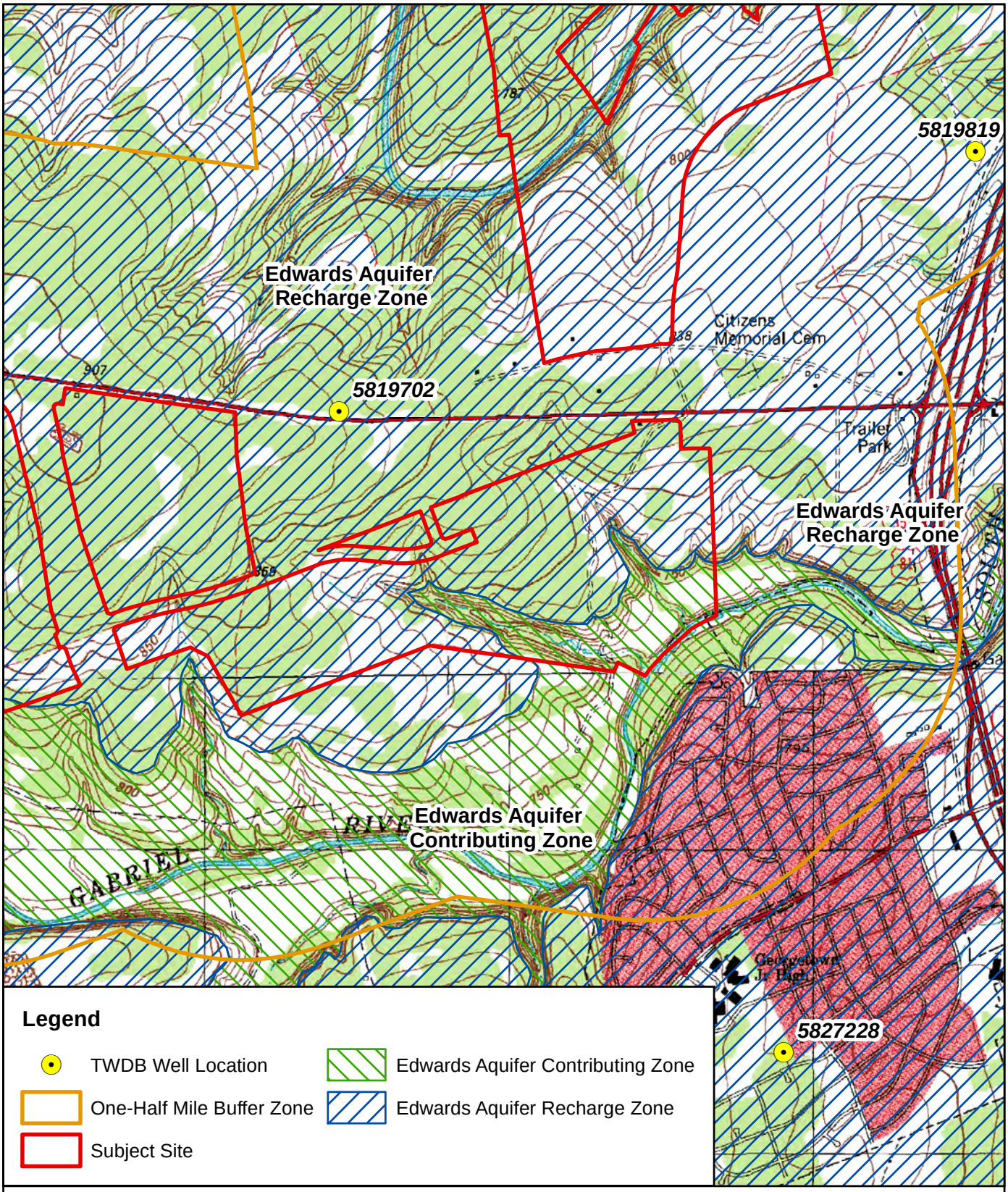
0 750 1,500
Feet

Horizon Environmental Services, Inc.

APPENDIX A, FIGURE 3B

TOPOGRAPHY AND
HYDROGEOLOGY MAP
TRACTS 2 AND 3
767-ACRE HILLWOOD WOLF RANCH
GEORGETOWN,
WILLIAMSON COUNTY, TEXAS

130219 - Hillwood Wolf Ranch\Graphics\GA Graphics\130219A05GA_T4_Topo_Hydro.mxd | REM | 10-29-2013



Legend

- TWDB Well Location
- One-Half Mile Buffer Zone
- Subject Site
- Edwards Aquifer Contributing Zone
- Edwards Aquifer Recharge Zone

MAP SOURCE: USGS, 1982 AND 1987; TCEQ, 2013; AND TWDB, 2013.

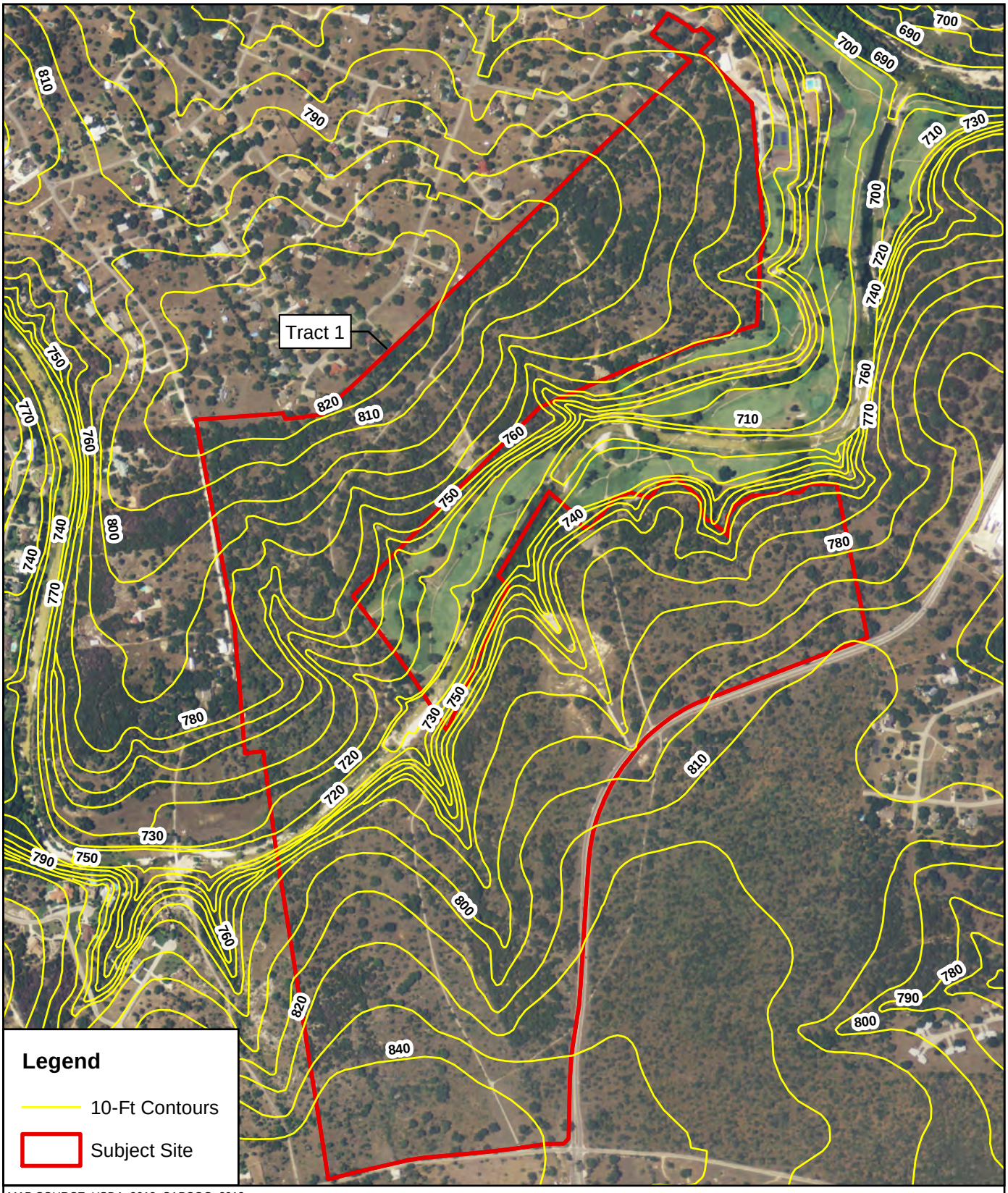
0 750 1,500
Feet

Horizon
Environmental Services, Inc.

APPENDIX A, FIGURE 3C

TOPOGRAPHY AND
HYDROGEOLOGY MAP
TRACT 4
767-ACRE HILLWOOD WOLF RANCH
GEORGETOWN,
WILLIAMSON COUNTY, TEXAS

130219 - Hillwood Wolf Ranch\Graphics\GA Graphics\130219A06GA_T1_Topo.mxd | REM | 10-29-2013



MAP SOURCE: USDA, 2012; CAPCOG, 2013.

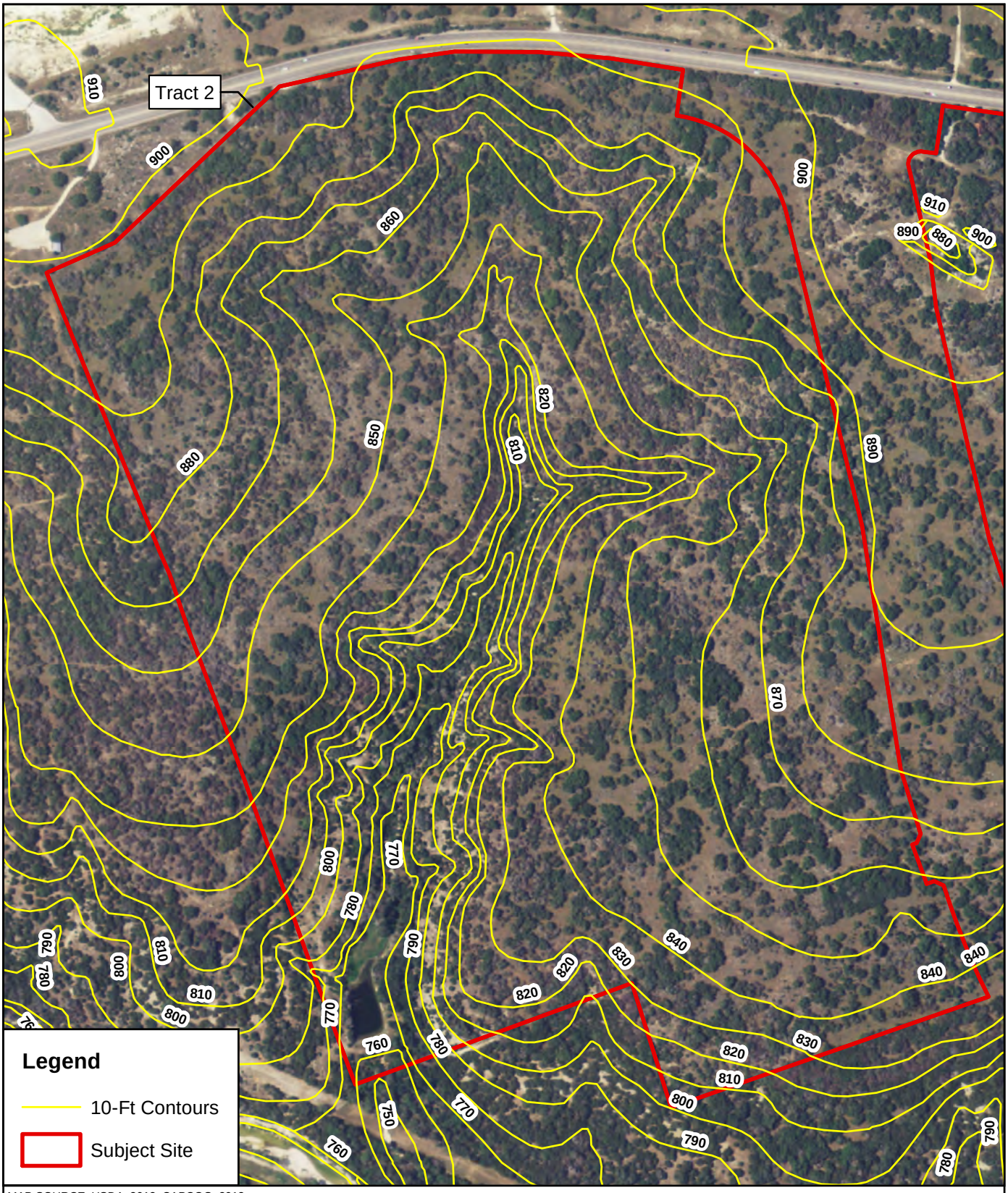
0 400 800
Feet

Horizon Environmental Services, Inc.

APPENDIX A, FIGURE 4A

SITE TOPOGRAPHY MAP
TRACT 1
767-ACRE HILLWOOD WOLF RANCH
GEORGETOWN,
WILLIAMSON COUNTY, TEXAS

130219 - Hillwood Wolf Ranch\Graphics\GA Graphics\130219A07GA_T2_Topo.mxd | REM | 10-29-2013



MAP SOURCE: USDA, 2012; CAPCOG, 2013.

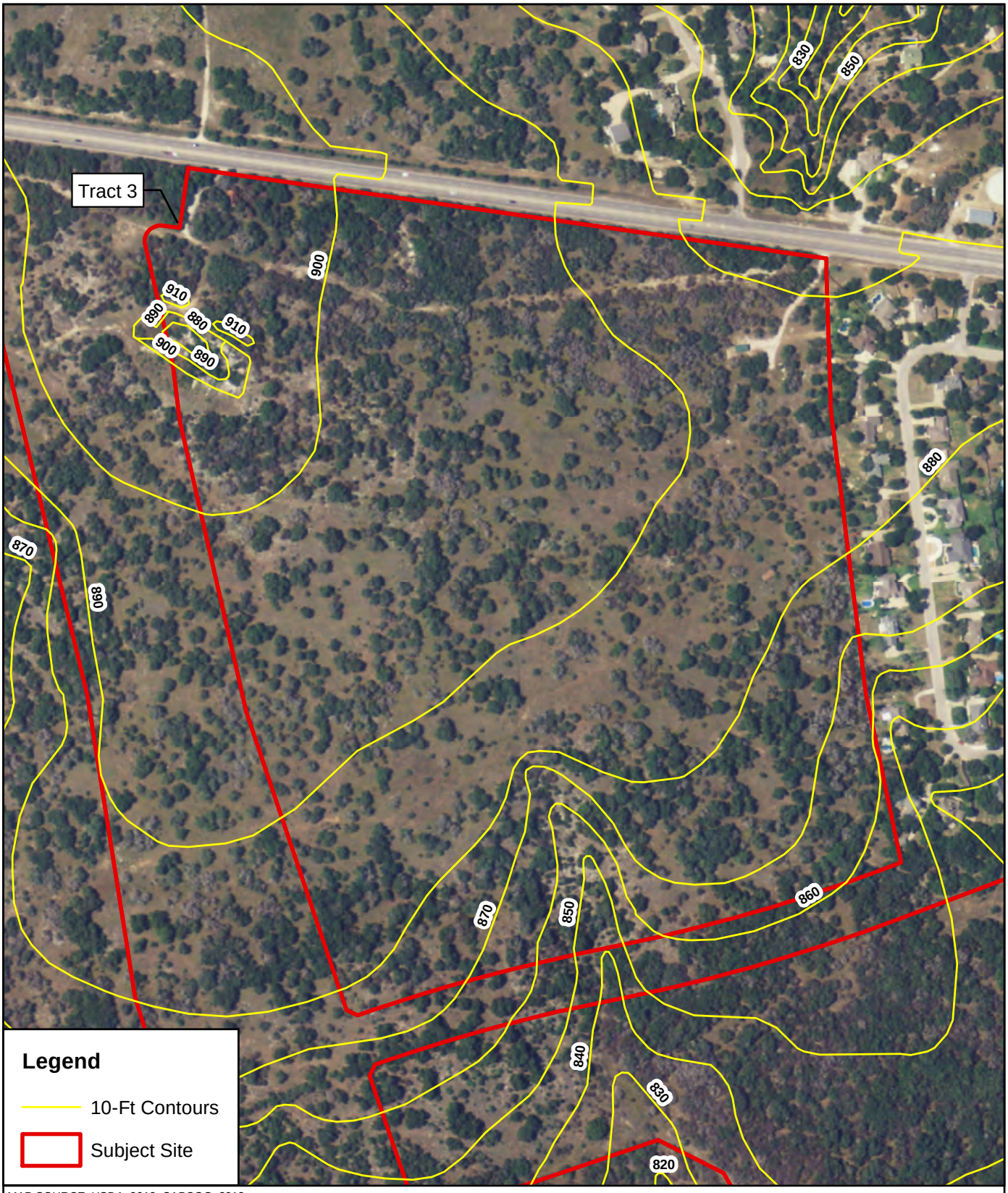
0 250 500
Feet

Horizon Environmental Services, Inc.

APPENDIX A, FIGURE 4B

SITE TOPOGRAPHY MAP
TRACT 2
767-ACRE HILLWOOD WOLF RANCH
GEORGETOWN,
WILLIAMSON COUNTY, TEXAS

130219 - Hillwood Wolf Ranch\Graphics\GA Graphics\130219A08GA_T3_Topo.mxd | REM | 10-29-2013



MAP SOURCE: USDA, 2012; CAPCOG, 2013.

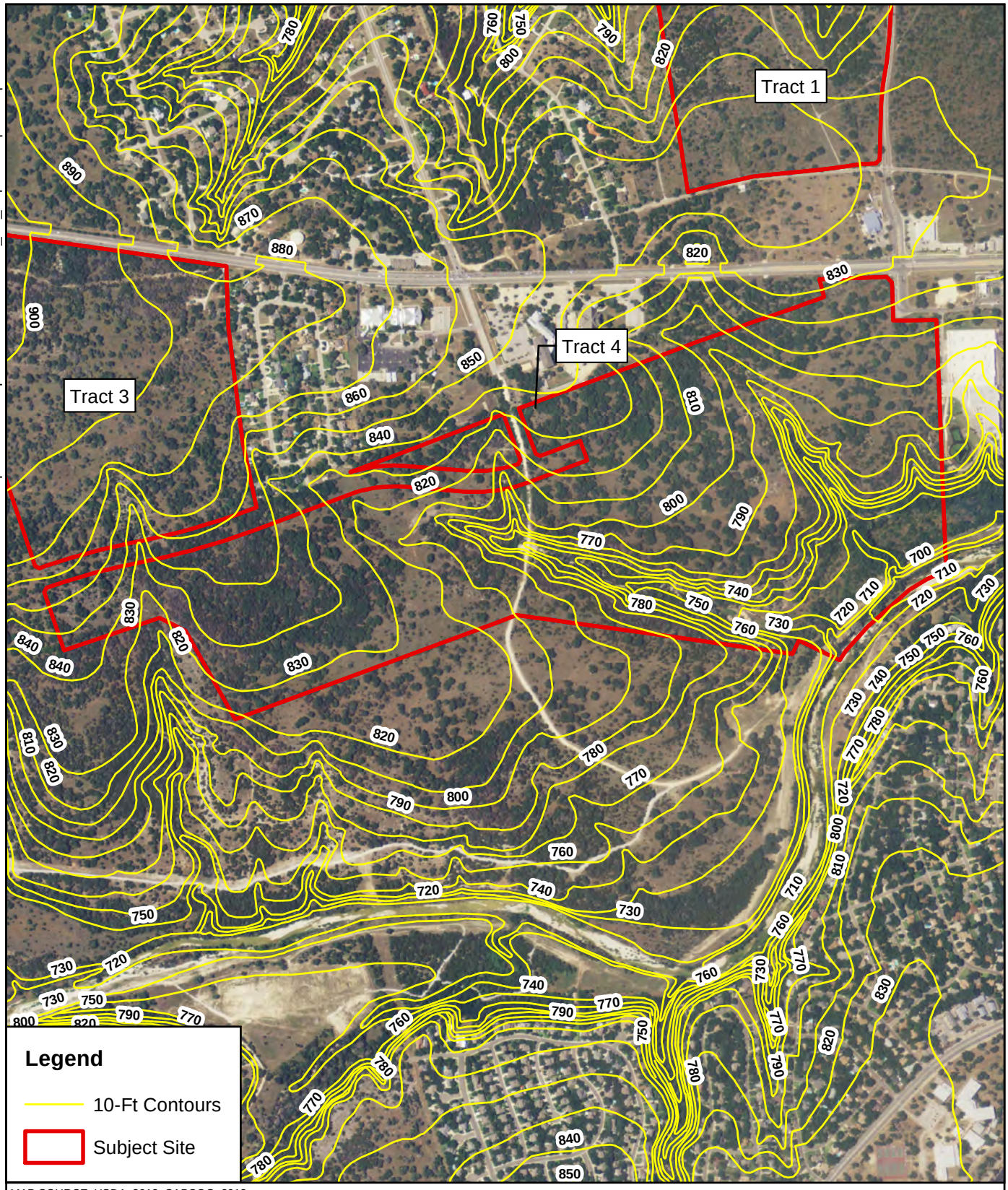
0 200 400
Feet

Horizon Environmental Services, Inc.

APPENDIX A, FIGURE 4C

SITE TOPOGRAPHY MAP
TRACT 3
767-ACRE HILLWOOD WOLF RANCH
GEORGETOWN,
WILLIAMSON COUNTY, TEXAS

130219 - Hillwood Wolf Ranch\Graphics\GA Graphics\130219A09GA_T4_Topo.mxd | REM | 10-30-2013



MAP SOURCE: USDA, 2012; CAPCOG, 2013.

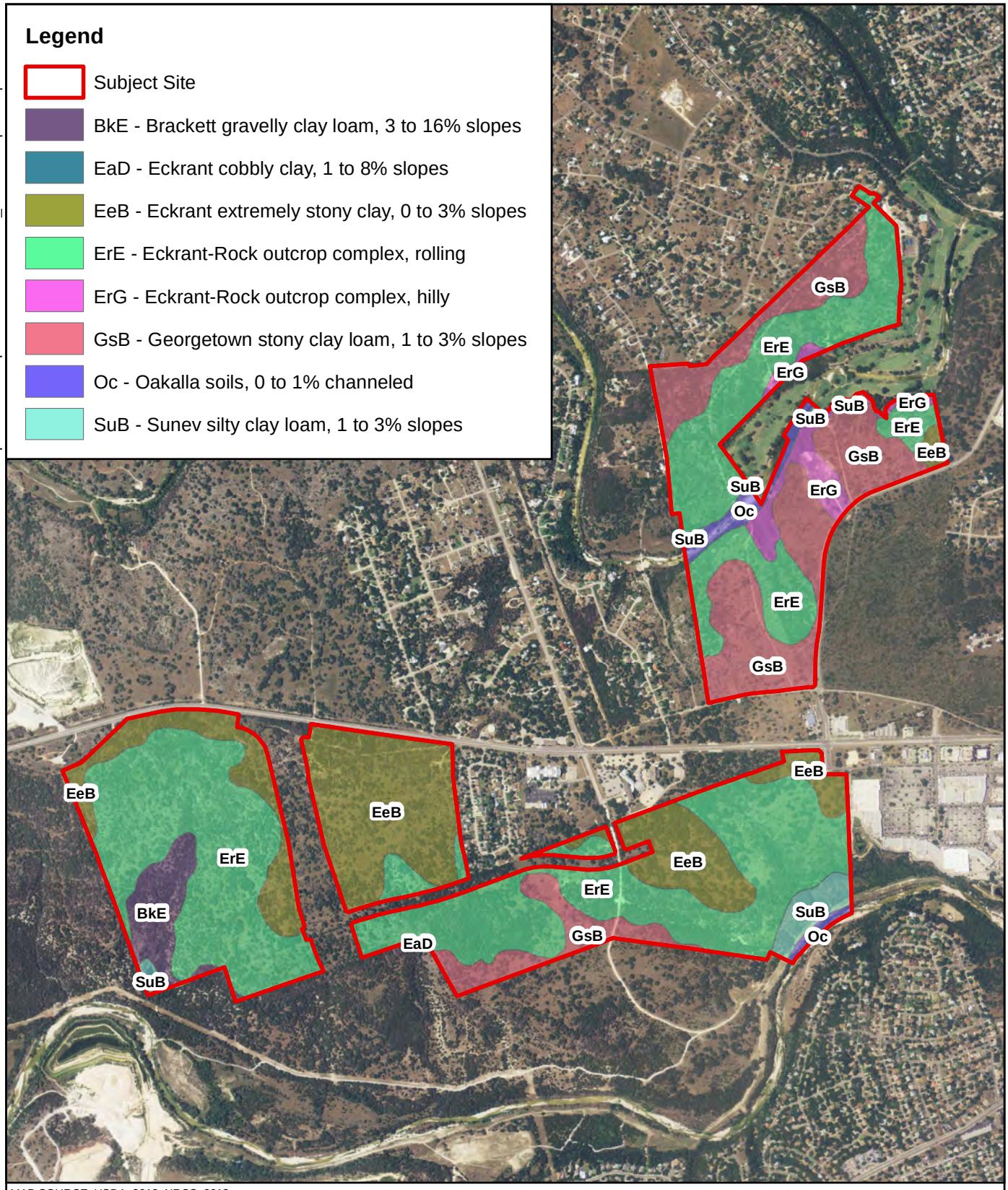
0 500 1,000
Feet

Horizon Environmental Services, Inc.

APPENDIX A, FIGURE 4D

SITE TOPOGRAPHY MAP
TRACT 4
767-ACRE HILLWOOD WOLF RANCH
GEORGETOWN,
WILLIAMSON COUNTY, TEXAS

130219 - Hillwood Wolf Ranch\Graphics\GA Graphics\130219A10GA_Soils.mxd | REM | 10-29-2013



MAP SOURCE: USDA, 2012; NRCS, 2013.

0 900 1,800
Feet

Horizon Environmental Services, Inc.

APPENDIX A, FIGURE 5

SURFACE SOILS MAP
TRACTS 1, 2, 3 AND 4
767-ACRE HILLWOOD WOLF RANCH
GEORGETOWN,
WILLIAMSON COUNTY, TEXAS

130219 - Hillwood Wolf Ranch\Graphics\GA Graphics\130219A11GA_Strat.mxd | REM | 11-01-2013

Geologic Unit	Hydrologic Unit	Approx. Thickness at Project Site (ft)	Elevation (ft msl)	Depth (ft)
			910	0
Edwards Formation (Ked)	Edwards Aquifer	100	810	100
Comanche Peak Formation (Kc)		60	750	160
Walnut Formation (Kwa)	Confining Unit	175	575	335

Note: Unit elevations and thicknesses given with respect to a ground surface elevation of 910 ft msl on the northwest boundary of the project site (Tract 3). The Edwards Formation thins to zero east and south of this locale, due to formational dip and ground surface topography.

Horizon Environmental Services, Inc.

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

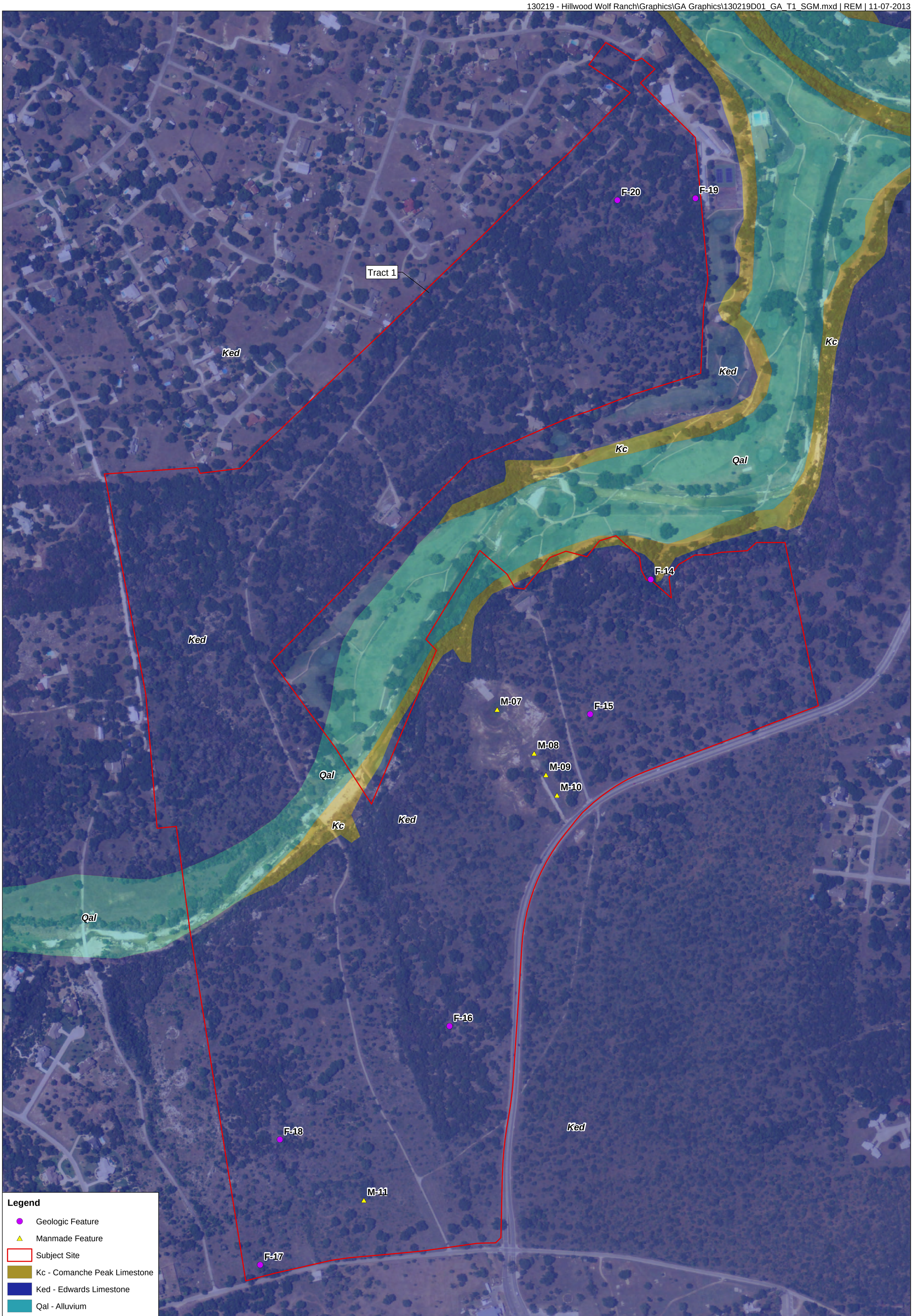
APPENDIX A, FIGURE 6

STRATIGRAPHIC COLUMN
767-ACRE HILLWOOD WOLF RANCH
GEORGETOWN,
WILLIAMSON COUNTY, TEXAS

Horizon
Environmental Services, Inc.

APPENDIX B

SITE GEOLOGIC MAP



MAP SOURCE: UT-BEG, 1995; USDA, 2012.

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

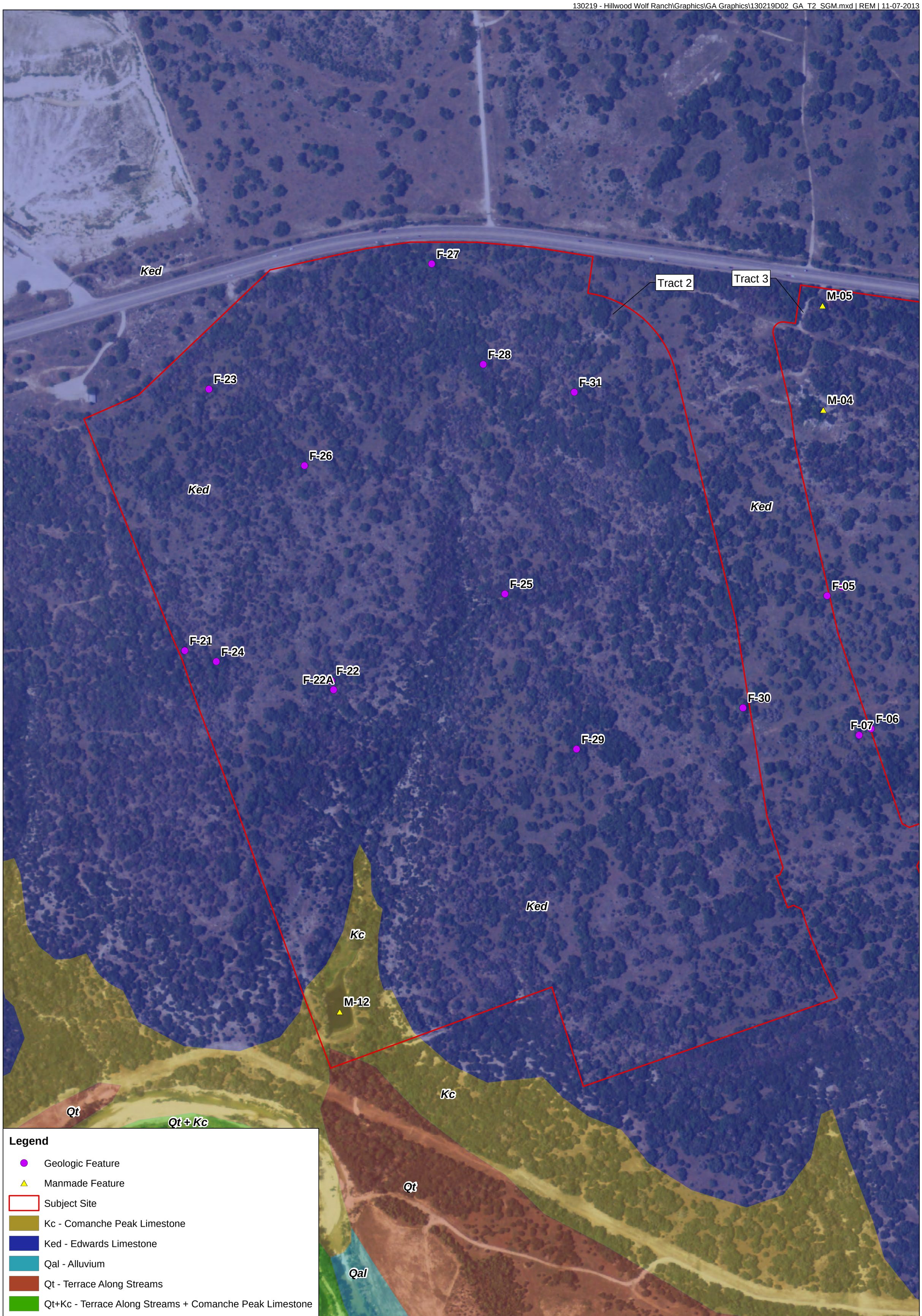
0 100 200
Feet

Scale: 1" = 200'

APPENDIX B, FIGURE 1A

SITE GEOLOGIC MAP
TRACT 1
767-ACRE HILLWOOD WOLF RANCH
GEORGETOWN,
WILLIAMSON COUNTY, TEXAS

Horizon
Environmental Services, Inc.



MAP SOURCE: UT-BEG, 1995; USDA, 2012.

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

0 100 200
Feet

Scale: 1" = 200'

APPENDIX B, FIGURE 1B

SITE GEOLOGIC MAP
TRACT 2
767-ACRE HILLWOOD WOLF RANCH
GEORGETOWN,
WILLIAMSON COUNTY, TEXAS

Horizon
Environmental Services, Inc.

Horizon™ Environmental Services

Date:	03/28/2023
Drawn:	KRV Revised by GLS
HJN NO:	170167
Source:	UT-BEG, 1981; Nearmap, 2023

APPENDIX B, FIGURE 1B

SITE GEOLOGIC MAP
TRACT 2
767-ACRE HILLWOOD WOLF RANCH
GEORGETOWN,
WILLIAMSON COUNTY, TEXAS

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

0 100 200
Feet

Scale: 1" = 200'

Horizon™ Environmental Services

Date:	03/28/2023
Drawn:	KRV Revised by GLS
HJN NO:	170167
Source:	UT-BEG, 1981; Nearmap, 2023

APPENDIX B, FIGURE 1B

SITE GEOLOGIC MAP
TRACT 2
767-ACRE HILLWOOD WOLF RANCH
GEORGETOWN,
WILLIAMSON COUNTY, TEXAS

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

0 100 200
Feet

Scale: 1" = 200'

MAP SOURCE: UT-BEG, 1995; USDA, 2012.

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

0 100 200
Feet

Scale: 1" = 200'

APPENDIX B, FIGURE 1C

SITE GEOLOGIC MAP
TRACTS 3 AND 4
767-ACRE HILLWOOD WOLF RANCH
GEORGETOWN,
WILLIAMSON COUNTY, TEXAS

Horizon
Environmental Services, Inc.

Horizon
Environmental Services, Inc.

APPENDIX C

SITE GEOLOGIC ASSESSMENT TABLE

GEOLOGIC ASSESSMENT TABLE			PROJECT NAME: 767 acres - Wolf Ranch Properties; SH 29 W; Georgetown, 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	
F-1	30.630696	-97.703815	SF	20	Ked	4	1	2.5	N280°W	0	--	--	C	30	50		X	X		Hillside
F-2	30.626763	-97.718564	SH/C	30	Ked	7.5	7.5	3	--	0	--	--	C,F,O	50	80		X		X	Hillside
F-3	30.6267113	-97.7164053	SC	20	Ked	0.8	0.7	1.5	--	0	--	--	F,O	12	32	X		X		Hillside
F-4	30.6277253	-97.7141506	SC	20	Ked	0.4	0.2	1.5	--	0	--	--	C,F,O	20	40		X	X		Hillside
F-5	30.6300972	-97.7210609	SH/C	30	Ked	12	13	4	--	0	--	--	C,F,FS,O	60	90		X		X	Hillside
F-6	30.628339	-97.7206703	SC	20	Ked	3	2	1.5	--	0	--	--	C,F,O	16	36	X		X		Hillside
F-7	30.6282607	-97.7208423	SH/C	30	Ked	12	13	4	--	0	--	--	C,F,FS,O	60	90		X		X	Hillside
F-8	30.627888	-97.717321	SC	20	Ked	3	2	5	--	0	--	--	C,F,O	27	47		X	X		Hillside
F-9	30.6283751	-97.7166082	SH/C	30	Ked	30	20	3	--	0	--	--	C,F,FS,O	55	85		X		X	Hillside
F-10	30.629189	-97.717977	SC/SH	20	Ked	1	0.5	2	--	0	--	--	C,F,O	30	50		X	X		Hillside
F-11	30.629322	-97.716741	SH/C	30	Ked	60	45	7	--	0	--	--	C,F,FS,O	65	95		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

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

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

Date : November 27, 2013

Sheet 1 of 5

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

GEOLOGIC ASSESSMENT TABLE			PROJECT NAME: 767 acres - Wolf Ranch Properties; SH 29 W; Georgetown, 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)	DOWN	DENSITY (NO/FT)	APERTURE (FEET)	INFILL	RELATIVE INFILTRATION RATE	TOTAL	SENSITIVITY		CATCHMENT AREA (ACRES)		TOPOGRAPHY
						X	Y	Z		10						<40	>40	<1.6	>1.6	
F-12	30.6300175	-97.7165837	SH	20	Ked	8	7	3	--	0	--	--	C,F,O	45	65		X	X		Hillside
F-13	30.630887	-97.717227	SH/C	30	Ked	60	50	7	--	0	--	--	C,F,O	65	95		X		X	Hillside
F-14	30.644811	-97.698051	SC	20	Ked	0.2	0.2	2	--	0	--	--	N	5	25	X		X		Hillside
F-15	30.642811	-97.699123	SH/SF/C	30	Ked	10	10	2	N65°E	0	--	--	C,F,O	60	90		X		X	Hillside
F-16	30.638188	-97.701607	SF/C	30	Ked	4	1.8	15	N70°E	0	--	--	C,F,O	60	90		X		X	Hillside
F-17	30.634662	-97.704916	SH	20	Ked	12	10	2	--	0	--	--	C,F,O	12	32	X		X		Hilltop
F-18	30.636526	-97.704553	SH/C	30	Ked	30	20	4	--	0	--	--	C,F,O,X	45	75		X		X	Hillside
F-19	30.6504807	-97.6972072	SH	20	Ked	20	12	2	--	0	--	--	C,F,O	30	50		X	X		Hillside
F-20	30.650467	-97.698552	SC	20	Ked	0.4	0.3	2	--	0	--	--	C,F,O	25	45		X	X		Hillside
F-21	30.629401	-97.730471	SC	20	Ked	0.5	0.2	1.5	--	0	--	--	C,F,O	25	45		X	X		Hillside
F-22	30.629009	-97.728377	SH/SF	20	Ked	4	4	2	N85°E	0	--	--	C,F,O	40	60		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

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

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

Date : November 27, 2013

Sheet 2 of 5

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

GEOLOGIC ASSESSMENT TABLE			PROJECT NAME: 767 acres - Wolf Ranch Properties; SH 29 W; Georgetown, 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	
F-22A	30.628897	-97.728349	SC	20	Ked	1	0.3	2.5	--	0	--	--	C,F,O	30	50		X	X		Hillside
F-23	30.632632	-97.730082	SC	20	Ked	1.5	0.7	3	--	0	--	--	C,F,O	35	55		X	X		Hilltop
F-24	30.629261	-97.7300215	SH	20	Ked	6	5	2	--	0	--	--	C,F,O	15	35	X		X		Hillside
F-25	30.630058	-97.725883	SC	20	Ked	--	0.3	2.5	--	0	--	--	N	5	25	X		X		Hillside
F-26	30.6316731	-97.7287284	SC	20	Ked	1	0.7	1.2	--	0	--	--	C,F,O	10	30	X		X		Hillside
F-27	30.6341486	-97.7268762	SH	20	Ked	12	10	2	--	0	--	--	C,F,O	19	39	X		X		Hilltop
F-28	30.6328998	-97.7261556	SH/SF/C	30	Ked	30	15	2	N330°W	0	--	--	C,F,FS,O	60	90		X		X	Hillside
F-29	30.6281267	-97.7248838	SH	20	Ked	30	25	4	--	0	--	--	C,F,O	30	50		X	X		Hillside
F-30	30.6286164	-97.7224986	SH/C	30	Ked	40	35	4	--	0	--	--	C,F,O	65	95		X		X	Hillside
F-31	30.6325428	-97.7248588	SC	20	Ked	1	0.8	3	--	0	--	--	C,F,O	28	48		X			Hillside
M-1	30.6256132	-97.7017999	MB	30	Qt	1.5	1.5	8	--	0	--	--	N	5	35	X		X		Floodplain

* 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

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

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

Date : November 27, 2013

Sheet 3 of 5

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

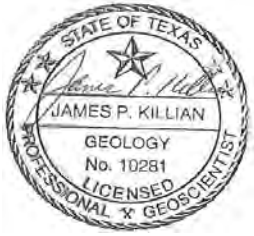
GEOLOGIC ASSESSMENT TABLE			PROJECT NAME: 767 acres - Wolf Ranch Properties; SH 29 W; Georgetown, Tx																	
LOCATION			FEATURE CHARACTERISTICS												EVALUATION			PHYSICAL SETTING		
1A	1B *	1C*	2A	2B	3	4			5	5A	6	7	8A	8B	9	10		11		12
FEATURE ID	LATITUDE	LONGITUDE	FEATURE TYPE	POINTS	FORMATION	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	
M-2	30.6266239	-97.7009221	MB	30	Qt	1	0.3	2.5	--	0	--	--	N	5	35	X		X		Hillside
M-3	30.627305	-97.699324	MB	30	Qt	1.5	0.7	3	--	0	--	--	N	5	35	X		X		Hillside
M-4	30.6322906	-97.7213021	MB/pit	30	Ked	200	120	20	--	0	--	--	C,F,O,X	9	39	X		X		Hilltop
M-5	30.633581	-97.721295	MB/well	30	Ked	2	2	--	--	0	--	--	F,O	8	38	X		X		Hilltop
M-6	30.6308594	-97.7172306	MB/well	30	Ked	0.2	0.2	--	--	0	--	--	N	5	35	X		X		Hillside
M-7	30.6428973	-97.7007256	MB/pond	30	Ked	70	70	15	--	0	--	--	C,F,O	7	37	X		X		Hillside
M-8	30.6422391	-97.7000951	MB	30	Ked	4	10	6	--	0	--	--	N	5	35	X		X		Hillside
M-9	30.641915	-97.6998959	MB	30	Ked	2	2	6	--	0	--	--	N	5	35	X		X		Hillside
M-10	30.641612	-97.69971	MB	30	Ked	2	2	6	--	0	--	--	N	5	35	X		X		Hillside
M-11	30.63561	-97.703118	MB/well	30	Ked	0.2	0.2	--	--	0	--	--	N	5	35	X		X		Hillside
M-12	30.6249138	-97.7283129	MB/pond	30	Kc	220	120	10	--	0	--	--	C,F,O	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
CD	Non-karst closed depression	5
Z	Zone, clustered or aligned features	30

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

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



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

Date : November 27, 2013

Sheet 4 of 5

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

GEOLOGIC ASSESSMENT TABLE			PROJECT NAME: 767 acres - Wolf Ranch Properties; SH 29 W; Georgetown, 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	
F-32	30.6271723	-97.7150157	SC	20	Ked	4	2	8	--	0	--	--	C, F, O	30	50		X	X		Hillside
F-33	30.6267681	-97.7124339	SC	20	Ked	3	2	4.5	--	0	--	--	C, F, O	15	35	X		X		Hillside
F-34	30.6269705	-97.7161	SC	20	Ked	2	1	2	--	0	--	--	C, F, O	12	32	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

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

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

Date : November 27, 2013

Sheet ___5___ of __5____

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

Horizon
Environmental Services, Inc.

APPENDIX D

SITE PHOTOGRAPHS

PHOTO 1
View of geologic feature F-1 (solution-enlarged fracture), facing southwest

PHOTO 2
View near center of geologic feature F-2 (sinkhole with cave), facing south

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

PHOTO 4
View of geologic feature F-4 (2 solution cavities), facing east

Horizon
Environmental Services, Inc.

PHOTO 5
View of geologic feature F-5 (large sinkhole with cave), facing east

PHOTO 6
Close up view of cave entrance near center of geologic feature F-5

PHOTO 7
Close up view of solution cavity (skylight) connected to geologic feature F-5 cave

PHOTO 8
View of geologic feature F-6 (solution cavity), facing southeast

Horizon
Environmental Services, Inc.

PHOTO 9
View of geologic feature F-6 (closed depression), facing north

PHOTO 10
View near center of geologic feature F-7 (large sinkhole with cave), facing south

PHOTO 11
View inside cave at geologic feature F-7, facing east

PHOTO 12
View of geologic feature F-8 (solution cavity), facing east

Horizon
Environmental Services, Inc.

PHOTO 13
Close up view of geologic feature F-8 (solution cavity)

PHOTO 14
View near center of geologic feature F-9 (large sinkhole with cave), facing southeast

PHOTO 15
Close up view of entrance drop (solution cavity) into cave for geologic feature F-9

PHOTO 16
View of geologic feature F-10 (solution cavity with small sinkhole), facing northwest

Horizon
Environmental Services, Inc.

PHOTO 17
View of geologic feature F-11 (very large sinkhole with cave), facing south

PHOTO 18
View near west side of geologic feature F-11 (cave entrance), facing north

PHOTO 19
View near northeast side of geologic feature F-11 (cave entrance), facing north

PHOTO 20
View inside cave of geologic feature F-11, facing north-northeast

Horizon
Environmental Services, Inc.

PHOTO 21
View of geologic feature F-12 (sinkhole), facing east

PHOTO 22
Close up view near center of geologic feature F-12

PHOTO 23
View near center of geologic feature F-13 (very large sinkhole with probable cave), facing north

PHOTO 24
View of geologic feature F-14 (spring), facing west

Horizon
Environmental Services, Inc.

PHOTO 25
View of cattle trough from geologic feature F-14 (spring), facing northeast

PHOTO 26
View of geologic feature F-15 (sinkhole with solution enlarged fracture cave), facing south

PHOTO 27
Close up view near center of geologic feature F-15 (solution enlarged fracture cave)

PHOTO 28
View of geologic feature F-16 (solution enlarged fracture cave), facing west

Horizon
Environmental Services, Inc.

PHOTO 29
Close up view of geologic feature F-16 (solution enlarged fracture cave)

PHOTO 30
View of geologic feature F-17 (sinkhole), facing north

PHOTO 31
View near center of geologic feature F-18 (large sinkhole with cave), facing south

PHOTO 32
View of geologic feature F-19 (sinkhole), facing south

Horizon
Environmental Services, Inc.

PHOTO 33
View of geologic feature F-20 (solution cavity), facing southwest

PHOTO 34
View of geologic feature F-21 (2 small solution cavities 8 ft apart), facing northwest

PHOTO 35
View of geologic feature F-22 (solution enlarged fracture within small sinkhole), facing northwest

PHOTO 36
View of geologic feature F-22A (solution cavity), facing north

Horizon
Environmental Services, Inc.

PHOTO 37
View of geologic feature F-23 (solution cavity), facing northwest

PHOTO 38
View of geologic feature F-24 (small sinkhole), facing east

PHOTO 39
View of geologic feature F-25 (spring), facing west

PHOTO 40
View of geologic feature F-26 (solution cavity), facing south

Horizon
Environmental Services, Inc.

PHOTO 41
View of geologic feature F-27 (sinkhole along edge of small drainage swale), facing north

PHOTO 42
Close up view of apparent drainage portal prior to excavation at geologic feature F-27

PHOTO 43
View of geologic feature F-28 (large sinkhole with cave), facing north

PHOTO 44
View of cave entrance (solution enlarged fracture) at north side of geologic feature F-28, facing southeast

Horizon
Environmental Services, Inc.

PHOTO 45
View of geologic feature F-29 (large sinkhole), facing north

PHOTO 46
View near center of geologic feature F-30 (large sinkhole with cave), facing north

PHOTO 47
Close up view of cave entrance for geologic feature F-30

PHOTO 48
View of geologic feature F-31 (solution cavity within small sinkhole), facing east

Horizon
Environmental Services, Inc.

PHOTO 49
View of geologic feature F-32 (NF-7, solution cavity), facing southwest

PHOTO 50
Close up view of geologic feature F-32 (NF-7, solution cavity)

PHOTO 51
Close up view of geologic feature F-33 (NF-5, solution cavity)

PHOTO 52
View of geologic feature F-34 (NF-1, solution cavity), facing east

Horizon
Environmental Services, Inc.

130219 - Hillwood Wolf Ranch\Photos\130219GA_Photos4.cdr | REM | 11-11-2013

PHOTO 53

View of manmade feature M-4 (borrow pit), facing east

PHOTO 54

View of manmade feature M-7 (stormwater retention pond), facing south

PHOTO 55

View of manmade feature M-12 (stock pond), facing east

Horizon
Environmental Services, Inc.

Horizon™
Environmental Services, Inc.

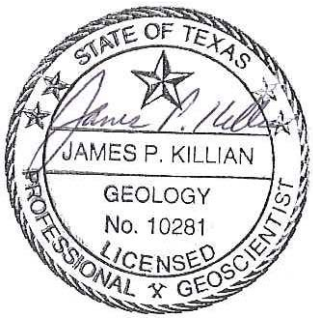
GEOLOGIC ASSESSMENT
APPROXIMATELY 366-ACRE
GUY TRACT
SOUTHERN TERMINUS OF D B WOOD ROAD
GEORGETOWN, WILLIAMSON COUNTY, TEXAS
HJN 170167 GA

PREPARED FOR:

HILLWOOD COMMUNITIES
DALLAS, TEXAS

PREPARED BY:

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



SEPTEMBER 2017

Guy Tract Hillwood Guy tract 170167 GA

CORPORATE HEADQUARTERS
1507 S Interstate 35 ★ Austin, TX 78741-2502 ★ (512) 328-2430 ★ www.horizon-esi.com
An LJA Company

Horizon
Environmental Services, Inc.

TABLE OF CONTENTS

I. GEOLOGIC ASSESSMENT FORM (TCEQ-0585)

II. ATTACHMENTS:

A GEOLOGIC ASSESSMENT TABLE
B STRATIGRAPHIC COLUMN
C DESCRIPTION OF SITE GEOLOGY
D SITE GEOLOGIC MAP
E SUPPORTING INFORMATION
F ADDITIONAL SITE MAPS
G SITE PHOTOGRAPHS

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

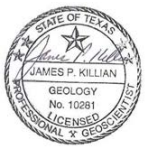
To the best of my knowledge, the responses to this form accurately reflect all information requested concerning the proposed regulated activities and methods to protect the Edwards Aquifer. My signature certifies that I am qualified as a geologist as defined by 30 TAC Chapter 213.

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

Date: 29 September 2017 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: 366-acre Guy Tract, Southern Terminus D B Wood Road, Georgetown, Williamson County, Texas

Project Information

1. Date(s) Geologic Assessment was performed: 21, 22, 23, and 24 August and 8, 11, and 12 September 2017
2. Type of Project:
   - ☒ WPAP
   - ☒ SCS
   - ☐ AST
   - ☐ UST
3. Location of Project:
   - ☒ Recharge Zone
   - ☐ Transition Zone

☐ Contributing Zone within the Transition Zone

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

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

Table 1 - Soil Units, Infiltration Characteristics and Thickness

Soil Name	Group*	Thickness(feet)
Brackett gravelly clay loam, 3 to 16% slopes (BkE)	C	1 to 2
Eckrant cobbly clay, 1 to 8% slopes (EaD)	D	0.5 to 1
Eckrant-Rock outcrop, 1 to 10% slopes (ErE)	D	0.5 to 1
Georgetown silty clay loam, 1 to 3% slopes (GsB)	D	2 to 4
Oakalla soils, 0 to 1% slopes, channeled, frequently flooded (Oc)	B	3 to 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.

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" = 300'
   Site Geologic Map Scale: 1" = 300'
   Site Soils Map Scale (if more than 1 soil type): 1" = 1200'

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 2 (#) 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.

Horizon
Environmental Services, Inc.

ATTACHMENT A

GEOLOGIC ASSESSMENT TABLE

GEOLOGIC ASSESSMENT TABLE			PROJECT NAME: 366-ac Guy tract; so. DB Wood Rd Georgetown, 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	
F-1	30.62425	-97.70658	SH	20	Ked	6	6	2	--	0	--	--	C,F,O	30	50	X		X		Hillside
F-2	30.62507	-97.7121	SC	20	Ked	1	1	1.5	--	0	--	--	C,F,O	25	45	X		X		Hilltop
F-2A	30.6251	-97.7215	SC	20	Ked	1	1	1.5	--	0	--	--	C,F,O	22	42	X		X		Hilltop
F-3	30.6222	-97.71203	SF	20	Kc	6	0.5	1	N75E	10	--	--	C,F,O	7	37	X		X		Hillside
F-4	30.6227	-97.7108	SC	20	Ked	0.8	0.3	1	--	0	--	--	C,F,O	7	27	X		X		Hillside
F-5	30.62459	-97.62459	C	30	Ked	20	15	3	--	0	--	--	C,F,O	5	35	X		X		Cliff
M-1	30.62457	-97.7225	MB	30	Ked	0.2	0.2	--	--	0	--	--	X	5	35	X		X		Hilltop
M-2	30.62291	-97.7045	MB	30	Kc	0.5	0.5	--	--	0	--	--	X	5	35	X		X		Hillside

* DATUM:_____

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	Man-made 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: **steel casing/conctrete**

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

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

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

Date : September 29, 2017

Sheet ___1___ of __1____

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

ATTACHMENT B

STRATIGRAPHIC COLUMN

Geologic Unit	Hydrologic Unit	Approx. Thickness at Project Site (ft)	Elevation (ft msl)	Depth (ft)
			845	0
Edwards Formation (Ked)	Edwards Aquifer	65	780	65
Comanche Peak Formation (Kc)		60	720	125
Walnut Formation (Kwa)	Confining Unit	175	545	300

Note: Unit elevation and thickness given with respect to a ground surface elevation of 845 feet on the northern boundary of the subject site.

Horizon Environmental Services, Inc.

Date:	09/14/2017
Drawn:	REO
HJN NO:	170167

Attachment B

Stratigraphic Column
Guy Tract
Southern Terminus of D B Wood Road
Georgetown, Williamson County, Texas

STATE OF TEXAS
JAMES P. KILLIAN
GEOLOGY
No. 10291
LICENSED
PROFESSIONAL GEOSCIENTIST

170167 - Hillwood Guy Tract\Graphics\170167GA_05A_Strat.mxd

Horizon
Environmental Services, Inc.

ATTACHMENT C

DESCRIPTION OF SITE GEOLOGY

Geologic information for the subject site obtained via literature review is provided in Attachment E, Supporting Information.

A geologic assessment of the approximately 366-acre Guy Tract was conducted pursuant to Texas rules for regulated activities on the Edwards Aquifer Recharge Zone (EARZ) (30 TAC 213). The subject site consists of undeveloped rangeland located at the southern terminus of D B Wood Road in Georgetown, Williamson County, Texas. Assessment findings were used to develop recommendations for site construction measures intended to be protective of water resources at the subject site and adjacent areas.

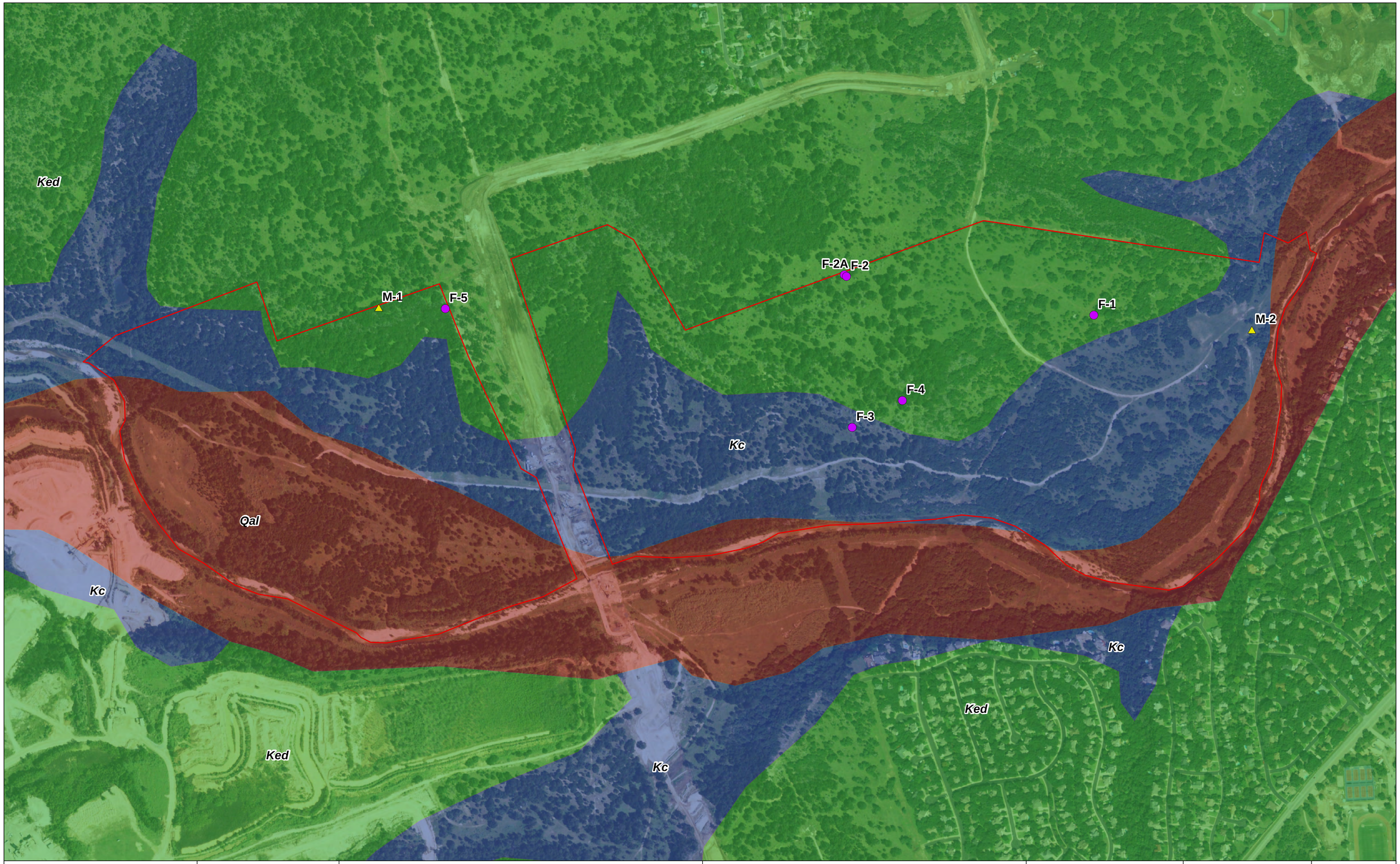
The northern portion (approximately 76.3 acres) of the subject site is located within the Edwards Aquifer Recharge Zone (EARZ), as defined by the Texas Commission on Environmental Quality (TCEQ). The EARZ occurs where surface water enters the subsurface through exposed limestone bedrock containing faults, fractures, sinkholes, and caves. The western and southern portions of the site (approximately 289.7 acres) are located within the Edwards Aquifer Contributing Zone.

The subject site is predominantly underlain by both the undifferentiated Edwards Limestone Formation (Ked) and Comanche Peak Limestone (Kc) (UT-BEG, 1981), with estimated maximum thicknesses of about 65 and 60 feet, respectively. In addition, recent alluvium deposits (Qal) occur along the lower, eroded areas located along and near the South Fork of the San Gabriel River, with an estimated maximum thickness of up to 30 feet.

Six natural geologic features (F-1, F-2, F-2A, F-3, F-4, and F-5) and 2 man-made features (M-1 and M-2) were identified at the subject site. Further information pertaining to the geologic and man-made features are presented in Attachments D, E, and F. Photographs of the geologic and man-made features are presented in Attachment G.

ATTACHMENT D

SITE GEOLOGIC MAP



Horizon Environmental Services, Inc.

Date:	9/29/2017
Drawn:	REO
HJN NO:	170167
Source:	UT-BEG, 1981; USDA, 2016

Legend

- Geologic Feature
- Man-Made Feature
- Subject Site
- Alluvium (Qal)
- Edwards Limestone (Ked)
- Comanche Peak (Kc)

Attachment D

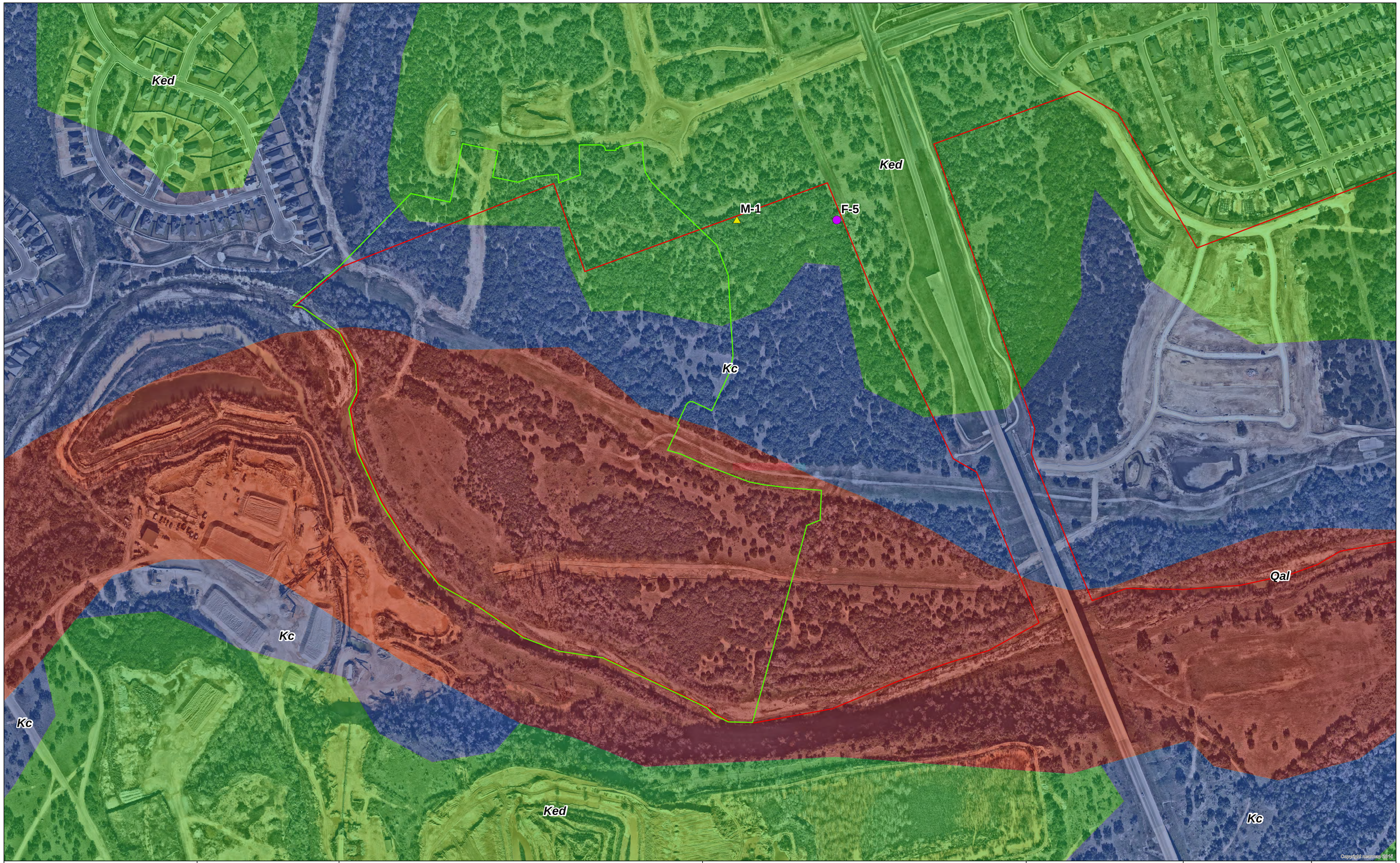
Site Geologic Map
Guy Tract
Southern Terminus D B Wood Road
Georgetown, Williamson County, Texas

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

0 150 300
Feet

Scale: 1" = 300'

170167 - Hillwood Guy Tract\Graphics\170167GA_06D_SGM.mxd



Horizon™ Environmental Services

Date:	03/28/2023
Drawn:	KRW
HJN NO:	170167
Source:	UT-BEG, 1981; Nearmap, 2023

Legend

- Geologic Feature
- Man-Made Feature
- Overall Boundary
- Section 6G
- Alluvium (Qal)
- Edwards Limestone (Ked)
- Comanche Peak (Kc)

Attachment D

Site Geologic Map
Guy Tract
Southern Terminus D B Wood Road
Georgetown, Williamson County, Texas

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

0 100 200
Feet
Scale: 1" = 200'

170167 - Hillwood Guy Tract\Graphics\170167GA_06D_SGM.mxd

Horizon
Environmental Services, Inc.

ATTACHMENT E

SUPPORTING INFORMATION

1.0 INTRODUCTION AND METHODOLOGY

This report and any proposed abatement measures are intended to fulfill Texas Commission on Environmental Quality (TCEQ) reporting requirements (TCEQ, 2005b). This geologic assessment includes a review of the subject site for potential aquifer recharge and documentation of general geologic characteristics for the subject site. Horizon Environmental Services, Inc. (Horizon) conducted the necessary field and literature studies according to TCEQ *Instructions to Geologists for Geologic Assessments on the Edwards Aquifer Recharge/Transition Zones* (TCEQ, 2004).

Horizon walked transects spaced less than 50 feet apart, mapped the locations of features using a sub-foot accurate Trimble Geo HX handheld GPS, and posted processed data utilizing GPS Pathfinder Office software, topographic maps, and aerial photographs. Horizon also searched the area around any potential recharge features encountered to look for additional features. When necessary, Horizon removed loose rocks and soil (by hand) to preliminarily assess each feature's subsurface extent while walking transects. However, labor-intensive excavation was not conducted during this assessment. Features that did not meet the TCEQ definition of a potential recharge feature (per TCEQ, 2004), such as surface weathering, karren, or animal burrows, were evaluated in the field and omitted from this report.

The results of this survey do not preclude the possibility of encountering 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, work should be halted until the TCEQ (or appropriate agency) is contacted and a geologist can investigate the feature.

2.0 ENVIRONMENTAL SETTING

2.1 LOCATION AND GENERAL DESCRIPTION

The subject site consists of approximately 366 acres of mostly undeveloped rangeland located at the southern terminus of D B Wood Road in Georgetown, Williamson County, Texas (Attachment F, Figure 1).

2.2 LAND USE

The subject site is currently undeveloped rangeland used to raise beef cattle. Surrounding lands are generally used for agricultural, single-family residential, and/or commercial retail purposes.

2.3 TOPOGRAPHY AND SURFACE WATER

The subject site is situated on gently to steeply sloping terrain that is located within the San Gabriel River watershed (Attachment F, Figures 2 and 3). Surface elevations on the subject site vary from a minimum of approximately 720 feet above mean sea level (amsl) along the southern property boundary at the South Fork of the San Gabriel River to a maximum of approximately 845 feet amsl along the northern property boundary (USGS, 1987). In general,

drainage on the site occurs by overland sheet flow in multiple directions (from north to south, northwest to southeast, and northeast to southwest) into several unnamed tributaries of the South Fork of the San Gabriel River.

2.4 EDWARDS AQUIFER ZONE

The northern portion of the subject site (approximately 76.3 acres) is located within the Edwards Aquifer Recharge Zone (EARZ) (TCEQ, 2017) (Attachment F, Figure 2). The Recharge Zone is described as an area where the stratigraphic units constituting the Edwards Aquifer crop out, including the outcrops of other geologic formations in proximity to the Edwards Aquifer, where caves, sinkholes, faults, fractures, or other permeable features would create a potential for recharge of surface waters into the Edwards Aquifer. The western and southern portions of the site (approximately 289.7 acres) are located within the Edwards Aquifer Contributing Zone. The Contributing Zone of the Edwards Aquifer includes all watersheds that feed runoff into rivers and streams that flow over the Recharge Zone (TCEQ, 2005b). TCEQ rules regulate activities in the portions of the Contributing Zone that are within the counties already regulated by the Edwards Aquifer rules. These areas are generally north and west of the Recharge Zone.

2.5 SURFACE SOILS

Six soil units are mapped within the subject site (NRCS, 2017) (Attachment F, Figure 4). Generally, the soil series are similar in their physical, chemical, and engineering properties, with the principal exception being rock fragment content and thickness. The soil units are described in further detail below.

Brackett gravelly clay loam, 3 to 12% slopes (BkE): 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.

Eckrant cobbly clay, 1 to 8% slopes (EaD): 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-Rock outcrop complex, rolling (ErE): This unit occurs 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.

Georgetown stony clay loam, 1 to 3% slopes (GsB): This a gently sloping soil that occurs within central upland areas of the subject site. 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 is slight.

Oakalla soils, channeled (Oc) occur primarily along the bottomlands of the South Fork of the San Gabriel River. The surface layer is dark brown loam about 7 inches thick, followed by a dark brown clay loam layer about 16 inches thick. The underlying layer, to 66 inches, is dark brown, sandy, clay loam. This soil is calcareous and moderately alkaline. The available water capacity is high.

Sunev silty clay loam, 1 to 3% slopes (SuB): 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.

2.6 WATER WELLS

A review of TCEQ and Texas Water Development Board (TWDB) records revealed no water wells on the subject site and 3 wells within 0.5 miles of the subject site (TCEQ, 2017; TWDB, 2017). According to the TWDB records, 2 of the off-site wells (ID nos. 5827217 and 5819702) are reportedly completed within the Edwards Aquifer at total depths of 121 and 106 feet below surface grade, respectively. The third well (ID no. 54762) is reportedly completed within the Trinity Aquifer at a total depth of 840 feet below surface grade. Additionally, Horizon observed 2 unused private water wells (M-1 and M-2) at the subject site; however, no available records for these wells were found.

The results of this assessment do not preclude the existence of additional undocumented or abandoned wells on the site. If a water well or casing is encountered during construction, work should be halted near the object until the TCEQ is contacted. If any on-site wells are not intended for future use, they should be capped or properly abandoned according to the Administrative Rules of the Texas Department of Licensing and Regulation (TDLR), 16 Texas Administrative Code (TAC), Chapter 76. A plugging report must be submitted by a licensed water well driller to the TDLR Water Well Driller's Program, Austin, Texas. TCEQ publication RG-347, "Landowner's Guide to Plugging Abandoned Water Wells," provides specific guidance. If a well is intended for use, it must comply with 16 TAC §76.

2.7 GEOLOGY

Literature Review

A review of existing literature shows the subject site is predominantly underlain by both the undifferentiated Edwards Limestone Formation (Ked) and Comanche Peak Limestone (Kc) (UT-BEG, 1981), with estimated maximum thicknesses of about 65 and 60 feet, respectively. In addition, recent alluvium deposits (Qal - gravel, sand, silt, and clay) occur along the lower, eroded areas located along and near the South Fork of the San Gabriel River, with an estimated maximum thickness of up to 30 feet.

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 underlies the Edwards and crops out on the south-facing slopes located near the South Fork of the San Gabriel River. It is approximately 60 feet thick and consists of white, soft, nodular limestone interbedded with marl and calcareous clay. Underlying the Comanche Peak Limestone is the Walnut Formation (Kwa). The uppermost 50 feet of the Walnut Formation is named the Keys Valley Marl Member, 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 and Bee Creek Marl members of the Walnut Formation. In general, the rock strata beneath the subject site dip to the east-southeast at about 10 to 30 feet per mile.

The subject site is located within the Balcones Fault Zone, and available geologic reports indicate the nearest mapped fault is located about 2 miles to the northeast. In general, the rock strata beneath the site dip to the east-southeast at about 10 to 30 feet per mile (less than 1°). The site Stratigraphic Column is provided as Attachment B, and the Site Geologic Map is Attachment D.

Field Assessment

A field survey of the subject site was conducted by a licensed Horizon geologist and support staff on 21, 22, 23, and 24 August 2017 and 8, 11, and 12 September 2017. Horizon identified 6 geologic features (F-1, F-2, F-2A, F-3, F-4, and F-5) and 2 man-made features (M-1 and M-2; private water wells previously discussed) on the subject site that meet the TCEQ definition of a potential recharge feature. In addition, Horizon observed no apparent springs at the subject site.

Geologic features identified on the subject site are described as follows:

Geologic Feature F-1: Small upland sinkhole measuring approximately 6 feet in diameter by 1 foot deep, with a semi-open drainage portal (approximately 1.5 feet long by 0.5 feet wide by 1.5 feet deep) amongst rock and loose soil infilling. Slight air flow conductivity was noted at the opening. After limited hand excavation, probing with a steel rod encountered loose soil, small rocks, and/or cobbles about 2 feet below the surface. On 8 September 2017, Horizon staff hand- excavated an area (3 feet long by 2 feet wide by 4 feet deep) and found the portal narrows

to only about 1 foot in diameter at 6 feet below the surface. No other voids and/or drainage portals were observed along the excavated floor or walls. Additional probing within the portal revealed loose soil and/or rocks infilling at 8 feet below the surface. The excavation area was left open. This feature has an intermediate infiltration rate and a surface runoff catchment of less than 0.4 acres.

Geologic Features F-2 and F-2A: Two small solution cavities spaced about 15 feet apart, measuring approximately 0.5 feet in diameter by 1.5 feet deep, with semi-open drainage portals along soil/rock-filled floor areas. Probing with a steel rod encountered light brown clay soil about 2 feet below the surface. Slight air flow conductivity was noted at the openings. On 8 and 11 September 2017, Horizon staff hand-excavated both cavities (approximately 3 feet in diameter by 1.5 feet deep [F-2A] and 3 feet long by 2 feet wide by 2 feet deep [F-2]) and exposed 2 open drainage portals along the excavated floor of the eastern (F-2) solution cavity. The larger portal was about 0.5 feet long by 0.2 feet wide by 1.5 feet deep, with an apparent thin (6-inch high) bedding plane void below. The excavation areas were left open. These features have an intermediate infiltration rate and a surface runoff catchment of less than 0.1 acres, since they are located on a flat to very gently sloping area.

Geologic Feature F-3: Solution-enlarged fracture measuring approximately 6 feet long by 0.5 feet wide by 1.5 feet deep (azimuth: N75°E), with apparent semi-open drainage portals and no apparent air flow conductivity. After limited hand excavation, probing with a steel rod encountered loose clay and cobbles about 2 feet below the surface. On 12 September 2017, Horizon staff hand-excavated an area (2.5 feet long by 2 feet wide by 2.5 feet deep) near the center of the fracture and found no voids and/or drainage portals along the excavated floor and/or walls. Additional probing within the excavation revealed soft weathered bedrock at 3 feet below the surface. The excavation area was left open. This feature has a low infiltration rate and an apparent surface runoff catchment of less than 0.1 acres.

Geologic Feature F-4: Epikarstic solution cavity measuring approximately 0.8 feet long by 0.3 feet wide by 1 foot deep, with firm soil and/or rock infilling. No air flow conductivity or apparent drainage portals were noted. After limited hand excavation, probing with a steel rod encountered firm soil infilling about 1.5 feet below the surface. This feature has a low infiltration rate and an apparent surface runoff catchment of less than 0.1 acres.

Geologic Feature F-5: Small rock shelter cave located along a steep cliff edge within an unnamed tributary of the San Gabriel River near the northeastern corner of the subject site (west tract). The cave measures approximately 15 feet across by 3 feet high along the entrance and extends into the cliff face for about 20 feet. Near the back of the cave is a narrow, low passage about 2 feet wide by 0.5 to 1 foot high that extends for an unknown distance. Slight to moderate air flow conductivity was noted near this opening. This feature is a relic discharge feature that, at one time in the past, may have had groundwater flowing out of the cave entrance as a spring. No water was observed inside the cave. This feature has a very low infiltration rate and no surface runoff catchment.

The geologic and man-made features were evaluated for their potential to be significant pathways for fluid movement into the Edwards Aquifer. The Geologic Assessment

Table (Attachment A) 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).

3.0 CONCLUSIONS AND RECOMMENDATIONS

Three geologic features (F-1, F-2, and F-2A) 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, for features F-2 and F-2A, only a 50-foot-diameter setback buffer around each opening is recommended, since the immediate topography is relatively flat surrounding these features.

Three geologic features (F-3, F-4, and F-5) have been evaluated as non-sensitive for groundwater recharge capability and would therefore not require a TCEQ protective setback buffer. No further action is recommended for these non-sensitive geologic features. The man-made features (M-1 and M-2) have also been evaluated as non-sensitive for groundwater recharge capability and would therefore not require TCEQ protective setback buffers. Additionally, some of the larger unnamed tributaries of the South Fork of the San Gabriel River would require protection or mitigation pursuant to the City of Georgetown Edwards Aquifer Recharge Zone Water Quality Ordinance No. 2013-59.

The site generally appears well suited to development prospectuses. 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-disturbing activities.

Because a portion of the subject site is located over the Edwards Aquifer Recharge Zone, it is possible that subsurface voids underlie the site. If any subsurface voids are encountered during site development, work should halt immediately so that a geologist may assess the potential for the void(s) to provide meaningful contribution to the Edwards Aquifer.

4.0 REFERENCES

(CAPCOG) Capital Area Council of Governments. *Data, Maps, and Reports.* Contours 10 Foot Merge, <http://www.capcog.org/data-maps-and-reports/geospatial-data/>. 7 November 2013.

(NRCS) Web Soil Survey, <http://websoilsurvey.nrcs.usda.gov/app/WebSoilSurvey.aspx>. Accessed 27 September 2017.

(OSM) OpenStreetMap contributors. Open Street Map, <http://www.openstreetmap.org>. Available under the Open Database License (www.opendatacommons.org/ licenses/odbl). Accessed 18 September 2017.

(TCEQ) *Instructions to Geologists for Geologic Assessments on the Edwards Aquifer Recharge/Transition Zones*. Revised October 2004.

_____. 2005a. Edwards Aquifer Protection Program, Chapter 213 Rules – Recharge Zone, Transition Zone, Contributing Zone, and Contributing Zone Within the Transition Zone. Vector digital data. Available at <https://www.tceq.texas.gov/gis/download-tceq-gis-data>. 2005; accessed 9 March 2017.

_____. 2005b. *Complying with the Edwards Aquifer Rules: Administrative Guidance.* RG-348. Revised July 2005.

_____. Edwards Aquifer Protection Program. Edwards Aquifer Viewer, <https://www.tceq.texas.gov/gis/edwards-viewer.html>. Accessed 18 September 2017.

(TNRIS) Texas Natural Resources Information System. Texas Orthoimagery Program. Williamson County, Texas. 2015.

(TWDB) Texas Water Development Board. Water Information Integration and Dissemination System. TWDB Groundwater Database, <http://www2.twdb.texas.gov/apps/ waterdatainteractive/groundwaterdataviewer>. Accessed 18 September 2017.

(USDA) US Department of Agriculture. Digital orthophoto quarter-quadrangle, Georgetown, Texas. National Agriculture Imagery Program, Farm Service Agency, Aerial Photography Field Office. 2016

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

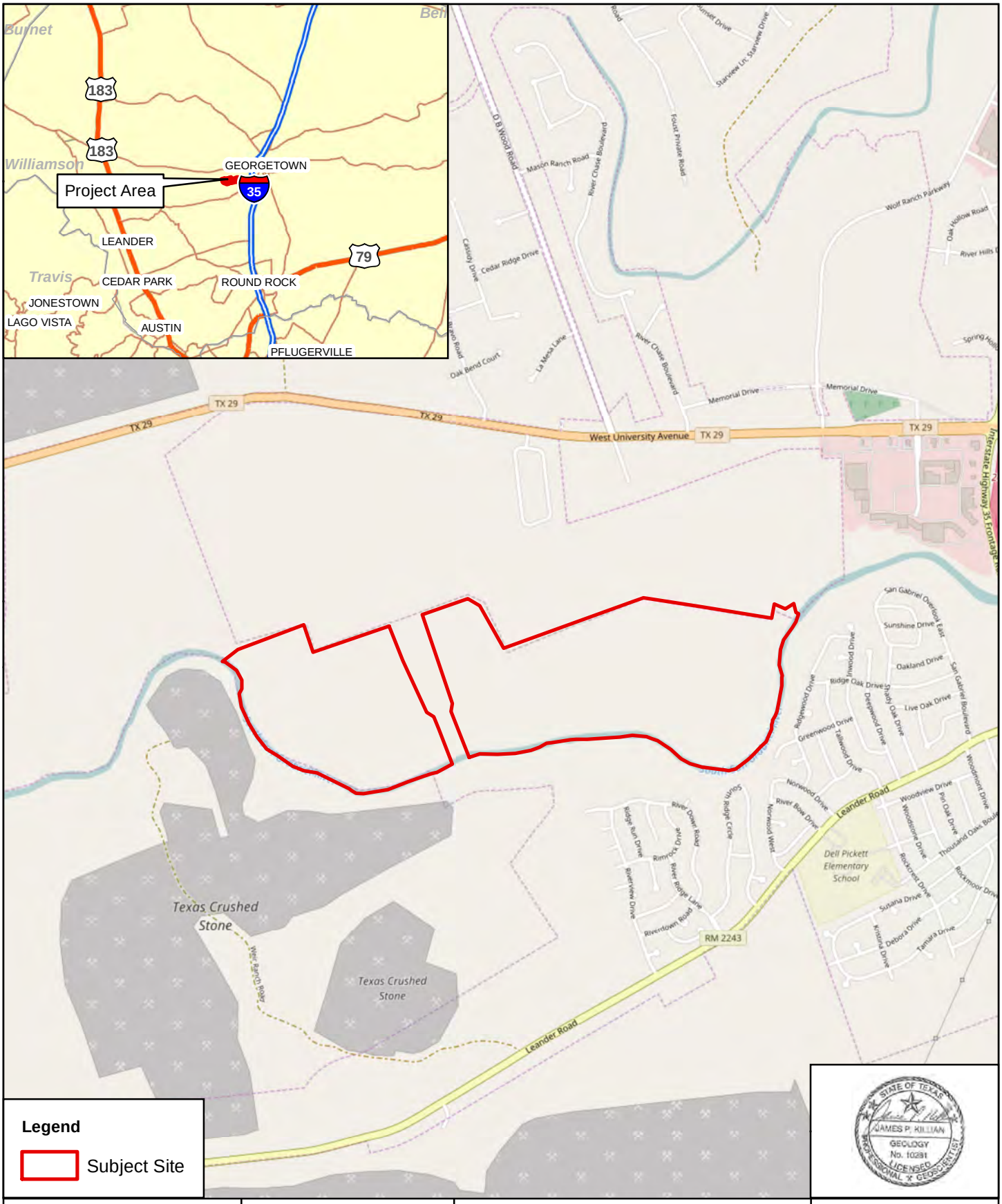
(UT-BEG) The University of Texas at Austin Bureau of Economic Geology; C.V. Proctor, Jr., T.E. Brown, J.H. McGowen, N.B. Waechter, and V.E. Barnes. *Geologic Atlas of Texas*, Austin Sheet. Francis Luther Whitney Memorial Edition. 1974; revised 1981.

_____. State Map GIS Databases. Geology of the Georgetown area. <http://www.beg.utexas.edu/mainweb/services/GISdatabases.htm>. 19 February 2002.

Werchan, L. E., and John L. Coker. *Soil Survey of Williamson County, Texas*. US Department of Agriculture, Natural Resources Conservation Service (formerly Soil Conservation Service), in cooperation with the Texas Agricultural Experiment Station. 1983.

ATTACHMENT F

ADDITIONAL SITE MAPS



STATE OF TEXAS
JAMES P. KILLIAN
GEOLOGY
No. 10291
LICENSED
PROFESSIONAL GEOSCIENTIST

Horizon Environmental Services, Inc.

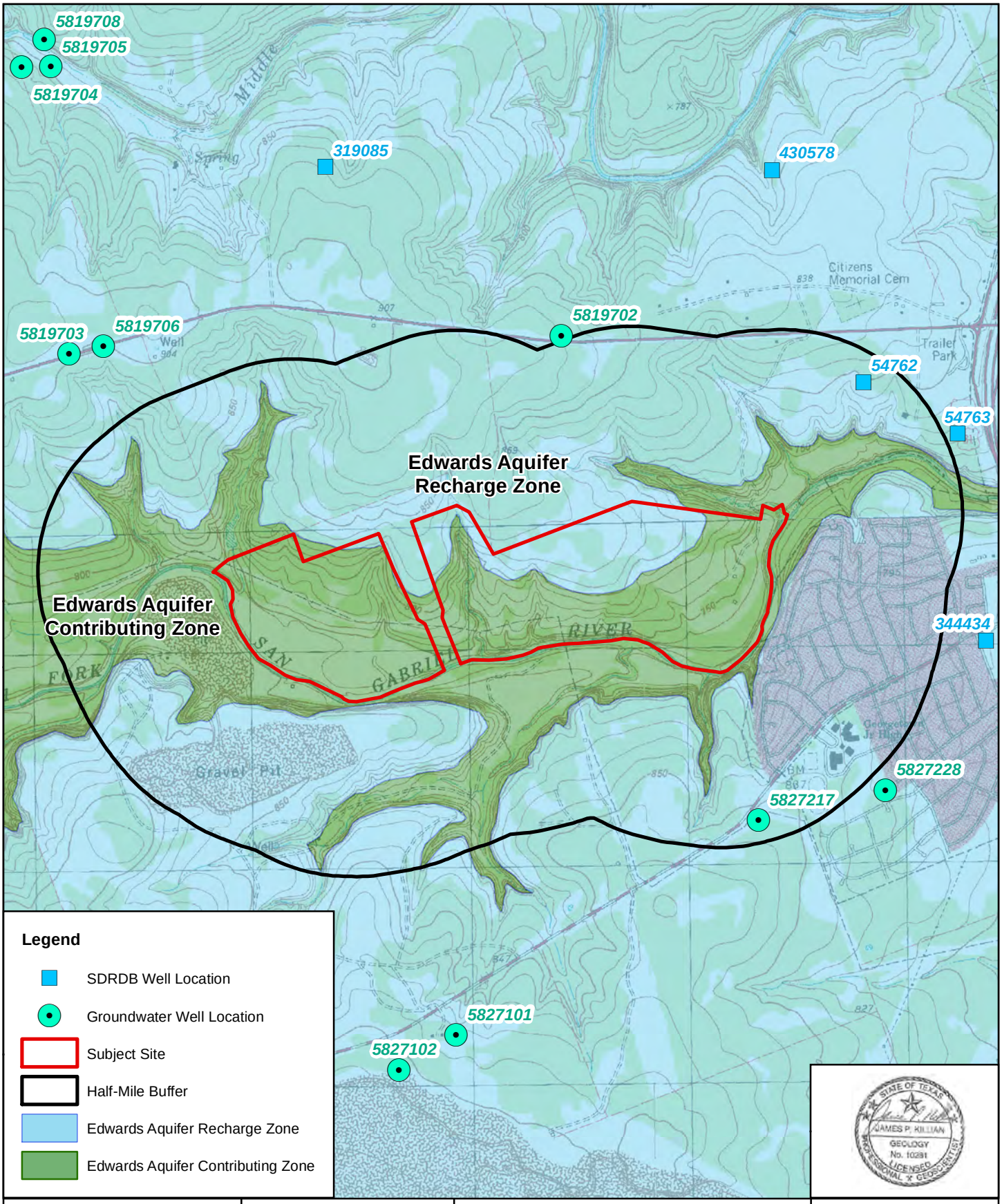
Date:	08/23/2017
Drawn:	REO
HJN NO:	170167
Source:	OSM, 2017

Attachment F, Figure 1

Vicinity Map
Guy Tract
Southern Terminus of D B Wood Road
Georgetown, Williamson County, Texas

0 1,000 2,000
Feet

170167 - Hillwood Guy Tract\Graphics\170167GA_01A_Vicinity.mxd



Horizon Environmental Services, Inc.

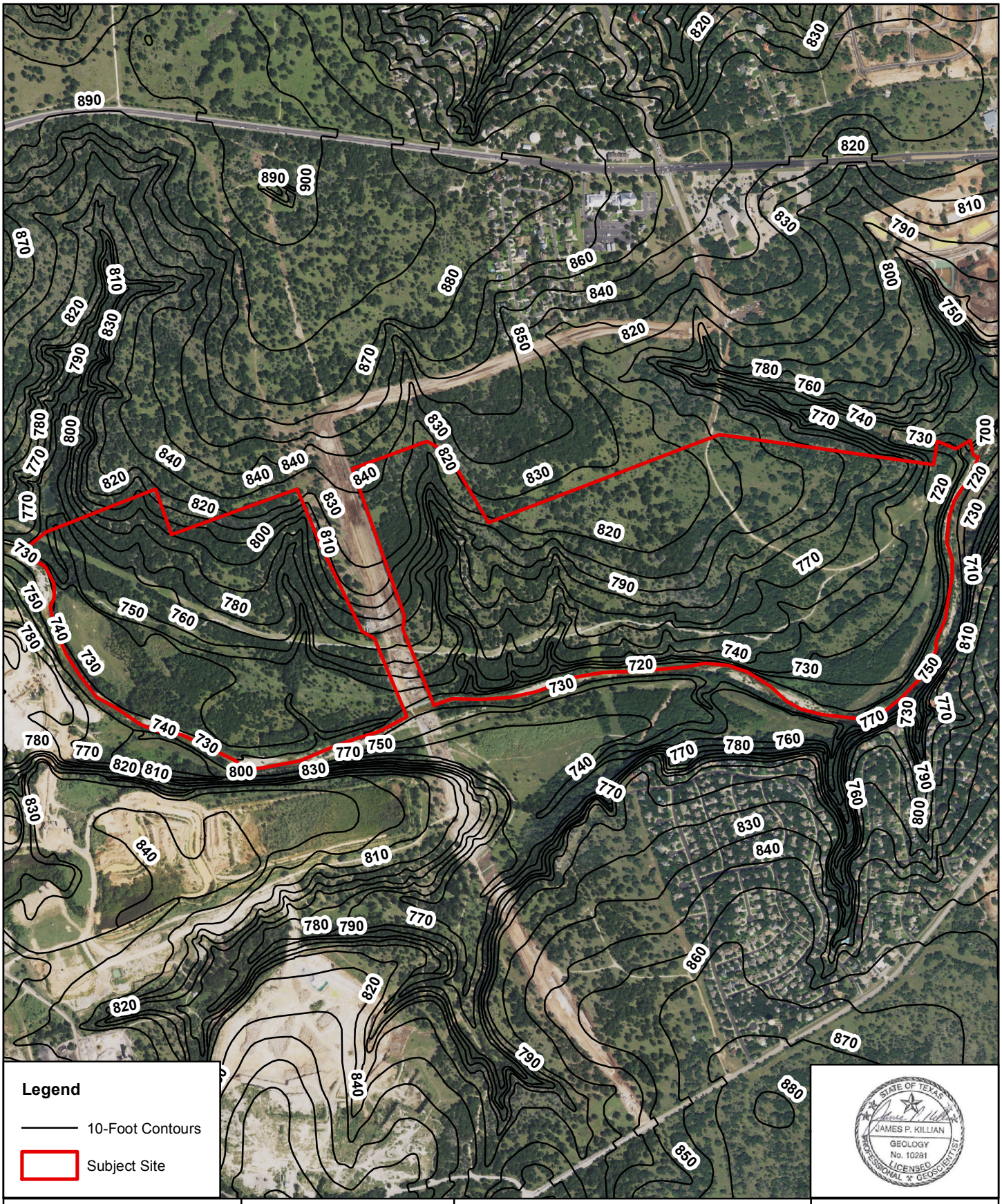
Date:	08/23/2017
Drawn:	REO
HJN NO:	170167
Source:	USGS, 1987; TCEQ, 2107; TWDB, 2017

Attachment F, Figure 2

Topography and Hydrogeology Map
Guy Tract
Southern Terminus of D B Wood Road
Georgetown, Williamson County, Texas

0 1,000 2,000
Feet

170167 - Hillwood Guy Tract\Graphics\170167GA_02A_Topo_Hydro.mxd



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

Horizon
Environmental Services, Inc.

Date:	08/23/2017
Drawn:	REO
HJN NO:	170167
Source:	CAPCOG, 2013; USDA, 2016

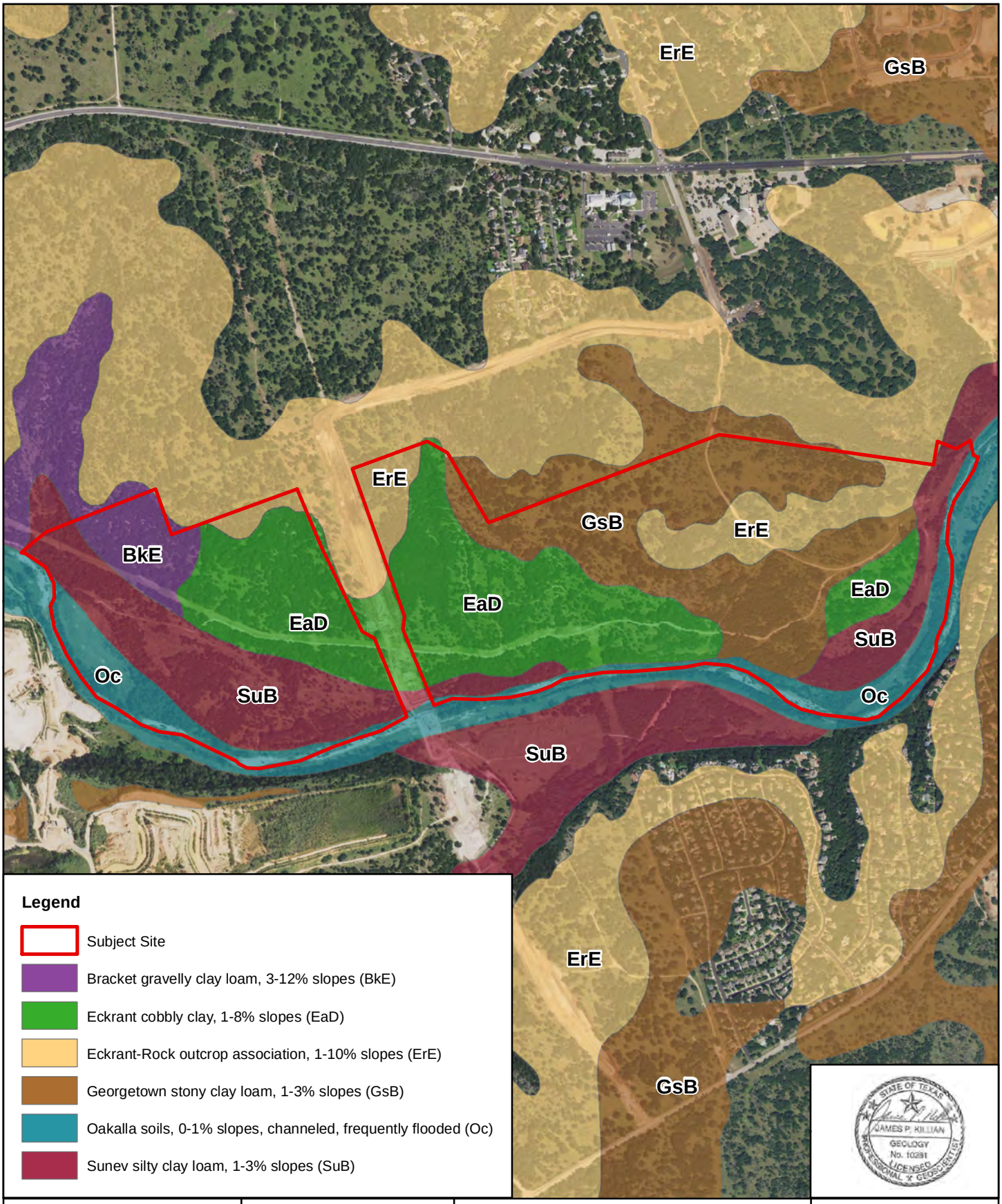
Attachment F, Figure 3

Site Topography Map
Guy Tract
Southern Terminus D B Wood Road
Georgetown, Williamson County, Texas

N

0 600 1,200
Feet

170167 - Hillwood Guy Tract\Graphics\170167GA_03A_Topo.mxd



Legend

- Subject Site
- Bracket gravelly clay loam, 3-12% slopes (BkE)
- Eckrant cobbly clay, 1-8% slopes (EaD)
- Eckrant-Rock outcrop association, 1-10% slopes (ErE)
- Georgetown stony clay loam, 1-3% slopes (GsB)
- Oakalla soils, 0-1% slopes, channeled, frequently flooded (Oc)
- Sunev silty clay loam, 1-3% slopes (SuB)

STATE OF TEXAS
JAMES P. KILLIAN
GEOLOGY
No. 10291
LICENSED
PROFESSIONAL GEOSCIENTIST

Horizon Environmental Services, Inc.

Date:	08/23/2017
Drawn:	REO
HJN NO:	170167
Source:	USDA, 2016; NRCS, 2017

Attachment F, Figure 4

Surface Soil Map
Guy Tract
Southern Terminus of D B Wood Road
Georgetown, Williamson County, Texas

N

0 600 1,200
Feet

170167 - Hillwood Guy Tract\Graphics\170167GA_04A_Soils.mxd

ATTACHMENT G

SITE PHOTOGRAPHS

Horizon
Environmental Services, Inc.

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

PHOTO 2
View of F-1 after hand excavation with narrow, open drainage portal(s)

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

PHOTO 4
View of F-2 after hand excavation with open drainage portals

Horizon
Environmental Services, Inc.

PHOTO 5
View of geologic feature F-2A (solution cavity), facing down

PHOTO 6
View of F-2A after hand excavation with open drainage portal

PHOTO 7
View of geologic feature F-3 (solution-enlarged fracture), facing east

PHOTO 8
View of F-3 after hand excavation with no voids or open drainage portals

Horizon
Environmental Services, Inc.

PHOTO 9
View of geologic feature F-4 (epikarstic solution cavity), facing north

PHOTO 10
View of geologic feature F-5 (rock shelter cave), facing northeast

PHOTO 11
View inside F-5 (rock shelter cave), facing northeast

PHOTO 12
Another view inside F-5, facing east

PHOTO 13
View of man-made feature M-1 (unused water well), facing south

PHOTO 14
View of man-made feature M-2 (water well) used to water livestock, facing west

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: Wolf Ranch West Section 6G

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: Fred J. Balda
   Entity: H4 Georgetown, LP & H4 Georgetown Phase 1 , LLC
   Mailing Address: 129 Canyon View Road
   City, State: Georgetown, Texas Zip: 78626
   Telephone: 713-516-7964 Fax: _____
   Email Address: carter.DeWalch@hillwood.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: John Pickens
   Texas Licensed Professional Engineer's Number: 110631
   Entity: Kimley-Horn & Associates, Inc.
   Mailing Address: 10814 Jollyville Road, Building IV, Suite 200
   City, State:Austin, Texas Zip: 78759
   Telephone:512-720-5466 Fax:_____
   Email Address:john.pickens@kimley-horn.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: 31
   ☐ 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 — 7,595 gallons/day
   _____% Industrial — _____ gallons/day
   _____% Commingled — _____ gallons/day

   Total gallons/day: 7,595

6. Existing and anticipated infiltration/inflow is 2,500 gallons/day. This will be addressed by: including infiltration/in flow with peak wet weather flow.

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 with SCS 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)*
8" (gravity)	1,107	SDR-26-PVC	ASTM D 3034
6" (gravity laterals)	593	SDR-26-PVC	ASTM D 3034

Total Linear Feet: 1,700

(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 San Gabriel Wastewater Treatment Plant (City of Georgetown) (name) Treatment Plant. The treatment facility is:

   ☒ Existing
   ☐ Proposed

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

   ☒ The City of Georgetown 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?*
SEE ATTACHED WWMH SUMMARY	Of		
	Of		
	Of		
	Of		
	Of		
	Of		

WOLF RANCH WEST SECTION 6G WW MANHOLE SUMMARY			
LINE	**SHOWN ON SHEET**	**STATION**	**MANHOLE OR CLEANOUT?**
B	70 OF 87	9+85.74	MH B4
B	71 OF 87	10+84.86	MH B5
B	71 OF 87	11+90.92	MH B6
B	71 OF 87	14+74.10	MH B7
B	71 OF 87	15+70.93	MH B8
B	71 OF 87	17+04.03	MH B9
E	74 OF 87	8+18.69	MH E4
F	75 OF 87	3+83.68	MH F1
F	75 OF 87	4+82.80	MH F2
F	75 OF 87	6+73.88	MH F3

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" = 100', 60', 50', 40'.

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

20. Lateral stub-outs:

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

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

21. Location of existing and proposed water lines:

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

22. 100-year floodplain:

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

Table 3 - 100-Year Floodplain

Line	***Sheet***	***Station***
N/A	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***
N/A	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***
N/A				

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***
N/A			

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*
N/A			

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*
N/A					

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]**	86 of 87
Manhole, showing inverts comply with 30 TAC §217.55(l)(2) **[Required]**	86 of 87
Alternate method of joining lateral to existing SCS line for potential future connections **[Required]**	N/A of N/A
Typical trench cross-sections **[Required]**	86 of 87
Bolted manholes **[Required]**	N/A of N/A
Sewer Service lateral standard details **[Required]**	86 of 87
Clean-out at end of line **[Required, if used]**	86 of 87
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]**	85 of 87
Mandrel detail or specifications showing compliance with 30 TAC §217.57(b) and (c) **[Required, if Flexible Pipe is used]**	87 of 87

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: 01/20/2024

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

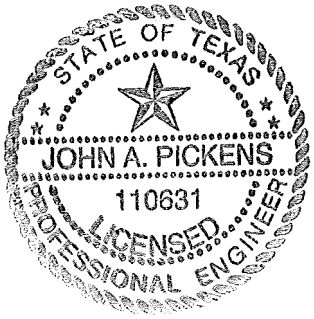
To the best of my knowledge, the responses to this form accurately reflect all information requested concerning the proposed regulated activities and methods to protect the Edwards Aquifer. This **Organized Sewage Collection System Application** is hereby submitted for TCEQ review and executive director 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: John Pickens, P.E.

Date: 11/06/2023

Place engineer's seal here:

Signature of Licensed Professional Engineer:



11/15/2023

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)

WASTEWATER ENGINEERING REPORT AND SPECIFICATIONS

Wolf Ranch West
Section 6G
Georgetown, Williamson County, Texas

Prepared By:

John Pickens
Kimley-Horn and Associates, Inc.
10814 Jollyville Road
Building IV, Suite 200
Austin, TX 78759
TEXAS REGISTRATION #928

STATE OF TEXAS
JOHN A. PICKENS
110631
LICENSED
PROFESSIONAL ENGINEER

November 2023

Kimley»Horn

11/15/2023

Engineering Design Report

For

Wolf Ranch West Section 6G
Organized Sewage Collection System

November 2023

Prepared By:
Kimley-Horn & Assocates, Inc.
10814 Jollyville Road, Building IV, Suite 200
Austin, Texas 78759
TBPE Registration Number F928

TABLE OF CONTENTS

Table of Contents	2
PVC Pipe Standards	3
Proposed Type of Pipe	4
Flow Capacity Analysis	4
Minimum and Maximum Grades for Pipes	5
Minimum and Maximum Velocities for the Proposed System	5
Average Values for Modulus of Soil Reaction, E'	6
Pipe Bedding Class	7
Pipe Bedding Angle	8
Live Load Determination	8
Prism Load Determination	9
Buckling Pressure (Allowable)	10
Buckling Pressure (Installed Condition)	11
Wall Crushing Calculation	12
Deflection Analysis: Leonhardt's Zeta Factor	14
Pipe Stiffness	15
Pipe Stiffness to Soil Stiffness Factor	16
Predicted Pipe Deflection	17
Pipe Strain	18
TCEQ Pipe Bedding and Trenching Requirements	20
Manhole Specifications	22

ATTACHMENTS

Attachment A: Wastewater/Sewage Calculations	29
Attachment B: Wastewater Utility Service Agreement	30
Attachment C: Local Sanitary Sewer Construction Notes	31

PVC PIPE STANDARDS

The American Society for Testing and Materials (ASTM) also known as ASTM International (Reference: www.astm.org) governs the manufacturing specifications for Polyvinyl Chloride (PVC) pipes, including the dimension ratio and water pressure allowable for use of each pipe, through its D-3034 standard. ASTM D-3034 lists its pipe dimensions and pipe classes using the "SDR" mark up, such as SDR-13.5, SDR-21, SDR-26 and SDR-41. The SDR refers to the standard dimension ratio (SDR) of the outside pipe diameter and the wall thickness. This project specifies the use of SDR-26 PVC pipe, which are to meet the ASTM pressure rating of 160 psi and fall in the size category listed below. ASTM D-3034 standards must be meticulously adhered to by all PVC pipe manufacturers and is recognized as the standard during PVC pressure pipe testing and quality checks. Other in-depth information can be found published in Thermoplastic Pressure Pipe Design and Selection UNI-TR-7, by the Uni-Bell PVC Pipe Association.

SDR 26 Pipe Size Matrix (Per ASTM D-3034)			
Size (in)	**O.D. (in)**	**Avg I.D. (in)**	**Thickness (in)**
4	4.215	3.891	0.162
6	6.275	5.793	0.241
8	8.4	7.754	0.323
10	10.5	9.692	0.404
12	12.5	11.538	0.481
15	15.3	14.124	0.588

PROPOSED TYPE OF PIPE (8")
(8")

Type I, Grade I, Polyvinyl Chloride (PVC) Specifications:
Size of Pipe: 8.00 in.

SDR 26 Properties

Pipe Compliance:	ASTM D-3034
Joint Compliance:	ASTM D-3139
Cell Classification:	12454
Minimum Tensile Strength (psi):	7,000
Minimum Modulus of Elasticity (psi):	400,000
Average Inner Diameter (inch):	7.754
Average Outer Diameter inch):	8.4
Wall Thickness (inch):	0.323
Approximate Trenching Width (feet):	2.70
Minimum Pipe Depth (Cover) used (feet):	**7.00**
Maximum Pipe Depth (Cover) used (feet):	**12.00**

FLOW/CAPACITY ANALYSIS

For the Proposed Project:

Proposed Waste Water Usage: **10,095 GPD** (max)

Q_{max} (As determined in Attachment A) = 0.016 CFS

$$Q_{full} = \frac{1.486}{n} \times A \times R^{\frac{2}{3}} \times \sqrt{S}$$

For the Specified Pipe at the Minimum Design Slope, the full flow is

Q_{full} = **2.042 CFS**

0.016 < 2.042
Design meets TCEQ Guidelines

MINIMUM AND MAXIMUM GRADES FOR PIPES (30 TAC §217.53(l)(2)(A))
(8")

Minimum and Maximum Pipe Slopes		
Size of Pipe	Minimum Slope (%)	Maximum Slope (%)
6	0.5	12.35
8	0.33	8.4
10	0.25	6.23
12	0.2	4.88
15	0.15	3.62
18	0.11	2.83
21	0.09	2.3
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 pipes larger than 39 inches in diameter, the slope is determined by Manning's formula to maintain a velocity greater than **2.0 feet per second and less than 10.0 feet per second** when flowing full.		

MINIMUM AND MAXIMUM VELOCITY FOR THE PROPOSED SYSTEM:
(8")

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

So, using 8.00 inch PVC Pipe:

V = velocity (ft/sec)	=	(solve)
n = Manning's coefficient	=	0.013
R_h = hydraulic radius	=	0.165
S = slope (ft/ft)		

Minimum Slope Used (%): **3.01**

Maximum Slope Used (%): **8.07**

V_{min} = 5.98 ft/sec

V_{max} = 9.79 ft/sec

5.98 > 2.00 ft/sec

9.79 < 10.00 ft/sec

Design meets TCEQ Guidelines

Design meets TCEQ Guidelines

AVERAGE VALUES OF MODULUS OF SOIL REACTION, E'

Soil type-pipe bedding material (Unified Classification System)	E' for Degree of Compaction of Bedding, in pounds per square inch			
	Dumped	Slight <85% Proctor, <40% relative density	Moderate 85%-95% Proctor, 40%-70% relative density	High, >95% Proctor, >70% relative density
(1)	(2)	(3)	(4)	(5)
Fine-grained Soils (LL>50[b]) Soils with medium to high plasticity CH, MH, CH-MH	No data available; consult a competent soils engineer; Otherwise use E'=0			
Fine-grained Soils (LL<50) Soils with medium to no plasticity, CL, ML, ML-CL,with less than 25% coarse-grained particles	50	200	400	1000
Fine-grained Soils (LL<50) Soils with medium to no plasticity, CL, ML, ML-CL,with more than 25% coarse-grained particles	100	400	1000	2000
Coarse-grained Soils with Fines GM, GC, SM, SC[c] contains more than 12% fines				
Coarse-grained Soils with Little or no Fines GW, GP, SW, SP[c] contains less than 12% fines	200	1000	2000	3000
Crushed Rock	1000	3000	3000	3000
Accuracy in Terms of Percentage Deflection	± 2	± 2	± 1	± 0.5

Taken from: Howard, Amster K. "Soil Reaction for Buried Flexible Pipe"
U.S. Bureau of Reclamation, Denver, CO and the American Society of Civil Engineers.

Modulus of Soil Reaction for the in-situ soil is determined to be = 1000 psi

PIPE BEDDING CLASS

Taken from the American Society for Testing and Material (ASTM) D 2321 and American Association of State Highway and Transportation Officials (AASHTO) M43, and as published on Table 7, in Deflection: The Pipe/Soil Mechanism UNI-TR-1-97, Uni-Bell PVC Pipe Association, Pg 24.

Pipe Embedment Material						E', psi (kPa) for Degree of Embedment Compaction				
ASTM D 2321*		ASTM D 2487		AASHTO M43 Notation	Min. Std. Proctor Density (%)	Lift Placement Depth	Dumped	Slightly < 85%	Moderate 85% - 95%	High > 95%
Class	Description	Notation	Description							
IA	Open-graded, clean manu-factured aggregates	N/A	Angular crushed stone or rock, crushed gravel, crushed slag; large voids with little or no fines	5 56	Dumped	18" (0.45 m)	1000 (6,900)	3000 (20,700)	3000 (20,700)	3000 (20,700)
IB	Dense-graded, clean manu-factured, processed aggregates	N/A	Angular crushed stone or other Class IA material and stone/sand mixtures; little or no fines							
II	Clean, coarse-grained soils	GW	Well-graded gravel, gravel/sand mixtures; little or no fines	57 6 67	85%	12" (0.30 m)	N/R	1000 (6,900)	2000 (13,800)	3000 (20,700)
		GP	Poorly graded gravel, gravel/sand mixtures; little or no fines							
		SW	Well-graded sands, gravelly sands; little or no fines							
		SP	Poorly graded sands, gravelly sands; little or no fines							
III	Coarse-grained soils with fines	GM	Silty gravels, gravel/sand/silt mixtures	Gravel and sand with <10% fines	90%	9" (0.20 m)	N/R	N/R	1000 (6,900)	2000 (13,800)
		GC	Clayey gravels, gravel/sand/clay mixtures							
		SM	Silty sands, sand/silt mixtures							
		SC	Clayey sands, sand/clay mixtures							

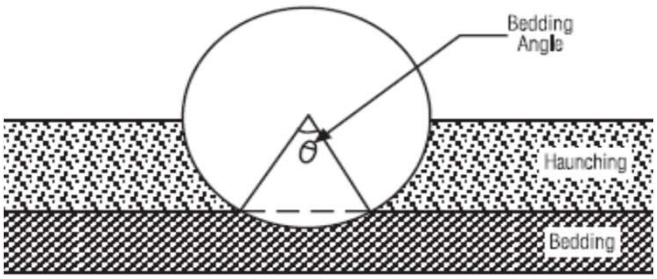
NOTE:

Per TCEQ guidelines, a contractor is allowed to use ASTM D 2321 Bedding Class 1A, 1B, II, or III at no less than 85% percent compaction. To grant the contractor its ability to make the proper judgment of which bedding class to use, the calculations provided in this Engineering Design Report reflect the use of **Bedding Class III, at 85%-95%** compaction, with an E' value of 1000 psi. This provides the "worst case" scenario for the SCS line. All other Bedding Class options will provide an improved value for the zeta factor as well as pipe deflection.

For Bedding Class III, 85%-95% Compaction, E_b = **1000** **psi**

PIPE BEDDING ANGLE

As Published on Figure 8 and Table 5, in Deflection: The Pipe/Soil Mechanism UNI-TR-1-97, Uni-Bell PVC Pipe Association, Pgs 18-19.



Bedding Constant Values

Bedding Angle, degrees	Bedding Constant
0	0.110
30	0.108
45	0.105
60	0.102
90	0.096
120	0.090
180	0.083

LIVE LOAD DETERMINATION

Source: AASHTO H20 and E80 Loads and as Published on Table 4, in Deflection: The Pipe/Soil Mechanism UNI-TR-1-97, Uni-Bell PVC Pipe Association, Pg 14.

Height of Cover (ft)	Live Load Transferred to Pipe, lb/in^2			Height of Cover (ft)	Live Load Transferred to Pipe, lb/in^2		
	Highway H20[1]	Railway E80[2]	Airport[3]		Highway H20[1]	Railway E80[2]	Airport[3]
1	12.50			14	*	4.17	3.06
2	5.56	26.39	13.14	16	*	3.47	2.29
3	4.17	23.61	12.28	18	*	2.78	1.91
4	2.78	18.40	11.27	20	*	2.08	1.53
5	1.74	16.67	10.09	22	*	1.91	1.14
6	1.39	15.63	8.79	24	*	1.74	1.05
7	1.22	12.15	7.85	26	*	1.39	*
8	0.69	11.11	6.93	28	*	1.04	*
10	*	7.64	6.09	30	*	0.69	*
12	*	5.56	4.76	35	*	*	*
				40	*	*	*

[1] Simulates 20 ton truck + impact
[2] Simulates 80,000 lb/ft railway load + impact
[3] 180,000 lbs. dual tandem gear assembly. 26 inch spacing between tires and 66 inch center-to-center spacing between fore and aft tires under a rigid pavement 12 inches thick + impact.
* Negligible live load influence

PRISM LOAD DETERMINATION

Also referred to as the 'dead' load, the prism load is the pressure acting on the pipe by the weight of the soil column above a given section of the pipe. The following prism load columns are industry standards as referenced from Table 3, Deflection: The Pipe/Soil Mechanism UNI-TR-1-97, Uni-Bell PVC Pipe Association, Pg 13.

Table 3
Prism Load Soil Pressure (lbs/in²)

Height of Cover (ft)	Soil Unit Weight (lb/ft³) 100	110	120	125	130
1	0.69	0.76	0.83	0.87	0.90
2	1.39	1.53	1.67	1.74	1.81
3	2.08	2.29	2.50	2.60	2.71
4	2.78	3.06	3.33	3.47	3.61
5	3.47	3.82	4.17	4.34	4.51
6	4.17	4.58	5.00	5.21	5.42
7	4.86	5.35	5.83	6.08	6.32
8	5.56	6.11	6.67	6.94	7.22
9	6.25	6.88	7.50	7.81	8.13
10	6.94	7.64	8.33	8.68	9.03
11	7.64	8.40	9.17	9.55	9.93
12	8.33	9.17	10.00	10.42	10.83
13	9.03	9.93	10.83	11.28	11.74
14	9.72	10.69	11.67	12.15	12.64
15	10.42	11.46	12.50	13.02	13.54
16	11.11	12.22	13.33	13.89	14.44
17	11.81	12.99	14.17	14.76	15.35
18	12.50	13.75	15.00	15.63	16.25
19	13.19	14.51	15.83	16.49	17.15
20	13.89	15.28	16.67	17.36	18.06
21	14.58	16.04	17.50	18.23	18.96
22	15.28	16.81	18.33	19.10	19.86
23	15.97	17.57	19.17	19.97	20.76
24	16.67	18.33	20.00	20.83	21.67
25	17.36	19.10	20.83	21.70	22.57
26	18.06	19.86	21.67	22.57	23.47
27	18.75	20.63	22.50	23.44	24.38
28	19.44	21.39	23.33	24.31	25.28
29	20.14	22.15	24.17	25.17	26.18
30	20.83	22.92	25.00	26.04	27.08
31	21.53	23.68	25.83	26.91	27.99
32	22.22	24.44	26.67	27.78	28.89
33	22.92	25.21	27.50	28.65	29.79
34	23.61	25.97	28.33	29.51	30.69
35	24.31	26.74	29.17	30.38	31.60
36	25.00	27.50	30.00	31.25	32.50
37	25.69	28.26	30.83	32.12	33.40
38	26.39	29.03	31.67	32.99	34.31
39	27.08	29.79	32.50	33.85	35.21
40	27.78	30.56	33.33	34.72	36.11
41	28.47	31.32	34.17	35.59	37.01
42	29.17	32.08	35.00	36.46	37.92
43	29.86	32.85	35.83	37.33	38.82
44	30.56	33.61	36.67	38.19	39.72
45	31.25	34.38	37.50	39.06	40.63
46	31.94	35.14	38.33	39.93	41.53
47	32.64	35.90	39.17	40.80	42.43
48	33.33	36.67	40.00	41.67	43.33
49	34.03	37.43	40.83	42.53	44.24
50	34.72	38.19	41.67	43.40	45.14

Note that the Prism Loads are calculated based upon the Marston Theory of Loads, developed by Professor Anson Marston, circa 1913, and is calculated using the formula:

$$P = \frac{\gamma_s * H}{144}$$

This formula determines the earth load on a flexible pipe and is regarded as a conservative approach to determining the dead load placed upon a buried flexible pipe.

BUCKLING PRESSURE (ALLOWABLE)

(8")

Where:	q_a	=	Allowable buckling pressure (psi)	
	h	=	Height of soil surface above top of pipe (in)	
	H	=	Depth of burial, feet, from ground surface to top of pipe	
	B'	=	Empirical coefficient of elastic support	
	E_b	=	Modulus of soil reaction for the bedding material (psi)	
	E	=	Modulus of elasticity of the pipe material (psi)	
	I	=	Moment of inertia of the pipe, per linear inch of pipe (in^3)	
	t	=	Pipe wall thickness (in)	
	D	=	Mean pipe diameter, outer (in)	D = 8.4

Solving for the Empirical coefficient of elastic support, given by Luscher in 1966, as referenced on Pg 113 of Moser, A.P., Buried Pipe Design. 2nd Ed., McGraw-Hill:

$$B' = \frac{4(h^2 + Dh)}{1.5(2h + D)^2}$$

$$B' = \frac{979.2}{1574.64} = 0.622$$

Using the Allowable Buckling Pressure Equation as shown in Moser, A.P., Buried Pipe Design. 2nd Ed., McGraw-Hill, Pg 112, and an initial factor of safety (SF) of 2.5, the Allowable Buckling Pressure is then:

$$q_a = \frac{1}{FS} * \sqrt{32 * R_w * B' * E_b * \left(E * \frac{I}{D^3}\right)}$$

$$q_a = \frac{1}{2.5}\sqrt{\left[32\right]\left[1\right]\left[0.622\right]\left[1000\right]\left[400000 \quad \frac{0.003}{592.70}\right]}$$

$$q_a = \mathbf{77.68} \quad \mathbf{psi}$$

BUCKLING PRESSURE (INSTALLED CONDITION)

(8")

Where:	q_P	=	Pressure applied to pipe under installed conditions (psi)
	γ_W	=	Specific Weight of Water = 0.0361 (pci)
	γ_S	=	Specific Weight of Soil (pcf)
	W_c	=	Vertical Soil Load on the pipe per unit length (lb/in)
	L_L	=	Live load as determined from chart

Standard industry vertical soil load (W_c) calculation (lb/in) developed from empirical data:

$$W_c = \gamma_s * H * \left(\frac{D + t}{144}\right)$$

Where: γ_S = 120 D = 8.4 t = 0.323

$$W_C = \left[\ 120\ \right]\left[\ 12.00\right]\left[\frac{8.4 + 0.323}{144}\right]$$

$$W_C = 87.23 \quad \text{lb/in}$$

Using the Equation on Pg 114 of Moser, A.P., Buried Pipe Design. 2nd Ed., McGraw-Hill, Pressure Applied to Pipe under installed conditions at its deepest installed depth (Note, hw = 0, therefore Rw = 1) is calculated to be:

$$q_p = \gamma_w h_w + R_w\left(\frac{W_c + L_L}{D}\right)$$

$$q_P = 62.4 \times 0 + 1 \times \left[\frac{97.23}{8.4}\right]$$

$$\boldsymbol{q_P = 21.96 \quad \text{psi}}$$

Note: The Buckling pressure under installed conditions is less than the Allowable Buckling Pressure of the specified pipe, (i.e.. $q_a > q_p$) therefore the design is acceptable for installation.

WALL CRUSHING CALCULATION

(8")

Where:	D_o	=	outside pipe diameter, in. =	8.4 in
	P_c	=	Compressive stress or hydrostatic design basis (HDB). For typical PVC pipe assume 4,000 psi. For any other pipe material the HDB must be supplied by the pipe manufacturer.	
	A	=	surface area of the pipe wall, in.^{2}/ft =	0.323 in.^{2}/ft
	γ_S	=	specific weight of soil, pcf, =	120 pcf
	H	=	Depth of burial (ft) from ground surface to crown of pipe	

Using the Wall Crushing and Wall Thrust equations, as referenced in Plastic Pipe Design Manual published by Vylon Pipe, Pg 14 the Wall Crushing due to compressive stress can be found using the following:

$$P_c = \frac{T}{A} \quad \text{where T, Thrust, is calculated as} \quad T = \frac{P_y D}{2}$$

Substituting the Thrust equation into the Wall Crushing equation:

$$P_c = \frac{\frac{P_y D}{2}}{A} = \frac{P_y D}{2A}$$

From the Marston Equation determining the Prism Load Calculation (See previous section on Prism Load), substitute the equation for P_y:

$$P_c = \frac{\frac{\gamma_s * H}{144} D}{2A} \quad \text{Rearranging this equation, it becomes:} \quad 2AP_c = \frac{\gamma_s * H}{144} D$$

And simplifies to: $288\,AP_c = \gamma_s HD$

Note that the Surface Area of the Pipe Wall, A, is per unit length in inches^2 per foot, a conversion factor (from feet to inches) of 12 must be applied, therefore,

$$24\,AP_c = \gamma_s HD$$

Solving for H, the equation becomes:

$$H = \frac{24 * P_c * A}{\gamma_s * D_o}$$

(Continued on next page)

Using this equation, and converting all units, solve for “height” of the soil column, or in other words, the depth of burial of the PVC pipe:

$$H = \frac{[24][4000][0.323 \times 12]}{120 \times 8.4} = \mathbf{369.14}$$

H = 369.14 feet

Note: The resulting Wall Crushing will occur at a greater depth than the deepest burial depth of the proposed SCS lines, therefore pipe design is acceptable.

DEFLECTION ANALYSIS: LEONHARDT'S ZETA FACTOR
(8")

The Leonhardt's Zeta Factor Equation can be calculated using Equation 9 of Buczala and Cassady in Buried Plastic Pipe Technology, Pgs 196-197

Where:	D	=	Pipe Outer Diameter, in	=	8.4
	B	=	Trench Width, in, = 2.7' =		32.4
	E_b	=	Modulus of soil reaction for the bedding material (psi)		
	E'_n	=	Modulus of soil reaction for the in-situ soil (psi)		

$$zeta = \frac{1.662 + 0.639\left(\frac{B}{D-1}\right)}{\frac{B}{D-1} + \left[1.662 + 0.361\left(\frac{B}{D}\right) - 1\right]\left[\frac{E_b}{E'_n}\right]}$$

The Leonhardt Zeta factor is then determined as:

$$zeta = \frac{1.662 + 0.639 \times \left(\frac{32.4}{7.4}\right)}{\frac{32.4}{7.4}\left(1.662 + 0.361 \times \left(\frac{32.4}{8.4}\right) - 1\right)\left(\frac{1000}{1000}\right)}$$

***Leonhardt's zeta factor* = 0.693**

<u>PIPE STIFFNESS (Figure: 30 TAC §217.53(k)(3))</u>
(8")

Using Equation B.1, as directed in 30 TAC §217.53(k)(3), to Calculate the Pipe Stiffness:

$$PS = C \times RSC \times \left(\frac{8.337}{D}\right)$$

Where:	PS	=	Pipe Stiffness in pounds per square inch (psi)	
	C	=	Conversion factor = 0.8	
	RSC	=	Ring Stiffness Constant	
	D	=	Mean Pipe Diameter, Outer =	8.400 in

The RSC can be supplied by the manufacturer or otherwise calculated using Equation 4 of <u>Resistance to Ring Bending – Pipe Stiffness (PS), Ring Stiffness Constant (RSC) and Flexibility Factor (FF) for Buried Gravity Flow Pipes TN-19/2005, Pg 6 published by the Plastics Pipe Institute:</u>

$$RSC = 6.44 \times \frac{EI}{D^2}$$

And E = 400,000 psi

Solving for the Moment of Inertia:

$$I = \left(\frac{t^3}{12}\right) * \left(\frac{inches^3}{in_{linear}}\right) = 0.003$$

$$RSC = 6.44 \times \frac{1123.276}{70.560} = 102.521$$

$$PS = 0.8 \times 102.521 \times \frac{8.337}{8.400}$$

PS = 81.40 psi

PIPE STIFFNESS TO SOIL STIFFNESS FACTOR
(8")

Where:	PS	=	Pipe Stiffness (psi) =	81.40 psi
	E_b	=	Modulus of soil reaction for the bedding material (psi)	
	zeta	=	Leonhardt's Zeta factor =	0.693
	SSF	=	Soil stiffness factor ($0.061 \times zeta \times E_b$)	

The Soil Stiffness Factor is calculated using Equation 10 referenced by Buczala and Cassady, Buried Plastic Pipe Technology, Pg 198, where:

$$SSF = 0.6 * zeta * E_b$$

Therefore,

$$\frac{PS}{SSF} = \frac{PS}{0.6 * zeta * E_b}$$

$$\frac{\text{PS}}{\text{SSF}} = \frac{81.40}{415.97} = 0.20$$

PREDICTED PIPE DEFLECTION

(8")

Using the Modified Iowa Equation, referenced and published by the Uni-Bell PVC Pipe association and found at http://www.uni-bell.org/faq.html, and Equation 14 of Deflection: The Pipe/Soil Mechanism UNI-TR-1-97, Uni-Bell PVC Pipe Association Pgs 17, the predicted pipe deflection can be calculated.

Where:	%ΔY/D	=	Predicted % vertical deflection under load	
	P	=	Prism Load, psi	
	K	=	Bedding angle constant, Assumed to =	0.110
	W'	=	Live Load, psi, =	0
	DR	=	Dimension Ratio=	26
	E	=	Modulus of tensile elasticity of the pipe material, psi	
	E'	=	Modulus of Soil Reaction, psi	
	D_L	=	Deflection Lag Factor = 1.5	

And using the Modified Iowa Equation:

$$(\%)\ \frac{\Delta Y}{D} = \frac{(D_L KP + KW') \times 100}{[2E/(3(DR-1)^3)] + 0.061E'}$$

Where, Prism Load, $P = \frac{\gamma_s * H}{144}$

and/or from previous chart, prism load = 10.00 psi

The Predicted Deflection is determined as:

$$(\%)\ \frac{\Delta Y}{D} = \frac{\left[\left[1.5 \times 1.1\right] + 0\right] \times 100}{\left[\frac{800000}{46875}\right] + \left[0.061 \times 1000\right]} = 2.11\%$$

NOTE: 2.11% < 5%, therefore pipe design is acceptable

PIPE STRAIN
(8")

Pipe strain is also known as the elongation of the pipe over the original length of the pipe. Under normal loading conditions of the PVC pipe, the variable that affects the elongation or straining of the pipe stems from the either the flexure or deflection (i.e.. bending) of the pipe within the bedding material (i.e. increased or excessive pipe deflection causing the pipe to elongate) or hoop stress within the pipe wall. Please note that pipe strain is not generally known to be the limiting performance factor during pipe failure. For this system, pipe deflection is limited to 5% for a SDR 26 pipe. This 5% deflection value is the industry accepted value placing the pipe within its straining limits. Therefore, as the calculated deflection above is shown to be less than 5%, the pipe and bedding class used in this system is within the acceptable straining limits for this pipe.

However, total Pipe strain is calculated as the combination of the before mentioned hoop stress and the maximum strain due to deflection. Both items are calculated below using Equations 15 and 16 found in Deflection: the Pipe/Soil Mechanism, UNI-TR-1-97, Published by the Uni-Bell PVC Pipe Association (Pgs 28-30):

Where:	$\in_h$	=	Maximum Pipe Strain due to Hoop Stress, in/in
	P	=	Pressure on the pipe (Live + Prism Loads), psi
	E	=	Modulus of Elasticity of the Pipe, psi
	t	=	Pipe Wall thickness, in
	D	=	Pipe Diameter, Average Outer, in

$$\in_h = \frac{PD}{2tE}$$

Using the maximum cover for both live loads and prism loads as well as the previous unit weight of the soil:

$$\in_h = \frac{[\ 0.00 \ + \ 10.00\ ] \times \ 8.4}{2 \ \times \ 0.323 \ \times \ 400{,}000} = \mathbf{3.251E\text{-}04} \ \frac{\text{in}}{\text{in}}$$

(*Continued on following page)*

Where:	$\in_f$	=	Maximum Pipe Strain due to Ring Deflection, in/in
	ΔY	=	Change in vertical pipe diameter under load, in, (numerator in the deflection equation, but in decimal form)
	t	=	Pipe Wall thickness, in
	D	=	Pipe Diameter, Average Outer, in
	DR	=	Dimension Ratio= 26

$$\in_f = \frac{t}{D}\left[\frac{3\Delta Y / D}{1 - 2\Delta Y / D}\right] = \frac{1}{DR}\left[\frac{3\Delta Y}{D - 2\Delta Y}\right]$$

$$\in_f = 0.038 \times \frac{4.950}{8.4 - 3.300} = 0.0373 \ \frac{\text{in}}{\text{in}}$$

$$\in_{total} = \mathbf{3.7655E\text{-}02} \ \frac{\text{in}}{\text{in}}$$

TCEQ PIPE BEDDING AND TRENCHING REQUIREMENTS (30 TAC 217.54)

These notes are provided in the Construction Documents on General Notes Sheet

a. Pipe Embedment
    1. A rigid pipe must be laid with the adequate bedding, haunching, and initial backfill to support the anticipated load. The bedding classes that are allowed are A, B, or C, as described in American Society for Testing and Materials (ASTM) C 12, American National Standards Institute (ANSI) A 106.2,Water Environment Federation Manual of Practice No. 9 or American Society of Civil Engineers (ASCE) MOP 37.
    2. A flexible pipe must be laid with the adequate bedding, haunching, and initial backfill to support the anticipated load. The bedding classes that are allowed are IA, IB, II, or III, as described in ASTM D-2321 or ANSI K65.171.
    3. Debris, large clods, or stones that are greater than six inches in diameter, organic matter, or other unstable materials are prohibited as bedding, haunching, or initial backfill.
    4. Backfill must not disturb the alignment of a collection system pipe.
    5. If trenching encounters significant fracture, fault zones, caves, or solutional modification to the rock strata, an owner must halt construction until an engineer prepares a written report detailing how construction will accommodate these site conditions.

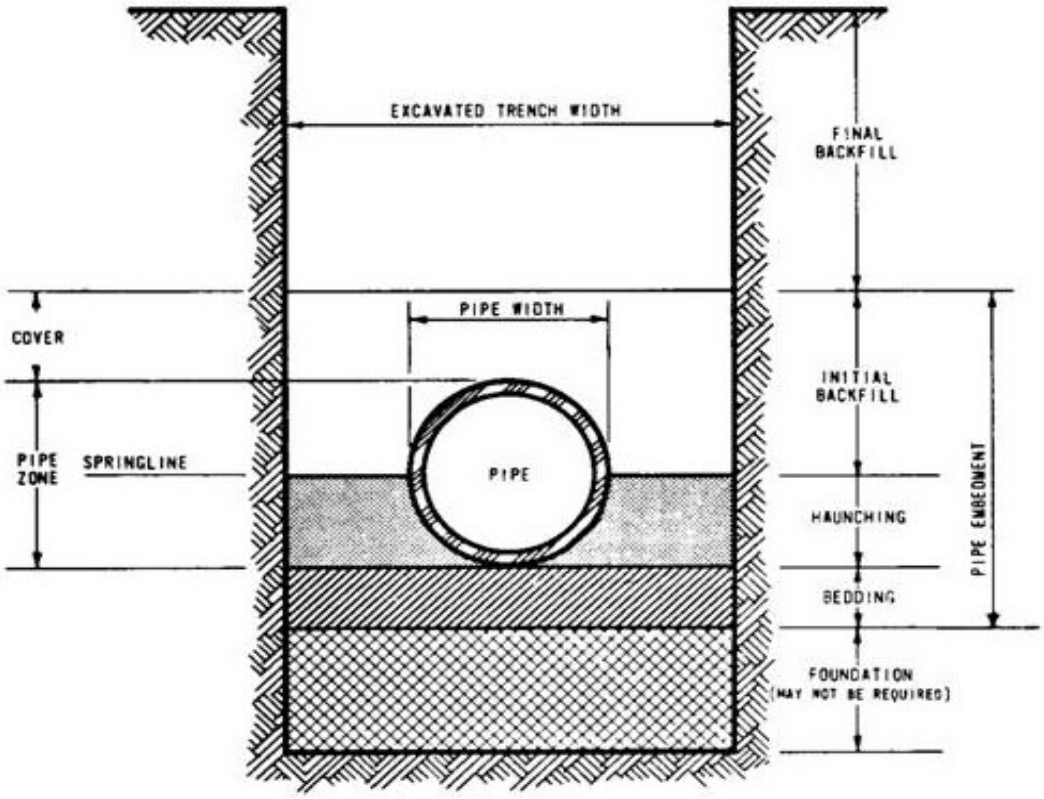
b. Compaction.
    1. Compaction of an embedment envelope must meet the manufacturer's recommendations for the collection system pipe used in a project.
    2. Compaction of an embedment envelope must provide the modulus of soil reaction for the bedding material necessary to ensure a wastewater collection system pipe's structural integrity as required by §217.53 of this title (relating to Pipe Design).
    3. The placement of the backfill above a pipe must not affect the structural integrity of a pipe.

c. Envelope Size.
    1. A minimum clearance of 6.0 inches below and on each side of the bell of all pipes to the trench walls and floor is required.
    2. The embedment material used for haunching and initial backfill must be installed to a minimum depth of 12 inches above the crown of a pipe.

d. Trench Width.

1. The width of a trench must allow a pipe to be laid and jointed properly and must allow the backfill to be placed and compacted as needed.
2. The maximum and minimum trench width needed for safety and a pipe's structural integrity must be included in the report.
3. The width of a trench must be sufficient to properly and safely place and compact haunching materials.
4. The space between a pipe and a trench wall must be wider than the compaction equipment used in the pipe zone.

TRENCH CROSS-SECTION (30 TAC 217.54)



NOTE:

Trenching Details along with 30 TAC 217.54 are annotated in the Construction Documents/Plan Sheets on Wastewater Details Sheet.

MANHOLE SPECIFICATIONS

30 TAC 217.55 Requirements with design comments:

a. An owner must include manholes in a wastewater collection system at:
    1. All points of change in alignment, grade, or size;
    2. At the intersection of all pipes; and
    3. At the end of all pipes that may be extended at a future date.

b. Manholes placed at the end of a wastewater collection system pipe that may be extended in the future must include pipe stub outs with plugs. (pipe stub-outs with plugs are proposed at the end of each line that will be extended with Phase 2 of Section 19.)

c. A clean-out with watertight plugs may be installed in lieu of a manhole at the end of a wastewater collection system pipe if no extensions are anticipated. **(Self explanatory, clean outs not used in-lieu of manholes)**

d. Cleanout installations must pass all applicable testing requirements outlined for gravity collection pipes in §217.57 of this title (relating to Testing Requirements for Installation of Gravity Collection System Pipes). **(Self explanatory, see Item c above)**

e. A manhole must be made of monolithic, cast-in-place concrete, fiberglass, pre-cast concrete, high-density polyethylene, or equivalent material that provides adequate structural integrity. **See the Pre-Cast Manhole Details following these construction notes)**

f. The use of bricks to adjust a manhole cover to grade or construct a manhole is prohibited. **(Self explanatory, See Details following these notes)**

g. Manholes may be spaced no further apart than the distances specified in the following table for a wastewater collection system with straight alignment and uniform grades, unless a variance based on the availability of cleaning equipment that is capable of servicing greater distances is granted by the executive director. **(Self explanatory and maintained throughout the design of the SCS)**

Table C.2. - Maximum Manhole Spacing

Pipe Diameter	Maximum Manhole
6-15	500
18-30	800
36-48	1000
54 or larger	2000

h. Tunnels are exempt from manhole spacing requirements because of construction constraints. **(Self explanatory and not applicable)**

i. An intersection of three or more collection pipes must have a manhole. **(Self explanatory and maintained throughout the design of the SCS)**
j. A manhole must not be located in the flow path of a watercourse, or in an area where ponding of surface water is probable. **(Self explanatory and maintained throughout the design of the SCS)**
k. The inside diameter of a manhole must be no less than 48 inches. A manhole diameter must be sufficient to allow personnel and equipment to enter, exit, and work in the manhole and to allow proper joining of the collection system pipes in the manhole wall. **(See Manhole Details following these notes)**
l. Manholes must meet the following requirements for covers, inlets, and bases.
    1. Manhole Covers
        A. A manhole where personnel entry is anticipated requires at least a 30 inch diameter clear opening. (**Covers to have 32" Openings see Manhole Details)**
        B. A manhole located within a 100-year flood plain must have a means of preventing inflow. **(Self explanatory and maintained throughout the design of the SCS)**
        C. A manhole cover construction must be constructed of impervious material. **(Self explanatory, See Manhole Details following these construction notes)**
        D. A manhole cover that is located in a roadway must meet or exceed the American Association of State Highways and Transportation Officials standard M-306 for load bearing. **(Self explanatory, See Manhole Details)**
    2. Manhole Inverts
        A. The bottom of a manhole must contain a U-shaped channel that is a smooth continuation of the inlet and outlet pipes. **(Self explanatory, see Manhole Details)**
        B. A manhole connected to a pipe less than 15 inches in diameter must have a channel depth equal to at least half the largest pipe's diameter **(Self explanatory, see Manhole Details)**
        C. A manhole connected to a pipe at least 15 inches in diameter but not more than 24 inches in diameter must have a channel depth equal to at least three-fourths of the largest pipe's diameter **(Self explanatory, but not applicable for this project)**
        D. A manhole connected to a pipe greater than 24 inches in diameter must have a channel depth equal to at least the largest pipe's diameter **(Self explanatory, but not applicable for this project)**.

E. A manhole with pipes of different sizes must have the tops of the pipes at the same elevation and flow channels in the invert sloped on an even slope from pipe to pipe. **(Self explanatory and maintained throughout the design of the SCS)**

F. A bench provided above a channel must slope at a minimum of 0.5 inch per foot. **(Self Explanatory)**

G. An invert must be filleted to prevent solids from being deposited if a wastewater collection system pipe enters a manhole higher than 24 inches above a manhole invert. **(Self Explanatory, see manhole details. Not applicable for this site.)**

H. A wastewater collection system pipe entering a manhole more than 24 inches above an invert must have a drop pipe. **(Self Explanatory, see Manhole Details)**

m. The inclusion of steps in a manhole is prohibited. **(Self Explanatory, see Manhole Details)**

n. Connections. A manhole-pipe connection must use watertight, size-on-size resilient connectors that allow for differential settlement and must conform to American Society for Testing and Materials C-923. **(Self Explanatory, see Manhole Details)**

o. Venting. An owner must use an alternate means of venting if manholes are at more than 1,500 foot intervals and gasketed manhole covers are required for more than three manholes in sequence. Vents must meet the following requirements: **(Self Explanatory, but not applicable for this project)**

1. Vent design must minimize inflow;
2. Vents must be located above a 100-year flood event elevation; and
3. Tunnels must be vented in compliance with this subsection.

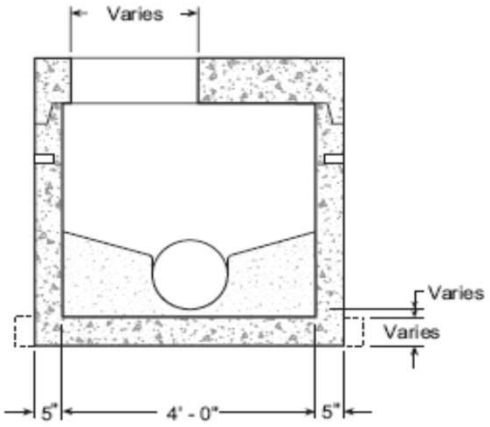
p. Cleanouts. The size of a cleanout must be equal to the size of the wastewater collection system main. **(Self Explanatory)**

<u>Precast Manhole Information:</u>

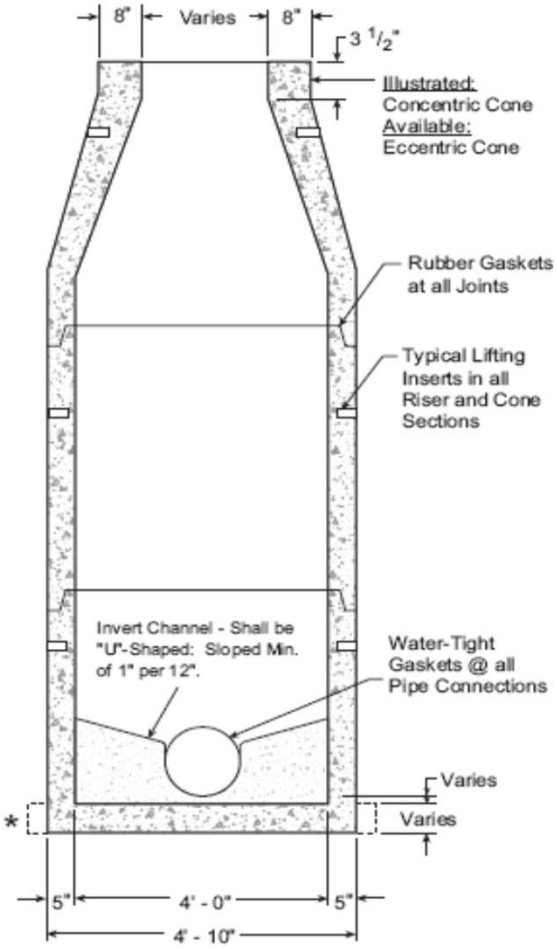
<u>Hanson Pipe and Precast</u>
Hanson Building Products West
300 E John Carpenter Freeway
11th floor
Irving, TX 75062
972.653.5500

San Antonio Metro Area Contact:
210.661.2351
866.426.7661

Precast Manholes



Flattop Illustration
for Shallow Manhole



Section View
4' I.D. Manhole - Regular Base
with Reducing Cone

Materials & Features

HOLES AS SPECIFIED: Max diameter = 32"
CONCRETE: 5,000 PSI, 28 day strength.
REINFORCING: Meets or exceeds ASTM C478 requirements.
Average weight of 24" depth base w/8" invert = 4,500 lbs.
Estimated weight of riser and cone sections = 870 lbs. / vt. ft.

* - Extended base is available to meet local requirements.

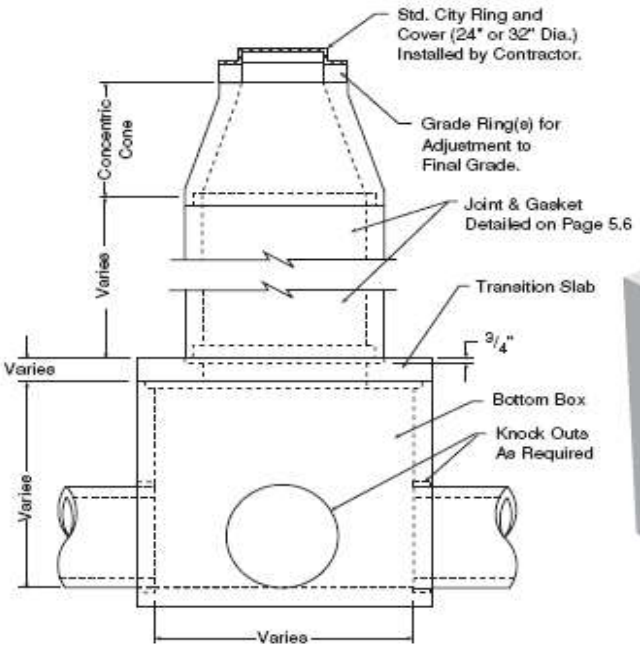
In the event a boot is loose contact your Hanson representative to resolve.

