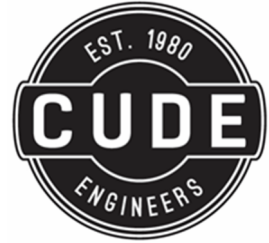


ORGANIZED SEWER COLLECTION SYSTEM
HIDDEN CANYON SUBDIVISION, UNIT 2A P.U.D.

PREPARED FOR
STONE OAK HIDDEN CANYON, LLC
FEBRUARY 2024



February 7th, 2024

Texas Commission on Environmental Quality - Region 13
Edwards Aquifer Protection Program
14250 Judson Rd.
San Antonio, TX 78233-4480

Re: Hidden Canyon Subdivision, Unit 2A P.U.D.
Organized Sewage Collection System Application

To Whom It May Concern:

Please find the attached original (1) and one (1) copy of the Hidden Canyon Subdivision, Unit 2A P.U.D. Organized Sewage Collection System Plan Modification application submittal. This application has been prepared to be consistent with the Texas Commission on Environmental Quality (30 TAC 213) and its current policies for development over the Edwards Aquifer Recharge Zone.

The appropriate review fee in the amount of \$650.00 is included herein. If you should have any questions regarding the contained information, please do not hesitate to contact our office.

Sincerely,

A handwritten signature in blue ink, appearing to read "W. Patrick Murphy", is written over a circular blue stamp or seal.

W. Patrick Murphy, P.E., CFM
Associate



*HIDDEN CANYON SUBDIVISION,
UNIT 2A P.U.D.*

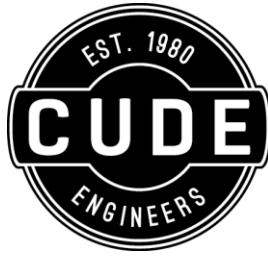
ORGANIZED SEWAGE COLLECTION SYSTEM (SCS)
MODIFICATION

PREPARED FOR:

STONE OAK HIDDEN CANYON, LLC
6002 CAMP BULLIS ROAD
SAN ANTONIO, TX 78257



3/4/2024



**HIDDEN CANYON SUBDIVISION,
UNIT 2A P.U.D.**

***CORE DATA FORM
(TCEQ-10400)***



TCEQ Use Only

TCEQ Core Data Form

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.)		
<input checked="" type="checkbox"/> New Permit, Registration or Authorization (Core Data Form should be submitted with the program application.)		
<input type="checkbox"/> Renewal (Core Data Form should be submitted with the renewal form)	<input type="checkbox"/> Other	
2. Customer Reference Number (if issued) CN 603399239	Follow this link to search for CN or RN numbers in Central Registry**	3. Regulated Entity Reference Number (if issued) RN 111799789

SECTION II: Customer Information

4. General Customer Information	5. Effective Date for Customer Information Updates (mm/dd/yyyy)		2/7/2024	
<input type="checkbox"/> New Customer <input checked="" type="checkbox"/> Update to Customer Information <input type="checkbox"/> Change in Regulated Entity Ownership <input type="checkbox"/> Change in Legal Name (Verifiable with the Texas Secretary of State or Texas Comptroller of Public Accounts)				
<i>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).</i>				
6. Customer Legal Name (If an individual, print last name first: eg: Doe, John)			If new Customer, enter previous Customer below:	
Stone Oak Hidden Canyon, LLC				
7. TX SOS/CPA Filing Number	8. TX State Tax ID (11 digits)	9. Federal Tax ID (9 digits)	10. DUNS Number (if applicable)	
11. Type of Customer:	<input type="checkbox"/> Corporation	<input type="checkbox"/> Individual	Partnership: <input type="checkbox"/> General <input type="checkbox"/> Limited	
Government: <input type="checkbox"/> City <input type="checkbox"/> County <input type="checkbox"/> Federal <input type="checkbox"/> State <input type="checkbox"/> Other	<input type="checkbox"/> Sole Proprietorship		<input type="checkbox"/> Other:	
12. Number of Employees			13. Independently Owned and Operated?	
<input type="checkbox"/> 0-20 <input type="checkbox"/> 21-100 <input type="checkbox"/> 101-250 <input type="checkbox"/> 251-500 <input type="checkbox"/> 501 and higher			<input type="checkbox"/> Yes <input type="checkbox"/> No	
14. Customer Role (Proposed or Actual) – as it relates to the Regulated Entity listed on this form. Please check one of the following				
<input type="checkbox"/> Owner <input type="checkbox"/> Operator <input type="checkbox"/> Owner & Operator <input type="checkbox"/> Occupational Licensee <input type="checkbox"/> Responsible Party <input type="checkbox"/> Voluntary Cleanup Applicant <input type="checkbox"/> Other:				
15. Mailing Address:	6002 Camp Bullis Road			
	City	San Antonio	State	TX
	ZIP	78257	ZIP + 4	
16. Country Mailing Information (if outside USA)			17. E-Mail Address (if applicable)	
18. Telephone Number		19. Extension or Code		20. Fax Number (if applicable)
() -				() -

SECTION III: Regulated Entity Information

21. General Regulated Entity Information (If 'New Regulated Entity' is selected below this form should be accompanied by a permit application)
<input checked="" type="checkbox"/> New Regulated Entity <input type="checkbox"/> Update to Regulated Entity Name <input type="checkbox"/> Update to Regulated Entity Information
<i>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).</i>
22. Regulated Entity Name (Enter name of the site where the regulated action is taking place.)
Hidden Canyon Subdivision, Unit 2A PUD

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

Enter Physical Location Description if no street address is provided.

25. Description to Physical Location:	Approximately 0.57 miles northwest of the Stone Oak Parkway and Canyon Golf Road intersection.					
26. Nearest City				State	Nearest ZIP Code	
27. Latitude (N) In Decimal:	29.6494			28. Longitude (W) In Decimal:	-98.4872	
Degrees	Minutes	Seconds	Degrees	Minutes	Seconds	
29	38	58	-98	29	14	
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	1623	236115	237110			
33. What is the Primary Business of this entity? <i>(Do not repeat the SIC or NAICS description.)</i>						
34. Mailing Address:						
	City		State		ZIP	ZIP + 4
35. E-Mail Address:						
36. Telephone Number	37. Extension or Code		38. Fax Number <i>(if applicable)</i>			
() -			() -			

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.

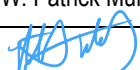
<input type="checkbox"/> Dam Safety	<input type="checkbox"/> Districts	<input checked="" type="checkbox"/> Edwards Aquifer	<input type="checkbox"/> Emissions Inventory Air	<input type="checkbox"/> Industrial Hazardous Waste
		13-02091801		
<input type="checkbox"/> Municipal Solid Waste	<input type="checkbox"/> New Source Review Air	<input type="checkbox"/> OSSF	<input type="checkbox"/> Petroleum Storage Tank	<input type="checkbox"/> PWS
<input type="checkbox"/> Sludge	<input type="checkbox"/> Storm Water	<input type="checkbox"/> Title V Air	<input type="checkbox"/> Tires	<input type="checkbox"/> Used Oil
<input type="checkbox"/> Voluntary Cleanup	<input type="checkbox"/> Waste Water	<input type="checkbox"/> Wastewater Agriculture	<input type="checkbox"/> Water Rights	<input type="checkbox"/> Other:

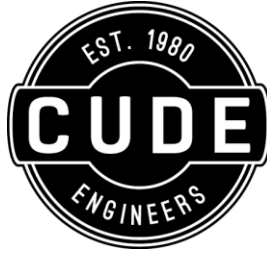
SECTION IV: Preparer Information

40. Name:	W. Patrick Murphy, P.E.		41. Title:	Associate
42. Telephone Number	43. Ext./Code	44. Fax Number	45. E-Mail Address	
(210) 681-2951	107	(210) 523-7112	wmurphy@cudeengineers.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:	Cude Engineers, LLC	Job Title:	Associate
Name <i>(In Print)</i> :	W. Patrick Murphy	Phone:	(210) 681- 2951
Signature:		Date:	03/04/2024



**HIDDEN CANYON SUBDIVISION,
UNIT 2A P.U.D.**

***EDWARDS AQUIFER APPLICATION COVER PAGE
(TCEQ-20705)***

Texas Commission on Environmental Quality

Edwards Aquifer Application Cover Page

Our Review of Your Application

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

Administrative Review

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

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

2. This Edwards Aquifer Application Cover Page form (certified by the applicant or agent) must be included in the application and brought to the administrative review meeting.
3. Administrative reviews are scheduled with program staff who will conduct the review. Applicants or their authorized agent should call the appropriate regional office, according to the county in which the project is located, to schedule a review. The average meeting time is one hour.
4. In the meeting, the application is examined for administrative completeness. Deficiencies will be noted by staff and emailed or faxed to the applicant and authorized agent at the end of the meeting, or shortly after. Administrative deficiencies will cause the application to be deemed incomplete and returned.

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

5. If an application is received by mail, courier service, or otherwise submitted without a review meeting, the administrative review will be conducted within 30 days. The applicant and agent will be contacted with the results of the administrative review. If the application is found to be administratively incomplete, it can be retrieved from the regional office or returned by regular mail. If returned by mail, the regional office may require arrangements for return shipping.
6. If the geologic assessment was completed before October 1, 2004 and the site contains “possibly sensitive” features, the assessment must be updated in accordance with the *Instructions to Geologists* (TCEQ-0585 Instructions).

Technical Review

1. When an application is deemed administratively complete, the technical review period begins. The regional office will distribute copies of the application to the identified affected city, county, and groundwater conservation district whose jurisdiction includes the subject site. These entities and the public have 30 days to provide comments on the application to the regional office. All comments received are reviewed by TCEQ.
2. A site assessment is usually conducted as part of the technical review, to evaluate the geologic assessment and observe existing site conditions. The site must be accessible to our staff. The site boundaries should be

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

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

Mid-Review Modifications

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

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

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

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

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

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

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

1. Regulated Entity Name: Hidden Canyon Subdivision, Unit 2A P.U.D.					2. Regulated Entity No.: 111799789				
3. Customer Name: Stone Oak Hidden Canyon, LLC					4. Customer No.: 603399239				
5. Project Type: (Please circle/check one)	New		<u>Modification</u>			Extension		Exception	
6. Plan Type: (Please circle/check one)	WPAP	CZP	<u>SCS</u>	UST	AST	EXP	EXT	Technical Clarification	Optional Enhanced Measures
7. Land Use: (Please circle/check one)	<u>Residential</u>		Non-residential			8. Site (acres):		29.067 Acres	
9. Application Fee:	\$650.00		10. Permanent BMP(s):			1 Batch Detention Pond			
11. SCS (Linear Ft.):	1,231.93		12. AST/UST (No. Tanks):			N/A			
13. County:	Bexar		14. Watershed:			Salado Creek			

Application Distribution

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

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

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

Austin Region			
County:	Hays	Travis	Williamson
Original (1 req.)	—	—	—
Region (1 req.)	—	—	—
County(ies)	—	—	—
Groundwater Conservation District(s)	<input type="checkbox"/> Edwards Aquifer Authority <input type="checkbox"/> Barton Springs/ Edwards Aquifer <input type="checkbox"/> Hays Trinity <input type="checkbox"/> Plum Creek	<input type="checkbox"/> Barton Springs/ Edwards Aquifer	NA
City(ies) Jurisdiction	<input type="checkbox"/> Austin <input type="checkbox"/> Buda <input type="checkbox"/> Dripping Springs <input type="checkbox"/> Kyle <input type="checkbox"/> Mountain City <input type="checkbox"/> San Marcos <input type="checkbox"/> Wimberley <input type="checkbox"/> Woodcreek	<input type="checkbox"/> Austin <input type="checkbox"/> Bee Cave <input type="checkbox"/> Pflugerville <input type="checkbox"/> Rollingwood <input type="checkbox"/> Round Rock <input type="checkbox"/> Sunset Valley <input type="checkbox"/> West Lake Hills	<input type="checkbox"/> Austin <input type="checkbox"/> Cedar Park <input type="checkbox"/> Florence <input type="checkbox"/> Georgetown <input type="checkbox"/> Jerrell <input type="checkbox"/> Leander <input type="checkbox"/> Liberty Hill <input type="checkbox"/> Pflugerville <input type="checkbox"/> Round Rock

San Antonio Region					
County:	Bexar	Comal	Kinney	Medina	Uvalde
Original (1 req.)	<u>X</u>	—	—	—	—
Region (1 req.)	<u>X</u>	—	—	—	—
County(ies)	<u>X</u>	—	—	—	—
Groundwater Conservation District(s)	<input checked="" type="checkbox"/> Edwards Aquifer Authority <input checked="" type="checkbox"/> Trinity-Glen Rose	<input type="checkbox"/> Edwards Aquifer Authority	<input type="checkbox"/> Kinney	<input type="checkbox"/> EAA <input type="checkbox"/> Medina	<input type="checkbox"/> EAA <input type="checkbox"/> Uvalde
City(ies) Jurisdiction	<input type="checkbox"/> Castle Hills <input type="checkbox"/> Fair Oaks Ranch <input type="checkbox"/> Helotes <input type="checkbox"/> Hill Country Village <input type="checkbox"/> Hollywood Park <input checked="" type="checkbox"/> San Antonio (SAWS) <input type="checkbox"/> Shavano Park	<input type="checkbox"/> Bulverde <input type="checkbox"/> Fair Oaks Ranch <input type="checkbox"/> Garden Ridge <input type="checkbox"/> New Braunfels <input type="checkbox"/> Schertz	NA	<input type="checkbox"/> 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.

W. Patrick Murphy, P.E.

Print Name of Customer/Authorized Agent

Signature of Customer/Authorized Agent

Date 03/04/2024

****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):

Modification of a Previously Approved Plan Checklist

- ✓ **Edwards Aquifer Application Cover Page (TCEQ-20705)**
- ✓ **General Information Form (TCEQ-0587)**
 - Attachment A - Road Map
 - Attachment B - USGS / Edwards Recharge Zone Map
 - Attachment C - Project Description
- ✓ **Geologic Assessment Form (TCEQ-0585)**
 - Attachment A - Geologic Assessment Table (TCEQ-0585-Table)
 - Attachment B - Stratigraphic Column
 - Attachment C - Site Geology
 - Attachment D - Site Geologic Map(s)
- ✓ **Modification of a Previously Approved Plan (TCEQ-0590)**
 - Attachment A - Original Approval Letter and Approved Modification Letters
 - Attachment B - Narrative of Proposed Modification
 - Attachment C - Current Site Plan of the Approved Project
- ✓ **Application Form (include any applicable to the proposed modification):**
 - Aboveground Storage Tank Facility Plan (TCEQ-0575)
 - Organized Sewage Collection System Application (TCEQ-0582)
 - Underground Storage Tank Facility Plan (TCEQ-0583)
 - Water Pollution Abatement Plan Application (TCEQ-0584)
 - Lift Station / Force Main System Application (TCEQ-0624)
- ✓ **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 requested)
 - 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
- ✓ **Permanent Stormwater Section (TCEQ-0600), if necessary**
 - Attachment A - 20% or Less Impervious Cover Declaration (if requested for multi-family, school, or small business 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

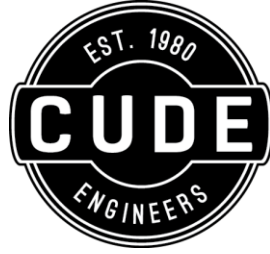
Attachment F - Construction Plans

Attachment G - Inspection, Maintenance, Repair and Retrofit Plan

Attachment H - Pilot-Scale Field Testing Plan (if requested)

Attachment I - Measures for Minimizing Surface Stream Contamination

- ✓ **Agent Authorization Form (TCEQ-0599), if application submitted by agent**
- ✓ **Application Fee Form (TCEQ-0574)**
- ✓ **Check Payable to the "Texas Commission on Environmental Quality"**
- ✓ **Core Data Form (TCEQ-10400)**



**HIDDEN CANYON SUBDIVISION,
UNIT 2A P.U.D.**

***GENERAL INFORMATION SECTION
(TCEQ-0587)***

General Information Form

Texas Commission on Environmental Quality

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

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

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

Signature

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

Print Name of Customer/Agent: W. Patrick Murphy, P.E.

Date: 2/7/2024

Signature of Customer/Agent:



Project Information

1. Regulated Entity Name: Hidden Canyon Subdivision, Unit 2A P.U.D.

2. County: Bexar

3. Stream Basin: Salado Creek

4. Groundwater Conservation District (If applicable): N/A

5. Edwards Aquifer Zone:

- Recharge Zone
 Transition Zone

6. Plan Type:

- | | |
|--|--|
| <input type="checkbox"/> WPAP | <input type="checkbox"/> AST |
| <input checked="" type="checkbox"/> SCS | <input type="checkbox"/> UST |
| <input checked="" type="checkbox"/> Modification | <input type="checkbox"/> Exception Request |

7. Customer (Applicant):

Contact Person: Rajeev Puri
Entity: Stone Oak Hidden Canyon, LLC
Mailing Address: 6002 Camp Bullis Road
City, State: San Antonio, TX Zip: 78257
Telephone: (210) 698-3004 FAX: _____
Email Address: rpuri@athenadomain.com

8. Agent/Representative (If any):

Contact Person: W. Patrick Murphy, P.E.
Entity: M.W. Cude Engineers, LLC
Mailing Address: 4122 Pond Hill Road, Suite 101
City, State: San Antonio, TX Zip: 78231
Telephone: (210) 681-2951 FAX: (210) 523-7112
Email Address: wmurphy@cudeengineers.com

9. Project Location:

- The project site is located inside the city limits of San Antonio.
- 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 site is located approximately 2,000 feet north of the intersection of Stone Oak Parkway and Canyon Golf Road in north Bexar County, Texas within the limits of the City of San Antonio.

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

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

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

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

Survey staking will be completed by this date: _____

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

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

15. Existing project site conditions are noted below:

- Existing commercial site
- Existing industrial site
- Existing residential site
- Existing paved and/or unpaved roads
- Undeveloped (Cleared)
- Undeveloped (Undisturbed/Uncleared)
- Other: Undeveloped (mostly undisturbed and uncleared)

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.

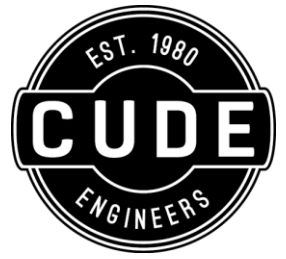
19. Application fees are due and payable at the time the application is filed. If the correct fee is not submitted, the TCEQ is not required to consider the application until the correct fee is submitted. Both the fee and the Edwards Aquifer Fee Form have been sent to the Commission's:

- 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





NOT TO SCALE

OUTSIDE CITY LIMITS

CITY OF SAN ANTONIO

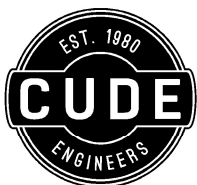
CANYON GOLF RD

SITE

HARDY OAK

STONE OAK

EVANS ROAD



CUDE ENGINEERS

4122 POND HILL RD. • SUITE 101
SAN ANTONIO, TEXAS 78231
TEL 210.681.2951 • FAX 210.523.7112
WWW.CUDEENGINEERS.COM
TBPE FIRM #455
TBPLS FIRM #10048500

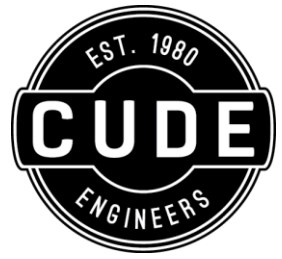
**HIDDEN CANYON
SUBDIVISION, UNIT 2A P.U.D.**

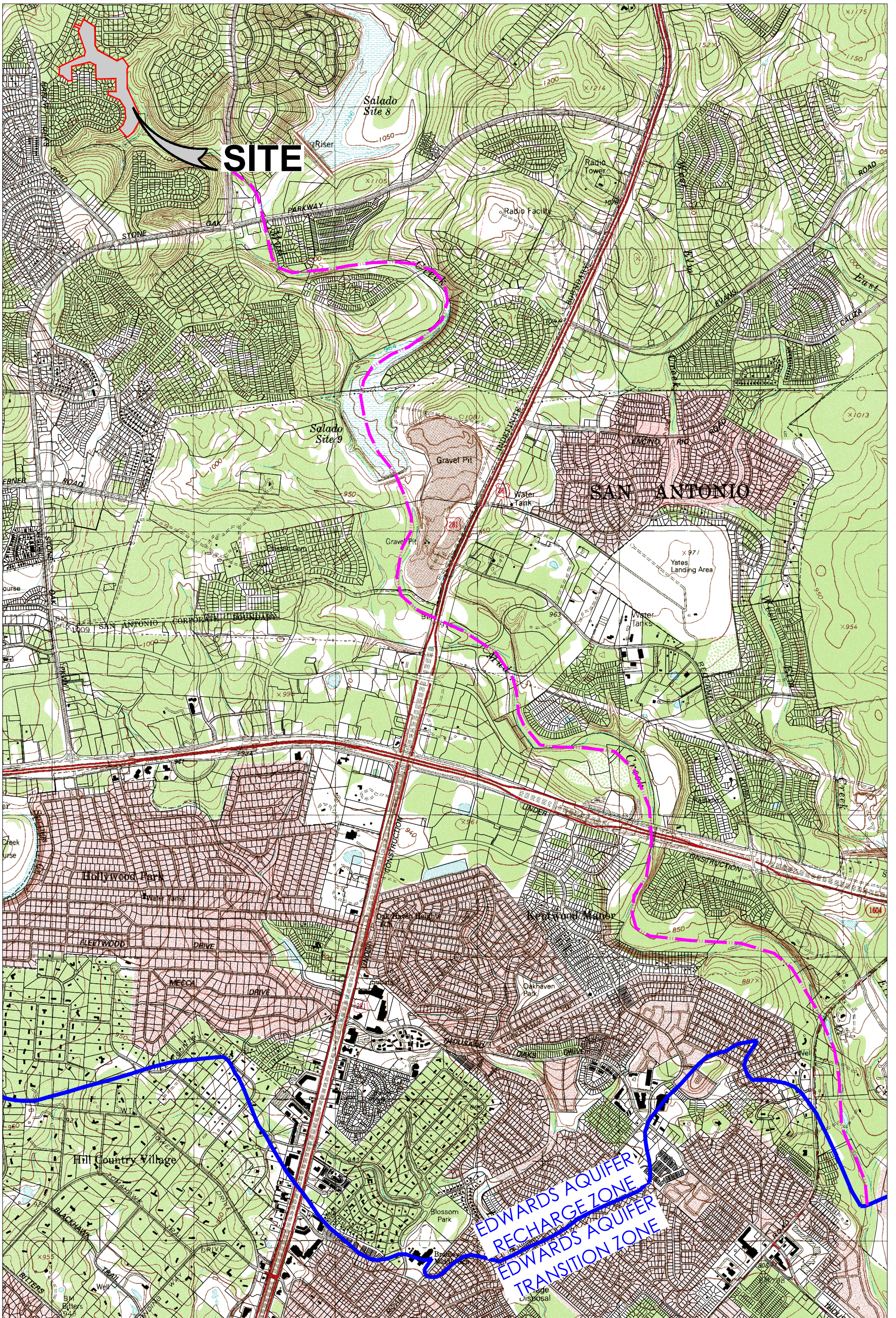
ATTACHMENT A - ROAD MAP

DATE: 2022/08/01

01564.004.0

ATTACHMENT B
USGS/Edwards Recharge Zone Map





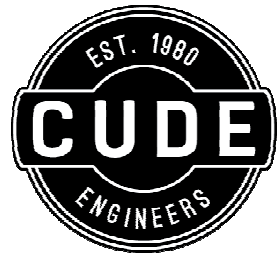
SITE

SAN ANTONIO

**EDWARDS AQUIFER
RECHARGE ZONE
EDWARDS AQUIFER
TRANSITION ZONE**

DRAINAGE FLOW
BULVERDE, TX QUADRANGLE

SCALE: 1" = 2000'
USGS/EDWARDS RECHARGE ZONE MAP
ATTACHMENT B
SHEET 1 OF 1



ATTACHMENT C Project Description

The original Water Pollution Abatement Plan (WPAP) Application for Hidden Canyon subdivision was originally approved on January 6, 2003 (TCEQ file No. 1897.07) and covered 117.80 acres with 15.1 acres of impervious cover. The project was the design of temporary best management practices to abate potential water pollution because of construction related activities. The first WPAP Modification Application was approved on March 8, 2013 (TCEQ file No. 1897.18). The purpose of the initial Modification Application was the adjustment of the overall site acreage, total impervious cover area and number of residential lots. The total site acreage in the first WPAP Modification was reduced from 117.80 acres to 116.81 acres, the impervious cover was decreased from 23.3 acres to 20.97 acres, and the total number of homes was increased from 50 to 112. The second WPAP Modification Application was approved on September 18, 2014 (TCEQ investigation No. 1173950) further reduced the total site acreage to 104.88 acres, the total impervious cover was reduced from 23.3 acres to 20.97 acres and the number of lots was decreased from 112 to 81 single-family residential lots. The third WPAP modification was approved on June 3, 2022 (TCEQ No. 13001513) which increased the limits of the area associated with the WPAP to 118.35 acres, increased the amount of impervious cover 23.66 acres, and increased the number of single-family residential lots to 122. A portion of Hidden Canyon Subdivision, Unit 2A will not fall under the 20% impervious cover exemption and will require a future WPAP submittal including permanent best management practices (BMPs).

This project is a single-family residential development consisting of approximately 29 acres. The site is located approximately 2,000 feet north of the intersection of Stone Oak Parkway and Canyon Golf Road in north Bexar County, Texas within the limits of the City of San Antonio. This project includes 52 lots with street, drainage, sidewalk, curb, 1,231.93 linear feet of 8-inch sanitary sewer, water, and utility infrastructure. This modification is being submitted to add a sanitary sewer line to the approved SCS due to a comment received by the sewer purveyor for this area, San Antonio Water System (SAWS).

Topographically, this site slopes generally from all directions towards a low point near the southeast boundary of the site. An investigation of the F.E.M.A. Flood Insurance Rate Map's for Bexar County, Texas, Panel Number 48029C0140G dated September 29, 2010, indicates that no portion of the site falls inside of the 100 Year FEMA Flood Plain. The entire site lies inside the Edwards Aquifer Recharge Zone. Stormwater originating on-site will eventually contribute to the Salado Creek watershed by way of Mud Creek. Recharge zone features, whether classified as sensitive or not sensitive may be found in the geologic site assessment found in the next section of the report. Temporary best management practice measures to be used are intended to inhibit sediment and suspended solids from

leaving the site. By containing the sediment and solids within the site, they will not enter surface streams and/or sensitive features. Water and sanitary sewer service are to be provided by San Antonio Water System (SAWS). The sewage flows from this development will ultimately flow to and be treated by the Dos Rios Water Recycling Center in southern Bexar County.

Jon Niermann, *Chairman*
Emily Lindley, *Commissioner*
Bobby Janecka, *Commissioner*
Toby Baker, *Executive Director*



TEXAS COMMISSION ON ENVIRONMENTAL QUALITY

Protecting Texas by Reducing and Preventing Pollution

June 3, 2022

Mr. Rajeev Puri
Stone Oak Hidden Canyon, LLC
6002 Camp Bullis Road
San Antonio, Texas 78257

Re: Edwards Aquifer, Bexar County

NAME OF PROJECT: Hidden Canyon Subdivision; Located approximately 0.57 miles northwest of Stone Oak Parkway and Golf Canyon Road intersection; San Antonio, Texas

TYPE OF PLAN: Request for Modification of an Approved Water Pollution Abatement Plan (WPAP); 30 Texas Administrative Code (TAC) Chapter 213 Edwards Aquifer

Regulated Entity No. RN102891918; Additional ID. No. 13001513

Dear Mr. Puri:

The Texas Commission on Environmental Quality (TCEQ) has completed its review of the WPAP Modification application for the above-referenced project submitted to the San Antonio Regional Office by M. W. Cude Engineers, LLC on behalf of Stone Oak Hidden Canyon, LLC on April 5, 2022. Final review of the WPAP Modification was completed after additional material was received on May 24, 2022. As presented to the TCEQ, the Temporary and Permanent Best Management Practices (BMPs) were selected and construction plans were prepared by a Texas Licensed Professional Engineer to be in general compliance with the requirements of 30 TAC Chapter 213. These planning materials were sealed, signed and dated by a Texas Licensed Professional Engineer. Therefore, based on the engineer's concurrence of compliance, the planning materials for construction of the proposed project and pollution abatement measures are hereby approved subject to applicable state rules and the conditions in this letter. The applicant or a person affected may file with the chief clerk a motion for reconsideration of the executive director's final action on this Edwards Aquifer Protection Plan. A motion for reconsideration must be filed no later than 23 days after the date of this approval letter. *This approval expires two (2) years from the date of this letter unless, prior to the expiration date, more than 10 percent of the construction has commenced on the project or an extension of time has been requested.*

BACKGROUND

The Hidden Canyon Subdivision WPAP was approved by letter dated January 6, 2003, for a 117.80-acre development with 15.10 acres (12.80 percent) of impervious cover. The project proposed 50 single-family residences and associated roadways with a less than 20 percent impervious cover waiver from permanent BMPs. The Hidden Canyon Subdivision WPAP Modification approved by letter dated March 8, 2013, decreased the site acreage to 116.81 acres and increased impervious cover to 23.30 acres (19.94 percent), plus the number of residential lots increased to 112. The second WPAP Modification approved by letter dated September 18,

2014, reduced site acreage to 104.88 acres and reduced impervious cover to 20.97 acres (19.99 percent), plus decreased single-family residential lots to 81.

PROJECT DESCRIPTION

The project is on a 118.35-acre site and with 23.66 acres (19.99 percent) of proposed impervious cover. The project proposes the construction of 122 single-family residential lots with various sizing along with associated streets and infrastructure. Project wastewater will be disposed of by conveyance to the existing Steven M. Clouse Water Recycling Center owned and operated by the San Antonio Water System.

PERMANENT POLLUTION ABATEMENT MEASURES

This single-family residential development will have no more than 20 percent impervious cover.

GEOLOGY

According to the geologic assessment included with the application, the site is located on the dolomitic member and basal nodular member of the Kainer Formation. Thirty-seven (37) non-sensitive manmade features in bedrock, thirty-seven (37) non-sensitive geologic features, six (6) non-karst closed depressions and one (1) sensitive geologic feature (S-77) were noted by the project geologist within the project limits. The site assessment conducted on June 2, 2022, revealed that the site was generally as described in the application.

Sensitive feature S-77, a swallet, has a natural buffer that is based on the drainage area of the feature. The buffer is shown on the site plan. No regulated activities (such as construction or soil disturbing activities) will take place within the natural buffer. The buffer is to remain in a natural state.

SPECIAL CONDITIONS

- I. This modification is subject to all Special and Standard Conditions listed in the WPAP approval letter dated January 6, 2003, and subsequent Modifications dated March 8, 2013, and September 18, 2014.
- II. Since this project will not have more than 20 percent impervious cover, an exemption from additional permanent BMPs is approved. If the percent impervious cover ever increases above 20 percent or the land use changes, the exemption for the whole site as described in the property boundaries required by §213.4(g), may no longer apply and the property owner must notify the appropriate regional office of these changes.
- III. This will be the last WPAP Modification being granted a less than 20 percent impervious cover waiver from permanent BMPs as various lots are less than one (1) acre and do not meet the definition of a low-density development.
- IV. Future development will be over 20 percent impervious cover and will require submittal of a WPAP Modification to include permanent BMPs.

STANDARD CONDITIONS

1. Pursuant to Chapter 7 Subchapter C of the Texas Water Code, any violations of the requirements in 30 TAC Chapter 213 may result in administrative penalties.
2. The holder of the approved Edwards Aquifer protection plan must comply with all provisions of 30 TAC Chapter 213 and all best management practices and measures

contained in the approved plan. Additional and separate approvals, permits, registrations and/or authorizations from other TCEQ Programs (i.e., Stormwater, Water Rights, UIC) can be required depending on the specifics of the plan.

3. In addition to the rules of the Commission, the applicant may also be required to comply with state and local ordinances and regulations providing for the protection of water quality.

Prior to Commencement of Construction:

4. Within 60 days of receiving written approval of an Edwards Aquifer Protection Plan, the applicant must submit to the San Antonio Regional Office, proof of recordation of notice in the county deed records, with the volume and page number(s) of the county deed records of the county in which the property is located. A description of the property boundaries shall be included in the deed recordation in the county deed records. A suggested form (Deed Recordation Affidavit, TCEQ-0625) that you may use to deed record the approved WPAP is enclosed.
5. All contractors conducting regulated activities at the referenced project location shall be provided a copy of this notice of approval. At least one complete copy of the approved WPAP and this notice of approval shall be maintained at the project location until all regulated activities are completed.
6. Modification to the activities described in the referenced WPAP application following the date of approval may require the submittal of a plan to modify this approval, including the payment of appropriate fees and all information necessary for its review and approval prior to initiating construction of the modifications.
7. The applicant must provide written notification of intent to commence construction, replacement, or rehabilitation of the referenced project. Notification must be submitted to the San Antonio Regional Office no later than 48 hours prior to commencement of the regulated activity. Written notification must include the date on which the regulated activity will commence, the name of the approved plan and program ID number for the regulated activity, and the name of the prime contractor with the name and telephone number of the contact person. The executive director will use the notification to determine if the approved plan is eligible for an extension.
8. Temporary erosion and sedimentation (E&S) controls, i.e., silt fences, rock berms, stabilized construction entrances, or other controls described in the approved WPAP, must be installed prior to construction and maintained during construction. Temporary E&S controls may be removed when vegetation is established, and the construction area is stabilized. If a water quality pond is proposed, it shall be used as a sedimentation basin during construction. The TCEQ may monitor stormwater discharges from the site to evaluate the adequacy of temporary E&S control measures. Additional controls may be necessary if excessive solids are being discharged from the site.
9. All borings with depths greater than or equal to 20 feet must be plugged with non-shrink grout from the bottom of the hole to within three (3) feet of the surface. The remainder of the hole must be backfilled with cuttings from the boring. All borings less than 20 feet must be backfilled with cuttings from the boring. All borings must be backfilled or plugged within four (4) days of completion of the drilling operation. Voids may be filled with gravel.

During Construction:

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

11. This approval does not authorize the installation of temporary aboveground storage tanks on this project. If the contractor desires to install a temporary aboveground storage tank for use during construction, an application to modify this approval must be submitted and approved prior to installation. The application must include information related to tank location and spill containment. Refer to Standard Condition No. 6, above.
12. If any sensitive feature (caves, solution cavities, sink holes, etc.) is discovered during construction, all regulated activities near the feature must be suspended immediately. The applicant or his agent must immediately notify the San Antonio Regional Office of the discovery of the feature. Regulated activities near the feature may not proceed until the executive director has reviewed and approved the methods proposed to protect the feature and the aquifer from potentially adverse impacts to water quality. The plan must be sealed, signed, and dated by a Texas Licensed Professional Engineer.
13. No wells exist on site. All water wells, including injection, dewatering, and monitoring wells must be in compliance with the requirements of the Texas Department of Licensing and Regulation under Title 16 TAC Chapter 76 (relating to Water Well Drillers and Pump Installers) and all other locally applicable rules, as appropriate.
14. If sediment escapes the construction site, the sediment must be removed at a frequency sufficient to minimize offsite impacts to water quality (e.g., fugitive sediment in street being washed into surface streams or sensitive features by the next rain). Sediment must be removed from sediment traps or sedimentation ponds not later than when design capacity has been reduced by 50 percent. Litter, construction debris, and construction chemicals shall be prevented from becoming stormwater discharge pollutants.
15. Intentional discharges of sediment laden water are not allowed. If dewatering becomes necessary, the discharge will be filtered through appropriately selected best management practices. These may include vegetated filter strips, sediment traps, rock berms, silt fence rings, etc.
16. The following records shall be maintained and made available to the executive director upon request: the dates when major grading activities occur, the dates when construction activities temporarily or permanently cease on a portion of the site, and the dates when stabilization measures are initiated.
17. Stabilization measures shall be initiated as soon as practicable in portions of the site where construction activities have temporarily or permanently ceased, and construction activities will not resume within 21 days. When the initiation of stabilization measures by the 14th day is precluded by weather conditions, stabilization measures shall be initiated as soon as practicable.

After Completion of Construction:

18. 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 San Antonio Regional Office within 30 days of site completion.
19. The applicant shall be responsible for maintaining the permanent BMPs after construction until such time as the maintenance obligation is either assumed in writing by another entity having ownership or control of the property (such as without limitation, an owner's association, a new property owner or lessee, a district, or municipality) or the ownership of the property is transferred to the entity. The regulated entity shall then be responsible for maintenance until another entity assumes such obligations in writing or ownership is transferred. A copy of the transfer of responsibility must be filed with the executive director through San Antonio Regional Office within 30 days of the transfer. A copy of the transfer form (TCEQ-10263) is enclosed.

Mr. Rajeev Puri
June 3, 2022
Page 5

20. Upon legal transfer of this property, the new owner(s) is required to comply with all terms of the approved Edwards Aquifer protection plan. If the new owner intends to commence any new regulated activity on the site, a new Edwards Aquifer protection plan that specifically addresses the new activity must be submitted to the executive director. Approval of the plan for the new regulated activity by the executive director is required prior to commencement of the new regulated activity.
21. An Edwards Aquifer protection plan approval or extension will expire and no extension will be granted if more than 50 percent of the total construction has not been completed within ten years from the initial approval of a plan. A new Edwards Aquifer protection plan must be submitted to the San Antonio Regional Office with the appropriate fees for review and approval by the executive director prior to commencing any additional regulated activities.
22. At project locations where construction is initiated and abandoned, or not completed, the site shall be returned to a condition such that the aquifer is protected from potential contamination.

This action is taken under authority delegated by the Executive Director of the Texas Commission on Environmental Quality. If you have any questions or require additional information, please contact Dianne Pavlicek-Mesa, P.G., of the Edwards Aquifer Protection Program of the San Antonio Regional Office at 210-403-4074.

Sincerely,



Lillian Butler, Section Manager
Edwards Aquifer Protection Program
Texas Commission on Environmental Quality

LIB/dpm

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

cc: Mr. W. Patrick Murphy, P.E., M. W. Cude Engineers, LLC

Jon Niermann, *Chairman*
Emily Lindley, *Commissioner*
Bobby Janecka, *Commissioner*
Toby Baker, *Executive Director*



TEXAS COMMISSION ON ENVIRONMENTAL QUALITY

Protecting Texas by Reducing and Preventing Pollution

December 2, 2022

Mr. Rajeev Puri
Stone Oak Hidden Canyon, LLC.
6002 Camp Bullis Road
San Antonio, Texas, 78257

Re: Edwards Aquifer, Bexar County

NAME OF PROJECT: Hidden Canyon Subdivision; Located approximately 57 miles northwest of Stone Oak Parkway and Canyon Golf Road intersection; San Antonio, Texas

TYPE OF PLAN: Request for Water Pollution Abatement Plan (WPAP); 30 Texas Administrative Code (TAC) Chapter 213 Edwards Aquifer

Regulated Entity No. RN102891918; Additional ID No. 13001617

Dear Mr. Puri:

The Texas Commission on Environmental Quality (TCEQ) has completed its review of the WPAP application for the above-referenced project submitted to the San Antonio Regional Office by M.W. Cude Engineers, LLC. on behalf of Stone Oak Hidden Canyon, LLC. on September 29, 2022. Final review of the WPAP was completed after additional material was received on November 15, 2022. As presented to the TCEQ, the Temporary and Permanent Best Management Practices (BMPs) were selected and construction plans were prepared by a Texas Licensed Professional Engineer to be in general compliance with the requirements of 30 TAC Chapter 213. These planning materials were sealed, signed, and dated by a Texas Licensed Professional Engineer. Therefore, based on the engineer's concurrence of compliance, the planning materials for construction of the proposed project and pollution abatement measures are hereby approved subject to applicable state rules and the conditions in this letter. The applicant or a person affected may file with the chief clerk a motion for reconsideration of the executive director's final action on this Edwards Aquifer Protection Plan. A motion for reconsideration must be filed no later than 23 days after the date of this approval letter. *This approval expires two (2) years from the date of this letter unless, prior to the expiration date, more than 10 percent of the construction has commenced on the project or an extension of time has been requested.*

PROJECT DESCRIPTION

The proposed single-family residential project will have an area of approximately 9.16-acres with 5.55-acres (60.59 percent) of impervious cover. The project proposes the construction of 34 single-family residential lots with associated streets, sidewalks, drainage, and utility infrastructure. Project wastewater will be disposed of by conveyance to the existing Steven M. Clouse Water Recycling Center owned and operated by the San Antonio Water System.

PERMANENT POLLUTION ABATEMENT MEASURES

To prevent the pollution of stormwater runoff originating on-site or upgradient of the site and potentially flowing across and off the site after construction, one (1) batch detention basin, designed using the TCEQ technical guidance document, Complying with the Edwards Aquifer Rules: Technical Guidance on Best Management Practices (2005), will be constructed to treat stormwater runoff. The required total suspended solids (TSS) treatment for this project is 4,529 pounds of TSS generated from the 5.55-acres of impervious cover. The approved measures meet the required 80 percent removal of the increased load in TSS caused by the project.

GEOLOGY

According to the geologic assessment included with the application, the site is located within the dolomitic and basal nodular member of the Kainer Formation. One (1) sensitive geologic feature was noted by the project geologist. Sensitive karst feature S-77 (swallow hole) will have a natural buffer that is based on the drainage area of the feature. Buffers are shown on the site plan and no regulated activities (such as construction or soil disturbing activities) will take place within the natural buffers. The site assessment conducted on October 27, 2022, revealed that the site was generally described in the application.

SPECIAL CONDITIONS

- I. The permanent pollution abatement measure shall be operational prior to first occupancy of the homes.
- II. All sediment and/or media removed from the water quality basin during maintenance activities shall be properly disposed of according to 30 TAC 330 or 30 TAC 335, as applicable.

STANDARD CONDITIONS

1. Pursuant to Chapter 7 Subchapter C of the Texas Water Code, any violations of the requirements in 30 TAC Chapter 213 may result in administrative penalties.
2. The holder of the approved Edwards Aquifer protection plan must comply with all provisions of 30 TAC Chapter 213 and all best management practices and measures contained in the approved plan. Additional and separate approvals, permits, registrations and/or authorizations from other TCEQ Programs (i.e., Stormwater, Water Rights, UIC) can be required depending on the specifics of the plan.
3. In addition to the rules of the Commission, the applicant may also be required to comply with state and local ordinances and regulations providing for the protection of water quality.

Prior to Commencement of Construction:

4. Within 60 days of receiving written approval of an Edwards Aquifer Protection Plan, the applicant must submit to the San Antonio Regional Office, proof of recordation of notice in the county deed records, with the volume and page number(s) of the county deed records of the county in which the property is located. A description of the property boundaries shall be included in the deed recordation in the county deed records. A suggested form (Deed Recordation Affidavit, TCEQ-0625) that you may use to deed record the approved WPAP is enclosed.
5. All contractors conducting regulated activities at the referenced project location shall be provided a copy of this notice of approval. At least one complete copy of the approved WPAP and this notice of approval shall be maintained at the project location until all regulated activities are completed.

6. Modification to the activities described in the referenced WPAP application following the date of approval may require the submittal of a plan to modify this approval, including the payment of appropriate fees and all information necessary for its review and approval prior to initiating construction of the modifications.
7. The applicant must provide written notification of intent to commence construction, replacement, or rehabilitation of the referenced project. Notification must be submitted to the San Antonio Regional Office no later than 48 hours prior to commencement of the regulated activity. Written notification must include the date on which the regulated activity will commence, the name of the approved plan and program ID number for the regulated activity, and the name of the prime contractor with the name and telephone number of the contact person. The executive director will use the notification to determine if the approved plan is eligible for an extension.
8. Temporary erosion and sedimentation (E&S) controls, i.e., silt fences, rock berms, stabilized construction entrances, or other controls described in the approved WPAP, must be installed prior to construction and maintained during construction. Temporary E&S controls may be removed when vegetation is established and the construction area is stabilized. If a water quality pond is proposed, it shall be used as a sedimentation basin during construction. The TCEQ may monitor stormwater discharges from the site to evaluate the adequacy of temporary E&S control measures. Additional controls may be necessary if excessive solids are being discharged from the site.
9. All borings with depths greater than or equal to 20 feet must be plugged with non-shrink grout from the bottom of the hole to within three (3) feet of the surface. The remainder of the hole must be backfilled with cuttings from the boring. All borings less than 20 feet must be backfilled with cuttings from the boring. All borings must be backfilled or plugged within four (4) days of completion of the drilling operation. Voids may be filled with gravel.

During Construction:

10. During the course of regulated activities related to this project, the applicant or agent shall comply with all applicable provisions of 30 TAC Chapter 213, Edwards Aquifer. The applicant shall remain responsible for the provisions and conditions of this approval until such responsibility is legally transferred to another person or entity.
11. This approval does not authorize the installation of temporary aboveground storage tanks on this project. If the contractor desires to install a temporary aboveground storage tank for use during construction, an application to modify this approval must be submitted and approved prior to installation. The application must include information related to tank location and spill containment. Refer to Standard Condition No. 6, above.
12. If any sensitive feature (caves, solution cavities, sink holes, etc.) is discovered during construction, all regulated activities near the feature must be suspended immediately. The applicant or his agent must immediately notify the San Antonio Regional Office of the discovery of the feature. Regulated activities near the feature may not proceed until the executive director has reviewed and approved the methods proposed to protect the feature and the aquifer from potentially adverse impacts to water quality. The plan must be sealed, signed, and dated by a Texas Licensed Professional Engineer.
13. No wells exist on site. All water wells, including injection, dewatering, and monitoring wells must be in compliance with the requirements of the Texas Department of Licensing and Regulation under Title 16 TAC Chapter 76 (relating to Water Well Drillers and Pump Installers) and all other locally applicable rules, as appropriate.
14. If sediment escapes the construction site, the sediment must be removed at a frequency sufficient to minimize offsite impacts to water quality (e.g., fugitive sediment in street being washed into surface streams or sensitive features by the next rain). Sediment must be removed from sediment traps or sedimentation ponds not later than when design capacity has been reduced by 50 percent. Litter, construction debris, and construction chemicals shall be prevented from becoming stormwater discharge pollutants.

15. Intentional discharges of sediment laden water are not allowed. If dewatering becomes necessary, the discharge will be filtered through appropriately selected best management practices. These may include vegetated filter strips, sediment traps, rock berms, silt fence rings, etc.
16. The following records shall be maintained and made available to the executive director upon request: the dates when major grading activities occur, the dates when construction activities temporarily or permanently cease on a portion of the site, and the dates when stabilization measures are initiated.
17. Stabilization measures shall be initiated as soon as practicable in portions of the site where construction activities have temporarily or permanently ceased, and construction activities will not resume within 21 days. When the initiation of stabilization measures by the 14th day is precluded by weather conditions, stabilization measures shall be initiated as soon as practicable.

After Completion of Construction:

18. 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 San Antonio Regional Office within 30 days of site completion.
19. The applicant shall be responsible for maintaining the permanent BMPs after construction until such time as the maintenance obligation is either assumed in writing by another entity having ownership or control of the property (such as without limitation, an owner's association, a new property owner or lessee, a district, or municipality) or the ownership of the property is transferred to the entity. The regulated entity shall then be responsible for maintenance until another entity assumes such obligations in writing or ownership is transferred. A copy of the transfer of responsibility must be filed with the executive director through San Antonio Regional Office within 30 days of the transfer. A copy of the transfer form (TCEQ-10263) is enclosed.
20. Upon legal transfer of this property, the new owner(s) is required to comply with all terms of the approved Edwards Aquifer protection plan. If the new owner intends to commence any new regulated activity on the site, a new Edwards Aquifer protection plan that specifically addresses the new activity must be submitted to the executive director. Approval of the plan for the new regulated activity by the executive director is required prior to commencement of the new regulated activity.
21. An Edwards Aquifer protection plan approval or extension will expire and no extension will be granted if more than 50 percent of the total construction has not been completed within ten years from the initial approval of a plan. A new Edwards Aquifer protection plan must be submitted to the San Antonio Regional Office with the appropriate fees for review and approval by the executive director prior to commencing any additional regulated activities.
22. At project locations where construction is initiated and abandoned, or not completed, the site shall be returned to a condition such that the aquifer is protected from potential contamination.

Mr. Rajeev Puri
Page 5
December 2, 2022

This action is taken under authority delegated by the Executive Director of the Texas Commission on Environmental Quality. If you have any questions or require additional information, please contact Mr. Hunter Patterson of the Edwards Aquifer Protection Program of the San Antonio Regional Office at 210-403-4026.

Sincerely,



Lillian Butler, Section Manager
Edwards Aquifer Protection Program
Texas Commission on Environmental Quality

LIB/hhp

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

cc: Mr. Patrick Murphy, P.E., M.W. Cude Engineers, LLC.

**Change in Responsibility for Maintenance
on Permanent Best Management Practices and Measures**

The applicant is no longer responsible for maintaining the permanent best management practice (BMP) and other measures. The project information and the new entity responsible for maintenance is listed below.

Customer: _____

Regulated Entity Name: _____

Site Address: _____

City, Texas, Zip: _____

County: _____

Approval Letter Date: _____

BMPs for the project: _____

New Responsible Party: _____

Name of contact: _____

Mailing Address: _____

City, State: _____ Zip: _____

Telephone: _____ FAX: _____

Signature of New Responsible Party Date

I acknowledge and understand that I am assuming full responsibility for maintaining all permanent best management practices and measures approved by the TCEQ for the site, until another entity assumes such obligations in writing or ownership is transferred.

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.

Deed Recordation Affidavit
Edwards Aquifer Protection Plan

THE STATE OF TEXAS §

County of _____ §

BEFORE ME, the undersigned authority, on this day personally appeared _____ who, being duly sworn by me, deposes and says:

- (1) That my name is _____ and that I own the real property described below.
- (2) That said real property is subject to an EDWARDS AQUIFER PROTECTION PLAN which was required under the 30 Texas Administrative Code (TAC) Chapter 213.
- (3) That the EDWARDS AQUIFER PROTECTION PLAN for said real property was approved by the Texas Commission on Environmental Quality (TCEQ) on _____.

A copy of the letter of approval from the TCEQ is attached to this affidavit as Exhibit A and is incorporated herein by reference.

- (4) The said real property is located in _____ County, Texas, and the legal description of the property is as follows:

LANDOWNER-AFFIANT

SWORN AND SUBSCRIBED TO before me, on this __ day of _____, _____.

NOTARY PUBLIC

THE STATE OF _____ §

County of _____ §

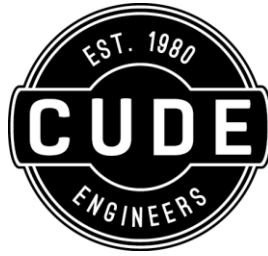
BEFORE ME, the undersigned authority, on this day personally appeared _____ known to me to be the person whose name is subscribed to the foregoing instrument, and acknowledged to me that (s)he executed same for the purpose and consideration therein expressed.

GIVEN under my hand and seal of office on this __ day of _____, _____.

NOTARY PUBLIC

Typed or Printed Name of Notary

MY COMMISSION EXPIRES: _____



**HIDDEN CANYON SUBDIVISION,
UNIT 2A P.U.D.**

***GEOLOGIC ASSESSMENT SECTION
(TCEQ-0585)***

Geologic Site Assessment (SCS)

Hidden Canyon, Unit 2A
Additional Proposed Sewer Line
San Antonio, Texas

FROST GEOSCIENCES, INC.
PROJECT No.: FGS-E24116

MARCH 1, 2024

Prepared exclusively for

Stone Oak Hidden Canyon, LLC
6002 Camp Bulliis Road
San Antonio, Texas

Frost GeoSciences

Geotechnical ▪ Construction Materials
Forensics ▪ Environmental

13406 Western Oak Helotes, Texas 78023 Phone: (210) 372-1315

Frost GeoSciences

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Forensics • Environmental

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www.frostgeosciences.com
TBPE Firm Registration # F-9227
TBPG Firm Registration # 50040

March 1, 2024

Stone Oak Hidden Canyon, LLC
6002 Camp Bullis Road
San Antonio, Texas 78257

Attn: Mr. Rajeev Puri

Re: Geologic Site Assessment (SCS)
for Regulated Activities / Development on the
Edwards Aquifer Recharge / Transition Zone
Hidden Canyon, Unit 2A Additional Sewer Line
San Antonio, Texas

Frost GeoSciences, Inc. Control # FGS-E24116

Dear Sir:

Attached is a copy of the Geologic Assessment Report completed for the above referenced project site as it relates to 30 TAC §213.5(b)(3), effective June 1, 1999. Our investigation was conducted and this report was prepared in general accordance with the "Instructions to Geologists", TCEQ-0585-Instructions (Rev. 10-1-04). The results of our investigation, along with any recommendations for Best Management Practices (BMP's), are provided in the following report.

If you have any questions regarding this report, or if Frost GeoSciences, Inc. may be of additional assistance to you on this project, please feel free to call our office. It has been a pleasure to work with you and we wish to thank you for the opportunity to be of service to you on this project. We look forward to being of continued service.



Sincerely,
Frost GeoSciences, Inc.

A handwritten signature in black ink that reads "Steve Frost".

Steve Frost, C.P.G.
President, Senior Geologist

Distribution: (6) Stone Oak Hidden Canyon, Unit 2A LLC

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APPENDIX

A: Site Location Plates

 Figure 1: Site Plan

 Figure 2: Street Map

 Figure 3: USGS Topographic Map

 Figure 4: Bexar County Watersheds Map

 Figure 5: Edwards Underground Water District Reference Map

 Figure 6: FEMA Flood Map

 Figure 7: USDA Soil Survey Aerial Photograph, 1"=500'

 Figure 8: U.S. Geological Survey, Water Resources Investigation # 4030-95

 Figure 9: 2023 Aerial Photograph, 1"=500'

 Figure 10: 2023 Aerial Photograph with PRF's, 1"=200'

B: Site Photographs

C: Site Geologic Map

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

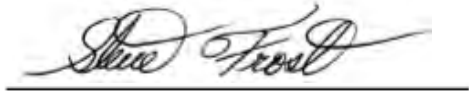
To the best of my knowledge, the responses to this form accurately reflect all information requested concerning the proposed regulated activities and methods to protect the Edwards Aquifer. My signature certifies that I am qualified as a geologist as defined by 30 TAC Chapter 213.

Print Name of Geologist: Steve Frost, C.P.G. Telephone: (210) 372-1315

Date: March 1, 2024 Fax: (210) 372-1318

Representing: Frost GeoSciences, Inc.

Signature of Geologist:



Regulated Entity Name: Hidden Canyon, Unit 2A

Project Information

1. Date(s) Geologic Assessment was performed: February 27, 2024

2. Type of Project:

WPAP

AST

SCS

UST

3. Location of Project:

Recharge Zone

Transition Zone

Contributing Zone within the Transition Zone

- 4. **Attachment A - Geologic Assessment Table.** Completed Geologic Assessment Table (Form TCEQ-0585-Table) is attached.
- 5. Soil cover on the project site is summarized in the table below and uses the SCS Hydrologic Soil Groups* (Urban Hydrology for Small Watersheds, Technical Release No. 55, Appendix A, Soil Conservation Service, 1986). If there is more than one soil type on the project site, show each soil type on the site Geologic Map or a separate soils map.

Table 1 - Soil Units, Infiltration Characteristics and Thickness

Soil Name	Group*	Thickness(feet)
TaD	C	0-1

* 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" = 200 '
 Site Geologic Map Scale: 1" = 100 '
 Site Soils Map Scale (if more than 1 soil type): 1" = 500 '
- 9. Method of collecting positional data:
 - Global Positioning System (GPS) technology.
 - Other method(s). Please describe method of data collection: 2023 Aerial Photography
- 10. The project site and boundaries are clearly shown and labeled on the Site Geologic Map.
- 11. Surface geologic units are shown and labeled on the Site Geologic Map.

12. Geologic or manmade features were discovered on the project site during the field investigation. They are shown and labeled on the Site Geologic Map and are described in the attached Geologic Assessment Table.
- Geologic or manmade features were not discovered on the project site during the field investigation.
13. The Recharge Zone boundary is shown and labeled, if appropriate.
14. All known wells (test holes, water, oil, unplugged, capped and/or abandoned, etc.): If applicable, the information must agree with Item No. 20 of the WPAP Application Section.
- There are ____ (#) wells present on the project site and the locations are shown and labeled. (Check all of the following that apply.)
- The wells are not in use and have been properly abandoned.
- The wells are not in use and will be properly abandoned.
- The wells are in use and comply with 16 TAC Chapter 76.
- There are no wells or test holes of any kind known to exist on the project site.

Administrative Information

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

Stratigraphic Column

[Hydrogeologic subdivisions modified from Maclay and Small (1976); groups, formations, and members modified from Rose (1972); lithology modified from Dunham (1962); and porosity type modified from Choquette and Pray (1970). CU, confining unit; AQ, aquifer]

Hydrogeologic subdivision	Group, formation, or member	Hydro-logic function	Thickness (feet)	Lithology	Field identification	Cavern development	Porosity/permeability type				
Upper Cretaceous	Upper confining units	Eagle Ford Group	CU	30 – 50	Brown, flaggy shale and argillaceous limestone	Thin flagstones; petroliferous	None	Primary porosity lost/ low permeability			
		Buda Limestone	CU	40 – 50	Buff, light gray, dense mudstone	Porcelaneous limestone with calcite-filled veins	Minor surface karst	Low porosity/low permeability			
		Del Rio Clay	CU	40 – 50	Blue-green to yellow-brown clay	Fossiliferous; <i>Ilymatogyra arietina</i>	None	None/primary upper confining unit			
Lower Cretaceous	Edwards aquifer	Edwards Group	Person Formation	I	Georgetown Formation	Karst AQ; not karst CU	2 – 20	Reddish-brown, gray to light tan marly limestone	Marker fossil; <i>Waconella wacoensis</i>	None	Low porosity/low permeability
				II	Cyclic and marine members, undivided	AQ	80 – 90	Mudstone to packstone; <i>miliolid</i> grainstone; chert	Thin graded cycles; massive beds to relatively thin beds; crossbeds	Many subsurface; might be associated with earlier karst development	Laterally extensive; both fabric and not fabric/water-yielding
				III	Leached and collapsed members, undivided	AQ	70 – 90	Crystalline limestone; mudstone to grainstone; chert; collapsed breccia	Bioturbated iron-stained beds separated by massive limestone beds; stromatolitic limestone	Extensive lateral development; large rooms	Majority not fabric/one of the most permeable
				IV	Regional dense member	CU	20 – 24	Dense, argillaceous mudstone	Wispy iron-oxide stains	Very few; only vertical fracture enlargement	Not fabric/low permeability; vertical barrier
				V	Grainstone member	AQ	50 – 60	<i>Miliolid</i> grainstone; mudstone to wackestone; chert	White crossbedded grainstone	Few	Not fabric/ recrystallization reduces permeability
				VI	Kirschberg evaporite member	AQ	50 – 60	Highly altered crystalline limestone; chalky mudstone; chert	Boxwork voids, with neospar and travertine frame	Probably extensive cave development	Majority fabric/one of the most permeable
				VII	Dolomitic member	AQ	110 – 130	Mudstone to grainstone; crystalline limestone; chert	Massively bedded light gray, <i>Toucasia</i> abundant	Caves related to structure or bedding planes	Mostly not fabric; some bedding plane-fabric/water-yielding
				VIII	Basal nodular member	Karst AQ; not karst CU	50 – 60	Shaly, nodular limestone; mudstone and <i>miliolid</i> grainstone	Massive, nodular and mottled, <i>Exogyra texana</i>	Large lateral caves at surface; a few caves near Cibolo Creek	Fabric; stratigraphically controlled/large conduit flow at surface; no permeability in subsurface
					Lower confining unit	Upper member of the Glen Rose Limestone	CU; evaporite beds AQ	350 – 500	Yellowish tan, thinly bedded limestone and marl	Stair-step topography; alternating limestone and marl	Some surface cave development

GEOLOGIC ASSESSMENT TABLE PROJECT NAME: Hidden Canyon, Unit 2A FGS-E22170

LOCATION		FEATURE CHARACTERISTICS										EVALUATION			PHYSICAL SETTING				
1A	1B*	1C*	2A	2B	3	4			5	5A	6	7	8A	8B	9	10	11	12	
FEATURE	LATITUDE	LONGITUDE	FEATURE TYPE	POINTS	FORMATION	DIMENSIONS (FEET)			TREND (DEGREES)	DOM	DENSITY (NO/FT)	APERTURE (FEET)	INFILL	RELATIVE INFILTRATION RATE	TOTAL	SENSITIVITY	CATCHMENT AREA (ACRES)	TOPOGRAPHY	
						X	Y	Z		10					< 40	≥ 40	<1.6	≥1.6	
S-27	N29° 38.477'	W98° 29.352'	MB	30	KcK	3	3	7	-	-	-	-	X	5	35	35	Yes	Hillside	
S-63	N29° 39.031'	W98° 29.269'	MB	30	KcK	3	3	7	-	-	-	-	X	5	35	35	Yes	Streambed	
S-67	N29° 39.091'	W98° 29.302'	MB	30	KcK	3	3	7	-	-	-	-	X	5	35	35	Yes	Streambed	
S-70	N29° 39.140'	W98° 29.333'	MB	30	KcK	3	3	7	-	-	-	-	X	5	35	35	Yes	Drainage	

* DATUM 1983 North American Datum (NAD83)

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 Natural Resource Conservation Commission'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 213.

Signature *Steve M. Frost*



Date March 1, 2024 Sheet 1 of 1

LOCATION

The Site is located within the existing Hidden Canyon Subdivision near the northwest corner of the intersection of Stone Oak Parkway and Canyon Golf Road, in San Antonio, Texas. The proposed additional sewer line extends to the southeast of Line G in the central portion of the Site and along Mud Creek. An overall view of the area is shown on copies of the site plan, a street map, the U.S.G.S. Topographic Map, the Official Edwards Aquifer Recharge Zone Map, the FIRM Map, a geologic map, a 2023 Aerial Photo at a scale of 1"=500', a 2023 Aerial Photo at a scale of 1"=200', and a 1959 Aerial Photo at a scale of 1"=500', Figures 1 through 10 in Appendix A.

METHODOLOGY

The Geologic Assessment was performed by Mr. Steve Frost, C.P.G., P.G., President, and Ethan Levine, Staff Geologist of Frost GeoSciences, Inc. Mr. Frost is a Licensed Professional Geoscientist in the State of Texas (License # 315), and is a Certified Professional Geologist with the American Institute of Professional Geologists (Certification # 10176).

Frost GeoSciences, Inc. researched the geology of the area surrounding the intersection of Stone Oak Parkway and Canyon Golf Road in Bexar County, Texas. The research included, but was not limited to, the Geologic Atlas of Texas, San Antonio Sheet, FEMA maps, Edwards Aquifer Recharge Zone Maps, U.S.G.S. 7.5 Minute Quadrangle Maps, the Bureau of Economic Geology-Geologic Atlas of Texas San Antonio Sheet, the Geologic Map of the New Braunfels, Texas 30 X 60 Minute Quadrangle, the U.S.G.S. Water-Resources Investigations Report 95-4030, and the U.S.D.A. Soil Survey of Bexar County, Texas.

After reviewing the available information, a field investigation was performed to identify any geologic or man made potential recharge features. A transect spacing of approximately 50 feet, or less depending on vegetation thickness, was used to

inspect the project area within a 50 foot boundary of the proposed additional sewer line. A 2023 aerial photograph, in conjunction with a hand held Global Positioning System with an Estimated Potential Error ranging from 8 to 11 feet, was used to navigate around the property and identify the locations of potential recharge features, as recommended in the “Instructions to Geologists”, TCEQ-0585-Instructions (Rev. 10-1-04). The Site Geologic Map, indicating the limits of the project site, and the locations of any potential recharge features and rock outcrops noted on the project site, is included in Appendix C. A copy of a 2023 Aerial Photograph at an approximate scale of 1”=200’ indicating the limits of the project site, and the locations of any potential recharge features and rock outcrops noted on the project site, is included on Figure 10 in Appendix A. The Geologic Assessment Form TCEQ-0585, (Rev. 02-11-15), Stratigraphic Column, and the Geologic Assessment Table have been filled with the appropriate information for this project site and are included on pages 1-5 of this report.

RESEARCH & OBSERVATIONS

7.5 Minute Quadrangle Map Review

According to the U.S.G.S. 7.5 Minute Quadrangle Map, Bulverde, Texas Sheet (1988), the elevation across the project site range from 1075 to 1130 feet above mean sea level. The Site is located in small intermittent stream valley with steep sloping hillsides. The general direction of area runoff is to the south and east along an unnamed tributary of Mud Creek. A copy of the U.S.G.S. 7.5 Minute Quadrangle Map indicating the location of the project site is included on Figure 3 in Appendix A.

According to the Bexar County Watersheds Map, the project site is located within the Upper Salado Creek Watershed. A copy of the above referenced Bexar County Watersheds Map, indicating the location of the project site, is included in this report on Figure 4 in Appendix A.

Recharge / Transition Zone

According to the Official Edwards Aquifer Recharge Zone Map, Bulverde, Texas Sheet (2014), the project site is located within the Recharge Zone of the Edwards Aquifer. A copy of the Official Edwards Aquifer Recharge Zone Map, Bulverde, Texas Sheet (2014), indicating the location of the project site is included on Figure 5 in Appendix A.

100-Year Floodplain

The Federal Emergency Management Agency (FEMA) Flood Insurance Rate Map for the Bexar County, Texas, Community Panel Number 48029C0140G (Revised September 29, 2010) was reviewed to determine if the project site is located in areas prone to flooding. A review of the above mentioned Panel Number indicates that the project site is located within "Zone X". According to the Panel Legend, Zone X represents areas determined to be outside the 0.2% annual chance floodplain. A copy of the above referenced FIRM panel indicating the location of the project site is included on Figure 6 in Appendix A.

Soils

According to the United States Department of Agriculture, Soil Conservation Service, Soil Survey of Bexar County, Texas, Sheet 16, (1966), the project site is located on the Tarrant Association, hilly (TaD). A copy of the 1959 aerial photo (approximate scale: 1"=500') from the U.S.D.A. Soil Survey of Bexar County, Texas indicating the location of the project site and the soil types is included on Figure 7 in Appendix A.

The Tarrant Association consists of stony soils that are very shallow, dark colored, and gently undulating to steep. The Tarrant Association occurs on the limestone prairies in the northern third of the county. The surface layer is very dark grayish brown, calcareous clay loam and is about 10 inches thick. It has moderate, fine, subangular blocky structure. This layer is crumbly and friable when moist. Limestone fragments that range from a quarter of an inch to 24 inches in diameter cover about 35 percent of the surface. The subsurface

layer, about 8 inches thick, is hard fractured limestone. The cracks and spaces are filled with dark grayish brown clay loam. The bedrock is hard limestone. Tarrant soils have rapid surface drainage and good internal drainage. The capacity to hold water is low. Natural fertility is high. Water erosion is a hazard.

This soil has a USDA Texture Classification of Clay Loam. The Unified Classification is CL or CH. The AASHTO Classification is A-7. This soil has an average permeability from 1.0 to 1.5 inches/hour.

Narrative Description of the Site Geology

Based on a visual inspection of the ground surface, the overall potential for fluid flow from the project site into the Edwards Aquifer appears to be low.

The locations of the Potential Recharge Features are identified on the 2023 aerial photograph on Figure 10 in Appendix A, and on the Site Geologic Map provided in Appendix C. Color photographs of the project site and some of the potential recharge features are included in Appendix B.

Potential Recharge Features # S-27, S-63, S-67, and S-70 are sanitary sewer manhole covers associated with the City of San Antonio sanitary sewer easements crossing through project site servicing the residential areas on the adjoining properties surrounding the project site. Frost GeoSciences, Inc., rate the relative infiltration of these features as low on figure 1 of the TCEQ-0585-Instructions (Rev. 10-01-04). These features score a 35 on the sensitivity scale, column 10 in the Geologic Assessment Table on page 5 of this report. Frost GeoSciences, Inc. does not consider the manhole covers to be sensitive features.

Portions of the property were covered with a dense stand of vegetative cover with areas of the project site covered by sparse stands of vegetative cover. Site visit photographs indicating the condition of the property at the time of the on-site inspection are included in Appendix B. The vegetative cover on the property is visible in the 2023 aerial photograph on Figures 9 and 10 in Appendix A.

According to the site plan provided by Cude Engineers, the surveyed elevations within the project area range from 1068 feet in the southeastern portion of the project site to 1126 feet in the southwestern portion of the site. A copy of the site plan indicating the boundary of the project site and the elevations is included on the Site Plan included on Figure 2 in Appendix A and the Site Geologic Map in Appendix C of this report.

According to the U.S. Geological Survey Water Resources Investigations 95-4030, the project site is located on the Dolomitic Member and the Basal Nodular Member of the Cretaceous Edwards Kainer Limestone (Kek). A copy of the Geologic Map indicating the boundary of the project site is included on Figure 8 in Appendix A. A copy of the Stratigraphic Column highlighting the outcropping formations is included on Page 4 of this report.

The Dolomitic Member consists of mudstone to grainstone and crystalline limestone with chert. This member is massively bedded, and light gray with abundant *Toucasia*. Cavernous development in this member is typically related to structure or bedding planes. Overall thickness ranges from 110 to 130 feet. The Basal Nodular Member consists of a shaly, nodular limestone with mudstone and miliolid grainstone. This member is typically massive, nodular, and mottled. Fossils of *Exogyra texana* are common. The Basal Nodular Member forms large lateral caves at the surface. Overall thickness ranges from 50 to 60 feet.

BEST MANAGEMENT PRACTICE (BMP)

Based on a visual inspection of the ground surface, the overall potential for fluid flow from the project site into the Edwards Aquifer appears to be low. The potential always exists to encounter solution cavities within the subsurface during excavating activities. Frost GeoSciences, Inc. is of the opinion that it is very important for construction personnel to be informed of the potential to encounter cavities in the subsurface that lack a surface expression. Construction personnel should also be informed of the proper protocol to follow in the event a karst feature is encountered during the development of the project site.

DISCLAIMER

This report has been prepared in general accordance with the “Instructions to Geologists”, TCEQ-0585-Instructions (Rev. 10-1-04) by a Licensed Texas Professional Geoscientist. All areas of the project site were carefully inspected for features that could contribute to the recharge of the Edwards Aquifer, however, this survey cannot preclude the presence of subsurface karst features that lack surface expression. This report is not intended to be a definitive investigation of all possible geologic or karst features at this site. All conclusions, opinions, and recommendations for Best Management Practices (BMP’s) in this report are based on information obtained while researching the project, and on the site conditions at the time of our field investigation.

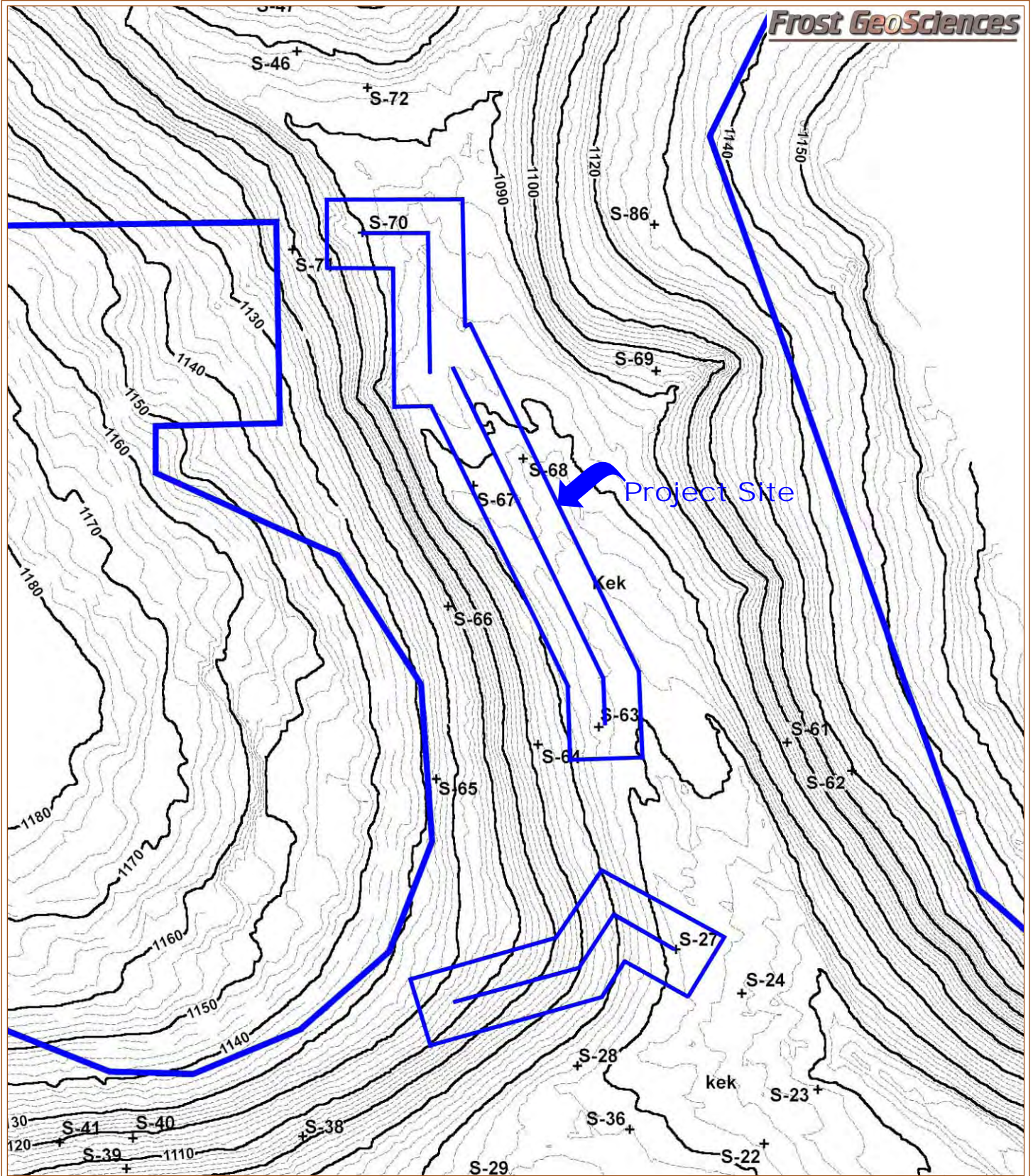
This report has been prepared for the exclusive use of Stone Oak Hidden Canyon, LLC. This report is based on available known records, a visual inspection of the project site, and the work generally accepted for a Geologic Assessment for Regulated Activities / Developments on the Edwards Aquifer Recharge / Transition Zone, relating to 30 TAC §213.5(b)(3), effective June 1, 1999.

REFERENCES

- 1) U.S.G.S. 7.5 Minute Quadrangle Map, Bulverde, Texas Sheet (1988).
- 2) San Antonio Water Systems, Bexar County Watersheds Map (2004).
- 3) Official Edwards Aquifer Recharge Zone Map, Bulverde, Texas Sheet (2014).
- 4) Stein, W.G. and Ozuna, G.B., 1995, Geologic Framework and Hydrogeologic Characteristics of the Edwards Aquifer Recharge Zone, Bexar County, Texas.
U.S. Geological Survey Water Resources Investigations 95-4030.
- 5) Barnes, V.L., 1983, Geologic Atlas of Texas, San Antonio Sheet, Bureau of Economic Geology, The University of Texas at Austin, Texas.
- 6) Federal Emergency Management Agency (FEMA), September 29, 2010, Bexar County, Texas and Incorporated Areas, Flood Insurance Rate Map (FIRM), Panel #48029C140G.
FEMA, Washington D.C.
- 7) U.S.D.A. Soil Conservation Service, Soil Survey of Bexar County, Texas (1966).
- 8) TCEQ-0585-Instructions (Rev. 10-1-04). "Instructions to Geologists for Geologic Assessments on the Edwards Aquifer Recharge/Transition Zone".
- 9) Collins, Edward, W., 2000, Geologic Map of the New Braunfels, Texas 30 X 60 Minute Quadrangle, Bureau of Economic Geology, The University of Texas at Austin, Texas.

Appendix A

Site Location Figures



PROJECT NAME:

Geologic Site Assessment (SCS)
 for Regulated Activities/Development on the
 Edwards Aquifer Recharge/Transition Zone
 Hidden Canyon Unit 2A
 Bexar County, Texas

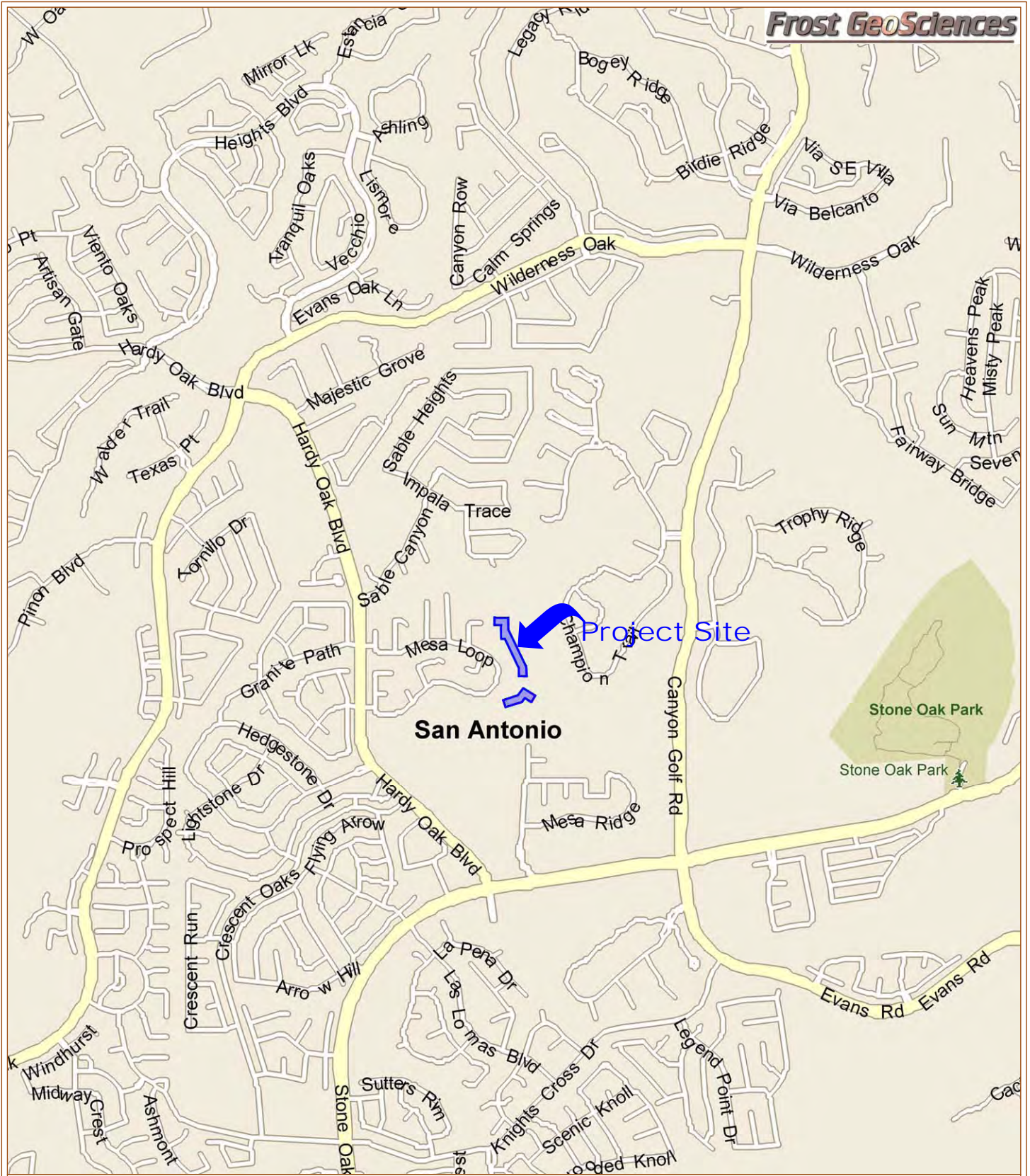
Site Plan

PROJECT No.:

FGS-E24116

DATE:

March 1, 2024



PROJECT NAME:

Geologic Site Assessment (SCS)
for Regulated Activities/Development on the
Edwards Aquifer Recharge/Transition Zone
Hidden Canyon Unit 2A
Bexar County, Texas

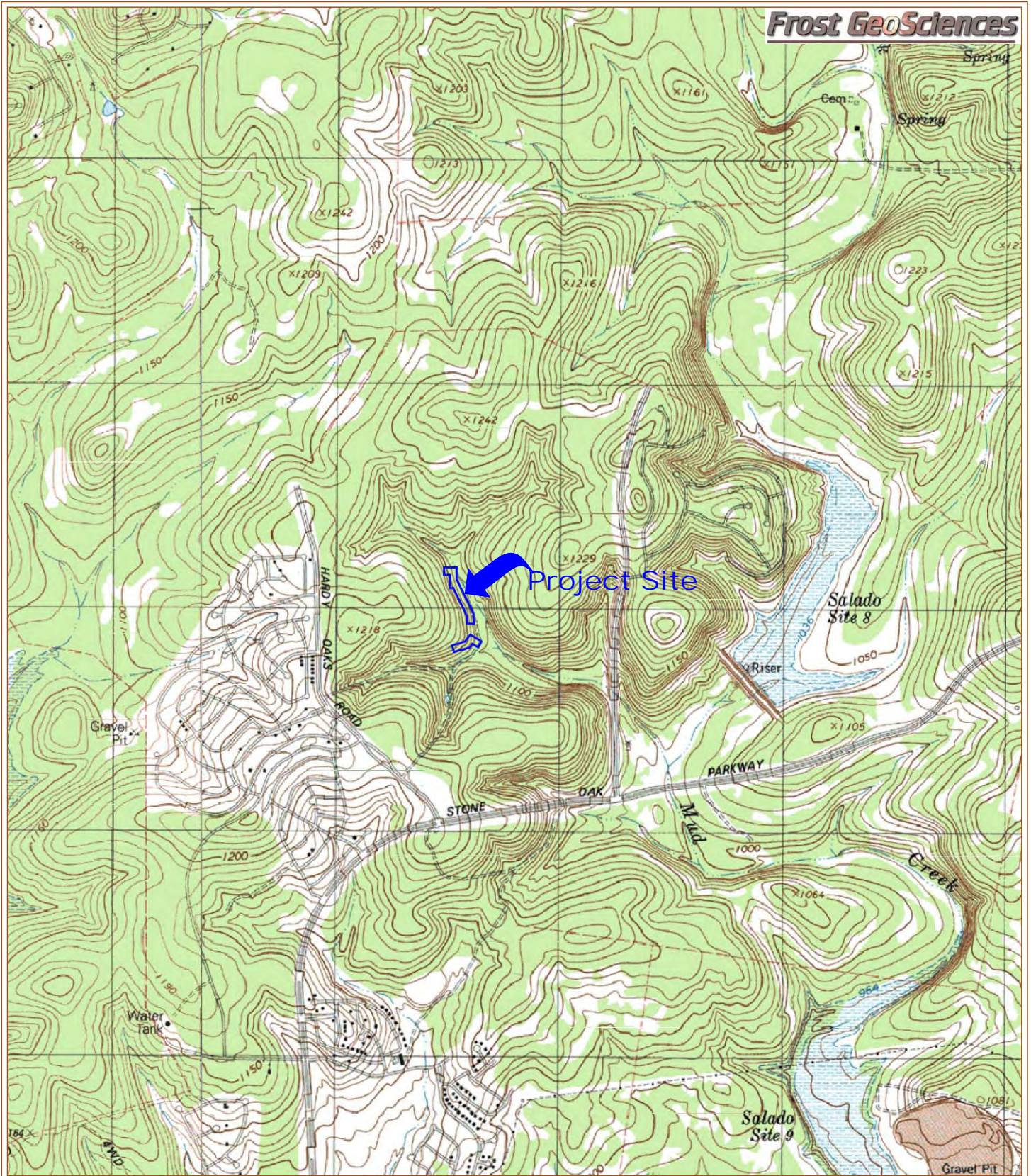
Street Map
Microsoft Streets and Trips (2013)

PROJECT No.:

FGS-E24116

DATE:

March 1, 2024

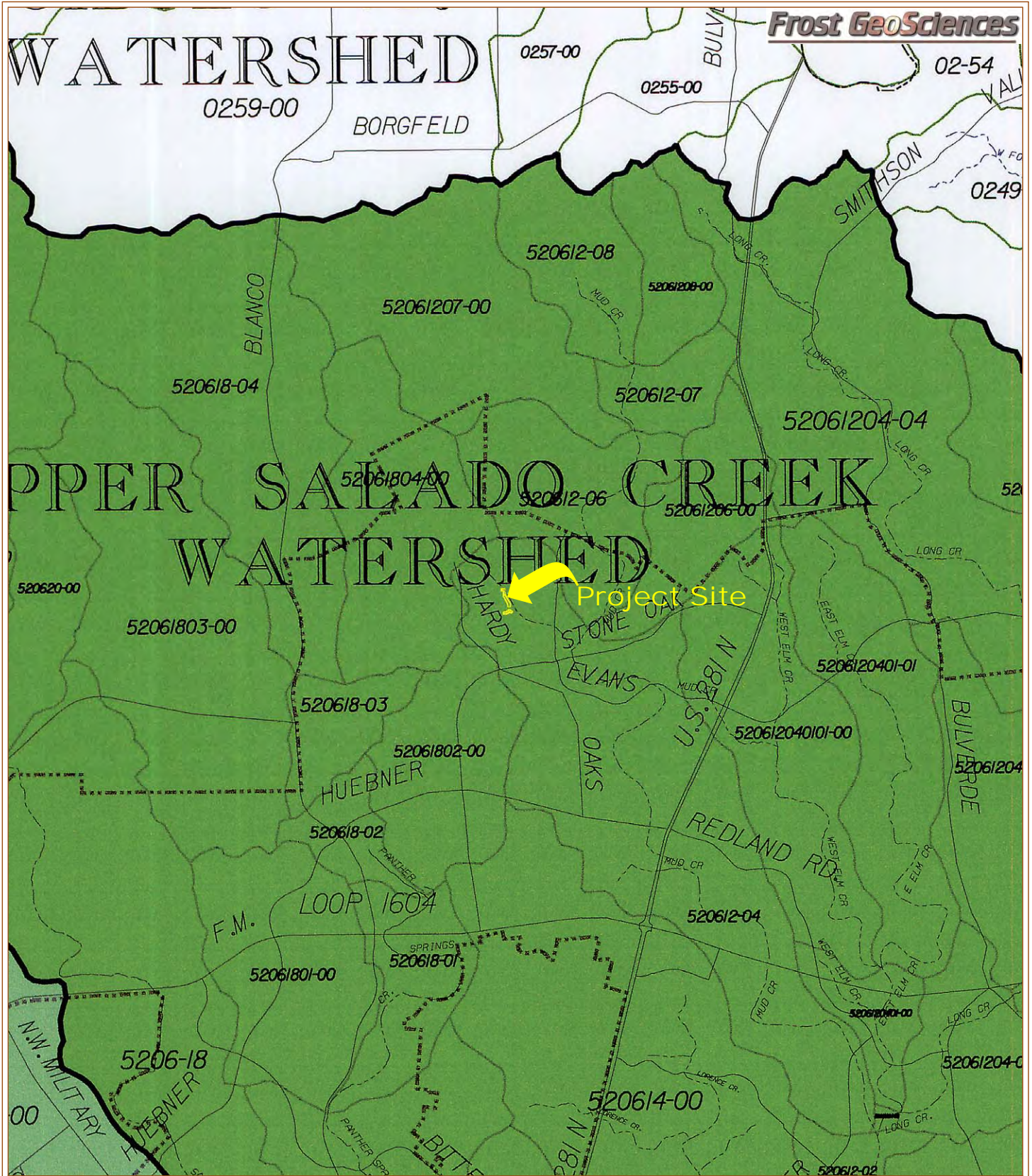


PROJECT NAME:
 Geologic Site Assessment (SCS)
 for Regulated Activities/Development on the
 Edwards Aquifer Recharge/Transition Zone
 Hidden Canyon Unit 2A
 Bexar County, Texas

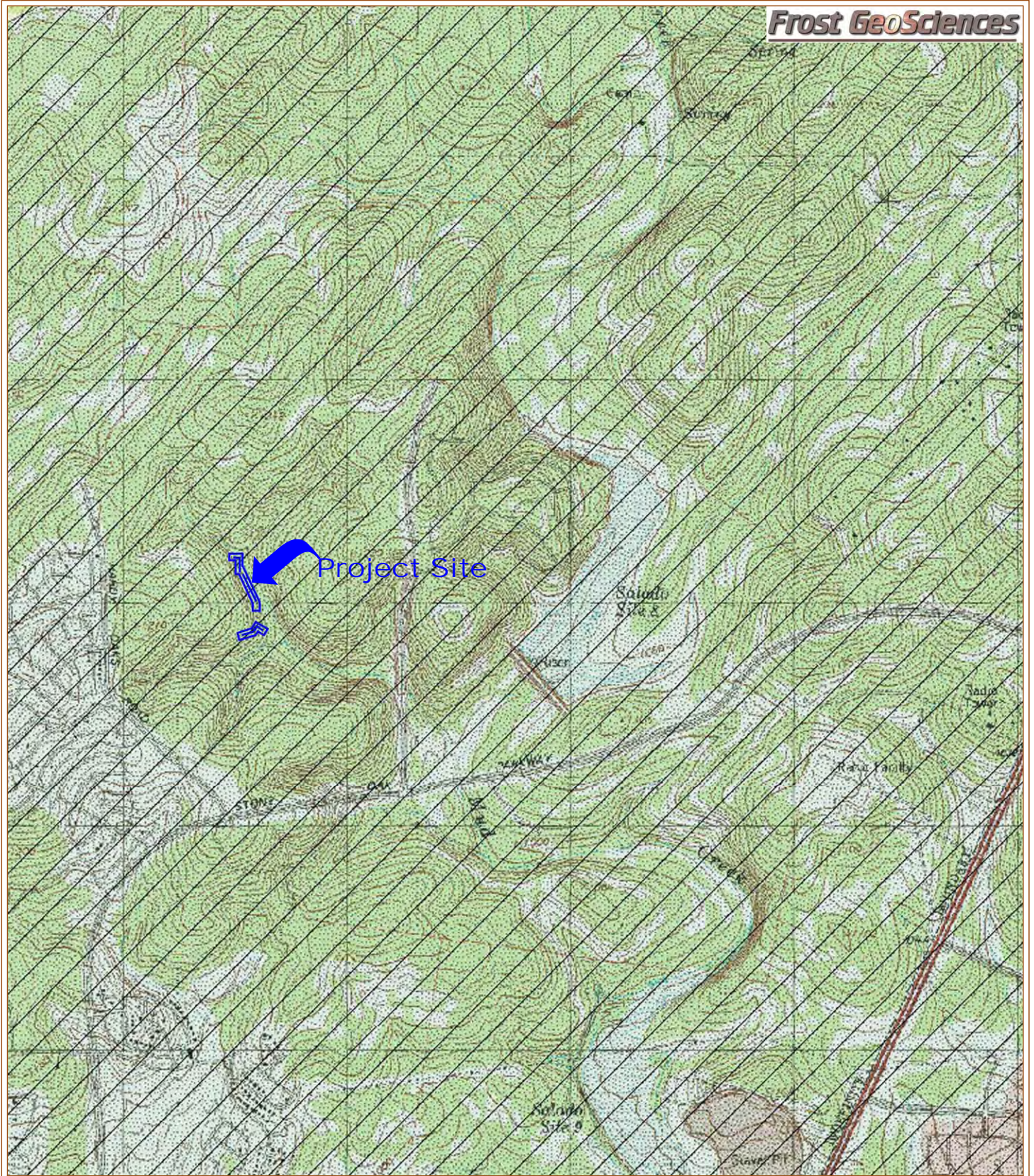
U.S.G.S. 7.5 Minute Quadrangle Map
 Bulverde, Texas Sheet (1988)

PROJECT No.:
 FGS-E24116

DATE:
 March 1, 2024



<p>PROJECT NAME: Geologic Site Assessment (SCS) for Regulated Activities/Development on the Edwards Aquifer Recharge/Transition Zone Hidden Canyon Unit 2A Bexar County, Texas</p>	<p>Bexar County Watersheds Map San Antonio Water Systems (2004)</p>	
	<p>PROJECT No.: FGS-E24116</p>	<p>DATE: March 1, 2024</p>

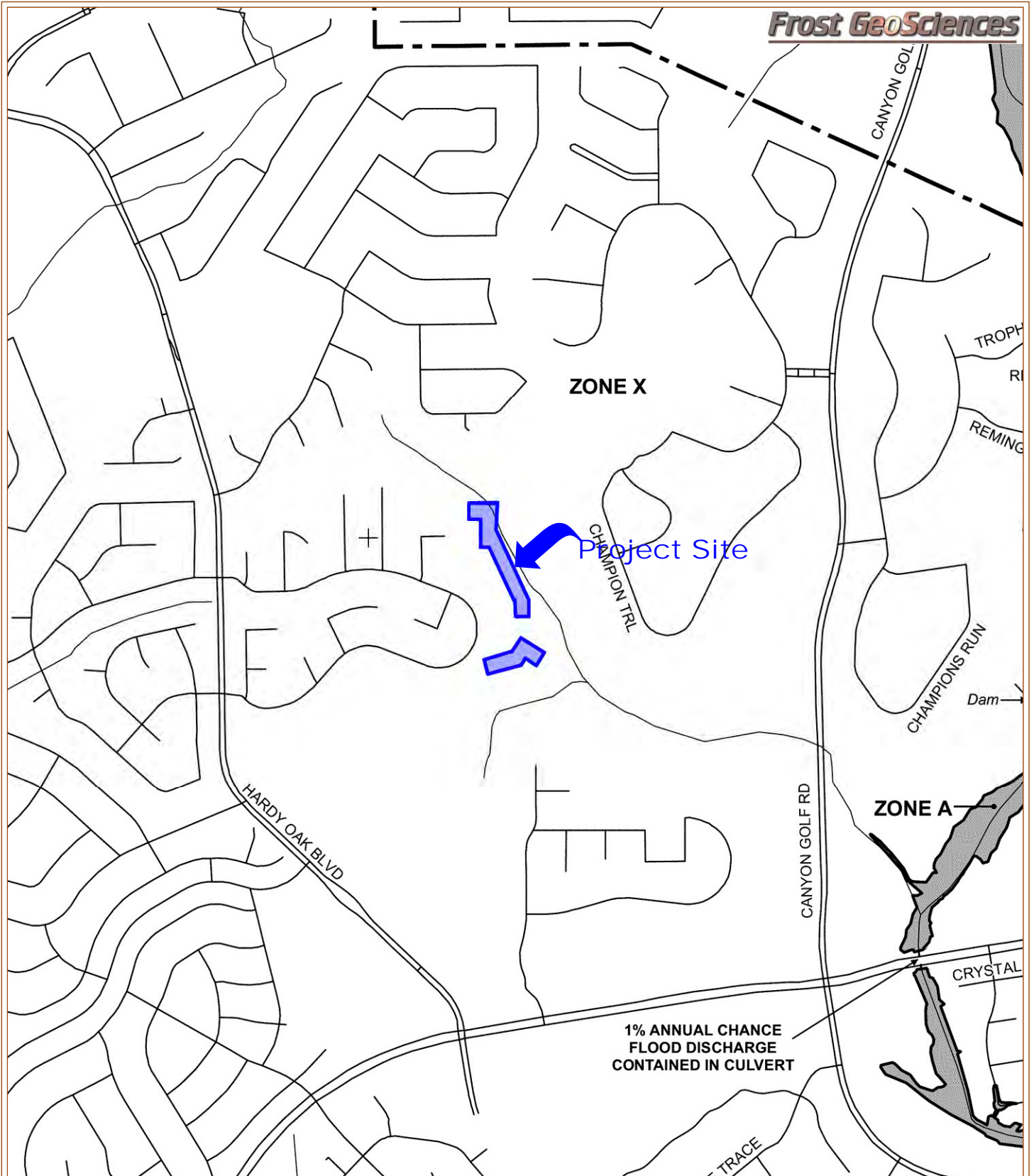


PROJECT NAME:
Geologic Site Assessment (SCS)
for Regulated Activities/Development on the
Edwards Aquifer Recharge/Transition Zone
Hidden Canyon Unit 2A
Bexar County, Texas