"Manufactured to your specifications."

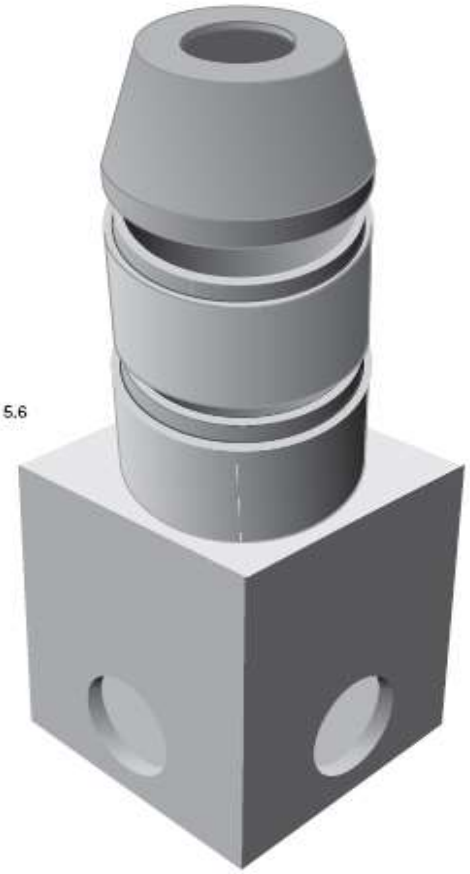
-No Scale-
All dimensions subject to allowable specification tolerances.

TITLE	PLANT	STATE	SECTION.PAGE	DATE	
4' I.D. Manhole **Regular Base w / Reducing Cone**	All Plants	TX	5.5	07-01-06	Hanson

Precast Manholes



Side View



Isometric View

Materials & Features

CONCRETE: 5,000 PSI in 28 days.

REINFORCING STEEL: per ASTM A-615 / A-185

REINFORCING to meet AASHTO HS 20-44 Loading.

BASE DESIGN EQUAL TO OR EXCEEDS ASTM C-357

RISER DESIGN EQUAL TO OR EXCEEDS ASTM C-478

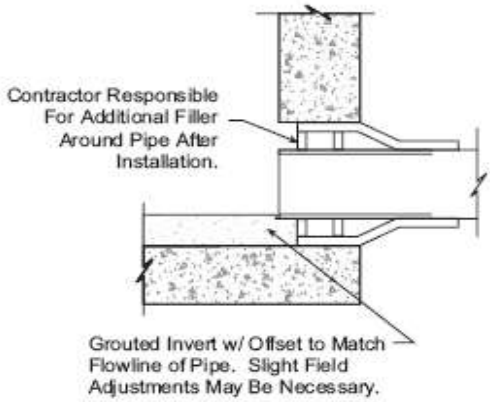
In the event a boot is loose contact your Hanson representative to resolve.

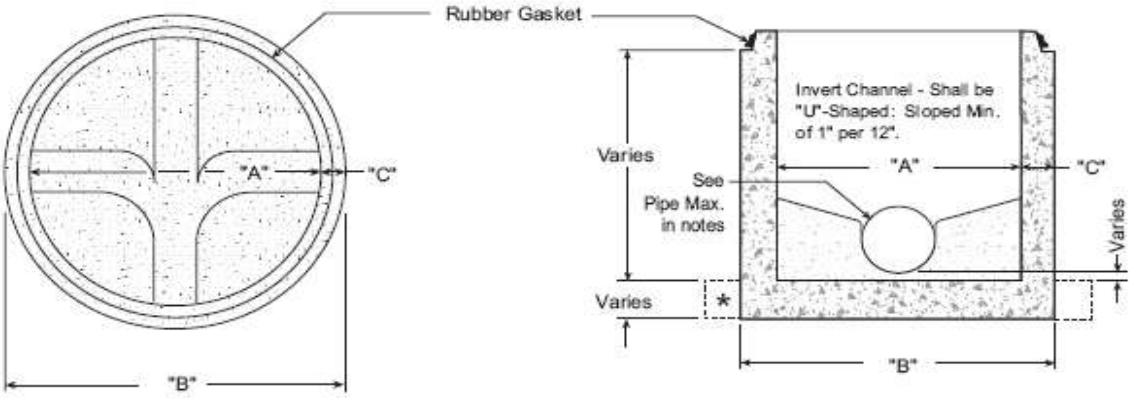
-No Scale-
All dimensions subject to allowable specification tolerances.

TITLE	PLANT	STATE	SECTION.PAGE	DATE	
Type "C" Manhole	Houston San Antonio	TX	5.11	07-01-06	Hanson

Precast Manholes

For Pipe Entering the Manhole at Excessive Depths Above the Flow Line Out, the Contractor May be Responsible for Grout Work Necessary to Bring Channel up to Flow Line on Inlet Pipe.





Plan View **Section View**

Pipe Size	I.D. "A"	O.D. "B"	Wall Thk. "C"
4'	4' - 0"	4' - 10"	5"
5'	5' - 0"	6' - 0"	6"
6'	6' - 0"	7' - 2"	7"

Materials & Features

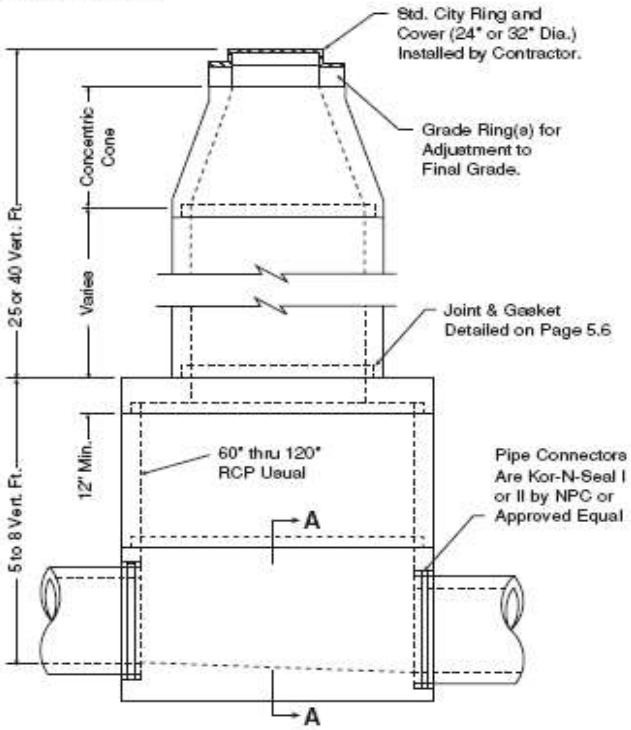
HOLES AS SPECIFIED:
For 4' I.D. max. diameter = 32"
For 5' I.D. max. diameter = 40"
For 6' I.D. max. diameter = 54"
CONCRETE: 5,000 PSI, 28 day strength.
REINFORCING: Meets or exceeds ASTM C478 requirements.
Average weight of 24" depth base w/8" invert = 4,500 lbs.
Water-tight gaskets at all pipe connections.
* - Regular base shown: Extended base also available.
In the event a boot is loose contact your Hanson representative to resolve.

-No Scale-
All dimensions subject to allowable specification tolerances.

TITLE	PLANT	STATE	SECTION.PAGE	DATE
Details: 4', 5' & 6' I.D. Precast Regular Manhole Base	All Plants	TX	5.7	07-01-06

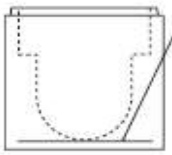
Hanson

Precast Manholes



w/ Precast Base

Isometric View



Section A-A

Base Slab Reinforcing

30' Deep Structure
60"ø - 6" Thick Slab min. - #5 @ 8" ea.way
72"ø - 8" Thick Slab min. - #5 @ 8" ea.way
84"ø - 8" Thick Slab min. - #5 @ 6" ea.way
96"ø - 10" Thick Slab min. - #5 @ 6" ea.way

45' Deep Structure
60"ø - 8" Thick Slab min. - #5 @ 8" ea.way
72"ø - 8" Thick Slab min. - #5 @ 8" ea.way
84"ø - 10" Thick Slab min. - #5 @ 6" ea.way
96"ø - 12" Thick Slab min. - #5 @ 6" ea.way

All Reinforcing has $1^1/_2$" cover from top of slab.

Materials & Features

CONCRETE: 5,000 PSI in 28 days.

REINFORCING STEEL: per ASTM A-615, Grade 60.

REINFORCING to meet AASHTO HS 20-44 Loading.

DESIGN EQUAL TO OR EXCEEDS ASTM C-478

In the event a boot is loose contact your Hanson representative to resolve.

Note:

- Inverts shall be specifically sized for connecting pipes; and shall be U-Shaped with the min. depth 3/4 of the largest pipe diameter.

-No Scale-
All dimensions subject to allowable specification tolerances.

TITLE	PLANT	STATE	SECTION.PAGE	DATE	
30 & 45 Ft. Depth 60" thru 96"Large Base Manhole	Houston San Antonio	TX	5.10	07-01-06	Hanson

ATTACHMENT A

WASTEWATER / SEWAGE CALCULATIONS

WASTEWATER FLOWS

Project Name: Wolf Ranch Section 6G
Project Number: 2022-19-CON
Date Prepared: 12/14/2023

Wastewater Line																																								
									Maximum Flow			Minimum Flow																											
Line Number	from	to	SF UNITS	CUMULATIVE SF UNITS	Cumulative Population	Cumulative Population (ROUNDED)	Avg. Dry Weather Flow F (gpd)	Avg. Dry Weather Flow F (gpm)	Peak Flow Factor PF	Max Dry Weather Flow Q_{max} (gpd)	Max Dry Weather Flow Q_{max} (gpm)	Min Flow Factor MF	Min Dry Weather Flow Q_{min} (gpd)	Min Dry Weather Flow Q_{min} (gpm)	Area Served A (ac)	Cumul. Area Served A (ac)	Inflow/Infiltration (1000 gal/acre/day) I/I (gpd)	Inflow/Infiltration (1000 gal/acre/day) I/I (gpm)	Peak Wet Weather Flow Qpw (gpd)	Peak Wet Weather Flow Qpw (gpm)	MAX DRY WEATHER (GPM)	MAX DRY WEATHER (CFS)	MAX WET WEATHER (GPM)	MAX WET WEATHER (CFS)	PIPE SIZE (IN)	PIPE SLOPE FT/100	65% CAPACITY (CFS) (n=0.013)	65% CAPACITY (GPM) (n=0.013)	85% CAPACITY (CFS) (n=0.013)	85% CAPACITY (GPM) (n=0.013)	LENGTH (FT)	PEAK DRY Q (CFS)	PEAK DRY Q (GPM)	PEAK DRY VELOCITY (FPS) FROM FLOWMASTER	PEAK DRY DEPTH (IN) FROM FLOWMASTER	PEAK WET Q (CFS)	PEAK WET Q (GPM)	PEAK WET VELOCITY (FPS) FROM FLOWMASTER
A11	A11	A10	1	1	2.5	**3**	250.00	0.17	4.45	1,112.11	0.77	0.06	15.83	0.01	1.39	**1.39**	1,390.00	0.97	2,502.11	1.74	0.77	0.0017	1.74	0.0038	8	0.5	0.56	249.30	0.73	326.00	118	0.0017	0.77	0.50	0.30	0.0038	1.74	0.62
A10	A10	A9	3	4	10	**10**	1,000.00	0.69	4.40	4,398.38	3.05	0.08	80.36	0.06	0.67	**2.06**	2,060.00	1.43	6,458.38	4.48	3.05	0.0067	4.48	0.0098	8	0.5	0.56	249.30	0.73	326.00	143	0.0067	3.05	0.73	0.50	0.0098	4.48	0.82
A9	A9	A8	9	13	32.5	**33**	3,250.00	2.26	4.32	14,043.19	9.75	0.10	330.81	0.23	0.95	**3.01**	3,010.00	2.09	17,053.19	11.84	9.75	0.0214	11.84	0.0259	8	0.5	0.56	249.30	0.73	326.00	289	0.0214	9.75	1.04	0.90	0.0259	11.84	1.10
A8	A8	A7	2	15	37.5	**38**	3,750.00	2.60	4.31	16,156.61	11.22	0.10	392.52	0.27	2.47	**5.48**	5,480.00	3.81	21,636.61	15.03	11.22	0.0246	15.03	0.0329	8	0.5	0.56	249.30	0.73	326.00	99	0.0246	11.22	1.08	0.90	0.0329	15.03	1.18
A7	A7	A6	0	15	37.5	**38**	3,750.00	2.60	4.31	16,156.61	11.22	0.10	392.52	0.27	1.59	**7.07**	7,070.00	4.91	23,226.61	16.13	11.22	0.0246	16.13	0.0353	8	0.5	0.56	249.30	0.73	326.00	158	0.0246	11.22	1.08	0.90	0.0353	16.13	1.20
A6	A6	A5	4	66	165	**165**	16,500.00	11.46	4.12	67,995.36	47.22	0.14	2,309.81	1.60	1.36	**8.43**	8,430.00	5.85	76,425.36	53.07	47.22	0.1035	53.07	0.1163	8	0.5	0.56	249.30	0.73	326.00	185	0.1035	47.22	1.65	1.90	0.1163	53.07	1.71
A5	A5	A4	2	68	170	**170**	17,000.00	11.81	4.12	69,969.55	48.59	0.14	2,393.91	1.66	0.43	**21.42**	21,420.00	14.88	91,389.55	63.46	48.59	0.1065	63.46	0.1391	8	0.5	0.56	249.30	0.73	326.00	251	0.1065	48.59	1.67	1.90	0.1391	63.46	1.80
A4	A4	A3	4	72	180	**180**	18,000.00	12.50	4.11	73,907.51	51.32	0.14	2,563.58	1.78	1.50	**22.92**	22,920.00	15.92	96,827.51	67.24	51.32	0.1125	67.24	0.1473	8	1.4	0.93	415.66	1.21	543.56	269	0.1125	51.32	2.45	1.50	0.1473	67.24	2.64
A3	A3	A2	2	74	185	**185**	18,500.00	12.85	4.10	75,871.40	52.69	0.14	2,649.12	1.84	2.03	**24.95**	24,950.00	17.33	100,821.40	70.01	52.69	0.1154	70.01	0.1534	8	1.5	0.96	431.80	1.26	564.66	106	0.1154	52.69	2.52	1.50	0.1534	70.01	2.74
A2	A2	A1	0	74	185	**185**	18,500.00	12.85	4.10	75,871.40	52.69	0.14	2,649.12	1.84	1.90	**26.85**	26,850.00	18.65	102,721.40	71.33	52.69	0.1154	71.33	0.1563	8	2.3	1.20	538.16	1.57	703.75	305	0.1154	52.69	2.93	1.40	0.1563	71.33	3.20
B9	B9	B8	5	5	12.5	**13**	1,250.00	0.87	4.39	5,483.47	3.81	0.08	105.80	0.07	0.69	**0.69**	690.00	0.48	6,173.47	4.29	3.81	0.0083	4.29	0.0094	8	4.0	1.57	705.12	2.05	922.08	133	0.0083	3.81	1.62	0.30	0.0094	4.29	1.67
B8	B8	B7	2	7	17.5	**18**	1,750.00	1.22	4.37	7,641.94	5.31	0.09	157.98	0.11	0.70	**1.39**	1,390.00	0.97	9,031.94	6.27	5.31	0.0116	6.27	0.0137	8	5.0	1.76	788.35	2.30	1,030.92	97	0.0116	5.31	1.91	0.40	0.0137	6.27	2.02
B7	B7	B6	6	13	32.5	**33**	3,250.00	2.26	4.32	14,043.19	9.75	0.10	330.81	0.23	0.38	**1.77**	1,770.00	1.23	15,813.19	10.98	9.75	0.0214	10.98	0.0241	8	5.0	1.76	788.35	2.30	1,030.92	284	0.0214	9.75	2.30	0.50	0.0241	10.98	2.38
B6	B6	B5	2	15	37.5	**38**	3,750.00	2.60	4.31	16,156.61	11.22	0.10	392.52	0.27	2.01	**3.78**	3,780.00	2.63	19,936.61	13.84	11.22	0.0246	13.84	0.0303	8	5.0	1.76	788.35	2.30	1,030.92	106	0.0246	11.22	2.38	0.50	0.0303	13.84	2.56
B5	B5	B4	4	19	47.5	**48**	4,750.00	3.30	4.29	20,357.86	14.14	0.11	520.73	0.36	0.76	**4.54**	4,540.00	3.15	24,897.86	17.29	14.14	0.0310	17.29	0.0379	8	5.0	1.76	788.35	2.30	1,030.92	99	0.0310	14.14	2.58	0.60	0.0379	17.29	2.76
B4	B4	B3	8	27	67.5	**68**	6,750.00	4.69	4.25	28,671.96	19.91	0.12	792.81	0.55	0.80	**5.34**	5,340.00	3.71	34,011.96	23.62	19.91	0.0436	23.62	0.0518	8	5.0	1.76	788.35	2.30	1,030.92	319	0.0436	19.91	2.88	0.70	0.0518	23.62	3.01
B3	B3	B2	2	29	72.5	**73**	7,250.00	5.03	4.24	30,734.23	21.34	0.12	863.59	0.60	1.48	**6.82**	6,820.00	4.74	37,554.23	26.08	21.34	0.0468	26.08	0.0571	8	6.4	1.99	894.70	2.61	1,169.99	99	0.0468	21.34	3.20	0.70	0.0571	26.08	3.41
B2	B2	B1	3	32	80	**80**	8,000.00	5.56	4.23	33,816.59	23.48	0.12	970.36	0.67	0.51	**7.33**	7,330.00	5.09	41,146.59	28.57	23.48	0.0515	28.57	0.0626	8	6.4	1.99	894.70	2.61	1,169.99	104	0.0515	23.48	3.29	0.70	0.0626	28.57	3.49
B1	B1	A5	0	47	117.5	**118**	11,750.00	8.16	4.17	49,051.69	34.06	0.13	1,539.22	1.07	0.38	**12.56**	12,560.00	8.72	61,611.69	42.79	34.06	0.0746	42.79	0.0937	8	5.6	1.85	832.07	2.42	1,088.09	364	0.0746	34.06	3.51	0.90	0.0937	42.79	3.77
B1	B1	END & PLUG	0	0	0	**0**	0.00	0.00	4.50	0.00	0.00	0.00	0.00	0.00	0.15	**0.15**	150.00	0.10	150.00	0.10	0.00	0.0000	0.10	0.0002	8	0.500	0.56	249.30	0.73	326.00	140	0.0000	0.00	0.05	0.10	0.0002	0.10	0.06
D5	D5	D4	4	4	10	**10**	1,000.00	0.69	4.40	4,398.38	3.05	0.08	80.36	0.06	0.55	**0.55**	550.00	0.38	4,948.38	3.44	3.05	0.0067	3.44	0.0075	8	7.0	2.08	932.79	2.72	1,219.80	135	0.0067	3.05	1.81	0.30	0.0075	3.44	1.88
D4	D4	D3	2	6	15	**15**	1,500.00	1.04	4.38	6,564.53	4.56	0.09	130.61	0.09	1.18	**1.73**	1,730.00	1.20	8,294.53	5.76	4.56	0.0100	5.76	0.0126	8	2.0	1.11	498.60	1.45	652.01	99	0.0100	4.56	1.18	0.40	0.0126	5.76	1.42
D3	D3	D2	3	9	22.5	**23**	2,250.00	1.56	4.35	9,786.95	6.80	0.09	213.22	0.15	0.95	**2.68**	2,680.00	1.86	12,466.95	8.66	6.80	0.0149	8.66	0.0190	8	1.5	0.96	431.80	1.26	564.66	117	0.0149	6.80	1.36	0.60	0.0190	8.66	1.48
D2	D2	D1	1	10	25	**25**	2,500.00	1.74	4.34	10,854.99	7.54	0.10	240.86	0.17	1.27	**3.95**	3,950.00	2.74	14,804.99	10.28	7.54	0.0165	10.28	0.0225	8	1.8	1.04	466.39	1.36	609.90	32	0.0165	7.54	1.49	0.60	0.0225	10.28	1.65
D1	D1	B1	5	15	37.5	**38**	3,750.00	2.60	4.31	16,156.61	11.22	0.10	392.52	0.27	0.90	**4.85**	4,850.00	3.37	21,006.61	14.59	11.22	0.0246	14.59	0.0320	8	1.8	1.04	466.39	1.36	609.90	318	0.0246	11.22	1.70	0.70	0.0320	14.59	1.83
E5	E5	E4	2	2	5	**5**	500.00	0.35	4.43	2,213.76	1.54	0.07	35.03	0.02	0.41	**0.41**	410.00	0.28	2,623.76	1.82	1.54	0.0034	1.82	0.0040	8	6.0	1.92	863.59	2.52	1,129.31	99	0.0034	1.54	1.42	0.20	0.0040	1.82	1.48
E4	E4	E3	2	4	10	**10**	1,000.00	0.69	4.40	4,398.38	3.05	0.08	80.36	0.06	0.49	**0.90**	900.00	0.63	5,298.38	3.68	3.05	0.0067	3.68	0.0081	8	4.0	1.57	705.12	2.05	922.08	134	0.0067	3.05	1.50	0.30	0.0081	3.68	1.61
E3	E3	E2	8	12	30	**30**	3,000.00	2.08	4.33	12,982.97	9.02	0.10	299.65	0.21	0.79	**1.69**	1,690.00	1.17	14,672.97	10.19	9.02	0.0198	10.19	0.0223	8	6.0	1.92	863.59	2.52	1,129.31	218	0.0198	9.02	2.40	0.50	0.0223	10.19	2.48
E2	E2	E1	0	12	30	**30**	3,000.00	2.08	4.33	12,982.97	9.02	0.10	299.65	0.21	1.38	**3.07**	3,070.00	2.13	16,052.97	11.15	9.02	0.0198	11.15	0.0244	8	6.0	1.92	863.59	2.52	1,129.31	96	0.0198	9.02	2.40	0.50	0.0244	11.15	2.55
E1	E1	CTE	5	17	42.5	**43**	4,250.00	2.95	4.30	18,261.30	12.68	0.11	455.87	0.32	2.83	**5.90**	5,900.00	4.10	24,161.30	16.78	12.68	0.0278	16.78	0.0368	8	0.5	0.56	249.30	0.73	326.00	270	0.0278	12.68	2.49	0.60	0.0368	16.78	2.74
F3	F3	F2	6	6	15	**15**	1,500.00	1.04	4.38	6,564.53	4.56	0.09	130.61	0.09	0.17	**0.17**	170.00	0.12	6,734.53	4.68	4.56	0.0100	4.68	0.0102	8	7.0	2.08	932.79	2.72	1,219.80	192	0.0100	4.56	2.04	0.30	0.0102	4.68	2.05
F2	F2	F1	4	10	25	**25**	2,500.00	1.74	4.34	10,854.99	7.54	0.10	240.86	0.17	0.87	**1.04**	1,040.00	0.72	11,894.99	8.26	7.54	0.0165	8.26	0.0181	8	7.0	2.08	932.79	2.72	1,219.80	99	0.0165	7.54	2.40	0.40	0.0181	8.26	2.47
F1	CTE	3	13	32.5	**33**	3,250.00	2.26	4.32	14,043.19	9.75	0.10	330.81	0.23	2.53	**3.57**	3,570.00	2.48	17,613.19	12.23	9.75	0.0214	12.23	0.0268	8	0.5	0.56	249.30	0.73	326.00	284	0.0214	9.75	1.04	0.90	0.0268	12.23	1.11

CTE*: Connect to Existing Wastewater Manhole

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: John Pickens, P.E. -Kimley-Horn

Date: 11/15/2023

Signature of Customer/Agent:

_____

STATE OF TEXAS
JOHN A. PICKENS
110631
LICENSED
PROFESSIONAL ENGINEER

11/15/2023

Regulated Entity Name: Wolf Ranch West Section 6G

Regulated Entity Information

1. The type of project is:

   ☐ Residential: Number of Lots:
   ☒ Residential: Number of Living Unit Equivalents:117
   ☐ Commercial
   ☐ Industrial
   ☐ Other:_____

2. Total site acreage (size of property):89.416

3. Estimated projected population:293

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	664,290	÷ 43,560 =	15.25
Parking		÷ 43,560 =	
Other paved surfaces	304,920	÷ 43,560 =	7.00
Total Impervious Cover	969,210	÷ 43,560 =	22.25

Total Impervious Cover 22.25 **÷ Total Acreage** 89.416 **X 100 =** 24.88**% 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:

X % Domestic	28,665 Gallons/day
_____ % Industrial	_____ Gallons/day
_____ % Commingled	_____ Gallons/day
TOTAL gallons/day 28,665	

15. Wastewater will be disposed of by:

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

☐ **Attachment C - Suitability Letter from Authorized Agent**. An on-site sewage facility will be used to treat and dispose of the wastewater from this site. The appropriate licensing authority's (authorized agent) written approval is attached. It states that the land is suitable for the use of private sewage facilities and will meet or exceed the requirements for on-site sewage facilities as specified under 30 TAC Chapter 285 relating to On-site Sewage Facilities.

☐ Each lot in this project/development is at least one (1) acre (43,560 square feet) in size. The system will be designed by a licensed professional engineer or registered sanitarian and installed by a licensed installer in compliance with 30 TAC Chapter 285.

☒ Sewage Collection System (Sewer Lines):

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

☒ Private service laterals from the wastewater generating facilities will be connected to a proposed SCS.

☐ The SCS was previously submitted on_____.

☒ The SCS was submitted with this application.

☐ The SCS will be submitted at a later date. The owner is aware that the SCS may not be installed prior to Executive Director approval.

☒ The sewage collection system will convey the wastewater to the San Gabriel Wastewater Treatment Plant-City of Georgetown (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" = 100', 60', 50', and 40'.

18. 100-year floodplain boundaries:

☒ Some part(s) of the project site is located within the 100-year floodplain. The floodplain is shown and labeled.
☐ No part of the project site is located within the 100-year floodplain.
The 100-year floodplain boundaries are based on the following specific (including date of material) sources(s): FEMA FIRM 48491C0290E dated 9/26/08 & 48491C0480F dated 12/20/2019

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 0 (#) 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.

ATTACHMENT A -- FACTORS AFFECTING WATER QUALITY

Possible factors that could affect surface water and ground water quality are:

- Petroleum drippings from vehicle movement
- Integrated Pest Management
- Landscape Maintenance
- Asphalt and/or Concrete Products
- Soil/Stock Pile
- Paint
- Oils
- Sediment and soil from disturbed areas

ATTACHMENT B -- VOLUME AND CHARACTER OF STORMWATER

EXISTING DRAINAGE CONDITIONS

The natural topography of the site is defined by gently rolling hills. The entire site drains south to the San Gabriel River.

STORM WATER DETENTION AND WATER QUALITY

Detention for this site is not required so only water quality aspects were analyzed.

Water Quality for the site is provide in 2 batch detention water quality ponds and 1 natural filter strip. Onsite batch detention water quality ponds A & B as well as the natural filter strip were designed to treat the impervious cover generated onsite. the impervious cover

Water Quality Pond A, the proposed top and bottom elevations of the storm overflow are 773.00 and 770.50, respectively. The proposed top and bottom elevations of the water quality are 770.50 and 765.50, respectively. The following table (Table 1) is the routing summary for conveyance of the 2 through 100-year storms.

TABLE 1: WATER QUALITY POND A ROUTING SUMMARY		
EVENT (YEAR)	DETENTION POND PEAK FLOW (CFS)	DETENTION POND DESIGN MAX WATER SURFACE ELEVATION
2	47	771.02
10	130	771.53
25	169	771.71
100	230	772.00

Table 2 is the Water Quality Pond A water quality volume summary.

TABLE 2: WATER QUALITY POND A WATER QUALITY VOLUME SUMMARY		
ELEVATION (FT)	AREA (SF)	VOLUME SUM (CF)
765.5	25	0
766	5,235	937
767	17,981	11,910
768	26,995	34,246
769	29,333	62,401
770	31,726	92,923
770.5	32,936	109,088
771	34,177	125,865
772	36,684	161,288
773	39,247	199,247

Required water quality volume for Pond A is 70,120 CF and the provided water quality volume provided is 109,088 CF.

Water Quality Pond B, the proposed top and bottom elevations of the storm overflow are 751.0 and 749.0, respectively. The proposed top and bottom elevations of the water quality are 749.0 and 743.5, respectively. The following table (Table 3) is the routing summary for conveyance of the 2 through 100-year storms.

TABLE 3: WATER QUALITY POND B ROUTING SUMMARY		
EVENT (YEAR)	**DETENTION POND PEAK FLOW (CFS)**	**DETENTION POND DESIGN MAX WATER SURFACE ELEVATION**
2	16	749.20
10	63	749.66
25	83	749.80
100	114	750.00

Table 4 is the Water Quality Pond B water quality volume summary.

TABLE 4: WATER QUALITY POND B WATER QUALITY VOLUME SUMMARY		
ELEVATION (FT)	**AREA (SF)**	**VOLUME SUM (CF)**
743.50	16	0
744	4,054	721
745	10,831	7,891
746	12,475	19,535
747	14,177	32,852
748	15,935	47,899
749	17,729	64,723
750	19,579	83,369
751	21,485	103,894

Required water quality volume for Pond B is 34,327 CF and the provided water quality volume provided is 64,723 CF.

ATTACHMENT C – SUITABILITY LETTER FROM AUTHORIZED AGENT

Attachment C is not applicable for this project. An on-site sewage facility will not be implemented for this development. Proposed private service laterals will be connected to a sewage collection system.

ATTACHMENT D – EXEMPTION TO THE REQUIRED GEOLOGIC ASSESSMENT

Attachment D is not applicable for this project. A geological assessment exemption will not be requested. A copy of the site Geological Assessment performed by Horizon Environmental Services, Inc. has been provided, see Geologic Assessment Form and Attachments.

Temporary Stormwater Section

Texas Commission on Environmental Quality

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

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

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

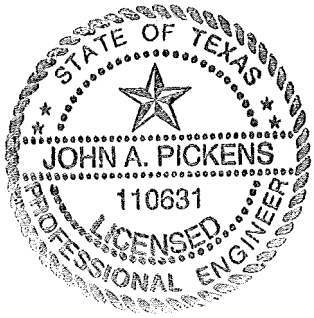
Signature

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

Print Name of Customer/Agent: John Pickens, P.E. -Kimley-Horn

Date: 11-15-2023

Signature of Customer/Agent:



11/15/2023

Regulated Entity Name: Wolf Ranch West Section 6G

Project Information

Potential Sources of Contamination

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

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

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

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

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

- ☐ Aboveground storage tanks with a cumulative storage capacity between 250 gallons and 499 gallons will be stored on the site for less than one (1) year.
- ☐ Aboveground storage tanks with a cumulative storage capacity of 500 gallons or more will be stored on the site. An Aboveground Storage Tank Facility Plan application must be submitted to the appropriate regional office of the TCEQ prior to moving the tanks onto the project.

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

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

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

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

Sequence of Construction

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

   - ☒ For each activity described, an estimate (in acres) of the total area of the site to be disturbed by each activity is given.
   - ☒ For each activity described, include a description of appropriate temporary control measures and the general timing (or sequence) during the construction process that the measures will be implemented.

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

Temporary Best Management Practices (TBMPs)

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

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

- ☒ A description of how BMPs and measures will prevent pollution of surface water, groundwater or stormwater that originates upgradient from the site and flows across the site.
- ☒ A description of how BMPs and measures will prevent pollution of surface water or groundwater that originates on-site or flows off site, including pollution caused by contaminated stormwater runoff from the site.
- ☒ A description of how BMPs and measures will prevent pollutants from entering surface streams, sensitive features, or the aquifer.
- ☒ A description of how, to the maximum extent practicable, BMPs and measures will maintain flow to naturally-occurring sensitive features identified in either the geologic assessment, TCEQ inspections, or during excavation, blasting, or construction.

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

   - ☐ **Attachment E - Request to Temporarily Seal a Feature**. A request to temporarily seal a feature is attached. The request includes justification as to why no reasonable and practicable alternative exists for each feature.
   - ☒ There will be no temporary sealing of naturally-occurring sensitive features on the site.

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

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

    - ☒ For areas that will have more than 10 acres within a common drainage area disturbed at one time, a sediment basin will be provided.
    - ☐ For areas that will have more than 10 acres within a common drainage area disturbed at one time, a smaller sediment basin and/or sediment trap(s) will be used.
    - ☐ For areas that will have more than 10 acres within a common drainage area disturbed at one time, a sediment basin or other equivalent controls are not attainable, but other TBMPs and measures will be used in combination to protect down slope and side slope boundaries of the construction area.
    - ☐ There are no areas greater than 10 acres within a common drainage area that will be disturbed at one time. A smaller sediment basin and/or sediment trap(s) will be used in combination with other erosion and sediment controls within each disturbed drainage area.

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

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

☐ N/A

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

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

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

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

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

Soil Stabilization Practices

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

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

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

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

Administrative Information

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

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

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

ATTACHMENT A – SPILL RESPONSE ACTIONS

Good Housekeeping and Material Management Practices shall include, but are not limited to the following:

- Neat and orderly storage of any chemicals, pesticides, fertilizers, fuels, etc., that are being stored on site. All storage tanks will be above ground, have a maximum storage capacity of 250 gallons and be stored on site for less than one (1) year. Aboveground Storage Tanks (ASTs) shall comply with Title 30 Texas Administrative Code, Chapter 334, Subchapter F and will be located within the respective phase's Stockpiling Area as illustrated on the Erosion and Sedimentation Control Plans included with this submittal.
- Regular garbage, rubbish, construction waste and sanitary waste disposal.
- Prompt cleanup of any spills that have occurred of liquid or dry materials.
- Cleanup of sediments that have been tracked by vehicles or have been transported by wind or storm water about the site or onto nearby roadways.

In addition to the Good Housekeeping and Material Management Practices, discussed in the previous sections of this plan, the following practices will be followed for spill prevention and clean up.

- Manufacturer's recommended methods of spill cleanup will be clearly posted and site personnel will be made aware of the procedures and the location of the information and the clean up supplies.
- Materials and equipment necessary for spill cleanup will be kept in the materials storage area onsite. Equipment and materials will include but are not limited to brooms, dust pans, mops, rags, gloves, goggles, kitty litter, sand, sawdust, plastic and metal trash containers specifically for this purpose.
- All spills will be cleaned up immediately after discovery.
- The spill area will be kept well ventilated and personnel will wear appropriate clothing to prevent injury from contact with a hazardous substance.
- Spills of toxic or hazardous material will be reported to the appropriate State, or Local Government Agency, regardless of the size.
- The spill prevention plan will be adjusted to include measures to prevent this type of spill from recurring and how to cleanup the spill if there is another one. A description of the spill, what caused it, and the cleanup measures will also be included.
- The site superintendent responsible for the day-to-day site operations will be the spill prevention and cleanup coordinator. He will designate at least three (3) other

site personnel who will receive spill prevention and cleanup training. These individuals will each become responsible for a particular phase of prevention and cleanup. The names of responsible spill personnel will be posted in the material storage area and in the office trailer onsite.

- Reportable quantities of hydrocarbon or hazardous material spills should be reported to the Texas Commissions on Environmental Quality (TCEQ) at the following 24-hour toll free number 1-800-832-8224. The reportable quantity depends on the substance released and where released. Reference the "Spill Reporting" section on the external TCEQ website for a table to use to determine whether the spill should be reported and under what rule.

The Contractor shall notify the agency as soon as possible whenever necessary to provide information that would trigger a change in the response to the spill or discharge. If the discharge or spill creates an imminent health threat, the Contractor shall immediately notify and cooperate with local emergency authorities.

The Contractor will cooperate with the local emergency authority in providing support to implement appropriate notification and response actions. The local emergency authority, as necessary, will implement its emergency management plan, which may include notifying and evacuating affected personnel. In the absence of a local emergency authority, the Contractor shall take reasonable measure to notify potentially affected persons of the imminent health threat.

As soon as possible, but no later than two (2) weeks after discovery of the spill or discharge, the Contractor shall reasonably attempt to notify the Owner (if identifiable) or Occupant of the property upon which the discharge or spill occurred as well as the occupants of any property that the Contractor believes is adversely affected.

ATTACHMENT B -- POTENTIAL SOURCES OF CONTAMINATION

Asphalt products will be used on this project. After placement of asphalt, emulsion, or coatings, the applicant will be responsible for immediate cleanup should an unexpected rain occur. For the duration of the asphalt curing time, the applicant should maintain standby personnel and equipment to contain any asphalt wash-off should an unexpected rain occur.

Sediment and soil from disturbed areas are another potential source of contamination. During activities causing soil disturbance, temporary best management practices outlined in ***Attachment D***, shall be followed to prevent discharge of sediment to South Fork San Gabriel River.

Other potential sources of contamination include hydraulic fluid and diesel fuel from mechanical equipment, as well as paints and chemicals used on site. Any spills shall be handled according to the Spill Response Actions in ***Attachment A***.

ATTACHMENT C – SEQUENCE OF MAJOR ACTIVITIES

Wolf Ranch West Section 6G limits of construction includes a total of approximately 89.416 acres of disturbed area in the Recharge and Contributing Zones. The location of the temporary erosion control measures is shown on the Erosion & Sedimentation Control Sheets.

1. Install temporary erosion control measures, stabilized construction entrance, and tree protection according to the plans and specifications prior to any clearing and grubbing, grading, excavating, etc. Notify Construction Inspection Division, when installed. (±0.5 acres)

2. Prior to beginning construction the Owner or his authorized representative shall convene a Pre-Construction Conference between the Texas Commission on Environmental Quality (TCEQ), City of Georgetown, Williamson County, Consulting Engineer, Contractor, and any other affected parties. Notify the TCEQ at least 48 hours prior to the time of the conference and 48 hours prior to the beginning of construction. On-site Pre-Construction meeting should be held with Contractor, TCEQ, Engineer, and Owner.

3. Set up all erosion control devices and temporary Best Management Practices measures. (±38 acres)

4. Clear and Grub for the streets, utilities, and lot grading. (±38 acres)

5. Rough Cut Roadway and perform lot grading. (±38 acres)

6. Begin construction including water, wastewater, paving, dry utilities, drainage, and other related site improvements. Install all utilities to be located under proposed pavement. (±15 acres)

7. Upon completion, restore as much disturbed areas as possible, particularly large open area. (±38 acres)

8. Clean site and re-vegetate all disturbed areas according to the plans and specifications. Disturbed areas of the construction site that will not be re-disturbed for 21 days or more must be stabilized by the 14 th day after the last disturbance. Stabilization measures should include seeding and/or mulching. (±38 acres)

9. Complete permanent erosion control and restoration of site vegetation. (±38 acres)

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

Complete any necessary final dress up of areas. Conduct a final inspection and complete all punch list items.

ATTACHMENT D -- TEMPORARY BEST MANAGEMENT PRACTICES AND MEASURES

Temporary Best Management Practices (BMPs) and measures will be used during construction to prevent pollution of groundwater, surface water and naturally occurring environmental features. Silt fence, inlet protection, stabilized construction entrance, and construction stockpiling areas will be installed prior to beginning construction and prior to commencement of any of the activities defined in the sequence of construction as ***Attachment C***. Inspection and maintenance of the on-site controls shall be performed during the site clearing and rough grading process. The perimeter fence shall be regularly monitored to ensure that the buffers remain no-construction zones until the site work has been completed and authorization has been granted by the Engineer. Please reference attached copy of the Erosion and Sedimentation Control Plans for specific controls and details.

Best Management Practices and measures will prevent pollution of surface water or groundwater that originates on site or flows off-site, including pollution caused by contaminated stormwater run-off from the site, through the use of silt fences placed immediately downstream of disturbed areas. To minimize destruction to any portion of the Recharge Zone, on-site perimeter silt fence will also be implemented for pertinent areas throughout the entirety of construction. The Contractor is expected to inspect the controls weekly and after significant rainfalls to ensure proper function. When silt accumulates six (6) inches in depth the Contractor shall promptly remove the silt from the controls. As noted earlier, the proposed water quality ponds will be used to treat storm water from the construction of the site. The water quality facility shall be properly inspected throughout construction and restored upon completion of the respective phase.

BMPs and measures will prevent pollutants from entering surface streams or the aquifer by intercepting stormwater potentially carrying sediment and other pollutants. BMPs and measures will implement two (2) stabilized construction entrances and a construction stockpiling/staging area to help minimize pollutant run-off and erosion generated during construction. Paved streets and driveways adjacent to these sites will be cleaned regularly to remove excess mud, dirt or rock tracked from the site. Sedimentation will be concentrated only in these areas for efficient maintenance. Water trucks will be on-site as necessary to aid in controlling dust. No setbacks were proposed for the site; however, BMPs will be implemented to limit/prevent contaminated inflow from entering surface streams or the aquifer. These practices are to include the following measures: the use of silt fence, triangular filter dikes and vegetative buffer zones. The fabricated silt fence barricade, triangular filter dikes and natural living filter vegetative buffer will provide help to reduce the likelihood of contaminated runoff from entering the aquifer. If any sensitive features are identified by
TCEQ inspections, or during excavation or construction, measures appropriate to the sensitivity of the discovered feature will be enacted. No blasting is proposed.

Temporary Erosion and Sedimentation Notes:

1. The Contractor shall maintain, install erosion/sedimentation controls and tree/natural protective fencing prior to any site preparation work (clearing, grubbing or excavation).

2. The placement of erosion/sedimentation controls and tree/natural protective fencing shall be in accordance with Williamson County's current Environmental Protection rules and the approved Erosion and Sedimentation Control Plan. No erosion controls shall be placed beyond the property lines of the site unless written permission has been obtained from adjacent property Owners.

3. A pre-construction conference shall be held on-site with the Contractor, Design Engineer/permit applicant and Environmental Inspector after installation of the erosion/sedimentation and tree/natural area protection measures and prior to beginning any site preparation work. The Contractor shall notify the Environmental Inspector at least three (3) days prior to the meeting date.

4. Any major variation in materials or locations of controls or fences from those shown on the approved plans will require a revision and must be approved by the Reviewing Engineer, Environmental Specialist or City Arborist as appropriate. Minor changes to be made as field revisions to the Erosion and Sedimentation Control Plan may be required by the Environmental Inspector during the course of construction to correct control inadequacies.

5. The Contractor is required to inspect the controls at weekly intervals and after significant rainfall events to ensure that they are functioning properly. The person(s) responsible for maintenance of controls shall immediately make any necessary repairs to damaged areas. Silt accumulation at controls must be removed when the depth reaches six (6) inches.

6. Prior to final acceptance by the City of Georgetown and Williamson County, haul roads and waterway crossing constructed for temporary Contractor access must be removed, accumulated sediment removed from the waterway and the area restored to the original grade and revegetated. All land clearing debris shall be disposed of in approved spoil disposal sites.

7. All work must stop if a void in the rock substrate is discovered, which is one (1) square foot in total area, blows air from within the substrate, and/or consistently received water during any rain event. At this time it is the responsibility of the Project Manager to immediately contact an Environmental Inspector for further investigation.

8. Erosion control measures, site work and restoration work shall be in accordance with the Williamson County Storm Water Management System Requirements.

9. 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.

10. 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 Williamson County for effectiveness. Additional measures may be required if, in the opinion of the County Engineer, they are warranted.

11. 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.

12. Any dirt, mud, rocks, debris, etc., that is spilled, tracked, or otherwise deposited on any existing paved street shall by cleaned up immediately.

ATTACHMENT E – REQUEST TO SEAL FEATURES

No environmental features are being temporarily sealed. Therefore, this section is not applicable.

ATTACHMENT F – STRUCTURAL PRACTICES

Silt fencing will be placed on the down gradient side of any exposed soils in order to limit the discharge of silt and pollutant form exposed areas of the site. Additionally, triangular filter dikes will be placed down gradient of areas that may require dewatering. Dewatering shall be directed toward the water quality pond and/or filter dikes to limit the discharge of silt and pollutants from exposed areas of the site. Also included are stabilized construction entrances to reduce the amount of mud tracked onto surrounding streets by construction vehicles. Inspection and maintenance of the onsite controls shall be performed during the site clearing and rough grading process.

Additionally, the use of the proposed pond will also protect against contaminated runoff leaving the site. The Contractor will be responsible for proper inlet protection in addition to cleaning out all structures adversely affected by sediment after heavy rainfalls.

ATTACHMENT G – DRAINAGE AREA MAPS

(See Construction Plans)

ATTACHMENT H – TEMPORARY SEDIMENT POND PLANS AND CALCULATIONS

The proposed water quality ponds A & B will be used as a sediment basin during construction. Developed Water Quality Area to the Water Quality Pond A is approximately 29-acres with no offsite drainage and Water Quality Pond B is approximately 15-acres with no offsite drainage. A surface skimmer will be utilized for dewatering during construction if warranted. Any excess sediment generated during construction will be spoiled in the location outlined in the construction plans. The entire system shall be protected from erosion and maintained throughout the course of construction until final site restoration is complete. The construction plans and design calculations will identify that adequate storage volume will be provided for construction.

ATTACHMENT I – INSPECTION AND MAINTENANCE FOR BEST MANAGEMENT PRACTICES

The following sections address inspection and maintenance taken from the TNRCC Manual, "Complying with Edward Aquifer Rules: Technical Guidance on Best Management Practices."

Silt Fence:

1. Inspection shall be made weekly and after each rainfall event, in accordance with Section 1.4.3 of RG-348.

2. Torn fabric shall be replaced or a second line of fencing parallel to the torn section shall be implemented as needed.

3. Accumulated silt shall be removed when it reaches a depth of six (6) inches. The silt shall be disposed of on an approved site and in such a manner that will not contribute to additional siltation.

4. Silt fence shall be removed when the site is completely stabilized so as not to block or impede storm flow or drainage.

Inlet Protection:

1. Daily inspection shall be made by the Contractor and silt accumulation must be removed when depth reaches 50 millimeters (two (2) inches).

2. 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.

3. Inlet protections shall be removed as soon as the source of sediment is stabilized.

Stabilized Construction Entrance:

1. The entrance shall be maintained in a condition that will prevent tracking or flowing of sediment onto public roadway. This may require periodic top dressing with additional stone as conditions demand. As well as repair and clean out of any measure device used to trap sediment. All sediments that are spilled, dropped, washed or tracked onto public roadway must be removed immediately.

2. Entrance shall be properly graded to prevent run-off from leaving the construction site.

Concrete Washout Area:

1. Routine inspection in accordance with Section 1.4.18 of RG-348 of the area to insure

that sufficient quantity and volume remain to contain all liquid and concrete waste generated by washout operations.

2. Plastic lining material should be a minimum of 10 millimeters in polyethylene sheeting and should be free of holes, tears, or other defects that compromise the impermeability of the material.

3. When temporary concrete washout facilities are no longer required for the work, the hardened concrete should be removed and disposed of. Materials used to construct temporary concrete washout facilities should be removed from the site of the work and disposed of. Holes, depressions or other ground disturbance caused by the removal of the temporary concrete washout facilities should be backfilled and repaired.

Sediment Basins

1. Inspection should be made weekly and after each rainfall in accordance to Section 1.4.13 of RG-348.

2. To prevent clogging of the outlet structure of proposed water quality facilities implemented as temporary sediment basins, trash and other debris shall be removed promptly after each rainfall event.

3. Silt accumulation should be removed as well as basin re-graded to original dimensions once the capability of the facility has been reduced to 75% of original storage capacity.

4. Removed sediment should be redistributed in the respective phases' stockpiling area.

Rock Berm

1. Inspection should be made weekly and after each rainfall in accordance to Section 1.4.5 of RG-348. If placed in streambeds, inspection should occur on a daily basis.

2. Accumulated silt shall be removed when it reaches a depth of six (6) inches. The silt shall be disposed of on an approved site and in such a manner that will not contribute to additional siltation.

3. Loose wire sheathing shall be repaired immediately when necessary and the berm shall be reshaped as needed during inspection.

4. Berm shall be replaced if the structure ceases to function as initially intended due to

factors such as silt accumulation, washout, construction traffic damage, etc.

5. When all upstream areas are stabilized and the accumulated silt has been removed, the rock berm should be removed and disposed of.

ATTACHMENT J – SCHEDULE OF INTERIM AND PERMANENT SOIL STABILIZATION PRACTICES

Prior to commencing construction, all temporary erosion and sedimentation control measures must be properly selected, installed, and maintained in accordance with the Manufacturer's Specifications And Good Engineering Practices. Controls specified in the Storm Water Pollution Prevention Plan section of the approved Edwards Aquifer Contributing Zone Plan are required during construction. If inspections indicate a control has been used inappropriately, or incorrectly, the applicant must replace or modify the control for site situations. The controls must remain in place until disturbed areas are revegetated and the areas have become permanently stabilized.*

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.*

(*see General Notes for Edwards Aquifer Recharge Zone Plan)

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: John Pickens, P.E. -Kimley-Horn

Date: 11/15/2023

Signature of Customer/Agent

STATE OF TEXAS
JOHN A. PICKENS
110631
LICENSED
PROFESSIONAL ENGINEER

Regulated Entity Name: Wolf Ranch West Section 6G

Permanent Best Management Practices (BMPs)

11/15/2023

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

ATTACHMENT A -- 20% OR LESS IMPERVIOUS COVER WAIVER

No waiver is being requested because this site will be more than 20% impervious cover. Therefore this section is not applicable to our submittal.

ATTACHMENT B -- BMPs FOR UPGRADIENT STORM WATER

There is no upgradient storm water for Wolf Ranch West Section 6G. All of the storm water originates onsite and is captured in the proposed storm sewer system and routed to the proposed Batch Detention Ponds and Vegetative Filter Strips.

ATTACHMENT C -- BMPs FOR ONSITE STORMWATER

Storm water runoff arising from this development will be conveyed through a combination of sheet flow and storm sewer flow to the proposed water quality ponds or Vegetative Filter Strips. Ultimately the ponds will discharge into South Fork of the San Gabriel River. See attached plans for the proposed expansion to the water quality pond included with the construction plans under ***Attachment F***. See TSS removal calculations under ***Attachment I***.

1. Permanent Erosion and Sedimentation Notes:

   All disturbed areas shall be restored as noted below.

   a. A minimum of four inches of top soil shall be placed in all drainage channels (except rock) and between the curb and right-of-way line.

   b. The seeding for permanent erosion control shall be applied over areas disturbed by construction as follows:

      Broadcast seeding:

      i. From September 15 to March 1, seeding shall be with a combination of two (2) pounds per 1,000 square feet of unhulled Bermuda and seven (7) pounds per 1,000 square feet of Winter Rye with a purity of 95% with 90% germination.

      ii. From March 2 to September 14, seeding shall be with hulled Bermuda at a rate of two (2) pounds per 1,000 square feet with a purity of 95% with 85% germination.

      iii. Fertilizer shall be a pelleted or granular slow release with an analysis of 15-15-15 to be applied once at planting and once during the period of establishment at a rate of one (1) pounds per 1,000 square feet.

      iv. Mulch type used shall be hay, straw or mulch applied at a rate of 45 pounds per 1,000 square feet.

      Hydraulic seeding:

      i. From September 15 to March 1, seeding shall be with a combination of one (1) pounds per 1,000 square feet of unhulled Bermuda and seven (7) pounds per 1,000 square feet of Winter Rye with a purity of 95% with 90% germination.

      ii. From March 2 to September 14, seeding shall be with hulled Bermuda at a rate of one (1) pounds per 1,000 square feet with a purity of 95% with 85% germination.

      iii. Fertilizer shall be a water soluble fertilizer with an analysis of 15-15-15 at a rate of 1.5 pounds per 1,000 square feet.

      iv. Mulch type used shall be hay, straw or mulch applied at a rate of 45 pounds per 1,000 square feet, with soil tackifier at a rate of 1.4 pounds per 1,000 square feet.

   c. The planted area shall be irrigated or sprinkled in a manner that will not erode the topsoil, but will sufficiently soak the soil to a depth of six (6) inches. The irrigation shall occur at ten (10)-day intervals during the first two (2) months. Rainfall occurrences of half (½) inch or more shall postpone the watering schedule for one (1) week.

   d. Restoration shall be acceptable when the grass has grown at least one and a half (1½) inches high with 95% coverage, provided no bare spots larger than 16 square feet exist.

   e. When required, native grass seeding shall comply with the requirements of the City of Georgetown.

ATTACHMENT D -- BMPs FOR SURFACE STREAMS

As described in ***Attachments B*** and ***C***, storm water runoff will be treated and contained within the proposed water quality ponds. The permanent water quality ponds are batch detention ponds TSS reduction efficiency of 91%. Please refer to ***Attachment I*** of this section for the TSS removal calculations.

ATTACHMENT E – REQUEST TO SEAL FEATURES

No environmental features are being sealed. Therefore, this section is not applicable.

ATTACHMENT F – CONSTRUCTION PLANS

See attached construction plans.

ATTACHMENT G – INSPECTION, MAINTENANCE, REPAIR AND RETROFIT PLAN

Inspection, Maintenance, Repair and Retrofit Plan, and
Schedule for Batch Detention Water Quality Ponds & Vegetative Filter Strips

PROJECT NAME: Wolf Ranch West Section 6G
ADDRESS: Wolf Canyon Road
CITY, STATE ZIP: Georgetown, Texas 78626

VEGETATIVE FILTER STRIPS

First Two Months: The first two months are the most important for vegetative filter strips, or until they are well established. The following guidelines should be followed most closely during this time period. After the vegetative filter strips have been well established, little additional maintenance is necessary.

Pest Management: An Integrated Pest Management (IPM) Plan should be developed for vegetated areas. This plan should specify how problem insects and weeds will be controlled with minimal or no use of insecticides and herbicides.

Seasonal Mowing and Lawn Care: If the filter strip is made up of turf grass, it should be mowed as needed to limit vegetation height to 18 inches, using a mulching mower (or removal of clippings). If native grasses are used, the filter may require less frequent mowing, but a minimum of twice annually. Grass clippings and brush debris should not be deposited on vegetated filter strip area. Regular mowing should also include weed control practices, however herbicide use should be kept to a minimum (Urbonas et al., 1992). Healthy grass can be maintained without using fertilizers because runoff usually contains sufficient nutrients. Irrigation of the site can help assure a dense and healthy vegetative cover.

Inspection: Inspect filter strips at least twice annually for erosion or damage to vegetation; however, additional inspection after periods of heavy runoff is most desirable. The strip should be checked for uniformity of grass cover, debris and litter, and areas of sediment accumulation. More frequent inspections of the grass cover during the first few years after establishment will help to determine if any problems are developing, and to plan for long-term restorative maintenance needs. Bare spots and areas of erosion identified during semi-annual inspections must be replanted and restored to meet specifications. Construction of a level spreader device may be necessary to reestablish shallow overland flow.

Debris and Litter Removal: Trash tends to accumulate in vegetated areas, particularly along highways. Any filter strip structures (i.e. level spreaders) should be kept free of obstructions to reduce floatables being flushed downstream, and for aesthetic reasons. The need for this practice is determined through periodic inspection, but should be performed no less than 4 times per year.

Sediment Removal: Sediment removal is not normally required in filter strips, since the vegetation normally grows through it and binds it to the soil. However, sediment may accumulate along the upstream boundary of the strip preventing uniform overland flow. Excess sediment should be removed by hand or with flat-bottomed shovels.

Grass Reseeding and Mulching: A healthy dense grass should be maintained on the filter strip. If areas are eroded, they should be filled, compacted, and reseeded so that the final grade is level. Grass damaged during the sediment removal process should be promptly replaced using the same seed mix used during filter strip establishment. If possible, flow should be diverted from the damaged areas until the grass is firmly established. Bare spots and areas of erosion identified during semi-annual inspections must be replanted and restored to meet specifications. Corrective maintenance such as weeding or replanting should be done more frequently in the first two to three years after installation to ensure stabilization. Dense vegetation may require irrigation immediately after planting, and during particularly dry periods, particularly as the vegetation is initially established.

BATCH DETENTION WATER QUALITY PONDS

Routine Maintenance:

Mowing. The upper stage, side slopes, embankment, and emergency spillway of an extended detention basin must be mowed regularly to discourage woody growth and control weeds. Grass areas in and around basins should be mowed at least twice annually to limit vegetation height to 18 inches. More frequent mowing to maintain aesthetic appeal may be necessary in landscaped areas. When mowing of grass is performed, a mulching mower should be used, or grass clippings should be caught and removed.

Inspections. 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 pond is meeting the target detention times. In particular, the extended detention control device should be regularly inspected for evidence of clogging, or conversely, for too rapid a release. If the design drawdown times are exceeded by more than 24 hours, then repairs should be scheduled immediately. The upper stage pilot channel, if any, and its flow path to the lower stage should be checked for erosion problems. During each inspection, erosion areas inside and downstream of the BMP should be identified and repaired or revegetated immediately.

Debris and Litter Removal. Debris and litter will accumulate near the extended detention control device and should be removed during regular mowing operations and inspections. Particular attention should be paid to floating debris that can eventually clog the control device or riser..

Erosion Control. The pond side slopes, emergency spillway, and embankment all may periodically suffer from slumping and erosion, although this should not occur often if the soils are properly compacted during construction. Regrading and revegetation may be required to correct the problems. Similarly, the channel connecting an upper stage with a lower stage may periodically need to be replaced or repaired. g: Grass areas in and around sand filters must be mowed at least twice annually to limit vegetation height to 18 inches. More frequent mowing to maintain aesthetic appeal may be necessary in landscape areas. Vegetation on the pond embankments should be mowed as appropriate to prevent the establishment of woody vegetation

Nuisance Control. Standing water (not desired in a extended detention basin) or soggy conditions within the lower stage of the basin can create nuisance conditions for nearby residents. Odors, mosquitoes, weeds, and litter are all occasionally perceived to be problems. Most of these problems are generally a sign that regular inspections and maintenance are not being performed (e.g., mowing, debris removal, clearing the outlet control device).

Non-routine maintenance.

Structural Repairs and Replacement. With each inspection, any damage to the structural elements of the system (pipes, concrete drainage structures, retaining walls, etc.) should be identified and repaired immediately. These repairs should include patching of cracked concrete, sealing of voids, and removal of vegetation from cracks and joints. The various inlet/outlet and riser works in a basin will eventually deteriorate and must be replaced. Public works experts have estimated that corrugated metal pipe (CMP) has a useful life of about 25 yr, whereas reinforced concrete barrels and risers may last from 50 to 75 yr.

Sediment Removal. When properly designed, dry extended detention basins will accumulate quantities of sediment over time. Sediment accumulation is a serious maintenance concern in extended detention dry ponds for several reasons. First, the sediment gradually reduces available stormwater management storage capacity within the basin. Second, unlike wet extended detention basins (which have a permanent pool to conceal deposited sediments), sediment accumulation can make dry extended detention basins very unsightly. Third, and perhaps most importantly, sediment tends to accumulate around the control device. Sediment deposition increases the risk that the orifice will become clogged, and gradually reduces storage capacity reserved for pollutant removal. Sediment can also be resuspended if allowed to accumulate over time and escape through the hydraulic control to downstream channels and streams. For these reasons, accumulated sediment needs to be removed from the lower stage when sediment buildup fills 20% of the volume of the basin or at least every 10 years.

An amended copy of this document will be provided to the Texas Commission on Environmental Quality within thirty (30) days of any changes in the following information.

Responsible Party for Maintenance: H4 Georgetown, LP & H4 Georgetown Phase 1, LLC

Address: 129 Canyon View Road

City, State, Zip: Georgetown, Texas 78626

Telephone Number: ~~(662) 816-2787~~ 972-201-2800

Signature of Responsible Party:

Authorized Representative

Hillwood Communities, Austin General Manager

ATTACHMENT H – PILOT-SCALE FIELD TESTING PLAN

A pilot-scale field testing plan is not applicable for this project.

ATTACHMENT I – MEASURES FOR MINIMIZING SURFACE STREAM CONTAMINATION

All flows generated onsite due to this development are conveyed through a combination of sheet flow and storm sewer to the proposed water quality ponds and vegetative filter stip. Ultimately the flows are conveyed to the South Fork of the San Gabriel River.

The TSS removal calculations for the proposed pond are attached.

Texas Commission on Environmental Quality

TSS Removal Calculations 04-20-2009

Project Name: **Wolf Ranch Phase 6G (Water Quality Area A)**
Date Prepared: **10/10/2023**

Additional information is provided for cells with a red triangle in the upper right corner. Place the cursor over the cell.
Text shown in blue indicate location of instructions in the Technical Guidance Manual - RG-348.
Characters shown in red are data entry fields.
Characters shown in black (Bold) are calculated fields. Changes to these fields will remove the equations used in the spreadsheet.

1. The Required Load Reduction for the total project: Calculations from RG-348 Pages 3-27 to 3-30

Page 3-29 Equation 3.3: $L_M = 27.2(A_N \times P)$

where:

$L_{M\ TOTAL\ PROJECT}$ = Required TSS removal resulting from the proposed development = 80% of increased load
A_N = Net increase in impervious area for the project
P = Average annual precipitation, inches

Site Data: Determine Required Load Removal Based on the Entire Project

County =	**Williamson**	
Total project area included in plan * =	**89.42**	acres
Predevelopment impervious area within the limits of the plan * =	**0.00**	acres
Total post-development impervious area within the limits of the plan* =	**22.25**	acres
Total post-development impervious cover fraction * =	**0.25**	
P =	**32**	inches
$L_{M\ TOTAL\ PROJECT}$ =	**19366**	lbs.

*** The values entered in these fields should be for the total project area.**

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** **WQ POND-A**

Total drainage basin/outfall area =	**34.39**	acres
Predevelopment impervious area within drainage basin/outfall area =	**0.00**	acres
Post-development impervious area within drainage basin/outfall area =	**14.65**	acres
Post-development impervious fraction within drainage basin/outfall area =	**0.43**	
$L_{M\ THIS\ BASIN}$ =	**12751**	lbs.

3. Indicate the proposed BMP Code for this basin.

Proposed BMP = **Batch Detention**
Removal efficiency = **91** percent

Aqualogic Cartridge Filter

Bioretention
Contech StormFilter
Constructed Wetland
Extended Detention
Grassy Swale
Retention / Irrigation
Sand Filter
Stormceptor
Vegetated Filter Strips
Vortechs
Wet Basin
Wet Vault

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

RG-348 Page 3-33 Equation 3.7: L_R = (BMP efficiency) x P x (A_I x 34.6 + A_P x 0.54)

where:

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

A_C =	**28.28**	acres
A_I =	**14.05**	acres
A_P =	**14.23**	acres
L_R =	**14380**	lbs

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

Desired $L_{M\ THIS\ BASIN}$ =	**12751**	lbs.
F =	**0.89**	

6. Calculate Capture Volume required by the BMP Type for this drainage basin / outfall area. Calculations from RG-348 Pages 3-34 to 3-36

Rainfall Depth =	**1.60**	inches
Post Development Runoff Coefficient =	**0.36**	
On-site Water Quality Volume =	**58433**	cubic feet

Calculations from RG-348 Pages 3-36 to 3-37

Off-site area draining to BMP =	**0.00**	acres
Off-site Impervious cover draining to BMP =	**0.00**	acres
Impervious fraction of off-site area =	**0**	
Off-site Runoff Coefficient =	**0.00**	
Off-site Water Quality Volume =	**0**	cubic feet
Storage for Sediment =	**11687**	
Total Capture Volume (required water quality volume(s) x 1.20) =	**70120**	cubic feet

Texas Commission on Environmental Quality

TSS Removal Calculations 04-20-2009

Project Name: **Wolf Ranch Phase 6G (Water Quality Area B)**
Date Prepared: **10/10/2023**

Additional information is provided for cells with a red triangle in the upper right corner. Place the cursor over the cell.
Text shown in blue indicate location of instructions in the Technical Guidance Manual - RG-348.
Characters shown in red are data entry fields.
Characters shown in black (Bold) are calculated fields. Changes to these fields will remove the equations used in the spreadsheet.

1. The Required Load Reduction for the total project: Calculations from RG-348 Pages 3-27 to 3-30

Page 3-29 Equation 3.3: $L_M = 27.2(A_N \times P)$

where:

$L_{M\ TOTAL\ PROJECT}$ = Required TSS removal resulting from the proposed development = 80% of increased load
A_N = Net increase in impervious area for the project
P = Average annual precipitation, inches

Site Data: Determine Required Load Removal Based on the Entire Project

County =	**Williamson**	
Total project area included in plan * =	**89.42**	acres
Predevelopment impervious area within the limits of the plan * =	**0.00**	acres
Total post-development impervious area within the limits of the plan* =	**22.25**	acres
Total post-development impervious cover fraction * =	**0.25**	
P =	**32**	inches
$L_{M\ TOTAL\ PROJECT}$ =	**19366**	lbs.

*** The values entered in these fields should be for the total project area.**

Number of drainage basins / outfalls areas leaving the plan area = **4**

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

Drainage Basin/Outfall Area No. = **2** **WQ POND-B**

Total drainage basin/outfall area =	**15.37**	acres
Predevelopment impervious area within drainage basin/outfall area =	**0.00**	acres
Post-development impervious area within drainage basin/outfall area =	**6.13**	acres
Post-development impervious fraction within drainage basin/outfall area =	**0.40**	
$L_{M\ THIS\ BASIN}$ =	**5336**	lbs.

3. Indicate the proposed BMP Code for this basin.

Proposed BMP = **Batch Detention**
Removal efficiency = **91** percent

Aqualogic Cartridge Filter

Bioretention
Contech StormFilter
Constructed Wetland
Extended Detention
Grassy Swale
Retention / Irrigation
Sand Filter
Stormceptor
Vegetated Filter Strips
Vortechs
Wet Basin
Wet Vault

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

RG-348 Page 3-33 Equation 3.7: L_R = (BMP efficiency) x P x (A_I x 34.6 + A_P x 0.54)

where:

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

A_C =	**14.50**	acres
A_I =	**5.65**	acres
A_P =	**8.85**	acres
L_R =	**5832**	lbs

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

Desired $L_{M\ THIS\ BASIN}$ = **5336** lbs.

F = **0.91**

6. Calculate Capture Volume required by the BMP Type for this drainage basin / outfall area. Calculations from RG-348 Pages 3-34 to 3-36

Rainfall Depth =	**1.80**	inches
Post Development Runoff Coefficient =	**0.30**	
On-site Water Quality Volume =	**28605**	cubic feet

Calculations from RG-348 Pages 3-36 to 3-37

Off-site area draining to BMP =	**0.00**	acres
Off-site Impervious cover draining to BMP =	**0.00**	acres
Impervious fraction of off-site area =	**0**	
Off-site Runoff Coefficient =	**0.00**	
Off-site Water Quality Volume =	**0**	cubic feet
Storage for Sediment =	**5721**	
Total Capture Volume (required water quality volume(s) x 1.20) =	**34327**	cubic feet

Texas Commission on Environmental Quality

TSS Removal Calculations 04-20-2009

Project Name: **Wolf Ranch Phase 6G (Water Quality Area C)**
Date Prepared: **10/10/2023**

Additional information is provided for cells with a red triangle in the upper right corner. Place the cursor over the cell.
Text shown in blue indicate location of instructions in the Technical Guidance Manual - RG-348.
Characters shown in red are data entry fields.
Characters shown in black (Bold) are calculated fields. Changes to these fields will remove the equations used in the spreadsheet.

1. The Required Load Reduction for the total project: Calculations from RG-348 Pages 3-27 to 3-30

Page 3-29 Equation 3.3: $L_M = 27.2(A_N \times P)$

where:

$L_{M\ TOTAL\ PROJECT}$ = Required TSS removal resulting from the proposed development = 80% of increased load
A_N = Net increase in impervious area for the project
P = Average annual precipitation, inches

Site Data: Determine Required Load Removal Based on the Entire Project

County =	**Williamson**	
Total project area included in plan * =	**89.42**	acres
Predevelopment impervious area within the limits of the plan * =	**0.00**	acres
Total post-development impervious area within the limits of the plan* =	**22.25**	acres
Total post-development impervious cover fraction * =	**0.25**	
P =	**32**	inches
$L_{M\ TOTAL\ PROJECT}$ =	**19366**	lbs.

*** The values entered in these fields should be for the total project area.**

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. = **3** **NATURAL VFS-A**

Total drainage basin/outfall area =	**46.01**	acres
Predevelopment impervious area within drainage basin/outfall area =	**0.00**	acres
Post-development impervious area within drainage basin/outfall area =	**1.47**	acres
Post-development impervious fraction within drainage basin/outfall area =	**0.03**	
$L_{M\ THIS\ BASIN}$ =	**1279**	lbs.

3. Indicate the proposed BMP Code for this basin.

Proposed BMP = **Vegetated Filter Strips**
Removal efficiency = **85** percent

Aqualogic Cartridge Filter

Bioretention
Contech StormFilter
Constructed Wetland
Extended Detention
Grassy Swale
Retention / Irrigation
Sand Filter
Stormceptor
Vegetated Filter Strips
Vortechs
Wet Basin
Wet Vault

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

RG-348 Page 3-33 Equation 3.7: L_R = (BMP efficiency) x P x (A_I x 34.6 + A_P x 0.54)

where:

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

A_C =	**46.01**	acres
A_I =	**1.47**	acres
A_P =	**44.54**	acres
L_R =	**2038**	lbs

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

Desired $L_{M\ THIS\ BASIN}$ =	**1279**	lbs.
F =	**0.63**	

6. Calculate Capture Volume required by the BMP Type for this drainage basin / outfall area. Calculations from RG-348 Pages 3-34 to 3-36

Rainfall Depth =	**0.64**	inches
Post Development Runoff Coefficient =	**0.06**	
On-site Water Quality Volume =	**6091**	cubic feet

Calculations from RG-348 Pages 3-36 to 3-37

Off-site area draining to BMP =	**0.00**	acres
Off-site Impervious cover draining to BMP =	**0.00**	acres
Impervious fraction of off-site area =	**0**	
Off-site Runoff Coefficient =	**0.00**	
Off-site Water Quality Volume =	**0**	cubic feet
Storage for Sediment =	**1218**	
Total Capture Volume (required water quality volume(s) x 1.20) =	**7309**	cubic feet

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

I FREO J. BALDA,
Print Name

PRESIDENT,
Title - Owner/President/Other

of H4 GEORGETOWN, LP & H4 GEORGETOWN PHASE 1, LLC.
Corporation/Partnership/Entity Name

have authorized John Pickens, P.E.
Print Name of Agent/Engineer

of Kimley-Horn And Associates, Inc.
Print Name of Firm

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

I also understand that:

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

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

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

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

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

SIGNATURE PAGE:

Fred Balda

Applicant's Signature

6-10-22

Date

THE STATE OF Texas §

County of Dallas §

BEFORE ME, the undersigned authority, on this day personally appeared Fred Balda 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 10 day of June, 2022.

Shannon Dear

NOTARY PUBLIC

Shannon Dear

Typed or Printed Name of Notary

MY COMMISSION EXPIRES: 1/22/26

SHANNON DEAR
Notary Public, State of Texas
Comm. Expires 01-22-2026
Notary ID 10935492

Application Fee Form

Texas Commission on Environmental Quality
Name of Proposed Regulated Entity: Wolf Ranch West Section 6G
Regulated Entity Location: City of Georgetown , Willamson County, TX
Name of Customer: H4 GEORGETOWN, LP & H4 Georgetown Phase 1, LLC
Contact Person: Fred J. Balda Phone: 713-516-7964
Customer Reference Number (if issued):CN _____
Regulated Entity Reference Number (if issued):RN _____

Austin Regional Office (3373)

☐ Hays ☐ Travis ☒ Williamson

San Antonio Regional Office (3362)

☐ Bexar ☐ Medina ☐ Uvalde
☐ Comal ☐ Kinney

Application fees must be paid by check, certified check, or money order, payable to the **Texas Commission on Environmental Quality**. Your canceled check will serve as your receipt. **This form must be submitted with your fee payment**. This payment is being submitted to:

☒ Austin Regional Office
☐ Mailed to: TCEQ - Cashier
Revenues Section
Mail Code 214
P.O. Box 13088
Austin, TX 78711-3088

☐ San Antonio Regional Office
☐ Overnight Delivery to: TCEQ - Cashier
12100 Park 35 Circle
Building A, 3rd Floor
Austin, TX 78753
(512)239-0357

Site Location (Check All That Apply):

☒ Recharge Zone ☒ Contributing Zone ☐ Transition Zone

Type of Plan	***Size***	***Fee Due***
Water Pollution Abatement Plan, Contributing Zone Plan: One Single Family Residential Dwelling	Acres	$
Water Pollution Abatement Plan, Contributing Zone Plan: Multiple Single Family Residential and Parks	89.4 Acres	$ 6,500.00
Water Pollution Abatement Plan, Contributing Zone Plan: Non-residential	Acres	$
Sewage Collection System	1,700 L.F.	$ 850.00
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: John Pickens Date: 11/06/2023

Application Fee Schedule

Texas Commission on Environmental Quality

Edwards Aquifer Protection Program 30 TAC Chapter 213 (effective 05/01/2008)

Water Pollution Abatement Plans and Modifications

Contributing Zone Plans and Modifications

Project	*Project Area in Acres*	*Fee*
One Single Family Residential Dwelling	< 5	$650
Multiple Single Family Residential and Parks	< 5 5 < 10 10 < 40 40 < 100 100 < 500 ≥ 500	$1,500 $3,000 $4,000 $6,500 $8,000 $10,000
Non-residential (Commercial, industrial, institutional, multi-family residential, schools, and other sites where regulated activities will occur)	< 1 1 < 5 5 < 10 10 < 40 40 < 100 ≥ 100	$3,000 $4,000 $5,000 $6,500 $8,000 $10,000

Organized Sewage Collection Systems and Modifications

Project	*Cost per Linear Foot*	*Minimum Fee-Maximum Fee*
Sewage Collection Systems	$0.50	$650 - $6,500

Underground and Aboveground Storage Tank System Facility Plans and Modifications

Project	*Cost per Tank or Piping System*	*Minimum Fee-Maximum Fee*
Underground and Aboveground Storage Tank Facility	$650	$650 - $6,500

Exception Requests

Project	*Fee*
Exception Request	$500

Extension of Time Requests

Project	*Fee*
Extension of Time Request	$150

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)		3. Regulated Entity Reference Number (if issued)
CN	Follow this link to search for CN or RN numbers in **Central Registry****	RN

SECTION II: Customer Information

4. General Customer Information | 5. Effective Date for Customer Information Updates (mm/dd/yyyy): 11/15/2023

☒ 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: e.g.: Doe, John): H4 GEORGETOWN, LP & H4 GEORGETOWN PHASE 1, LLC

If new Customer, enter previous Customer below:

7. TX SOS/CPA Filing Number	8. TX State Tax ID (11 digits)	9. Federal Tax ID (9 digits)	10. DUNS Number (if applicable)
N/A	N/A	830792522	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: 129 CANYON VIEW ROAD

City	GEORGETOWN	State	TX	ZIP	78626	ZIP + 4	

16. Country Mailing Information (if outside USA)	17. E-Mail Address (if applicable)
	Carter.DeWalch@hillwood.com

18. Telephone Number	19. Extension or Code	20. Fax Number (if applicable)
(713) 516 - 7964		( ) -

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.)

WOLF RANCH WEST SECTION 6G

23. Street Address of the Regulated Entity: (No PO Boxes)	WOLF CANYON ROAD						
	City	GEORGETOWN	State	TX	ZIP	78626	ZIP + 4
24. County	WILLIAMSON						

Enter Physical Location Description if no street address is provided.

25. Description to Physical Location:	WEST SIDE OF SOUTHWEST BYPASS AND SOUTH OF WOLF RANCH WEST SECTION 7.

26. Nearest City	State	Nearest ZIP Code
GEORGETOWN	TX	78626

27. Latitude (N) In Decimal:	30.624150		28. Longitude (W) In Decimal:	-97.725171	
Degrees	Minutes	Seconds	Degrees	Minutes	Seconds
30	37	26.94	-97	43	30.61

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	1611	236116	237310

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

SINGLE FAMILY MASTER PLANNED COMMUNITY

34. Mailing Address:	129 CANYON VIEW ROAD						
	City	GEORGETOWN	State	TX	ZIP	78626	ZIP + 4
35. E-Mail Address:	Carter.DeWalch@hillwood.com						

36. Telephone Number	37. Extension or Code	38. Fax Number (if applicable)
(713) 516 - 7964		( ) -

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
		SCS/WPAP		
☐ 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: John A Pickens			41. Title: PROJECT MANAGER
42. Telephone Number	43. Ext./Code	44. Fax Number	45. E-Mail Address
(757) 685 - 7200		( ) -	JOHN.PICKENS@KIMLEY-HORN.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:	KIMLEY-HORN AND ASSOCIATES, INC.	Job Title:	PROJECT MANAGER
Name(*In Print*):	JOHN PICKENS, P.E.	Phone:	(757) 685 - 7200
Signature:	John Pickens	Date:	11/15/2024

GENERAL CONSTRUCTION PLAN NOTES:

1. THESE PLANS WERE PREPARED, SEALED, SIGNED, AND DATED BY A TEXAS LICENSED PROFESSIONAL ENGINEER. THEREFORE, BASED ON THE ENGINEER'S CONCURRENCE OF COMPLIANCE, THE 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 TO THE CITY.
3. ALL ELECTRIC DISTRIBUTION LINES AND INDIVIDUAL SERVICE LINES SHALL BE INSTALLED UNDERGROUND. IF OVERHEAD LINES EXISTED PRIOR TO UNDERGROUND INSTALLATION, SUCH POLES, GUY WIRES, AND RELATED STRUCTURES SHALL BE REMOVED FOLLOWING CONSTRUCTION OF THE UNDERGROUND INFRASTRUCTURE.
4. WHERE NO OVERHEAD INFRASTRUCTURE EXISTS, UNDERGROUND ELECTRIC UTILITY LINES SHALL BE LOCATED ALONG THE STREET AND WITHIN THE SITE. WHERE EXISTING OVERHEAD INFRASTRUCTURE IS TO BE RELOCATED, IT SHALL BE RE-INSTALLED UNDERGROUND AND THE EXISTING FACILITIES SHALL BE REMOVED AT THE DISCRETION OF THE DEVELOPMENT ENGINEER (ONLY APPLICABLE FOR NON-RESIDENTIAL AND MULTI-FAMILY DEVELOPMENT).
5. ALL ELECTRIC AND COMMUNICATION INFRASTRUCTURE SHALL COMPLY WITH UDC SECTION 13.06.
6. THE PROPERTY SUBJECT TO THIS APPLICATION IS SUBJECT TO THE WATER QUALITY REGULATIONS OF THE CITY OF GEORGETOWN.
7. A GEOLOGIC ASSESSMENT, IN ACCORDANCE WITH THE CITY OF GEORGETOWN WATER QUALITY REGULATIONS, WAS COMPLETED IN NOVEMBER OF 2013. ANY SPRINGS AND STREAMS IDENTIFIED IN THE GEOLOGIC ASSESSMENT ARE SHOWN HEREIN.
8. THIS SUBDIVISION IS SUBJECT TO THE DEVELOPMENT AGREEMENT BETWEEN THE WOLF LEGACY, L.P. AND THE CITY OF GEORGETOWN UNDER DOCUMENT NUMBER 2014095878, APPROVED BY THE CITY OF GEORGETOWN CITY COUNCIL ON AUGUST 12, 2014 AND EXECUTED ON AUGUST 26, 2014.
9. THIS SUBDIVISION IS SUBJECT TO THE CITY OF GEORGETOWN ORDINANCE NUMBER 2018-66 (2014UDC) AMENDING THE OFFICIAL ZONING MAP TO BE REZONED FROM AGRICULTURE (AG) DISTRICT TO PLANNED UNIT DEVELOPMENT (PUD) KNOWN AS WOLF RANCH HILLWOOD, APPROVED BY THE CITY OF GEORGETOWN CITY COUNCIL ON NOVEMBER 13, 2018.
10. FIRE FLOW REQUIREMENT OF 1500 GALLONS PER MINUTE ARE BEING MET BY THIS PLAN.
11. ANY HERITAGE TREE NOTED ON THIS SUBDIVISION CONSTRUCTION PLAN IS SUBJECT TO EXHIBIT H-7 OF THE CITY OF GEORGETOWN ORDINANCE NUMBER 2018-66 AMENDING THE OFFICIAL ZONING MAP TO BE REZONED FROM AGRICULTURE (AG) DISTRICT TO PLANNED UNIT DEVELOPMENT (PUD) KNOWN AS WOLF RANCH HILLWOOD PUD, APPROVED BY THE CITY OF GEORGETOWN CITY COUNCIL ON NOVEMBER 13, 2018.
12. THE PRELIMINARY PLAT FOR THIS PROPERTY IS 2023-28-PP "WOLF RANCH WEST SECTION 6G" (APPROVED DECEMBER 18, 2023.

MUD SIGNATURE BLOCK:

REVIEW OF THE PLANS BY THE DISTRICT IS LIMITED TO WATER, WASTEWATER, AND DRAINAGE AND DOES NOT INDICATE A REVIEW FOR ADEQUACY OF THE DESIGN OF THE FACILITIES. IN APPROVING THESE PLANS, THE DISTRICT MUST RELY ON THE ADEQUACY OF THE WORK OF THE DESIGN ENGINEER.

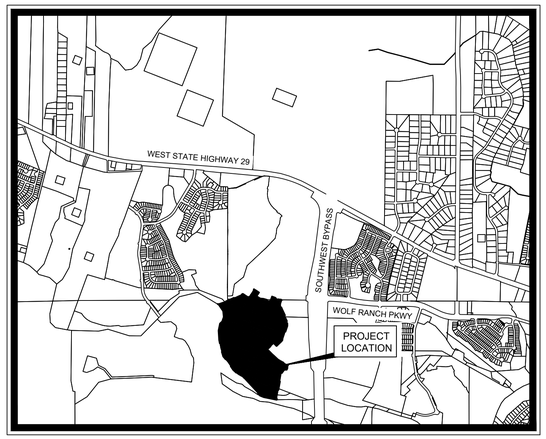
WILLIAMSON COUNTY MUD 29: DATE:

ON BEHALF OF WILLIAMSON COUNTY MUNICIPAL UTILITY DISTRICT #29 CIVIL CONSTRUCTION PLANS PAVING, GRADING, & UTILITIES

FOR

WOLF RANCH SECTION 6G

CITY OF GEORGETOWN, WILLIAMSON COUNTY, TEXAS



N
W E
S

VICINITY MAP
SCALE: 1" = 2,000'

FEBRUARY 2024

LEGAL DESCRIPTION

BEING 89.416 ACRES OUT OF THE
ISAAC DOAGAN SURVEY, ABSTRACT 178
JOSEPH THOMPSON SURVEY, ABSTRACT 608
WILLIAMSON COUNTY, TEXAS

SUBMITTAL DATE: 10/23/2023

PROJECT INFORMATION

GENERAL INFORMATION:
TOTAL BLOCKS.....7
TOTAL SINGLE FAMILY LOTS.....117
TOTAL OPEN SPACE LOTS.....3
TOTAL M.U.D. MAINTAINED WATER QUALITY/ DETENTION & OPEN SPACE LOTS.....2
TOTAL LOTS.....122
TOTAL PHASES.....1

OWNER/DEVELOPER

H4 GEORGETOWN PHASE 6G, LLC
129 CANYON VIEW ROAD
GEORGETOWN, TX 78628
CONTACT: CARTER DeWALCH
PHONE: 713-516-7964
EMAIL: CARTER.DEWALCH@HILLWOOD.COM

ENGINEER

KIMLEY-HORN AND ASSOCIATES, INC.
10814 JOLLYVILLE ROAD, CAMPUS IV, SUITE 200
AUSTIN, TEXAS 78759
TBPE FIRM REGISTRATION NO. F-928
CONTACT: JOHN PICKENS, P.E.
PHONE: 757-685-7200
EMAIL: JOHN.PICKENS@KIMLEY-HORN.COM

SURVEYOR

KIMLEY-HORN AND ASSOCIATES, INC.
10814 JOLLYVILLE ROAD, CAMPUS IV, SUITE 200
AUSTIN, TEXAS 78759
TBPE FIRM REGISTRATION NO. F-928
CONTACT: MIKE MONTGOMERY II
PHONE: 512-886-4146
EMAIL: MIKE.MONTGOMERY@KIMLEY-HORN.COM

PREPARED BY:

Kimley»Horn
10814 JOLLYVILLE ROAD, CAMPUS IV, SUITE 200
AUSTIN, TEXAS 78759
CERTIFICATE OF REGISTRATION #928
Tel. No. (512) 418-1771
Fax No. (512) 418-1791

GAS SERVICE

ATMOS ENERGY CORPORATION
3110 N INTERSTATE 35
ROUND ROCK, TEXAS 78681
TELEPHONE: (512) 310-3854
CONTACT: DAVID DOBERNECKI
WEBSITE: www.atmosenergy.com

ELECTRIC SERVICE

PEDERNALES ELECTRIC COOPERATIVE, INC. (PEC)
LIBERTY HILL OFFICE
10625 WEST HIGHWAY 8642
TELEPHONE: 877-372-0391
WEBSITE: https://www.pec.coop/

WATER SERVICE

CITY OF GEORGETOWN
300 INDUSTRIAL AVE #1
GEORGETOWN, TEXAS 78626
TELEPHONE: (512) 930-3640
CONTACT: DAVID MUNK
WEBSITE: https://gus.georgetown.org/

WASTEWATER SERVICE

CITY OF GEORGETOWN
GEORGETOWN UTILITY SYSTEMS
300-1 INDUSTRIAL AVENUE
GEORGETOWN, TEXAS 78626
TELEPHONE: (512)930-3555
CONTACT: DAVID MUNK
WEBSITE: https://gus.georgetown.org/

RELEASE OF THIS APPLICATION DOES NOT CONSTITUTE A VERIFICATION OF ALL DATA, INFORMATION AND CALCULATIONS SUPPLIED BY THE APPLICANT. THE ENGINEER OF RECORD IS SOLELY RESPONSIBLE FOR THE COMPLETENESS, ACCURACY AND ADEQUACY OF HIS/HER SUBMITTAL, WHETHER OR NOT THE APPLICATION IS REVIEWED FOR CODE COMPLIANCE BY CITY ENGINEERS.

SHEET INDEX

Sheet Number	Sheet Title
1	COVER SHEET
2	GENERAL NOTES
3	KH GENERAL NOTES
4	TCEQ NOTES
5	PRELIMINARY PLAT (1 of 7)
6	PRELIMINARY PLAT (2 of 7)
7	PRELIMINARY PLAT (3 of 7)
8	PRELIMINARY PLAT (4 of 7)
9	PRELIMINARY PLAT (5 of 7)
10	PRELIMINARY PLAT (6 of 7)
11	PRELIMINARY PLAT (7 of 7)
12	EXISTING CONDITIONS AND DEMOLITION PLAN (1 OF 2)
13	EXISTING CONDITIONS AND DEMOLITION PLAN (2 OF 2)
14	EROSION CONTROL PLAN (1 OF 2)
15	EROSION CONTROL PLAN (2 OF 2)
16	TREE PRESERVATION PLAN (1 OF 3)
17	TREE PRESERVATION PLAN (2 OF 3)
18	TREE PRESERVATION PLAN (3 OF 3)
19	GRADING PLAN (1 OF 2)
20	GRADING PLAN (2 OF 2)
21	CRIMSON SUNSET DRIVE - PAVING PLAN AND PROFILE (1 OF 3)
22	CRIMSON SUNSET DRIVE - PAVING PLAN AND PROFILE (2 OF 3)
23	CRIMSON SUNSET DRIVE - PAVING PLAN AND PROFILE (3 OF 3)
24	LOOKOUT MOUNTAIN ROAD - PAVING PLAN AND PROFILE
25	DOUBLE SPUR TRAIL - PAVING PLAN AND PROFILE
26	SUNDOWN TRAIL - PAVING PLAN AND PROFILE
27	MORNING MIST DRIVE - PAVING PLAN AND PROFILE (1 OF 2)
28	MORNING MIST DRIVE - PAVING PLAN AND PROFILE (2 OF 2)
29	INTERSECTION KNUCKLE & CUL-DE-SAC GRADING PLANS (1 OF 2)
30	INTERSECTION KNUCKLE & CUL-DE-SAC GRADING PLANS (2 OF 2)
31	INLET DRAINAGE AREA MAP
32	DRAINAGE CALCULATIONS SHEET (1 OF 2)
33	DRAINAGE CALCULATIONS SHEET (2 OF 2)
34	WATER QUALITY AREA MAP
35	COG WATER QUALITY CALCULATIONS
36	TCEQ WATER QUALITY CALCULATIONS
37	WATER QUALITY POND A PLAN
38	WATER QUALITY POND B PLAN
39	WATER QUALITY POND PROFILES
40	WATER QUALITY POND DETAILS
41	OVERALL STORM PLAN (1 OF 2)
42	OVERALL STORM PLAN (2 OF 2)
43	STORM PLAN AND PROFILE - SD-A
44	STORM PLAN AND PROFILE - SD-B
45	STORM PLAN AND PROFILE - SD-C
46	STORM PLAN AND PROFILE - SD-D (1 OF 2)
47	STORM PLAN AND PROFILE - SD-D (2 OF 2)
48	STORM PLAN AND PROFILE - SD-E & F
49	STORM PLAN AND PROFILE - SD-G (1 OF 2)
50	STORM PLAN AND PROFILE - SD-G (2 OF 2)
51	STORM PLAN AND PROFILE - SD-H
52	STORM LATERALS (1 OF 4)
53	STORM LATERALS (2 OF 4)
54	STORM LATERALS (3 OF 4)
55	STORM LATERALS (4 OF 4)
56	OVERALL WATER PLAN (1 OF 2)
57	OVERALL WATER PLAN (2 OF 2)
58	WATER PLAN AND PROFILE-WL-A (1 OF 3)
59	WATER PLAN AND PROFILE-WL-A (2 OF 3)
60	WATER PLAN AND PROFILE-WL-A (3 OF 3)
61	WATER PLAN AND PROFILE-WL-B (1 OF 2)
62	WATER PLAN AND PROFILE-WL-B (2 OF 2)
63	WATER PLAN AND PROFILE-WL-C
64	WATER PLAN AND PROFILE-WL-D
65	WATER PLAN AND PROFILE-WL-E
66	OVERALL WASTEWATER PLAN (1 OF 2)
67	OVERALL WASTEWATER PLAN (2 OF 2)
68	WASTEWATER PLAN AND PROFILE-WWL-A (1 OF 2)
69	WASTEWATER PLAN AND PROFILE-WWL-A (2 OF 2)
70	WASTEWATER PLAN AND PROFILE-WWL-B (1 OF 2)
71	WASTEWATER PLAN AND PROFILE-WWL-B (2 OF 2)
72	WASTEWATER PLAN AND PROFILE-WWL-C
73	WASTEWATER PLAN AND PROFILE-WWL-D
74	WASTEWATER PLAN AND PROFILE-WWL-E
75	WASTEWATER PLAN AND PROFILE-WWL-F
76	DRY UTILITY AND BORE PLAN SHEET (1 OF 2)
77	DRY UTILITY AND BORE PLAN SHEET (2 OF 2)
78	STREET LIGHT AND SIGN PLAN (1 OF 2)
79	STREET LIGHT AND SIGN PLAN (2 OF 2)
80	EROSION CONTROL DETAILS
81	PAVING DETAILS (1 OF 2)
82	PAVING DETAILS (SHEET 2 OF 2)
83	STORM DETAILS
84	WATER DETAILS (1 OF 2)
85	WATER DETAILS (2 OF 2)
86	WASTEWATER DETAILS (1 OF 2)
87	WASTEWATER DETAILS (2 OF 2)

BENCHMARKS

ADD BENCHMARKS HERE

No.	REVISIONS	DATE	BY

WOLF RANCH - SECTION 6G

Kimley»Horn
© 2024 KIMLEY-HORN AND ASSOCIATES, INC.
10814 JOLLYVILLE ROAD, CAMPUS IV, SUITE 200, AUSTIN, TX 78759
PHONE: 512-418-1771 FAX: 512-418-1791
WWW.KIMLEY-HORN.COM
TEXAS REGISTERED ENGINEERING FIRM F-928

STATE OF TEXAS
JOHN A. PICKENS
110631
LICENSED
PROFESSIONAL ENGINEER
02/02/2024

KHA PROJECT 064461307
DATE: DECEMBER 2023
SCALE: AS SHOWN
DESIGNED BY: RRJ
DRAWN BY: AJM
CHECKED BY: JAP

COVER SHEET

WOLF RANCH
SECTION 6G
CITY OF GEORGETOWN
WILLIAMSON COUNTY, TEXAS

SHEET NUMBER
1 OF 87

Plotted By:Castillo, Jaime Date:February 08, 2024 08:51:39am File Path:K:\AUS_Civil\064461307-Wolf Ranch Section 6G\Cad\PlanSheets\C-Cover Sheet.dwg
This document, together with the concepts and designs presented herein, as an instrument of service, is intended only for the specific purpose and client for which it was prepared. Reuse of and improper reliance on this document without written authorization and adaptation by Kimley-Horn and Associates, Inc. shall be without liability to Kimley-Horn and Associates, Inc.

GENERAL NOTES

1. ALL CONSTRUCTION TO BE IN ACCORDANCE WITH THESE PLANS, THE CITY OF GEORGETOWN "UNIFIED DEVELOPMENT CODE" AND THE STANDARD SPECIFICATIONS FOR PUBLIC WORKS CONSTRUCTION.
2. THE CONTRACTOR SHALL BE RESPONSIBLE FOR FURNISHING ALL MATERIAL AND LABOR TO CONSTRUCT THE FACILITY AS SHOWN AND DESCRIBED IN THE CONSTRUCTION DOCUMENTS IN ACCORDANCE WITH THE APPROPRIATE APPROVING AUTHORITIES, SPECIFICATIONS AND REQUIREMENTS.
3. CONTRACTOR SHALL CONTACT ALL FRANCHISE UTILITY COMPANIES TO HAVE THEM LOCATE EXISTING UTILITIES PRIOR TO CONSTRUCTION. THE CONTRACTOR SHALL COORDINATE THE EXACT LOCATION AND DEPTH OF ALL FRANCHISE UTILITY SERVICES AND ANY REQUIRED RELOCATION AND/OR EXTENSIONS. SERVICES SHOWN ON THE PLANS ARE CONCEPTUAL.
4. THE CONTRACTOR IS RESPONSIBLE FOR COORDINATING RELOCATION AND INSTALLATION OF FRANCHISE UTILITIES NECESSARY FOR ON AND OFF SITE CONSTRUCTION.
5. BRACING OF UTILITY POLES MAY BE REQUIRED BY UTILITY COMPANIES WHEN TRENCHING OR EXCAVATION IS IN CLOSE PROXIMITY TO THE POLES. THE COST OF BRACING POLES WILL BE BORNE BY THE CONTRACTOR. THERE IS NO SEPARATE PAY ITEM FOR THIS WORK. THE COST IS INCIDENTAL TO THE VARIOUS PAY ITEMS FOR INSTALLATION OF PIPE.
6. THE LOCATIONS, ELEVATIONS, AND DIMENSIONS OF EXISTING UTILITIES SHOWN ON THE PLANS WERE OBTAINED FROM AVAILABLE UTILITY COMPANY RECORDS AND PLANS AND ARE CONSIDERED APPROXIMATE. IT SHALL BE THE CONTRACTOR'S RESPONSIBILITY TO VERIFY LOCATIONS, ELEVATIONS, AND DIMENSIONS OF ADJACENT AND/OR CONFLICTING UTILITIES SUFFICIENTLY IN ADVANCE OF CONSTRUCTION IN ORDER THAT ADJUSTMENTS CAN BE MADE TO PROVIDE ADEQUATE CLEARANCES. THE CONTRACTOR SHALL PRESERVE AND PROTECT PUBLIC AND PRIVATE UTILITIES AT ALL TIMES DURING CONSTRUCTION. ANY DAMAGE TO UTILITIES RESULTING FROM CONTRACTOR'S OPERATIONS SHALL BE RESTORED AT THEIR EXPENSE. THE ENGINEER SHALL BE NOTIFIED WHEN PROPOSED FACILITY GRADES CONFLICT WITH EXISTING UTILITY GRADES.
7. CONTRACTOR SHALL USE ALL NECESSARY PRECAUTIONS TO AVOID CONTACT WITH OVERHEAD AND UNDERGROUND POWER LINES.
8. THE CONTRACTOR SHALL REVIEW AND VERIFY ALL DIMENSIONS SHOWN ON THE PLANS AND REVIEW ALL FIELD CONDITIONS, INCLUDING EXISTING GRADES AND UTILITY FLOW LINES, AND SHOULD DISCREPANCIES OCCUR, THE CONTRACTOR SHALL NOTIFY THE ENGINEER TO OBTAIN THE ENGINEER'S CLARIFICATION BEFORE COMMENCING WITH CONSTRUCTION.
9. THE CONTRACTOR SHALL IMMEDIATELY REPAIR OR REPLACE ANY PHYSICAL DAMAGE TO PRIVATE PROPERTY, INCLUDING, BUT NOT LIMITED TO FENCES, WALLS, PAVEMENT, GRASS, TREES, LAWN SPRINKLER AND IRRIGATION SYSTEMS AT NO COST TO THE OWNER. THIS WORK SHALL BE SUBSIDIARY TO THE CONTRACT (UNLESS OTHERWISE NOTED) AND IS NOT A SEPARATE PAY ITEM.
10. THE CONTRACTOR SHALL BE RESPONSIBLE TO OBTAIN ALL NECESSARY PERMITS AND APPROVALS PRIOR TO CONSTRUCTION.
11. THE CONTRACTOR SHALL HAVE AVAILABLE AT THE JOB SITE AT ALL TIMES ONE COPY OF THE APPROVED CONTRACT DOCUMENTS INCLUDING PLANS, SPECIFICATIONS, AND SPECIAL CONDITIONS, COPIES OF ANY REQUIRED CONSTRUCTION PERMITS, EROSION CONTROL PLANS, SWPPP AND INSPECTION REPORTS.
12. IT IS THE CONTRACTOR'S RESPONSIBILITY TO MAINTAIN NEAT AND ACCURATE CONSTRUCTION RECORD PLANS.
13. CONNECTIONS TO EXISTING FACILITIES SHALL BE ACCOMPLISHED IN A NEAT AND PROFESSIONAL MANNER. WHEN FIELD CONDITIONS INDICATE ANY VARIANCE FROM DETAILED METHODS, THE CONTRACTOR SHALL PROVIDE COMPREHENSIVE AND DETAILED DRAWINGS (FOR APPROVAL) OF METHODS PROPOSED.
14. ANY DISCREPANCIES ON THE DRAWINGS SHALL BE IMMEDIATELY BROUGHT TO THE ATTENTION OF THE ARCHITECT AND ENGINEER BEFORE COMMENCING WORK. NO FIELD CHANGES OR DEVIATIONS FROM DESIGN ARE TO BE MADE WITHOUT PRIOR APPROVAL OF THE OWNER AND NOTIFICATION TO THE ENGINEER. NO CONSIDERATION WILL BE GIVEN TO CHANGE ORDERS FOR WHICH THE OWNER AND ENGINEER WERE NOT CONTACTED PRIOR TO CONSTRUCTION OF THE AFFECTED ITEM.
15. ALL COPIES OF COMPACTION, CONCRETE AND OTHER REQUIRED TEST RESULTS ARE TO BE SENT TO THE OWNER AND DESIGN ENGINEER OF RECORD DIRECTLY FROM THE TESTING AGENCY.
16. ALL NECESSARY INSPECTIONS AND/OR CERTIFICATIONS REQUIRED BY CODES, JURISDICTIONAL AGENCIES AND/OR UTILITY SERVICE COMPANIES SHALL BE PERFORMED PRIOR TO THE FINAL CONNECTION OF SERVICES.
17. CONTRACTOR SHALL VERIFY BENCHMARKS AND DATUM PRIOR TO COMMENCING CONSTRUCTION OR STAKING OF IMPROVEMENTS.
18. ALL HORIZONTAL DIMENSIONS GIVEN ARE TO FACE OF CURB AND TO PIPE CENTERLINES, UNLESS OTHERWISE NOTED ON PLANS.
19. CONTRACTOR SHALL BE RESPONSIBLE FOR ALL CONSTRUCTION STAKING. CONSTRUCTION STAKING SHALL BE PERFORMED BY A REGISTERED PUBLIC SURVEYOR IN THE STATE OF TEXAS.
20. THE CONTRACTOR SHALL TOPSOIL, SEED AND FERTILIZE ALL AREAS DISTURBED BY CONSTRUCTION. THE CONTRACTOR SHALL PROVIDE WHATEVER MEASURES ARE NEEDED INCLUDING TEMPORARY IRRIGATION TO ENSURE FULL COVERAGE OF GRASSING. UNLESS OTHERWISE NOTED, PRIVATE LAWN AREAS AND PARKWAYS IN FRONT OF PRIVATE LAWN AREAS DISTURBED BY CONSTRUCTION SHALL BE REPLACED WITH BLOCK SOD OF A SIMILAR GRASS TO THAT EXISTING. ALL SEEDED OR SODDED AREAS SHALL RECEIVE SIX(6) INCHES OF TOPSOIL. ANY AREAS DISTURBED FOR ANY REASON PRIOR TO FINAL ACCEPTANCE OF THE JOB SHALL BE CORRECTED BY THE CONTRACTOR AT NO ADDITIONAL COST TO THE OWNER.
21. ALL SLOPES AND AREAS DISTURBED BY CONSTRUCTION SHALL BE GRADED SMOOTH. THE AREAS SHALL THEN BE SEEDED, IRRIGATED, AND STABILIZED AS SPECIFIED IN THE PLANS, AND MAINTAINED UNTIL SOIL IS STABILIZED IN ALL AREAS. ANY AREAS DISTURBED FOR ANY REASON PRIOR TO FINAL ACCEPTANCE OF THE JOB SHALL BE CORRECTED BY THE CONTRACTOR AT NO ADDITIONAL COST TO THE OWNER. ALL EARTHEN AREAS WILL BE STABILIZED AND MULCHED AS SHOWN ON THE LANDSCAPE, GRADING, AND EROSION CONTROL PLANS.
22. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE CONTROL OF DUST AND DIRT RISING AND SCATTERING IN THE AIR DURING CONSTRUCTION AND SHALL PROVIDE WATER SPRINKLING OR OTHER SUITABLE METHODS OF CONTROL. THE CONTRACTOR SHALL COMPLY WITH ALL GOVERNING REGULATIONS PERTAINING TO ENVIRONMENTAL PROTECTION.
23. SOD MUST BE INSTALLED AND MAINTAINED ON EXPOSED SLOPES WITHIN TO PREVENT EROSION, SEDIMENTATION OR TURBID DISCHARGES.
24. CONTRACTOR IS TO CONSTRUCT A STABILIZED CONSTRUCTION EXIT AT ALL PRIMARY POINTS OF ACCESS. THIS STABILIZED EXIT SHALL BE CONSTRUCTED PER CITY DETAILS.
25. CONTRACTOR SHALL BE RESPONSIBLE FOR IMPLEMENTING THE STORM WATER POLLUTION PREVENTION PLAN (SWPPP). THE CONTRACTOR MUST REVIEW AND MAINTAIN A COPY OF THE STORM WATER POLLUTION PREVENTION PLAN WITH ALL CONDITIONS, ATTACHMENTS, EXHIBITS, AND PERMIT MODIFICATIONS IN GOOD CONDITION AT THE CONSTRUCTION SITE. THE COMPLETE SWPPP MUST BE MADE READILY AVAILABLE AT THE TIME OF AN ON-SITE INSPECTION TO: THE EXECUTIVE DIRECTOR; A FEDERAL, STATE, OR LOCAL AGENCY APPROVING SEDIMENT AND EROSION PLANS, GRADING PLANS, OR STORMWATER MANAGEMENT PLANS; LOCAL GOVERNMENT OFFICIALS; AND THE OPERATOR OF A MUNICIPAL SEPARATE STORM SEWER (MS4) RECEIVING DISCHARGES FROM THE SITE.
26. ANY ENTITY THAT MEETS THE DEFINITION OF A "PRIMARY OPERATOR" FOR A LARGE CONSTRUCTION ACTIVITY (FIVE OR MORE ACRES) SHALL BE RESPONSIBLE FOR COMPLETING AND SUBMITTING A NOTICE OF INTENT (NOI) AND A NOTICE OF TERMINATION (NOT) WITH THE TEXAS COMMISSION ON ENVIRONMENTAL QUALITY (TCEQ).
27. THE CONTRACTOR MUST CONSTRUCT AND MAINTAIN A PERMANENT STABLE PROTECTIVE COVER (GRASS) FOR EROSION AND SEDIMENT CONTROL ON ALL LAND SURFACES EXPOSED OR DISTURBED BY CONSTRUCTION OF THE PERMITTED PROJECT. THE PROTECTIVE COVER MUST BE INSTALLED WITHIN FOURTEEN DAYS AFTER FINAL GRADING OF THE AFFECTED LAND SURFACE. A PERMANENT STABLE COVER MUST BE ESTABLISHED WITHIN 60 DAYS OF IT'S INSTALLATION.
28. UPON COMPLETION OF CONSTRUCTION, CONTRACTOR SHALL PROVIDE AS-BUILT PLANS IDENTIFYING ALL DEVIATIONS OR VARIATIONS OF ORIGINAL PLANS. AS-BUILT PLANS ARE SUBSIDIARY TO ALL OTHER BID ITEMS AND SHALL NOT BE PAID FOR AS A SEPARATE LINE ITEM.
29. DURING CONSTRUCTION, ALL MATERIAL TESTING SHALL BE COORDINATED WITH THE CITY OF GEORGETOWN CONSTRUCTION INSPECTOR. THE CONTRACTOR WILL BE RESPONSIBLE FOR COMPLYING WITH ALL APPLICABLE CITY STANDARD SPECIFICATIONS. ALL SOILS TESTING IS THE RESPONSIBILITY OF AND WILL BE PAID FOR BY THE CONTRACTOR. MATERIAL TESTING SHALL BE PERFORMED BY AN INDEPENDENT TESTING LABORATORY.
30. ALL EXISTING TRAFFIC AND STREET SIGNS DISTURBED SHALL BE REINSTALLED WHERE APPLICABLE BY THE CONTRACTOR.
31. ALL EXISTING SHRUBS, TREES, PLANTING, AND OTHER VEGETATION, OUTSIDE OF PROPERTY LIMITS DISTURBED DURING CONSTRUCTION SHALL BE REPLACED WITH EQUIVALENT MATERIAL BY THE CONTRACTOR AT NO ADDITIONAL COST.
32. THE CONTRACTOR SHALL SALVAGE AND PROTECT ALL EXISTING POWER POLES, SIGNS, MANHOLES, TELEPHONE RISERS, WATER VALVES, ETC. DURING ALL CONSTRUCTION PHASES.
33. CONTRACTOR IS RESPONSIBLE FOR REMOVING ALL SILT AND DEBRIS OFFSITE FROM THE EXISTING ROADWAYS AND PROJECT SITE THAT ARE A RESULT OF THE PROPOSED CONSTRUCTION AS REQUESTED BY THE CITY OF GEORGETOWN. AT A MINIMUM, THIS TASK SHOULD OCCUR ONCE A WEEK.
34. CONNECTIONS TO EXISTING FACILITIES SHALL BE ACCOMPLISHED IN A NEAT AND PROFESSIONAL MANNER. WHEN FIELD CONDITIONS INDICATE ANY VARIANCE FROM DETAILED METHODS, THE CONTRACTOR SHALL PROVIDE COMPREHENSIVE AND DETAILED DRAWINGS (FOR APPROVAL) OF METHODS PROPOSED.
35. WATER SHALL NOT BE PERMITTED IN OPEN TRENCHES DURING CONSTRUCTION.
36. CONTRACTOR SHALL CONTACT THE DESIGNATED CONSTRUCTION INSPECTOR ASSIGNED TO THIS PROJECT AT LEAST 48 HOURS PRIOR TO STARTING CONSTRUCTION.
37. THE CONTRACTOR SHALL BE RESPONSIBLE FOR SUBMITTING A TRENCH SAFETY PLAN TO THE CITY OF GEORGETOWN PUBLIC WORKS DEPARTMENT AT THE TIME OF THE PRECONSTRUCTION MEETING, OR PRIOR TO BEGINNING CONSTRUCTION OF THESE IMPROVEMENTS. CONTRACTOR SHALL BE RESPONSIBLE FOR MAINTAINING TRENCH SAFETY REQUIREMENTS IN ACCORDANCE WITH CITY STANDARDS, TEXAS STATE LAW, AND O.S.H.A. STANDARDS FOR ALL EXCAVATION IN EXCESS OF FIVE FEET IN DEPTH. NO OPEN TRENCHES WILL BE ALLOWED OVERNIGHT WITHOUT THE PRIOR SPECIFIC WRITTEN APPROVAL OF THE CITY OF GEORGETOWN PUBLIC WORKS DEPARTMENT, OR DESIGNATED REPRESENTATIVE. ONSITE SAFETY IS THE SOLE RESPONSIBILITY OF THE CONTRACTOR.
38. CONTRACTOR TO REVIEW DESIGN INTENT OF THESE PLANS AND SUBMIT REQUESTS-FOR-INFORMATION IN A TIMELY MANNER PRIOR TO COMMENCING THAT WORK.
39. ALL APPURTENANCES INSTALLED IN PAVEMENT AREAS SHALL BE ADJUSTED AS REQUIRED TO BE FLUSH WITH FINISHED PAVEMENT.
40. THE CONTRACTOR WILL BE SOLELY RESPONSIBLE FOR COMPLETING AND IMPLEMENTING TRAFFIC CONTROL PLAN.

PAVING & STRIPING NOTES

1. ALL CONSTRUCTION SHALL BE IN GENERAL ACCORDANCE WITH THESE PLANS, CITY OF GEORGETOWN, TX STANDARD SPECIFICATIONS, THE FINAL GEOTECHNICAL REPORT AND COMMONLY ACCEPTED CONSTRUCTION STANDARDS.
2. TESTING OF MATERIALS REQUIRED FOR THE CONSTRUCTION OF THE PAVING IMPROVEMENTS SHALL BE PERFORMED BY AN APPROVED AGENCY FOR TESTING MATERIALS. THE NOMINATION OF THE TESTING LABORATORY AND THE PAVEMENT OF SUCH TESTING SERVICES SHALL BE MADE BY THE CONTRACTOR. THE OWNER SHALL APPROVE THE LABORATORY NOMINATED TO DO THE TESTING OF MATERIALS. IT SHALL BE THE CONTRACTOR'S RESPONSIBILITY TO SHOW BY STANDARD TESTING PROCEDURES THAT THE WORK CONSTRUCTED DOES MEET THE REQUIREMENTS OF THE CITY'S SPECIFICATIONS AND THESE PLANS.
3. BARRIER FREE RAMPS SHALL BE CONSTRUCTED AT ALL DRIVEWAY APPROACHES PER CITY STANDARDS.
4. ALL SIGNS, PAVEMENT MARKINGS, AND OTHER TRAFFIC CONTROL DEVICES SHALL CONFORM TO THE "TEXAS MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES".
5. CONTRACTOR SHALL FURNISH AND INSTALL ALL PAVEMENT MARKINGS FOR FIRE LANES, PARKING STALLS, HANDICAPPED PARKING SYMBOLS, AND MISCELLANEOUS STRIPING WITHIN PARKING LOT AND AROUND BUILDING AS SHOWN ON THE PLANS. ALL PAINT FOR PAVEMENT MARKINGS SHALL ADHERE TO CITY OF GEORGETOWN STANDARD DETAILS AND SPECIFICATIONS.
6. REFER TO GEOTECHNICAL REPORT FOR PAVING JOINT LAYOUT PLAN.
7. REFER TO GEOTECHNICAL REPORT FOR REINFORCEMENT STEEL.
8. REFER TO GEOTECHNICAL REPORT FOR SOIL COMPACTION SPECIFICATION.
9. FIRE LANES SHALL BE DESIGNATED BY CONTINUOUS PAINTED LINES FOUR (4) INCHES IN WIDTH ON EACH SIDE OF THE FIRE LANE STARTING AT THE ENTRANCE FROM THE STREET AND TO BE CONTINUED TO THE EXIT. SUCH LINES SHALL BE BRIGHT RED IN COLOR.
10. FIRE LANES ADJACENT TO CURBS SHALL BE OUTLINED BY A FOUR (4) INCH WIDE STRIP PAINTED BRIGHT RED IN COLOR ALONG THE CURB'S GUTTER LINE.
11. THE WORDS "FIRE LANE" AND "NO PARKING" SHALL BE STENCILED IN FOUR (4) INCH HIGH WHITE LETTERS ALTERNATELY EVERY FIFTEEN (15) FEET ALONG THE RED FIRE LANE STRIPES.
12. ALL HANDICAP RAMPING, STRIPING, AND PAVEMENT MARKINGS SHALL CONFORM TO THE AMERICANS WITH DISABILITIES ACT THAT IS MOST CURRENT.
13. REFERENCE CITY OF GEORGETOWN, TX STANDARD CONSTRUCTION DETAILS FOR HANDICAP RAMP AND OTHER PAVING DETAILS.
14. CONTRACTOR RESPONSIBLE FOR PREPARATION, SUBMITTAL, AND APPROVAL BY CITY OF GEORGETOWN, TX OF TRAFFIC CONTROL PLAN PRIOR TO START OF CONSTRUCTION.
15. SIDEWALKS ADJACENT TO CURB SHALL BE CONNECTED TO BACK OF CURB USING LONGITUDINAL BUTT JOINT.
16. UNLESS THE PLANS SPECIFICALLY DICTATE TO THE CONTRARY, ON-SITE AND OTHER DIRECTIONAL SIGNS SHALL BE LOCATED OUT OF THE PEDESTRIAN AND AUTOMOBILE ROUTES AND SHALL BE LOCATED BETWEEN THREE TO FIVE FEET BEHIND THE NEAREST BACK OF CURB. SIGN HEIGHT, LOCATION, AND STRUCTURE SHALL BE SUCH THAT THE SIGNS POSE NO THREAT TO PUBLIC SAFETY.
17. UNLESS THE PLANS SPECIFICALLY DICTATE TO THE CONTRARY, ON-SITE AND OTHER DIRECTIONAL SIGNS SHALL BE ORIENTED SO THEY ARE READILY VISIBLE TO THE ONCOMING TRAFFIC FOR WHICH THEY ARE INTENDED, FIELD ADJUSTMENTS OF LOCATION AND ORIENTATION OF THE SIGNS ARE TO BE MADE TO ACCOMPLISH THIS.
18. THE CONTRACTOR FOR THE PROJECT SHALL NOT PLACE ANY PERMANENT PAVEMENT UNTIL ALL SLEEVING FOR ELECTRIC, GAS, TELEPHONE, CABLE TV, SITE IRRIGATION, OR ANY OTHER UNDERGROUND UTILITY HAS BEEN INSTALLED. IT SHALL BE THE CONTRACTOR'S RESPONSIBILITY TO CONFIRM THAT ALL SLEEVING IS IN PLACE PRIOR TO PLACEMENT OF PERMANENT PAVEMENT.
19. BEFORE PLACING PAVEMENT, CONTRACTOR SHALL VERIFY THAT SUITABLE HANDICAPPED ROUTES (PER A.D.A. & T.A.S) EXIST TO AND FROM EVERY DOOR. IN NO CASE SHALL HANDICAP RAMP SLOPES EXCEED 1 VERTICAL TO 12 HORIZONTAL. IN NO CASE SHALL SIDEWALK CROSS SLOPES EXCEED 2.0 PERCENT. IN NO CASE SHALL LONGITUDINAL SIDEWALK SLOPES EXCEED 5.0 PERCENT. CONTRACTOR SHALL CONTACT ENGINEER PRIOR TO PAVING IF ANY EXCESSIVE SLOPES ARE ENCOUNTERED. NO CONTRACTOR CHANGE ORDERS WILL BE ACCEPTED FOR A.D.A. AND T.A.S. COMPLIANCE ISSUES.
20. STREETS, SIDEWALKS, DRIVEWAYS, AND STORM DRAINAGE FACILITIES IN THE PUBLIC RIGHT-OF-WAY SHALL BE CONSTRUCTED IN CONFORMANCE WITH THE CITY OF GEORGETOWN INFRASTRUCTURE DESIGN & DEVELOPMENT STANDARDS MANUAL, LATEST EDITION.
21. FIRE LANES SHALL REMAIN OPEN/ACCESSIBLE AT ALL TIMES DURING CONSTRUCTION; FIRE LANE SHALL BE INSTALLED & ACCEPTED BY THE CITY PRIOR TO ANY CONSTRUCTION ABOVE THE FOUNDATION.

GRADING NOTES

1. ALL CONSTRUCTION SHALL BE IN GENERAL ACCORDANCE WITH THESE PLANS, CITY OF GEORGETOWN, TX STANDARD SPECIFICATIONS, THE FINAL GEOTECHNICAL REPORT, AND COMMONLY ACCEPTED CONSTRUCTION STANDARDS.
2. UNLESS OTHERWISE NOTED, PROPOSED CONTOURS AND SPOT ELEVATIONS SHOWN IN PAVED AREAS REFLECT TOP OF PAVEMENT SURFACE. ADD .50' TO PAVING GRADE FOR TOP OF CURB GRADE. THE LIMITS OF EARTHWORK IN PAVED AREAS IS THE BOTTOM OF PAVEMENT.
3. THE CONTRACTOR SHALL MAINTAIN ADEQUATE SITE DRAINAGE DURING ALL PHASES OF CONSTRUCTION. THE CONTRACTOR SHALL USE SILT FENCES (OR OTHER METHODS APPROVED BY THE ENGINEER AND CITY) AS REQUIRED TO PREVENT SILT AND CONSTRUCTION DEBRIS FROM FLOWING ONTO ADJACENT PROPERTIES. CONTRACTOR SHALL COMPLY WITH ALL APPLICABLE FEDERAL, STATE, OR LOCAL EROSION, CONSERVATION, AND SILTATION REQUIREMENTS. CONTRACTOR SHALL REMOVE ALL TEMPORARY EROSION CONTROL DEVICES UPON COMPLETION OF PERMANENT DRAINAGE FACILITIES AND THE ESTABLISHMENT OF A STAND OF GRASS OR OTHER GROWTH TO PREVENT EROSION. CONTRACTOR IS RESPONSIBLE FOR FILING N.O.I. AND N.O.T. WITH THE TCEQ. CONTRACTOR SOLELY RESPONSIBLE FOR ALL MANDATED SWPPP RECORD KEEPING AND REPORTING.
4. ALL EXCAVATING IS UNCLASSIFIED AND SHALL INCLUDE ALL MATERIALS ENCOUNTERED. UNUSABLE EXCAVATED MATERIAL AND ALL WASTE RESULTING FROM SITE CLEARING AND GRUBBING SHALL BE DISPOSED OF OFF SITE BY THE GRADING CONTRACTOR AT HIS EXPENSE.
5. BEFORE ANY EARTHWORK IS PERFORMED, THE CONTRACTOR SHALL STAKE OUT AND MARK THE LIMITS OF PAVEMENT AND OTHER ITEMS ESTABLISHED BY THE PLANS. THE CONTRACTOR SHALL PROVIDE ALL NECESSARY ENGINEERING AND SURVEYING FOR LINE AND GRADE CONTROL POINTS RELATED TO EARTHWORK.
6. REFERENCE STRUCTURAL DRAWINGS AND SPECIFICATIONS AND GEOTECHNICAL REPORT FOR STRUCTURAL SCOPE AND PAVING SUBGRADE INFORMATION.
7. THE CONTRACTOR SHALL CLEAR AND GRUB THE SITE AND PLACE, COMPACT, AND MOISTURE CONDITION ALL FILL PER THE PROJECT GEOTECHNICAL ENGINEER'S SPECIFICATIONS. THE FILL MATERIAL TO BE USED SHALL BE APPROVED BY THE GEOTECHNICAL ENGINEER PRIOR TO PLACEMENT.
8. GRADING CONTRACTOR SHALL COORDINATE WITH THE UTILITY COMPANIES FOR ANY REQUIRED UTILITY ADJUSTMENTS AND/OR RELOCATIONS.
9. TESTING OF MATERIALS REQUIRED FOR THE CONSTRUCTION OF THE PAVING IMPROVEMENTS SHALL BE PERFORMED BY AN APPROVED AGENCY FOR TESTING MATERIALS. THE NOMINATION OF THE TESTING LABORATORY AND THE PAYMENTS FOR SUCH TESTING SERVICES SHALL BE MADE BY THE CONTRACTOR. THE OWNER SHALL APPROVE THE LABORATORY NOMINATED TO DO THE TESTING OF MATERIALS. IT SHALL BE THE CONTRACTOR'S RESPONSIBILITY TO SHOW BY STANDARD TESTING PROCEDURES THAT THE WORK CONSTRUCTED DOES MEET THE REQUIREMENTS OF THE CITY'S SPECIFICATIONS AND THESE PLANS.
10. PROPOSED CONTOURS ARE APPROXIMATE. PROPOSED SPOT ELEVATIONS AND DESIGNATED GRADIENT ARE TO BE USED IN CASE OF DISCREPANCY.
11. REFER TO SITE PLAN AND/OR DIMENSION CONTROL PLAN AND FINAL PLAT FOR HORIZONTAL DIMENSIONS.
12. REFER TO EROSION CONTROL PLAN FOR EROSION CONTROL DEVICES TO BE INSTALLED PRIOR TO COMMENCING CONSTRUCTION.
13. NO TREE SHALL BE REMOVED OR DAMAGED WITHOUT PRIOR AUTHORIZATION OF THE OWNER OR OWNER'S REPRESENTATIVE. EXISTING TREES SHALL BE PRESERVED WHENEVER POSSIBLE.
14. CONTRACTOR SHALL VERIFY HORIZONTAL AND VERTICAL CONTROL PRIOR TO COMMENCING CONSTRUCTION AND SHALL NOTIFY ENGINEER OF ANY DISCREPANCIES BEFORE CONSTRUCTION COMMENCES.
15. AFTER PLACEMENT OF SUBGRADE AND PRIOR TO PLACEMENT OF PAVEMENT, CONTRACTOR SHALL TEST AND OBSERVE PAVEMENT AREAS FOR EVIDENCE OF PONDING. ALL AREAS SHALL ADEQUATELY DRAIN TOWARDS THE INTENDED STRUCTURE TO CONVEY STORM RUNOFF. CONTRACTOR SHALL IMMEDIATELY NOTIFY OWNER AND ENGINEER IF ANY DISCREPANCIES ARE DISCOVERED.

STORM SEWER NOTES

1. THE CONTRACTOR SHALL FIELD VERIFY THE HORIZONTAL AND VERTICAL LOCATIONS OF ALL EXISTING UTILITIES PRIOR TO START OF CONSTRUCTION AND SHALL NOTIFY THE CONSTRUCTION MANAGER AND ENGINEER OF ANY CONFLICTS DISCOVERED. CONTRACTOR IS RESPONSIBLE FOR PROTECTING EXISTING UTILITIES (SHOWN OR NOT SHOWN) WITHIN SCOPE OF CONSTRUCTION. IF ANY EXISTING UTILITIES ARE DAMAGED, THE CONTRACTOR SHALL REPLACE THEM AT HIS OWN EXPENSE.
2. THE CONTRACTOR SHALL VERIFY AND COORDINATE ALL DIMENSIONS SHOWN, INCLUDING THE HORIZONTAL AND VERTICAL LOCATION OF CURB INLETS AND GRATE INLETS AND ALL UTILITIES CROSSING THE STORM SEWER.
3. THE SITE UTILITY CONTRACTOR SHALL PROVIDE ALL MATERIALS AND APPURTENANCES NECESSARY FOR COMPLETE INSTALLATION OF THE STORM SEWER.
4. THE INSPECTOR SHALL INSPECT ALL "PUBLIC" CONSTRUCTION. THE CONTRACTOR'S BID PRICE SHALL INCLUDE ALL INSPECTION FEES.
5. ALL PVC TO RCP CONNECTIONS SHALL BE CONSTRUCTED WITH CONCRETE COLLARS.
6. ALL ONSITE STORM SEWER LINES SHALL BE HDPE, ALL PRIVATE STORM SHALL BE NOTED AS ON PLANS. CONTRACTOR TO CONTACT ENGINEER WITH QUESTIONS ABOUT PIPE MATERIAL PRIOR TO ORDERING. CONTRACTOR SHALL SUBMIT TECHNICAL DATA TO PROJECT ENGINEER AND CITY ENGINEER FOR APPROVAL PRIOR TO ORDERING MATERIAL.
7. ALL MATERIALS AND WORKMANSHIP SHALL CONFORM TO THE STANDARD SPECIFICATIONS FOR PUBLIC WORKS CONSTRUCTION FOR NORTH CENTRAL TEXAS, LATEST EDITION, AND ANY SPECIAL PROVISION AS APPROVED BY THE CITY OF GEORGETOWN, TX.
8. THE CONTRACTOR SHALL PROVIDE CONSTRUCTION STAKING FOR ALL STORM SEWER LINES AND OTHER UTILITIES.
9. EMBEDMENT FOR ALL ONSITE SEWER LINES, PUBLIC OR PRIVATE, SHALL BE PER CITY OF GEORGETOWN, TX STANDARD DETAILS.
10. REFER TO TCEQ DESIGN GUIDELINES (CHAPTER 290) FOR ALL UTILITY CROSSINGS.
11. THE CONTRACTOR SHALL BE RESPONSIBLE FOR PREPARING AND IMPLEMENTING A TRENCH PROTECTION PLAN FOR ALL OPEN TRENCH EXCAVATION.
12. USE 4 FOOT JOINTS WITH BEVELED ENDS IF RADIUS OF STORM SEWER IS LESS THAN 100 FEET.
13. ALL PRIVATE LANDSCAPE AREA DRAINS SHALL BE OF MATERIAL APPROVED BY BOTH ENGINEER AND LANDSCAPE ARCHITECT.

WATER AND SANITARY SEWER NOTES

1. ALL MATERIALS AND WORKMANSHIP TO CONFORM TO THE REQUIREMENTS SET FORTH IN THE CITY OF GEORGETOWN WATER AND WASTEWATER CONSTRUCTION STANDARDS AND DETAILS, LATEST EDITION.
2. WATER PIPE SHALL BE PVC C-900 DR 18, EXCEPT WHEN OTHERWISE NOTED.
3. SEWER PIPE SHALL BE MINIMUM SDR 35 PVC OR ULTRA RIB PVC SDR 26.
4. WATER MAINS SHALL HAVE THE FOLLOWING MINIMUM COVER BELOW STREET GRADES:

SIZE	COVER
6"	3.5'
8"	4.0'
10"	4.0'
12"	5.0'
LARGER	AS SHOWN ON PLANS

5. PLASTIC TAPE FOR UTILITY SERVICES SHALL BE ATTACHED TO THE ENDS OF ALL WATER AND SEWER SERVICE LINES AND EXTEND ABOVE GROUND LEVEL. THE TAPE SHALL MEET THE FOLLOWING SPECIFICATION:
   A. "GEORGETOWN MARKING TAPE" OR APPROVED EQUAL.
   B. ROLL MARKED CONTINUOUSLY, "CAUTION WATER LINE" OR "CAUTION SEWER LINE".
   C. SIX (6) INCHES IN WIDTH.
   D. RED TAPE FOR SEWER SERVICES.
   E. BLUE TAPE FOR WATER SERVICES.
6. IT IS THE CONTRACTORS RESPONSIBILITY TO FIELD VERIFY EXACT LOCATIONS OF EXISTING PUBLIC AND PRIVATE UTILITIES AND SERVICES PRIOR TO COMMENCING CONSTRUCTION. THE CONTRACTOR SHALL CALL 811 FOR FIELD LOCATION OF EXISTING UTILITIES. CALL AT LEAST 48 HOURS BEFORE LOCATIONS ARE NEEDED. NOTE THAT THE DIG TESS SERVICE DOES NOT LOCATE ALL UTILITIES, ONLY THOSE REGISTERED WITH THE SERVICE.
7. REFER TO SITE GRADING PLANS, PAVING PLANS, AND LANDSCAPE PLANS FOR FINAL GRADES FOR DETERMINING PROPOSED MANHOLE RIM ELEVATIONS.
8. LOCATIONS AND SIZES OF EXISTING PUBLIC AND PRIVATE UTILITIES SHOWN ON THESE PLANS ARE FROM CITY AND UTILITY COMPANY RECORDS ONLY. THE CONTRACTOR IS SOLELY RESPONSIBLE FOR LOCATING ALL UTILITIES AND FOR DAMAGES RESULTING FROM FAILURE TO DO SO.
9. THE CONTRACTOR SHALL BE RESPONSIBLE FOR PROVIDING "RECORD" PLANS TO THE ENGINEER SHOWING THE LOCATION OF WATER AND SEWER SERVICES AND ANY DEVIATIONS FROM PLANS MADE DURING CONSTRUCTION.
10. THE CONTRACTOR SHALL VERIFY ALL DIMENSIONS SHOWN, COORDINATING THE HORIZONTAL AND VERTICAL LOCATION OF ALL UTILITY SERVICES ENTERING THE BUILDING AND/OR CROSSING OTHER UTILITIES.
11. ALL WATER AND SANITARY SEWER SERVICES SHALL TERMINATE FIVE (5) FEET OUTSIDE THE BUILDING, UNLESS NOTED OTHERWISE.
12. THE SITE UTILITY CONTRACTOR SHALL PROVIDE ALL MATERIALS AND APPURTENANCES NECESSARY FOR COMPLETE INSTALLATION OF THE UTILITIES. ALL PUBLIC PIPE, STRUCTURES, AND FITTINGS SHALL BE INSPECTED BY THE CITY INSPECTOR PRIOR TO BEING COVERED. THE INSPECTOR MUST ALSO BE PRESENT DURING DISINFECTION AND PRESSURE TESTING OF ALL MAINS. THE CONTRACTOR'S BID PRICE SHALL INCLUDE ALL INSPECTION FEES.
13. THE CONTRACTOR SHALL BE SOLELY RESPONSIBLE FOR SITE TRENCH SAFETY DURING ALL PHASES OF CONSTRUCTION. THE CONTRACTOR SHALL SUBMIT A TRENCH EXCAVATION PROTECTION PLAN, SEALED BY A GEOTECHNICAL ENGINEER REGISTERED IN THE STATE OF TEXAS, FOR ALL TRENCHES DEEPER THAN FIVE (5) FEET.
14. THE CONTRACTOR SHALL PROVIDE CONSTRUCTION STAKING FOR ALL WATER AND SANITARY SEWER LINES AND OTHER UTILITIES.
15. REFER TO TCEQ DESIGN GUIDELINES (CHAPTER 290) FOR ALL UTILITY CROSSINGS.
16. CONTRACTOR TO SEQUENCE CONSTRUCTION AS TO AVOID INTERRUPTION OF WATER OR SANITARY SEWER SERVICE TO SURROUNDING AREAS.
17. EXISTING MANHOLE TOPS, VALVE BOXES, ETC. ARE TO BE ADJUSTED AS REQUIRED TO MATCH PROPOSED GRADES.
18. FIRE HYDRANTS SHALL BE LOCATED A MINIMUM OF TWO (2) FEET AND A MAXIMUM OF SIX (6) FEET BEHIND THE CURB LINE OF FIRE LANE AND STREET.
19. ANY WATER OR SANITARY SEWER SERVICE LOCATED OUTSIDE OF A STREET, ALLEY OR EASEMENT SHALL BE INSTALLED BY A PLUMBER AND BE INSPECTED BY CODE ENFORCEMENT.

MUD NOTES

1. THE DISTRICT ENGINEER, JONES-HEROY & ASSOCIATES, INC. (KEN HEROY, PH: 512-989-2200) SHALL BE CONTACTED 48 HOURS PRIOR TO:
   i) PRE-CONSTRUCTION MEETINGS;
   ii) BEGINNING EACH PHASE OF CONSTRUCTION;
   iii) TESTING; AND
   iv) FINAL WALK-THROUGH OF FACILITIES

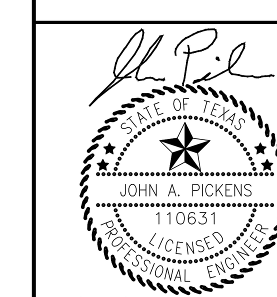
CITY OF GEORGETOWN NOTES:

1. THE CONSTRUCTION PORTION OF THESE PLANS WERE PREPARED, SEALED, SIGNED AND DATED BY A TEXAS LICENSED PROFESSIONAL ENGINEER. THEREFORE BASED ON THE ENGINEER'S CONCURRENCE OF COMPLIANCE, THE CONSTRUCTION PLANS FOR CONSTRUCTION OF THE PROPOSED PROJECT ARE HEREBY APPROVED SUBJECT TO THE STANDARD CONSTRUCTION SPECIFICATIONS AND DETAILS MANUAL AND ALL OTHER APPLICABLE CITY, STATE AND FEDERAL REQUIREMENTS AND CODES.
2. THIS PROJECT IS SUBJECT TO ALL CITY STANDARD SPECIFICATIONS AND DETAILS IN EFFECT AT THE TIME OF SUBMITTAL OF THE PROJECT TO THE CITY.
3. THE SITE CONSTRUCTION PLANS SHALL MEET ALL REQUIREMENTS OF THE APPROVED SITE PLAN.
4. WASTEWATER MAINS AND SERVICE LINES SHALL BE SDR 26 PVC.
5. WASTEWATER MAINS SHALL BE INSTALLED WITHOUT HORIZONTAL OR VERTICAL BENDS.
6. MAXIMUM DISTANCE BETWEEN WASTEWATER MANHOLES IS 500 FEET.
7. WASTEWATER MAINS SHALL BE LOW PRESSURE AIR TESTED AND MANDREL TESTED BY THE CONTRACTOR ACCORDING TO CITY OF GEORGETOWN AND TCEQ REQUIREMENTS.
8. WASTEWATER MANHOLES SHALL BE VACUUM TESTED AND COATED BY THE CONTRACTOR ACCORDING TO CITY OF GEORGETOWN AND TCEQ REQUIREMENTS.
9. WASTEWATER MAINS SHALL BE CAMERA TESTED BY THE CONTRACTOR AND SUBMITTED TO THE CITY ON DVD FORMAT PRIOR TO PAVING THE STREETS.
10. PRIVATE WATER SYSTEM FIRE LINES SHALL BE TESTED BY THE CONTRACTOR TO 200 PSI FOR 2 HOURS.
11. 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.
12. PUBLIC WATER SYSTEM MAINS SHALL BE 150 PSI C900 PVC AND TESTED BY THE CONTRACTOR AT 150 PSI FOR 4 HOURS.
13. ALL BENDS AND CHANGES IN DIRECTION ON WATER MAINS SHALL BE RESTRAINED AND THRUST BLOCKED.
14. LONG FIRE HYDRANT LEADS SHALL BE RESTRAINED.
15. ALL WATER LINES ARE TO BE BACTERIA TESTED BY THE CONTRACTOR ACCORDING TO CITY OF GEORGETOWN STANDARDS AND SPECIFICATIONS.
16. WATER AND SEWER MAIN CROSSINGS SHALL MEET ALL REQUIREMENTS OF THE TCEQ AND THE CITY.
17. FLEXIBLE BASE MATERIAL FOR PUBLIC STREETS SHALL BE TXDOT TYPE A GRADE 1.
18. HOT MIX ASPHALTIC CONCRETE PAVEMENT SHALL BE TYPE D UNLESS OTHERWISE SPECIFIED AND SHALL BE A MINIMUM OF 2 INCHES THICK ON PUBLIC STREETS AND ROADWAYS.
19. ALL SIDEWALK RAMPS AND SIDEWALK ALONG PARKLAND, OPEN SPACE, OR OTHER NON-RESIDENTIAL LOTS ARE TO BE INSTALLED WITH THE PUBLIC INFRASTRUCTURE.
20. A MAINTENANCE BOND IS REQUIRED TO BE SUBMITTED TO THE CITY PRIOR TO ACCEPTANCE OF THE PUBLIC IMPROVEMENTS. 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.
21. RECORD DRAWINGS OF THE PUBLIC IMPROVEMENTS SHALL BE SUBMITTED TO THE CITY BY THE DESIGN ENGINEER PRIOR TO ACCEPTANCE OF THE PROJECT. THESE DRAWINGS SHALL BE ON MYLAR OR ON TIFF OR PDF DISK (300DPI). IF A DISK IS SUBMITTED, A BOND SET SHALL BE INCLUDED WITH THE DISK.
22. IT IS THE RESPONSIBILITY OF THE PROPERTY OWNER, AND SUCCESSORS TO THE CURRENT PROPERTY OWNER, TO ENSURE THE SUBJECT PROPERTY AND ANY IMPROVEMENTS ARE MAINTAINED IN CONFORMANCE WITH THIS SITE DEVELOPMENT PLAN.
23. THE DEVELOPMENT SHALL COMPLY WITH ALL STANDARDS OF THE UNIFIED DEVELOPMENT CODE (UDC), THE CITY OF GEORGETOWN CONSTRUCTION STANDARDS AND SPECIFICATIONS MANUAL, THE DEVELOPMENT MANUAL AND ALL OTHER APPLICABLE CITY STANDARDS.
24. THE SITE DEVELOPMENT PLAN SHALL MEET THE UDC STORMWATER REQUIREMENTS.
25. ALL SIGNAGE REQUIRES A SEPARATE APPLICATION AND APPROVAL FROM THE INSPECTION SERVICES DEPARTMENT. NO SIGNAGE IS APPROVED WITH THE SITE DEVELOPMENT PLAN.
26. SIDEWALKS SHALL BE PROVIDED IN ACCORDANCE WITH THE UDC.
27. DRIVEWAYS WILL REQUIRE APPROVAL BY THE DEVELOPMENT ENGINEER OF THE CITY OF GEORGETOWN.
28. OUTDOOR LIGHTING SHALL COMPLY WITH SECTION 7.05 OF THE UDC.
29. SCREENING OF MECHANICAL EQUIPMENT, DUMPSTERS AND PARKING SHALL COMPLY WITH CHAPTER 8 OF THE UDC. THE SCREENING IS SHOWN ON THE LANDSCAPE AND ARCHITECTURAL PLANS, AS APPLICABLE.
30. THE COMPANION LANDSCAPE PLAN HAS BEEN DESIGNED AND PLANT MATERIALS SHALL BE INSTALLED TO MEET ALL REQUIREMENTS OF THE UDC.
31. ALL MAINTENANCE OF REQUIRED LANDSCAPE SHALL COMPLY WITH THE MAINTENANCE STANDARDS OF CHAPTER 8 OF THE UDC.
32. A SEPARATE IRRIGATION PLAN SHALL BE REQUIRED AT THE TIME OF BUILDING PERMIT APPLICATION.
33. FIRE FLOW REQUIREMENTS OF 1,500 GALLONS PER MINUTE ARE BEING MET BY THIS PLAN.
34. ANY HERITAGE TREE NOTED ON THIS SITE DEVELOPMENT PLAN IS SUBJECT, IN PERPETUITY, TO THE MAINTENANCE, CAR, PRUNING, AND REMOVAL REQUIREMENTS OF THE UDC.

No.	REVISIONS	DATE	BY

Kimley»Horn

© 2024 KIMLEY-HORN AND ASSOCIATES, INC.
10814 JOLLYVILLE ROAD, CAMPUS IV, SUITE 200, AUSTIN, TX 78759
PHONE: 512-418-1771 FAX: 512-418-1791
WWW.KIMLEY-HORN.COM
TEXAS REGISTERED ENGINEERING FIRM F-928



02/02/2024

KHA PROJECT	064461307
DATE	DECEMBER 2023
SCALE:	AS SHOWN
DESIGNED BY:	RRJ
DRAWN BY:	AJM
CHECKED BY:	JAP

GENERAL NOTES

WOLF RANCH
SECTION 6G
CITY OF GEORGETOWN
WILLIAMSON COUNTY, TEXAS

SHEET NUMBER
2 OF 87

Plotted By: Castillo, Jaime Date: February 08, 2024 08:51:44am File Path: K:\AUS_Civil\064461307-Wolf Ranch Section 6G\Cad\PlanSheets\C-General Notes.dwg
This document, together with the concepts and designs presented herein, as an instrument of service, is intended only for the specific purpose and client for which it was prepared. Reuse of and improper reliance on this document without written authorization and adaptation by Kimley-Horn and Associates, Inc. shall be without liability to Kimley-Horn and Associates, Inc.