Official Edwards Aquifer Recharge Zone Map,
Bulverde, Texas Quadrangle (2014)

PROJECT No.:
FGS-E24116

DATE:
March 1, 2024

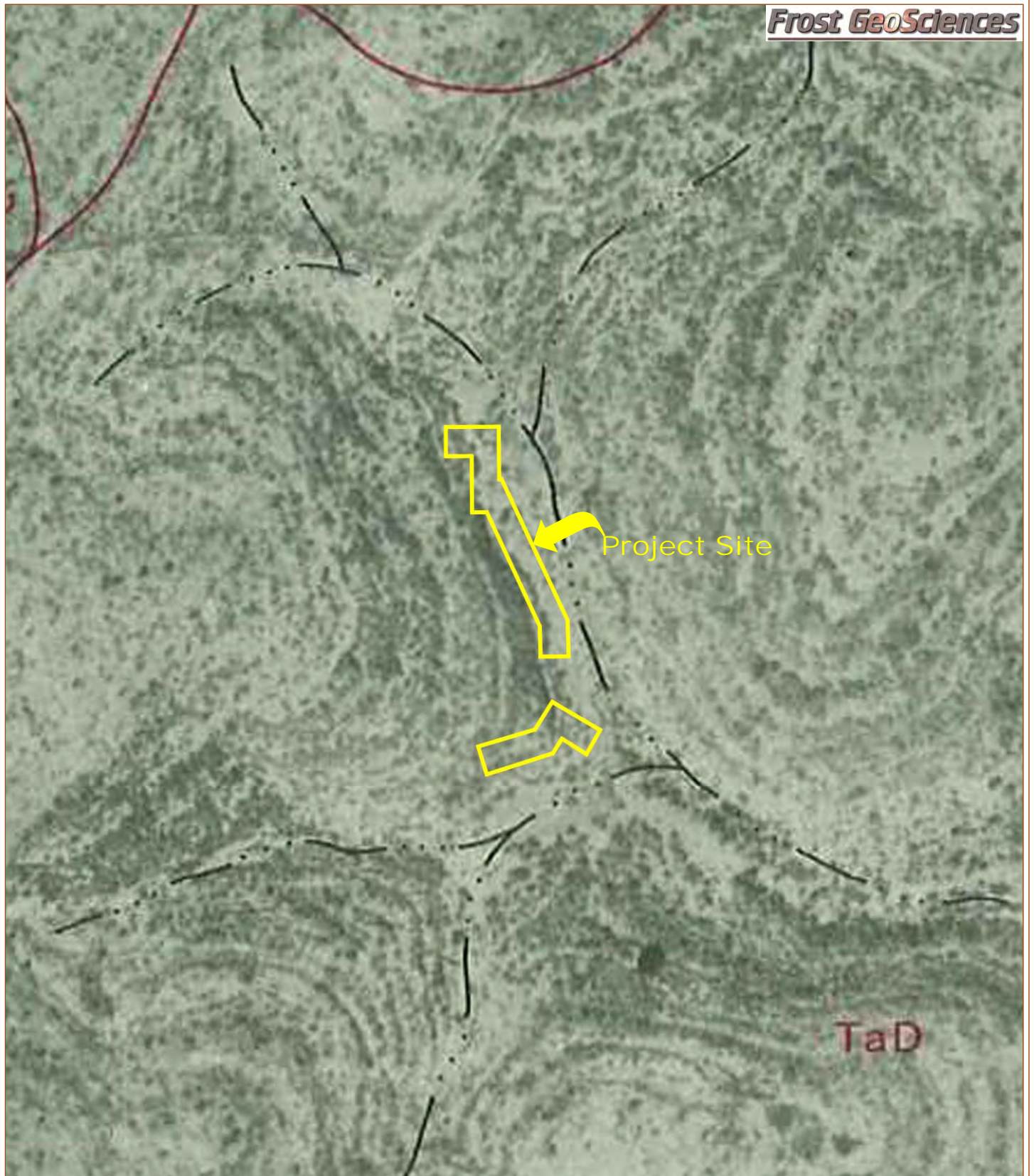


PROJECT NAME:
 Geologic Site Assessment (SCS)
 for Regulated Activities/Development on the
 Edwards Aquifer Recharge/Transition Zone
 Hidden Canyon Unit 2A
 Bexar County, Texas

Flood Insurance Rate Map (FIRM)
 Community Panel # 48029C0140G
 (September 29, 2010)

PROJECT No.:
 FGS-E24116

DATE:
 March 1, 2024

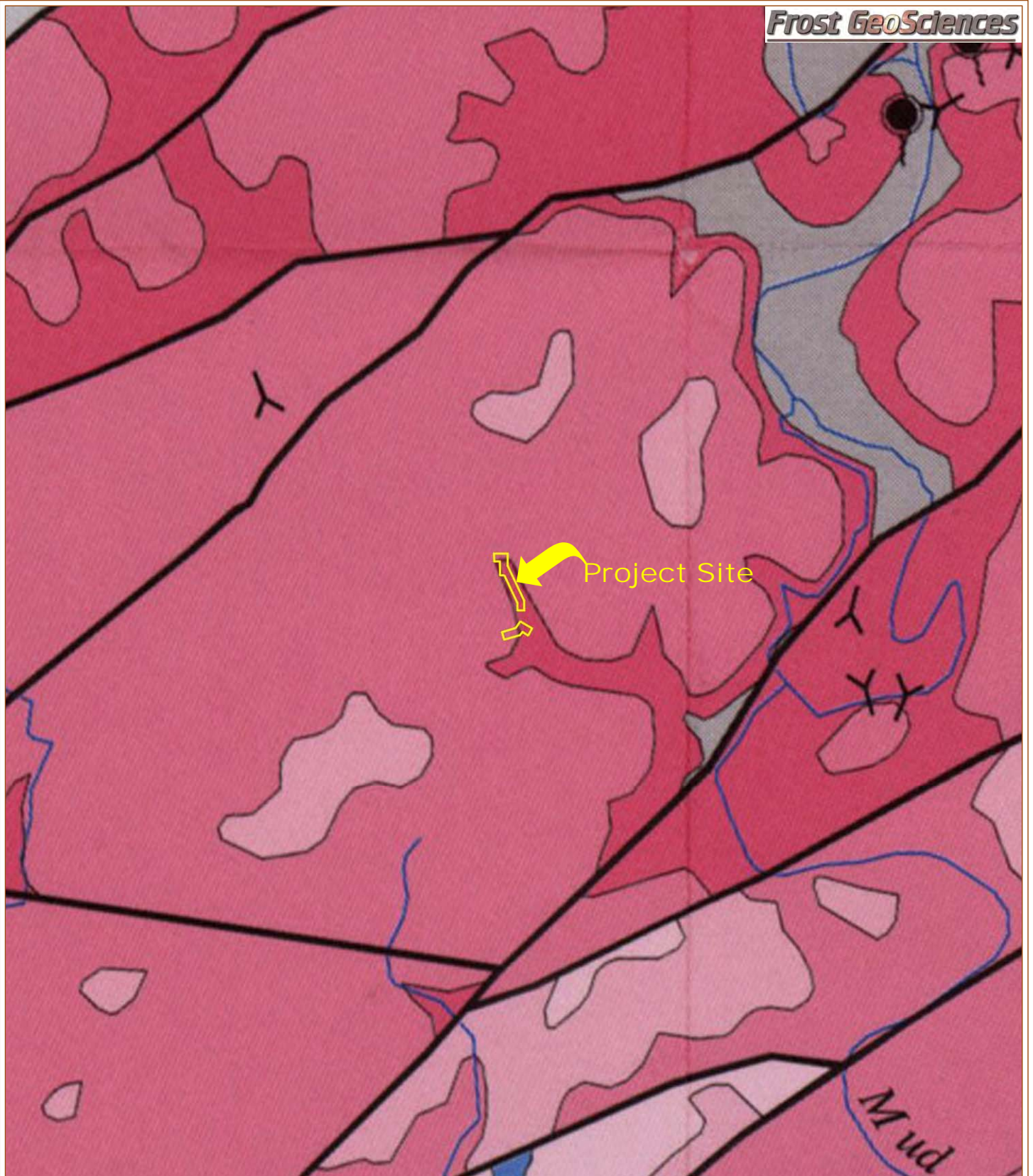


PROJECT NAME:
Geologic Site Assessment (SCS)
for Regulated Activities/Development on the
Edwards Aquifer Recharge/Transition Zone
Hidden Canyon Unit 2A
Bexar County, Texas

United States Department of Agriculture
Soil Survey of Bexar County, Texas
(1966)

PROJECT No.:
FGS-E24116

DATE:
March 1, 2024

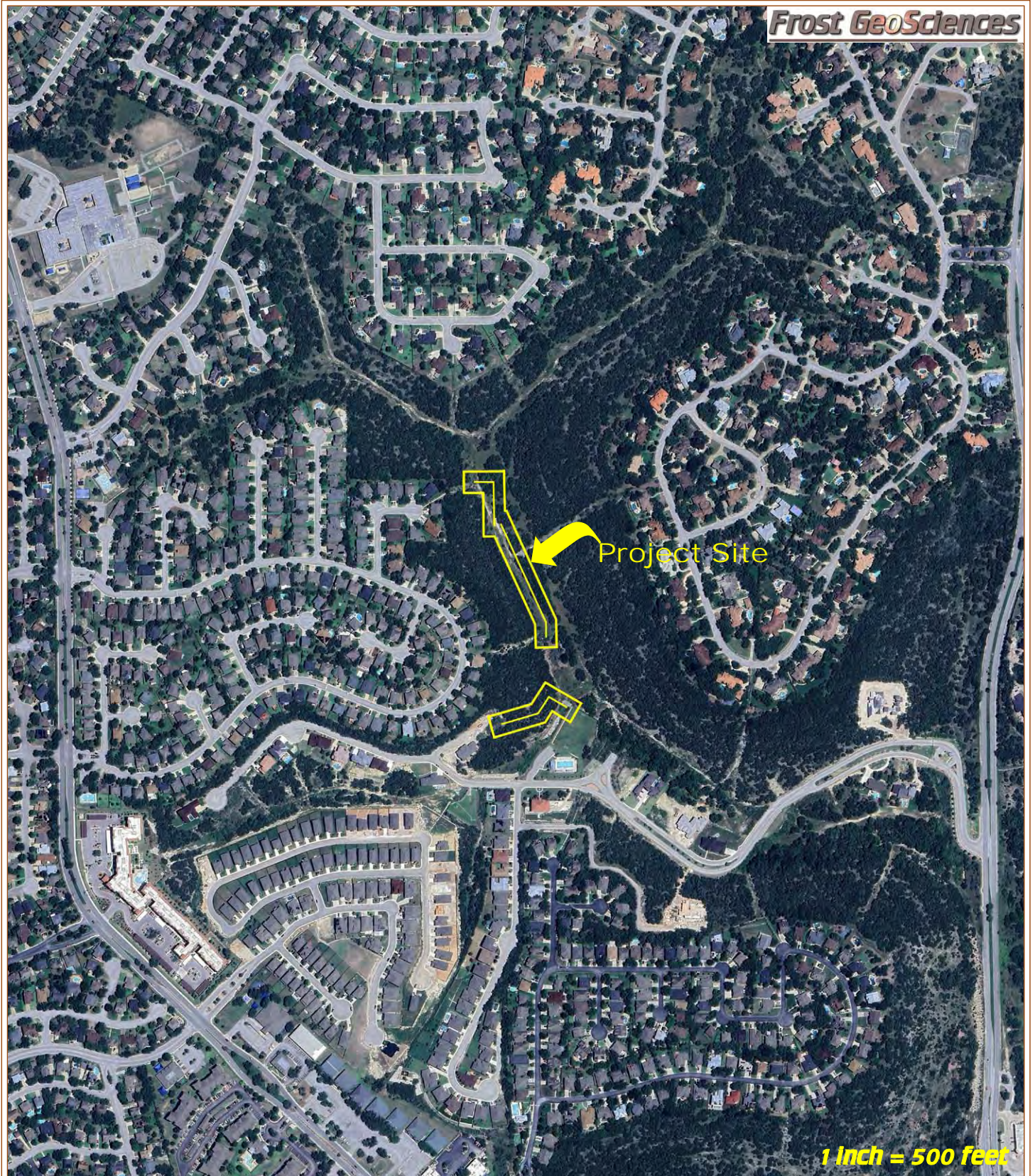


PROJECT NAME:
Geologic Site Assessment (SCS)
for Regulated Activities/Development on the
Edwards Aquifer Recharge/Transition Zone
Hidden Canyon Unit 2A
Bexar County, Texas

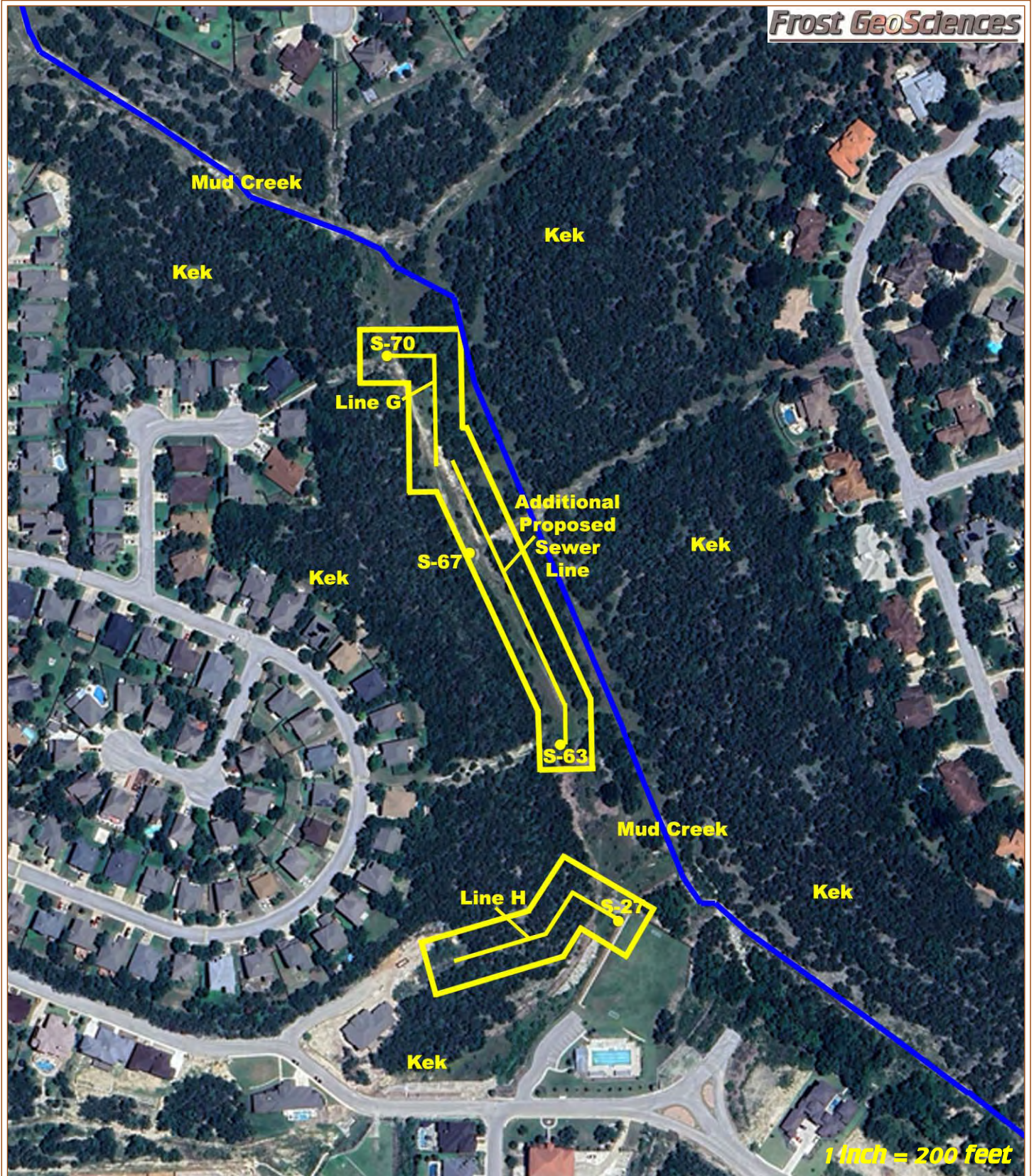
United States Geologic Survey
Water Resources Investigations #4030-95
Geologic Map

PROJECT No.:
FGS-E24116

DATE:
March 1, 2024



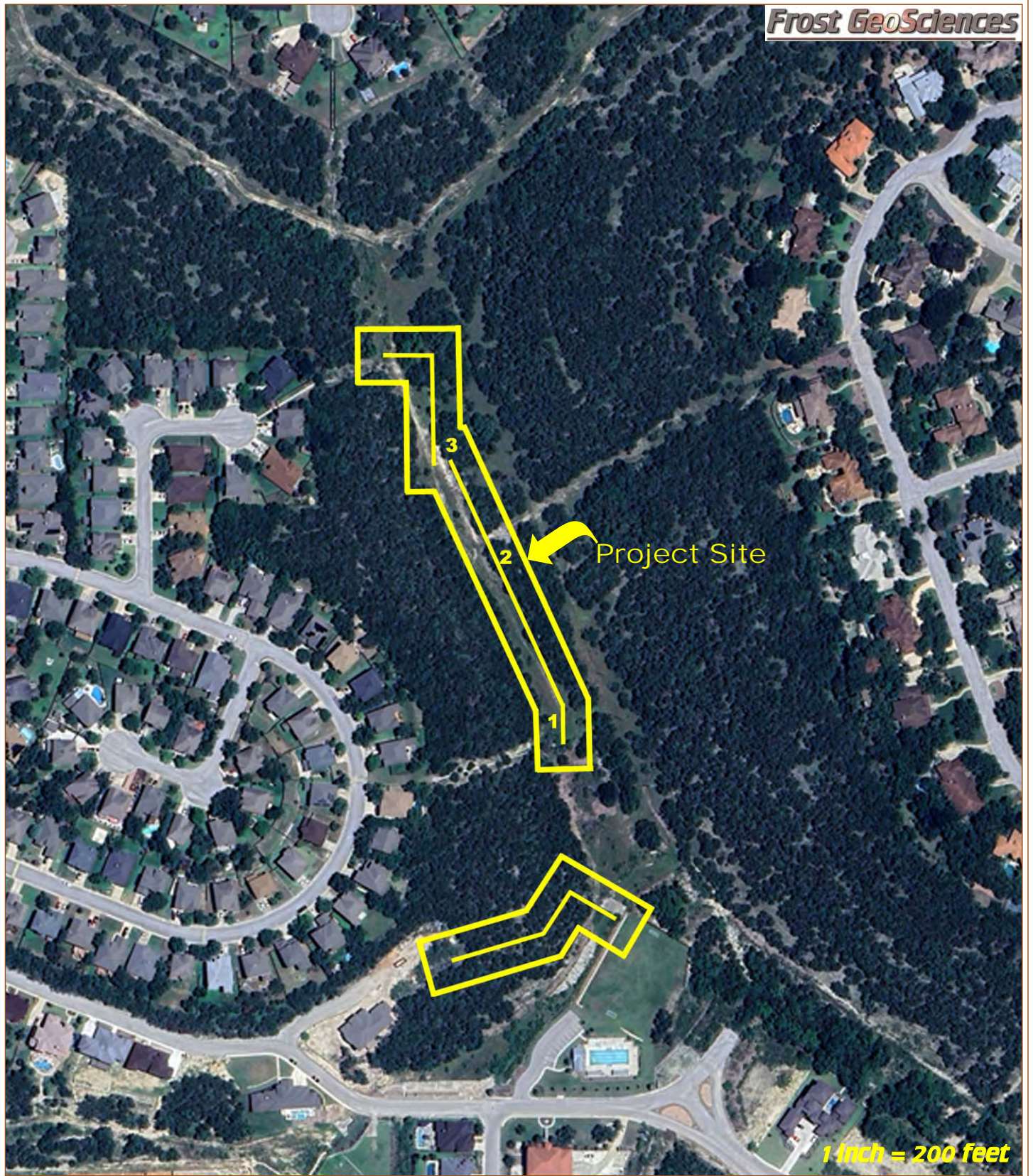
PROJECT NAME: Geologic Site Assessment (SCS) for Regulated Activities/Development on the Edwards Aquifer Recharge/Transition Zone Bexar County, Texas	2023 Aerial Photograph Google Earth	
	PROJECT No.: FGS-E24116	DATE: March 1, 2024



<p>PROJECT NAME: Geologic Site Assessment (SCS) for Regulated Activities/Development on the Edwards Aquifer Recharge/Transition Zone Bexar County, Texas</p>	<p>2023 Aerial Photograph with PRFs Google Earth</p>	
	<p>PROJECT No.: FGS-E24116</p>	<p>DATE: March 1, 2024</p>

Appendix B

Site Inspection Photographs



PROJECT NAME:

Geologic Site Assessment (SCS)
for Regulated Activities/Development on the
Edwards Aquifer Recharge/Transition Zone
Bexar County, Texas

2023 Aerial Photograph with Noted Areas
Google Earth

PROJECT No.:

FGS-E24116

DATE:

March 1, 2024



View to the north from Area 1.



View to the south from Area 1.



View of Potential Recharge Feature # S-63.



View to the southwest from Area 2.



View to the northeast from Area 2.



View of Potential Recharge Feature # S-67



View to the northeast from Area 2.



View to the north from Area 3.



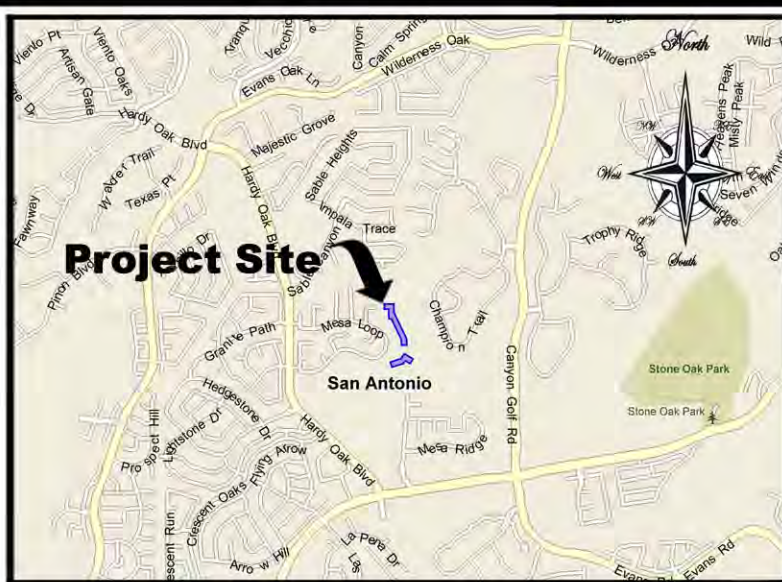
View to the east from Area 3.



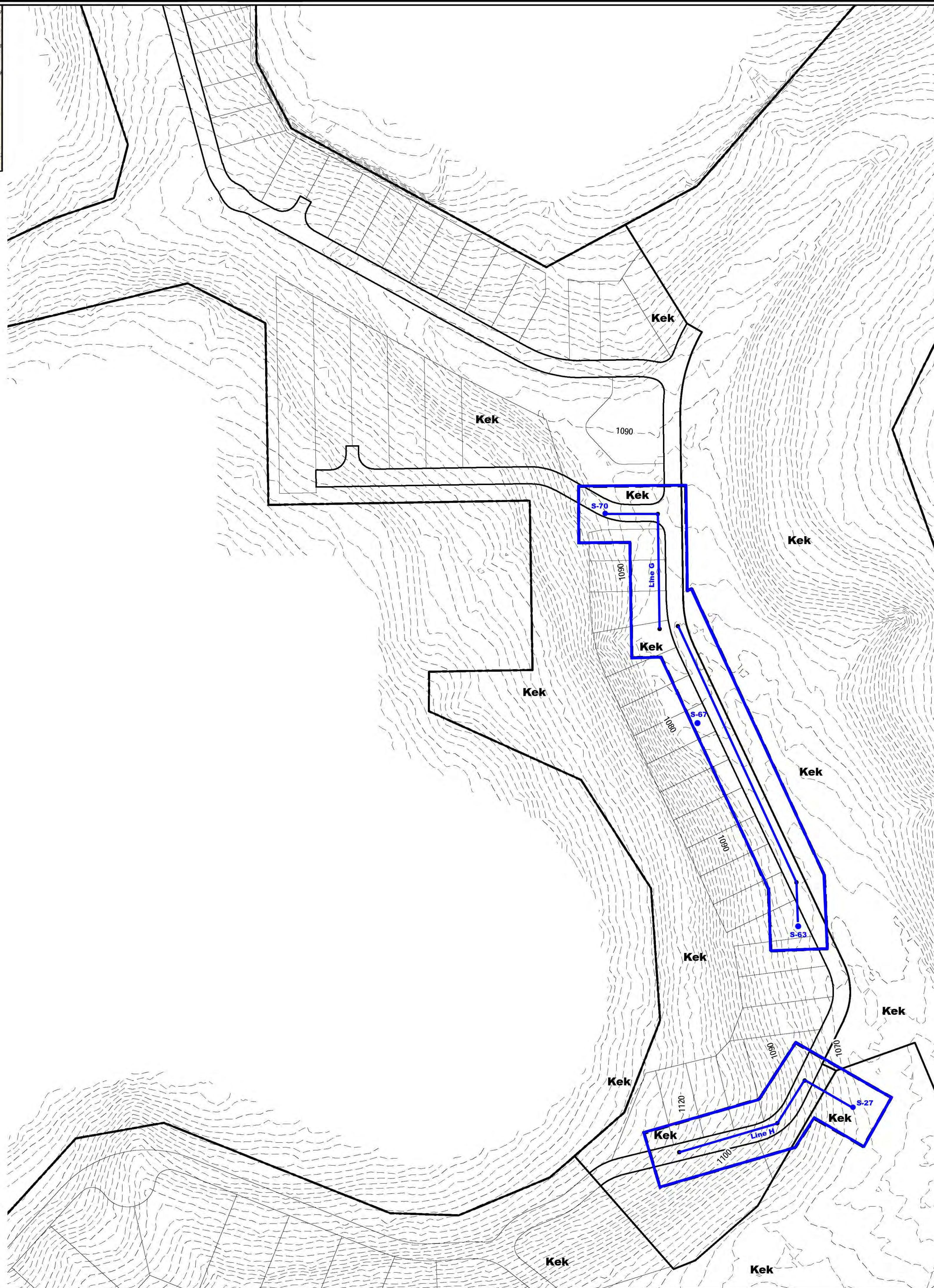
View to the south near Area 3.

Appendix C

Site Geologic Map



Location Map



Site Geologic Map

Geologic Site Assessment (SCS)
 for Regulated Activities / Development on the
 Edwards Aquifer Recharge / Transition Zone
 for
 Hidden Canyon, Unit 2A
 Additional Proposed Sewer Line
 San Antonio, Texas

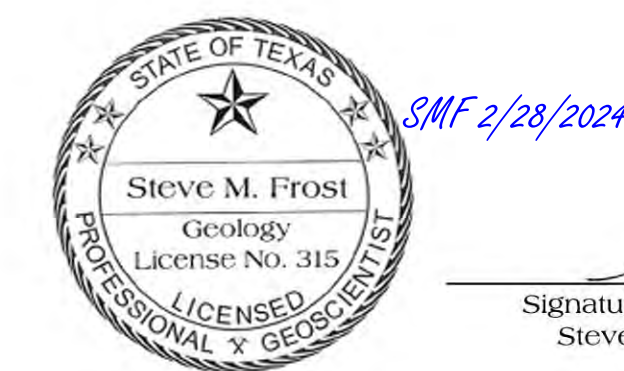
Frost GeoSciences, Inc. Control # FGS-E24116.SCS

Legend

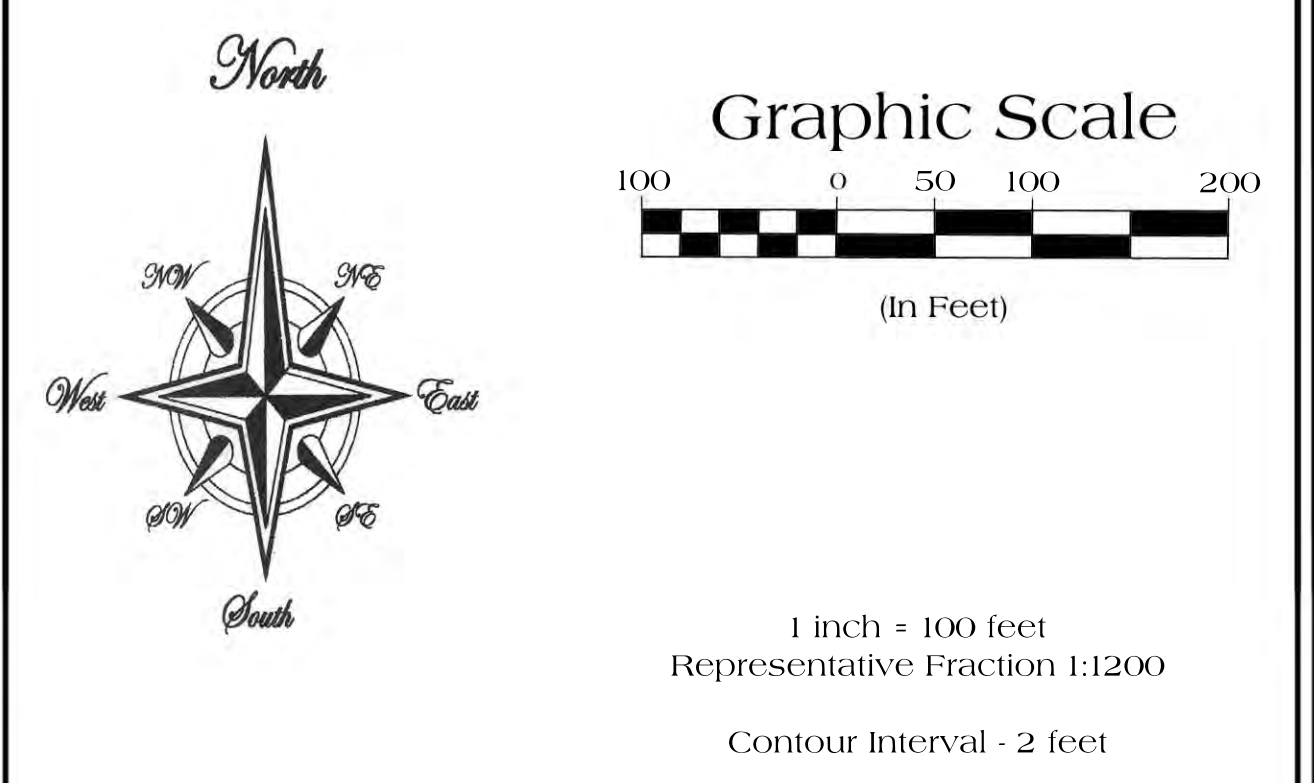
- Fill - Fill Material
 - Qal - Alluvium
 - Kau - Austin Chalk
 - Kef - Eagle Ford Shale
 - Kbu - Buda Limestone
 - Kdr - Del Rio Clay
 - Kgt - Georgetown Limestone
 - Kep - Edwards Person Limestone
 - Kek - Edwards Kainer Limestone
 - Kgr - Glen Rose Formation
-
- S# - Potential Recharge Feature (PRF)
 - - Formation Contact
 - - 100-Year Floodplain - Zone A
 - - 100-Year Floodplain - Zone AE
 - - Other Flood Hazard Area - Zone X (shaded)

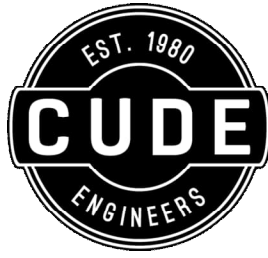
Floodplain Information Obtained From
 FIRM: Flood Insurance Rate Map
 Bexar County, Texas: Panel # 48029C0140G, Revised 9/29/10

Fault Information Obtained From:
 Bureau of Economic Geology, Geologic Atlas of Texas, San Antonio Sheet (1983)
 U.S. Geological Survey, Water Resources Investigations Report 95-4030 (1995)
 Geologic Map of the New Braunfels, Texas 30 X 60 Minute Quadrangle (2000)



Steve Frost
 Signature of Texas Licensed Geoscientist
 Steve Frost, TPG# 315, AIPG # 10176





HIDDEN CANYON SUBDIVISION,
UNIT 2A P.U.D.

*MODIFICATION OF A PREVIOUSLY APPROVED
PLAN
(TCEQ-0590)*

Modification of a Previously Approved Plan

Texas Commission on Environmental Quality

for Regulated Activities on the Edwards Aquifer Recharge Zone and Transition Zone and Relating to 30 TAC 213.4(j), Effective June 1, 1999

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

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

Signature

To the best of my knowledge, the responses to this form accurately reflect all information requested concerning the proposed regulated activities and methods to protect the Edwards Aquifer. This request for a Modification of a Previously Approved Plan is hereby submitted for TCEQ review and executive director approval. The request was prepared by:

Print Name of Customer/Agent: W. Patrick Murphy, P.E.

Date: 03/20/2024

Signature of Customer/Agent:



Project Information

1. Current Regulated Entity Name: Hidden Canyon Subdivision, Unit 2A P.U.D.
Original Regulated Entity Name: Hidden Canyon Subdivision, Unit 2A P.U.D.
Regulated Entity Number(s) (RN): 111799789
Edwards Aquifer Protection Program ID Number(s): 13-02091801
 The applicant has not changed and the Customer Number (CN) is: 603399239
 The applicant or Regulated Entity has changed. A new Core Data Form has been provided.
2. Attachment A: Original Approval Letter and Approved Modification Letters. A copy of the original approval letter and copies of any modification approval letters are attached.

3. A modification of a previously approved plan is requested for (check all that apply):
- Physical or operational modification of any water pollution abatement structure(s) including but not limited to ponds, dams, berms, sewage treatment plants, and diversionary structures;
 - Change in the nature or character of the regulated activity from that which was originally approved or a change which would significantly impact the ability of the plan to prevent pollution of the Edwards Aquifer;
 - Development of land previously identified as undeveloped in the original water pollution abatement plan;
 - Physical modification of the approved organized sewage collection system;
 - Physical modification of the approved underground storage tank system;
 - Physical modification of the approved aboveground storage tank system.
4. Summary of Proposed Modifications (select plan type being modified). If the approved plan has been modified more than once, copy the appropriate table below, as necessary, and complete the information for each additional modification.

<i>WPAP Modification</i>	<i>Approved Project</i>	<i>Proposed Modification</i>
<i>Summary</i>		
Acres	_____	_____
Type of Development	_____	_____
Number of Residential Lots	_____	_____
Impervious Cover (acres)	_____	_____
Impervious Cover (%)	_____	_____
Permanent BMPs	_____	_____
Other	_____	_____

<i>SCS Modification</i>	<i>Approved Project</i>	<i>Proposed Modification</i>
<i>Summary</i>		
Linear Feet	<u>662.42'</u>	<u>1231.93'</u>
Pipe Diameter	<u>8"</u>	<u>8"</u>
Other	_____	_____

<i>AST Modification</i>	<i>Approved Project</i>	<i>Proposed Modification</i>
<i>Summary</i>		
Number of ASTs	_____	_____
Volume of ASTs	_____	_____
Other	_____	_____

<i>UST Modification</i>	<i>Approved Project</i>	<i>Proposed Modification</i>
<i>Summary</i>		
Number of USTs	_____	_____
Volume of USTs	_____	_____
Other	_____	_____

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

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

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

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

Jon Niermann, *Chairman*
Emily Lindley, *Commissioner*
Bobby Janecka, *Commissioner*
Toby Baker, *Executive Director*



Attachment A

TEXAS COMMISSION ON ENVIRONMENTAL QUALITY

Protecting Texas by Reducing and Preventing Pollution

December 2, 2022

Mr. Rajeev Puri
Stone Oak Hidden Canyon, LLC
6002 Camp Bullis Road
San Antonio, Texas 78257

Re: Edwards Aquifer, Bexar County

NAME OF PROJECT: Hidden Canyon Subdivision, Unit 2A P.U.D.; Located approximately 0.57 miles northwest of the Stone Oak Parkway and Canyon Golf Road intersection; San Antonio, Texas

TYPE OF PLAN: Request for Approval of an Organized Sewage Collection System (SCS) Plan; 30 Texas Administrative Code (TAC) Chapter 213 Edwards Aquifer

Regulated Entity No. RN102891918; Additional ID No. 13001610

Dear Mr. Puri:

The Texas Commission on Environmental Quality (TCEQ) has completed its review of the organized sewage collection system plans and specifications for the referenced project submitted to the San Antonio Regional Office on behalf of Stone Oak Hidden Canyon, LLC by M. W. Cude Engineers, LLC on September 20, 2022. Final review of the SCS was completed after additional material was received on November 23, 2022. As presented to the TCEQ, the construction documents were prepared by a Texas Licensed Professional Engineer to be in general compliance with the requirements of 30 TAC Chapter 213 and Chapter 217. Therefore, based on the Texas Licensed Professional Engineer's concurrence of compliance, the planning materials for construction of the proposed sewage collection system and pollution abatement measures are hereby approved subject to applicable state rules and the conditions in this letter. The applicant or a person affected may file with the chief clerk a motion for reconsideration of the executive director's final action on this Edwards Aquifer protection plan. A motion for reconsideration must be filed no later than 23 days after the date of this approval letter. *This approval expires (2) two years from the date of this letter unless, prior to the expiration date, more than 10 percent of construction has commenced, or an extension of time has been requested.*

PROJECT DESCRIPTION

The gravity collection system will consist of 642.42 linear feet of 8-inch PVC, SDR-26, ASTM-D-3034 gravity sewer main and 20.00 linear feet of 8-inch PVC, SDR-26, ASTM D-2241, Class 160 pressure pipe. The proposed sewage collection system will provide disposal service for residential development.

The system will be connected to an existing City of San Antonio/San Antonio Water System (SAWS) wastewater line for conveyance to the Steven M. Clouse Water Recycling Center for treatment and disposal. The project is located within the City of San Antonio and will conform to all applicable codes, ordinances, and requirements of the City of San Antonio and SAWS.

GEOLOGY

According to the geologic assessment included with the application, the project site is located on the dolomitic member and the basal nodular member of the Kainer Limestone. The geologic assessment indicates that no sensitive geologic features and two man-made features in bedrock (existing sanitary sewer manholes) were identified within 50 feet of the proposed sewer line for this unit by the project geologist. The site assessment conducted on November 10, 2022, revealed the site was generally as described in the application.

SPECIAL CONDITION

- I. By the responsible engineer's dated signature and seal on the Engineering Design Report attached to the submitted application, all information therein accurately reflects the information requested concerning the proposed regulated activities and methods to protect the Edwards Aquifer in accordance with the requirements of 30 TAC 213.5 (c) and Chapter 217.

STANDARD CONDITIONS

1. Pursuant to Chapter 7 Subchapter C of the Texas Water Code, any violations of the requirements in 30 TAC Chapter 213 may result in administrative penalties.
2. The holder of the approved Edwards Aquifer protection plan must comply with all provisions of 30 TAC Chapter 213 and all best management practices and measures contained in the approved plan. Additional and separate approvals, permits, registrations and/or authorizations from other TCEQ Programs (i.e., Stormwater, Water Rights, UIC) can be required depending on the specifics of the plan.
3. In addition to the rules of the Commission, the applicant may also be required to comply with state and local ordinances and regulations providing for the protection of water quality.

Prior to Commencement of Construction:

4. All contractors conducting regulated activities at the project location shall be provided a copy of this notice of approval. At least one complete copy of the approved SCS plan and this notice of approval shall be maintained at the project location until all regulated activities are completed.
5. Modification to the activities described in the referenced SCS application following the date of approval may require the submittal of a plan to modify this approval, including the payment of appropriate fees and all information necessary for its review and approval prior to initiating construction of the modifications.
6. The applicant must provide written notification of intent to commence construction, replacement, or rehabilitation of the referenced project. Notification must be submitted to the San Antonio Regional Office no later than 48 hours prior to commencement of the regulated activity. Written notification must include the date on which the regulated activity will commence, the name of the approved plan and program ID number for the regulated activity, and the name of the prime contractor with the name and telephone number of the contact person. The executive director will use the notification to determine if the approved plan is eligible for an extension.
7. Temporary erosion and sedimentation (E&S) controls, i.e., silt fences, rock berms, stabilized construction entrances, or other controls described in the approved application, must be installed prior to construction and maintained during construction. Temporary E&S controls may be removed when vegetation is established, and the construction area is stabilized. The TCEQ may monitor stormwater discharges from the site to evaluate the

adequacy of temporary E&S control measures. Additional controls may be necessary if excessive solids are being discharged from the site.

During Construction:

8. During the course of regulated activities related to this project, the applicant or his agent shall comply with all applicable provisions of 30 TAC Chapter 213 and Chapter 217. The applicant shall remain responsible for the provisions and conditions of this approval until such responsibility is legally transferred to another person or entity, upon which that person or entity shall assume responsibility for all provisions and conditions of this approval.
9. If sediment escapes the construction site, the sediment must be removed at a frequency sufficient to minimize offsite impacts to water quality (e.g., fugitive sediment in street being washed into surface streams or sensitive features by the next rain). Sediment must be removed from sediment traps or sedimentation ponds not later than when design capacity has been reduced by 50 percent. Litter, construction debris, and construction chemicals shall be prevented from becoming stormwater discharge pollutants.
10. If any sensitive feature (caves, solution cavities, sink holes, etc.) is discovered during construction, all regulated activities near the feature must be suspended immediately. The applicant or his agent must immediately notify the San Antonio Regional Office of the discovery of the feature. Regulated activities near the feature may not proceed until the executive director has reviewed and approved the methods proposed to protect the feature and the aquifer from potentially adverse impacts to water quality. The plan must be sealed, signed, and dated by a Texas Licensed Professional Engineer.
11. The following records shall be maintained by the applicant and made available to the executive director upon request: the dates trenching 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 and completed.
12. 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.
13. Intentional discharges of sediment laden stormwater during construction are not allowed. If dewatering of excavated areas becomes necessary, the discharge will be filtered through appropriately selected temporary best management practices. These may include vegetative filter strips, sediment traps, rock berms, silt fence rings, etc.
14. No part of the system shall be used as a holding tank for a pump-and-haul operation.

After Completion of Construction:

15. Certification by a Texas Licensed Professional Engineer of the testing of sewage collection systems required by 30 TAC Chapter 213 and Chapter 217 shall be submitted to the San Antonio Regional Office within 30 days of test completion and prior to the new sewage collection system being put into service. The certification should include the project name as it appeared on the approved application, the program ID number, and two copies of a site plan sheet(s) indicating the wastewater lines and manholes that were tested and are being certified as complying with the appropriate regulations. 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. Should any test result fail to meet passing test criteria and then subsequently pass

testing, the result(s) and an explanation of what repair, adjustment, or other means were taken to facilitate a subsequent passing result shall be provided.

16. Every five years after the initial certification, the sewage collection system shall be retested. Any lines that fail the test must be repaired and retested. Certification that the system continues to meet the requirements of 30 TAC Chapter 213 and Chapter 217 shall be submitted to the San Antonio Regional Office. The certification should include the project name as it appeared on the approved application, the program ID number and two copies of a site plan sheet(s) indicating the wastewater lines and manholes that were tested and are being certified as complying with the appropriate regulations. Should any test result fail to meet passing test criteria, and then subsequently pass testing, the result(s) and an explanation of what repair, adjustment, or other means were taken to facilitate a subsequent passing result shall be provided.
17. If ownership of this organized sewage collection system is legally transferred (e.g., developer to city or Municipal Utility District), the new owner(s) is required to comply with all terms of the approved Edwards Aquifer protection plan. If the new owner intends to commence any new regulated activity on the site, a new Edwards Aquifer protection plan that specifically addresses the new activity must be submitted to the executive director. Approval of the plan for the new regulated activity by the executive director is required prior to commencement of the new regulated activity.
18. An Edwards Aquifer protection plan approval or extension will expire, and no extension will be granted if more than 50 percent of the total construction has not been completed within ten years from the initial approval of a plan. A new Edwards Aquifer protection plan must be submitted to the San Antonio Regional Office with the appropriate fees for review and approval by the executive director prior to commencing any additional regulated activities.

This action is taken under authority delegated by the Executive Director of the Texas Commission on Environmental Quality. If you have any questions or require additional information, please contact Don Vandertulip, PE, BCEE of the Edwards Aquifer Protection Program of the San Antonio Regional Office at (210) 403-4057.