KH GENERAL NOTES

OVERALL:

1. ALL CONSTRUCTION AND MATERIALS SHALL BE IN ACCORDANCE WITH THESE PLANS, CITY (OR TOWN) STANDARD DETAILS AND SPECIFICATIONS, THE FINAL GEOTECHNICAL REPORT AND ALL ISSUED ADDENDA, AND COMMONLY ACCEPTED CONSTRUCTION STANDARDS. THE CITY SPECIFICATIONS SHALL GOVERN WHERE OTHER SPECIFICATIONS DO NOT EXIST. IN CASE OF CONFLICTING SPECIFICATIONS OR DETAILS, THE MORE RESTRICTIVE SPECIFICATION AND DETAIL SHALL BE FOLLOWED.
2. THE CONTRACTOR SHALL COMPLY WITH CITY (OR TOWN) “GENERAL NOTES” FOR CONSTRUCTION, IF EXISTING AND REQUIRED BY THE CITY. FOR INSTANCES WHERE THEY CONFLICT WITH THESE KH GENERAL NOTES, THEN THE MORE RESTRICTIVE SHALL APPLY.
3. THE CONTRACTOR SHALL FURNISH ALL MATERIAL AND LABOR TO CONSTRUCT THE FACILITY AS SHOWN AND DESCRIBED IN THE CONSTRUCTION DOCUMENTS IN ACCORDANCE WITH THE APPROPRIATE AUTHORITIES' SPECIFICATIONS AND REQUIREMENTS.
4. THE CONTRACTOR SHALL VISIT THE SITE PRIOR TO BIDDING TO DETERMINE EXISTING CONDITIONS.
5. THE EXISTING CONDITIONS SHOWN ON THESE PLANS WERE PROVIDED BY THE TOPOGRAPHIC SURVEY PREPARED BY THE PROJECT SURVEYOR, AND ARE BASED ON THE BENCHMARKS SHOWN. THE CONTRACTOR SHALL REFERENCE THE SAME BENCHMARKS.
6. THE CONTRACTOR SHALL REVIEW AND VERIFY THE EXISTING TOPOGRAPHIC SURVEY SHOWN ON THE PLANS REPRESENTS EXISTING FIELD CONDITIONS PRIOR TO CONSTRUCTION, AND SHALL REPORT ANY DISCREPANCIES FOUND TO THE OWNER AND ENGINEER IMMEDIATELY.
7. IF THE CONTRACTOR DOES NOT ACCEPT THE EXISTING TOPOGRAPHIC SURVEY AS SHOWN ON THE PLANS, WITHOUT EXCEPTION, THEN THE CONTRACTOR SHALL SUPPLY AT THEIR OWN EXPENSE, A TOPOGRAPHIC SURVEY BY A REGISTERED PROFESSIONAL LAND SURVEYOR TO THE OWNER AND ENGINEER FOR REVIEW.
8. CONTRACTOR SHALL PROVIDE ALL CONSTRUCTION SURVEYING AND STAKING.
9. CONTRACTOR SHALL VERIFY HORIZONTAL AND VERTICAL CONTROL, INCLUDING BENCHMARKS PRIOR TO COMMENCING CONSTRUCTION OR STAKING OF IMPROVEMENTS. PROPERTY LINES AND CORNERS SHALL BE HELD AS THE HORIZONTAL CONTROL.
10. THE CONTRACTOR SHALL REVIEW AND VERIFY ALL DIMENSIONS, ELEVATIONS, AND FIELD CONDITIONS THAT MAY AFFECT CONSTRUCTION. ANY DISCREPANCIES ON THE DRAWINGS SHALL BE IMMEDIATELY BROUGHT TO THE ATTENTION OF THE ARCHITECT AND ENGINEER BEFORE COMMENCING WORK. NO FIELD CHANGES OR DEVIATIONS FROM DESIGN ARE TO BE MADE WITHOUT PRIOR APPROVAL OF THE ARCHITECT, ENGINEER, AND IF APPLICABLE THE CITY AND OWNER. NO CONSIDERATION WILL BE GIVEN TO CHANGE ORDERS FOR WHICH THE CITY, ENGINEER, AND OWNER WERE NOT CONTACTED PRIOR TO CONSTRUCTION OF THE AFFECTED ITEM.
11. CONTRACTOR SHALL THOROUGHLY CHECK COORDINATION OF CIVIL, LANDSCAPE, MEP, ARCHITECTURAL, AND OTHER PLANS PRIOR TO COMMENCING CONSTRUCTION. OWNER/ENGINEER SHALL BE NOTIFIED OF ANY DISCREPANCY PRIOR TO COMMENCING WITH CONSTRUCTION.
12. IT IS THE CONTRACTOR'S RESPONSIBILITY TO CONTACT THE VARIOUS UTILITY COMPANIES WHICH MAY HAVE BURIED OR AERIAL UTILITIES WITHIN OR NEAR THE CONSTRUCTION AREA BEFORE COMMENCING WORK TO HAVE THEM LOCATE THEIR EXISTING UTILITIES PRIOR TO CONSTRUCTION. THE CONTRACTOR SHALL PROVIDE AN ADEQUATE MINIMUM NOTICE TO ALL UTILITY COMPANIES PRIOR TO BEGINNING CONSTRUCTION.
13. CONTRACTOR SHALL CALL TEXAS 811 AN ADEQUATE AMOUNT OF TIME PRIOR TO COMMENCING CONSTRUCTION OR ANY EXCAVATION.
14. CONTRACTOR SHALL USE EXTREME CAUTION AS THE SITE CONTAINS VARIOUS KNOWN AND UNKNOWN PUBLIC AND PRIVATE UTILITIES.
15. THE LOCATIONS, ELEVATIONS, DEPTH, AND DIMENSIONS OF EXISTING UTILITIES SHOWN ON THE PLANS WERE OBTAINED FROM AVAILABLE UTILITY COMPANY MAPS AND PLANS, AND ARE CONSIDERED APPROXIMATE AND INCOMPLETE. IT SHALL BE THE CONTRACTORS' RESPONSIBILITY TO VERIFY THE PRESENCE, LOCATION, ELEVATION, DEPTH, AND DIMENSION OF EXISTING UTILITIES SUFFICIENTLY IN ADVANCE OF CONSTRUCTION SO THAT ADJUSTMENTS CAN BE MADE TO PROVIDE ADEQUATE CLEARANCES. THE ENGINEER SHALL BE NOTIFIED WHEN A PROPOSED IMPROVEMENT CONFLICTS WITH AN EXISTING UTILITY.
16. THE CONTRACTOR IS RESPONSIBLE FOR COORDINATING ANY ADJUSTMENTS AND RELOCATIONS OF EXISTING UTILITIES THAT CONFLICT WITH THE PROPOSED IMPROVEMENTS, INCLUDING BUT NOT LIMITED TO, ADJUSTING EXISTING MANHOLES TO MATCH PROPOSED GRADE, RELOCATING EXISTING POLES AND GUY WIRES THAT ARE LOCATED IN PROPOSED DRIVEWAYS, ADJUSTING THE HORIZONTAL OR VERTICAL ALIGNMENT OF EXISTING UNDERGROUND UTILITIES TO ACCOMMODATE PROPOSED GRADE OR CROSSING WITH A PROPOSED UTILITY, AND ANY OTHERS THAT MAY BE ENCOUNTERED THAT ARE UNKNOWN AT THIS TIME AND NOT SHOWN ON THESE PLANS.
17. CONTRACTOR SHALL ARRANGE FOR OR PROVIDE, AT ITS EXPENSE, ALL GAS, TELECOMMUNICATIONS, CABLE, OVERHEAD AND UNDERGROUND POWER LINE, AND UTILITY POLE ADJUSTMENTS NEEDED.
18. CONTRACTOR IS RESPONSIBLE FOR COORDINATING INSTALLATION OF FRANCHISE UTILITIES THAT ARE NECESSARY FOR ON-SITE AND OFF-SITE CONSTRUCTION, AND SERVICE TO THE PROPOSED DEVELOPMENT.
19. THE CONTRACTOR SHALL BE FULLY RESPONSIBLE FOR ALL DAMAGES DUE TO THE CONTRACTORS' FAILURE TO EXACTLY LOCATE AND PRESERVE ALL UTILITIES. THE OWNER OR ENGINEER WILL ASSUME NO LIABILITY FOR ANY DAMAGES SUSTAINED OR COST INCURRED BECAUSE OF THE OPERATIONS IN THE VICINITY OF EXISTING UTILITIES OR STRUCTURES. IF IT IS NECESSARY TO SHORE, BRACE, SWING OR RELOCATE A UTILITY, THE UTILITY COMPANY OR DEPARTMENT AFFECTED SHALL BE CONTACTED BY THE CONTRACTOR AND THEIR PERMISSION OBTAINED REGARDING THE METHOD TO USE FOR SUCH WORK.
20. BRACING OF UTILITY POLES MAY BE REQUIRED BY THE UTILITY COMPANIES WHEN TRENCHING OR EXCAVATING IN CLOSE PROXIMITY TO THE POLES. THE COST OF BRACING POLES WILL BE BORNE BY THE CONTRACTOR, WITH NO SEPARATE PAY ITEM FOR THIS WORK. THE COST IS INCIDENTAL TO THE PAY ITEM.
21. CONTRACTOR SHALL USE ALL NECESSARY SAFETY PRECAUTIONS TO AVOID CONTACT WITH OVERHEAD AND UNDERGROUND POWER LINES. CONTRACTOR SHALL COMPLY WITH ALL APPLICABLE LOCAL, STATE, FEDERAL AND UTILITY OWNER REGULATIONS PERTAINING TO WORK SETBACKS FROM POWER LINES.
22. THE CONTRACTOR SHALL BE RESPONSIBLE TO OBTAIN ALL REQUIRED CONSTRUCTION PERMITS, APPROVALS, AND BONDS PRIOR TO CONSTRUCTION.
23. THE CONTRACTOR SHALL HAVE AVAILABLE AT THE JOB SITE AT ALL TIMES A COPY OF THE CONTRACT DOCUMENTS INCLUDING PLANS, GEOTECHNICAL REPORT AND ADDENDA, PROJECT AND CITY SPECIFICATIONS, AND SPECIAL CONDITIONS, COPIES OF ANY REQUIRED CONSTRUCTION PERMITS, EROSION CONTROL PLANS, SWPPP AND INSPECTION REPORTS.
24. ALL SHOP DRAWINGS AND OTHER DOCUMENTS THAT REQUIRE ENGINEER REVIEW SHALL BE SUBMITTED BY THE CONTRACTOR SUFFICIENTLY IN ADVANCE OF CONSTRUCTION OF THAT ITEM, SO THAT NO LESS THAN 10 BUSINESS DAYS FOR REVIEW AND RESPONSE IS AVAILABLE.
25. ALL NECESSARY INSPECTIONS AND/OR CERTIFICATIONS REQUIRED BY CODES, JURISDICTIONAL AGENCIES, AND/OR UTILITY SERVICE COMPANIES SHALL BE PERFORMED PRIOR TO USE OF THE FACILITY AND THE FINAL CONNECTION OF SERVICES.
26. CONTRACTOR SHALL ARRANGE FOR REQUIRED CITY INSPECTIONS.
27. CONTRACTOR'S BID PRICE SHALL INCLUDE ALL INSPECTION FEES.
28. ALL SYMBOLS SHOWN ON THESE PLANS (E.G. FIRE HYDRANT, METERS, VALVES, INLETS, ETC.…) ARE FOR PRESENTATION PURPOSES ONLY AND ARE NOT TO SCALE. CONTRACTOR SHALL COORDINATE FINAL SIZES AND LOCATIONS WITH APPROPRIATE CITY INSPECTOR.
29. THE SCOPE OF WORK FOR THE CIVIL IMPROVEMENTS SHOWN ON THESE PLANS TERMINATES 5-FEET FROM THE BUILDING. REFERENCE THE BUILDING PLANS (E.G. ARCHITECTURAL, STRUCTURAL, MEP) FOR AREAS WITHIN 5-FEET OF THE BUILDING AND WITHIN THE BUILDING FOOTPRINT.
30. REFER TO ARCHITECTURAL AND STRUCTURAL PLANS FOR ALL FINAL BUILDING DIMENSIONS.
31. THE PROPOSED BUILDING FOOTPRINT(S) SHOWN IN THESE PLANS WAS PROVIDED TO KIMLEY-HORN AND ASSOCIATES, INC. (KH) BY THE PROJECT ARCHITECT AT THE TIME THESE PLANS WERE PREPARED. IT MAY NOT BE THE FINAL CORRECT VERSION BECAUSE THE BUILDING DESIGN WAS ONGOING. THE CONTRACTOR IS SOLELY RESPONSIBLE FOR CONFIRMING THE FINAL CORRECT VERSION OF THE BUILDING FOOTPRINT WITH THE ARCHITECT AND STRUCTURAL ENGINEER PRIOR TO LAYOUT. DIMENSIONS AND/OR COORDINATES SHOWN ON THESE PLANS WERE BASED ON THE ABOVE STATED ARCHITECTURAL FOOTPRINT, AND ARE THEREFORE A PRELIMINARY LOCATION OF THE BUILDING. THE CONTRACTOR IS SOLELY RESPONSIBLE TO VERIFY WHAT PART OF THE BUILDING THE ARCHITECT'S FOOTPRINT REPRESENTS (E.G. SLAB, OUTSIDE WALL, MASONRY LEDGE, ETC.….) AND TO CONFIRM ITS FINAL POSITION ON THE SITE BASED ON THE FINAL ARCHITECTURAL FOOTPRINT, CIVIL DIMENSION CONTROL PLAN, SURVEY BOUNDARY AND/OR PLAT. ANY DIFFERENCES FOUND SHALL BE REPORTED TO KH IMMEDIATELY.
32. ALL CONSTRUCTION SHALL COMPLY WITH THE PROJECT'S FINAL GEOTECHNICAL REPORT (OR LATEST EDITION), INCLUDING SUBSEQUENT ADDENDA.
33. CONTRACTOR IS RESPONSIBLE FOR ALL MATERIALS TESTING AND CERTIFICATION, UNLESS SPECIFIED OTHERWISE BY OWNER. ALL MATERIALS TESTING SHALL BE COORDINATED WITH THE APPROPRIATE CITY INSPECTOR AND COMPLY WITH CITY STANDARD SPECIFICATIONS AND GEOTECHNICAL REPORT. TESTING SHALL BE PERFORMED BY AN APPROVED INDEPENDENT AGENCY FOR TESTING MATERIALS. OWNER SHALL APPROVE THE AGENCY NOMINATED BY THE CONTRACTOR FOR MATERIALS TESTING.
34. ALL COPIES OF MATERIALS TEST RESULTS SHALL BE SENT TO THE OWNER, ENGINEER AND ARCHITECT DIRECTLY FROM THE TESTING AGENCY.
35. IT SHALL BE THE CONTRACTORS RESPONSIBILITY TO SHOW, BY THE STANDARD TESTING PROCEDURES OF THE MATERIALS, THAT THE WORK CONSTRUCTED MEETS THE PROJECT REQUIREMENTS AND CITY SPECIFICATIONS.
36. DUE TO THE POTENTIAL FOR DIFFERENTIAL SOIL MOVEMENT ADJACENT TO THE BUILDING, THE CONTRACTOR SHALL ADHERE TO GEOTECHNICAL REPORT'S RECOMMENDATION FOR SUBGRADE PREPARATION SPECIFIC TO FLATWORK ADJACENT TO THE PROPOSED BUILDING. THE OWNER AND CONTRACTOR ARE ADVISED TO OBTAIN A GEOTECHNICAL ENGINEER RECOMMENDATION SPECIFIC TO FLATWORK ADJACENT TO THE BUILDING, IF NONE IS CURRENTLY EXISTING.
37. ALL CONTRACTORS MUST CONFINE THEIR ACTIVITIES TO THE WORK AREA. NO ENCROACHMENTS OUTSIDE OF THE WORK AREA WILL BE ALLOWED. ANY DAMAGE RESULTING THEREFROM SHALL BE CONTRACTOR'S SOLE RESPONSIBILITY TO REPAIR.
38. THE CONTRACTOR SHALL PROTECT ALL EXISTING STRUCTURES, UTILITIES, MANHOLES, POLES, GUY WIRES, VALVE COVERS, VAULT LIDS, FIRE HYDRANTS, COMMUNICATION BOXES/PEDESTALS, AND OTHER FACILITIES TO REMAIN AND SHALL REPAIR ANY DAMAGES AT NO COST TO THE OWNER.
39. THE CONTRACTOR SHALL IMMEDIATELY REPAIR OR REPLACE ANY PHYSICAL DAMAGE TO PRIVATE PROPERTY OR PUBLIC IMPROVEMENTS, INCLUDING BUT NOT LIMITED TO: FENCES, WALLS, SIGNS, PAVEMENT, CURBS, UTILITIES, SIDEWALKS, GRASS, TREES, LANDSCAPING, AND IRRIGATION SYSTEMS, ETC.… TO ORIGINAL CONDITION OR BETTER AT NO COST TO THE OWNER.
40. ALL AREAS IN EXISTING RIGHT-OF-WAY DISTURBED BY SITE CONSTRUCTION SHALL BE REPAIRED TO ORIGINAL CONDITION OR BETTER, INCLUDING AS NECESSARY GRADING, LANDSCAPING, CULVERTS, AND PAVEMENT.
41. THE CONTRACTOR SHALL SALVAGE ALL EXISTING POWER POLES, SIGNS, WATER VALVES, FIRE HYDRANTS, METERS, ETC... THAT ARE TO BE RELOCATED DURING CONSTRUCTION.
42. CONTRACTOR SHALL MAINTAIN ADEQUATE SITE DRAINAGE DURING ALL PHASES OF CONSTRUCTION, INCLUDING MAINTAINING EXISTING DITCHES OR CULVERTS FREE OF OBSTRUCTIONS AT ALL TIMES.
43. THE CONTRACTOR IS RESPONSIBLE FOR OBTAINING AND SUBMITTING A TRENCH SAFETY PLAN, PREPARED BY A PROFESSIONAL ENGINEER IN THE STATE OF TEXAS, TO THE CITY PRIOR TO CONSTRUCTION. CONTRACTOR IS RESPONSIBLE FOR MAINTAINING TRENCH SAFETY REQUIREMENTS IN ACCORDANCE WITH CITY, STATE, AND FEDERAL REQUIREMENTS, INCLUDING OSHA FOR ALL TRENCHES. NO OPEN TRENCHES SHALL BE ALLOWED OVERNIGHT WITHOUT PRIOR WRITTEN APPROVAL OF THE CITY.
44. THE CONTRACTOR SHALL KEEP TRENCHES FREE FROM WATER.
45. SITE SAFETY IS SOLELY THE RESPONSIBILITY OF THE CONTRACTOR.
46. THESE PLANS DO NOT EXTEND TO OR INCLUDE DESIGNS OR SYSTEMS PERTAINING TO THE SAFETY OF THE CONTRACTOR OR ITS EMPLOYEES, AGENTS OR REPRESENTATIVES IN THE PERFORMANCE OF THE WORK. THE ENGINEER'S SEAL HEREON DOES NOT EXTEND TO ANY SUCH SAFETY SYSTEM. THE CONTRACTOR SHALL BE RESPONSIBLE FOR IMPLEMENTATION OF ALL REQUIRED SAFETY PROCEDURES AND PROGRAMS.
47. SIGNS RELATED TO SITE OPERATION OR SAFETY ARE NOT INCLUDED IN THESE PLANS.
48. CONTRACTOR OFFICE AND STAGING AREA SHALL BE AGREED ON BY THE OWNER AND CONTRACTOR PRIOR TO BEGINNING OF CONSTRUCTION. CONTRACTOR IS RESPONSIBLE FOR ALL PERMITTING REQUIREMENTS FOR THE CONSTRUCTION OFFICE, TRAILER, STORAGE, AND STAGING OPERATIONS AND LOCATIONS.
49. LIGHT POLES, SIGNS, AND OTHER OBSTRUCTIONS SHALL NOT BE PLACED IN ACCESSIBLE ROUTES.
50. ALL SIGNS, PAVEMENT MARKINGS, AND OTHER TRAFFIC CONTROL DEVICES SHALL CONFORM TO THE "TEXAS MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES".
51. TOP RIM ELEVATIONS OF ALL EXISTING AND PROPOSED MANHOLES SHALL BE COORDINATED WITH TOP OF PAVEMENT OR FINISHED GRADE AND SHALL BE ADJUSTED TO BE FLUSH WITH THE ACTUAL FINISHED GRADE AT THE TIME OF PAVING.
52. CONTRACTOR SHALL ADJUST ALL EXISTING AND PROPOSED VALVES, FIRE HYDRANTS, AND OTHER UTILITY APPURTENANCES TO MATCH ACTUAL FINISHED GRADES AT THE TIME OF PAVING.
53. THE CONTRACTOR IS RESPONSIBLE FOR CONSTRUCTION SEQUENCING AND PHASING, AND SHALL CONTACT THE APPROPRIATE CITY OFFICIALS, INCLUDING BUILDING OFFICIAL, ENGINEERING INSPECTOR, AND FIRE MARSHALL TO LEARN OF ANY REQUIREMENTS.
54. CONTRACTOR IS RESPONSIBLE FOR PREPARATION, SUBMITTAL, AND APPROVAL BY THE CITY OF A TRAFFIC CONTROL PLAN PRIOR TO THE START OF CONSTRUCTION, AND THEN THE IMPLEMENTATION OF THE PLAN.
55. CONTRACTOR SHALL KEEP A NEAT AND ACCURATE RECORD OF CONSTRUCTION, INCLUDING ANY DEVIATIONS OR VARIANCES FROM THE PLANS.
56. THE CONTRACTOR SHALL BE RESPONSIBLE FOR PROVIDING AS-BUILT PLANS TO THE ENGINEER AND CITY IDENTIFYING ALL DEVIATIONS AND VARIATIONS FROM THESE PLANS MADE DURING CONSTRUCTION.

EROSION CONTROL:

1. THE CONTRACTOR SHALL COMPLY WITH ALL LOCAL, STATE, AND FEDERAL EROSION CONTROL AND WATER QUALITY REQUIREMENTS, LAWS, AND ORDINANCES THAT APPLY TO THE CONSTRUCTION SITE LAND DISTURBANCE.
2. CONTRACTOR SHALL COMPLY WITH THE REQUIREMENTS OF THE “TCEQ GENERAL PERMIT TO DISCHARGE UNDER THE TEXAS POLLUTANT DISCHARGE ELIMINATION SYSTEM TXR 150000”.
3. EROSION CONTROL DEVICES SHOWN ON THE EROSION CONTROL PLAN FOR THE PROJECT SHALL BE INSTALLED PRIOR TO THE START OF LAND DISTURBANCE.
4. ALL EROSION CONTROL DEVICES ARE TO BE INSTALLED IN ACCORDANCE WITH THE APPROVED PLANS AND SPECIFICATIONS FOR THE PROJECT.
5. CONTRACTOR IS SOLELY RESPONSIBLE FOR INSTALLATION, IMPLEMENTATION, MAINTENANCE, AND EFFECTIVENESS OF ALL EROSION CONTROL DEVICES, BEST MANAGEMENT PRACTICES (BMPS), AND FOR UPDATING THE EROSION CONTROL PLAN DURING CONSTRUCTION AS FIELD CONDITIONS CHANGE.
6. CONTRACTOR SHALL DOCUMENT THE DATES OF INSTALLATION, MAINTENANCE OR MODIFICATION, AND REMOVAL FOR EACH BMP EMPLOYED IN THE STORM WATER POLLUTION PREVENTION PLAN (SWPPP) IF APPLICABLE.
7. AS STORM SEWER INLETS ARE INSTALLED ON-SITE, TEMPORARY EROSION CONTROL DEVICES SHALL BE INSTALLED AT EACH INLET PER APPROVED DETAILS.
8. THE EROSION CONTROL DEVICES SHALL REMAIN IN PLACE UNTIL THE AREA IT PROTECTS HAS BEEN PERMANENTLY STABILIZED.
9. CONTRACTOR SHALL PROVIDE ADEQUATE EROSION CONTROL DEVICES NEEDED DUE TO PROJECT PHASING.
10. CONTRACTOR SHALL OBSERVE THE EFFECTIVENESS OF THE EROSION CONTROL DEVICES AND MAKE FIELD ADJUSTMENTS AND MODIFICATIONS AS NEEDED TO PREVENT SEDIMENT FROM LEAVING THE SITE. IF THE EROSION CONTROL DEVICES DO NOT EFFECTIVELY CONTROL EROSION AND PREVENT SEDIMENTATION FROM WASHING OFF THE SITE, THEN THE CONTRACTOR SHALL NOTIFY THE ENGINEER.
11. OFF-SITE SOIL BORROW, SPOIL, AND STORAGE AREAS (IF APPLICABLE) ARE CONSIDERED AS PART OF THE PROJECT SITE AND MUST ALSO COMPLY WITH THE EROSION CONTROL REQUIREMENTS FOR THIS PROJECT. THIS INCLUDES THE INSTALLATION OF BMP'S TO CONTROL EROSION AND SEDIMENTATION AND THE ESTABLISHMENT OF PERMANENT GROUND COVER ON DISTURBED AREAS PRIOR TO FINAL APPROVAL OF THE PROJECT. CONTRACTOR IS RESPONSIBLE FOR MODIFYING THE SWPPP AND EROSION CONTROL PLAN TO INCLUDE BMPS FOR ANY OFF-SITE THAT ARE NOT ANTICIPATED OR SHOWN ON THE EROSION CONTROL PLAN.
12. ALL STAGING, STOCKPILES, SPOIL, AND STORAGE SHALL BE LOCATED SUCH THAT THEY WILL NOT ADVERSELY AFFECT STORM WATER QUALITY. PROTECTIVE MEASURES SHALL BE PROVIDED IF NEEDED TO ACCOMPLISH THIS REQUIREMENT, SUCH AS COVERING OR ENCIRCLING THE AREA WITH AN APPROPRIATE BARRIER.
13. CONTRACTORS SHALL INSPECT ALL EROSION CONTROL DEVICES, BMPS, DISTURBED AREAS, AND VEHICLE ENTRY AND EXIT AREAS WEEKLY AND WITHIN 24 HOURS OF ALL RAINFALL EVENTS OF 0.5 INCHES OR GREATER, AND KEEP A RECORD OF THIS INSPECTION IN THE SWPPP BOOKLET IF APPLICABLE, TO VERIFY THAT THE DEVICES AND EROSION CONTROL PLAN ARE FUNCTIONING PROPERLY.
14. CONTRACTOR SHALL CONSTRUCT A STABILIZED CONSTRUCTION ENTRANCE AT ALL PRIMARY POINTS OF ACCESS IN ACCORDANCE WITH CITY SPECIFICATIONS. CONTRACTOR SHALL ENSURE THAT ALL CONSTRUCTION TRAFFIC USES THE STABILIZED ENTRANCE AT ALL TIMES FOR ALL INGRESS/EGRESS.
15. SITE ENTRY AND EXITS SHALL BE MAINTAINED IN A CONDITION THAT WILL PREVENT THE TRACKING AND FLOWING OF SEDIMENT AND DIRT ONTO OFF-SITE ROADWAYS. ALL SEDIMENT AND DIRT FROM THE SITE THAT IS DEPOSITED ONTO AN OFF-SITE ROADWAY SHALL BE REMOVED IMMEDIATELY.
16. THE CONTRACTOR IS RESPONSIBLE FOR REMOVING ALL SILT AND DEBRIS FROM THE AFFECTED OFF-SITE ROADWAYS THAT ARE A RESULT OF THE CONSTRUCTION, AS REQUESTED BY OWNER AND CITY. AT A MINIMUM, THIS SHOULD OCCUR ONCE PER DAY FOR THE OFF-SITE ROADWAYS.
17. WHEN WASHING OF VEHICLES IS REQUIRED TO REMOVE SEDIMENT PRIOR TO EXITING THE SITE, IT SHALL BE DONE IN AN AREA STABILIZED WITH CRUSHED STONE THAT DRAINS INTO AN APPROVED SEDIMENT TRAP BMP.
18. CONTRACTOR SHALL INSTALL A TEMPORARY SEDIMENT BASIN FOR ANY ON-SITE DRAINAGE AREAS THAT ARE GREATER THAN 10 ACRES, PER TCEQ AND CITY STANDARDS. IF NO ENGINEERING DESIGN HAS BEEN PROVIDED FOR A SEDIMENTATION BASIN ON THESE PLANS, THEN THE CONTRACTOR SHALL ARRANGE FOR AN APPROPRIATE DESIGN TO BE PROVIDED.
19. ALL FINES IMPOSED FOR SEDIMENT OR DIRT DISCHARGED FROM THE SITE SHALL BE PAID BY THE RESPONSIBLE CONTRACTOR.
20. WHEN SEDIMENT OR DIRT HAS CLOGGED THE CONSTRUCTION ENTRANCE VOID SPACES BETWEEN STONES OR DIRT IS BEING TRACKED ONTO A ROADWAY, THE AGGREGATE PAD MUST BE WASHED DOWN OR REPLACED. RUNOFF FROM THE WASH-DOWN OPERATION SHALL NOT BE ALLOWED TO DRAIN DIRECTLY OFF SITE WITHOUT FIRST FLOWING THROUGH ANOTHER BMP TO CONTROL SEDIMENTATION. PERIODIC RE-GRADING OR NEW STONE MAY BE REQUIRED TO MAINTAIN THE EFFECTIVENESS OF THE CONSTRUCTION ENTRANCE.
21. TEMPORARY SEEDING OR OTHER APPROVED STABILIZATION SHALL BE INITIATED WITHIN 14 DAYS OF THE LAST DISTURBANCE OF ANY AREA, UNLESS ADDITIONAL CONSTRUCTION IN THE AREA IS EXPECTED WITHIN 21 DAYS OF THE LAST DISTURBANCE.
22. CONTRACTOR SHALL FOLLOW GOOD HOUSEKEEPING PRACTICES DURING CONSTRUCTION, ALWAYS CLEANING UP DIRT, LOOSE MATERIAL, AND TRASH AS CONSTRUCTION PROGRESSES.
23. UPON COMPLETION OF FINE GRADING, ALL SURFACES OF DISTURBED AREAS SHALL BE PERMANENTLY STABILIZED. STABILIZATION IS ACHIEVED WHEN THE AREA IS EITHER COVERED BY PERMANENT IMPERVIOUS STRUCTURES, SUCH AS BUILDINGS, SIDEWALK, PAVEMENT, OR A UNIFORM PERENNIAL VEGETATIVE COVER.
24. AT THE CONCLUSION OF THE PROJECT, ALL INLETS, DRAIN PIPE, CHANNELS, DRAINAGEWAYS AND BORROW DITCHES AFFECTED BY THE CONSTRUCTION SHALL BE DREDGED, AND THE SEDIMENT GENERATED BY THE PROJECT SHALL BE REMOVED AND DISPOSED IN ACCORDANCE WITH APPLICABLE REGULATIONS.
25. ANY SEQUENCE OF CONSTRUCTION SHOWN HEREON IS A GENERAL OVERVIEW AND IS INTENDED TO CONVEY THE GENERAL CONCEPTS OF THE EROSION CONTROL DESIGN AND SHOULD NOT BE RELIED UPON FOR CONSTRUCTION PURPOSES. THE CONTRACTOR IS SOLELY RESPONSIBLE FOR DETAILED PHASING AND CONSTRUCTION SEQUENCING NECESSARY TO CONSTRUCT THE PROPOSED IMPROVEMENTS INCLUDED IN THESE PLANS. THE CONTRACTOR SHALL NOTIFY ENGINEER IN WRITING IMMEDIATELY, PRIOR TO AND/OR DURING CONSTRUCTION IF ANY ADDITIONAL INFORMATION ON THE CONSTRUCTION SEQUENCE IS NECESSARY. CONTRACTOR IS SOLELY RESPONSIBLE FOR COMPLYING WITH THE REQUIREMENTS OF THE AUTHORITY HAVING JURISDICTION AND ALL OTHER APPLICABLE LAWS.

STORM WATER DISCHARGE AUTHORIZATION:

1. CONTRACTOR SHALL COMPLY WITH ALL TCEQ AND EPA STORM WATER POLLUTION PREVENTION REQUIREMENTS.
2. CONTRACTOR SHALL COMPLY WITH THE REQUIREMENTS OF THE TCEQ GENERAL PERMIT TO DISCHARGE UNDER THE TEXAS POLLUTANT DISCHARGE ELIMINATION SYSTEM TXR 150000.
3. THE CONTRACTOR SHALL ENSURE THAT ALL PRIMARY OPERATORS SUBMIT A NOI TO TCEQ AT LEAST SEVEN DAYS PRIOR TO COMMENCING CONSTRUCTION (IF APPLICABLE), OR IF UTILIZING ELECTRONIC SUBMITTAL, PRIOR TO COMMENCING CONSTRUCTION. ALL PRIMARY OPERATORS SHALL PROVIDE A COPY OF THE SIGNED NOI TO THE OPERATOR OF ANY MS4 (TYPICALLY THE CITY) RECEIVING DISCHARGE FROM THE SITE.
4. CONTRACTOR SHALL BE RESPONSIBLE FOR THE IMPLEMENTATION OF THE STORM WATER POLLUTION PREVENTION PLAN (SWPPP) IF APPLICABLE, INCLUDING POSTING SITE NOTICE, INSPECTIONS, DOCUMENTATION, AND SUBMISSION OF ANY INFORMATION REQUIRED BY THE TCEQ AND EPA (E.G. NOI).
5. ALL CONTRACTORS AND SUBCONTRACTORS PROVIDING SERVICES RELATED TO THE SWPPP SHALL SIGN THE REQUIRED CONTRACTOR CERTIFICATION STATEMENT ACKNOWLEDGING THEIR RESPONSIBILITIES AS SPECIFIED IN THE SWPPP.
6. A COPY OF THE SWPPP, INCLUDING NOI, SITE NOTICE, CONTRACTOR CERTIFICATIONS, AND ANY REVISIONS, SHALL BE SUBMITTED TO THE CITY BY THE CONTRACTOR AND SHALL BE RETAINED ON-SITE DURING CONSTRUCTION.
7. A NOTICE OF TERMINATION (NOT) SHALL BE SUBMITTED TO TCEQ BY ANY PRIMARY OPERATOR WITHIN 30 DAYS AFTER ALL SOIL DISTURBING ACTIVITIES AT THE SITE HAVE BEEN COMPLETED AND A UNIFORM VEGETATIVE COVER HAS BEEN ESTABLISHED ON ALL UNPAVED AREAS AND AREAS NOT COVERED BY STRUCTURES, A TRANSFER OF OPERATIONAL CONTROL HAS OCCURRED, OR THE OPERATOR HAS OBTAINED ALTERNATIVE AUTHORIZATION UNDER A DIFFERENT PERMIT. A COPY OF THE NOT SHALL BE PROVIDED TO THE OPERATOR OF ANY MS4 RECEIVING DISCHARGE FROM THE SITE.

DEMOLITION:

1. KH IS NOT RESPONSIBLE FOR THE MEANS AND METHODS EMPLOYED BY THE CONTRACTOR TO IMPLEMENT THIS DEMOLITION PLAN. THIS PRELIMINARY DEMOLITION PLAN SIMPLY INDICATES THE KNOWN OBJECTS ON THE SUBJECT TRACT THAT ARE TO BE DEMOLISHED AND REMOVED FROM THE SITE.
2. KH DOES NOT WARRANT OR REPRESENT THAT THE PLAN, WHICH WAS PREPARED BASED ON SURVEY AND UTILITY INFORMATION PROVIDED BY OTHERS, SHOWS ALL IMPROVEMENTS AND UTILITIES, THAT THE IMPROVEMENTS AND UTILITIES ARE SHOWN ACCURATELY, OR THAT THE UTILITIES SHOWN CAN BE REMOVED. THE CONTRACTOR IS RESPONSIBLE FOR PERFORMING ITS OWN SITE RECONNAISSANCE TO SCOPE ITS WORK AND TO CONFIRM WITH THE OWNERS OF IMPROVEMENTS AND UTILITIES THE ABILITY AND PROCESS FOR THE REMOVAL OF THEIR FACILITIES.
3. THIS PLAN IS INTENDED TO GIVE A GENERAL GUIDE TO THE CONTRACTOR, NOTHING MORE. THE GOAL OF THE DEMOLITION IS TO LEAVE THE SITE IN A STATE SUITABLE FOR THE CONSTRUCTION OF THE PROPOSED DEVELOPMENT. REMOVAL OR PRESERVATION OF IMPROVEMENTS, UTILITIES, ETC. TO ACCOMPLISH THIS GOAL ARE THE RESPONSIBILITY OF THE CONTRACTOR.
4. CONTRACTOR IS STRONGLY CAUTIONED TO REVIEW THE FOLLOWING REPORTS DESCRIBING SITE CONDITIONS PRIOR TO BIDDING AND IMPLEMENTING THE DEMOLITION PLAN:
   a. ENVIRONMENTAL SITE ASSESSMENT PROVIDED BY THE OWNER,
   b. ASBESTOS BUILDING INSPECTION REPORT(S) PROVIDED BY THE OWNER,
   c. GEOTECHNICAL REPORT PROVIDED BY THE OWNER.
   d. OTHER REPORTS THAT ARE APPLICABLE AND AVAILABLE.
5. CONTRACTOR SHALL CONTACT THE OWNER TO VERIFY WHETHER ADDITIONAL REPORTS OR AMENDMENTS TO THE ABOVE CITED REPORTS HAVE BEEN PREPARED AND TO OBTAIN/REVIEW/AND COMPLY WITH THE RECOMMENDATION OF SUCH STUDIES PRIOR TO STARTING ANY WORK ON THE SITE.
6. CONTRACTOR SHALL COMPLY WITH ALL LOCAL, STATE, AND FEDERAL REGULATIONS REGARDING THE DEMOLITION OF OBJECTS ON THE SITE AND THE DISPOSAL OF THE DEMOLISHED MATERIALS OFF-SITE. IT IS THE CONTRACTOR'S SOLE RESPONSIBILITY TO REVIEW THE SITE, DETERMINE THE APPLICABLE REGULATIONS, RECEIVE THE REQUIRED PERMITS AND AUTHORIZATIONS, AND COMPLY.
7. KH DOES NOT REPRESENT THAT THE REPORTS AND SURVEYS REFERENCED ABOVE ARE ACCURATE, COMPLETE, OR COMPREHENSIVE SHOWING ALL ITEMS THAT WILL NEED TO BE DEMOLISHED AND REMOVED.
8. SURFACE PAVEMENT INDICATED MAY OVERLAY OTHER HIDDEN STRUCTURES, SUCH AS ADDITIONAL LAYERS OF PAVEMENT, FOUNDATIONS OR WALLS, THAT ARE ALSO TO BE REMOVED.

GRADING:

1. THE CONTRACTOR AND GRADING SUBCONTRACTOR SHALL VERIFY THE SUITABILITY OF EXISTING AND PROPOSED SITE CONDITIONS INCLUDING GRADES AND DIMENSIONS BEFORE START OF CONSTRUCTION. THE CIVIL ENGINEER SHALL BE NOTIFIED IMMEDIATELY OF ANY DISCREPANCIES.
2. CONTRACTOR SHALL OBTAIN ANY REQUIRED GRADING PERMITS FROM THE CITY.
3. UNLESS OTHERWISE NOTED, PROPOSED CONTOURS AND SPOT ELEVATIONS SHOWN IN PAVED AREA REFLECT TOP OF PAVEMENT SURFACE. IN LOCATIONS ALONG A CURB LINE, ADD 6-INCHES (OR THE HEIGHT OF THE CURB) TO THE PAVING GRADE FOR TOP OF CURB ELEVATION.
4. PROPOSED SPOT ELEVATIONS AND CONTOURS OUTSIDE THE PAVEMENT ARE TO TOP OF FINISHED GRADE.
5. PROPOSED CONTOURS ARE APPROXIMATE. PROPOSED SPOT ELEVATIONS AND DESIGNATED GRADIENT ARE TO BE USED IN CASE OF DISCREPANCY.
6. ALL FINISHED GRADES SHALL TRANSITION UNIFORMLY BETWEEN THE FINISHED ELEVATIONS SHOWN.
7. CONTOURS AND SPOT GRADES SHOWN ARE ELEVATIONS OF TOP OF THE FINISHED SURFACE. WHEN PERFORMING THE GRADING OPERATIONS, THE CONTRACTOR SHALL PROVIDE AN APPROPRIATE ELEVATION HOLD-DOWN ALLOWANCE FOR THE THICKNESS OF PAVEMENT, SIDEWALK, TOPSOIL, MULCH, STONE, LANDSCAPING, RIP-RAP AND ALL OTHER SURFACE MATERIALS THAT WILL CONTRIBUTE TO THE TOP OF FINISHED GRADE. FOR EXAMPLE, THE LIMITS OF EARTHWORK IN PAVED AREAS IS THE BOTTOM OF THE PAVEMENT SECTION.
8. NO REPRESENTATIONS OF EARTHWORK QUANTITIES OR SITE BALANCE ARE MADE BY THESE PLANS. THE CONTRACTOR SHALL PROVIDE THEIR OWN EARTHWORK CALCULATION TO DETERMINE THEIR CONTRACT QUANTITIES AND COST. ANY SIGNIFICANT VARIANCE FROM A BALANCED SITE SHALL BE IMMEDIATELY BROUGHT TO THE ATTENTION OF THE CIVIL ENGINEER.
9. ALL GRADING AND EARTHWORK SHALL COMPLY WITH THE PROJECT'S FINAL GEOTECHNICAL REPORT (OR LATEST EDITION), INCLUDING SUBSEQUENT ADDENDA.
10. ALL EXCAVATION IS UNCLASSIFIED AND SHALL INCLUDE ALL MATERIALS ENCOUNTERED. UNUSABLE EXCAVATED MATERIAL AND ALL WASTE RESULTING FROM SITE CLEARING AND GRUBBING SHALL BE REMOVED FROM THE SITE AND APPROPRIATELY DISPOSED BY THE CONTRACTOR AT NO ADDITIONAL EXPENSE.
11. EROSION CONTROL DEVICES SHOWN ON THE EROSION CONTROL PLAN FOR THE PROJECT SHALL BE INSTALLED PRIOR TO THE START OF GRADING. REFERENCE EROSION CONTROL PLAN, DETAILS, GENERAL NOTES, AND SWPPP FOR ADDITIONAL INFORMATION AND REQUIREMENTS.
12. BEFORE ANY EARTHWORK IS PERFORMED, THE CONTRACTOR SHALL STAKE OUT AND MARK THE LIMITS OF THE PROJECT'S PROPERTY LINE AND SITE IMPROVEMENTS. THE CONTRACTOR SHALL PROVIDE ALL NECESSARY ENGINEERING AND SURVEYING FOR LINE AND GRADE CONTROL POINTS RELATED TO EARTHWORK.
13. CONTRACTOR TO DISPOSE OF ALL EXCESS EXCAVATION MATERIALS IN A MANNER THAT ADHERES TO LOCAL, STATE AND FEDERAL LAWS AND REGULATIONS. THE CONTRACTOR SHALL KEEP A RECORD OF WHERE EXCESS EXCAVATION WAS DISPOSED, ALONG WITH THE RECEIVING LANDOWNER'S APPROVAL TO DO SO.
14. CONTRACTOR IS RESPONSIBLE FOR REMOVAL AND REPLACEMENT OF TOPSOIL AT THE COMPLETION OF FINE GRADING. CONTRACTOR SHALL REFER TO LANDSCAPE ARCHITECTURE PLANS FOR SPECIFICATIONS AND REQUIREMENTS FOR TOPSOIL.
15. CONTRACTOR SHALL MAINTAIN ADEQUATE SITE DRAINAGE DURING ALL PHASES OF CONSTRUCTION, INCLUDING MAINTAINING EXISTING DITCHES OR CULVERTS FREE OF OBSTRUCTIONS AT ALL TIMES.
16. NO EARTHWORK FILL SHALL BE PLACED IN ANY EXISTING DRAINAGE WAY, SWALE, CHANNEL, DITCH, CREEK, OR FLOODPLAIN FOR ANY REASON OR ANY LENGTH OF TIME, UNLESS THESE PLANS SPECIFICALLY INDICATE THIS IS REQUIRED.
17. TEMPORARY CULVERTS MAY BE REQUIRED IN SOME LOCATIONS TO CONVEY RUN-OFF.
18. REFER TO DIMENSION CONTROL PLAN, AND PLAT FOR HORIZONTAL DIMENSIONS.
19. THE CONTRACTOR SHALL CLEAR AND GRUB THE SITE AND PLACE, COMPACT, AND CONDITION FILL PER THE PROJECT GEOTECHNICAL ENGINEER'S SPECIFICATIONS. THE FILL MATERIAL TO BE USED SHALL BE APPROVED BY THE GEOTECHNICAL ENGINEER PRIOR TO PLACEMENT.
20. CONTRACTOR IS RESPONSIBLE FOR ALL SOILS TESTING AND CERTIFICATION, UNLESS SPECIFIED OTHERWISE BY OWNER. ALL SOILS TESTING SHALL BE COORDINATED WITH THE APPROPRIATE CITY INSPECTOR AND SHALL COMPLY WITH CITY STANDARD SPECIFICATIONS AND THE GEOTECHNICAL REPORT. SOILS TESTING SHALL BE PERFORMED BY AN APPROVED INDEPENDENT AGENCY FOR TESTING SOILS. THE OWNER SHALL APPROVE THE AGENCY NOMINATED BY THE CONTRACTOR FOR SOILS TESTING.
21. ALL COPIES OF SOILS TEST RESULTS SHALL BE SENT TO THE OWNER, ENGINEER AND ARCHITECT DIRECTLY FROM THE TESTING AGENCY.
22. IT SHALL BE THE CONTRACTORS RESPONSIBILITY TO SHOW, BY THE STANDARD TESTING PROCEDURES OF THE SOILS, THAT THE WORK CONSTRUCTED MEETS THE PROJECT REQUIREMENTS AND CITY SPECIFICATIONS.
23. THE SCOPE OF WORK FOR CIVIL IMPROVEMENT SHOWN ON THESE PLANS TERMINATES 5-FEET FROM THE BUILDING. CONTRACTOR SHALL REFER TO THE GEOTECHNICAL REPORT AND STRUCTURAL PLANS AND SPECIFICATIONS FILL, CONDITIONING, AND PREPARATION IN THE BUILDING PAD.
24. DUE TO THE POTENTIAL FOR DIFFERENTIAL SOIL MOVEMENT ADJACENT TO THE BUILDING, THE CONTRACTOR SHALL ADHERE TO GEOTECHNICAL REPORT'S RECOMMENDATION FOR SUBGRADE PREPARATION SPECIFIC TO FLATWORK ADJACENT TO THE PROPOSED BUILDING. THE OWNER AND CONTRACTOR ARE ADVISED TO OBTAIN A GEOTECHNICAL ENGINEER RECOMMENDATION SPECIFIC TO FLATWORK ADJACENT TO THE BUILDING, IF NONE IS CURRENTLY EXISTING.
25. CONTRACTOR SHALL ENSURE THAT SUFFICIENT POSITIVE SLOPE AWAY FROM THE BUILDING PAD IS ACHIEVED FOR ENTIRE PERIMETER OF THE PROPOSED BUILDING(S) DURING GRADING OPERATIONS AND IN THE FINAL CONDITION. IF THE CONTRACTOR OBSERVES THAT THIS WILL NOT BE ACHIEVED, THE CONTRACTOR SHALL CONTACT THE ENGINEER TO REVIEW THE LOCATION.
26. THE CONTRACTOR SHALL TAKE ALL AVAILABLE PRECAUTIONS TO CONTROL DUST. CONTRACTOR SHALL CONTROL DUST BY SPRINKLING WATER, OR BY OTHER MEANS APPROVED BY THE CITY, AT NO ADDITIONAL COST TO THE OWNER.
27. CONTRACTOR SHALL COORDINATE WITH THE UTILITY COMPANIES FOR ANY REQUIRED UTILITY ADJUSTMENTS AND/OR RELOCATIONS NEEDED FOR GRADING OPERATIONS AND TO ACCOMMODATE PROPOSED GRADE, INCLUDING THE UNKNOWN UTILITIES NOT SHOWN ON THESE PLANS. CONTRACTOR SHALL REFER TO THE GENERAL NOTES “OVERALL” SECTION THESE PLANS FOR ADDITIONAL INFORMATION.
28. EXISTING TREE LOCATIONS SHOWN ON THESE PLANS ARE APPROXIMATE. CONTRACTOR SHALL REPORT ANY DISCREPANCIES FOUND IN THE FIELD THAT AFFECT THE GRADING PLAN TO THE CIVIL ENGINEER.
29. CONTRACTOR SHALL FIELD VERIFY ALL PROTECTED TREE LOCATIONS, INDIVIDUAL PROTECTED TREE CRITICAL ROOT ZONES, AND PROPOSED SITE GRADING, AND NOTIFY THE CIVIL ENGINEER AND LANDSCAPE ARCHITECT OF ANY CONFLICTS WITH THE TREE PRESERVATION PLAN BY THE LANDSCAPE ARCHITECT PRIOR TO COMMENCING THE WORK.
30. TREE PROTECTION MEASURES SHALL BE INSTALLED IN ACCORDANCE WITH THE CITY STANDARD TREE PROTECTION DETAILS AND THE APPROVED TREE PRESERVATION PLANS BY THE LANDSCAPE ARCHITECT.
31. CONTRACTOR SHALL REFER TO THE LANDSCAPING AND TREE PRESERVATIONS PLANS FOR ALL INFORMATION AND DETAILS REGARDING EXISTING TREES TO BE REMOVED AND PRESERVED.
32. NO TREE SHALL BE REMOVED UNLESS A TREE REMOVAL PERMIT HAS BEEN ISSUED BY THE CITY, OR CITY HAS OTHERWISE CONFIRMED IN WRITING THAT ONE IS NOT NEEDED FOR THE TREE(S).
33. NO TREE SHALL BE REMOVED OR DAMAGED WITHOUT PRIOR AUTHORIZATION OF THE OWNER OR OWNER'S REPRESENTATIVE. EXISTING TREES SHALL BE PRESERVED WHENEVER POSSIBLE AND GRADING IMPACT TO THEM HELD TO A MINIMUM.
34. AFTER PLACEMENT OF SUBGRADE AND PRIOR TO PLACEMENT OF PAVEMENT, CONTRACTOR SHALL TEST AND OBSERVE PAVEMENT AREAS FOR EVIDENCE OF PONDING AND INADEQUATE SLOPE FOR DRAINAGE. ALL AREAS SHALL ADEQUATELY DRAIN TOWARDS THE INTENDED STRUCTURE TO CONVEY STORMWATER RUNOFF. CONTRACTOR SHALL IMMEDIATELY NOTIFY OWNER AND ENGINEER IF ANY AREAS OF POOR DRAINAGE ARE DISCOVERED.
35. CONTRACTOR FIELD ADJUSTMENT OF PROPOSED SPOT GRADES IS ALLOWED, IF THE APPROVAL OF THE CIVIL ENGINEER IS OBTAINED.

RETAINING WALLS:

1. RETAINING WALLS SHOWN ARE FOR SITE GRADING PURPOSES ONLY, AND INCLUDE ONLY LOCATION AND SURFACE SPOT ELEVATIONS AT THE TOP AND BOTTOM OF THE WALL.
2. RETAINING WALL TYPE OR SYSTEM SHALL BE SELECTED BY THE OWNER.
3. RETAINING WALL DESIGN SHALL BE PROVIDED BY OTHERS AND SHALL FIT IN THE WALL ZONE OR LOCATION SHOWN ON THESE PLANS. STRUCTURAL DESIGN AND PERMITTING OF RETAINING WALLS, RAILINGS, AND OTHER WALL SAFETY DEVICES SHALL BE PERFORMED BY A LICENSED ENGINEER AND ARE NOT PART OF THIS PLAN SET.
4. RETAINING WALL DESIGN SHALL MEET THE INTENT OF THE GRADING PLAN AND SHALL ACCOUNT FOR ANY INFLUENCE ON ADJACENT BUILDING FOUNDATIONS, UTILITIES, PROPERTY LINES AND OTHER CONSTRUCTABILITY NOTES.
5. RETAINING WALL ENGINEER SHALL CONSULT THESE PLANS AND THE GEOTECHNICAL REPORT FOR POTENTIAL CONFLICTS.

PAVING:

1. ALL PAVING MATERIALS AND CONSTRUCTION SHALL BE IN ACCORDANCE WITH THESE PLANS, THE CITY STANDARD DETAILS AND SPECIFICATIONS, THE FINAL GEOTECHNICAL REPORT AND ALL ISSUED ADDENDA, AND COMMONLY ACCEPTED CONSTRUCTION STANDARDS. THE CITY SPECIFICATIONS SHALL GOVERN WHERE OTHER SPECIFICATIONS DO NOT EXIST. IN CASE OF CONFLICTING SPECIFICATIONS OR DETAILS, THE MORE RESTRICTIVE SPECIFICATION/DETAIL SHALL BE FOLLOWED.
2. ALL PRIVATE ON-SITE PAVING AND PAVING SUBGRADE SHALL COMPLY WITH THE PROJECT'S FINAL GEOTECHNICAL REPORT (OR LATEST EDITION), INCLUDING ALL ADDENDA.
3. ALL FIRELANE PAVING AND PAVING SUBGRADE SHALL COMPLY WITH CITY STANDARDS AND DETAILS. IF THESE ARE DIFFERENT THAN THOSE IN THE GEOTECHNICAL REPORT, THEN THE MORE RESTRICTIVE SHALL BE FOLLOWED.
4. ALL PUBLIC PAVING AND PAVING SUBGRADE SHALL COMPLY WITH CITY STANDARD CONSTRUCTION DETAILS AND SPECIFICATIONS.
5. CONTRACTOR IS RESPONSIBLE FOR ALL PAVING AND PAVING SUBGRADE TESTING AND CERTIFICATION, UNLESS SPECIFIED OTHERWISE BY OWNER. ALL PAVING AND PAVING SUBGRADE TESTING SHALL BE COORDINATED WITH THE APPROPRIATE CITY INSPECTOR. TESTING SHALL BE PERFORMED BY AN APPROVED INDEPENDENT AGENCY FOR TESTING PAVING AND SUBGRADE. OWNER SHALL APPROVE THE AGENCY NOMINATED BY THE CONTRACTOR FOR PAVING AND PAVING SUBGRADE TESTING.
6. IT SHALL BE THE CONTRACTORS RESPONSIBILITY TO SHOW, BY THE STANDARD TESTING PROCEDURES OF THE PAVING AND PAVING SUBGRADE, THAT THE WORK CONSTRUCTED MEETS THE PROJECT REQUIREMENTS AND CITY SPECIFICATIONS.
7. DUE TO THE POTENTIAL FOR DIFFERENTIAL SOIL MOVEMENT ADJACENT TO THE BUILDING, THE CONTRACTOR SHALL ADHERE TO GEOTECHNICAL REPORT'S RECOMMENDATION FOR SUBGRADE PREPARATION SPECIFIC TO FLATWORK ADJACENT TO THE PROPOSED BUILDING. THE OWNER AND CONTRACTOR ARE ADVISED TO OBTAIN A GEOTECHNICAL ENGINEER RECOMMENDATION SPECIFIC TO FLATWORK ADJACENT TO THE BUILDING, IF NONE IS CURRENTLY EXISTING.
8. CURB RAMPS ALONG PUBLIC STREETS AND IN THE PUBLIC RIGHT-OF-WAY SHALL BE CONSTRUCTED BASED ON THE CITY STANDARD CONSTRUCTION DETAIL AND SPECIFICATIONS.
9. PRIVATE CURB RAMPS ON THE SITE (I.E. OUTSIDE PUBLIC STREET RIGHT-OF-WAY) SHALL CONFORM TO ADA AND TAS STANDARDS AND SHALL HAVE A DETECTABLE WARNING SURFACE THAT IS FULL WIDTH AND FULL DEPTH OF THE CURB RAMP, NOT INCLUDING FLARES.
10. ALL ACCESSIBLE RAMPS, CURB RAMPS, STRIPING, AND PAVEMENT MARKINGS SHALL CONFORM TO ADA AND TAS STANDARDS, LATEST EDITION.
11. ANY COMPONENTS OF THE PROJECT SUBJECT TO RESIDENTIAL USE SHALL ALSO CONFORM TO THE FAIR HOUSING ACT, AND COMPLY WITH THE FAIR HOUSING ACT DESIGN MANUAL BY THE US DEPARTMENT OF HOUSING AND URBAN DEVELOPMENT.
12. CONTRACTOR SHALL CONSTRUCT PROPOSED PAVEMENT TO MATCH EXISTING PAVEMENT WITH A SMOOTH, FLUSH, CONNECTION.
13. CONTRACTOR SHALL FURNISH AND INSTALL ALL PAVEMENT MARKINGS FOR FIRE LANES, PARKING STALLS, HANDICAPPED PARKING SYMBOLS, AND MISCELLANEOUS STRIPING WITHIN PARKING LOT AND AROUND BUILDING AS SHOWN ON THE PLANS. ALL PAINT AND PAVEMENT MARKINGS SHALL ADHERE TO CITY AND OWNER STANDARDS.
14. REFER TO GEOTECHNICAL REPORT FOR PAVING JOINT LAYOUT PLAN REQUIREMENTS FOR PRIVATE PAVEMENT.
15. REFER TO CITY STANDARD DETAILS AND SPECIFICATIONS FOR JOINT LAYOUT PLAN REQUIREMENTS FOR PUBLIC PAVEMENT.
16. ALL REINFORCING STEEL SHALL CONFORM TO THE GEOTECHNICAL REPORT, CITY STANDARDS, AND ASTM A-615, GRADE 60, AND SHALL BE SUPPORTED BY BAR CHAIRS. CONTRACTOR SHALL USE THE MORE STRINGENT OF THE CITY AND GEOTECHNICAL STANDARDS.
17. ALL JOINTS SHALL EXTEND THROUGH THE CURB.
18. THE MINIMUM LENGTH OF OFFSET JOINTS AT RADIUS POINTS SHALL BE 2 FEET.
19. CONTRACTOR SHALL SUBMIT A JOINTING PLAN TO THE ENGINEER AND OWNER PRIOR TO BEGINNING ANY OF THE PAVING WORK.
20. ALL SAWCUTS SHALL BE FULL DEPTH FOR PAVEMENT REMOVAL AND CONNECTION TO EXISTING PAVEMENT.
21. FIRE LANES SHALL BE MARKED AND LABELED AS A FIRELANE PER CITY STANDARDS.
22. UNLESS THE PLANS SPECIFICALLY DICTATE TO THE CONTRARY, ON-SITE AND OTHER DIRECTIONAL SIGNS SHALL BE ORIENTED SO THEY ARE READILY VISIBLE TO THE ONCOMING TRAFFIC FOR WHICH THEY ARE INTENDED.
23. CONTRACTOR IS RESPONSIBLE FOR INSTALLING NECESSARY CONDUIT FOR LIGHTING, IRRIGATION, ETC. PRIOR TO PLACEMENT OF PAVEMENT. ALL CONSTRUCTION DOCUMENTS (CIVIL, MEP, LANDSCAPE, IRRIGATION, AND ARCHITECT) SHALL BE CONSULTED.
24. BEFORE PLACING PAVEMENT, CONTRACTOR SHALL VERIFY THAT SUITABLE ACCESSIBLE PEDESTRIAN ROUTES (PER ADA, TAS, AND FHA) EXIST TO AND FROM EVERY DOOR AND ALONG SIDEWALKS, ACCESSIBLE PARKING SPACES, ACCESS AISLES, AND ACCESSIBLE ROUTES. IN NO CASE SHALL AN ACCESSIBLE RAMP SLOPE EXCEED 1 VERTICAL TO 12 HORIZONTAL. IN NO CASE SHALL SIDEWALK CROSS SLOPE EXCEED 2.0 PERCENT. IN NO CASE SHALL LONGITUDINAL SIDEWALK SLOPE EXCEED 5.0 PERCENT. ACCESSIBLE PARKING SPACES AND ACCESS AISLES SHALL NOT EXCEED 2.0 PERCENT SLOPE IN ANY DIRECTION.
25. CONTRACTOR SHALL TAKE FIELD SLOPE MEASUREMENTS ON FINISHED SUBGRADE AND FORM BOARDS PRIOR TO PLACING PAVEMENT TO VERIFY THAT ADA/TAS SLOPE REQUIREMENTS ARE PROVIDED. CONTRACTOR SHALL CONTACT ENGINEER PRIOR TO PAVING IF ANY EXCESSIVE SLOPES ARE ENCOUNTERED. NO CONTRACTOR CHANGE ORDERS WILL BE ACCEPTED FOR ADA AND TAS SLOPE COMPLIANCE ISSUES.

STORM DRAINAGE:

1. ALL STORM SEWER MATERIALS AND CONSTRUCTION SHALL COMPLY WITH CITY STANDARD CONSTRUCTION DETAILS AND SPECIFICATIONS.
2. THE SITE UTILITY CONTRACTOR SHALL PROVIDE ALL MATERIALS AND APPURTENANCES NECESSARY FOR COMPLETE INSTALLATION OF THE STORM SEWER.
3. THE CONTRACTOR SHALL FIELD VERIFY THE SIZE, CONDITION, HORIZONTAL, AND VERTICAL LOCATIONS OF ALL EXISTING STORM SEWER FACILITIES THAT ARE TO BE CONNECTED TO, PRIOR TO START OF CONSTRUCTION OF ANY STORM SEWER, AND SHALL NOTIFY THE ENGINEER OF ANY CONFLICTS DISCOVERED.
4. THE CONTRACTOR SHALL VERIFY AND COORDINATE ALL DIMENSIONS SHOWN, INCLUDING THE HORIZONTAL AND VERTICAL LOCATION OF CURB INLETS AND GRATE INLETS AND ALL UTILITIES CROSSING THE STORM SEWER.
5. FLOW LINE, TOP-OF-CURB, RIM, THROAT, AND GRATE ELEVATIONS OF PROPOSED INLETS SHALL BE VERIFIED WITH THE GRADING PLAN AND FIELD CONDITIONS PRIOR TO THEIR INSTALLATION.
6. ALL PUBLIC STORM SEWER CONSTRUCTION, PIPE, STRUCTURES, AND FITTINGS SHALL ADHERE TO CITY PUBLIC WORKS STANDARD DETAILS AND SPECIFICATIONS. CONTRACTOR SHALL ARRANGE FOR REQUIRED CITY INSPECTIONS.
7. ALL PRIVATE STORM SEWER CONSTRUCTION, PIPE, STRUCTURES, AND FITTINGS SHALL ADHERE TO THE APPLICABLE PLUMBING CODE. CONTRACTOR SHALL ARRANGE FOR REQUIRED CITY INSPECTIONS.
8. ALL PVC TO RCP CONNECTIONS AND ALL STORM PIPE CONNECTIONS ENTERING STRUCTURES OR OTHER STORM PIPES SHALL HAVE A CONCRETE COLLAR AND BE GROUTED TO ASSURE THE CONNECTION IS WATERTIGHT.
9. ALL PUBLIC STORM SEWER LINES SHALL BE MINIMUM CLASS III RCP. PRIVATE STORM SEWER LINES 18-INCHES AND GREATER SHALL BE CLASS III RCP OR OTHER APPROVED MATERIAL.
10. WHERE COVER EXCEEDS 20-FEET OR IS LESS THAN 2-FEET, CLASS IV RCP SHALL BE USED.
11. IF CONTRACTOR PROPOSES TO USE HDPE OR PVC IN LIEU OF RCP FOR PRIVATE STORM SEWER, CONTRACTOR SHALL SUBMIT TECHNICAL DATA TO THE OWNER, ENGINEER AND CITY ENGINEER/INSPECTOR FOR APPROVAL PRIOR TO ORDERING THE MATERIAL. ANY PROPOSED HDPE AND PVC SHALL BE WATERTIGHT.
12. THE CONTRACTOR SHALL PROVIDE CONSTRUCTION SURVEYING FOR ALL STORM SEWER LINES.
13. EMBEDMENT FOR ALL STORM SEWER LINES, PUBLIC OR PRIVATE, SHALL BE PER CITY STANDARD DETAILS.
14. ALL WYE CONNECTIONS AND PIPE BENDS ARE TO BE PREFABRICATED AND INSTALLED PER MANUFACTURERS SPECIFICATIONS.
15. USE 4 FOOT JOINTS WITH BEVELED ENDS IF RADIUS OF STORM SEWER IS LESS THAN 100 FEET.
16. THE CONTRACTOR IS RESPONSIBLE FOR OBTAINING AND SUBMITTING A TRENCH SAFETY PLAN, PREPARED BY A PROFESSIONAL ENGINEER IN THE STATE OF TEXAS, TO THE CITY PRIOR TO CONSTRUCTION. CONTRACTOR IS RESPONSIBLE FOR MAINTAINING TRENCH SAFETY REQUIREMENTS IN ACCORDANCE WITH CITY, STATE, AND FEDERAL REQUIREMENTS, INCLUDING OSHA FOR ALL TRENCHES. NO OPEN TRENCHES SHALL BE ALLOWED OVERNIGHT WITHOUT PRIOR WRITTEN APPROVAL OF THE CITY.
17. THE CONTRACTOR SHALL KEEP TRENCHES FREE FROM WATER.

POND NOTES:

1. ANY PONDS THAT ARE INTENDED TO HOLD WATER INDEFINITELY SHALL BE CONSTRUCTED WATERTIGHT.
2. FOR ANY PONDS INTENDED TO HOLD WATER INDEFINITELY: THE CONTRACTOR SHALL REFER TO THE GEOTECHNICAL REPORT FOR POND LINER SPECIFICATIONS.
3. A GEOTECHNICAL ENGINEER SHALL REVIEW AND APPROVE ALL POND LINER MATERIAL, PLACEMENT PROCEDURES, AND PROVIDE TESTING TO ENSURE THE POND LINER MATERIAL PLACED IS WATERTIGHT.
4. STORM SEWER PIPES AND HEADWALLS THAT CONNECT TO A POND INTENDED TO HOLD WATER INDEFINITELY SHALL BE INSTALLED WITH WATERTIGHT JOINTS TO AT LEAST 1-FOOT ABOVE THE NORMAL POOL WATER SURFACE ELEVATION.
5. ANY GRAVEL OR OTHER PERVIOUS EMBEDMENT AROUND PIPES OR OUTFALL STRUCTURES NEAR THE POND SHALL BE ELIMINATED FOR AT LEAST 20-FEET FROM THE POND SO NO ROUTE FOR WATER TO LEAK THROUGH THE EMBEDMENT MATERIAL IS PROVIDED. BACKFILL IN THESE AREAS SHALL BE OF IMPERVIOUS MATERIAL.
6. FOR ANY PONDS INTENDED TO HOLD WATER INDEFINITELY: THE WATER LEVEL FOLLOWING COMPLETION AND FILLING OF THE POND SHALL BE MONITORED BY THE CONTRACTOR FOR AT LEAST 60 DAYS TO OBSERVE WATER INFLOW, OUTFLOW, AND CALCULATE EVAPORATION TO VERIFY THAT THE POND IS WATERTIGHT.
7. FOR ANY PONDS INTENDED TO HOLD WATER INDEFINITELY: THE POND WATER LEVEL SHALL ALSO BE MAINTAINED BY THE CONTRACTOR FOR THE DURATION OF CONSTRUCTION SO THAT IT REMAINS FULL TO ITS DESIGN WATER LEVEL, AND IS NOT LOWERED, AS THIS MAY DRY-OUT THE POND LINER AND RISK ITS WATERTIGHT PROPERTIES.

WATER AND WASTEWATER:

1. ALL WATER AND WASTEWATER MATERIALS AND CONSTRUCTION SHALL COMPLY WITH CITY STANDARD CONSTRUCTION DETAILS AND SPECIFICATIONS.
2. CONTRACTOR SHALL FIELD VERIFY THE SIZE, CONDITION, HORIZONTAL, AND VERTICAL LOCATIONS OF ALL EXISTING WATER AND WASTEWATER FACILITIES THAT ARE TO BE CONNECTED TO, PRIOR TO START OF CONSTRUCTION OF ANY WATER OR WASTEWATER CONSTRUCTION, AND SHALL NOTIFY THE ENGINEER OF ANY CONFLICTS DISCOVERED.
3. CONTRACTOR SHALL VERIFY AND COORDINATE ALL DIMENSIONS SHOWN, INCLUDING THE HORIZONTAL AND VERTICAL LOCATION OF ALL UTILITY SERVICES ENTERING THE BUILDING.
4. THE CONTRACTOR SHALL FIELD VERIFY THE ELEVATION OF ALL UTILITY CROSSINGS PRIOR TO THE INSTALLATION OF ANY PIPE.
5. THE SITE UTILITY CONTRACTOR SHALL PROVIDE ALL MATERIALS AND APPURTENANCES NECESSARY FOR COMPLETE INSTALLATION OF THE WATER AND WASTEWATER IMPROVEMENTS.
6. ALL PUBLIC WATER AND WASTEWATER CONSTRUCTION, PIPE, STRUCTURES, AND FITTINGS SHALL ADHERE TO CITY PUBLIC WORKS STANDARD DETAILS AND SPECIFICATIONS. CONTRACTOR SHALL ARRANGE FOR REQUIRED CITY INSPECTIONS.
7. ALL PRIVATE WATER AND WASTEWATER CONSTRUCTION, PIPE, STRUCTURES, AND FITTINGS SHALL ADHERE TO THE APPLICABLE PLUMBING CODE. CONTRACTOR SHALL ARRANGE FOR REQUIRED CITY INSPECTIONS.
8. FIRE SPRINKLER LINES SHALL BE DESIGNED AND INSTALLED BY A LICENSED FIRE SPRINKLER CONTRACTOR, AND COMPLY TO THE APPLICABLE CODES AND INSPECTIONS REQUIRED. THESE PLANS WERE PREPARED WITHOUT THE BENEFIT OF THE FIRE SPRINKLER DESIGN. CONTRACTOR SHALL NOTIFY THE ENGINEER IF ANY DISCREPANCIES.
9. EMBEDMENT FOR ALL WATER AND WASTEWATER LINES, PUBLIC OR PRIVATE, SHALL BE PER CITY STANDARD DETAILS.
10. CONTRACTOR SHALL TAKE REQUIRED SANITARY PRECAUTIONS, FOLLOWING ANY CITY, TCEQ, AND AWWA STANDARDS, TO KEEP WATER PIPE AND FITTINGS CLEAN AND CAPPED AT TIMES WHEN INSTALLATION IS NOT IN PROGRESS.
11. CONTRACTOR SHALL PROVIDE CONSTRUCTION SURVEYING FOR ALL WATER AND WASTEWATER LINES.
12. ALL WATER AND WASTEWATER SERVICES SHALL TERMINATE 5-FEET OUTSIDE THE BUILDING, UNLESS NOTED OTHERWISE.
13. CONTRACTOR SHALL COMPLY WITH CITY REQUIREMENTS FOR WATER AND WASTEWATER SERVICE DISRUPTIONS AND THE AMOUNT OF PRIOR NOTICE THAT IS REQUIRED, AND SHALL COORDINATE DIRECTLY WITH THE APPROPRIATE CITY DEPARTMENT.
14. CONTRACTOR SHALL SEQUENCE WATER AND WASTEWATER CONSTRUCTION TO AVOID INTERRUPTION OF SERVICE TO SURROUNDING PROPERTIES.
15. CONTRACTOR SHALL MAINTAIN WATER SERVICE AND WASTEWATER SERVICE TO ALL CUSTOMERS THROUGHOUT CONSTRUCTION (IF NECESSARY, BY USE OF TEMPORARY METHODS APPROVED BY THE CITY AND OWNER). THIS WORK SHALL BE CONSIDERED SUBSIDIARY TO THE PROJECT AND NO ADDITIONAL COMPENSATION SHALL BE ALLOWED.
16. THE CONTRACTOR IS RESPONSIBLE TO PROTECT ALL WATER AND WASTEWATER LINES CROSSING THE PROJECT. THE CONTRACTOR SHALL REPAIR ALL DAMAGED LINES IMMEDIATELY. ALL REPAIRS OF EXISTING WATER MAINS, WATER SERVICES, SEWER MAINS, AND SANITARY SEWER SERVICES ARE SUBSIDIARY TO THE WORK, AND NO ADDITIONAL COMPENSATION SHALL BE ALLOWED.
17. VALVE ADJUSTMENTS SHALL BE CONSTRUCTED SUCH THAT THE COVERS ARE AT FINISHED SURFACE GRADE OF THE PROPOSED PAVEMENT.
18. THE ENDS OF ALL EXISTING WATER MAINS THAT ARE CUT, BUT NOT REMOVED, SHALL BE PLUGGED AND ABANDONED IN PLACE. THIS WORK SHALL BE CONSIDERED AS A SUBSIDIARY COST TO THE PROJECT AND NO ADDITIONAL COMPENSATION SHALL BE ALLOWED.
19. ALL FIRE HYDRANTS, VALVES, TEES, BENDS, WYES, REDUCERS, FITTINGS, AND ENDS SHALL BE MECHANICALLY RESTRAINED AND/OR THRUST BLOCKED TO CITY STANDARDS.
20. CONTRACTOR SHALL INSTALL A FULL SEGMENT OF WATER OR WASTEWATER PIPE CENTERED AT ALL UTILITY CROSSINGS SO THAT THE JOINTS ARE GREATER THAN 9-FEET FROM THE CROSSING.
21. ALL CROSSINGS AND LOCATIONS WHERE WASTEWATER IS LESS THAN 9-FEET FROM WATER, WASTEWATER CONSTRUCTION AND MATERIALS SHALL COMPLY WITH TCEQ CHAPTER 217.53.
22. ALL CROSSING AND LOCATIONS WHERE WATER IS LESS THAN 9-FEET FROM WASTEWATER, WATER CONSTRUCTION AND MATERIALS SHALL COMPLY WITH TCEQ CHAPTER 290.44.
23. ALL WATER AND WASTEWATER SHALL BE TESTED IN ACCORDANCE WITH THE CITY, AWWA, AND TCEQ STANDARDS AND SPECIFICATIONS. AT A MINIMUM, THIS SHALL CONSIST OF THE FOLLOWING:
   a. ALL WATERLINES SHALL BE HYDROSTATICALLY TESTED AND CHLORINATED BEFORE BEING PLACED INTO SERVICE. CONTRACTOR SHALL COORDINATE WITH THE CITY FOR THEIR REQUIRED PROCEDURES AND SHALL ALSO COMPLY WITH TCEQ REGULATIONS.
   b. WASTEWATER LINES AND MANHOLES SHALL BE PRESSURE TESTED. CONTRACTOR SHALL COORDINATE WITH THE CITY FOR THEIR REQUIRED PROCEDURES AND SHALL ALSO COMPLY WITH TCEQ REGULATIONS. AFTER COMPLETION OF THESE TESTS, A TELEVISION INSPECTION SHALL BE PERFORMED AND PROVIDED TO THE CITY AND OWNER ON A DVD.
24. CONTRACTOR SHALL INSTALL DETECTABLE WIRING OR MARKING TAPE A MINIMUM OF 12” ABOVE WATER AND WASTEWATER LINES. MARKER DECALS SHALL BE LABELED “CAUTION - WATER LINE”, OR “CAUTION - SEWER LINE”. DETECTABLE WIRING AND MARKING TAPE SHALL COMPLY WITH CITY STANDARDS, AND SHALL BE INCLUDED IN THE COST OF THE WATER AND WASTEWATER PIPE.
25. DUCTILE IRON PIPE SHALL BE PROTECTED FROM CORROSION BY A LOW-DENSITY POLYETHYLENE LINER WRAP THAT IS AT LEAST A SINGLE LAYER OF 8-MIL. ALL DUCTILE IRON JOINTS SHALL BE BONDED.
26. WATERLINES SHALL BE INSTALLED AT NO LESS THAN THE MINIMUM COVER REQUIRED BY THE CITY.
27. CONTRACTOR SHALL PROVIDE CLEAN-OUTS FOR PRIVATE SANITARY SEWER LINES AT ALL CHANGES IN DIRECTION AND 100-FOOT INTERVALS, OR AS REQUIRED BY THE APPLICABLE PLUMBING CODE. CLEAN-OUTS REQUIRED IN PAVEMENT OR SIDEWALKS SHALL HAVE CAST IRON COVERS FLUSH WITH FINISHED GRADE.
28. CONTRACTOR SHALL PROVIDE BACKWATER VALVES FOR PLUMBING FIXTURES AS REQUIRED BY THE APPLICABLE PLUMBING CODE (E.G. FLOOR ELEVATION OF FIXTURE UNIT IS BELOW THE ELEVATION OF THE MANHOLE COVER OF THE NEXT UPSTREAM MANHOLE IN THE PUBLIC SEWER). CONTRACTOR SHALL REVIEW BOTH MEP AND CIVIL PLANS TO CONFIRM WHERE THESE ARE REQUIRED.
29. THE CONTRACTOR IS RESPONSIBLE FOR OBTAINING AND SUBMITTING A TRENCH SAFETY PLAN, PREPARED BY A PROFESSIONAL ENGINEER IN THE STATE OF TEXAS, TO THE CITY PRIOR TO CONSTRUCTION. CONTRACTOR IS RESPONSIBLE FOR MAINTAINING TRENCH SAFETY REQUIREMENTS IN ACCORDANCE WITH CITY, STATE, AND FEDERAL REQUIREMENTS, INCLUDING OSHA FOR ALL TRENCHES. NO OPEN TRENCHES SHALL BE ALLOWED OVERNIGHT WITHOUT PRIOR WRITTEN APPROVAL OF THE CITY.
30. THE CONTRACTOR SHALL KEEP TRENCHES FREE FROM WATER.

ABBREVIATIONS AND DEFINITIONS:

A	AREA
ADA	AMERICANS WITH DISABILITIES ACT
AWWA	AMERICAN WATER WORKS ASSOCIATION
B-B	BACK TO BACK
BC	BEGIN CURVE
BC	BACK OF CURB
BCR	BEGIN CURB RETURN
BMP	BEST MANAGEMENT PRACTICE
BOC	BACK OF CURB
BVCE	BEGIN VERTICAL CURVE ELEVATION
BVCS	BEGIN VERTICAL CURVE STATION
BW	BOTTOM OF WALL
CFS	CUBIC FEET PER SECOND
CITY	CITY, TOWN, OR OTHER APPLICABLE LOCAL GOVERNMENT JURISDICTION
C/L	CENTERLINE
CL	CENTERLINE
CONC	CONCRETE
CY	CUBIC YARD
DEMO	DEMOLITION
DG	DECOMPOSED GRANITE
DTL	DETAIL
EA	EACH
EC	END CURVE
ECR	END CURB RETURN
EG	EXISTING GROUND
EL	ELEVATION
ELEC	ELECTRICAL / ELECTRICITY
ELEV	ELEVATION
EPA	UNITES STATES ENVIRONMENTAL PROTECTION AGENCY
ESMT	EASEMENT
EVCE	END VERTICAL CURVE ELEVATION
EVCS	END VERTICAL CURVE STATION
EX.	EXISTING
F-F	FACE TO FACE
FG	FINISHED GROUND
FH	FIRE HYDRANT
FL	FLOW LINE
FOC	FACE OF CURB
FT	FEET
HGL	HYDRAULIC GRADE LINE
KH	KIMLEY-HORN AND ASSOCIATES, INC.
KHA	KIMLEY-HORN AND ASSOCIATES, INC.
LAT	LATERAL
LF	LINEAR FEET
LT	LEFT
MAX	MAXIMUM
ME	MATCH EXISTING ELEVATION
MH	MANHOLE
MIN	MINUTE / MINIMUM
NO	NUMBER
NOI	NOTICE OF INTENT, REF. TCEQ GENERAL PERMIT
NOT	NOTICE OF TERMINATION, REF. TCEQ GENERAL PERMIT
NTS	NOT TO SCALE
OC	ON CENTER
OFF	OFFSET
OSHA	OCCUPATIONAL SAFETY AND HEALTH ADMINISTRATION
PC	POINT OF CURVATURE
PCC	PORTLAND CEMENT CONCRETE / POINT OF COMPOUND CURVATURE
PGL	PROPOSED GRADE LINE
PI	POINT OF INFLECTION
PROP	PROPOSED
PRC	POINT OF REVERSE CURVATURE
PSI	POUNDS PER SQUARE INCH
PT	POINT OF TANGENCY
PVC	POLYVINYL CHLORIDE
PVI	POINT OF VERTICAL INFLECTION
PVMT	PAVEMENT
RCP	REINFORCED CONCRETE PIPE
ROW	RIGHT OF WAY
RT	RIGHT
SF	SQUARE FEET
SS	SANITARY SEWER
SSMH	SANITARY SEWER MANHOLE
STA	STATION
STD	STANDARD
SY	SQUARE YARD
TAS	ARCHITECTURAL BARRIERS TEXAS ACCESSIBILITY STANDARDS
TC	TOP OF CURB
TCEQ	TEXAS COMMISSION OF ENVIRONMENTAL QUALITY
TEMP	TEMPORARY
TXDOT	TEXAS DEPARTMENT OF TRANSPORTATION
TXMUTCD	TEXAS MANUAL OF UNIFORM TRAFFIC CONTROL DEVICES
TW	TOP OF WALL
TYP	TYPICAL
VC	VERTICAL CURVE
WTR	WATER
WW	WASTEWATER

THESE PLAN AND GENERAL NOTES REFER TO:
GEOTECHNICAL ENGINEERING REPORT
(FIRM) MLA
WOLF RANCH SECTION 6G
(DATE)
INCLUDING ALL REVISIONS AND ADDENDA TO THIS REPORT THAT MAY HAVE BEEN RELEASED AFTER THE NOTED DATE.

BENCHMARKS

ADD BENCHMARKS HERE

© COPYRIGHT 2017 KIMLEY-HORN AND ASSOCIATES, INC., ALL RIGHTS RESERVED

No.	REVISIONS	DATE	BY

Kimley»Horn
© 2024 KIMLEY-HORN AND ASSOCIATES, INC.
10814 JOLLYVILLE ROAD, CAMPUS IV, SUITE 200, AUSTIN, TX 78759
PHONE: 512-418-1771 FAX: 512-418-1791
WWW.KIMLEY-HORN.COM
TEXAS REGISTERED ENGINEERING FIRM F-928

STATE OF TEXAS
JOHN A. PICKENS
110631
LICENSED PROFESSIONAL ENGINEER
02/02/2024

KHA PROJECT 064461307
DATE DECEMBER 2023
SCALE: AS SHOWN
DESIGNED BY: RRJ
DRAWN BY: AJM
CHECKED BY: JAP

KH GENERAL NOTES

WOLF RANCH
SECTION 6G
CITY OF GEORGETOWN
WILLIAMSON COUNTY, TEXAS

SHEET NUMBER
3 OF 87

Plotted By: Castillo, Jaime Date: February 08, 2024 08:51:51am File Path: K:\AUS_Civil\064461307-Wolf Ranch Section 6G\Cad\PlanSheets\C-KH General Notes.dwg
This document, together with the concepts and designs presented herein, as an instrument of service, is intended only for the specific purpose and client for which it was prepared. Reuse of and improper reliance on this document without written authorization and adaptation by Kimley-Horn and Associates, Inc. shall be without liability to Kimley-Horn and Associates, Inc.

TEXAS COMMISSION ON ENVIRONMENTAL QUALITY
ORGANIZED SEWAGE COLLECTION SYSTEM (SCS)
GENERAL CONSTRUCTION NOTES

1. THIS ORGANIZED SEWAGE COLLECTION SYSTEM MUST BE DESIGNED AND CONSTRUCTED IN ACCORDANCE WITH THE TEXAS COMMISSION ON ENVIRONMENTAL QUALITY'S (TCEQ) EDWARDS AQUIFER RULES 30 TEXAS ADMINISTRATIVE CODE (TAC) §§213.5(C) AND 217.51 – 217.70 AND 30 TAC CHAPTER 217, SUBCHAPTER D, AND THE CITY OF ROUND ROCK STANDARD SPECIFICATIONS.

2. ALL CONTRACTORS CONDUCTING REGULATED ACTIVITIES ASSOCIATED WITH THIS PROPOSED REGULATED PROJECT MUST BE PROVIDED WITH COPIES OF THE SEWAGE COLLECTION SYSTEM 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. NO LATER THAN 48 HOURS PRIOR TO COMMENCING ANY REGULATED ACTIVITY, THE APPLICANT OR HIS AGENT MUST NOTIFY THE TCEQ AUSTIN REGIONAL OFFICE, IN WRITING, OF THE DATE ON WHICH THE REGULATED ACTIVITY WILL BEGIN.

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. ALL TEMPORARY EROSION AND SEDIMENTATION CONTROLS MUST BE INSTALLED PRIOR TO CONSTRUCTION, MUST BE MAINTAINED DURING CONSTRUCTION, AND MUST BE REMOVED WHEN SUFFICIENT VEGETATION IS ESTABLISHED TO CONTROL THE EROSION AND SEDIMENTATION AND THE CONSTRUCTION AREA IS STABILIZED.

6. THE SEWER LINE TRENCH DETAILS SHOWING THE CROSS SECTION WITH THE DIMENSIONS, PIPE PLACEMENT, AND BACKFILL INSTRUCTIONS ARE INCLUDED ON PLAN SHEET 80 OF 124 OF THESE PLANS. ALL SEWER PIPES JOINTS MUST MEET THE REQUIREMENTS IN 30 TAC §§217.53(C) AN 217.65.

   GRAVITY LINES MUST HAVE A SDR 35 OR LESS. PRESSURIZED SEWER SYSTEMS MUST HAVE PIPE WITH A MINIMUM WORKING PRESSURE RATING OF 150 PSI.

   THE ASTM, ANSI, OR AWWA SPECIFICATION NUMBERS FOR THE PIPE(S) AND JOINTS ARE ASTM-D3034.

   THE PIPE MATERIAL, THE PRESSURE CLASSES, AND THE SDR AND/OR DR DESIGNATIONS ARE SDR-26.

7. 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 TEXAS COMMISSION ON ENVIRONMENTAL QUALITY 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 WITHIN TWO WORKING DAYS. 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.

8. 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 SIX (6) INCHES.

9. 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.

10. 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 75 & 77 OF 124.

    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.

11. 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).

12. 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: N/A.

    IF PIPE FLEXURE IS PROPOSED, THE FOLLOWING METHOD OF PREVENTING DEFLECTION OF THE JOINT MUST BE USED: N/A.

    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.

13. 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.

14. 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.

15. 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).

16. 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) OR A COLLECTION SYSTEM PIPE THAT WILL TRANSPORT WASTEWATER BY GRAVITY FLOW, THE DESIGN MUST SPECIFY AN INFILTRATION AND EXFILTRATION TEST OR A LOW-PRESSURE AIR TEST. A TEST MUST CONFORM TO THE FOLLOWING REQUIREMENTS:

(1) LOW PRESSURE AIR TEST.
  (A) A LOW PRESSURE AIR TEST MUST FOLLOW THE PROCEDURES DESCRIBED IN AMERICAN SOCIETY FOR TESTING AND MATERIALS (ASTM) C-828, ASTM C-924, OR ASTM F-1417 OR OTHER PROCEDURE APPROVED BY THE EXECUTIVE DIRECTOR, EXCEPT AS TO TESTING TIMES AS REQUIRED IN TABLE C.3 IN SUBPARAGRAPH (C) OF THIS PARAGRAPH OR EQUATION C.3 IN SUBPARAGRAPH (B)(II) OF THIS PARAGRAPH.
  (B) FOR SECTIONS OF COLLECTION SYSTEM PIPE LESS THAN 36 INCH AVERAGE INSIDE DIAMETER, THE FOLLOWING PROCEDURE MUST APPLY, UNLESS A PIPE IS TO BE TESTED AS REQUIRED BY PARAGRAPH (2) OF THIS SUBSECTION.
    (I) A PIPE MUST BE PRESSURIZED TO 3.5 POUNDS PER SQUARE INCH (PSI) GREATER THAN THE PRESSURE EXERTED BY GROUNDWATER ABOVE THE PIPE.
    (II) ONCE THE PRESSURE IS STABILIZED, THE MINIMUM TIME ALLOWABLE FOR THE PRESSURE TO DROP FROM 3.5 PSI GAUGE TO 2.5 PSI GAUGE IS COMPUTED FROM THE FOLLOWING EQUATION:

EQUATION C.3

$$T = \frac{0.085 \times D \times K}{Q}$$

WHERE:

T = TIME FOR PRESSURE TO DROP 1.0 POUND PER SQUARE INCH GAUGE IN SECONDS
K = 0.000419 X D X L, BUT NOT LESS THAN 1.0
D = AVERAGE INSIDE PIPE DIAMETER IN INCHES
L = LENGTH OF LINE OF SAME SIZE BEING TESTED, IN FEET
Q = RATE OF LOSS, 0.0015 CUBIC FEET PER MINUTE PER SQUARE FOOT INTERNAL SURFACE

(C) SINCE A K VALUE OF LESS THAN 1.0 MAY NOT BE USED, THE MINIMUM TESTING TIME FOR EACH PIPE DIAMETER IS SHOWN IN THE FOLLOWING

TABLE C.3:

PIPE DIAMETER (INCHES)	MINIMUM TIME (SECONDS)	MAXIMUM LENGTH FOR MINIMUM TIME (FEET)	TIME FOR LONGER LENGTH (SECONDS/FOOT)
6	340	398	0.855
8	454	298	1.520
10	567	239	2.374
12	680	199	3.419
15	850	159	5.342
18	1020	133	7.693
21	1190	114	10.471
24	1360	100	13.676
27	1530	88	17.309
30	1700	80	21.369
33	1870	72	25.856

  (D) AN OWNER MAY STOP A TEST IF NO PRESSURE LOSS HAS OCCURRED DURING THE FIRST 25% OF THE CALCULATED TESTING TIME.
  (E) IF ANY PRESSURE LOSS OR LEAKAGE HAS OCCURRED DURING THE FIRST 25% OF A TESTING PERIOD, THEN THE TEST MUST CONTINUE FOR THE ENTIRE TEST DURATION AS OUTLINED ABOVE OR UNTIL FAILURE.
  (F) WASTEWATER COLLECTION SYSTEM PIPES WITH A 27 INCH OR LARGER AVERAGE INSIDE DIAMETER MAY BE AIR TESTED AT EACH JOINT INSTEAD OF FOLLOWING THE PROCEDURE OUTLINED IN THIS SECTION.
  (G) A TESTING PROCEDURE FOR PIPE WITH AN INSIDE DIAMETER GREATER THAN 33 INCHES MUST BE APPROVED BY THE EXECUTIVE DIRECTOR.

(2) INFILTRATION/EXFILTRATION TEST.
  (A) THE TOTAL EXFILTRATION, AS DETERMINED BY A HYDROSTATIC HEAD TEST, MUST NOT EXCEED 50 GALLONS PER INCH OF DIAMETER PER MILE OF PIPE PER 24 HOURS AT A MINIMUM TEST HEAD OF 2.0 FEET ABOVE THE CROWN OF A PIPE AT AN UPSTREAM MANHOLE.
  (B) AN OWNER SHALL USE AN INFILTRATION TEST IN LIEU OF AN EXFILTRATION TEST WHEN PIPES ARE INSTALLED BELOW THE GROUNDWATER LEVEL.
  (C) THE TOTAL EXFILTRATION, AS DETERMINED BY A HYDROSTATIC HEAD TEST, MUST NOT EXCEED 50 GALLONS PER INCH DIAMETER PER MILE OF PIPE PER 24 HOURS AT A MINIMUM TEST HEAD OF TWO FEET ABOVE THE CROWN OF A PIPE AT AN UPSTREAM MANHOLE, OR AT LEAST TWO FEET ABOVE EXISTING GROUNDWATER LEVEL, WHICHEVER IS GREATER.
  (D) FOR CONSTRUCTION WITHIN A 25-YEAR FLOOD PLAIN, THE INFILTRATION OR EXFILTRATION MUST NOT EXCEED 10 GALLONS PER INCH DIAMETER PER MILE OF PIPE PER 24 HOURS AT THE SAME MINIMUM TEST HEAD AS IN SUBPARGRAPH (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.
  (F) 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.

17. ALL MANHOLES MUST BE TESTED TO MEET OR EXCEED THE REQUIREMENTS OF 30 TAC §217.58.

18. 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.

SUPPLEMENTAL TCEQ NOTES:

1. WATERTIGHT, SIZE ON SIZE RESILIENT CONNECTORS CONFORMING TO ASTM C-923 ARE REQUIRED FOR CONNECTING PIPE TO MANHOLES.

2. IF FAULTS, CAVERNS, OR SUBSIDENCE ARE DISCOVERED DURING CONSTRUCTION, CONSTRUCTION SHOULD BE HALTED TO ALLOW THE FEATURES TO BE INSPECTED BY THE DESIGN ENGINEER OR GEOLOGICAL OR GEOTECHNICAL PROFESSIONAL.

3. TRENCH WALLS MUST BE VERTICAL TO AT LEAST ONE FOOT ABOVE THE PIPE. TRENCH BACKFILL MUST BE FREE OF STONES GREATER THAN 6-INCHES AND FREE OF ORGANIC OR ANY OTHER UNSTABLE MATERIAL.

4. ALL WASTEWATER PIPE MATERIAL PVC SDR26-ASTM-3034 USED MUST HAVE A MINIMUM ALLOWABLE TENSILE.

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

1. WRITTEN CONSTRUCTION NOTIFICATION MUST BE GIVEN TO THE APPROPRIATE TCEQ REGIONAL OFFICE NO LATER THAN 48 HOURS PRIOR TO COMMENCEMENT OF THE REGULATED ACTIVITY.INFORMATION MUST INCLUDE THE DATE ON WHICH THE REGULATED ACTIVITY WILL COMMENCE, THE NAME OF THE APPROVED PLAN FOR THE REGULATED ACTIVITY, AND THE NAME OF THE PRIME CONTRACTOR AND THE NAME AND TELEPHONE NUMBER OF THE CONTACT PERSON.

2. ALL CONTRACTORS CONDUCTING REGULATED ACTIVITIES ASSOCIATED WITH THIS PROJECT MUST BE PROVIDED WITH COMPLETE COPIES OF THE APPROVED WATER POLLUTION ABATEMENT PLAN AND THE TCEQ LETTER INDICATING THE SPECIFIC CONDITIONS OF ITS APPROVAL. DURING THE COURSE OF THESE REGULATED ACTIVITIES, THE CONTRACTORS ARE REQUIRED TO KEEP ON-SITE COPIES OF THE APPROVED PLAN AND APPROVAL LETTER.

3. IF ANY SENSITIVE FEATURE IS DISCOVERED DURING CONSTRUCTION, ALL REGULATED ACTIVITIES NEAR THE SENSITIVE FEATURE MUST BE SUSPENDED IMMEDIATELY. THE APPROPRIATE TCEQ REGIONAL OFFICE MUST BE IMMEDIATELY NOTIFIED OF ANY SENSITIVE FEATURES ENCOUNTERED DURING CONSTRUCTION. THE REGULATED ACTIVITIES NEAR THE SENSITIVE FEATURE MAY NOT PROCEED UNTIL THE TCEQ HAS REVIEWED AND APPROVED THE METHODS PROPOSED TO PROTECT THE SENSITIVE FEATURE AND THE EDWARDS AQUIFER FROM ANY POTENTIALLY ADVERSE IMPACTS TO WATER QUALITY.

4. NO TEMPORARY ABOVEGROUND HYDROCARBON AND HAZARDOUS SUBSTANCE STORAGE TANK SYSTEM IS INSTALLED WITHIN 150 FEET OF A DOMESTIC, INDUSTRIAL, IRRIGATION, OR PUBLIC WATER SUPPLY WELL, OR OTHER SENSITIVE FEATURE.

5. PRIOR TO COMMENCEMENT OF CONSTRUCTION, ALL TEMPORARY EROSION AND SEDIMENTATION (E&S) CONTROL MEASURES MUST BE PROPERLY SELECTED, INSTALLED, AND MAINTAINED IN ACCORDANCE WITH THE MANUFACTURERS SPECIFICATIONS AND GOOD ENGINEERING PRACTICES. CONTROLS SPECIFIED IN THE TEMPORARY STORM WATER SECTION OF THE APPROVED EDWARDS AQUIFER PROTECTION PLAN ARE REQUIRED DURING CONSTRUCTION. IF INSPECTIONS INDICATE A CONTROL HAS BEEN USED INAPPROPRIATELY, OR INCORRECTLY, THE APPLICANT MUST REPLACE OR MODIFY THE CONTROL FOR SITE SITUATIONS. THE CONTROLS MUST REMAIN IN PLACE UNTIL DISTURBED AREAS ARE REVEGETATED AND THE AREAS HAVE BECOME PERMANENTLY STABILIZED.

6. IF SEDIMENT ESCAPES THE CONSTRUCTION SITE, OFF-SITE ACCUMULATIONS OF SEDIMENT MUST BE REMOVED AT A FREQUENCY SUFFICIENT TO MINIMIZE OFFSITE IMPACTS TO WATER QUALITY (E.G., FUGITIVE SEDIMENT IN STREET BEING WASHED INTO SURFACE STREAMS OR SENSITIVE FEATURES BY THE NEXT RAIN).

7. SEDIMENT MUST BE REMOVED FROM SEDIMENT TRAPS OR SEDIMENTATION PONDS NOT LATER THAN WHEN DESIGN CAPACITY HAS BEEN REDUCED BY 50%. A PERMANENT STAKE MUST BE PROVIDED THAT CAN INDICATE WHEN THE SEDIMENT OCCUPIES 50% OF THE BASIN VOLUME.

8. LITTER, CONSTRUCTION DEBRIS, AND CONSTRUCTION CHEMICALS EXPOSED TO STORMWATER SHALL BE PREVENTED FROM BECOMING A POLLUTANT SOURCE FOR STORMWATER DISCHARGES (E.G., SCREENING OUTFALLS, PICKED UP DAILY).

9. ALL SPOILS (EXCAVATED MATERIAL) GENERATED FROM THE PROJECT SITE MUST BE STORED ON-SITE WITH PROPER E&S CONTROLS. FOR STORAGE OR DISPOSAL OF SPOILS AT ANOTHER SITE ON THE EDWARDS AQUIFER RECHARGE ZONE, THE OWNER OF THE SITE MUST RECEIVE APPROVAL OF A WATER POLLUTION ABATEMENT PLAN FOR THE PLACEMENT OF FILL MATERIAL OR MASS GRADING PRIOR TO THE PLACEMENT OF SPOILS AT THE OTHER SITE.

10. STABILIZATION MEASURES SHALL BE INITIATED AS SOON AS PRACTICABLE IN PORTIONS OF THE SITE WHERE CONSTRUCTION ACTIVITIES HAVE TEMPORARILY OR PERMANENTLY CEASED, BUT IN NO CASE MORE THAN 14 DAYS AFTER THE CONSTRUCTION ACTIVITY IN THAT PORTION OF THE SITE HAS TEMPORARILY OR PERMANENTLY CEASED. WHERE THE INITIATION OF STABILIZATION MEASURES BY THE 14TH DAY AFTER CONSTRUCTION ACTIVITY TEMPORARY OR PERMANENTLY CEASE IS PRECLUDED BY WEATHER CONDITIONS, STABILIZATION MEASURES SHALL BE INITIATED AS SOON AS PRACTICABLE. WHERE CONSTRUCTION ACTIVITY ON A PORTION OF THE SITE IS TEMPORARILY CEASED, AND EARTH DISTURBING ACTIVITIES WILL BE RESUMED WITHIN 21 DAYS, TEMPORARY STABILIZATION MEASURES DO NOT HAVE TO BE INITIATED ON THAT PORTION OF SITE. IN AREAS EXPERIENCING DROUGHTS WHERE THE INITIATION OF STABILIZATION MEASURES BY THE 14TH DAY AFTER CONSTRUCTION ACTIVITY HAS TEMPORARILY OR PERMANENTLY CEASED IS PRECLUDED BY SEASONAL ARID CONDITIONS, STABILIZATION MEASURES SHALL BE INITIATED AS SOON AS PRACTICABLE.

11. THE FOLLOWING RECORDS SHALL BE MAINTAINED AND MADE AVAILABLE TO THE TCEQ UPON REQUEST: THE DATES WHEN MAJOR GRADING ACTIVITIES OCCUR; THE DATES WHEN CONSTRUCTION ACTIVITIES TEMPORARILY OR PERMANENTLY CEASE ON A PORTION OF THE SITE; AND THE DATES WHEN STABILIZATION MEASURES ARE INITIATED.

12. THE HOLDER OF ANY APPROVED 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.

13. TCEQ REGION 11 AUSTIN OFFICE
    12100 PARK 35 CIRCLE
    BUILDING A, RM 179
    AUSTIN, TX 78753
    (P) (512) 339-2929, (F) (512) 339-3795

    MAILING ADDRESS
    MCR11
    PO BOX 13087
    AUSTIN, TX 78711-3087

TEXAS COMMISSION ON ENVIRONMENTAL QUALITY
WATER DISTRIBUTION SYSTEM
GENERAL CONSTRUCTION NOTES

1. This water distribution system must be constructed in accordance with the current Texas Commission on Environmental Quality (TCEQ) Rules and Regulations for Public Water Systems 30 Texas Administrative Code (TAC) Chapter 290 Subchapter D. When conflicts are noted with local standards, the more stringent requirement shall be applied. Construction for public water systems must always, at a minimum, meet TCEQ's "Rules and Regulations for Public Water Systems.

2. An appointed engineer shall notify in writing the local TCEQ's Regional Office when construction will start. Please keep in mind that upon completion of the water works project, the engineer or owner shall notify the commission's Water Supply Division, in writing, as to its completion and attest to the fact that the work has been completed essentially according to the plans and change orders on file with the commission as required in 30 TAC §290.39(h)(3).

3. All newly installed pipes and related products must conform to American National Standards Institute/National Sanitation Foundation (ANSI/NSF) Standard 61-G and must be certified by an organization accredited by ANSI, as required by 30 TAC §290.44(a)(1).

4. Plastic pipe for use in public water systems must bear the National Sanitation Foundation Seal of Approval (NSF pw-G) and have an ASTM design pressure rating of at least 150 psi or a standard dimension ratio of 26 or less, as required by 30 TAC §290.44(a)(2).

5. No pipe which has been used for any purpose other than the conveyance of drinking water shall be accepted or relocated for use in any public drinking water supply, as required by 30 TAC §290.44(a)(3).

6. Water transmission and distribution lines shall be installed in accordance with the manufacturer's instructions. However, the top of the water line must be located below the frost line and in no case shall the top of the water line be less than 24 inches below ground surface, as required by 30 TAC §290.44(a)(4).

7. Pursuant to 30 TAC §290.44(a)(5), the hydrostatic leakage rate shall not exceed the amount allowed or recommended by the most current AWWA formulas for PVC pipe, cast iron and ductile iron pipe. Include the formulas in the notes on the plans.
   - The hydrostatic leakage rate for polyvinyl chloride (PVC) pipe and appurtenances shall not exceed the amount allowed or recommended by formulas in America Water Works Association (AWWA) C-605 as required in 30 TAC §290.44(a)(5). Please ensure that the formula for this calculation is correct and most current formula is in use;

   $$Q = \frac{LD\sqrt{P}}{148{,}000}$$

   Where:

     - Q = the quantity of makeup water in gallons per hour,
     - L = the length of the pipe section being tested, in feet,
     - D = the nominal diameter of the pipe in inches, and
     - P = the average test pressure during the hydrostatic test in pounds per square inch (psi).

   - The hydrostatic leakage rate for ductile iron (DI) pipe and appurtenances shall not exceed the amount allowed or recommended by formulas in America Water Works Association (AWWA) C-600 as required in 30 TAC §290.44(a)(5). Please ensure that the formula for this calculation is correct and most current formula is in use;

   $$L = \frac{SD\sqrt{P}}{148{,}000}$$

   Where:

     - L = the quantity of makeup water in gallons per hour,
     - S = the length of the pipe section being tested, in feet,
     - D = the nominal diameter of the pipe in inches, and
     - P = the average test pressure during the hydrostatic test in pounds per square inch (psi).

8. Projects constructed on or after January 4, 2014 must comply with changes to the Safe Drinking Water Act that reduce the maximum allowable lead content of pipes, pipe fittings, plumbing fittings, and fixtures to 0.25 percent.

9. The system must be designed to maintain a minimum pressure of 35 psi at all points within the distribution network at flow rates of at least 1.5 gallons per minute per connection. When the system is intended to provide firefighting capability, it must also be designed to maintain a minimum pressure of 20 psi under combined fire and drinking water flow conditions as required by 30 TAC §290.44(d).

10. The contractor shall install appropriate air release devices in the distribution system at all points where topography or other factors may create air locks in the lines. All vent openings to the atmosphere shall be covered with 16-mesh or finer, corrosion resistant screening material or an acceptable equivalent as required by 30 TAC §290.44(d)(1).

11. Pursuant to 30 TAC §290.44(d)(4), accurate water meters shall be provided. Service connections and meter locations should be shown on the plans.

12. Pursuant to 30 TAC §290.44(d)(5), sufficient valves and blowoffs to make repairs. The engineering report shall establish criteria for this design.

13. Pursuant to 30 TAC §290.44(d)(6), the system shall be designed to afford effective circulation of water with a minimum of dead ends. All dead-end mains shall be provided with acceptable flush valves and discharge piping. All dead-end lines less than two inches in diameter will not require flush valves if they end at a customer service. Where dead ends are necessary as a stage in the growth of the system, they shall be located and arranged to ultimately connect the ends to provide circulation.

14. The contractor shall maintain a minimum separation distance in all directions of nine feet between the proposed waterline and wastewater collection facilities including manholes and septic tank drainfields. If this distance cannot be maintained, the contractor must immediately notify the project engineer for further direction. Separation distances, installation methods, and materials utilized must meet 30 TAC §290.44(e)(1-4) of the current rules.

15. Pursuant to 30 TAC §290.44(e)(5), the separation distance from a potable waterline to a wastewater main or lateral manhole or cleanout shall be a minimum of nine feet. Where the nine-foot separation distance cannot be achieved, the potable waterline shall be encased in a joint of at least 150 psi pressure class pipe at least 18 feet long and two nominal sizes larger than the new conveyance. The space around the carrier pipe shall be supported at five-foot intervals with spacers or be filled to the springline with washed sand. The encasement pipe shall be centered on the crossing and both ends sealed with cement grout or manufactured sealant.

16. Pursuant to 30 TAC §290.44(e)(6), fire hydrants shall not be installed within nine feet vertically or horizontally of any wastewater line, wastewater lateral, or wastewater service line regardless of construction.

17. Pursuant to 30 TAC §290.44(e)(7), suction mains to pumping equipment shall not cross wastewater mains, wastewater laterals, or wastewater service lines. Raw water supply lines shall not be installed within five feet of any tile or concrete wastewater main, wastewater lateral, or wastewater service line.

18. Pursuant to 30 TAC §290.44(e)(8), waterlines shall not be installed closer than ten feet to septic tank drainfields.

19. Pursuant to 30 TAC §290.44(f)(1), the contractor shall not place the pipe in water or where it can be flooded with water or sewage during its storage or installation.

20. Pursuant to 30 TAC §290.44(f)(2), when waterlines are laid under any flowing or intermittent stream or semi-permanent body of water the water main shall be installed in a separate watertight pipe encasement. Valves must be provided on each side of the crossing with facilities to allow the underwater portion of the system to be isolated and tested.

21. The contractor shall disinfect the new water mains in accordance with AWWA Standard C-651 and then flush and sample the lines before being placed into service. Samples shall be collected for microbiological analysis to check the effectiveness of the disinfection procedure which shall be repeated if contamination persists. A minimum of one sample for each 1,000 feet of completed water line will be required or at the next available sampling point beyond 1,000 feet as designated by the design engineer, in accordance with 30 TAC §290.44(f)(3).

No.	REVISIONS	DATE	BY

Kimley»Horn
© 2024 KIMLEY-HORN AND ASSOCIATES, INC.
10814 JOLLYVILLE ROAD, CAMPUS IV, SUITE 200, AUSTIN, TX 78759
PHONE: 512-418-1771 FAX: 512-418-1791
WWW.KIMLEY-HORN.COM
TEXAS REGISTERED ENGINEERING FIRM F-928

STATE OF TEXAS
JOHN A. PICKENS
110631
LICENSED PROFESSIONAL ENGINEER
02/02/2024

KHA PROJECT 064461307
DATE DECEMBER 2023
SCALE: AS SHOWN
DESIGNED BY: RRJ
DRAWN BY: AJM
CHECKED BY: JAP

TCEQ NOTES

WOLF RANCH
SECTION 6G
CITY OF GEORGETOWN
WILLIAMSON COUNTY, TEXAS

SHEET NUMBER
4 OF 87

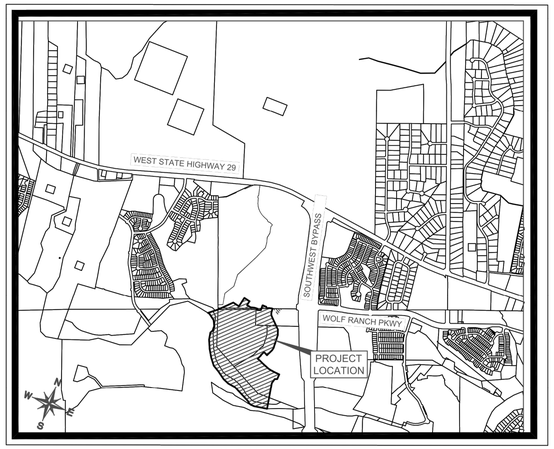
Plotted By: Castillo, Jaime Date: February 08, 2024 08:51:56am File Path: K:\AUS_Civil\064461307-Wolf Ranch Section 6G\Cad\PlanSheets\C-General Notes.dwg
This document, together with the concepts and designs presented herein, as an instrument of service, is intended only for the specific purpose and client for which it was prepared. Reuse of and improper reliance on this document without written authorization and adaptation by Kimley-Horn and Associates, Inc. shall be without liability to Kimley-Horn and Associates, Inc.

GENERAL NOTES

1. UTILITY PROVIDERS FOR THIS DEVELOPMENT ARE WATER: CITY OF GEORGETOWN, WASTEWATER/SEPTIC: CITY OF GEORGETOWN, AND ELECTRIC: PEDERNALES ELECTRIC COOPERATIVE.
2. ALL STRUCTURES/ OBSTRUCTIONS ARE PROHIBITED IN DRAINAGE EASEMENTS.
3. A PORTION OF THIS SUBDIVISION FALLS WITHIN THE 100-YEAR FLOODPLAIN AS DEFINED BY FIRM MAP NUMBER 48491C0290E, EFFECTIVE DATE SEPTEMBER 26, 2008.
4. PRIOR TO ANY CHANNEL ALTERATION OR BRIDGE CONSTRUCTION, WHICH WILL CHANGE EXISTING FLOOD PATTERNS OR ELEVATIONS, A LETTER OF MAP AMENDMENT MUST BE SUBMITTED TO THE CITY OF GEORGETOWN FLOODPLAIN ADMINISTRATOR FOR APPROVAL AND APPROVAL BY THE FEDERAL EMERGENCY MANAGEMENT AGENCY.
5. IN ORDER TO PROMOTE DRAINAGE AWAY FROM A STRUCTURE, THE SLAB ELEVATION SHOULD BE BUILT AT LEAST ONE-FOOT ABOVE THE SURROUNDING GROUND, AND THE GROUND SHOULD BE GRADED AWAY FROM THE STRUCTURE AT A SLOPE OF 1/2" PER FOOT FOR A DISTANCE OF AT LEAST 10 FEET.
6. ALL SEDIMENTATION, FILTRATION, DETENTION, AND/OR RETENTION BASINS AND RELATED APPURTENANCES SHOWN SHALL BE SITUATED WITHIN A DRAINAGE EASEMENT OR DRAINAGE LOT. THE OWNERS, HOA, OR ASSIGNEES OF THE TRACTS UPON WHICH ARE LOCATED SUCH EASEMENTS, APPURTENANCES, AND DETENTION FACILITIES SHALL MAINTAIN SAME AND BE RESPONSIBLE FOR THEIR MAINTENANCE, ROUTINE INSPECTION, AND UPKEEP.
7. PARKLAND DEDICATION REQUIREMENTS ARE BEING MET BY THE DEVELOPMENT AGREEMENT BETWEEN THE WOLF LEGACY, L.P. AND THE CITY OF GEORGETOWN, APPROVED BY THE CITY OF GEORGETOWN CITY COUNCIL ON AUGUST 12, 2014 AND EXECUTED ON AUGUST 26, 2014.
8. ANY HERITAGE TREE AS NOTED ON THIS PLAT IS SUBJECT TO EXHIBIT H-7 OF THE CITY GEORGETOWN ORDINANCE NO. 2018-026 AMENDING THE OFFICIAL ZONING MAP TO BE REZONED FROM AGRICULTURE (AG) DISTRICT TO PLANNED UNIT DEVELOPMENT (PUD) KNOWN AS WOLF RANCH HILLWOOD, APPROVED BY THE CITY OF GEORGETOWN CITY COUNCIL ON OCTOBER 23, 2018.
9. ALL INDIVIDUAL LOTS CONTAINING HERITAGE TREES ARE CONFIGURED AND DESIGNED SO THAT THE LOT IS DEVELOPABLE FOR THE INTENDED PURPOSE WITHOUT REQUIRING REMOVAL OF THE HERITAGE TREES OR EXCEEDING THE PERCENTAGE OF ALLOWABLE DISTURBANCE WITHIN THE HERITAGE TREES CRZ.
10. A 10-FOOT PUBLIC UTILITY EASEMENT IS RESERVED ALONG ALL STREET FRONTAGES WITHIN THIS PLAT.
11. THE MONUMENTS OF THIS PLAT HAVE BEEN ROTATED TO THE NAD 83/93 HARN-TEXAS CENTRAL ZONE AND NAVD 88.
12. THE MAXIMUM GROSS IMPERVIOUS COVER FOR THE PARCEL IS 50% PER RESPECTIVE EXHIBITS E AND H-3 OF THE DEVELOPMENT AGREEMENT BETWEEN THE WOLF LEGACY, L.P. AND THE CITY OF GEORGETOWN UNDER DOCUMENT NUMBER 2014095876, APPROVED BY THE CITY OF GEORGETOWN ON AUGUST 12, 2014 AND EXECUTED ON AUGUST 26, 2014. THE MAXIMUM IMPERVIOUS COVER PER RESIDENTIAL LOT IS 60% AND THE MAXIMUM IMPERVIOUS COVER PER OPEN SPACE LOT AND PARK LOT IS 5%.
13. THE LANDOWNER ASSUMES ALL RISKS ASSOCIATED WITH IMPROVEMENTS LOCATED IN THE RIGHT-OF-WAY, OR ROAD WIDENING EASEMENTS. BY PLACING ANYTHING IN THE RIGHT-OF-WAY OR ROAD WIDENING EASEMENTS, THE LANDOWNER INDEMNIFIES AND HOLDS THE CITY OF GEORGETOWN, WILLIAMSON COUNTY, THEIR OFFICERS, AGENTS AND EMPLOYEES HARMLESS FROM ANY LIABILITY OWING TO PROPERTY DEFECTS OR NEGLIGENCE NOT ATTRIBUTABLE TO THEM AND ACKNOWLEDGES THAT THE IMPROVEMENTS MAY BE REMOVED BY THE CITY AND/OR COUNTY AND THAT THE OWNER OF THE IMPROVEMENTS WILL BE RESPONSIBLE FOR THE RELOCATION AND/OR REPLACEMENT OF THE IMPROVEMENTS.
14. THE BUILDING OF ALL STREETS, ROADS, AND OTHER PUBLIC THOROUGHFARES AND ANY BRIDGES OR CULVERTS NECESSARY TO BE CONSTRUCTED OR PLACED IS THE RESPONSIBILITY OF THE OWNERS OF THE TRACT OF LAND COVERED BY THIS PLAT IN ACCORDANCE WITH THE PLANS AND SPECIFICATIONS PRESCRIBED BY THE CITY OF GEORGETOWN AND/OR WILLIAMSON COUNTY, TEXAS. NEITHER THE CITY OF GEORGETOWN NOR WILLIAMSON COUNTY ASSUMES ANY OBLIGATION TO BUILD ANY OF THE STREETS, ROADS, OR OTHER PUBLIC THOROUGHFARES SHOWN ON THIS PLAT OR OF CONSTRUCTING ANY OF THE BRIDGES OR DRAINAGE IMPROVEMENTS IN CONNECTION THEREWITH. NEITHER THE CITY OF GEORGETOWN NOR WILLIAMSON COUNTY ASSUMES ANY RESPONSIBILITY FOR DRAINAGE WAYS OR EASEMENTS IN THE SUBDIVISION, OTHER THAN THOSE DRAINING OR PROTECTING THE ROAD SYSTEM AND STREETS IN THEIR RESPECTIVE JURISDICTIONS.
15. NEITHER THE CITY OF GEORGETOWN NOR WILLIAMSON COUNTY ASSUMES ANY RESPONSIBILITY FOR THE ACCURACY OF REPRESENTATIONS BY OTHER PARTIES IN THIS PLAT. FLOODPLAIN DATA, IN PARTICULAR, MAY CHANGE DEPENDING ON SUBSEQUENT DEVELOPMENT. IT IS FURTHER UNDERSTOOD THAT THE OWNERS OF THE TRACT OF LAND COVERED BY THIS PLAT MUST INSTALL AT THEIR OWN EXPENSE ALL TRAFFIC CONTROL DEVICES AND SIGNAGE THAT MAY BE REQUIRED BEFORE THE STREETS IN THE SUBDIVISION HAVE FINALLY BEEN ACCEPTED FOR MAINTENANCE BY THE CITY AND/OR COUNTY.
16. RIGHT-OF-WAY EASEMENTS FOR WIDENING ROADWAYS OR IMPROVING DRAINAGE SHALL BE MAINTAINED BY THE LANDOWNER UNTIL ROAD OR DRAINAGE IMPROVEMENTS ARE ACTUALLY CONSTRUCTED ON THE PROPERTY. THE CITY AND/OR COUNTY HAVE THE RIGHT AT ANY TIME TO TAKE POSSESSION OF ANY ROAD WIDENING EASEMENT FOR CONSTRUCTION, IMPROVEMENT, OR MAINTENANCE OF THE ADJACENT ROAD.
17. THIS PLAT IS SUBJECT TO THE CITY OF GEORGETOWN WATER CONSERVATION ORDINANCE.
18. THE SUBDIVISION SUBJECT TO THIS APPLICATION IS SUBJECT TO THE WATER QUALITY REGULATIONS OF THE CITY OF GEORGETOWN. WATER QUALITY PONDS WITHIN THIS SUBDIVISION SHALL REMOVE 85% TSS.
19. A GEOLOGIC ASSESSMENT, IN ACCORDANCE WITH THE CITY OF GEORGETOWN WATER QUALITY REGULATIONS, WAS COMPLETED IN NOVEMBER OF 2013. ANY SPRINGS OR STREAMS AS IDENTIFIED IN THE GEOLOGIC ASSESSMENT ARE SHOWN HEREIN.
20. UNLESS OTHERWISE NOTED HEREIN, ALL EASEMENTS DEDICATED TO THE CITY OF GEORGETOWN BY THIS PLAT SHALL BE EXCLUSIVE TO THE CITY OF GEORGETOWN, AND GRANTOR COVENANTS THAT GRANTOR AND GRANTOR'S HEIRS, SUCCESSORS, AND ASSIGNS SHALL NOT CONVEY ANY OTHER EASEMENT, LICENSE, OR CONFLICTING RIGHT TO USE IN ANY MANNER, THE AREA (OR ANY PORTION THEREOF) COVERED BY THIS GRANT.
21. ALL EASEMENTS DEDICATED TO THE CITY OF GEORGETOWN BY THIS PLAT ADDITIONALLY INCLUDE THE FOLLOWING RIGHTS: (1) THE RIGHT OF THE CITY TO CHANGE THE SIZE OF ANY FACILITIES INSTALLED, MAINTAINED, OR OPERATED WITHIN THE EASEMENT AREA; (2) THE RIGHT OF THE CITY TO RELOCATE ANY FACILITIES WITHIN THE EASEMENT AREA; AND (3) THE RIGHT OF THE CITY TO REMOVE FROM THE EASEMENT AREA ALL TREES AND PARTS THEREOF, OR OTHER OBSTRUCTIONS, WHICH ENDANGER OR MAY INTERFERE WITH THE EFFICIENCY AND MAINTENANCE OF ANY FACILITIES WITHIN THE EASEMENT AREA.
22. STATE-OWNED RIVERBEDS AND BEDS OF NAVIGABLE STREAMS IN THE PUBLIC DOMAIN ARE HELD IN TRUST FOR THE PUBLIC. THERE IS HEREBY GRANTED FOR THE USE AND BENEFIT OF THE PUBLIC A CONTINUING ACCESS EASEMENT FOR THE FREE AND UNOBSTRUCTED USE OF THE NAVIGABLE RIVER AND THE RIGHT OF PORTAGE ALONG ITS BANKS, ACROSS ANY PORTION OF THE PROPERTY BETWEEN THE MEAN HIGH-WATER MARKS OF THE RIVER IN ITS NATURAL STATE.

STREET SUMMARY TABLE

STREET NAME	STREET TYPE	ROW	FOC-FOC	CURB TYPE	CLEAR ZONE	DESIGN SPEED (MPH)
CRIMSON SUNSET DRIVE	LOCAL STREET	50'	27'	VERTICAL	5'	20-30 MPH PER PUD
CRIMSON SUNSET COVE	LOCAL STREET	50'	27'	VERTICAL	5'	20-30 MPH PER PUD
MORNING MIST DRIVE	LOCAL STREET	50'	27'	VERTICAL	5'	20-30 MPH PER PUD
LOOKOUT MOUNTAIN ROAD	LOCAL STREET	50'	27'	VERTICAL	5'	20-30 MPH PER PUD
DOUBLE SPUR TRAIL	LOCAL STREET	50'	27'	VERTICAL	5'	20-30 MPH PER PUD
SUNDOWN TRAIL	LOCAL STREET	50'	27'	VERTICAL	5'	20-30 MPH PER PUD
SUMMER MOON DRIVE	LOCAL STREET	50'	27'	VERTICAL	5'	20-30 MPH PER PUD



VICINITY MAP

SCALE: 1" = 2,000'

Informational: tree preservation is due prior to final acceptance of the project show plantings, deep root invigoration, credit trees 8.02.040 Mitigation inches for these items as shown with this draft

SHEET INDEX

SHEET NO.	DESCRIPTION
1	COVER SHEET
2	OVERALL PRELIMINARY PLAN
3	PRELIMINARY PLAN (SHEET 1 OF 3)
4	PRELIMINARY PLAN (SHEET 2 OF 3)
5	PRELIMINARY PLAN (SHEET 3 OF 3)
6	LEGAL DESCRIPTION (SHEET 1 OF 2)
7	LEGAL DESCRIPTION (SHEET 2 OF 2)

PARKLAND DEDICATION TABLE

SECTION	PROPOSED DEDICATION
5G	23.63 ACRES (8.0 ACRES OUTSIDE 100-YR FLOODPLAIN)
6G	0. ACRES
7	0 ACRES
8	0 ACRES
TOTAL	23.63 ACRES (8.0 ACRES OUTSIDE 100-YR FLOODPLAIN)
REQUIRED	23.00 ACRES (3.0 ACRES OUTSIDE 100-YR FLOODPLAIN)

GENERAL INFORMATION:

TOTAL BLOCKS.....7
TOTAL SINGLE FAMILY LOTS.....117
TOTAL OPEN SPACE LOTS.....3
TOTAL M.U.D. MAINTAINED WATER QUALITY/
DETENTION & OPEN SPACE LOTS.....2
TOTAL LOTS.....122
TOTAL PHASES.....1

APPROVALS/REVISIONS/CORRECTIONS

NO.	DESCRIPTION	SUBMITTAL DATE	APPROVAL DATE	

GEORGETOWN TEXAS

Approved by the City of Georgetown according to UDC Sec 2.01.020 on:

12-18-2023

Per Section 3.08.070.E of the Unified Development Code, this Preliminary Plat will expire on 12-18-2025 if a Final Plat is not recorded.

For Review:

This document is released for the purpose of review under the authority of John Pickens, Professional Engineer No. 110631 on XX/XX/2023. It is not to be used for bidding, permit or construction.

WOLF RANCH WEST SECTION 6G PRELIMINARY PLAT

A SUBDIVISION OF 89.416 ACRES IN THE
I. DONAGAN SURVEY, ABSTRACT 178 &
J. THOMPSON SURVEY, ABSTRACT 608
CITY OF GEORGETOWN,
WILLIAMSON COUNTY, TEXAS
SUBMITTAL DATE: 08/21/2023

OWNERS:
H4 GEORGETOWN, LP
H4 GEORGETOWN PHASE 1, LLC
129 CANYON VIEW ROAD
GEORGETOWN, TX 78628
(662) 816-2787

APPLICANT:
KIMLEY-HORN AND ASSOCIATES, INC.
10814 JOLLYVILLE ROAD, CAMPUS IV, SUITE 200
AUSTIN, TEXAS 78759
TBPE FIRM REGISTRATION NO. F-928
PH: (512) 782-0614
CONTACT: JOHN PICKENS P.E.

SURVEYOR:
KIMLEY-HORN AND ASSOCIATES, INC.
10814 JOLLYVILLE ROAD, AVALLON IV, SUITE 200
AUSTIN, TEXAS 78759
TBPE FIRM REGISTRATION NO. F-928
PH: (512) 886-4146
CONTACT: MICHEAL MONTGOMERY P.E.

CIVIL ENGINEER:
KIMLEY-HORN AND ASSOCIATES, INC.
10814 JOLLYVILLE ROAD, AVALLON IV, SUITE 200
AUSTIN, TEXAS 78759
TBPE FIRM REGISTRATION NO. F-928
PH: (512) 720-5466
CONTACT: JOHN PICKENS P.E.

Kimley»Horn

Scale	Drawn by	Checked by	Date	KHA Project No.	Sheet No.
	AJM	JAP	AUGUST 2023	064461307	1 OF 7

City Project Number: 2023-28-PP

Copyright © 2023
Kimley-Horn and Associates, Inc.
All rights reserved

DWG NAME: C:\USERS\JOHN.PICKENS\ONEDRIVE - KHDESKTOP\WOLF RANCH 6G PP\PRELIMINARY\PLANSHEETS\C - COVER SHEET.DWG PLOTTED BY PICKENS, JOHN 11/5/2023 11:40 PM LAST SAVED 11/5/2023 11:40 PM

No.	REVISIONS	DATE	BY

Kimley»Horn
© 2024 KIMLEY-HORN AND ASSOCIATES, INC.
10814 JOLLYVILLE ROAD, CAMPUS IV, SUITE 200, AUSTIN, TX 78759
PHONE: 512-418-1771 FAX: 512-418-1791
WWW.KIMLEY-HORN.COM
TEXAS REGISTERED ENGINEERING FIRM F-928

JOHN A. PICKENS
110631
LICENSED
PROFESSIONAL ENGINEER
02/02/2024

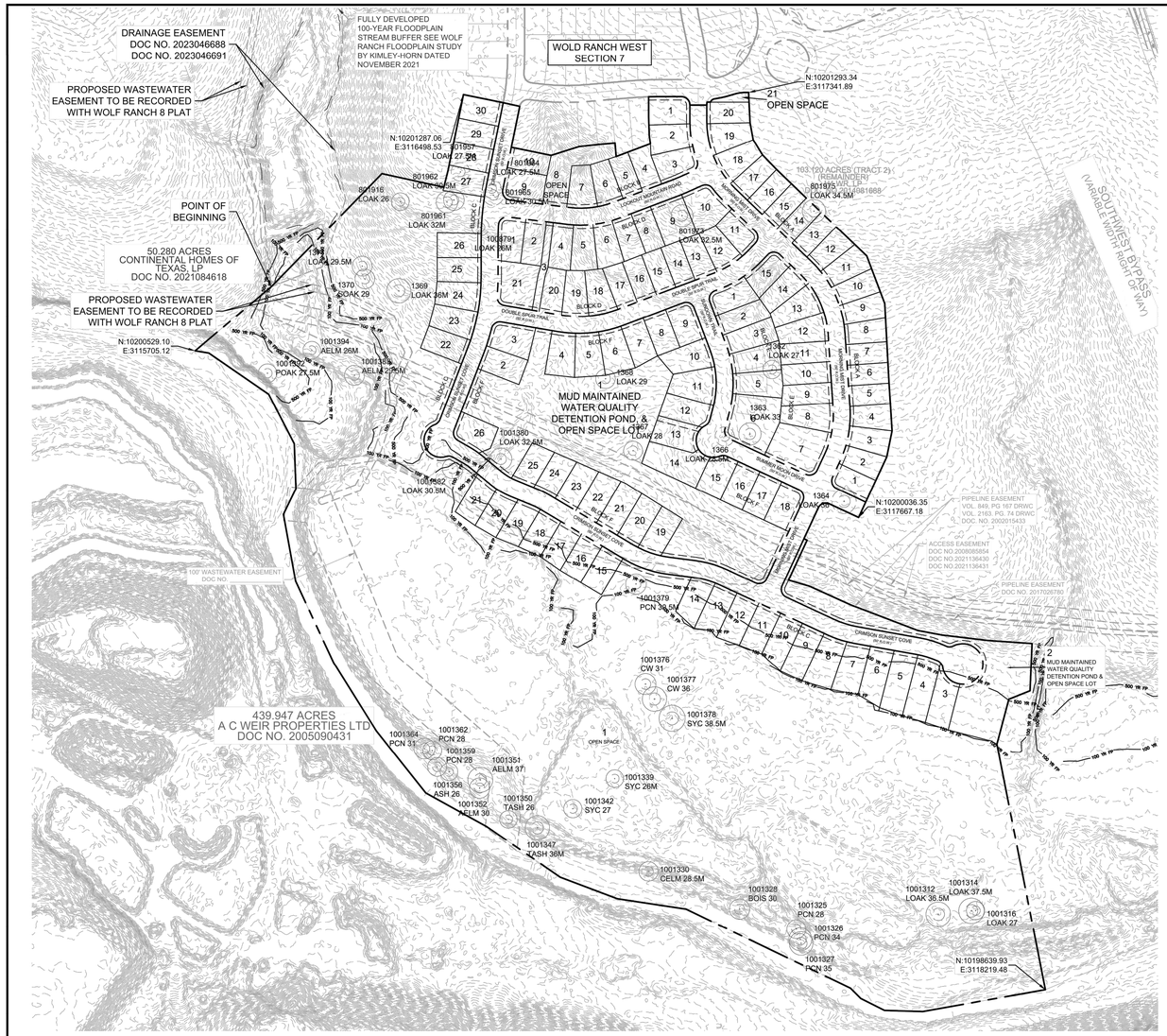
KHA PROJECT 064461307
DATE DECEMBER 2023
SCALE: AS SHOWN
DESIGNED BY: RRJ
DRAWN BY: AJM
CHECKED BY: JAP

PRELIMINARY PLAT
(1 OF 7)

WOLF RANCH
SECTION 6G
CITY OF GEORGETOWN
WILLIAMSON COUNTY, TEXAS

SHEET NUMBER
5 OF 87

Plotted By:Castillo, Jaime Date:February 08, 2024 08:52:03am File Path:K:\AUS_Civil\064461307-Wolf Ranch Section 6G\Cad\PlanSheets\C-Preliminary Plat (1 of 7).dwg
This document, together with the concepts and designs presented herein, as an instrument of service, is intended only for the specific purpose and client for which it was prepared. Reuse of and improper reliance on this document without written authorization and adaptation by Kimley-Horn and Associates, Inc. shall be without liability to Kimley-Horn and Associates, Inc.



Copyright © 2023
Kimley-Horn and Associates, Inc.
All rights reserved

N
W E
S

0 200' 400'
GRAPHIC SCALE 200' @ 24X18

LEGEND

IRSC	1/2" IRON ROD W/ "KHA" CAP SET
IRFC	1/2" IRON ROD FOUND W/ CAP
OPRWC	OFFICIAL PUBLIC RECORDS OF WILLIAMSON COUNTY TEXAS
P.O.C.	POINT OF COMMENCING
P.O.B.	POINT OF BEGINNING
ROW	RIGHT OF WAY
D.E.	DRAINAGE EASEMENT
S.D.E.	SIGHT DISTANCE EASEMENT
W.W.E.	WASTEWATER EASEMENT
B.L.	BUILDING LINE
	SIDEWALK
	P.U.E PUBLIC UTILITY EASEMENT
	PHASE LINE/MATCH LINE
A	BLOCK LABEL
	HERITAGE TREE TO BE REMOVED
	HERITAGE TREE TO REMAIN

WOLF RANCH WEST SECTION 6G
PRELIMINARY PLAT

A SUBDIVISION OF 92.541 ACRES IN THE
I. DONAGAN SURVEY, ABSTRACT 178 &
J. THOMPSON SURVEY, ABSTRACT 608
CITY OF GEORGETOWN,
WILLIAMSON COUNTY, TEXAS
SUBMITTAL DATE: 08/21/2023

Kimley»Horn

Scale	Drawn by	Checked by	Date	KHA Project No.	Sheet No.
1"=200'	AJM	JAP	AUGUST 2023	064461307	2 OF #

City Project Number: 2022-21-CON

DWG NAME: C:\USERS\JOHN.PICKENS\ONEDRIVE - KHA\DESKTOP\WOLF RANCH 6G PP\PRELIMINARY\PLANSHEETS\C- OVERALL PRELIMINARY PLAN.DWG PLOTTED BY PICKENS, JOHN 12/8/2023 11:25 AM LAST SAVED 11/5/2023 11:00 PM

No.	REVISIONS	DATE	BY

Kimley»Horn
© 2024 KIMLEY-HORN AND ASSOCIATES, INC.
10814 JOLLYVILLE ROAD, CAMPUS IV, SUITE 200, AUSTIN, TX 78759
PHONE: 512-418-1771 FAX: 512-418-1791
WWW.KIMLEY-HORN.COM
TEXAS REGISTERED ENGINEERING FIRM F-928

STATE OF TEXAS
JOHN A. PICKENS
110631
LICENSED
PROFESSIONAL ENGINEER
02/02/2024

KHA PROJECT 064461307	
DATE DECEMBER 2023	
SCALE:	AS SHOWN
DESIGNED BY:	RRJ
DRAWN BY:	AJM
CHECKED BY:	JAP

PRELIMINARY PLAT
(2 OF 7)

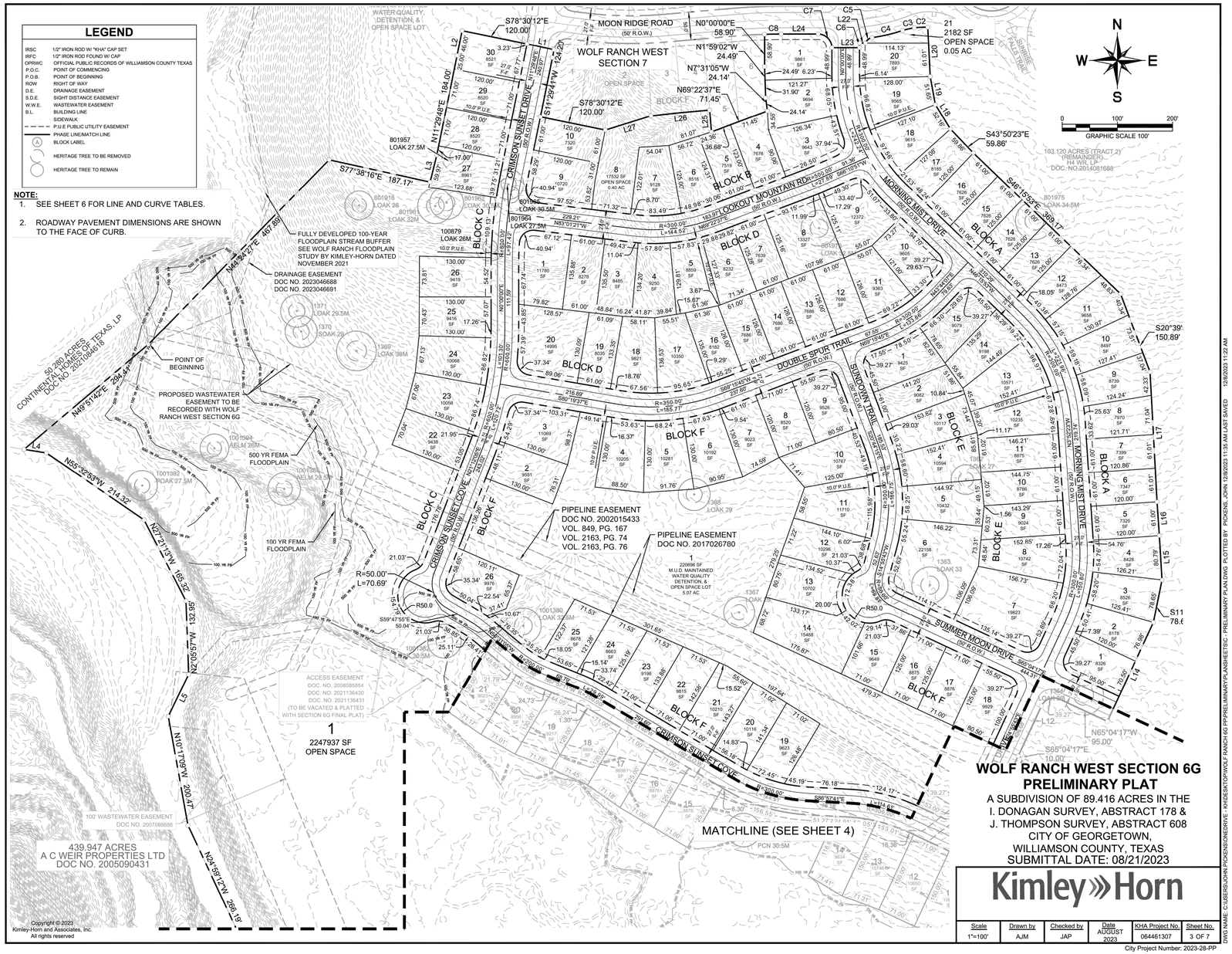
WOLF RANCH
SECTION 6G
CITY OF GEORGETOWN
WILLIAMSON COUNTY, TEXAS

BENCHMARKS

ADD BENCHMARKS HERE

SHEET NUMBER
6 OF 87

Plotted By:Castillo, Jaime Date:February 08, 2024 08:52:11am File Path:K:\AUS_Civil\064461307-Wolf Ranch, Section 6G\Cad\PlanSheets\C-Preliminary Plat (2 of 7).dwg
This document, together with the concepts and designs presented herein, as an instrument of service, is intended only for the specific purpose and client for which it was prepared. Reuse of and improper reliance on this document without written authorization and adaptation by Kimley-Horn and Associates, Inc. shall be without liability to Kimley-Horn and Associates, Inc.



WOLF RANCH WEST SECTION 6G
PRELIMINARY PLAT

A SUBDIVISION OF 89.416 ACRES IN THE I. DONAGAN SURVEY, ABSTRACT 178 & J. THOMPSON SURVEY, ABSTRACT 608
CITY OF GEORGETOWN, WILLIAMSON COUNTY, TEXAS
SUBMITTAL DATE: 08/21/2023

Kimley»Horn

Scale	Drawn by	Checked by	Date	KHA Project No.	Sheet No.
1"=100'	AJM	JAP	AUGUST 2023	064461307	3 OF 7

City Project Number: 2023-28-PP

DWG NAME: C:\USERS\JOHN.PICKENS\ONEDRIVE - KHCESKTOP\WOLF RANCH 6G PP\PRELIMINARY\PLANSHEETS\C - PRELIMINARY PLAN.DWG PLOTTED BY PICKENS, JOHN 12/8/2023 11:35 AM LAST SAVED 12/8/2023 11:22 AM

No.	REVISIONS	DATE	BY

Kimley»Horn
© 2024 KIMLEY-HORN AND ASSOCIATES, INC.
10814 JOLLYVILLE ROAD, CAMPUS IV, SUITE 200, AUSTIN, TX 78759
PHONE: 512-418-1771 FAX: 512-418-1791
WWW.KIMLEY-HORN.COM
TEXAS REGISTERED ENGINEERING FIRM F-928

JOHN A. PICKENS 110631 LICENSED COMMONWEALTH OF VIRGINIA
02/02/2024

KHA PROJECT	064461307
DATE	DECEMBER 2023
SCALE:	AS SHOWN
DESIGNED BY:	RRJ
DRAWN BY:	AJM
CHECKED BY:	JAP

PRELIMINARY PLAT (3 OF 7)

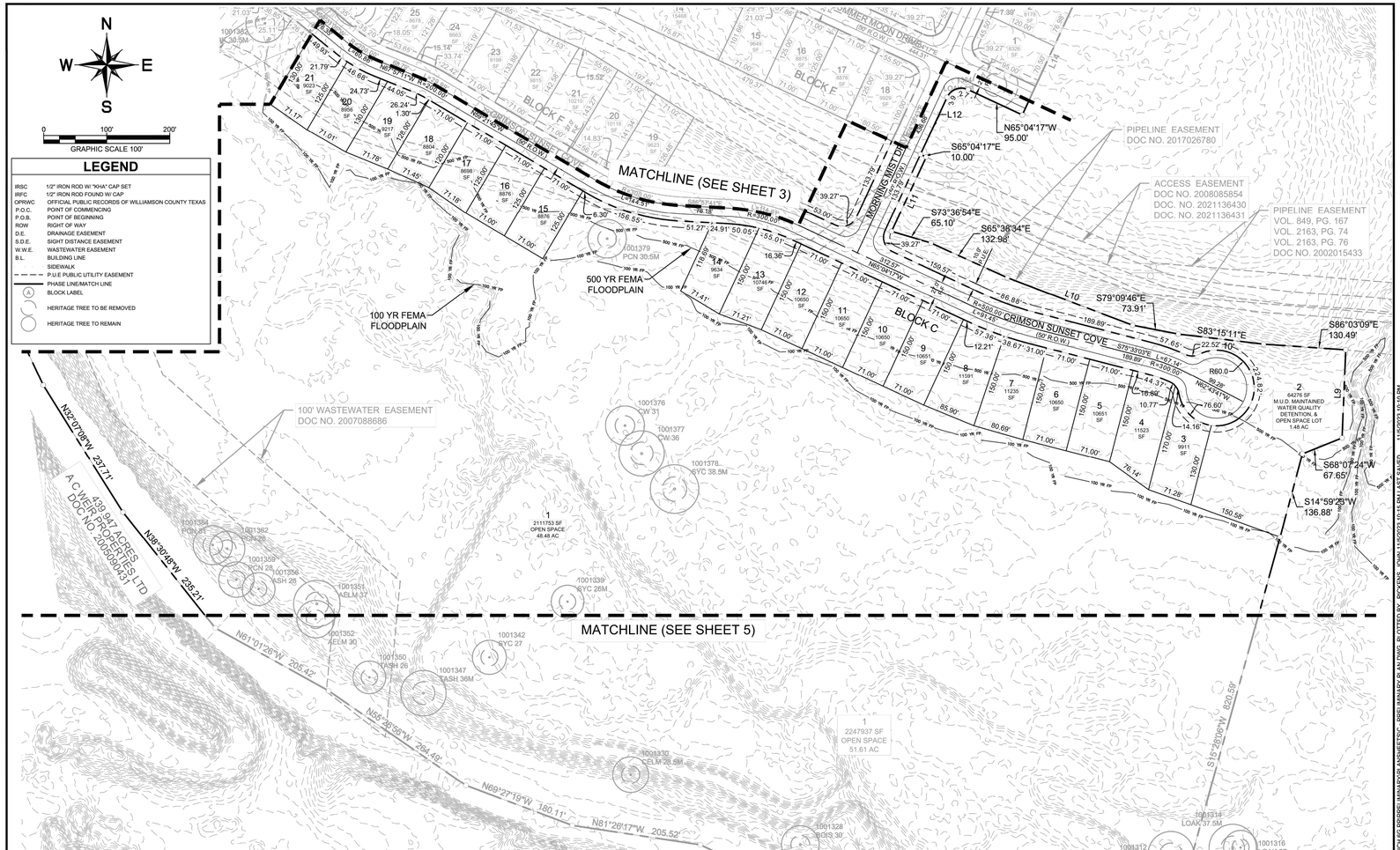
WOLF RANCH
SECTION 6G
CITY OF GEORGETOWN
WILLIAMSON COUNTY, TEXAS

BENCHMARKS

ADD BENCHMARKS HERE

SHEET NUMBER
7 OF 87

Plotted By:Castillo, Jaime Date:February 08, 2024 08:52:23am File Path:K:\AUS_Civil\064461307-Wolf Ranch, Section 6G\Cad\PlanSheets\C-Preliminary Plat (3 of 7).dwg
This document, together with the concepts and designs presented herein, as an instrument of service, is intended only for the specific purpose and client for which it was prepared. Reuse of and improper reliance on this document without written authorization and adaptation by Kimley-Horn and Associates, Inc. shall be without liability to Kimley-Horn and Associates, Inc.



NOTE:

1. SEE SHEET 6 FOR LINE AND CURVE TABLES.
2. ROADWAY PAVEMENT DIMENSIONS ARE SHOWN TO THE FACE OF CURB.

WOLF RANCH WEST SECTION 6G PRELIMINARY PLAT

A SUBDIVISION OF 89.416 ACRES IN THE
I. DONAGAN SURVEY, ABSTRACT 178 &
J. THOMPSON SURVEY, ABSTRACT 608
CITY OF GEORGETOWN,
WILLIAMSON COUNTY, TEXAS
SUBMITTAL DATE: 08/21/2023

Kimley»Horn

Scale	Drawn by	Checked by	Date	KHA Project No.	Sheet No.
1"=100'	AJM	JAP	AUGUST 2023	064461307	4 OF 7

City Project Number: 2023-28-PP

Copyright © 2023
Kimley-Horn and Associates, Inc.
All rights reserved

DWG NAME: C:\USERS\JOHN.PICKENS\ONEDRIVE - KHDESK\TOP\WOLF RANCH 6G PP\PRELIMINARY\PLANSHEETS\C-PRELIMINARY PLAN.DWG PLOTTED BY: PICKENS, JOHN | 11/30/2023 10:10 PM LAST SAVED 11/30/2023 10:10 PM

No.	REVISIONS	DATE	BY

Kimley»Horn

© 2024 KIMLEY-HORN AND ASSOCIATES, INC.
10814 JOLLYVILLE ROAD, CAMPUS IV, SUITE 200, AUSTIN, TX 78759
PHONE: 512-418-1771 FAX: 512-418-1791
WWW.KIMLEY-HORN.COM
TEXAS REGISTERED ENGINEERING FIRM F-928

STATE OF TEXAS
JOHN A. PICKENS
110631
LICENSED
PROFESSIONAL ENGINEER

02/02/2024

KHA PROJECT 064461307
DATE DECEMBER 2023
SCALE: AS SHOWN
DESIGNED BY: RRJ
DRAWN BY: AJM
CHECKED BY: JAP

PRELIMINARY PLAT
(4 OF 7)

WOLF RANCH
SECTION 6G
CITY OF GEORGETOWN
WILLIAMSON COUNTY, TEXAS

BENCHMARKS

ADD BENCHMARKS HERE

SHEET NUMBER
8 OF 87

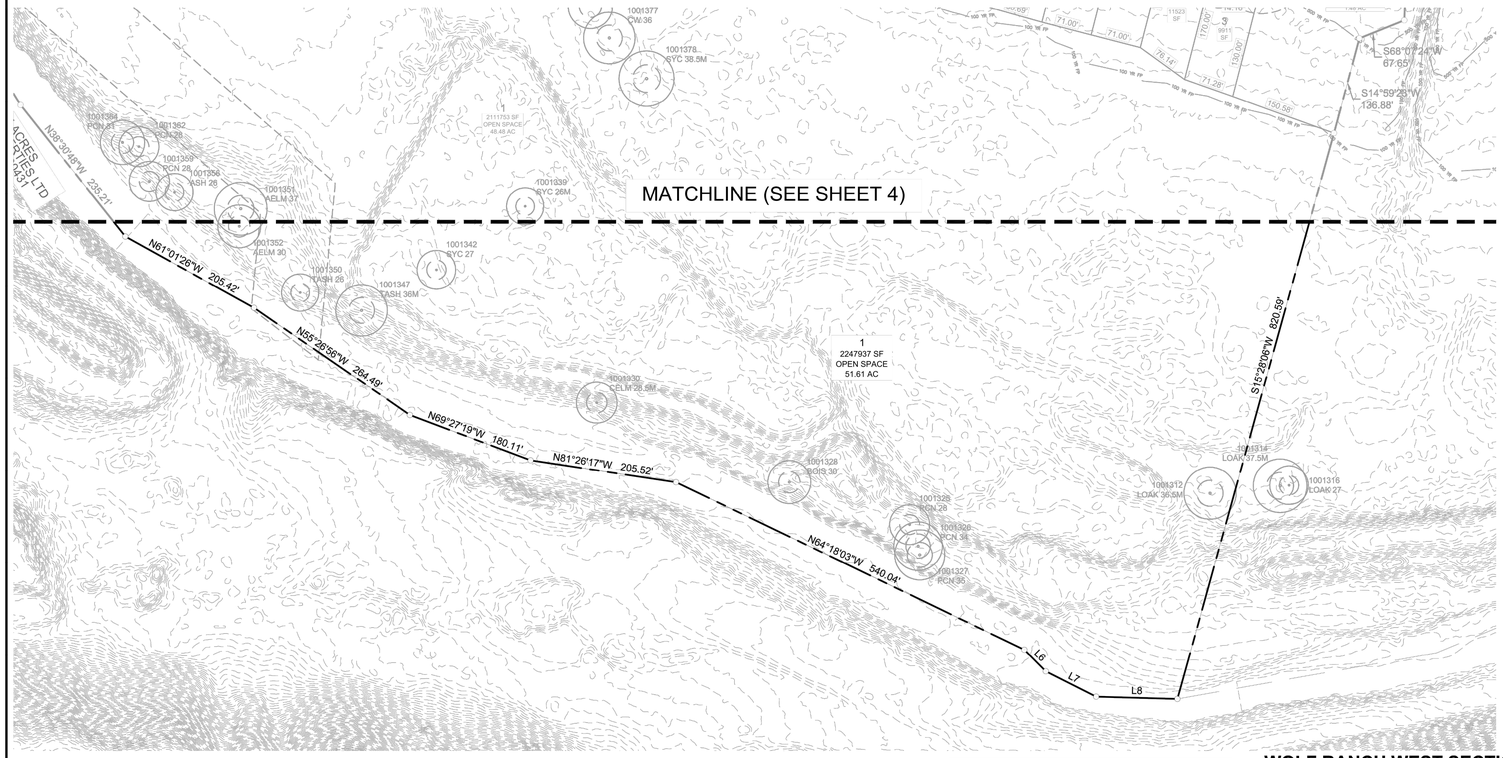
Plotted By:Castillo, Jaime Date:February 08, 2024 08:52:33am File Path:K:\AUS_Civil\064461307-Wolf Ranch Section 6G\Cad\PlanSheets\C-Preliminary Plat (4 of 7).dwg
This document, together with the concepts and designs presented herein, as an instrument of service, is intended only for the specific purpose and client for which it was prepared. Reuse of and improper reliance on this document without written authorization and adaptation by Kimley-Horn and Associates, Inc. shall be without liability to Kimley-Horn and Associates, Inc.

N
W E
S

0 100' 200'
GRAPHIC SCALE 100'

LEGEND

IRSC	1/2" IRON ROD W/ "KHA" CAP SET
IRFC	1/2" IRON ROD FOUND W/ CAP
OPRWC	OFFICIAL PUBLIC RECORDS OF WILLIAMSON COUNTY TEXAS
P.O.C.	POINT OF COMMENCING
P.O.B.	POINT OF BEGINNING
ROW	RIGHT OF WAY
D.E.	DRAINAGE EASEMENT
S.D.E.	SIGHT DISTANCE EASEMENT
W.W.E.	WASTEWATER EASEMENT
B.L.	BUILDING LINE
	SIDEWALK
	P.U.E PUBLIC UTILITY EASEMENT
	PHASE LINE/MATCH LINE
A	BLOCK LABEL
	HERITAGE TREE TO BE REMOVED
	HERITAGE TREE TO REMAIN



NOTE:
1. SEE SHEET 6 FOR LINE AND CURVE TABLES.
2. ROADWAY PAVEMENT DIMENSIONS ARE SHOWN TO THE FACE OF CURB.

WOLF RANCH WEST SECTION 6G
PRELIMINARY PLAT

A SUBDIVISION OF 89.416 ACRES IN THE
I. DONAGAN SURVEY, ABSTRACT 178 &
J. THOMPSON SURVEY, ABSTRACT 608
CITY OF GEORGETOWN,
WILLIAMSON COUNTY, TEXAS
SUBMITTAL DATE: 08/21/2023

Kimley»Horn

Scale	Drawn by	Checked by	Date	KHA Project No.	Sheet No.
1"=100'	AJM	JAP	AUGUST 2023	064461307	5 OF 7

City Project Number: 2023-28-PP

Copyright © 2023
Kimley-Horn and Associates, Inc.
All rights reserved

DWG NAME: C:\USERS\JOHN.PICKENS\ONEDRIVE - KHI\DESKTOP\WOLF RANCH 6G PP\PRELIMINARY\PLANSHEETS\C - PRELIMINARY PLAN.DWG PLOTTED BY PICKENS, JOHN 11/5/2023 10:06 PM LAST SAVED 11/5/2023 9:20 PM

No.	REVISIONS	DATE	BY

Kimley»Horn
© 2024 KIMLEY-HORN AND ASSOCIATES, INC.
10814 JOLLYVILLE ROAD, CAMPUS IV, SUITE 200, AUSTIN, TX 78759
PHONE: 512-418-1771 FAX: 512-418-1791
WWW.KIMLEY-HORN.COM
TEXAS REGISTERED ENGINEERING FIRM F-928

STATE OF TEXAS
JOHN A. PICKENS
110631
LICENSED
PROFESSIONAL ENGINEER
02/02/2024

KHA PROJECT 064461307
DATE DECEMBER 2023
SCALE: AS SHOWN
DESIGNED BY: RRJ
DRAWN BY: AJM
CHECKED BY: JAP

PRELIMINARY PLAT
(5 OF 7)

WOLF RANCH
SECTION 6G
CITY OF GEORGETOWN
WILLIAMSON COUNTY, TEXAS

BENCHMARKS
ADD BENCHMARKS HERE

SHEET NUMBER
9 OF 87

Plotted By:Castillo, Jaime Date:February 08, 2024 08:52:40am File Path:K:\AUS_Civil\064461307-Wolf Ranch Section 6G\Cad\PlanSheets\C-Preliminary Plat (5 of 7).dwg
This document, together with the concepts and designs presented herein, as an instrument of service, is intended only for the specific purpose and client for which it was prepared. Reuse of and improper reliance on this document without written authorization and adaptation by Kimley-Horn and Associates, Inc. shall be without liability to Kimley-Horn and Associates, Inc.

LEGAL DESCRIPTION:
TRACT 1 - 89.416 ACRES

BEING A 89.416 ACRES TRACT OF LAND SITUATED IN BOTH THE ISAAC DONAGAN SURVEY, ABSTRACT 178, AND THE JOSEPH THOMAS SURVEY, ABSTRACT 608, WILLIAMSON COUNTY, TEXAS; AND BEING ALL OF A CALLED 37.814 ACRES TRACT OF LAND AND A PORTION OF A CALLED 64.920 ACRES TRACT OF LAND DESCRIBED TO H4 GEORGETOWN PHASE 1, LLC AS SHOWN ON INSTRUMENT RECORDED UNDER DOCUMENT NO. 2020157115, A PORTION OF A CALLED 97.122 ACRES TRACT OF LAND, DESCRIBED TO H4 GEORGETOWN, LP AS SHOWN ON INSTRUMENT RECORDED UNDER DOCUMENT NO. 2022006590, A PORTION OF A REMAINDER OF A CALLED 128.974 ACRES TRACT OF LAND, DESCRIBED TO H4 GEORGETOWN, LP AS SHOWN ON INSTRUMENT RECORDED UNDER DOCUMENT NO. 2018054155, ALL OF THE OFFICIAL PUBLIC RECORDS OF WILLIAMSON COUNTY, TEXAS (O.P.R.W.C.T); AND BEING MORE PARTICULARLY DESCRIBED AS FOLLOWS

BEGINNING AT A 1/2" IRON ROD WITH PLASTIC SURVEYOR'S CAP STAMPED "KHA" SET AT THE NORTHWEST CORNER OF SAID 37.814 ACRES TRACT, THE SOUTHWEST CORNER OF SAID 97.122 ACRES TRACT, THE SOUTHEAST CORNER OF A CALLED 64.275 ACRES TRACT OF LAND DESCRIBED TO CONTINENTAL HOMES OF TEXAS, L.P. AS SHOWN ON INSTRUMENT RECORDED UNDER DOCUMENT NO. 2021084618 OF SAID (O.P.R.W.C.T.);

THENCE, OVER AND ACROSS SAID 97.122 ACRES TRACT, AND SAID 64.920 ACRES TRACT, AND SAID REMAINDER OF THE 128.974 ACRES TRACT, THE FOLLOWING FIFTY-SIX (56) COURSES AND DISTANCES:

1. NORTH 44°24'27" EAST, A DISTANCE OF 467.89 FEET TO A 1/2-INCH IRON ROD WITH PLASTIC CAP STAMPED "KHA" SET,
2. SOUTH 77°38'16" EAST, A DISTANCE OF 187.17 FEET TO A 1/2-INCH IRON ROD WITH PLASTIC CAP STAMPED "KHA" SET,
3. NORTH 14°09'04" EAST, A DISTANCE OF 50.12 FEET TO A 1/2-INCH IRON ROD WITH PLASTIC CAP STAMPED "KHA" SET,
4. NORTH 11°29'48" EAST, A DISTANCE OF 184.00 FEET TO A 1/2-INCH IRON ROD WITH PLASTIC CAP STAMPED "KHA" SET,
5. NORTH 11°29'14" EAST, A DISTANCE OF 46.00 FEET TO A 1/2-INCH IRON ROD WITH PLASTIC CAP STAMPED "KHA" SET,
6. SOUTH 78°30'12" EAST, A DISTANCE OF 120.00 FEET TO A 1/2-INCH IRON ROD WITH PLASTIC CAP STAMPED "KHA" SET,
7. SOUTH 77°41'22" EAST, A DISTANCE OF 50.01 FEET TO A 1/2-INCH IRON ROD WITH PLASTIC CAP STAMPED "KHA" SET FOR THE BEGINNING OF A CURVE,
8. IN A SOUTHWESTERLY DIRECTION, ALONG SAID CURVE TO THE RIGHT A DISTANCE OF 2.52 FEET, WITH A CENTRAL ANGLE OF 00°11'58", A RADIUS OF 725.00 FEET, AND A CHORD BEARING AND DISTANCE OF SOUTH 11°23'50" WEST, 2.52 FEET, TO A 1/2-INCH IRON ROD WITH PLASTIC CAP STAMPED "KHA" SET,
9. SOUTH 11°29'48" WEST, A DISTANCE OF 121.68 FEET TO A 1/2-INCH IRON ROD WITH PLASTIC CAP STAMPED "KHA" SET,
10. SOUTH 78°30'12" EAST, A DISTANCE OF 120.00 FEET TO A 1/2-INCH IRON ROD WITH PLASTIC CAP STAMPED "KHA" SET,
11. NORTH 72°38'55" EAST, A DISTANCE OF 86.70 FEET TO A 1/2-INCH IRON ROD WITH PLASTIC CAP STAMPED "KHA" SET,
12. NORTH 83°50'52" EAST, A DISTANCE OF 55.70 FEET TO A 1/2-INCH IRON ROD WITH PLASTIC CAP STAMPED "KHA" SET,
13. NORTH 85°02'31" EAST, A DISTANCE OF 51.00 FEET TO A 1/2-INCH IRON ROD WITH PLASTIC CAP STAMPED "KHA" SET,
14. SOUTH 04°57'29" EAST, A DISTANCE OF 39.82 FEET TO A 1/2-INCH IRON ROD WITH PLASTIC CAP STAMPED "KHA" SET,
15. NORTH 69°22'37" EAST, A DISTANCE OF 108.13 FEET TO A 1/2-INCH IRON ROD WITH PLASTIC CAP STAMPED "KHA" SET,
16. NORTH 07°31'05" WEST, A DISTANCE OF 24.14 FEET TO A 1/2-INCH IRON ROD WITH PLASTIC CAP STAMPED "KHA" SET,
17. NORTH 01°59'02" WEST, A DISTANCE OF 56.39 FEET TO A 1/2-INCH IRON ROD WITH PLASTIC CAP STAMPED "KHA" SET,
18. NORTH 00°00'00" EAST, A DISTANCE OF 58.90 FEET TO A 1/2-INCH IRON ROD WITH PLASTIC CAP STAMPED "KHA" SET FOR THE BEGINNING OF A CURVE,
19. IN A NORTHEASTERLY DIRECTION, ALONG SAID CURVE TO THE RIGHT A DISTANCE OF 30.04 FEET, WITH A CENTRAL ANGLE OF 01°45'54", A RADIUS OF 975.00 FEET, AND A CHORD BEARING AND DISTANCE OF NORTH 89°07'03" EAST, 30.03 FEET, TO A 1/2-INCH IRON ROD WITH PLASTIC CAP STAMPED "KHA" SET,
20. NORTH 90°00'00" EAST, A DISTANCE OF 66.97 FEET TO A 1/2-INCH IRON ROD WITH PLASTIC CAP STAMPED "KHA" SET FOR THE BEGINNING OF A CURVE,
21. IN A SOUTHEASTERLY DIRECTION, ALONG SAID CURVE TO THE RIGHT A DISTANCE OF 39.27 FEET, WITH A CENTRAL ANGLE OF 90°00'00", A RADIUS OF 25.00 FEET, AND A CHORD BEARING AND DISTANCE OF SOUTH 45°00'00" EAST, 35.36 FEET, TO A 1/2-INCH IRON ROD WITH PLASTIC CAP STAMPED "KHA" SET,
22. NORTH 90°00'00" EAST, A DISTANCE OF 50.00 FEET TO A 1/2-INCH IRON ROD WITH PLASTIC CAP STAMPED "KHA" SET,
23. NORTH 00°00'00" EAST, A DISTANCE OF 3.63 FEET TO A 1/2-INCH IRON ROD WITH PLASTIC CAP STAMPED "KHA" SET FOR THE BEGINNING OF A CURVE,
24. IN A NORTHEASTERLY DIRECTION, ALONG SAID CURVE TO THE RIGHT A DISTANCE OF 5.08 FEET, WITH A CENTRAL ANGLE OF 11°38'14", A RADIUS OF 25.00 FEET, AND A CHORD BEARING AND DISTANCE OF NORTH 05°49'07" EAST, 5.07 FEET, TO A 1/2-INCH IRON ROD WITH PLASTIC CAP STAMPED "KHA" SET,
25. NORTH 90°00'00" EAST, A DISTANCE OF 10.36 FEET TO A 1/2-INCH IRON ROD WITH PLASTIC CAP STAMPED "KHA" SET FOR THE BEGINNING OF A CURVE,
26. IN A NORTHEASTERLY DIRECTION, ALONG SAID CURVE TO THE RIGHT A DISTANCE OF 16.26 FEET, WITH A CENTRAL ANGLE OF 62°06'04", A RADIUS OF 15.00 FEET, AND A CHORD BEARING AND DISTANCE OF NORTH 50°41'43" EAST, 15.47 FEET, TO A 1/2-INCH IRON ROD WITH PLASTIC CAP STAMPED "KHA" SET FOR THE BEGINNING OF A REVERSE CURVE,
27. IN A NORTHEASTERLY DIRECTION, ALONG SAID CURVE TO THE LEFT A DISTANCE OF 56.61 FEET, WITH A CENTRAL ANGLE OF 09°40'58", A RADIUS OF 335.00 FEET, AND A CHORD BEARING AND DISTANCE OF NORTH 76°54'16" EAST, 56.55 FEET, TO A 1/2-INCH IRON ROD WITH PLASTIC CAP STAMPED "KHA" SET FOR THE BEGINNING OF A REVERSE CURVE,
28. IN A SOUTHEASTERLY DIRECTION, ALONG SAID CURVE TO THE RIGHT A DISTANCE OF 21.89 FEET, WITH A CENTRAL ANGLE OF 09°59'42", A RADIUS OF 125.50 FEET, AND A CHORD BEARING AND DISTANCE OF NORTH 77°03'38" EAST, 21.87 FEET, TO A 1/2-INCH IRON ROD WITH PLASTIC CAP STAMPED "KHA" SET FOR THE BEGINNING OF A COMPOUND CURVE,
29. IN A NORTHEASTERLY DIRECTION, ALONG SAID CURVE TO THE RIGHT A DISTANCE OF 24.41 FEET, WITH A CENTRAL ANGLE OF 11°08'43", A RADIUS OF 125.50 FEET, AND A CHORD BEARING AND DISTANCE OF NORTH 87°37'50" EAST, 24.37 FEET, TO A 1/2-INCH IRON ROD WITH PLASTIC CAP STAMPED "KHA" SET,
30. SOUTH 02°50'53" EAST, A DISTANCE OF 89.57 FEET TO A 1/2-INCH IRON ROD WITH PLASTIC CAP STAMPED "KHA" SET,
31. SOUTH 10°22'40" EAST, A DISTANCE OF 51.70 FEET TO A 1/2-INCH IRON ROD WITH PLASTIC CAP STAMPED "KHA" SET,
32. SOUTH 31°36'53" EAST, A DISTANCE OF 52.16 FEET TO A 1/2-INCH IRON ROD WITH PLASTIC CAP STAMPED "KHA" SET,
33. SOUTH 43°50'23" EAST, A DISTANCE OF 59.86 FEET TO A 1/2-INCH IRON ROD WITH PLASTIC CAP STAMPED "KHA" SET,
34. SOUTH 46°15'53" EAST, A DISTANCE OF 369.17 FEET TO A 1/2-INCH IRON ROD WITH PLASTIC CAP STAMPED "KHA" SET,
35. SOUTH 20°39'54" EAST, A DISTANCE OF 150.89 FEET TO A 1/2-INCH IRON ROD WITH PLASTIC CAP STAMPED "KHA" SET,
36. SOUTH 03°05'48" EAST, A DISTANCE OF 235.39 FEET TO A 1/2-INCH IRON ROD WITH PLASTIC CAP STAMPED "KHA" SET,
37. SOUTH 03°54'01" EAST, A DISTANCE OF 61.00 FEET TO A 1/2-INCH IRON ROD WITH PLASTIC CAP STAMPED "KHA" SET,
38. SOUTH 03°30'03" EAST, A DISTANCE OF 80.79 FEET TO A 1/2-INCH IRON ROD WITH PLASTIC CAP STAMPED "KHA" SET,
39. SOUTH 11°36'12" WEST, A DISTANCE OF 78.65 FEET TO A 1/2-INCH IRON ROD WITH PLASTIC CAP STAMPED "KHA" SET,
40. SOUTH 24°55'43" WEST, A DISTANCE OF 197.50 FEET TO A 1/2-INCH IRON ROD WITH PLASTIC CAP STAMPED "KHA" SET,
41. NORTH 65°04'17" WEST, A DISTANCE OF 95.00 FEET TO A 1/2-INCH IRON ROD WITH PLASTIC CAP STAMPED "KHA" SET FOR THE BEGINNING OF A CURVE,
42. IN A SOUTHWESTERLY DIRECTION, ALONG SAID CURVE TO THE LEFT A DISTANCE OF 39.27 FEET, WITH A CENTRAL ANGLE OF 90°00'00", A RADIUS OF 25.00 FEET, AND A CHORD BEARING AND DISTANCE OF SOUTH 69°55'43" WEST, 35.36 FEET, TO A 1/2-INCH IRON ROD WITH PLASTIC CAP STAMPED "KHA" SET,
43. SOUTH 24°55'43" WEST, A DISTANCE OF 100.00 FEET TO A 1/2-INCH IRON ROD WITH PLASTIC CAP STAMPED "KHA" SET,
44. SOUTH 65°04'17" EAST, A DISTANCE OF 10.00 FEET TO A 1/2-INCH IRON ROD WITH PLASTIC CAP STAMPED "KHA" SET,
45. SOUTH 24°55'43" WEST, A DISTANCE OF 130.27 FEET TO A 1/2-INCH IRON ROD WITH PLASTIC CAP STAMPED "KHA" SET,
46. SOUTH 73°36'54" EAST, A DISTANCE OF 65.10 FEET TO A 1/2-INCH IRON ROD WITH PLASTIC CAP STAMPED "KHA" SET,
47. SOUTH 65°38'34" EAST, A DISTANCE OF 132.98 FEET TO A 1/2-INCH IRON ROD WITH PLASTIC CAP STAMPED "KHA" SET,
48. SOUTH 69°09'07" EAST, A DISTANCE OF 46.26 FEET TO A 1/2-INCH IRON ROD WITH PLASTIC CAP STAMPED "KHA" SET,
49. SOUTH 69°09'07" EAST, A DISTANCE OF 166.36 FEET TO A 1/2-INCH IRON ROD WITH PLASTIC CAP STAMPED "KHA" SET,
50. SOUTH 79°09'46" EAST, A DISTANCE OF 73.91 FEET TO A 1/2-INCH IRON ROD WITH PLASTIC CAP STAMPED "KHA" SET,
51. SOUTH 83°15'11" EAST, A DISTANCE OF 136.10 FEET TO A 1/2-INCH IRON ROD WITH PLASTIC CAP STAMPED "KHA" SET,
52. SOUTH 86°03'09" EAST, A DISTANCE OF 130.49 FEET TO A 1/2-INCH IRON ROD WITH PLASTIC CAP STAMPED "KHA" SET,
53. SOUTH 02°22'09" WEST, A DISTANCE OF 139.83 FEET TO A 1/2-INCH IRON ROD WITH PLASTIC CAP STAMPED "KHA" SET,
54. SOUTH 68°07'24" WEST, A DISTANCE OF 67.65 FEET TO A 1/2-INCH IRON ROD WITH PLASTIC CAP STAMPED "KHA" SET,
55. SOUTH 14°59'23" WEST, A DISTANCE OF 136.88 FEET TO A 1/2-INCH IRON ROD WITH PLASTIC CAP STAMPED "KHA" SET,
56. SOUTH 15°28'06" EAST, A DISTANCE OF 820.59 FEET TO A 1/2-INCH IRON ROD WITH PLASTIC CAP STAMPED "KHA" SET IN THE SOUTH BOUNDARY LINE OF SAID 128.974 ACRES TRACT, SAME BEING THE NORTH BOUNDARY LINE OF A CALLED 12.695 ACRES TRACT OF LAND DESCRIBED TO A C WEIRD PROPERTIES LTD, WEIR A C PROPERTIES LTD AS SHOWN ON INSTRUMENT RECORDED UNDER DOCUMENT NO. 2005090431 OF SAID O.P.R.W.C.T.,

THENCE, WITH SAID SOUTH BOUNDARY LINE OF THE 128.974 ACRES TRACT AND SAID NORTH BOUNDARY LINE OF THE 12.695 ACRES TRACT THE FOLLOWING ONE (1) COURSE AND DISTANCES:

1. NORTH 88°26'16" WEST, A DISTANCE OF 113.47 FEET TO CALCULATED POINT FOR IN SAID SOUTH BOUNDARY LINE OF THE 128.974 ACRES TRACT AND SAID NORTH BOUNDARY LINE OF THE 12.695 ACRES TRACT, FOR THE EAST CORNER OF A CALLED 25.75 ACRES TRACT OF LAND DESCRIBED TO A C WEIR PROPERTIES LTD, WEIR A C PROPERTIES LTD AS SHOWN ON INSTUMENT RECORDED UNDER DOCUMENT NO. 2005090431 OF SAID O.P.R.W.C.T.;

THENCE, WITH SAID SOUTH BOUNDARY LINE OF THE 128.974 ACRES TRACT, SAME BEING THE NORTH BOUNDARY LINE OF SAID 25.75 ACRES TRACT, THE FOLLOWING SEVENTEEN (17) COURSES AND DISTANCES:

1. NORTH 63°11'41" WEST, A DISTANCE OF 78.86 FEET TO A 1/2-INCH IRON ROD WITH PLASTIC CAP STAMPED "KHA" SET,
2. NORTH 45°02'21" WEST, A DISTANCE OF 42.54 FEET TO A 1/2-INCH IRON ROD WITH PLASTIC CAP STAMPED "KHA" SET,
3. NORTH 64°18'03" WEST, A DISTANCE OF 540.04 FEET TO A 1/2-INCH IRON ROD WITH PLASTIC CAP STAMPED "KHA" SET,
4. NORTH 81°26'17" WEST, A DISTANCE OF 205.52 FEET TO A 1/2-INCH IRON ROD WITH PLASTIC CAP STAMPED "KHA" SET,
5. NORTH 69°27'19" WEST, A DISTANCE OF 180.11 FEET TO A 1/2-INCH IRON ROD WITH PLASTIC CAP STAMPED "KHA" SET,
6. NORTH 55°26'56" WEST, A DISTANCE OF 264.49 FEET TO A 1/2-INCH IRON ROD WITH PLASTIC CAP STAMPED "KHA" SET,
7. NORTH 61°01'26" WEST, A DISTANCE OF 205.42 FEET TO A 1/2-INCH IRON ROD WITH PLASTIC CAP STAMPED "KHA" SET,
8. NORTH 38°30'48" WEST, A DISTANCE OF 235.21 FEET TO A 1/2-INCH IRON ROD WITH PLASTIC CAP STAMPED "KHA" SET,
9. NORTH 32°07'08" WEST, A DISTANCE OF 237.71 FEET TO A 1/2-INCH IRON ROD WITH PLASTIC CAP STAMPED "KHA" SET,
10. NORTH 24°59'12" WEST, A DISTANCE OF 266.19 FEET TO A 1/2-INCH IRON ROD WITH PLASTIC CAP STAMPED "KHA" SET,
11. NORTH 10°17'09" WEST, A DISTANCE OF 200.47 FEET TO A 1/2-INCH IRON ROD WITH PLASTIC CAP STAMPED "KHA" SET,
12. NORTH 25°55'46" EAST, A DISTANCE OF 84.58 FEET TO A 1/2-INCH IRON ROD WITH PLASTIC CAP STAMPED "KHA" SET,
13. NORTH 02°05'57" WEST, A DISTANCE OF 132.95 FEET TO A 1/2-INCH IRON ROD WITH PLASTIC CAP STAMPED "KHA" SET,
14. NORTH 27°21'13" WEST, A DISTANCE OF 165.32 FEET TO A 1/2-INCH IRON ROD WITH PLASTIC CAP STAMPED "KHA" SET,
15. NORTH 55°32'53" WEST, A DISTANCE OF 214.32 FEET TO A 1/2-INCH IRON ROD WITH PLASTIC CAP STAMPED "KHA" SET,
16. NORTH 80°52'32" WEST, A DISTANCE OF 41.02 FEET TO A 1/2-INCH IRON ROD WITH PLASTIC CAP STAMPED "KHA" SET,
17. NORTH 49°51'42" EAST, A DISTANCE OF 294.41 FEET TO THE POINT OF BEGINNING AND CONTAINING 89.416 ACRES OF LAND, MORE OR LESS, IN WILLIAMSON COUNTY, TEXAS. THIS DOCUMENT WAS PREPARED IN THE OFFICE OF KIMLEY-HORN INC. IN AUSTIN, TEXAS.

The State of Texas §
County of Williamson
I, (Michael A Montgomery II), Registered Professional Land Surveyor in the State of Texas, do hereby certify that this surveyed preliminary plat boundary is true and correctly made from an actual survey made on the ground of the property legally described hereon, and that there are no apparent discrepancies, conflicts, overlapping improvements, visible utility lines or roads in place, except as shown on the accompanying preliminary plat, and that the corner monuments shown hereon were properly placed under my supervision in accordance with the Subdivision Regulations of the City of Georgetown, Texas.

_____
Michael A Montgomery II, R.P.L.S.
Land Surveyor No. 6890
Kimley-Horn and Associates, Inc.
10814 Jollyville Road
Avallon IV, Suite 200
Austin, Texas 78759

The State of Texas §
County of Williamson §

I, John Pickens, Registered Professional Engineer in the State of Texas, do hereby certify that this subdivision is in the Edwards Aquifer Recharge Zone, Edwards Aquifer Contributing Zone, and is partially encroached by a Zone A flood area, as denoted herein, and as defined by Federal Emergency Management Administration Flood Hazard Boundary Map, Community Panel Numbers 48491C0290E effective dates September 26, 2008, and that each lot conforms to the city of Georgetown regulations.

The Fully developed, concentrated stormwater runoff resulting from the one hundred (100) year frequency storm is contained within the drainage easement shown and/or public rights-of-way dedicated by this plat.

_____
John Pickens, P.E.
Registered Professional Engineer No. 110613
Kimley-Horn and Associates, Inc.
10814 Jollyville Road
Avallon IV, Suite 200
Austin, Texas 78759

Copyright © 2023
Kimley-Horn and Associates, Inc.
All rights reserved

LINE TABLE

LINE	LENGTH	BEARING
L1	50.01	S77°41'21.85"E
L2	46.00	N11°29'13.71"E
L3	50.12	N14°09'04.30"E
L4	41.02	N80°52'32.00"W
L5	84.58	N25°55'46.00"E
L6	42.54	N45°02'21.00"W
L7	78.86	N63°11'41.00"W
L8	113.47	N88°26'16.00"W
L9	139.83	S2°22'09.33"W
L10	212.62	S69°09'06.67"E
L11	130.27	S24°55'42.51"W
L12	100.00	S24°55'42.51"W
L14	197.50	S24°55'42.51"W
L15	80.79	S3°30'03.22"E
L16	61.00	S3°54'01.18"E
L17	235.39	S3°05'47.59"E
L18	52.16	S31°36'53.31"E
L19	51.70	S10°22'39.67"E
L20	89.57	S2°50'53.11"E
L22	10.36	N90°00'00.00"E
L23	50.00	N90°00'00.00"E
L24	66.97	N90°00'00.00"E
L25	39.82	S4°57'28.50"E
L26	55.70	N83°50'51.55"E
L27	86.70	N72°38'54.78"E

CURVE TABLE

CURVE	RADIUS	LENGTH	CHORD BEARING	CHORD	DELTA	TANGENT
C2	125.50'	24.41'	N87°37'50"E	24.37'	11°08'43"	12.24'
C3	125.50'	21.89'	N77°03'38"E	21.87'	9°59'42"	10.97'
C4	335.00'	56.61'	N76°54'16"E	56.55'	9°40'58"	28.37'
C5	15.00'	16.26'	N50°41'43"E	15.47'	62°06'04"	9.03'
C6	25.00'	5.08'	N5°49'07"E	5.07'	11°38'14"	2.55'
C7	25.00'	39.27'	S45°00'00"E	35.36'	90°00'00"	25.00'
C8	975.00'	30.04'	N89°07'03"E	30.03'	1°45'54"	15.02'

WOLF RANCH WEST SECTION 6G
PRELIMINARY PLAT
A SUBDIVISION OF 89.416 ACRES IN THE
I. DONAGAN SURVEY, ABSTRACT 178 &
J. THOMPSON SURVEY, ABSTRACT 608
CITY OF GEORGETOWN,
WILLIAMSON COUNTY, TEXAS
SUBMITTAL DATE: 08/21/2023

Kimley»Horn

Scale	Drawn by	Checked by	Date	KHA Project No.	Sheet No.
	AJM	JAP	AUGUST 2023	064461307	6 OF 7

City Project Number: 2023-28-PP

DWG NAME: C:\USERS\JOHN.PICKENS\ONEDRIVE - KHDESKTOP\WOLF RANCH 6G PP\PRELIMINARY\PLANSHEETS\C - PRELIMINARY PLAN.DWG PLOTTED BY PICKENS, JOHN 11/5/2023 9:23 PM LAST SAVED11/5/2023 9:20 PM

BENCHMARKS

ADD BENCHMARKS HERE

No.	REVISIONS	DATE	BY

Kimley»Horn
© 2024 KIMLEY-HORN AND ASSOCIATES, INC.
10814 JOLLYVILLE ROAD, CAMPUS IV, SUITE 200, AUSTIN, TX 78759
PHONE: 512-418-1771 FAX: 512-418-1791
WWW.KIMLEY-HORN.COM
TEXAS REGISTERED ENGINEERING FIRM F-928

STATE OF TEXAS
JOHN A. PICKENS
110631
LICENSED
PROFESSIONAL ENGINEER
02/02/2024

KHA PROJECT 064461307
DATE DECEMBER 2023
SCALE: AS SHOWN
DESIGNED BY: RRJ
DRAWN BY: AJM
CHECKED BY: JAP

PRELIMINARY PLAT
(6 OF 7)

WOLF RANCH
SECTION 6G
CITY OF GEORGETOWN
WILLIAMSON COUNTY, TEXAS

SHEET NUMBER
10 OF 87

Plotted By:Castillo, Jaime Date:February 08, 2024 08:52:49am File Path:K:\AUS_Civil\064461307-Wolf Ranch Section 6G\Cad\PlanSheets\C-Preliminary Plat (6 of 7).dwg
This document, together with the concepts and designs presented herein, as an instrument of service, is intended only for the specific purpose and client for which it was prepared. Reuse of and improper reliance on this document without written authorization and adaptation by Kimley-Horn and Associates, Inc. shall be without liability to Kimley-Horn and Associates, Inc.

WOLF RANCH PHASE 6G TREE TABLE

TAG NO.	DESCRIPTION SPECIES DIA (INCHES)	STATUS	TREE TYPE
1362	LOAK 27	TO REMAIN	HERITAGE
1363	LOAK 33	TO REMAIN	HERITAGE
1364	LOAK 36	TO BE REMOVED	HERITAGE
1366	LOAK 28.5M	TO BE REMOVED	HERITAGE
1367	LOAK 28	TO REMAIN	HERITAGE
1368	LOAK 29	TO REMAIN	HERITAGE
1369	LOAK 36M	TO REMAIN	HERITAGE
1370	SOAK 29	TO REMAIN	HERITAGE
1371	LOAK 29.5M	TO REMAIN	HERITAGE
100879	LOAK 26M	TO BE REMOVED	HERITAGE
801916	LOAK 26	TO REMAIN	HERITAGE
801957	LOAK 27.5M	TO BE REMOVED	HERITAGE
801961	LOAK 32M	TO REMAIN	HERITAGE
801962	LOAK 30.5M	TO REMAIN	HERITAGE
801964	LOAK 27.5M	TO BE REMOVED	HERITAGE
801965	LOAK 30.5M	TO BE REMOVED	HERITAGE
801973	LOAK 32.5M	TO REMAIN	HERITAGE
801975	LOAK 34.5M	TO REMAIN	HERITAGE
1001312	LOAK 36.5M	TO REMAIN	HERITAGE
1001325	PCN 28	TO REMAIN	HERITAGE
1001326	PCN 34	TO REMAIN	HERITAGE
1001327	PCN 35	TO REMAIN	HERITAGE
1001328	BOIS 30	TO REMAIN	HERITAGE
1001330	CELM 28.5M	TO REMAIN	HERITAGE
1001339	SYC 26M	TO REMAIN	HERITAGE
1001342	SYC 27	TO REMAIN	HERITAGE
1001347	TASH 36M	TO REMAIN	HERITAGE
1001350	TASH 26	TO REMAIN	HERITAGE
1001351	AELM 37	TO REMAIN	HERITAGE
1001352	AELM 30	TO REMAIN	HERITAGE
1001356	ASH 26	TO REMAIN	HERITAGE
1001359	PCN 28	TO REMAIN	HERITAGE
1001362	PCN 28	TO REMAIN	HERITAGE
1001364	PCN 31	TO REMAIN	HERITAGE
1001376	CW 31	TO REMAIN	HERITAGE
1001377	CW 36	TO REMAIN	HERITAGE
1001378	SYC 38.5M	TO REMAIN	HERITAGE
1001379	PCN 30.5M	TO REMAIN	HERITAGE
1001380	LOAK 32.5M	TO REMAIN	HERITAGE
1001382	LOAK 30.5M	TO REMAIN	HERITAGE
1001385	AELM 29.5M	TO REMAIN	HERITAGE
1001392	POAK 27.5M	TO REMAIN	HERITAGE
1001394	AELM 26M	TO REMAIN	HERITAGE

TREE SUMMARY
TOTAL HERITAGE TREES: 1,312 INCHES
TOTAL ALLOWABLE REMOVAL OF HERITAGE TREE: 262.4 INCHES
TOTAL HERITAGE TREES REMOVED: 176 INCHES
TOTAL HERITAGE TREES REMAIN: 1,136 INCHES
TOTAL REQUIRED HERITAGE TREE MITIGATION: 528 INCHES

NOTE:

PER PUD ORDINANCE 2018-66:

1. REMOVE OF 20% OF THE HERITAGE TREES WITH A DBH OF 26-INCHES AND GREATER WITHOUT ANY FURTHER APPROVAL FROM THE CITY IS ALLOWED IN SINGLE FAMILY USES.
2. NO PRESERVATION REQUIREMENTS FOR PROTECTED TREES WITH A DBH OF 12-INCHES AND GREATER ARE REQUIRED IN SINGLE FAMILY RESIDENTIAL USES.
3. HERITAGE TREES REMOVED WITH A DBH OF 26-INCHES OR GREATER: MITIGATION SHALL BE PROVIDED AT A 3:1 INCH BASIS FOR THE TOTAL DIAMETER INCHES OF HERITAGE TREES REMOVED, MEASURED AT DBH.
4. NO MITIGATION REQUIREMENTS FOR PROTECTED TREES WITH A DBH LESS THAN 26-INCHES IN SINGLE FAMILY USES.

Copyright © 2023
Kimley-Horn and Associates, Inc.
All rights reserved

WOLF RANCH WEST SECTION 6G
PRELIMINARY PLAT
A SUBDIVISION OF 89.416 ACRES IN THE
I. DONAGAN SURVEY, ABSTRACT 178 &
J. THOMPSON SURVEY, ABSTRACT 608
CITY OF GEORGETOWN,
WILLIAMSON COUNTY, TEXAS
SUBMITTAL DATE: 08/21/2023

Kimley»Horn

Scale	Drawn by	Checked by	Date	KHA Project No.	Sheet No.
	AJM	JAP	AUGUST 2023	064461307	7 OF 7

City Project Number: 2023-28-PP

DWG NAME: C:\USERS\JOHN.PICKENS\ONEDRIVE - KHDESIRTOP\WOLF RANCH 6G PP\PRELIMINARY\PLANSHEETS\C - PRELIMINARY PLAN.DWG PLOTTED BY PICKENS, JOHN 11/5/2023 9:56 PM LAST SAVED11/5/2023 9:23 PM

BENCHMARKS

ADD BENCHMARKS HERE

No.	REVISIONS	DATE	BY

Kimley»Horn
© 2024 KIMLEY-HORN AND ASSOCIATES, INC.
10814 JOLLYVILLE ROAD, CAMPUS IV, SUITE 200, AUSTIN, TX 78759
PHONE: 512-418-1771 FAX: 512-418-1791
WWW.KIMLEY-HORN.COM
TEXAS REGISTERED ENGINEERING FIRM F-928

STATE OF TEXAS
JOHN A. PICKENS
110631
LICENSED
PROFESSIONAL ENGINEER
02/02/2024

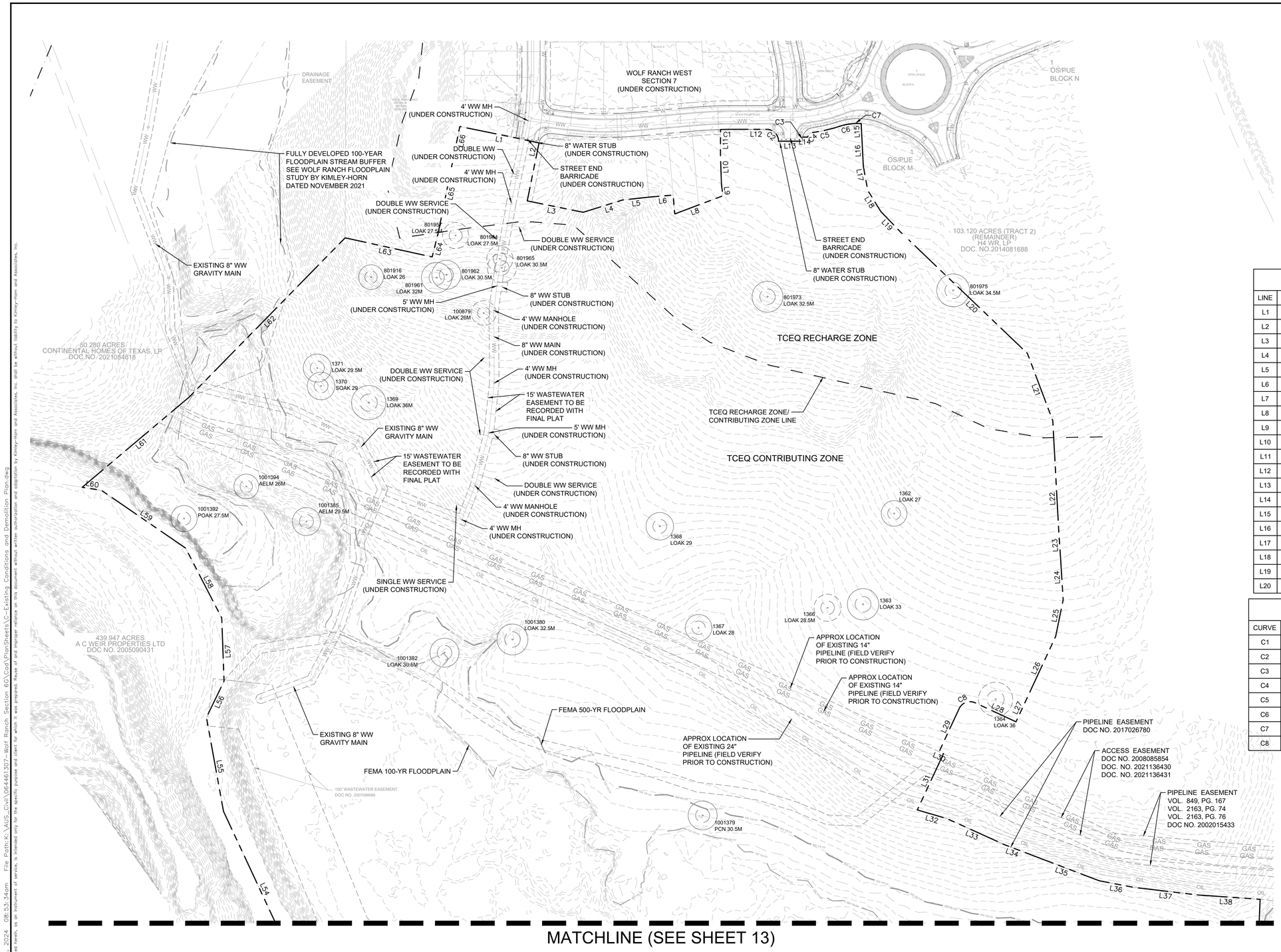
KHA PROJECT 064461307
DATE DECEMBER 2023
SCALE: AS SHOWN
DESIGNED BY: RRJ
DRAWN BY: AJM
CHECKED BY: JAP

PRELIMINARY PLAT
(7 OF 7)

WOLF RANCH
SECTION 6G
CITY OF GEORGETOWN
WILLIAMSON COUNTY, TEXAS

SHEET NUMBER
11 OF 87

Plotted By:Castillo, Jaime Date:February 08, 2024 08:52:55am File Path:K:\AUS_Civil\064461307-Wolf Ranch Section 6G\Cad\PlanSheets\C-Preliminary Plat (7 of 7).dwg
This document, together with the concepts and designs presented herein, as an instrument of service, is intended only for the specific purpose and client for which it was prepared. Reuse of and improper reliance on this document without written authorization and adaptation by Kimley-Horn and Associates, Inc. shall be without liability to Kimley-Horn and Associates, Inc.



N
W E
S
0 100' 200'
GRAPHIC SCALE 100'

UTILITY LEGEND

- PROPERTY LINE
- 632 — EXISTING CONTOUR
- OHP — EXISTING OVERHEAD POWER LINE
- W — EXISTING WATER LINE
- WW — EXISTING WASTEWATER LINE
- EXISTING POWER POLE
- EXISTING FIRE HYDRANT
- EXISTING WATER METER
- EXISTING WASTEWATER MANHOLE

LINE TABLE

LINE	LENGTH	BEARING
L1	120.00	N78°30'11.57"W
L2	109.53	N11°29'48.43"E
L3	120.00	N78°30'11.57"W
L4	86.70	S72°38'54.78"W
L5	55.70	S83°50'51.55"W
L6	51.00	S85°02'31.50"W
L7	1.13	S27°28'27.95"E
L8	108.13	S69°22'37.36"W
L9	24.14	S7°31'04.95"E
L10	56.39	S1°59'01.56"E
L11	58.90	S0°00'00.00"E
L12	66.97	N90°00'00.00"W
L13	50.00	N90°00'00.00"W
L14	10.36	N90°00'00.00"W
L15	28.55	N2°50'53.11"W
L16	61.01	N2°50'53.11"W
L17	51.70	N10°22'39.67"W
L18	52.16	N31°36'53.31"W
L19	59.86	N43°50'23.21"W
L20	369.17	N46°15'53.16"W

LINE TABLE

LINE	LENGTH	BEARING
L21	150.89	N20°39'54.13"W
L22	235.39	N3°05'47.59"W
L23	61.00	N3°54'01.18"W
L24	80.79	N3°30'03.22"W
L25	78.65	N11°36'11.58"E
L26	147.50	N24°55'42.51"E
L27	50.00	N24°55'42.51"E
L28	95.00	S65°04'17.49"E
L29	100.00	N24°55'42.51"E
L30	10.00	N65°04'17.49"W
L31	130.27	N24°55'42.51"E
L32	65.10	N73°36'53.67"W
L33	132.98	N65°38'33.67"W
L34	46.26	N69°09'06.67"W
L35	166.36	N69°09'06.67"W
L36	73.91	N79°09'45.67"W
L37	136.10	N83°15'10.67"W
L38	130.49	N86°03'09.05"W
L54	266.19	S24°59'12.00"E
L55	200.47	S10°17'09.00"E

CURVE TABLE

CURVE	RADIUS	LENGTH	CHORD BEARING	CHORD	DELTA	TANGENT
C1	975.00'	30.04'	S89°07'03"W	30.03'	1°45'54"	15.02'
C2	25.00'	39.27'	N45°00'00"W	35.36'	90°00'00"	25.00'
C3	25.00'	5.08'	S5°49'07"W	5.07'	11°38'14"	2.55'
C4	15.00'	16.26'	S50°41'43"W	15.47'	62°06'04"	9.03'
C5	335.00'	56.61'	S76°54'16"W	56.55'	9°40'58"	28.37'
C6	125.50'	21.89'	S77°03'38"W	21.87'	9°59'42"	10.97'
C7	125.50'	24.41'	S87°37'50"W	24.37'	11°08'43"	12.24'
C8	25.00'	39.27'	N69°55'43"E	35.36'	90°00'00"	25.00'

BENCHMARKS

ADD BENCHMARKS HERE

No.	REVISIONS	DATE	BY

Kimley»Horn
© 2024 KIMLEY-HORN AND ASSOCIATES, INC.
10814 JOLLYVILLE ROAD, CAMPUS IV, SUITE 200, AUSTIN, TX 78759
PHONE: 512-418-1771 FAX: 512-418-1791
WWW.KIMLEY-HORN.COM
TEXAS REGISTERED ENGINEERING FIRM F-928

STATE OF TEXAS
JOHN A. PICKENS
110631
LICENSED
PROFESSIONAL ENGINEER
02/02/2024

KHA PROJECT: 064461307
DATE: DECEMBER 2023
SCALE: AS SHOWN
DESIGNED BY: RRJ
DRAWN BY: AJM
CHECKED BY: JAP

EXISTING CONDITIONS AND DEMOLITION PLAN (1 OF 2)

WOLF RANCH
SECTION 6G
CITY OF GEORGETOWN
WILLIAMSON COUNTY, TEXAS

SHEET NUMBER
12 OF 87

Plotted By:Castillo, Jaime Date:February 08, 2024 08:53:34am File Path:K:\AUS_Civil\064461307-Wolf Ranch Section 6G\Cad\PlanSheets\C-Existing Conditions and Demolition Plan.dwg
This document, together with the concepts and designs presented herein, as an instrument of service, is intended only for the specific purpose and client for which it was prepared. Reuse of and improper reliance on this document without written authorization and adaptation by Kimley-Horn and Associates, Inc. shall be without liability to Kimley-Horn and Associates, Inc.

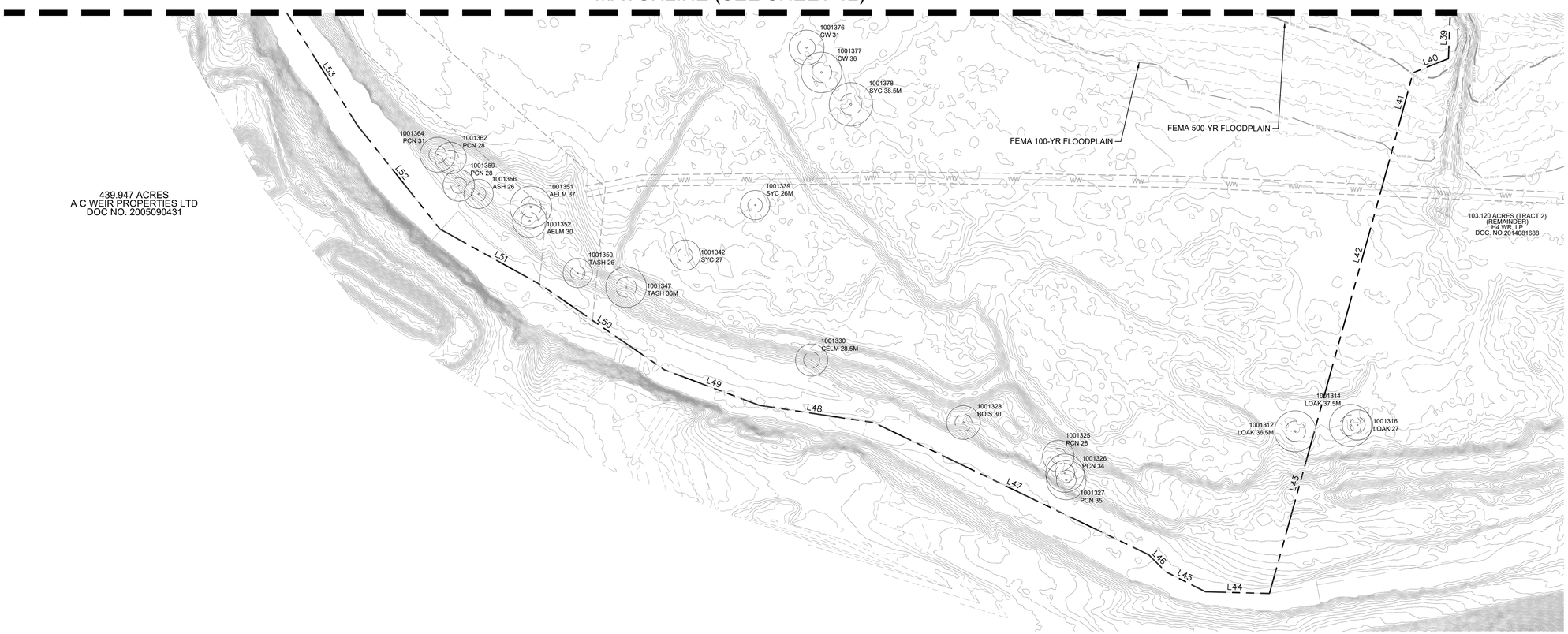
LINE TABLE		
LINE	LENGTH	BEARING
L39	139.83	N2°22'09.33"E
L40	67.65	N68°07'24.07"E
L41	136.88	N14°59'22.50"E
L42	410.29	N15°28'05.86"E
L43	410.29	N15°28'05.86"E
L44	113.47	S88°26'16.00"E
L45	78.86	S63°11'41.00"E
L46	42.54	S45°02'21.00"E
L47	540.04	S64°18'03.00"E
L48	205.52	S81°26'17.00"E
L49	180.11	S69°27'19.00"E
L50	264.49	S55°26'56.00"E
L51	205.42	S61°01'26.00"E
L52	235.21	S38°30'48.00"E
L53	237.71	S32°07'08.00"E

N
W E
S
0 100' 200'
GRAPHIC SCALE 100'

UTILITY LEGEND

- PROPERTY LINE
- 632 EXISTING CONTOUR
- OHP EXISTING OVERHEAD POWER LINE
- W EXISTING WATER LINE
- WW EXISTING WASTEWATER LINE
- EXISTING POWER POLE
- EXISTING FIRE HYDRANT
- EXISTING WATER METER
- EXISTING WASTEWATER MANHOLE

MATCHLINE (SEE SHEET 12)



BENCHMARKS

ADD BENCHMARKS HERE

No.	REVISIONS	DATE	BY

Kimley»Horn

© 2024 KIMLEY-HORN AND ASSOCIATES, INC.
10814 JOLLYVILLE ROAD, CAMPUS IV, SUITE 200, AUSTIN, TX 78759
PHONE: 512-418-1771 FAX: 512-418-1791
WWW.KIMLEY-HORN.COM
TEXAS REGISTERED ENGINEERING FIRM F-928

STATE OF TEXAS
JOHN A. PICKENS
110631
LICENSED
02/02/2024

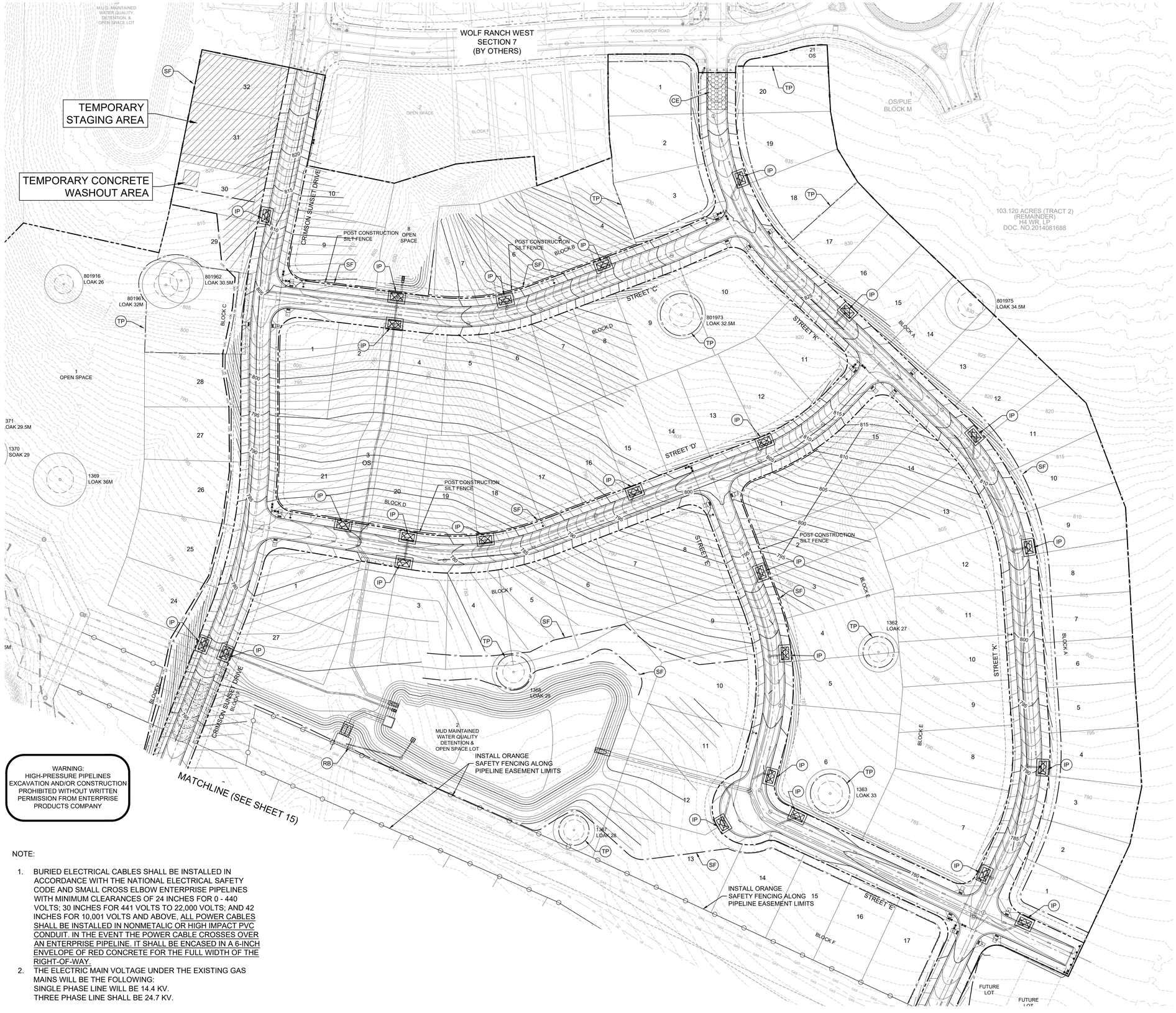
KHA PROJECT 064461307
DATE DECEMBER 2023
SCALE: AS SHOWN
DESIGNED BY: RRJ
DRAWN BY: AJM
CHECKED BY: JAP

EXISTING CONDITIONS AND DEMOLITION PLAN (2 OF 2)

WOLF RANCH
SECTION 6G
CITY OF GEORGETOWN
WILLIAMSON COUNTY, TEXAS

SHEET NUMBER
13 OF 87

Plotted By:Castillo, Jaime Date:February 08, 2024 08:54:04am File Path:K:\AUS_Civil\064461307-Wolf Ranch Section 6G\Cad\PlanSheets\C-Existing Conditions and Demolition Plan2.dwg
This document, together with the concepts and designs presented herein, as an instrument of service, is intended only for the specific purpose and client for which it was prepared. Reuse of and improper reliance on this document without written authorization and adaptation by Kimley-Horn and Associates, Inc. shall be without liability to Kimley-Horn and Associates, Inc.



WARNING:
HIGH-PRESSURE PIPELINES
EXCAVATION AND/OR CONSTRUCTION
PROHIBITED WITHOUT WRITTEN
PERMISSION FROM ENTERPRISE
PRODUCTS COMPANY

NOTE:

1. BURIED ELECTRICAL CABLES SHALL BE INSTALLED IN ACCORDANCE WITH THE NATIONAL ELECTRICAL SAFETY CODE AND SMALL CROSS ELBOW ENTERPRISE PIPELINES WITH MINIMUM CLEARANCES OF 24 INCHES FOR 0 - 440 VOLTS; 30 INCHES FOR 441 VOLTS TO 22,000 VOLTS; AND 42 INCHES FOR 10,001 VOLTS AND ABOVE, ALL POWER CABLES SHALL BE INSTALLED IN NONMETALIC OR HIGH IMPACT PVC CONDUIT. IN THE EVENT THE POWER CABLE CROSSES OVER AN ENTERPRISE PIPELINE, IT SHALL BE ENCASED IN A 6-INCH ENVELOPE OF RED CONCRETE FOR THE FULL WIDTH OF THE RIGHT-OF-WAY.
2. THE ELECTRIC MAIN VOLTAGE UNDER THE EXISTING GAS MAINS WILL BE THE FOLLOWING:
SINGLE PHASE LINE WILL BE 14.4 KV.
THREE PHASE LINE SHALL BE 24.7 KV.

EROSION CONTROL LEGEND

	PROPERTY LINE
632	PROPOSED CONTOUR
632	EXISTING CONTOUR
SF	SILT FENCE
CE	STABALIZED CONSTRUCTION ENTRANCE/EXIT
IP	INLET PROTECTION
RB	ROCK BERM
LOC	LIMITS OF CONSTRUCTION
	TREE TO BE REMOVED
	TREE TO REMAIN

NOTES:

1. FOR TREE PROTECTION SEE SHEETS 16 - 18.
2. CONTRACTOR IS SOLELY RESPONSIBLE FOR IMPLEMENTATION, MAINTENANCE, AND EFFECTIVENESS OF ALL SWPPP CONTROLS - CONTROLS SHOWN ON THIS SITE MAP ARE SUGGESTED CONTROLS ONLY.
3. CONTRACTOR SHALL RECORD INSTALLATION, MAINTENANCE OR MODIFICATION, AND REMOVAL DATES FOR EACH BMP EMPLOYED (WHETHER CALLED OUT ON ORIGINAL SWPPP OR NOT) DIRECTLY ON THE SITE MAP.
4. THE ENVIRONMENTAL INSPECTOR HAS THE AUTHORITY TO ADD AND/OR MODIFY EROSION/SEDIMENTATION CONTROLS ON SITE TO KEEP PROJECT IN COMPLIANCE WITH THE CITY OF GEORGETOWN RULES AND REGULATIONS.
5. CONTRACTOR SHALL UTILIZE DUST CONTROL MEASURES DURING SITE CONSTRUCTION AS PER THE CITY OF GEORGETOWN OR AS DIRECTED BY THE ENVIRONMENTAL INSPECTOR.
6. TEMPORARY AND PERMANENT STABILIZATION PRACTICES AND BMP'S SHALL BE INSTALLED AT THE EARLIEST POSSIBLE TIME DURING THE CONSTRUCTION SEQUENCE. AS AN EXAMPLE, PERIMETER SILT FENCE SHALL BE INSTALLED BEFORE COMMENCEMENT OF ANY GRADING ACTIVITIES. OTHER BMP'S SHALL BE INSTALLED AS SOON AS PRACTICABLE AND SHALL BE MAINTAINED UNTIL FINAL SITE STABILIZATION IS ATTAINED. CONTRACTOR SHALL ALSO REFERENCE CIVIL AND LANDSCAPE PLANS SINCE PERMANENT STABILIZATION IS PROVIDED BY LANDSCAPING, THE BUILDING(S), AND SITE PAVING.
7. BMP'S HAVE BEEN LOCATED AS INDICATED ON THIS PLAN IN ACCORDANCE WITH GENERALLY ACCEPTED ENGINEERING PRACTICES IN ORDER TO MINIMIZE SEDIMENT TRANSFER.
8. ADDITIONAL EROSION AND SEDIMENTATION CONTROLS MAY BE REQUIRED BY THE CITY DURING CONSTRUCTION.
9. REFERENCE EROSION CONTROL DETAILS ON SHEET 80.
10. USE J-HOOKS WHERE SILT FENCE CANNOT BE INSTALLED PARALLEL TO THE EXISTING CONTOURS. CONTRACTOR TO MAINTAIN AND UPDATE AS NECESSARY PER TCEQ & CITY REQUIREMENTS.
11. CONTRACTOR SHALL INSTALL, MAINTAIN, AND UPDATE PROPOSED SILT FENCE AS NECESSARY PER TCEQ & CITY REQUIREMENTS.
12. ALL SILT FENCE IS REQUIRED TO BE FABRIC PRODUCT AND NOT WOVEN MATERIAL. OSHA APPROVED IMPALEMENTS CAPS ARE REQUIRED FOR ALL REBAR AND STAKING.
13. PHASE 2 SILT FENCE IS TO BE INSTALLED IMMEDIATELY AFTER LOT GRADING HAS BEEN COMPLETED TO KEEP THE DISTURBANCE FROM RUNNING INTO THE ROW. IT IS THE RESPONSIBILITY OF THE DEVELOPER/SUBDIVISION CONTRACTOR TO INSTALL AS WELL AS MAINTAIN THE PHASE 2 SILT FENCE.

BENCHMARKS

ADD BENCHMARKS HERE

No.	REVISIONS	DATE	BY

Kimley»Horn
© 2024 KIMLEY-HORN AND ASSOCIATES, INC.
10814 JOLLYVILLE ROAD, CAMPUS IV, SUITE 200, AUSTIN, TX 78759
PHONE: 512-418-1771 FAX: 512-418-1791
WWW.KIMLEY-HORN.COM
TEXAS REGISTERED ENGINEERING FIRM F-928

STATE OF TEXAS
JOHN A. PICKENS
110631
LICENSED
PROFESSIONAL ENGINEER

02/02/2024

KHA PROJECT 064461307
DATE: DECEMBER 2023
SCALE: AS SHOWN
DESIGNED BY: RRJ
DRAWN BY: AJM
CHECKED BY: JAP

EROSION CONTROL PLAN (1 OF 2)

WOLF RANCH
SECTION 6G
CITY OF GEORGETOWN
WILLIAMSON COUNTY, TEXAS

SHEET NUMBER
14 OF 87

Plotted By:Castillo, Jaime Date:February 08, 2024 08:54:53am File Path:K:\AUS_Civil\064461307-Wolf Ranch: Section 6G\Cad\PlanSheets\C-Erosion Control Plan (1 of 2).dwg
This document, together with the concepts and designs presented herein, as an instrument of service, is intended only for the specific purpose and client for which it was prepared. Reuse or alteration of this document without written authorization and adaptation by Kimley-Horn and Associates, Inc. shall be without liability to Kimley-Horn and Associates, Inc.

WARNING:
HIGH-PRESSURE PIPELINES
EXCAVATION AND/OR CONSTRUCTION
PROHIBITED WITHOUT WRITTEN
PERMISSION FROM ENTERPRISE
PRODUCTS COMPANY

NOTE:

1. BURIED ELECTRICAL CABLES SHALL BE INSTALLED IN ACCORDANCE WITH THE NATIONAL ELECTRICAL SAFETY CODE AND SMALL CROSS ELBOW ENTERPRISE PIPELINES WITH MINIMUM CLEARANCES OF 24 INCHES FOR 0 - 440 VOLTS; 30 INCHES FOR 441 VOLTS TO 22,000 VOLTS; AND 42 INCHES FOR 10,001 VOLTS AND ABOVE, ALL POWER CABLES SHALL BE INSTALLED IN NONMETALIC OR HIGH IMPACT PVC CONDUIT. IN THE EVENT THE POWER CABLE CROSSES OVER AN ENTERPRISE PIPELINE. IT SHALL BE ENCASED IN A 6-INCH ENVELOPE OF RED CONCRETE FOR THE FULL WIDTH OF THE RIGHT-OF-WAY.
2. THE ELECTRIC MAIN VOLTAGE UNDER THE EXISTING GAS MAINS WILL BE THE FOLLOWING:
SINGLE PHASE LINE WILL BE 14.4 KV.
THREE PHASE LINE SHALL BE 24.7 KV.

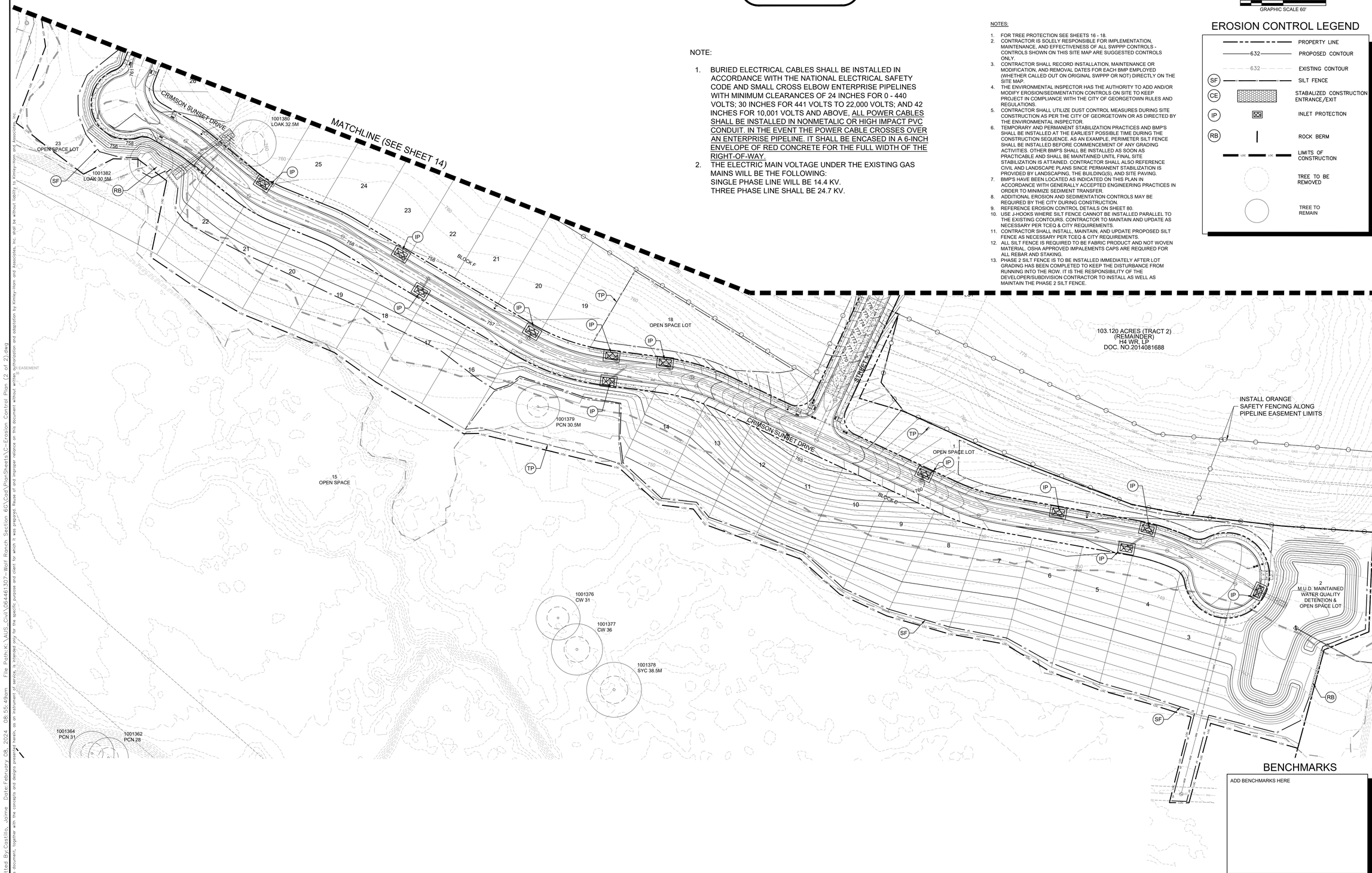
NOTES:

1. FOR TREE PROTECTION SEE SHEETS 16 - 18.
2. CONTRACTOR IS SOLELY RESPONSIBLE FOR IMPLEMENTATION, MAINTENANCE, AND EFFECTIVENESS OF ALL SWPPP CONTROLS - CONTROLS SHOWN ON THIS SITE MAP ARE SUGGESTED CONTROLS ONLY.
3. CONTRACTOR SHALL RECORD INSTALLATION, MAINTENANCE OR MODIFICATION, AND REMOVAL DATES FOR EACH BMP EMPLOYED (WHETHER CALLED OUT ON ORIGINAL SWPPP OR NOT) DIRECTLY ON THE SITE MAP.
4. THE ENVIRONMENTAL INSPECTOR HAS THE AUTHORITY TO ADD AND/OR MODIFY EROSION/SEDIMENTATION CONTROLS ON SITE TO KEEP PROJECT IN COMPLIANCE WITH THE CITY OF GEORGETOWN RULES AND REGULATIONS.
5. CONTRACTOR SHALL UTILIZE DUST CONTROL MEASURES DURING SITE CONSTRUCTION AS PER THE CITY OF GEORGETOWN OR AS DIRECTED BY THE ENVIRONMENTAL INSPECTOR.
6. TEMPORARY AND PERMANENT STABILIZATION PRACTICES AND BMP'S SHALL BE INSTALLED AT THE EARLIEST POSSIBLE TIME DURING THE CONSTRUCTION SEQUENCE. AS AN EXAMPLE, PERIMETER SILT FENCE SHALL BE INSTALLED BEFORE COMMENCEMENT OF ANY GRADING ACTIVITIES. OTHER BMP'S SHALL BE INSTALLED AS SOON AS PRACTICABLE AND SHALL BE MAINTAINED UNTIL FINAL SITE STABILIZATION IS ATTAINED. CONTRACTOR SHALL ALSO REFERENCE CIVIL AND LANDSCAPE PLANS SINCE PERMANENT STABILIZATION IS PROVIDED BY LANDSCAPING, THE BUILDING(S), AND SITE PAVING.
7. BMP'S HAVE BEEN LOCATED AS INDICATED ON THIS PLAN IN ACCORDANCE WITH GENERALLY ACCEPTED ENGINEERING PRACTICES IN ORDER TO MINIMIZE SEDIMENT TRANSFER.
8. ADDITIONAL EROSION AND SEDIMENTATION CONTROLS MAY BE REQUIRED BY THE CITY DURING CONSTRUCTION.
9. REFERENCE EROSION CONTROL DETAILS ON SHEET 80.
10. USE J-HOOKS WHERE SILT FENCE CANNOT BE INSTALLED PARALLEL TO THE EXISTING CONTOURS. CONTRACTOR TO MAINTAIN AND UPDATE AS NECESSARY PER TCEQ & CITY REQUIREMENTS.
11. CONTRACTOR SHALL INSTALL, MAINTAIN, AND UPDATE PROPOSED SILT FENCE AS NECESSARY PER TCEQ & CITY REQUIREMENTS.
12. ALL SILT FENCE IS REQUIRED TO BE FABRIC PRODUCT AND NOT WOVEN MATERIAL. OSHA APPROVED IMPALEMENTS CAPS ARE REQUIRED FOR ALL REBAR AND STAKING.
13. PHASE 2 SILT FENCE IS TO BE INSTALLED IMMEDIATELY AFTER LOT GRADING HAS BEEN COMPLETED TO KEEP THE DISTURBANCE FROM RUNNING INTO THE ROW. IT IS THE RESPONSIBILITY OF THE DEVELOPER/SUBDIVISION CONTRACTOR TO INSTALL AS WELL AS MAINTAIN THE PHASE 2 SILT FENCE.

N
W E
S
0 60' 120'
GRAPHIC SCALE 60'

EROSION CONTROL LEGEND

	PROPERTY LINE
632	PROPOSED CONTOUR
632	EXISTING CONTOUR
SF	SILT FENCE
CE	STABALIZED CONSTRUCTION ENTRANCE/EXIT
IP	INLET PROTECTION
RB	ROCK BERM
	LIMITS OF CONSTRUCTION
	TREE TO BE REMOVED
	TREE TO REMAIN



BENCHMARKS

ADD BENCHMARKS HERE

No.	REVISIONS	DATE	BY

Kimley»Horn
© 2024 KIMLEY-HORN AND ASSOCIATES, INC.
10814 JOLLYVILLE ROAD, CAMPUS IV, SUITE 200, AUSTIN, TX 78759
PHONE: 512-418-1771 FAX: 512-418-1791
WWW.KIMLEY-HORN.COM
TEXAS REGISTERED ENGINEERING FIRM F-928

STATE OF TEXAS
JOHN A. PICKENS
110631
LICENSED
PROFESSIONAL ENGINEER
02/02/2024

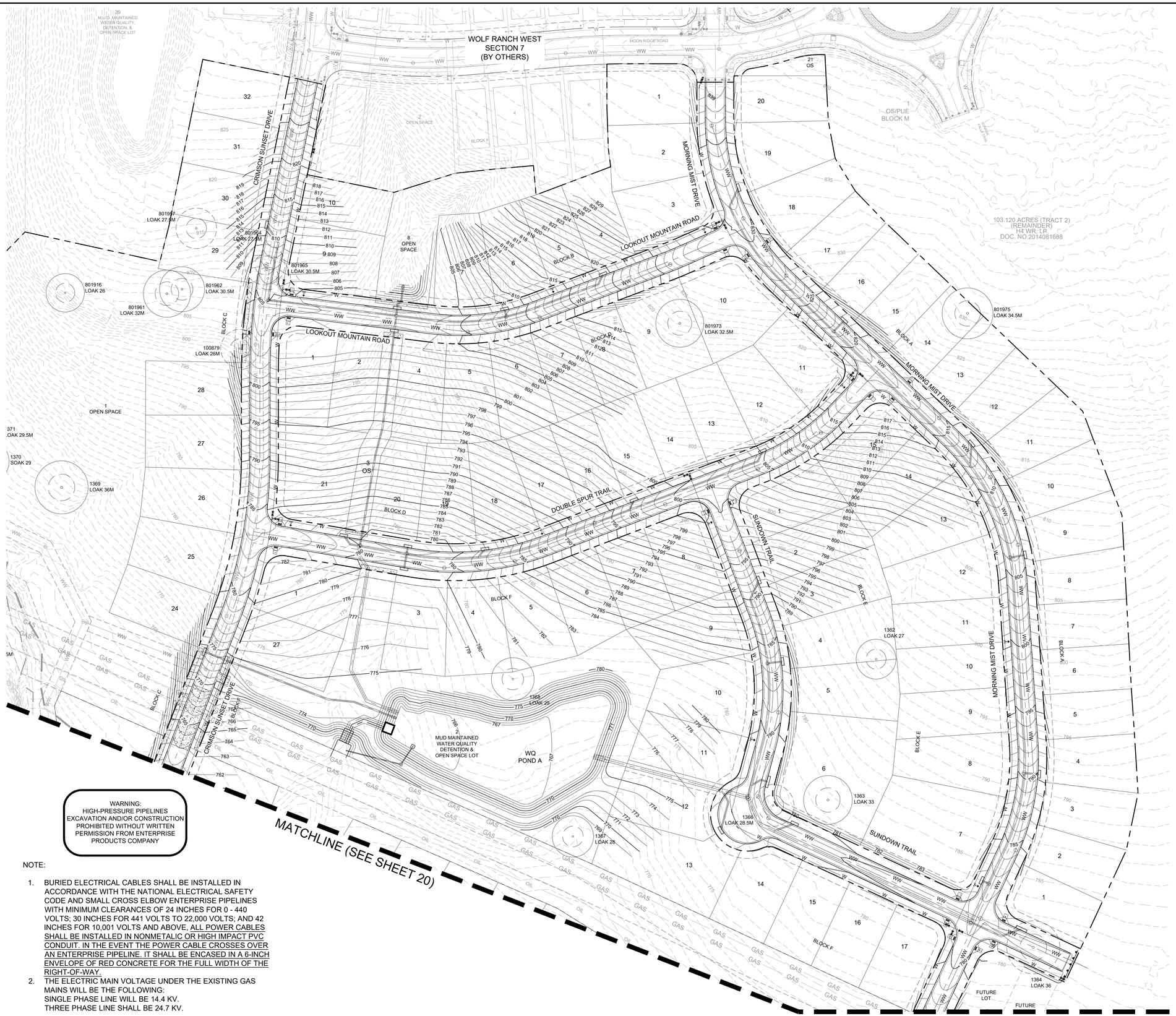
KHA PROJECT 064461307	
DATE DECEMBER 2023	
SCALE: AS SHOWN	
DESIGNED BY:	RRJ
DRAWN BY:	AJM
CHECKED BY:	JAP

EROSION CONTROL PLAN (2 OF 2)

WOLF RANCH
SECTION 6G
CITY OF GEORGETOWN
WILLIAMSON COUNTY, TEXAS

SHEET NUMBER
15 OF 87

Plotted By:Castillo, Jaime Date:February 08, 2024 08:55:49am File Path:K:\AUS_Civil\064461307-Wolf Ranch Section 6G\Cad\PlanSheets\C-Erosion Control Plan (2 of 2).dwg
This document, together with the concepts and designs presented herein, as an instrument of service, is intended only for the specific purpose and client for which it was prepared. Reuse of and improper reliance on this document without written authorization and adaptation by Kimley-Horn and Associates, Inc. shall be without liability to Kimley-Horn and Associates, Inc.



WARNING:
HIGH-PRESSURE PIPELINES
EXCAVATION AND/OR CONSTRUCTION
PROHIBITED WITHOUT WRITTEN
PERMISSION FROM ENTERPRISE
PRODUCTS COMPANY

NOTE:

1. BURIED ELECTRICAL CABLES SHALL BE INSTALLED IN ACCORDANCE WITH THE NATIONAL ELECTRICAL SAFETY CODE AND SMALL CROSS ELBOW ENTERPRISE PIPELINES WITH MINIMUM CLEARANCES OF 24 INCHES FOR 0 - 440 VOLTS; 30 INCHES FOR 441 VOLTS TO 22,000 VOLTS; AND 42 INCHES FOR 10,001 VOLTS AND ABOVE, ALL POWER CABLES SHALL BE INSTALLED IN NONMETALIC OR HIGH IMPACT PVC CONDUIT. IN THE EVENT THE POWER CABLE CROSSES OVER AN ENTERPRISE PIPELINE. IT SHALL BE ENCASED IN A 6-INCH ENVELOPE OF RED CONCRETE FOR THE FULL WIDTH OF THE RIGHT-OF-WAY.
2. THE ELECTRIC MAIN VOLTAGE UNDER THE EXISTING GAS MAINS WILL BE THE FOLLOWING:
   SINGLE PHASE LINE WILL BE 14.4 KV.
   THREE PHASE LINE SHALL BE 24.7 KV.

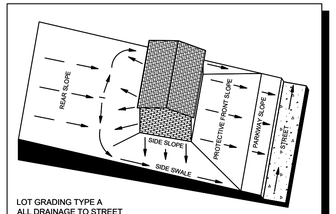
N
W E
S

0 60' 120'
GRAPHIC SCALE 60'

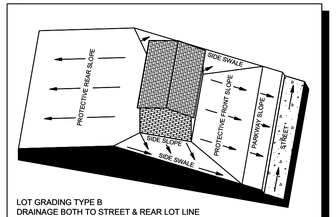
LEGEND

- PROPERTY LINE
- 555 PROPOSED CONTOUR
- EXISTING CONTOUR
- PROPOSED RETAINING WALL
- PROPOSED EASEMENT
- LOT DRAINAGE FLOW DIRECTION
- STREET DRAINAGE FLOW DIRECTION
- EXISTING TREE TO REMAIN

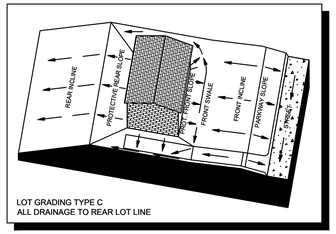
NOTE:
1. CONTRACTOR TO PROVIDE STRUCTURAL WALL DESIGN FOR ALL WALLS.
2. BW = BOTTOM OF GRADE
   TW = TOP OF GRADE
   SEE STRUCTURAL FOR TOP OF FOOTING AND TOP OF BLOCK.



LOT GRADING TYPE A
ALL DRAINAGE TO STREET



LOT GRADING TYPE B
DRAINAGE BOTH TO STREET & REAR LOT LINE



LOT GRADING TYPE C
ALL DRAINAGE TO REAR LOT LINE

BENCHMARKS

ADD BENCHMARKS HERE

No.	REVISIONS	DATE	BY

Kimley»Horn
© 2024 KIMLEY-HORN AND ASSOCIATES, INC.
10814 JOLLYVILLE ROAD, CAMPUS IV, SUITE 200, AUSTIN, TX 78759
PHONE: 512-418-1771 FAX: 512-418-1791
WWW.KIMLEY-HORN.COM
TEXAS REGISTERED ENGINEERING FIRM F-928

STATE OF TEXAS
JOHN A. PICKENS
110631
LICENSED
PROFESSIONAL ENGINEER
02/02/2024

KHA PROJECT	066461307
DATE	DECEMBER 2023
SCALE:	AS SHOWN
DESIGNED BY:	RRJ
DRAWN BY:	AJM
CHECKED BY:	JAP

GRADING PLAN (1 OF 2)

WOLF RANCH
SECTION 6G
CITY OF GEORGETOWN
WILLIAMSON COUNTY, TEXAS

SHEET NUMBER
19 OF 87

Plotted By:Castillo, Jaime Date:February 08, 2024 08:57:24am File Path:K:\AUS_Civil\066461307-Wolf Ranch Section 6G\Cad\PlanSheets\C-Grading Plan (1 of 2).dwg
This document, together with the concepts and designs presented herein, as an instrument of service, is intended only for the specific purpose and client for which it was prepared. Reuse of and improper reliance on this document without written authorization and adaptation by Kimley-Horn and Associates, Inc. shall be without liability to Kimley-Horn and Associates, Inc.

NOTE:

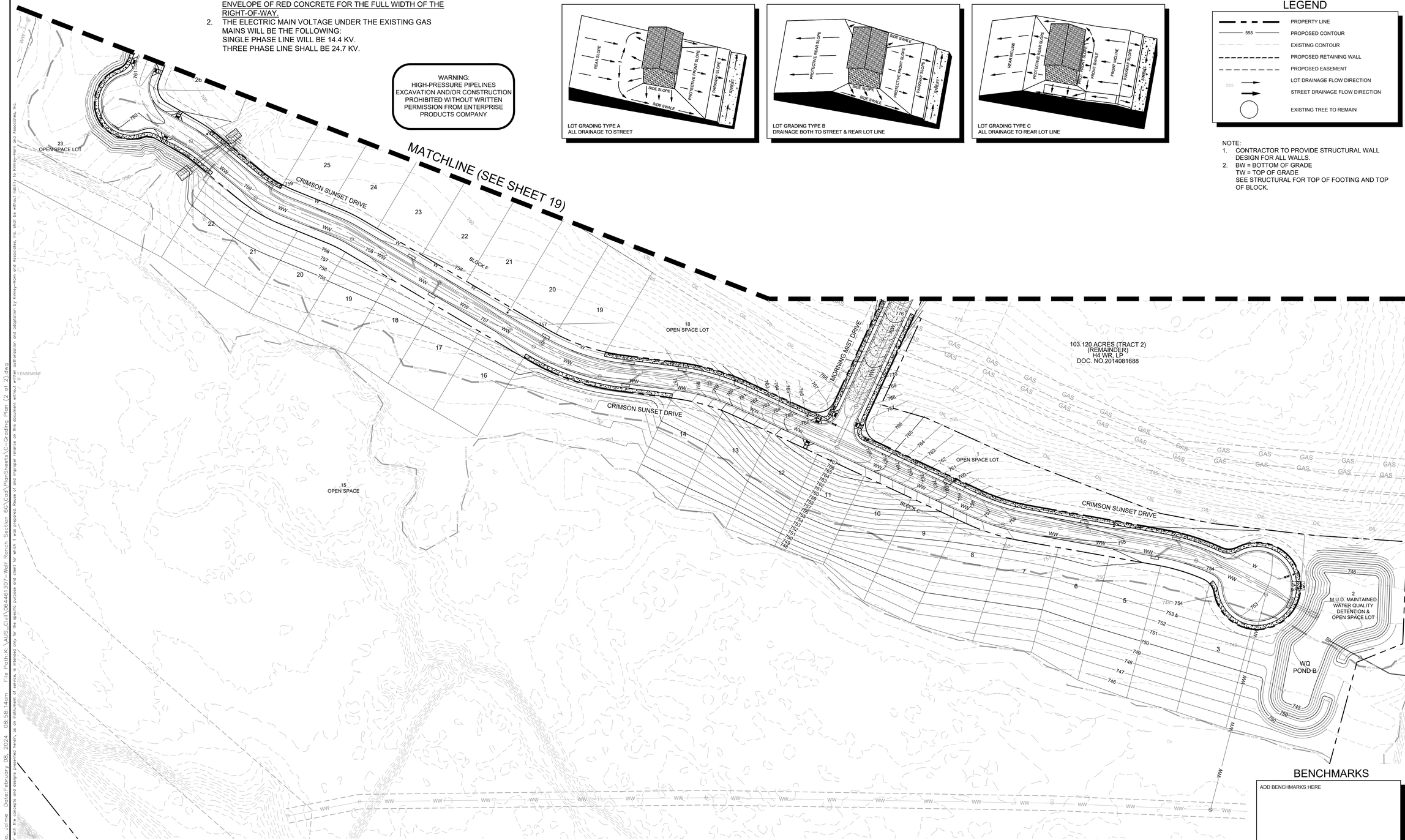
1. BURIED ELECTRICAL CABLES SHALL BE INSTALLED IN ACCORDANCE WITH THE NATIONAL ELECTRICAL SAFETY CODE AND SMALL CROSS ELBOW ENTERPRISE PIPELINES WITH MINIMUM CLEARANCES OF 24 INCHES FOR 0 - 440 VOLTS; 30 INCHES FOR 441 VOLTS TO 22,000 VOLTS; AND 42 INCHES FOR 10,001 VOLTS AND ABOVE, ALL POWER CABLES SHALL BE INSTALLED IN NONMETALIC OR HIGH IMPACT PVC CONDUIT. IN THE EVENT THE POWER CABLE CROSSES OVER AN ENTERPRISE PIPELINE, IT SHALL BE ENCASED IN A 6-INCH ENVELOPE OF RED CONCRETE FOR THE FULL WIDTH OF THE RIGHT-OF-WAY.
2. THE ELECTRIC MAIN VOLTAGE UNDER THE EXISTING GAS MAINS WILL BE THE FOLLOWING:
   SINGLE PHASE LINE WILL BE 14.4 KV.
   THREE PHASE LINE SHALL BE 24.7 KV.

WARNING:
HIGH-PRESSURE PIPELINES
EXCAVATION AND/OR CONSTRUCTION
PROHIBITED WITHOUT WRITTEN
PERMISSION FROM ENTERPRISE
PRODUCTS COMPANY

LOT GRADING TYPE A
ALL DRAINAGE TO STREET

LOT GRADING TYPE B
DRAINAGE BOTH TO STREET & REAR LOT LINE

LOT GRADING TYPE C
ALL DRAINAGE TO REAR LOT LINE



BENCHMARKS

ADD BENCHMARKS HERE

N
W E
S

0 60' 120'
GRAPHIC SCALE 60'

LEGEND

- PROPERTY LINE
- 555 PROPOSED CONTOUR
- EXISTING CONTOUR
- PROPOSED RETAINING WALL
- PROPOSED EASEMENT
- 555 LOT DRAINAGE FLOW DIRECTION
- STREET DRAINAGE FLOW DIRECTION
- EXISTING TREE TO REMAIN

NOTE:
1. CONTRACTOR TO PROVIDE STRUCTURAL WALL DESIGN FOR ALL WALLS.
2. BW = BOTTOM OF GRADE
   TW = TOP OF GRADE
   SEE STRUCTURAL FOR TOP OF FOOTING AND TOP OF BLOCK.

No.	REVISIONS	DATE	BY

Kimley»Horn
© 2024 KIMLEY-HORN AND ASSOCIATES, INC.
10814 JOLLYVILLE ROAD, CAMPUS IV, SUITE 200, AUSTIN, TX 78759
PHONE: 512-418-1771 FAX: 512-418-1791
WWW.KIMLEY-HORN.COM
TEXAS REGISTERED ENGINEERING FIRM F-928

JOHN A. PICKENS
110631
LICENSED
PROFESSIONAL ENGINEER
02/02/2024

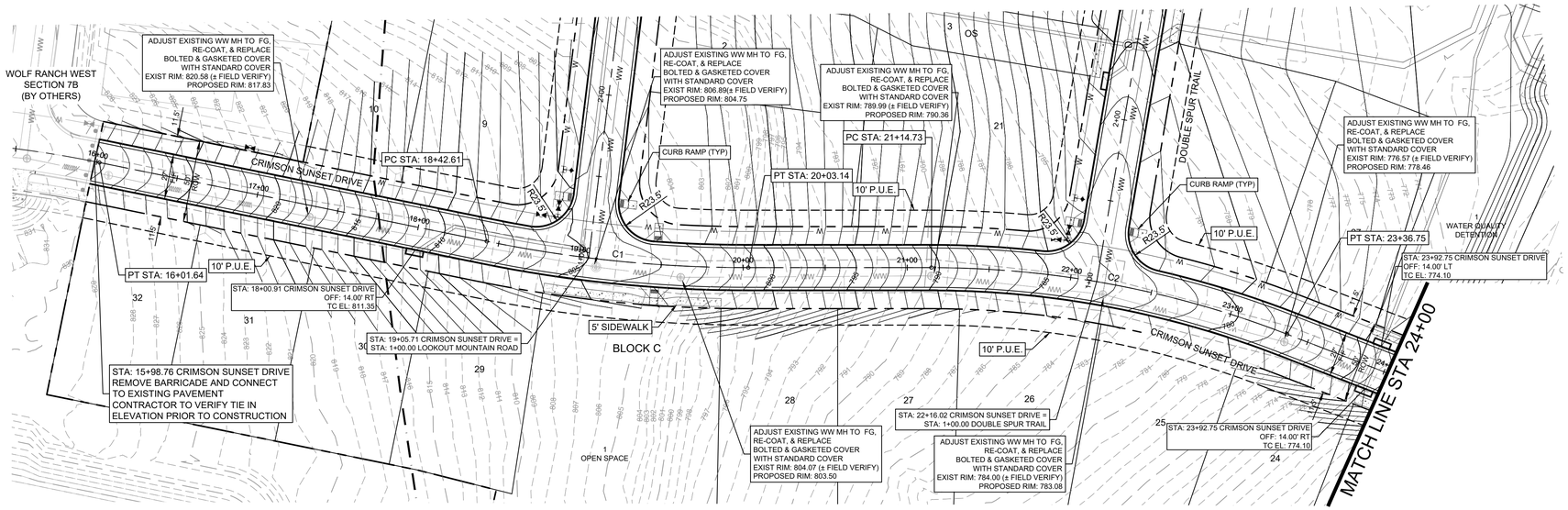
KHA PROJECT	064461307
DATE	DECEMBER 2023
SCALE:	AS SHOWN
DESIGNED BY:	RRJ
DRAWN BY:	AJM
CHECKED BY:	JAP

GRADING PLAN (2 OF 2)

WOLF RANCH
SECTION 6G
CITY OF GEORGETOWN
WILLIAMSON COUNTY, TEXAS

SHEET NUMBER
20 OF 87

Plotted By: Castillo, Jaime Date: February 08, 2024 08:58:14am File Path: K:\AUS_Civil\064461307-Wolf Ranch Section 6G\Cad\PlanSheets\G-Grading Plan (2 of 2).dwg
This document, together with the concepts and designs presented herein, as an instrument of service, is intended only for the specific purpose and client for which it was prepared. Reuse of and improper reliance on this document without written authorization and adaptation by Kimley-Horn and Associates, Inc. shall be without liability to Kimley-Horn and Associates, Inc.



0 40' 80'
GRAPHIC SCALE 40'

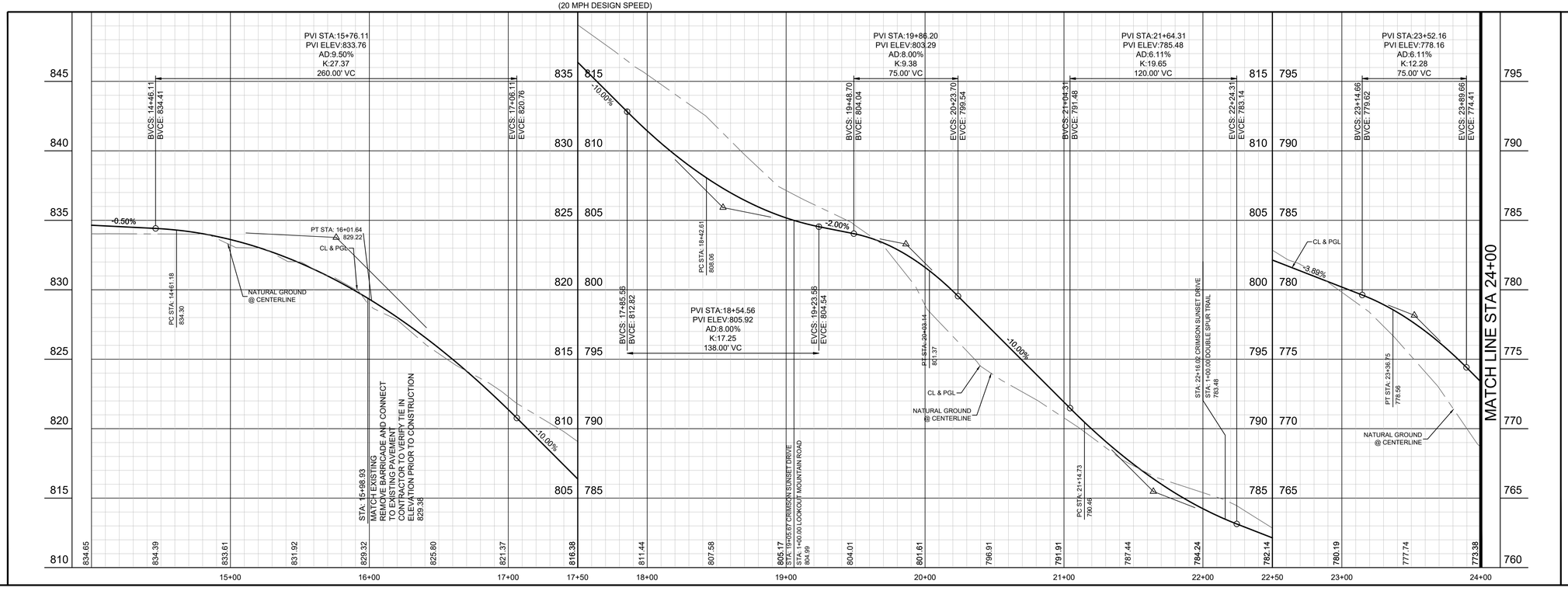
LEGEND

- PROPERTY LINE
- EXISTING CONTOUR
- PROPOSED CONTOUR
- PROPOSED WATER LINE
- PROPOSED WASTEWATER LINE
- PROPOSED STORM SEWER LINE
- PROPOSED FIRE HYDRANT
- PROPOSED WASTEWATER MANHOLE
- SIDEWALK (THIS CONTRACT)
- RIGHT-OF-WAY
- EASEMENT

NOTE:
ALL DIMENSIONS ARE SHOWN TO THE FRONT OF CURB

CURVE TABLE						
CURVE	RADIUS	LENGTH	CHORD BEARING	CHORD	DELTA	TANGENT
C1	800.00'	160.53'	S5°44'54"W	160.26'	11°29'48"	80.53'
C2	600.00'	222.02'	S10°36'03"W	220.76'	21°12'05"	112.29'

CRIMSON SUNSET DRIVE
(20 MPH DESIGN SPEED)



PROFILE SCALE
1" = 40' HORIZONTAL
1" = 4' VERTICAL

BENCHMARKS
ADD BENCHMARKS HERE

No.	REVISIONS	DATE	BY

Kimley»Horn
© 2024 KIMLEY-HORN AND ASSOCIATES, INC.
10814 JOLLYVILLE ROAD, CAMPUS IV, SUITE 200, AUSTIN, TX 78759
PHONE: 512-418-1771 FAX: 512-418-1791
WWW.KIMLEY-HORN.COM
TEXAS REGISTERED ENGINEERING FIRM F-928

STATE OF TEXAS
JOHN A. PICKENS
110631
LICENSED
PROFESSIONAL ENGINEER
02/02/2024

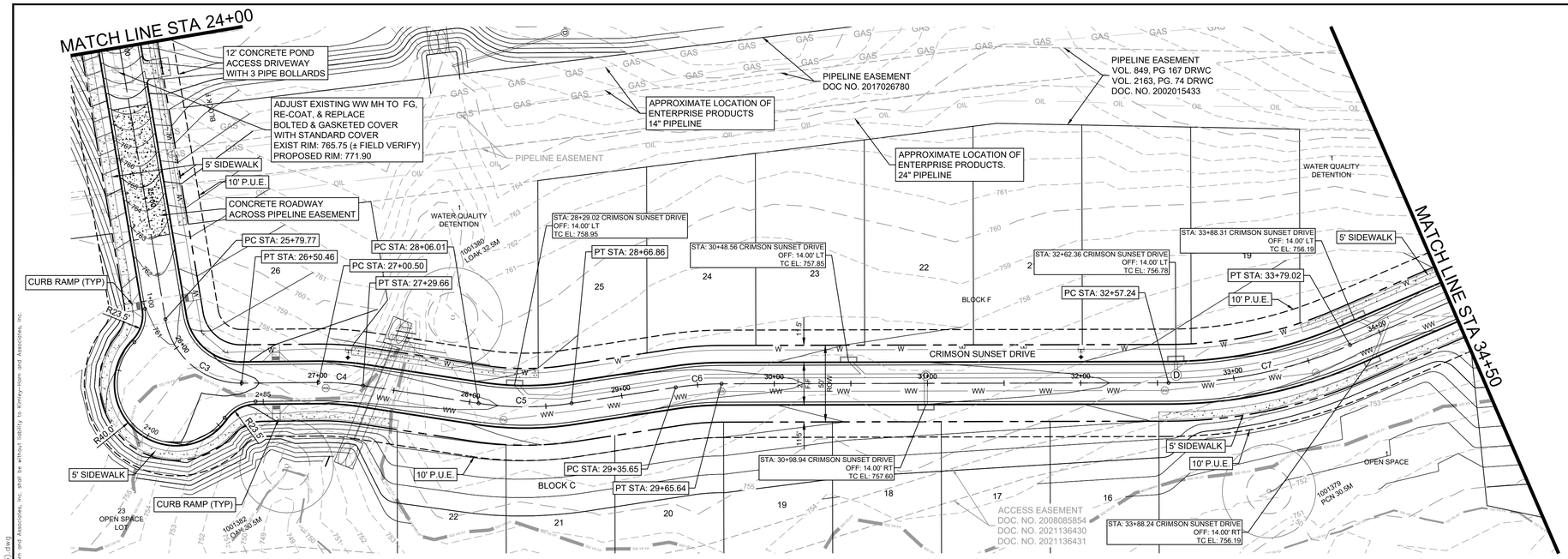
KHA PROJECT 064461307
DATE DECEMBER 2023
SCALE: AS SHOWN
DESIGNED BY: RRJ
DRAWN BY: AJM
CHECKED BY: JAP

CRIMSON SUNSET DRIVE - PAVING PLAN AND PROFILE (1 OF 3)

WOLF RANCH
SECTION 6G
CITY OF GEORGETOWN
WILLIAMSON COUNTY, TEXAS

SHEET NUMBER
21 OF 87

Plotted By:Castillo, Jaime Date:February 08, 2024 08:59:34am File Path:K:\AUS_Civil\064461307-Wolf Ranch, Section 6G\Cad\PlanSheets\C-Paving Plan and Profile Crimson Sunset Drive (1 of 3).dwg
This document, together with the concepts and designs presented herein, as an instrument of service, is intended only for the specific purpose and client for which it was prepared. Reuse of and improper reliance on this document without written authorization and adaptation by Kimley-Horn and Associates, Inc. shall be without liability to Kimley-Horn and Associates, Inc.



0 40' 80'
GRAPHIC SCALE 40'

LEGEND

- PROPERTY LINE
- 555 EXISTING CONTOUR
- 555 PROPOSED CONTOUR
- W PROPOSED WATER LINE
- WW PROPOSED WASTEWATER LINE
- PROPOSED STORM SEWER LINE
- PROPOSED FIRE HYDRANT
- PROPOSED WASTEWATER MANHOLE
- SIDEWALK (THIS CONTRACT)
- RIGHT-OF-WAY
- EASEMENT

NOTE:
ALL DIMENSIONS ARE SHOWN TO THE FRONT OF CURB

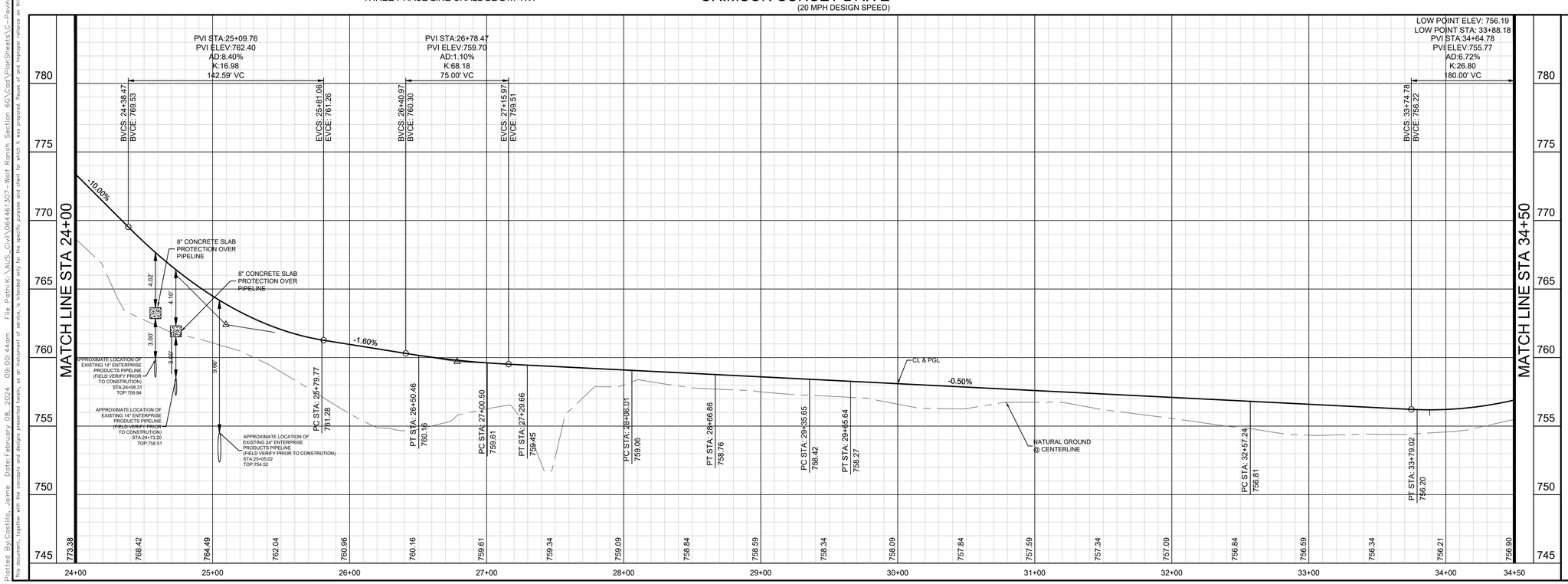
WARNING:
HIGH-PRESSURE PIPELINES
EXCAVATION AND/OR CONSTRUCTION
PROHIBITED WITHOUT WRITTEN
PERMISSION FROM ENTERPRISE
PRODUCTS COMPANY

NOTE:

1. BURIED ELECTRICAL CABLES SHALL BE INSTALLED IN ACCORDANCE WITH THE NATIONAL ELECTRICAL SAFETY CODE AND SMALL CROSS ELBOW ENTERPRISE PIPELINES WITH MINIMUM CLEARANCES OF 24 INCHES FOR 0 - 440 VOLTS; 30 INCHES FOR 441 VOLTS TO 22,000 VOLTS; AND 42 INCHES FOR 10,001 VOLTS AND ABOVE, ALL POWER CABLES SHALL BE INSTALLED IN NONMETALIC OR HIGH IMPACT PVC CONDUIT. IN THE EVENT THE POWER CABLE CROSSES OVER AN ENTERPRISE PIPELINE. IT SHALL BE ENCASED IN A 6-INCH ENVELOPE OF RED CONCRETE FOR THE FULL WIDTH OF THE RIGHT-OF-WAY.
2. THE ELECTRIC MAIN VOLTAGE UNDER THE EXISTING GAS MAINS WILL BE THE FOLLOWING:
   SINGLE PHASE LINE WILL BE 14.4 KV.
   THREE PHASE LINE SHALL BE 24.7 KV.

CURVE TABLE						
CURVE	RADIUS	LENGTH	CHORD BEARING	CHORD	DELTA	TANGENT
C3	50.00'	70.69'	S19°17'55"E	64.94'	81°00'00"	42.70'
C4	180.00'	29.16'	S55°09'30"E	29.12'	9°16'50"	14.61'
C5	200.00'	60.86'	S59°14'08"E	60.63'	17°26'06"	30.67'
C6	200.00'	29.99'	S63°39'28"E	29.96'	8°35'26"	15.02'
C7	300.00'	121.78'	S70°59'30"E	120.95'	23°15'30"	61.74'

CRIMSON SUNSET DRIVE
(20 MPH DESIGN SPEED)



PROFILE SCALE
1" = 40' HORIZONTAL
1" = 4' VERTICAL

BENCHMARKS

ADD BENCHMARKS HERE

No.	REVISIONS	DATE	BY

Kimley»Horn
© 2024 KIMLEY-HORN AND ASSOCIATES, INC.
10814 JOLLYVILLE ROAD, CAMPUS IV, SUITE 200, AUSTIN, TX 78759
PHONE: 512-418-1771 FAX: 512-418-1791
WWW.KIMLEY-HORN.COM
TEXAS REGISTERED ENGINEERING FIRM F-928

STATE OF TEXAS
JOHN A. PICKENS
110631
LICENSED
PROFESSIONAL ENGINEER
02/02/2024

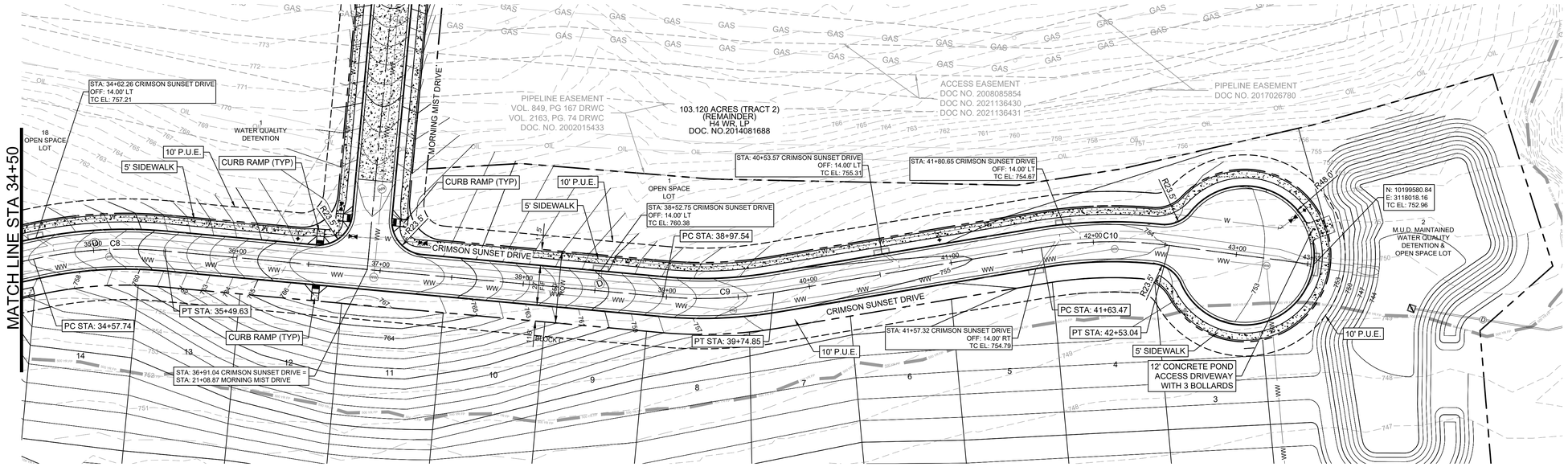
KHA PROJECT 064461307
DATE DECEMBER 2023
SCALE: AS SHOWN
DESIGNED BY: RRJ
DRAWN BY: AJM
CHECKED BY: JAP

CRIMSON SUNSET DRIVE - PAVING PLAN AND PROFILE (2 OF 3)

WOLF RANCH
SECTION 6G
CITY OF GEORGETOWN
WILLIAMSON COUNTY, TEXAS

SHEET NUMBER
22 OF 87

Plotted By:Castillo, Jaime Date:February 08, 2024 09:00:44am File Path:K:\AUS_Civil\064461307-Wolf Ranch Section 6G\Cad\PlanSheets\C-Paving Plan and Profile Crimson Sunset Drive (2 of 3).dwg
This document, together with the concepts and designs presented herein, as an instrument of service, is intended only for the specific purpose and client for which it was prepared. Reuse of and improper reliance on this document without written authorization and adaptation by Kimley-Horn and Associates, Inc. shall be without liability to Kimley-Horn and Associates, Inc.



LEGEND

- PROPERTY LINE
- EXISTING CONTOUR
- PROPOSED CONTOUR
- PROPOSED WATER LINE
- PROPOSED WASTEWATER LINE
- PROPOSED STORM SEWER LINE
- PROPOSED FIRE HYDRANT
- PROPOSED WASTEWATER MANHOLE
- SIDEWALK (THIS CONTRACT)
- RIGHT-OF-WAY
- EASEMENT

NOTE:
ALL DIMENSIONS ARE SHOWN TO
THE FRONT OF CURB

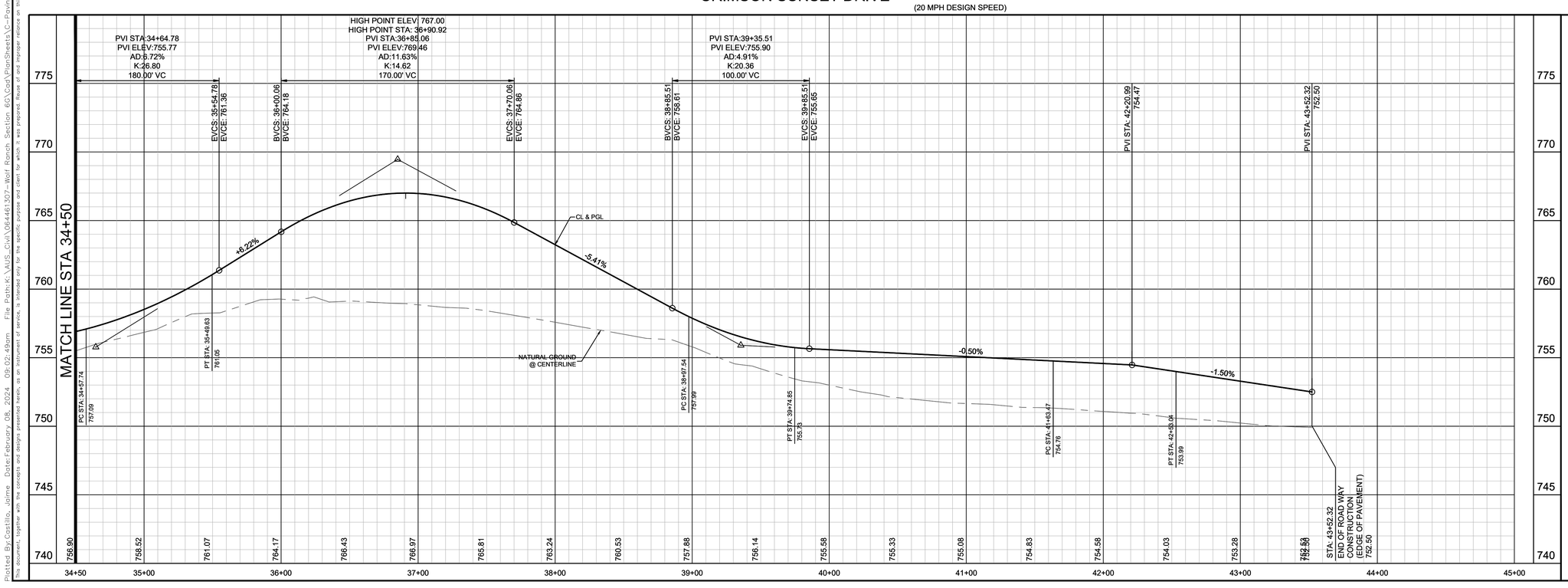
WARNING:
HIGH-PRESSURE PIPELINES
EXCAVATION AND/OR CONSTRUCTION
PROHIBITED WITHOUT WRITTEN
PERMISSION FROM ENTERPRISE
PRODUCTS COMPANY

CURVE TABLE

CURVE	RADIUS	LENGTH	CHORD BEARING	CHORD	DELTA	TANGENT
C8	300.00'	91.89'	S73°50'46"E	91.53'	17°32'58"	46.31'
C9	300.00'	77.31'	S72°27'14"E	77.09'	14°45'53"	38.87'
C10	300.00'	89.58'	S71°16'55"E	89.25'	17°06'30"	45.12'

CRIMSON SUNSET DRIVE

(20 MPH DESIGN SPEED)



PROFILE SCALE
1" = 40' HORIZONTAL
1" = 4' VERTICAL

BENCHMARKS

ADD BENCHMARKS HERE

No.	REVISIONS	DATE	BY

Kimley»Horn
© 2024 KIMLEY-HORN AND ASSOCIATES, INC.
10814 JOLLYVILLE ROAD, CAMPUS IV, SUITE 200, AUSTIN, TX 78759
PHONE: 512-418-1771 FAX: 512-418-1791
WWW.KIMLEY-HORN.COM
TEXAS REGISTERED ENGINEERING FIRM F-928

STATE OF TEXAS
JOHN A. PICKENS
110631
LICENSED
PROFESSIONAL ENGINEER
02/02/2024

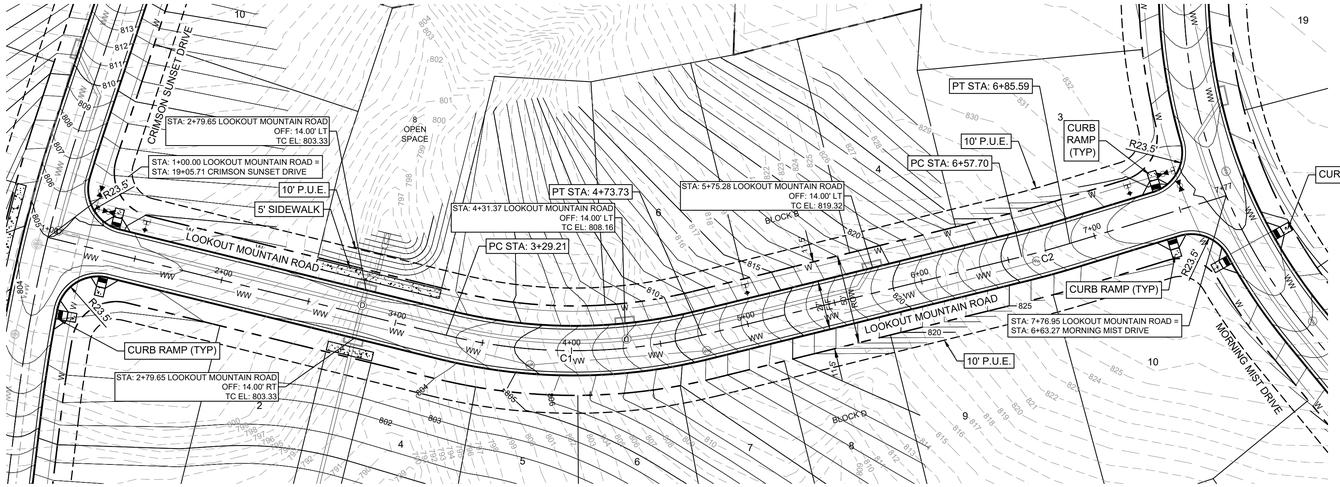
KHA PROJECT 064481307
DATE DECEMBER 2023
SCALE: AS SHOWN
DESIGNED BY: RRJ
DRAWN BY: AJM
CHECKED BY: JAP

CRIMSON SUNSET DRIVE - PAVING PLAN AND PROFILE (3 OF 3)

WOLF RANCH
SECTION 6G
CITY OF GEORGETOWN
WILLIAMSON COUNTY, TEXAS

SHEET NUMBER
23 OF 87

Plotted By:Castillo, Jaime Date:February 08, 2024 09:02:49am File Path:K:\AUS_Civil\064481307-Wolf Ranch, Section 6G\Cad\PlanSheets\C-Paving Plan and Profile Crimson Sunset Drive (3 of 3).dwg
This document, together with the concepts and designs presented herein, as an instrument of service, is intended only for the specific purpose and client for which it was prepared. Reuse of and improper reliance on this document without written authorization and adaptation by Kimley-Horn and Associates, Inc. shall be without liability to Kimley-Horn and Associates, Inc.



CURVE TABLE						
CURVE	RADIUS	LENGTH	CHORD BEARING	CHORD	DELTA	TANGENT
C1	300.00'	144.52'	N83°10'38"E	143.12'	27°36'01"	73.69'
C2	500.00'	27.89'	N67°46'44"E	27.89'	3°11'46"	13.95'

N
W E
S

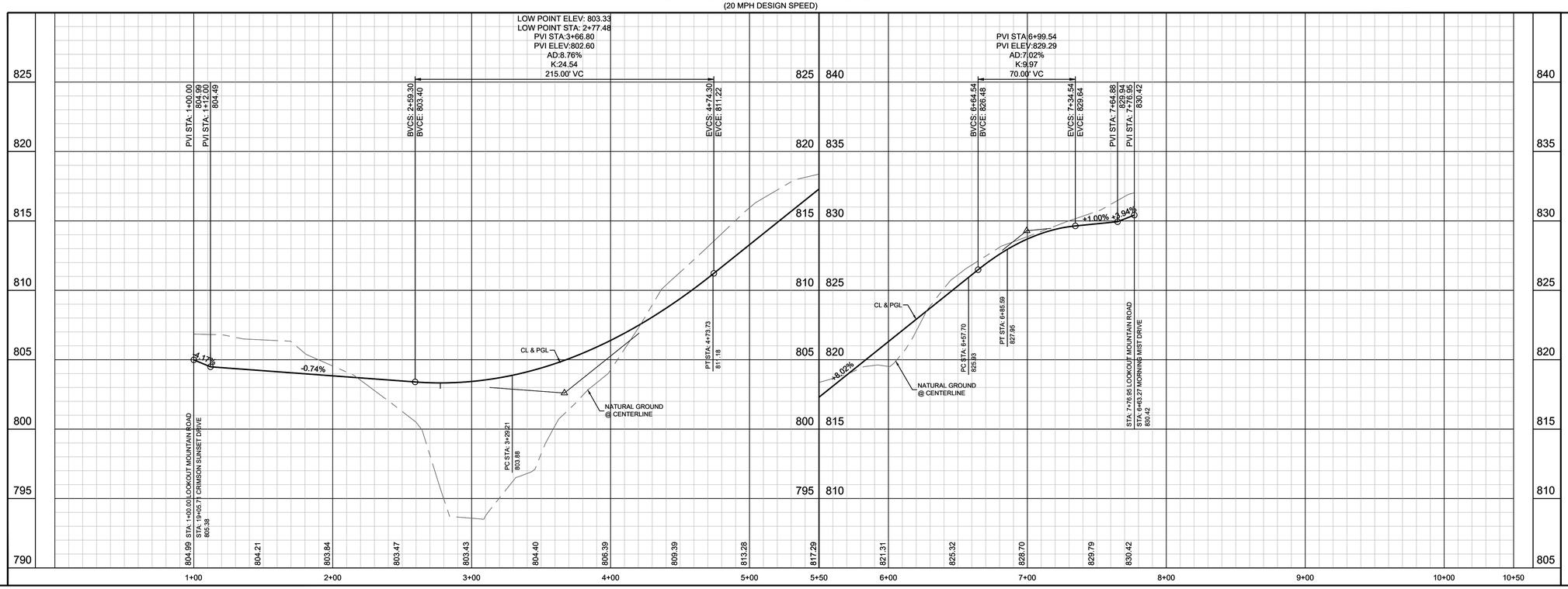
0 40' 80'
GRAPHIC SCALE 40'

LEGEND

- PROPERTY LINE
- EXISTING CONTOUR
- PROPOSED CONTOUR
- PROPOSED WATER LINE
- PROPOSED WASTEWATER LINE
- PROPOSED STORM SEWER LINE
- PROPOSED FIRE HYDRANT
- PROPOSED WASTEWATER MANHOLE
- SIDEWALK (THIS CONTRACT)
- RIGHT-OF-WAY
- EASEMENT

NOTE:
ALL DIMENSIONS ARE SHOWN TO
THE FRONT OF CURB

LOOKOUT MOUNTAIN ROAD
(20 MPH DESIGN SPEED)



PROFILE SCALE
1" = 40' HORIZONTAL
1" = 4' VERTICAL

BENCHMARKS
ADD BENCHMARKS HERE

No.	REVISIONS	DATE	BY

Kimley»Horn
© 2024 KIMLEY-HORN AND ASSOCIATES, INC.
10814 JOLLYVILLE ROAD, CAMPUS IV, SUITE 200, AUSTIN, TX 78759
PHONE: 512-418-1771 FAX: 512-418-1791
WWW.KIMLEY-HORN.COM
TEXAS REGISTERED ENGINEERING FIRM F-928

STATE OF TEXAS
JOHN A. PICKENS
110631
LICENSED
PROFESSIONAL ENGINEER
02/02/2024

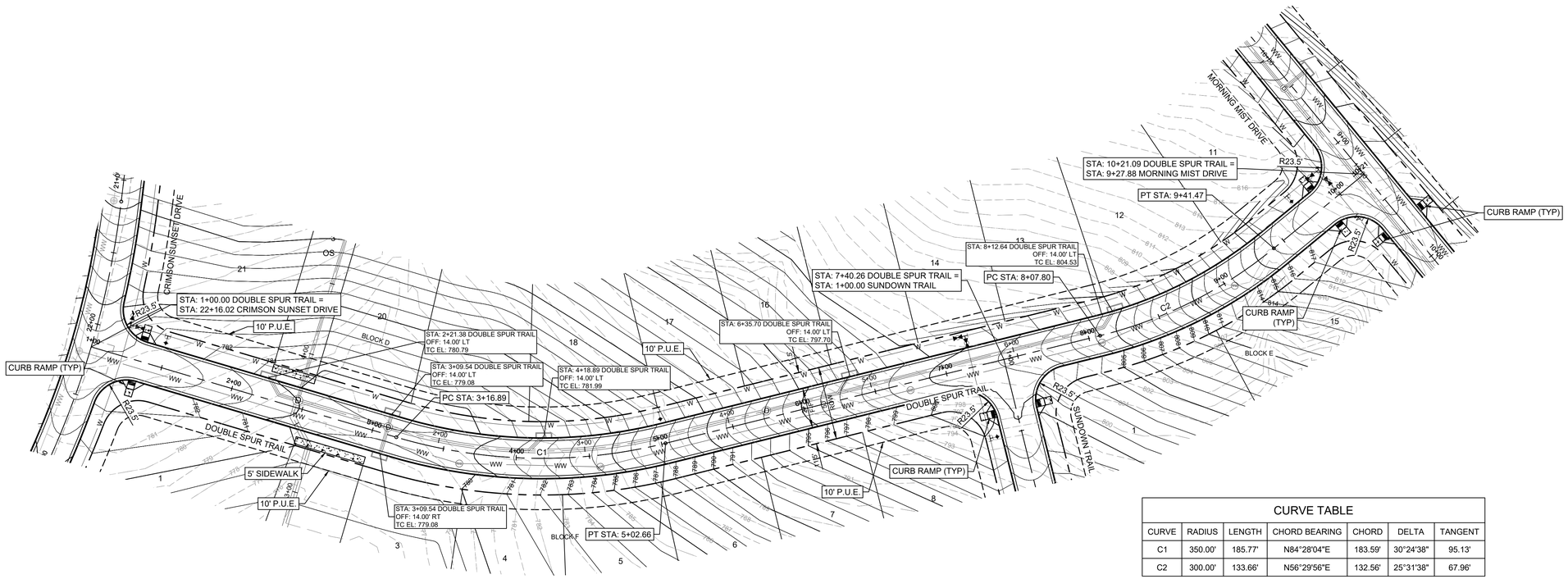
KHA PROJECT 064461307
DATE DECEMBER 2023
SCALE: AS SHOWN
DESIGNED BY: RRJ
DRAWN BY: AJM
CHECKED BY: JAP

LOOKOUT MOUNTAIN ROAD - PAVING PLAN AND PROFILE

WOLF RANCH
SECTION 6G
CITY OF GEORGETOWN
WILLIAMSON COUNTY, TEXAS

SHEET NUMBER
24 OF 87

Plotted By:Castillo, Jaime Date:February 08, 2024 09:05:14am File Path:K:\AUS_Civil\064461307-Wolf Ranch, Section 6G\Cad\PlanSheets\C-Paving Plan and Profile LOOKOUT MOUNTAIN ROAD.dwg
This document, together with the concepts and designs presented herein, as an instrument of service, is intended only for the specific purpose and client for which it was prepared. Reuse of and improper reliance on this document without written authorization and adaptation by Kimley-Horn and Associates, Inc. shall be without liability to Kimley-Horn and Associates, Inc.



CURVE TABLE						
CURVE	RADIUS	LENGTH	CHORD BEARING	CHORD	DELTA	TANGENT
C1	350.00'	185.77'	N84°28'04"E	183.59'	30°24'38"	95.13'
C2	300.00'	133.66'	N56°29'56"E	132.56'	25°31'38"	67.96'

N
W E
S

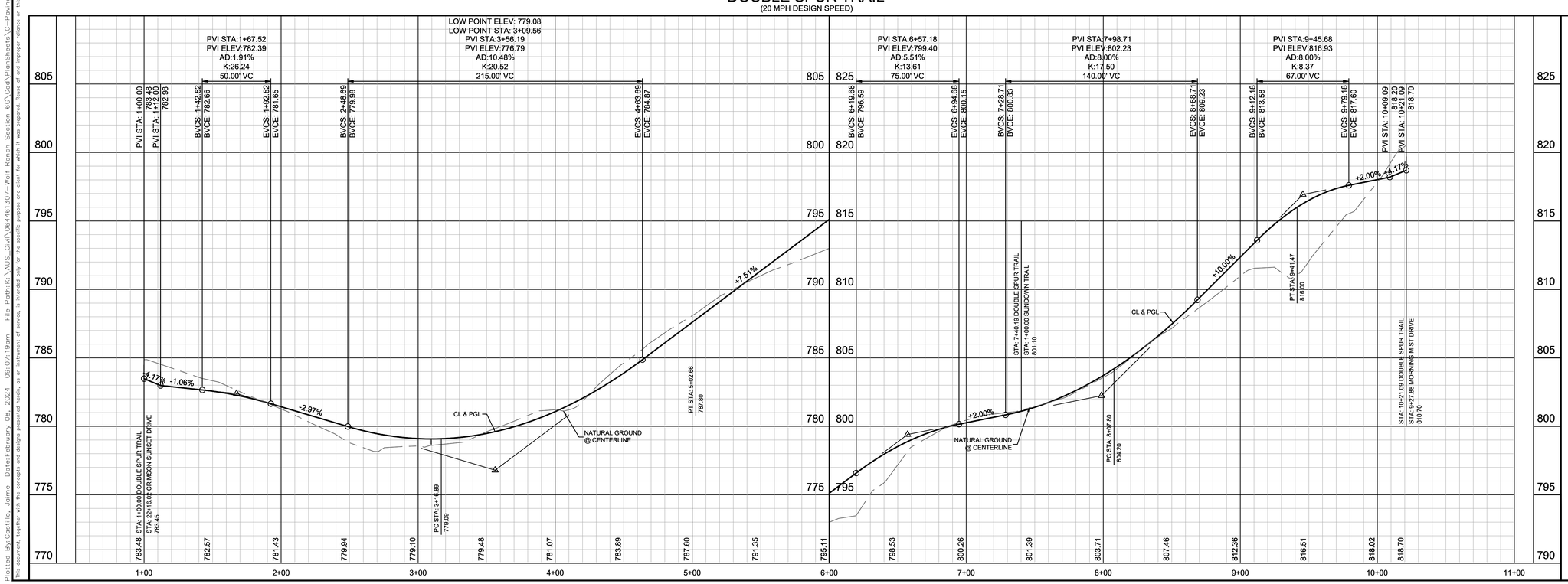
0 40' 80'
GRAPHIC SCALE 40'

LEGEND

- PROPERTY LINE
- EXISTING CONTOUR
- PROPOSED CONTOUR
- PROPOSED WATER LINE
- PROPOSED WASTEWATER LINE
- PROPOSED STORM SEWER LINE
- PROPOSED FIRE HYDRANT
- PROPOSED WASTEWATER MANHOLE
- SIDEWALK (THIS CONTRACT)
- RIGHT-OF-WAY
- EASEMENT

NOTE:
ALL DIMENSIONS ARE SHOWN TO THE FRONT OF CURB

DOUBLE SPUR TRAIL
(20 MPH DESIGN SPEED)



PROFILE SCALE
1" = 40' HORIZONTAL
1" = 4' VERTICAL

BENCHMARKS

ADD BENCHMARKS HERE

No.	REVISIONS	DATE	BY

Kimley»Horn
© 2024 KIMLEY-HORN AND ASSOCIATES, INC.
10814 JOLLYVILLE ROAD, CAMPUS IV, SUITE 200, AUSTIN, TX 78759
PHONE: 512-418-1771 FAX: 512-418-1791
WWW.KIMLEY-HORN.COM
TEXAS REGISTERED ENGINEERING FIRM F-928

STATE OF TEXAS
JOHN A. PICKENS
110631
LICENSED
PROFESSIONAL ENGINEER
02/02/2024

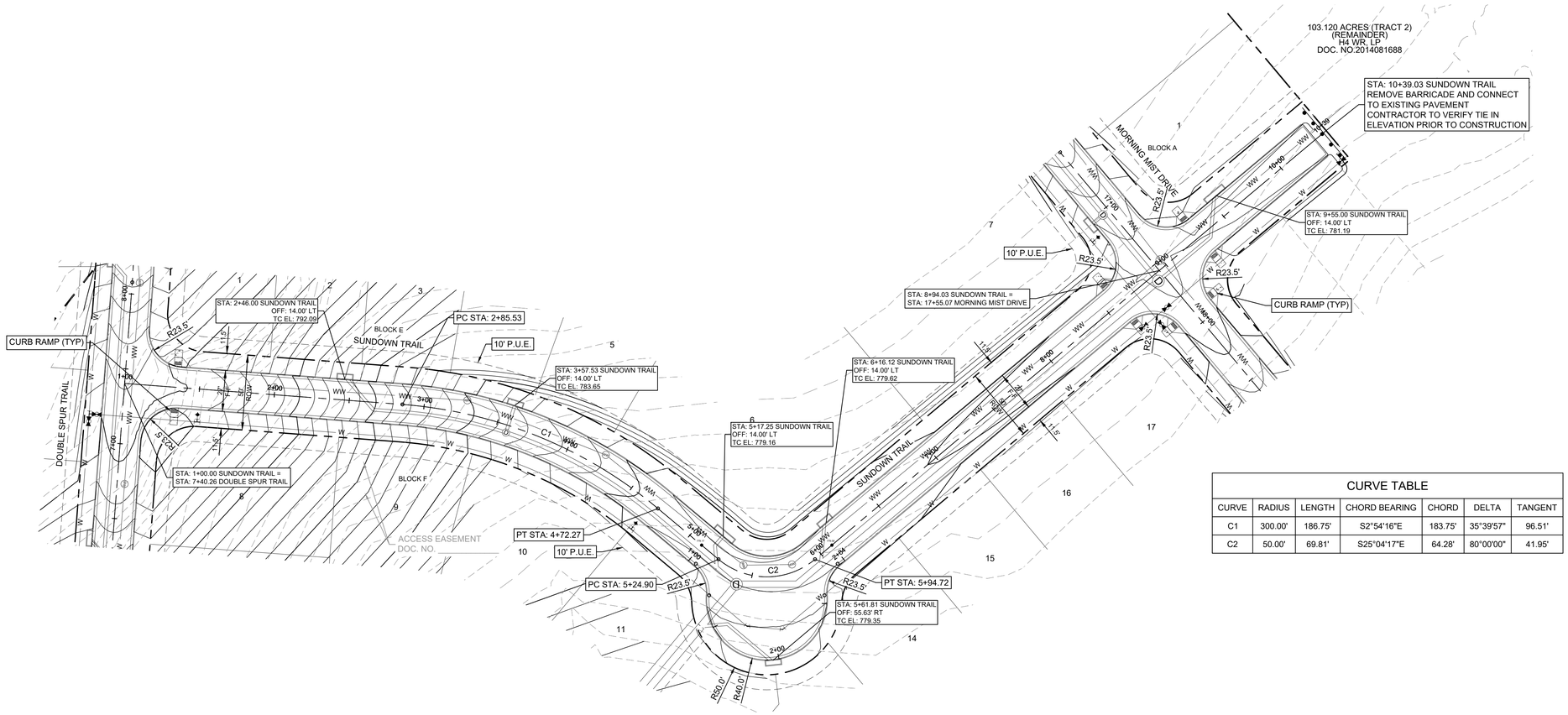
KHA PROJECT 064461307
DATE DECEMBER 2023
SCALE: AS SHOWN
DESIGNED BY: RRJ
DRAWN BY: AJM
CHECKED BY: JAP

DOUBLE SPUR TRAIL - PAVING PLAN AND PROFILE

WOLF RANCH
SECTION 6G
CITY OF GEORGETOWN
WILLIAMSON COUNTY, TEXAS

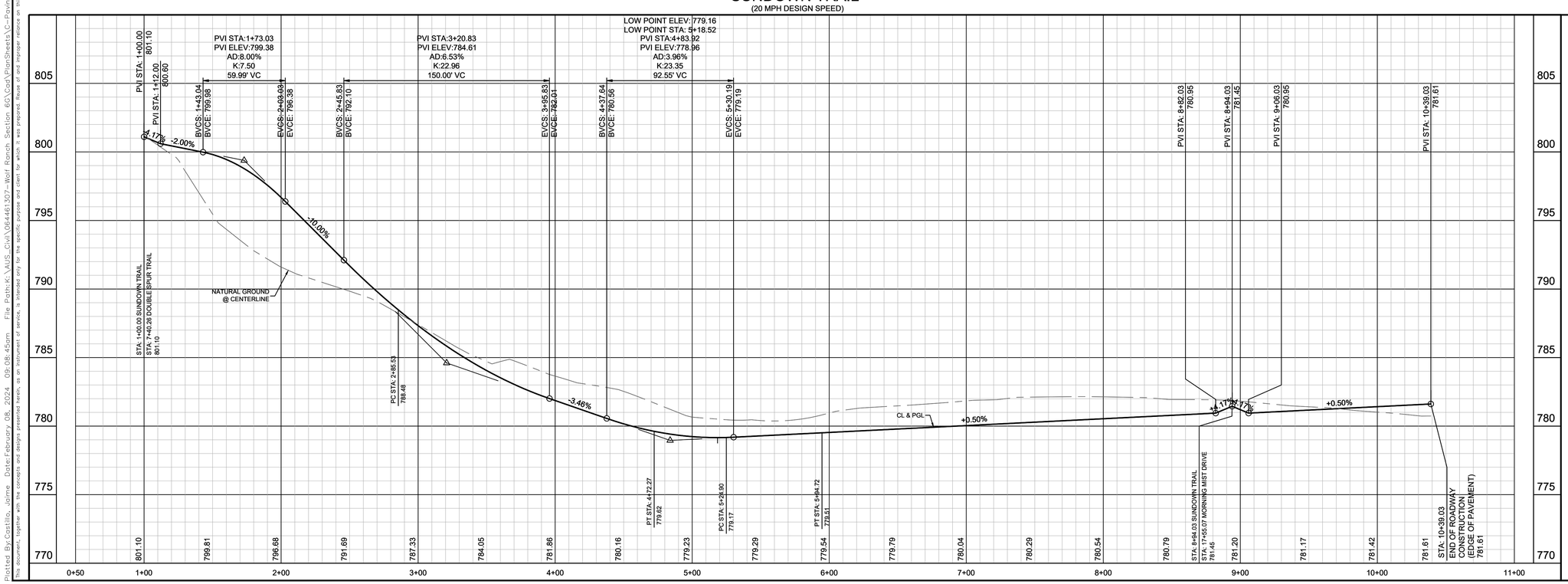
SHEET NUMBER
25 OF 87

Plotted By:Castillo, Jaime Date:February 08, 2024 09:07:19am File Path:K:\AUS_Civil\064461307-Wolf Ranch Section 6G\Cad\PlanSheets\C-Paving Plan and Profile DOUBLE SPUR TRAIL.dwg
This document, together with the concepts and designs presented herein, as an instrument of service, is intended only for the specific purpose and client for which it was prepared. Reuse of and improper reliance on this document without written authorization and adaptation by Kimley-Horn and Associates, Inc. shall be without liability to Kimley-Horn and Associates, Inc.



SUNDOWN TRAIL

(20 MPH DESIGN SPEED)



CURVE TABLE

CURVE	RADIUS	LENGTH	CHORD BEARING	CHORD	DELTA	TANGENT
C1	300.00'	186.75'	S2°54'16"E	183.75'	35°39'57"	96.51'
C2	50.00'	69.81'	S25°04'17"E	64.28'	80°00'00"	41.95'

GRAPHIC SCALE 40'

0 40' 80'

LEGEND

- PROPERTY LINE
- EXISTING CONTOUR
- PROPOSED CONTOUR
- PROPOSED WATER LINE
- PROPOSED WASTEWATER LINE
- PROPOSED STORM SEWER LINE
- PROPOSED FIRE HYDRANT
- PROPOSED WASTEWATER MANHOLE
- SIDEWALK (THIS CONTRACT)
- RIGHT-OF-WAY
- EASEMENT

PROFILE SCALE

1" = 40' HORIZONTAL
1" = 4' VERTICAL

BENCHMARKS

ADD BENCHMARKS HERE

No.	REVISIONS	DATE	BY

Kimley»Horn
© 2024 KIMLEY-HORN AND ASSOCIATES, INC.
10814 JOLLYVILLE ROAD, CAMPUS IV, SUITE 200, AUSTIN, TX 78759
PHONE: 512-418-1771 FAX: 512-418-1791
WWW.KIMLEY-HORN.COM
TEXAS REGISTERED ENGINEERING FIRM F-928

STATE OF TEXAS
JOHN A. PICKENS
110631
LICENSED
PROFESSIONAL ENGINEER

02/02/2024

KHA PROJECT
064461307

DATE
DECEMBER 2023

SCALE: AS SHOWN

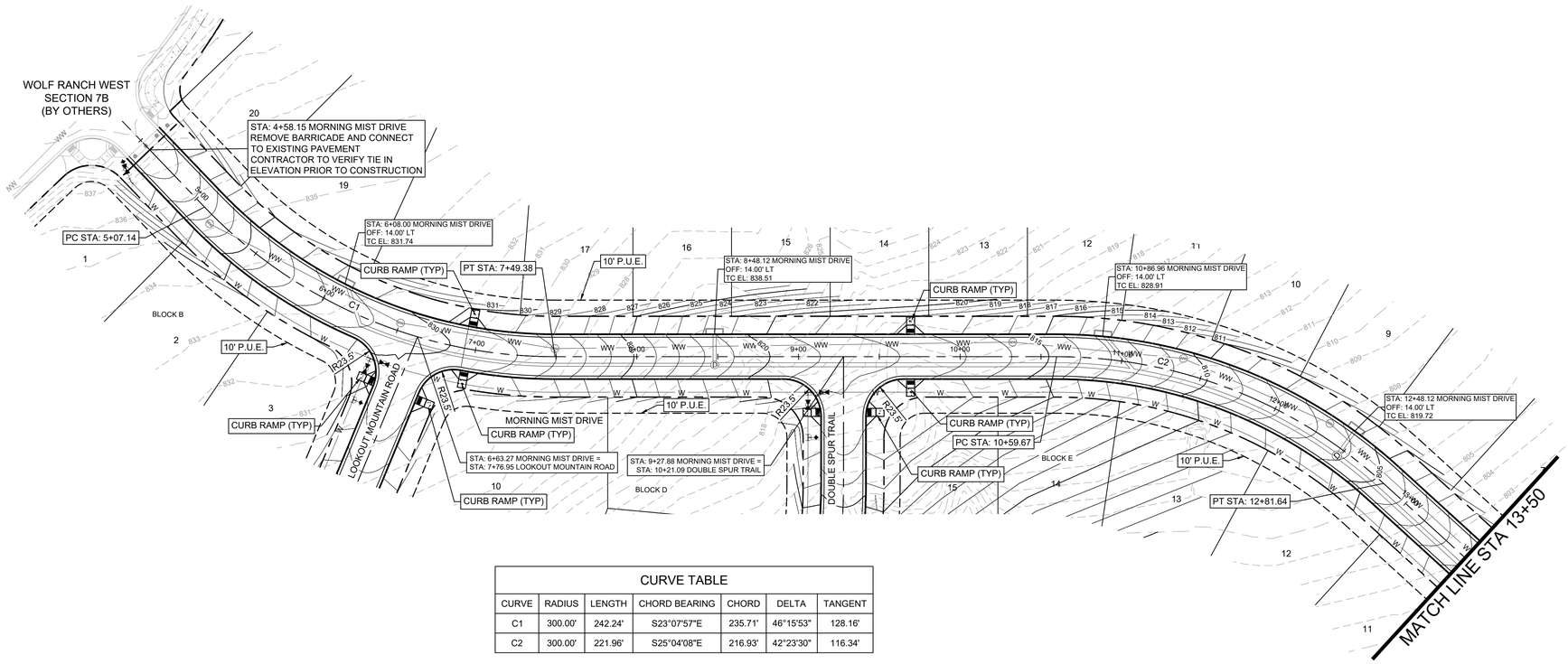
DESIGNED BY: RRJ
DRAWN BY: AJM
CHECKED BY: JAP

SUNDOWN TRAIL - PAVING PLAN AND PROFILE

WOLF RANCH
SECTION 6G
CITY OF GEORGETOWN
WILLIAMSON COUNTY, TEXAS

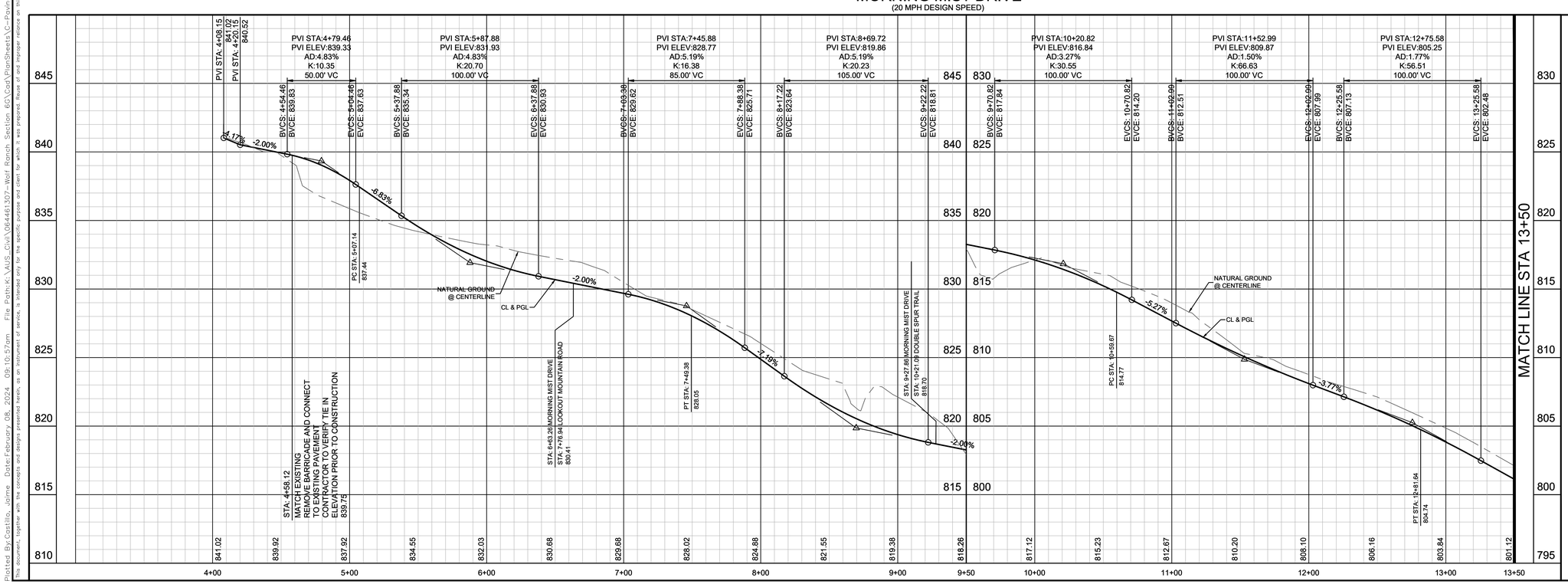
SHEET NUMBER
26 OF 87

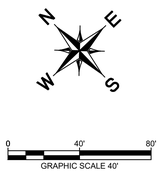
Plotted By:Castillo, Jaime Date:February 08, 2024 09:08:45am File Path:K:\AUS_Civil\064461307-Wolf Ranch Section 6G\Cad\PlanSheets\C-Paving Plan and Profile SUNDOWN TRAIL.dwg
This document, together with the concepts and designs presented herein, as an instrument of service, is intended only for the specific purpose and client for which it was prepared. Reuse of and improper reliance on this document without written authorization and adaptation by Kimley-Horn and Associates, Inc. shall be without liability to Kimley-Horn and Associates, Inc.