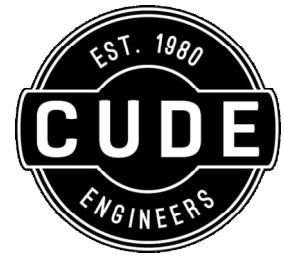
Sincerely,



Lillian Butler, Section Manager
Edwards Aquifer Protection Program
Texas Commission on Environmental Quality

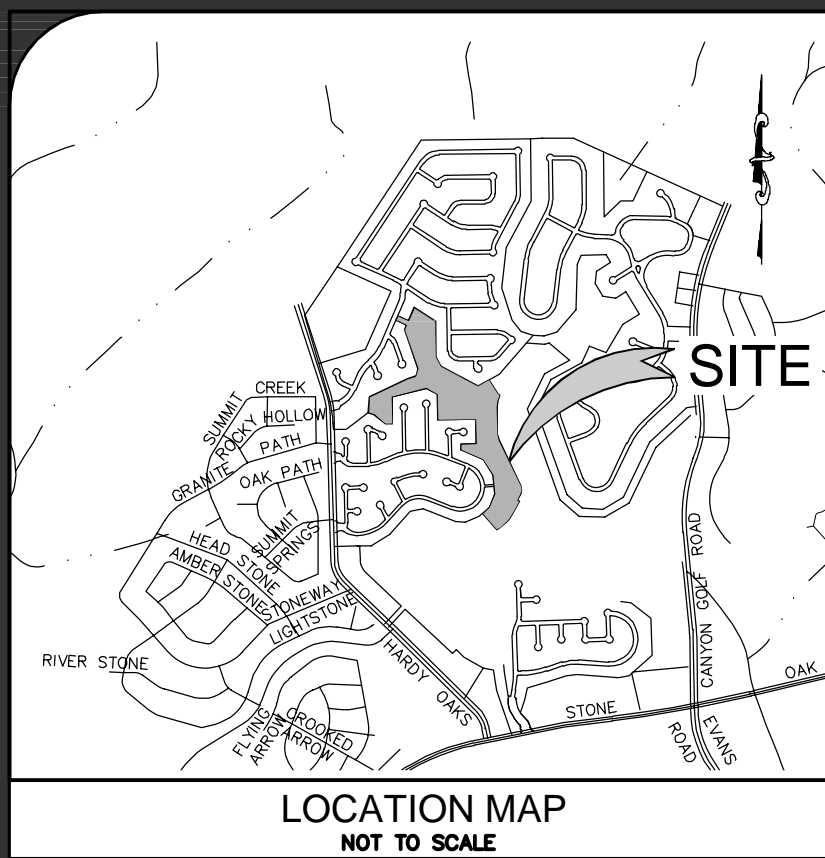
LIB/dv

cc: Mr. Patrick Murphy, PE, M. W. Cude Engineers, LLC



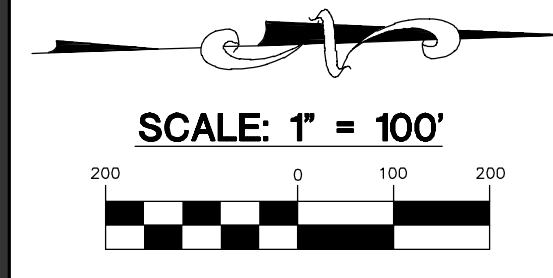
ATTACHMENT B
Narrative of Proposed Modification

This project is a single-family residential development consisting of approximately 29 acres. The site is located approximately 2,000 feet north of the intersection of Stone Oak Parkway and Canyon Golf Road in north Bexar County, Texas within the limits of the City of San Antonio. This project includes 52 lots with street, drainage, sidewalk, curb, water, and utility infrastructure. The original approved SCS included 662.42 linear feet of 8-inch sanitary sewer main and services. This modification is being submitted to add a sanitary sewer line to the approved SCS due to a comment received by the sewer purveyor for this area, San Antonio Water System (SAWS) and now includes a total of 1231.93 linear feet of 8-inch sanitary sewer main. In addition, 5 additional sanitary sewer laterals were added into the plans to serve lots in a future unit within Hidden Canyon Subdivision. An exhibit showing the original approved sanitary sewer layout as well as showing the added sanitary sewer main is included in the next section of this report.

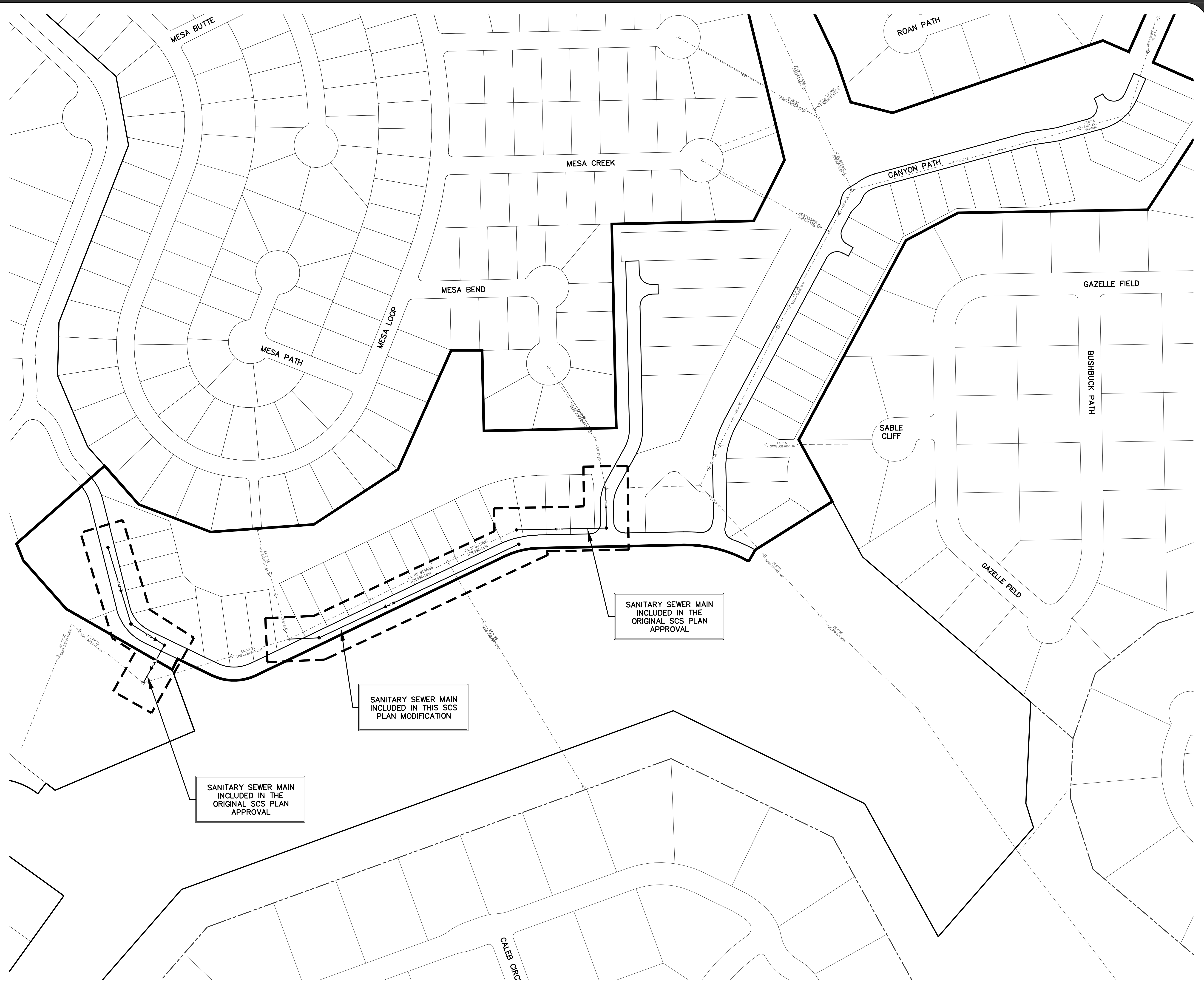


DEVELOPER
 STONE OAK HIDDEN CANYON, L.L.C.
 24165 I.H. 10 WEST, SUITE 217-641
 SAN ANTONIO, TEXAS 78257
 CONTACT PERSON: RAJEEV PURI
 PHONE: (210) 698-3004
 FAX: (210) 698-3014

CIVIL ENGINEER
 M.W. CUDE ENGINEERS, L.L.C.
 4122 POND HILL ROAD, SUITE 101
 SAN ANTONIO, TEXAS 78231
 (210) 681-2951
 FAX: (210) 523-7112
 WWW.CUDEENGINEERS.COM



Attachment C



**HIDDEN CANYON
 SUBDIVISION, P.U.D.**
 SCS MODIFICATION EXHIBIT



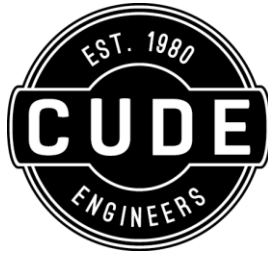
M.W. CUDE ENGINEERS, L.L.C.
 4122 POND HILL ROAD, SUITE 101
 SAN ANTONIO, TEXAS 78231
 TEL: 210.681.2951 • FAX: 210.523.7112
 WWW.CUDEENGINEERS.COM
 TBR# FIRM #455

REVISIONS

1.	
2.	
3.	
4.	
5.	

DATE: 03/03/14 PROJECT NO: 01564.160
 DRAWN BY: BS CHECKED BY: CRD
 PLAT NO:

E25.1
 SHEET
 1 of 1



**HIDDEN CANYON SUBDIVISION,
UNIT 2A P.U.D.**

***ORGANIZED SEWAGE COLLECTION SYSTEM PLAN
(TCEQ-0582)***

Organized Sewage Collection System Application

Texas Commission on Environmental Quality

For Regulated Activities on the Edwards Aquifer Recharge Zone and Relating to 30 TAC §213.5(c), Effective June 1, 1999

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

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

Regulated Entity Name: Hidden Canyon Subdivision, Unit 2A P.U.D.

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: Rajeev Puri

Entity: Stone Oak Hidden Canyon, LLC

Mailing Address: 6002 Camp Bullis Road

City, State: San Antonio, Texas

Zip: 78257

Telephone: (210) 698-3004

Fax: _____

Email Address: rpuri@athenadomain.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: W. Patrick Murphy, P.E.

Texas Licensed Professional Engineer's Number: 111597

Entity: M.W. Cude Engineers, LLC

Mailing Address: 4122 Pond Hill Road, Suite 101

City, State: San Antonio, Texas

Zip: 78231

Telephone: (210) 681-2951

Fax: (210) 523-7112

Email Address: wmurphy@cudeengineers.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: 57
 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:

<u>100</u> % Domestic	<u>11,400</u> gallons/day
_____% Industrial	_____ gallons/day
_____% Commingled	_____ gallons/day
Total gallons/day: <u>11,400</u>	

6. Existing and anticipated infiltration/inflow is 7,416 gallons/day. This will be addressed by: The infiltration or exfiltration rates are as regulated by the SAWS Utility Service Regulations, dated February 9, 2016 (Proposed Updates dated October 2019), Section 11.3.1 - Determination of Wastewater Flows and include infiltration and inflow for 12.36 acres. Periodic monitoring of manhole exfiltration will be determined by a hydrostatic exfiltration test or manhole vacuum test. Sanitary Sewer lines will be periodically monitored using a low pressure air test in accordance with ASTM C-828, ASTM C-924 or ASTM F-1417. If the quantity of infiltration (if sanitary sewer pipes are installed below groundwater) or exfiltration exceeds the maximum specified amount per TCEQ Design Criteria for Sewerage Systems, Chapter 217.57(a)(2)C, remedial action shall be undertaken in order to reduce the infiltration or exfiltration to an amount within the specified limits. The owner shall retest sanitary sewer facilities to confirm the remedial action was successful.

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 June 3rd, 2022 and December 2nd, 2022. A copy of the approval letter is attached.
 The WPAP application for this development was submitted to the TCEQ on _____, 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

<i>Pipe Diameter(Inches)</i>	<i>Linear Feet (1)</i>	<i>Pipe Material (2)</i>	<i>Specifications (3)</i>

Table 1 - Pipe Description

<i>Pipe Diameter(Inches)</i>	<i>Linear Feet (1)</i>	<i>Pipe Material (2)</i>	<i>Specifications (3)</i>
8	1,211.93	PVC SDR-26	ASTM D-3034, 3212 (PS-115)
8	20.00	PVC SDR-26	ASTM D-2241, 3139 (PS-115/CLASS 160)

Total Linear Feet: 1,231.93

- (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 Steven M. Clouse (name) Treatment Plant. The treatment facility is:

- Existing
- Proposed

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

- The City of San Antonio 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

<i>Line</i>	<i>Shown on Sheet</i>	<i>Station</i>	<i>Manhole or Clean-out?</i>
G-1	8 Of 9	1+00	MH
G-2	8 Of 9	3+03.52	MH
H-1	8 Of 9	1+98.23	MH
H-2	8 Of 9	2+87.96	MH
H-3	8 Of 9	4+69.12	MH
L-1	8E Of 9	1+69.51	MH
L-2	8E Of 9	6+69.51	MH
	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'.

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

<i>Line</i>	<i>Sheet</i>	<i>Station</i>
	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

<i>Line</i>	<i>Sheet</i>	<i>Station</i>
	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

<i>Line</i>	<i>Station or Closest Point</i>	<i>Crossing or Parallel</i>	<i>Horizontal Separation Distance</i>	<i>Vertical Separation Distance</i>
H	1+79.19	Crossing	0'	9.91'

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

<i>Line</i>	<i>Manhole</i>	<i>Station</i>	<i>Sheet</i>

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

<i>Line</i>	<i>Manhole</i>	<i>Station</i>	<i>Sheet</i>

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

<i>Line</i>	<i>Profile Sheet</i>	<i>Station to Station</i>	<i>FPS</i>	<i>% Slope</i>	<i>Erosion/Shock Protection</i>

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

<i>Standard Details</i>	<i>Shown on Sheet</i>
Lateral stub-out marking [Required]	9 of 9
Manhole, showing inverts comply with 30 TAC §217.55(l)(2) [Required]	9 of 9

Standard Details	Shown on Sheet
Alternate method of joining lateral to existing SCS line for potential future connections [Required]	9 of 9
Typical trench cross-sections [Required]	9 of 9
Bolted manholes [Required]	9 of 9
Sewer Service lateral standard details [Required]	9 of 9
Clean-out at end of line [Required, if used]	N/A of
Baffles or concrete encasement for shock/erosion protection [Required, if flow velocity of any section of pipe >10 fps]	N/A of
Detail showing Wastewater Line/Water Line Crossing [Required, if crossings are proposed]	9 of 9
Mandrel detail or specifications showing compliance with 30 TAC §217.57(b) and (c) [Required, if Flexible Pipe is used]	9 of 9
Drop manholes [Required, if a pipe entering a manhole is more than 24 inches above manhole invert]	N/A of

36. All organized sewage collection system general construction notes (TCEQ-0596) are included on the construction plans for this sewage collection system.
37. All proposed sewer lines will be sufficiently surveyed/staked to allow an assessment prior to TCEQ executive director approval. If the alignments of the proposed sewer lines are not walkable on that date, the application will be deemed incomplete and returned.
- Survey staking was completed on this date: _____
38. Submit one (1) original and one (1) copy of the application, plus additional copies as needed for each affected incorporated city, groundwater conservation district, and county in which the project will be located. The TCEQ will distribute the additional copies to these jurisdictions. The copies must be submitted to the appropriate regional office.
39. Any modification of this SCS application will require TCEQ approval, prior to construction, and may require submission of a revised application, with appropriate fees.

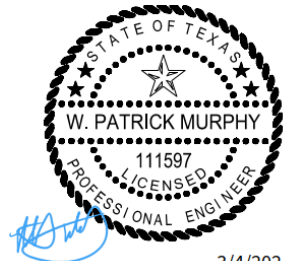
Signature

To the best of my knowledge, the responses to this form accurately reflect all information requested concerning the proposed regulated activities and methods to protect the Edwards Aquifer. This **Organized Sewage Collection System Application** is hereby submitted for TCEQ review and executive director approval. The system was designed in accordance with the requirements of 30 TAC §213.5(c) and 30 TAC §217 and prepared by:

Print Name of Licensed Professional Engineer: W. Patrick Murphy

Date: 02/07/2024

Place engineer's seal here:



3/4/2024

TBPE FIRM #0455

Signature of Licensed Professional Engineer:

03/04/2024

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

<i>Pipe Diameter(Inches)</i>	<i>% Slope required for minimum flow velocity of 2.0 fps</i>	<i>% Slope which produces flow velocity of 10.0 fps</i>
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

<i>Pipe Diameter(Inches)</i>	<i>% Slope required for minimum flow velocity of 2.0 fps</i>	<i>% Slope which produces flow velocity of 10.0 fps</i>
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

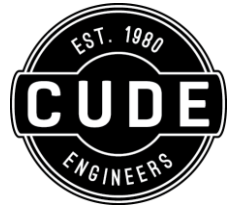
Where:

v = velocity (ft/sec)

*n = Manning's roughness coefficient
(0.013)*

R_h = hydraulic radius (ft)

S = slope (ft/ft)



ATTACHMENT A
SCS Engineering Design Report

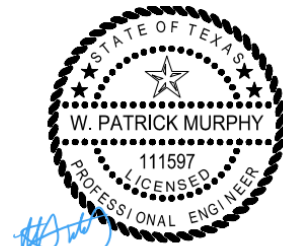
TCEQ Engineering Design Report - 8" Sanitary Sewer Main

For

Hidden Canyon Subdivision, Unit 2A P.U.D. Organized Sewage Collection System

March 2024

Prepared By:
Cude Engineers, LLC
4122 Pond Hill Road, suite 101
San Antonio, Texas 78231
TBPE Registration Number: 455
TBPLS Registration Number: 10048500



3/4/2024

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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 greater than 115 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)	Calc I.D. (in)	Thickness (in)
4	4.215	3.891	0.162
6	6.275	5.793	0.241
8	8.400	7.754	0.323
10	10.500	9.692	0.404
12	12.500	11.538	0.481
15	15.300	14.124	0.588

“This project is proposed the use of flexible pipe materials that will have a minimum structural life of 50 years. This report includes all the calculations and information pertinent to the determination of an adequate structural design of the sewer main. Issues such as odor control and corrosion potential also have been addressed. Due to the PVC material, there will not be a corrosion potential or odor control problem. The proposed pipe is ASTM D3034 and ASTM D2241, which is manufactured from compounds conforming to cell class 12454B in accordance with ASTM-D1784 according to the Northern Pipe Products attachment. Based on this cell class for the material, the PVC pipe will have a tensile strength of 7000 psi and a Modulus of elasticity in tension of 400,000 psi. These values are used later in the equations below. In the future, connections to the main will be recommended that vented manholes be installed to allow for the release of gases prior to the buildup.”

PROPOSED TYPE OF PIPE

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-3212
Cell Classification:	12454
Minimum Tensile Strength (psi):	7,000
Minimum Modulus of Elasticity (psi):	400,000
Calculated Inner Diameter (in) = (Outer Diameter - 2t)	7.754
Outer Diameter (inch):	8.400
Wall Thickness (inch):	0.323
Mean Pipe Diameter (in) = (Outer Diameter - Thickness)	8.077
Approximate Trenching Width (feet):	2.70

Minimum Pipe Depth (Cover) used (feet): **4.63**

Maximum Pipe Depth (Cover) used (feet): **15.04**

FLOW/CAPACITY ANALYSIS

Proposed Waste Water Usage: **18,816.00 GPD**

Q_{max} (As determined in Attachment A) = 0.029 CFS

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

A = Cross-Sectional Area, (ft²) = 0.328

S = Slope, decimal, minimum used = 0.004

R_h = hydraulic radius = 0.162

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

$$Q_{full} = 0.703 \text{ CFS}$$

$$0.029 < 0.703$$

Design meets TCEQ Guidelines

MINIMUM AND MAXIMUM GRADES FOR PIPES (30 TAC §217.53(1)(2)(A))

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:

So, using 8.00 inch PVC Pipe:

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

- V = velocity (ft/sec) = (solve)
- n = Manning's coefficient = 0.013
- Calc. Inner Diameter (in) = 7.754
- A = Cross-Sectional Area, ft² = 0.328
- Wp = Wetted Perimeter, ft = 2.030
- R_h = hydraulic radius, A/Wp = 0.162
- S = slope (ft/ft) = 0.004

Minimum Slope Used (%): **0.40**

Maximum Slope Used (%): **8.34**

V_{min} = 2.15 ft/sec

V_{max} = 9.81 ft/sec

2.15 > **2.00** ft/sec

9.81 < **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 _s) 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 = 2000 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 manufactured 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 manufactured, 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:

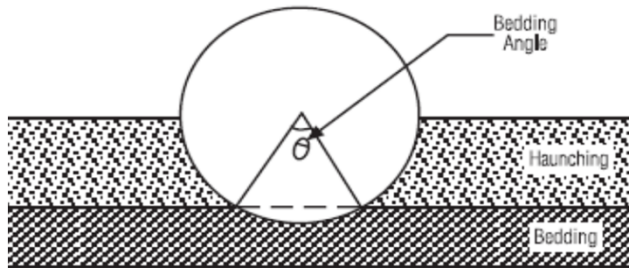
Per TCEQ guidelines, a contractor is allowed to use ASTM D 2321 Bedding Class 1A, 1B, II, or III at no less than 85% percent compaction. To grant the contractor its ability to make the proper judgment of which bedding class to use, the calculations provided in this Engineering Design Report reflect the use of **Bedding Class III, at >95% compaction**, with an E' value of 2000 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, >95% Compaction,

$$E_b = 2000 \text{ psi}$$

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.

Height of Cover (ft)	Soil Unit Weight (lb/ft ³)				
	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.

At maximum burial depth of 15.04 feet, prism load = **13.33** psi

BUCKLING PRESSURE (ALLOWABLE)

Where:	q_a	=	Allowable buckling pressure (psi)	
	h	=	Height of soil above top of pipe (in) =	180.48 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 (in)	$D = 8.077$ in

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:

$$B' = \frac{4(h^2 + Dh)}{1.5(2h + D)^2} \qquad I = \left(\frac{t^3}{12}\right) = \left(\frac{\text{inches}^3}{\text{in}_{\text{linear}}}\right) =$$

$$B' = \frac{136123}{204282} = 0.666 \qquad I = \frac{0.0337}{12} = 0.0028$$

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:

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

$$R_w = 1 - 0.33(h_w / h)$$

$$q_a = \frac{1}{2.5} \sqrt{\left[32 \right] \left[1 \right] \left[0.666 \right] \left[2000 \right] \left[400000 \frac{0.0028}{526.93} \right]}$$

$$q_a = 120.61 \quad \text{psi}$$

BUCKLING PRESSURE (INSTALLED CONDITION)

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	
	hw	=	Height of Groundwater above pipe, typically = 0	
	D	=	Mean Pipe Diameter (in)	D = 8.077 in
	t	=	Pipe Wall Thickness (in)	t = 0.323 in

The Vertical Soil Load can be calculated using Equation 6.6 of Uni-Bell's Handbook of PVC Pipe , Ch VI Superimposed Loads on Buried Pipe, Pg 183

$$W_c = H \times \gamma_s \times (D + t)$$

Where: $\gamma_s = 120$ Value taken from: **Geotechnical Report**

$$W_c = \left[15.04 \right] \left[12 \text{ in/ft} \right] \left[120.00 \right] \left[\frac{1 \text{ ft}^3}{1728 \text{ in}^3} \right] \left[8.40 \right]$$

$$W_c = 105.28 \text{ lb/in}$$

At Max Pipe Depth (H) of 15.04 ft

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, since hw = 0, the Water Buoyancy Factor (R_w) = 1) is calculated to be:

$$q_p = \gamma_w h_w + R_w \left(\frac{W_c}{D} \right) + L_L \text{ and } L_L = 1.22 \quad R_w = 1 - 0.33(h_w / h)$$

$$q_p = 0.0361 \times 0 + 1 \times \left[\frac{105.28}{8.077} \right] + 1.22$$

$$q_p = 14.25 \text{ psi}$$

Note: The pressure applied to the pipe 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

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:

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

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 :

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

$$\text{And simplifies to: } 288AP_c = \gamma_s HD$$

Note that the Surface Area of the Pipe Wall, A , is per unit length in inches² per foot, a conversion factor (from feet to inches) of 12 must be applied, therefore,

$$24AP_c = \gamma_s HD$$

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:

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

$$H = 369.14 \text{ feet}$$

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

The Leonhardt's Zeta Factor Equation can be calculated using Equation 7.32 of Uni-Bell's Handbook of PVC Pipe , Ch VII Design of Buried PVC Pipe, Pg 268

Where:	Do	=	Pipe Outer Diameter, in	=	8.400
	B	=	Trench Width, in,	=	32.40 in
	E _b	=	Modulus of soil reaction, bedding material (psi)	=	2000
	E _n	=	Modulus of soil reaction for the in-situ soil (psi)	=	2000

$$zeta = \frac{1.44}{f + [1.44 - f] \times \left[\frac{E_b}{E'_n} \right]}$$

where,

$$f = \frac{\frac{B}{Do} - 1}{1.154 + 0.444 \left[\frac{B}{Do} - 1 \right]}$$

$$f = \frac{2.857143}{2.420571} = 1.18036$$

Substituting f into the zeta equation:

$$zeta = \frac{1.44}{\left[1.180 \right] + \left[0.260 \right] \times \left[1.000 \right]}$$

The Leonhardt Zeta factor is then determined as: **1.000**

PIPE STIFFNESS (Figure: 30 TAC §217.53(k)(3))

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, for SDR-26 PVC (psi) = 11. 115 psi
C = Conversion factor = 0.8
RSC = Ring Stiffness Constant
D = Mean Pipe Diameter (in), D = 8.077 in

The RSC can be supplied by the manufacturer or calculated by rearranging Equation B.1

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

$$RSC = \frac{115}{0.825752}$$

$$RSC = 139.267$$

PREDICTED PIPE DEFLECTION

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:	% $\Delta Y/D$	=	Predicted % vertical deflection under load
	P	=	Prism Load, psi
	K	=	Bedding angle constant, Assumed to = 0.096
	W'	=	Live Load, psi, = 1.22 At max depth (ft) : 15.04
	DR	=	Dimension Ratio= 26
	E	=	Modulus of tensile elasticity of the pipe material, psi
	E'	=	Modulus of Soil Reaction (zeta x Eb) = 2000.00
	D _L	=	Deflection Lag Factor = 1.5

And using the Modified Iowa Equation:

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

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

and/or from previous chart, prism load = 13.33 psi

The Predicted Deflection is determined as:

$$(\%) \frac{\Delta Y}{D} = \frac{[[[1.5 \times 1.280] + 0.11712] \times 100}{\left[\frac{800000}{46875} \right] + [0.061 \times 2000.00]} = 1.46 \%$$

NOTE: 1.46 < 5%, therefore pipe design is acceptable

A deflection lag factor of 1.0 is typical for new pipes. Over the life of the pipe, the pipe will tend to deflect. Therefore, 1.5 is a conservative factor for the 50 year life.

PIPE STRAIN

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:	ϵ_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) = 0.323
	D	=	Pipe Diameter, Outer (in) = 8.400

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

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

$$\epsilon_h = \frac{[1.22 + 13.33] \times 8.400}{2 \times 0.323 \times 400,000} = 4.730E-04 \frac{\text{in}}{\text{in}}$$

(Continued on following page)

Where:	ϵ_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) = 0.323
	D	=	Pipe Diameter, Outer (in) = 8.400
	DR	=	Dimension Ratio, PVC Pipe = 26

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

$$\epsilon_f = \frac{0.323}{8.400} \times \frac{610.992}{8.400 - 407.328} = -0.05889 \frac{\text{in}}{\text{in}}$$

$$\epsilon_{total} = -0.0584 \frac{\text{in}}{\text{in}}$$

TCEQ PIPE BEDDING AND TRENCHING REQUIREMENTS (30 TAC 217.54)

****These notes are provided in the Construction Documents on Plan Sheet C38****

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.

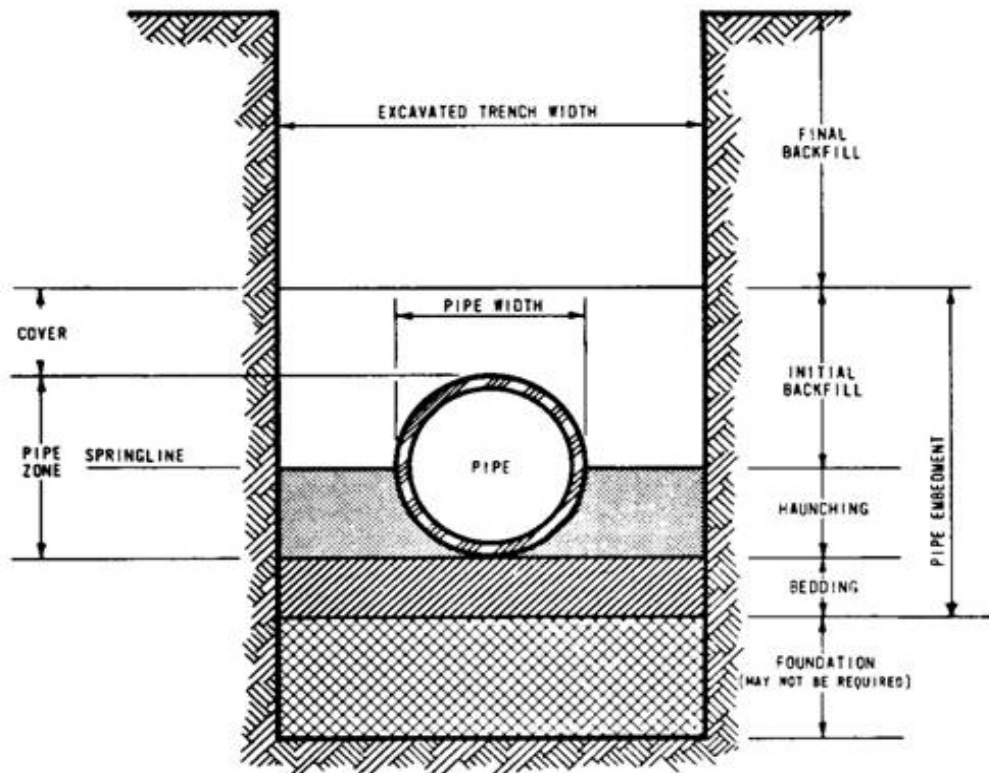
c. Envelope Size.

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 [Sheet C40](#).

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. **(Self explanatory, the SCS line will not be extended therefore no stub-outs)**
- 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. **(Self explanatory, see item a above)**
- 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. **(Manholes are spaced no greater than 500 L.F. per San Antonio Water Systems specifications)**

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 per SAWS Specifications and Notes on Sheet C40)**
 - B. A manhole located within a 100-year flood plain must have a means of preventing inflow. **(Self explanatory but not applicable for this project)**
 - 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 SAWS Details Sheet C40)**
 - 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 SAWS Details Sheet C40)**
 - 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, but not applicable for this project).**
- 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, but not applicable for this project.)**
- H. A wastewater collection system pipe entering a manhole more than 24 inches above an invert must have a drop pipe. **(Self Explanatory, but not applicable for this project.)**
- m. The inclusion of steps in a manhole is prohibited. **(Self Explanatory, steps are not included in SAWS 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 SAWS Details Sheet C40 and General Notes)**
- 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)**
 - 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)**

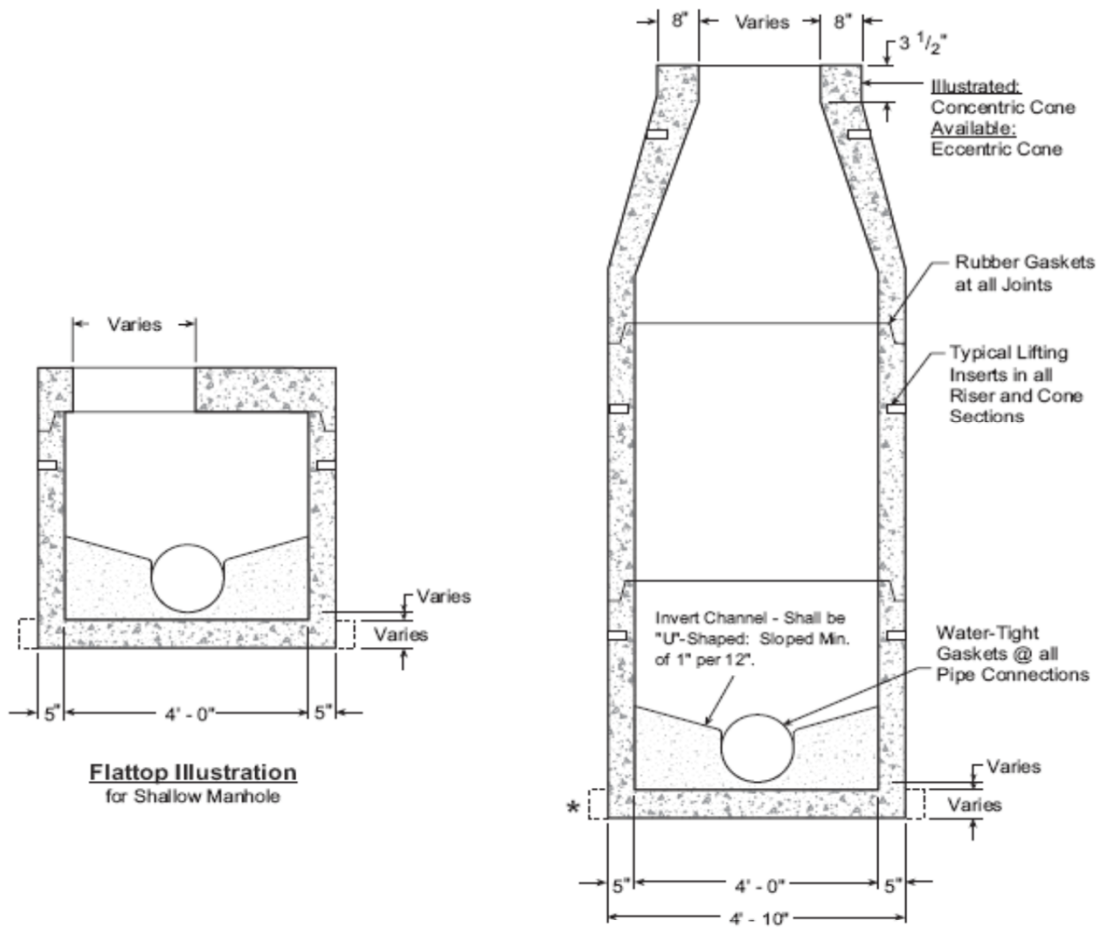
Precast Manhole Information:

Hanson Pipe and Precast

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.

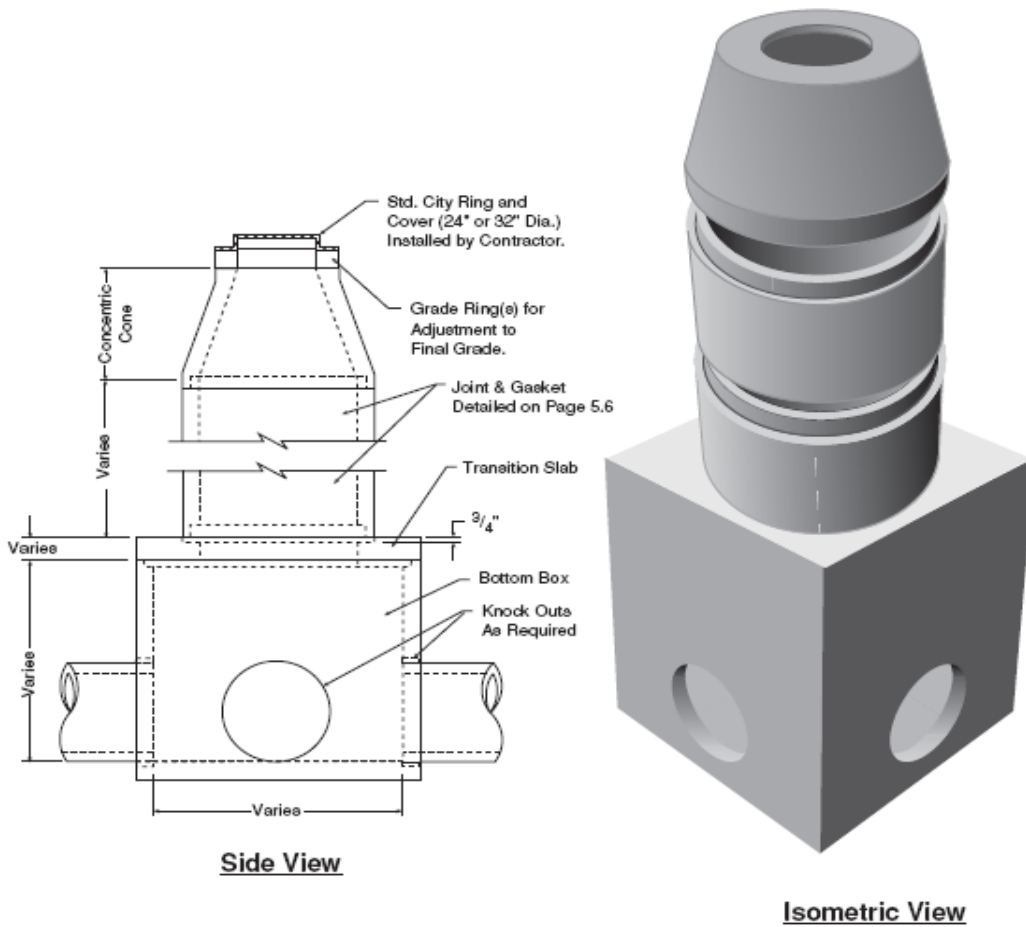
In the event a boot is loose contact your Hanson representative to resolve.

"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	

Precast Manholes



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

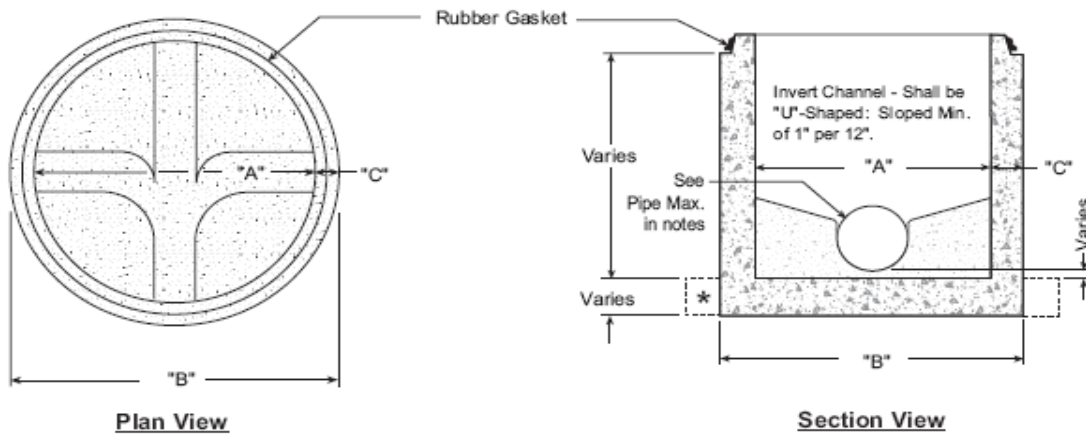
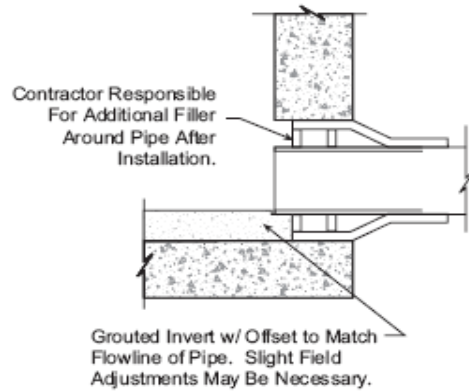
In the event a boot is loose contact your Hanson representative to resolve.

-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	

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.



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.

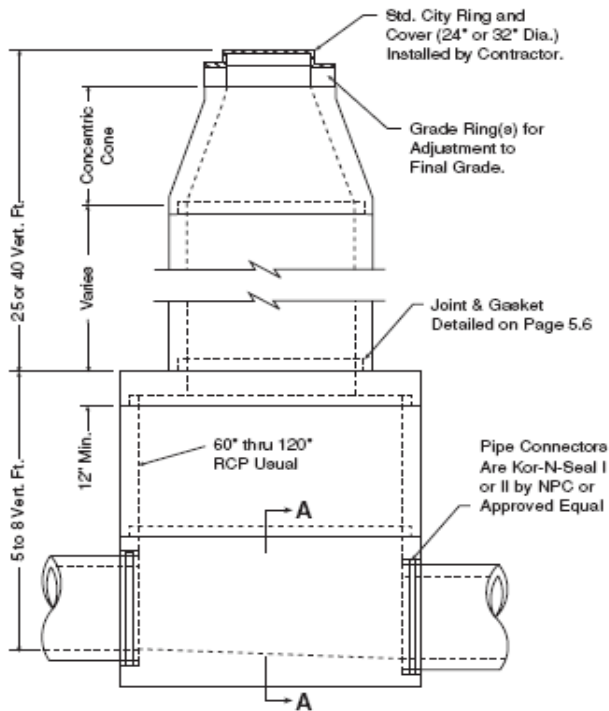
In the event a boot is loose contact your Hanson representative to resolve.

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"

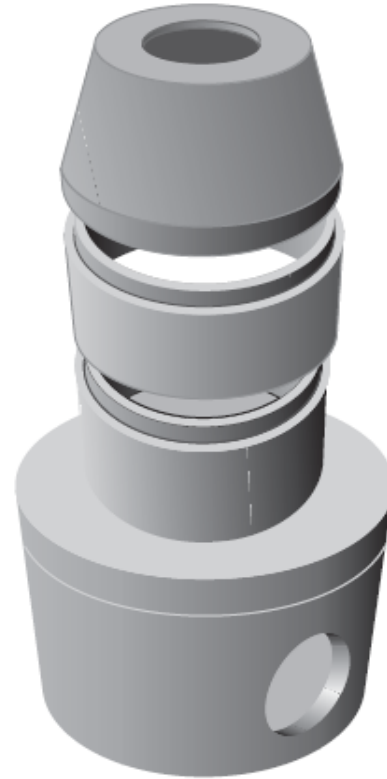
-No Scale-
All dimensions subject to allowable specification tolerances.

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

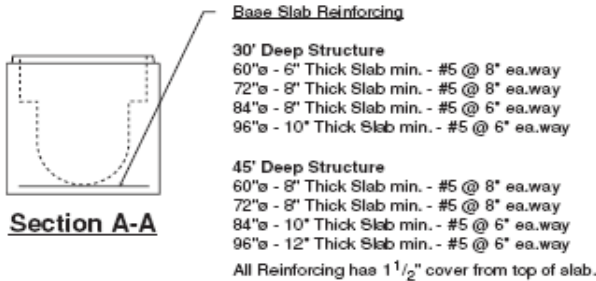
Precast Manholes



w/ Precast Base



Isometric View



Section A-A

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	

ATTACHMENT A
PROJECT DESCRIPTION / SEWAGE CALCULATIONS

**Engineering Report
ATTACHMENT A
WASTEWATER/SEWAGE CALCULATIONS**

TYPE OF DEVELOPMENT	ACRES	EDUs REQUIRED
SINGLE FAMILY RESIDENTIAL	29.07	52
TOTALS	29.07	52

Design and Flow Calculations:

Existing Condition Shed for 10" at Point #3

Total number of EDU's carried in 8" main = 770 EDUs

Average Flow (gal/day): 770 EDUs * 200 gal/day (Per EDU) = 154,000 gal/day

Peak Dry Weather Flow (gal/day): 2.5 (Peaking Factor) * 154,000 gal/day = 385,000 gpd

Peak Flow (gpm): 385,000 gal/day / 1440 min/day = 267.36 gal/min

Infiltration / Inflow (based on 273.14 acres of contributing drainage shed @ 600 gallons/day/acre):

163,884 gallons/day / 1440 min/day = 113.81 gpm

Total anticipated flow = 381.17 gpm

*Full flow capacity (10" PVC pipe SDR-26 @ 0.54% min slope I.D. 9.874") = 722.60 gpm

SAWS 90% Full Flow Capacity (10" PVC pipe SDR-26 @ 0.54% min slope I.D. 9.874") = 722.60 gpm * 0.90 = 650.34 gpm

Sewer line total flow (381.17 gpm) > Full flow capacity 10" PVC pipe SDR-26 (650.34 gpm)

Proposed Condition Shed for 10" at Point #3

Total number of EDU's carried in 10" main = 822 EDUs

Average Flow (gal/day): 822 EDUs * 200 gal/day (Per EDU) = 164,400 gal/day

Peak Dry Weather Flow (gal/day): 2.5 (Peaking Factor) * 164,400 gal/day = 411,000 gpd

Peak Flow (gpm): 411,000 gal/day / 1440 min/day = 285.42 gpm

Infiltration / Inflow (based on 273.14 acres of contributing drainage shed @ 600 gallons/day/acre):

163,884 gallons/day / 1440 min/day = 113.81 gpm

Total anticipated flow = 399.23 gpm

*Full flow capacity (10" PVC pipe SDR-26 @ 0.54% min slope I.D. 9.874") = 722.60 gpm

SAWS 90% Full Flow Capacity (10" PVC pipe SDR-26 @ 0.54% min slope I.D. 9.874") = 722.60 gpm * 0.90 = 650.34 gpm

Sewer line total flow (399.23 gpm) > Full flow capacity 10" PVC pipe SDR-26 (650.34 gpm)

Ultimate Condition Shed for 10" at Point #3

Total number of EDU's carried in 10" main = 845 EDUs

Average Flow (gal/day): 845 EDUs * 200 gal/day (Per EDU) = 169,000 gal/day

Peak Dry Weather Flow (gal/day): 2.5 (Peaking Factor) * 169,000 gal/day = 422,500 gpd

Peak Flow (gpm): 422,500 gal/day / 1440 min/day = 293.40 gpm

Infiltration / Inflow (based on 273.14 acres of contributing drainage shed @ 600 gallons/day/acre):

163,884 gallons/day / 1440 min/day = 113.81 gpm

Total anticipated flow = 407.21 gpm

*Full flow capacity (10" PVC pipe SDR-26 @ 0.54% min slope I.D. 9.874") = 722.60 gpm
SAWS 90% Full Flow Capacity (10" PVC pipe SDR-26 @ 0.54% min slope I.D. 9.874") = 722.60 gpm * 0.90 = 650.34 gpm

Sewer line total flow (407.21 gpm) > Full flow capacity 10" PVC pipe SDR-26 (650.34 gpm)

Existing Condition Shed for 10" at Point #2

Total number of EDU's carried in 8" main = 1068 EDUs
Average Flow (gal/day): 1068 EDUs * 200 gal/day (Per EDU) = 213,600 gal/day
Peak Dry Weather Flow (gal/day): 2.5 (Peaking Factor) * 213,600 gal/day = 534,000 gpd
Peak Flow (gpm): 534,000 gal/day / 1440 min/day = 370.83 gal/min
Infiltration / Inflow (based on 409.98 acres of contributing drainage shed @ 600 gallons/day/acre):
245,988 gallons/day / 1440 min/day = 170.83 gpm
Total anticipated flow = 541.66 gpm

*Full flow capacity (10" PVC pipe SDR-26 @ 0.50% min slope I.D. 9.874") = 695.32 gpm
SAWS 90% Full Flow Capacity (10" PVC pipe SDR-26 @ 0.50% min slope I.D. 9.874") = 695.32 gpm * 0.90 = 625.79 gpm

Sewer line total flow (541.66 gpm) > Full flow capacity 10" PVC pipe SDR-26 (625.79 gpm)

Proposed Condition Shed for 10" at Point #2

Total number of EDU's carried in 10" main = 1120 EDUs
Average Flow (gal/day): 1120 EDUs * 200 gal/day (Per EDU) = 224,000 gal/day
Peak Dry Weather Flow (gal/day): 2.5 (Peaking Factor) * 224,000 gal/day = 560,000 gpd
Peak Flow (gpm): 560,000 gal/day / 1440 min/day = 388.89 gpm
Infiltration / Inflow (based on 409.98 acres of contributing drainage shed @ 600 gallons/day/acre):
245,988 gallons/day / 1440 min/day = 170.83 gpm
Total anticipated flow = 559.72 gpm

*Full flow capacity (10" PVC pipe SDR-26 @ 0.50% min slope I.D. 9.874") = 695.32 gpm
SAWS 90% Full Flow Capacity (10" PVC pipe SDR-26 @ 0.50% min slope I.D. 9.874") = 695.32 gpm * 0.90 = 625.79 gpm

Sewer line total flow (559.72 gpm) > Full flow capacity 10" PVC pipe SDR-26 (625.79 gpm)

Ultimate Condition Shed for 10" at Point #2

Total number of EDU's carried in 10" main = 1158 EDUs
Average Flow (gal/day): 1158 EDUs * 200 gal/day (Per EDU) = 231,600 gal/day
Peak Dry Weather Flow (gal/day): 2.5 (Peaking Factor) * 231,600 gal/day = 579,000 gpd
Peak Flow (gpm): 579,000 gal/day / 1440 min/day = 402.08 gpm
Infiltration / Inflow (based on 409.98 acres of contributing drainage shed @ 600 gallons/day/acre):
245,988 gallons/day / 1440 min/day = 170.83 gpm
Total anticipated flow = 572.91 gpm

*Full flow capacity (10" PVC pipe SDR-26 @ 0.50% min slope I.D. 9.874") = 695.32 gpm

SAWS 90% Full Flow Capacity (10" PVC pipe SDR-26 @ 0.50% min slope I.D. 9.874") = 695.32gpm
* 0.90 = 625.79 gpm

Sewer line total flow (572.91 gpm) > Full flow capacity 10" PVC pipe SDR-26 (625.79 gpm)

Existing Condition Shed for 10" at Point #1

Total number of EDU's carried in 10" main = 1117 EDUs

Average Flow (gal/day): 1117 EDUs * 200 gal/day (Per EDU) = 223,400 gal/day

Peak Dry Weather Flow (gal/day): 2.5 (Peaking Factor) * 223,400 gal/day = 558,500 gpd

Peak Flow (gpm): 558,500 gal/day / 1440 min/day = 387.85 gpm

Infiltration / Inflow (based on 481.49 acres of contributing drainage shed @ 600 gallons/day/acre):
288,894 gallons/day / 1440 min/day = 200.62 gpm

Total anticipated flow = 588.47 gpm

*Full flow capacity (10" PVC pipe SDR-26 @ 0.88% min slope I.D. 9.874") = 922.45 gpm

SAWS 90% Full Flow Capacity (10" PVC pipe SDR-26 @ 0.88% min slope I.D. 9.874") = 922.45
gpm * 0.90 = 830.21 gpm

Sewer line total flow (588.47 gpm) < Full flow capacity 10" PVC pipe SDR-26 (830.21 gpm)

Proposed Condition Shed for 10" at Point #1

Total number of EDU's carried in 10" main = 1169 EDUs

Average Flow (gal/day): 1169 EDUs * 200 gal/day (Per EDU) = 233,800 gal/day

Peak Dry Weather Flow (gal/day): 2.5 (Peaking Factor) * 233,800 gal/day = 584,500 gpd

Peak Flow (gpm): 584,500 gal/day / 1440 min/day = 405.90 gpm

Infiltration / Inflow (based on 481.49 acres of contributing drainage shed @ 600 gallons/day/acre):
288,894 gallons/day / 1440 min/day = 200.62 gpm

Total anticipated flow = 606.52 gpm

*Full flow capacity (10" PVC pipe SDR-26 @ 0.88% min slope I.D. 9.874") = 922.45 gpm

SAWS 90% Full Flow Capacity (10" PVC pipe SDR-26 @ 0.88% min slope I.D. 9.874") = 922.45
gpm * 0.90 = 830.21 gpm

Sewer line total flow (606.52 gpm) < Full flow capacity 10" PVC pipe SDR-26 (830.21 gpm)

Ultimate Condition Shed for 10" at Point #1

Total number of EDU's carried in 10" main = 1207 EDUs

Average Flow (gal/day): 1207 EDUs * 200 gal/day (Per EDU) = 241,400 gal/day

Peak Dry Weather Flow (gal/day): 2.5 (Peaking Factor) * 241,400 gal/day = 603,500 gpd

Peak Flow (gpm): 603,500 gal/day / 1440 min/day = 419.10 gpm

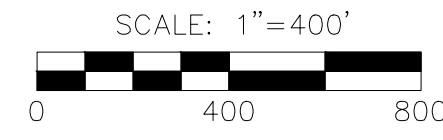
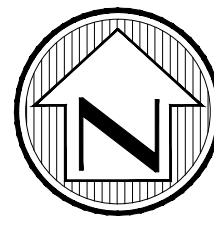
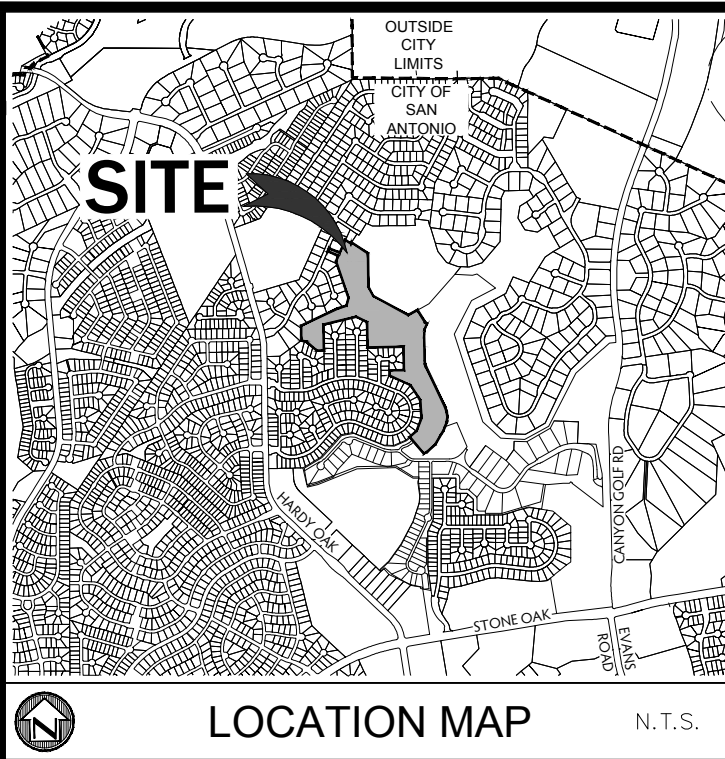
Infiltration / Inflow (based on 481.49 acres of contributing drainage shed @ 600 gallons/day/acre):
288,894 gallons/day / 1440 min/day = 200.62 gpm

Total anticipated flow = 619.72 gpm

*Full flow capacity (10" PVC pipe SDR-26 @ 0.88% min slope I.D. 9.874") = 922.45 gpm

SAWS 90% Full Flow Capacity (10" PVC pipe SDR-26 @ 0.88% min slope I.D. 9.874") = 922.45
gpm * 0.90 = 830.21 gpm

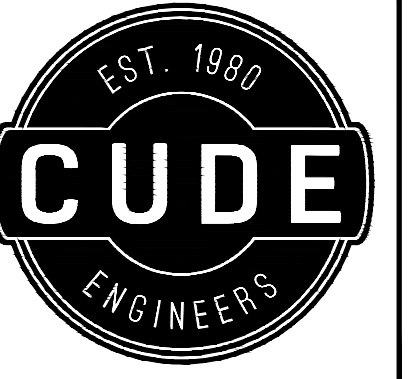
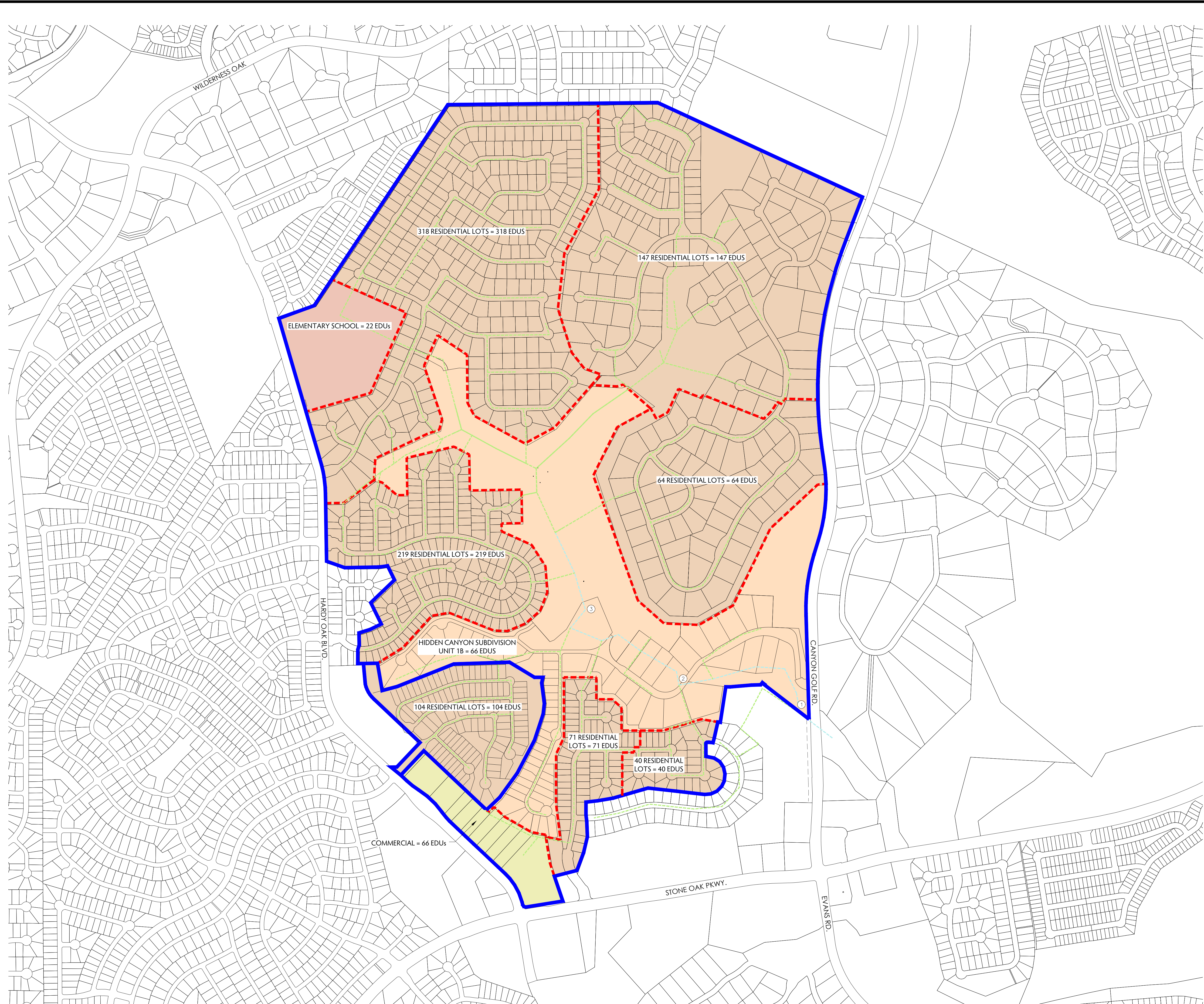
Sewer line total flow (619.72 gpm) < Full flow capacity 10" PVC pipe SDR-26 (830.21 gpm)



SEWER SHED ACCUMULATION	TOTAL EDUs
1	1117
2	1068
3	770

LEGEND

- SEWER SHED BOUNDARY
- - - SEWER SUB-SHED BOUNDARY
- - - EXISTING 8" SEWER MAIN
- - - EXISTING 10" SEWER MAIN
- RESIDENTIAL AREAS
- COMMERCIAL AREAS
- SCHOOL AREAS
- HIDDEN CANYON SUBDIVISION
- 1 EDU ACCUMULATION POINT



4122 Pond Hill Road, Suite 101
San Antonio, Texas 78231
P: (210) 681.2951 F: (210) 523.7112

HIDDEN CANYON PHASE 2A

**EXISTING CONDITIONS
SANITARY SEWER SHED ANALYSIS**

DATE
08/16/2022

PROJECT NO.
P01564.004

DRAWN BY
M.R.H.

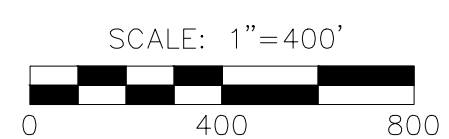
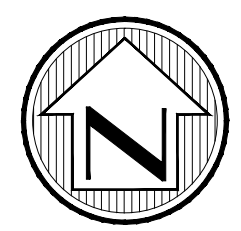
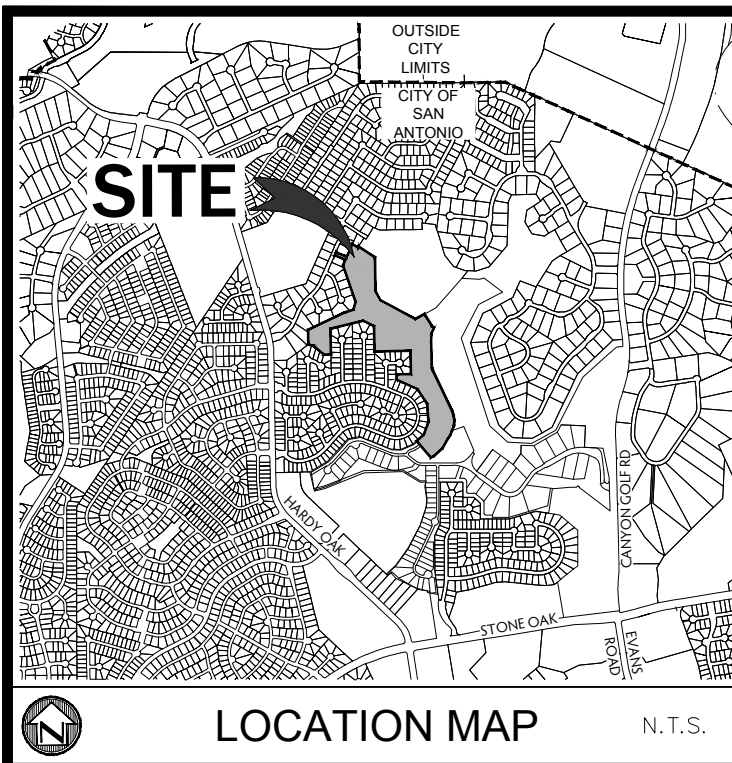
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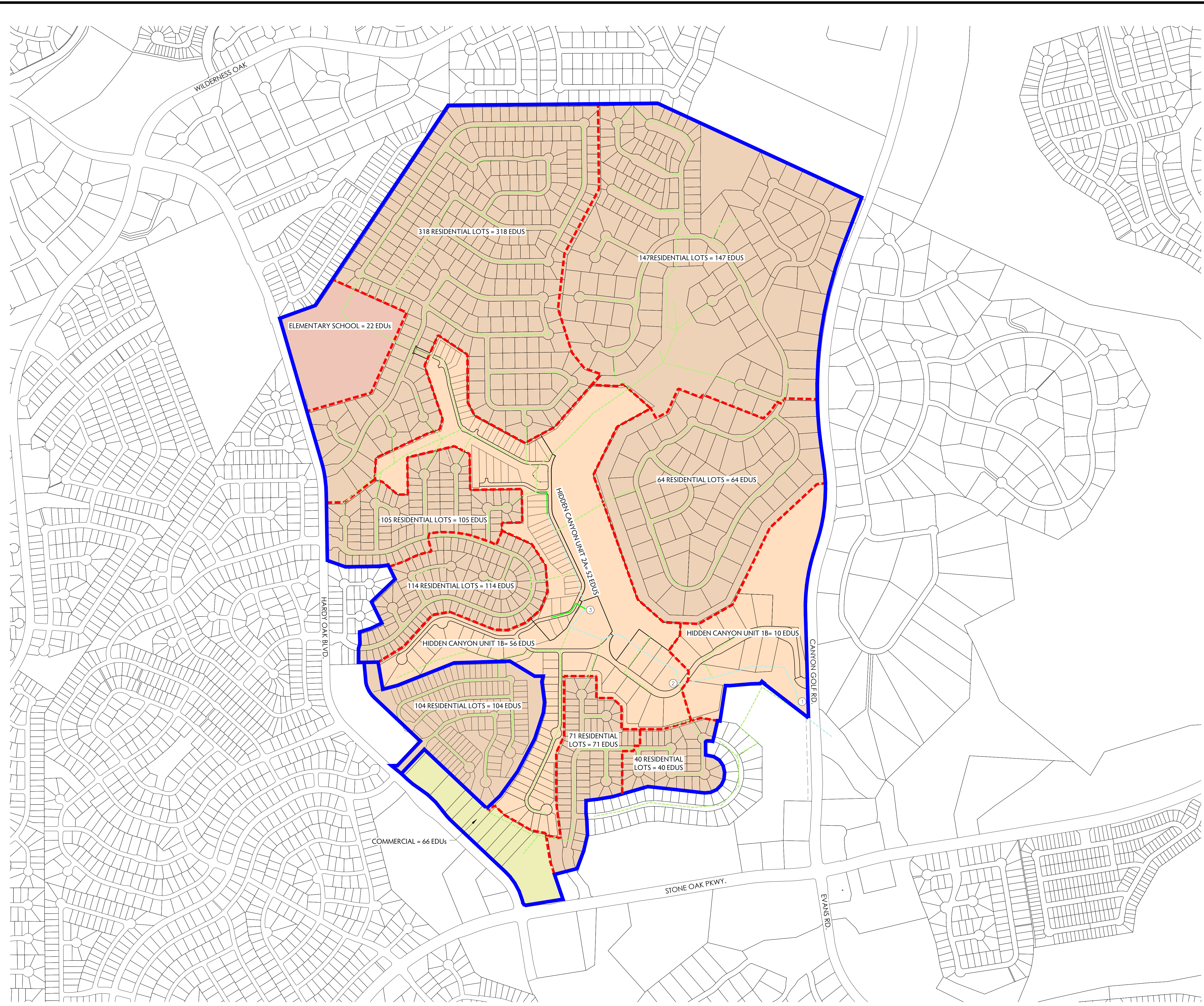
CUDE ENGINEERS
TBPE No. 455
TBPLS NO. 10048500

E1



SEWER SHED ACCUMULATION	TOTAL EDUs
1	1169
2	1120
3	822

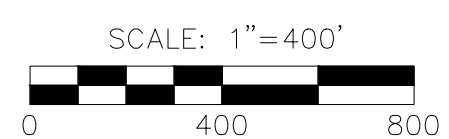
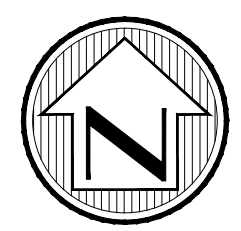
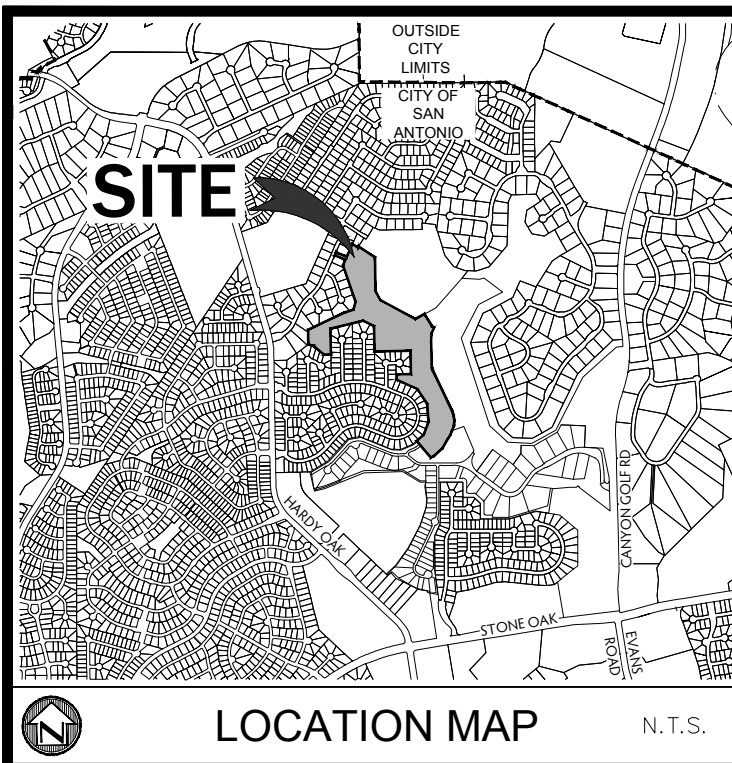
- LEGEND**
- SEWER SHED BOUNDARY
 - - - SEWER SUB-SHED BOUNDARY
 - - - ACCUMULATION POINT SHED
 - - - EXISTING 8" SEWER MAIN
 - PROPOSED 8" SEWER MAIN
 - - - EXISTING 10" SEWER MAIN
 - PROPOSED 10" SEWER MAIN
 - RESIDENTIAL AREAS
 - COMMERCIAL AREAS
 - SCHOOL AREAS
 - HIDDEN CANYON SUBDIVISION
 - 1 EDU ACCUMULATION POINT



DATE	08/16/2022
PROJECT NO.	P01564.004
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CHECKED BY	W.P.M.

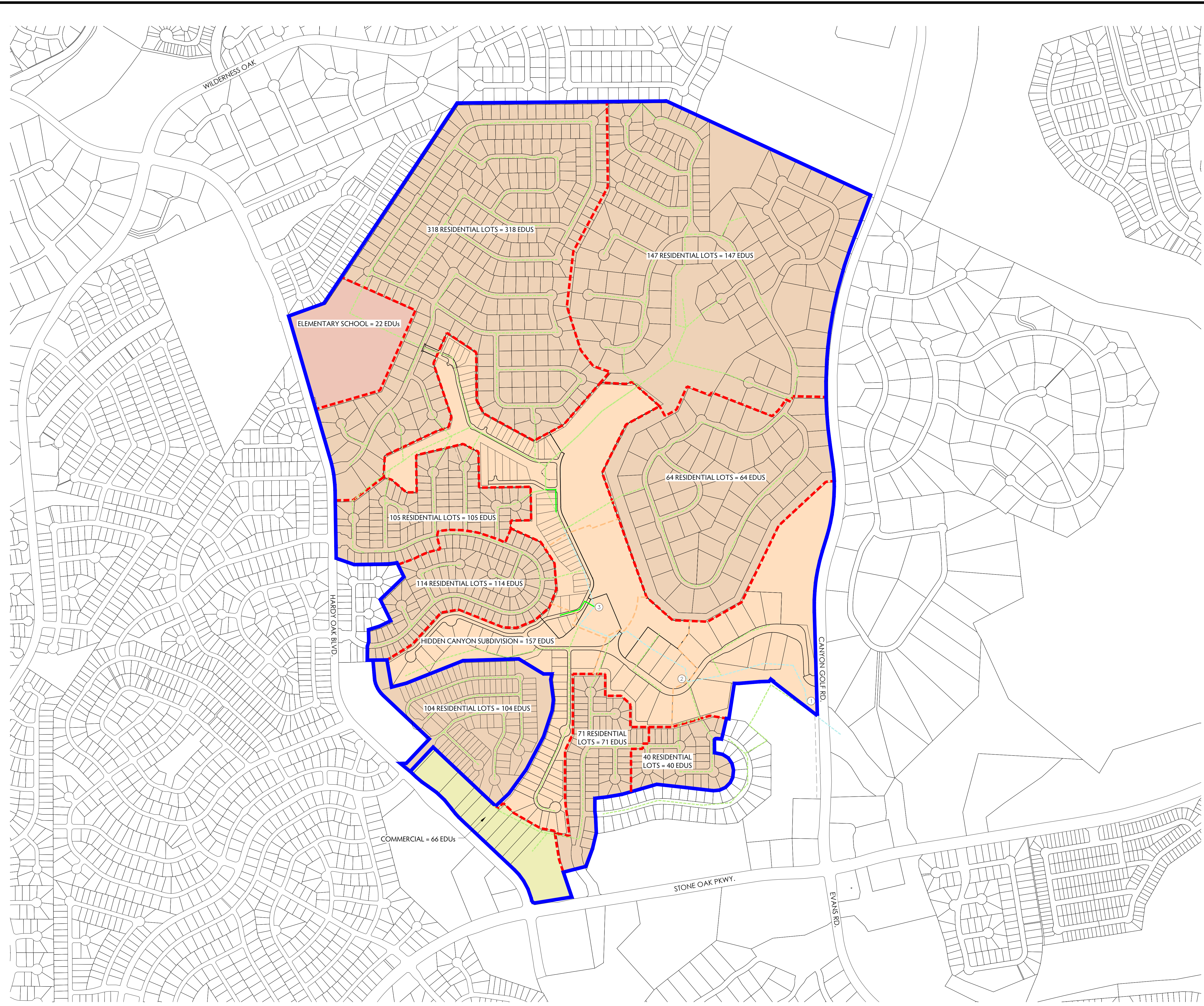
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REPRODUCTION OF THE ORIGINAL SIGNED AND SEALED PLAN AND/OR ELECTRONIC MEDIA MAY HAVE BEEN INADVERTENTLY ALTERED. CONTRACTOR IS RESPONSIBLE FOR VERIFYING THE SCALE OF THE DOCUMENT AND CONTACTING CUDE ENGINEERS TO VERIFY DISCREPANCIES PRIOR TO CONSTRUCTION.



SEWER SHED ACCUMULATION	TOTAL EDUs
1	1207
2	1158
3	845

- LEGEND**
- SEWER SHED BOUNDARY
 - - - SEWER SUB-SHED BOUNDARY
 - - - ACCUMULATION POINT SHED
 - EXISTING 8" SEWER MAIN
 - PROPOSED 8" SEWER MAIN
 - EXISTING 10" SEWER MAIN
 - PROPOSED 10" SEWER MAIN
 - RESIDENTIAL AREAS
 - COMMERCIAL AREAS
 - SCHOOL AREAS
 - HIDDEN CANYON SUBDIVISION
 - ① EDU ACCUMULATION POINT



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HIDDEN CANYON PHASE 2A

ULTIMATE CONDITIONS
SANITARY SEWER SHED ANALYSIS

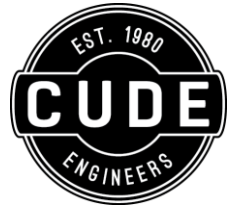
DATE	08/16/2022
PROJECT NO.	P01564.004
DRAWN BY	M.R.H.
CHECKED BY	W.P.M.

REVISIONS

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CUDE ENGINEERS
TBPE No. 455
TBPLS No. 10048500

REPRODUCTION OF THE ORIGINAL SIGNED AND SEALED PLAN AND/OR ELECTRONIC MEDIA MAY HAVE BEEN INADVERTENTLY ALTERED. CONTRACTOR IS RESPONSIBLE FOR VERIFYING THE SCALE OF THE DOCUMENT AND CONTACTING CUDE ENGINEERS TO VERIFY DISCREPANCIES PRIOR TO CONSTRUCTION.



Engineering Design Report - Supplement

Based on capacity analysis of the proposed sewer infrastructure we do not anticipate a capacity issue. Capacity of this system has been reviewed by San Antonio Water System at the time of sewer contract. These construction plans as well as engineering design report have been submitted to SAWS for their review and approval regarding compliance with the items outlined in the existing sewer contract. It is not anticipated that odor control will be necessary based on the quantity of sewage flows generated, the maximum line size being 8", the average slope of these sewer mains and that the manholes are required to be watertight. SAWS standards for providing odor control measures on lateral connections begin for main size exceeding 21 inches.

ATTACHMENT B
UTILITY SERVICE AGREEMENT

UTILITY SERVICE AGREEMENT

STATE OF TEXAS §
 §
COUNTY OF BEXAR §

This Utility Service Agreement (“Agreement”) is entered into by and between the San Antonio Water System Board (“SAWS”) and Stone Oak Hidden Canyon, LLC (“Developer”) together the Parties (“Parties”).

Recitals

Whereas, Developer has requested that SAWS provide Water and Wastewater service (the “Services”) to an approximate 67-acre tract of land, (the “Hidden Canyon Subdivision Units 2 & 3 Tract” or “Tract”), which is located inside SAWS water CCN, inside SAWS wastewater CCN, and does not require SAWS’ financial participation in the development of infrastructure through oversizing or impact fee credits, therefore, Board action is not required; and

Whereas, the Tract is located over the Edwards Aquifer Recharge or Contributing Zone, which is located within the 5-mile Awareness Zone of Camp Bullis, such Tract being more particularly described in Attachment VI hereto, as accepted by SAWS; and

Whereas, SAWS desires to provide the Services to the Developer pursuant to this Agreement, the SAWS Utility Service Regulations, and all applicable local, state, and federal regulations, as amended.

Now Therefore, The Parties Hereto Agree To The Following Terms and Conditions:

1.00 Interpretation of Agreement.

1.01 The Parties acknowledge that the Services contemplated by this Agreement shall be provided in accordance with the SAWS Utility Service Regulations, Design Criteria, Schedules, Attachments and Instruments thereto, as amended (together “USR”). In the event the specific terms of this Agreement are in conflict with the USR, the specific terms of this Agreement shall apply. The above notwithstanding, for the specific conflicting terms to prevail, the conflict must be expressly noted in the Agreement. The Parties further acknowledge that this Agreement is subject to future acts of the City Council of the City of San Antonio with respect to the adoption or amendment of impact fee ordinances/resolutions.

1.02 The Parties agree that the purpose of this Agreement is the reservation of the designated water supply and /or wastewater discharge capacity for the Tract. Any rights that the Developer claims arise under Chapter 245, Texas Local Government Code, that are related to this Agreement shall comply with the Unified Development Code Article IV, Division 1, Chapter 35-410 and applicable requirements in Article VII, Division 2 *Vested Rights*. If Developer intends to rely on this USA as its application for the purposes of vested rights under Chapter 245, then please contact Development Services Department, Land Entitlement team at 210-207-1111 or 1901 S. Alamo,

CHICAGO TITLE GF# 4-3201582303179VEJ

San Antonio, TX. 78204. In no event shall the Utility Service Regulations replace or conflict with the City's Unified Development Code, Article IV, Division 1, Chapter 35-410 and applicable requirements in Article VII, Division 2 *Vested Rights*.

2.00 Obligation Conditioned.

The obligation of SAWS to provide the Services is conditioned upon present rules, regulations and statutes of the United States of America and the State of Texas and any court order that directly affects the SAWS' Regional Water Production and Distribution System and/or Regional Wastewater Transportation and Treatment System and/or the utility infrastructure directly servicing the Tract. Developer acknowledges that if the rules, regulations and statutes of the United States of America and/or the State of Texas that are in effect upon the execution date of this Agreement are repealed, revised or amended to such an extent that SAWS becomes incapable of, or prevented from, providing the Services, then no liability of any nature is to be imposed upon SAWS as a result of SAWS' compliance with such legal or regulatory mandates. SAWS agrees that it will use its best efforts to prevent the enactment of such legal or regulatory mandates.

3.00 Term.

3.01 The term of this Agreement shall be seven (7) years from the Effective Date if the Developer complies with the requirements set out in G.C. 19.00 (attached) within the time period therein stated. This Agreement shall automatically expire if Developer fails to comply with the requirements of G.C. 19.00 within the time period therein provided. The term of this Agreement may be extended to fifteen (15) years from the Effective Date, if Developer complies with the requirements to extend the term set forth in G.C. 19.00 within the time period therein stated. Certain obligations of SAWS (described in Section 3.03 below) may survive the expiration of the term of this Agreement, to the extent that Developer has (i) paid all applicable impact fees for the Services at the then-current rate, and (ii) complied with all On-Site and Off-Site utility infrastructure requirements of this Agreement (described in the Special Conditions), including over-sizing requirements.

3.02 To the extent that SAWS' obligations do not survive the expiration of this Agreement, Developer understands and agrees that a new Utility Service Agreement must be entered into with SAWS to receive the Services for the development project that is the subject of this Agreement.

3.03 To the extent that Developer timely pays all applicable impact fees and complies with all On-Site and Off-Site utility infrastructure requirements prior to the expiration of this Agreement, the following obligations will survive expiration of this Agreement:

- (i) SAWS' recognition of the EDUs referenced as the subject of this agreement as Guaranteed Capacity.
- (ii) SAWS' continued recognition of impact fee credits previously earned by the Developer pursuant to Sections 15.8 and 15.9 of the USR.

- (iii) SAWS' continued provision of the Services to retail customers located in the Tract, so long as such customers pay for the services and comply with the regulations applicable to individual customers.

4.00 Entire Agreement.

The following documents attached hereto and incorporated herein are as fully a part of this Agreement as if herein repeated in full, together with this Agreement, comprise the Agreement in its entirety:

Attachment I:	General Conditions
Attachment II:	Special Conditions
Attachment III:	Description of Proposed Water and/or Wastewater Infrastructure
Attachment IV:	Board Summary & Recommendation and Resolution (if necessary)
Attachment V:	Developer Water and/or Wastewater Master Plan (if necessary)
Attachment VI:	Engineering Study Including Description of the Tract
Attachment VII:	Lift Station & Force Main Supplemental Agreement (if necessary)
Attachment VIII:	Water Recycling and Conservation Plan (if necessary)

Any of the above attachments that are created and submitted by the Developer as an attachment to this USA shall be limited to providing relevant engineering, planning or managing information for the purposes of setting aside or reserving water and/or wastewater service capacity as specified in the body of this USA, the General Conditions and the Special Conditions. Developer agrees that it will not attempt to rely on, and SAWS does not authorize, any of the contents of any attachments created and submitted by the Developer as a basis for claiming rights under Chapter 245 of the Texas Local Government Code, except as specifically required by Section 1.02 of this USA.

Developer understands that this Agreement, including, its General Conditions, Special Conditions and Attachments, is subject to the Texas Public Information Act; and, therefore, agrees that it will not claim that any of the information contained herein is subject to any third party exception under that Act.

5.00 Developer's Obligations.

The Developer acknowledges and agrees that the capacity provided by this Agreement runs with the land and shall be an appurtenance to the Tract. The Developer acknowledges that recordation of this Agreement in the Real Property Records of the County in which the Tract is located within three (3) years of the Effective Date of this Agreement is required; otherwise, this Agreement will automatically terminate. Developer shall record the Agreement and the delivery of a recorded copy to the Director within three (3) years of the Effective date of this Agreement or before any transfer of property or EDUs as specified in G.C. 20.00, whichever is sooner, is required. The Developer shall maintain records of EDU's remaining on the Tract pursuant to the approved Developer Master Plan. Developer shall provide SAWS with such records upon SAWS written request.

6.00 Indemnity.

TO THE EXTENT ALLOWED BY LAW AND TEXAS CONSTITUTION, THE DEVELOPER FURTHER AGREES TO DEFEND, INDEMNIFY AND HOLD HARMLESS SAWS AND ITS SUCCESSOR AND ASSIGNS FROM THE CLAIMS OF THIRD PARTIES ARISING OUT OF SAWS' RECOGNITION OF THE TRANSFER OF CAPACITY UNDER THIS AGREEMENT TO DEVELOPER'S SUBSEQUENT PURCHASERS, SUCCESSORS AND ASSIGNS.

7.00 Notices.

Any notice, request, demand, report, certificate or other instrument which may be required or permitted to be furnished to or served upon the parties shall be deemed sufficiently given or furnished or served if in writing and deposited in the United States mail, registered or certified, return receipt requested, addressed to such party at the address set forth below:

IF TO SAN ANTONIO WATER SYSTEM:

**SAN ANTONIO WATER SYSTEM
POST OFFICE BOX 2449
SAN ANTONIO, TEXAS 78298-2449
ATTN: TRACEY B. LEHMANN, P.E., SENIOR DIRECTOR, DEVELOPMENT ENGINEERING**

IF TO DEVELOPER:

**Stone Oak Hidden Canyon, LLC
6002 Camp Bullis Rd
San Antonio, TX 78257
Attn: Rajeev Puri**

8.00 Severability.

If for any reason any one or more paragraph of this Agreement are held legally invalid, such judgment shall not prejudice, affect impair or invalidate the remaining paragraphs of the Agreement as a whole, but shall be confined to the specific sections, clauses, or paragraphs of this contract held legally invalid.

9.00 Effective Date.

The Effective Date of this Agreement shall be the date signed by the authorized representative of the San Antonio Water System.

10.00 Ownership.

By signing this Agreement the Developer represents and warrants that it is the owner of the Tract or has the authority of the Tract owner to develop the area. Any misrepresentation of authority or ownership by Developer shall make this Agreement voidable by SAWS. If the Developer does not own the Tract, then the Developer must provide documentation from the owner of the Tract to show that Developer has the proper authority to develop the Tract.

ACCEPTED AND AGREED TO IN ALL THINGS:

San Antonio Water System
Signature: [Signature]
Print Name: Robert R. Puente
Title: President/Chief Executive Officer
Date: 11/9/2023

Developer
Signature: [Signature]
Print Name: RAJEEV PURI
Title: MANAGER
Date: 10/24/2023

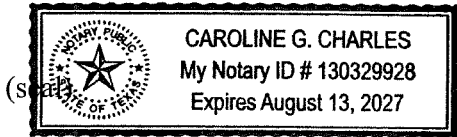
ACKNOWLEDGEMENTS

STATE OF TEXAS, COUNTY OF BEXAR

§

BEFORE ME, the undersigned Notary Public, on this day personally appeared Robert R. Puente known to me to be the person whose name is subscribed to the foregoing instrument and that he has executed the same as President/CEO for the purposes and consideration therein expressed and in the capacity therein stated.

GIVEN UNDER MY HAND AND SEAL OF OFFICE this 9 day of November, 2023.



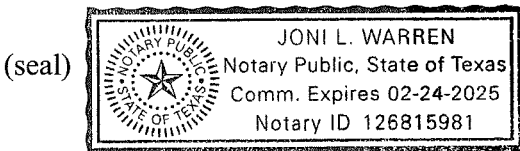
[Signature]
Notary Public

STATE OF TEXAS, COUNTY OF BEXAR

§

BEFORE ME, the undersigned Notary Public, on this day personally appeared RAJEEV PURI known to me to be the person whose name is subscribed to the foregoing instrument and that he has executed the same as MANAGER for the purposes and consideration therein expressed and in the capacity therein stated.

GIVEN UNDER MY HAND AND SEAL OF OFFICE this 24th day of October, 2023.



[Signature]
Notary Public

GENERAL CONDITIONS OF THE UTILITY SERVICE AGREEMENT

G.C.1.00 Definitions.

G.C.1.01 Developer.

Owner of the tract, his subsequent purchasers, successors, and/or assigns.

G.C.1.02 Director of Development Engineering.

The Director of Development Engineering of the San Antonio Water System or his/her designated representative.

G.C. 1.03 Definition of Terms.

Unless defined in the Utility Service Agreement (the "Agreement"), the terms used in this General Conditions of the Utility Service Agreement (the "General Conditions") shall have the same definitions and meaning as those set out in Chapter 2, Definitions, of the Utility Service Regulations ("USR"). In the event a term is specifically defined in the General Conditions, and the definition is in conflict with that found in the USR, and such conflict is acknowledged in the General Conditions, the definition set out in the General Conditions shall apply.

G.C.2.00 Required Submittals.

If determined to be necessary by the Director of Development Engineering ("Director"), the Developer hereby agrees to submit the following documents prior to the execution of the Agreement: Developer Master Plan, Developer Utility Layout, Water Recycling and Conservation Plan, and Engineering Report. The Parties agree that such documents are included instruments to the Agreement. The submittal of such documents is a condition precedent to plat recordation and initiation of Services. Developer shall modify such documents as may be reasonably required by the Director. Such documents shall be updated as required by the Director and the USR.

G.C.3.00 Dedication to SAWS.

The Developer agrees to dedicate, grant, and convey to SAWS all rights, title and interest of Developer in both the Off-Site and On-Site utility infrastructure that the Developer is required to construct under the Special Conditions of the Utility Service Agreement (the "Special Conditions"), and to dedicate, grant, and convey to SAWS easements for such utility infrastructure. Upon written acceptance of Off-Site and On-Site utility infrastructure by SAWS, the infrastructure shall be owned, operated and maintained by SAWS.

G.C.4.00 Design and Construction Requirements.

The design and construction of all Off-Site and On-Site utility infrastructure shall, at a minimum, comply with the requirements established by SAWS, including the USR, the City of San Antonio, the County of Bexar, the State of Texas, and any agency thereof with jurisdiction, including but not limited to the Texas Commission on Environmental Quality and the Texas Department of Health. Off-Site and On-Site utility infrastructure shall be constructed under the inspection of SAWS. Provision of the Services to the Tract shall not commence until the Director has accepted and approved Off-Site and On-Site utility infrastructure in writing.

G.C.5.00 Joint Venture Agreements.

In the event the Developer enters into a Joint Venture Agreement covering the costs for supplying the Services to the Tract, the Developer shall send a copy of such agreement to the attention of the Director.

G.C.6.00 Assignment.

This Agreement may not be assigned in whole or in part; however, Developer may assign, convey or transfer EDU capacity ("EDU capacity transfer") to buyers of portions of the Tract in accordance with the terms in G.C. 20.00.

General Conditions of USA

Preparer's Initials 

USA-34279 Hidden Canyon Subdivision Units 2 & 3

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G.C.7.00 Event of Foreclosure.

In the event Developer's interest in the Tract described in Attachment VI are extinguished by an act of foreclosure, and the foreclosing party has supplied sufficient evidence to SAWS that they are the successor in interest to the Tract as a result of such foreclosure, and that there are no lawsuits pending concerning the Tract, SAWS shall consider the foreclosing party a successor in interest if the foreclosing party executes a utility service agreement with SAWS after the Director determines that the execution of such an agreement will not be adverse to SAWS' interest.

G.C.8.00 Payment for Provision of Utility Service.

In the event payment for the Services provided to a subdivision plat within the Tract is not billed by SAWS, the amount of the monthly fees for the provision of the Services will be those charged to the various customer classifications as set by City Ordinances, with the billing and collection thereof on behalf of SAWS, being the responsibility of the billing utility purveyor. To facilitate this arrangement, Developer is to insert into any utility agreement with whatever utility purveyor is to bill for utility services to a subdivision plat within the Tract, a provision requiring said purveyor to enter into a Contract with SAWS to bill and collect SAWS' monthly utility services fees and transmit said fees to SAWS. The billing utility purveyor shall advise customers that delinquent non-payment of any of SAWS' fees will result in interruption and/or termination of the Services provided by SAWS, in accordance with applicable interruption and termination policies and procedures, as amended. SAWS shall not be obligated to provide the Services to any plat within the Tract unless and until the utility purveyor has executed a contract with SAWS to provide for the billing and collection of the Services provided by SAWS.

G.C.9.00 Enforcement of Industrial Waste Ordinance if Required by SAWS.

The Developer shall cause to be recorded in the Deed and Plat Records of the counties in which the Tract is located, a restrictive covenant covering the entire Tract. This restrictive covenant shall run with the land in the Tract described in Attachment VI. Such covenant shall contain language expressly granting to SAWS the right, should SAWS so elect, to enforce and or otherwise pursue to the extent provided at law or in equity, the provisions of the City's Industrial Waste Ordinance No. 57214, as amended or as may be amended (codified as Chapter 34, Article V, Division 3 of the City Code). SAWS' right shall include, to the extent provided at law or in equity, the right to inspection, sampling and monitoring of the collection system to assure ordinance compliance.

Recordation of the Covenant shall be a condition precedent for SAWS' provision of the Services to any portion of said Tract.

G.C.10.00 Oversizing.

Developer must pay for all mains and other utility facilities needed to serve the Tract. SAWS may require the installation of oversized water mains and wastewater mains and related facilities. SAWS' requirements for oversizing, if any, are set forth in the Special Conditions. SAWS will execute a trilateral contract with Developer and a contractor for the construction of oversized facilities. Contracts for the construction of oversized facilities must be competitively bid as required by law. All oversizing shall be done in accordance with the USR.

G.C.11.00 Off-Site /On-Site Facilities.

Developer shall construct and install all required Off-Site and On-Site utility infrastructure in accordance with the USR and Special Conditions, at no cost to SAWS. Any specific requirements related to the facilities are set forth in the Special Conditions.

G.C.12.00 Impact Fee Payment.

Developer agrees that the Agreement does not constitute an assessment of impact fees. Developer agrees to pay all applicable impact fees at the time and in the amount prescribed by ordinance or resolution of the City Council of the City of San Antonio and the USR, as amended. An estimate of the impact fees for the development Tract is provided in the Special Conditions. The estimate does not constitute an assessment of impact fees, and the amount of impact fees is subject to change by the City Council of the City of San Antonio as provided by law.

G.C.13.00 SAWS' Obligation to Supply Service.

To the extent that Developer pays all applicable impact fees and complies with all Off-Site and On-Site utility infrastructure requirements, Developer shall be entitled to the permanent use and benefit of the Services and is entitled to receive immediate service from any existing facilities with actual capacity to serve the development for which impact fees were paid, subject to compliance with other valid regulations. If, after collecting the impact fees, there is no actual capacity in existing facilities to provide the Services, SAWS will provide the Services within a reasonable period of time not to exceed five (5) years, as prescribed by Chapter 395 of the Local Government Code, as amended. In the event Services are required by Developer earlier than the five (5) year period, Developer and SAWS may agree that Developer may construct or finance the capital improvements or facility expansions required to provide Services, and the costs incurred or funds advanced will be credited against impact fees otherwise due from the new development or reimbursed to Developer from impact fees paid from other new developments that will use such capital improvements or facility expansions, which fees shall be collected and reimbursed to Developer at the time the other new development records it plat.

G.C.14.00 Facility Design and Construction.

The Developer shall design and construct all On-Site and Off-Site utility infrastructure described in the Special Conditions, including any oversizing, in accordance with the USR and all applicable local, state and federal requirements. Developer further recognizes that SAWS' approval in all respects as to facility right-of-way adequacy, location, size, grade and invert elevation is a condition precedent to any further obligation of SAWS. Specific design and construction requirements are set forth in the Special Conditions.

G.C.15.00 Use of Capacity by SAWS.

Developer understands that capacity in Off-Site and On-Site utility infrastructure resulting from the Agreement for the Tract may be utilized by SAWS for other tracts requesting service from SAWS. SAWS shall keep accurate records of the capacity provided to the Tract under the Agreement, whether Set-Aside or Guaranteed Capacity, and in no event will Developer be denied capacity as a result of SAWS' utilization of such capacity for another tract. Set-Aside capacity shall not survive the expiration of the Agreement.

G.C.16.00 Utility Master Plan Requirements.

The Developer will prepare a utility master plan, which details the water and/or wastewater systems for the Tract pursuant to the USR, as amended.

G.C.17.00 Phased Utility Master Plans.

If the Developer's water and/or wastewater systems are to be installed in phases or units, the Developer shall submit overall utility master plans to SAWS for review and approval. The overall utility master plan(s) shall be submitted before the first construction phase is submitted for plat approval. The overall utility master plan(s) shall show the development phases or units including the sequence and a timetable for build-out. The Developer shall also provide SAWS with a digital version of the proposed recorded plat, as submitted for plat recordation in a format acceptable to SAWS, for each phase or unit of the development project.

G.C.18.00 Conformance of Plans to Utility Master Plan.

All water and wastewater system facilities to serve the Tract shall be designed and constructed in conformance with the approved utility master plan. Changes in the water and wastewater system design shall be resubmitted to SAWS for written approval.

G.C.19.00 Timing Requirements for Submission of Plans.

Developer shall have three (3) years from the Effective Date of the Agreement to complete and submit the required utility master plan and to start construction of the Off-Site and On-Site utility infrastructure described in the Special Conditions. Developer agrees that the Agreement for the provision of Services shall automatically expire if Developer

General Conditions of USA

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has not submitted a utility master plan and started construction of required Off-Site and On-Site utility infrastructure within three (3) years of the Effective Date of the Agreement, and a new request for the Services must be submitted to SAWS, which SAWS will grant based on then existing policies and regulations. In the event Developer meets the above-mentioned requirements within the three (3) year period provided, the Agreement shall remain in effect for seven (7) years from the Effective Date. If Developer submits a revised Utility Master Plan in accordance with the USR prior to the expiration of the seven (7) year period, the Agreement for the provision of Services may be extended to a maximum term of fifteen (15) years from the Effective Date.