CURVE TABLE						
CURVE	RADIUS	LENGTH	CHORD BEARING	CHORD	DELTA	TANGENT
C1	300.00'	242.24'	S23°07'57"E	235.71'	46°15'53"	128.16'
C2	300.00'	221.96'	S25°04'08"E	216.93'	42°23'30"	116.34'

MORNING MIST DRIVE
(20 MPH DESIGN SPEED)





LEGEND

- PROPERTY LINE
- EXISTING CONTOUR
- PROPOSED CONTOUR
- PROPOSED WATER LINE
- PROPOSED WASTEWATER LINE
- PROPOSED STORM SEWER LINE
- PROPOSED FIRE HYDRANT
- PROPOSED WASTEWATER MANHOLE
- SIDEWALK (THIS CONTRACT)
- RIGHT-OF-WAY
- EASEMENT

NOTE:
ALL DIMENSIONS ARE SHOWN TO
THE FRONT OF CURB

PROFILE SCALE
1" = 40' HORIZONTAL
1" = 4' VERTICAL

BENCHMARKS

ADD BENCHMARKS HERE

No.	REVISIONS	DATE	BY

Kimley»Horn
© 2024 KIMLEY-HORN AND ASSOCIATES, INC.
10814 JOLLYVILLE ROAD, CAMPUS IV, SUITE 200, AUSTIN, TX 78759
PHONE: 512-418-1771 FAX: 512-418-1791
WWW.KIMLEY-HORN.COM
TEXAS REGISTERED ENGINEERING FIRM F-928

JOHN A. PICKENS
110631
LICENSED
PROFESSIONAL ENGINEER
02/02/2024

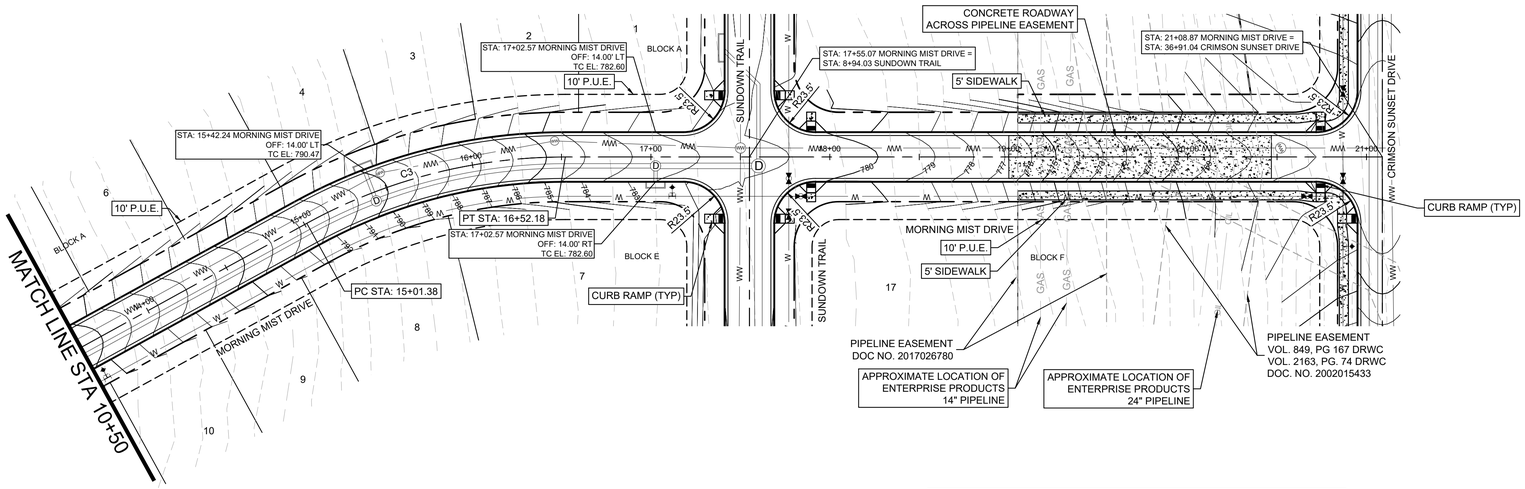
KHA PROJECT 064461307
DATE DECEMBER 2023
SCALE: AS SHOWN
DESIGNED BY: RRJ
DRAWN BY: AJM
CHECKED BY: JAP

MORNING MIST DRIVE - PAVING PLAN AND PROFILE (1 OF 2)

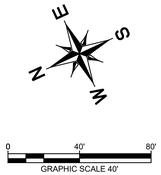
WOLF RANCH
SECTION 6G
CITY OF GEORGETOWN
WILLIAMSON COUNTY, TEXAS

SHEET NUMBER
27 OF 87

This document, together with the concepts and designs presented herein, as an instrument of service, is intended only for the specific purpose and client for which it was prepared. Reuse of and improper reliance on this document without written authorization and adaptation by Kimley-Horn and Associates, Inc. shall be without liability to Kimley-Horn and Associates, Inc.
Plotted By:Castillo, Jaime Date:February 08, 2024 09:10:57am File Path:K:\AUS_Civil\064461307-Wolf Ranch Section 6G\Cad\PlanSheets\C-Paving Plan and Profile MORNING MIST DRIVE (1 of 2).dwg



WARNING:
HIGH-PRESSURE PIPELINES
EXCAVATION AND/OR CONSTRUCTION
PROHIBITED WITHOUT WRITTEN
PERMISSION FROM ENTERPRISE
PRODUCTS COMPANY



LEGEND

- PROPERTY LINE
- EXISTING CONTOUR
- PROPOSED CONTOUR
- PROPOSED WATER LINE
- PROPOSED WASTEWATER LINE
- PROPOSED STORM SEWER LINE
- PROPOSED FIRE HYDRANT
- PROPOSED WASTEWATER MANHOLE
- SIDEWALK (THIS CONTRACT)
- RIGHT-OF-WAY
- EASEMENT

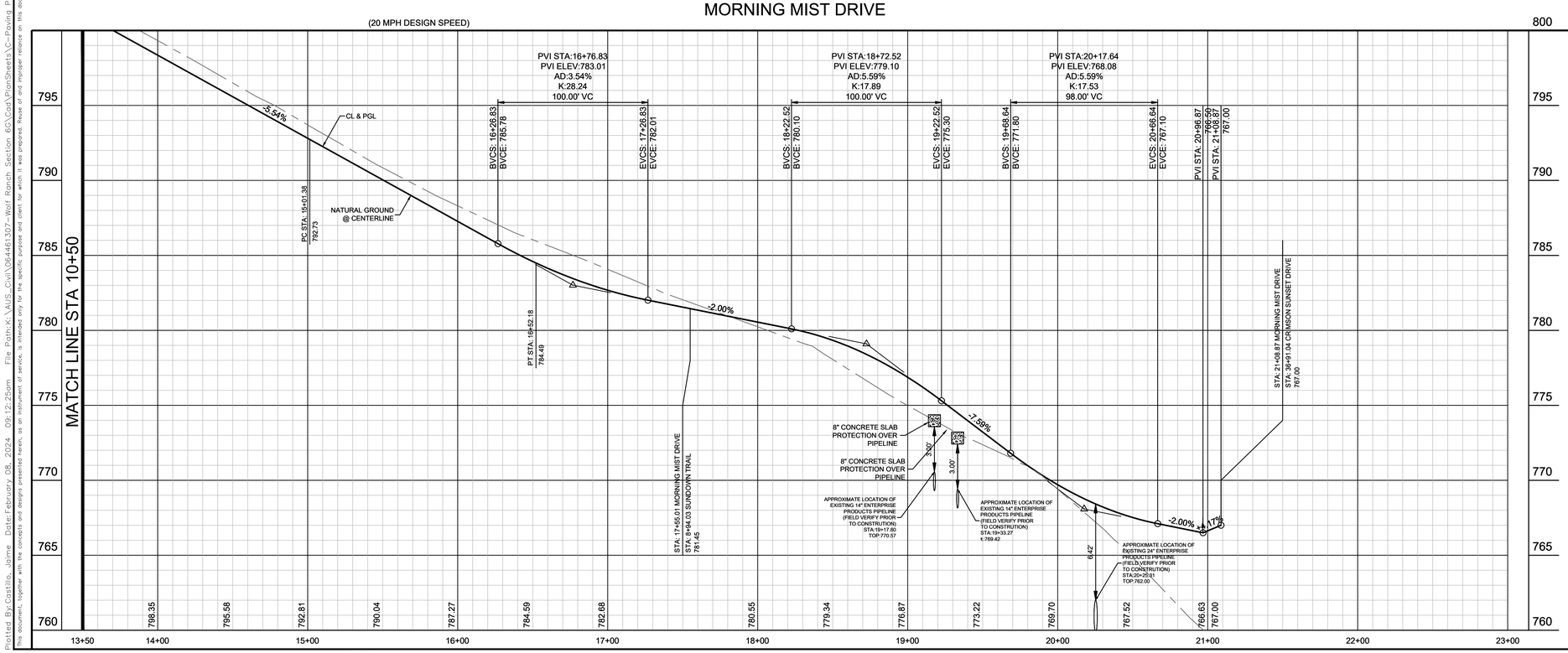
NOTE:
ALL DIMENSIONS ARE SHOWN TO
THE FRONT OF CURB

CURVE TABLE

CURVE	RADIUS	LENGTH	CHORD BEARING	CHORD	DELTA	TANGENT
C3	300.00'	150.80'	S10°31'40"W	149.22'	28°48'05"	77.03'

MORNING MIST DRIVE

(20 MPH DESIGN SPEED)



PROFILE SCALE
1" = 40' HORIZONTAL
1" = 4' VERTICAL

BENCHMARKS
ADD BENCHMARKS HERE

No.	REVISIONS	DATE	BY

Kimley»Horn
© 2024 KIMLEY-HORN AND ASSOCIATES, INC.
10814 JOLLYVILLE ROAD, CAMPUS IV, SUITE 200, AUSTIN, TX 78759
PHONE: 512-418-1771 FAX: 512-418-1791
WWW.KIMLEY-HORN.COM
TEXAS REGISTERED ENGINEERING FIRM F-928

STATE OF TEXAS
JOHN A. PICKENS
110631
LICENSED
PROFESSIONAL ENGINEER
02/02/2024

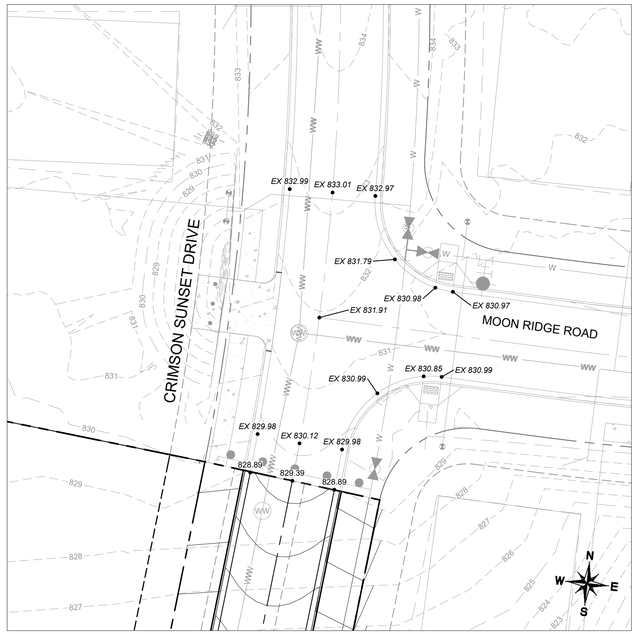
KHA PROJECT 064461307
DATE DECEMBER 2023
SCALE: AS SHOWN
DESIGNED BY: RRJ
DRAWN BY: AJM
CHECKED BY: JAP

MORNING MIST DRIVE - PAVING PLAN AND PROFILE (2 OF 2)

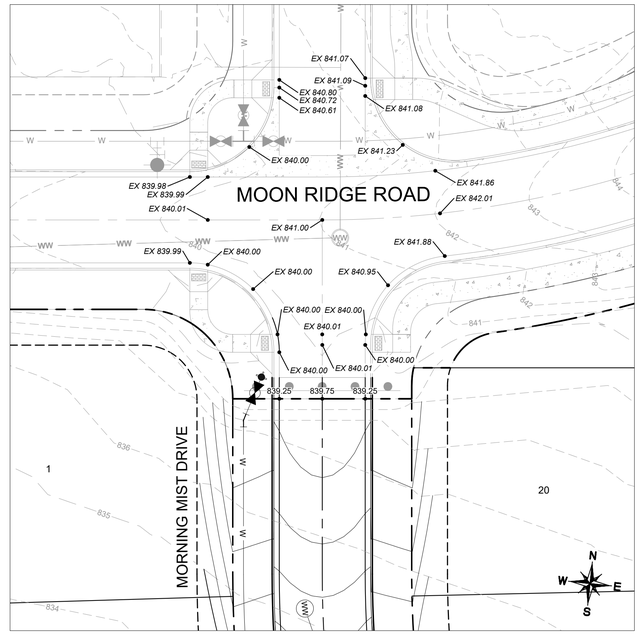
WOLF RANCH
SECTION 6G
CITY OF GEORGETOWN
WILLIAMSON COUNTY, TEXAS

SHEET NUMBER
28 OF 87

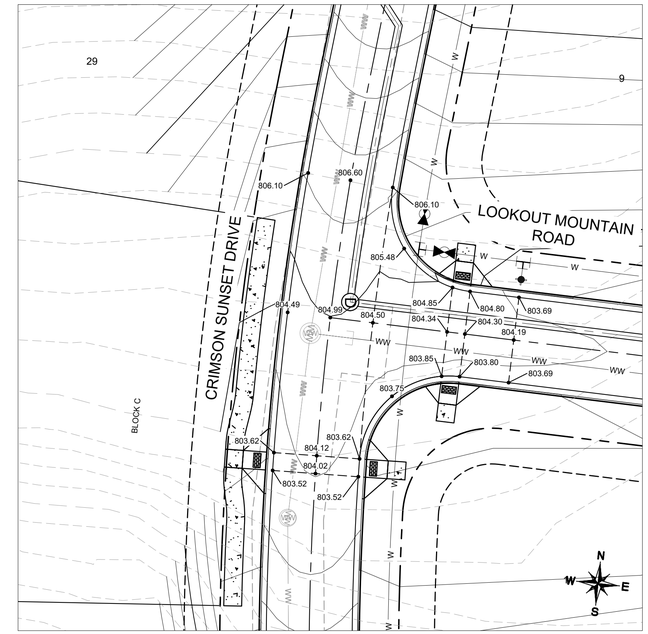
Plotted By:Castillo, Jaime Date:February 08, 2024 09:12:25am File Path:K:\AUS_Civil\064461307-Wolf Ranch Section 6G\Cad\PlanSheets\C-Paving Plan and Profile MORNING MIST DRIVE (2 of 2).dwg
This document, together with the concepts and designs presented herein, as an instrument of service, is intended only for the specific purpose and client for which it was prepared. Reuse of and improper reliance on this document without written authorization and adaptation by Kimley-Horn and Associates, Inc. shall be without liability to Kimley-Horn and Associates, Inc.



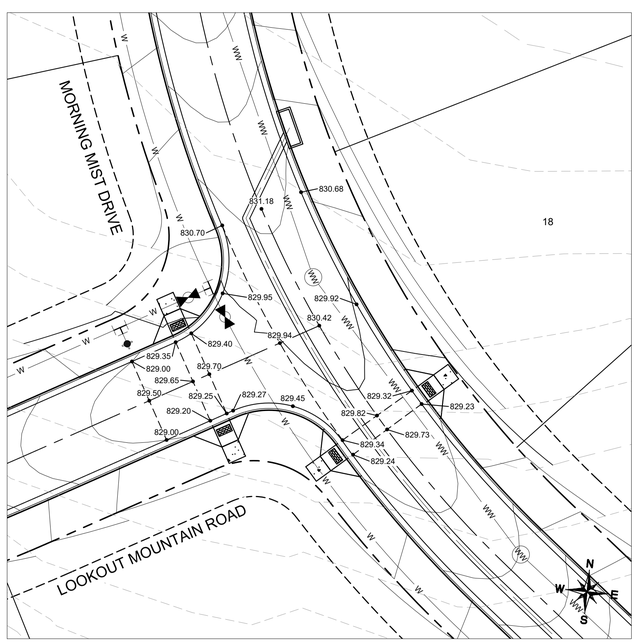
MOON RIDGE ROAD AT
CRIMSON SUNSET DRIVE



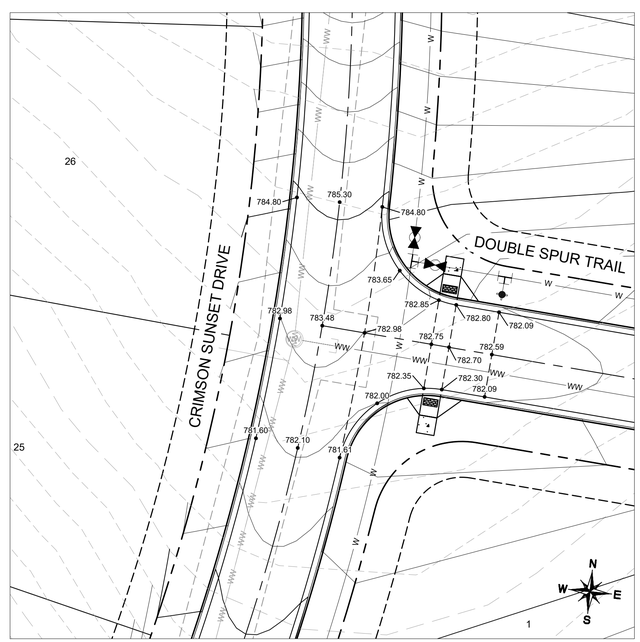
MOON RIDGE ROAD AT
MORNING MIST DRIVE



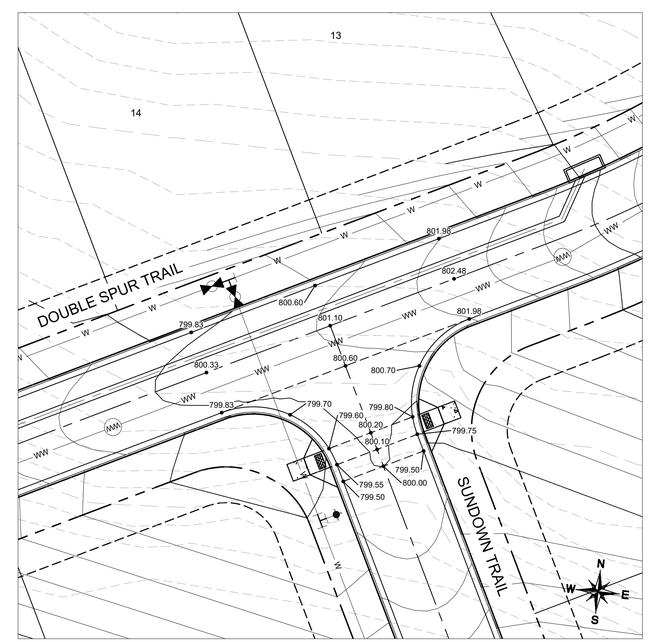
CRIMSON SUNSET DRIVE AT
LOOKOUT MOUNTAIN ROAD



LOOKOUT MOUNTAIN ROAD AT MORNING MIST DRIVE



CRIMSON SUNSET DRIVE AT DOUBLE SPUR TRAIL



DOUBLE SPUR TRAIL AT SUNDOWN TRAIL

BENCHMARKS

ADD BENCHMARKS HERE

No.	REVISIONS	DATE	BY

Kimley»Horn
© 2024 KIMLEY-HORN AND ASSOCIATES, INC.
10814 JOLLYVILLE ROAD, CAMPUS IV, SUITE 200, AUSTIN, TX 78759
PHONE: 512-418-1771 FAX: 512-418-1791
WWW.KIMLEY-HORN.COM
TEXAS REGISTERED ENGINEERING FIRM F-928

JOHN A. PICKENS
110631
LICENSED
PROFESSIONAL ENGINEER
02/02/2024

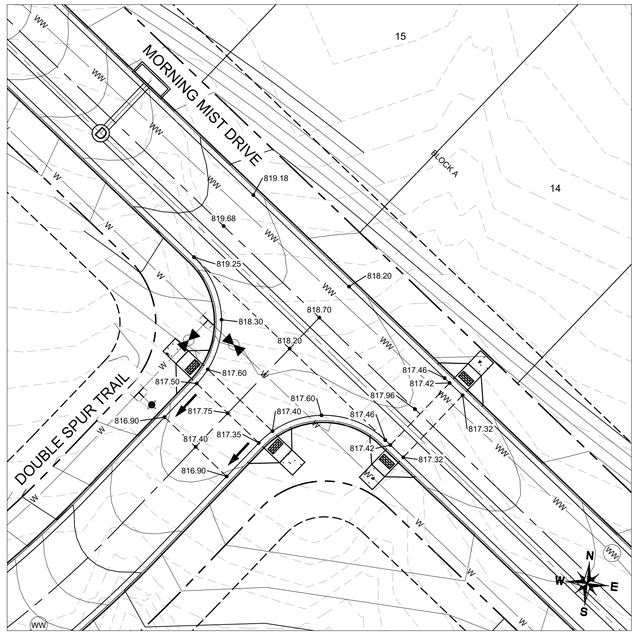
KHA PROJECT 064461307
DATE DECEMBER 2023
SCALE: AS SHOWN
DESIGNED BY: RRJ
DRAWN BY: AJM
CHECKED BY: JAP

INTERSECTION KNUCKLE & CUL-DE-SAC GRADING PLANS (1 OF 2)

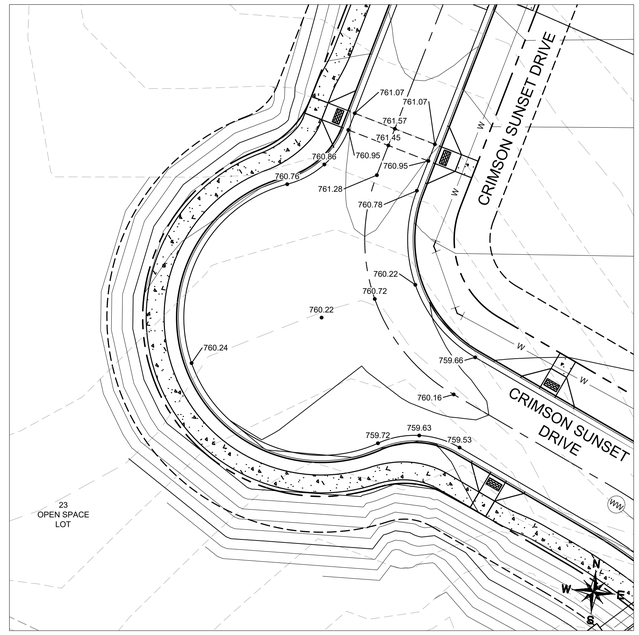
WOLF RANCH
SECTION 6G
CITY OF GEORGETOWN
WILLIAMSON COUNTY, TEXAS

SHEET NUMBER
29 OF 87

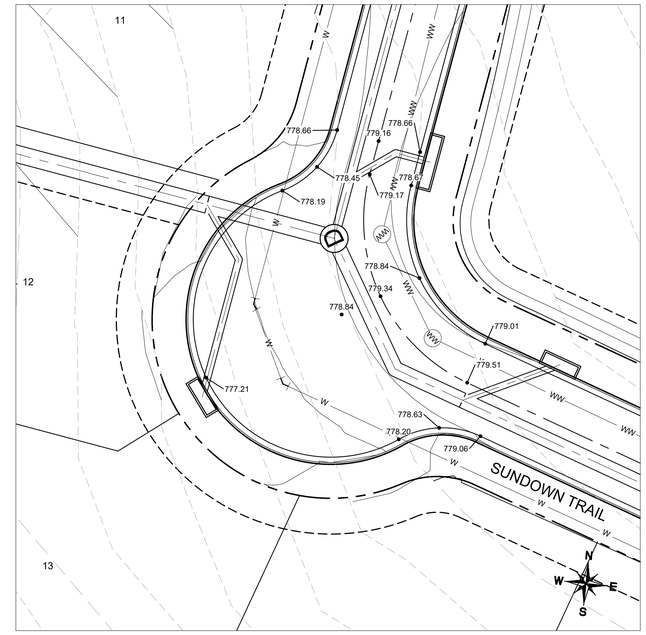
Plotted By:Castillo, Jaime Date:February 08, 2024 09:15:46am File Path:K:\AUS_Civil\064461307-Wolf Ranch Section 6G\Cad\PlanSheets\C-Intersection Knuckle & Cul-de-sac Grading Plans.dwg
This document, together with the concepts and designs presented herein, as an instrument of service, is intended only for the specific purpose and client for which it was prepared. Reuse of and improper reliance on this document without written authorization and adaptation by Kimley-Horn and Associates, Inc. shall be without liability to Kimley-Horn and Associates, Inc.



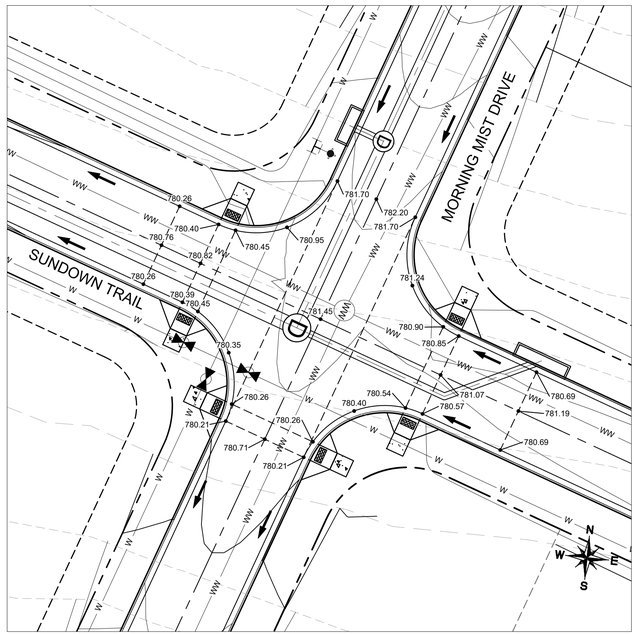
MORNING MIST DRIVE AT DOUBLE SPUR TRAIL



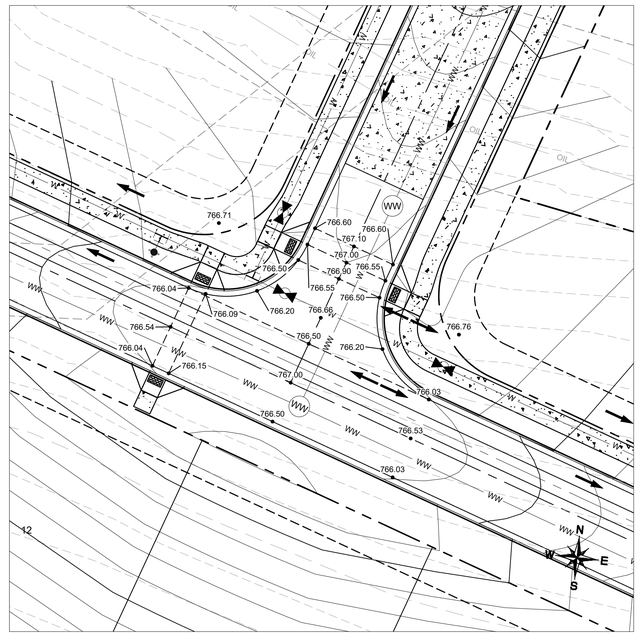
CRIMSON SUNSET DRIVE CUL-DE-SAC A



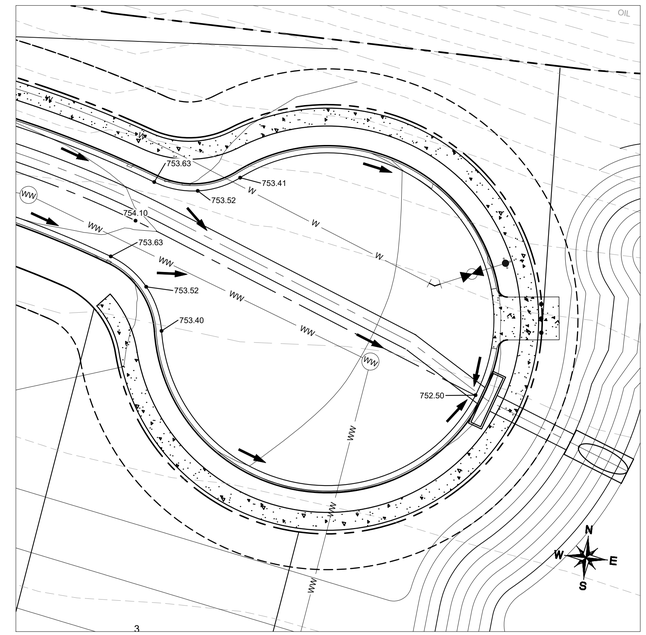
SUNDOWN TRAIL KNUCKLE A



SUNDOWN TRAIL AT MORNING MIST DRIVE



CRIMSON SUNSET DRIVE AT MORNING MIST DRIVE



CRIMSON SUNSET DRIVE AT CUL-DE-SAC B

BENCHMARKS

ADD BENCHMARKS HERE

No.	REVISIONS	DATE	BY

Kimley»Horn
© 2024 KIMLEY-HORN AND ASSOCIATES, INC.
10814 JOLLYVILLE ROAD, CAMPUS IV, SUITE 200, AUSTIN, TX 78759
PHONE: 512-418-1771 FAX: 512-418-1791
WWW.KIMLEY-HORN.COM
TEXAS REGISTERED ENGINEERING FIRM F-928

STATE OF TEXAS
JOHN A. PICKENS
110631
LICENSED
PROFESSIONAL ENGINEER
02/02/2024

KHA PROJECT 064461307
DATE DECEMBER 2023
SCALE: AS SHOWN
DESIGNED BY: RRJ
DRAWN BY: AJM
CHECKED BY: JAP

INTERSECTION KNUCKLE & CUL-DE-SAC GRADING PLANS (2 OF 2)

WOLF RANCH
SECTION 6G
CITY OF GEORGETOWN
WILLIAMSON COUNTY, TEXAS

SHEET NUMBER
30 OF 87

Plotted By:Castillo, Jaime Date:February 08, 2024 09:18:24am File Path:K:\AUS_Civil\064461307-Wolf Ranch Section 6G\Cad\PlanSheets\C-Intersection Knuckle & Cul-de-sac Grading Plans.dwg
This document, together with the concepts and designs presented herein, as an instrument of service, is intended only for the specific purpose and client for which it was prepared. Reuse of and improper reliance on this document without written authorization and adaptation by Kimley-Horn and Associates, Inc. shall be without liability to Kimley-Horn and Associates, Inc.

N
W E
S

0 100' 200'
GRAPHIC SCALE 100'

LEGEND

X-1 / 9.9 ac	AREA DESIGNATOR / AREA IN ACRES
	PROPERTY LINE
	PROPOSED STORM DRAIN LINE
	EXISTING STORM DRAIN LINE
	PROPOSED DRAINAGE DIVIDE
	PROPOSED STORM DRAIN INLET
	PROPOSED STORM DRAIN MANHOLE
	PROPOSED STORM DRAIN HEADWALL
	PROPOSED FLOW DIRECTION
555	PROPOSED CONTOUR
555	EXISTING CONTOUR

NOTES:

1. REFER TO DRAINAGE CALCULATIONS (SHEET 32) FOR INLET CALCULATIONS.

BENCHMARKS

ADD BENCHMARKS HERE

No.	REVISIONS	DATE	BY

Kimley»Horn
© 2024 KIMLEY-HORN AND ASSOCIATES, INC.
10814 JOLLYVILLE ROAD, CAMPUS IV, SUITE 200, AUSTIN, TX 78759
PHONE: 512-418-1771 FAX: 512-418-1791
WWW.KIMLEY-HORN.COM
TEXAS REGISTERED ENGINEERING FIRM F-928

STATE OF TEXAS
JOHN A. PICKENS
110631
LICENSED
PROFESSIONAL ENGINEER
02/02/2024

KHA PROJECT	064461307
DATE	DECEMBER 2023
SCALE:	AS SHOWN
DESIGNED BY:	RRJ
DRAWN BY:	AJM
CHECKED BY:	JAP

INLET DRAINAGE AREA MAP

WOLF RANCH
SECTION 6G
CITY OF GEORGETOWN
WILLIAMSON COUNTY, TEXAS

SHEET NUMBER
31 OF 87

Plotted By:Castillo, Jaime Date:February 08, 2024 09:19:06am File Path:K:\AUS_Civil\064461307-Wolf Ranch Section 6G\Cad\PlanSheets\C-Inlet Drainage Area Map.dwg
This document, together with the concepts and designs presented herein, as an instrument of service, is intended only for the specific purpose and client for which it was prepared. Reuse of and improper reliance on this document without written authorization and adaptation by Kimley-Horn and Associates, Inc. shall be without liability to Kimley-Horn and Associates, Inc.

WOLF RANCH SECTION 6G
Proposed "C" Value Calculations

DRAINAGE AREA	AREA (SF)	AREA (AC)	LOTS 61's	LOTS 71's	AREA OF LOTS (SF)	STREET AREA + SIDEWALK (SF)	IMPERVIOUS COVER (SF)	IMPERVIOUS COVER (Ac.)	IMPERVIOUS COVER %	Comp. C_2	Comp. C_{10}	Comp. C_{25}	Comp. C_{100}
A-1	43,995.60	1.01	1.50	2.00	17,350	8,299	25,649	0.59	58%	0.69	0.72	0.73	0.76
A-2	23,522.40	0.54	2.50	0.00	11,250	2,715	13,965	0.32	59%	0.70	0.72	0.73	0.76
A-3	29,185.20	0.67	0.00	0.00	0	12,690	12,690	0.29	43%	0.60	0.63	0.64	0.68
A-4	44,431.20	1.02	2.50	0.00	11,250	12,355	23,605	0.54	53%	0.66	0.68	0.70	0.73
A-5	72,745.20	1.67	5.00	0.00	22,500	0	22,500	0.52	31%	0.51	0.55	0.57	0.62
B-1	40,946.40	0.94	3.00	0.00	13,500	8,765	22,265	0.51	54%	0.67	0.69	0.71	0.74
B-2	44,866.80	1.03	5.00	0.00	22,500	3,360	25,860	0.59	58%	0.69	0.71	0.72	0.75
B-3	47,480.40	1.09	5.50	0.00	24,750	4,085	28,835	0.66	61%	0.71	0.73	0.74	0.77
B-4	27,442.80	0.63	0.00	0.00	0	11,890	11,890	0.27	43%	0.60	0.62	0.64	0.68
B-5	38,768.40	0.89	3.50	0.00	15,750	3,305	19,055	0.44	49%	0.63	0.66	0.68	0.71
C-1	30,927.60	0.71	0.00	3.00	15,900	4,079	19,979	0.46	65%	0.74	0.75	0.76	0.79
C-2	40,075.20	0.92	3.00	0.00	13,500	8,003	21,503	0.49	54%	0.66	0.69	0.70	0.73
D-1	31,363.20	0.72	2.00	0.00	9,000	4,510	13,510	0.31	43%	0.59	0.62	0.64	0.68
D-2	55,321.20	1.27	5.00	0.00	22,500	4,771	27,271	0.63	49%	0.64	0.66	0.68	0.71
D-3	58,806.00	1.35	7.00	0.00	31,500	4,555	36,055	0.83	61%	0.71	0.73	0.75	0.77
D-4	45,738.00	1.05	4.00	0.00	18,000	3,154	21,154	0.49	46%	0.62	0.64	0.66	0.70
D-5	45,738.00	1.05	5.00	0.00	22,500	5,625	28,125	0.65	61%	0.72	0.74	0.75	0.77
D-6	32,670.00	0.75	0.00	0.00	0	14,485	14,485	0.33	44%	0.60	0.63	0.65	0.69
D-7	24,829.20	0.57	1.00	0.00	4,500	6,054	10,554	0.24	43%	0.59	0.62	0.64	0.68
D-8	38,768.40	0.89	0.00	0.00	0	13,709	13,709	0.31	35%	0.54	0.58	0.60	0.64
E-1	48,351.60	1.11	4.50	0.00	20,250	7,977	28,227	0.65	58%	0.70	0.72	0.73	0.76
E-2	44,866.80	1.03	4.50	0.00	20,250	2,155	22,405	0.51	50%	0.64	0.66	0.68	0.71
E-3	62,726.40	1.44	5.00	0.00	22,500	4,383	26,883	0.62	43%	0.59	0.62	0.64	0.68
F-1	33,541.20	0.77	3.00	0.00	13,500	6,400	19,900	0.46	59%	0.70	0.72	0.73	0.76
G-1	59,241.60	1.36	0.00	1.00	5,300	8,270	13,570	0.31	23%	0.46	0.50	0.52	0.58
G-2	51,836.40	1.19	0.00	3.00	15,900	4,055	19,955	0.46	38%	0.56	0.59	0.61	0.66
G-3	29,185.20	0.67	0.00	0.00	0	17,202	17,202	0.39	59%	0.70	0.72	0.73	0.76
G-4	77,972.40	1.79	0.00	4.00	21,200	4,557	25,757	0.59	33%	0.53	0.56	0.58	0.63
G-5	20,473.20	0.47	0.00	0.00	0	10,330	10,330	0.24	50%	0.64	0.67	0.68	0.72
G-6	58,806.00	1.35	0.00	3.00	15,900	3,468	19,368	0.44	33%	0.53	0.56	0.58	0.63
G-7	62,726.40	1.44	0.00	2.00	10,600	11,355	21,955	0.50	35%	0.54	0.57	0.59	0.64
G-8	57,063.60	1.31	3.00	0.00	13,500	12,181	25,681	0.59	45%	0.61	0.63	0.65	0.69
G-9	48,351.60	1.11	3.00	0.00	13,500	3,782	17,282	0.40	36%	0.55	0.58	0.60	0.64
G-10	23,522.40	0.54	0.00	0.00	0	9,797	9,797	0.22	42%	0.58	0.61	0.63	0.67
G-11	37,461.60	0.86	3.00	0.00	13,500	2,364	15,864	0.36	42%	0.59	0.62	0.64	0.68
G-12	58,370.40	1.34	3.00	0.00	13,500	11,875	25,375	0.58	43%	0.60	0.63	0.64	0.68
H-1	39,204.00	0.90	0.00	0.00	0	11,135	11,135	0.26	28%	0.50	0.53	0.55	0.60
H-2	6,969.60	0.16	0.00	0.00	0	3,355	3,355	0.08	48%	0.63	0.65	0.67	0.71

Storm Event	Good Condition (Grass cover > 75% 2-7%)	
C'	Pervious	Impervious
C_2	0.31	0.97
C_{10}	0.36	0.97
C_{25}	0.39	0.97
C_{100}	0.46	0.97

WOLF RANCH SECTION 6G
"Tc" Value Calculations

DRAINAGE AREA	TOTAL Tc** (min)
A-1	5.00
A-2	5.00
A-3	5.00
A-4	5.00
A-5	5.00
B-1	5.00
B-2	5.00
B-3	5.00
B-4	5.00
B-5	5.00
C-1	5.00
C-2	5.00
D-1	5.00
D-2	5.00
D-3	5.00
D-4	5.00
D-5	5.00
D-6	5.00
D-7	5.00
D-8	5.00
E-1	5.00
E-2	5.00
E-3	5.00
F-1	5.00
G-1	5.00
G-2	5.00
G-3	5.00
G-4	10.00
G-5	5.00
G-6	5.00
G-7	5.00
G-8	5.00
G-9	5.00
G-10	5.00
G-11	5.00
G-12	5.00
H-1	5.00
H-2	5.00

**The minimum Tc is 5 minutes per the City of Austin DCM.

WOLF RANCH SECTION 6G
Proposed Inlet Runoff (Q) Calculations

D.A. Number	Drainage Area (Ac)	TOTAL I.C. (%)	Comp. C_2	Comp. C_{10}	Comp. C_{25}	Comp. C_{100}	TOTAL T_c (Min.)	i_2 (in/hr)	i_{10} (in/hr)	i_{25} (in/hr)	i_{100} (in/hr)	Q_2 (cfs)	Q_{10} (cfs)	Q_{25} (cfs)	Q_{100} (cfs)
A-1	1.01	58%	0.69	0.72	0.73	0.76	5.00	6.48	8.64	9.84	11.88	4.55	6.25	7.24	9.09
A-2	0.54	59%	0.70	0.72	0.73	0.76	5.00	6.48	8.64	9.84	11.88	2.46	3.37	3.90	4.89
A-3	0.67	43%	0.60	0.63	0.64	0.68	5.00	6.48	8.64	9.84	11.88	2.59	3.62	4.23	5.43
A-4	1.02	53%	0.66	0.68	0.70	0.73	5.00	6.48	8.64	9.84	11.88	4.37	6.03	7.01	8.86
A-5	1.67	31%	0.51	0.55	0.57	0.62	5.00	6.48	8.64	9.84	11.88	5.56	7.92	9.36	12.26
B-1	0.94	54%	0.67	0.69	0.71	0.74	5.00	6.48	8.64	9.84	11.88	4.07	5.62	6.52	8.23
B-2	1.03	58%	0.69	0.71	0.72	0.75	5.00	6.48	8.64	9.84	11.88	4.61	6.33	7.34	9.23
B-3	1.09	61%	0.71	0.73	0.74	0.77	5.00	6.48	8.64	9.84	11.88	5.02	6.88	7.96	9.97
B-4	0.63	43%	0.60	0.62	0.64	0.68	5.00	6.48	8.64	9.84	11.88	2.43	3.40	3.98	5.10
B-5	0.89	49%	0.63	0.66	0.68	0.71	5.00	6.48	8.64	9.84	11.88	3.66	5.07	5.91	7.51
C-1	0.71	65%	0.74	0.75	0.76	0.79	5.00	6.48	8.64	9.84	11.88	3.39	4.63	5.34	6.66
C-2	0.92	54%	0.66	0.69	0.70	0.73	5.00	6.48	8.64	9.84	11.88	3.96	5.46	6.35	8.02
D-1	0.72	43%	0.59	0.62	0.64	0.68	5.00	6.48	8.64	9.84	11.88	2.77	3.87	4.53	5.81
D-2	1.27	49%	0.64	0.66	0.68	0.71	5.00	6.48	8.64	9.84	11.88	5.23	7.25	8.45	10.73
D-3	1.35	61%	0.71	0.73	0.75	0.77	5.00	6.48	8.64	9.84	11.88	6.25	8.56	9.90	12.39
D-4	1.05	46%	0.62	0.64	0.66	0.70	5.00	6.48	8.64	9.84	11.88	4.19	5.83	6.80	8.68
D-5	1.05	61%	0.72	0.74	0.75	0.77	5.00	6.48	8.64	9.84	11.88	4.87	6.67	7.71	9.65
D-6	0.75	44%	0.60	0.63	0.65	0.69	5.00	6.48	8.64	9.84	11.88	2.93	4.09	4.78	6.11
D-7	0.57	43%	0.59	0.62	0.64	0.68	5.00	6.48	8.64	9.84	11.88	2.18	3.05	3.57	4.58
D-8	0.89	35%	0.54	0.58	0.60	0.64	5.00	6.48	8.64	9.84	11.88	3.13	4.43	5.21	6.77
E-1	1.11	58%	0.70	0.72	0.73	0.76	5.00	6.48	8.64	9.84	11.88	5.00	6.87	7.96	9.99
E-2	1.03	50%	0.64	0.66	0.68	0.71	5.00	6.48	8.64	9.84	11.88	4.27	5.92	6.89	8.75
E-3	1.44	43%	0.59	0.62	0.64	0.68	5.00	6.48	8.64	9.84	11.88	5.53	7.73	9.05	11.61
F-1	0.77	59%	0.70	0.72	0.73	0.76	5.00	6.48	8.64	9.84	11.88	3.50	4.80	5.56	6.98
G-1	1.36	23%	0.46	0.50	0.52	0.58	5.00	6.48	8.64	9.84	11.88	4.06	5.87	7.00	9.32
G-2	1.19	38%	0.56	0.59	0.61	0.66	5.00	6.48	8.64	9.84	11.88	4.35	6.12	7.18	9.28
G-3	0.67	59%	0.70	0.72	0.73	0.76	5.00	6.48	8.64	9.84	11.88	3.03	4.17	4.82	6.05
G-4	1.79	33%	0.53	0.56	0.58	0.63	10.00	5.37	7.29	8.40	10.22	5.08	7.32	8.74	11.49
G-5	0.47	50%	0.64	0.67	0.68	0.72	5.00	6.48	8.64	9.84	11.88	1.96	2.71	3.16	4.01
G-6	1.35	33%	0.53	0.56	0.58	0.63	5.00	6.48	8.64	9.84	11.88	4.61	6.54	7.72	10.07
G-7	1.44	35%	0.54	0.57	0.59	0.64	5.00	6.48	8.64	9.84	11.88	5.05	7.14	8.40	10.92
G-8	1.31	45%	0.61	0.63	0.65	0.69	5.00	6.48	8.64	9.84	11.88	5.15	7.18	8.39	10.73
G-9	1.11	36%	0.55	0.58	0.60	0.64	5.00	6.48	8.64	9.84	11.88	3.93	5.54	6.52	8.47
G-10	0.54	42%	0.58	0.61	0.63	0.67	5.00	6.48	8.64	9.84	11.88	2.05	2.87	3.36	4.31
G-11	0.86	42%	0.59	0.62	0.64	0.68	5.00	6.48	8.64	9.84	11.88	3.28	4.60	5.38	6.91
G-12	1.34	43%	0.60	0.63	0.64	0.68	5.00	6.48	8.64	9.84	11.88	5.18	7.24	8.47	10.85
H-1	0.90	28%	0.50	0.53	0.55	0.60	5.00	6.48	8.64	9.84	11.88	2.90	4.15	4.91	6.47
H-2	0.16	48%	0.63	0.65	0.67	0.71	5.00	6.48	8.64	9.84	11.88	0.65	0.90	1.05	1.34

No.	REVISIONS	DATE	BY

Kimley»Horn
© 2024 KIMLEY-HORN AND ASSOCIATES, INC.
10814 JOLLYVILLE ROAD, CAMPUS IV, SUITE 200, AUSTIN, TX 78759
PHONE: 512-418-1771 FAX: 512-418-1791
WWW.KIMLEY-HORN.COM
TEXAS REGISTERED ENGINEERING FIRM F-928

STATE OF TEXAS
JOHN A. PICKENS
110631
LICENSED
PROFESSIONAL ENGINEER
02/02/2024

KHA PROJECT 064461307
DATE: DECEMBER 2023
SCALE: AS SHOWN
DESIGNED BY: RRJ
DRAWN BY: AJM
CHECKED BY: JAP

DRAINAGE CALCULATIONS SHEET (1 OF 2)

WOLF RANCH
SECTION 6G
CITY OF GEORGETOWN
WILLIAMSON COUNTY, TEXAS

Plotted By:Castillo, Jaime Date:February 08, 2024 09:19:16am File Path:K:\AUS_Civil\064461307-Wolf Ranch Section 6C\Cad\PlanSheets\C-DrainageCalculations.dwg
This document, together with the concepts and designs presented herein, as an instrument of service, is intended only for the specific purpose and client for which it was prepared. Reuse of and improper reliance on this document without written authorization and adaptation by Kimley-Horn and Associates, Inc. shall be without liability to Kimley-Horn and Associates, Inc.

INLET FLOW CALCULATION TABLE (25-Yr Flows)

Parabolic Crown

Inlet No.	Inlet Type	Drainage Area No.	Street Width (FOC - FOC)	K0	K1	K2	Q (cfs)	Q Pass (cfs)	Q Total (Qa) (cfs)	Slope (%)	a (in.)	yo (ft.)	Ponded Width (ft)	R.F. (%)	Qa/La	La (ft)	Length (ft)	L/La	a/yo	Q/Qa	Q (cfs)	Q Pass (cfs)
A1	Grade	A-1	27'	2.85	0.50	3.03	**7.24**		**7.24**	7.86%	5.0	0.335	5.75	10	0.79	9.16	10	1.09	1.24	1.09	7.90	0.00
A2	Grade	A-2	27'	2.85	0.50	3.03	**3.90**		**3.90**	6.50%	5.0	0.282	4.59	10	0.73	5.31	10	1.88	1.48	1.88	7.35	0.00
A3	Sump	A-3	27'	2.85	0.50	3.03	**4.23**		**4.23**	0.50%	5.0	SEE SUMP CALCULATIONS BELOW										
A4	Sump	A-4	27'	2.85	0.50	3.03	**7.01**		**7.01**	0.50%	5.0	SEE SUMP CALCULATIONS BELOW										
HEADWALL	Headwall	A-5	27'	2.85	0.50	3.03	**9.36**		**9.36**	0.00%	5.0	HEADWALL										
B5	Grade	B-1	27'	2.85	0.50	3.03	**6.52**		**6.52**	7.08%	5.0	0.330	5.62	10	0.78	8.32	10	1.20	1.26	1.20	7.84	0.00
B4	Grade	B-2	27'	2.85	0.50	3.03	**7.34**		**7.34**	6.17%	5.0	0.351	6.12	10	0.81	9.11	10	1.10	1.19	1.10	8.06	0.00
B3	Grade	B-3	27'	2.85	0.50	3.03	**7.96**		**7.96**	5.30%	5.0	0.369	6.60	10	0.83	9.64	10	1.04	1.13	1.04	8.26	0.00
B2	Sump	B-4	27'	2.85	0.50	3.03	**3.98**		**3.98**	0.50%	5.0	SEE SUMP CALCULATIONS BELOW										
B1	Sump	B-5	27'	2.85	0.50	3.03	**5.91**		**5.91**	0.50%	5.0	SEE SUMP CALCULATIONS BELOW										
C2	Grade	C-1	27'	2.85	0.50	3.03	**5.34**		**5.34**	9.16%	5.0	0.296	4.87	10	0.75	7.14	10	1.40	1.41	1.40	7.49	0.00
C1	Grade	C-2	27'	2.85	0.50	3.03	**6.35**		**6.35**	3.01%	5.0	0.376	6.78	10	0.83	7.62	10	1.31	1.11	1.31	8.33	0.00
D8	Grade	D-1	27'	2.85	0.50	3.03	**4.53**		**4.53**	3.29%	5.0	0.332	5.67	10	0.79	5.77	10	1.73	1.26	1.73	7.86	0.00
D7	Grade	D-2	27'	2.85	0.50	3.03	**8.45**		**8.45**	4.45%	5.0	0.388	7.10	10	0.85	9.99	10	1.00	1.08	1.00	8.45	0.00
D6	Grade	D-3	27'	2.85	0.50	3.03	**9.90**		**9.90**	4.45%	5.0	0.408	7.72	10	0.87	11.41	10	0.88	1.02	0.88	8.68	1.23
D5	Grade	D-4	27'	2.85	0.50	3.03	**6.80**	1.23	**8.03**	4.22%	5.0	0.384	7.01	10	0.84	9.54	10	1.05	1.08	1.05	8.42	0.00
D4	Grade	D-5	27'	2.85	0.50	3.03	**7.71**		**7.71**	5.44%	5.0	0.364	6.45	10	0.82	9.41	10	1.06	1.15	1.06	8.20	0.00
D3	Grade	D-6	27'	2.85	0.50	3.03	**4.78**		**4.78**	2.90%	5.0	0.345	5.97	10	0.80	5.97	10	1.67	1.21	1.67	7.99	0.00
D2	Grade	D-7	27'	2.85	0.50	3.03	**3.57**		**3.57**	0.50%	5.0	0.418	8.04	10	0.88	4.06	10	2.46	1.00	2.46	8.79	0.00
D1	Sump	D-8	27'	2.85	0.50	3.03	**5.21**		**5.21**	0.50%		SEE SUMP CALCULATIONS BELOW										
E3	Grade	E-1	27'	2.85	0.50	3.03	**7.96**		**7.96**	9.75%	5.0	0.334	5.72	10	0.79	10.10	10	0.99	1.25	0.99	7.88	0.08
E2	Grade	E-2	27'	2.85	0.50	3.03	**6.89**	0.08	**6.97**	4.86%	5.0	0.358	6.32	10	0.81	8.56	10	1.17	1.16	1.17	8.14	0.00
E1	Sump	E-3	27'	2.85	0.50	3.03	**9.05**		**9.05**	0.50%		SEE SUMP CALCULATIONS BELOW										
F1	Sump	F-1	27'	2.85	0.50	3.03	**5.56**		**5.56**	0.50%		SEE SUMP CALCULATIONS BELOW										
C11	Grade	G-1	27'	2.85	0.50	3.03	**7.00**		**7.00**	0.70%	5.0	0.494	12.04	10	0.96	7.27	10	1.38	0.84	1.38	9.63	0.00
G10	Grade	G-2	27'	2.85	0.50	3.03	**7.18**		**7.18**	0.70%	5.0	0.498	12.73	10	0.97	7.42	10	1.35	0.84	1.35	9.68	0.00
G9	Grade	G-3	27'	2.85	0.50	3.03	**4.82**		**4.82**	0.70%	5.0	0.437	8.71	10	0.90	5.37	10	1.86	0.95	1.86	8.99	0.00
G8	Grade	G-4	27'	2.85	0.50	3.03	**8.74**		**8.74**	1.20%	5.0	0.487	11.29	10	0.95	9.16	10	1.09	0.86	1.09	9.54	0.00
G6	Sump	G-5	27'	2.85	0.50	3.03	**3.16**		**3.16**	0.50%	5.0	SEE SUMP CALCULATIONS BELOW										
G7	Sump	G-6	27'	2.85	0.50	3.03	**7.72**		**7.72**	0.50%	5.0	SEE SUMP CALCULATIONS BELOW										
G5	Grade	G-7	27'	2.85	0.50	3.03	**8.40**		**8.40**	2.50%	5.0	0.425	8.29	10	0.89	9.48	10	1.05	0.98	1.05	8.86	0.00
G4	Grade	G-8	27'	2.85	0.50	3.03	**8.39**		**8.39**	4.50%	5.0	0.386	7.05	10	0.84	9.95	10	1.01	1.08	1.01	8.43	0.00
G3	Grade	G-9	27'	2.85	0.50	3.03	**6.52**		**6.52**	0.70%	5.0	0.483	11.00	10	0.95	6.87	10	1.46	0.86	1.46	9.50	0.00
G2	Grade	G-10	27'	2.85	0.50	3.03	**3.36**		**3.36**	0.70%	5.0	0.388	7.10	10	0.85	3.97	10	2.52	1.07	2.52	8.45	0.00
C1	Grade	G-11	27'	2.85	0.50	3.03	**5.38**		**5.38**	0.70%	5.0	0.453	9.36	10	0.92	5.87	10	1.70	0.92	1.70	9.17	0.00
G12	Sump	G-12	27'	2.85	0.50	3.03	**8.47**		**8.47**	0.50%	5.0	SEE SUMP CALCULATIONS BELOW										
H2	Grade	H-1	27'	2.85	0.50	3.03	**4.91**		**4.91**	9.75%	5.0	0.285	4.64	10	0.74	6.66	10	1.50	1.46	1.50	7.37	0.00
H1	Grade	H-2	27'	2.85	0.50	3.03	**1.05**		**1.05**	9.75%	5.0	0.171	2.55	10	0.63	1.68	10	5.94	2.43	5.94	6.25	0.00

Sump Inlets

Inlet No.	Inlet Type	Drainage Area No.	Street Width (CL - FOC)				Q (cfs)	Q Pass (cfs)	Q Total (Qa) (cfs)	Cw	L (ft)	W (ft)	d (ft)	Inlet Capacity (cfs)	PASS/FAIL	
A3	Sump	A-3	13.5'				**4.23**	0.00	**4.23**	2.3	10	1.5	0.50	10.33	PASS	*All Sump Equations Assume Weir flow per City of Austin Drainage Criteria Manual Section 4.3.1
A4	Sump	A-4	13.5'				**7.01**	0.00	**7.01**	2.3	10	1.5	0.50	10.33	PASS	*All Sump Equations Assume Weir flow per City of Austin Drainage Criteria Manual Section 4.3.1
B1	Sump	B-5	13.5'				**5.91**	0.00	**5.91**	2.3	10	1.5	0.50	10.33	PASS	*All Sump Equations Assume Weir flow per City of Austin Drainage Criteria Manual Section 4.3.1
B2	Sump	B-4	13.5'				**3.98**	0.00	**3.98**	2.3	10	1.5	0.50	10.33	PASS	*All Sump Equations Assume Weir flow per City of Austin Drainage Criteria Manual Section 4.3.1
D1	Sump	D-8	13.5'				**5.21**	0.00	**5.21**	2.3	10	1.5	0.50	10.33	PASS	*All Sump Equations Assume Weir flow per City of Austin Drainage Criteria Manual Section 4.3.1
E1	Sump	E-3	13.5'				**9.05**	0.00	**9.05**	2.3	10	1.5	0.50	10.33	PASS	*All Sump Equations Assume Weir flow per City of Austin Drainage Criteria Manual Section 4.3.1
F1	Sump	F-1	13.5'				**5.56**	0.00	**5.56**	2.3	10	1.5	0.50	10.33	PASS	*All Sump Equations Assume Weir flow per City of Austin Drainage Criteria Manual Section 4.3.1
G6	Sump	G-5	13.5'				**3.16**	0.00	**3.16**	2.3	10	1.5	0.50	10.33	PASS	*All Sump Equations Assume Weir flow per City of Austin Drainage Criteria Manual Section 4.3.1
G7	Sump	G-6	13.5'				**7.72**	0.00	**7.72**	2.3	10	1.5	0.50	10.33	PASS	*All Sump Equations Assume Weir flow per City of Austin Drainage Criteria Manual Section 4.3.1
G12	Sump	G-12	13.5'				**8.47**	0.00	**8.47**	2.3	10	1.5	0.50	10.33	PASS	*All Sump Equations Assume Weir flow per City of Austin Drainage Criteria Manual Section 4.3.1

FOC-FOC	K0	K1	K2
27	**2.85**	**0.5**	**3.03**
28	**2.85**	**0.5**	**3.03**
30	**2.85**	**0.5**	**3.03**
36	**2.89**	**0.5**	**2.99**
60	**2.85**	**0.5**	**2.74**

INLET FLOW CALCULATION TABLE (100-Yr Flows)

Parabolic Crown

Inlet No.	Inlet Type	Drainage Area No.	Street Width (FOC - FOC)	K0	K1	K2	Q (cfs)	Q Pass (cfs)	Q Total (Qa) (cfs)	Slope (%)	a (in.)	yo (ft.)	Ponded Width (ft)	R.F. (%)	Qa/La	La (ft)	Length (ft)	L/La	a/yo	Q/Qa	Q (cfs)	Q Pass (cfs)
A1	Grade	A-1	27'	2.85	0.50	3.03	**9.09**		**9.09**	7.86%	5.0	0.361	6.39	10	0.82	11.12	10	0.90	1.15	0.90	8.17	0.91
A2	Grade	A-2	27'	2.85	0.50	3.03	**4.89**	0.91	**5.80**	6.50%	5.0	0.322	5.44	10	0.78	7.48	10	1.34	1.30	1.34	7.75	0.00
A3	Sump	A-3	27'	2.85	0.50	3.03	**5.43**		**5.43**	0.50%	5.0	SEE SUMP CALCULATIONS BELOW										
A4	Sump	A-4	27'	2.85	0.50	3.03	**8.86**		**8.86**	0.50%	5.0	SEE SUMP CALCULATIONS BELOW										
HEADWALL	Headwall	A-5	27'	2.85	0.50	3.03	**12.26**		**12.26**	0.00%	5.0	HEADWALL										
B5	Grade	B-1	27'	2.85	0.50	3.03	**8.23**		**8.23**	7.08%	5.0	0.356	6.25	10	0.81	10.15	10	0.99	1.17	0.99	8.11	0.12
B4	Grade	B-2	27'	2.85	0.50	3.03	**9.23**	0.12	**9.35**	6.17%	5.0	0.380	6.88	10	0.84	11.17	10	0.90	1.10	0.90	8.37	0.98
B3	Grade	B-3	27'	2.85	0.50	3.03	**9.97**	0.98	**10.95**	5.30%	5.0	0.410	7.78	10	0.87	12.59	10	0.79	1.02	0.79	8.70	2.25
B2	Sump	B-4	27'	2.85	0.50	3.03	**5.10**		**5.10**	0.50%	5.0	SEE SUMP CALCULATIONS BELOW										
B1	Sump	B-5	27'	2.85	0.50	3.03	**7.51**	2.25	**9.76**	0.50%	5.0	SEE SUMP CALCULATIONS BELOW										
C2	Grade	C-1	27'	2.85	0.50	3.03	**6.66**		**6.66**	9.16%	5.0	0.318	5.36	10	0.77	8.63	10	1.16	1.31	1.16	7.72	0.00
C1	Grade	C-2	27'	2.85	0.50	3.03	**8.02**		**8.02**	3.01%	5.0	0.406	7.66	10	0.87	9.27	10	1.08	1.03	1.08	8.65	0.00
D8	Grade	D-1	27'	2.85	0.50	3.03	**5.81**		**5.81**	3.29%	5.0	0.360	6.36	10	0.82	7.13	10	1.40	1.16	1.40	8.16	0.00
D7	Grade	D-2	27'	2.85	0.50	3.03	**10.73**		**10.73**	4.45%	5.0	0.419	8.08	10	0.88	12.20	10	0.82	0.99	0.82	8.80	1.94
D6	Grade	D-3	27'	2.85	0.50	3.03	**12.39**	1.94	**14.33**	4.45%	5.0	0.461	9.75	10	0.93	15.48	10	0.65	0.90	0.65	9.26	5.07
D5	Grade	D-4	27'	2.85	0.50	3.03	**8.68**	5.07	**13.75**	4.22%	5.0	0.459	9.64	10	0.92	14.89	10	0.67	0.91	0.67	9.24	4.52
D4	Grade	D-5	27'	2.85	0.50	3.03	**9.65**	4.52	**14.17**	5.44%	5.0	0.445	9.01	10	0.91	15.61	10	0.64	0.94	0.64	9.08	5.10
D3	Grade	D-6	27'	2.85	0.50	3.03	**6.11**		**6.11**	2.90%	5.0	0.374	6.72	10	0.83	7.36	10	1.36	1.11	1.36	8.30	0.00
D2	Grade	D-7	27'	2.85	0.50	3.03	**4.58**		**4.58**	0.50%	5.0	0.454	9.42	10	0.92	4.99	10	2.00	0.92	2.00	9.18	0.00
D1	Sump	D-8	27'	2.85	0.50	3.03	**6.77**		**6.77**	0.50%	5.0	SEE SUMP CALCULATIONS BELOW										
E3	Grade	E-1	27'	2.85	0.50	3.03	**9.99**		**9.99**	9.75%	5.0	0.360	6.35	10	0.82	12.25	10	0.82	1.16	0.82	8.16	1.84
E2	Grade	E-2	27'	2.85	0.50	3.03	**8.75**	1.84	**10.59**	4.86%	5.0	0.411	7.82	10	0.87	12.15	10	0.82	1.01	0.82	8.71	1.87
E1	Sump	E-3	27'	2.85	0.50	3.03	**11.61**	1.87	**13.48**	0.50%	5.0	SEE SUMP CALCULATIONS BELOW										
F1	Sump	F-1	27'	2.85	0.50	3.03	**6.98**	5.10	**12.08**	0.50%	5.0	SEE SUMP CALCULATIONS BELOW										
G11	Grade	G-1	27'	2.85	0.50	3.03	**9.32**		**9.32**	0.70%	5.0	0.543	WITHIN ROW	10	1.02	9.15	10	1.09	0.77	1.09	10.19	0.00
G10	Grade	G-2	27'	2.85	0.50	3.03	**9.28**		**9.28**	0.70%	5.0	0.542	WITHIN ROW	10	1.02	9.12	10	1.10	0.77	1.10	10.18	0.00
G9	Grade	G-3	27'	2.85	0.50	3.03	**6.05**		**6.05**	0.70%	5.0	0.471	10.25	10	0.94	6.46	10	1.55	0.88	1.55	9.37	0.00
G8	Grade	G-4	27'	2.85	0.50	3.03	**11.49**		**11.49**	1.20%	5.0	0.533	WITHIN ROW	10	1.01	11.42	10	0.88	0.78	0.88	10.07	1.43
G6	Sump	G-5	27'	2.85	0.50	3.03	**4.01**		**4.01**	0.50%	5.0	SEE SUMP CALCULATIONS BELOW										
G7	Sump	G-6	27'	2.85	0.50	3.03	**10.07**	3.07	**13.14**	0.50%	5.0	SEE SUMP CALCULATIONS BELOW										
G5	Grade	G-7	27'	2.85	0.50	3.03	**10.92**		**10.92**	2.50%	5.0	0.464	9.87	10	0.93	11.76	10	0.85	0.90	0.85	9.29	1.63
G4	Grade	G-8	27'	2.85	0.50	3.03	**10.73**		**10.73**	4.50%	5.0	0.419	8.05	10	0.88	12.21	10	0.82	1.00	0.82	8.79	1.94
G3	Grade	G-9	27'	2.85	0.50	3.03	**8.47**	1.94	**10.41**	0.70%	5.0	0.563	WITHIN ROW	10	1.04	9.99	10	1.00	0.74	1.00	10.42	0.00
G2	Grade	G-10	27'	2.85	0.50	3.03	**4.31**		**4.31**	0.70%	5.0	0.421	8.14	10	0.88	4.89	10	2.04	0.99	2.04	8.82	0.00
G1	Grade	G-11	27'	2.85	0.50	3.03	**6.91**		**6.91**	0.70%	5.0	0.492	11.79	10	0.96	7.19	10	1.39	0.85	1.39	9.60	0.00
G12	Sump	G-12	27'	2.85	0.50	3.03	**10.85**		**10.85**	0.50%	5.0	SEE SUMP CALCULATIONS BELOW										
H2	Grade	H-1	27'	2.85	0.50	3.03	**6.47**		**6.47**	9.75%	5.0	0.312	5.22	10	0.77	8.45	10	1.18	1.34	1.18	7.65	0.00
H1	Grade	H-2	27'	2.85	0.50	3.03	**1.34**		**1.34**	9.75%	5.0	0.185	2.79	10	0.64	2.10	10	4.76	2.25	4.76	6.39	0.00

Sump Inlets

Inlet No.	Inlet Type	Drainage Area No.	Street Width (CL - FOC)				Q (cfs)	Q Pass (cfs)	Q Total (Qa) (cfs)	Cw	L (ft)	W (ft)	d (ft)	Inlet Capacity (cfs)	PASS/FAIL	
A3	Sump	A-3	13.5'				**5.43**	0.00	**5.43**	2.3	10	1.5	0.50	10.33	PASS	*All Sump Equations Assume Weir flow per City of Austin Drainage Criteria Manual Section 4.3.1
A4	Sump	A-4	13.5'				**8.86**	0.00	**8.86**	2.3	10	1.5	0.50	10.33	PASS	*All Sump Equations Assume Weir flow per City of Austin Drainage Criteria Manual Section 4.3.1
B2	Sump	B-4	13.5'				**5.10**	0.00	**5.10**	2.3	10	1.5	0.50	10.33	PASS	*All Sump Equations Assume Weir flow per City of Austin Drainage Criteria Manual Section 4.3.1
B1	Sump	B-5	13.5'				**7.51**	2.25	**9.76**	2.3	10	1.5	0.50	10.33	PASS	*All Sump Equations Assume Weir flow per City of Austin Drainage Criteria Manual Section 4.3.1
D1	Sump	D-8	13.5'				**6.77**	0.12	**6.89**	2.3	10	1.5	0.50	10.33	PASS	*All Sump Equations Assume Weir flow per City of Austin Drainage Criteria Manual Section 4.3.1
E1	Sump	E-3	13.5'				**11.61**	1.87	**13.48**	2.3	15	1.5	0.50	14.39	PASS	*All Sump Equations Assume Weir flow per City of Austin Drainage Criteria Manual Section 4.3.1
F1	Sump	F-1	13.5'				**6.98**	5.10	**12.08**	2.3	15	1.5	0.50	14.39	PASS	*All Sump Equations Assume Weir flow per City of Austin Drainage Criteria Manual Section 4.3.1
G6	Sump	G-5	13.5'				**4.01**	0.00	**4.01**	2.3	10	1.5	0.50	10.33	PASS	*All Sump Equations Assume Weir flow per City of Austin Drainage Criteria Manual Section 4.3.1
G7	Sump	G-6	13.5'				**10.07**	3.07	**13.14**	2.3	15	1.5	0.50	14.39	PASS	*All Sump Equations Assume Weir flow per City of Austin Drainage Criteria Manual Section 4.3.1
G12	Sump	G-12	13.5'				**10.85**	0.00	**10.85**	2.3	15	1.5	0.50	14.39	PASS	*All Sump Equations Assume Weir flow per City of Austin Drainage Criteria Manual Section 4.3.1

No.	REVISIONS	DATE	BY

Kimley»Horn
© 2024 KIMLEY-HORN AND ASSOCIATES, INC.
10814 JOLLYVILLE ROAD, CAMPUS IV, SUITE 200, AUSTIN, TX 78759
PHONE: 512-418-1771 FAX: 512-418-1791
WWW.KIMLEY-HORN.COM
TEXAS REGISTERED ENGINEERING FIRM F-928

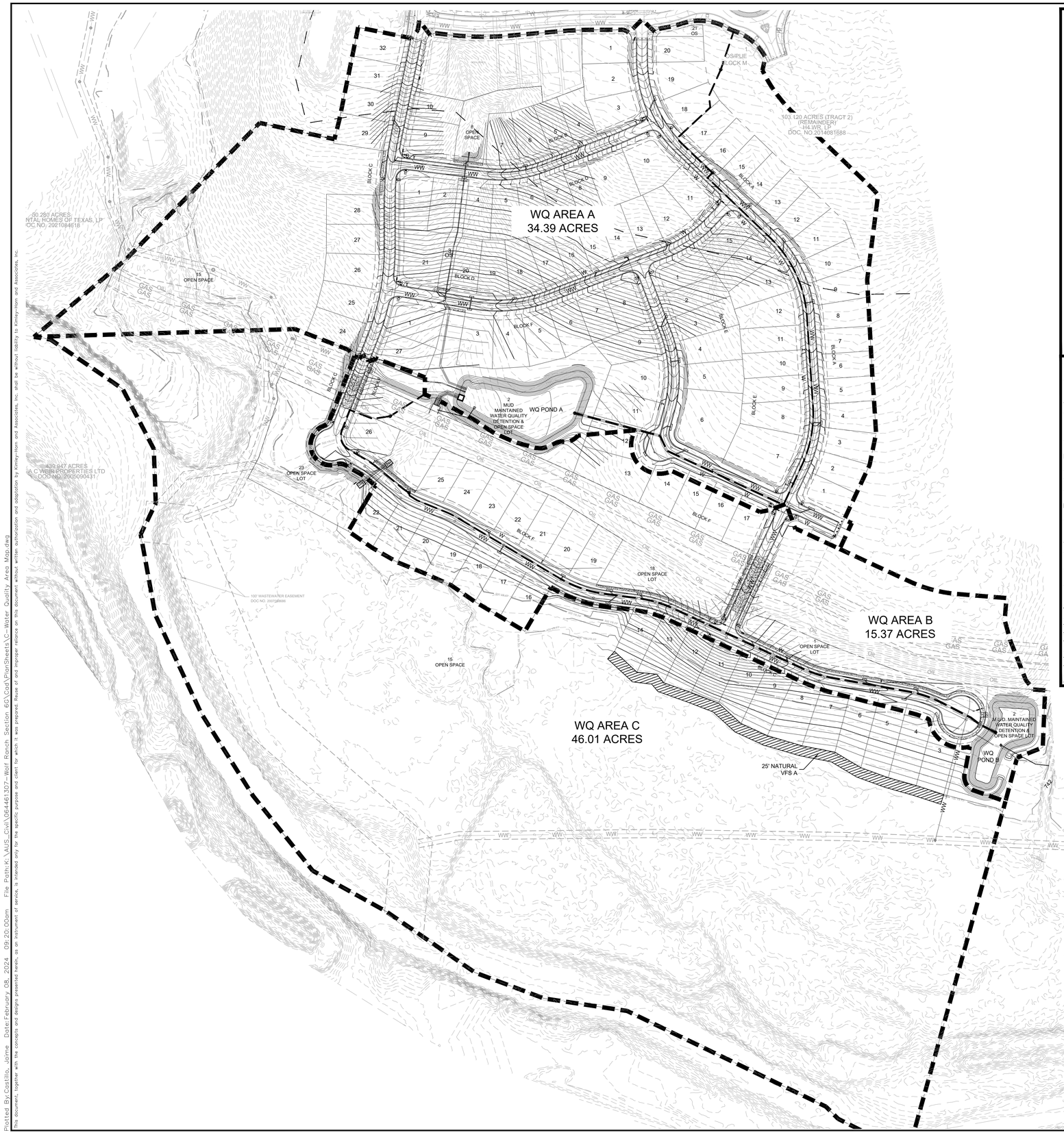
STATE OF TEXAS
JOHN A. PICKENS
110631
LICENSED
PROFESSIONAL ENGINEER
02/02/2024

KHA PROJECT 064461307
DATE: DECEMBER 2023
SCALE: AS SHOWN
DESIGNED BY: RRJ
DRAWN BY: AJM
CHECKED BY: JAP

DRAINAGE CALCULATIONS SHEET (2 OF 2)

WOLF RANCH
SECTION 6G
CITY OF GEORGETOWN
WILLIAMSON COUNTY, TEXAS

Plotted By: Castillo, Jaime Date: February 08, 2024 09:19:18am File Path: K:\AUS_Civil\064461307-Wolf Ranch Section 6G\Cad\PlanSheets\C-DrainageCalculations.dwg
This document, together with the concepts and designs presented herein, as an instrument of service, is intended only for the specific purpose and client for which it was prepared. Reuse of and improper reliance on this document without written authorization and adaptation by Kimley-Horn and Associates, Inc. shall be without liability to Kimley-Horn and Associates, Inc.



WQ AREA A (POND A)

TOTAL AREA: 34.39 ACRES

AREA/IC TO POND

TOTAL AREA TO POND: 28.28 ACRES

ASPHALT AREA TO POND----------3.10 ACRES
SIDEWALK AREA TO POND----------1.10 ACRES

LOT IC TO POND:

71' LOTS (SECTION 6G) 17.5 @ 5,300 SF PER LOT-----2.13 ACRES
61' LOTS (SECTION 6G) 62 @ 4,500 SF PER LOT ----6.40 ACRES

51' LOTS 5 (SECTION 7B) @ 3,700 SF PER LOT-----0.43 ACRES
51' LOTS 9 (FUTURE SECTION 5G) @ 3,700 SF PER LOT-----0.77 ACRES

MISC IC TO POND: 0.12 ACRES

TOTAL IC TO POND: 14.05 ACRES

AREA/IC POND BYPASS

TOTAL AREA POND BYPASS: 6.11 ACRES

71' LOTS 5 @ 5,300 SF PER LOT---0.60 ACRES

TOTAL IC POND BYPASS------0.60 ACRES

SUMMARY:

TOTAL AREA----------34.39 ACRES
TOTAL AREA TO POND:----------28.28 ACRES
TOTAL IC TO POND:----------14.05 ACRES

TOTAL AREA POND BYPASS: ----------6.11 ACRES
TOTAL IC POND BYPASS----------0.60 ACRES

TOTAL IC TO POND & POND BYPASS:--------14.65 ACRES

WQ AREA B (POND B)

TOTAL AREA: 15.37 ACRES

AREA/IC TO POND

TOTAL AREA TO POND: 14.50 ACRES

ASPHALT AREA: 1.67 ACRES
SIDEWALK: 0.60 ACRES

LOT IC TO POND:

71' LOTS 13.5 @ 5,300 SF PER LOT---1.65 ACRES
71' LOTS PARTIAL (BACK UP TO OS) 7 @ 2,300 SF PER LOT--0.37 ACRES
51' LOTS (FUTURE 5G) 11 @ 3,700 SF PER LOT-----0.95 ACRES

MISC IC TO POND: 0.41 ACRES

TOTAL IC TO POND: 5.65 ACRES

AREA/IC POND BYPASS

TOTAL AREA POND BYPASS: 0.87 ACRES

71' LOTS PARTIAL (BACK UP TO OS) 7 @ 3,000 SF PER LOT--0.48 ACRES

TOTAL IC POND BYPASS------0.48 ACRES

SUMMARY:

TOTAL AREA----------15.37 ACRES
TOTAL AREA TO POND:----------14.50 ACRES
TOTAL IC TO POND:----------5.65 ACRES

TOTAL AREA POND BYPASS: ----------0.87 ACRES
TOTAL IC POND BYPASS----------0.48 ACRES

TOTAL IC TO POND & POND BYPASS:--------6.13 ACRES

N
W E
S

0 100' 200'
GRAPHIC SCALE 100'

LEGEND

X-1 / 9.9 ac	AREA DESIGNATOR / AREA IN ACRES
	PROPERTY LINE
	PROPOSED STORM DRAIN LINE
	EXISTING STORM DRAIN LINE
	PROPOSED DRAINAGE DIVIDE
	PROPOSED STORM DRAIN INLET
	PROPOSED STORM DRAIN MANHOLE
	PROPOSED STORM DRAIN HEADWALL
	PROPOSED FLOW DIRECTION
555	PROPOSED CONTOUR
555	EXISTING CONTOUR

WQ AREA C (VFS A)

TOTAL AREA: 46.01 ACRES

ASPHALT AREA: 0.00 ACRES
SIDEWALK: 0.00 ACRES

LOT IC:

71' LOTS 12 @ 5,300 SF PER LOT---1.47 ACRES

MISC IC: 0.00

TOTAL IC: 1.47 ACRES

SECTION 6G TOTAL ACREAGE: 89.42 ACRES

TOTAL SECTION 6G & FUTURE 5G PORTION IC: 22.25 ACRES
TOTAL EXISTING IC: 0.00 ACRES

TOTAL IC: 22.25 ACRES

BENCHMARKS

ADD BENCHMARKS HERE

No.	REVISIONS	DATE	BY

Kimley»Horn
© 2024 KIMLEY-HORN AND ASSOCIATES, INC.
10814 JOLLYVILLE ROAD, CAMPUS IV, SUITE 200, AUSTIN, TX 78759
PHONE: 512-418-1771 FAX: 512-418-1791
WWW.KIMLEY-HORN.COM
TEXAS REGISTERED ENGINEERING FIRM F-928

STATE OF TEXAS
JOHN A. PICKENS
110631
LICENSED
PROFESSIONAL ENGINEER
02/02/2024

KHA PROJECT 064481307	
DATE: DECEMBER 2023	
SCALE: AS SHOWN	
DESIGNED BY: RRJ	
DRAWN BY: AJM	
CHECKED BY: JAP	

WATER QUALITY AREA MAP

WOLF RANCH
SECTION 6G
CITY OF GEORGETOWN
WILLIAMSON COUNTY, TEXAS

SHEET NUMBER
34 OF 87

Plotted By:Castillo, Jaime Date:February 08, 2024 - 09:20:00am File Path:K:\AUS_Civil\064481307-Wolf Ranch Section 6G\Cad\PlanSheets\C-Water Quality Area Map.dwg
This document, together with the concepts and designs presented herein, as an instrument of service, is intended only for the specific purpose and client for which it was prepared. Reuse of and improper reliance on this document without written authorization and adaptation by Kimley-Horn and Associates, Inc. shall be without liability to Kimley-Horn and Associates, Inc.

Texas Commission on Environmental Quality

TSS Removal Calculations 04-20-2009

Project Name: Wolf Ranch Phase 6G (Water Quality Area A)
Date Prepared: 10/10/2023

Additional information is provided for cells with a red triangle in the upper right corner. Place the cursor over the cell.
Text shown in blue indicate location of instructions in the Technical Guidance Manual - RG-348.
Characters shown in red are data entry fields.
Characters shown in black (Bold) are calculated fields. Changes to these fields will remove the equations used in the spreadsheet.

1. The Required Load Reduction for the total project: Calculations from RG-348 — Pages 3-27 to 3-30

Page 3-29 Equation 3.3: $L_M = 27.2(A_N \times P)$

where:
$L_{M\ TOTAL\ PROJECT}$ = Required TSS removal resulting from the proposed development = 80% of increased load
A_N = Net increase in impervious area for the project
P = Average annual precipitation, inches

Site Data: Determine Required Load Removal Based on the Entire Project

County =	Williamson	
Total project area included in plan * =	89.42	acres
Predevelopment impervious area within the limits of the plan * =	0.00	acres
Total post-development impervious area within the limits of the plan* =	22.25	acres
Total post-development impervious cover fraction * =	0.25	
P =	32	inches
$L_{M\ TOTAL\ PROJECT}$ =	20598	lbs.

85% REDUCTION PER COG — Changed Formula

* The values entered in these fields should be for the total project area.

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	WQ POND-A
Total drainage basin/outfall area =	34.39	acres
Predevelopment impervious area within drainage basin/outfall area =	0.00	acres
Post-development impervious area within drainage basin/outfall area =	14.65	acres
Post-development impervious fraction within drainage basin/outfall area =	0.43	
$L_{M\ THIS\ BASIN}$ =	13562	lbs.

85% REDUCTION PER COG — Changed Formula

3. Indicate the proposed BMP Code for this basin.

Proposed BMP = Batch Detention
Removal efficiency = 91 percent

Aqualogic Cartridge Filter
Bioretention
Contech StormFilter
Constructed Wetland
Extended Detention
Grassy Swale
Retention / Irrigation
Sand Filter
Stormceptor
Vegetated Filter Strips
Vortechs
Wet Basin
Wet Vault

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

RG-348 Page 3-33 Equation 3.7: L_R = (BMP efficiency) x P x (A_I x 34.6 + A_P x 0.54)

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

A_C =	28.28	acres
A_I =	14.05	acres
A_P =	14.23	acres
L_R =	14380	lbs

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

Desired $L_{M\ THIS\ BASIN}$ = 13562 lbs.

F = 0.94

6. Calculate Capture Volume required by the BMP Type for this drainage basin / outfall area. Calculations from RG-348 — Pages 3-34 to 3-36

Rainfall Depth =	2.40	inches
Post Development Runoff Coefficient =	0.36	
On-site Water Quality Volume =	87649	cubic feet

Calculations from RG-348 — Pages 3-36 to 3-37

Off-site area draining to BMP =	0.00	acres
Off-site Impervious cover draining to BMP =	0.00	acres
Impervious fraction of off-site area =	0	
Off-site Runoff Coefficient =	0.00	
Off-site Water Quality Volume =	0	cubic feet
Storage for Sediment =	17530	
Total Capture Volume (required water quality volume(s) x 1.20) =	105179	cubic feet

Texas Commission on Environmental Quality

TSS Removal Calculations 04-20-2009

Project Name: Wolf Ranch Phase 6G Water Quality Area B
Date Prepared: 10/10/2023

Additional information is provided for cells with a red triangle in the upper right corner. Place the cursor over the cell.
Text shown in blue indicate location of instructions in the Technical Guidance Manual - RG-348.
Characters shown in red are data entry fields.
Characters shown in black (Bold) are calculated fields. Changes to these fields will remove the equations used in the spreadsheet.

1. The Required Load Reduction for the total project: Calculations from RG-348 — Pages 3-27 to 3-30

Page 3-29 Equation 3.3: $L_M = 27.2(A_N \times P)$

where:
$L_{M\ TOTAL\ PROJECT}$ = Required TSS removal resulting from the proposed development = 80% of increased load
A_N = Net increase in impervious area for the project
P = Average annual precipitation, inches

Site Data: Determine Required Load Removal Based on the Entire Project

County =	Williamson	
Total project area included in plan * =	89.42	acres
Predevelopment impervious area within the limits of the plan * =	0.00	acres
Total post-development impervious area within the limits of the plan* =	22.25	acres
Total post-development impervious cover fraction * =	0.25	
P =	32	inches
$L_{M\ TOTAL\ PROJECT}$ =	20598	lbs.

85% REDUCTION PER COG — Changed Formula

* The values entered in these fields should be for the total project area.

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. =	2	WQ POND-B
Total drainage basin/outfall area =	15.37	acres
Predevelopment impervious area within drainage basin/outfall area =	0.00	acres
Post-development impervious area within drainage basin/outfall area =	6.13	acres
Post-development impervious fraction within drainage basin/outfall area =	0.40	
$L_{M\ THIS\ BASIN}$ =	5675	lbs.

85% REDUCTION PER COG — Changed Formula

3. Indicate the proposed BMP Code for this basin.

Proposed BMP = Batch Detention
Removal efficiency = 91 percent

Aqualogic Cartridge Filter
Bioretention
Contech StormFilter
Constructed Wetland
Extended Detention
Grassy Swale
Retention / Irrigation
Sand Filter
Stormceptor
Vegetated Filter Strips
Vortechs
Wet Basin
Wet Vault

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

RG-348 Page 3-33 Equation 3.7: L_R = (BMP efficiency) x P x (A_I x 34.6 + A_P x 0.54)

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

A_C =	14.50	acres
A_I =	5.65	acres
A_P =	8.85	acres
L_R =	5832	lbs

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

Desired $L_{M\ THIS\ BASIN}$ = 5675 lbs.

F = 0.97

6. Calculate Capture Volume required by the BMP Type for this drainage basin / outfall area. Calculations from RG-348 — Pages 3-34 to 3-36

Rainfall Depth =	3.00	inches
Post Development Runoff Coefficient =	0.30	
On-site Water Quality Volume =	47676	cubic feet

Calculations from RG-348 — Pages 3-36 to 3-37

Off-site area draining to BMP =	0.00	acres
Off-site Impervious cover draining to BMP =	0.00	acres
Impervious fraction of off-site area =	0	
Off-site Runoff Coefficient =	0.00	
Off-site Water Quality Volume =	0	cubic feet
Storage for Sediment =	9535	
Total Capture Volume (required water quality volume(s) x 1.20) =	57211	cubic feet

Texas Commission on Environmental Quality

TSS Removal Calculations 04-20-2009

Project Name: Wolf Ranch Phase 6G (Water Quality Area C)
Date Prepared: 10/10/2023

Additional information is provided for cells with a red triangle in the upper right corner. Place the cursor over the cell.
Text shown in blue indicate location of instructions in the Technical Guidance Manual - RG-348.
Characters shown in red are data entry fields.
Characters shown in black (Bold) are calculated fields. Changes to these fields will remove the equations used in the spreadsheet.

1. The Required Load Reduction for the total project: Calculations from RG-348 — Pages 3-27 to 3-30

Page 3-29 Equation 3.3: $L_M = 27.2(A_N \times P)$

where:
$L_{M\ TOTAL\ PROJECT}$ = Required TSS removal resulting from the proposed development = 80% of increased load
A_N = Net increase in impervious area for the project
P = Average annual precipitation, inches

Site Data: Determine Required Load Removal Based on the Entire Project

County =	Williamson	
Total project area included in plan * =	89.42	acres
Predevelopment impervious area within the limits of the plan * =	0.00	acres
Total post-development impervious area within the limits of the plan* =	22.25	acres
Total post-development impervious cover fraction * =	0.25	
P =	32	inches
$L_{M\ TOTAL\ PROJECT}$ =	20598	lbs.

85% REDUCTION PER COG — Changed Formula

* The values entered in these fields should be for the total project area.

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. =	3	NATURAL VFS A
Total drainage basin/outfall area =	46.01	acres
Predevelopment impervious area within drainage basin/outfall area =	0.00	acres
Post-development impervious area within drainage basin/outfall area =	1.47	acres
Post-development impervious fraction within drainage basin/outfall area =	0.03	
$L_{M\ THIS\ BASIN}$ =	1361	lbs.

85% REDUCTION PER COG — Changed Formula

3. Indicate the proposed BMP Code for this basin.

Proposed BMP = Vegetated Filter Strips
Removal efficiency = 85 percent

Aqualogic Cartridge Filter
Bioretention
Contech StormFilter
Constructed Wetland
Extended Detention
Grassy Swale
Retention / Irrigation
Sand Filter
Stormceptor
Vegetated Filter Strips
Vortechs
Wet Basin
Wet Vault

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

RG-348 Page 3-33 Equation 3.7: L_R = (BMP efficiency) x P x (A_I x 34.6 + A_P x 0.54)

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

A_C =	46.01	acres
A_I =	1.47	acres
A_P =	44.54	acres
L_R =	2038	lbs

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

Desired $L_{M\ THIS\ BASIN}$ = 1361 lbs.

F = 0.67

6. Calculate Capture Volume required by the BMP Type for this drainage basin / outfall area. Calculations from RG-348 — Pages 3-34 to 3-36

Rainfall Depth =	0.71	inches
Post Development Runoff Coefficient =	0.06	
On-site Water Quality Volume =	6819	cubic feet

Calculations from RG-348 — Pages 3-36 to 3-37

Off-site area draining to BMP =	0.00	acres
Off-site Impervious cover draining to BMP =	0.00	acres
Impervious fraction of off-site area =	0	
Off-site Runoff Coefficient =	0.00	
Off-site Water Quality Volume =	0	cubic feet
Storage for Sediment =	1364	
Total Capture Volume (required water quality volume(s) x 1.20) =	8183	cubic feet

No.	REVISIONS	DATE	BY

Kimley»Horn
© 2024 KIMLEY-HORN AND ASSOCIATES, INC.
10814 JOLLYVILLE ROAD, CAMPUS IV, SUITE 200, AUSTIN, TX 78759
PHONE: 512-418-1771 FAX: 512-418-1791
WWW.KIMLEY-HORN.COM
TEXAS REGISTERED ENGINEERING FIRM F-928

STATE OF TEXAS — JOHN A. PICKENS — 110631 — LICENSED — PROFESSIONAL ENGINEER
02/02/2024

KHA PROJECT 064461307
DATE DECEMBER 2023
SCALE: AS SHOWN
DESIGNED BY: RRJ
DRAWN BY: AJM
CHECKED BY: JAP

COG WATER QUALITY CALCULATIONS

WOLF RANCH
SECTION 6G
CITY OF GEORGETOWN
WILLIAMSON COUNTY, TEXAS

SHEET NUMBER

Plotted By:Castillo, Jaime Date:February 08, 2024 09:20:09am File Path:K:\AUS_Civil\064461307-Wolf Ranch, Section 6G\Cad\PlanSheets\C-WaterQuality\Calcs.dwg
This document, together with the concepts and designs presented herein, as an instrument of service, is intended only for the specific purpose and client for which it was prepared. Reuse of and improper reliance on this document without written authorization and adaptation by Kimley-Horn and Associates, Inc. shall be without liability to Kimley-Horn and Associates, Inc.

Texas Commission on Environmental Quality

TSS Removal Calculations 04-20-2009

Project Name: Wolf Ranch Phase 6G (Water Quality Area A)
Date Prepared: 10/10/2023

Additional information is provided for cells with a red triangle in the upper right corner. Place the cursor over the cell.
Text shown in blue indicate location of instructions in the Technical Guidance Manual - RG-348.
Characters shown in red are data entry fields.
Characters shown in black (Bold) are calculated fields. Changes to these fields will remove the equations used in the spreadsheet.

1. The Required Load Reduction for the total project: Calculations from RG-348 — Pages 3-27 to 3-30

Page 3-29 Equation 3.3: $L_M = 27.2(A_N \times P)$

where:
$L_{M\ TOTAL\ PROJECT}$ = Required TSS removal resulting from the proposed development = 80% of increased load
A_N = Net increase in impervious area for the project
P = Average annual precipitation, inches

Site Data: Determine Required Load Removal Based on the Entire Project

County =	Williamson	
Total project area included in plan * =	89.42	acres
Predevelopment impervious area within the limits of the plan * =	0.00	acres
Total post-development impervious area within the limits of the plan* =	22.25	acres
Total post-development impervious cover fraction * =	0.25	
P =	32	inches
$L_{M\ TOTAL\ PROJECT}$ =	19366	lbs.

* The values entered in these fields should be for the total project area.

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	WQ POND-A
Total drainage basin/outfall area =	34.39	acres
Predevelopment impervious area within drainage basin/outfall area =	0.00	acres
Post-development impervious area within drainage basin/outfall area =	14.65	acres
Post-development impervious fraction within drainage basin/outfall area =	0.43	
$L_{M\ THIS\ BASIN}$ =	12751	lbs.

3. Indicate the proposed BMP Code for this basin.

Proposed BMP = Batch Detention
Removal efficiency = 91 percent

Aqualogic Cartridge Filter
Bioretention
Contech StormFilter
Constructed Wetland
Extended Detention
Grassy Swale
Retention / Irrigation
Sand Filter
Stormceptor
Vegetated Filter Strips
Vortechs
Wet Basin
Wet Vault

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

RG-348 Page 3-33 Equation 3.7: L_R = (BMP efficiency) x P x (A_I x 34.6 + A_P x 0.54)

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

A_C =	28.28	acres
A_I =	14.05	acres
A_P =	14.23	acres
L_R =	14380	lbs

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

Desired $L_{M\ THIS\ BASIN}$ = 12751 lbs.

F = 0.89

6. Calculate Capture Volume required by the BMP Type for this drainage basin / outfall area. Calculations from RG-348 — Pages 3-34 to 3-36

Rainfall Depth =	1.60	inches
Post Development Runoff Coefficient =	0.36	
On-site Water Quality Volume =	58433	cubic feet

Calculations from RG-348 — Pages 3-36 to 3-37

Off-site area draining to BMP =	0.00	acres
Off-site Impervious cover draining to BMP =	0.00	acres
Impervious fraction of off-site area =	0	
Off-site Runoff Coefficient =	0.00	
Off-site Water Quality Volume =	0	cubic feet
Storage for Sediment =	11687	
Total Capture Volume (required water quality volume(s) x 1.20) =	70120	cubic feet

Texas Commission on Environmental Quality

TSS Removal Calculations 04-20-2009

Project Name: Wolf Ranch Phase 6G (Water Quality Area B)
Date Prepared: 10/10/2023

Additional information is provided for cells with a red triangle in the upper right corner. Place the cursor over the cell.
Text shown in blue indicate location of instructions in the Technical Guidance Manual - RG-348.
Characters shown in red are data entry fields.
Characters shown in black (Bold) are calculated fields. Changes to these fields will remove the equations used in the spreadsheet.

1. The Required Load Reduction for the total project: Calculations from RG-348 — Pages 3-27 to 3-30

Page 3-29 Equation 3.3: $L_M = 27.2(A_N \times P)$

where:
$L_{M\ TOTAL\ PROJECT}$ = Required TSS removal resulting from the proposed development = 80% of increased load
A_N = Net increase in impervious area for the project
P = Average annual precipitation, inches

Site Data: Determine Required Load Removal Based on the Entire Project

County =	Williamson	
Total project area included in plan * =	89.42	acres
Predevelopment impervious area within the limits of the plan * =	0.00	acres
Total post-development impervious area within the limits of the plan* =	22.25	acres
Total post-development impervious cover fraction * =	0.25	
P =	32	inches
$L_{M\ TOTAL\ PROJECT}$ =	19366	lbs.

* The values entered in these fields should be for the total project area.

Number of drainage basins / outfalls areas leaving the plan area = 4

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

Drainage Basin/Outfall Area No. =	2	WQ POND-B
Total drainage basin/outfall area =	15.37	acres
Predevelopment impervious area within drainage basin/outfall area =	0.00	acres
Post-development impervious area within drainage basin/outfall area =	6.13	acres
Post-development impervious fraction within drainage basin/outfall area =	0.40	
$L_{M\ THIS\ BASIN}$ =	5336	lbs.

3. Indicate the proposed BMP Code for this basin.

Proposed BMP = Batch Detention
Removal efficiency = 91 percent

Aqualogic Cartridge Filter
Bioretention
Contech StormFilter
Constructed Wetland
Extended Detention
Grassy Swale
Retention / Irrigation
Sand Filter
Stormceptor
Vegetated Filter Strips
Vortechs
Wet Basin
Wet Vault

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

RG-348 Page 3-33 Equation 3.7: L_R = (BMP efficiency) x P x (A_I x 34.6 + A_P x 0.54)

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

A_C =	14.50	acres
A_I =	5.65	acres
A_P =	8.85	acres
L_R =	5832	lbs

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

Desired $L_{M\ THIS\ BASIN}$ = 5336 lbs.

F = 0.91

6. Calculate Capture Volume required by the BMP Type for this drainage basin / outfall area. Calculations from RG-348 — Pages 3-34 to 3-36

Rainfall Depth =	1.80	inches
Post Development Runoff Coefficient =	0.30	
On-site Water Quality Volume =	28605	cubic feet

Calculations from RG-348 — Pages 3-36 to 3-37

Off-site area draining to BMP =	0.00	acres
Off-site Impervious cover draining to BMP =	0.00	acres
Impervious fraction of off-site area =	0	
Off-site Runoff Coefficient =	0.00	
Off-site Water Quality Volume =	0	cubic feet
Storage for Sediment =	5721	
Total Capture Volume (required water quality volume(s) x 1.20) =	34327	cubic feet

Texas Commission on Environmental Quality

TSS Removal Calculations 04-20-2009

Project Name: Wolf Ranch Phase 6G (Water Quality Area C)
Date Prepared: 10/10/2023

Additional information is provided for cells with a red triangle in the upper right corner. Place the cursor over the cell.
Text shown in blue indicate location of instructions in the Technical Guidance Manual - RG-348.
Characters shown in red are data entry fields.
Characters shown in black (Bold) are calculated fields. Changes to these fields will remove the equations used in the spreadsheet.

1. The Required Load Reduction for the total project: Calculations from RG-348 — Pages 3-27 to 3-30

Page 3-29 Equation 3.3: $L_M = 27.2(A_N \times P)$

where:
$L_{M\ TOTAL\ PROJECT}$ = Required TSS removal resulting from the proposed development = 80% of increased load
A_N = Net increase in impervious area for the project
P = Average annual precipitation, inches

Site Data: Determine Required Load Removal Based on the Entire Project

County =	Williamson	
Total project area included in plan * =	89.42	acres
Predevelopment impervious area within the limits of the plan * =	0.00	acres
Total post-development impervious area within the limits of the plan* =	22.25	acres
Total post-development impervious cover fraction * =	0.25	
P =	32	inches
$L_{M\ TOTAL\ PROJECT}$ =	19366	lbs.

* The values entered in these fields should be for the total project area.

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. =	3	NATURAL VFS-A
Total drainage basin/outfall area =	46.01	acres
Predevelopment impervious area within drainage basin/outfall area =	0.00	acres
Post-development impervious area within drainage basin/outfall area =	1.47	acres
Post-development impervious fraction within drainage basin/outfall area =	0.03	
$L_{M\ THIS\ BASIN}$ =	1279	lbs.

3. Indicate the proposed BMP Code for this basin.

Proposed BMP = Vegetated Filter Strips
Removal efficiency = 85 percent

Aqualogic Cartridge Filter
Bioretention
Contech StormFilter
Constructed Wetland
Extended Detention
Grassy Swale
Retention / Irrigation
Sand Filter
Stormceptor
Vegetated Filter Strips
Vortechs
Wet Basin
Wet Vault

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

RG-348 Page 3-33 Equation 3.7: L_R = (BMP efficiency) x P x (A_I x 34.6 + A_P x 0.54)

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

A_C =	46.01	acres
A_I =	1.47	acres
A_P =	44.54	acres
L_R =	2038	lbs

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

Desired $L_{M\ THIS\ BASIN}$ = 1279 lbs.

F = 0.63

6. Calculate Capture Volume required by the BMP Type for this drainage basin / outfall area. Calculations from RG-348 — Pages 3-34 to 3-36

Rainfall Depth =	0.64	inches
Post Development Runoff Coefficient =	0.06	
On-site Water Quality Volume =	6091	cubic feet

Calculations from RG-348 — Pages 3-36 to 3-37

Off-site area draining to BMP =	0.00	acres
Off-site Impervious cover draining to BMP =	0.00	acres
Impervious fraction of off-site area =	0	
Off-site Runoff Coefficient =	0.00	
Off-site Water Quality Volume =	0	cubic feet
Storage for Sediment =	1218	
Total Capture Volume (required water quality volume(s) x 1.20) =	7309	cubic feet

No.	REVISIONS	DATE	BY

Kimley»Horn
© 2024 KIMLEY-HORN AND ASSOCIATES, INC.
10814 JOLLYVILLE ROAD, CAMPUS IV, SUITE 200, AUSTIN, TX 78759
PHONE: 512-418-1771 FAX: 512-418-1791
WWW.KIMLEY-HORN.COM
TEXAS REGISTERED ENGINEERING FIRM F-928

STATE OF TEXAS
JOHN A. PICKENS
110631
LICENSED
PROFESSIONAL ENGINEER
02/02/2024

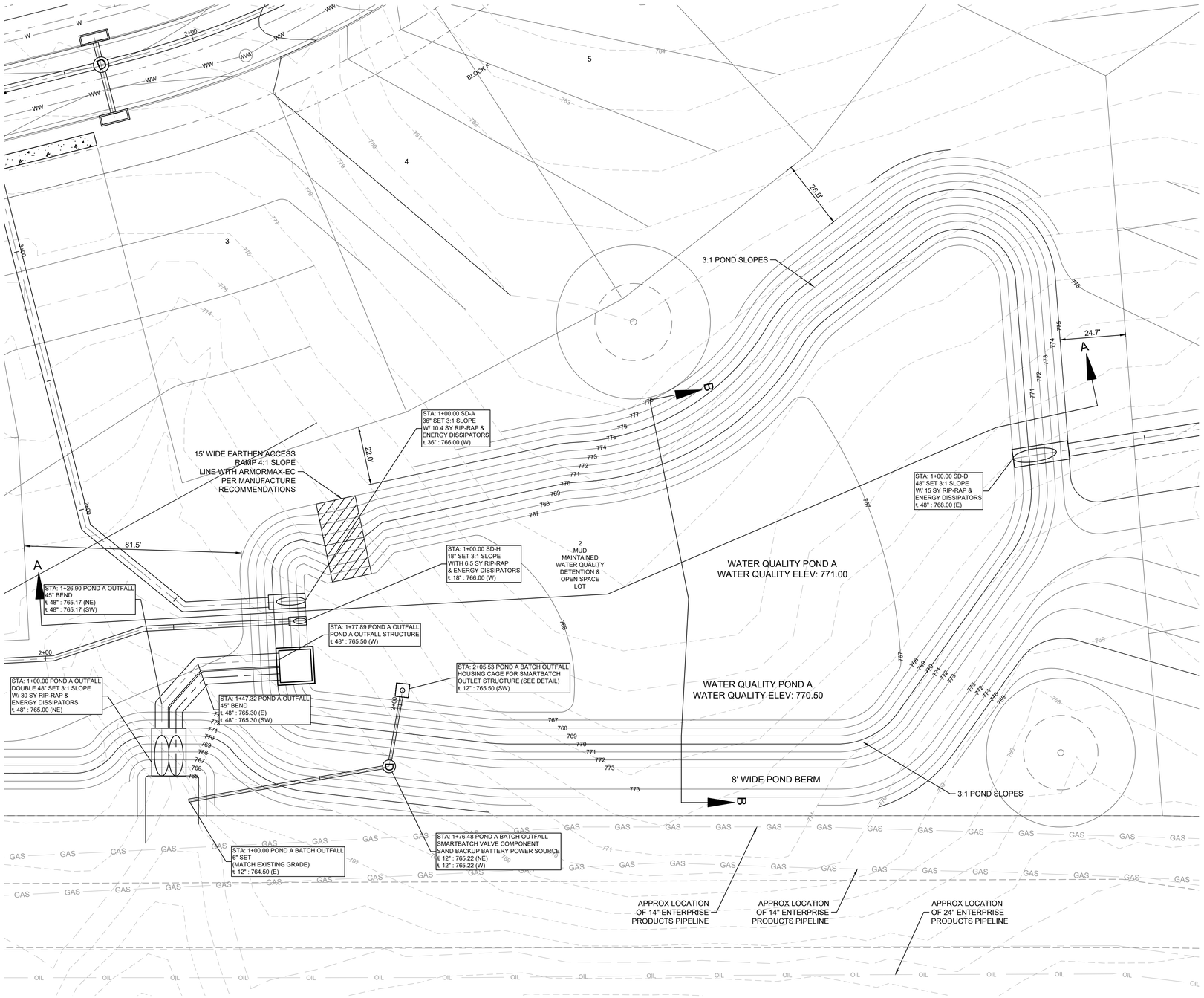
KHA PROJECT 064461307
DATE: DECEMBER 2023
SCALE: AS SHOWN
DESIGNED BY: RRJ
DRAWN BY: AJM
CHECKED BY: JAP

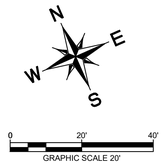
TCEQ WATER QUALITY CALCULATIONS

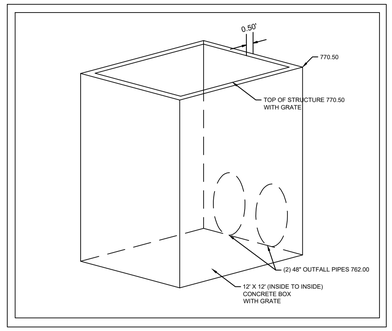
WOLF RANCH
SECTION 6G
CITY OF GEORGETOWN
WILLIAMSON COUNTY, TEXAS

SHEET NUMBER
36 OF 87

Plotted By:Castillo, Jaime Date:February 08, 2024 09:20:10am File Path:K:\AUS_Civil\064461307-Wolf Ranch, Section 6G\Cad\PlanSheets\C-WaterQuality\Calcs.dwg
This document, together with the concepts and designs presented herein, as an instrument of service, is intended only for the specific purpose and client for which it was prepared. Reuse of and improper reliance on this document without written authorization and adaptation by Kimley-Horn and Associates, Inc. shall be without liability to Kimley-Horn and Associates, Inc.







POND A OUTFALL STRUCURE ISOMETRIC VIEW
N.T.S.

WARNING:
HIGH-PRESSURE PIPELINES
EXCAVATION AND/OR CONSTRUCTION
PROHIBITED WITHOUT WRITTEN
PERMISSION FROM ENTERPRISE
PRODUCTS COMPANY

WATER QUALITY POND A SUMMARY:	
CITY OF GEORGETOWN REQUIRED WATER QUALITY VOLUME:	105,179 CUBIC FEET
TCEQ REQUIRED WATER QUALITY VOLUME:	70.120 CUBIC FEET
WATER QUALITY VOLUME PROVIDED:	109,088 CUBIC FEET

WQV

ELEVATION (FT)	AREA (SF)	CUMULATIVE STORAGE (CF)
765.00	25.00	0.00
766.00	5,235.33	937.02
767.00	17,980.71	11,909.80
768.00	26,995.22	34,245.66
769.00	29,332.57	62,401.47
770.00	31,726.46	92,923.16
770.50	32,935.95	109,087.82
771.00	34,176.91	125,865.07
772.00	36,683.90	161,288.08
773.00	39,247.44	199,246.54

WQV

WQ POND A	
POND DRAWDOWN CALCULATIONS	
SURFACE EQUATION A (SQ.FT.)	109087.82
WATER SURFACE ELEVATION (FT)	770.5
OUTFALL INVERT ELEVATION (FT)	764.5
ORIFICE COEFFICIENT	0.6
H1 (FT)	6.0
H2 (FT)	0.0
T (HR)	48
A0 (SQ.FT.)	0.642
ORIFICE DIAMETER (IN.)	10.852
PROVIDED DIAMTER (IN.)	10.75

WQ POND A
ROUTING TABLE

DESIGN SCENARIO	PEAK INFLOW (FT^3/S)	COMPUTED PEAK OUTFLOW (FT^3/S)	MAXIMUM WATER SURFACE ELEVATION (FT)	MAXIMUM STORAGE (FT)
2 yr	81.60	47.26	771.02	126,531.00
10 yr	138.84	130.11	771.53	144,164.00
25 YR	177.04	169.29	771.71	150,862.00
100 YR	420.10	230.30	772.00	161,440.00

NOTES:

1. BOTTOM OF SEDIMENTATION AND DETENTION BASINS SHALL BE GRASS LINED.
2. ALL POND BOTTOMS, SIDE SLOPES, AND EARTHEN EMBANKMENTS SHALL BE COMPACTED TO 95% MAXIMUM DENSITY PER GEOTECH REPORT.
3. POND BOTTOM SHALL INCLUDE GEOMEMBRANE LINER CONFORMING TO CITY OF AUSTIN ENVIRONMENTAL CRITERIA MANUAL 1.6.2.C.1.B.1.
4. BARRIER FENCE SHALL BE INSTALLED ON ANY WALLS IN EXCESS OF 30" TALL.
5. CONTRACTOR SHALL SUBMIT STRUCTURAL DESIGN TO THE CITY FOR APPROVAL PRIOR TO CONSTRUCTION ON THIS STRUCTURE.

BENCHMARKS

ADD BENCHMARKS HERE

No.	REVISIONS	DATE	BY

Kimley»Horn
© 2024 KIMLEY-HORN AND ASSOCIATES, INC.
10814 JOLLYVILLE ROAD, CAMPUS IV, SUITE 200, AUSTIN, TX 78759
PHONE: 512-418-1771 FAX: 512-418-1791
WWW.KIMLEY-HORN.COM
TEXAS REGISTERED ENGINEERING FIRM F-928

STATE OF TEXAS
JOHN A. PICKENS
110631
LICENSED
PROFESSIONAL ENGINEER
02/02/2024

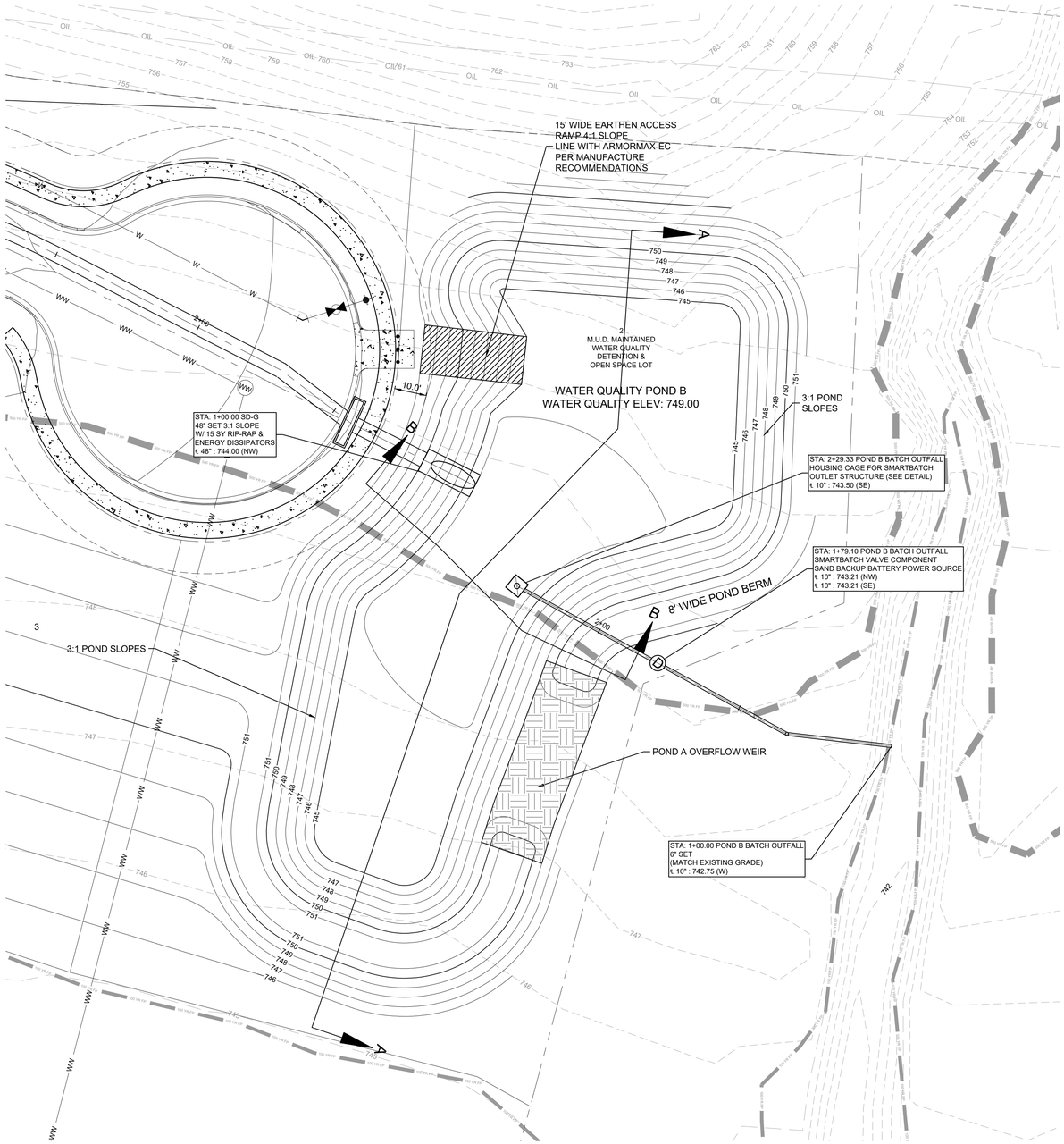
KHA PROJECT 064461307	
DATE	DECEMBER 2023
SCALE:	AS SHOWN
DESIGNED BY:	RRJ
DRAWN BY:	AJM
CHECKED BY:	JAP

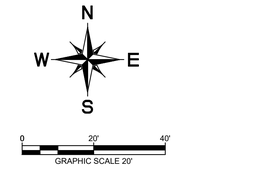
WATER QUALITY POND A PLAN

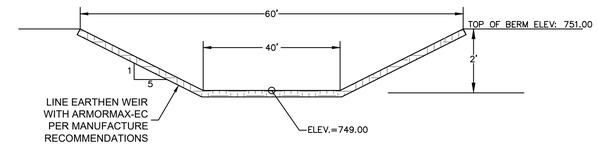
WOLF RANCH
SECTION 6G
CITY OF GEORGETOWN
WILLIAMSON COUNTY, TEXAS

SHEET NUMBER
37 OF 87

Plotted By:Pickens, John Date:February 12, 2024 02:12:17pm File Path:K:\AUS_Civil\064461307-Wolf Ranch Section 6G\Cad\PlanSheets\C-Pond A.dwg
This document, together with the concepts and designs presented herein, as an instrument of service, is intended only for the specific purpose and client for which it was prepared. Reuse of and improper reliance on this document without written authorization and adaptation by Kimley-Horn and Associates, Inc. shall be without liability to Kimley-Horn and Associates, Inc.

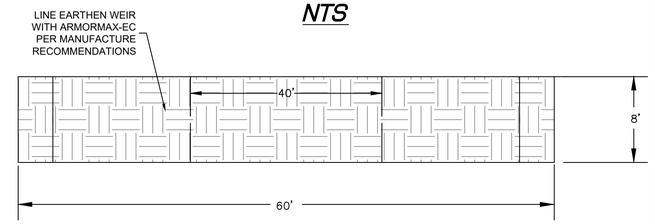






POND B OVERFLOW WEIR

NTS



WATER QUALITY POND A SUMMARY:	
CITY OF GEORGETOWN REQUIRED WATER QUALITY VOLUME:	57,211 CUBIC FEET
TCEQ REQUIRED WATER QUALITY VOLUME:	34,327 CUBIC FEET
WATER QUALITY VOLUME PROVIDED:	64,723 CUBIC FEET

NOTES:

1. BOTTOM OF SEDIMENTATION AND DETENTION BASINS SHALL BE GRASS LINED.
2. ALL POND BOTTOMS, SIDE SLOPES, AND EARTHEN EMBANKMENTS SHALL BE COMPACTED TO 95% MAXIMUM DENSITY PER GEOTECH REPORT.
3. POND BOTTOM SHALL INCLUDE GEOMEMBRANE LINER CONFORMING TO CITY OF AUSTIN ENVIRONMENTAL CRITERIA MANUAL 1.6.2.C.1.B.1.
4. BARRIER FENCE SHALL BE INSTALLED ON ANY WALLS IN EXCESS OF 30" TALL.
5. CONTRACTOR SHALL SUBMIT STRUCTURAL DESIGN TO THE CITY FOR APPROVAL PRIOR TO CONSTRUCTION ON THIS STRUCTURE.

WQ POND B

STAGE STORAGE TABLE

ELEVATION (FT)	AREA (SF)	CUMULATIVE STORAGE (CF)
743.50	16.00	0.00
744.00	4,053.81	720.75
745.00	10,830.99	7,891.09
746.00	12,475.48	19,534.64
747.00	14,176.79	32,851.72
748.00	15,934.91	47,899.01
749.00	17,728.77	64,722.88
750.00	19,578.90	83,369.06
751.00	21,485.31	103,893.78

WQ POND B

POND DRAWDOWN CALCULATIONS

SURFACE EQUATION A (SQ.FT.)	64722.88
WATER SURFACE ELEVATION (FT)	749
OUTFALL INVERT ELEVATION (FT)	742.75
ORIFICE COEFFICIENT	0.6
H1 (FT)	6.3
H2 (FT)	0.0
T (HR)	48
A0 (SQ.FT.)	0.389
ORIFICE DIAMETER (IN.)	8.445
PROVIDED DIAMTER (IN.)	8.25

WQ POND B

ROUTING TABLE

DESIGN SCENARIO	PEAK INFLOW (FT^3/S)	COMPUTED PEAK OUTFLOW (FT^3/S)	MAXIMUM WATER SURFACE ELEVATION (FT)	MAXIMUM STORAGE (FT)
2 YR	37.16	15.63	749.20	68,368.00
10 YR	65.21	62.93	749.66	76,898.00
25 YR	84.07	82.85	749.80	79,437.00
100 YR	115.37	114.00	750.00	83,445.00

BENCHMARKS

ADD BENCHMARKS HERE

No.	REVISIONS	DATE	BY

Kimley»Horn
© 2024 KIMLEY-HORN AND ASSOCIATES, INC.
10814 JOLLYVILLE ROAD, CAMPUS IV, SUITE 200, AUSTIN, TX 78759
PHONE: 512-418-1771 FAX: 512-418-1791
WWW.KIMLEY-HORN.COM
TEXAS REGISTERED ENGINEERING FIRM F-928

STATE OF TEXAS
JOHN A. PICKENS
110631
LICENSED
PROFESSIONAL ENGINEER

02/02/2024

KHA PROJECT 064461307
DATE DECEMBER 2023
SCALE: AS SHOWN
DESIGNED BY: RRJ
DRAWN BY: AJM
CHECKED BY: JAP

WATER QUALITY POND B PLAN

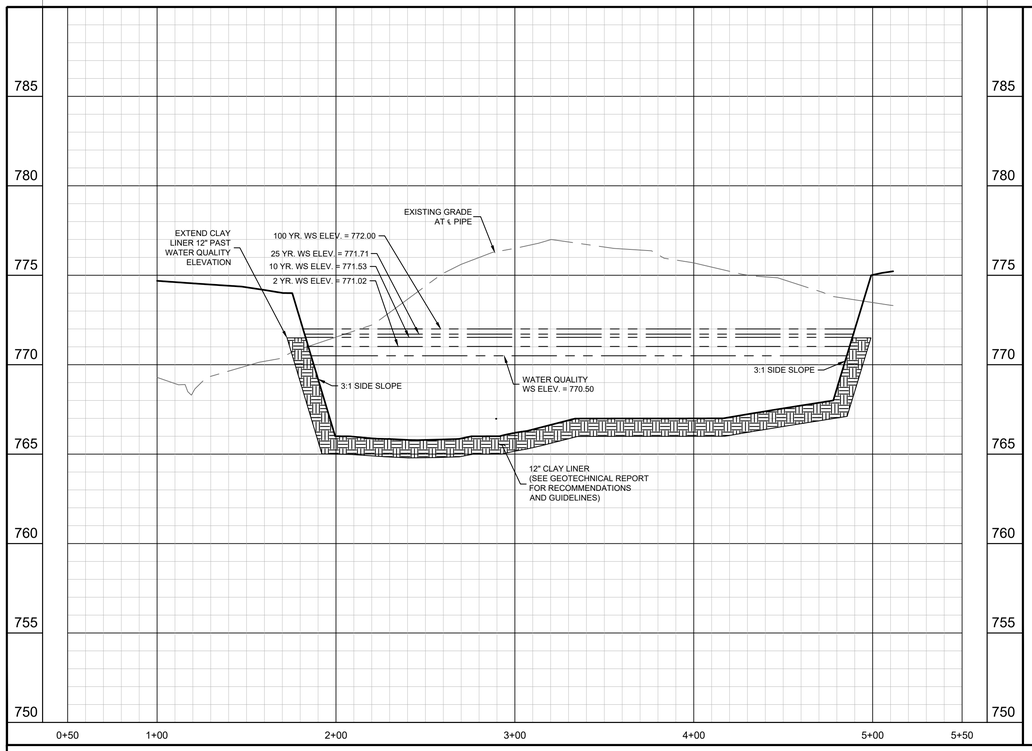
WOLF RANCH SECTION 6G

CITY OF GEORGETOWN
WILLIAMSON COUNTY, TEXAS

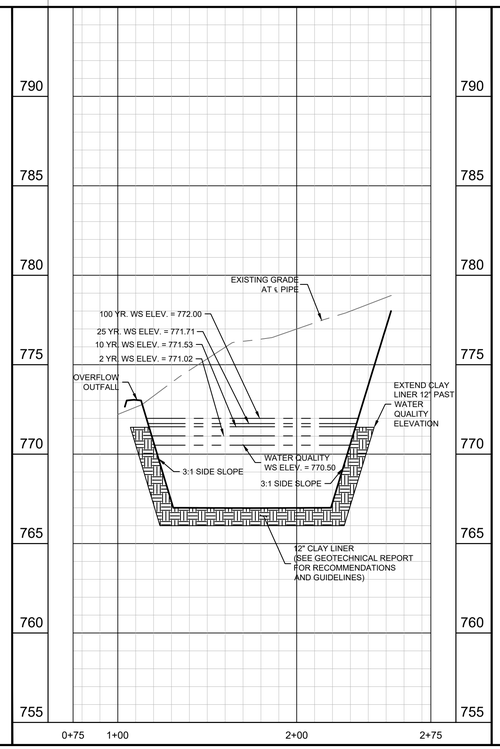
SHEET NUMBER
38 OF 87

Plotted By: Pickens, John Date: February 12, 2024 02:16:10pm File Path: K:\AUS_Civil\064461307-Wolf Ranch Section 6G\Cad\PlanSheets\C-Pond B.dwg
This document, together with the concepts and designs presented herein, as an instrument of service, is intended only for the specific purpose and client for which it was prepared. Reuse of and improper reliance on this document without written authorization and adaptation by Kimley-Horn and Associates, Inc. shall be without liability to Kimley-Horn and Associates, Inc.

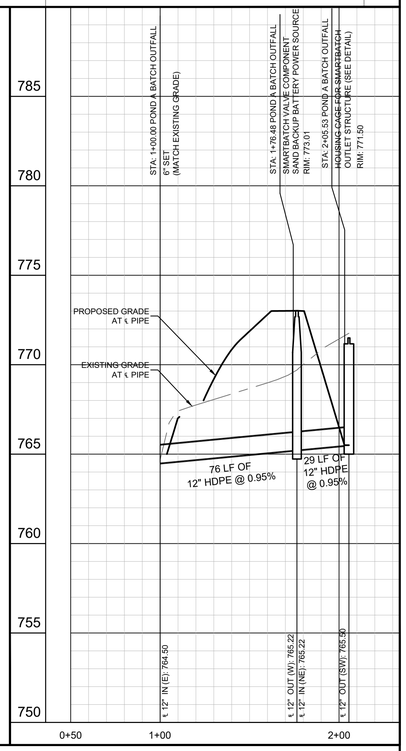
WQ POND A - SECTION A



WQ POND A - SECTION B

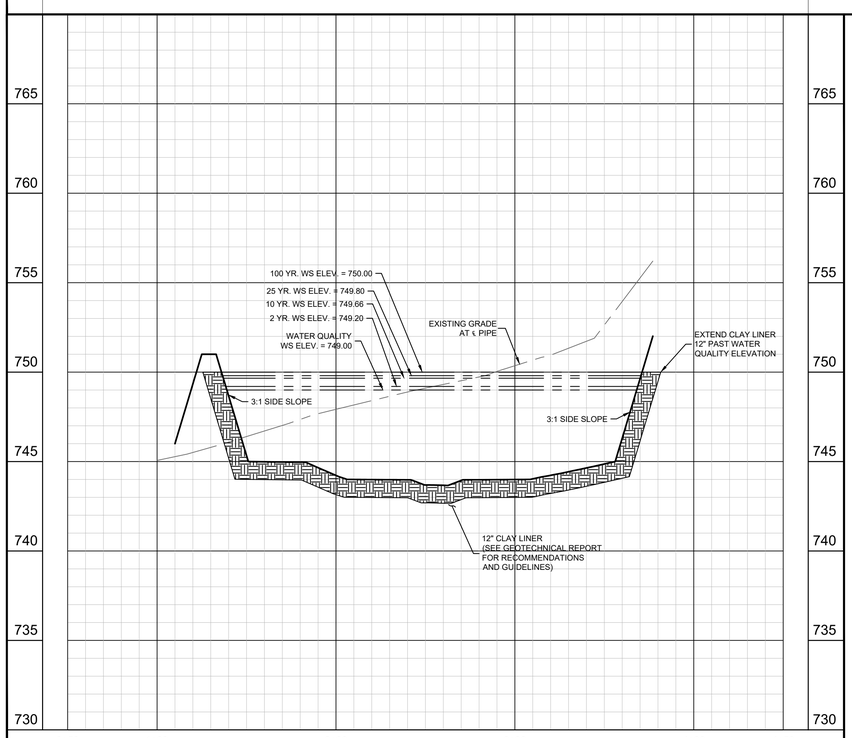


POND A BATCH OUTFALL

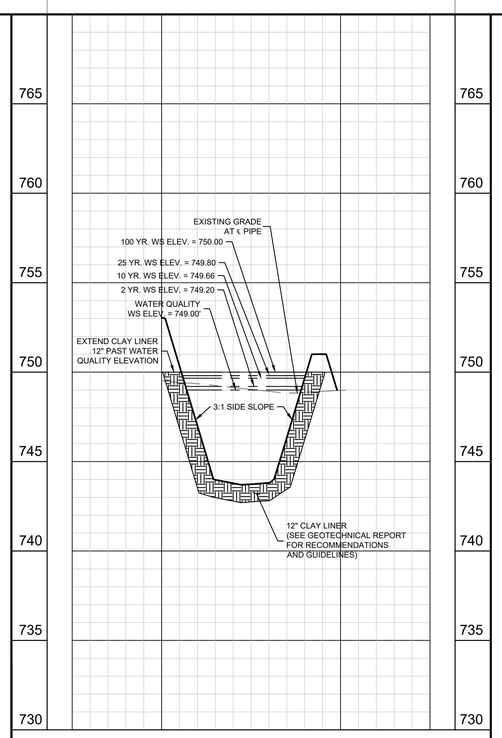


PROFILE SCALE
1" = 40' HORIZONTAL
1" = 4' VERTICAL

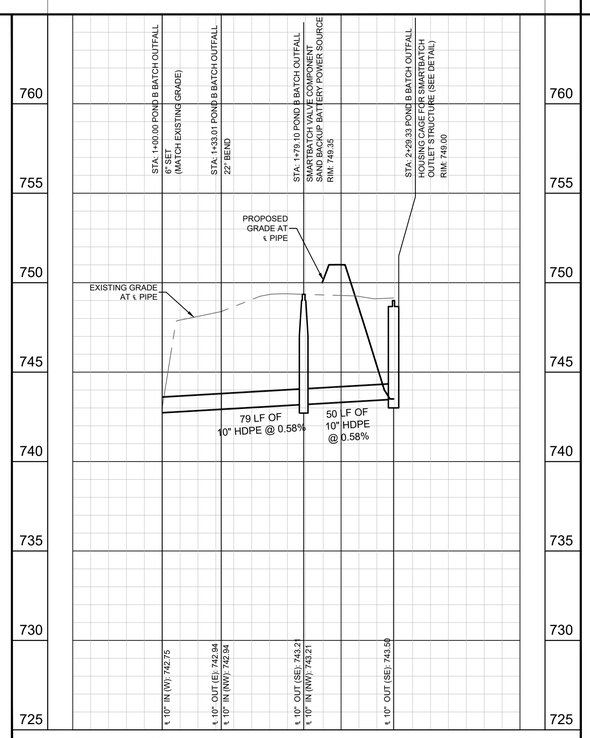
WQ POND B - SECTION A



WQ POND B - SECTION B



POND B BATCH OUTFALL



PROFILE SCALE
1" = 40' HORIZONTAL
1" = 4' VERTICAL

BENCHMARKS

ADD BENCHMARKS HERE

No.	REVISIONS	DATE	BY

Kimley»Horn
© 2024 KIMLEY-HORN AND ASSOCIATES, INC.
10814 JOLLYVILLE ROAD, CAMPUS IV, SUITE 200, AUSTIN, TX 78759
PHONE: 512-418-1771 FAX: 512-418-1791
WWW.KIMLEY-HORN.COM
TEXAS REGISTERED ENGINEERING FIRM F-928

STATE OF TEXAS
JOHN A. PICKENS
110631
LICENSED
PROFESSIONAL ENGINEER
02/02/2024

KHA PROJECT 064461307	
DATE	DECEMBER 2023
SCALE:	AS SHOWN
DESIGNED BY:	RRJ
DRAWN BY:	AJM
CHECKED BY:	JAP

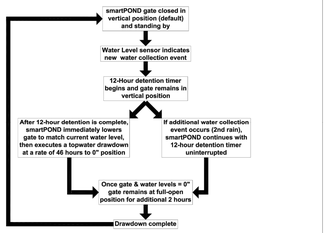
WATER QUALITY POND PROFILES

WOLF RANCH
SECTION 6G
CITY OF GEORGETOWN
WILLIAMSON COUNTY, TEXAS

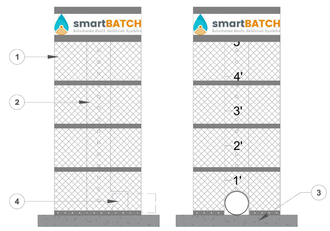
SHEET NUMBER
39 OF 87

Plotted By:Castillo, Jaime Date:February 08, 2024 09:22:34am File Path:K:\AUS_Civil\064461307-Wolf Ranch, Section 6G\Cad\PlanSheets\C-Pond Profiles.dwg
This document, together with the concepts and designs presented herein, as an instrument of service, is intended only for the specific purpose and client for which it was prepared. Reuse of and improper reliance on this document without written authorization and adaptation by Kimley-Horn and Associates, Inc. shall be without liability to Kimley-Horn and Associates, Inc.

PROGRAMMABLE LOGIC FLOW CHART

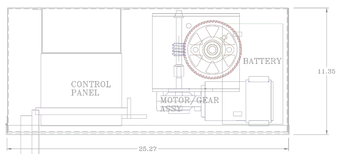


TRASH CAGE WITH PERFORATED RISER PIPE

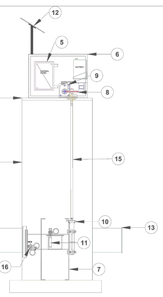


Parts List	
Item	smartPOND Valve Component
1	30" DIAMETER CAGE WITH 1 $\frac{1}{4}$" GALVANIZED MESH SCREEN
2	8" SQUARE PERFORATED TUBING WITH 1" PERFORATION, WITH 4" VERTICAL SPACING ON CENTERS WITH WATER DEPTH MARKER
3	3 $\frac{1}{2}$' X 3 $\frac{1}{2}$' X 4" CONCRETE PAD (BY OTHERS)
4	6" PVC OUTFALL PIPE (BY OTHERS)
5	WEATHERPROOF ELECTRONIC BOX
6	CONTROL BOX
7	PEDESTAL
8	ACTUATOR
9	MOTOR
10	6" VALVE
11	LEVEL TRANSDUCER
12	SOLAR PANEL
13	OUTLET PIPE (BY OTHERS)
14	30" DRAIN BASIN
15	VALVE STEM
16	QUICK DISCONNECT VALVE CONNECTION

PLAN VIEW OF ENCLOSER



SECTION VIEW OF SMARTBATCH



FRONT VIEW OF SMARTBATCH

smartBATCH
Automated Batch Detention Systems

FOR ADDITIONAL INFORMATION PLEASE CONTACT: CONSTRUCTION ECO SERVICES, 832-456-1000, www.ecosvs.com

CONVERGENT WATER TECHNOLOGIES

smartPOND Valve SPECIFICATION

Continuously Monitored Automated Stormwater System with Valve

1. Introduction
The following specifications describe the components, general functions, and applications of a smartPOND Continuously Monitored Automated Stormwater System (C-MASS) with Valve. The system functions as an electronically controlled, solar powered stormwater management device, providing precision management capabilities and real-time data. Using sensors, solar power, an electronic actuator, and an Internet-based control interface, the smartPOND valve connects to a specialized perforated riser inside the stormwater impoundment to enable managers to precisely control water retention and detention automatically or in real time.

2. smartPOND Valve Applications in Stormwater Management
The smartPOND valve is a device for active Stormwater management. As opposed to passive devices such as floating skimmers or stationary weirs, active water management dramatically increases the efficiency and effectiveness of a detention or retention pond. Where a passive stormwater detention system allows water to leave immediately upon collection, the smartPOND valve can detain newly caught Stormwater and allow it to settle for a programmed period before automatically dewatering the impoundment completely. For stormwater retention systems, it is possible to manage the treatment volume while maintaining a specified amount of capacity for flood storage or other use.

2.1 Pre-Programmed Control
Many functions can be pre-programmed without any human interactions, leaving the valve to automatically receive commands based on environmental conditions and respond as programmed.

2.1.1 Batch Detention function for Stormwater Quality
The smartPOND valve meets TCEQ Batch Detention specifications for a 91% Total Suspended Solid removal rate. The function proceeds as follows. With the valve in the closed position and the impoundment dry, the system will stand by and wait for a water collection event. At the first sign of water collection, the unit will begin a 12-hour detention timer. At the end of the 12-hour detention period, the valve will open and release all of the water that has been collected. After the water level drops to 0", the valve will remain open for an additional 2 hours to facilitate final drainage, then return to the closed position to stand by for the next water collection event.

2.1.2 Predevelopment Hydrograph Function for Flood Control
The smartPOND valve predevelopment hydrograph function takes in site specific variables to determine a maximum release rate based on predevelopment conditions. The valve reads water depth in the pond every 15 minutes to determine the maximum release rate desirable to ensure the impoundment neither overtops, nor exceeds its maximum release based on predevelopment flows.

2.1.3 Hazmat Function for Spill Containment
smartPOND when specified for hazmat spill containment can be equipped with pollutant specific sensors that when triggered automatically close the valve until the command is overridden.

2.2 Real Time Monitoring
smartPOND comes standard with telemetry available on each unit and access to the user app available at no additional cost for 1 year. This option allows for real time monitoring of the unit and the data that comes along with it. From the real time monitoring app, a user can:
- Control the valve, either open or close
- See the water level
- See if trash or debris is surrounding the inlet
- Get maintenance alerts (Low Battery, Valve Failure, Etc.)
- Maintain specified water level

3. Components
The smartPOND valve may be implemented either above or below ground, and is comprised of the following components:

3.1 Hardware and Configuration
The standard smartPOND valve features a cast 6" valve. An extended spool and mounting flange on each side of the valve allows it to be attached to the outfall pipe in various configurations. The valve is actuated with an electric motor connected by an extendable drive shaft for underground applications.

For above ground applications, the entire system including all necessary components for operation assemble into one kit and are housed under a single lockable steel enclosure with the solar panel mounted on top. In this configuration, the unit can be installed on a stable, level pad and be bolted onto the back of the outfall pipe with six ¾" bolts and then switched to the "ON" position.

For underground applications, the valve is installed in a vault or concrete encasement as needed. An extended drive shaft connects between the underground valve and the rest of the components, including the motor and all electronics, which are housed in the lockable steel enclosure directly above ground.

3.2 Electronics and Software Specifications
- **Main board** - The main board of the smartPOND valve's electronics box serves as the main connection terminal for all sensors and additional control boards
- **Motor Controller Board** - The motor controller board of the smartPOND valve regulates the connection between the battery and the motor and receives inputs from the main board to control motor direction. It also powers the main board.
- **Motor** - The smartPOND valve's motor operates on 12-volts and has two wires connecting to the motor controller board. It is mounted on a bracket and connects to the directly to the valve with a driveshaft.
- **Battery** - The smartPOND valve is powered by a 12-volt, 30 amp/hour gel battery. Two terminals at the top connect the power wires to the motor controller board and the solar charge controller to the battery.
- **Solar Panel** - The solar panel of the smartPOND valve is 12-volts with 15 watt charging capability. It connects to a solar charge controller which regulates the voltage and current before connecting with two wires to the positive and negative battery terminals.
- **Sensors**
  - *Pressure Transducer* - The water level sensor is a pressure transducer sensor capable of staying submersed in water indefinitely. It mounts on the side of the smartPOND valve's center spool.
  - *Valve position sensor* - A proximity sensor senses the position of the valve's drive shaft in order to control and determine the position of the valve.
- **(Optional)**
  - *Cell data modem* - A cellular data modem will be required for real time control and alert options as well as predevelopment hydrograph functions.
  - *Hydrocarbon Sensor* - This optional sensor may be fitted to the smartPOND valve to perform specific functions based on the presence of hydrocarbon contamination.

4. Real Time Monitoring Interface (optional)
If the real time monitoring option is selected, the smartPOND valve may be monitored in real time through the Autoflow app. Live and historical data from each unit may be viewed in the app, as well as alerts (detailed in section 5).

4.1 Accessing unit data
To access live and historical data in the Autoflow app, select the unit of interest on the home page by clicking on the unit's name. From there, select the "Data" button, and the data page for that unit will be displayed.

4.2 Sending a command
To send a remote-control command to the SmartPOND valve, click the "Send New Command" button on the unit's home page. The unit's current position will be displayed at the top. To change the unit's position, simply select "OPEN" or "CLOSE". Within 1-3 minutes, the unit will move to the new position and update its status in the app.

5. Alerts
The smartPOND valve will indicate the following alerts by illuminating an exteriorly visible red LED light
- Low battery
- Loss of function
- Valve malfunction
- Hydrocarbon contamination (optional)

If the telemetry option is selected, the unit will upload the above alerts to the Autoflow app and notify the operator via text or email.

6. In Case of Failure
To bypass the smartPOND valve's normal automated functions and control the valve position in case of failure:

6.1 Removal of motor and manual direct control
In case of a total electronic or motor failure, the motor and motor bracket can be uninstalled together by removing the two bolts at the bottom of the motor bracket. With the motor and motor bracket removed, the output shaft on the butterfly valve can be manually controlled with a socket wrench, or any other tool that can grip the output shaft.

7. Additional Components List

7.1 Perforated Riser
The smartPOND valve system includes a stackable perforated steel riser which installs on the inlet side of the outfall pipe within the impoundment area. The perforated riser features an 8-inch steel perforated square tube within a 24" round steel mesh tube. At the bottom of the 8-inch square tube, there is a female threaded fitting for a six inch PVC outfall pipe to connect. The steel tube is perforated with 1-inch holes every 4" on center to the height of the impoundment.

7.2 Trash Cage
The trash cage attaches to the perforated riser with a coupling and calder pin. The trash cage will be comprised of steel banding and a 1.5" x 1.5" mesh to prevent floatable's and other contaminants from entering and clogging the perforated riser. The trash cage will sit 0.5" above the bottom of the impoundment to allow the last 0.5" out of the impoundment.

7.3 Valve Stem Extension
The drive shaft/valve stem of the smartPOND system may be extended to any length necessary for instances where the valve will be in an underground vault or manhole. The valve stem will connect the valve to the above ground controls.

8. Maintenance

8.1 Grease
The smartPOND valve includes a grease fitting on the valve itself which should be greased twice per year. It is also recommended that a thick, mildly heat-resistant grease be used to avoid grease melting out of the groove in warmer temperatures.

8.2 Flange Bolts
Check the 8 bolts connecting the smartPOND valve's flange to the outfall pipe or fixture. During routine maintenance intervals, these bolts should be checked for tightness. All bolts should be tightened evenly.

8.3 Perforated Riser
Silt, sediment, and debris can build up around the perforated riser with time. An annual inspection of the unit is necessary to ensure that excess debris or sediment has not limited the drainage capacity of the perforated riser. To access the perforated riser for maintenance, lift the trash cage off of the riser, dig out any accumulated sediment, and clear all perforations.

8.4 Trash Cage
As a part of routine maintenance, it is advisable to remove trash and debris that has accumulated on the trash cage and properly dispose.

8.5 Solar Panel
On all inspection visits, it is necessary to confirm that the solar panel is facing south and is well secured. The solar panel is commonly utilized by birds and insects. It is important to keep the surface clean of bird litter, insect nests and debris in order to maintain optimal performance.

8.6 Battery
Over time, battery terminals may corrode. Check annually for corrosion and clean as needed. The battery should be replaced every 4 to 6 years.

8.7 Storage
The smartPOND valve is shipped in a near-fully assembled configuration and should be stored likewise. The systems are transported and stored on pallets and must remain secured via straps or steel bands to said pallet at all times. The solar panel is not installed at times of transport or storage and should not be installed until the unit is ready to begin operation. The battery may be stored inside the electronics box and if removed, should never be stored on a concrete surface.

9. Installation
The smartPOND valve can be installed in a near-completely assembled configuration. Only the solar panel should be removed during the installation process. There are several ways to install the smartPOND valve with the key being structured support.

9.1 Structural Support
If the smartPOND valve is mounted to a steel pipe in an above ground/fully assembled configuration, the weight of the unit may be supported by the steel pipe. For plastic or concrete pipes, it is recommended that the weight of the unit be supported by either a concrete pad or steel frame. For below ground installations, the upper unit (electronics and actuator) should be fastened to the surface of the concrete vault. For vault installations, see design details for standard vault design.

10. Important Safety Information and Warnings:
- Always keep hands clear of the valve and motor when unit is in operation.
- Turn the power switch off when doing any electrical work.
- Do not enter the water when the device is actively draining water
- Always use proper PPE and confined space protocol when servicing a valve beneath ground.

11. PRODUCTS
Manufacturer/Supplier/Reseller shall be an established stormwater company that has at least 5 installations of automated stormwater management devices that have been in use and functional for the past 3 or more years.

A. Acceptable smartPOND Valve
"smartBATCH" Automated Batch Detention System
"smartPONDS" Automated Detention System

B. Acceptable System Supplier
Convergent Water Technologies, Inc.
(800)731-5428
www.convergentwater.com

C. Authorized Value Added Reseller
Construction Ecoservices
(800)456-1000
www.ecosvs.com

12. Quality Assurance and Performance Specifications
The quality of all system components and all other appurtenances and their assembly process shall be subject to inspection upon delivery of the system to the work site.Installation is to be performed only by skilled work people with satisfactory record of performance on earthworks, pipe, welding, chamber, or pond/landfill construction projects of comparable size and quality.

smartPOND
Automated Stormwater Control

FOR ADDITIONAL INFORMATION PLEASE CONTACT:
CONSTRUCTION ECO SERVICES
832-456-1000
www.ecosvs.com

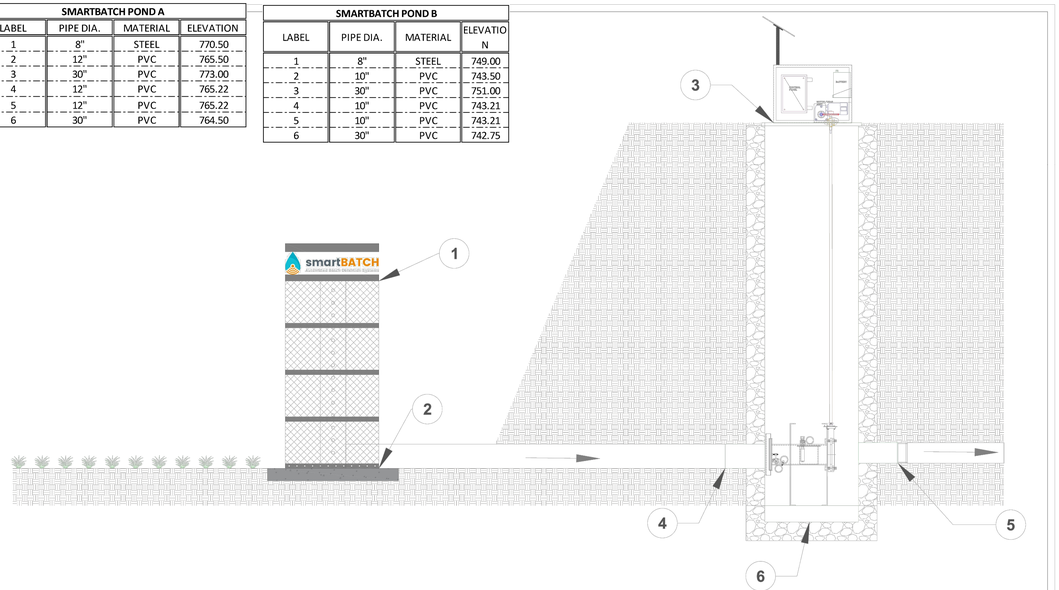
smartPOND Valve
Specifications

REV 0
DATE 5/26/2020
SHEET NO.

NOTE: ENGINEER OF RECORD TO REVIEW, APPROVE AND ENDORSE FINAL SITE SPECIFIC DESIGN.

SMARTBATCH POND A			
LABEL	PIPE DIA.	MATERIAL	ELEVATION
1	8"	STEEL	770.50
2	12"	PVC	765.50
3	30"	PVC	773.00
4	12"	PVC	765.22
5	12"	PVC	765.22
6	30"	PVC	764.50

SMARTBATCH POND B			
LABEL	PIPE DIA.	MATERIAL	ELEVATION
1	8"	STEEL	749.00
2	10"	PVC	743.50
3	30"	PVC	751.00
4	10"	PVC	743.21
5	10"	PVC	743.21
6	30"	PVC	742.75

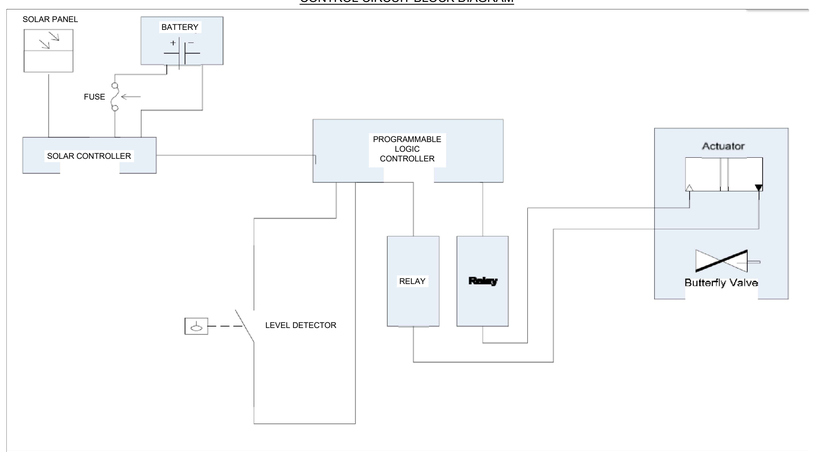


smartBATCH
Automated Batch Detention Systems

FOR ADDITIONAL INFORMATION PLEASE CONTACT: CONSTRUCTION ECO SERVICES, 832-456-1000, www.ecosvs.com

CONVERGENT WATER TECHNOLOGIES

CONTROL CIRCUIT BLOCK DIAGRAM



NOTE:
CONTRACTOR TO PROVIDE SHOP DRAWING SHOWING ELEVATIONS OF ALL PROPOSED SMARTBATCH VALVE PIPING PRIOR TO FABRICATION.