G.C. 20.00 EDU Transfers.

The transfer of EDU capacity outside the original boundaries of this Utility Service Agreement will not be allowed. The San Antonio Water System considers this Agreement to run with the land; however, EDU capacity transfers to subdivided tracts within the Tract of this Agreement are the responsibility of the Developer and approval of such transfers is not required by the San Antonio Water System. The Developer shall maintain an accounting of the EDU capacity that is used by the Developer and/or transferred after the effective date of this Agreement to portions of the Tract. If the Developer sells a portion of the Tract and transfers part of the EDU capacity contained in this Agreement, then that EDU capacity transfer must be included in the deed, bill of sale or instrument conveying the land and the Developer must require the buyer of the land who receives the allocated EDUs to record the instrument effectuating the transfer. Developer may file a Master Development Plan or an EDU Plan, prepared by an engineer, that shows specific EDU capacity allocations within the Tract and shall ensure that the Master Development Plan or EDU Plan is attached to this Agreement and properly recorded. SAWS will recognize the capacity allocations within the Master Development Plan or EDU Plan so long as those allocations are within the parameters of this Agreement. For properties that have areas of unplanned use, the demand will be calculated at four (4) EDUs per acre unless the engineering report specifies otherwise or there is not enough EDU capacity remaining for the Tract to allocate four (4) EDUs per acre.

In no event will the System be responsible to 3rd parties for providing water supply or wastewater discharge capacity beyond the total EDU capacity identified in this Agreement for the Tract. Developer expressly disclaims, releases and holds harmless SAWS from any liability, damages, costs or fees, and agrees to indemnify SAWS for any liability, including, costs and attorney's fees, associated with any dispute related to the transfer of all or a portion of EDU capacity approved for the Tract in this Utility Services Agreement.

G.C. 21.00 Camp Bullis Awareness Zone.

In the event that the Tract is located within, or partially within, the Camp Bullis Awareness Zone, the Developer acknowledges that certain lighting regulations may apply within at least a 3-mile radius of Camp Bullis, commonly referred to as down-lighting or dark sky lighting, and Developer will comply with those regulations. Developer agrees to comply with any local, state or federal law, rule or regulation related to the protection of the environment or endangered species, including but not limited to, any site assessments or surveys and notice to the United States Fish & Wildlife when required by law, rule or regulation. Developer acknowledges that any required assessment, survey or notice shall be current or updated as may be required by law, rule or regulation.

G.C. 22.00 Written Project Information.

The project associated with this Utility Service Agreement is described in the forms submitted by the applicant including but not limited to 1) a cover sheet clearly stating "USA Request" and the project name; 2) the Engineering Report; and 3) a legal description, metes and bounds description, or Master Development Plan (MDP), subdivision plat, or similar document of the Tract.

SPECIAL CONDITIONS OF THE UTILITY SERVICE AGREEMENT

WATER SERVICE

S.C.1.00 Tract Location and Ultimate Demand.

Hidden Canyon Subdivision Units 2 & 3, a 67-acre tract inside the City of San Antonio limits, is located west of the intersection of Champions and Canyon Golf Rd, as shown in Attachment VI (the "Tract"). The Tract is located over the Edwards Aquifer Recharge or Contributing Zone and is located within the 5-mile Awareness Zone of Camp Bullis. The proposed Tract is located inside SAWS' water CCN, inside SAWS' wastewater CCN and does not require SAWS' financial participation in the development of infrastructure through oversizing or impact fee credits, therefore, Board Action is not required.

The ultimate demand from the proposed development, on SAWS' water infrastructure, shall not exceed 99 equivalent dwelling units (EDUs) of water supply.

S.C.2.00 Infrastructure Requirements.

Water Supply to the Tract will be from Pressure Zone (PZ) 1400. The flow capacity of a 12-inch main is required to supply water to the 67-acre Tract, in conformance with SAWS' Utility Service Regulations (USR).

The Developer shall be required to provide an easement for a future waterline along the Tract's entire frontage bordering Canyon Golf Rd, as shown in Attachment III.

As determined by SAWS' Development Engineering Department, the Developer shall be required to cap and abandon the existing on-site 8-inch main (Job No. DSP-2242), as shown in Attachment III.

The Developer shall construct a series of looped 8-inch mains throughout the Tract while making connections to the existing 12-inch main (Job No. DSP-17032) on Sable Canyon, and to both existing 8-inch mains (Job No. 12-3106) on Rustic Holw, as shown in Attachment III.

The Developer shall then connect services to the proposed series of looped 8-inch mains throughout the Tract.

Note: No connections shall be made below the ground elevation of 1054 feet, where the static pressure will theoretically be greater than 150 psi.

S.C. 3.00 SAWS Master Plan and Oversizing Requirements.

N/A

S.C.4.00 Impact Fee Credit Eligibility.

N/A

S.C.5.00 Engineering Study Report and/or Pro-Rata Refund Eligibility.

The engineering study report “Hidden Canyon Subdivision Units 2 & 3, Utility Service Agreement Engineering Report”, by Cude Engineers, dated April 2023 is included as Attachment VI.

S.C.6.00 Developer On-Site and/or Off-Site Requirements.

The Developer shall acquire any right-of-way or easements, and install all On-Site and Off-Site utility infrastructure required to serve the Tract in accordance with SAWS’ USR, solely at the Developer’s cost, unless otherwise stated in S.C.3.00 or S.C.4.00. Other On-Site requirements within the Tract will be determined at such time as the engineer submits an overall Utility Master Plan, and any subsequent revisions, for the Tract.

S.C.7.00 Requirement to Install Approved Pressure Regulators and/or Booster Pumps.

The entire Tract is below ground elevation of 1215 feet where the static pressure will theoretically exceed 80 psi. Any service connections within the Tract, at elevations lower than this ground elevation, shall require the installation of a Pressure Reducing Valve (PRV), on the customer(s) side of the meter, rated for a maximum working pressure of no less than 300 psi, prior to a SAWS meter being installed. Installation shall be in conformance with the current Plumbing Code with Local Amendments adopted by the City of San Antonio.

S.C.8.00 Time for Water Impact Fee Assessment and Payment.

Water Impact Fees will be assessed at the rates in effect at the time of plat recordation or the latest date allowed by law. Impact fees will be collected at either the time of plat recordation or connection to the SAWS’ water system, at the discretion of the Developer.

S.C.9.00 Water Impact Fee Estimates Based Upon Current Charges.


Following is an estimate of impact fees for the provision of Services contemplated under the Agreement, which are based on current impact fee rates. This estimate shall not constitute an assessment of impact fees and impact fee rates are subject to change by the San Antonio City Council.

Type of Impact Fee	EDUs	\$/EDUs	Current Total
Flow Development	99	\$1,188	\$117,612
System Development Middle	99	\$1,014	\$100,386
Water Supply	99	\$2,706	\$267,894
Total			\$485,892

S.C.10.00 Pro-Rata Charge Requirement.

Developer shall be required to pay a Pro-Rata Charge pursuant to the USR, as amended, prior to connection to the SAWS water system if Developer is tying into a main that is subject to a pro-rata refund.

Special Conditions of USA
 USA-34279 Hidden Canyon Subdivision Units 2 & 3
 10/20/23, Page 2 of 4

Preparer’s Initials 

SPECIAL CONDITIONS OF THE UTILITY SERVICE AGREEMENT

WASTEWATER SERVICE

S.C.1.00 Tract Location and Ultimate Demand.

Hidden Canyon Subdivision Units 2 & 3, a 67-acre tract inside the City of San Antonio limits, is located west of the intersection of Champions and Canyon Golf Rd, as shown in Attachment VI (the "Tract") and lies within SAWS' Upper Collection and Treatment Area (UCTA). The Tract is located over the Edwards Aquifer Recharge or Contributing Zone and is located within the 5-mile Awareness Zone of Camp Bullis. The proposed Tract is located inside SAWS' water CCN, inside SAWS' wastewater CCN and does not require SAWS' financial participation in the development of infrastructure through oversizing or impact fee credits, therefore, Board Action is not required.

The ultimate demand from the proposed development, on SAWS' wastewater infrastructure, shall not exceed 96 equivalent dwelling units (EDUs) of wastewater discharge.

S.C.2.00 Infrastructure Requirements.

The Tract is situated within SAWS' Upper Collection and Treatment Area (UCTA) and lies within the Mud Creek Watershed. The capacity of an 8-inch gravity main at 0.40 percent minimum slope is required to provide wastewater service to the Tract, in conformance with SAWS' USR.

This Tract is currently upstream of the Mudd Creek Lift Station and force main system (LS 191), which is currently at capacity. The Developer may wait until LS 191 has been eliminated through a future gravity outfall main (Future Job No. 21-4401).

Alternatively, the Developer may make improvements to the Mudd Creek Lift Station and force main system to accommodate the additional flow from this Tract, in conformance with SAWS' USR.

The Developer shall construct an 8-inch gravity sewer main from the existing 8-inch gravity sewer main (Job No. 12-1616) on Winding Ravine, to the Tract.

Once LS 191 has been eliminated through the future gravity outfall main (Job No. 21-4401), or improvements have been made to the existing LS 191, the Developer may connect a maximum of 96 EDUs of total capacity to the proposed 8-inch gravity sewer main and/or the existing 8-inch and 10-inch gravity sewer mains traversing the Tract.

S.C.3.00 SAWS Master Plan and Oversizing Requirements.

N/A

S.C.4.00 Impact Fee Credit Eligibility.

N/A

S.C.5.00 Engineering Study Report and/or Pro-Rata Refund Eligibility.

The engineering study report “Hidden Canyon Subdivision Units 2 & 3, Utility Service Agreement Engineering Report”, by Cude Engineers, dated April 2023 is included as Attachment VI.

S.C.6.00 Developer On-Site and/or Off-Site Requirements.

The Developer will also be required to acquire any right-of-way and easements, install all On-Site and Off-Site utility infrastructure, and upgrade existing lift stations necessary to serve the Tract in accordance with SAWS’ USR, solely at the Developer’s cost, unless stated otherwise in S.C.3.00 or S.C.4.00. Other On-Site utility infrastructure requirements within the Tract will be determined at such time as the engineer submits an overall Utility Master Plan, and any subsequent revisions, for the Tract.

S.C.7.00 Lift Stations and Force Mains.

Lift stations and force mains are only allowed by prior written supplemental agreement with SAWS. Applicable fees, as set out in the supplemental agreement, must be paid in full prior to service connection. Whenever a lift station is proposed, a Present Value analysis of the lift station vs. gravity solutions, shall be included in the Engineering Report/Study in conformance with the requirements of SAWS’ USR.

S.C.8.00 Time for Wastewater Impact Fee Assessment and Payment.

Wastewater Impact Fees will be assessed at the rates in effect at the time of plat recordation or the latest date allowed by law. Wastewater Impact Fees will be collected at either the time of plat recordation or connection to the SAWS wastewater system, at the discretion of the Developer.

S.C.9.00 Wastewater Impact Fee Estimates Based Upon Current Charges.

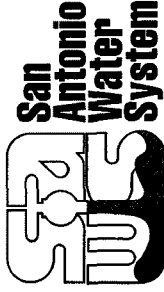
Following is an estimate of impact fees for the provision of Services contemplated under the Agreement, which are based on impact fee rates in effect as of the Effective Date of the Agreement. This estimate shall not constitute an assessment of impact fees and impact fee rates are subject to change by action of the San Antonio City Council as permitted by law.

Type of Impact Fee	EDUs	\$/EDUs	Current Total
Wastewater Collection Upper	96	\$2,800	\$268,800
Wastewater Treatment Dos Rios/Leon Creek	96	\$651	\$62,496
Total			\$331,296

S.C.10.00 Pro-Rata Payment Fee Requirement.

Developer shall be required to pay a pro-rata fee pursuant to the USR, as amended, prior to connection to the wastewater system, if Developer is tapping into a main that is subject to a pro-rata refund.

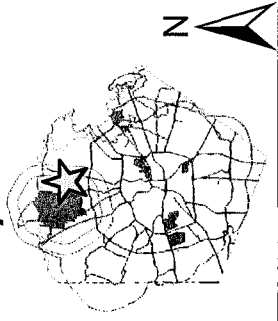
Attachment III:
 USA-34279
 "Hidden Canyon Units 2 & 3" Tract
 Proposed Water Infrastructure Map
 67 Acres



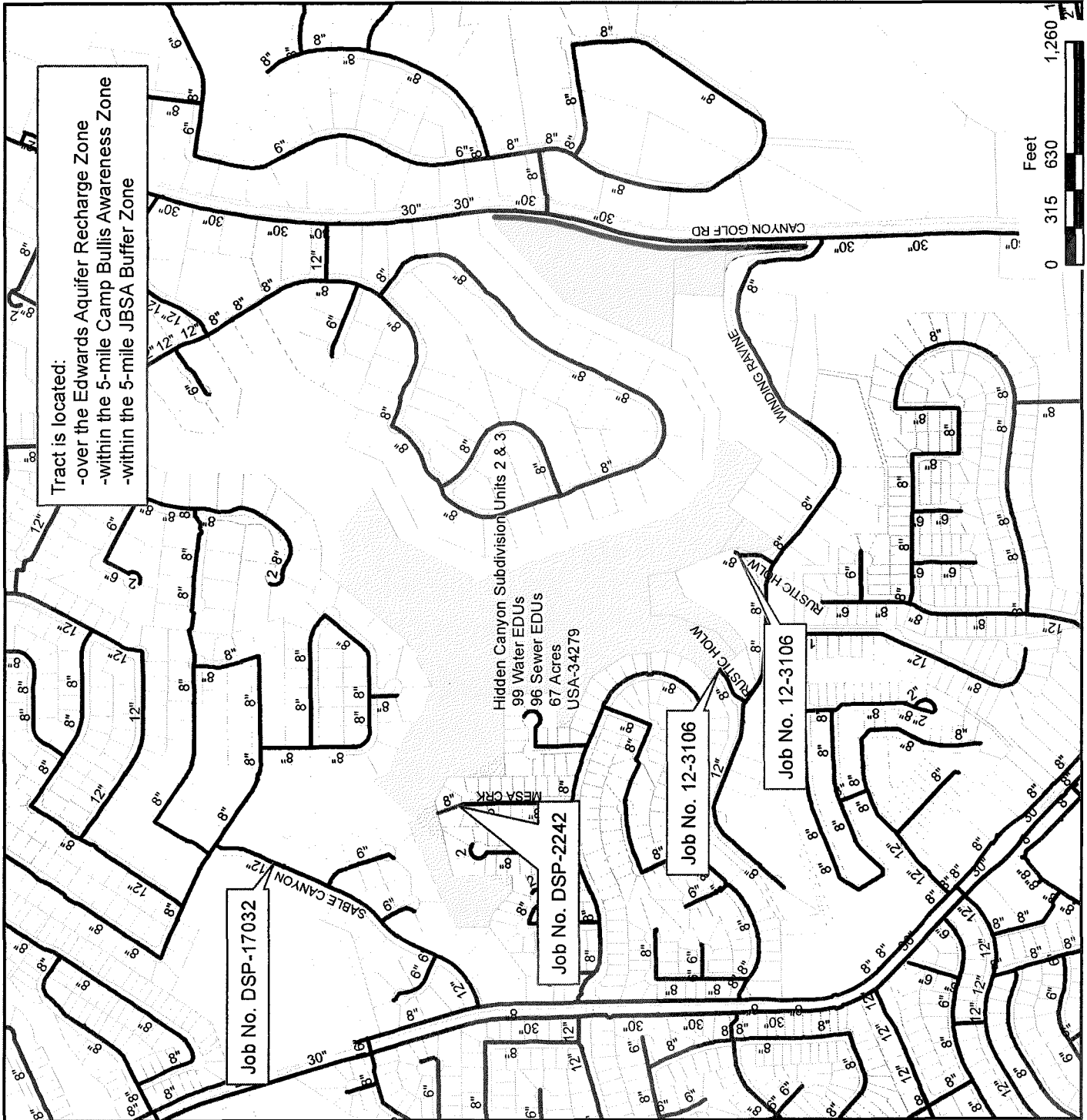
Legend

- Parcels Update
- USA Tract
- Existing Water Main
- Abandon Main
- Proposed Easement

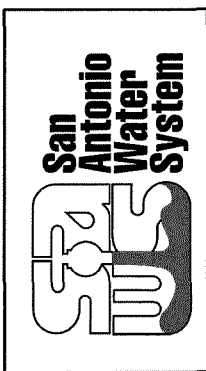
Project Location



SAWS UTILITY MAP DISCLAIMER
 The utility map is for reference only. The information may not represent what actually has been constructed. SAWS explicitly disclaims any representation of the accuracy or completeness of the information shown on this map or any errors, omissions, or inaccuracies in the map regardless of how caused. Field verification should be done as necessary. SAWS prohibits the reproduction or sale of this document. This SAWS utility map may not under any circumstances, be copied, reproduced, or otherwise used without the written permission of the San Antonio Water System (SAWS).



Attachment III:
USA-34279
"Hidden Canyon Units 2 & 3" Tract
Proposed Sewer Infrastructure Map
67 Acres

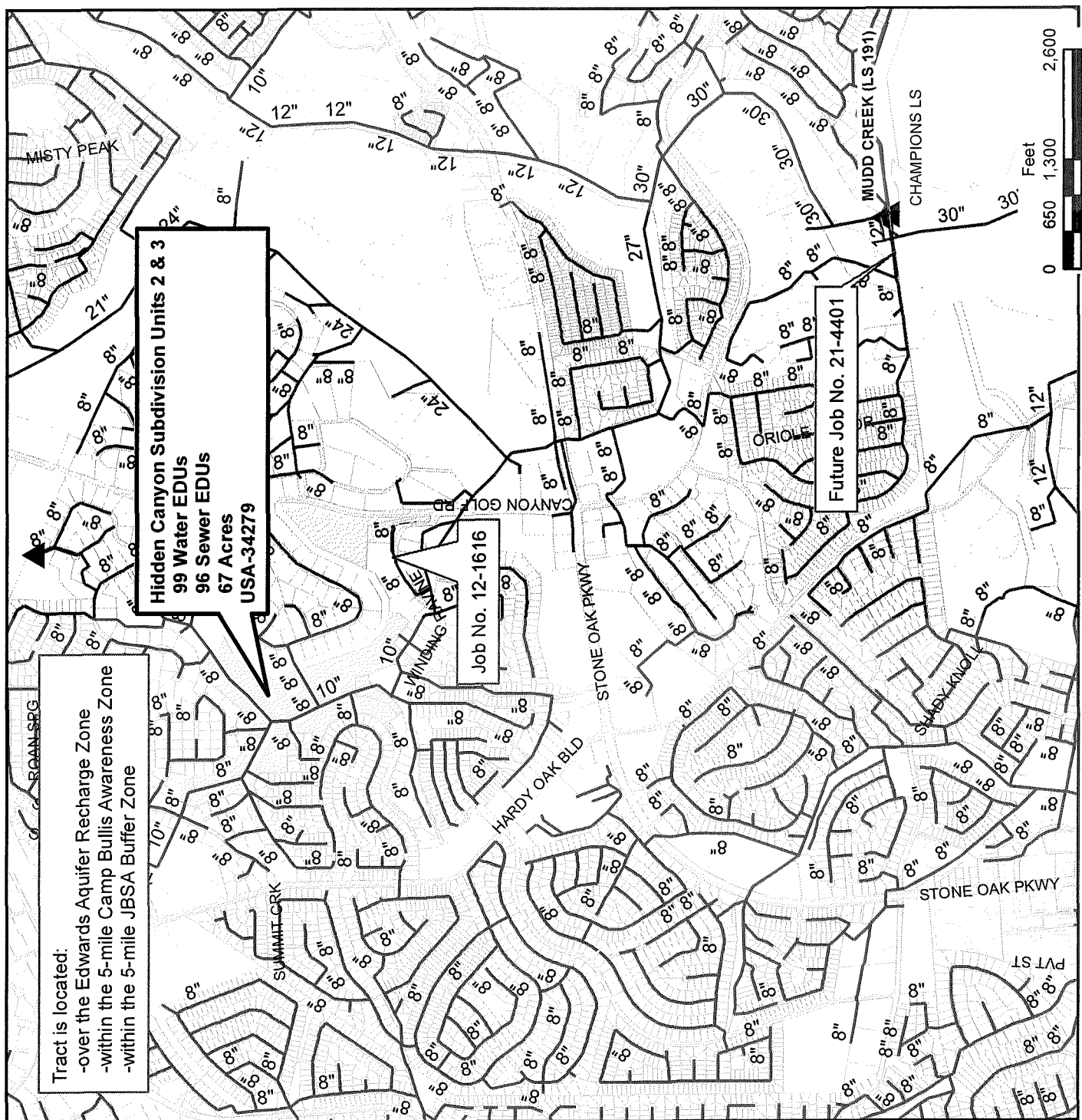


Legend

- Parcels Update
- USA Tract
- Existing Sewer Main
- Proposed Gravity Sewer Main
- Future Job No. 21-4401
- Existing Lift Station

Project Location

SAWS UTILITY MAP DISCLAIMER
This utility map is for reference only. The information may not represent what actually has been constructed. SAWS assumes no liability for any errors, omissions, or inaccuracies in the map regardless of how caused. Field verification should be done as necessary. SAWS prohibits the reproduction or sale of this document. This SAWS map or published in any form or media, or transmitted to another without the written permission of the San Antonio Water System (SAWS).



File Information

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Any provision herein which restricts the sale or use of the described real property because of race is invalid and unenforceable under Federal law

STATE OF TEXAS, COUNTY OF BEXAR

I hereby Certify that this instrument was eFILED in File Number Sequence on this date and at the time stamped hereon by me and was duly eRECORDED in the Official Public Record of Bexar County, Texas on: 11/15/2023 3:27 PM



Lucy Adame-Clark
Lucy Adame-Clark
Bexar County Clerk

ATTACHMENT C
GENERAL WASTEWATER NOTES

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

Edwards Aquifer Protection Program Construction Notes – Legal Disclaimer

The following/listed “construction notes” are intended to be advisory in nature only and do not constitute an approval or conditional approval by the Executive Director, nor do they constitute a comprehensive listing of rules or conditions to be followed during construction. Further actions may be required to achieve compliance with TCEQ regulations found in Title 30, Texas Administrative Code, Chapters 213 and 217, as well as local ordinances and regulations providing for the protection of water quality. Additionally, nothing contained in the following/listed “construction notes” restricts the powers of the Executive Director, the commission or any other governmental entity to prevent, correct, or curtail activities that result or may result in pollution of the Edwards Aquifer or hydrologically connected surface waters. The holder of any Edwards Aquifer Protection Plan containing “construction notes” is still responsible for compliance with Title 30, Texas Administrative Code, Chapters 213 or any other applicable TCEQ regulation, as well as all conditions of an Edwards Aquifer Protection Plan through all phases of plan implementation. Failure to comply with any condition of the Executive Director’s approval, whether or not in contradiction of any “construction notes,” is a violation of TCEQ regulations and any violation is subject to administrative rules, orders, and penalties as provided under Title 30, Texas Administrative Code § 213.10 (relating to Enforcement). Such violations may also be subject to civil penalties and injunction. The following/listed “construction notes” in no way represent an approved exception by the Executive Director to any part of Title 30 Texas Administrative Code, Chapters 213 and 217, or any other TCEQ applicable regulation.

1. This Organized Sewage Collection System (SCS) must be constructed in accordance with 30 Texas Administrative Code (TAC) §213.5(c), the Texas Commission on Environmental Quality’s (TCEQ) Edwards Aquifer Rules and any local government standard specifications.
2. All contractors conducting regulated activities associated with this proposed regulated project must be provided with copies of the SCS plan and the TCEQ letter indicating the specific conditions of its approval. During the course of these regulated activities, the contractors must be required to keep on-site copies of the plan and the approval letter.
3. A written notice of construction must be submitted to the presiding TCEQ regional office at least 48 hours prior to the start of any regulated activities. This notice must include:
 - the name of the approved project;
 - the activity start date; and
 - the contact information of the prime contractor.
4. Any modification to the activities described in the referenced SCS application following the date of approval may require the submittal of an SCS application to modify this approval, including the payment of appropriate fees and all information necessary for its review and approval.
5. Prior to beginning any construction activity, all temporary erosion and sedimentation (E&S) control measures must be properly installed and maintained in accordance with the manufacturers specifications. These controls must remain in place until the disturbed areas have been permanently stabilized.
6. If any sensitive features are discovered during the wastewater line trenching activities, all regulated activities near the sensitive feature must be suspended immediately. The applicant must immediately notify the appropriate regional office of the TCEQ of the feature discovered. A geologist’s assessment of the location and extent of the feature discovered must be reported to that regional office in writing and the applicant must submit a plan for ensuring the structural integrity of the sewer line or for modifying the proposed collection system alignment around the feature. The regulated activities near the sensitive feature may not proceed until the

executive director has reviewed and approved the methods proposed to protect the sensitive feature and the Edwards Aquifer from any potentially adverse impacts to water quality while maintaining the structural integrity of the line.

7. Sewer lines located within or crossing the 5-year floodplain of a drainage way will be protected from inundation and stream velocities which could cause erosion and scouring of backfill. The trench must be capped with concrete to prevent scouring of backfill, or the sewer lines must be encased in concrete. All concrete shall have a minimum thickness of 6 inches.
8. Blasting procedures for protection of existing sewer lines and other utilities will be in accordance with the National Fire Protection Association criteria. Sand is not allowed as bedding or backfill in trenches that have been blasted. If any existing sewer lines are damaged, the lines must be repaired and retested.
9. All manholes constructed or rehabilitated on this project must have watertight size on size resilient connectors allowing for differential settlement. If manholes are constructed within the 100-year floodplain, the cover must have a gasket and be bolted to the ring. Where gasketed manhole covers are required for more than three manholes in sequence or for more than 1500 feet, alternate means of venting will be provided. Bricks are not an acceptable construction material for any portion of the manhole.

The diameter of the manholes must be a minimum of four feet and the manhole for entry must have a minimum clear opening diameter of 30 inches. These dimensions and other details showing compliance with the commission's rules concerning manholes and sewer line/manhole inverts described in 30 TAC §217.55 are included on Plan Sheet 9 of 9.

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

10. Where water lines and new sewer line are installed with a separation distance closer than nine feet (i.e., water lines crossing wastewater lines, water lines paralleling wastewater lines, or water lines next to manholes) the installation must meet the requirements of 30 TAC §217.53(d) (Pipe Design) and 30 TAC §290.44(e) (Water Distribution).
11. Where sewers lines deviate from straight alignment and uniform grade all curvature of sewer pipe must be achieved by the following procedure which is recommended by the pipe manufacturer: 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.

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

If no stub-out is present an alternate method of joining laterals is shown in the detail on Plan Sheet 9 of 9. (For potential future laterals).

The private service lateral stub-outs must be installed as shown on the plan and profile sheets on Plan Sheet 9 of 9 and marked after backfilling as shown in the detail on Plan Sheet 9 of 9.

13. Trenching, bedding and backfill must conform with 30 TAC §217.54. The bedding and backfill for flexible pipe must comply with the standards of ASTM D-2321, Classes IA, IB, II or III. Rigid pipe bedding must comply with the requirements of ASTM C 12 (ANSI A 106.2) classes A, B or C.
14. Sewer lines must be tested from manhole to manhole. When a new sewer line is connected to an existing stub or clean-out, it must be tested from existing manhole to new manhole. If a stub or clean-out is used at the end of the proposed sewer line, no private service attachments may be connected between the last manhole and the cleanout unless it can be certified as conforming with the provisions of 30 TAC §213.5(c)(3)(E).
15. All sewer lines must be tested in accordance with 30 TAC §217.57. The engineer must retain copies of all test results which must be made available to the executive director upon request. The engineer must certify in writing that all wastewater lines have passed all required testing to the appropriate regional office within 30 days of test completion and prior to use of the new collection system. Testing method will be:
 - (a) For a collection system pipe that will transport wastewater by gravity flow, the design must specify an infiltration and exfiltration test or a low-pressure air test. A test must conform to the following requirements:
 - (1) *Low Pressure Air Test.*
 - (A) A low pressure air test must follow the procedures described in American Society For Testing And Materials (ASTM) C-828, ASTM C-924, or ASTM F-1417 or other procedure approved by the executive director, except as to testing times as required in Table C.3 in subparagraph (C) of this paragraph or Equation C.3 in subparagraph (B)(ii) of this paragraph.
 - (B) For sections of collection system pipe less than 36 inch average inside diameter, the following procedure must apply, unless a pipe is to be tested as required by paragraph (2) of this subsection.
 - (i) A pipe must be pressurized to 3.5 pounds per square inch (psi) greater than the pressure exerted by groundwater above the pipe.
 - (ii) Once the pressure is stabilized, the minimum time allowable for the pressure to drop from 3.5 psi gauge to 2.5 psi gauge is computed from the following equation:

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

Where:

- T = time for pressure to drop 1.0 pound per square inch gauge in seconds
K = 0.000419 X D X L, but not less than 1.0
D = average inside pipe diameter in inches

L = length of line of same size being tested, in feet
 Q = rate of loss, 0.0015 cubic feet per minute per square foot internal surface

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

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

- (D) An owner may stop a test if no pressure loss has occurred during the first 25% of the calculated testing time.
- (E) If any pressure loss or leakage has occurred during the first 25% of a testing period, then the test must continue for the entire test duration as outlined above or until failure.
- (F) Wastewater collection system pipes with a 27 inch or larger average inside diameter may be air tested at each joint instead of following the procedure outlined in this section.
- (G) A testing procedure for pipe with an inside diameter greater than 33 inches must be approved by the executive director.

(2) *Infiltration/Exfiltration Test.*

- (A) The total exfiltration, as determined by a hydrostatic head test, must not exceed 50 gallons per inch of diameter per mile of pipe per 24 hours at a minimum test head of 2.0 feet above the crown of a pipe at an upstream manhole.
- (B) An owner shall use an infiltration test in lieu of an exfiltration test when pipes are installed below the groundwater level.
- (C) The total exfiltration, as determined by a hydrostatic head test, must not exceed 50 gallons per inch diameter per mile of pipe per 24 hours at a minimum test head of two feet above the crown of a pipe at an upstream manhole, or at least two feet above existing groundwater level, whichever is greater.
- (D) For construction within a 25-year flood plain, the infiltration or exfiltration must not exceed 10 gallons per inch diameter per mile of pipe per 24 hours at the same minimum test head as in subparagraph (C) of this paragraph.
- (E) If the quantity of infiltration or exfiltration exceeds the maximum quantity specified, an owner shall undertake remedial action in order to reduce

the infiltration or exfiltration to an amount within the limits specified. An owner shall retest a pipe following a remediation action.

- (b) If a gravity collection pipe is composed of flexible pipe, deflection testing is also required. The following procedures must be followed:
 - (1) For a collection pipe with inside diameter less than 27 inches, deflection measurement requires a rigid mandrel.
 - (A) *Mandrel Sizing.*
 - (i) A rigid mandrel must have an outside diameter (OD) not less than 95% of the base inside diameter (ID) or average ID of a pipe, as specified in the appropriate standard by the ASTMs, American Water Works Association, UNI-BELL, or American National Standards Institute, or any related appendix.
 - (ii) If a mandrel sizing diameter is not specified in the appropriate standard, the mandrel must have an OD equal to 95% of the ID of a pipe. In this case, the ID of the pipe, for the purpose of determining the OD of the mandrel, must equal be the average outside diameter minus two minimum wall thicknesses for OD controlled pipe and the average inside diameter for ID controlled pipe.
 - (iii) All dimensions must meet the appropriate standard.
 - (B) *Mandrel Design.*
 - (i) A rigid mandrel must be constructed of a metal or a rigid plastic material that can withstand 200 psi without being deformed.
 - (ii) A mandrel must have nine or more odd number of runners or legs.
 - (iii) A barrel section length must equal at least 75% of the inside diameter of a pipe.
 - (iv) Each size mandrel must use a separate proving ring.
 - (C) *Method Options.*
 - (i) An adjustable or flexible mandrel is prohibited.
 - (ii) A test may not use television inspection as a substitute for a deflection test.
 - (iii) If requested, the executive director may approve the use of a deflectometer or a mandrel with removable legs or runners on a case-by-case basis.
 - (2) For a gravity collection system pipe with an inside diameter 27 inches and greater, other test methods may be used to determine vertical deflection.
 - (3) A deflection test method must be accurate to within plus or minus 0.2% deflection.
 - (4) An owner shall not conduct a deflection test until at least 30 days after the final backfill.
 - (5) Gravity collection system pipe deflection must not exceed five percent (5%).
 - (6) If a pipe section fails a deflection test, an owner shall correct the problem and conduct a second test after the final backfill has been in place at least 30 days.

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

- (a) All manholes must pass a leakage test.
- (b) An owner shall test each manhole (after assembly and backfilling) for leakage, separate and independent of the collection system pipes, by hydrostatic exfiltration testing, vacuum testing, or other method approved by the executive director.
 - (1) Hydrostatic Testing.

- (A) The maximum leakage for hydrostatic testing or any alternative test methods is 0.025 gallons per foot diameter per foot of manhole depth per hour.
- (B) To perform a hydrostatic exfiltration test, an owner shall seal all wastewater pipes coming into a manhole with an internal pipe plug, fill the manhole with water, and maintain the test for at least one hour.
- (C) A test for concrete manholes may use a 24-hour wetting period before testing to allow saturation of the concrete.

(2) Vacuum Testing.

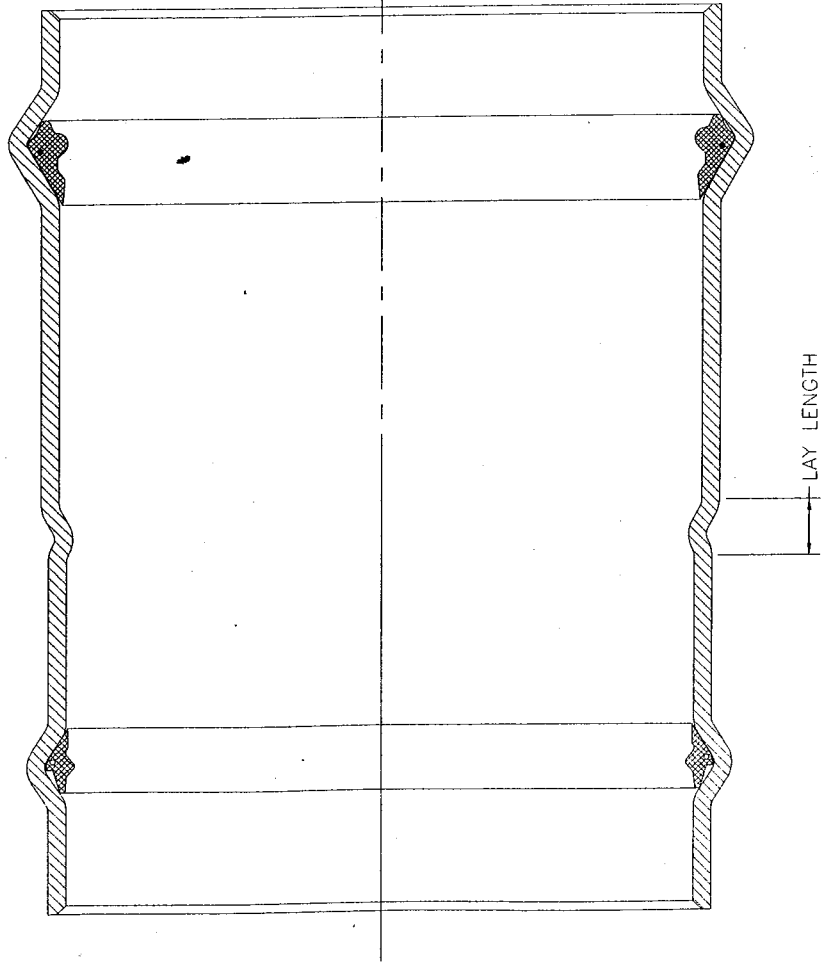
- (A) To perform a vacuum test, an owner shall plug all lift holes and exterior joints with a non-shrink grout and plug all pipes entering a manhole.
- (B) No grout must be placed in horizontal joints before testing.
- (C) Stub-outs, manhole boots, and pipe plugs must be secured to prevent movement while a vacuum is drawn.
- (D) An owner shall use a minimum 60 inch/lb torque wrench to tighten the external clamps that secure a test cover to the top of a manhole.
- (E) A test head must be placed at the inside of the top of a cone section, and the seal inflated in accordance with the manufacturer's recommendations.
- (F) There must be a vacuum of 10 inches of mercury inside a manhole to perform a valid test.
- (G) A test does not begin until after the vacuum pump is off.
- (H) A manhole passes the test if after 2.0 minutes and with all valves closed, the vacuum is at least 9.0 inches of mercury.

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

<p>Austin Regional Office 12100 Park 35 Circle, Building A Austin, Texas 78753-1808 Phone (512) 339-2929 Fax (512) 339-3795</p>	<p>San Antonio Regional Office 14250 Judson Road San Antonio, Texas 78233-4480 Phone (210) 490-3096 Fax (210) 545-4329</p>
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THESE GENERAL CONSTRUCTION NOTES MUST BE INCLUDED ON THE CONSTRUCTION PLANS PROVIDED TO THE CONTRACTOR AND ALL SUBCONTRACTORS.

REV		DESCRIPTION	DATE	APPROVED
A	UPDATE BORDER & NOTES		12/7/07	SH




ALL DIMENSIONS ARE APPROXIMATE

PART NUMBER: 4619-08021

DESCRIPTION: 8" PSM SDR26 X IPS

LAY LENGTH: 1.25"

ITEM	QTY	PART NO	DESCRIPTION	SPECIFICATION
				ADAPTER OXG
DATE: SH 2/10/98		SIZE: D		REV: A
PART NUMBER: GB 2/10/98		SCALE: 1/1		SHEET 1 OF 1

THIS PRINT DISCLOSES SUBJECT MATTER IN WHICH NACO INDUSTRIES, HAS PROPRIETARY RIGHTS. THE RECEIPT OR POSSESSION OF THIS PRINT DOES NOT CONFER, TRANSFER, OR LICENSE THE USE OF THE DESIGN OR TECHNICAL INFORMATION SHOWN HEREIN. REPRODUCTION OF THIS PRINT OR ANY INFORMATION CONTAINED HEREIN OR MANUFACTURE OF ANY ARTICLE HEREFROM, FOR THE DISCLOSURE TO OTHERS IS FORBIDDEN, EXCEPT BY SPECIFIC WRITTEN PERMISSION FROM NACO INDUSTRIES.



Specifications for Fabricated PVC Pipe Fittings

Fittings:

SDR35 and SDR26 Solvent Weld and Gasketed Sewer PVC Fittings

NACO Industries certifies that our SDR35 and SDR26 Solvent Weld and/or Gasketed PVC (Poly Vinyl Chloride) Fittings meet or exceed the following applicable standards, and/or materials used in the manufacturing process meet or exceed the following applicable standards.

Applicable Specifications:

ASTM D 1784 – Standard Specification for Rigid Poly (Vinyl Chloride) (PVC) Compounds and Chlorinated Poly (Vinyl Chloride) (CPVC) Compounds.

ASTM D 3034 – Standard Specification for Type PSM Poly (Vinyl Chloride) (PVC) Sewer Pipe and Fittings.

ASTM F 1366 – Standard Specification for Poly (Vinyl Chloride) (PVC) Gasketed Sewer Fittings.

ASTM F 679 – Standard Specification for Poly (Vinyl Chloride) (PVC) Large Diameter Plastic Gravity Sewer Pipe and Fittings, 18" through 27".

ASTM F 477 – Standard Specification for Elastomeric Seals (Gaskets) for Joining Plastic Pipe.

General Specifications:

A tolerance of $\pm \frac{1}{2}$ " on dimensions should be allowed in the design of piping systems. Lay lengths shall not exceed $\pm \frac{1}{2}$ " on fittings up to 12" in diameter and ± 1 " on fittings 14" in diameter and above.

Elbows, Wyes and all change in direction fittings shall not exceed $\pm 1^\circ$ variance in the specified angle.

DO NOT use NACO Industries' fittings to transport or store compressed air or gases, or test thermoplastic piping systems with compressed air or gases.



Specifications for Fabricated PVC Pipe Fittings

Fittings:

IPS (Iron Pipe Size) Class 63, 100, 125, 160 and 200 Pressure Solvent Weld and Gasketed PVC Fittings.

NACO Industries certifies that our IPS (Iron Pipe Size) Class 63, 100, 125, 160 and 200 PVC (Poly Vinyl Chloride) Fittings meet or exceed the following applicable standards, and/or materials used in the manufacturing process meet or exceed the following applicable standards.

Applicable Specifications:

ASTM D 1784 – Standard Specification for Rigid Poly (Vinyl Chloride) (PVC) Compounds and Chlorinated Poly (Vinyl Chloride) (CPVC) Compounds.

ASTM D 2241 – Standard Specification for Poly (Vinyl Chloride) (PVC) Pressure Rated Pipe (SDR Series).

ASTM D 2564 – Standard Specification for Solvent Cements for Poly (Vinyl Chloride) (PVC) Plastic Piping Systems.

ASTM D 2672 – Standard Specification for Joints for IPS PVC Pipe Using Solvent Cements.

ASTM D 2855 – Standard Practice for Making Solvent Cement Joints with Poly (Vinyl Chloride) (PVC) Pipe and Fittings.

ASTM D 3139 – Standard Specification for Joints for Plastic Pressure Pipe Using Flexible Elastomeric Seals.

ASTM F 477 – Standard Specification for Elastomeric Seals (Gaskets) for Joining Plastic Pipe.

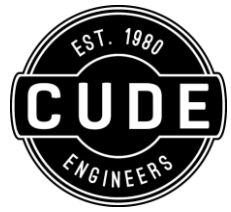
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A tolerance of $\pm \frac{1}{2}$ " on dimensions should be allowed in the design of piping systems. Lay lengths shall not exceed $\pm \frac{1}{2}$ " on fittings up to 12" in diameter and ± 1 " on fittings 14" in diameter and above.

Elbows, Wyes and all change in direction fittings shall not exceed $\pm 1^\circ$ variance in the specified angle.

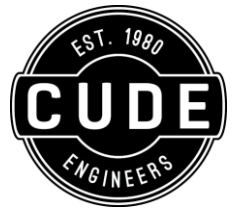
Standard fabricated fittings shall be tested to a minimum of two times the applicable maximum internal pressure ratings in accordance with ASTM D 1599. When temperatures rise above 73° F, the tensile strength of thermoplastics decreases, thereby derating the pipe or fitting Maximum Internal Pressure. When temperatures fall below 73° F, the tensile strength of thermoplastics increases, and the impact strength decreases.

DO NOT use NACO Industries' fittings to transport or store compressed air or gases, or test thermoplastic piping systems with compressed air or gases.



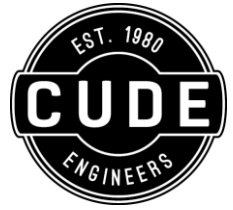
ATTACHMENT B
Justification and Calculations for Deviation in Straight Alignment
Without Manholes

Not applicable to this project



ATTACHMENT C
Justification for Variance from Maximum Manhole Spacing

Not applicable to this project



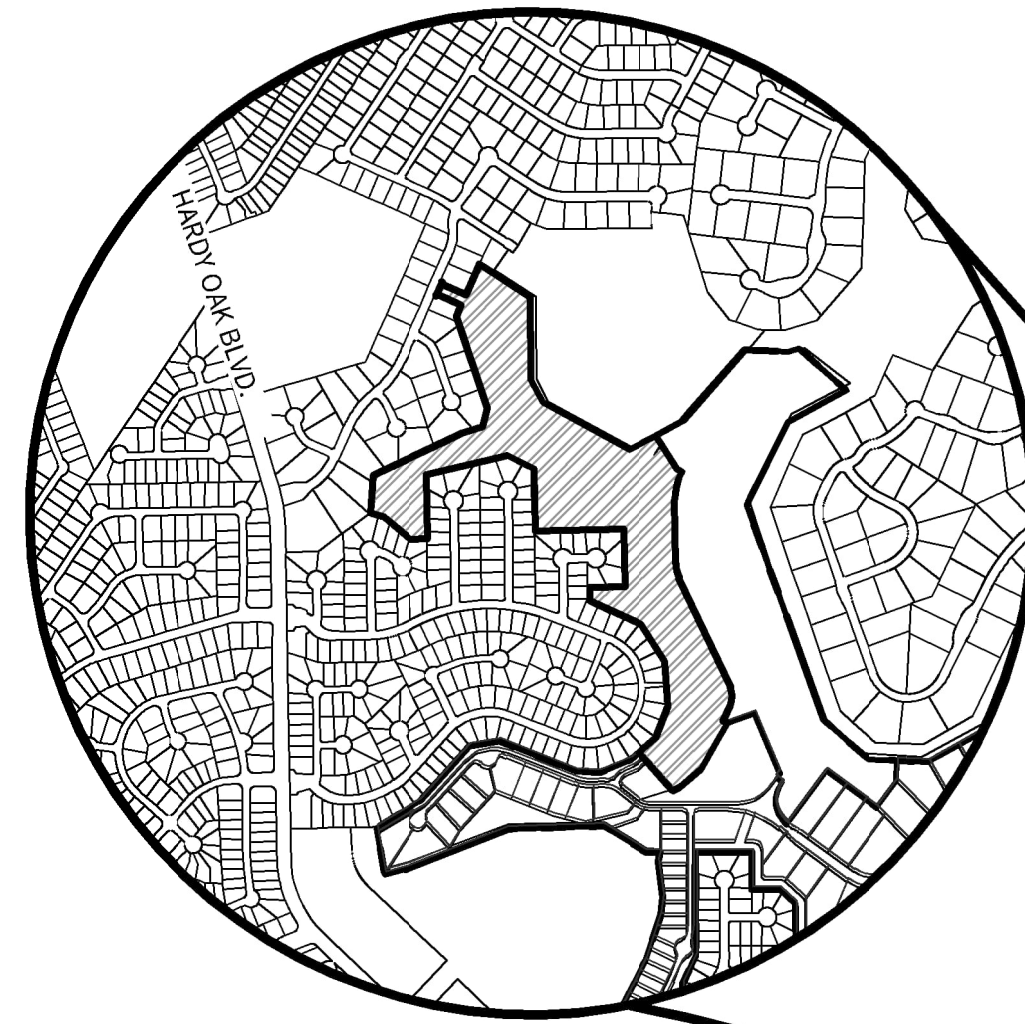
ATTACHMENT D
Calculations for Slopes for Flows Greater than 10.0 Feet Per Second

Not applicable to this project

SANITARY SEWER CONSTRUCTION PLANS

- C32 - OVERALL SANITARY SEWER MASTER PLAN
- C33 - OVERALL SANITARY SEWER MASTER PLAN
- C34 - OVERALL SANITARY SEWER MASTER PLAN
- C35 - SEWAGE COLLECTION SYSTEM SITE PLAN
- C36 - SEWAGE COLLECTION SYSTEM SITE PLAN
- C37 - SEWAGE COLLECTION SYSTEM SITE PLAN
- C38 - SANITARY SEWER GENERAL NOTES
- C39 - SANITARY SEWER PLAN & PROFILE - LINE 'G' & LINE 'H'
- C39A - SANITARY SEWER PLAN & PROFILE - EX. LINE 'B'
- C39B - SANITARY SEWER PLAN & PROFILE - EX. LINE 'B'
- C39C - SANITARY SEWER PLAN & PROFILE - EX. LINE 'B'
- C39D - SANITARY SEWER PLAN & PROFILE - EX. LINE 'C'
- C39E - SANITARY SEWER PLAN & PROFILE - LINE 'L'
- C40 - SANITARY SEWER STANDARD DETAILS*

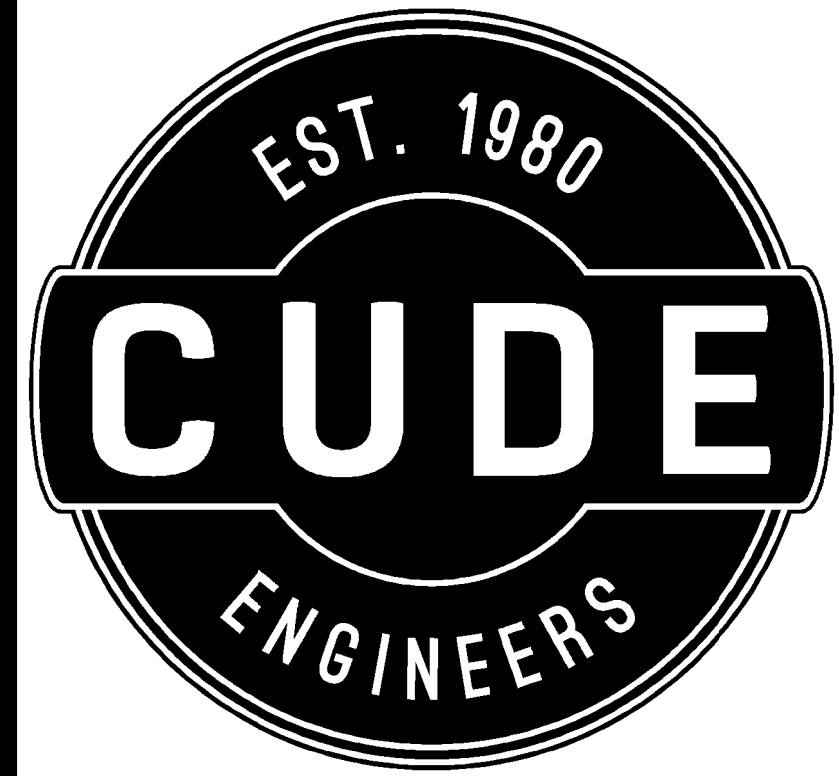
* DENOTES STANDARD DETAILS ADOPTED FOR USE ON THIS PROJECT.