No.	REVISIONS	DATE	BY

Kimley»Horn
© 2024 KIMLEY-HORN AND ASSOCIATES, INC.
10814 JOLLYVILLE ROAD, CAMPUS IV, SUITE 200, AUSTIN, TX 78759
PHONE: 512-418-1771 FAX: 512-418-1791
WWW.KIMLEY-HORN.COM
TEXAS REGISTERED ENGINEERING FIRM F-928

STATE OF TEXAS
JOHN A. PICKENS
110631
LICENSED
PROFESSIONAL ENGINEER
02/02/2024

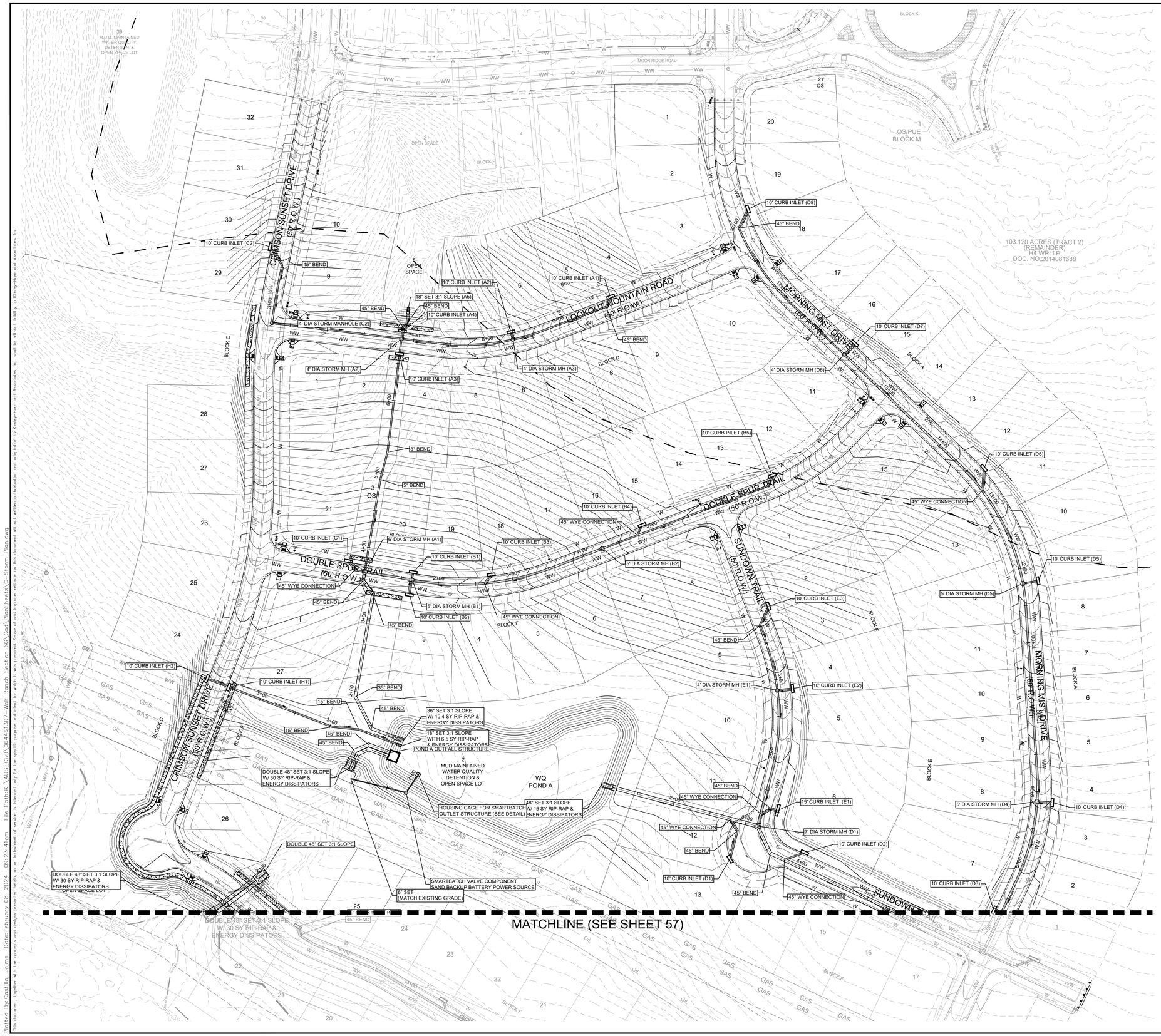
KHA PROJECT 064461307
DATE DECEMBER 2023
SCALE: AS SHOWN
DESIGNED BY: RRJ
DRAWN BY: AJM
CHECKED BY: JAP

WATER QUALITY POND DETAILS

WOLF RANCH
SECTION 6G
CITY OF GEORGETOWN
WILLIAMSON COUNTY, TEXAS

SHEET NUMBER

Plotted By:Pickens, John Date:February 12, 2024 02:19:51pm File Path:K:\AUS_Civil\064461307-Wolf Ranch Section 6G\Cad\PlanSheets\C-Water Quality Pond Details.dwg
This document, together with the concepts and designs presented herein, as an instrument of service, is intended only for the specific purpose and client for which it was prepared. Reuse of and improper reliance on this document without written authorization and adaptation by Kimley-Horn and Associates, Inc. shall be without liability to Kimley-Horn and Associates, Inc.



N
W E
S

0 60' 120'
GRAPHIC SCALE 60'

UTILITY LEGEND

- PROPERTY LINE
- PROPOSED WASTE WATER LINE
- PROPOSED WATER LINE
- PROPOSED WASTE WATER MANHOLE
- WASTE WATER FLOW DIRECTION
- PROPOSED FIRE HYDRANT
- EXISTING OVERHEAD POWER LINE
- EXISTING WATER LINE
- EXISTING WASTE WATER LINE
- EXISTING STORM SEWER LINE
- EXISTING POWER POLE
- EXISTING FIRE HYDRANT
- EXISTING WATER METER
- EXISTING WASTE WATER MANHOLE

BENCHMARKS

ADD BENCHMARKS HERE

No.	REVISIONS	DATE	BY

Kimley»Horn
© 2024 KIMLEY-HORN AND ASSOCIATES, INC.
10814 JOLLYVILLE ROAD, CAMPUS IV, SUITE 200, AUSTIN, TX 78759
PHONE: 512-418-1771 FAX: 512-418-1791
WWW.KIMLEY-HORN.COM
TEXAS REGISTERED ENGINEERING FIRM F-928

STATE OF TEXAS
JOHN A. PICKENS
110631
LICENSED
PROFESSIONAL ENGINEER
02/02/2024

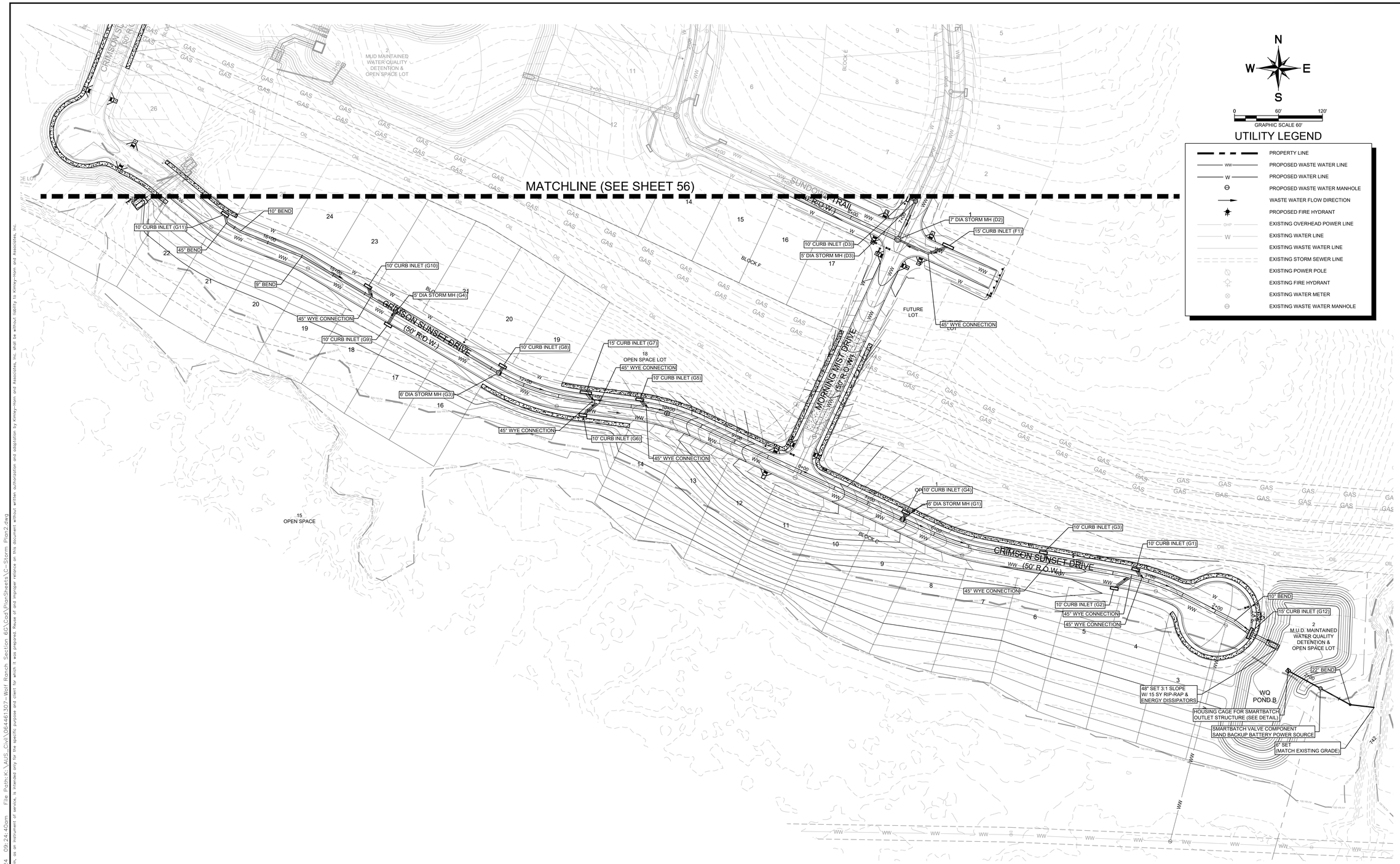
KHA PROJECT 064461307	
DATE DECEMBER 2023	
SCALE: AS SHOWN	DESIGNED BY: RRJ
	DRAWN BY: AJM
	CHECKED BY: JAP

OVERALL STORM PLAN (1 OF 2)

WOLF RANCH
SECTION 6G
CITY OF GEORGETOWN
WILLIAMSON COUNTY, TEXAS

SHEET NUMBER
41 OF 87

Plotted By:Castillo, Jaime Date:February 08, 2024 09:23:41am File Path:K:\AUS_Civil\064461307-Wolf Ranch: Section 6G\Cad\PlanSheets\C-Storm Plan.dwg
This document, together with the concepts and designs presented herein, as an instrument of service, is intended only for the specific purpose and client for which it was prepared. Reuse of and improper reliance on this document without written authorization and adaptation by Kimley-Horn and Associates, Inc. shall be without liability to Kimley-Horn and Associates, Inc.



N
W E
S

0 60' 120'
GRAPHIC SCALE 60'

UTILITY LEGEND

- PROPERTY LINE
- PROPOSED WASTE WATER LINE
- PROPOSED WATER LINE
- PROPOSED WASTE WATER MANHOLE
- WASTE WATER FLOW DIRECTION
- PROPOSED FIRE HYDRANT
- EXISTING OVERHEAD POWER LINE
- EXISTING WATER LINE
- EXISTING WASTE WATER LINE
- EXISTING STORM SEWER LINE
- EXISTING POWER POLE
- EXISTING FIRE HYDRANT
- EXISTING WATER METER
- EXISTING WASTE WATER MANHOLE

BENCHMARKS

ADD BENCHMARKS HERE

No.	REVISIONS	DATE	BY

Kimley»Horn
© 2024 KIMLEY-HORN AND ASSOCIATES, INC.
10814 JOLLYVILLE ROAD, CAMPUS IV, SUITE 200, AUSTIN, TX 78759
PHONE: 512-418-1771 FAX: 512-418-1791
WWW.KIMLEY-HORN.COM
TEXAS REGISTERED ENGINEERING FIRM F-928

STATE OF TEXAS
JOHN A. PICKENS
110631
LICENSED
PROFESSIONAL ENGINEER
02/02/2024

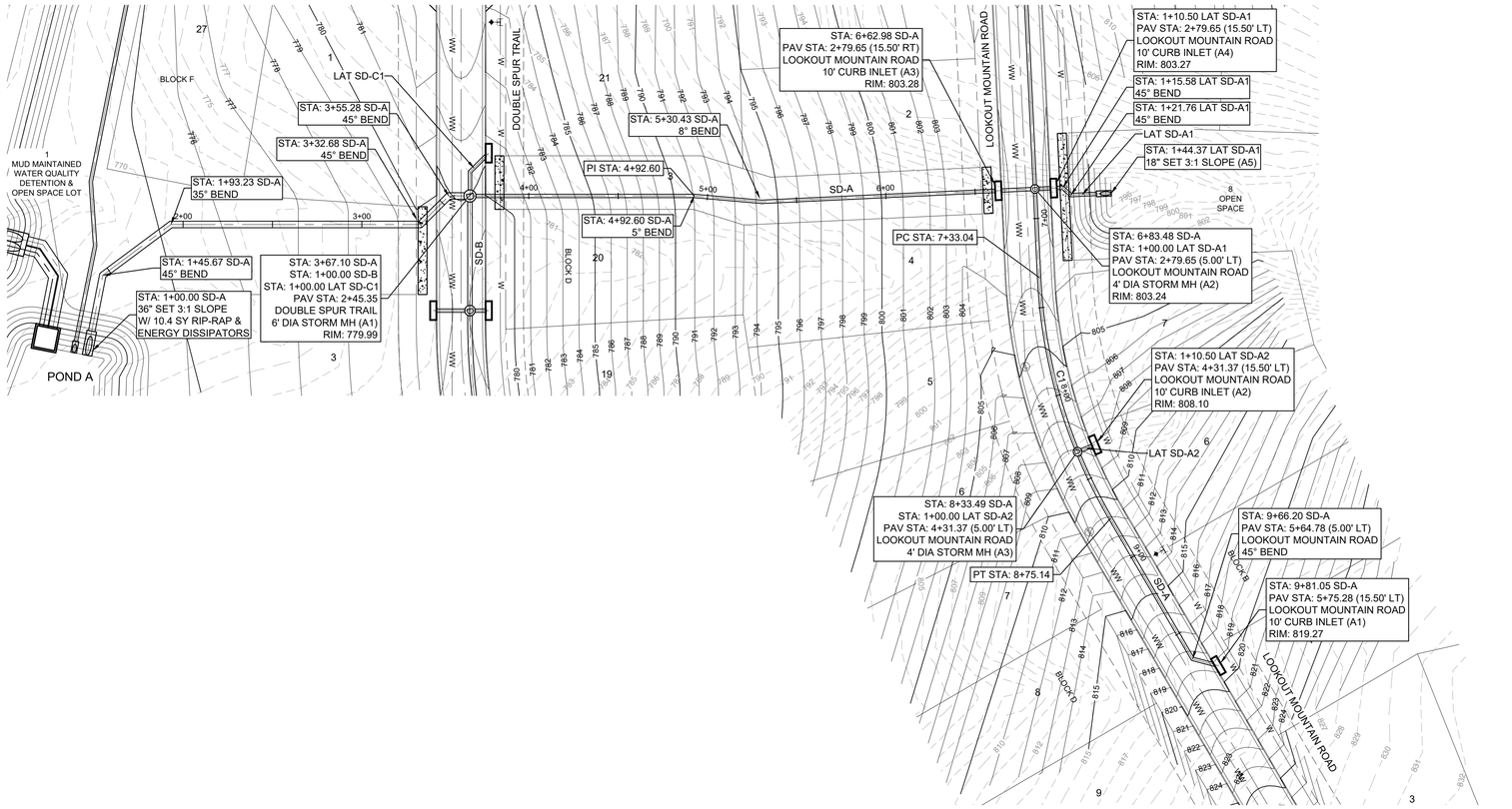
KHA PROJECT 064461307
DATE DECEMBER 2023
SCALE: AS SHOWN
DESIGNED BY: RRJ
DRAWN BY: AJM
CHECKED BY: JAP

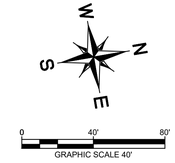
OVERALL STORM PLAN (2 OF 2)

WOLF RANCH
SECTION 6G
CITY OF GEORGETOWN
WILLIAMSON COUNTY, TEXAS

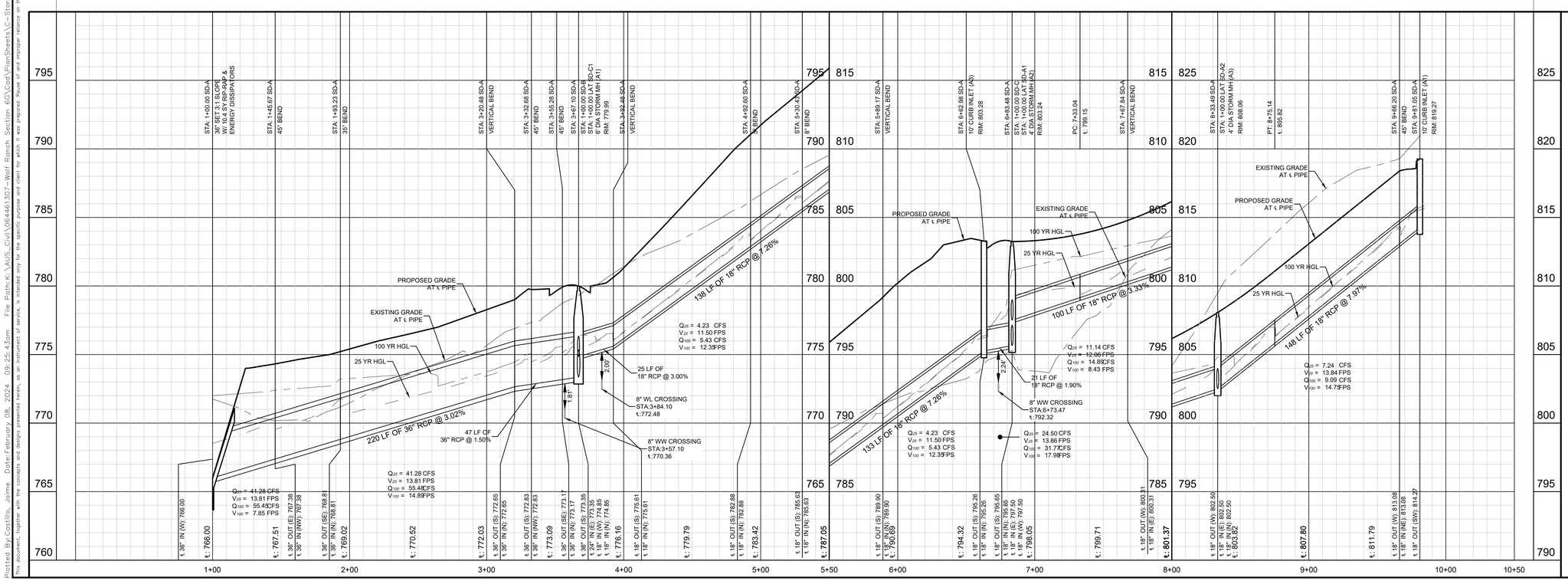
SHEET NUMBER
42 OF 87

Plotted By:Castillo, Jaime Date:February 08, 2024 09:24:40am File Path:K:\AUS_Civil\064461307-Wolf Ranch Section 6G\Cad\PlanSheets\C-Storm Plan2.dwg
This document, together with the concepts and designs presented herein, as an instrument of service, is intended only for the specific purpose and client for which it was prepared. Reuse of and improper reliance on this document without written authorization and adaptation by Kimley-Horn and Associates, Inc. shall be without liability to Kimley-Horn and Associates, Inc.





CURVE TABLE						
CURVE	RADIUS	LENGTH	CHORD BEARING	CHORD	DELTA	TANGENT
C1	295.00'	142.11'	N83°10'38"E	140.74'	27°36'01"	72.46'



BENCHMARKS

ADD BENCHMARKS HERE

No.	REVISIONS	DATE	BY

Kimley»Horn
© 2024 KIMLEY-HORN AND ASSOCIATES, INC.
10814 JOLLYVILLE ROAD, CAMPUS IV, SUITE 200, AUSTIN, TX 78759
PHONE: 512-418-1771 FAX: 512-418-1791
WWW.KIMLEY-HORN.COM
TEXAS REGISTERED ENGINEERING FIRM F-928

STATE OF TEXAS
JOHN A. PICKENS
110631
LICENSED
PROFESSIONAL ENGINEER
02/02/2024

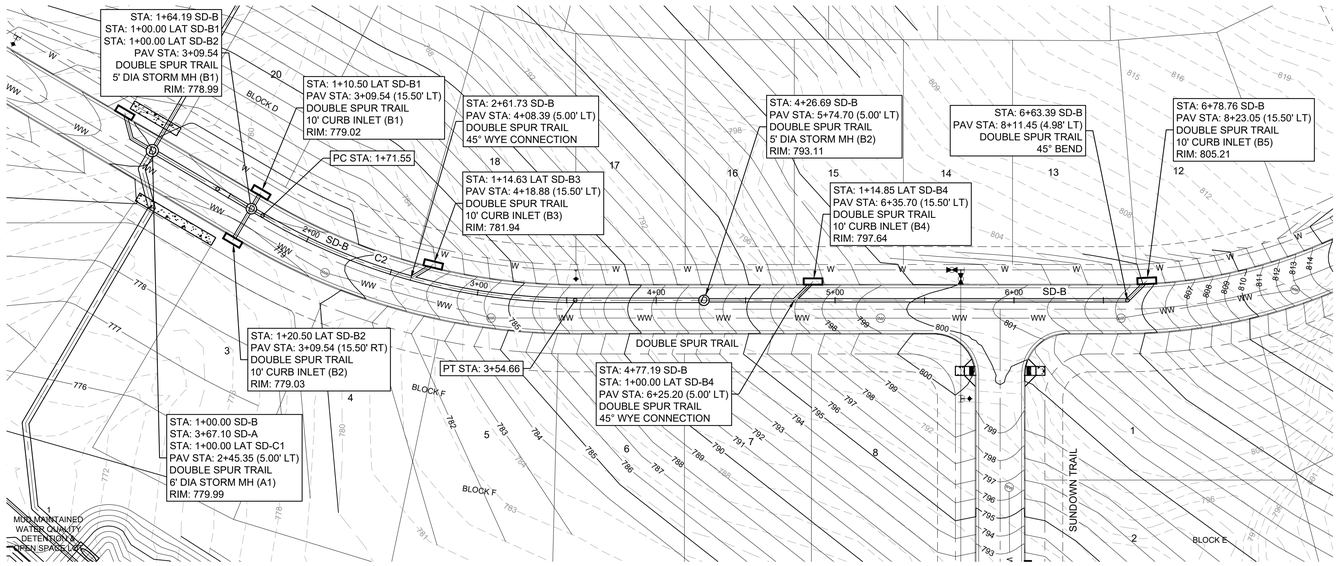
KHA PROJECT 064461307
DATE DECEMBER 2023
SCALE: AS SHOWN
DESIGNED BY: RRJ
DRAWN BY: AJM
CHECKED BY: JAP

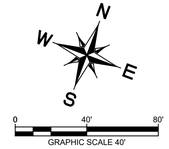
STORM PLAN AND PROFILE - SD-A

WOLF RANCH
SECTION 6G
CITY OF GEORGETOWN
WILLIAMSON COUNTY, TEXAS

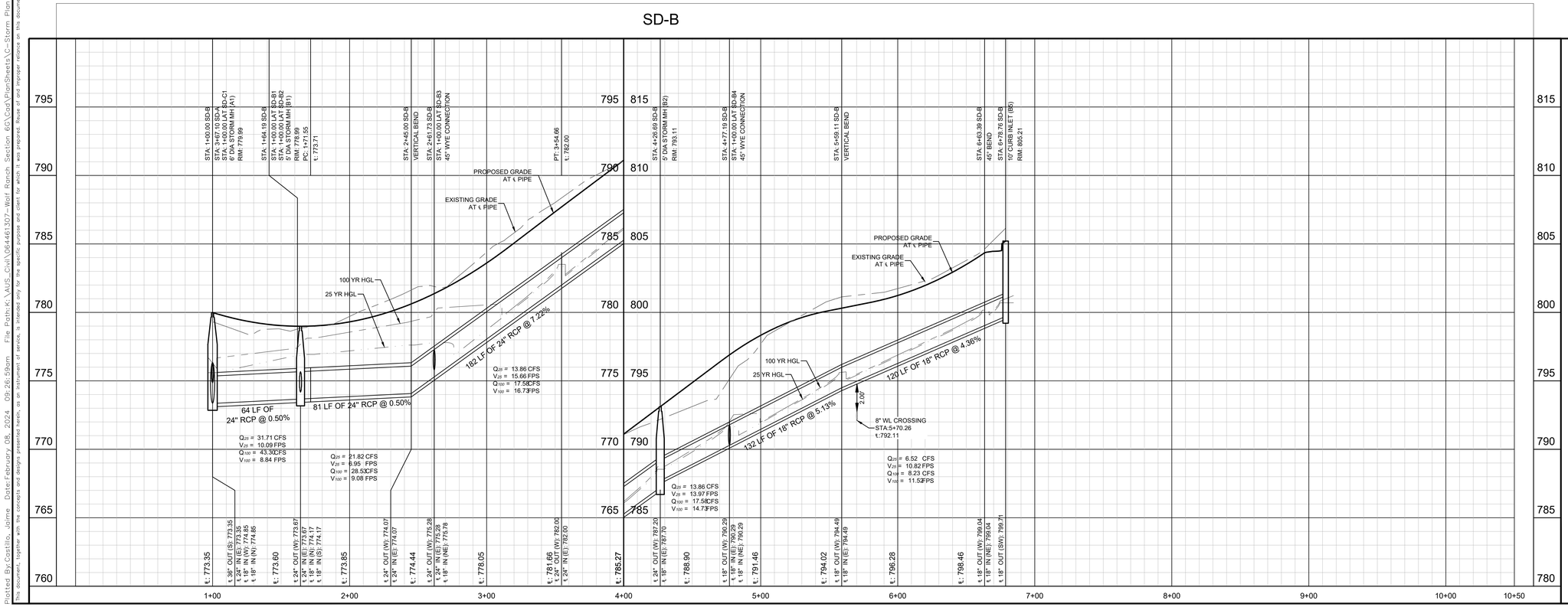
SHEET NUMBER
43 OF 87

Plotted By: Castillo, Jaime Date: February 08, 2024 09:25:43am File Path: K:\AUS_Civil\064461307-Wolf Ranch Section 6G\Cad\PlanSheets\C-Storm Plan and Profile A1.dwg
This document, together with the concepts and designs presented herein, as an instrument of service, is intended only for the specific purpose and client for which it was prepared. Reuse of and improper reliance on this document without written authorization and adaptation by Kimley-Horn and Associates, Inc. shall be without liability to Kimley-Horn and Associates, Inc.





CURVE TABLE						
CURVE	RADIUS	LENGTH	CHORD BEARING	CHORD	DELTA	TANGENT
C2	345.00'	183.11'	N84°28'04"E	180.97'	30°24'38"	93.77'



PROFILE SCALE
1" = 40' HORIZONTAL
1" = 4' VERTICAL

BENCHMARKS

ADD BENCHMARKS HERE

No.	REVISIONS	DATE	BY

Kimley»Horn
© 2024 KIMLEY-HORN AND ASSOCIATES, INC.
10814 JOLLYVILLE ROAD, CAMPUS IV, SUITE 200, AUSTIN, TX 78759
PHONE: 512-418-1771 FAX: 512-418-1791
WWW.KIMLEY-HORN.COM
TEXAS REGISTERED ENGINEERING FIRM F-928

STATE OF TEXAS
JOHN A. PICKENS
110631
LICENSED
PROFESSIONAL ENGINEER
02/02/2024

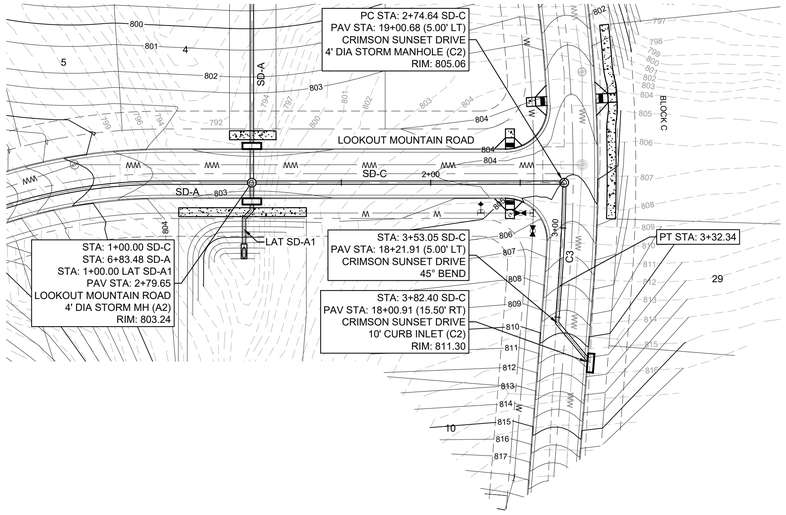
KHA PROJECT 064461307
DATE DECEMBER 2023
SCALE: AS SHOWN
DESIGNED BY: RRJ
DRAWN BY: AJM
CHECKED BY: JAP

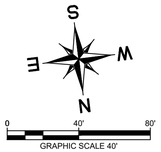
STORM PLAN AND PROFILE - SD-B

WOLF RANCH
SECTION 6G
CITY OF GEORGETOWN
WILLIAMSON COUNTY, TEXAS

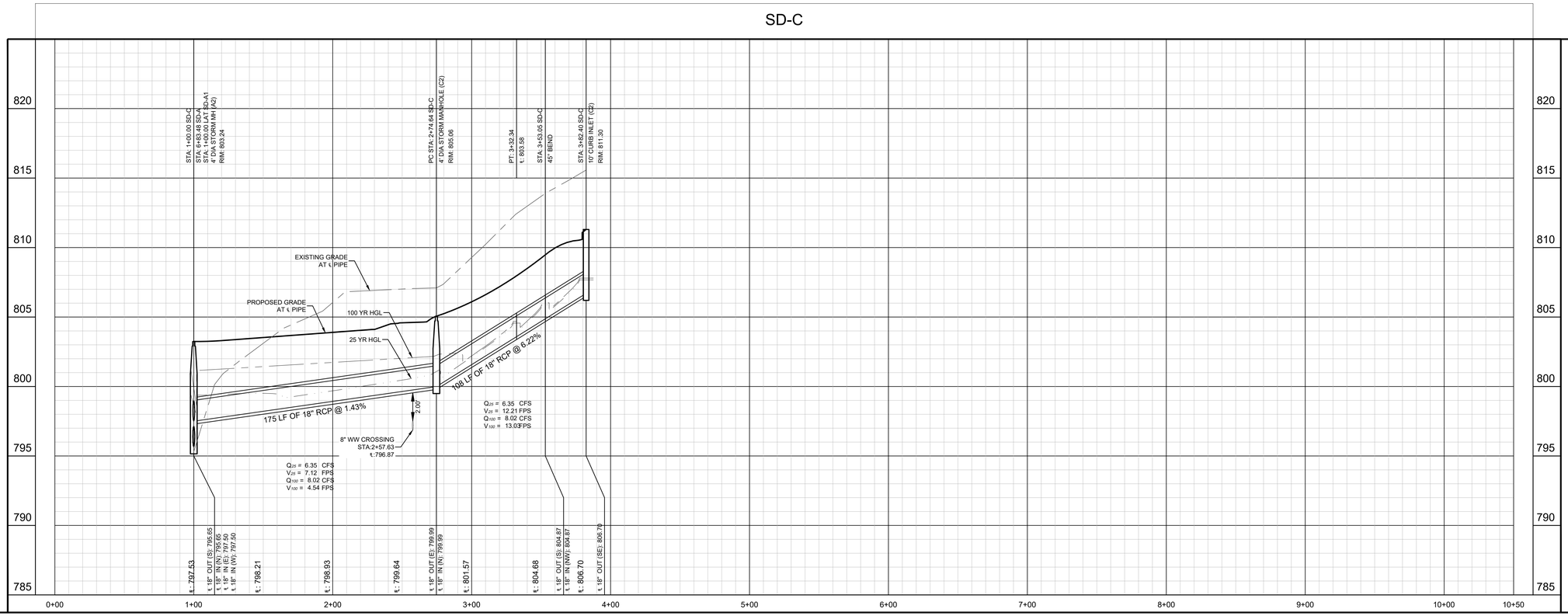
SHEET NUMBER
44 OF 87

Plotted By:Castillo, Jaime Date:February 08, 2024 09:26:59am File Path:K:\AUS_Civil\064461307-Wolf Ranch Section 6G\Cad\PlanSheets\C-Storm Plan and Profile B.dwg
This document, together with the concepts and designs presented herein, as an instrument of service, is intended only for the specific purpose and client for which it was prepared. Reuse of and improper reliance on this document without written authorization and adaptation by Kimley-Horn and Associates, Inc. shall be without liability to Kimley-Horn and Associates, Inc.





CURVE TABLE						
CURVE	RADIUS	LENGTH	CHORD BEARING	CHORD	DELTA	TANGENT
C3	795.00'	57.71'	N9°25'02"E	57.70'	4°09'32"	28.87"



PROFILE SCALE
1" = 40' HORIZONTAL
1" = 4' VERTICAL

BENCHMARKS

ADD BENCHMARKS HERE

No.	REVISIONS	DATE	BY

Kimley»Horn

© 2024 KIMLEY-HORN AND ASSOCIATES, INC.
10814 JOLLYVILLE ROAD, CAMPUS IV, SUITE 200, AUSTIN, TX 78759
PHONE: 512-418-1771 FAX: 512-418-1791
WWW.KIMLEY-HORN.COM
TEXAS REGISTERED ENGINEERING FIRM F-928

STATE OF TEXAS
JOHN A. PICKENS
110631
LICENSED
PROFESSIONAL ENGINEER
02/02/2024

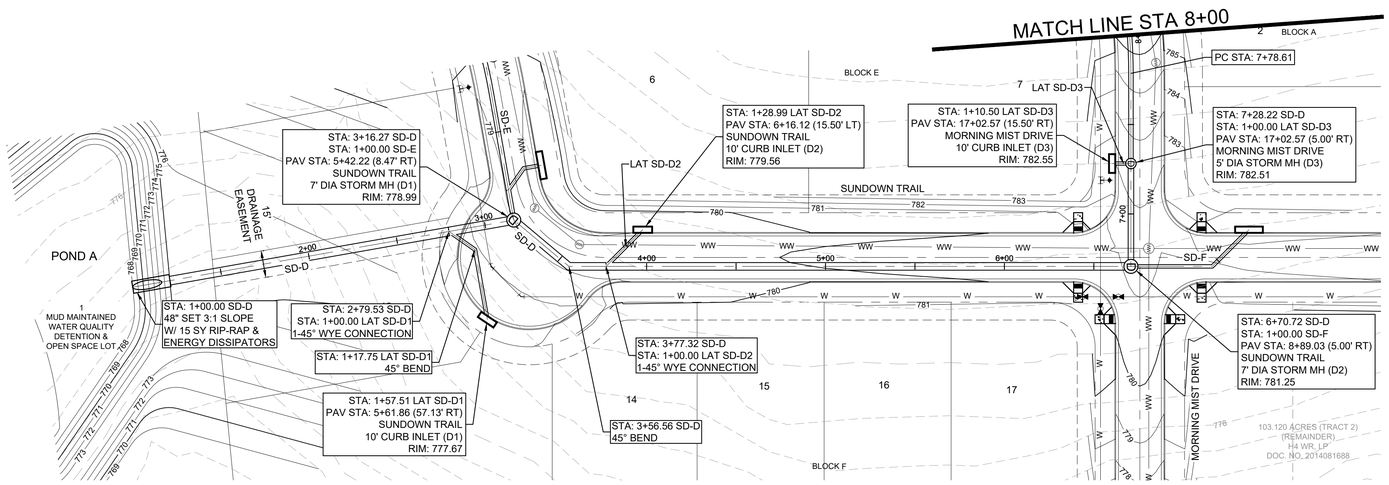
KHA PROJECT 064461307
DATE DECEMBER 2023
SCALE: AS SHOWN
DESIGNED BY: RRJ
DRAWN BY: AJM
CHECKED BY: JAP

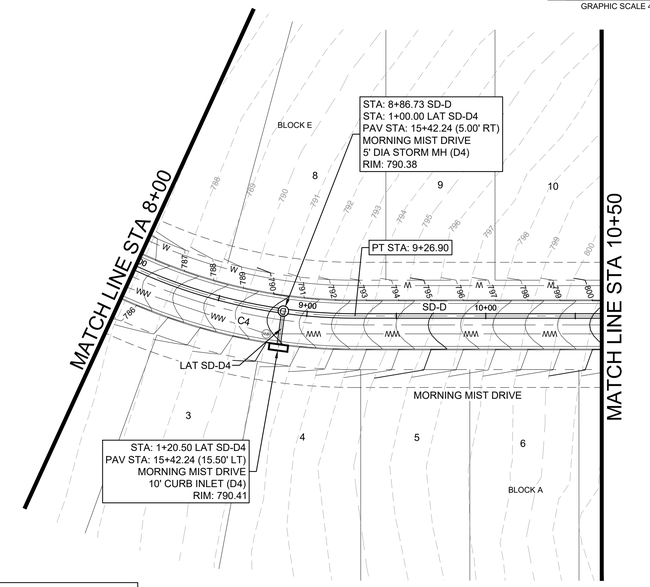
STORM PLAN AND PROFILE - SD-C

WOLF RANCH
SECTION 6G
CITY OF GEORGETOWN
WILLIAMSON COUNTY, TEXAS

SHEET NUMBER
45 OF 87

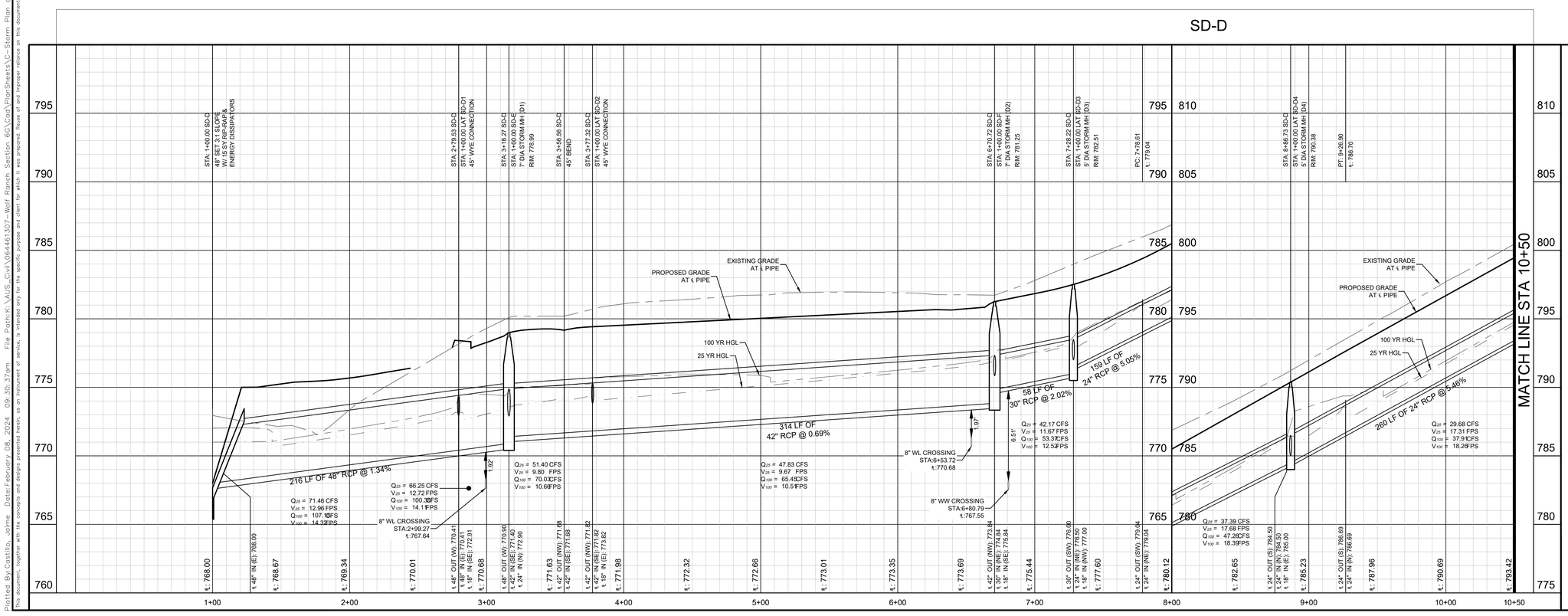
Plotted By:Castillo, Jaime Date:February 08, 2024 09:29:00am File Path:K:\AUS_Civil\064461307-Wolf Ranch Section 6G\Cad\PlanSheets\C-Storm Plan and Profile C.dwg
This document, together with the concepts and designs presented herein, as an instrument of service, is intended only for the specific purpose and client for which it was prepared. Reuse of and improper reliance on this document without written authorization and adaptation by Kimley-Horn and Associates, Inc. shall be without liability to Kimley-Horn and Associates, Inc.





GRAPHIC SCALE 40'

CURVE TABLE						
CURVE	RADIUS	LENGTH	CHORD BEARING	CHORD	DELTA	TANGENT
C4	300.00'	150.80'	S10°31'40"W	149.22'	28°48'05"	77.03'



BENCHMARKS

ADD BENCHMARKS HERE

No.	REVISIONS	DATE	BY

Kimley»Horn

© 2024 KIMLEY-HORN AND ASSOCIATES, INC.

10814 JOLLYVILLE ROAD, CAMPUS IV, SUITE 200, AUSTIN, TX 78759
PHONE: 512-418-1771 FAX: 512-418-1791
WWW.KIMLEY-HORN.COM
TEXAS REGISTERED ENGINEERING FIRM F-928

JOHN A. PICKENS
110631
LICENSED
PROFESSIONAL ENGINEER
STATE OF TEXAS

02/02/2024

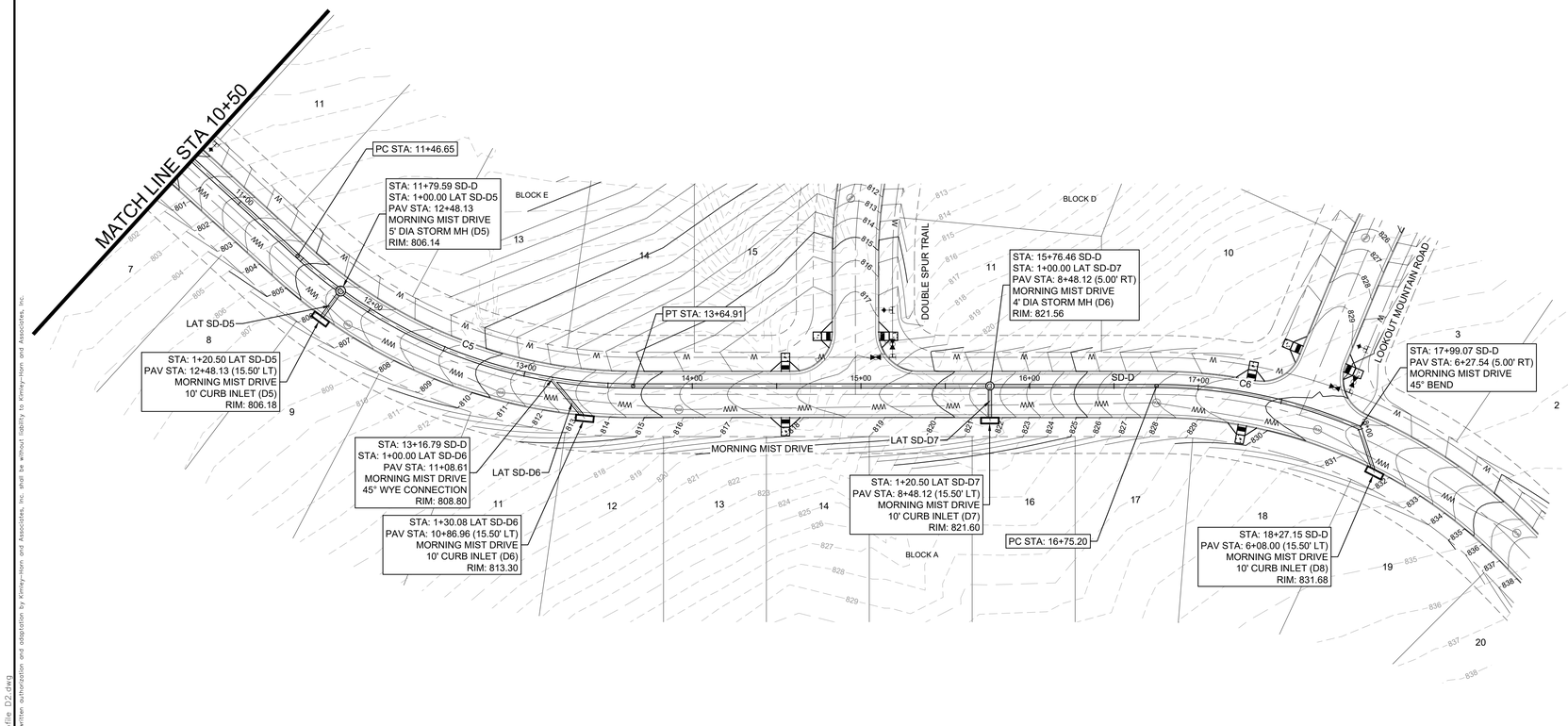
KHA PROJECT 064461307
DATE DECEMBER 2023
SCALE: AS SHOWN
DESIGNED BY: RRJ
DRAWN BY: AJM
CHECKED BY: JAP

STORM PLAN AND PROFILE - SD-D (1 OF 2)

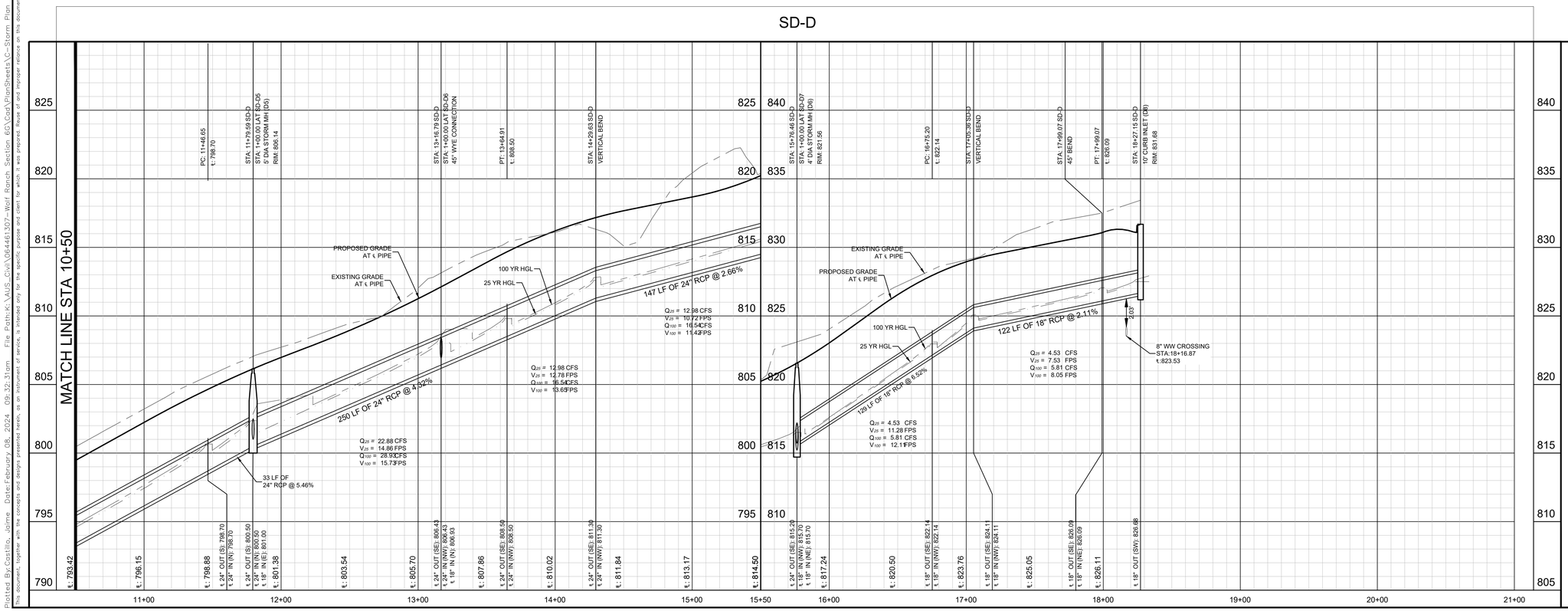
WOLF RANCH
SECTION 6G
CITY OF GEORGETOWN
WILLIAMSON COUNTY, TEXAS

SHEET NUMBER
46 OF 87

Plotted By:Castillo, Jaime Date:February 08, 2024 09:30:37am File Path:K:\AUS_Civil\064461307-Wolf Ranch Section 6G\Cad\PlanSheets\C-Storm Plan and Profile D.dwg
This document, together with the concepts and designs presented herein, as an instrument of service, is intended only for the specific purpose and client for which it was prepared. Reuse of and improper reliance on this document without written authorization and adaptation by Kimley-Horn and Associates, Inc. shall be without liability to Kimley-Horn and Associates, Inc.



CURVE TABLE						
CURVE	RADIUS	LENGTH	CHORD BEARING	CHORD	DELTA	TANGENT
C5	295.00'	218.26'	N25°04'08"W	213.32'	42°23'30"	114.40'
C6	305.00'	123.87'	N34°37'48"W	123.02'	23°16'11"	62.80'



BENCHMARKS

ADD BENCHMARKS HERE

No.	REVISIONS	DATE	BY

Kimley»Horn

© 2024 KIMLEY-HORN AND ASSOCIATES, INC.
10814 JOLLYVILLE ROAD, CAMPUS IV, SUITE 200, AUSTIN, TX 78759
PHONE: 512-418-1771 FAX: 512-418-1791
WWW.KIMLEY-HORN.COM
TEXAS REGISTERED ENGINEERING FIRM F-928

STATE OF TEXAS
JOHN A. PICKENS
110631
LICENSED
PROFESSIONAL ENGINEER
02/02/2024

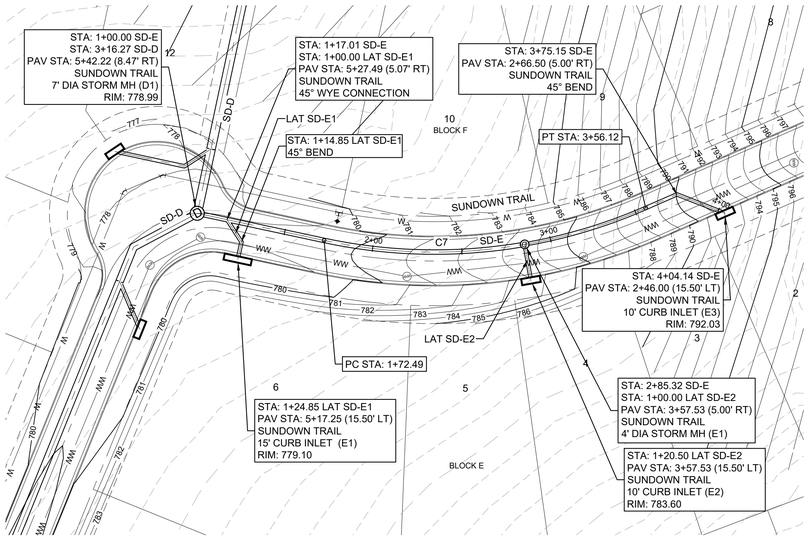
KHA PROJECT 064461307
DATE DECEMBER 2023
SCALE: AS SHOWN
DESIGNED BY: RRJ
DRAWN BY: AJM
CHECKED BY: JAP

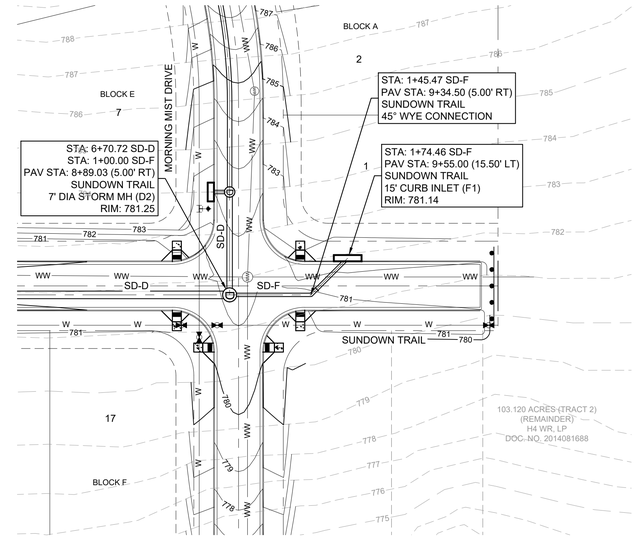
STORM PLAN AND PROFILE - SD-D (2 OF 2)

WOLF RANCH
SECTION 6G
CITY OF GEORGETOWN
WILLIAMSON COUNTY, TEXAS

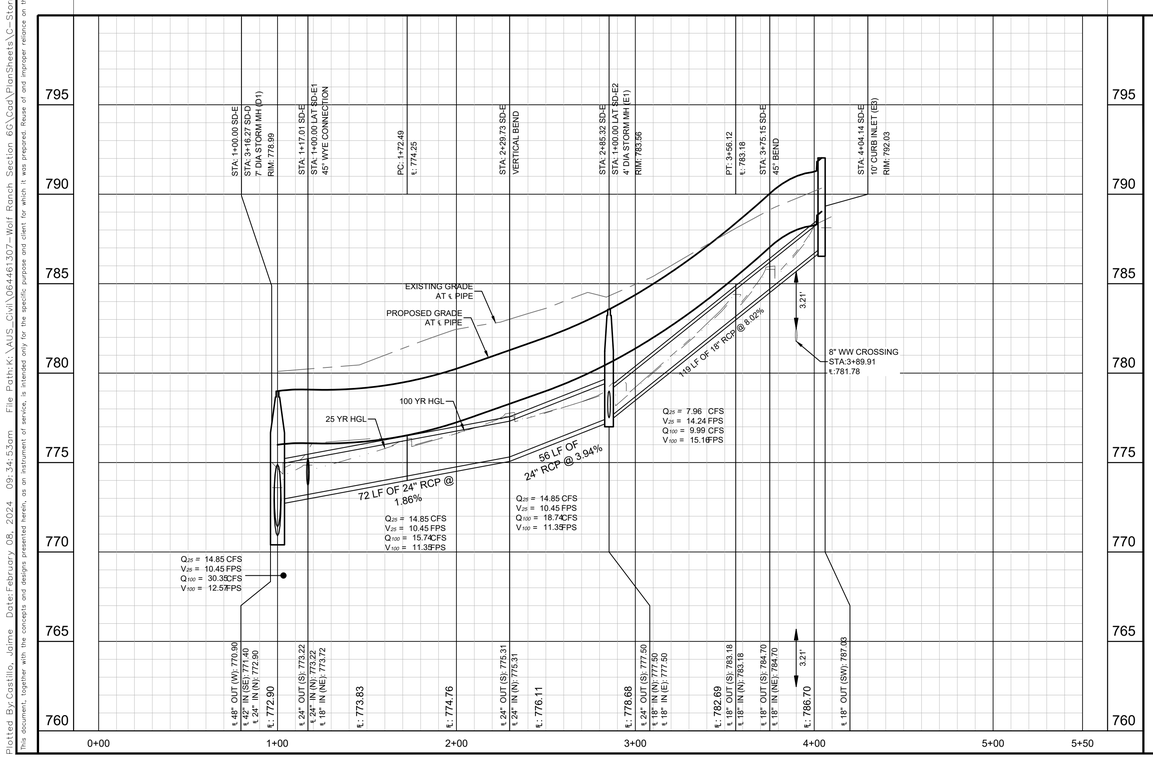
SHEET NUMBER

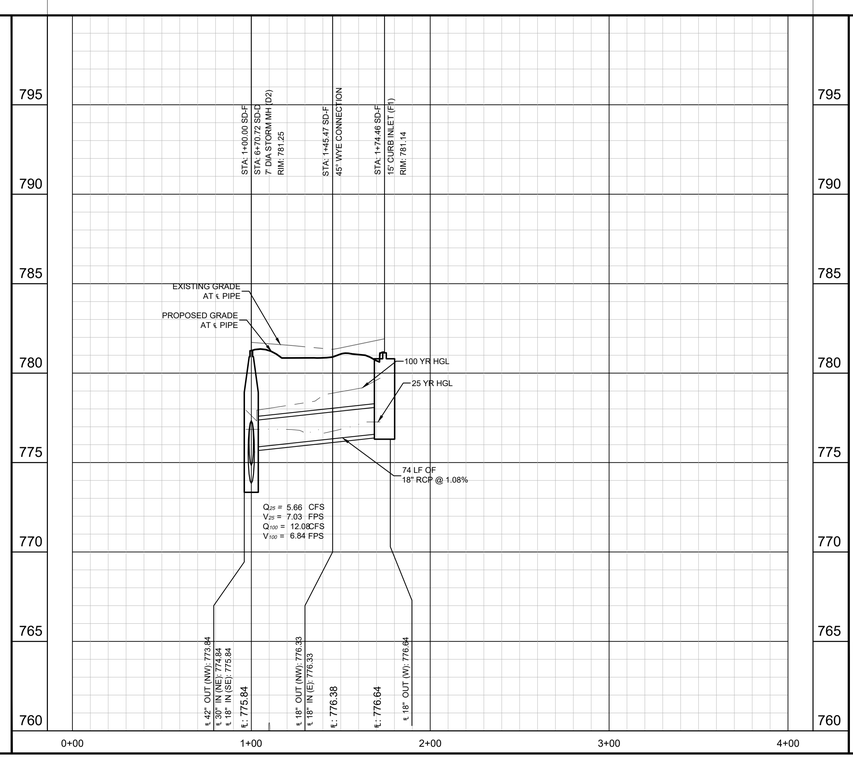
Plotted By:Castillo, Jaime Date:February 08, 2024 09:32:31am File Path:K:\AUS_Civil\064461307-Wolf Ranch Section 6G\Cad\PlanSheets\C-Storm Plan and Profile D2.dwg
This document, together with the concepts and designs presented herein, as an instrument of service, is intended only for the specific purpose and client for which it was prepared. Reuse of and improper reliance on this document without written authorization and adaptation by Kimley-Horn and Associates, Inc. shall be without liability to Kimley-Horn and Associates, Inc.





CURVE TABLE						
CURVE	RADIUS	LENGTH	CHORD BEARING	CHORD	DELTA	TANGENT
C7	295.00'	183.63'	N2°54'16"W	180.68'	35°39'57"	94.90'





PROFILE SCALE
1" = 40' HORIZONTAL
1" = 4' VERTICAL

BENCHMARKS

ADD BENCHMARKS HERE

No.	REVISIONS	DATE	BY

Kimley»Horn
© 2024 KIMLEY-HORN AND ASSOCIATES, INC.
10814 JOLLYVILLE ROAD, CAMPUS IV, SUITE 200, AUSTIN, TX 78759
PHONE: 512-418-1771 FAX: 512-418-1791
WWW.KIMLEY-HORN.COM
TEXAS REGISTERED ENGINEERING FIRM F-928

JOHN A. PICKENS
110631
LICENSED
PROFESSIONAL ENGINEER
02/02/2024

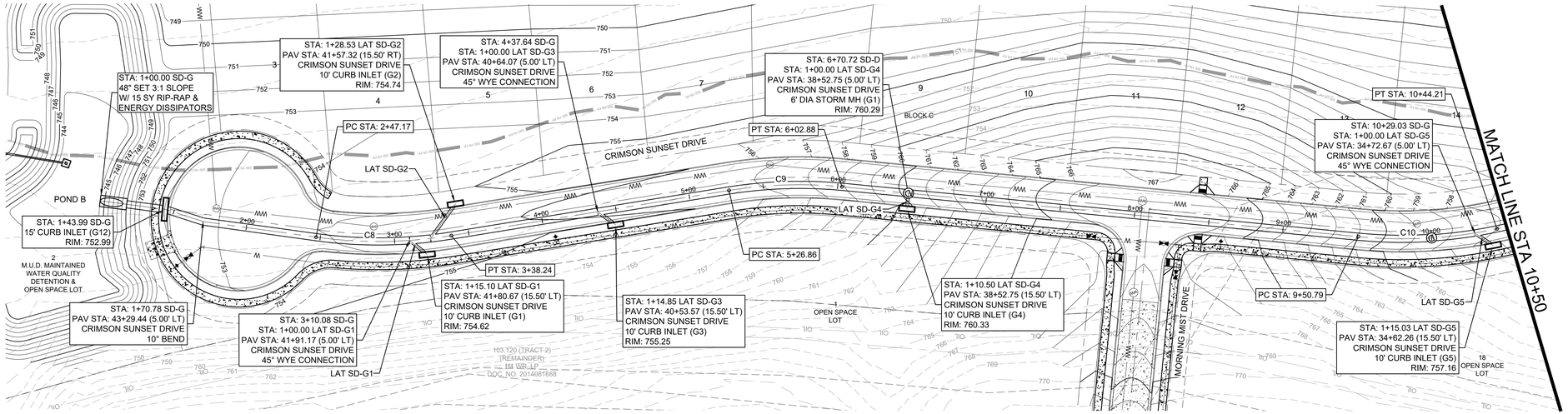
KHA PROJECT 064461307
DATE DECEMBER 2023
SCALE: AS SHOWN
DESIGNED BY: RRJ
DRAWN BY: AJM
CHECKED BY: JAP

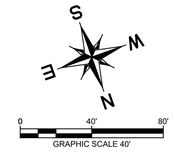
STORM PLAN AND PROFILE - SD-E & F

WOLF RANCH
SECTION 6G
CITY OF GEORGETOWN
WILLIAMSON COUNTY, TEXAS

SHEET NUMBER
48 OF 87

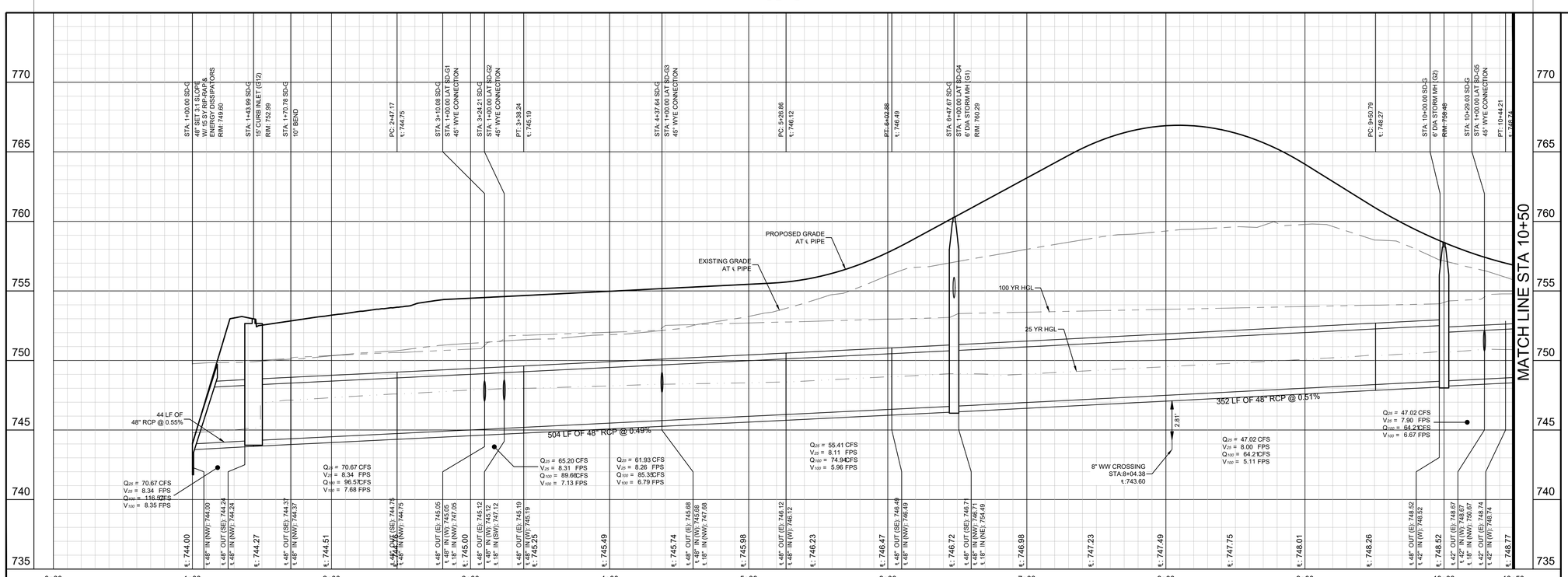
Plotted By:Castillo, Jaime Date:February 08, 2024 09:34:53am File Path:K:\AUS_Civil\064461307-Wolf Ranch Section 6G\Cad\PlanSheets\C-Storm Plan and Profile E - F.dwg
This document, together with the concepts and designs presented herein, as an instrument of service, is intended only for the specific purpose and client for which it was prepared. Reuse of and improper reliance on this document without written authorization and adaptation by Kimley-Horn and Associates, Inc. shall be without liability to Kimley-Horn and Associates, Inc.





CURVE TABLE						
CURVE	RADIUS	LENGTH	CHORD BEARING	CHORD	DELTA	TANGENT
C8	305.00'	91.07'	N71°16'55"W	90.73'	17°06'30"	45.88'
C9	295.00'	76.02'	N72°27'14"W	75.81'	14°45'53"	38.22'
C10	305.00'	93.42'	N73°50'46"W	93.06'	17°32'58"	47.08'

SD-G



PROFILE SCALE
1" = 40' HORIZONTAL
1" = 4' VERTICAL

BENCHMARKS

ADD BENCHMARKS HERE

No.	REVISIONS	DATE	BY

Kimley»Horn
© 2024 KIMLEY-HORN AND ASSOCIATES, INC.
10814 JOLLYVILLE ROAD, CAMPUS IV, SUITE 200, AUSTIN, TX 78759
PHONE: 512-418-1771 FAX: 512-418-1791
WWW.KIMLEY-HORN.COM
TEXAS REGISTERED ENGINEERING FIRM F-928

STATE OF TEXAS
JOHN A. PICKENS
110631
LICENSED
PROFESSIONAL ENGINEER
02/02/2024

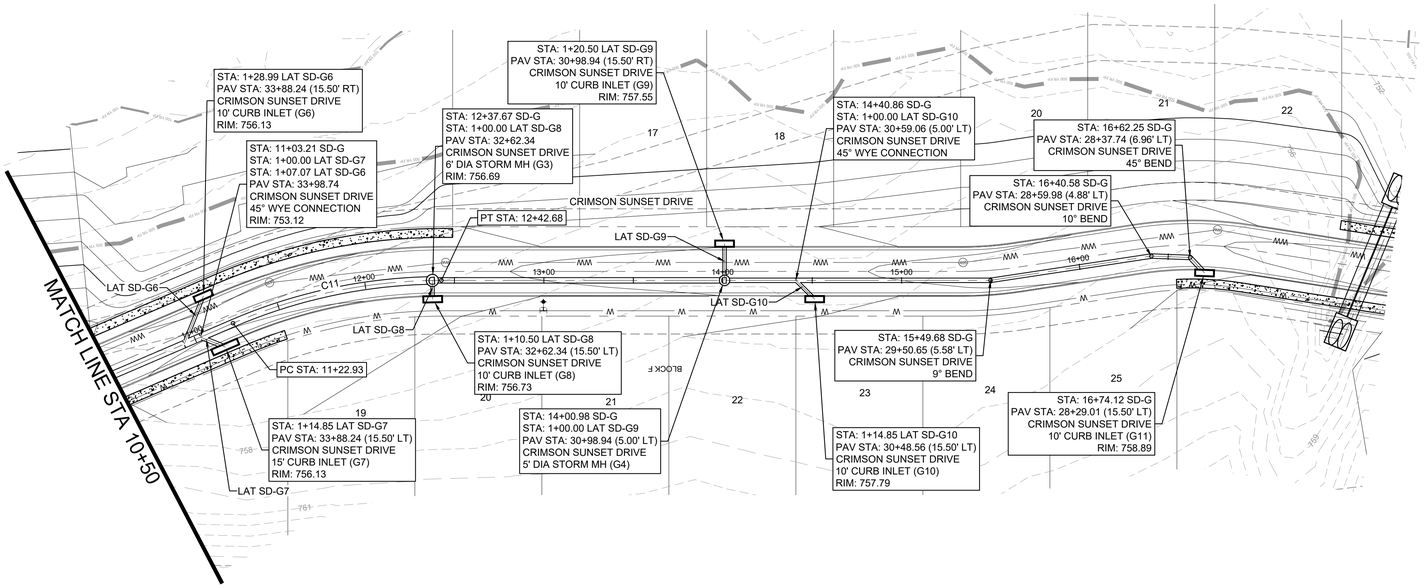
KHA PROJECT 064461307
DATE DECEMBER 2023
SCALE: AS SHOWN
DESIGNED BY: RRJ
DRAWN BY: AJM
CHECKED BY: JAP

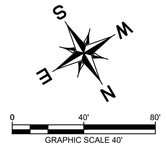
STORM PLAN AND PROFILE - SD-G (1 OF 2)

WOLF RANCH
SECTION 6G
CITY OF GEORGETOWN
WILLIAMSON COUNTY, TEXAS

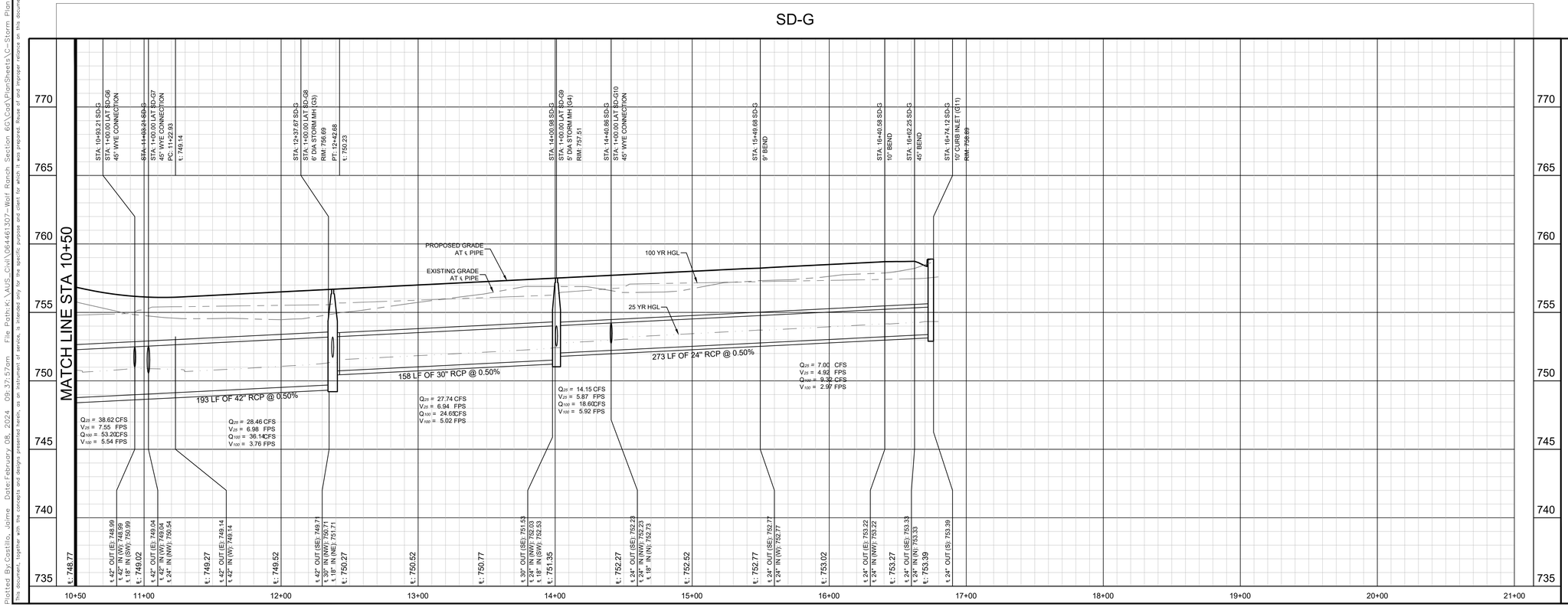
SHEET NUMBER

Plotted By:Castillo, Jaime Date:February 08, 2024 09:36:46am File Path:K:\AUS_Civil\064461307-Wolf Ranch, Section 6G\Cad\PlanSheets\C-Storm Plan and Profile G.dwg
This document, together with the concepts and designs presented herein, as an instrument of service, is intended only for the specific purpose and client for which it was prepared. Reuse of and improper reliance on this document without written authorization and adaptation by Kimley-Horn and Associates, Inc. shall be without liability to Kimley-Horn and Associates, Inc.





CURVE TABLE						
CURVE	RADIUS	LENGTH	CHORD BEARING	CHORD	DELTA	TANGENT
C11	295.00'	119.75'	N70°59'30"W	118.93'	23°15'30"	60.71'



PROFILE SCALE
1" = 40' HORIZONTAL
1" = 4' VERTICAL

BENCHMARKS

ADD BENCHMARKS HERE

No.	REVISIONS	DATE	BY

Kimley»Horn
© 2024 KIMLEY-HORN AND ASSOCIATES, INC.
10814 JOLLYVILLE ROAD, CAMPUS IV, SUITE 200, AUSTIN, TX 78759
PHONE: 512-418-1771 FAX: 512-418-1791
WWW.KIMLEY-HORN.COM
TEXAS REGISTERED ENGINEERING FIRM F-928

STATE OF TEXAS
JOHN A. PICKENS
110631
LICENSED
PROFESSIONAL ENGINEER
02/02/2024

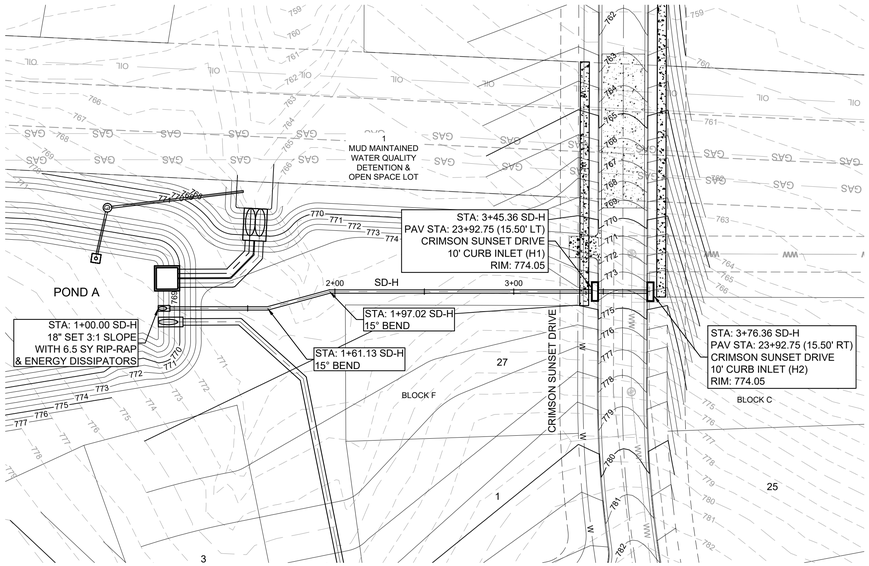
KHA PROJECT 064461307
DATE DECEMBER 2023
SCALE: AS SHOWN
DESIGNED BY: RRJ
DRAWN BY: AJM
CHECKED BY: JAP

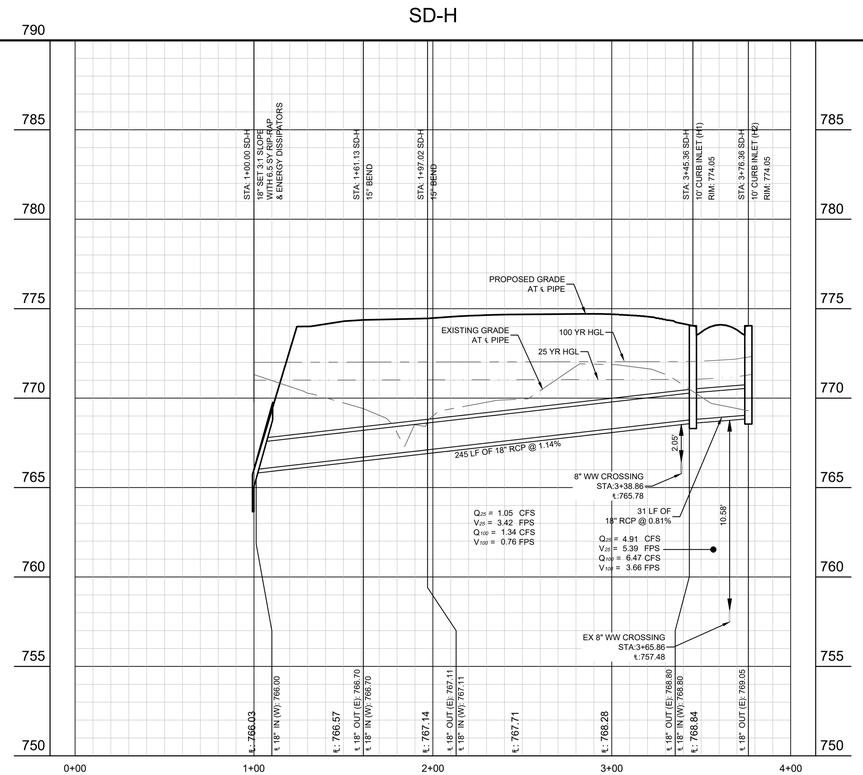
STORM PLAN AND PROFILE - SD-G (2 OF 2)

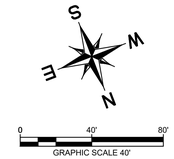
WOLF RANCH
SECTION 6G
CITY OF GEORGETOWN
WILLIAMSON COUNTY, TEXAS

SHEET NUMBER
50 OF 87

Plotted By:Castillo, Jaime Date:February 08, 2024 09:37:57am File Path:K:\AUS_Civil\064461307-Wolf Ranch, Section 6G\Cad\PlanSheets\C-Storm Plan and Profile G2.dwg
This document, together with the concepts and designs presented herein, as an instrument of service, is intended only for the specific purpose and client for which it was prepared. Reuse of and improper reliance on this document without written authorization and adaptation by Kimley-Horn and Associates, Inc. shall be without liability to Kimley-Horn and Associates, Inc.







PROFILE SCALE

1" = 40' HORIZONTAL
1" = 4' VERTICAL

BENCHMARKS

ADD BENCHMARKS HERE

No.	REVISIONS	DATE	BY

Kimley»Horn
© 2024 KIMLEY-HORN AND ASSOCIATES, INC.
10814 JOLLYVILLE ROAD, CAMPUS IV, SUITE 200, AUSTIN, TX 78759
PHONE: 512-418-1771 FAX: 512-418-1791
WWW.KIMLEY-HORN.COM
TEXAS REGISTERED ENGINEERING FIRM F-928

STATE OF TEXAS
JOHN A. PICKENS
110631
LICENSED
PROFESSIONAL ENGINEER

02/02/2024

KHA PROJECT 064461307
DATE DECEMBER 2023
SCALE: AS SHOWN
DESIGNED BY: RRJ
DRAWN BY: AJM
CHECKED BY: JAP

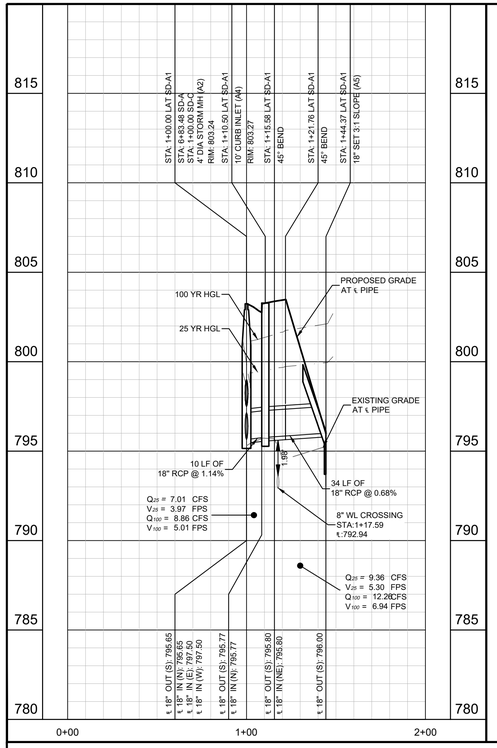
STORM PLAN AND PROFILE - SD-H

WOLF RANCH
SECTION 6G
CITY OF GEORGETOWN
WILLIAMSON COUNTY, TEXAS

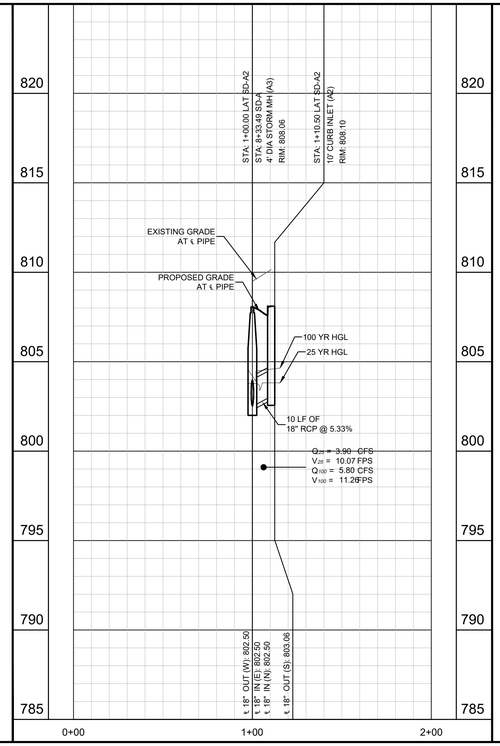
SHEET NUMBER
51 OF 87

Plotted By:Castillo, Jaime Date:February 08, 2024 09:39:20am File Path:K:\AUS_Civil\064461307-Wolf Ranch, Section 6G\Cad\PlanSheets\C-Storm Plan and Profile H & I.dwg
This document, together with the concepts and designs presented herein, as an instrument of service, is intended only for the specific purpose and client for which it was prepared. Reuse of and improper reliance on this document without written authorization and adaptation by Kimley-Horn and Associates, Inc. shall be without liability to Kimley-Horn and Associates, Inc.

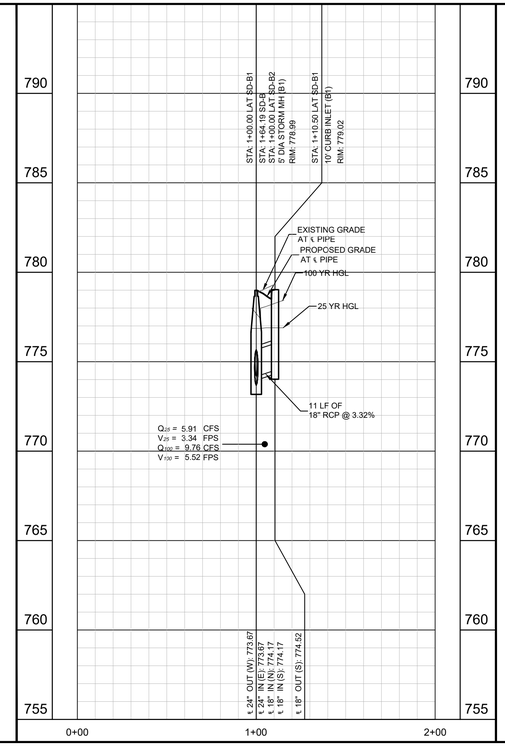
LAT SD-A1



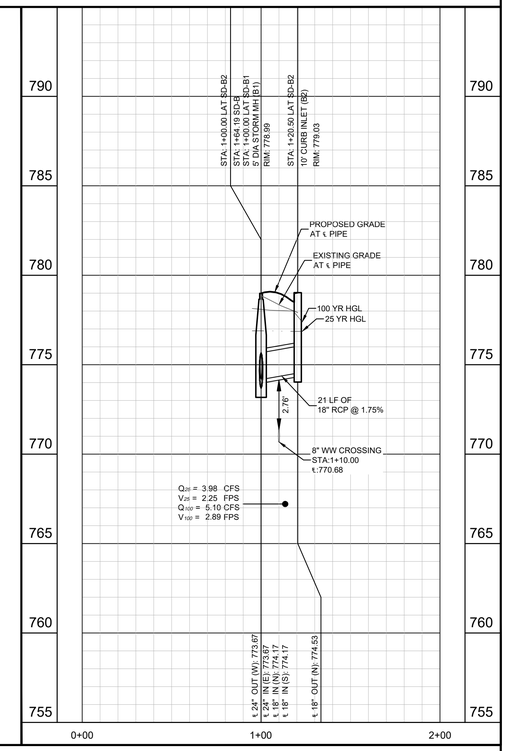
LAT SD-A2



LAT SD-B1

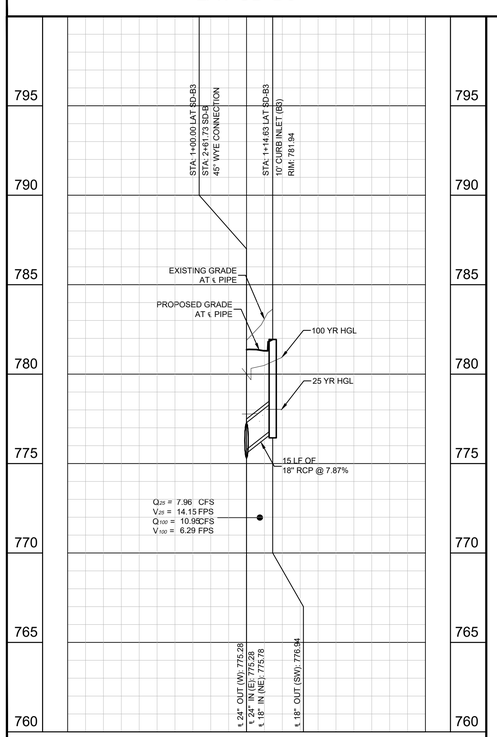


LAT SD-B2

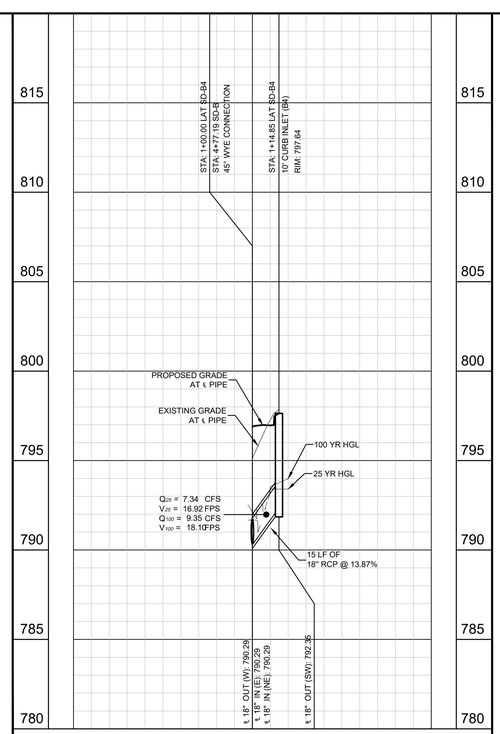


PROFILE SCALE
1" = 40' HORIZONTAL
1" = 4' VERTICAL

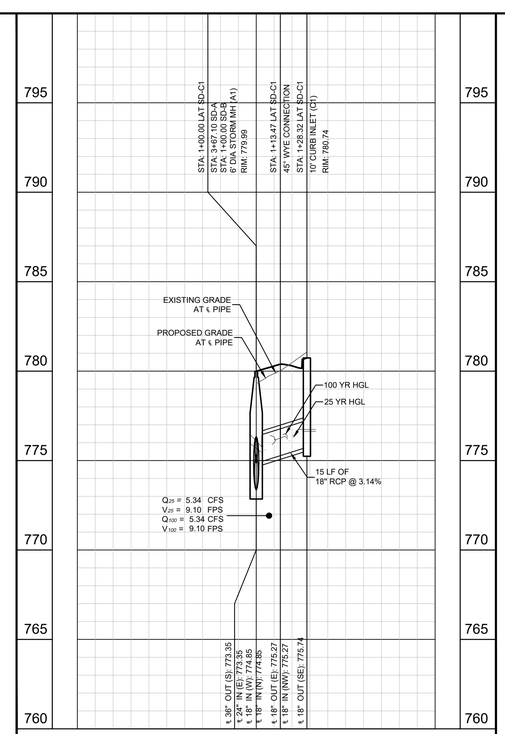
LAT SD-B3



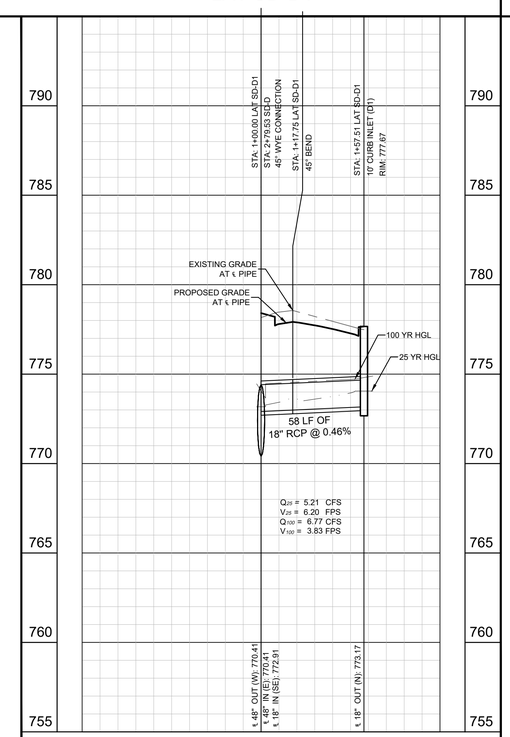
LAT SD-B4



LAT SD-C1



LAT SD-D1



PROFILE SCALE
1" = 40' HORIZONTAL
1" = 4' VERTICAL

BENCHMARKS

ADD BENCHMARKS HERE

No.	REVISIONS	DATE	BY

Kimley»Horn
© 2024 KIMLEY-HORN AND ASSOCIATES, INC.
10814 JOLLYVILLE ROAD, CAMPUS IV, SUITE 200, AUSTIN, TX 78759
PHONE: 512-418-1771 FAX: 512-418-1791
WWW.KIMLEY-HORN.COM
TEXAS REGISTERED ENGINEERING FIRM F-928

STATE OF TEXAS
JOHN A. PICKENS
110631
LICENSED
PROFESSIONAL ENGINEER
02/02/2024

KHA PROJECT 064461307
DATE DECEMBER 2023
SCALE: AS SHOWN
DESIGNED BY: RRJ
DRAWN BY: AJM
CHECKED BY: JAP

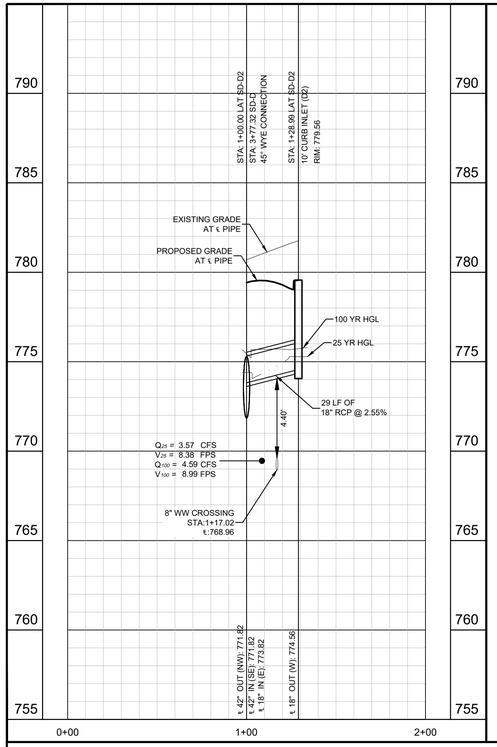
STORM LATERALS (1 OF 4)

WOLF RANCH
SECTION 6G
CITY OF GEORGETOWN
WILLIAMSON COUNTY, TEXAS

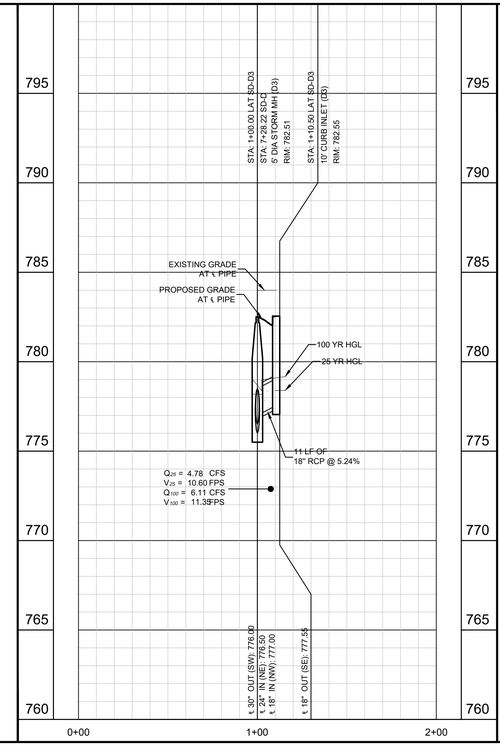
SHEET NUMBER
52 OF 87

Plotted By:Castillo, Jaime Date:February 08, 2024 09:41:38am File Path:K:\AUS_Civil\064461307-Wolf Ranch Section 6G\Cad\PlanSheets\C-Storm Laterals.dwg
This document, together with the concepts and designs presented herein, as an instrument of service, is intended only for the specific purpose and client for which it was prepared. Reuse of and improper reliance on this document without written authorization and adaptation by Kimley-Horn and Associates, Inc. shall be without liability to Kimley-Horn and Associates, Inc.

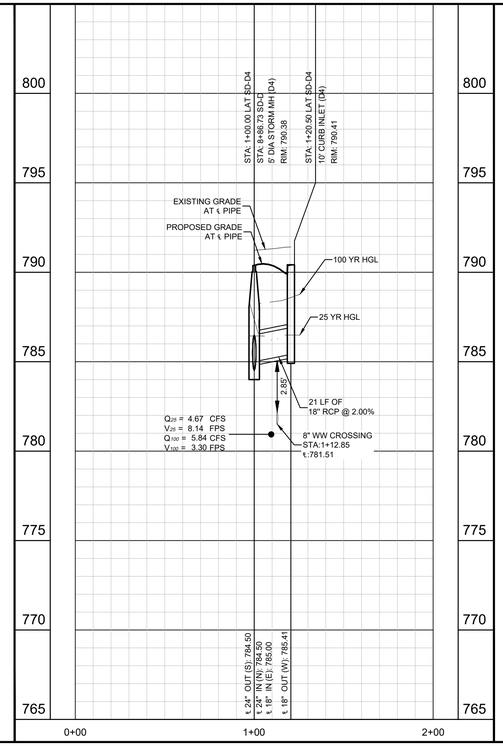
LAT SD-D2



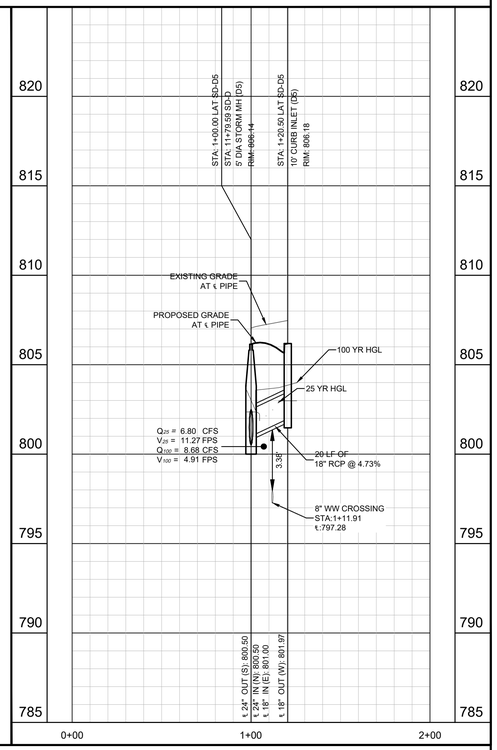
LAT SD-D3



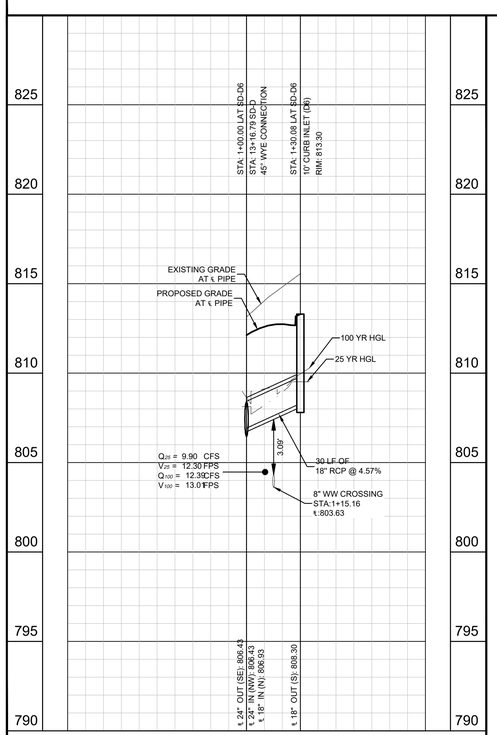
LAT SD-D4



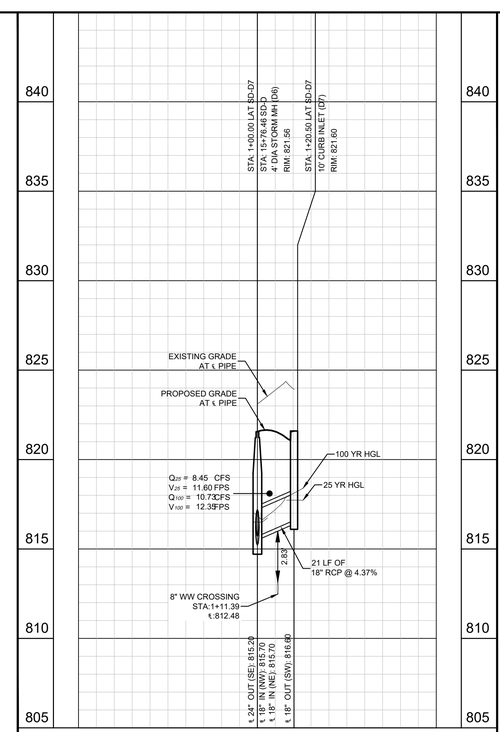
LAT SD-D5



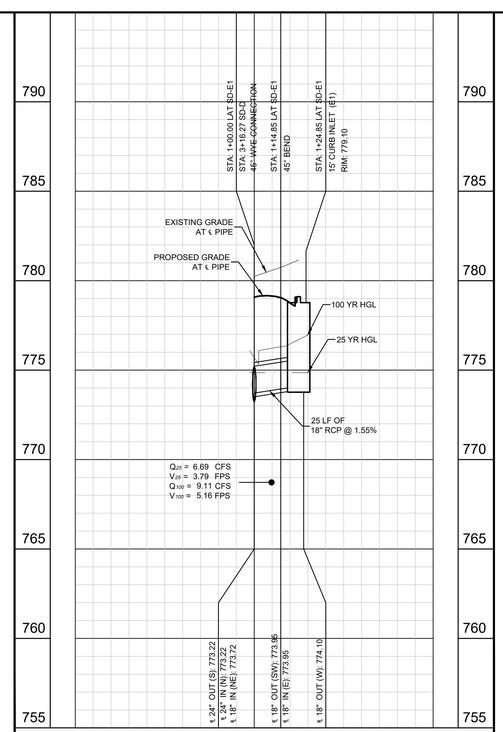
LAT SD-D6



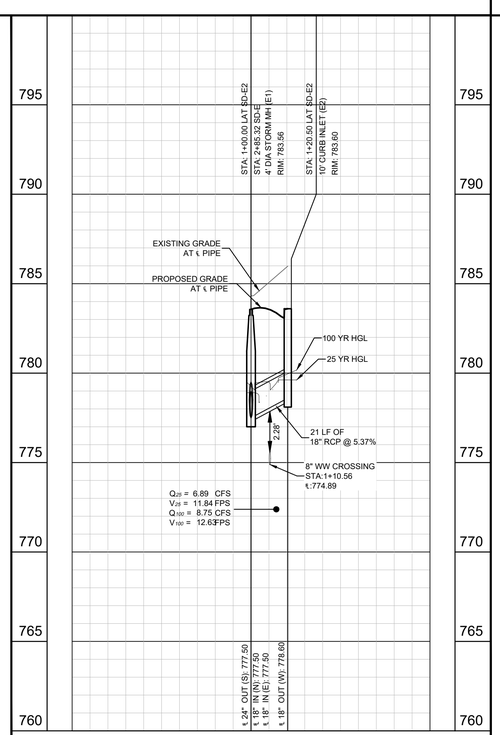
LAT SD-D7



LAT SD-E1



LAT SD-E2



PROFILE SCALE
1" = 40' HORIZONTAL
1" = 4' VERTICAL

PROFILE SCALE
1" = 40' HORIZONTAL
1" = 4' VERTICAL

BENCHMARKS

ADD BENCHMARKS HERE

No.	REVISIONS	DATE	BY

Kimley»Horn
© 2024 KIMLEY-HORN AND ASSOCIATES, INC.
10814 JOLLYVILLE ROAD, CAMPUS IV, SUITE 200, AUSTIN, TX 78759
PHONE: 512-418-1771 FAX: 512-418-1791
WWW.KIMLEY-HORN.COM
TEXAS REGISTERED ENGINEERING FIRM F-928

STATE OF TEXAS
JOHN A. PICKENS
110631
LICENSED
PROFESSIONAL ENGINEER
02/02/2024

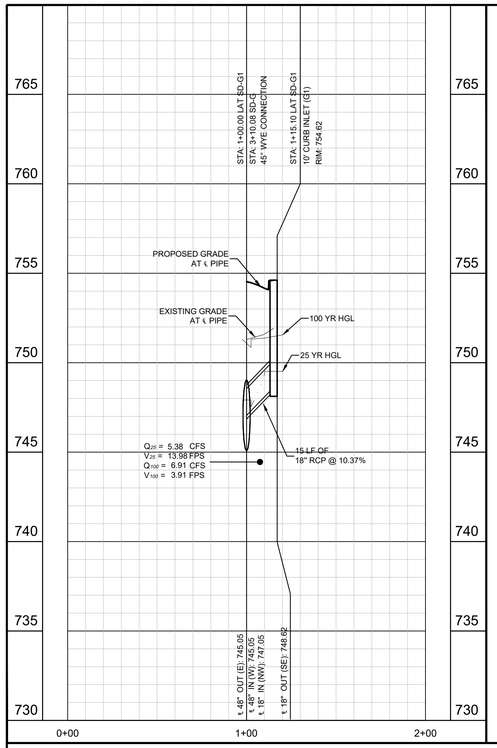
KHA PROJECT 064461307
DATE DECEMBER 2023
SCALE: AS SHOWN
DESIGNED BY: RRJ
DRAWN BY: AJM
CHECKED BY: JAP

STORM LATERALS (2 OF 4)

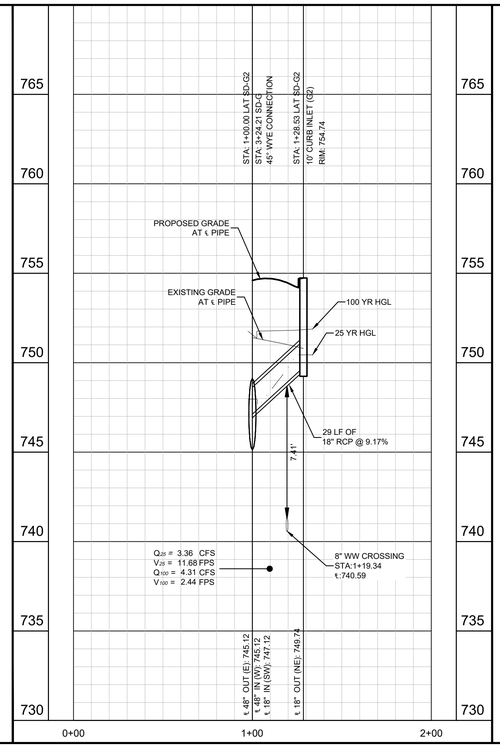
WOLF RANCH
SECTION 6G
CITY OF GEORGETOWN
WILLIAMSON COUNTY, TEXAS

Plotted By:Castillo, Jaime Date:February 08, 2024 09:43:29am File Path:K:\AUS_Civil\064461307-Wolf Ranch, Section 6G\Cad\PlanSheets\C-Storm Laterals.dwg
This document, together with the concepts and designs presented herein, as an instrument of service, is intended only for the specific purpose and client for which it was prepared. Reuse of and improper reliance on this document without written authorization and adaptation by Kimley-Horn and Associates, Inc. shall be without liability to Kimley-Horn and Associates, Inc.

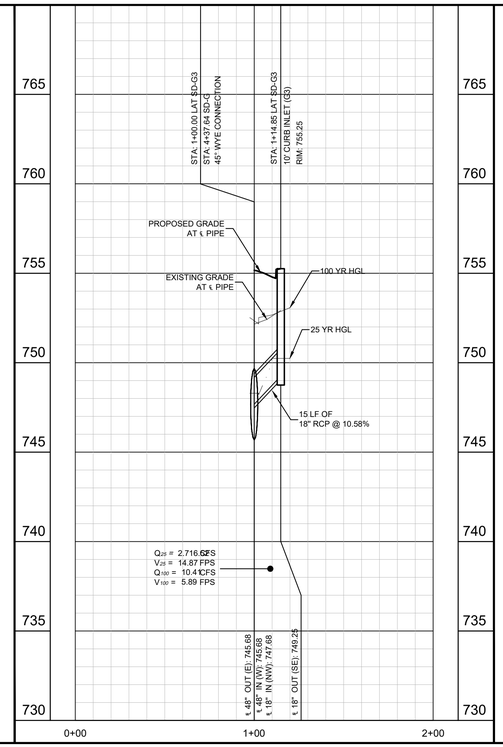
LAT SD-G1



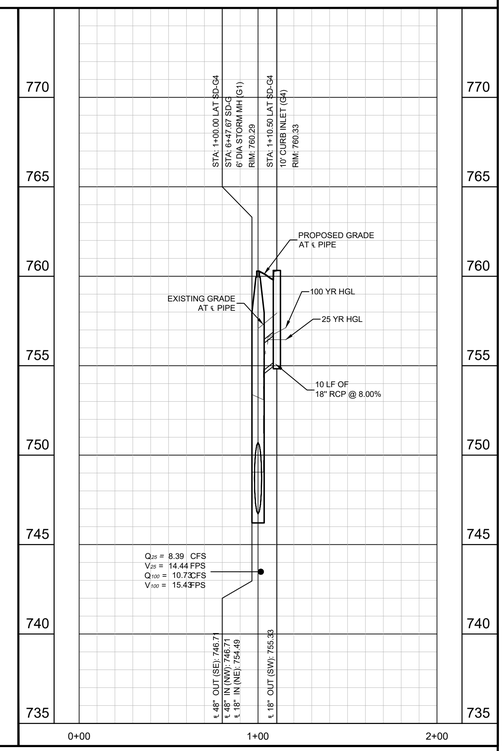
LAT SD-G2



LAT SD-G3

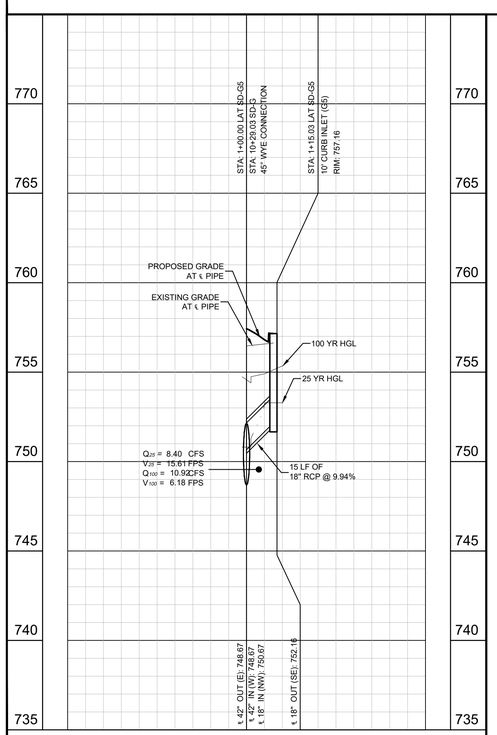


LAT SD-G4

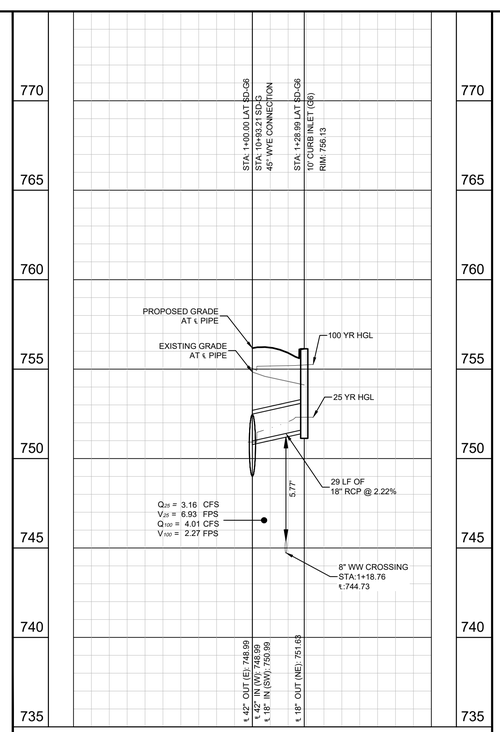


PROFILE SCALE
1" = 40' HORIZONTAL
1" = 4' VERTICAL

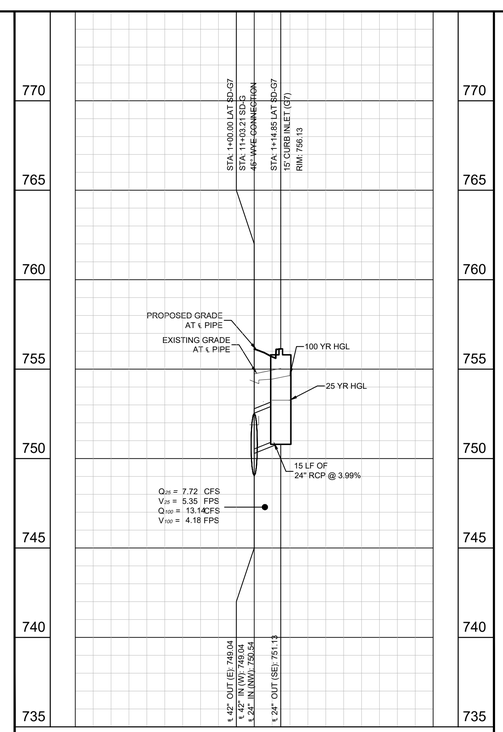
LAT SD-G5



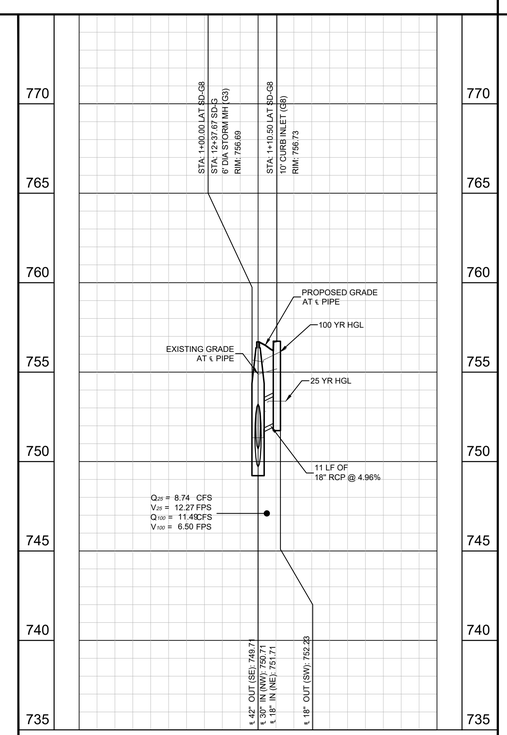
LAT SD-G6



LAT SD-G7



LAT SD-G8



PROFILE SCALE
1" = 40' HORIZONTAL
1" = 4' VERTICAL

BENCHMARKS

ADD BENCHMARKS HERE

No.	REVISIONS	DATE	BY

Kimley»Horn
© 2024 KIMLEY-HORN AND ASSOCIATES, INC.
10814 JOLLYVILLE ROAD, CAMPUS IV, SUITE 200, AUSTIN, TX 78759
PHONE: 512-418-1771 FAX: 512-418-1791
WWW.KIMLEY-HORN.COM
TEXAS REGISTERED ENGINEERING FIRM F-928

STATE OF TEXAS
JOHN A. PICKENS
110631
LICENSED
PROFESSIONAL ENGINEER
02/02/2024

KHA PROJECT 064461307
DATE DECEMBER 2023
SCALE: AS SHOWN
DESIGNED BY: RRJ
DRAWN BY: AJM
CHECKED BY: JAP

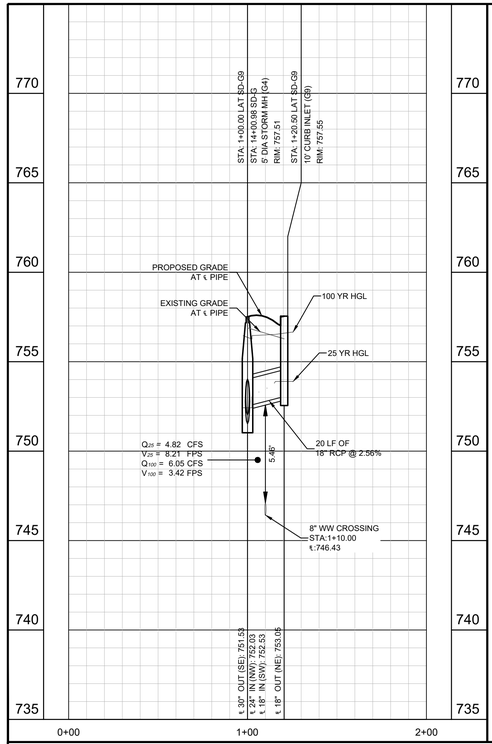
STORM LATERALS (3 OF 4)

WOLF RANCH
SECTION 6G
CITY OF GEORGETOWN
WILLIAMSON COUNTY, TEXAS

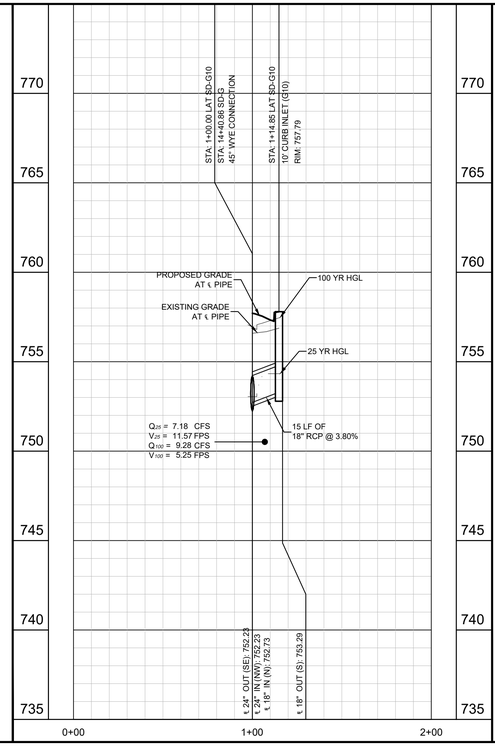
SHEET NUMBER
54 OF 87

Plotted By:Castillo, Jaime Date:February 08, 2024 09:45:21am File Path:K:\AUS_Civil\064461307-Wolf Ranch Section 6G\Cad\PlanSheets\C-Storm Laterals.dwg
This document, together with the concepts and designs presented herein, as an instrument of service, is intended only for the specific purpose and client for which it was prepared. Reuse of and improper reliance on this document without written authorization and adaptation by Kimley-Horn and Associates, Inc. shall be without liability to Kimley-Horn and Associates, Inc.

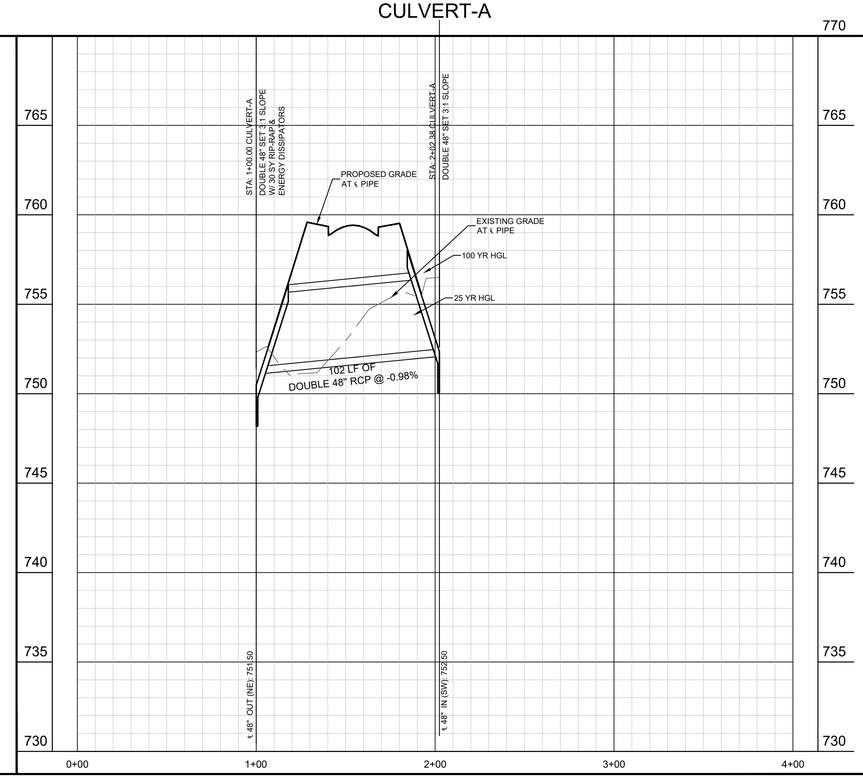
LAT SD-G9



LAT SD-G10



CULVERT-A



PROFILE SCALE
1" = 40' HORIZONTAL
1" = 4' VERTICAL

SPACE INTENTIONALLY LEFT BLANK

PROFILE SCALE
1" = 40' HORIZONTAL
1" = 4' VERTICAL

BENCHMARKS

ADD BENCHMARKS HERE

No.	REVISIONS	DATE	BY

Kimley»Horn
© 2024 KIMLEY-HORN AND ASSOCIATES, INC.
10814 JOLLYVILLE ROAD, CAMPUS IV, SUITE 200, AUSTIN, TX 78759
PHONE: 512-418-1771 FAX: 512-418-1791
WWW.KIMLEY-HORN.COM
TEXAS REGISTERED ENGINEERING FIRM F-928

JOHN A. PICKENS
110631
LICENSED
PROFESSIONAL ENGINEER
02/02/2024

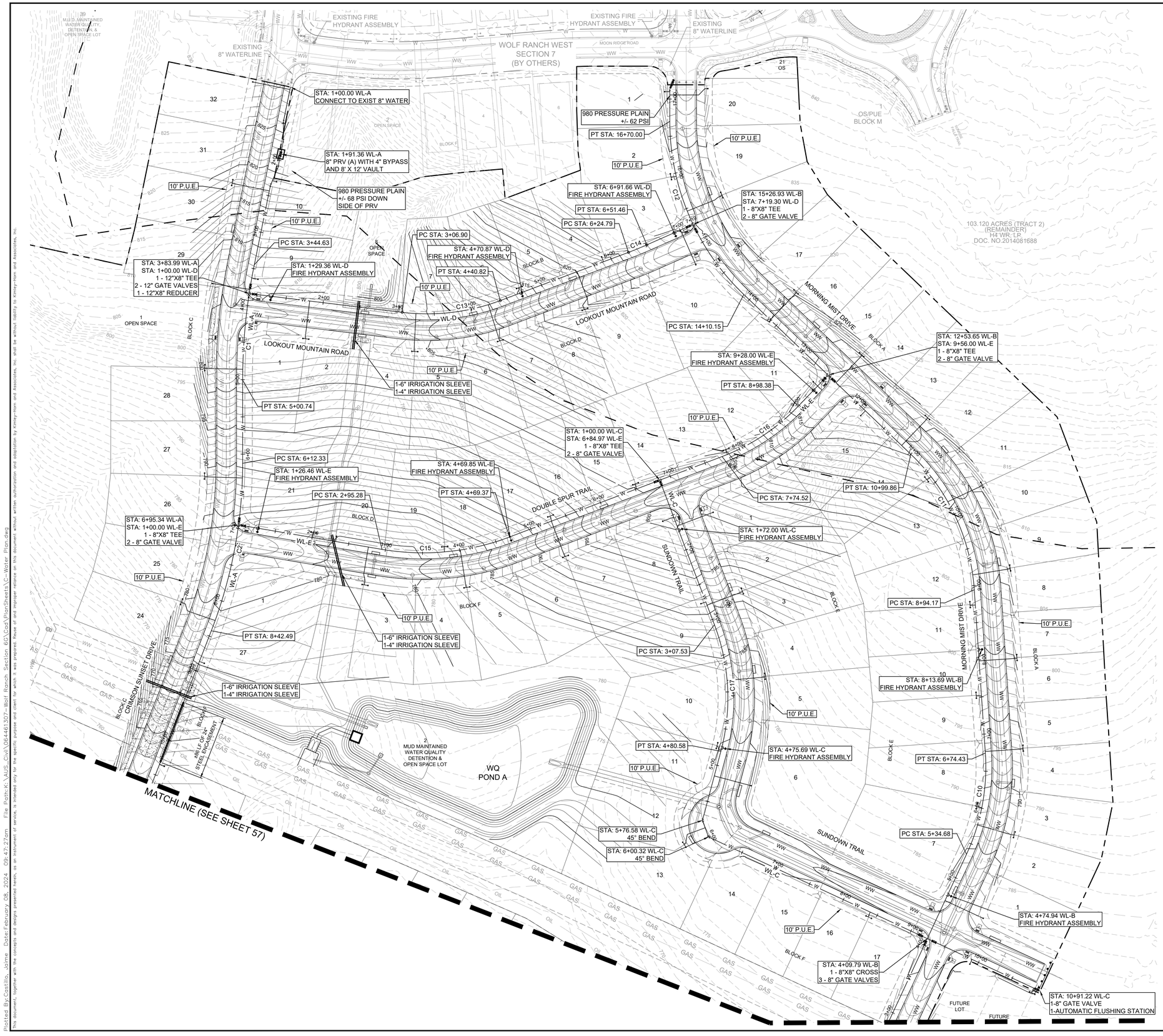
KHA PROJECT 064461307
DATE DECEMBER 2023
SCALE: AS SHOWN
DESIGNED BY: RRJ
DRAWN BY: AJM
CHECKED BY: JAP

STORM LATERALS (4 OF 4)

WOLF RANCH
SECTION 6G
CITY OF GEORGETOWN
WILLIAMSON COUNTY, TEXAS

SHEET NUMBER
55 OF 87

Plotted By:Castillo, Jaime Date:February 08, 2024 09:46:05am File Path:K:\AUS_Civil\064461307-Wolf Ranch, Section 6G\Cad\PlanSheets\C-Storm Laterals.dwg
This document, together with the concepts and designs presented herein, as an instrument of service, is intended only for the specific purpose and client for which it was prepared. Reuse of and improper reliance on this document without written authorization and adaptation by Kimley-Horn and Associates, Inc. shall be without liability to Kimley-Horn and Associates, Inc.



N
W E
S

0 60' 120'
GRAPHIC SCALE 60'

UTILITY LEGEND

- PROPERTY LINE
- PROPOSED WASTE WATER LINE
- PROPOSED WATER LINE
- PROPOSED WASTE WATER MANHOLE
- PROPOSED FIRE HYDRANT
- EXISTING OVERHEAD POWER LINE
- EXISTING WATER LINE
- EXISTING WASTE WATER LINE
- EXISTING STORM SEWER LINE
- EXISTING POWER POLE
- EXISTING FIRE HYDRANT
- EXISTING WATER METER
- EXISTING WASTE WATER MANHOLE

CURVE TABLE

CURVE	RADIUS	LENGTH	CHORD BEARING	CHORD	DELTA	TANGENT
C1	778.00'	156.11'	S5°44'54"W	155.85'	11°29'48"	78.32'
C2	622.00'	230.16'	S10°36'03"W	228.85'	21°12'05"	116.41'
C3	196.67'	38.02'	S56°03'25"E	37.97'	11°04'40"	19.07'
C4	178.00'	54.17'	S59°14'08"E	53.96'	17°26'06"	27.29'
C5	222.00'	33.29'	S63°39'28"E	33.25'	8°35'26"	16.67'
C10	278.00'	139.75'	N10°31'40"E	138.28'	28°48'05"	71.38'
C11	278.00'	205.69'	N25°04'08"W	201.03'	42°23'30"	107.81'
C12	322.00'	259.85'	N23°08'46"W	252.86'	46°14'13"	137.47'
C13	278.00'	133.91'	N83°10'37"E	132.62'	27°35'59"	68.28'
C14	478.00'	26.67'	N67°46'43"E	26.67'	3°11'49"	13.34'
C15	328.00'	174.09'	N84°28'04"E	172.05'	30°24'38"	89.15'
C16	278.00'	123.86'	N56°29'56"E	122.84'	25°31'38"	62.97'
C17	278.00'	173.05'	S2°54'16"E	170.27'	35°39'57"	89.43'

NOTES:

1. REFER TO PEDERNALES ELECTRIC COOPERATIVE DESIGN FOR FINAL ELECTRICAL AND LIGHTING LOCATIONS.
2. CONTRACTOR TO PROVIDE (D3-1) STREET SIGN DETAILS.
3. MINIMUM DIMENSIONS FOR R1-1 SIGN IS 30"X30" FOR SINGLE LANE ROADS AND 36"X36" FOR MULTI-LANE ROADS.
4. THE LOCATION OF ALL FIRE HYDRANTS SHALL BE IDENTIFIED WITH A BLUE REFLECTIVE ROAD DOT PLACED NEAR THE CENTER OF THE ROADWAY IN FRONT OF THE HYDRANT.
5. ALL STOP SIGN LOCATIONS WILL REQUIRE ADDITIONAL SIGNAGE PLACED BELOW THE STOP SIGN THAT READS "NO PARKING WITHIN 30 FEET". THE ADDITIONAL SIGN SHALL BE WHITE WITH RED LETTERS. A LARGE (P) IN THE CENTER WITH A CIRCLE AROUND IT AND A LINE CROSSED THROUGH THE (P). THE SIGN SHALL BE A MINIMUM OF 12 INCHES BY 18 INCHES.
6. ALL FIRE HYDRANTS SHALL BE RED IN COLOR AND THE LOCATION SHALL BE IDENTIFIED WITH A BLUE REFLECTIVE ROAD DOT (MARKER) PLACED NEAR THE CENTER OF THE ROADWAY ADJACENT TO THE FIRE HYDRANT. (2012 IFC 507.5.7)
7. PER CITY ORDINANCE SEC 13.15.120. - PRIVATE FIRE HYDRANT MAINTENANCE.
   - 7.1. ALL PRIVATE HYDRANT BARRELS WILL BE PAINTED RED WITH THE BONNET PAINTED USING THE HYDRANT FLOW STANDARD IN PARAGRAPH C OF THIS SECTION TO INDICATE FLOW. IT WILL BE THE CUSTOMER'S RESPONSIBILITY TO TEST AND MAINTAIN THEIR PRIVATE FIRE HYDRANT(S).
   - 7.2. ALL PRIVATE FIRE HYDRANTS SHOULD BE TESTED ANNUALLY AND SHALL BE COLOR CODED TO INDICATE THE EXPECTED FIRE FLOW FROM THE HYDRANT DURING NORMAL OPERATION. SUCH COLOR APPLIED TO THE FIRE HYDRANT BY PAINTING THE BONNET THE APPROPRIATE COLOR FOR THE EXPECTED FLOW CONDITION. PUBLIC HYDRANTS BARRELS WILL BE PAINTED SILVER, THE HYDRANTS WILL BE FLOW TESTED, AND THE BONNET PAINTED USING THE HYDRANT FLOW STANDARD AS FOLLOWS: AT 20 PSI RESIDUAL.
   - 7.3. HYDRANT FLOW CODING STANDARDS.
     - FLOW_COLOR
     - GREATER THAN 1500 GPM_BLUE
     - 1000 TO 1500 GPM_GREEN
     - 500 TO 999 GPM-ORANGE
     - LESS THAN 500_RED
     - NOT WORKING_BLACK OR BAGGED
8. STREET LIGHTS & SIGNS TO BE LOCATED 10' BEHIND BACK OF CURB.

BENCHMARKS

ADD BENCHMARKS HERE

No.	REVISIONS	DATE	BY

Kimley»Horn
© 2024 KIMLEY-HORN AND ASSOCIATES, INC.
10814 JOLLYVILLE ROAD, CAMPUS IV, SUITE 200, AUSTIN, TX 78759
PHONE: 512-418-1771 FAX: 512-418-1791
WWW.KIMLEY-HORN.COM
TEXAS REGISTERED ENGINEERING FIRM F-928

02/02/2024

KHA PROJECT 064461307
DATE DECEMBER 2023
SCALE: AS SHOWN
DESIGNED BY: RRJ
DRAWN BY: AJM
CHECKED BY: JAP

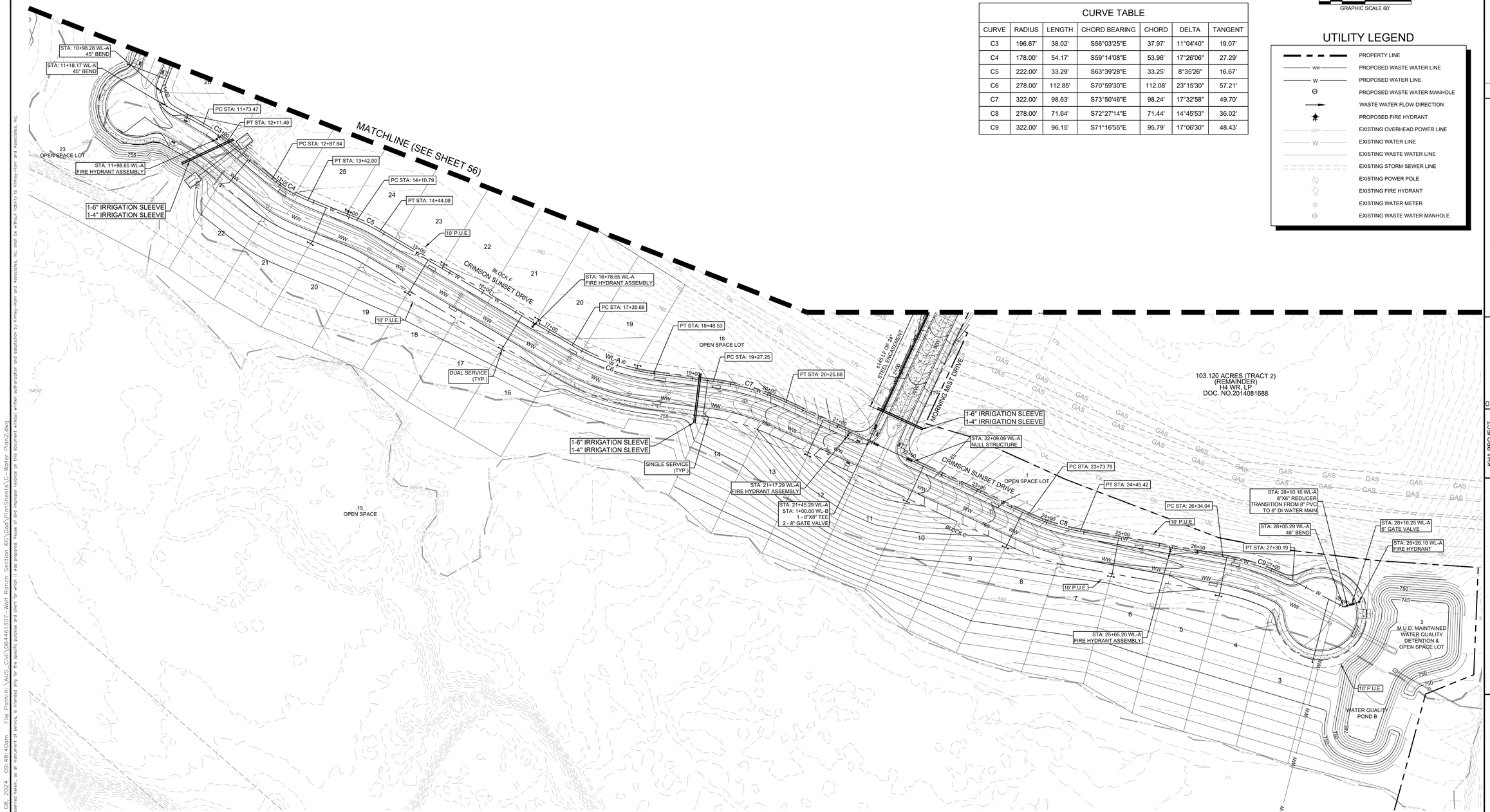
OVERALL WATER PLAN (1 OF 2)

WOLF RANCH SECTION 6G

CITY OF GEORGETOWN
WILLIAMSON COUNTY, TEXAS

SHEET NUMBER
56 OF 87

Plotted By:Castillo, Jaime Date:February 08, 2024 09:47:27am File Path:K:\AUS_Civil\064461307-Wolf Ranch, Section 6G\Cad\PlanSheets\C-Water Plan.dwg
This document, together with the concepts and designs presented herein, as an instrument of service, is intended only for the specific purpose and client for which it was prepared. Reuse of and improper reliance on this document without written authorization and adaptation by Kimley-Horn and Associates, Inc. shall be without liability to Kimley-Horn and Associates, Inc.



N
W E
S

0 60' 120'
GRAPHIC SCALE 60'

CURVE TABLE						
CURVE	RADIUS	LENGTH	CHORD BEARING	CHORD	DELTA	TANGENT
C3	196.67'	38.02'	S56°03'25"E	37.97'	11°04'40"	19.07'
C4	178.00'	54.17'	S59°14'08"E	53.96'	17°26'06"	27.29'
C5	222.00'	33.29'	S63°39'28"E	33.25'	8°35'26"	16.67'
C6	278.00'	112.85'	S70°59'30"E	112.08'	23°15'30"	57.21'
C7	322.00'	98.63'	S73°50'46"E	98.24'	17°32'58"	49.70'
C8	278.00'	71.64'	S72°27'14"E	71.44'	14°45'53"	36.02'
C9	322.00'	96.15'	S71°16'55"E	95.79'	17°06'30"	48.43'

UTILITY LEGEND

- PROPERTY LINE
- PROPOSED WASTE WATER LINE
- PROPOSED WATER LINE
- PROPOSED WASTE WATER MANHOLE
- WASTE WATER FLOW DIRECTION
- PROPOSED FIRE HYDRANT
- EXISTING OVERHEAD POWER LINE
- EXISTING WATER LINE
- EXISTING WASTE WATER LINE
- EXISTING STORM SEWER LINE
- EXISTING POWER POLE
- EXISTING FIRE HYDRANT
- EXISTING WATER METER
- EXISTING WASTE WATER MANHOLE

BENCHMARKS

ADD BENCHMARKS HERE

No.	REVISIONS	DATE	BY

Kimley»Horn
© 2024 KIMLEY-HORN AND ASSOCIATES, INC.
10814 JOLLYVILLE ROAD, CAMPUS IV, SUITE 200, AUSTIN, TX 78759
PHONE: 512-418-1771 FAX: 512-418-1791
WWW.KIMLEY-HORN.COM
TEXAS REGISTERED ENGINEERING FIRM F-928

JOHN A. PICKENS
110631
LICENSED
PROFESSIONAL ENGINEER
02/02/2024

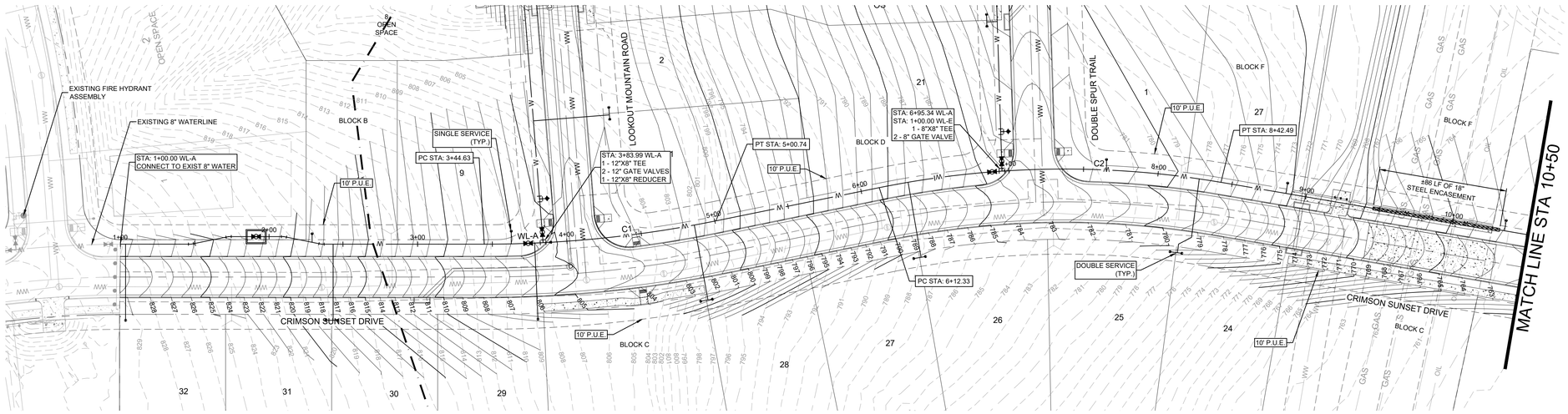
K.H.A. PROJECT 064461307
DATE: DECEMBER 2023
SCALE: AS SHOWN
DESIGNED BY: RRJ
DRAWN BY: AJM
CHECKED BY: JAP

OVERALL WATER PLAN (2 OF 2)

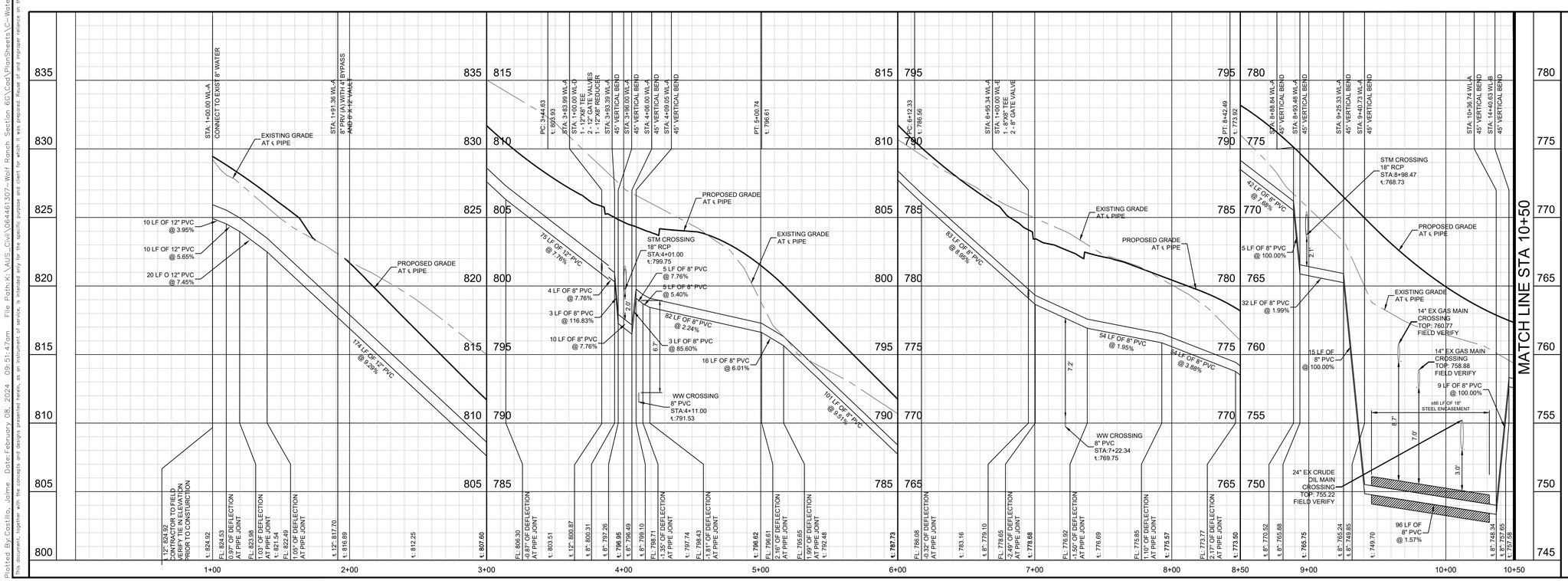
WOLF RANCH
SECTION 6G
CITY OF GEORGETOWN
WILLIAMSON COUNTY, TEXAS

SHEET NUMBER
57 OF 87

Plotted By:Castillo, Jaime Date:February 08, 2024 09:48:40am File Path:K:\AUS_Civil\064461307-Wolf Ranch Section 6G\Cad\PlanSheets\C-Water Plan2.dwg
This document, together with the concepts and designs presented herein, as an instrument of service, is intended only for the specific purpose and client for which it was prepared. Reuse of and improper reliance on this document without written authorization and adaptation by Kimley-Horn and Associates, Inc. shall be without liability to Kimley-Horn and Associates, Inc.



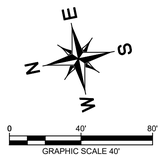
CURVE TABLE						
CURVE	RADIUS	LENGTH	CHORD BEARING	CHORD	DELTA	TANGENT
C1	778.00'	156.11'	S5°44'54"W	155.85'	11°29'48"	78.32'
C2	622.00'	230.16'	S10°36'03"W	228.85'	21°12'05"	116.41'



PROFILE SCALE
1" = 40' HORIZONTAL
1" = 4' VERTICAL

BENCHMARKS

ADD BENCHMARKS HERE



UTILITY LEGEND

- PROPERTY LINE
- PROPOSED WASTE WATER LINE
- PROPOSED WATER LINE
- PROPOSED WASTE WATER MANHOLE
- PROPOSED FIRE HYDRANT
- EXISTING OVERHEAD POWER LINE
- EXISTING WATER LINE
- EXISTING WASTE WATER LINE
- EXISTING STORM SEWER LINE
- EXISTING POWER POLE
- EXISTING FIRE HYDRANT
- EXISTING WATER METER
- EXISTING WASTE WATER MANHOLE

No.	REVISIONS	DATE	BY

Kimley»Horn

© 2024 KIMLEY-HORN AND ASSOCIATES, INC.
10814 JOLLYVILLE ROAD, CAMPUS IV, SUITE 200, AUSTIN, TX 78759
PHONE: 512-418-1771 FAX: 512-418-1791
WWW.KIMLEY-HORN.COM
TEXAS REGISTERED ENGINEERING FIRM F-928

STATE OF TEXAS
JOHN A. PICKENS
110631
LICENSED
PROFESSIONAL ENGINEER
02/02/2024

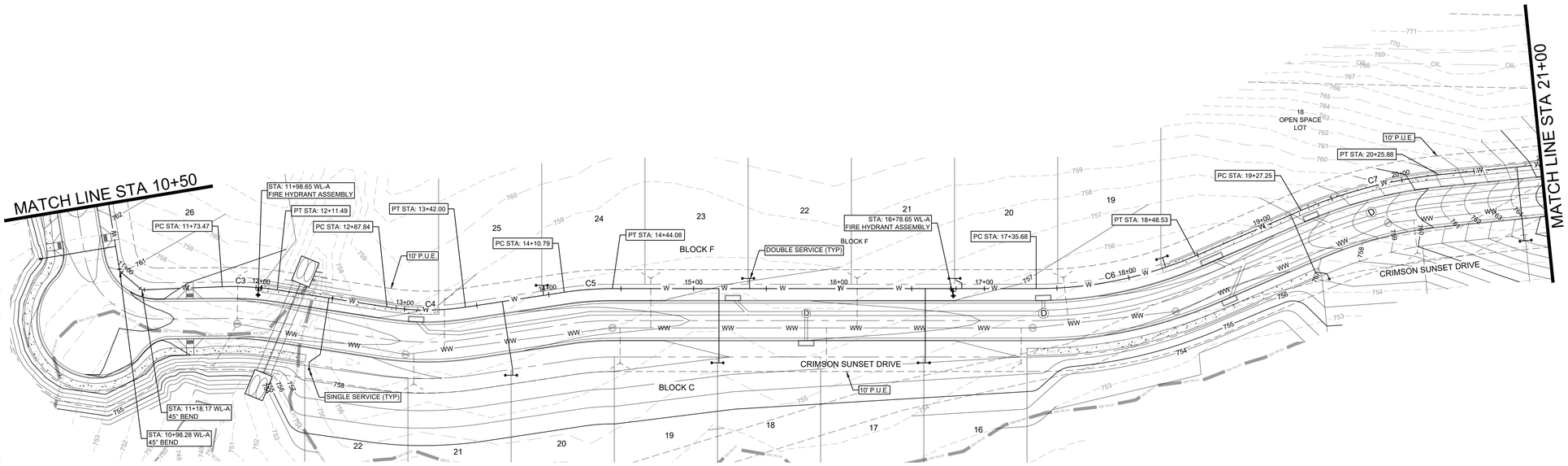
KHA PROJECT 064461307
DATE DECEMBER 2023
SCALE: AS SHOWN
DESIGNED BY: RRJ
DRAWN BY: AJM
CHECKED BY: JAP

WATER PLAN AND PROFILE-WL-A (1 OF 3)

WOLF RANCH
SECTION 6G
CITY OF GEORGETOWN
WILLIAMSON COUNTY, TEXAS

SHEET NUMBER
58 OF 87

Plotted By:Castillo, Jaime Date:February 08, 2024 09:51:47am File Path:K:\AUS_Civil\064461307-Wolf Ranch Section 6G\Cad\PlanSheets\C-Water Plan and Profile-A1.dwg
This document, together with the concepts and designs presented herein, as an instrument of service, is intended only for the specific purpose and client for which it was prepared. Reuse of and improper reliance on this document without written authorization and adaptation by Kimley-Horn and Associates, Inc. shall be without liability to Kimley-Horn and Associates, Inc.