LOCATION MAP



VICINITY MAP



HIDDEN CANYON SUBDIVISION

UNIT 2A

SANITARY SEWER
CONSTRUCTION PLANS

PLAT NO.
23-11800095
SAWS JOB NO.
23-1622

SEWER: UPPER - EAST SEWERSHED - DOS RIOS/ LEON CREEK

Developer's Name STONE OAK HIDDEN CANYON, L.L.C.
 Developer's Address 6002 CAMP BULLIS ROAD
 City SAN ANTONIO State TEXAS Zip 78257
 Phone # (210) 698-3004 Fax # (210) 698-3014
 SAWS Block Map # 162680 Total EDU's 52 Total Acreage 29.067 Ac.
 Total Linear Footage of Pipe 1,231.93 L.F. OF 8" Plot No. 23-11800095
 Number of Lots 52 SAWS Job No. 23-1622

DEVELOPER /OWNER / APPLICANT

STONE OAK HIDDEN CANYON, LLC
 CONTACT PERSON: RAJEEV PURI
 6002 CAMP BULLIS ROAD
 SAN ANTONIO, TX 78247
 TEL: (210) 698-3004
 FAX: (210) 698-3014

4122 Pond Hill Road, Suite 101

San Antonio, Texas 78231

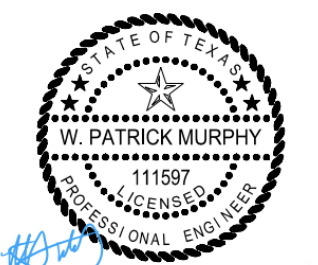
P: (210) 681.2951 F: (210) 523.7112

DRAWN BY
MW, AD, RM, MS, AB

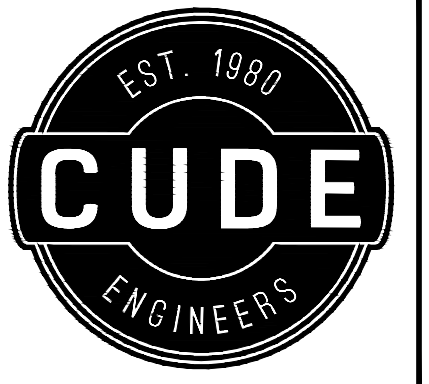
DATE
2023-12-20

CHECKED BY
PATRICK MURPHY, PE

PROJECT NO.
01564.004



CUDE ENGINEERS
 TBPE No. 455
 TBPLS No. 10048500

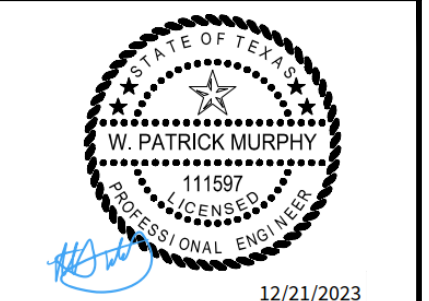


4122 Pond Hill Road, Suite 101
San Antonio, Texas 78231
P:(210) 681.2951 F:(210) 523.7112

HIDDEN CANYON SUBDIVISION
UNIT 2A P.U.D.
OVERALL SANITARY SEWER MASTER PLAN

DATE
01/06/2022
PROJECT NO.
P01564.004
DRAWN BY
R.M., A.B.B.
CHECKED BY
W.P.M./J.R.T.

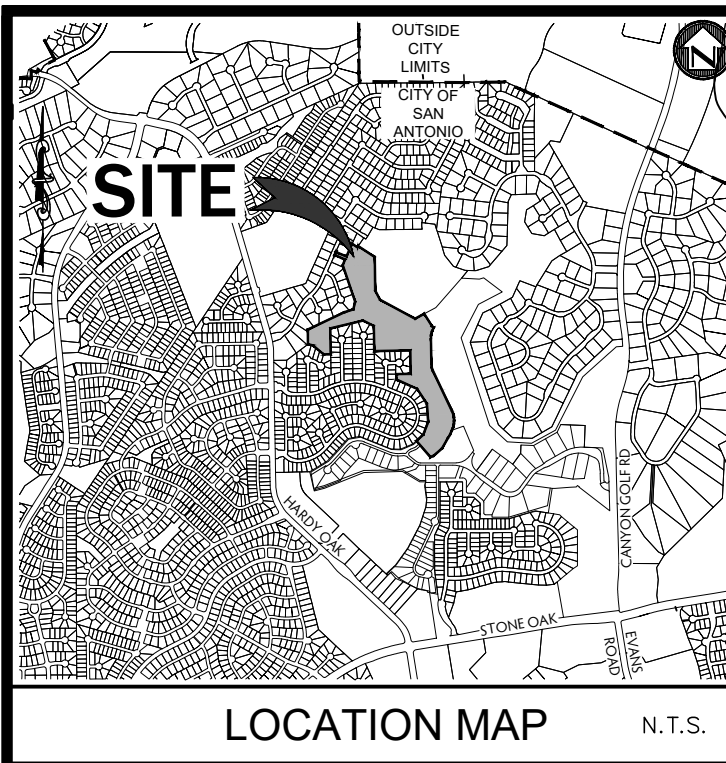
REVISIONS
1. 2022.01.06 - WATER SERVICES ADJUSTED FOR ELECTRIC TRANSFORMERS
2. 2022.01.06 - WATER SERVICES ADJUSTED FOR ELECTRIC TRANSFORMERS
3. 2022.01.06 - WATER SERVICES ADJUSTED FOR ELECTRIC TRANSFORMERS
4. 2022.01.06 - WATER SERVICES ADJUSTED FOR ELECTRIC TRANSFORMERS
5. 2022.01.06 - WATER SERVICES ADJUSTED FOR ELECTRIC TRANSFORMERS
6. 2022.01.06 - WATER SERVICES ADJUSTED FOR ELECTRIC TRANSFORMERS
7. 2022.01.06 - WATER SERVICES ADJUSTED FOR ELECTRIC TRANSFORMERS
8. 2022.01.06 - WATER SERVICES ADJUSTED FOR ELECTRIC TRANSFORMERS
9. 2022.01.06 - WATER SERVICES ADJUSTED FOR ELECTRIC TRANSFORMERS



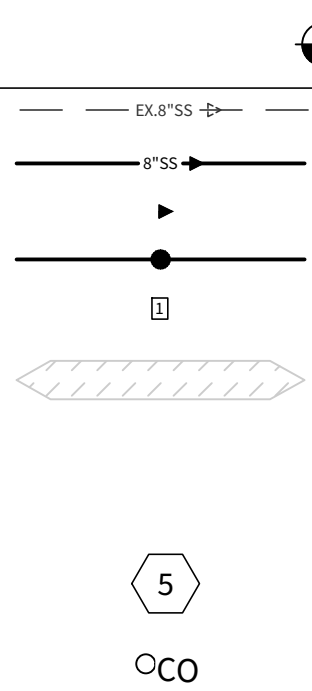
CUDE ENGINEERS
TBPE No. 455

PLAT #
23-1180095
SAWS #
23-1622

C32



LEGEND
EXISTING SANITARY SEWER
PROPOSED SANITARY SEWER
DIRECTION OF FLOW
SANITARY SEWER MANHOLE
EXISTING SEWER LINE I.D.
SANITARY SEWER MAIN & MANHOLES TO BE ABANDONED PER SAWS ITEM #862 (GROUTED IN PLACE)
SANITARY SEWER/ WATER MAIN CROSSING (SEE SHEET C38 - GENERAL CONSTRUCTION NOTE # 10)
5' E.G.T.CA. EASEMENT
SANITARY SEWER CLEANOUT LOCATION



BENCHMARK BM 32-1
CENTER OF EXISTING MANHOLE
APPROX. 76' SOUTH OF MH 'B-10'
APPROX. 166' WEST OF MH 'B-10'
MH TOP ELEV = 1112.87

NOTE:
EXISTING MANHOLE TOP ADJUSTMENT, WHERE REQUIRED, MUST BE TO FINAL FIELD FINISH GRADE FOR MANHOLES LOCATED IN PAVEMENT OR CONCRETE AND TO 4" ABOVE FINISHED GRADE IF LOCATED OUTSIDE OF OTHER IMPROVEMENTS

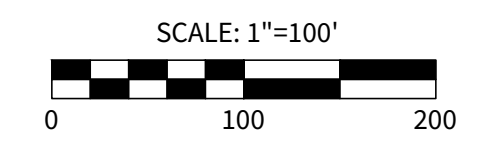
NOTES:

- ALL EXCAVATED MATERIAL SHALL BE PLACED ON THE UPGRADIENT SIDE OF THE SEWER TRENCH THIS ALLOWING THE TRENCH TO INTERCEPT ANY SILT CONTAMINATED RUNOFF.
- ALL SANITARY SEWER PIPE SHALL BE P.V.C. THAT MEETS ASTM SPECIFICATION D-3034, SDR-26 UNLESS OTHERWISE NOTED.
- CONSTRUCTION OF THE SEWER SERVICE LATERALS (WITH A ONE WAY CLEAN-OUT AT THE PROPERTY LINE) SHALL BE THE RESPONSIBILITY OF THE DEVELOPER.
- ALL RESIDENTIAL SEWER SERVICE LATERALS ARE 6" DIA. LATERALS TO BE BUILT TO FRONT UTILITY EASEMENT LINE.
- ALL LATERALS TO BE INSTALLED @ MIN. 2.0% SLOPE, UNLESS OTHERWISE NOTED. LATERALS TO "C" LOTS (SEE MASTER DRAINAGE & GRADING PLAN, SHEET C2) SHALL BE SLOPED FROM THE TEE OR STACK AT 2.0% TO THE PROPERTY LINE.

6. ALL RESIDENTIAL SEWER SERVICE LATERALS SHALL BE CAPPED & SEALED.

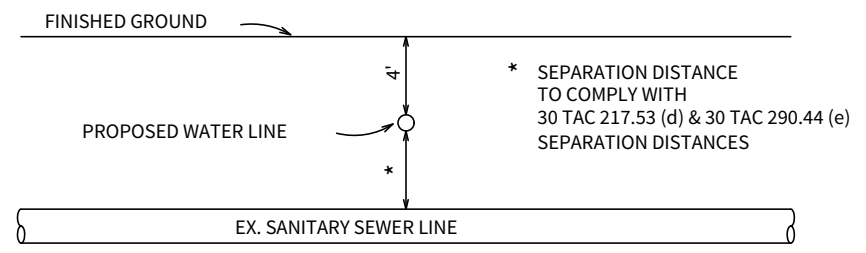
7. THE LOCATIONS AND DEPTHS OF ALL EXISTING UTILITIES, INCLUDING SERVICE LATERALS AND DRAINAGE STRUCTURES SHOWN ON THE PLANS ARE APPROXIMATE ONLY. THE CONTRACTOR SHALL VERIFY THE EXACT LOCATION AND DEPTHS OF UNDERGROUND UTILITIES AT LEAST 48 HOURS PRIOR TO CONSTRUCTION WHETHER SHOWN ON PLANS OR NOT, AND TO PROTECT THE SAME DURING CONSTRUCTION.

SAN ANTONIO WATER SYSTEM 210-233-2010
COSA DRAINAGE 210-207-2800
CITY SIDEWALK AND TRENCHING DIVISION 210-821-3240
COSA TRAFFIC SIGNAL OPERATIONS 210-207-7765
TEXAS STATE WIDE ONE CALL LOCATOR 1-800-545-6005
CITY PUBLIC SERVICE
AT&T
SPECTRUM COMMUNICATIONS
VALERO ENERGY CO.

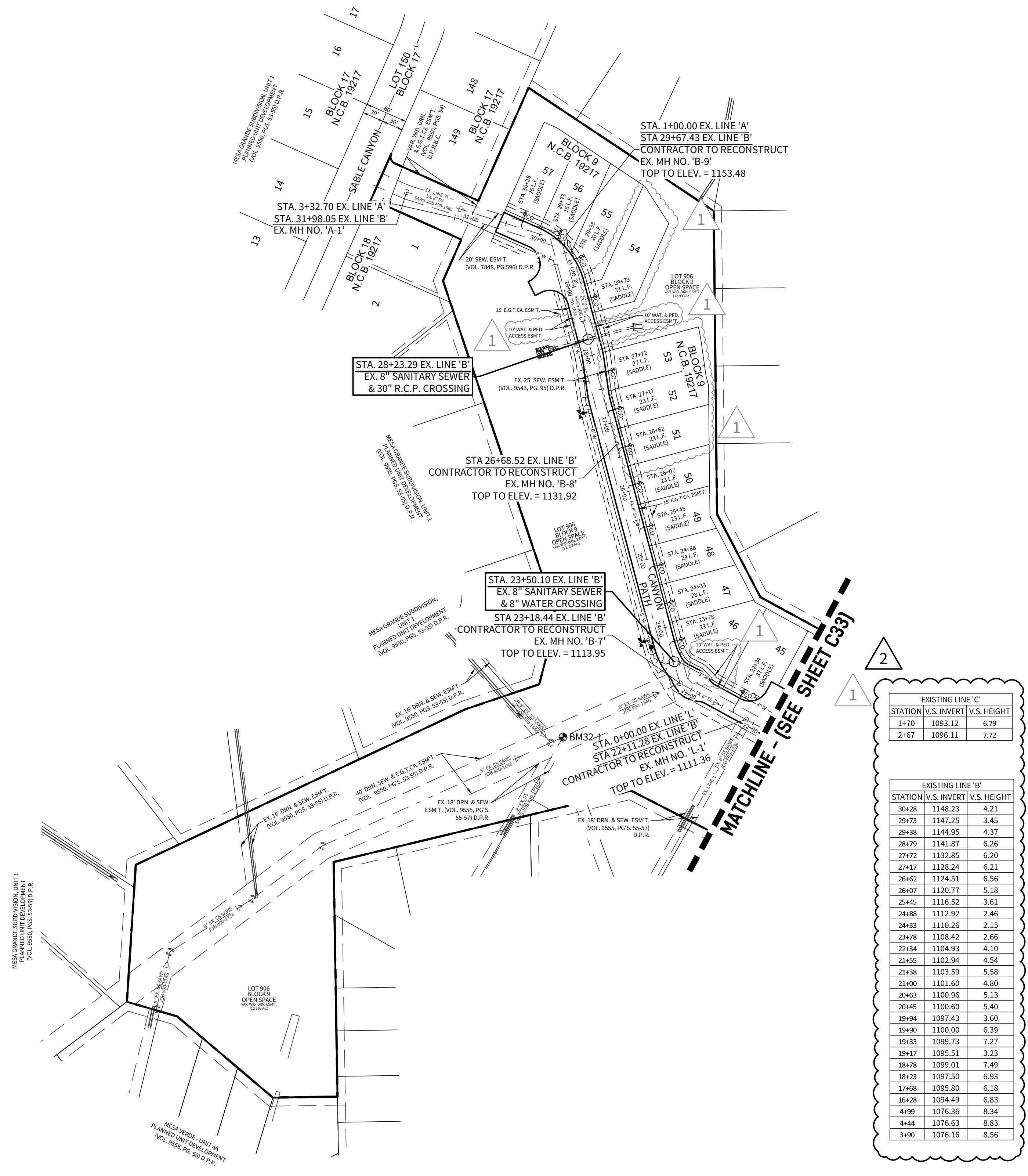


DEVELOPER:
STONE OAK HIDDEN CANYON, LLC
CONTACT PERSON: RAJEEV PURI
6002 CAMP BULLIS ROAD
SAN ANTONIO, TEXAS 78257
TEL: (210) 698-3004
FAX: (210) 698-3014

CAUTION!
CONTRACTOR SHALL BE AWARE THAT EXISTING 8" SEWER RUNS ALONG CANYON PATH, EXISTING 8" SEWER CROSSES RUSTIC HOLLOW, EXISTING 10" SEWER RUNS ALONG RUSTIC HOLLOW, OVERHEAD ELECTRIC EXISTS CROSSING RUSTIC HOLLOW. IT IS THE RESPONSIBILITY OF THE CONTRACTOR TO HAVE THESE UTILITIES LOCATED PRIOR TO COMMENCING CONSTRUCTION. THE CONTRACTOR SHALL USE EXTREME CAUTION WHEN WORKING IN THIS AREA. ANY DAMAGE DONE TO THESE EXISTING FACILITIES WILL BE THE SOLE RESPONSIBILITY OF THE CONTRACTOR TO REPAIR.



TYPICAL SANITARY SEWER/ WATER CROSSING
DETAIL "A" N.T.S.



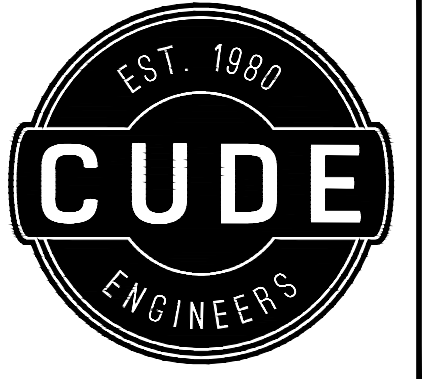
EXISTING LINE 'C'

STATION	V.S. INVERT	V.S. HEIGHT
1+70	1093.12	6.79
2+67	1096.11	7.72

EXISTING LINE 'B'

STATION	V.S. INVERT	V.S. HEIGHT
30+28	1148.23	4.21
29+73	1147.25	3.45
29+38	1144.95	4.37
28+79	1141.87	6.26
27+72	1132.85	6.20
27+17	1128.24	6.21
26+62	1124.51	6.56
26+07	1120.77	5.18
25+45	1116.52	3.61
24+88	1112.92	2.46
24+33	1110.26	2.15
23+78	1108.42	2.66
23+24	1104.93	4.10
21+55	1102.94	4.54
21+38	1103.59	5.58
21+00	1101.60	4.80
20+63	1100.96	5.13
20+45	1100.60	5.40
19+94	1097.43	3.60
19+90	1100.00	6.39
19+83	1099.73	7.27
19+17	1095.51	3.23
18+78	1099.01	7.49
18+23	1097.50	6.93
17+68	1095.80	6.18
16+28	1094.49	6.83
4+99	1076.36	8.34
4+44	1076.63	8.83
3+90	1076.16	8.56

TRENCH EXCAVATION SAFETY PROTECTION
CONTRACTOR AND/OR CONTRACTOR'S INDEPENDENTLY RETAINED EMPLOYEE OR STRUCTURAL DESIGN/GEOTECHNICAL/SAFETY/EQUIPMENT CONSULTANT, IF ANY, SHALL REVIEW THESE PLANS AND AVAILABLE GEOTECHNICAL INFORMATION AND THE ANTICIPATED INSTALLATION SITE(S) WITHIN THE PROJECT WORK AREA IN ORDER TO IMPLEMENT CONTRACTOR'S TRENCH EXCAVATION SAFETY PROTECTION SYSTEMS, PROGRAMS AND/OR PROCEDURES FOR THE PROJECT DESCRIBED IN THE CONTRACT DOCUMENTS. THE CONTRACTOR'S IMPLEMENTATION OF THESE SYSTEMS, PROGRAMS AND/OR PROCEDURES SHALL PROVIDE FOR ADEQUATE TRENCH EXCAVATION SAFETY PROTECTION THAT COMPLY WITH AS A MINIMUM, OSHA STANDARDS FOR TRENCH EXCAVATIONS. SPECIFICALLY, CONTRACTOR AND/OR CONTRACTOR'S INDEPENDENTLY RETAINED EMPLOYEE OR SAFETY CONSULTANT SHALL IMPLEMENT A TRENCH SAFETY PROGRAM IN ACCORDANCE WITH OSHA STANDARDS GOVERNING THE PRESENCE AND ACTIVITIES OF INDIVIDUALS WORKING IN AND AROUND TRENCH EXCAVATION.



4122 Pond Hill Road, Suite 101
San Antonio, Texas 78231
P:(210) 681.2951 F:(210) 523.7112

HIDDEN CANYON SUBDIVISION
UNIT 2A P.U.D.
OVERALL SANITARY SEWER MASTER PLAN

DATE
01/06/2022
PROJECT NO.
P01564.004
DRAWN BY
R.M., A.B.B.
CHECKED BY
W.P.M./J.R.T.

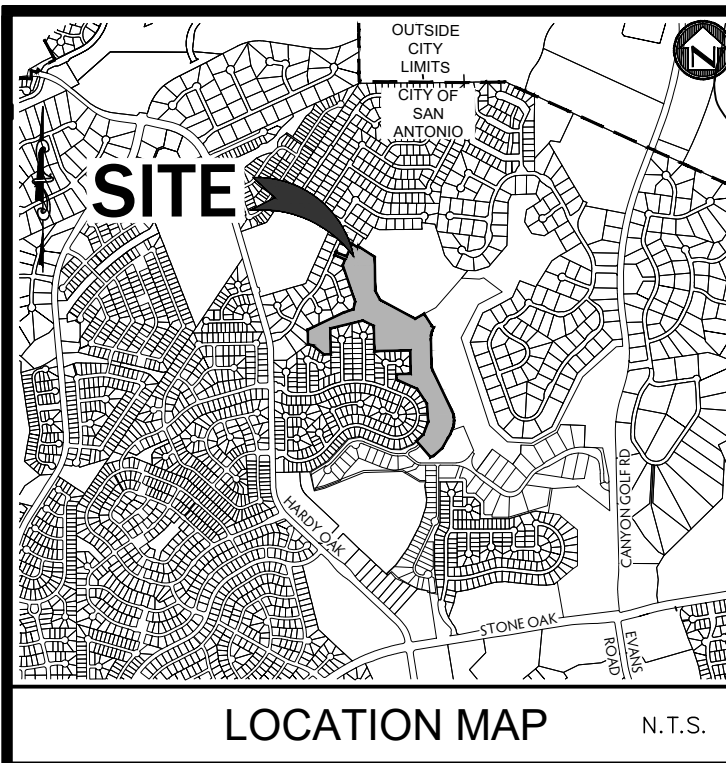
REVISIONS
1. 2022-11-22 - ADDED SEWER LATERALS
2. 2022-05-25 - WATER SERVICES ADJUSTED FOR ELECTRICAL
3. 2022-05-25 - WATER SERVICES ADJUSTED FOR ELECTRICAL
4. 2022-05-25 - WATER SERVICES ADJUSTED FOR ELECTRICAL
5. 2022-05-25 - WATER SERVICES ADJUSTED FOR ELECTRICAL
6. 2022-05-25 - WATER SERVICES ADJUSTED FOR ELECTRICAL
7. 2022-05-25 - WATER SERVICES ADJUSTED FOR ELECTRICAL
8. 2022-05-25 - WATER SERVICES ADJUSTED FOR ELECTRICAL
9. 2022-05-25 - WATER SERVICES ADJUSTED FOR ELECTRICAL



CUDE ENGINEERS
TBPE No. 455

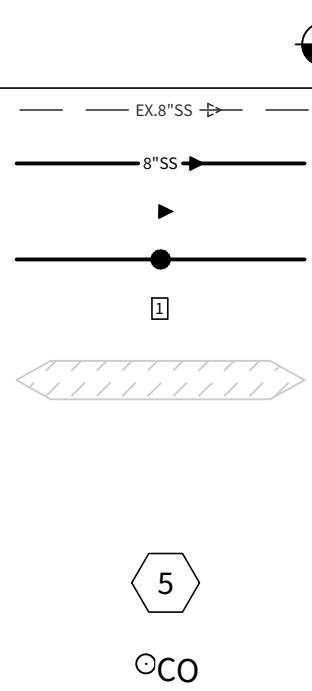
PLAT #
23-11800095
SAWS #
23-1622

C33



LEGEND

- EXISTING SANITARY SEWER
PROPOSED SANITARY SEWER
DIRECTION OF FLOW
SANITARY SEWER MANHOLE
EXISTING SEWER LINE I.D.
SANITARY SEWER MAIN & MANHOLES TO BE ABANDONED PER SAWS ITEM #862 (GROUTED IN PLACE)
SANITARY SEWER/ WATER MAIN CROSSING (SEE SHEET C38 - GENERAL CONSTRUCTION NOTE #10)
5' E.G.T.A. EASEMENT
SANITARY SEWER CLEANOUT LOCATION



BENCHMARK BM 33-1

CENTER OF EXISTING MANHOLE APPROX. 23' SOUTH OF MH 'B-5' APPROX. 112' WEST OF MH 'B-5' MH TOP ELEV = 1103.40

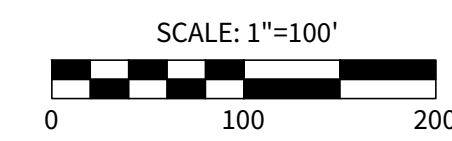
NOTE:

EXISTING MANHOLE TOP ADJUSTMENT, WHERE REQUIRED, MUST BE TO FINAL FIELD FINISH GRADE FOR MANHOLES LOCATED IN PAVEMENT OR CONCRETE AND TO 4" ABOVE FINISHED GRADE IF LOCATED OUTSIDE OF OTHER IMPROVEMENTS

NOTES:

- 1. ALL EXCAVATED MATERIAL SHALL BE PLACED ON THE UPGRADIENT SIDE OF THE SEWER TRENCH...
2. ALL SANITARY SEWER PIPE SHALL BE P.V.C. THAT MEETS ASTM SPECIFICATION D-3034, SDR-26 UNLESS OTHERWISE NOTED.
3. CONSTRUCTION OF THE SEWER SERVICE LATERALS (WITH A ONE WAY CLEAN-OUT AT THE PROPERTY LINE) SHALL BE THE RESPONSIBILITY OF THE DEVELOPER.
4. ALL RESIDENTIAL SEWER SERVICE LATERALS ARE 6" DIA. LATERALS TO BE BUILT TO FRONT UTILITY EASEMENT LINE.
5. ALL LATERALS TO BE INSTALLED @ MIN. 2.0% SLOPE, UNLESS OTHERWISE NOTED. LATERALS TO "C" LOTS (SEE MASTER DRAINAGE & GRADING PLAN, SHEET C2) SHALL BE SLOPED FROM THE TEE OR STACK AT 2.0% TO THE PROPERTY LINE.

- 6. ALL RESIDENTIAL SEWER SERVICE LATERALS SHALL BE CAPPED & SEALED.
7. THE LOCATIONS AND DEPTHS OF ALL EXISTING UTILITIES, INCLUDING SERVICE LATERALS AND DRAINAGE STRUCTURES SHOWN ON THE PLANS ARE APPROXIMATE ONLY. THE CONTRACTOR SHALL VERIFY THE EXACT LOCATION AND DEPTHS OF UNDERGROUND UTILITIES AT LEAST 48 HOURS PRIOR TO CONSTRUCTION...
SAN ANTONIO WATER SYSTEM 210-233-2010
COSA DRAINAGE 210-207-2800
CITY SIDEWALK AND TRENCHING DIVISION 210-821-3240
COSA TRAFFIC SIGNAL OPERATIONS 210-207-7765
TEXAS STATE WIDE ONE CALL LOCATOR 1-800-545-6005
CITY PUBLIC SERVICE
AT&T
SPECTRUM COMMUNICATIONS
VALERO ENERGY CO.

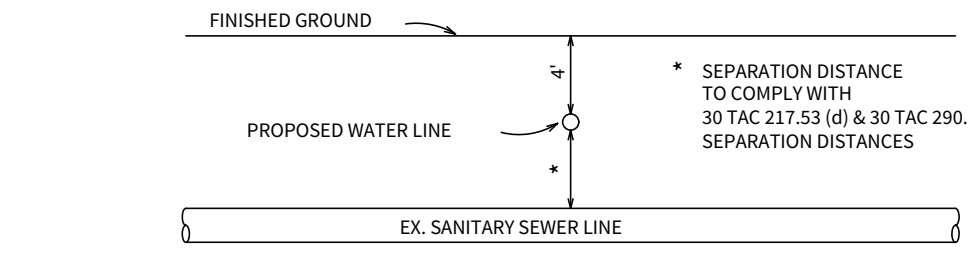


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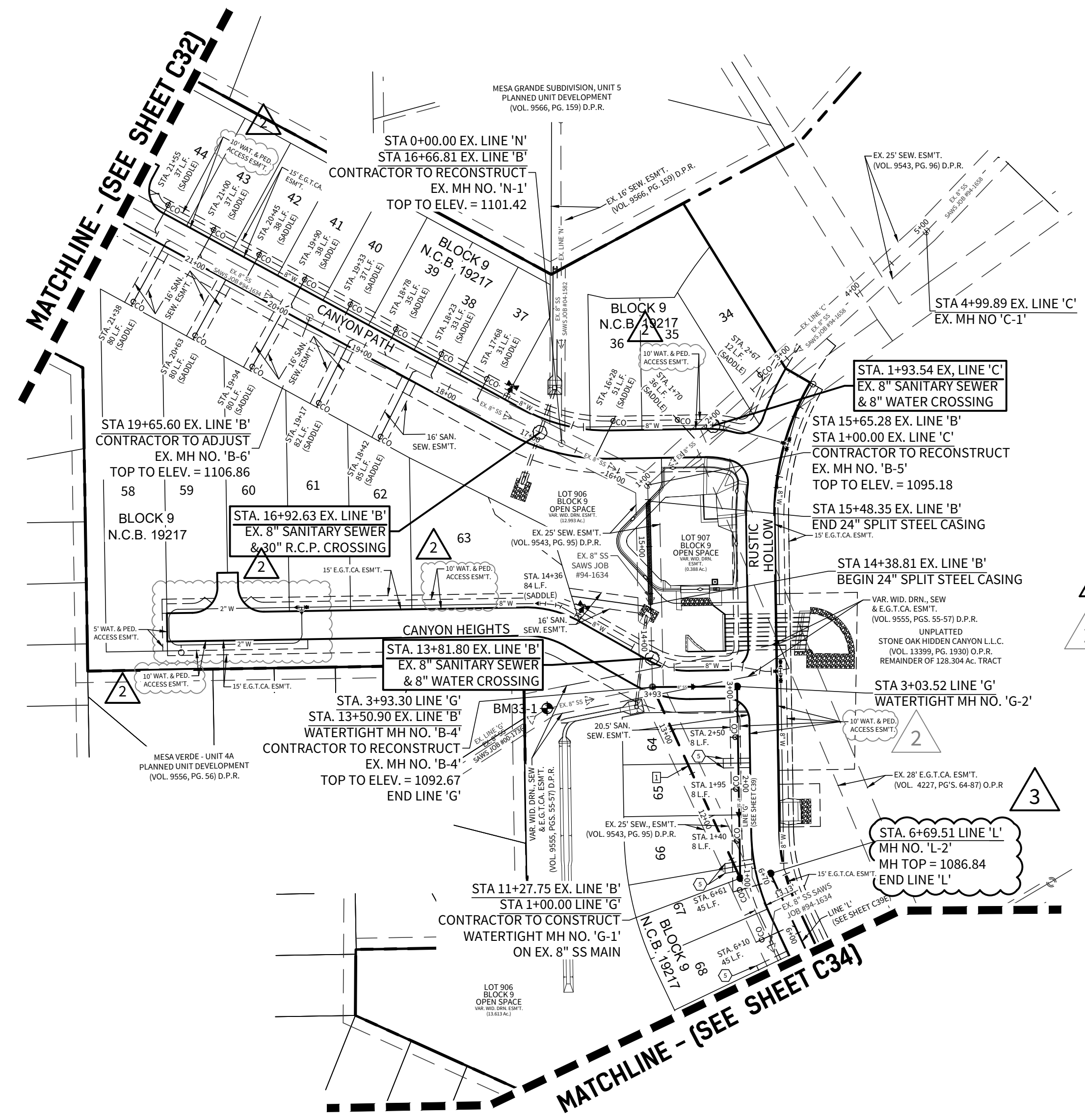
Table with 2 columns: ABANDONED SANITARY SEWER, L.F.
Total: 223.15

SANITARY SEWER TO BE ABANDONED

CAUTION!
CONTRACTOR SHALL BE AWARE THAT EXISTING 8" SEWER RUNS ALONG CANYON PATH, EXISTING 8" SEWER CROSSES RUSTIC HOLLOW, EXISTING 10" SEWER RUNS ALONG RUSTIC HOLLOW, OVERHEAD ELECTRIC EXISTS CROSSING RUSTIC HOLLOW... IT IS THE RESPONSIBILITY OF THE CONTRACTOR TO HAVE THESE UTILITIES LOCATED PRIOR TO COMMENCING CONSTRUCTION...



TYPICAL SANITARY SEWER/ WATER CROSSING DETAIL "A" N.T.S.



EXISTING LINE 'C'
STATION V.S. INVERT V.S. HEIGHT
Table with 3 columns: Station, Invert, Height

EXISTING LINE 'B'
STATION V.S. INVERT V.S. HEIGHT
Table with 3 columns: Station, Invert, Height

TRENCH EXCAVATION SAFETY PROTECTION

CONTRACTOR AND/OR CONTRACTOR'S INDEPENDENTLY RETAINED EMPLOYEE OR STRUCTURAL DESIGN/GEOTECHNICAL/SAFETY/EQUIPMENT CONSULTANT, IF ANY, SHALL REVIEW THESE PLANS AND AVAILABLE GEOTECHNICAL INFORMATION AND THE ANTICIPATED INSTALLATION SITE(S) WITHIN THE PROJECT WORK AREA IN ORDER TO IMPLEMENT CONTRACTOR'S TRENCH EXCAVATION SAFETY PROTECTION SYSTEMS, PROGRAMS AND/OR PROCEDURES FOR THE PROJECT DESCRIBED IN THE CONTRACT DOCUMENTS...

SAWS GENERAL NOTES:

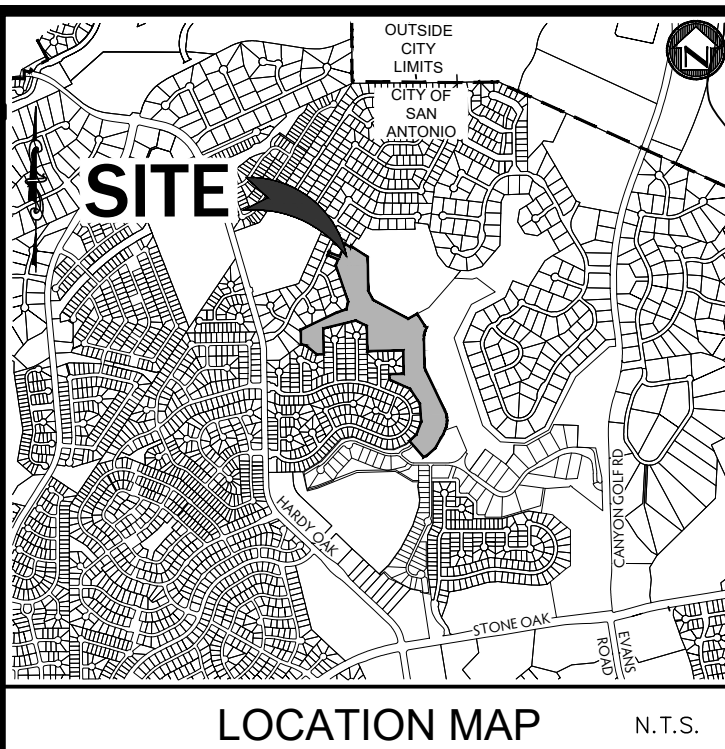
- 1. ALL MATERIALS AND CONSTRUCTION PROCEDURES WITHIN THE SCOPE OF THIS CONTRACT SHALL BE APPROVED BY THE SAN ANTONIO WATER SYSTEM (SAWS) AND COMPLY WITH THE PLANS, SPECIFICATIONS, GENERAL CONDITIONS AND WITH THE FOLLOWING AS APPLICABLE:
A. CURRENT TEXAS COMMISSION ON ENVIRONMENTAL QUALITY (TCEQ) "DESIGN CRITERIA FOR DOMESTIC WASTEWATER SYSTEM", TEXAS ADMINISTRATIVE CODE (TAC) TITLE 30 PART 1 CHAPTER 217 AND "PUBLIC DRINKING WATER", TAC TITLE 30 PART 1 CHAPTER 290.
B. CURRENT TXDOT "STANDARD SPECIFICATIONS FOR CONSTRUCTION OF HIGHWAYS, STREETS AND DRAINAGE".
C. CURRENT "SAN ANTONIO WATER SYSTEM STANDARD SPECIFICATIONS FOR WATER AND SANITARY SEWER CONSTRUCTION".
D. CURRENT CITY OF SAN ANTONIO "STANDARD SPECIFICATIONS FOR PUBLIC WORKS CONSTRUCTION".
E. CURRENT CITY OF SAN ANTONIO "UTILITY EXCAVATION CRITERIA MANUAL" (UECM).
2. THE CONTRACTOR SHALL NOT PROCEED WITH ANY PIPE INSTALLATION WORK UNTIL THEY OBTAIN A COPY OF THE APPROVED COUNTER PERMIT OR GENERAL CONSTRUCTION PERMIT (GCP) FROM THE CONSULTANT AND HAS BEEN NOTIFIED BY SAWS CONSTRUCTION INSPECTION DIVISION TO PROCEED WITH THE WORK AND HAS ARRANGED A MEETING WITH THE INSPECTOR AND CONSULTANT FOR THE WORK REQUIREMENTS...
3. THE CONTRACTOR SHALL OBTAIN THE SAWS STANDARD DETAILS FROM THE SAWS WEBSITE, HTTP://WWW.SAWS.ORG/BUSINESS_CENTER/SPECS. UNLESS OTHERWISE NOTED WITHIN THE DESIGN PLANS.
4. THE CONTRACTOR IS TO MAKE ARRANGEMENTS WITH THE SAWS CONSTRUCTION INSPECTION DIVISION AT 210-233-2973, ON NOTIFICATION PROCEDURES THAT WILL BE USED TO NOTIFY AFFECTED HOME RESIDENTS AND/OR PROPERTY OWNERS 48 HOURS PRIOR TO BEGINNING ANY WORK.
5. LOCATION AND DEPTH OF EXISTING UTILITIES AND SERVICE LATERALS SHOWN ON THE PLANS ARE UNDERSTOOD TO BE APPROXIMATE. ACTUAL LOCATIONS AND DEPTHS MUST BE FIELD VERIFIED BY THE CONTRACTOR AT LEAST 1 WEEK PRIOR TO CONSTRUCTION...
6. THE CONTRACTOR SHALL VERIFY THE EXACT LOCATION OF UNDERGROUND UTILITIES AND DRAINAGE STRUCTURES AT LEAST 1-2 WEEKS PRIOR TO CONSTRUCTION...
7. THE CONTRACTOR SHALL BE RESPONSIBLE FOR RESTORING EXISTING FENCES, CURBS, STREETS, DRIVEWAYS, SIDEWALKS, LANDSCAPING AND STRUCTURES TO ITS ORIGINAL OR BETTER CONDITION IF DAMAGES ARE MADE AS A RESULT OF THE PROJECT'S CONSTRUCTION.
8. ALL WORK IN TEXAS DEPARTMENT OF TRANSPORTATION (TXDOT) AND/OR BEXAR COUNTY RIGHT-OF-WAY SHALL BE DONE IN ACCORDANCE WITH RESPECTIVE CONSTRUCTION SPECIFICATIONS AND PERMIT REQUIREMENTS.
9. THE CONTRACTOR SHALL COMPLY WITH CITY OF SAN ANTONIO OR OTHER GOVERNING MUNICIPALITY'S TREE ORDINANCES WHEN EXCAVATING NEAR TREES.
10. THE CONTRACTOR SHALL NOT PLACE ANY WASTE MATERIALS IN THE 100-YEAR FLOOD PLAIN WITHOUT FIRST OBTAINING AN APPROVED FLOOD PLAIN PERMIT.
11. HOLIDAY WORK: CONTRACTORS WILL NOT BE ALLOWED TO PERFORM SAWS WORK ON SAWS RECOGNIZED HOLIDAYS. REQUEST SHOULD BE SENT TO CONSTRUCTION@SAWS.ORG. WEEKEND WORK: CONTRACTORS ARE REQUIRED TO NOTIFY THE SAWS INSPECTION CONSTRUCTION DEPARTMENT 48 HOURS IN ADVANCE TO REQUEST WEEKEND WORK...
12. COMPACTION NOTE (ITEM 804): THE CONTRACTOR SHALL BE RESPONSIBLE FOR MEETING THE COMPACTION REQUIREMENTS ON ALL TRENCH BACKFILL AND FOR PAYING FOR THE TESTS PERFORMED BY A THIRD PARTY...
13. A COPY OF ALL TESTING REPORTS SHALL BE FORWARDED TO SAWS CONSTRUCTION INSPECTION DIVISION.

SAWS SEWER NOTES:

- 1. THE CONTRACTOR IS RESPONSIBLE FOR ENSURING THAT NO SANITARY SEWER OVERFLOW (SSO) OCCURS AS A RESULT OF THEIR WORK. ALL CONTRACTOR PERSONNEL RESPONSIBLE FOR SSO PREVENTION AND CONTROL SHALL BE TRAINED ON PROPER RESPONSE SHOULD AN SSO OCCUR...
A. IDENTIFY THE SOURCE OF THE SSO AND NOTIFY SAWS EMERGENCY OPERATIONS CENTER (EOC) IMMEDIATELY AT (210) 233-2014. PROVIDE THE ADDRESS OF THE SPILL AND AN ESTIMATED VOLUME OR FLOW.
B. ATTEMPT TO ELIMINATE THE SOURCE OF THE SSO.
C. CONTAIN SEWAGE FROM THE SSO TO THE EXTENT OF PREVENTING A POSSIBLE CONTAMINATION OF WATERWAYS.
D. CLEAN UP SPILL SITE (RETURN CONTAINED SEWAGE TO THE COLLECTION SYSTEM IF POSSIBLE) AND PROPERLY DISPOSE OF CONTAMINATED SOIL/MATERIALS.
E. CLEAN THE AFFECTED SEWER MAINS AND REMOVE ANY DEBRIS.
F. MEET ALL POST-SSO REQUIREMENTS AS PER THE EPA CONSENT DECREE, INCLUDING LINE CLEANING AND TELEVISIONING THE AFFECTED SEWER MAINS (AT SAWS DIRECTION) WITHIN 24 HOURS.
2. IF BYPASS PUMPING IS REQUIRED, THE CONTRACTOR SHALL PERFORM SUCH WORK IN ACCORDANCE WITH SAWS STANDARD SPECIFICATION FOR WATER AND SANITARY SEWER CONSTRUCTION, ITEM NO. 864, "BYPASS PUMPING".
3. PRIOR TO TIE-INS, ANY SHUTDOWNS OF EXISTING FORCE MAINS OF ANY SIZE MUST BE COORDINATED WITH THE SAWS CONSTRUCTION INSPECTION DIVISION AT (210) 233-2973 AT LEAST ONE WEEK IN ADVANCE OF THE SHUTDOWN...
4. SEWER PIPE WHERE WATER LINE CROSSES SHALL BE 160 PSI AND MEET THE REQUIREMENTS OF ASTM D2241, TAC 217.53 AND TCEQ 290-44(E)(4)(B). CONTRACTOR SHALL CENTER A 20" JOINT OF 160 PSI PRESSURE RATED PVC AT THE PROPOSED WATER CROSSING.
5. ELEVATIONS POSTED FOR TOP OF MANHOLES ARE FOR REFERENCE ONLY: IT SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR TO MAKE ALLOWANCES AND ADJUSTMENTS FOR TOP OF MANHOLES TO MATCH THE FINISHED GRADE OF THE PROJECT'S IMPROVEMENTS. (NSPI)
6. SPILLS, OVERFLOWS, OR DISCHARGES OF WASTEWATER: ALL SPILLS, OVERFLOWS, OR DISCHARGES OF WASTEWATER, RECYCLED WATER, PETROLEUM PRODUCTS, OR CHEMICALS MUST BE REPORTED IMMEDIATELY TO THE SAWS INSPECTOR ASSIGNED TO THE COUNTER PERMIT OR GENERAL CONSTRUCTION PERMIT (GCP). THIS REQUIREMENT APPLIES TO EVERY SPILL, OVERFLOW, OR DISCHARGE REGARDLESS OF SIZE.
7. MANHOLE AND ALL PIPE TESTING (INCLUDING THE TV INSPECTION) MUST BE PERFORMED AND PASSED PRIOR TO FINAL FIELD ACCEPTANCE BY SAWS CONSTRUCTION INSPECTION DIVISION, AS PER THE SAWS SPECIFICATIONS FOR WATER AND SANITARY SEWER CONSTRUCTION.
8. ALL PVC PIPE OVER 14 FEET OF COVER SHALL BE EXTRA STRENGTH WITH MINIMUM PIPE STIFFNESS OF 115 PSI

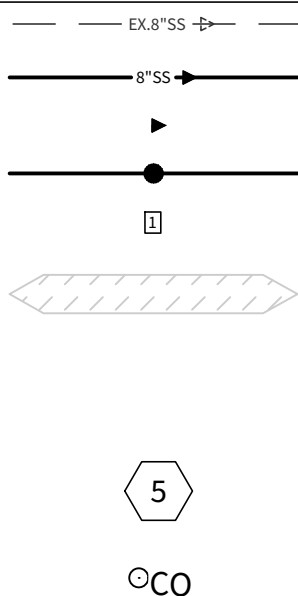
SEWER: UPPER - EAST SEWERSHED - DOS RIOS / LEON CREEK

Developer's Name: STONE OAK HIDDEN CANYON, L.L.C.
Developer's Address: 6002 CAMP BULLIS ROAD
City: SAN ANTONIO State: TEXAS Zip: 78257
Phone #: (210) 698-3004 Fax #: (210) 698-3014
SAWS Block Map #: 162860 Total EDU's: 52 Total Acreage: 29.067 Ac.
Total Linear Footage of Pipe: 1,231.93 L.F. OF 8" Plot No.: 23-11800095
Number of Lots: 52 SAWS Job No.: 23-1622



LEGEND

- EXISTING SANITARY SEWER
- PROPOSED SANITARY SEWER
- DIRECTION OF FLOW
- SANITARY SEWER MANHOLE
- EXISTING SEWER LINE I.D.
- SANITARY SEWER MAIN & MANHOLES TO BE ABANDONED PER SAWS ITEM #862 (GROUTED IN PLACE)
- SANITARY SEWER/ WATER MAIN CROSSING (SEE SHEET C38 - GENERAL CONSTRUCTION NOTE #10)
- 5' E.G.T.C.A. EASEMENT
- SANITARY SEWER CLEANOUT LOCATION



BENCHMARK BM 34-1
CENTER OF EXISTING MANHOLE
MH 'B'-2'
MH TOP ELEV = 1070.00

NOTE:

EXISTING MANHOLE TOP ADJUSTMENT, WHERE REQUIRED, MUST BE TO FINAL FIELD FINISH GRADE FOR MANHOLES LOCATED IN PAVEMENT OR CONCRETE AND TO 4" ABOVE FINISHED GRADE IF LOCATED OUTSIDE OF OTHER IMPROVEMENTS

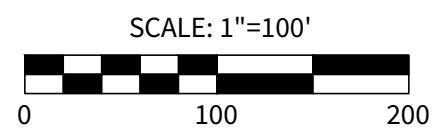
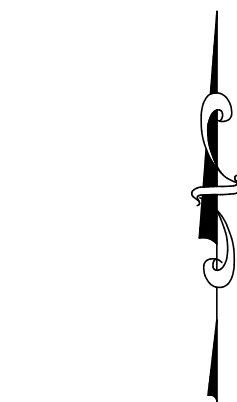
NOTES:

1. ALL EXCAVATED MATERIAL SHALL BE PLACED ON THE UPGRADIENT SIDE OF THE SEWER TRENCH THUS ALLOWING THE TRENCH TO INTERCEPT ANY SILT CONTAMINATED RUNOFF.
2. ALL SANITARY SEWER PIPE SHALL BE P.V.C. THAT MEETS ASTM SPECIFICATION D-3034, SDR-26 UNLESS OTHERWISE NOTED.
3. CONSTRUCTION OF THE SEWER SERVICE LATERALS (WITH A ONE WAY CLEAN-OUT AT THE PROPERTY LINE) SHALL BE THE RESPONSIBILITY OF THE DEVELOPER.
4. ALL RESIDENTIAL SEWER SERVICE LATERALS ARE 6" DIA. LATERALS TO BE BUILT TO FRONT UTILITY EASEMENT LINE.
5. ALL LATERALS TO BE INSTALLED @ MIN. 2.0% SLOPE, UNLESS OTHERWISE NOTED. LATERALS TO "C" LOTS (SEE MASTER DRAINAGE & GRADING PLAN, SHEET C2) SHALL BE SLOPED FROM THE TEE OR STACK AT 2.0% TO THE PROPERTY LINE.