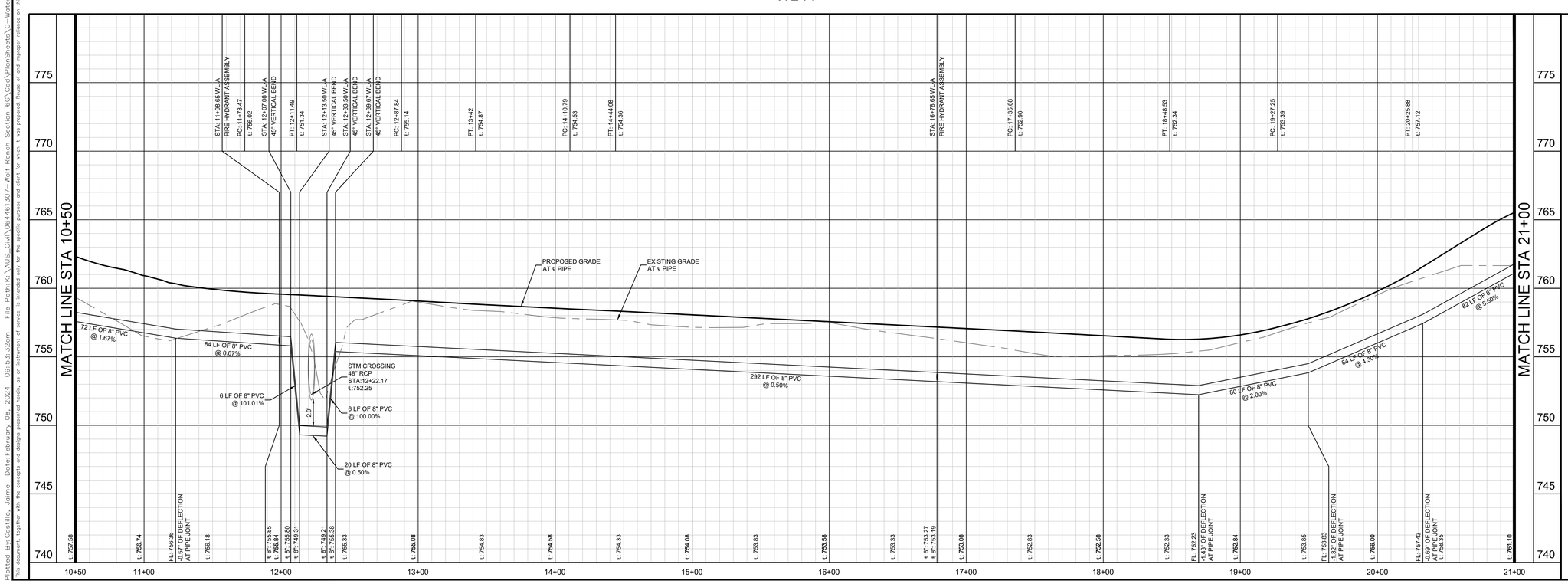
UTILITY LEGEND

- PROPERTY LINE
- PROPOSED WASTE WATER LINE
- PROPOSED WATER LINE
- PROPOSED WASTE WATER MANHOLE
- PROPOSED FIRE HYDRANT
- EXISTING OVERHEAD POWER LINE
- EXISTING WATER LINE
- EXISTING WASTE WATER LINE
- EXISTING STORM SEWER LINE
- EXISTING POWER POLE
- EXISTING FIRE HYDRANT
- EXISTING WATER METER
- EXISTING WASTE WATER MANHOLE

CURVE TABLE

CURVE	RADIUS	LENGTH	CHORD BEARING	CHORD	DELTA	TANGENT
C3	196.67'	38.02'	S56°03'25"E	37.97'	11°04'40"	19.07'
C4	178.00'	54.17'	S59°14'08"E	53.96'	17°26'06"	27.29'
C5	222.00'	33.29'	S63°39'28"E	33.25'	8°35'26"	16.67'
C6	278.00'	112.85'	S70°59'30"E	112.08'	23°15'30"	57.21'
C7	322.00'	98.63'	S73°50'46"E	98.24'	17°32'58"	49.70'

WL-A



PROFILE SCALE
1" = 40' HORIZONTAL
1" = 4' VERTICAL

BENCHMARKS

ADD BENCHMARKS HERE

No.	REVISIONS	DATE	BY

Kimley»Horn
© 2024 KIMLEY-HORN AND ASSOCIATES, INC.
10814 JOLLYVILLE ROAD, CAMPUS IV, SUITE 200, AUSTIN, TX 78759
PHONE: 512-418-1771 FAX: 512-418-1791
WWW.KIMLEY-HORN.COM
TEXAS REGISTERED ENGINEERING FIRM F-928

JOHN A. PICKENS
110631
LICENSED
PROFESSIONAL ENGINEER
02/02/2024

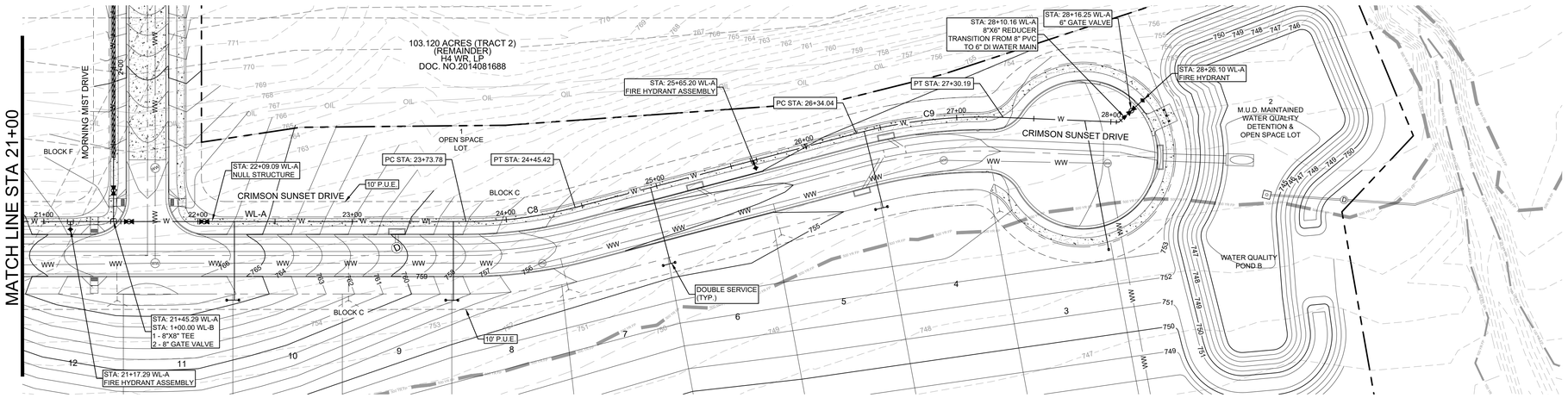
KHA PROJECT 064461307
DATE DECEMBER 2023
SCALE: AS SHOWN
DESIGNED BY: RRJ
DRAWN BY: AJM
CHECKED BY: JAP

WATER PLAN AND PROFILE-WL-A (2 OF 3)

WOLF RANCH
SECTION 6G
CITY OF GEORGETOWN
WILLIAMSON COUNTY, TEXAS

SHEET NUMBER
59 OF 87

Plotted By:Castillo, Jaime Date:February 08, 2024 09:53:32am File Path:K:\AUS_Civil\064461307-Wolf Ranch Section 6G\Cad\PlanSheets\C-Water Plan and Profile-A2.dwg
This document, together with the concepts and designs presented herein, as an instrument of service, is intended only for the specific purpose and client for which it was prepared. Reuse of and improper reliance on this document without written authorization and adaptation by Kimley-Horn and Associates, Inc. shall be without liability to Kimley-Horn and Associates, Inc.



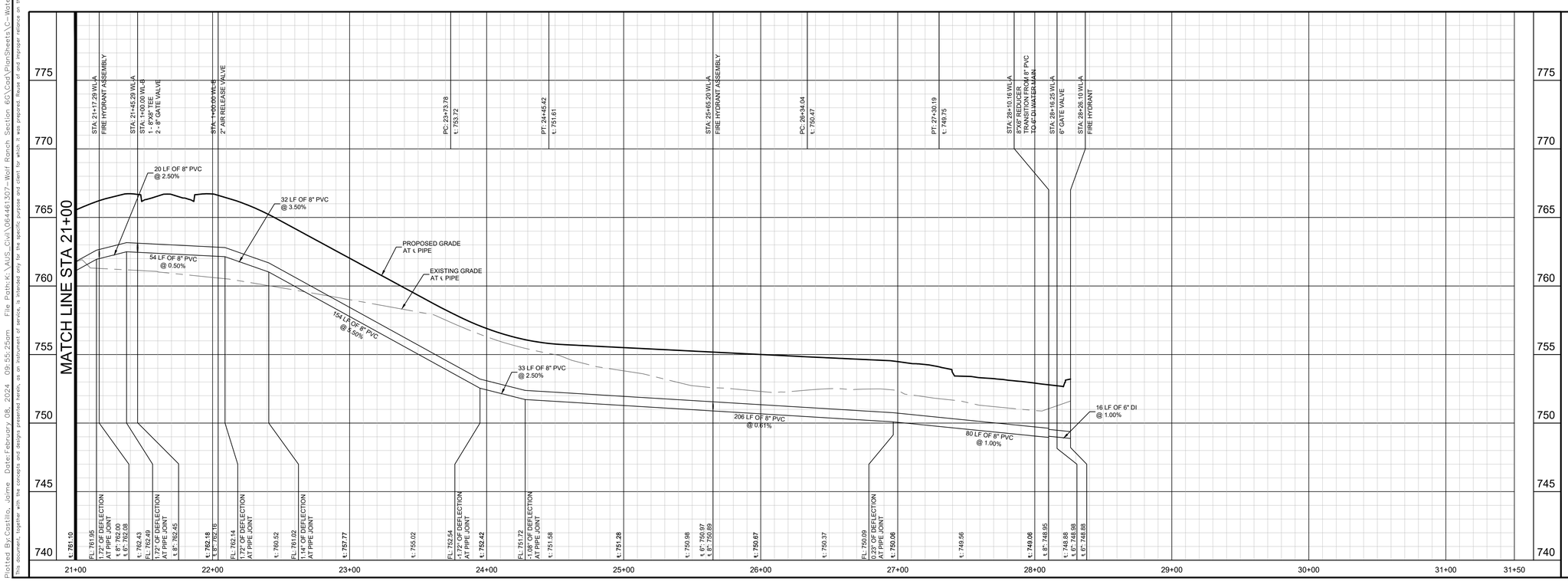
CURVE TABLE						
CURVE	RADIUS	LENGTH	CHORD BEARING	CHORD	DELTA	TANGENT
C8	278.00'	71.64'	S72°27'14"E	71.44'	14°45'53"	36.02'
C9	322.00'	96.15'	S71°16'55"E	95.79'	17°06'30"	48.43'

N E S W

0 40' 80'
GRAPHIC SCALE 40'

UTILITY LEGEND

- PROPERTY LINE
- PROPOSED WASTE WATER LINE
- PROPOSED WATER LINE
- PROPOSED WASTE WATER MANHOLE
- PROPOSED FIRE HYDRANT
- EXISTING OVERHEAD POWER LINE
- EXISTING WATER LINE
- EXISTING WASTE WATER LINE
- EXISTING STORM SEWER LINE
- EXISTING POWER POLE
- EXISTING FIRE HYDRANT
- EXISTING WATER METER
- EXISTING WASTE WATER MANHOLE



PROFILE SCALE
1" = 40' HORIZONTAL
1" = 4' VERTICAL

BENCHMARKS

ADD BENCHMARKS HERE

No.	REVISIONS	DATE	BY

Kimley»Horn
© 2024 KIMLEY-HORN AND ASSOCIATES, INC.
10814 JOLLYVILLE ROAD, CAMPUS IV, SUITE 200, AUSTIN, TX 78759
PHONE: 512-418-1771 FAX: 512-418-1791
WWW.KIMLEY-HORN.COM
TEXAS REGISTERED ENGINEERING FIRM F-928

STATE OF TEXAS
JOHN A. PICKENS
110631
LICENSED
PROFESSIONAL ENGINEER
02/02/2024

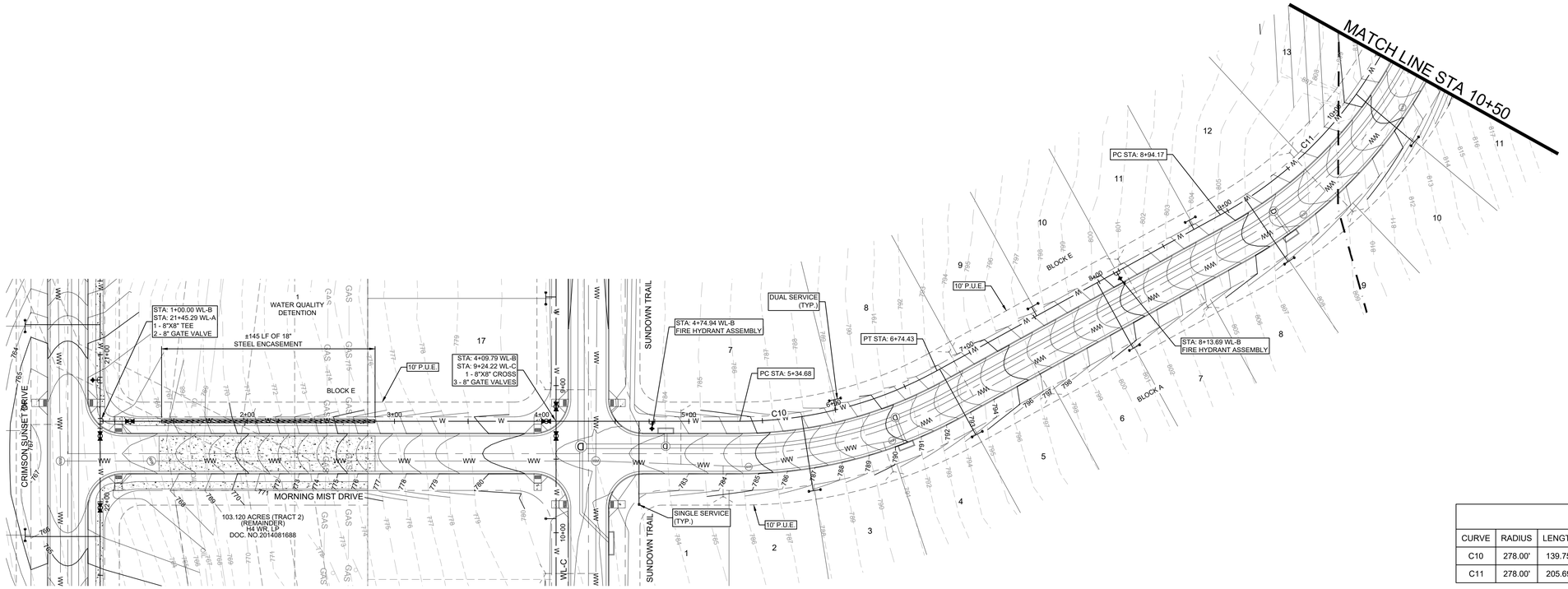
KHA PROJECT 064461307
DATE DECEMBER 2023
SCALE: AS SHOWN
DESIGNED BY: RRJ
DRAWN BY: AJM
CHECKED BY: JAP

WATER PLAN AND PROFILE-WL-A (3 OF 3)

WOLF RANCH
SECTION 6G
CITY OF GEORGETOWN
WILLIAMSON COUNTY, TEXAS

SHEET NUMBER
60 OF 87

Plotted By:Castillo, Jaime Date:February 08, 2024 09:55:25am File Path:K:\AUS_Civil\064461307-Wolf Ranch Section 6G\Cad\PlanSheets\C-Water Plan and Profile-A3.dwg
This document, together with the concepts and designs presented herein, as an instrument of service, is intended only for the specific purpose and client for which it was prepared. Reuse of and improper reliance on this document without written authorization and adaptation by Kimley-Horn and Associates, Inc. shall be without liability to Kimley-Horn and Associates, Inc.



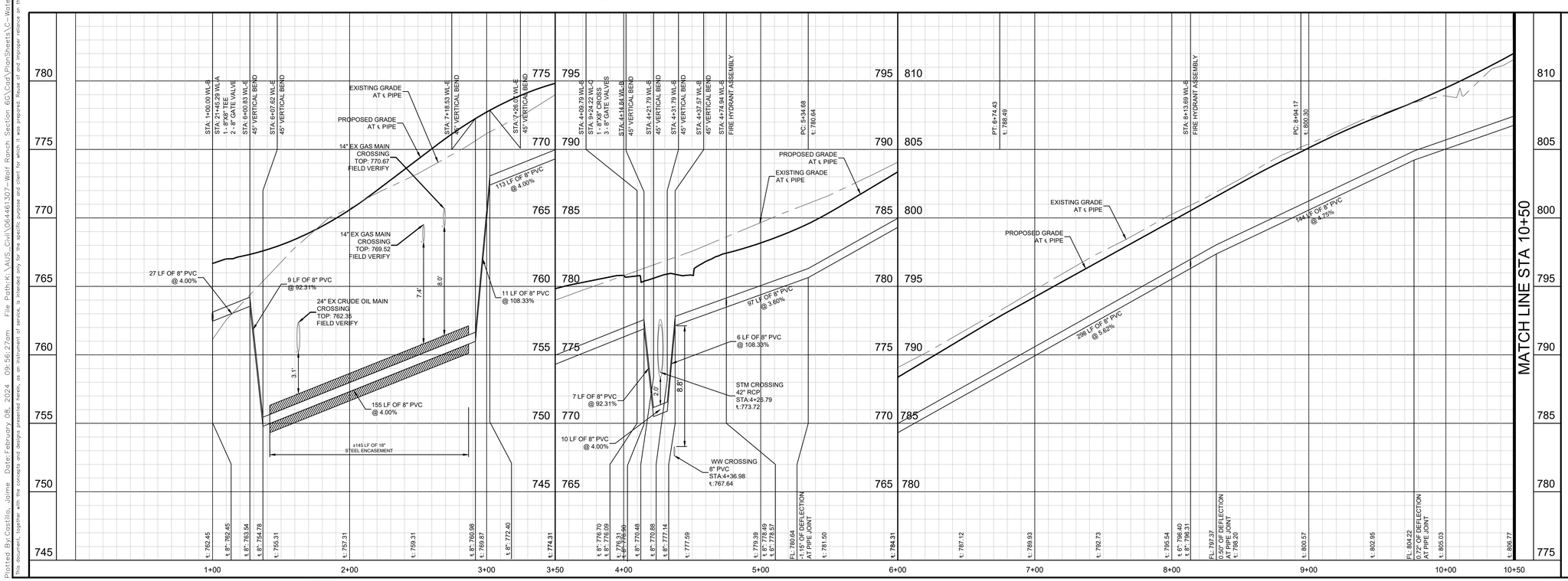
0 40' 80'
GRAPHIC SCALE 40'

UTILITY LEGEND

- PROPERTY LINE
- PROPOSED WASTE WATER LINE
- PROPOSED WATER LINE
- PROPOSED WASTE WATER MANHOLE
- PROPOSED FIRE HYDRANT
- EXISTING OVERHEAD POWER LINE
- EXISTING WATER LINE
- EXISTING WASTE WATER LINE
- EXISTING STORM SEWER LINE
- EXISTING POWER POLE
- EXISTING FIRE HYDRANT
- EXISTING WATER METER
- EXISTING WASTE WATER MANHOLE

CURVE TABLE						
CURVE	RADIUS	LENGTH	CHORD BEARING	CHORD	DELTA	TANGENT
C10	278.00'	139.75'	N10°31'40"E	138.28'	28°48'05"	71.38'
C11	278.00'	205.69'	N25°04'08"W	201.03'	42°23'30"	107.81'

WL-B



PROFILE SCALE
1" = 40' HORIZONTAL
1" = 4' VERTICAL

BENCHMARKS

ADD BENCHMARKS HERE

Kimley»Horn
© 2024 KIMLEY-HORN AND ASSOCIATES, INC.
10814 JOLLYVILLE ROAD, CAMPUS IV, SUITE 200, AUSTIN, TX 78759
PHONE: 512-418-1771 FAX: 512-418-1791
WWW.KIMLEY-HORN.COM
TEXAS REGISTERED ENGINEERING FIRM F-928

No.	REVISIONS	DATE	BY

JOHN A. PICKENS
110631
LICENSED
PROFESSIONAL ENGINEER
02/02/2024

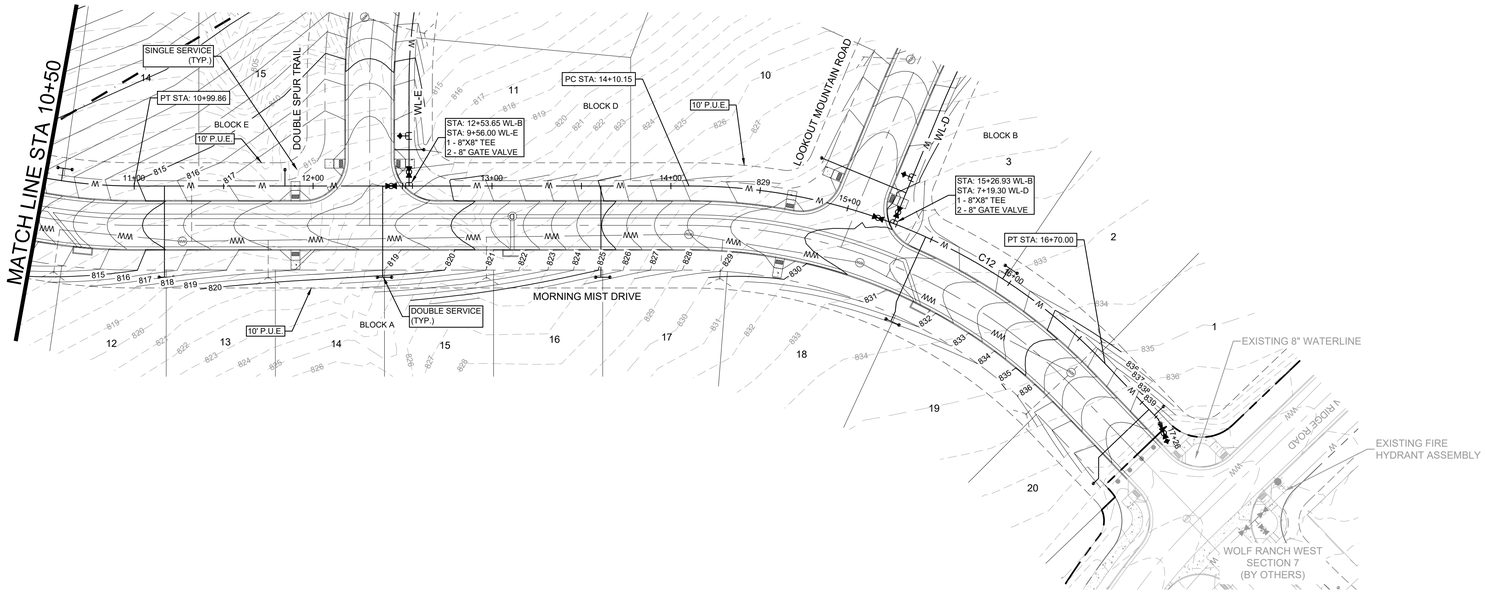
KHA PROJECT 064461307
DATE DECEMBER 2023
SCALE: AS SHOWN
DESIGNED BY: RRJ
DRAWN BY: AJM
CHECKED BY: JAP

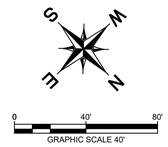
WATER PLAN AND PROFILE-WL-B (1 OF 2)

WOLF RANCH
SECTION 6G
CITY OF GEORGETOWN
WILLIAMSON COUNTY, TEXAS

SHEET NUMBER
61 OF 87

This document, together with the concepts and designs presented herein, as an instrument of service, is intended only for the specific purpose and client for which it was prepared. Reuse of and improper reliance on this document without written authorization and adaptation by Kimley-Horn and Associates, Inc. shall be without liability to Kimley-Horn and Associates, Inc.
Plotted By:Castillo, Jaime Date:February 08, 2024 09:56:27am File Path:K:\AUS_Civil\064461307-Wolf Ranch Section 6G\Civil\PlanSheets\C-Water Plan and Profile-B1.dwg





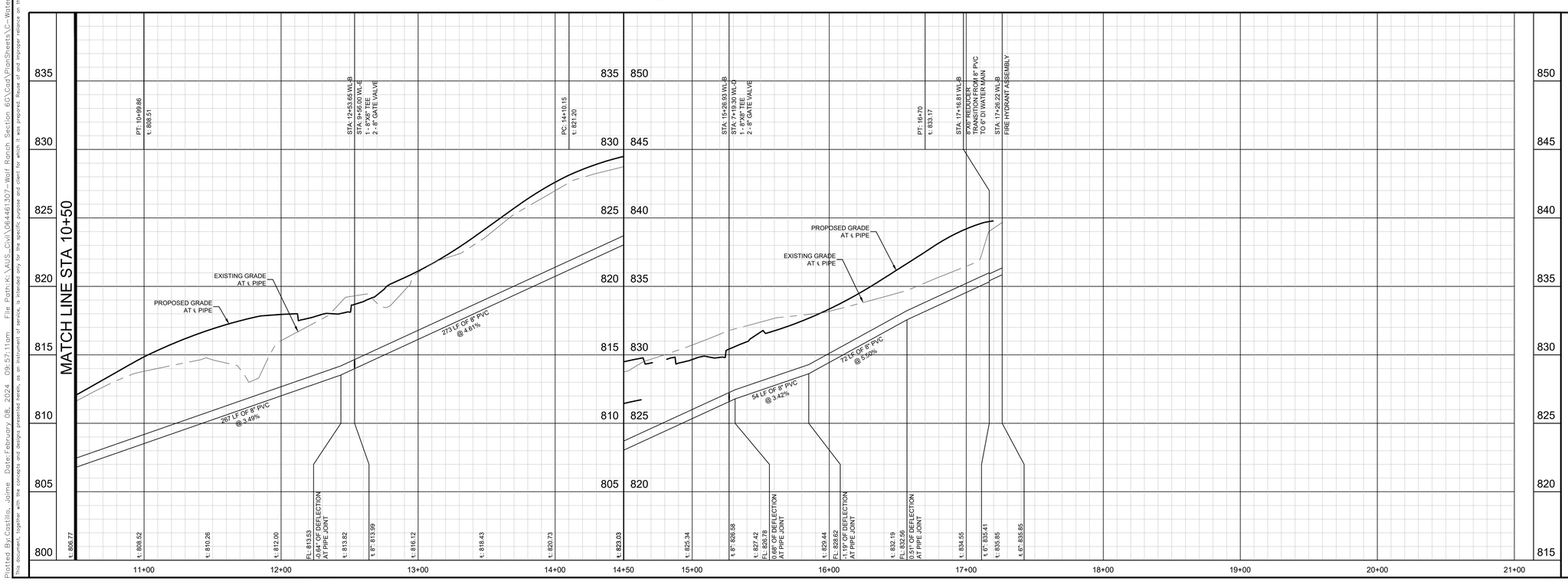
UTILITY LEGEND

- PROPERTY LINE
- PROPOSED WASTE WATER LINE
- PROPOSED WATER LINE
- PROPOSED WASTE WATER MANHOLE
- PROPOSED FIRE HYDRANT
- EXISTING OVERHEAD POWER LINE
- EXISTING WATER LINE
- EXISTING WASTE WATER LINE
- EXISTING STORM SEWER LINE
- EXISTING POWER POLE
- EXISTING FIRE HYDRANT
- EXISTING WATER METER
- EXISTING WASTE WATER MANHOLE

CURVE TABLE

CURVE	RADIUS	LENGTH	CHORD BEARING	CHORD	DELTA	TANGENT
C12	322.00'	259.85'	N23°08'46"W	252.86'	46°14'13"	137.47'

WL-B



PROFILE SCALE
1" = 40' HORIZONTAL
1" = 4' VERTICAL

BENCHMARKS

ADD BENCHMARKS HERE

No.	REVISIONS	DATE	BY

Kimley»Horn

© 2024 KIMLEY-HORN AND ASSOCIATES, INC.
10814 JOLLYVILLE ROAD, CAMPUS IV, SUITE 200, AUSTIN, TX 78759
PHONE: 512-418-1771 FAX: 512-418-1791
WWW.KIMLEY-HORN.COM
TEXAS REGISTERED ENGINEERING FIRM F-928

STATE OF TEXAS
JOHN A. PICKENS
110631
LICENSED
PROFESSIONAL ENGINEER
02/02/2024

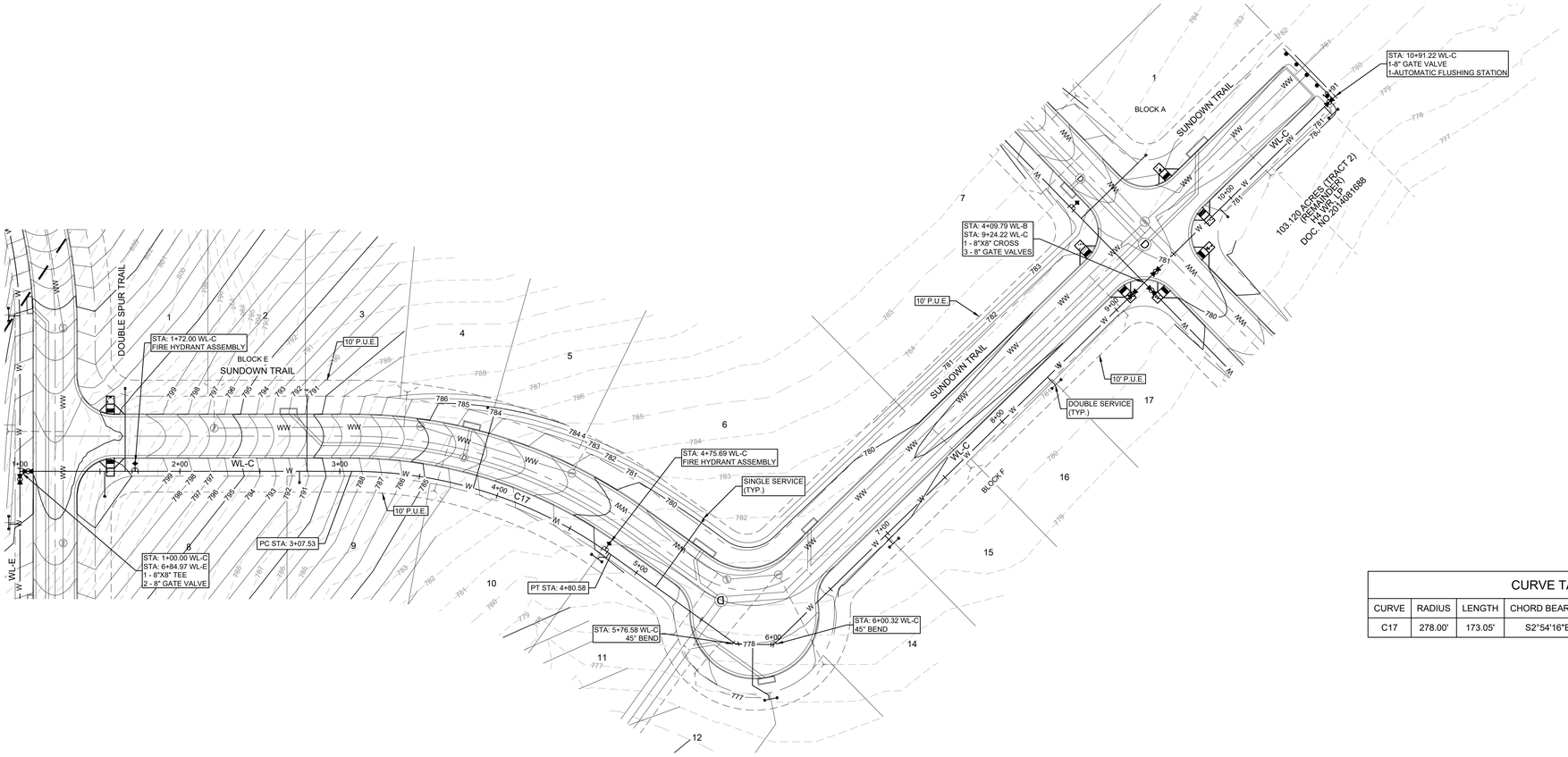
KHA PROJECT 064461307
DATE DECEMBER 2023
SCALE: AS SHOWN
DESIGNED BY: RRJ
DRAWN BY: AJM
CHECKED BY: JAP

WATER PLAN AND PROFILE-WL-B (2 OF 2)

WOLF RANCH
SECTION 6G
CITY OF GEORGETOWN
WILLIAMSON COUNTY, TEXAS

SHEET NUMBER
62 OF 87

Plotted By:Castillo, Jaime Date:February 08, 2024 09:57:11am File Path:K:\AUS_Civil\064461307-Wolf Ranch Section 6G\Cad\PlanSheets\C-Water Plan and Profile-R2.dwg
This document, together with the concepts and designs presented herein, as an instrument of service, is intended only for the specific purpose and client for which it was prepared. Reuse of and improper reliance on this document without written authorization and adaptation by Kimley-Horn and Associates, Inc. shall be without liability to Kimley-Horn and Associates, Inc.



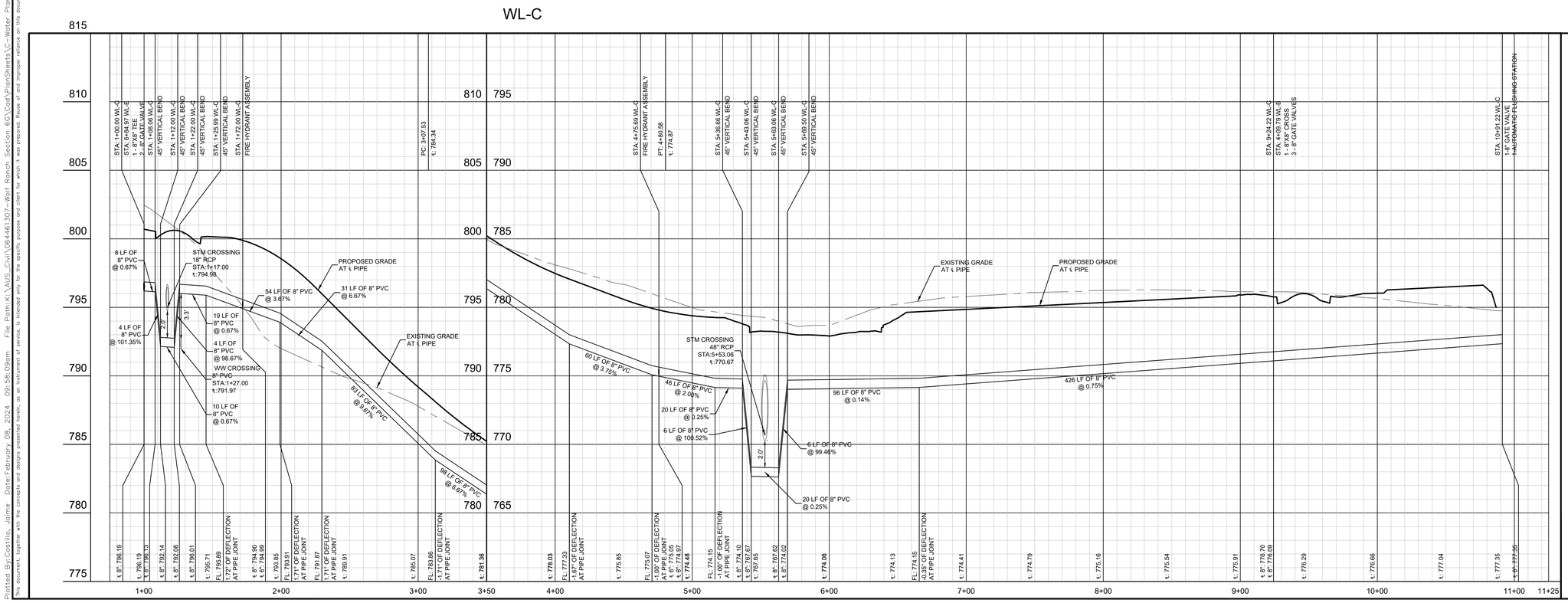
GRAPHIC SCALE 40'

UTILITY LEGEND

- PROPERTY LINE
- PROPOSED WASTE WATER LINE
- PROPOSED WATER LINE
- PROPOSED WASTE WATER MANHOLE
- PROPOSED FIRE HYDRANT
- EXISTING OVERHEAD POWER LINE
- EXISTING WATER LINE
- EXISTING WASTE WATER LINE
- EXISTING STORM SEWER LINE
- EXISTING POWER POLE
- EXISTING FIRE HYDRANT
- EXISTING WATER METER
- EXISTING WASTE WATER MANHOLE

CURVE TABLE

CURVE	RADIUS	LENGTH	CHORD BEARING	CHORD	DELTA	TANGENT
C17	278.00'	173.05'	S2°54'16"E	170.27'	35°39'57"	89.43'



PROFILE SCALE
1" = 40' HORIZONTAL
1" = 4' VERTICAL

BENCHMARKS

ADD BENCHMARKS HERE

No.	REVISIONS	DATE	BY

Kimley»Horn
© 2024 KIMLEY-HORN AND ASSOCIATES, INC.
10814 JOLLYVILLE ROAD, CAMPUS IV, SUITE 200, AUSTIN, TX 78759
PHONE: 512-418-1771 FAX: 512-418-1791
WWW.KIMLEY-HORN.COM
TEXAS REGISTERED ENGINEERING FIRM F-928

STATE OF TEXAS
JOHN A. PICKENS
110631
LICENSED
PROFESSIONAL ENGINEER
02/02/2024

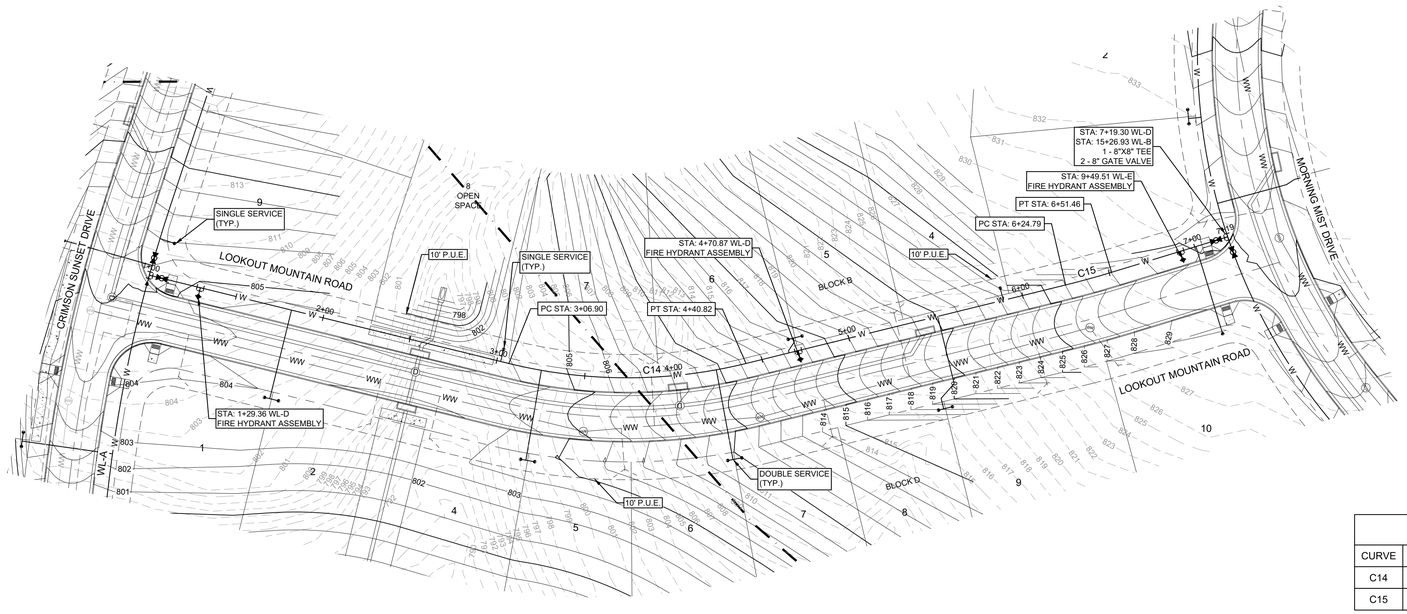
KHA PROJECT	064461307
DATE	DECEMBER 2023
SCALE:	AS SHOWN
DESIGNED BY:	RRJ
DRAWN BY:	AJM
CHECKED BY:	JAP

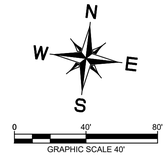
WATER PLAN AND PROFILE-WL-C

WOLF RANCH
SECTION 6G
CITY OF GEORGETOWN
WILLIAMSON COUNTY, TEXAS

SHEET NUMBER
63 OF 87

Plotted By:Castillo, Jaime Date:February 08, 2024 09:58:09am File Path:K:\AUS_Civil\064461307-Wolf Ranch Section 6G\Cad\PlanSheets\C-Water Plan and Profile-C1.dwg
This document, together with the concepts and designs presented herein, as an instrument of service, is intended only for the specific purpose and client for which it was prepared. Reuse of and improper reliance on this document without written authorization and adaptation by Kimley-Horn and Associates, Inc. shall be without liability to Kimley-Horn and Associates, Inc.



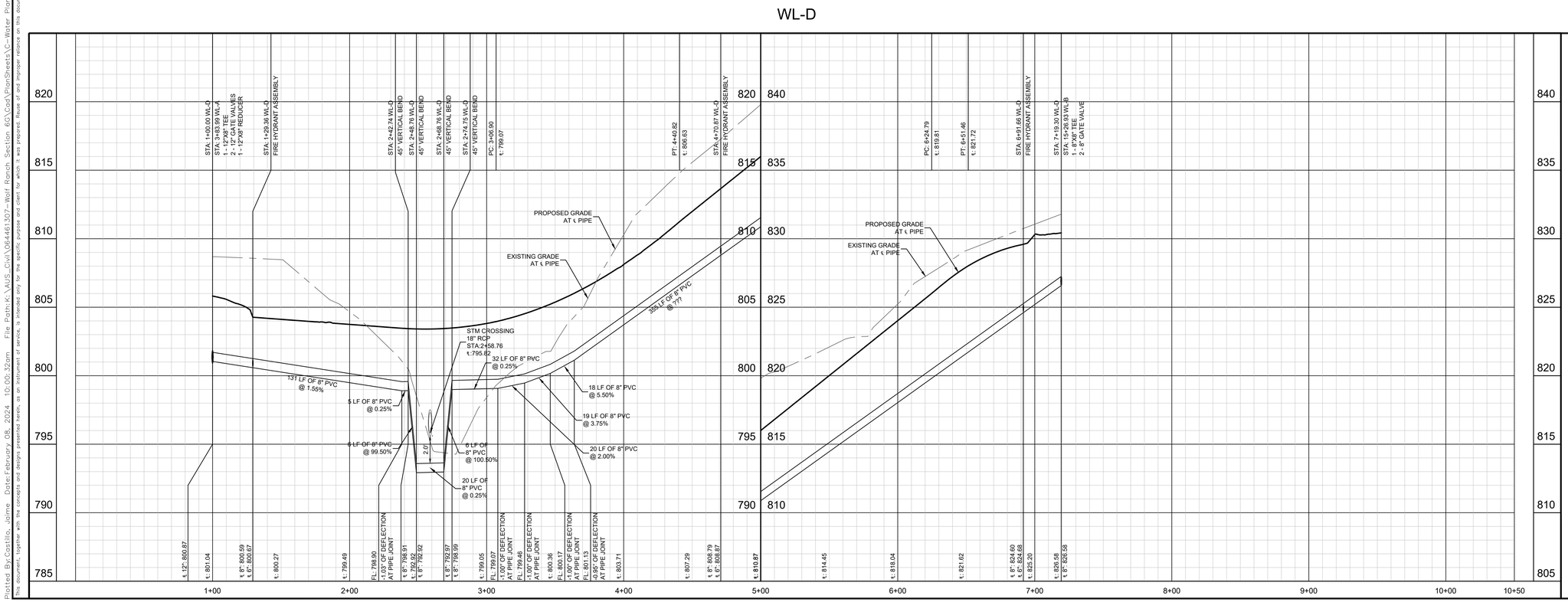


UTILITY LEGEND

- PROPERTY LINE
- PROPOSED WASTE WATER LINE
- PROPOSED WATER LINE
- PROPOSED WASTE WATER MANHOLE
- PROPOSED FIRE HYDRANT
- EXISTING OVERHEAD POWER LINE
- EXISTING WATER LINE
- EXISTING WASTE WATER LINE
- EXISTING STORM SEWER LINE
- EXISTING POWER POLE
- EXISTING FIRE HYDRANT
- EXISTING WATER METER
- EXISTING WASTE WATER MANHOLE

CURVE TABLE

CURVE	RADIUS	LENGTH	CHORD BEARING	CHORD	DELTA	TANGENT
C14	278.00'	133.91'	N83°10'37"E	132.62'	27°35'59"	68.28'
C15	478.00'	26.67'	N67°46'43"E	26.67'	3°11'49"	13.34'



PROFILE SCALE
1" = 40' HORIZONTAL
1" = 4' VERTICAL

BENCHMARKS

ADD BENCHMARKS HERE

No.	REVISIONS	DATE	BY

Kimley»Horn
© 2024 KIMLEY-HORN AND ASSOCIATES, INC.
10814 JOLLYVILLE ROAD, CAMPUS IV, SUITE 200, AUSTIN, TX 78759
PHONE: 512-418-1771 FAX: 512-418-1791
WWW.KIMLEY-HORN.COM
TEXAS REGISTERED ENGINEERING FIRM F-928

STATE OF TEXAS
JOHN A. PICKENS
110631
LICENSED
PROFESSIONAL ENGINEER
02/02/2024

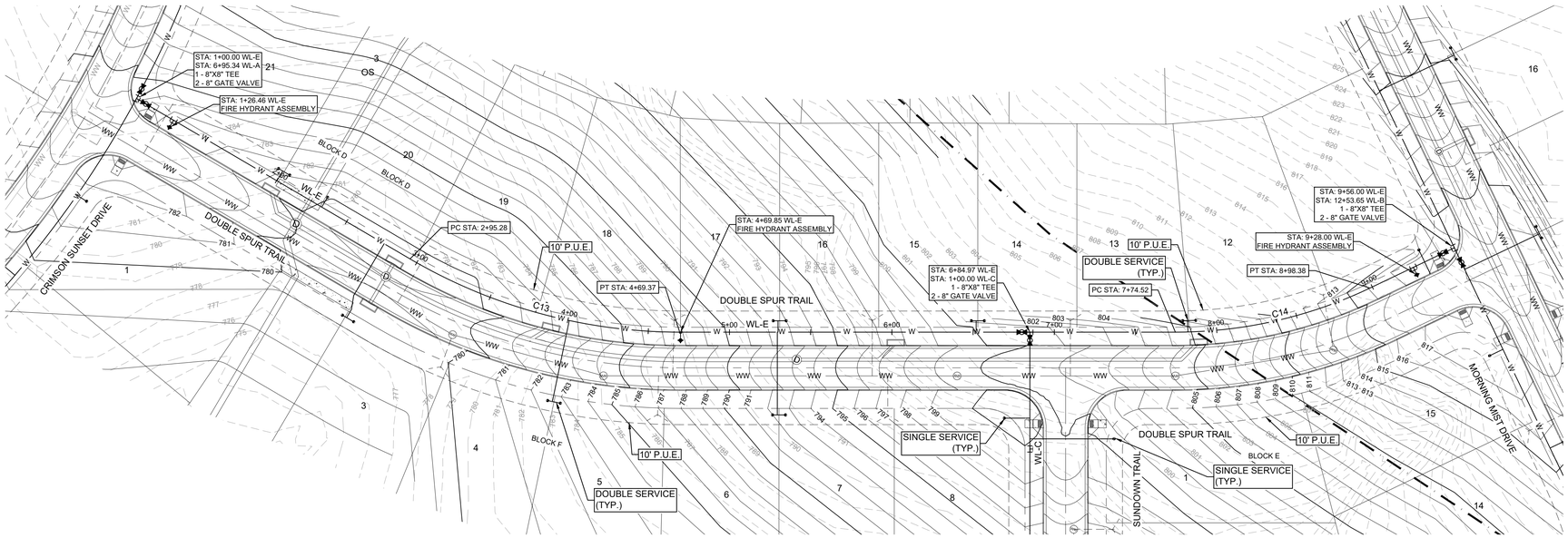
KHA PROJECT 064461307
DATE DECEMBER 2023
SCALE: AS SHOWN
DESIGNED BY: RRJ
DRAWN BY: AJM
CHECKED BY: JAP

WATER PLAN AND PROFILE-WL-D

WOLF RANCH
SECTION 6G
CITY OF GEORGETOWN
WILLIAMSON COUNTY, TEXAS

SHEET NUMBER
64 OF 87

Plotted By:Castillo, Jaime Date:February 08, 2024 10:00:32am File Path:K:\AUS_Civil\064461307-Wolf Ranch Section 6G\Cad\PlanSheets\C-Water Plan and Profile-D1.dwg
This document, together with the concepts and designs presented herein, as an instrument of service, is intended only for the specific purpose and client for which it was prepared. Reuse of and improper reliance on this document without written authorization and adaptation by Kimley-Horn and Associates, Inc. shall be without liability to Kimley-Horn and Associates, Inc.



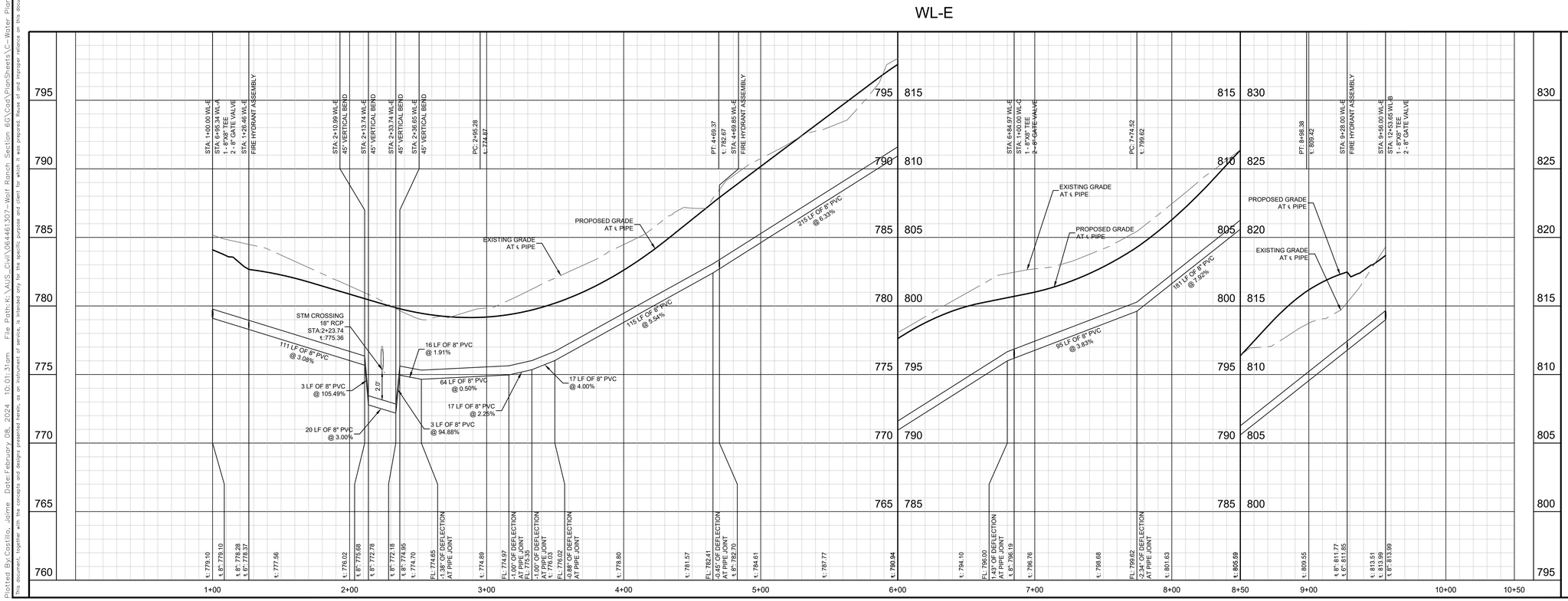
N
W E
S

0 40' 80'
GRAPHIC SCALE 40'

UTILITY LEGEND

- PROPERTY LINE
- PROPOSED WASTE WATER LINE
- PROPOSED WATER LINE
- PROPOSED WASTE WATER MANHOLE
- PROPOSED FIRE HYDRANT
- EXISTING OVERHEAD POWER LINE
- EXISTING WATER LINE
- EXISTING WASTE WATER LINE
- EXISTING STORM SEWER LINE
- EXISTING POWER POLE
- EXISTING FIRE HYDRANT
- EXISTING WATER METER
- EXISTING WASTE WATER MANHOLE

CURVE TABLE						
CURVE	RADIUS	LENGTH	CHORD BEARING	CHORD	DELTA	TANGENT
C13	328.00'	174.09'	N84°28'04"E	172.05'	30°24'38"	89.15'
C14	278.00'	123.86'	N56°29'56"E	122.84'	25°31'38"	62.97'



PROFILE SCALE
1" = 40' HORIZONTAL
1" = 4' VERTICAL

BENCHMARKS

ADD BENCHMARKS HERE

No.	REVISIONS	DATE	BY

Kimley»Horn
© 2024 KIMLEY-HORN AND ASSOCIATES, INC.
10814 JOLLYVILLE ROAD, CAMPUS IV, SUITE 200, AUSTIN, TX 78759
PHONE: 512-418-1771 FAX: 512-418-1791
WWW.KIMLEY-HORN.COM
TEXAS REGISTERED ENGINEERING FIRM F-928

STATE OF TEXAS
JOHN A. PICKENS
110631
LICENSED
PROFESSIONAL ENGINEER
02/02/2024

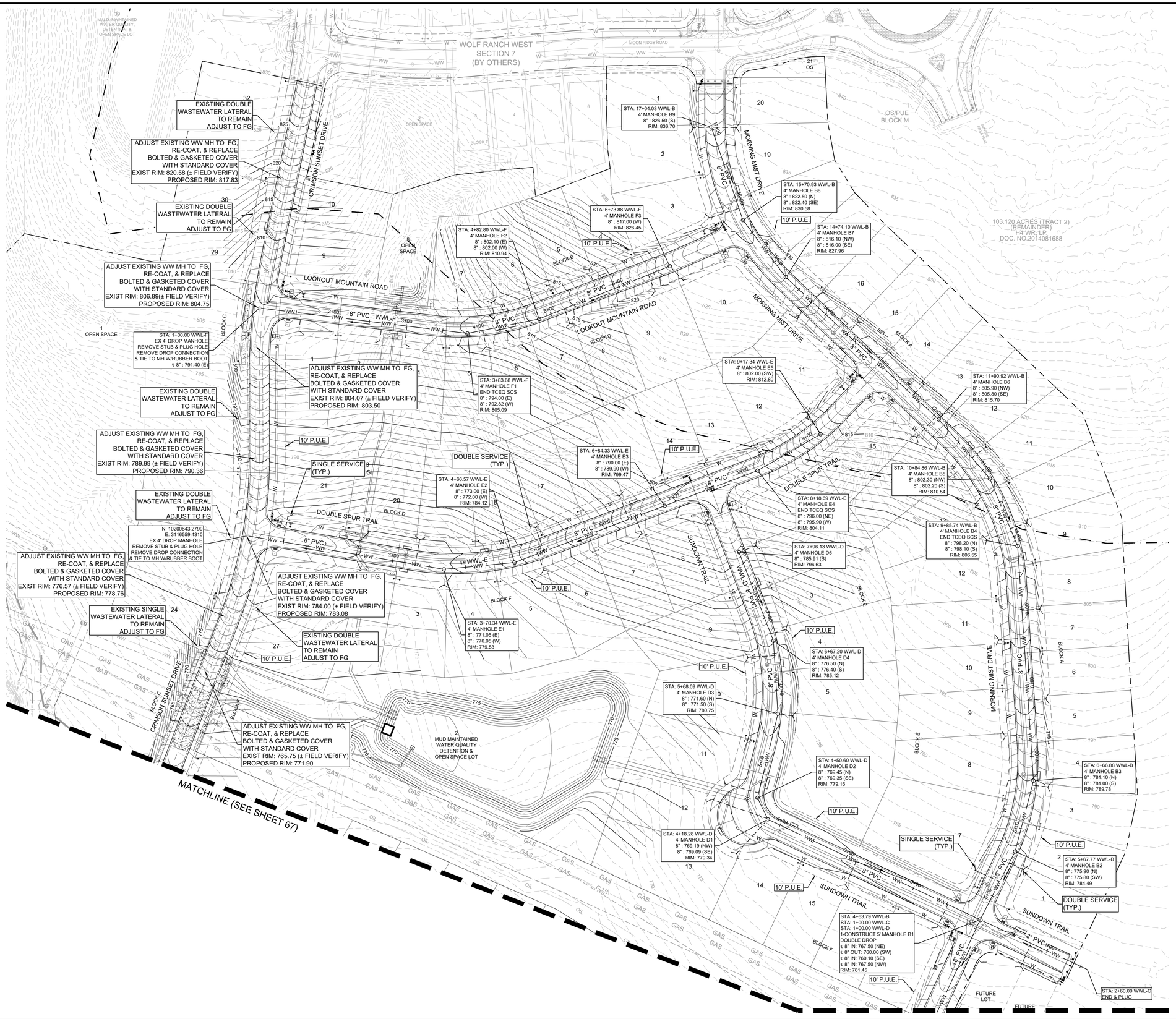
KHA PROJECT 064461307
DATE DECEMBER 2023
SCALE: AS SHOWN
DESIGNED BY: RRJ
DRAWN BY: AJM
CHECKED BY: JAP

WATER PLAN AND PROFILE-WL-E

WOLF RANCH
SECTION 6G
CITY OF GEORGETOWN
WILLIAMSON COUNTY, TEXAS

SHEET NUMBER
65 OF 87

Plotted By:Castillo, Jaime Date:February 08, 2024 10:01:31am File Path:K:\AUS_Civil\064461307-Wolf Ranch Section 6G\Cad\PlanSheets\C-Water Plan and Profile-E1.dwg
This document, together with the concepts and designs presented herein, as an instrument of service, is intended only for the specific purpose and client for which it was prepared. Reuse of and improper reliance on this document without written authorization and adaptation by Kimley-Horn and Associates, Inc. shall be without liability to Kimley-Horn and Associates, Inc.



N
W E
S

0 60' 120'
GRAPHIC SCALE 60'

UTILITY LEGEND

- PROPERTY LINE
- PROPOSED WASTE WATER LINE
- PROPOSED WATER LINE
- PROPOSED WASTE WATER MANHOLE
- WASTE WATER FLOW DIRECTION
- PROPOSED FIRE HYDRANT
- EXISTING OVERHEAD POWER LINE
- EXISTING WATER LINE
- EXISTING WASTE WATER LINE
- EXISTING STORM SEWER LINE
- EXISTING POWER POLE
- EXISTING FIRE HYDRANT
- EXISTING WATER METER
- EXISTING WASTE WATER MANHOLE

NOTES:

1. ALL DIMENSIONS ARE TO CENTERLINE OF PIPE UNLESS NOTED OTHERWISE.
2. CONTRACTOR TO FIELD VERIFY LOCATION OF ALL THE UTILITIES PRIOR TO CONSTRUCTION. CONTACT ENGINEER IF FIELD CONDITIONS VARY FROM APPROVED CONSTRUCTION DOCUMENTS.
3. PROPOSED WASTEWATER MANHOLES OUTSIDE OF PAVED AREAS REQUIRE BOLTED MANHOLE COVERS.
4. ALL PROPOSED WASTEWATER MANHOLES TO INCLUDE WATER TIGHT CAP INTERNAL TO MANHOLE.
5. ALL WASTEWATER MAINS SHALL BE EMBEDDED IN CEMENT STABILIZED SAND AT ALL WATER CROSSINGS FOR THE TOTAL LENGTH OF ONE PIPE SEGMENT PLUS 12 INCHES BEYOND THE JOINT ON EACH END.
6. THE USE OF PIPES AND PIPE FITTINGS THAT CONTAIN MORE THAN 0.25% LEAD OR SOLDERS AND FLUX THAT CONTAINS MORE THAN 0.2% LEAD IS PROHIBITED PURSUANT TO 30 TEXAS ADMINISTRATIVE CODE (TAC) §290.44(B)(1).
7. ALL UTILITY CROSSING NEED TO MAINTAIN MINIMUM 24" VERTICAL CLEARANCE FOR STORM SEWER AND WATER UNLESS SPECIFIED ON APPROVED CONSTRUCTION DOCUMENTS.
8. CENTER ONE JOINT OF PIPE ON ALL WATER & WASTEWATER CROSSINGS.
9. WASTEWATER MANHOLES SHALL BE CORED, BOOTED, GROUTED, AND RECOATED TO CITY OF GEORGETOWN STANDARDS.

BENCHMARKS

ADD BENCHMARKS HERE

No.	REVISIONS	DATE	BY

Kimley»Horn
© 2024 KIMLEY-HORN AND ASSOCIATES, INC.
10814 JOLLYVILLE ROAD, CAMPUS IV, SUITE 200, AUSTIN, TX 78759
PHONE: 512-418-1771 FAX: 512-418-1791
WWW.KIMLEY-HORN.COM
TEXAS REGISTERED ENGINEERING FIRM F-928

STATE OF TEXAS
JOHN A. PICKENS
110631
LICENSED
PROFESSIONAL ENGINEER
02/02/2024

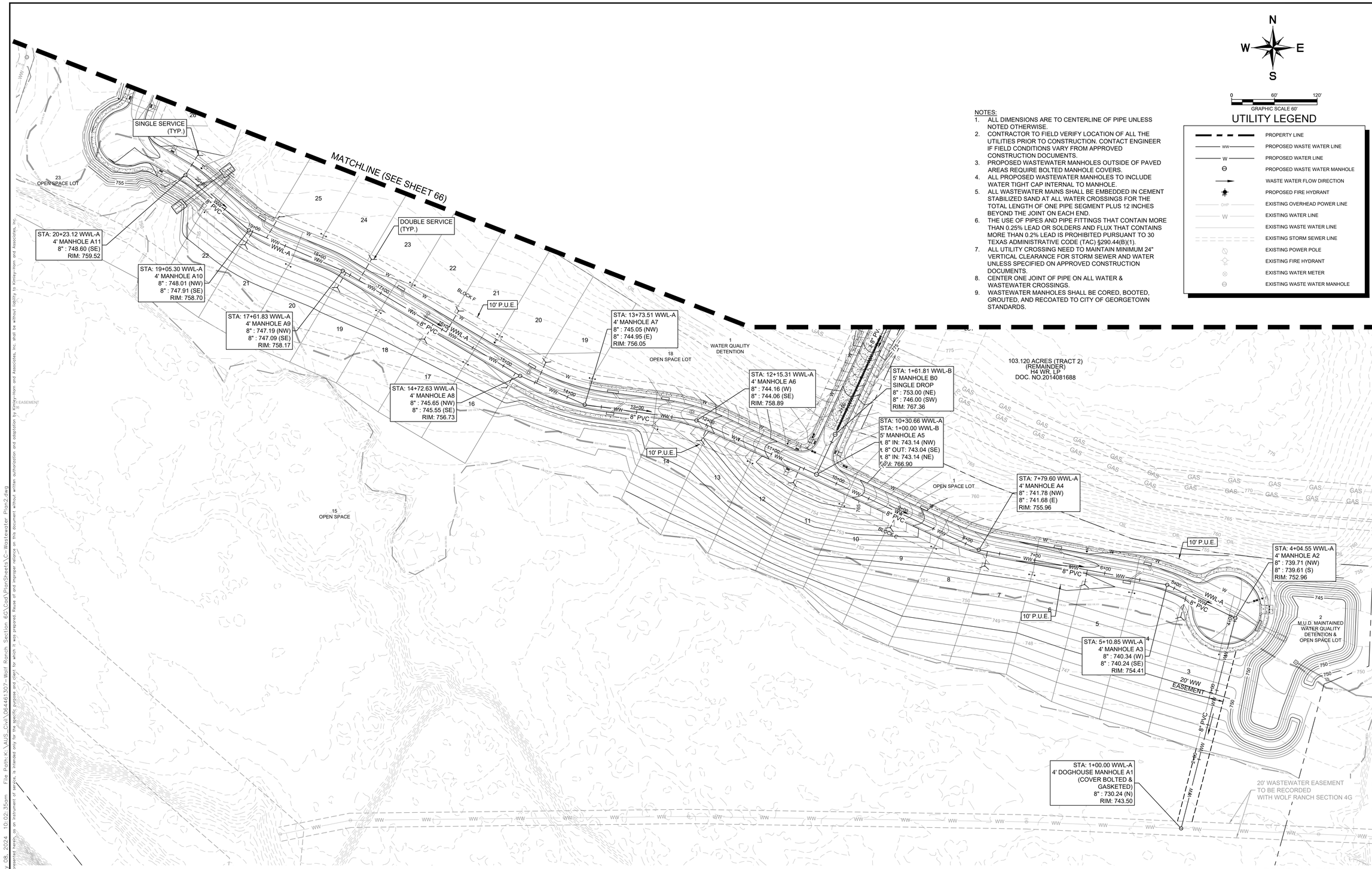
KHA PROJECT 064461307	
DATE: DECEMBER 2023	
SCALE: AS SHOWN	
DESIGNED BY: RRJ	
DRAWN BY: AJM	
CHECKED BY: JAP	

OVERALL WASTEWATER PLAN (1 OF 2)

WOLF RANCH
SECTION 6G
CITY OF GEORGETOWN
WILLIAMSON COUNTY, TEXAS

SHEET NUMBER
66 OF 87

Plotted By:Castillo, Jaime Date:February 08, 2024 10:02:01am File Path:K:\AUS_Civil\064461307-Wolf Ranch Section 6C\Cad\PlanSheets\C-Wastewater Plan.dwg
This document, together with the concepts and designs presented herein, as an instrument of service, is intended only for the specific purpose and client for which it was prepared. Reuse of and improper reliance on this document without written authorization and adaptation by Kimley-Horn and Associates, Inc. shall be without liability to Kimley-Horn and Associates, Inc.



NOTES:

1. ALL DIMENSIONS ARE TO CENTERLINE OF PIPE UNLESS NOTED OTHERWISE.
2. CONTRACTOR TO FIELD VERIFY LOCATION OF ALL THE UTILITIES PRIOR TO CONSTRUCTION. CONTACT ENGINEER IF FIELD CONDITIONS VARY FROM APPROVED CONSTRUCTION DOCUMENTS.
3. PROPOSED WASTEWATER MANHOLES OUTSIDE OF PAVED AREAS REQUIRE BOLTED MANHOLE COVERS.
4. ALL PROPOSED WASTEWATER MANHOLES TO INCLUDE WATER TIGHT CAP INTERNAL TO MANHOLE.
5. ALL WASTEWATER MAINS SHALL BE EMBEDDED IN CEMENT STABILIZED SAND AT ALL WATER CROSSINGS FOR THE TOTAL LENGTH OF ONE PIPE SEGMENT PLUS 12 INCHES BEYOND THE JOINT ON EACH END.
6. THE USE OF PIPES AND PIPE FITTINGS THAT CONTAIN MORE THAN 0.25% LEAD OR SOLDERS AND FLUX THAT CONTAINS MORE THAN 0.2% LEAD IS PROHIBITED PURSUANT TO 30 TEXAS ADMINISTRATIVE CODE (TAC) §290.44(B)(1).
7. ALL UTILITY CROSSING NEED TO MAINTAIN MINIMUM 24" VERTICAL CLEARANCE FOR STORM SEWER AND WATER UNLESS SPECIFIED ON APPROVED CONSTRUCTION DOCUMENTS.
8. CENTER ONE JOINT OF PIPE ON ALL WATER & WASTEWATER CROSSINGS.
9. WASTEWATER MANHOLES SHALL BE CORED, BOOTED, GROUTED, AND RECOATED TO CITY OF GEORGETOWN STANDARDS.

N
W E
S

0 60' 120'
GRAPHIC SCALE 60'

UTILITY LEGEND

- PROPERTY LINE
- PROPOSED WASTE WATER LINE
- PROPOSED WATER LINE
- PROPOSED WASTE WATER MANHOLE
- WASTE WATER FLOW DIRECTION
- PROPOSED FIRE HYDRANT
- EXISTING OVERHEAD POWER LINE
- EXISTING WATER LINE
- EXISTING WASTE WATER LINE
- EXISTING STORM SEWER LINE
- EXISTING POWER POLE
- EXISTING FIRE HYDRANT
- EXISTING WATER METER
- EXISTING WASTE WATER MANHOLE

No.	REVISIONS	DATE	BY

Kimley»Horn
© 2024 KIMLEY-HORN AND ASSOCIATES, INC.
10814 JOLLYVILLE ROAD, CAMPUS IV, SUITE 200, AUSTIN, TX 78759
PHONE: 512-418-1771 FAX: 512-418-1791
WWW.KIMLEY-HORN.COM
TEXAS REGISTERED ENGINEERING FIRM F-928

STATE OF TEXAS
JOHN A. PICKENS
110631
LICENSED
PROFESSIONAL ENGINEER
02/02/2024

KHA PROJECT	064461307
DATE	DECEMBER 2023
SCALE:	AS SHOWN
DESIGNED BY:	RRJ
DRAWN BY:	AJM
CHECKED BY:	JAP

OVERALL WASTEWATER PLAN (2 OF 2)

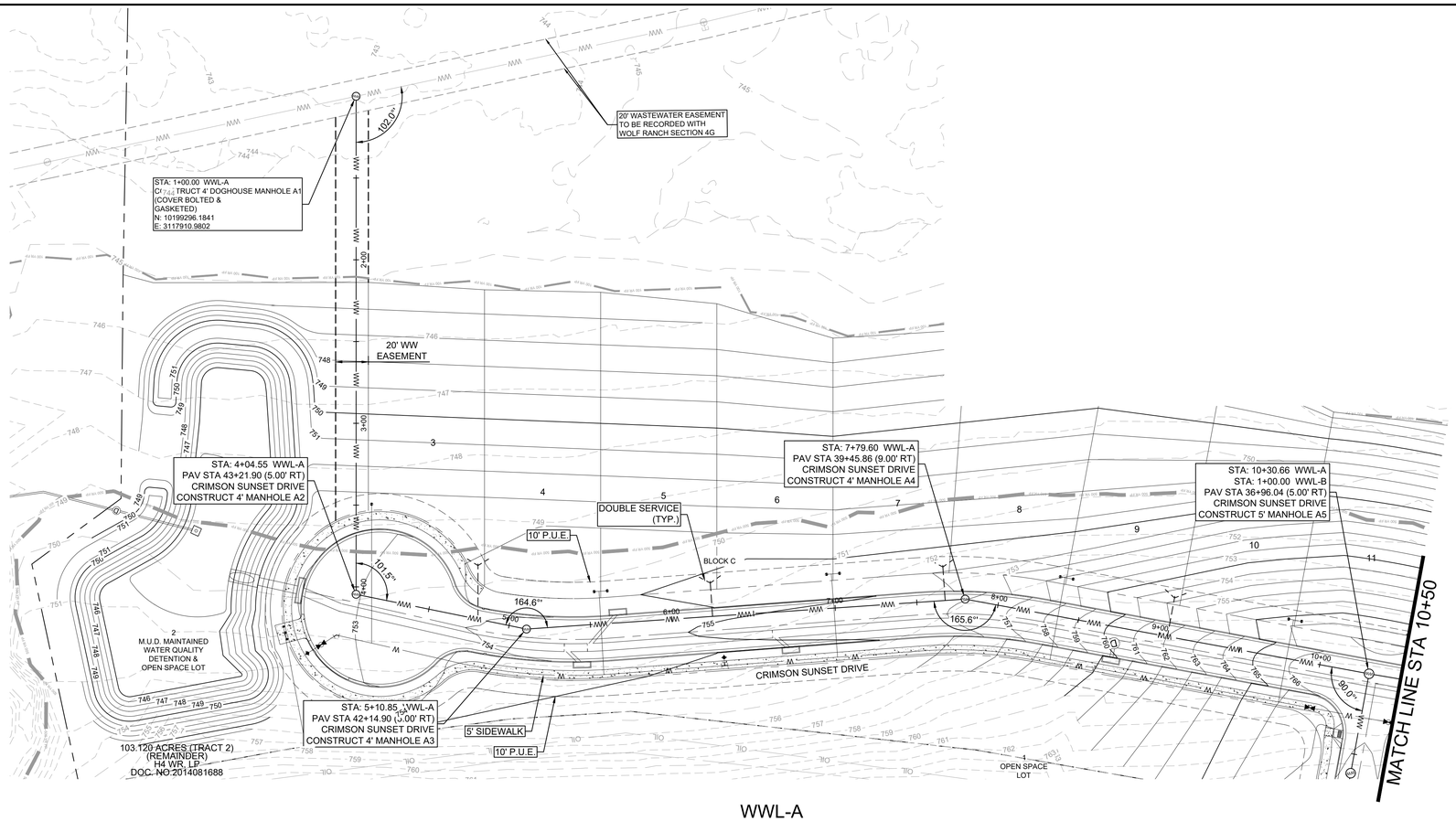
WOLF RANCH
SECTION 6G
CITY OF GEORGETOWN
WILLIAMSON COUNTY, TEXAS

SHEET NUMBER
67 OF 87

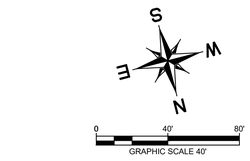
BENCHMARKS

ADD BENCHMARKS HERE

Plotted By:Castillo, Jaime Date:February 08, 2024 10:02:35am File Path:K:\AUS_Civil\064461307-Wolf Ranch Section 6G\Cad\PlanSheets\C-Wastewater Plan2.dwg
This document, together with the concepts and designs presented herein, is an instrument of service, is intended only for the specific purpose and client for which it was prepared. Reuse of and improper reliance on this document without written authorization and adaptation by Kimley-Horn and Associates, Inc. shall be without liability to Kimley-Horn and Associates, Inc.

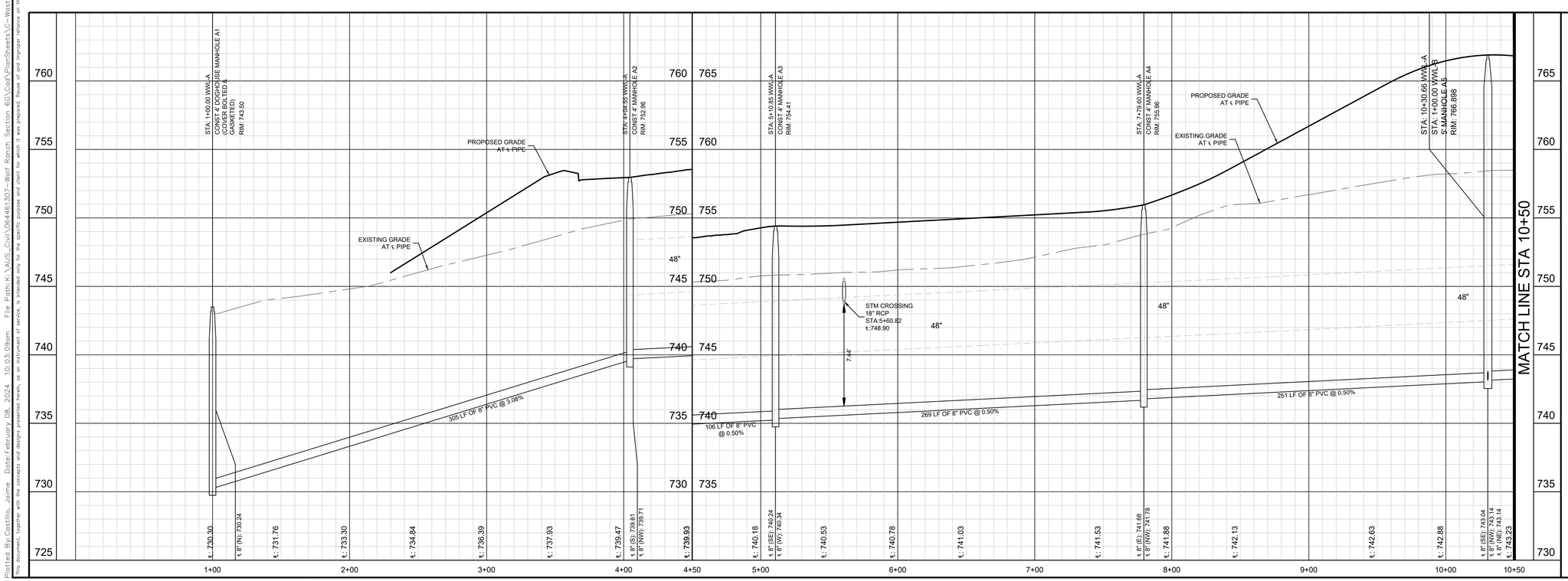


WWL-A



UTILITY LEGEND

- PROPERTY LINE
- PROPOSED WASTE WATER LINE
- PROPOSED WATER LINE
- PROPOSED WASTE WATER MANHOLE
- WASTE WATER FLOW DIRECTION
- PROPOSED FIRE HYDRANT
- EXISTING OVERHEAD POWER LINE
- EXISTING WATER LINE
- EXISTING WASTE WATER LINE
- EXISTING STORM SEWER LINE
- EXISTING POWER POLE
- EXISTING FIRE HYDRANT
- EXISTING WATER METER
- EXISTING WASTE WATER MANHOLE



PROFILE SCALE
1" = 40' HORIZONTAL
1" = 4' VERTICAL

BENCHMARKS

ADD BENCHMARKS HERE

No.	REVISIONS	DATE	BY

Kimley»Horn
© 2024 KIMLEY-HORN AND ASSOCIATES, INC.
10814 JOLLYVILLE ROAD, CAMPUS IV, SUITE 200, AUSTIN, TX 78759
PHONE: 512-418-1771 FAX: 512-418-1791
WWW.KIMLEY-HORN.COM
TEXAS REGISTERED ENGINEERING FIRM F-928

STATE OF TEXAS
JOHN A. PICKENS
110631
LICENSED
PROFESSIONAL ENGINEER
02/02/2024

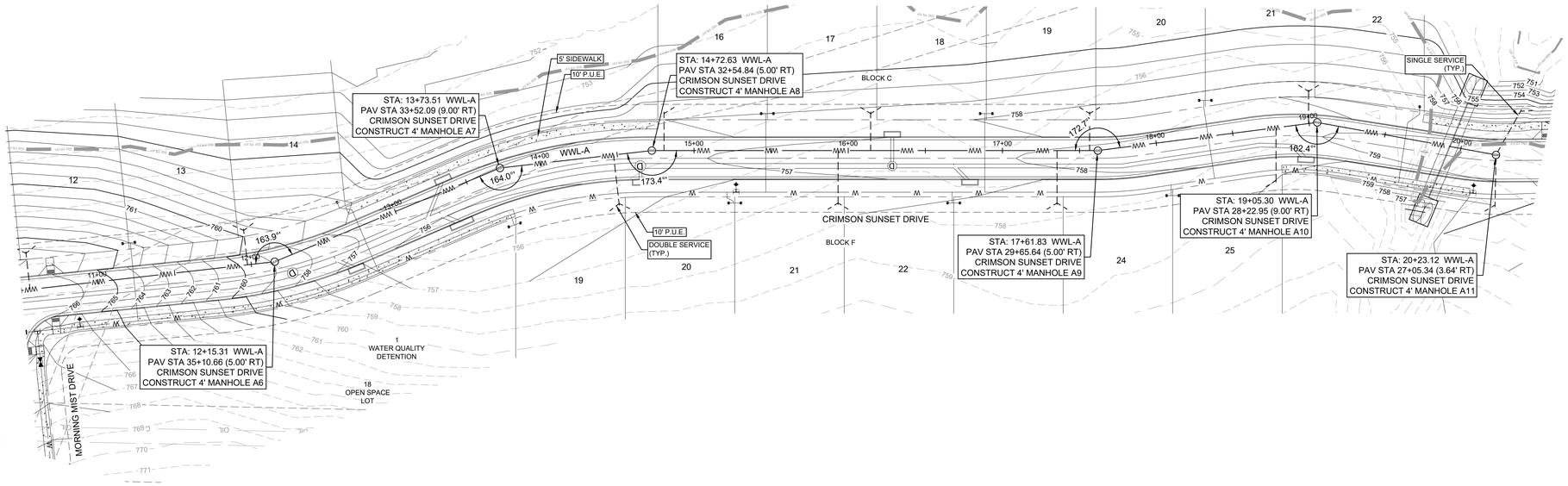
KHA PROJECT 064461307
DATE DECEMBER 2023
SCALE: AS SHOWN
DESIGNED BY: RRJ
DRAWN BY: AJM
CHECKED BY: JAP

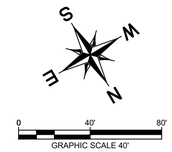
WASTEWATER PLAN AND PROFILE-WWL-A (1 OF 2)

WOLF RANCH
SECTION 6G
CITY OF GEORGETOWN
WILLIAMSON COUNTY, TEXAS

SHEET NUMBER
68 OF 87

Plotted By:Castillo, Jaime Date:February 08, 2024 10:03:09am File Path:K:\AUS_Civil\064461307-Wolf Ranch Section 6G\Cad\PlanSheets\C-Wastewater Plan and Profile-A1.dwg
This document, together with the concepts and designs presented herein, as an instrument of service, is intended only for the specific purpose and client for which it was prepared. Reuse of and improper reliance on this document without written authorization and adaptation by Kimley-Horn and Associates, Inc. shall be without liability to Kimley-Horn and Associates, Inc.

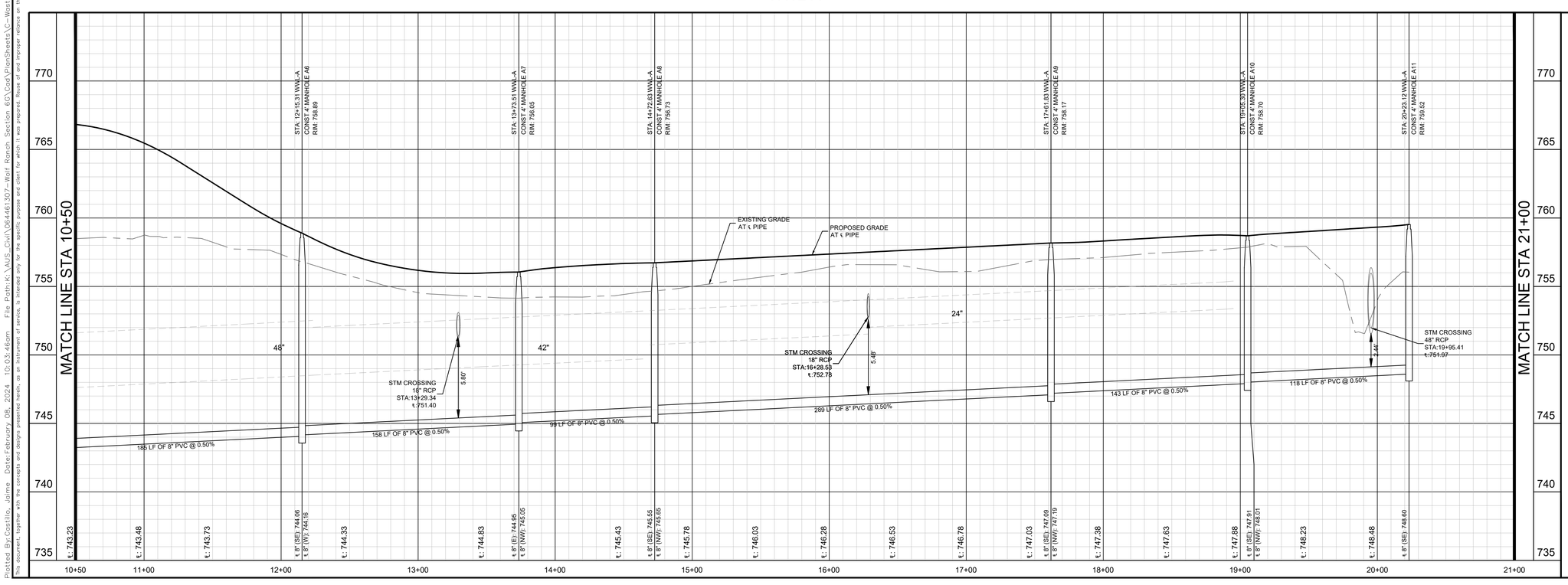




UTILITY LEGEND

- PROPERTY LINE
- PROPOSED WASTE WATER LINE
- PROPOSED WATER LINE
- PROPOSED WASTE WATER MANHOLE
- WASTE WATER FLOW DIRECTION
- PROPOSED FIRE HYDRANT
- EXISTING OVERHEAD POWER LINE
- EXISTING WATER LINE
- EXISTING WASTE WATER LINE
- EXISTING STORM SEWER LINE
- EXISTING POWER POLE
- EXISTING FIRE HYDRANT
- EXISTING WATER METER
- EXISTING WASTE WATER MANHOLE

WWL-A



PROFILE SCALE

1" = 40' HORIZONTAL
1" = 4' VERTICAL

BENCHMARKS

ADD BENCHMARKS HERE

No.	REVISIONS	DATE	BY

Kimley»Horn
© 2024 KIMLEY-HORN AND ASSOCIATES, INC.
10814 JOLLYVILLE ROAD, CAMPUS IV, SUITE 200, AUSTIN, TX 78759
PHONE: 512-418-1771 FAX: 512-418-1791
WWW.KIMLEY-HORN.COM
TEXAS REGISTERED ENGINEERING FIRM F-928

STATE OF TEXAS
JOHN A. PICKENS
110631
LICENSED
PROFESSIONAL ENGINEER
02/02/2024

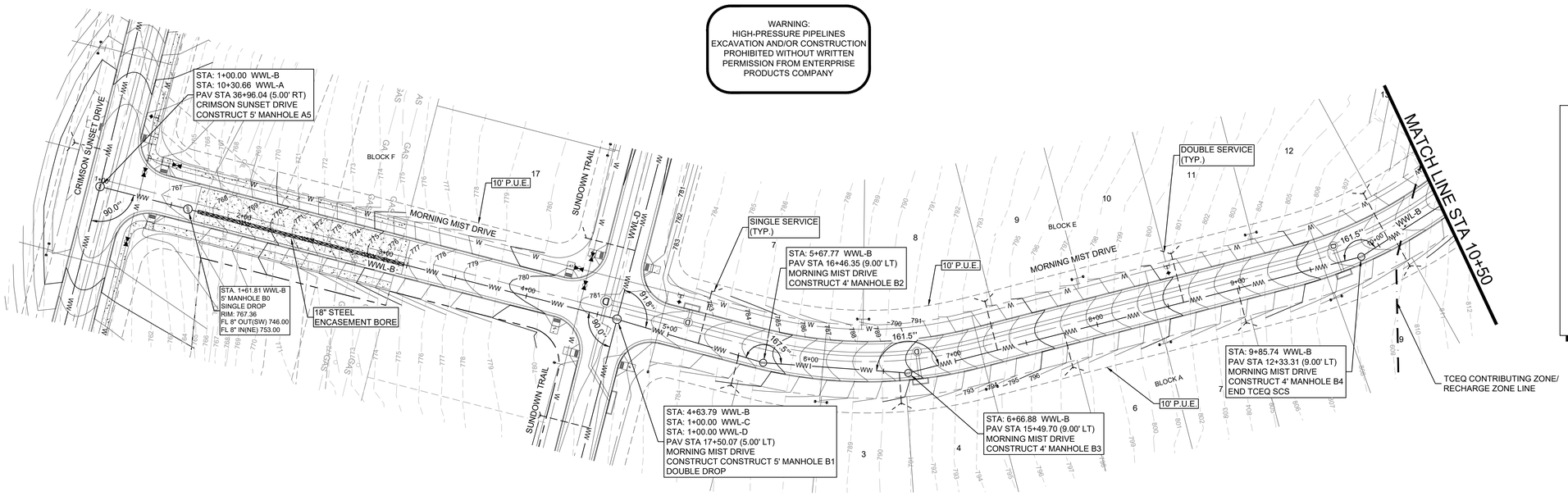
KHA PROJECT 064461307
DATE DECEMBER 2023
SCALE: AS SHOWN
DESIGNED BY: RRJ
DRAWN BY: AJM
CHECKED BY: JAP

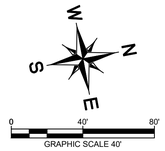
WASTEWATER PLAN AND PROFILE-WWL-A (2 OF 2)

WOLF RANCH
SECTION 6G
CITY OF GEORGETOWN
WILLIAMSON COUNTY, TEXAS

SHEET NUMBER
69 OF 87

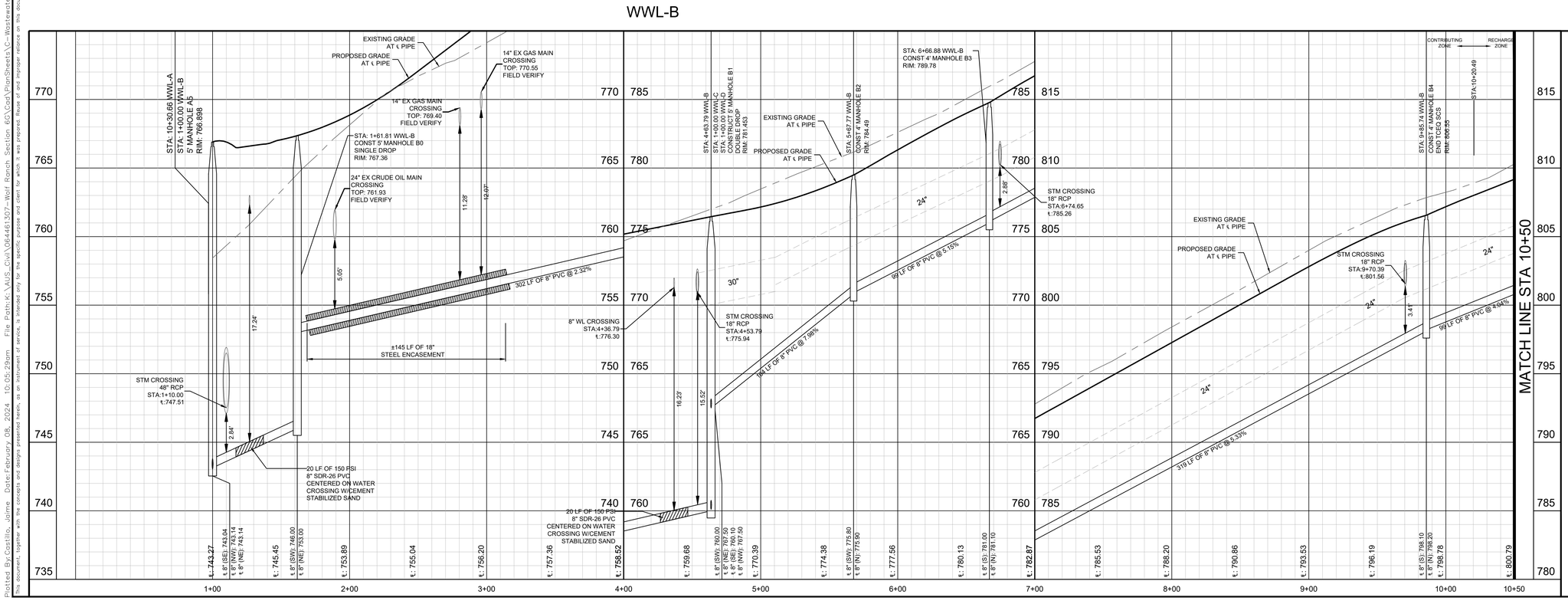
This document, together with the concepts and designs presented herein, as an instrument of service, is intended only for the specific purpose and client for which it was prepared. Reuse of and improper reliance on this document without written authorization and adaptation by Kimley-Horn and Associates, Inc. shall be without liability to Kimley-Horn and Associates, Inc.
Plotted By:Castillo, Jaime Date:February 08, 2024 10:03:46am File Path:K:\AUS_Civil\064461307-Wolf Ranch Section 6G\Cad\PlanSheets\C-Wastewater Plan and Profile-A2.dwg





UTILITY LEGEND

- PROPERTY LINE
- PROPOSED WASTE WATER LINE
- PROPOSED WATER LINE
- PROPOSED WASTE WATER MANHOLE
- WASTE WATER FLOW DIRECTION
- PROPOSED FIRE HYDRANT
- EXISTING OVERHEAD POWER LINE
- EXISTING WATER LINE
- EXISTING WASTE WATER LINE
- EXISTING STORM SEWER LINE
- EXISTING POWER POLE
- EXISTING FIRE HYDRANT
- EXISTING WATER METER
- EXISTING WASTE WATER MANHOLE



PROFILE SCALE

1" = 40' HORIZONTAL
1" = 4' VERTICAL

BENCHMARKS

ADD BENCHMARKS HERE

No.	REVISIONS	DATE	BY

Kimley»Horn
© 2024 KIMLEY-HORN AND ASSOCIATES, INC.
10814 JOLLYVILLE ROAD, CAMPUS IV, SUITE 200, AUSTIN, TX 78759
PHONE: 512-418-1771 FAX: 512-418-1791
WWW.KIMLEY-HORN.COM
TEXAS REGISTERED ENGINEERING FIRM F-928

STATE OF TEXAS
JOHN A. PICKENS
110631
LICENSED
PROFESSIONAL ENGINEER
02/02/2024

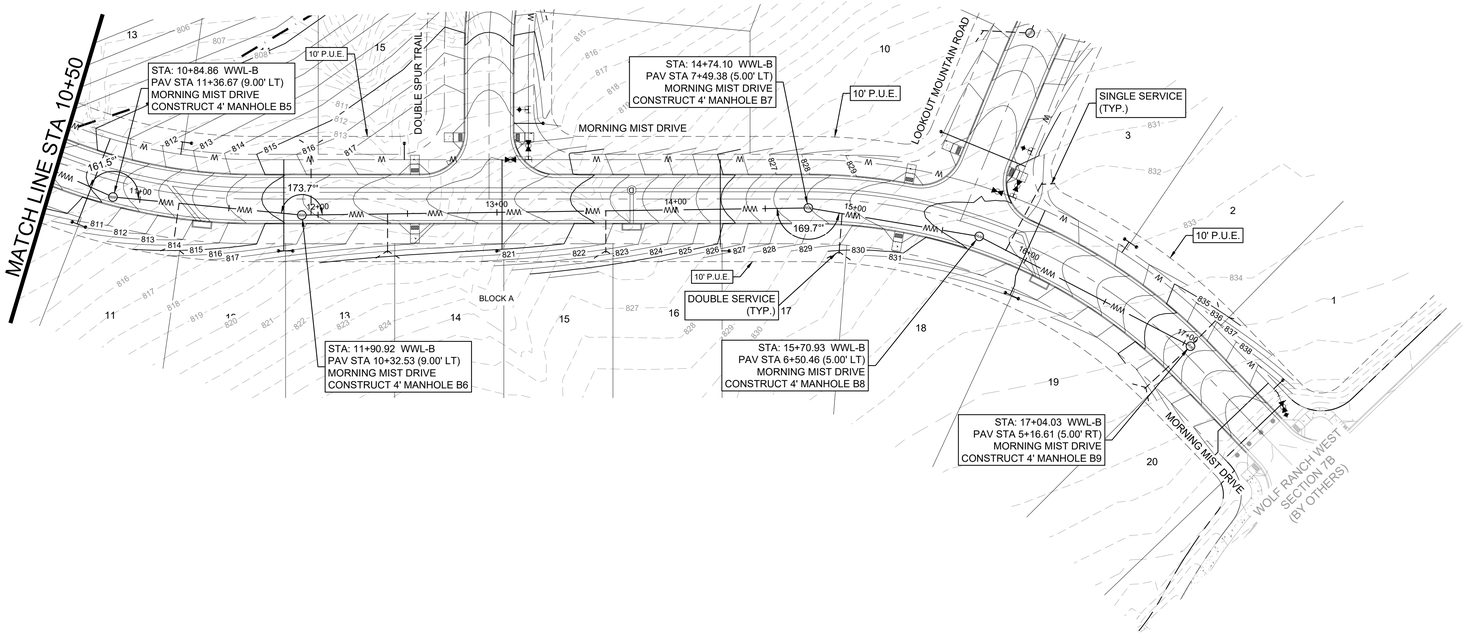
KHA PROJECT	064461307
DATE	DECEMBER 2023
SCALE:	AS SHOWN
DESIGNED BY:	RRJ
DRAWN BY:	AJM
CHECKED BY:	JAP

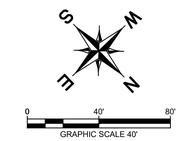
WASTEWATER PLAN AND PROFILE-WWL-B (1 OF 2)

WOLF RANCH
SECTION 6G
CITY OF GEORGETOWN
WILLIAMSON COUNTY, TEXAS

SHEET NUMBER
70 OF 87

This document, together with the concepts and designs presented herein, as an instrument of service, is intended only for the specific purpose and client for which it was prepared. Reuse of and improper reliance on this document without written authorization and adaptation by Kimley-Horn and Associates, Inc. shall be without liability to Kimley-Horn and Associates, Inc.
Plotted By:Castillo, Jaime Date:February 08, 2024 10:05:28am File Path:K:\AUS_Civil\064461307-Wolf Ranch Section 6G\Cad\PlanSheets\C-Wastewater Plan and Profile-B1.dwg

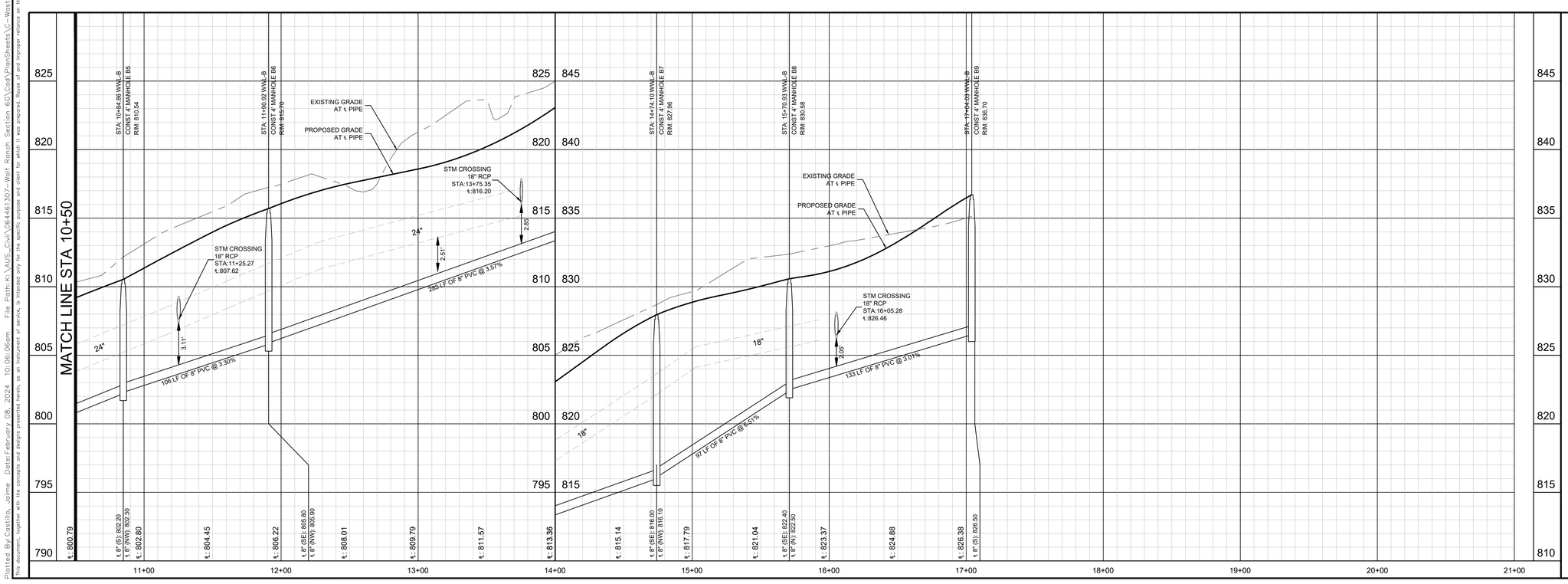




UTILITY LEGEND

- PROPERTY LINE
- PROPOSED WASTE WATER LINE
- PROPOSED WATER LINE
- PROPOSED WASTE WATER MANHOLE
- WASTE WATER FLOW DIRECTION
- PROPOSED FIRE HYDRANT
- EXISTING OVERHEAD POWER LINE
- EXISTING WATER LINE
- EXISTING WASTE WATER LINE
- EXISTING STORM SEWER LINE
- EXISTING POWER POLE
- EXISTING FIRE HYDRANT
- EXISTING WATER METER
- EXISTING WASTE WATER MANHOLE

WWL-B



PROFILE SCALE
1" = 40' HORIZONTAL
1" = 4' VERTICAL

BENCHMARKS

ADD BENCHMARKS HERE

No.	REVISIONS	DATE	BY

Kimley»Horn
© 2024 KIMLEY-HORN AND ASSOCIATES, INC.
10814 JOLLYVILLE ROAD, CAMPUS IV, SUITE 200, AUSTIN, TX 78759
PHONE: 512-418-1771 FAX: 512-418-1791
WWW.KIMLEY-HORN.COM
TEXAS REGISTERED ENGINEERING FIRM F-928

STATE OF TEXAS
JOHN A. PICKENS
110631
LICENSED
PROFESSIONAL ENGINEER
02/02/2024

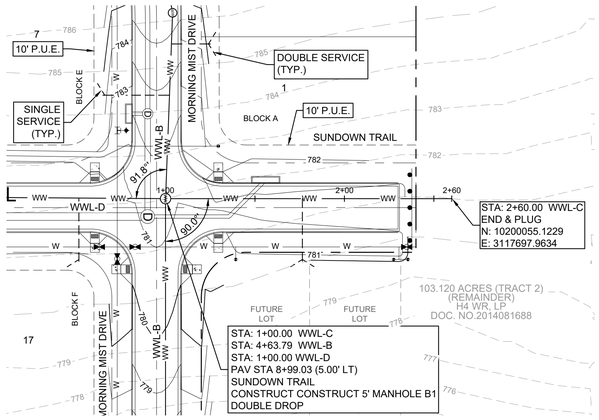
KHA PROJECT 064461307
DATE: DECEMBER 2023
SCALE: AS SHOWN
DESIGNED BY: RRJ
DRAWN BY: AJM
CHECKED BY: JAP

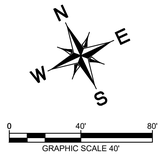
WASTEWATER PLAN AND PROFILE-WWL-B (2 OF 2)

WOLF RANCH
SECTION 6G
CITY OF GEORGETOWN
WILLIAMSON COUNTY, TEXAS

SHEET NUMBER
71 OF 87

Plotted By:Castillo, Jaime Date:February 08, 2024 10:06:06am File Path:K:\AUS_Civil\064461307-Wolf Ranch Section 6G\Cad\PlanSheets\C-Wastewater Plan and Profile-B2.dwg
This document, together with the concepts and designs presented herein, is an instrument of service, is intended only for the specific purpose and client for which it was prepared. Reuse of and improper reliance on this document without written authorization and adaptation by Kimley-Horn and Associates, Inc. shall be without liability to Kimley-Horn and Associates, Inc.

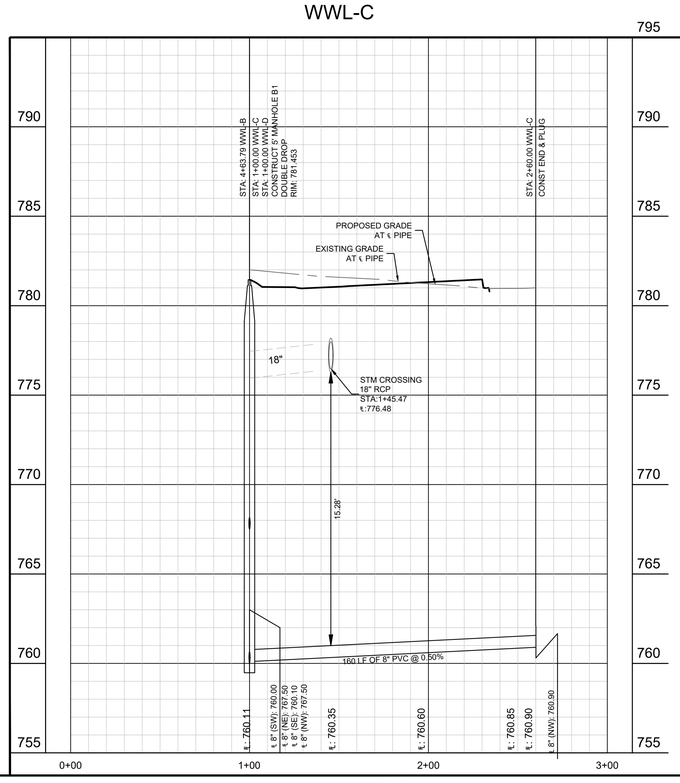


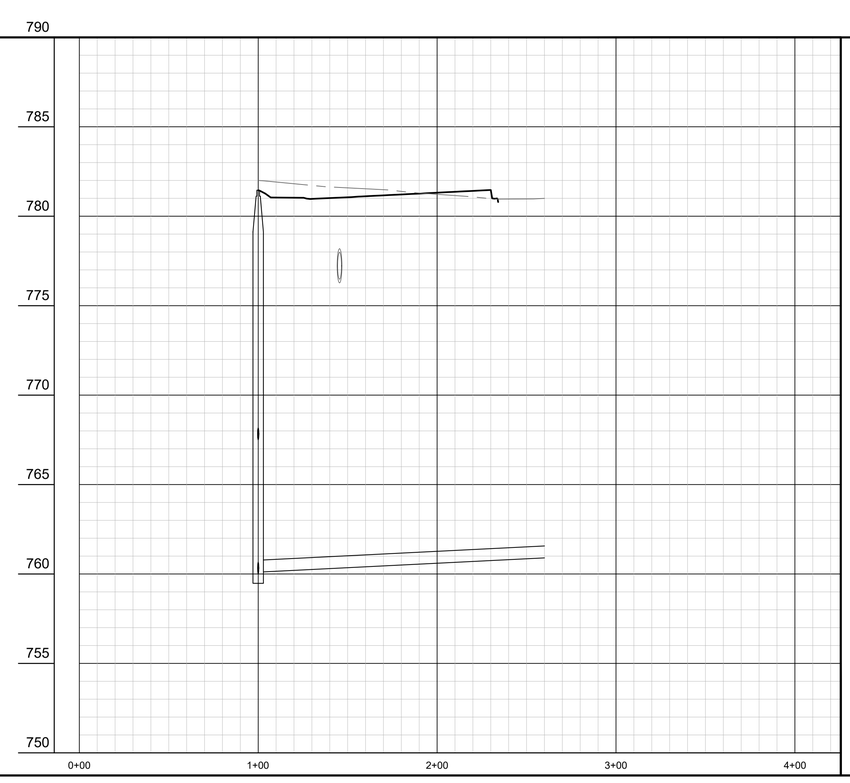


UTILITY LEGEND

- PROPERTY LINE
- PROPOSED WASTE WATER LINE
- PROPOSED WATER LINE
- PROPOSED WASTE WATER MANHOLE
- WASTE WATER FLOW DIRECTION
- PROPOSED FIRE HYDRANT
- EXISTING OVERHEAD POWER LINE
- EXISTING WATER LINE
- EXISTING WASTE WATER LINE
- EXISTING STORM SEWER LINE
- EXISTING POWER POLE
- EXISTING FIRE HYDRANT
- EXISTING WATER METER
- EXISTING WASTE WATER MANHOLE

WWL-C





PROFILE SCALE
1" = 40' HORIZONTAL
1" = 4' VERTICAL

BENCHMARKS

ADD BENCHMARKS HERE

No.	REVISIONS	DATE	BY

Kimley»Horn
© 2024 KIMLEY-HORN AND ASSOCIATES, INC.
10814 JOLLYVILLE ROAD, CAMPUS IV, SUITE 200, AUSTIN, TX 78759
PHONE: 512-418-1771 FAX: 512-418-1791
WWW.KIMLEY-HORN.COM
TEXAS REGISTERED ENGINEERING FIRM F-928

STATE OF TEXAS
JOHN A. PICKENS
110631
LICENSED
PROFESSIONAL ENGINEER
02/02/2024

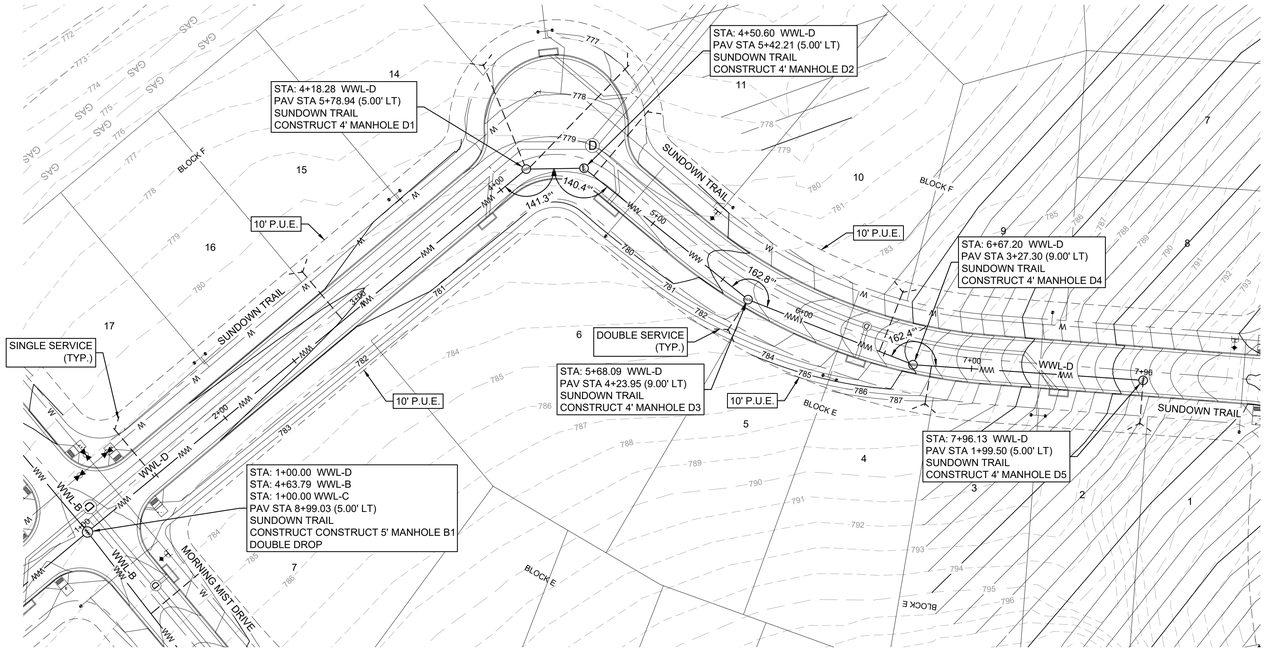
KHA PROJECT 064481307
DATE DECEMBER 2023
SCALE: AS SHOWN
DESIGNED BY: RRJ
DRAWN BY: AJM
CHECKED BY: JAP

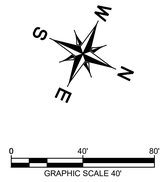
WASTEWATER PLAN AND PROFILE-WWL-C

WOLF RANCH
SECTION 6G
CITY OF GEORGETOWN
WILLIAMSON COUNTY, TEXAS

SHEET NUMBER
72 OF 87

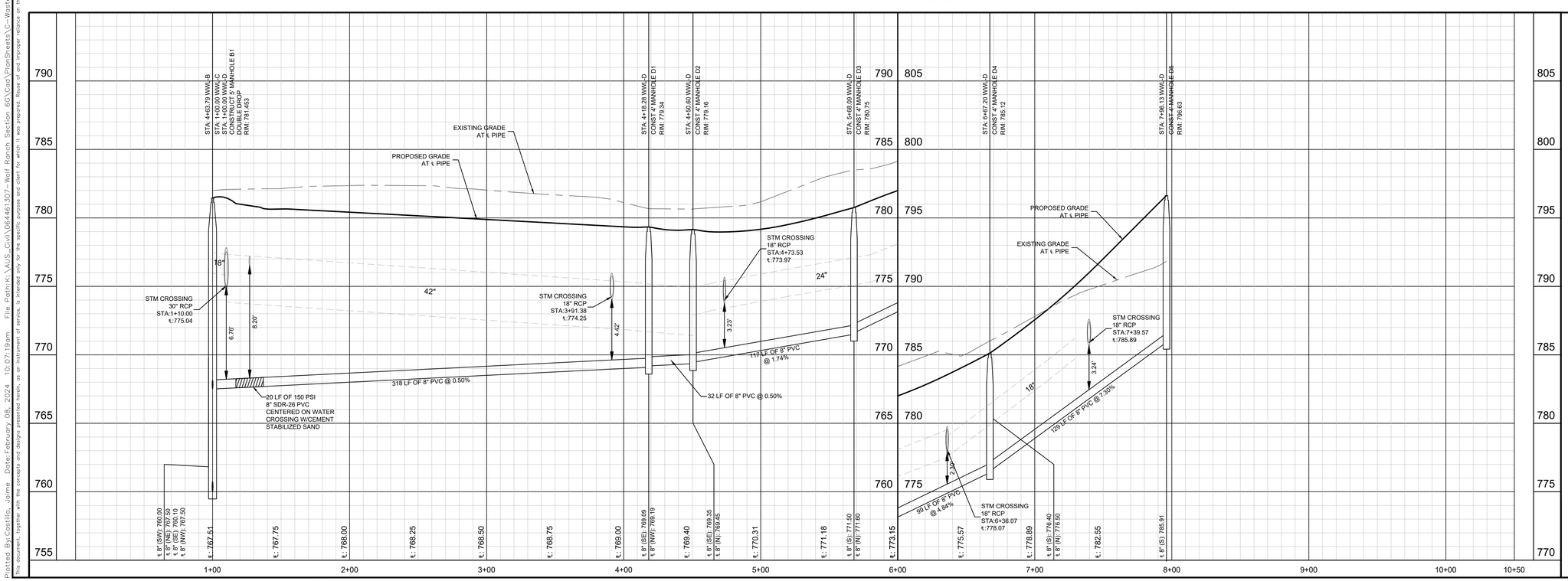
Plotted By:Castillo, Jaime Date:February 08, 2024 10:06:40am File Path:K:\AUS_Civil\064481307-Wolf Ranch Section 6G\Cad\PlanSheets\C-Wastewater Plan and Profile-C1.dwg
This document, together with the concepts and designs presented herein, as an instrument of service, is intended only for the specific purpose and client for which it was prepared. Reuse of and improper reliance on this document without written authorization and adaptation by Kimley-Horn and Associates, Inc. shall be without liability to Kimley-Horn and Associates, Inc.





UTILITY LEGEND

- PROPERTY LINE
- PROPOSED WASTE WATER LINE
- PROPOSED WATER LINE
- PROPOSED WASTE WATER MANHOLE
- WASTE WATER FLOW DIRECTION
- PROPOSED FIRE HYDRANT
- EXISTING OVERHEAD POWER LINE
- EXISTING WATER LINE
- EXISTING WASTE WATER LINE
- EXISTING STORM SEWER LINE
- EXISTING POWER POLE
- EXISTING FIRE HYDRANT
- EXISTING WATER METER
- EXISTING WASTE WATER MANHOLE



PROFILE SCALE
1" = 40' HORIZONTAL
1" = 4' VERTICAL

BENCHMARKS

ADD BENCHMARKS HERE

No.	REVISIONS	DATE	BY

Kimley»Horn
© 2024 KIMLEY-HORN AND ASSOCIATES, INC.
10814 JOLLYVILLE ROAD, CAMPUS IV, SUITE 200, AUSTIN, TX 78759
PHONE: 512-418-1771 FAX: 512-418-1791
WWW.KIMLEY-HORN.COM
TEXAS REGISTERED ENGINEERING FIRM F-928

STATE OF TEXAS
JOHN A. PICKENS
110631
LICENSED
PROFESSIONAL ENGINEER
02/02/2024

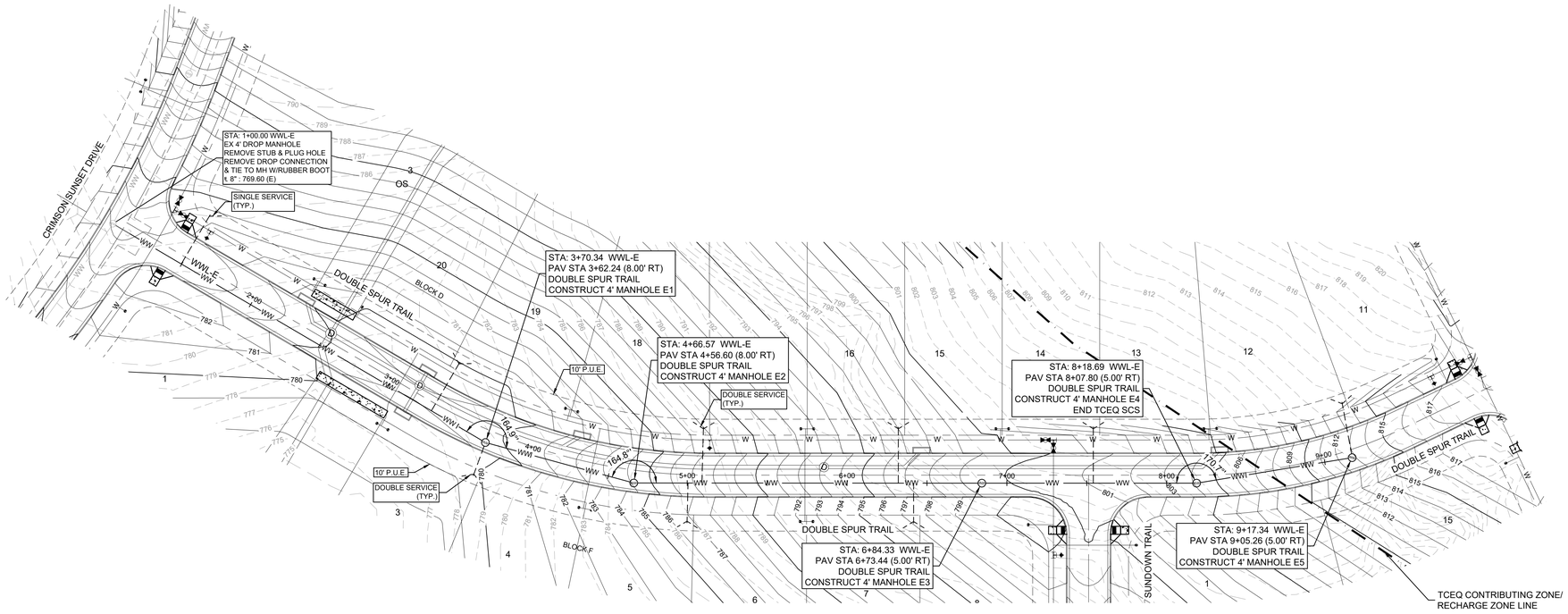
KHA PROJECT 064461307
DATE DECEMBER 2023
SCALE: AS SHOWN
DESIGNED BY: RRJ
DRAWN BY: AJM
CHECKED BY: JAP

WASTEWATER PLAN AND PROFILE-WWL-D

WOLF RANCH
SECTION 6G
CITY OF GEORGETOWN
WILLIAMSON COUNTY, TEXAS

SHEET NUMBER
73 OF 87

Plotted By:Castillo, Jaime Date:February 08, 2024 10:07:19am File Path:K:\AUS_Civil\064461307-Wolf Ranch Section 6G\Cad\PlanSheets\C-Wastewater Plan and Profile-D1.dwg
This document, together with the concepts and designs presented herein, as an instrument of service, is intended only for the specific purpose and client for which it was prepared. Reuse of and improper reliance on this document without written authorization and adaptation by Kimley-Horn and Associates, Inc. shall be without liability to Kimley-Horn and Associates, Inc.



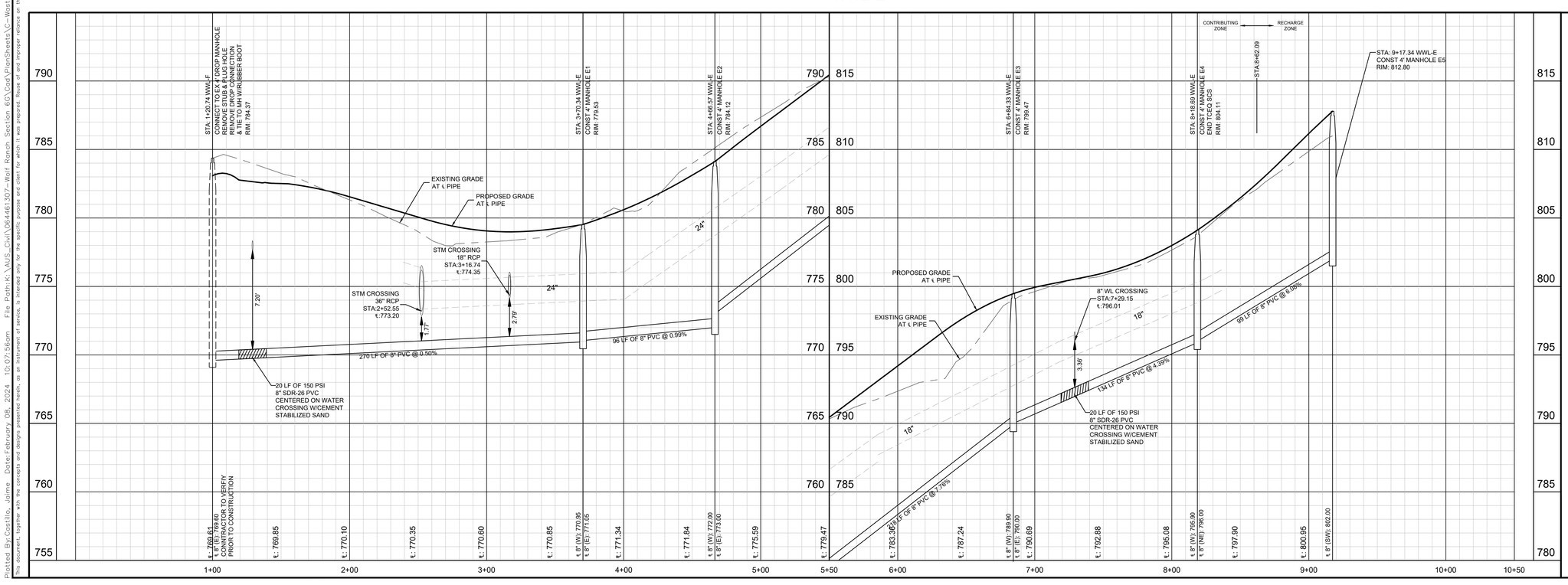
N
W E
S

0 40' 80'
GRAPHIC SCALE 40'

UTILITY LEGEND

- PROPERTY LINE
- PROPOSED WASTE WATER LINE
- PROPOSED WATER LINE
- PROPOSED WASTE WATER MANHOLE
- WASTE WATER FLOW DIRECTION
- PROPOSED FIRE HYDRANT
- EXISTING OVERHEAD POWER LINE
- EXISTING WATER LINE
- EXISTING WASTE WATER LINE
- EXISTING STORM SEWER LINE
- EXISTING POWER POLE
- EXISTING FIRE HYDRANT
- EXISTING WATER METER
- EXISTING WASTE WATER MANHOLE

WWL-E



PROFILE SCALE
1" = 40' HORIZONTAL
1" = 4' VERTICAL

BENCHMARKS

ADD BENCHMARKS HERE

No.	REVISIONS	DATE	BY

Kimley»Horn
© 2024 KIMLEY-HORN AND ASSOCIATES, INC.
10814 JOLLYVILLE ROAD, CAMPUS IV, SUITE 200, AUSTIN, TX 78759
PHONE: 512-418-1771 FAX: 512-418-1791
WWW.KIMLEY-HORN.COM
TEXAS REGISTERED ENGINEERING FIRM F-928

STATE OF TEXAS
JOHN A. PICKENS
110631
LICENSED
PROFESSIONAL ENGINEER
02/02/2024

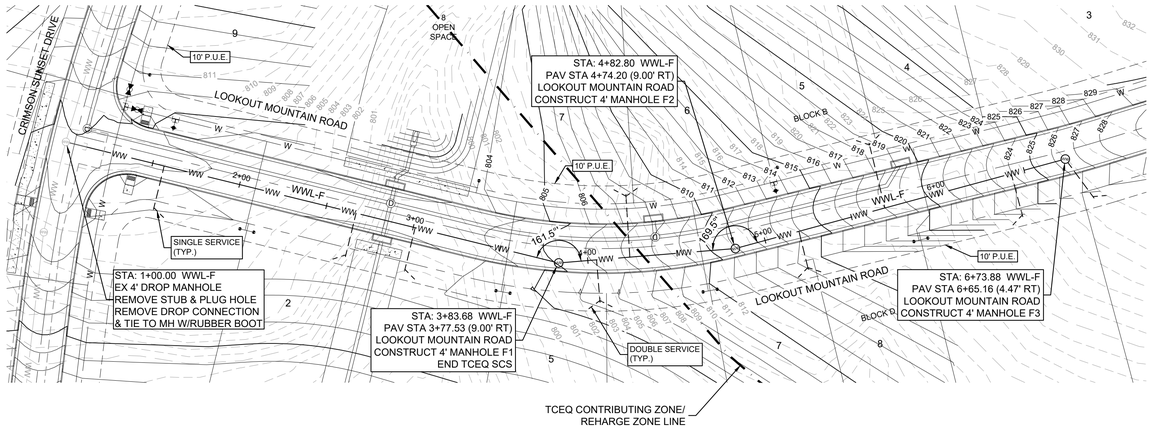
KHA PROJECT 064481307
DATE DECEMBER 2023
SCALE: AS SHOWN
DESIGNED BY: RRJ
DRAWN BY: AJM
CHECKED BY: JAP

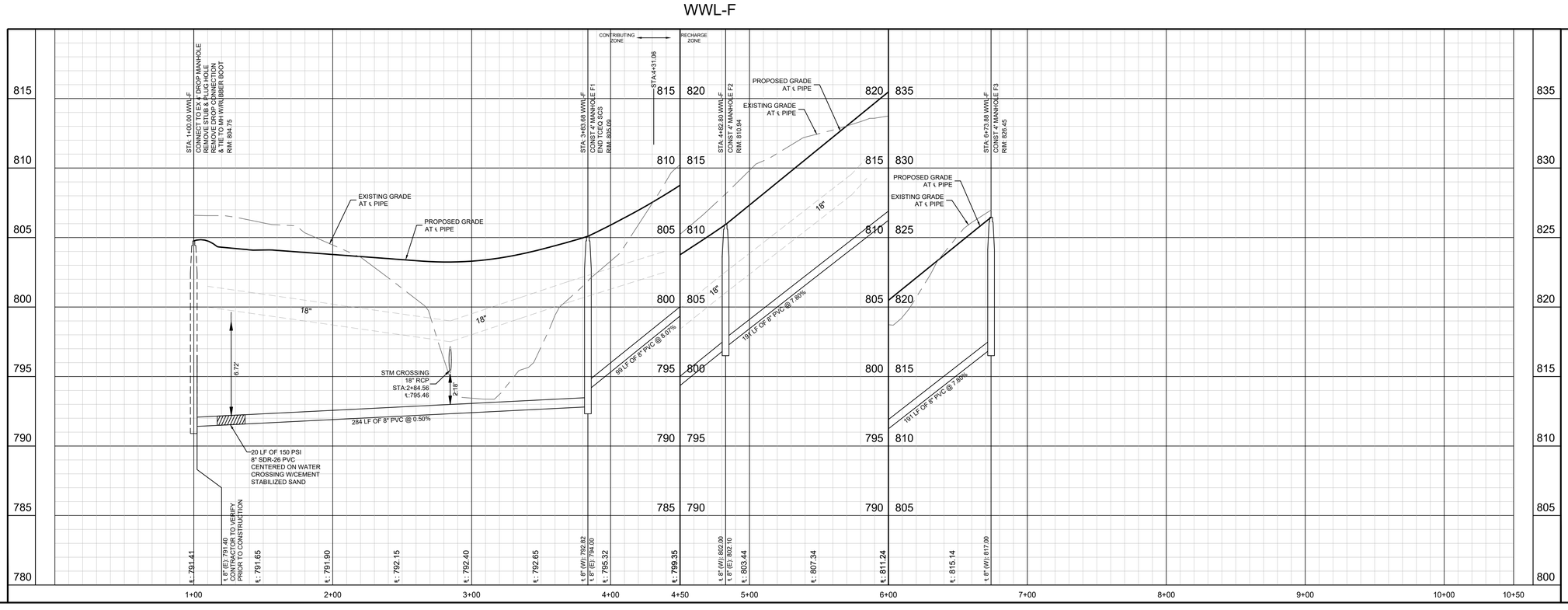
WASTEWATER PLAN AND PROFILE-WWL-E

WOLF RANCH
SECTION 6G
CITY OF GEORGETOWN
WILLIAMSON COUNTY, TEXAS

SHEET NUMBER
74 OF 87

This document, together with the concepts and designs presented herein, as an instrument of service, is intended only for the specific purpose and client for which it was prepared. Reuse of and improper reliance on this document without written authorization and adaptation by Kimley-Horn and Associates, Inc. shall be without liability to Kimley-Horn and Associates, Inc.
Plotted By:Castillo, Jaime Date:February 08, 2024 10:07:56am File Path:K:\AUS_Civil\064481307-Wolf Ranch Section 6G\Cad\PlanSheets\C-Wastewater Plan and Profile-E1.dwg





PROFILE SCALE
1" = 40' HORIZONTAL
1" = 4' VERTICAL

BENCHMARKS
ADD BENCHMARKS HERE

UTILITY LEGEND

- PROPERTY LINE
- PROPOSED WASTE WATER LINE
- PROPOSED WATER LINE
- PROPOSED WASTE WATER MANHOLE
- WASTE WATER FLOW DIRECTION
- PROPOSED FIRE HYDRANT
- EXISTING OVERHEAD POWER LINE
- EXISTING WATER LINE
- EXISTING WASTE WATER LINE
- EXISTING STORM SEWER LINE
- EXISTING POWER POLE
- EXISTING FIRE HYDRANT
- EXISTING WATER METER
- EXISTING WASTE WATER MANHOLE

No.	REVISIONS	DATE	BY

Kimley»Horn
© 2024 KIMLEY-HORN AND ASSOCIATES, INC.
10814 JOLLYVILLE ROAD, CAMPUS IV, SUITE 200, AUSTIN, TX 78759
PHONE: 512-418-1771 FAX: 512-418-1791
WWW.KIMLEY-HORN.COM
TEXAS REGISTERED ENGINEERING FIRM F-928

STATE OF TEXAS
JOHN A. PICKENS
110631
LICENSED
PROFESSIONAL ENGINEER
02/02/2024

KHA PROJECT 064481307
DATE DECEMBER 2023
SCALE: AS SHOWN
DESIGNED BY: RRJ
DRAWN BY: AJM
CHECKED BY: JAP

WASTEWATER PLAN AND PROFILE-WWL-F

WOLF RANCH
SECTION 6G
CITY OF GEORGETOWN
WILLIAMSON COUNTY, TEXAS

SHEET NUMBER
75 OF 87

This document, together with the concepts and designs presented herein, as an instrument of service, is intended only for the specific purpose and client for which it was prepared. Reuse of and improper reliance on this document without written authorization and adaptation by Kimley-Horn and Associates, Inc. shall be without liability to Kimley-Horn and Associates, Inc.
Plotted By:Castillo, Jaime Date:February 08, 2024 10:09:08am File Path:K:\AUS_Civil\064481307-Wolf Ranch Section 6G\Cad\PlanSheets\C-Wastewater Plan and Profile-F1.dwg

GUIDELINES FOR DESIGN AND INSTALLATION OF TEMPORARY EROSION AND SEDIMENTATION CONTROLS

TYPE OF STRUCTURE	REACH LENGTH	MAXIMUM DRAINAGE AREA	SLOPE
SILT FENCE	N/A	2 ACRES	0 – 10%
	200 FEET	2 ACRES	10 – 20%
	100 FEET	1 ACRE	20 – 30%
	50 FEET	1/2 ACRE	> 30%
TRIANGLE FILTER DIKE	100 FEET	1/2 ACRE	< 30% SLOPE
	50 FEET	1/4 ACRE	> 30% SLOPE
ROCK BERM *, **	500 FEET	< 5 ACRES	0 – 10%

* FOR ROCK BERM DESIGN WHERE PARAMETERS ARE OTHER THAN STATED, DRAINAGE AREA CALCULATIONS AND ROCK BERM DESIGN MUST BE SUBMITTED FOR REVIEW.

** HIGH SERVICE ROCK BERMS MAY BE REQUIRED IN AREAS OF ENVIRONMENTAL SIGNIFICANCE AS DETERMINED BY THE CITY OF GEORGETOWN.

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

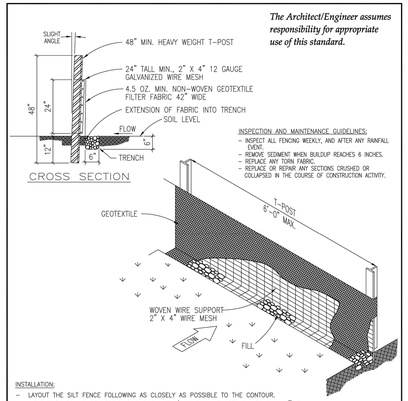
REVISION NOTE: ADOPTED 6/21/2006
DRAWING NAME:
CITY OF GEORGETOWN
CONSTRUCTION STANDARDS AND DETAILS
TEMPORARY EROSION AND SEDIMENTATION CONTROL GUIDELINES
EC01
SCALE: NTS | DATE: 1/2003 | DRAWN BY: MRS | APPROVED BY: TRB

NOTE: THIS SECTION IS INTENDED TO ASSIST THOSE PERSONS PREPARING WATER POLLUTION ABATEMENT PLANS (WPAP) OR STORM WATER POLLUTION PREVENTION PLANS (SWSP) THAT COMPLY WITH FEDERAL, STATE AND/OR LOCAL STORM WATER REGULATIONS.

1. THE CONTRACTOR TO INSTALL AND MAINTAIN EROSION/SEDIMENTATION CONTROLS AND TREE/NATURAL AREA PROTECTIVE FENCING PRIOR TO ANY SITE PREPARATION WORK (CLEARING, GRUBBING, GRADING, OR EXCAVATION). CONTRACTOR TO REMOVE EROSION/SEDIMENTATION CONTROLS AT THE COMPLETION OF PROJECT AND GRASS RESTORATION.
2. ALL PROJECTS WITHIN THE RECHARGE ZONE OF THE EDWARDS AQUIFER SHALL SUBMIT A BEST MANAGEMENT PRACTICES AND WATER POLLUTION AND ABATEMENT PLAN TO THE TNRCC FOR APPROVAL PRIOR TO ANY CONSTRUCTION.
3. THE PLACEMENT OF EROSION/SEDIMENTATION CONTROLS TO BE IN ACCORDANCE WITH THE APPROVED EROSION AND SEDIMENTATION CONTROL PLAN AND WATER POLLUTION ABATEMENT PLAN. DEVIATIONS FROM THE APPROVED PLAN MUST BE SUBMITTED TO AND APPROVED BY THE OWNER'S REPRESENTATIVE.
4. ALL PLANTING SHALL BE DONE BETWEEN MAY 1 AND SEPTEMBER 15 EXCEPT AS SPECIFICALLY AUTHORIZED IN WRITING. IF PLANTING IS AUTHORIZED TO BE DONE OUTSIDE THE DATES SPECIFIED, THE SEED SHALL BE PLANTED WITH THE ADDITION OF WINTER FESCUE (KENTUCKY 31) AT A RATE OF 100lb/ACRE. GRASS SHALL BE COMMON BERMUDA GRASS, HULLED, MINIMUM 82% PURE LIVE SEED. ALL GRASS SEED SHALL BE FREE FROM NOXIOUS WEED, GRADE "A" RECENT CROP, RECLEANED AND TREATED WITH APPROPRIATE FUNGICIDE AT TIME OF MIXING. SEED SHALL BE FURNISHED IN SEALED, STANDARD CONTAINERS WITH DEALER'S GUARANTEED ANALYSIS.
5. ALL DISTURBED AREAS TO BE RESTORED AS NOTED IN THE WATER POLLUTION ABATEMENT PLAN.
6. THE PLANTED AREA TO BE IRRIGATED OR SPRINKLED IN A MANNER THAT WILL NOT ERODE THE TOPSOIL, BUT WILL SUFFICIENTLY SOAK THE SOIL TO A DEPTH OF FOUR (4) INCHES. THE IRRIGATION TO OCCUR AT 10–DAY INTERVALS DURING THE FIRST TWO MONTHS TO INSURE GERMINATION AND ESTABLISHMENT OF THE GRASS . RAINFALL OCCURRENCES OF 1/2 INCH OR GREATER TO POSTPONE THE WATERING SCHEDULE ONE WEEK.
7. RESTORATION TO BE ACCEPTABLE WHEN THE GRASS HAS GROWN AT LEAST 1–1/2 INCHES HIGH WITH 95.E COVERAGE, PROVIDED NO BARE SPOTS LARGER THAN 25 SQUARE FEET EXIST.
8. A MINIMUM OF FOUR (4) INCHES OF TOPSOIL TO BE PLACED IN ALL AREAS DISTURBED BY CONSTRUCTION.
9. THE CONTRACTOR TO HYDROMULCH OR SOD (AS SHOWN ON PLANS) ALL EXPOSED CUTS AND FILLS UPON COMPLETION OF CONSTRUCTION.
10. EROSION AND SEDIMENTATION CONTROLS TO BE INSTALLED OR MAINTAINED IN A MANNER WHICH DOES NOT RESULT IN SOIL BUILDUP WITHIN TREE DRIPLINE.
11. TO AVOID SOIL COMPACTION, CONTRACTOR SHALL NOT ALLOW VEHICULAR TRAFFIC, PARKING, OR STORAGE OF EQUIPMENT OR MATERIALS IN THE TREE DRIPLINE AREAS.
12. WHERE A FENCE IS CLOSER THAN FOUR (4) FEET TO A TREE TRUNK, PROTECT THE TRUNK WITH STRAPPED–ON PLANKING TO A HEIGHT OF EIGHT (8) FEET (OR TO THE LIMITS OF LOWER BRANCHING) IN ADDITION TO THE FENCING.
13. TREES TO BE REMOVED IN A MANNER WHICH DOES NOT IMPACT TREES TO BE PRESERVED.
14. ANY ROOT EXPOSED BY CONSTRUCTION ACTIVITY TO BE PRUNED FLUSH WITH THE SOIL. BACKFILL ROOT AREAS WITH GOOD QUALITY TOPSOIL AS SOON AS POSSIBLE. IF EXPOSED ROOT AREAS ARE NOT BACKFILLED WITHIN TWO DAYS, COVER THEM WITH ORGANIC MATERIAL IN A MANNER WHICH REDUCES SOIL TEMPERATURE AND MINIMIZES WATER LOSS DUE TO EVAPORATION.
15. CONTRACTOR TO PRUNE VEGETATION TO PROVIDE CLEARANCE FOR STRUCTURES, VEHICULAR TRAFFIC, AND EQUIPMENT BEFORE DAMAGE OCCURS (RIPPING OF BRANCHES, ETC.). ALL FINISHED PRUNING TO BE DONE ACCORDING TO RECOGNIZED, APPROVED STANDARDS OF THE INDUSTRY (REFERENCE THE "NATIONAL ARBORIST ASSOCIATION PRUNING STANDARDS FOR SHADE TREES").
16. THE CONTRACTOR IS TO INSPECT THE CONTROLS AT WEEKLY INTERVALS AND AFTER EVERY RAINFALL EXCEEDING 1/4 INCH TO VERIFY THAT THEY HAVE NOT BEEN SIGNIFICANTLY DISTURBED. ANY ACCUMULATED SEDIMENT AFTER A SIGNIFICANT RAINFALL TO BE REMOVED AND PLACED IN THE OWNER DESIGNATED SPOIL DISPOSAL SITE. THE CONTRACTOR TO CONDUCT PERIODIC INSPECTIONS OF ALL EROSION/SEDIMENTATION CONTROLS AND TO MAKE ANY REPAIRS OR MODIFICATIONS NECESSARY TO ASSURE CONTINUED EFFECTIVE OPERATION OF EACH DEVICE.
17. WHERE THERE IS TO BE AN APPROVED GRADE CHANGE, IMPERMEABLE PAVING SURFACE, TREE WELL, OR OTHER SUCH SITE DEVELOPMENT IMMEDIATELY ADJACENT TO A PROTECTED TREE, ERECT THE FENCE APPROXIMATELY TWO TO FOUR FEET (2'–4') BEHIND THE AREA IN QUESTION.
18. NO ABOVE AND/OR BELOW GROUND TEMPORARY FUEL STORAGE FACILITIES TO BE STORED ON THE PROJECT SITE.
19. IF EROSION AND SEDIMENTATION CONTROL SYSTEMS ARE EXISTING FROM PRIOR CONTRACTS, OWNER'S REPRESENTATIVE AND THE CONTRACTOR TO EXAMINE THE EXISTING EROSION AND SEDIMENTATION CONTROL SYSTEMS FOR DAMAGE PRIOR TO CONSTRUCTION. ANY DAMAGE TO PREEXISTING EROSION AND SEDIMENTATION CONTROLS NOTED TO BE REPAIRED AT OWNERS EXPENSE.
20. INTENTIONAL RELEASE OF VEHICLE OR EQUIPMENT FLUIDS ONTO THE GROUND IS NOT ALLOWED. CONTAMINATED SOIL RESULTING FROM ACCIDENTAL SPILL TO BE REMOVED AND DISPOSED OF PROPERLY.

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

REVISION NOTE: ADOPTED 6/21/2006
DRAWING NAME:
CITY OF GEORGETOWN
CONSTRUCTION STANDARDS AND DETAILS
EROSION AND SEDIMENTATION AND TREE PROTECTION NOTES
EC01A
SCALE: NTS | DATE: 1/2003 | DRAWN BY: MRS | APPROVED BY: TRB

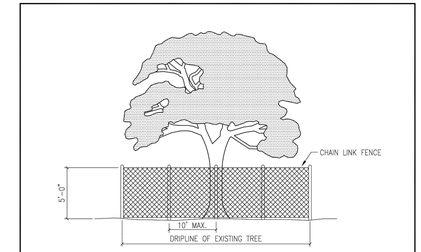


The Architect/Engineer assumes responsibility for appropriate use of this standard.

INSPECTION AND MAINTENANCE GUIDELINES:
- INSPECT ALL FENCING WEEKLY, AND AFTER ANY RAINFALL EVENT
- REMOVE SEDIMENT WHEN BUILDUP REACHES 6 INCHES.
- REPLACE ANY TORN FABRIC.
- REPLACE OR REPAIR ANY SECTIONS CRUSHED OR COLLAPSED IN THE COURSE OF CONSTRUCTION ACTIVITY.

INSTALLATION:
- LAYOUT THE SILT FENCE FOLLOWING AS CLOSELY AS POSSIBLE TO THE CONTOUR.
- CLEAR THE GROUND OF DEBRIS, ROCKS, PLANTS (INCLUDING GRASSES TALLER THAN 2") TO PROVIDE A SMOOTH FLOW APPROACH SURFACE. EXCAVATE 6" DEEP X 6" WIDE TRENCH ON UPSTREAM SIDE OF FACE PER PLANS.
- DRIVE THE HEAVY DUTY T–POST AT LEAST 12 INCHES INTO THE GROUND AND AT A SLIGHT ANGLE TOWARDS THE FLOW.
- ATTACH THE 2" X 4" 12 GAUGE WELDED WIRE MESH TO THE T–POST WITH 11 1/2 GAUGE GALVANIZED T–POST CLIPS. THE TOP OF THE WIRE TO BE 24" ABOVE GROUND LEVEL. THE WELDED WIRE MESH TO BE OVERLAPPED 6" AND TIED AT LEAST 6 TIMES WITH HOG RINGS.
- THE SILT FENCE TO BE INSTALLED WITH A SKIRT A MINIMUM OF 6" WIDE PLACED ON THE UPHILL SIDE OF THE FENCE INSIDE EXCAVATED TRENCH. THE FABRIC TO OVERLAP THE TOP OF THE WIRE BY 1".
- ANCHOR THE SILT FENCE BY BACKFILLING WITH EXCAVATED DIRT AND ROCKS (NOT LARGER THAN 2").
- GEOTEXTILE SPLICES SHOULD BE A MINIMUM OF 18" WIDE ATTACHED IN AT LEAST 6 PLACES. SPLICES IN CONCENTRATED FLOW AREAS WILL NOT BE ACCEPTED.
- SILT FENCE SHALL BE REMOVED WHEN THE SITE IS COMPLETELY STABILIZED SO AS NOT TO BLOCK OR IMPEDE STORM FLOW OR DRAINAGE.

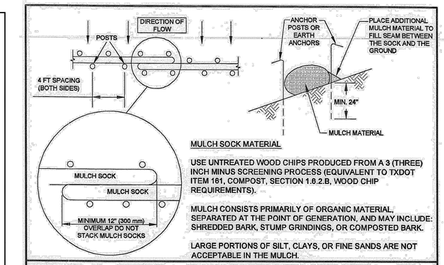
REVISION NOTE: ADOPTED 6/21/2006
DRAWING NAME:
CITY OF GEORGETOWN
CONSTRUCTION STANDARDS AND DETAILS
SILT FENCE DETAIL
EC02
SCALE: NTS | DATE: 1/2003 | DRAWN BY: MRS | APPROVED BY: TRB



NOTES:
1. TREE PROTECTION FENCES SHALL BE INSTALLED PRIOR TO THE COMMENCEMENT OF ANY SITE PREPARATION WORK (CLEARING, GRUBBING OR GRADING).
2. FENCES SHALL COMPLETELY SURROUND THE TREE, OR CLUSTERS OF TREES; WILL BE LOCATED AT THE OUTERMOST LIMIT OF THE TREE BRANCHES (DRIPLINE), AND WILL BE MAINTAINED THROUGHOUT THE CONSTRUCTION PROJECT IN ORDER TO PREVENT THE FOLLOWING:
   A. SOIL COMPACTION IN THE ROOT ZONE AREA RESULTING FROM VEHICULAR TRAFFIC, OR STORAGE OF EQUIPMENT OR MATERIALS.
   B. ROOT ZONE DISTURBANCES DUE TO GRADE CHANGES (GREATER THAN SIX INCHES (6") CUT OR FILL, OR TRENCHING NOT REVIEWED AND AUTHORIZED BY THE CITY.
   C. WOUNDS TO EXPOSED ROOTS, TRUNKS OR LIMBS BY MECHANICAL EQUIPMENT.
   D. OTHER ACTIVITIES DETRIMENTAL TO TREES, SUCH AS CHEMICAL STORAGE, CEMENT TRUCK CLEANING AND FIRE.
3. EXCEPTIONS TO INSTALLING FENCES AT TREE DRIPLINES MAY BE PERMITTED IN THE FOLLOWING CASES:
   A. WHERE PERMEABLE PAVING IS TO BE INSTALLED, ERECT THE FENCE AT THE OUTER LIMITS OF THE PERMEABLE PAVING AREA.
   B. WHERE TREES ARE CLOSE TO PROPOSED BUILDINGS, ERECT THE FENCE NO CLOSER THAN SIX FEET (6'–0") TO BUILDING.

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

REVISION NOTE: ADOPTED 6/21/2006
DRAWING NAME:
CITY OF GEORGETOWN
CONSTRUCTION STANDARDS AND DETAILS
TREE PROTECTION – CHAIN LINK FENCE
EC09
SCALE: NTS | DATE: 1/2003 | DRAWN BY: MRS | APPROVED BY: TRB



MULCH SOCK MATERIAL

USE UNTREATED WOOD CHIPS PRODUCED FROM A 3 (THREE) INCH MINUS SCREENING PROCESS (EQUIVALENT TO TXDOT ITEM 161, COMPOST, SECTION 1.8.2.B, WOOD CHIP REQUIREMENTS).

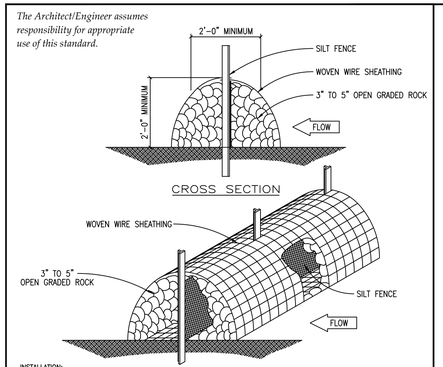
MULCH CONSISTS PRIMARILY OF ORGANIC MATERIAL, SEPARATED AT THE POINT OF GENERATION, AND MAY INCLUDE: SHREDDED BARK, STUMP GRINDINGS, OR COMPOSTED BARK.

LARGE PORTIONS OF SILT, CLAYS, OR FINE SANDS ARE NOT ACCEPTABLE IN THE MULCH.

NOTES:
1. STEEL OR WOOD POSTS WHICH SUPPORT THE MULCH SOCK SHALL BE INSTALLED ON A SLIGHT ANGLE TOWARD THE ANTICIPATED RUNOFF SOURCE. POST MUST BE EMBEDDED A MINIMUM OF 600mm (24 inches). IF WOOD POSTS CANNOT ACHIEVE 600mm (24 inches) DEPTH, USE STEEL POSTS. EARTH ANCHORS ARE ALSO ACCEPTABLE.
2. THE TOE OF THE MULCH SOCK SHALL BE PLACED SO THAT THE MULCH SOCK IS FLAT AND PERPENDICULAR TO THE LINE OF FLOW. IN ORDER TO PREVENT WATER FROM FLOWING BETWEEN THE JOINTS OF ADJACENT ENDS OFMULCH SOCKS, LAP THE ENDS OF ADJACENT MULCH SOCKS A MINIMUM OF 300mm (12 inches).
3. MULCH MATERIAL MUST BE FREE OF REFUSE, PHYSICAL CONTAMINANTS, AND MATERIAL TOXIC TO PLANT GROWTH; IT IS NOT ACCEPTABLE FOR THE MULCH MATERIAL TO CONTAIN GROUND CONSTRUCTION DEBRIS, BIOSOLIDS, OR MANURE.
4. SOCK MATERIAL WILL BE 100% BIODEGRADABLE, PHOTODEGRADABLE, OR RECYCLABLE SUCH AS BURLAP, TWINE, UV PHOTOBIODEGRADABLE PLASTIC, POLYESTER, OR ANY OTHER ACCEPTABLE MATERIAL.
5. MULCH SOCKS SHOULD BE USED AT THE BASE OF SLOPES NO STEEPER THAN 2:1 AND SHOULD NOT EXCEED THE MAXIMUM SPACING CRITERIA PROVIDED IN CITY OF AUSTIN ENVIRONMENTAL CRITERIA MANUAL TABLE 1.4.5.F.1 FOR A GIVEN SLOPE CATEGORY.
6. ACCUMULATED SILT SHALL BE REMOVED WHEN IT REACHES A DEPTH OF 150mm (6 inches). THE SILT SHALL BE DISPOSED OF ON AN APPROVED SITE AND IN SUCH A MANNER THAT WILL NOT CONTRIBUTE TO ADDITIONAL SILTATION.

CITY OF AUSTIN
WATERSHED PROTECTION DEPARTMENT
08/24/2010
ADOPTED
MULCH SOCK
THE ARCHITECT/ENGINEER ASSUMES RESPONSIBILITY FOR APPROPRIATE USE OF THIS STANDARD.
STANDARD NO. 648S-1

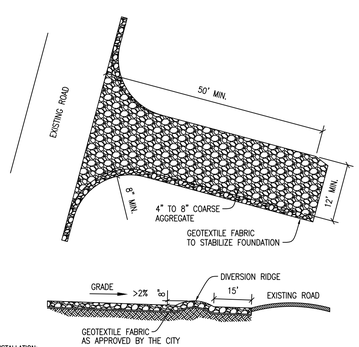
The Architect/Engineer assumes responsibility for appropriate use of this standard.



INSTALLATION:
- LAYOUT THE ROCK BERM FOLLOWING AS CLOSELY AS POSSIBLE TO THE CONTOUR.
- CLEAR THE GROUND OF DEBRIS, ROCKS OR PLANTS THAT WILL INTERFERE WITH INSTALLATION.
- PLACE WOVEN WIRE FABRIC ON THE GROUND ALONG THE PROPOSED INSTALLATION WITH ENOUGH OVERLAP TO COMPLETELY ENCIRCLE THE FINISHED SIZE OF THE BERM.
- INSTALL THE SILT FENCE ALONG THE CENTER OF THE PROPOSED BERM PLACEMENT. INSTALLATION SHOULD BE AS DESCRIBED IN DRAWING NO. EC–02 "SILT FENCE DETAIL".
- PLACE THE ROCK ALONG THE CENTER OF THE WIRE AND ON BOTH SIDES OF THE SILT FENCE TO THE DESIGNATED HEIGHT.
- WRAP THE STRUCTURE WITH THE PREVIOUSLY PLACED WIRE MESH SECURE ENOUGH SO THAT WHEN WALKED ACROSS THE STRUCTURE RETAINS IT'S SHAPE.
- SECURE WITH TIE WIRE.
- THE ROCK BERM SHOULD BE LEFT IN PLACE UNTIL ALL UPSTREAM AREAS ARE STABILIZED AND ACCUMULATED SILT REMOVED.

INSPECTION AND MAINTENANCE GUIDELINES:
- INSPECTION SHOULD BE MADE WEEKLY AND AFTER EACH RAINFALL EVENT BY THE CONTRACTOR. FOR THE INSTALLATIONS IN STREAMBEDS, ADDITIONAL DAILY INSPECTIONS SHOULD BE MADE ON ROCK BERM.
- REMOVE SEDIMENT AND OTHER DEBRIS WHEN BUILDUP REACHES 6 INCHES AND DISPOSE OF THE ACCUMULATED SILT IN AN APPROVED MANNER.
- REPAIR ANY LOOSE WIRE SHEATHING.
- THE BERM SHOULD BE RESHAPED AS NEEDED DURING INSPECTION.
- THE BERM SHOULD BE REPLACED WHEN THE STRUCTURE CEASES TO FUNCTION AS INTENDED DUE TO SILT ACCUMULATION AMONG THE ROCKS, WASHOUT, CONSTRUCTION TRAFFIC DAMAGE, ETC.

REVISION NOTE: ADOPTED 6/21/2006
DRAWING NAME:
CITY OF GEORGETOWN
CONSTRUCTION STANDARDS AND DETAILS
HIGH SERVICE ROCK BERM DETAIL
EC04
SCALE: NTS | DATE: 1/2003 | DRAWN BY: MRS | APPROVED BY: TRB

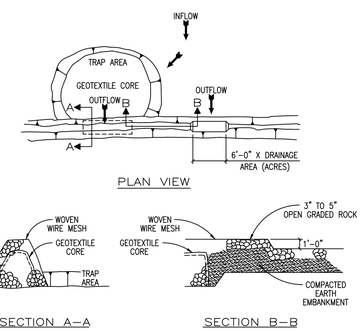


INSTALLATION:
- CLEAR THE AREA OF DEBRIS, ROCKS OR PLANTS THAT WILL INTERFERE WITH INSTALLATION.
- GRADE THE AREA FOR THE ENTRANCE TO FLOW BACK ON TO THE CONSTRUCTION SITE. RUNOFF FROM THE STABILIZED CONSTRUCTION
- PLACE GEOTEXTILE FABRIC AS APPROVED BY THE CITY.
- PLACE ROCK AS APPROVED BY THE CITY.

INSPECTIONS AND MAINTENANCE GUIDELINES:
- THE ENTRANCE SHOULD BE MAINTAINED IN A CONDITION, WHICH WILL PREVENT TRACKING OR FLOWING OF SEDIMENT ONTO PUBLIC RIGHTS–OF–WAY. THIS MAY REQUIRE PERIODIC TOP DRESSING WITH ADDITIONAL STONE AS CONDITIONS DEMAND AND REPAIR AND/OR CLEANOUT OF ANY MEASURES USED TO TRAP SEDIMENT.
- ALL SEDIMENT SPILLED, DROPPED, WASHED OR TRACKED ON TO PUBLIC RIGHTS–OF–WAY SHOULD BE REMOVED IMMEDIATELY BY CONTRACTOR.
- WHEN NECESSARY, WHEELS SHOULD BE CLEANED TO REMOVE SEDIMENT PRIOR TO ENTRANCE ONTO PUBLIC RIGHTS–OF–WAY.
- WHEN WASHING IS REQUIRED, IT SHOULD BE DONE ON AN AREA STABILIZED WITH CRUSHED STONE THAT DRAINS INTO AN APPROVED SEDIMENT TRAP OR SEDIMENT BASIN.
- ALL SEDIMENT SHOULD BE PREVENTED FROM ENTERING ANY STORM DRAIN, DITCH OR WATER COURSE BY USING APPROVED METHODS.

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

REVISION NOTE: ADOPTED 6/21/2006
DRAWING NAME:
CITY OF GEORGETOWN
CONSTRUCTION STANDARDS AND DETAILS
STABILIZED CONSTRUCTION ENTRANCE
EC06
SCALE: NTS | DATE: 1/2003 | DRAWN BY: MRS | APPROVED BY: TRB

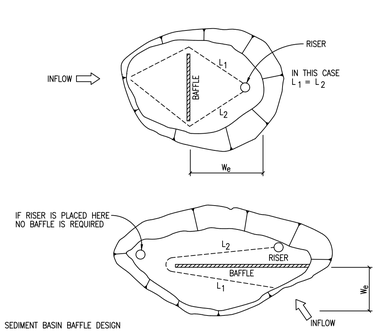


INSTALLATION:
- LOCATE THE SEDIMENT TRAP SO AS TO DISTURB AS FEW TREES AS POSSIBLE.
- CLEAR AND GRUB THE AREA UNDER THE EMBANKMENT OF ALL VEGETATION AND ROOT MATS.
- LAYOUT THE WIRE MESH AND THEN THE GEOTEXTILE FABRIC.
- CONSTRUCT THE GEOTEXTILE CORE AND CORRESPONDING ROCK EMBANKMENT TO THE DESIGNATED HEIGHT AND CONFIGURATION.
- WRAP THE STRUCTURE WITH THE PREVIOUSLY PLACED WIRE MESH SECURE ENOUGH SO THAT WHEN WALKED ACROSS THE STRUCTURE RETAINS IT'S SHAPE. SECURE WITH TIE WIRE.
- PLACE THE EMBANKMENT MATERIAL IN 8 TO 12 INCH LIFTS AND MACHINE COMPACT.

INSPECTION AND MAINTENANCE GUIDELINES:
- INSPECTION SHOULD BE MADE WEEKLY AND AFTER EACH RAINFALL. CHECK THE EMBANKMENT, SPILLWAYS, AND OUTLET FOR EROSION DAMAGE AND INSPECT THE EMBANKMENT FOR PIPING AND SETTLEMENT. REPAIR SHOULD BE MADE PROMPTLY AS NEEDED BY THE CONTRACTOR.
- TRASH AND OTHER DEBRIS SHOULD BE REMOVED AND THE TRAP RESTORED TO ITS ORIGINAL DIMENSIONS WHEN THE SEDIMENT HAS ACCUMULATED TO HALF OF THE DESIGN DEPTH OF THE TRAP.
- SEDIMENT REMOVED FROM THE TRAP SHOULD BE DEPOSITED IN AN APPROVED SPOILS AREA AND IN SUCH A MANNER THAT IT WILL NOT CAUSE ADDITIONAL SILTATION.

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

REVISION NOTE: ADOPTED 6/21/2006
DRAWING NAME:
CITY OF GEORGETOWN
CONSTRUCTION STANDARDS AND DETAILS
SEDIMENT TRAP DETAIL
EC07
SCALE: NTS | DATE: 1/2003 | DRAWN BY: MRS | APPROVED BY: TRB



SEDIMENT BASIN BAFFLE DESIGN

$W_e = A / (L_1 + L_2)$

W_e = EFFECTIVE WIDTH OF BASIN

A = SURFACE AREA OF BASIN WHEN FILLED TO RISER CREST

L_1, L_2 = SHORTEST TRAVEL DISTANCE AROUND THE BAFFLE FROM INLET TO OUTLET

INSPECTION AND MAINTENANCE GUIDELINES:
- INSPECTION SHOULD BE MADE WEEKLY AND AFTER EACH RAINFALL. CHECK THE EMBANKMENT, SPILLWAYS, AND OUTLET FOR EROSION DAMAGE, AND INSPECT THE EMBANKMENT FOR PIPING AND SETTLEMENT. REPAIR SHOULD BE MADE PROMPTLY AS NEEDED BY THE CONTRACTOR.
- TRASH AND OTHER DEBRIS SHOULD BE REMOVED AFTER EACH RAINFALL TO PREVENT CLOGGING OF THE OUTLET STRUCTURE.
- ACCUMULATED SILT SHOULD BE REMOVED AND THE BASIN SHOULD BE RE–GRADED TO ITS ORIGINAL DIMENSIONS AT SUCH POINT THAT THE CAPACITY OF THE IMPOUNDMENT HAS BEEN REDUCED TO 1/2 OF ITS ORIGINAL STORAGE CAPACITY.
- THE REMOVED SEDIMENT SHOULD BE STOCKPILED OR REDISTRIBUTED IN AREAS THAT ARE PROTECTED FROM EROSION.

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

REVISION NOTE: ADOPTED 6/21/2006
DRAWING NAME:
CITY OF GEORGETOWN
CONSTRUCTION STANDARDS AND DETAILS
SEDIMENT BASIN BAFFLE DESIGN
EC08
SCALE: NTS | DATE: 1/2003 | DRAWN BY: MRS | APPROVED BY: TRB

BENCHMARKS

ADD BENCHMARKS HERE

No.	REVISIONS	DATE	BY

Kimley»Horn
© 2024 KIMLEY-HORN AND ASSOCIATES, INC.
10814 JOLLYVILLE ROAD, CAMPUS IV, SUITE 200, AUSTIN, TX 78759
PHONE: 512-418-1771 FAX: 512-418-1791
WWW.KIMLEY-HORN.COM
TEXAS REGISTERED ENGINEERING FIRM F-928

STATE OF TEXAS
JOHN A. PICKENS
110631
LICENSED
PROFESSIONAL ENGINEER
02/02/2024

KHA PROJECT: 064461307
DATE: DECEMBER 2023
SCALE: AS SHOWN
DESIGNED BY: RRJ
DRAWN BY: AJM
CHECKED BY: JAP

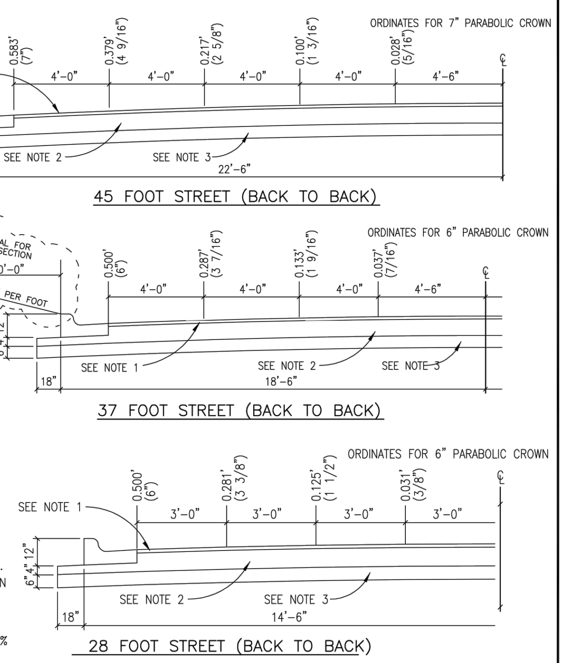
EROSION CONTROL DETAILS

WOLF RANCH
SECTION 6G
CITY OF GEORGETOWN
WILLIAMSON COUNTY, TEXAS

SHEET NUMBER
80 OF 87

Plotted By:Castillo, Jaime Date:February 08, 2024 10:13:43am File Path:K:\AUS_Civil\064461307-Wolf Ranch Section 6G\Cad\PlanSheets\C-Erosion Control Details.dwg
This document, together with the concepts and designs presented herein, as an instrument of service, is intended only for the specific purpose and client for which it was prepared. Reuse of and improper reliance on this document without written authorization and adaptation by Kimley-Horn and Associates, Inc. shall be without liability to Kimley-Horn and Associates, Inc.

SD01 – TYPICAL HALF CROSS – SECTIONS FOR H.M.A.C. SURFACED STREETS



NOTES:
1. 2" HOT MIX ASPHALTIC CONCRETE.
2. 8" FLEXBASE SHALL BE PLACED IN LIFTS NOT EXCEEDING 6" COMPACTED DEPTH AND TO 100% OF MAXIMUM DENSITY AS DETERMINED BY TEX-113E AT ±3% OF OPTIMUM MOISTURE CONTENT.
3. LIME STABILIZATION MAY BE USED IF A QUALIFIED GEOTECHNICAL REPORT INDICATES THAT THE SULFATE LEVELS ARE LOW ENOUGH.

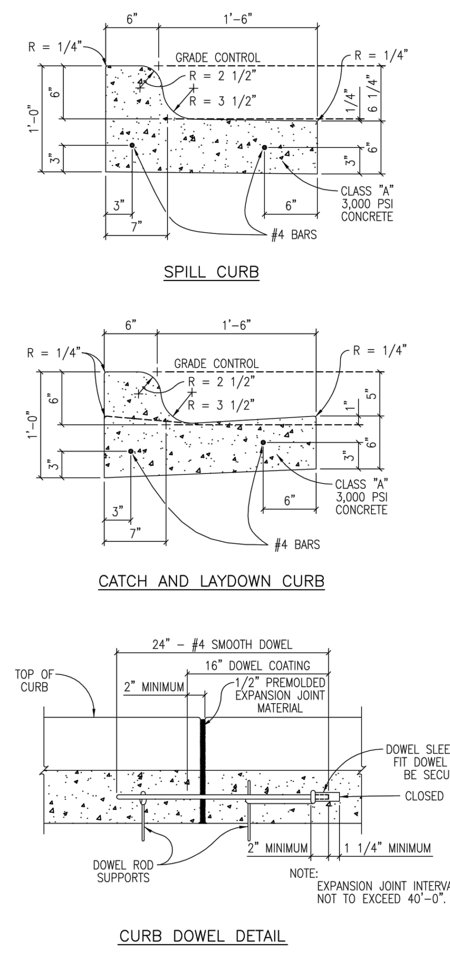
STREET AND ROADWAY DESIGN CRITERIA

STREET CLASSIFICATION	TOTAL EQUIVALENT 18K AXLE LOAD APPLICATIONS (20 YEAR FLEXIBLE DESIGN)
LOCAL	
ALLEY	20,000
RESIDENTIAL LANE	20,000
LOCAL STREET	20,000
COLLECTORS	
RESIDENTIAL	80,000
MAJOR NEIGHBOORHOOD	290,000
ARTERIALS	
MINOR ARTERIAL	1,020,000
MAJOR ARTERIAL	5,200,000

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

ADOPTED 6/21/2006
CITY OF GEORGETOWN CONSTRUCTION STANDARDS AND DETAILS
TYPICAL HALF CROSS – SECTIONS FOR H.M.A.C. SURFACED STREETS
SD01 | SCALE: NTS | DATE: 1/2003 | DRAWN BY: MRS | APPROVED BY: TRB

SD06 – CURB AND GUTTER DETAILS

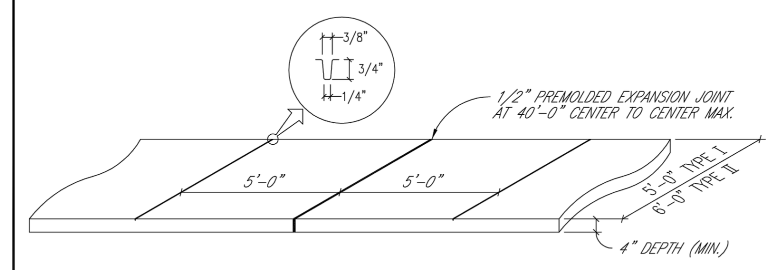


NOTES:
1. ALL WORK AND MATERIAL SHALL CONFORM TO ASTM A615, A615M, C309, AND D1752. BROOM FINISH EXPOSED SURFACE.
2. CONTRACTION JOINT SPACING 10' MAX.
3. EXPANSION JOINTS AS PER STD. ASTM D-1752.
4. 1/2" EXPANSION JOINT MATERIAL SHALL BE PROVIDED WHERE CURB IS ADJACENT TO SIDEWALK OR RIP-RAP.
5. TRANSITIONS BETWEEN CURBS OR DIFFERING CROSS SECTIONS SHALL OCCUR OVER A 20 FOOT LENGTH AS APPROVED BY THE ENGINEER OR THE CITY OF GEORGETOWN.
6. ALL CONCRETE SHALL BE CLASS A, 3000 PSI.
7. ALL SURFACES THAT ARE CHIPPED OR OTHERWISE DAMAGED DURING CONSTRUCTION SHALL BE REPAIRED.
8. THE FOLLOWING SCHEME OF REINFORCEMENT SHALL BE REQUIRED. THE MANNER OF PLACEMENT AND LOCATION SHALL BE TO THE SATISFACTION OF THE ENGINEER OR THE CITY OF GEORGETOWN.
   A. ALL CURB AND CURB AND GUTTER (REINFORCED) SHALL HAVE TWO #4 LONGITUDINAL REINFORCING BARS.
9. REINFORCING BARS SHALL BE LAPPED A MINIMUM OF 15 INCH.
10. REINFORCING BARS SHALL BE SUPPORTED WITH REBAR CHAIRS OR OTHER APPROVED METHODS.
11. REBAR SUPPORTS ARE NOT REQUIRED ON MACHINE PLACED CURB PROVIDED THAT REBAR IS PROPERLY GUIDED INTO THE CURB SECTION.

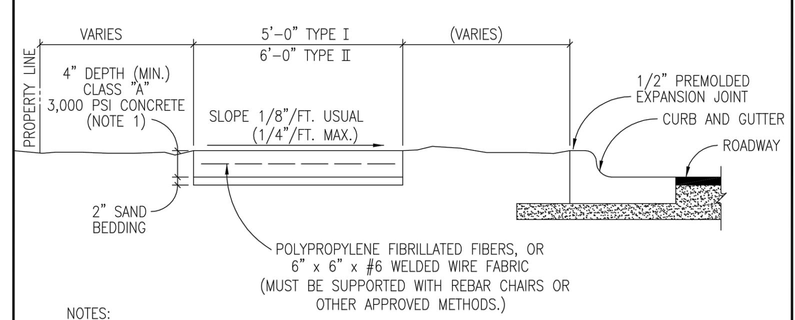
The Architect/Engineer assumes responsibility for appropriate use of this standard.

ADOPTED 6/21/2006
CITY OF GEORGETOWN CONSTRUCTION STANDARDS AND DETAILS
CURB AND GUTTER DETAILS
SD06 | SCALE: NTS | DATE: 1/2003 | DRAWN BY: MRS | APPROVED BY: TRB

SD14 – SIDEWALK SECTION AND JOINT DETAIL



TYPE I – AS REQUIRED FOR SINGLE FAMILY, DUPLEXES AND TOWNHOUSES.
TYPE II – AS REQUIRED FOR APARTMENTS, OFFICE AND PARKING LOTS, COMMERCIAL AND INDUSTRIAL.

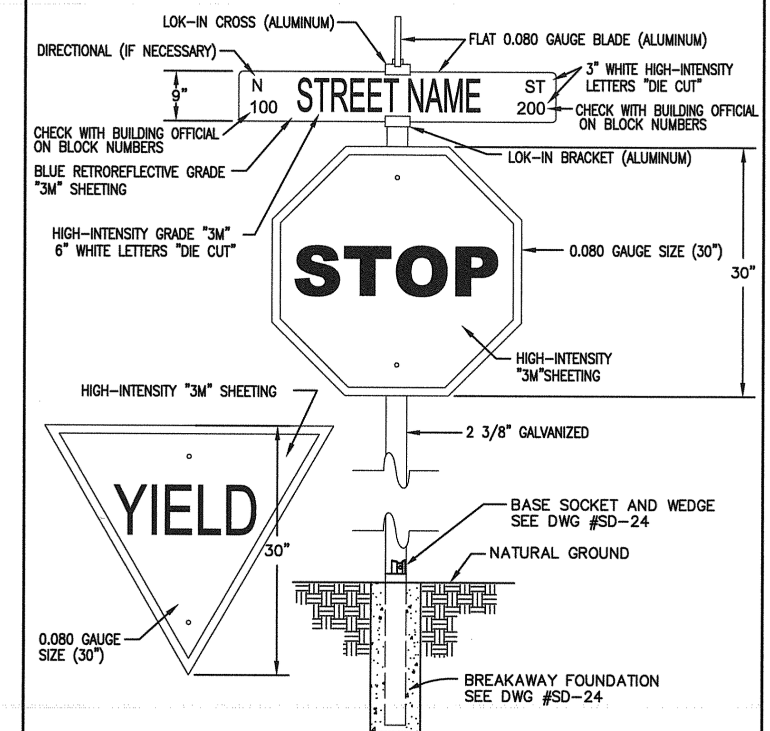


NOTES:
1. FOR ROLLER STAMPED SIDEWALK: MATCH TO SPECIFICATIONS.
2. STANDARD LOCATION OF SIDEWALK IS OFF BACK OF CURB. SPECIAL DESIGNS MAY BE APPROVED BY THE CITY ENGINEER, PRIOR TO FINAL DESIGN.
3. SIDEWALK SHALL CONFORM TO CURRENT AMERICANS WITH DISABILITIES ACT STANDARDS.
4. IF REQUIRED ALL SIDEWALKS SHALL BE SUBMITTED AND APPROVED BY THE TEXAS DEPARTMENT OF LICENSING AND REGULATION BY THE ENGINEER RECORD.
5. ANY VARIANCE IN TEXTURE, GRADE OR ALIGNMENT MUST BE APPROVED BY THE TEXAS DEPARTMENT OF LICENSING AND REGULATION.

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

ADOPTED 6/21/2006
CITY OF GEORGETOWN CONSTRUCTION STANDARDS AND DETAILS
SIDEWALK SECTION AND JOINT DETAIL
SD14 | SCALE: NTS | DATE: 1/2003 | DRAWN BY: MRS | APPROVED BY: TRB

SD25 – STANDARD STREET SIGN DETAIL

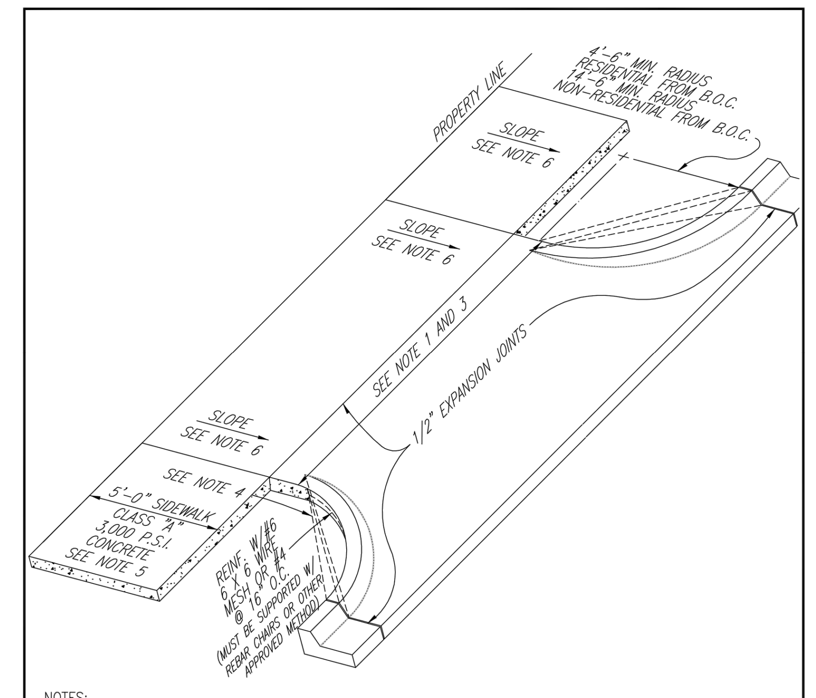


NOTES:
1. 7-FOOT MIN. HEIGHT FROM GROUND TO BOTTOM OF SIGN.
2. ALL SIGNS TO BE IN CONFORMANCE WITH THE CURRENT EDITION OF THE TEXAS MANUAL OF UNIFORM TRAFFIC CONTROL DEVICES (TMUTCD).
3. ALL SIGNAGE SHEETINGS SHALL BE HIGH-INTENSITY "3M" SHEETING.

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

REVISED 1/14/2014 WBD
ADOPTED 6/21/2006 TRB
CITY OF GEORGETOWN CONSTRUCTION STANDARDS AND DETAILS
STANDARD STREET SIGN DETAIL
SD25 | NTS | 1/2003 | MRS/AP | TRB

SD15 – CONCRETE DRIVEWAY APPROACH TYPICAL



NOTES:
1. MAXIMUM WIDTH OF APPROACH SHALL BE 24'-0" FOR RESIDENTIAL, 30'-0" FOR NON-RESIDENTIAL UNDIVIDED AND 45'-0" FOR NON-RESIDENTIAL DIVIDED.
2. DRIVEWAY PERMITS TO BE ACQUIRED FROM CITY INSPECTION OFFICE.
3. MINIMUM WIDTH OF APPROACH SHALL BE 10'-0" FOR RESIDENTIAL AND 15'-0" FOR NON-RESIDENTIAL.
4. LINEAR "RADIUS" AT CORNERS, PERMITTED FOR "SINGLE FAMILY" OR "TWO FAMILY" RESIDENTIAL DRIVEWAY APPROACH.
5. SIDEWALK LOCATION TO BE APPROVED BY CITY ENGINEER PRIOR TO FINAL DESIGN.
6. SLOPE 1/8" PER FOOT USUAL, NOT TO EXCEED 1/4" PER FOOT.
7. DRIVEWAY APPROACH THICKNESS TO BE A MIN. OF 6".

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

ADOPTED 6/21/2006
CITY OF GEORGETOWN CONSTRUCTION STANDARDS AND DETAILS
CONCRETE DRIVEWAY APPROACH TYPICAL
SD15 | SCALE: NTS | DATE: 1/2003 | DRAWN BY: MRS | APPROVED BY: TRB

SD28 – PEDESTRIAN RAMPS GENERAL NOTES

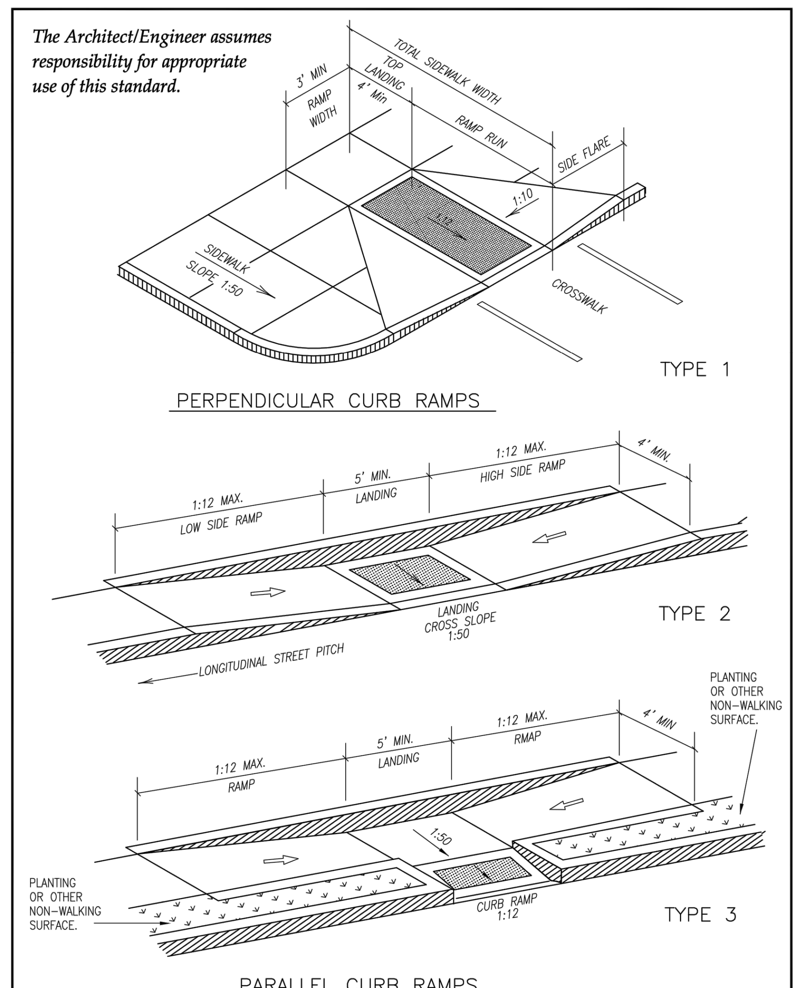
The Architect/Engineer assumes responsibility for appropriate use of this standard.

NOTES:
1. COMMERCIAL SIDEWALKS WIDTHS – 6'
   RESIDENTIAL SIDEWALKS WIDTHS – 5'
2. ALL SLOPES ARE MAXIMUM ALLOWABLE. FLATTER SLOPES THAT WILL STILL DRAIN PROPERLY ARE ENCOURAGED.
3. ALL CONCRETE SURFACES SHALL RECEIVE A LIGHT BROOM FINISH UNLESS NOTED OTHERWISE IN THE PLANS.
4. FOR PURPOSES OF WARNING, THE CURB RAMPS SHALL HAVE A LIGHT REFLECTIVE VALUE AND TEXTURE THAT SIGNIFICANTLY CONTRASTS WITH THAT OF ADJOINING PEDESTRIAN ROUTES.
5. TEXTURES MAY CONSIST OF PAVERS WITH TRUNCATED DOMED SURFACES OR GROOVES. TEXTURES ARE REQUIRED TO BE DETECTABLE UNDERFOOT. SURFACES THAT WOULD ALLOW WATER TO ACCUMULATE ARE PROHIBITED.
6. COLOR CONTRAST, FOR EXAMPLE, CAN BE ACCOMPLISHED WITH COLORED CONCRETE PAVERS THAT HAVE TRUNCATED DOMES OR BY COLORED STAINED CONCRETE WITH GROOVES, EITHER OF WHICH WOULD PROVIDE A CONTRAST WITH TYPICALLY LIGHT COLORED CONCRETE.
7. ADDITIONAL INFORMATION ON CURB RAMP LOCATION, DESIGN, VISIBILITY AND TEXTURE MAY BE FOUND IN THE CURRENT EDITION OF THE TEXAS ACCESSIBILITY STANDARDS (TAS) PREPARED AND ADMINISTERED BY THE TEXAS DEPARTMENT OF LICENSING AND REGULATION (TDLR).
8. RAISED MEDIANS SEPARATE OPPOSING DIRECTIONS OF TRAFFIC AND PROVIDE A REFUGE AREA FOR PEDESTRIANS IF THEY ARE UNABLE TO CROSS THE ENTIRE ROADWAY IN THE ALLOTTED SIGNAL PHASE. TO SERVE AS A REFUGE AREA, THE MEDIAN SHOULD BE A MINIMUM OF 4 FEET WIDE. MEDIANS SHOULD BE DESIGNED TO PROVIDE ACCESSIBLE PASSAGE OVER OR THROUGH THEM.
9. ALL SIDEWALK PLANS AND DETAILS SHALL BE SUBMITTED AND APPROVED BY THE TEXAS DEPARTMENT OF LICENSING AND REGUALTION (TDLR).
10. ANY PART OF THE ACCESSIBLE ROUTE WITH A SLOPE GRATER THAN 1:20 (5%) SHALL BE CONSIDERED A RAMP. IF A RAMP HAS A RISE GREATER THAN 6 INCHES OR A HORIZONTAL PROJECTION GREATER THAN 72 INCHES, THEN IT SHALL HAVE HANDRAILS ON BOTH SIDES. THE ONLY EXCEPTION IS AT CURB RAMPS. HANDRAILS ARE NOT REQUIRED ON CURB RAMPS. CURB RAMPS SHALL BE PROVIDED WHERE EVER AN ACCESSIBLE ROUTE CROSSES (PENETRATES) A CURB. CURB RAMPS ARE GENERALLY INTERPRETED AS ONLY THE PORTION TYING DIRECTLY INTO THE ROADWAY.
11. TRAFFIC SIGNAL OR ILLUMINATION POLES, GROUND BOXES, CONTROLLER BOXES, SIGNS, DRAINAGE FACILITIES AND OTHER ITEMS SHALL BE PLACED SO NOT TO OBSTRUCT THE ACCESSIBLE ROUTE.
12. ALL SIDEWALKS WILL BE DOWELED INTO EXISTING SIDEWALKS, DRIVEWALKS, DRIVEWAYS, INLET BOXES, RETAINING WALLS, ETC.
13. ALL SIDEWALK CROSS-SLOPES SHALL NOT EXCEED 1:50, UNLESS A VARIANCE IS PROVIDED BY TDLR.

ADOPTED 6/21/2006
CITY OF GEORGETOWN CONSTRUCTION STANDARDS AND DETAILS
PEDESTRIAN RAMPS GENERAL NOTES
SD28 | SCALE: NTS | DATE: 1/2003 | DRAWN BY: MRS | APPROVED BY: TRB

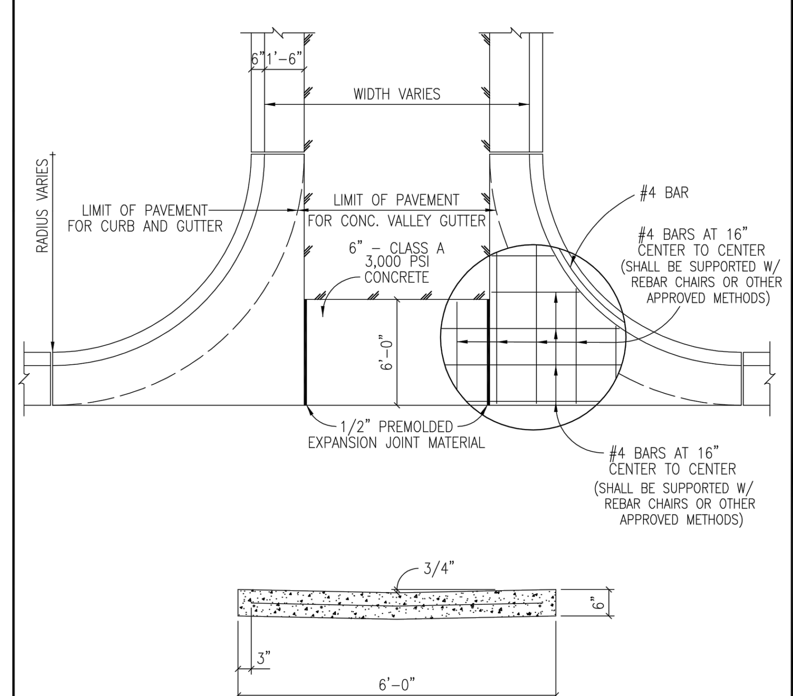
SD31 – SIDEWALK RAMP DETAILS TYPE 1-3

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



ADOPTED 6/21/2006
CITY OF GEORGETOWN CONSTRUCTION STANDARDS AND DETAILS
SIDEWALK RAMP DETAILS TYPE 1-3
SD31 | SCALE: NTS | DATE: 1/2003 | DRAWN BY: MRS | APPROVED BY: TRB

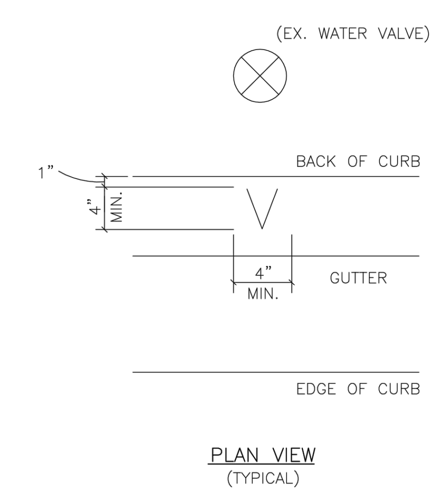
SD03 – CONCRETE VALLEY GUTTER DETAIL



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

ADOPTED 6/21/2006
CITY OF GEORGETOWN CONSTRUCTION STANDARDS AND DETAILS
CONCRETE VALLEY GUTTER DETAIL
SD03 | SCALE: NTS | DATE: 1/2003 | DRAWN BY: MRS | APPROVED BY: TRB

SD05 – CURB STAMP DETAIL



NOTES:
1. ALL WATER SERVICE, WASTE WATER SERVICE AND VALVE LOCATIONS SHALL BE APPROXIMATLEY MARKED AS FOLLOWS:

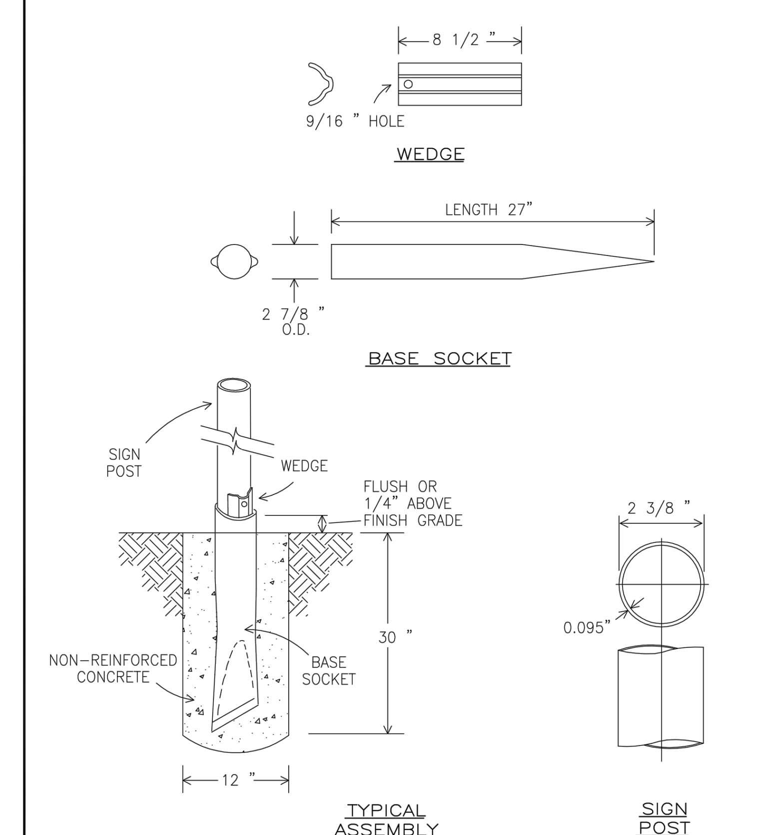
WATER SERVICE	"W"	TOP OF CURB
WASTE WATER SERVICE	"S"	TOP OF CURB
VALVE	"V"	TOP OF CURB

2. LETTERS SHALL HAVE A 1/2" MAX. WIDTH.

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

ADOPTED 6/21/2006
CITY OF GEORGETOWN CONSTRUCTION STANDARDS AND DETAILS
CURB STAMP DETAIL
SD05 | SCALE: NTS | DATE: 1/2003 | DRAWN BY: MRS | APPROVED BY: TRB

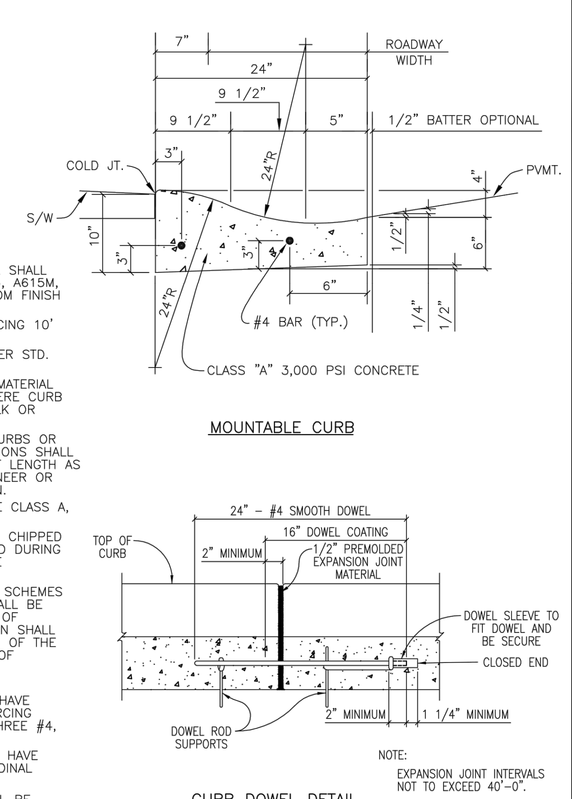
SD24 – POZ-LOC (BREAKAWAY FOUNDATION)



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

ADOPTED 6/21/2006
CITY OF GEORGETOWN CONSTRUCTION STANDARDS AND DETAILS
POZ-LOC (BREAKAWAY FOUNDATION)
SD24 | SCALE: NTS | DATE: 1/2003 | DRAWN BY: MRS | APPROVED BY: TRB

SD07 – MOUNTABLE CURB AND GUTTER DETAILS

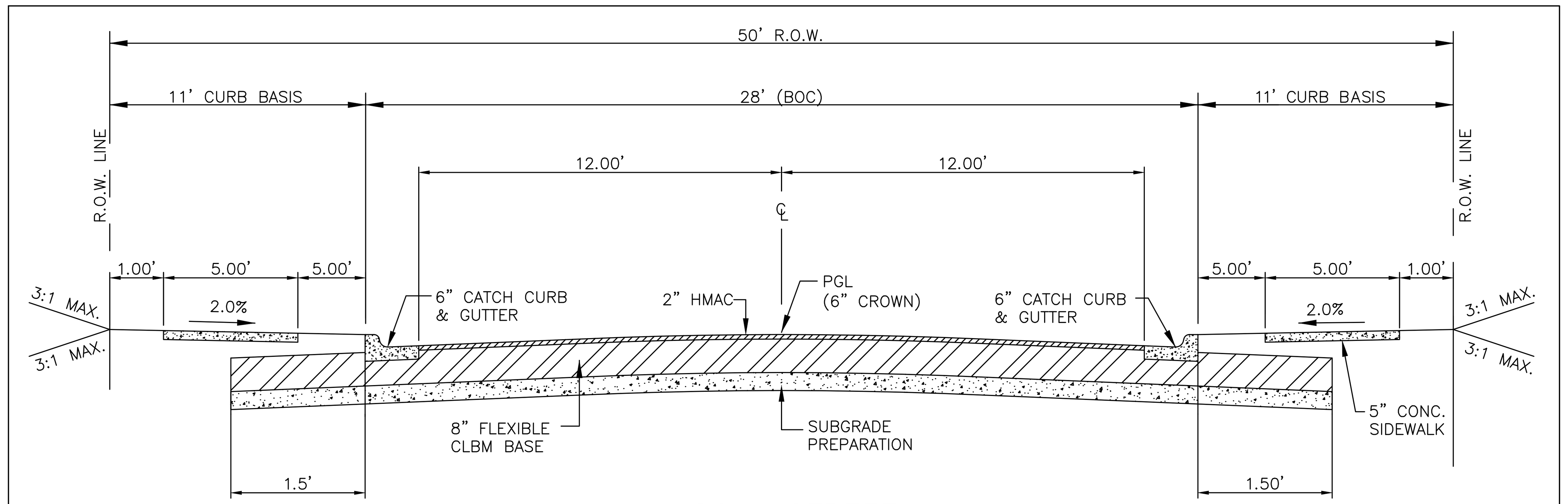


NOTES:
1. ALL WORK AND MATERIAL SHALL CONFORM TO ASTM A615, A615M, C309, AND D1752. BROOM FINISH EXPOSED SURFACE.
2. CONTRACTION JOINT SPACING 10' MAX.
3. EXPANSION JOINTS AS PER STD. ASTM D-1752.
4. 1/2" EXPANSION JOINT MATERIAL SHALL BE PROVIDED WHERE CURB IS ADJACENT TO SIDEWALK OR RIP-RAP.
5. TRANSITIONS BETWEEN CURBS OR DIFFERING CROSS SECTIONS SHALL OCCUR OVER A 20 FOOT LENGTH AS APPROVED BY THE ENGINEER OR TH CITY OF GEORGETOWN.
6. ALL CONCRETE SHALL BE CLASS A, 3000 PSI.
7. ALL SURFACES THAT ARE CHIPPED OR OTHERWISE DAMAGED DURING CONSTRUCTION SHALL BE REPAIRED.
8. ONE OF THE FOLLOWING SCHEMES OF REINFORCEMENT SHALL BE REQUIRED. THE MANNER OF PLACEMENT AND LOCATION SHALL BE TO THE SATISFACTION OF THE ENGINEER OR THE CITY OF GEORGETOWN.
   A. CURB AND GUTTER (REINFORCED) SHALL HAVE LONGITUDINAL REINFORCING BARS AS FOLLOWS: THREE #4,
   B. ALL TYPES OF CURB (REINFORCED) SHALL HAVE #4 BAR FOR LONGITUDINAL REINFORCEMENT.
9. REINFORCING BARS SHALL BE LAPPED A MINIMUM OF 15 INCH.
10. REINFORCING BARS SHALL BE SUPPORTED WITH REBAR CHAIRS OR OTHER APPROVED METHODS.
11. REBAR SUPPORTS ARE NOT REQUIRED ON MACHINE PLACED CURB PROVIDED THAT REBAR IS PROPERLY GUIDED INTO THE CURB SECTION.

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

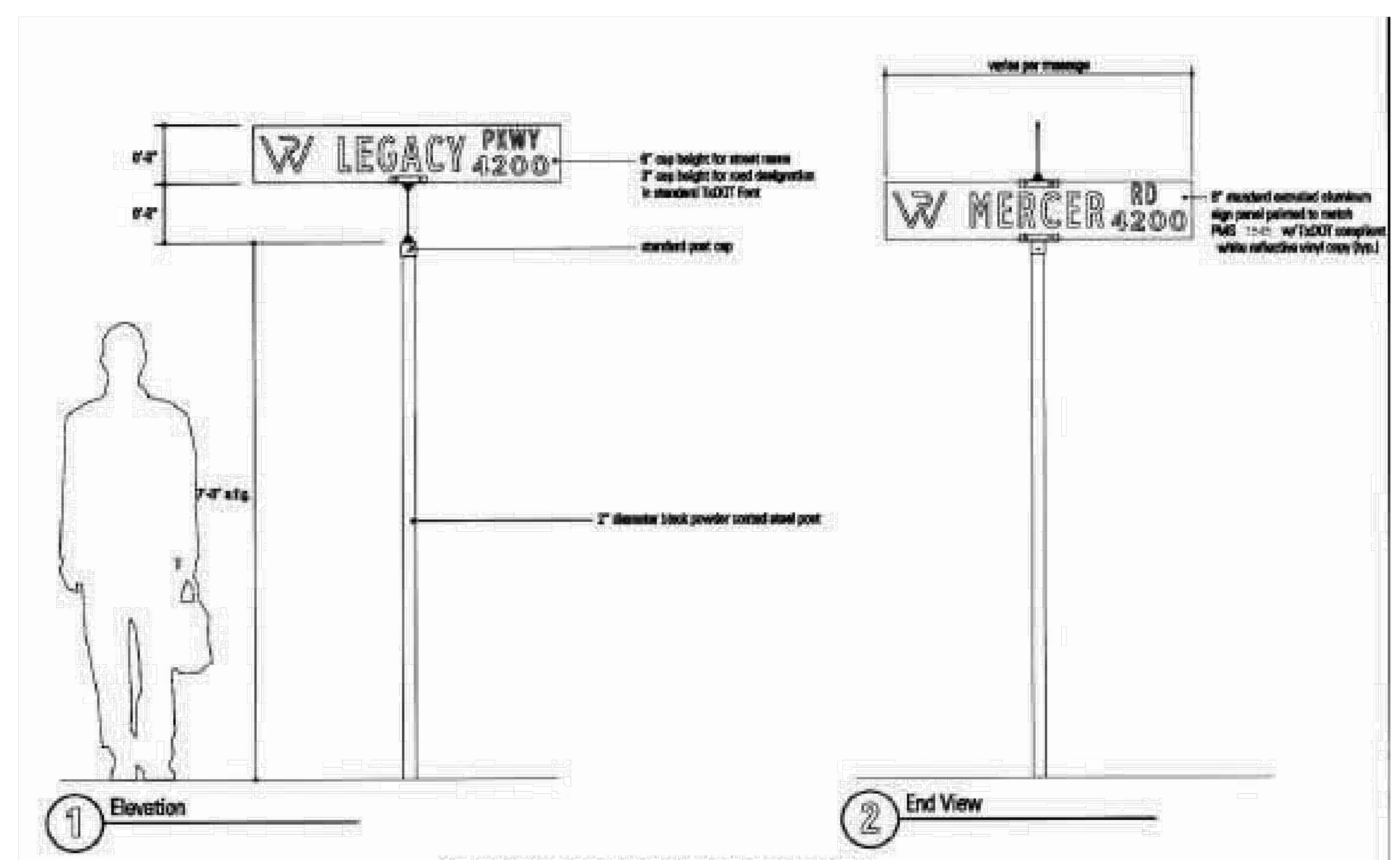
ADOPTED 6/21/2006
CITY OF GEORGETOWN CONSTRUCTION STANDARDS AND DETAILS
MOUNTABLE CURB AND GUTTER DETAILS
SD07 | SCALE: NTS | DATE: 1/2003 | DRAWN BY: MRS | APPROVED BY: TRB

ROADWAY SECTION DETAIL



LOCAL STREET
NTS
ROADWAY SECTION DETAIL

CUSTOM STREET SIGN DETAIL



CUSTOM STREET SIGN DETAIL

KIMLEY-HORN
© 2024 KIMLEY-HORN AND ASSOCIATES, INC.
10814 JOLLYVILLE ROAD, CAMPUS IV, SUITE 200, AUSTIN, TX 78759
PHONE: 512-418-1771 FAX: 512-418-1791
WWW.KIMLEY-HORN.COM
TEXAS REGISTERED ENGINEERING FIRM F-928

STATE OF TEXAS – JOHN A. PICKENS – 110631 – LICENSED PROFESSIONAL ENGINEER
02/02/2024

No.	REVISIONS	DATE	BY

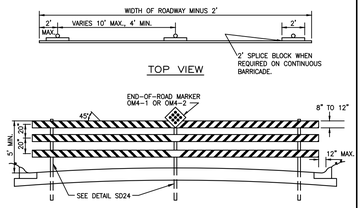
KHA PROJECT 064461307
DATE DECEMBER 2023
SCALE: AS SHOWN
DESIGNED BY: RRJ
DRAWN BY: AJM
CHECKED BY: JAP

PAVING DETAILS (1 OF 2)

WOLF RANCH SECTION 6G
CITY OF GEORGETOWN
WILLIAMSON COUNTY, TEXAS

SHEET NUMBER
81 OF 87

Plotted By: Castillo, Jaime Date: February 08, 2024 10:13:55am File Path: K:\AUS_Civil\064461307-Wolf Ranch Section 6G\Cad\PlanSheets\C-Paving Details.dwg
This document, together with the concepts and designs presented herein, as an instrument of service, is intended only for the specific purpose and client for which it was prepared. Reuse of and improper reliance on this document without written authorization and adaptation by Kimley-Horn and Associates, Inc. shall be without liability to Kimley-Horn and Associates, Inc.



GENERAL NOTES FOR THIN WALL TUBE TYPE SIGN SUPPORT:

1. THE BASE SOCKET IS FORMED FROM 2 7/8 " O.D. X 12 GAUGE GALVANIZED PIPE.
2. THE WEDGE IS FORMED FROM 11 GAUGE STEEL GALVANIZED PER ASTM A525.
3. THE SIGN POST IS 2.375" O.D. X 0.095" THIN WALL STEEL TUBING.
4. STEEL SUPPORTS SHALL BE MADE FROM NEW MATERIAL AND SHALL BE CORROSION RESISTANT. STEEL SUPPORTS SHALL BE GALVANIZED IN ACCORDANCE WITH ASTM DESIGNATIONS A123 OR A525 (G-90 OR BETTER).
5. SUPPORTS SHALL BE STRAIGHT WITHIN 1/4 " PER 5 FEET OF LENGTH AND SHALL HAVE A SMOOTH, UNIFORM FINISH FREE FROM DEFECTS AFFECTING STRENGTH OR APPEARANCE. ANY BOLT HOLES AND SHEARED ENDS SHALL BE FREE FROM BURRS. BASES OF MULTISECTION SUPPORTS SHALL NOT EXTEND MORE THAN 5 INCHES ABOVE GROUND WHEN INSTALLED.
6. BOLTS, NUTS, SCREWS, WASHERS AND OTHER MISCELLANEOUS HARDWARE SHALL BE GALVANIZED IN ACCORDANCE TO ASTM DESIGNATION: A153 CLASS C OR D, OR B695 CLASS 50.
7. BARRICADE SUPPORTS SYSTEMS USED ON THIS SHEET MAY BE SUITABLE FOR ONLY CERTAIN SOIL TYPES. THE CONTRACTOR IS RESPONSIBLE FOR SELECTING THE APPROPRIATE SUPPORT SYSTEM FOR SOIL CONDITIONS ON EACH PROJECT.
8. ALL BARRICADES TO BE IN CONFORMANCE WITH THE CURRENT EDITION OF THE TEXAS MANUAL OF UNIFORM TRAFFIC CONTROL DEVICES (TMUTCD).
9. RAL-HIGH DENSITY POLYETHYLENE OR HOLLOW PROFILE PLASTIC LUMBER AND SHEETING SHALL BE RETROREFLECTIVE, INCLUDING SPLICE BLOCKS.

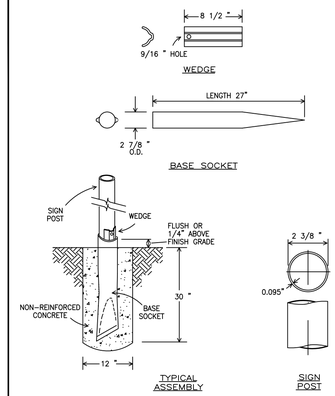
The Architect/Engineer assumes responsibility for appropriate use of this standard.

ADOPTED 6/21/2006

CITY OF GEORGETOWN
CONSTRUCTION STANDARDS AND DETAILS
PERMANENT END-OF-ROAD BARRICADE

SD21

NTS | 1/2003 | WRS/ | TRB



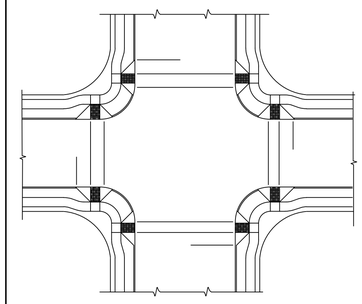
The Architect/Engineer assumes responsibility for appropriate use of this standard.

ADOPTED 6/21/2006

CITY OF GEORGETOWN
CONSTRUCTION STANDARDS AND DETAILS
POZ-LOC (BREAKAWAY FOUNDATION)

SD24

NTS | 1/2003 | WRS | TRB



OFFSET SIDEWALKS

NOTE: CURB RAMPS WITH RETURNED CURBS INSTEAD OF SIDE FLARES ARE PERMITTED WHERE PEDESTRIANS WOULD NOT NORMALLY WALK ACROSS THE RAMP

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

ADOPTED 6/21/2006

CITY OF GEORGETOWN
CONSTRUCTION STANDARDS AND DETAILS
TYPICAL INTERSECTON LAYOUT

SD29

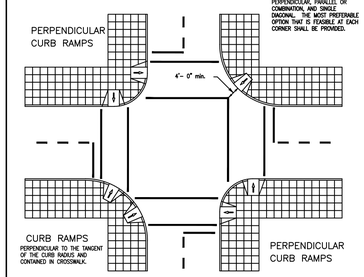
NTS | 1/2003 | WRS | TRB

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

SINGLE DIAGONAL CURB RAMP

FOR ON-SYSTEM NEW CONSTRUCTION, RECONSTRUCTION AND REHABILITATION PROJECTS WHERE PEDESTRIAN FACILITIES ARE NEWLY CONSTRUCTED OR SUBSTANTIALLY ALTERED, CONSTRUCTION OF SINGLE DIAGONAL RAMPS IS NOT PERMITTED.

FOR ON-SYSTEM PROJECTS SUCH AS RESTORATION, SEAL COAT AND OVERLAY PROJECTS, PLACEMENT OF CURB RAMPS SHOULD BE EVALUATED IN THE FOLLOWING ORDER OF PREFERENCE: PERPENDICULAR, PARALLEL OR COMBINATION, AND SINGLE DIAGONAL. THE MOST PREFERABLE OPTION THAT IS FEASIBLE AT EACH CORNER SHALL BE PROVIDED.



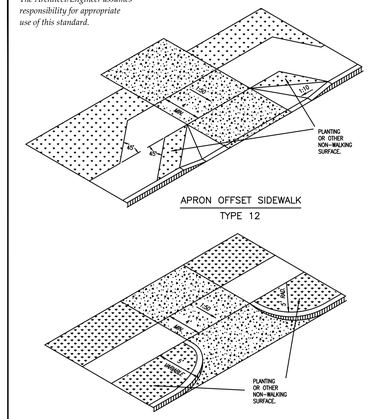
ADOPTED 6/21/2006

CITY OF GEORGETOWN
CONSTRUCTION STANDARDS AND DETAILS
CURB RAMP PLACEMENTS AT INTERSECTIONS

SD30

NTS | 1/2003 | WRS | TRB

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

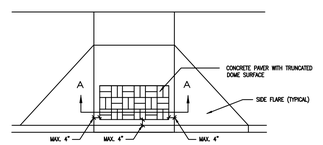


ADOPTED 6/21/2006

CITY OF GEORGETOWN
CONSTRUCTION STANDARDS AND DETAILS
DRIVEWAY APRONS TYPES 12 & 13

SD35

NTS | 1/2003 | WRS | TRB



TRUNCATED DOME PATTERN CURB RAMP

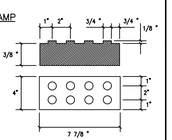
GENERAL NOTES

CONCRETE PAVER UNITS SHALL MEET ALL REQUIREMENTS OF ASTM C-936, C-33, AND SHALL BE LAID IN A TWO BY TWO ONE QUARTER WEAVE PATTERN, UNLESS SHOWN OTHERWISE IN THE PLANS.

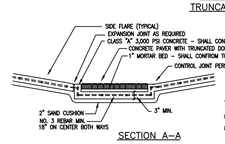
CONCRETE PAVER UNIT SHALL HAVE A TRUNCATED DOME TOP SURFACE FOR DETECTABLE WARNING TO PEDESTRIANS.

CONCRETE PAVER UNIT COLOR FOR THE RAMP SHALL BE A CONTRASTING COLOR TO THE ADJACENT SURFACES. THE COLOR OF THE CONCRETE PAVER UNITS SHALL BE SHOWN ELSEWHERE IN THE PLANS. (ADJACENT SURFACES INCLUDE SIDE FLARES).

CONCRETE PAVER UNITS SHALL BE SAW CUT ONLY AND ANY CUT UNIT SHALL BE NOT LESS THAN 25 PERCENT OF A FULL UNIT.



CONCRETE PAVER WITH TRUNCATED DOME SURFACE



SECTION A–A

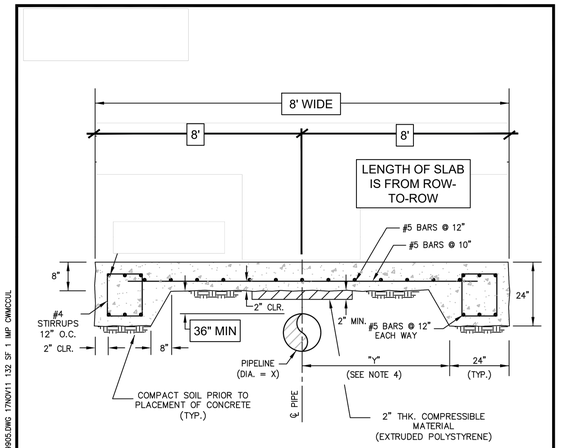
The Architect/Engineer assumes responsibility for appropriate use of this standard.

REVISED 3/14/2014 WBD
ADOPTED 6/21/2006 TRB

CITY OF GEORGETOWN
CONSTRUCTION STANDARDS AND DETAILS
CURB RAMP TEXTURES TYPE A

SD37

NTS | 1/2003 | WRS/AP | TRB



CONCRETE SLAB DETAIL
(DIA. = 4" TO 20")
NTS

NOTES:
1. X=NOMINAL DIAMETER OF PIPE
2. ALL REINFORCING BARS SHALL BE ASTM A 615 GR 60 AND PER ACI DETAILING MANUAL SP–66
3. CONCRETE COMPRESSIVE STRENGTH SHALL BE 4000 PSI
4. FOR MACHINE EXCAVATION, MIN. DISTANCE Y= 1/2 NOM. DIA. + 24"
5. ANY EXCAVATION COMPLETED WITHIN 2 FEET OF THE PIPELINE WILL BE DONE BY HAND

ENTERPRISE PRODUCTS OPERATING LLC

CONCRETE SLAB PROTECTION DETAIL FOR PIPELINE

DRAWN BY	CHECKED BY	APPROVED BY	REVISION DATE	REVISION NO.	DATE	SHEET 1 OF 1 / DRAWING NUMBER
WM	RC	ED SANGEL			11/16/11	19511–9905

MEI Project: 19511 – R:\PROJECTS\001\ENTERPRISE STANDARDS\19511-9905.DWG 17NOV11 1:32 SF 1 MAP CNMCCUL

No.	REVISIONS	DATE	BY

Kimley»Horn
© 2024 KIMLEY-HORN AND ASSOCIATES, INC.
10814 JOLLYVILLE ROAD, CAMPUS IV, SUITE 200, AUSTIN, TX 78759
PHONE: 512-418-1771 FAX: 512-418-1791
WWW.KIMLEY-HORN.COM
TEXAS REGISTERED ENGINEERING FIRM F-928

STATE OF TEXAS
JOHN A. PICKENS
110631
LICENSED
PROFESSIONAL ENGINEER
02/02/2024

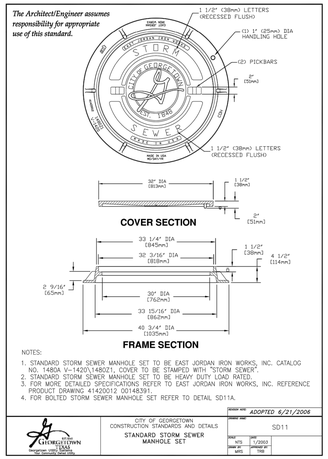
KHA PROJECT 064461307
DATE DECEMBER 2023
SCALE: AS SHOWN
DESIGNED BY: RRJ
DRAWN BY: AJM
CHECKED BY: JAP

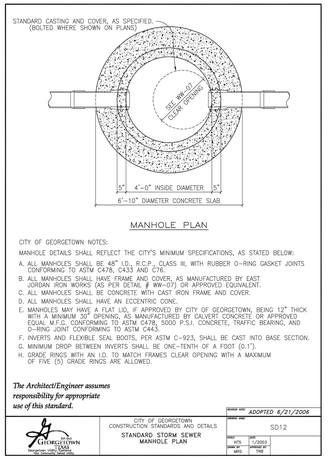
PAVING DETAILS (SHEET 2 OF 2)

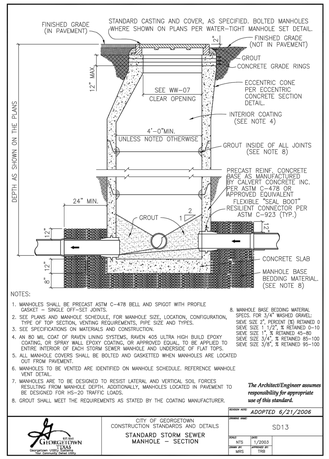
WOLF RANCH
SECTION 6G
CITY OF GEORGETOWN
WILLIAMSON COUNTY, TEXAS

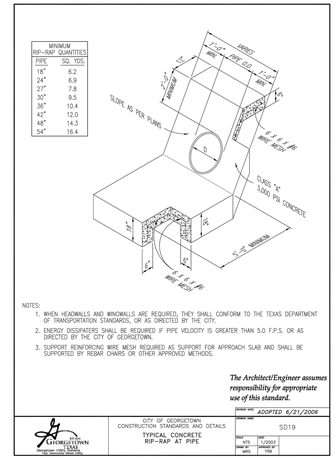
SHEET NUMBER
82 OF 87

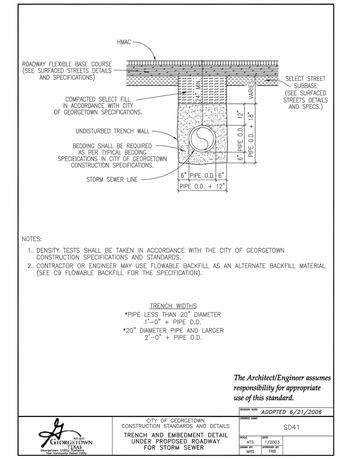
Posted By:Castillo, Jaime Date:February 08, 2024 10:14:05am File Path:K:\AUS_Civil\064461307-Wolf Ranch Section 6G\Cad\PlanSheets\C-Paving Details (Sheet 2 of 2).dwg
This document, together with the concepts and designs presented herein, as an instrument of service, is intended only for the specific purpose and client for which it was prepared. Reuse of and improper reliance on this document without written authorization and adaptation by Kimley-Horn and Associates, Inc. shall be without liability to Kimley-Horn and Associates, Inc.

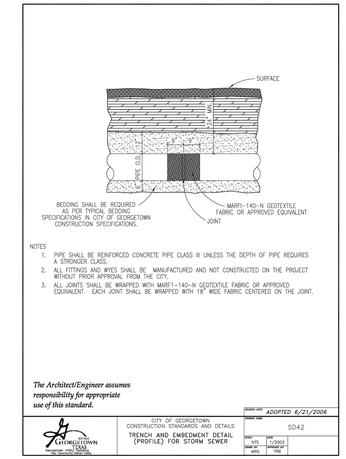


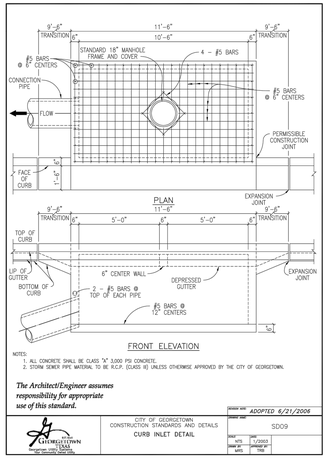


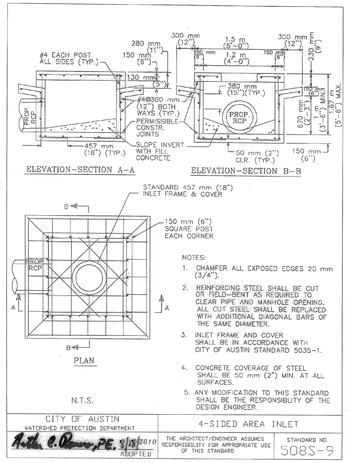


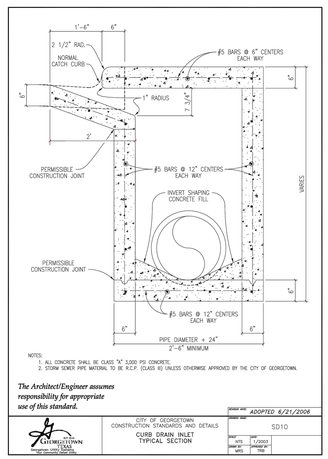


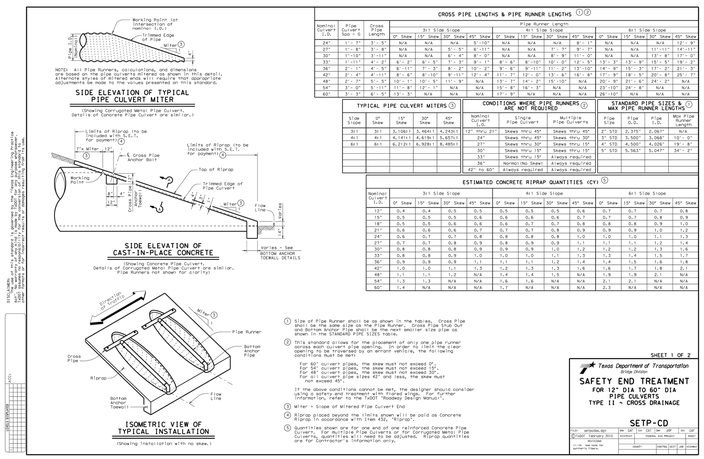


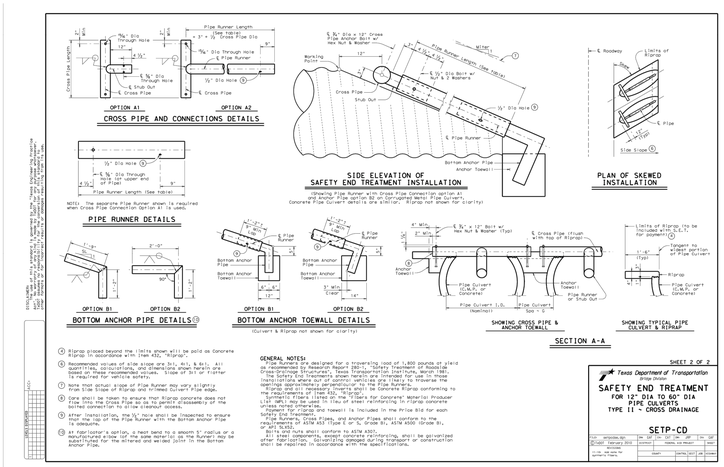


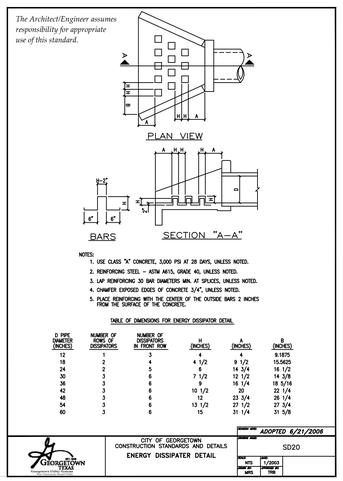












BENCHMARKS

ADD BENCHMARKS HERE

Kimley»Horn

© 2024 KIMLEY-HORN AND ASSOCIATES, INC.

10814 JOLLYVILLE ROAD, CAMPUS IV, SUITE 200, AUSTIN, TX 78759
PHONE: 512-418-1771 FAX: 512-418-1791
WWW.KIMLEY-HORN.COM
TEXAS REGISTERED ENGINEERING FIRM F-928

JOHN A. PICKENS 110631 LICENSED PROFESSIONAL ENGINEER

02/02/2024

No.	REVISIONS	DATE	BY

KHA PROJECT 064461307

DATE DECEMBER 2023

SCALE: AS SHOWN

DESIGNED BY: RRJ

DRAWN BY: AJM

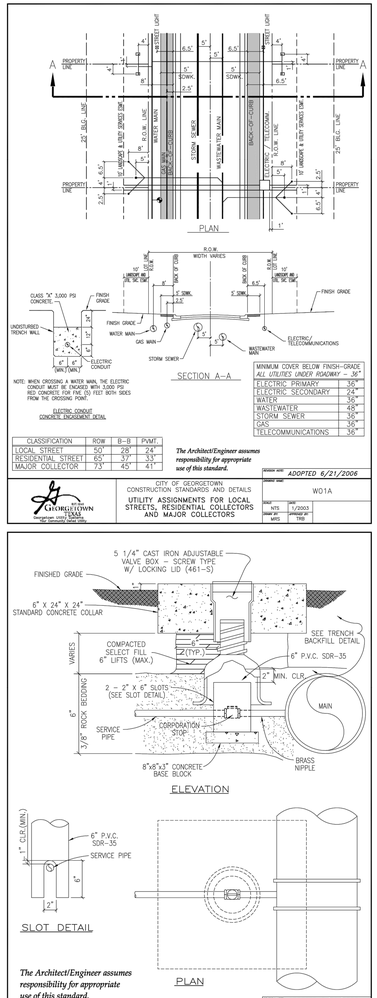
CHECKED BY: JAP

STORM DETAILS

WOLF RANCH
SECTION 6G
CITY OF GEORGETOWN
WILLIAMSON COUNTY, TEXAS

SHEET NUMBER
83 OF 87

Plotted By:Castillo, Jaime Date:February 08, 2024 10:14:19am File Path:K:\AUS_Civil\064461307-Wolf Ranch Section 6G\Cad\PlanSheets\C-Storm Drain Details.dwg
This document, together with the concepts and designs presented herein, as an instrument of service, is intended only for the specific purpose and client for which it was prepared. Reuse of and improper reliance on this document without written authorization and adaptation by Kimley-Horn and Associates, Inc. shall be without liability to Kimley-Horn and Associates, Inc.



CLASSIFICATION	ROW	B-B	PVMT.
LOCAL STREET	50'	28'	24'
RESIDENTIAL STREET	65'	37'	33'
MAJOR COLLECTOR	73'	45'	41'

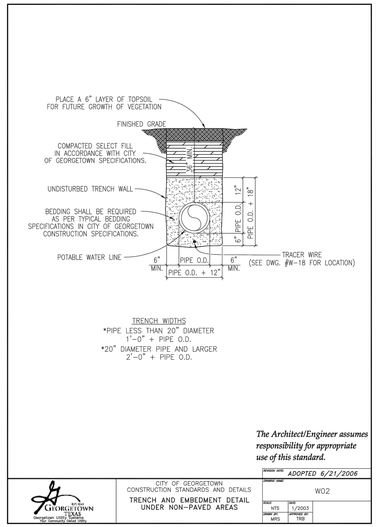
MINIMUM COVER BELOW FINISH-GRADE ALL UTILITIES UNDER ROADWAY – 36"	
ELECTRIC PRIMARY	36"
ELECTRIC SECONDARY	24"
WATER	36"
WASTEWATER	48"
STORM SEWER	36"
GAS	36"
TELECOMMUNICATIONS	36"

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

ADOPTED 6/21/2006

CITY OF GEORGETOWN CONSTRUCTION STANDARDS AND DETAILS
UTILITY ASSIGNMENTS FOR LOCAL STREETS, RESIDENTIAL COLLECTORS AND MAJOR COLLECTORS

W01A | NTS | 1/2003

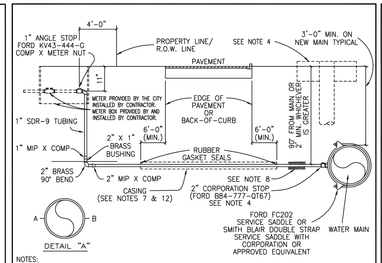


The Architect/Engineer assumes responsibility for appropriate use of this standard.

ADOPTED 6/21/2006

CITY OF GEORGETOWN CONSTRUCTION STANDARDS AND DETAILS
TRENCH AND EMBEDMENT DETAIL UNDER NON-PAVED AREAS

W02 | NTS | 1/2003



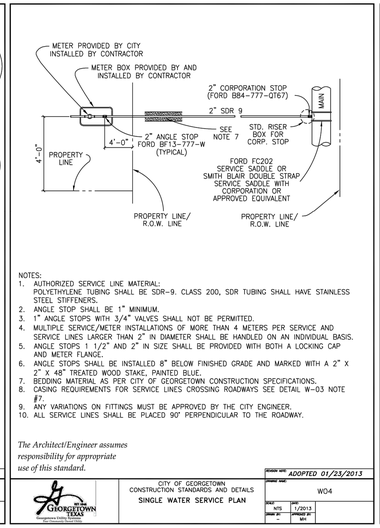
NOTES:
1. SUCCESSIVE TAPS INTO THE WATER MAIN SHALL BE SPACED A MINIMUM OF 18" OFFSET AND AT THE CENTERLINE AS SHOWN ON DETAIL "A".
2. WHERE NO SIDEWALK EXISTS, METER BOXES SHALL BE SET TO CONFORM TO FINISHED GRADE.
3. AUTHORIZED SERVICE LINE MATERIAL: POLYETHYLENE TUBING SHALL BE SDR–9. CLASS 200, SDR 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.

ADOPTED 01/23/2013

CITY OF GEORGETOWN CONSTRUCTION STANDARDS AND DETAILS
TYPICAL WATER SERVICE–ELEVATION

W03 | NTS | 1/2013



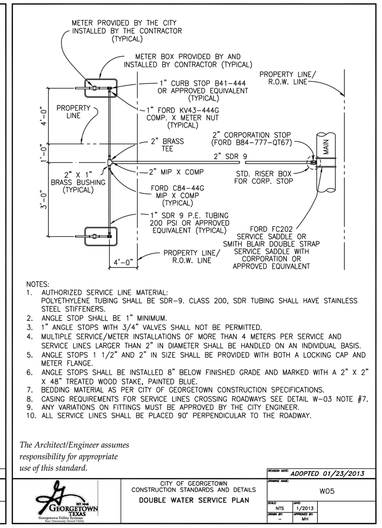
NOTES:
1. AUTHORIZED SERVICE LINE MATERIAL: POLYETHYLENE TUBING SHALL BE SDR–9. CLASS 200, SDR TUBING SHALL HAVE STAINLESS STEEL STIFFENERS.
2. ANGLE STOP SHALL BE 1" MINIMUM.
3. 1" ANGLE STOPS WITH 3/4" VALVES SHALL NOT BE PERMITTED.
4. MULTIPLE SERVICE/METER INSTALLATIONS OF MORE THAN 4 METERS PER 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.

ADOPTED 01/23/2013

CITY OF GEORGETOWN CONSTRUCTION STANDARDS AND DETAILS
SINGLE WATER SERVICE PLAN

W04 | NTS | 1/2013



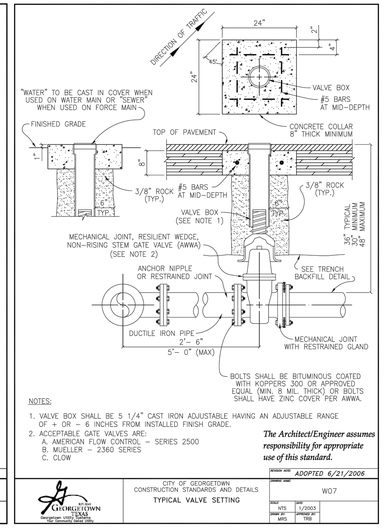
NOTES:
1. AUTHORIZED SERVICE LINE MATERIAL: POLYETHYLENE TUBING SHALL BE SDR–9. CLASS 200, SDR TUBING SHALL HAVE STAINLESS STEEL STIFFENERS.
2. ANGLE STOP SHALL BE 1" MINIMUM.
3. 1" ANGLE STOPS WITH 3/4" VALVES SHALL NOT BE PERMITTED.
4. MULTIPLE SERVICE/METER INSTALLATIONS OF MORE THAN 4 METERS PER 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.

ADOPTED 01/23/2013

CITY OF GEORGETOWN CONSTRUCTION STANDARDS AND DETAILS
DOUBLE WATER SERVICE PLAN

W05 | NTS | 1/2013



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.

ADOPTED 6/21/2006

CITY OF GEORGETOWN CONSTRUCTION STANDARDS AND DETAILS
TYPICAL VALVE SETTING

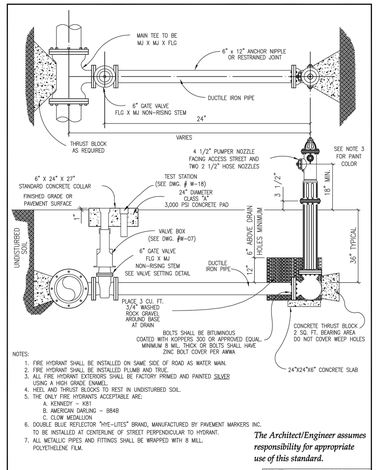
W07 | NTS | 1/2003

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

ADOPTED 6/21/2006

CITY OF GEORGETOWN CONSTRUCTION STANDARDS AND DETAILS
STANDARD RISER BOX FOR CORPORATION STOP

W08 | NTS | 1/2003



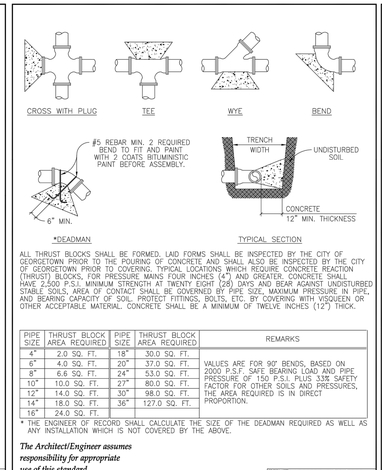
NOTES:
1. FIRE HYDRANT SHALL BE INSTALLED ON SAME SIDE OF ROAD AS WATER MAIN.
2. FIRE HYDRANT SHALL BE INSTALLED PLUMB AND TRUE.
3. ALL FIRE HYDRANT EXTERIORS SHALL BE FACTORY PRIMED AND PAINTED SILVER USING A HIGH GRADE (NAMEL).
4. HEEL AND THRUST BLOCKS TO REST IN UNDISTURBED SOIL.
5. THE ONLY FIRE HYDRANTS ACCEPTABLE ARE:
   A. KENNEDY – K81
   B. AMERICAN DARLING – B84B
   C. CLOW MEDALLION
6. DOUBLE BLUE REFLECTOR "PYE–LITES" BRAND, MANUFACTURED BY PAVEMENT MARKERS INC. TO BE INSTALLED AT CENTERLINE OF STREET PERPENDICULAR TO HYDRANT.
7. ALL METALLIC PIPES AND FITTINGS SHALL BE WRAPPED WITH 8 MILL. POLYETHELENE FILM.

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

ADOPTED 6/21/2006

CITY OF GEORGETOWN CONSTRUCTION STANDARDS AND DETAILS
TYPICAL FIRE HYDRANT INSTALLATION

W10 | NTS | 1/2003



ALL THRUST BLOCKS SHALL BE FORMED. LAID FORMS SHALL BE INSPECTED BY THE CITY OF GEORGETOWN PRIOR TO THE POURING OF CONCRETE AND SHALL ALSO BE INSPECTED BY THE CITY OF GEORGETOWN PRIOR TO COVERING. TYPICAL LOCATIONS WHICH REQUIRE CONCRETE REACTION (THRUST) BLOCKS, FOR PRESSURE MAINS FOUR INCHES (4") AND GREATER. CONCRETE SHALL HAVE 2,500 P.S.I. MINIMUM STRENGTH AT TWENTY EIGHT (28) DAYS AND BEAR AGAINST UNDISTURBED STABLE SOILS. AREA OF CONTACT SHALL BE GOVERNED BY PIPE SIZE, MAXIMUM PRESSURE IN PIPE, AND BEARING CAPACITY OF SOIL. PROTECT FITTINGS, BOLTS, ETC. BY COVERING WITH VISQUEEN OR OTHER ACCEPTABLE MATERIAL. CONCRETE SHALL BE A MINIMUM OF TWELVE INCHES (12") THICK.

PIPE SIZE	THRUST BLOCK AREA REQUIRED	PIPE SIZE	THRUST BLOCK AREA REQUIRED	REMARKS
4"	2.0 SQ. FT.	18"	30.0 SQ. FT.	VALUES ARE FOR 90° BENDS, BASED ON 2000 P.S.F. SAFE BEARING LOAD AND PIPE PRESSURE OF 150 P.S.I. PLUS 33% SAFETY FACTOR FOR OTHER SOILS AND PRESSURES, THE AREA REQUIRED IS IN DIRECT PROPORTION.
6"	4.0 SQ. FT.	20"	37.0 SQ. FT.	
8"	6.6 SQ. FT.	24"	53.0 SQ. FT.	
10"	10.0 SQ. FT.	27"	80.0 SQ. FT.	
12"	14.0 SQ. FT.	30"	98.0 SQ. FT.	
14"	18.0 SQ. FT.	36"	127.0 SQ. FT.	
16"	24.0 SQ. FT.			

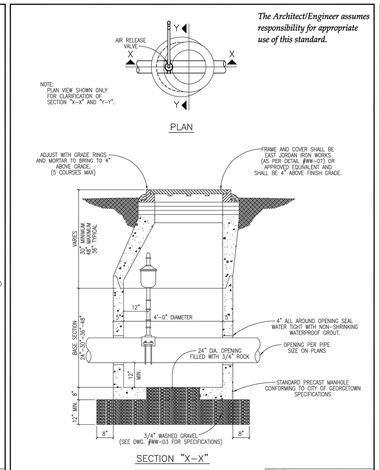
* THE ENGINEER OF RECORD SHALL CALCULATE THE SIZE OF THE DEADMAN REQUIRED AS WELL AS ANY INSTALLATION WHICH IS NOT COVERED BY THE ABOVE.

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

ADOPTED 6/21/2006

CITY OF GEORGETOWN CONSTRUCTION STANDARDS AND DETAILS
TYPICAL THRUST BLOCKS FOR WATER AND FORCE MAIN

W11 | NTS | 1/2003

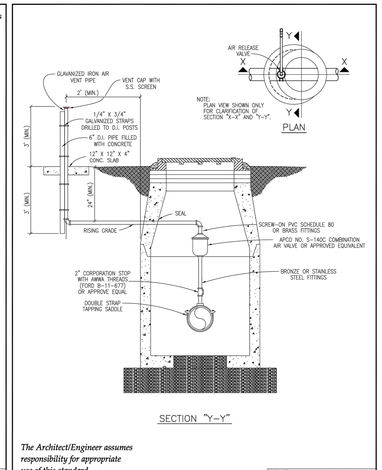


The Architect/Engineer assumes responsibility for appropriate use of this standard.

ADOPTED 6/21/2006

CITY OF GEORGETOWN CONSTRUCTION STANDARDS AND DETAILS
STANDARD AIR RELEASE VALVE FOR WATER MAIN

W12 | NTS | 1/2003

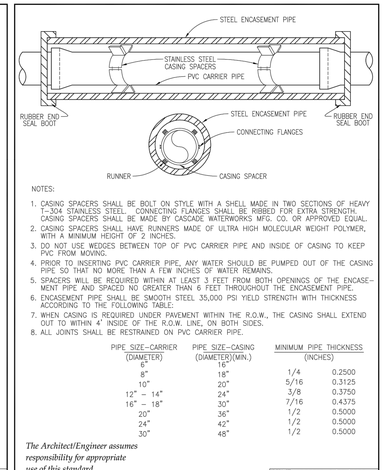


The Architect/Engineer assumes responsibility for appropriate use of this standard.

ADOPTED 6/21/2006

CITY OF GEORGETOWN CONSTRUCTION STANDARDS AND DETAILS
STANDARD AIR RELEASE VALVE FOR WATER MAIN

W13 | NTS | 1/2003



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

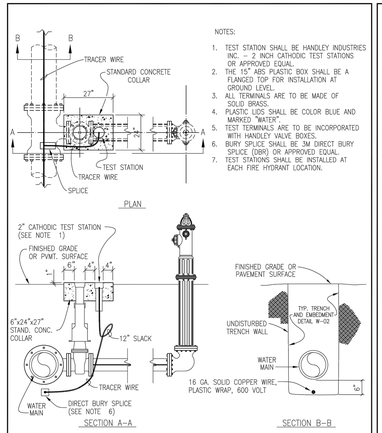
PIPE SIZE–CARRIER (DIAMETER)	PIPE SIZE–CASING (DIAMETER)(MIN.)	MINIMUM PIPE THICKNESS (INCHES)
6"	16"	
8"	18"	1/4 0.2500
10"	20"	5/16 0.3125
12" – 14"	24"	3/8 0.3750
16" – 18"	30"	7/16 0.4375
20"	36"	1/2 0.5000
24"	42"	1/2 0.5000
30"	48"	1/2 0.5000

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

ADOPTED 6/21/2006

CITY OF GEORGETOWN CONSTRUCTION STANDARDS AND DETAILS
INSTALLATION OF P.V.C. PIPE THROUGH CASING

W14 | NTS | 1/2003



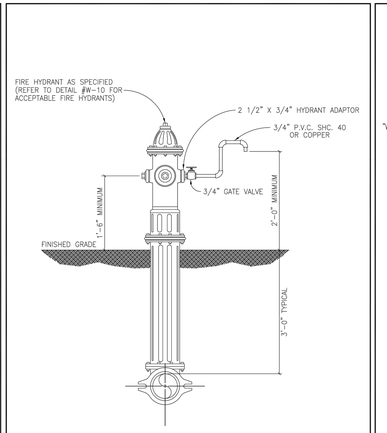
NOTES:
1. TEST STATION SHALL BE HANDLEY INDUSTRIES INC. – 2 INCH CATHODIC TEST STATIONS OR APPROVED EQUAL.
2. THE 15" ABS PLASTIC BOX SHALL BE A FLANGED TOP FOR INSTALLATION AT GROUND LEVEL.
3. ALL TERMINALS ARE TO BE MADE OF SOLID BRASS.
4. PLASTIC LIDS SHALL BE COLOR BLUE AND MARKED "WATER".
5. TEST 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.

ADOPTED 6/21/2006

CITY OF GEORGETOWN CONSTRUCTION STANDARDS AND DETAILS
TRACER WIRE INSTALLATION AND TEST STATION LOCATION

W18 | NTS | 1/2003

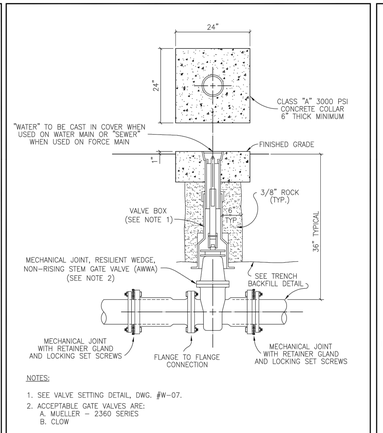


The Architect/Engineer assumes responsibility for appropriate use of this standard.

ADOPTED 6/21/2006

CITY OF GEORGETOWN CONSTRUCTION STANDARDS AND DETAILS
FIRE HYDRANT SAMPLING POINT

W19 | NTS | 1/2003



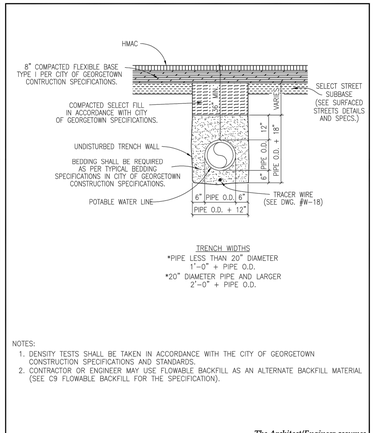
NOTES:
1. SEE VALVE SETTING DETAIL, DWG. #W–07.
2. ACCEPTABLE GATE VALVES ARE:
   A. MUELLER – 2360 SERIES
   B. CLOW

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

ADOPTED 6/21/2006

CITY OF GEORGETOWN CONSTRUCTION STANDARDS AND DETAILS
INLINE VALVE INSTALLATION

W21 | NTS | 1/2003



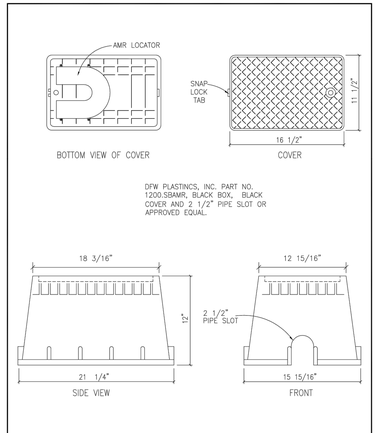
NOTES:
1. DENSITY TESTS SHALL BE TAKEN IN ACCORDANCE WITH THE CITY OF GEORGETOWN CONSTRUCTION SPECIFICATIONS AND STANDARDS.
2. CONTRACTOR OR ENGINEER MAY USE FLOWABLE BACKFILL AS AN ALTERNATE BACKFILL MATERIAL (SEE C9 FLOWABLE BACKFILL FOR THE SPECIFICATION).

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

ADOPTED 6/21/2006

CITY OF GEORGETOWN CONSTRUCTION STANDARDS AND DETAILS
TRENCH AND EMBEDMENT DETAIL UNDER PROPOSED ROADWAY

W22 | NTS | 1/2003



DFW PLASTINCS, INC. PART NO. 1200.SBAMR, BLACK BOX, BLACK COVER AND 2 1/2" PIPE SLOT OR APPROVED EQUAL.

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

ADOPTED 6/21/2006

CITY OF GEORGETOWN CONSTRUCTION STANDARDS AND DETAILS
METER BOX (NON–TRAFFIC AREAS)

W23 | NTS | 1/2003

No.	REVISIONS	DATE	BY

Kimley»Horn
© 2024 KIMLEY-HORN AND ASSOCIATES, INC.
10814 JOLLYVILLE ROAD, CAMPUS IV, SUITE 200, AUSTIN, TX 78759
PHONE: 512-418-1771 FAX: 512-418-1791
WWW.KIMLEY-HORN.COM
TEXAS REGISTERED ENGINEERING FIRM F-928

STATE OF TEXAS
JOHN A. PICKENS
110631
LICENSED
PROFESSIONAL ENGINEER
02/02/2024

KHA PROJECT 064461307
DATE: DECEMBER 2023
SCALE: AS SHOWN
DESIGNED BY: RRJ
DRAWN BY: AJM
CHECKED BY: JAP

WOLF RANCH
SECTION 6G
CITY OF GEORGETOWN
WILLIAMSON COUNTY, TEXAS

WATER DETAILS (1 OF 2)

SHEET NUMBER
84 OF 87

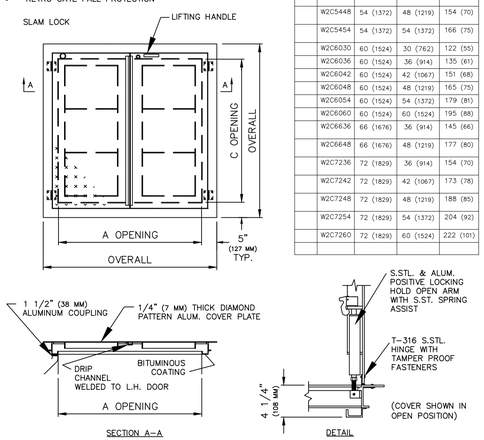
Plotted By:Castillo, Jaime Date:February 08, 2024 10:14:36am File Path:K:\AUS_Civil\064461307 - Wolf Ranch Section 6G\Cad\PlanSheets\C-Water Details.dwg
This document, together with the concepts and designs presented herein, as an instrument of service, is intended only for the specific purpose and client for which it was prepared. Reuse of and improper reliance on this document without written authorization and adaptation by Kimley-Horn and Associates, Inc. shall be without liability to Kimley-Horn and Associates, Inc.

Plotted By:Castillo, Jaime Date:February 08, 2024 10:14:39am File Path:K:\AUS_Civil\064461307-Wolf Ranch Section 6G\Cad\PlanSheets\C-Water Details.dwg
This document, together with the concepts and designs presented herein, as an instrument of service, is intended only for the specific purpose and client for which it was prepared. Reuse of and improper reliance on this document without written authorization and adaptation by Kimley-Horn and Associates, Inc. shall be without liability to Kimley-Horn and Associates, Inc.

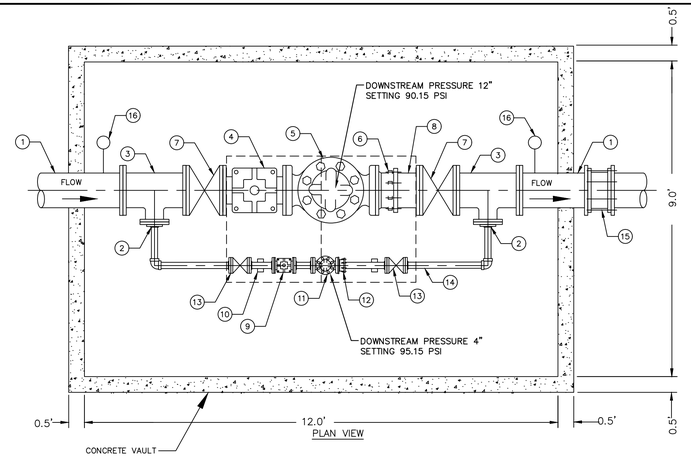
HATCH TO INCLUDE:

- AUTO-LOCK T-316 STAINLESS STEEL HOLD OPEN ARM WITH RELEASE HANDLE
- T-316 STAINLESS STEEL HINGES AND ATTACHING HARDWARE
- T-316 STAINLESS STEEL SLAM LOCK WITH REMOVABLE KEY
- STAINLESS STEEL COMPRESSION SPRING ASSIST
- BUILT-IN NEOPRENE CUSHION/GASKET
- NON-OZONE DEPLETING BITUMINOUS COATING
- DOUBLE LEAF CONSTRUCTION
- 300 LBS. PER SQ. FT. LOAD RATING (1464 KG. PER SQ. METER LOAD RATING)
- EXTRUDED ALUMINUM CHANNEL FRAME
- RECESSED LIFTING HANDLE
- LIFETIME GUARANTEE
- RETRO GATE FALL PROTECTION

STANDARD SIZES				
QTY.	MODEL NO.	A DIM. INCHES (MM)	C DIM. INCHES (MM)	UNIT WT. LBS. (KG.)
	W2C4242	42 (1067)	42 (1067)	119 (54)
	W2C4842	48 (1219)	42 (1067)	130 (59)
	W2C4848	48 (1219)	48 (1219)	142 (64)
	W2C5442	54 (1372)	42 (1067)	141 (64)
	W2C5448	54 (1372)	48 (1219)	154 (70)
	W2C5454	54 (1372)	54 (1372)	166 (75)
	W2C6030	60 (1524)	30 (762)	122 (55)
	W2C6036	60 (1524)	36 (914)	135 (61)
	W2C6042	60 (1524)	42 (1067)	151 (68)
	W2C6048	60 (1524)	48 (1219)	165 (75)
	W2C6054	60 (1524)	54 (1372)	179 (81)
	W2C6060	60 (1524)	60 (1524)	195 (88)
	W2C6636	66 (1676)	36 (914)	145 (66)
	W2C6648	66 (1676)	48 (1219)	177 (80)
	W2C7236	72 (1829)	36 (914)	154 (70)
	W2C7242	72 (1829)	42 (1067)	173 (78)
	W2C7248	72 (1829)	48 (1219)	188 (85)
	W2C7254	72 (1829)	54 (1372)	204 (92)
	W2C7260	72 (1829)	60 (1524)	222 (101)

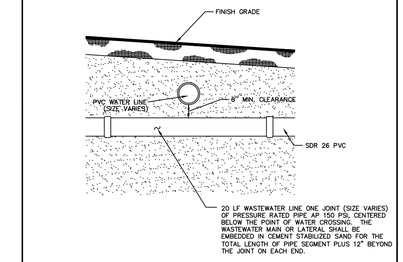


ALUMINUM HATCH DETAIL
N.T.S.



PLAN VIEW

MATERIAL LIST	
1	12" D.I.
2	6"x4" TAPPED BLIND FLANGED
3	12"x6" FLG TEE
4	12" STRAINER (CLA-VAL MODEL X-43H OR APPROVED EQUAL)
5	12" PRV (CLA-VAL MODEL 90-01 OR APPROVED EQUAL)
6	12" DRESSER DISMANTLING JOINT
7	12" D.I. FLANGED GATE VALVE
8	12" D.I.
9	4" STRAINER (CLA-VAL MODEL X-43H OR APPROVED EQUAL)
10	PIPE SUPPORT
11	4" PRV (CLA-VAL MODEL 90-48 OR APPROVED EQUAL)
12	4" DRESSER DISMANTLING JOINT
13	4" D.I. FLANGED GATE VALVE
14	4" SCH. 40 304 D.I. FLANGED
15	12" RESTRAINED TRANSITION COUPLING
16	PRESSURE GAUGE

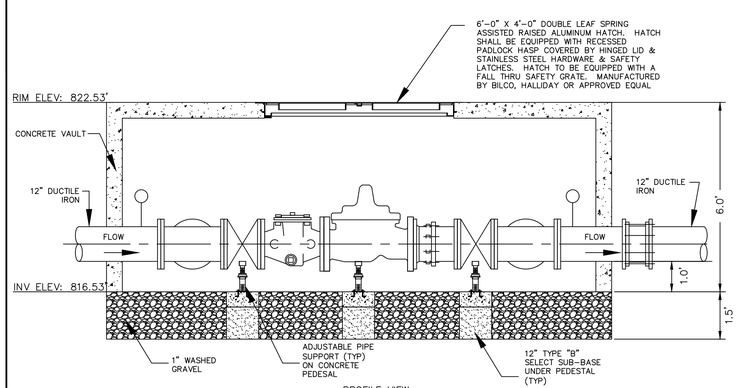


NOTE:

THE CEMENT STABILIZED SAND SHALL HAVE A MINIMUM OF 10% CEMENT PER CUBIC YARD OF CEMENT STABILIZED SAND MIXTURE, BASED ON LOOSE DRY WEIGHT VOLUME (AT LEAST 2.5 BAGS OF CEMENT PER CUBIC YARD OF MIXTURE). THE CEMENT STABILIZED SAND BEDDING SHALL BE A MINIMUM OF 6" ABOVE AND 4" BELOW THE WASTEWATER MAIN OR LATERAL. THE USE OF BROWN COLORING IN CEMENT STABILIZED SAND FOR WASTEWATER MAIN OR LATERAL BEDDING IS RECOMMENDED FOR THE IDENTIFICATION OF PRESSURE RATED WASTEWATER MAINS DURING FUTURE CONSTRUCTION.

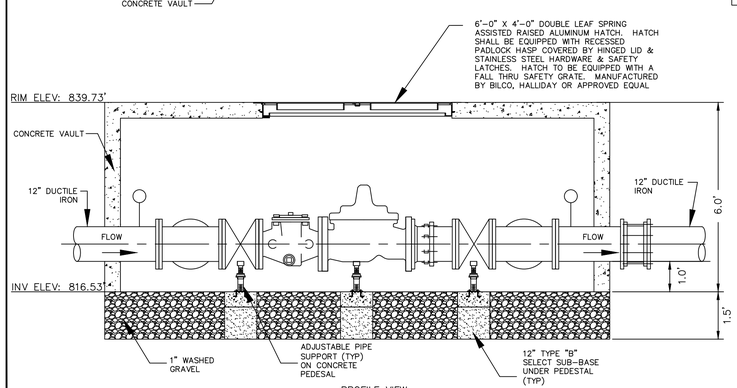
TCEQ NEW WATER/WASTEWATER CROSSING DETAIL
N.T.S.

	WGT APPROX. LBS EACH					D	
PIPE SIZE	COMPLETE	SADDLE ONLY	A	B	C	MINIMUM	MAXIMUM
2 1/2	9.0	4.8	2 1/2	3 1/2	1 1/2	8	13
3	9.2	5.0	2 /12	3 3/4	1 1/2	8 1/4	13 1/4
3 1/2	9.4	5.2	2 1/2	4	1 1/2	8 1/2	13 1/2
4	15.0	7.6	3	4 1/4	2 1/2	9 1/4	14
5	16.7	8.3	3	4 7/8	2 1/2	10	14 3/4
6	17.7	10.3	3	5 1/2	2 1/2	10 1/2	15 1/4
8	20.2	12.8	3	6 7/8	2 1/2	11 3/4	16 1/2
10	25.2	17.8	3	8 1/2	2 1/2	13 1/2	18 1/4
12	29.0	21.6	3	9 15/16	2 1/2	15	19 3/4
14	40.2	38.0	4	10 15/16	3	16 1/4	20 3/4
16	53.2	42.0	4	12 3/8	3	17 3/4	22 1/4
18	70.8	51.0	6	13 7/8	3 1/2	19 1/2	24
20	104.8	85.0	6	15 3/8	3 1/2	21	25 1/2
24	137.0	110.0	6	17 15/16	4	23 3/4	28 1/2
30	170.0	150.0	6	21 5/16	4	27	31 1/2
32	181.0	161.1	6	22 1/2	4	28 1/8	32 3/4
36	249.0	229.0	6	24 1/4	4	30 1/4	34 3/4



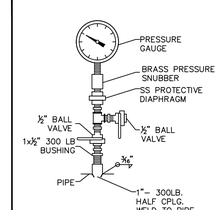
PROFILE VIEW

PRESSURE REDUCING VALVE (A) DETAIL
N.T.S.



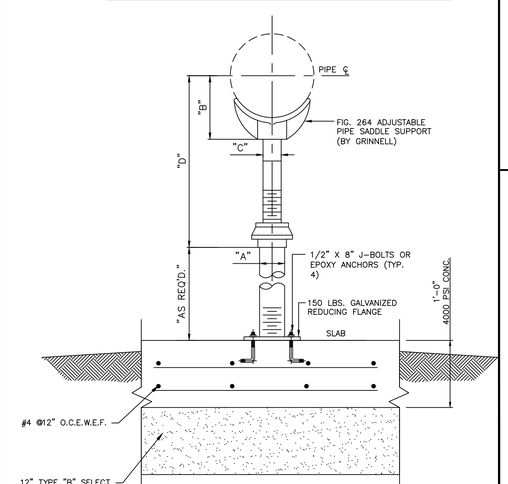
PROFILE VIEW

PRESSURE REDUCING VALVE (B) DETAIL
N.T.S.



NOTES:
1. USE DIAPHRAGM SEALS AND VALVES FOR ALL CHEMICALS, SEWAGE, SLUDGE AND OTHER LIQUIDS CONTAINING SOLIDS.

PRESSURE GAUGE DETAIL



ADJUSTABLE PIPE SUPPORT DETAIL
N.T.S.

No.	REVISIONS	DATE	BY

Kimley»Horn
© 2024 KIMLEY-HORN AND ASSOCIATES, INC.
10814 JOLLYVILLE ROAD, CAMPUS IV, SUITE 200, AUSTIN, TX 78759
PHONE: 512-418-1771 FAX: 512-418-1791
WWW.KIMLEY-HORN.COM
TEXAS REGISTERED ENGINEERING FIRM F-928

STATE OF TEXAS
JOHN A. PICKENS
110631
LICENSED
02/02/2024

KHA PROJECT 064461307
DATE DECEMBER 2023
SCALE: AS SHOWN
DESIGNED BY: RRJ
DRAWN BY: AJM
CHECKED BY: JAP

WATER DETAILS (2 OF 2)

WOLF RANCH
SECTION 6G
CITY OF GEORGETOWN
WILLIAMSON COUNTY, TEXAS

SHEET NUMBER
85 OF 87

CLASSIFICATION	ROW	B–B	PVMT
LOCAL STREET	50'	28'	24'
RESIDENTIAL STREET	65'	37'	33'
MAJOR COLLECTOR	73'	49'	41'

MINIMUM COVER BELOW FINISH-GRADE ALL UTILITIES UNDER ROADWAY – 36"
ELECTRIC PRIMARY 36"
ELECTRIC SECONDARY 24"
WATER 36"
WASTEWATER 48"
STORM SEWER 36"
GAS 36"
TELECOMMUNICATIONS 36"

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

ADOPTED 6/21/2006

CITY OF GEORGETOWN
CONSTRUCTION STANDARDS AND DETAILS
UTILITY ASSIGNMENTS FOR LOCAL STREETS, RESIDENTIAL COLLECTORS AND MAJOR COLLECTORS
WW01A — NTS — 1/2003

CITY OF GEORGETOWN NOTES:

MANHOLE DETAILS SHALL REFLECT THE CITY'S MINIMUM SPECIFICATIONS, AS STATED BELOW:

A. ALL MANHOLES SHALL BE 48" I.D., R.C.P., CLASS III, WITH RUBBER PROFILE GASKET – SINGLE OFF–SET JOINT CONFORMING TO ASTM C478, C433 AND C76.
B. ALL MANHOLES SHALL HAVE FRAME AND COVER, AS MANUFACTURED BY EAST JORDAN IRON WORKS (AS PER DETAIL # WW–07) OR APPROVED EQUIVALENT.
C. ALL MANHOLES SHALL BE CONCRETE WITH CAST IRON FRAME AND COVER.
D. ALL MANHOLES SHALL HAVE AN ECCENTRIC CONE.
E. MANHOLES MAY HAVE A FLAT LID, IF APPROVED BY CITY OF GEORGETOWN, BEING 12" THICK WITH A MINIMUM 30" OPENING, AS MANUFACTURED BY HANSEN PIPE AND PRECAST OR APPROVED EQUAL M.F.G. CONFORMING TO ASTM C478, 5000 P.S.I. CONCRETE, TRAFFIC BEARING AND WITH PROFILE GASKET – SINGLE OFF–SET JOINT CONFORMING TO ASTM C443.
F. INVERTS AND FLEXIBLE SEAL BOOTS, PER ASTM C–923, SHALL BE CAST INTO BASE SECTION.
G. MINIMUM DROP BETWEEN INVERTS SHALL BE ONE–TENTH OF A FOOT (0.1').
H. GRADE RINGS WITH AN I.D. TO MATCH FRAMES CLEAR OPENING WITH A MAXIMUM ADJUSTMENT OF 12" ARE ALLOWED.

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

ADOPTED 6/21/2006

CITY OF GEORGETOWN
CONSTRUCTION STANDARDS AND DETAILS
STANDARD MANHOLE – PLAN
WW02 — NTS — 1/2003

NOTES:

1. TO BE USED WHERE DROP IS SIX INCHES (6") TO TWO FEET (2'–0").
2. A FLOW CHANNEL SHALL BE CONSTRUCTED INSIDE MANHOLE TO DIRECT INFLUENT INTO FLOW STREAM.
3. CONSTRUCTION OF DROP SHALL PROVIDE AN OVERSIZED SLAB TO EXTEND UNDER THE DROP CONNECTION.
4. MINIMUM PIPE SIZE FOR DROP IS EIGHT INCHES (8").
5. SEE STANDARD MANHOLE DETAIL (DWG. # WW–03) FOR ADDITIONAL REQUIREMENTS.

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

ADOPTED 6/21/2006

CITY OF GEORGETOWN
CONSTRUCTION STANDARDS AND DETAILS
DROP CONNECTION–PRECAST MANHOLE TYPE "B"
WW05 — NTS — 1/2003

NOTES:

1. CONCRETE ENCASEMENT FOR DROP CONNECTION TO BE POURED INTEGRALLY WITH BOTH MANHOLE SLAB AND WALL.
2. DROP CONNECTIONS SHALL BE REQUIRED WHENEVER AN INFLUENT SEWER IS LOCATED TWO FEET (2') OR MORE ABOVE THE MAIN INVERT CHANNEL.
3. A FLOW CHANNEL SHALL BE CONSTRUCTED INSIDE MANHOLE TO DIRECT INFLUENT INTO FLOW STREAM.
4. WHEN P.V.C. IS USED IN SANITARY SEWER LINES, SOLVENT TYPE JOINT P.V.C. FITTINGS MAY BE UTILIZED IN THE DROP ASSEMBLY ONLY.
5. MINIMUM PIPE SIZE FOR DROP IS EIGHT INCHES (8").
6. SEE STANDARD MANHOLE DETAIL (DWG. # WW–03) FOR ADDITIONAL REQUIREMENTS.

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

ADOPTED 6/21/2006

CITY OF GEORGETOWN
CONSTRUCTION STANDARDS AND DETAILS
DROP CONNECTION–PRECAST MANHOLE TYPE "A"
WW04 — NTS — 1/2003

NOTES:

1. MANHOLES SHALL BE PRECAST ASTM C–478 BELL AND SPIGOT WITH PROFILE GASKET – SINGLE OFF–SET JOINTS.
2. SEE PLANS AND MANHOLE SCHEDULE, FOR MANHOLE SIZE, LOCATION, CONFIGURATION, TYPE OF TOP SECTION, VENTING REQUIREMENTS, PIPE SIZE AND TYPES.
3. SEE SPECIFICATIONS ON MATERIALS AND CONSTRUCTION.
4. AN ISO MIL COAT OF RAVEN LINING SYSTEMS, RAVEN 405 ULTRA HIGH BUILD EPOXY COATING, OR SPRAY WALL EPOXY COATING, OR APPROVED EQUAL, TO BE APPLIED TO ENTIRE INTERIOR OF EACH WASTEWATER MANHOLE AND UNDERSIDE OF FLAT TOPS.
5. ALL MANHOLE COVERS SHALL BE BOLTED AND GASKETTED WHEN MANHOLES ARE LOCATED OUT FROM PAVEMENT.
6. MANHOLES TO BE VENTED ARE IDENTIFIED ON MANHOLE SCHEDULE. REFERENCE MANHOLE VENT DETAIL.
7. MANHOLES ARE TO BE DESIGNED TO RESIST LATERAL AND VERTICAL SOIL FORCES RESULTING FROM MANHOLE DEPTH. ADDITIONALLY, MANHOLES LOCATED IN PAVEMENT TO BE DESIGNED FOR HS–20 TRAFFIC LOADS.
8. GROUT SHALL MEET THE REQUIREMENTS AS STATED BY THE COATING MANUFACTURER.
9. MANHOLE BASE BEDDING MATERIAL SPECS. FOR 3/4" WASHED GRAVEL:
   SIEVE SIZE 2", PERCENT (%) RETAINED 0
   SIEVE SIZE 1 1/2", % RETAINED 0–10
   SIEVE SIZE 1", % RETAINED 45–80
   SIEVE SIZE 3/4", % RETAINED 85–100
   SIEVE SIZE 3/8", % RETAINED 95–100

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

ADOPTED 6/21/2006

CITY OF GEORGETOWN
CONSTRUCTION STANDARDS AND DETAILS
STANDARD MANHOLE – SECTION
WW03 — NTS — 1/2003

NOTES:

1. INVERT CHANNELS TO BE CONSTRUCTED FOR SMOOTH FLOW WITH NO OBSTRUCTIONS.
2. SPILLWAYS SHALL BE CONSTRUCTED BETWEEN PIPES WITH DIFFERENT INVERT ELEVATIONS PROVIDING FOR SMOOTH FLOW.
3. CHANNELS FOR FUTURE CONSTRUCTIONS (STUBS) SHALL BE CONSTRUCTED, FILLED WITH SAND, AND COVERED WITH 1" OF MORTAR.
4. SLOPE MANHOLE ITSELF WITH A 1:2 SLOPE FROM MANHOLE WALL TO CHANNEL.
5. INVERT SHALL BE A MINIMUM OF 1/2 THE DIAMETER OF THE LARGEST PIPE OR 4" DEEP.

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

ADOPTED 6/21/2006

CITY OF GEORGETOWN
CONSTRUCTION STANDARDS AND DETAILS
FLOW PATTERNS FOR INVERT CHANNELS
WW06 — NTS — 1/2003

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

NOTES:

1. STANDARD WASTEWATER MANHOLE SET TO BE EAST JORDAN IRON WORKS, INC. CATALOG NO. 1480A V–1420/1480T1, COVER TO BE STAMPED WITH "SANITARY SEWER".
2. STANDARD WASTEWATER MANHOLE SET TO BE HEAVY DUTY LOAD RATED.
3. FOR MORE DETAILED SPECIFICATIONS REFER TO EAST JORDAN IRON WORKS, INC. REFERENCE PRODUCT DRAWING 41420012. 00148390.
4. FOR BOLTED WASTEWATER MANHOLE SET REFER TO DETAIL WW07A.

ADOPTED 6/21/2006

CITY OF GEORGETOWN
CONSTRUCTION STANDARDS AND DETAILS
STANDARD WASTEWATER MANHOLE SET
WW07 — NTS — 1/2003

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

ADOPTED 6/21/2006

CITY OF GEORGETOWN
CONSTRUCTION STANDARDS AND DETAILS
48"X5" TO 33"X8"X36" TALL ECCENTRIC CONCRETE SECTION
WW08 — NTS — 1/2003

NOTES:

1. AVAILABLE WITH CAST IRON RING AND COVER CAST IN PLACE.
2. PERMITTED ONLY WITH WRITTEN APPROVAL FROM GEORGETOWN UTILITY SYSTEMS, CITY OF GEORGETOWN

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

ADOPTED 6/21/2006

CITY OF GEORGETOWN
CONSTRUCTION STANDARDS AND DETAILS
48" MANHOLE FLAT LID
WW09 — NTS — 1/2003

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

ADOPTED 6/21/2006

CITY OF GEORGETOWN
CONSTRUCTION STANDARDS AND DETAILS
FLEXIBLE "SEAL BOOT" CONNECTOR
WW10 — NTS — 1/2003

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

ADOPTED 6/21/2006

CITY OF GEORGETOWN
CONSTRUCTION STANDARDS AND DETAILS
SEWER CLEAN–OUT DETAIL
WW12 — NTS — 1/2003

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

NOTES:

1. BOLTED WASTEWATER MANHOLE SET TO BE EAST JORDAN IRON WORKS, INC. CATALOG NO. 1480APT V–1420/1480ZT1PT, COVER TO BE STAMPED WITH "SANITARY SEWER".
2. BOLTED WASTEWATER MANHOLE SET TO BE HEAVY DUTY LOAD RATED.
3. FOR MORE DETAILED SPECIFICATIONS REFER TO EAST JORDAN IRON WORKS, INC. REFERENCE PRODUCT DRAWING 00148392. 41420013.
4. FOR STANDARD WASTEWATER MANHOLE SET REFER TO DETAIL WW07.

ADOPTED 6/21/2006

CITY OF GEORGETOWN
CONSTRUCTION STANDARDS AND DETAILS
BOLTED WASTEWATER MANHOLE SET
WW07A — NTS — 1/2006

NOTES:

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

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

ADOPTED 6/21/2006

CITY OF GEORGETOWN
CONSTRUCTION STANDARDS AND DETAILS
SEWER SERVICE CONNECTIONS
WW13 — NTS — 1/2003

ADOPTED 6/21/2006

CITY OF GEORGETOWN
CONSTRUCTION STANDARDS AND DETAILS
TRENCH AND EMBEDMENT DETAIL UNDER NON–PAVED AREAS
WW16 — NTS — 1/2003

NOTES:

1. DENSITY TESTS SHALL BE TAKEN IN ACCORDANCE WITH THE CITY OF GEORGETOWN CONSTRUCTION SPECIFICATIONS AND STANDARDS.
2. CONTRACTOR OR ENGINEER MAY USE FLOWABLE BACKFILL AS AN ALTERNATE BACKFILL MATERIAL (SEE CD FLOWABLE BACKFILL FOR THE SPECIFICATION).

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

ADOPTED 6/21/2006

CITY OF GEORGETOWN
CONSTRUCTION STANDARDS AND DETAILS
TRENCH AND EMBEDMENT DETAIL UNDER PROPOSED ROADWAY
WW18 — NTS — 1/2003

NOTE:

INSTALLATION OF THE CONCRETE CASTING IS REQUIRED FOR AND APPLIES TO ALL TYPES OF MANHOLES TO BE LOCATED IN THE ROADWAY.

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

APPROVED 6/21/2006

CITY OF GEORGETOWN
CONSTRUCTION STANDARDS AND DETAILS
CONCRETE CASTING MANHOLE DETAIL
WW21 — NTS — 1/2006

SADDLE TEE				
PART NO.	SIZE	L1	H	P
SX635	8"X8"	5.625	5.659	1.448

PLASTIC TRENDS INC. – 1/8 BEND – SPIGOT				
PART NO.	SIZE	A	B	C	D
2 406	6	11.275	6.146	1.870	6.060

NOTES:

1. FLEXIBLE SADDLE TO BE INSTALLED IN ACCORDANCE WITH MANUFACTURER'S REQUIREMENTS.
2. SADDLE TEE SHALL BE ORIENTATED 45° TO MAIN. (SEE SEWER SERVICE CONNECTIONS DETAIL – DWG # WW–13).
3. EXCAVATE AROUND EXISTING 8–INCH PIPE, EXPOSING SUFFICIENT ROOM FOR S.S. CLAMPS.
4. THOROUGHLY CLEAN AND DRY THE MATING SURFACE WITH RAG OR PAPER TOWEL. MAKE SURE THEY ARE FREE OF DUST AND MOISTURE.
5. MARK THE SIZE OF THE HOLE TO BE CUT USING THE GASKET SKIRT OR THE SADDLE ITSELF AS THE TEMPLATE.
6. SAW OUT THE SECTION OF THE PIPE WHERE THE SADDLE WILL BE LOCATED, WITH A SABER OR HOT HOLE SAW.
7. TEST TO MAKE SURE SADDLE FITS HOLE PROPERLY.
8. SERVICE PIPE SHALL NOT EXTEND MORE THAN ONE–HALF INCH INTO THE MAIN.
9. PLACE GASKET SKIRT AND SADDLE OVER OPENING AND TIGHTEN BAND CLAMPS EVENLY UNTIL SADDLE FIRMLY ATTACHED TO THE PIPE. APPLY PRESSURE ON THE SADDLE AGAINST THE PIPE WHILE TIGHTENING THE CLAMPS AS INDICATED ABOVE. DO NOT OVER TIGHTEN, DO NOT STRIP THREAD.
10. REPLACE THE BEDDING AND BACKFILL IN ACCORDANCE WITH THE TRENCH EMBEDMENT DETAIL.

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

ADOPTED 6/21/2006

CITY OF GEORGETOWN
CONSTRUCTION STANDARDS AND DETAILS
GASKETED SEWER FITTING FOR SEWER SERVICE CONNECTIONS TO EXISTING MAINS
WW13A — NTS — 1/2003

NOTES:

1. MANHOLES SHALL BE PRECAST ASTM C–478 BELL AND SPIGOT WITH PROFILE GASKET – SINGLE OFF–SET JOINTS.
2. SEE PLANS AND MANHOLE SCHEDULE, FOR MANHOLE SIZE, LOCATION, CONFIGURATION, TYPE OF TOP SECTION, VENTING REQUIREMENTS, PIPE SIZE AND TYPES.
3. SEE SPECIFICATIONS ON MATERIALS AND CONSTRUCTION.
4. AN ISO MIL COAT OF RAVEN LINING SYSTEMS, RAVEN 405 ULTRA HIGH BUILD COATING, OR SPRAY WALL EPOXY COATING, OR APPROVED EQUAL, TO BE APPLIED TO ENTIRE INTERIOR OF EACH WASTEWATER MANHOLE AND UNDERSIDE OF FLAT TOPS.
5. ALL MANHOLE COVERS SHALL BE BOLTED AND GASKETTED WHEN MANHOLES ARE LOCATED OUT FROM PAVEMENT.
6. MANHOLES TO BE VENTED ARE IDENTIFIED ON MANHOLE SCHEDULE. REFERENCE MANHOLE VENT DETAIL.
7. MANHOLES ARE TO BE DESIGNED TO RESIST LATERAL AND VERTICAL SOIL FORCES RESULTING FROM MANHOLE DEPTH. ADDITIONALLY, MANHOLES LOCATED IN PAVEMENT TO BE DESIGNED FOR HS–20 TRAFFIC LOADS.
8. GROUT SHALL MEET THE REQUIREMENTS AS STATED BY THE COATING MANUFACTURER.
9. MANHOLE BASE BEDDING MATERIAL SPECS. FOR 3/4" WASHED GRAVEL:
   SIEVE SIZE 2", PERCENT (%) RETAINED 0 — SIEVE SIZE 1 1/2", % RETAINED 0–10
   SIEVE SIZE 1", % RETAINED 45–80 — SIEVE SIZE 3/4", % RETAINED 85–100
   SIEVE SIZE 3/8", % RETAINED 95–100
10. ALL PVC PIPE SHALL BE REMOVED FROM INVERT.

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

ADOPTED 6/21/2006

CITY OF GEORGETOWN
CONSTRUCTION STANDARDS AND DETAILS
PRECAST MANHOLE ON CAST–IN–PLACE FOUNDATION
WW20 — NTS — 1/2006

No.	REVISIONS	DATE	BY

Kimley»Horn
© 2024 KIMLEY-HORN AND ASSOCIATES, INC.
10814 JOLLYVILLE ROAD, CAMPUS IV, SUITE 200, AUSTIN, TX 78759
PHONE: 512-418-1771 FAX: 512-418-1791
WWW.KIMLEY-HORN.COM
TEXAS REGISTERED ENGINEERING FIRM F-928

STATE OF TEXAS — JOHN A. PICKENS — 110631 — LICENSED — PROFESSIONAL ENGINEER

02/02/2024

KHA PROJECT 064461307
DATE DECEMBER 2023
SCALE: AS SHOWN
DESIGNED BY: RRJ
DRAWN BY: AJM
CHECKED BY: JAP

WOLF RANCH
SECTION 6G
CITY OF GEORGETOWN
WILLIAMSON COUNTY, TEXAS

WASTEWATER DETAILS (1 OF 2)

SHEET NUMBER
86 OF 87

Plotted By:Castillo, Jaime Date:February 08, 2024 10:14:58am File Path:K:\AUS_Civil\064461307 Wolf Ranch Section 6G\Cad\PlanSheets\C-Wastewater Details.dwg
This document, together with the concepts and designs presented herein, as an instrument of service, is intended only for the specific purpose and client for which it was prepared. Reuse of and improper reliance on this document without written authorization and adaptation by Kimley-Horn and Associates, Inc. shall be without liability to Kimley-Horn and Associates, Inc.

WASTEWATER FLOWS

Project Name: Wolf Ranch Section 6G
Project Number: 2022-19-CON
Date Prepared: 12/14/2023

Wastewater Line

Line Number	from	to	SF UNITS	CUMULATIVE SF UNITS	Cumulative Population	Cumulative Population (ROUNDED)	Avg. Dry Weather Flow F (gpd)	Avg. Dry Weather Flow F (gpm)	Maximum Flow: Peak Flow Factor PF	Maximum Flow: Max Dry Weather Flow Q_{max} (gpd)	Maximum Flow: Max Dry Weather Flow Q_{max} (gpm)	Minimum Flow: Min Flow Factor MF	Minimum Flow: Min Dry Weather Flow Q_{min} (gpd)	Minimum Flow: Min Dry Weather Flow Q_{min} (gpm)	Area Served A (ac)	Cumul. Area Served A (ac)	Inflow/Infiltration (1000 gal/acre/day) I/I (gpd)	Inflow/Infiltration (1000 gal/acre/day) I/I (gpm)	Peak Wet Weather Flow Qpw (gpd)	Peak Wet Weather Flow Qpw (gpm)	MAX DRY WEATHER (GPM)	MAX DRY WEATHER (CFS)	MAX WET WEATHER (GPM)	MAX WET WEATHER (CFS)	PIPE SIZE (IN)	PIPE SLOPE FT/100	65% CAPACITY (CFS) (n=0.013)	65% CAPACITY (GPM) (n=0.013)	85% CAPACITY (CFS) (n=0.013)	85% CAPACITY (GPM) (n=0.013)	LENGTH (FT)	PEAK DRY **Q** (CFS)	PEAK **DRY Q** (GPM)	PEAK **DRY VELOCITY** (FPS) FROM FLOWMASTER	PEAK **DRY DEPTH** (IN) FROM FLOWMASTER	PEAK **WET Q** (CFS)	PEAK **WET Q** (GPM)	PEAK **WET VELOCITY** (FPS) FROM FLOWMASTER
A11	A11	A10	1	1	2.5	**3**	250.00	0.17	4.45	1,112.11	0.77	0.06	15.83	0.01	1.39	**1.39**	1,390.00	0.97	2,502.11	1.74	0.77	0.0017	1.74	0.0038	8	0.5	0.56	249.30	0.73	326.00	118	0.0017	0.77	0.50	0.30	0.0038	1.74	0.62
A10	A10	A9	3	4	10	**10**	1,000.00	0.69	4.40	4,398.38	3.05	0.08	80.36	0.06	0.67	**2.06**	2,060.00	1.43	6,458.38	4.48	3.05	0.0067	4.48	0.0098	8	0.5	0.56	249.30	0.73	326.00	143	0.0067	3.05	0.73	0.50	0.0098	4.48	0.82
A9	A9	A8	9	13	32.5	**33**	3,250.00	2.26	4.32	14,043.19	9.75	0.10	330.81	0.23	0.95	**3.01**	3,010.00	2.09	17,053.19	11.84	9.75	0.0214	11.84	0.0259	8	0.5	0.56	249.30	0.73	326.00	289	0.0214	9.75	1.04	0.90	0.0259	11.84	1.10
A8	A8	A7	2	15	37.5	**38**	3,750.00	2.60	4.31	16,156.61	11.22	0.10	392.52	0.27	2.47	**5.48**	5,480.00	3.81	21,636.61	15.03	11.22	0.0246	15.03	0.0329	8	0.5	0.56	249.30	0.73	326.00	99	0.0246	11.22	1.08	0.90	0.0329	15.03	1.18
A7	A7	A6	0	15	37.5	**38**	3,750.00	2.60	4.31	16,156.61	11.22	0.10	392.52	0.27	1.59	**7.07**	7,070.00	4.91	23,226.61	16.13	11.22	0.0246	16.13	0.0353	8	0.5	0.56	249.30	0.73	326.00	158	0.0246	11.22	1.08	0.90	0.0353	16.13	1.20
A6	A6	A5	4	66	165	**165**	16,500.00	11.46	4.12	67,995.36	47.22	0.14	2,309.81	1.60	1.36	**8.43**	8,430.00	5.85	76,425.36	53.07	47.22	0.1035	53.07	0.1163	8	0.5	0.56	249.30	0.73	326.00	185	0.1035	47.22	1.65	1.90	0.1163	53.07	1.71
A5	A5	A4	2	68	170	**170**	17,000.00	11.81	4.12	69,969.55	48.59	0.14	2,393.91	1.66	0.43	**21.42**	21,420.00	14.88	91,389.55	63.46	48.59	0.1065	63.46	0.1391	8	0.5	0.56	249.30	0.73	326.00	251	0.1065	48.59	1.67	1.90	0.1391	63.46	1.80
A4	A4	A3	4	72	180	**180**	18,000.00	12.50	4.11	73,907.51	51.32	0.14	2,563.58	1.78	1.50	**22.92**	22,920.00	15.92	96,827.51	67.24	51.32	0.1125	67.24	0.1473	8	1.4	0.93	415.66	1.21	543.56	269	0.1125	51.32	2.45	1.50	0.1473	67.24	2.64
A3	A3	A2	2	74	185	**185**	18,500.00	12.85	4.10	75,871.40	52.69	0.14	2,649.12	1.84	2.03	**24.95**	24,950.00	17.33	100,821.40	70.01	52.69	0.1154	70.01	0.1534	8	1.5	0.96	431.80	1.26	564.66	106	0.1154	52.69	2.52	1.50	0.1534	70.01	2.74
A2	A2	A1	0	74	185	**185**	18,500.00	12.85	4.10	75,871.40	52.69	0.14	2,649.12	1.84	1.90	**26.85**	26,850.00	18.65	102,721.40	71.33	52.69	0.1154	71.33	0.1563	8	2.3	1.20	538.16	1.57	703.75	305	0.1154	52.69	2.93	1.40	0.1563	71.33	3.20
B9	B9	B8	5	5	12.5	**13**	1,250.00	0.87	4.39	5,483.47	3.81	0.08	105.80	0.07	0.69	**0.69**	690.00	0.48	6,173.47	4.29	3.81	0.0083	4.29	0.0094	8	4.0	1.57	705.12	2.05	922.08	133	0.0083	3.81	1.62	0.30	0.0094	4.29	1.67
B8	B8	B7	2	7	17.5	**18**	1,750.00	1.22	4.37	7,641.94	5.31	0.09	157.98	0.11	0.70	**1.39**	1,390.00	0.97	9,031.94	6.27	5.31	0.0116	6.27	0.0137	8	5.0	1.76	788.35	2.30	1,030.92	97	0.0116	5.31	1.91	0.40	0.0137	6.27	2.02
B7	B7	B6	6	13	32.5	**33**	3,250.00	2.26	4.32	14,043.19	9.75	0.10	330.81	0.23	0.38	**1.77**	1,770.00	1.23	15,813.19	10.98	9.75	0.0214	10.98	0.0241	8	5.0	1.76	788.35	2.30	1,030.92	284	0.0214	9.75	2.30	0.50	0.0241	10.98	2.38
B6	B6	B5	2	15	37.5	**38**	3,750.00	2.60	4.31	16,156.61	11.22	0.10	392.52	0.27	2.01	**3.78**	3,780.00	2.63	19,936.61	13.84	11.22	0.0246	13.84	0.0303	8	5.0	1.76	788.35	2.30	1,030.92	106	0.0246	11.22	2.38	0.50	0.0303	13.84	2.56
B5	B5	B4	4	19	47.5	**48**	4,750.00	3.30	4.29	20,357.86	14.14	0.11	520.73	0.36	0.76	**4.54**	4,540.00	3.15	24,897.86	17.29	14.14	0.0310	17.29	0.0379	8	5.0	1.76	788.35	2.30	1,030.92	99	0.0310	14.14	2.58	0.60	0.0379	17.29	2.76
B4	B4	B3	8	27	67.5	**68**	6,750.00	4.69	4.25	28,671.96	19.91	0.12	792.81	0.55	0.80	**5.34**	5,340.00	3.71	34,011.96	23.62	19.91	0.0436	23.62	0.0518	8	5.0	1.76	788.35	2.30	1,030.92	319	0.0436	19.91	2.88	0.70	0.0518	23.62	3.01
B3	B3	B2	2	29	72.5	**73**	7,250.00	5.03	4.24	30,734.23	21.34	0.12	863.59	0.60	1.48	**6.82**	6,820.00	4.74	37,554.23	26.08	21.34	0.0468	26.08	0.0571	8	6.4	1.99	894.70	2.61	1,169.99	99	0.0468	21.34	3.20	0.70	0.0571	26.08	3.41
B2	B2	B1	3	32	80	**80**	8,000.00	5.56	4.23	33,816.59	23.48	0.12	970.36	0.67	0.51	**7.33**	7,330.00	5.09	41,146.59	28.57	23.48	0.0515	28.57	0.0626	8	6.4	1.99	894.70	2.61	1,169.99	104	0.0515	23.48	3.29	0.70	0.0626	28.57	3.49
B1	B1	A5	0	47	117.5	**118**	11,750.00	8.16	4.17	49,051.69	34.06	0.13	1,539.22	1.07	0.38	**12.56**	12,560.00	8.72	61,611.69	42.79	34.06	0.0746	42.79	0.0937	8	5.6	1.85	832.07	2.42	1,088.09	364	0.0746	34.06	3.51	0.90	0.0937	42.79	3.77
B1	B1	END & PLUG	0	0	0	**0**	0.00	0.00	4.50	0.00	0.00	0.00	0.00	0.00	0.15	**0.15**	150.00	0.10	150.00	0.10	0.00	0.0000	0.10	0.0002	8	0.500	0.56	249.30	0.73	326.00	140	0.0000	0.00	0.05	0.10	0.0002	0.10	0.06
D5	D5	D4	4	4	10	**10**	1,000.00	0.69	4.40	4,398.38	3.05	0.08	80.36	0.06	0.55	**0.55**	550.00	0.38	4,948.38	3.44	3.05	0.0067	3.44	0.0075	8	7.0	2.08	932.79	2.72	1,219.80	135	0.0067	3.05	1.81	0.30	0.0075	3.44	1.88
D4	D4	D3	2	6	15	**15**	1,500.00	1.04	4.38	6,564.53	4.56	0.09	130.61	0.09	1.18	**1.73**	1,730.00	1.20	8,294.53	5.76	4.56	0.0100	5.76	0.0126	8	2.0	1.11	498.60	1.45	652.01	99	0.0100	4.56	1.18	0.40	0.0126	5.76	1.42
D3	D3	D2	3	9	22.5	**23**	2,250.00	1.56	4.35	9,786.95	6.80	0.09	213.22	0.15	0.95	**2.68**	2,680.00	1.86	12,466.95	8.66	6.80	0.0149	8.66	0.0190	8	1.5	0.96	431.80	1.26	564.66	117	0.0149	6.80	1.36	0.60	0.0190	8.66	1.48
D2	D2	D1	1	10	25	**25**	2,500.00	1.74	4.34	10,854.99	7.54	0.10	240.86	0.17	1.27	**3.95**	3,950.00	2.74	14,804.99	10.28	7.54	0.0165	10.28	0.0225	8	1.8	1.04	466.39	1.36	609.90	32	0.0165	7.54	1.49	0.60	0.0225	10.28	1.65
D1	D1	B1	5	15	37.5	**38**	3,750.00	2.60	4.31	16,156.61	11.22	0.10	392.52	0.27	0.90	**4.85**	4,850.00	3.37	21,006.61	14.59	11.22	0.0246	14.59	0.0320	8	1.8	1.04	466.39	1.36	609.90	318	0.0246	11.22	1.70	0.70	0.0320	14.59	1.83
E5	E5	E4	2	2	5	**5**	500.00	0.35	4.43	2,213.76	1.54	0.07	35.03	0.02	0.41	**0.41**	410.00	0.28	2,623.76	1.82	1.54	0.0034	1.82	0.0040	8	6.0	1.92	863.59	2.52	1,129.31	99	0.0034	1.54	1.42	0.20	0.0040	1.82	1.48
E4	E4	E3	2	4	10	**10**	1,000.00	0.69	4.40	4,398.38	3.05	0.08	80.36	0.06	0.49	**0.90**	900.00	0.63	5,298.38	3.68	3.05	0.0067	3.68	0.0081	8	4.0	1.57	705.12	2.05	922.08	134	0.0067	3.05	1.50	0.30	0.0081	3.68	1.61
E3	E3	E2	8	12	30	**30**	3,000.00	2.08	4.33	12,982.97	9.02	0.10	299.65	0.21	0.79	**1.69**	1,690.00	1.17	14,672.97	10.19	9.02	0.0198	10.19	0.0223	8	6.0	1.92	863.59	2.52	1,129.31	218	0.0198	9.02	2.40	0.50	0.0223	10.19	2.48
E2	E2	E1	0	12	30	**30**	3,000.00	2.08	4.33	12,982.97	9.02	0.10	299.65	0.21	1.38	**3.07**	3,070.00	2.13	16,052.97	11.15	9.02	0.0198	11.15	0.0244	8	6.0	1.92	863.59	2.52	1,129.31	96	0.0198	9.02	2.40	0.50	0.0244	11.15	2.55
E1	E1	CTE	5	17	42.5	**43**	4,250.00	2.95	4.30	18,261.30	12.68	0.11	455.87	0.32	2.83	**5.90**	5,900.00	4.10	24,161.30	16.78	12.68	0.0278	16.78	0.0368	8	0.5	0.56	249.30	0.73	326.00	270	0.0278	12.68	2.49	0.60	0.0368	16.78	2.74
F3	F3	F2	6	6	15	**15**	1,500.00	1.04	4.38	6,564.53	4.56	0.09	130.61	0.09	0.17	**0.17**	170.00	0.12	6,734.53	4.68	4.56	0.0100	4.68	0.0102	8	7.0	2.08	932.79	2.72	1,219.80	192	0.0100	4.56	2.04	0.30	0.0102	4.68	2.05
F2	F2	F1	4	10	25	**25**	2,500.00	1.74	4.34	10,854.99	7.54	0.10	240.86	0.17	0.87	**1.04**	1,040.00	0.72	11,894.99	8.26	7.54	0.0165	8.26	0.0181	8	7.0	2.08	932.79	2.72	1,219.80	99	0.0165	7.54	2.40	0.40	0.0181	8.26	2.47
F1	F1	CTE	3	13	32.5	**33**	3,250.00	2.26	4.32	14,043.19	9.75	0.10	330.81	0.23	2.53	**3.57**	3,570.00	2.48	17,613.19	12.23	9.75	0.0214	12.23	0.0268	8	0.5	0.56	249.30	0.73	326.00	284	0.0214	9.75	1.04	0.90	0.0268	12.23	1.11

CTE* Connect to Existing Wastewater Manhole

No.	REVISIONS	DATE	BY

Kimley»Horn
© 2024 KIMLEY-HORN AND ASSOCIATES, INC.
10814 JOLLYVILLE ROAD, CAMPUS IV, SUITE 200, AUSTIN, TX 78759
PHONE: 512-418-1771 FAX: 512-418-1791
WWW.KIMLEY-HORN.COM
TEXAS REGISTERED ENGINEERING FIRM F-928

02/02/2024

KHA PROJECT 064461307
DATE DECEMBER 2023
SCALE: AS SHOWN
DESIGNED BY: RRJ
DRAWN BY: AJM
CHECKED BY: JAP

WASTEWATER DETAILS (2 OF 2)

WOLF RANCH
SECTION 6G
CITY OF GEORGETOWN
WILLIAMSON COUNTY, TEXAS

SHEET NUMBER
87 OF 87

Plotted By:Castillo, Jaime Date:February 08, 2024 10:15:06am File Path:K:\AUS_Civil\064461307-Wolf Ranch Section 6G\Cad\PlanSheets\C-WastewaterCalculations.dwg
This document, together with the concepts and designs presented herein, as an instrument of service, is intended only for the specific purpose and client for which it was prepared. Reuse of and improper reliance on this document without written authorization and adaptation by Kimley-Horn and Associates, Inc. shall be without liability to Kimley-Horn and Associates, Inc.