6. ALL RESIDENTIAL SEWER SERVICE LATERALS SHALL BE CAPPED & SEALED.
7. THE LOCATIONS AND DEPTHS OF ALL EXISTING UTILITIES, INCLUDING SERVICE LATERALS AND DRAINAGE STRUCTURES SHOWN ON THE PLANS ARE APPROXIMATE ONLY. THE CONTRACTOR SHALL VERIFY THE EXACT LOCATION AND DEPTHS OF UNDERGROUND UTILITIES AT LEAST 48 HOURS PRIOR TO CONSTRUCTION WHETHER SHOWN ON PLANS OR NOT, AND TO PROTECT THE SAME DURING CONSTRUCTION.

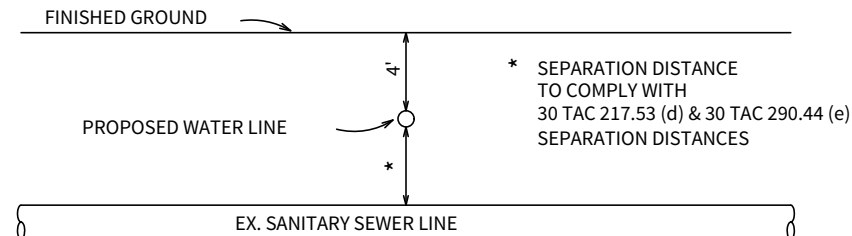
SAN ANTONIO WATER SYSTEM
 COSA DRAINAGE
 CITY SIDEWALK AND TRENCHING DIVISION
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 TEXAS STATE WIDE ONE CALL LOCATOR
 CITY PUBLIC SERVICE
 AT&T
 SPECTRUM COMMUNICATIONS
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210-233-2010
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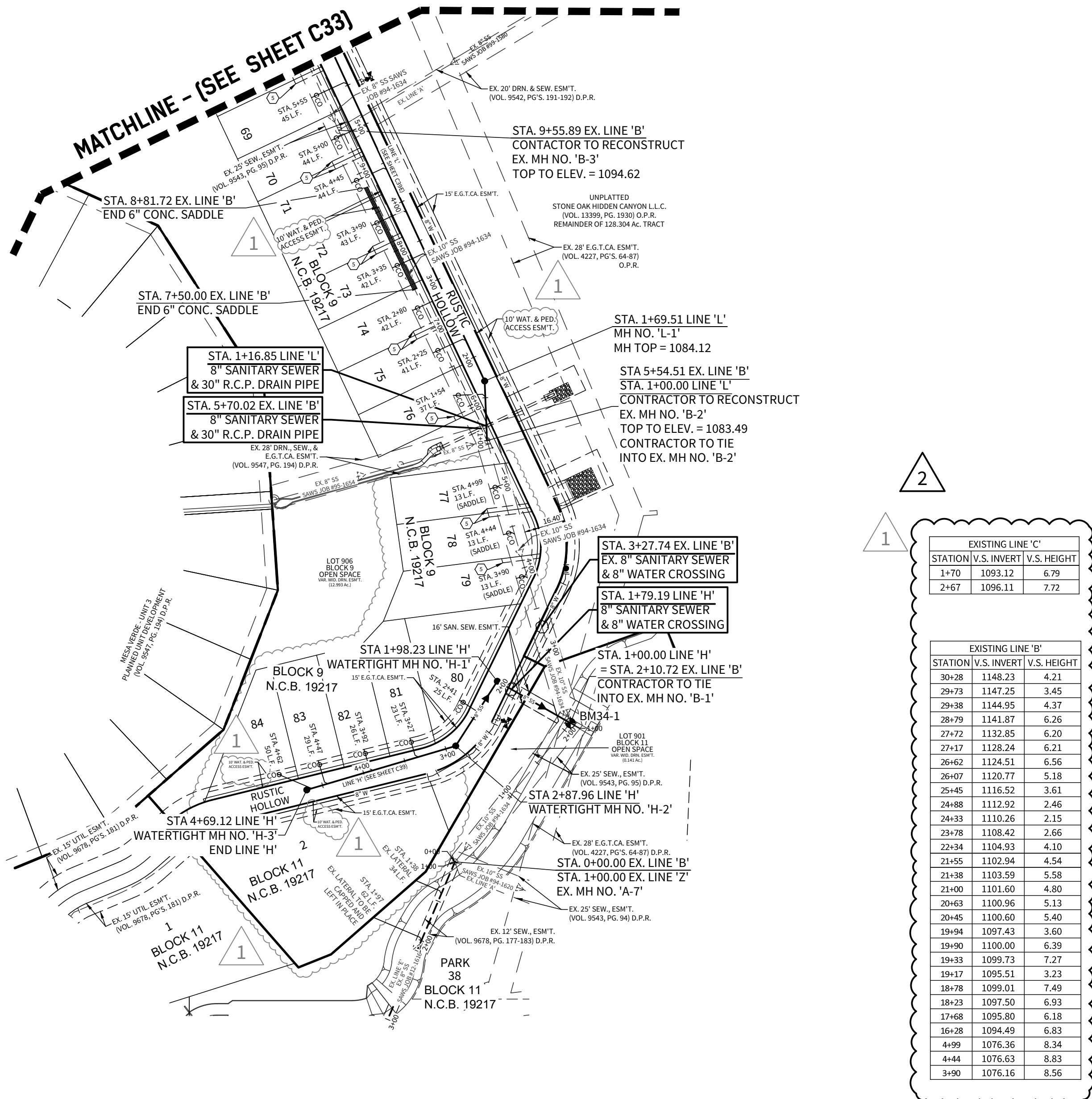


DEVELOPER:
 STONE OAK HIDDEN CANYON, LLC
 CONTACT PERSON: RAJEEV PURI
 6002 CAMP BULLIS ROAD
 SAN ANTONIO, TEXAS 78257
 TEL: (210) 698-3004
 FAX: (210) 698-3014

CAUTION!
 CONTRACTOR SHALL BE AWARE THAT EXISTING 8" SEWER RUNS ALONG CANYON PATH, EXISTING 8" SEWER CROSSES RUSTIC HOLLOW, EXISTING 10" SEWER RUNS ALONG RUSTIC HOLLOW, OVERHEAD ELECTRIC EXISTS CROSSING RUSTIC HOLLOW. IT IS THE RESPONSIBILITY OF THE CONTRACTOR TO HAVE THESE UTILITIES LOCATED PRIOR TO COMMENCING CONSTRUCTION. THE CONTRACTOR SHALL USE EXTREME CAUTION WHEN WORKING IN THIS AREA. ANY DAMAGE DONE TO THESE EXISTING FACILITIES WILL BE THE SOLE RESPONSIBILITY OF THE CONTRACTOR TO REPAIR.



TYPICAL SANITARY SEWER/ WATER CROSSING DETAIL "A" N.T.S.



SAWS GENERAL NOTES:

1. ALL MATERIALS AND CONSTRUCTION PROCEDURES WITHIN THE SCOPE OF THIS CONTRACT SHALL BE APPROVED BY THE SAN ANTONIO WATER SYSTEM (SAWS) AND COMPLY WITH THE PLANS, SPECIFICATIONS, GENERAL CONDITIONS AND WITH THE FOLLOWING AS APPLICABLE:
 - A. CURRENT TEXAS COMMISSION ON ENVIRONMENTAL QUALITY (TCEQ) "DESIGN CRITERIA FOR DOMESTIC WASTEWATER SYSTEM", TEXAS ADMINISTRATIVE CODE (TAC) TITLE 30 PART 1 CHAPTER 217 AND "PUBLIC DRINKING WATER", TAC TITLE 30 PART 1 CHAPTER 290.
 - B. CURRENT TXDOT "STANDARD SPECIFICATIONS FOR CONSTRUCTION OF HIGHWAYS, STREETS AND DRAINAGE".
 - C. CURRENT "SAN ANTONIO WATER SYSTEM STANDARD SPECIFICATIONS FOR WATER AND SANITARY SEWER CONSTRUCTION".
 - D. CURRENT CITY OF SAN ANTONIO "STANDARD SPECIFICATIONS FOR PUBLIC WORKS CONSTRUCTION".
 - E. CURRENT CITY OF SAN ANTONIO "UTILITY EXCAVATION CRITERIA MANUAL" (UECM).
2. THE CONTRACTOR SHALL NOT PROCEED WITH ANY PIPE INSTALLATION WORK UNTIL THEY OBTAIN A COPY OF THE APPROVED COUNTER PERMIT OR GENERAL CONSTRUCTION PERMIT (GCP) FROM THE CONSULTANT AND HAS BEEN NOTIFIED BY SAWS CONSTRUCTION INSPECTION DIVISION TO PROCEED WITH THE WORK AND HAS ARRANGED A MEETING WITH THE INSPECTOR AND CONSULTANT FOR THE WORK REQUIREMENTS. WORK COMPLETED BY THE CONTRACTOR WITHOUT AN APPROVED COUNTER PERMIT AND/OR A GCP WILL BE SUBJECT TO REMOVAL AND REPLACEMENT AT THE EXPENSE OF THE CONTRACTORS AND/OR THE DEVELOPER.
3. THE CONTRACTOR SHALL OBTAIN THE SAWS STANDARD DETAILS FROM THE SAWS WEBSITE, [HTTP://WWW.SAWS.ORG/BUSINESS_CENTER/SPECS](http://www.saws.org/business_center/specs). UNLESS OTHERWISE NOTED WITHIN THE DESIGN PLANS.
4. THE CONTRACTOR IS TO MAKE ARRANGEMENTS WITH THE SAWS CONSTRUCTION INSPECTION DIVISION AT 210-233-2973, ON NOTIFICATION PROCEDURES THAT WILL BE USED TO NOTIFY AFFECTED HOME RESIDENTS AND/OR PROPERTY OWNERS 48 HOURS PRIOR TO BEGINNING ANY WORK.
5. LOCATION AND DEPTH OF EXISTING UTILITIES AND SERVICE LATERALS SHOWN ON THE PLANS ARE UNDERSTOOD TO BE APPROXIMATE. ACTUAL LOCATIONS AND DEPTHS MUST BE FIELD VERIFIED BY THE CONTRACTOR AT LEAST 1 WEEK PRIOR TO CONSTRUCTION. IT SHALL BE THE CONTRACTOR'S RESPONSIBILITY TO LOCATE UTILITY SERVICE LINES AS REQUIRED FOR CONSTRUCTION AND TO PROTECT THEM DURING CONSTRUCTION AT NO COST TO SAWS.
6. THE CONTRACTOR SHALL VERIFY THE EXACT LOCATION OF UNDERGROUND UTILITIES AND DRAINAGE STRUCTURES AT LEAST 1-2 WEEKS PRIOR TO CONSTRUCTION WHETHER SHOWN ON PLANS OR NOT. PLEASE ALLOW UP TO 7 BUSINESS DAYS FOR LOCATES REQUESTING PIPE LOCATION MARKERS ON SAWS FACILITIES. THE FOLLOWING CONTACT INFORMATION IS SUPPLIED FOR VERIFICATION PURPOSES:

SAWS UTILITY LOCATES: COSA DRAINAGE COSA TRAFFIC SIGNAL OPERATIONS COSA TRAFFIC SIGNAL DAMAGES TEXAS STATE WIDE ONE CALL LOCATOR	HTTP://WWW.SAWS.ORG/SERVICE/LOCATES (210) 207-0724 OR (210) 207-6026 (210) 206-8480 (210) 207-3951 1-800-545-6005 OR 811
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7. THE CONTRACTOR SHALL BE RESPONSIBLE FOR RESTORING EXISTING FENCES, CURBS, STREETS, DRIVEWAYS, SIDEWALKS, LANDSCAPING AND STRUCTURES TO ITS ORIGINAL OR BETTER CONDITION IF DAMAGES ARE MADE AS A RESULT OF THE PROJECT'S CONSTRUCTION.
8. ALL WORK IN TEXAS DEPARTMENT OF TRANSPORTATION (TXDOT) AND/OR BEXAR COUNTY RIGHT-OF-WAY SHALL BE DONE IN ACCORDANCE WITH RESPECTIVE CONSTRUCTION SPECIFICATIONS AND PERMIT REQUIREMENTS.
9. THE CONTRACTOR SHALL COMPLY WITH CITY OF SAN ANTONIO OR OTHER GOVERNING MUNICIPALITY'S TREE ORDINANCES WHEN EXCAVATING NEAR TREES.
10. THE CONTRACTOR SHALL NOT PLACE ANY WASTE MATERIALS IN THE 100-YEAR FLOOD PLAIN WITHOUT FIRST OBTAINING AN APPROVED FLOOD PLAIN PERMIT.
11. HOLIDAY WORK: CONTRACTORS WILL NOT BE ALLOWED TO PERFORM SAWS WORK ON SAWS RECOGNIZED HOLIDAYS. REQUEST SHOULD BE SENT TO CONSTRWKRQ@SAWS.ORG. WEEKEND WORK: CONTRACTORS ARE REQUIRED TO NOTIFY THE SAWS INSPECTION CONSTRUCTION DEPARTMENT 48 HOURS IN ADVANCE TO REQUEST WEEKEND WORK. REQUEST SHOULD BE SENT TO CONSTRWKRQ@SAWS.ORG. ANY AND ALL SAWS UTILITY WORK INSTALLED WITHOUT HOLIDAY/WEEKEND APPROVAL WILL BE SUBJECT TO BE UNCOVERED FOR PROPER INSPECTION.
12. COMPACTION NOTE (ITEM 804): THE CONTRACTOR SHALL BE RESPONSIBLE FOR MEETING THE COMPACTION REQUIREMENTS ON ALL TRENCH BACKFILL AND FOR PAYING FOR THE TESTS PERFORMED BY A THIRD PARTY. COMPACTION TESTS WILL BE DONE AT ONE LOCATION POINT RANDOMLY SELECTED, OR AS INDICATED BY THE SAWS INSPECTOR AND/OR THE TEST ADMINISTRATOR, PER EACH 12-INCH LOOSE LIFT PER 400 LINEAR FEET AT A MINIMUM. THIS PROJECT WILL NOT BE ACCEPTED AND FINALIZED BY SAWS WITHOUT THIS REQUIREMENT BEING MET AND VERIFIED BY PROVIDING ALL NECESSARY DOCUMENTED TEST RESULTS.
13. A COPY OF ALL TESTING REPORTS SHALL BE FORWARDED TO SAWS CONSTRUCTION INSPECTION DIVISION.

SAWS SEWER NOTES:

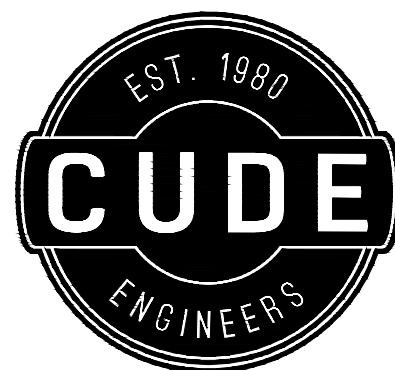
1. THE CONTRACTOR IS RESPONSIBLE FOR ENSURING THAT NO SANITARY SEWER OVERFLOW (SSO) OCCURS AS A RESULT OF THEIR WORK. ALL CONTRACTOR PERSONNEL RESPONSIBLE FOR SSO PREVENTION AND CONTROL SHALL BE TRAINED ON PROPER RESPONSE. SHOULD AN SSO OCCUR, THE CONTRACTOR SHALL:
 - A. IDENTIFY THE SOURCE OF THE SSO AND NOTIFY SAWS EMERGENCY OPERATIONS CENTER (EOC) IMMEDIATELY AT (210) 233-2014. PROVIDE THE ADDRESS OF THE SPILL AND AN ESTIMATED VOLUME OR FLOW.
 - B. ATTEMPT TO ELIMINATE THE SOURCE OF THE SSO.
 - C. CONTAIN SEWAGE FROM THE SSO TO THE EXTENT OF PREVENTING A POSSIBLE CONTAMINATION OF WATERWAYS.
 - D. CLEAN UP SPILL SITE (RETURN CONTAINED SEWAGE TO THE COLLECTION SYSTEM IF POSSIBLE) AND PROPERLY DISPOSE OF CONTAMINATED SOIL/MATERIALS.
 - E. CLEAN THE AFFECTED SEWER MAINS AND REMOVE ANY DEBRIS.
 - F. MEET ALL POST-SSO REQUIREMENTS AS PER THE EPA CONSENT DECREE, INCLUDING LINE CLEANING AND TELEVISIONING THE AFFECTED SEWER MAINS (AT SAWS DIRECTION) WITHIN 24 HOURS.
2. SHOULD THE CONTRACTOR FAIL TO ADDRESS AN SSO IMMEDIATELY AND TO SAWS SATISFACTION, THEY WILL BE RESPONSIBLE FOR ALL COSTS INCURRED BY SAWS, INCLUDING ANY FINES FROM EPA, TCEQ AND/OR ANY OTHER FEDERAL, STATE OR LOCAL AGENCIES.
- NO SEPARATE MEASUREMENT OR PAYMENT SHALL BE MADE FOR THIS WORK. ALL WORK SHALL BE DONE ACCORDING TO GUIDELINES SET BY THE TCEQ AND SAWS.
3. IF BYPASS PUMPING IS REQUIRED, THE CONTRACTOR SHALL PERFORM SUCH WORK IN ACCORDANCE WITH SAWS STANDARD SPECIFICATION FOR WATER AND SANITARY SEWER CONSTRUCTION, ITEM NO. 864, "BYPASS PUMPING".
4. PRIOR TO THE-INS, ANY SHUTDOWNS OF EXISTING FORCE MAINS OF ANY SIZE MUST BE COORDINATED WITH THE SAWS CONSTRUCTION INSPECTION DIVISION AT (210) 233-2973 AT LEAST ONE WEEK IN ADVANCE OF THE SHUTDOWN. THE CONTRACTOR MUST ALSO PROVIDE A SEQUENCE OF WORK AS RELATED TO THE THE-INS. THIS IS AT NO ADDITIONAL COST TO SAWS OR THE PROJECT AND IT IS THE RESPONSIBILITY OF THE CONTRACTOR TO SEQUENCE THE WORK ACCORDINGLY.
5. SEWER PIPE WHERE WATER LINE CROSSES SHALL BE 160 PSI AND MEET THE REQUIREMENTS OF ASTM D2241, TAC 217.53 AND TCEQ 290-44(E)(4)(B). CONTRACTOR SHALL CENTER A 20" JOINT OF 160 PSI PRESTRESS RATED PVC AT THE PROPOSED WATER CROSSING.
6. ELEVATIONS POSTED FOR TOP OF MANHOLES ARE FOR REFERENCE ONLY. IT SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR TO MAKE ALLOWANCES AND ADJUSTMENTS FOR TOP OF MANHOLES TO MATCH THE FINISHED GRADE OF THE PROJECT'S IMPROVEMENTS. (NSPI)
7. SPILLS, OVERFLOWS, OR DISCHARGES OF WASTEWATER: ALL SPILLS, OVERFLOWS, OR DISCHARGES OF WASTEWATER, RECYCLED WATER, PETROLEUM PRODUCTS, OR CHEMICALS MUST BE REPORTED IMMEDIATELY TO THE SAWS INSPECTOR ASSIGNED TO THE COUNTER PERMIT OR GENERAL CONSTRUCTION PERMIT (GCP). THIS REQUIREMENT APPLIES TO EVERY SPILL, OVERFLOW, OR DISCHARGE REGARDLESS OF SIZE.
8. MANHOLE AND ALL PIPE TESTING (INCLUDING THE TV INSPECTION) MUST BE PERFORMED AND PASSED PRIOR TO FINAL FIELD ACCEPTANCE BY SAWS CONSTRUCTION INSPECTION DIVISION, AS PER THE SAWS SPECIFICATIONS FOR WATER AND SANITARY SEWER CONSTRUCTION.
9. ALL PVC PIPE OVER 14 FEET OF COVER SHALL BE EXTRA STRENGTH WITH MINIMUM PIPE STIFFNESS OF 115 PSI

SEWER: UPPER - EAST SEWERSHED - DOS RIOS/ LEON CREEK

Developer's Name STONE OAK HIDDEN CANYON, L.L.C.
 Developer's Address 6002 CAMP BULLIS ROAD
 City SAN ANTONIO State TEXAS Zip 78257
 Phone # (210) 698-3004 Fax # (210) 698-3014
 SAWS Block Map # 162860 Total EDU's 52 Total Acreage 29.067 Ac.
 Total Linear Footage of Pipe 1,231.93 L.F. OF 8" Plot No. 23-11800095
 Number of Lots 52 SAWS Job No. 23-1622

TRENCH EXCAVATION SAFETY PROTECTION

CONTRACTOR AND/OR CONTRACTOR'S INDEPENDENTLY RETAINED EMPLOYEE OR STRUCTURAL DESIGN/GEOTECHNICAL/SAFETY/EQUIPMENT CONSULTANT, IF ANY, SHALL REVIEW THESE PLANS AND AVAILABLE GEOTECHNICAL INFORMATION AND THE ANTICIPATED INSTALLATION SITE(S) WITHIN THE PROJECT WORK AREA IN ORDER TO IMPLEMENT CONTRACTOR'S TRENCH EXCAVATION SAFETY PROTECTION SYSTEMS, PROGRAMS AND/OR PROCEDURES FOR THE PROJECT DESCRIBED IN THE CONTRACT DOCUMENTS. THE CONTRACTOR'S IMPLEMENTATION OF THESE SYSTEMS, PROGRAMS AND/OR PROCEDURES SHALL PROVIDE FOR ADEQUATE TRENCH EXCAVATION SAFETY PROTECTION THAT COMPLY WITH AS A MINIMUM, OSHA STANDARDS FOR TRENCH EXCAVATIONS. SPECIFICALLY, CONTRACTOR AND/OR CONTRACTOR'S INDEPENDENTLY RETAINED EMPLOYEE OR SAFETY CONSULTANT SHALL IMPLEMENT A TRENCH SAFETY PROGRAM IN ACCORDANCE WITH OSHA STANDARDS GOVERNING THE PRESENCE AND ACTIVITIES OF INDIVIDUALS WORKING IN AND AROUND TRENCH EXCAVATION.



4122 Pond Hill Road, Suite 101
 San Antonio, Texas 78231
 P:(210) 681.2951 F:(210) 523.7112

HIDDEN CANYON SUBDIVISION
UNIT 2A P.U.D.
OVERALL SANITARY SEWER MASTER PLAN

DATE
01/06/2022

PROJECT NO.
P01564.004

DRAWN BY
R.M., A.B.B.

CHECKED BY
W.P.M./J.R.T.

REVISIONS

1. 2022 02 02 - NEW WATER MAINS AND OVERHEAD ELECTRIC
2. 2022 02 02 - NEW WATER MAINS AND OVERHEAD ELECTRIC
3. 2022 12 20 - SAWS COMMENTS
- 4.
- 5.
- 6.
- 7.
- 8.
- 9.

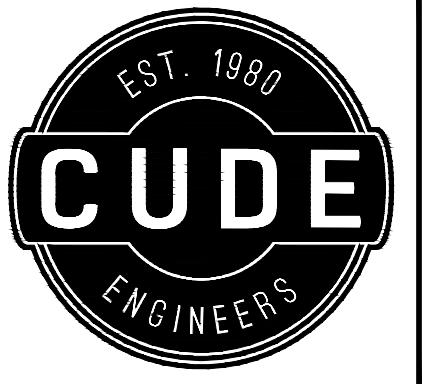


CUDE ENGINEERS
 TBPE No. 455

PLAT #
23-11800095

SAWS #
23-1622

C34

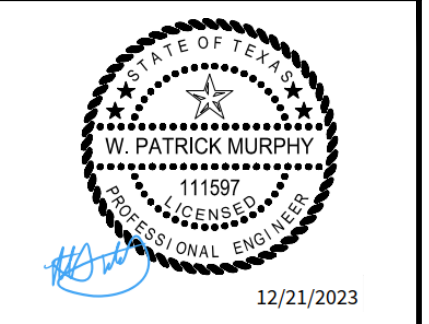


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HIDDEN CANYON SUBDIVISION
UNIT 2A P.U.D.
SEWAGE COLLECTION SYSTEM SITE PLAN

DATE
01/06/2022
PROJECT NO.
P01564.004
DRAWN BY
R.M., A.B.B.
CHECKED BY
W.P.M./J.R.T.

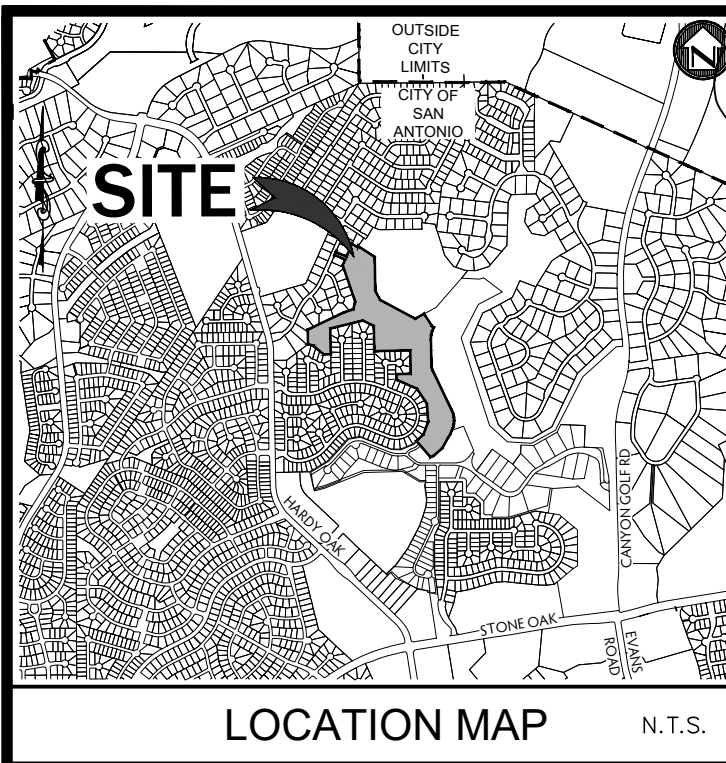
REVISIONS
1. 2022-02-24: WATER BERM MODIFIED FOR COLLECTIVE...
2. 2022-12-20: SAWS COMMENTS



CUDE ENGINEERS
TBPE No. 455

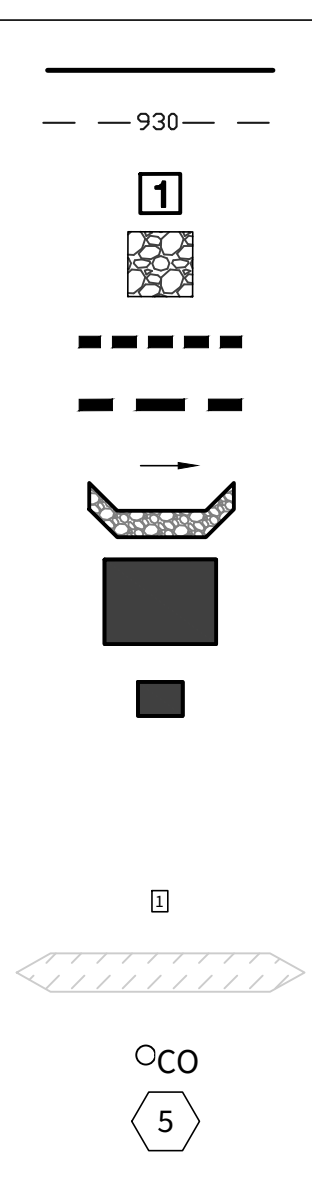
PLAT #
23-1180095
SAWS #
23-1622

C35



LEGEND

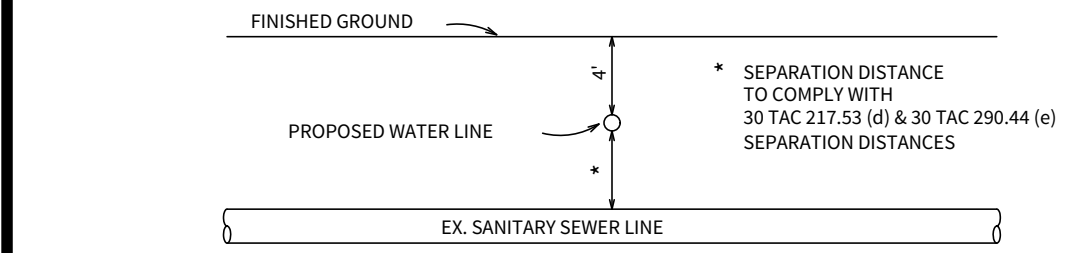
- PROPERTY LINE
- EXISTING CONTOURS
- BMP ITEM NUMBER
- TEMPORARY CONSTRUCTION ENTRANCE/EXIT
- SILT FENCE
- 50' ENVELOPE
- FLOW ARROW
- HIGH SERVICE ROCK BERM
- STAGING AREA



DEVELOPER:
STONE OAK HIDDEN CANYON, LLC
CONTACT PERSON: RAJEEV PURI
6002 CAMP BULLIS ROAD
SAN ANTONIO, TEXAS 78257
TEL: (210) 698-3004
FAX: (210) 698-3014

NOTE:
EXISTING MANHOLE TOP ADJUSTMENT, WHERE REQUIRED, MUST BE TO FINAL FIELD FINISH GRADE FOR MANHOLES LOCATED IN PAVEMENT OR CONCRETE AND TO 4" ABOVE FINISHED GRADE IF LOCATED OUTSIDE OF OTHER IMPROVEMENTS

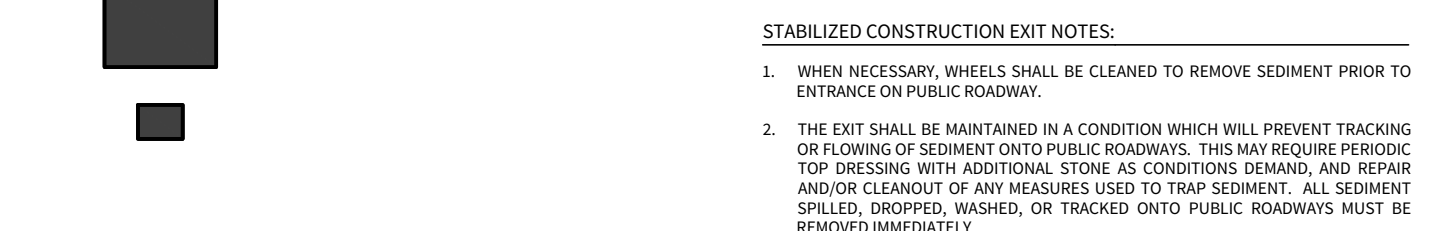
CAUTION!
CONTRACTOR SHALL BE AWARE THAT EXISTING 8" SEWER RUNS ALONG CANYON PATH, EXISTING 10" SEWER RUNS ALONG RUSTIC HOLLOW, OVERHEAD ELECTRIC EXISTS CROSSING RUSTIC HOLLOW. IT IS THE RESPONSIBILITY OF THE CONTRACTOR TO HAVE THESE UTILITIES LOCATED PRIOR TO COMMENCING CONSTRUCTION. THE CONTRACTOR SHALL USE EXTREME CAUTION WHEN WORKING IN THIS AREA. ANY DAMAGE DONE TO THESE EXISTING FACILITIES WILL BE THE SOLE RESPONSIBILITY OF THE CONTRACTOR TO REPAIR.



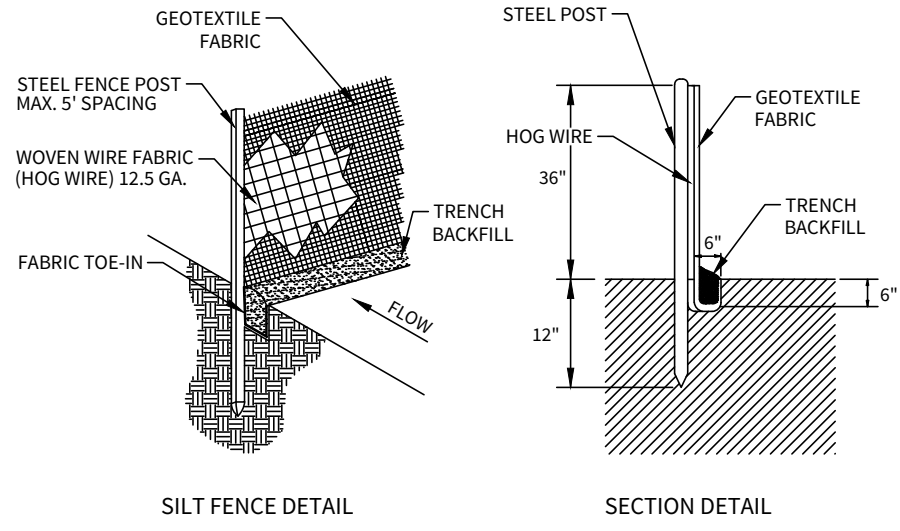
TYPICAL SANITARY SEWER/ WATER CROSSING DETAIL "A" N.T.S.

TRENCH EXCAVATION SAFETY PROTECTION

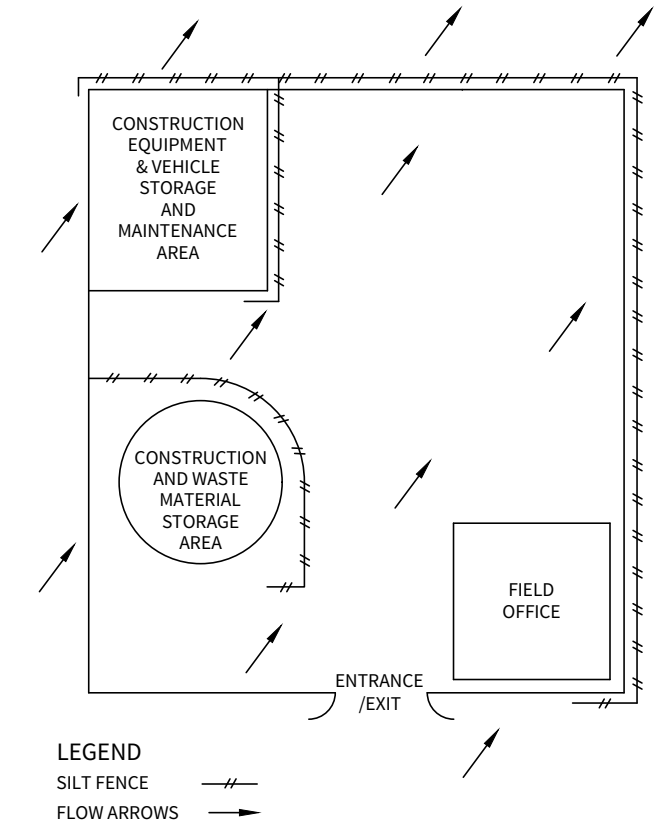
CONTRACTOR AND/OR CONTRACTOR'S INDEPENDENTLY RETAINED EMPLOYEE OR STRUCTURAL DESIGN/GEOTECHNICAL/SAFETY/EQUIPMENT CONSULTANT, IF ANY, SHALL REVIEW THESE PLANS AND AVAILABLE GEOTECHNICAL INFORMATION AND THE ANTICIPATED INSTALLATION SITE(S) WITHIN THE PROJECT WORK AREA IN ORDER TO IMPLEMENT CONTRACTOR'S TRENCH EXCAVATION SAFETY PROTECTION SYSTEMS, PROGRAMS AND/OR PROCEDURES FOR THE PROJECT DESCRIBED IN THE CONTRACT DOCUMENTS. THE CONTRACTOR'S IMPLEMENTATION OF THESE SYSTEMS, PROGRAMS AND/OR PROCEDURES SHALL PROVIDE FOR ADEQUATE TRENCH EXCAVATION SAFETY PROTECTION THAT COMPLY WITH AS A MINIMUM, OSHA STANDARDS FOR TRENCH EXCAVATIONS. SPECIFICALLY, CONTRACTOR AND/OR CONTRACTOR'S INDEPENDENTLY RETAINED EMPLOYEE OR SAFETY CONSULTANT SHALL IMPLEMENT A TRENCH SAFETY PROGRAM IN ACCORDANCE WITH OSHA STANDARDS GOVERNING THE PRESENCE AND ACTIVITIES OF INDIVIDUALS WORKING IN AND AROUND TRENCH EXCAVATION.



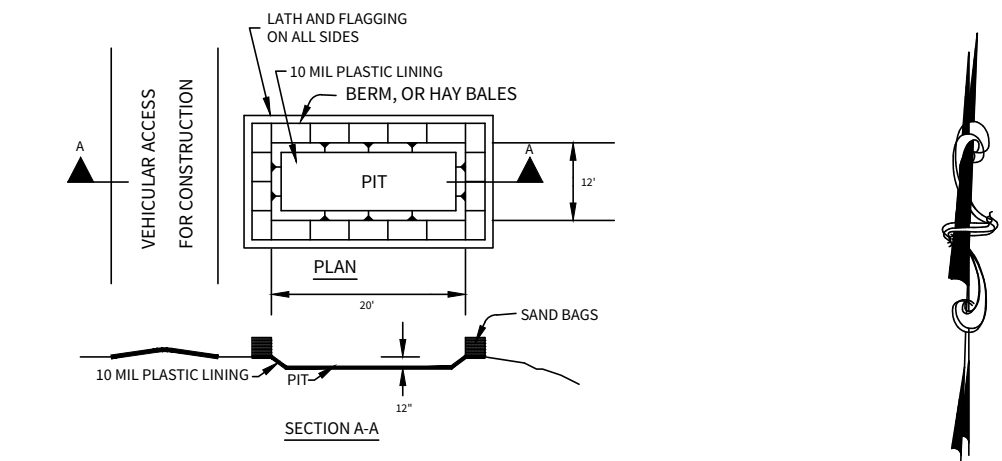
STABILIZED CONSTRUCTION ENTRANCE/EXIT 1 N.T.S.



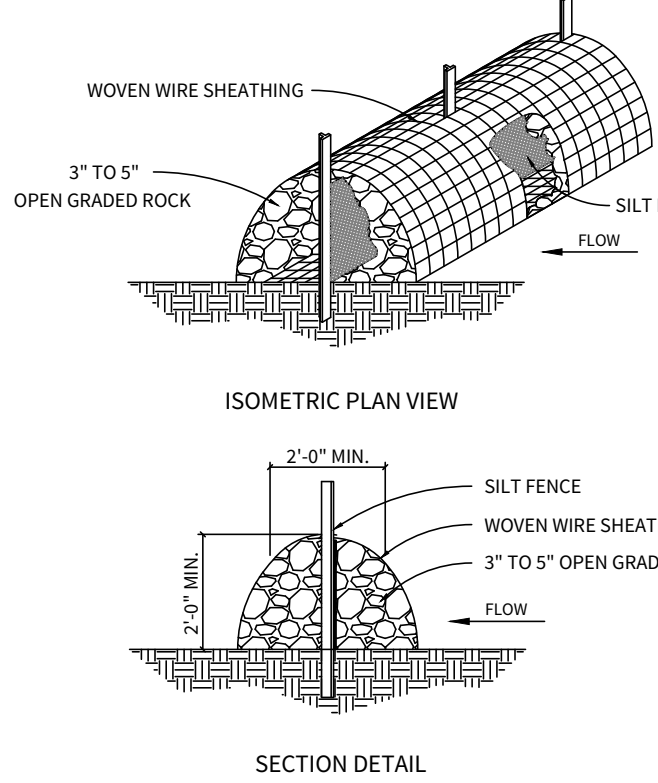
STANDARD SILT FENCE 2 N.T.S.



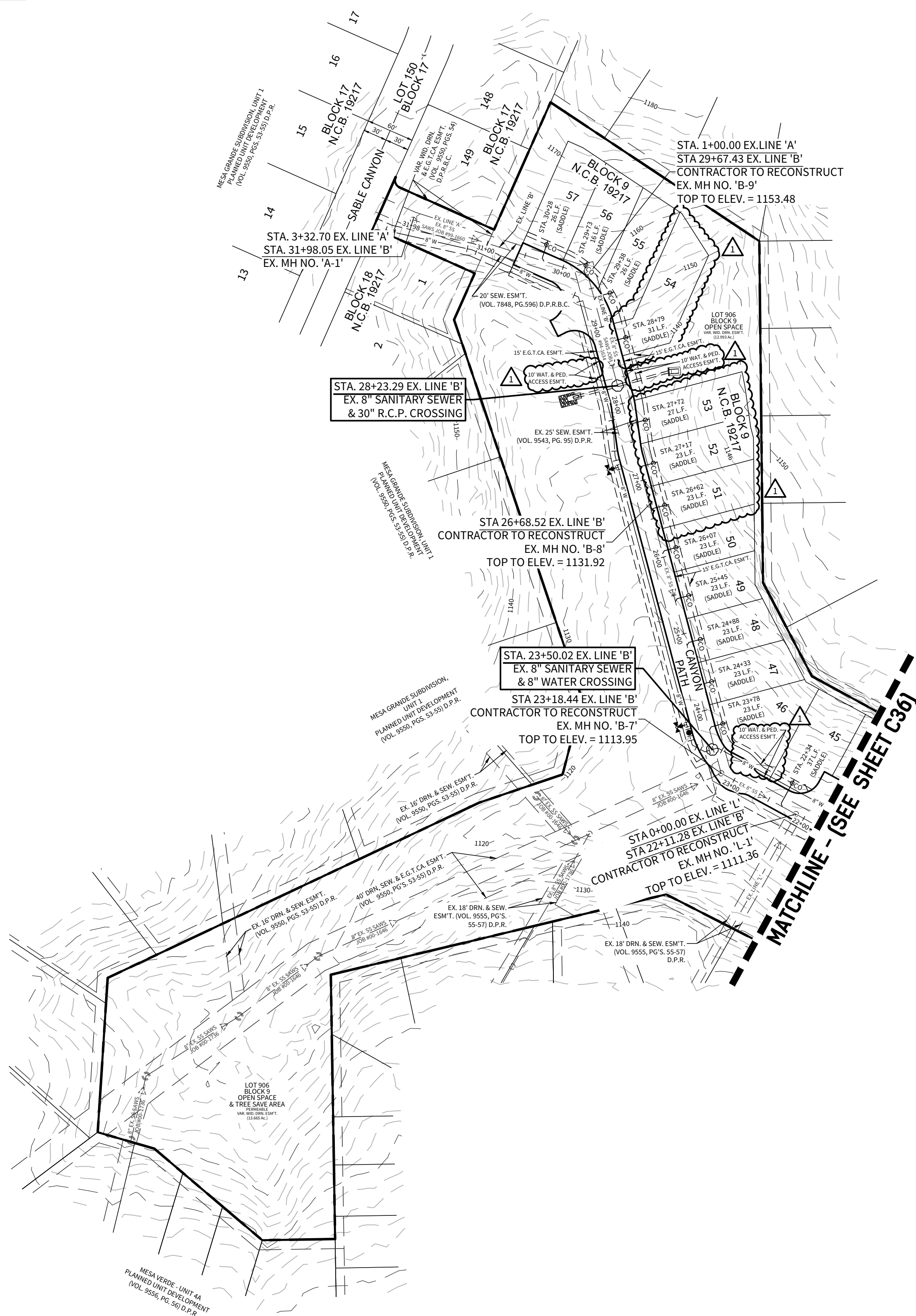
TYP. CONSTRUCTION STAGING AREA 3 N.T.S.



CONCRETE TRUCK WASHOUT PIT 4 N.T.S.



HIGH-SERVICE ROCK BERM 5 N.T.S.



EXISTING LINE 'C' table with columns for Station, V.S. Invert, and V.S. Height.

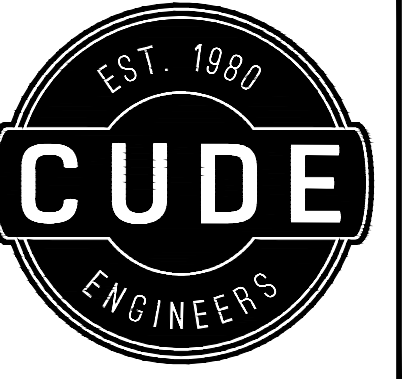
EXISTING LINE 'B' table with columns for Station, V.S. Invert, and V.S. Height.

SAWS GENERAL NOTES:

- 1. ALL MATERIALS AND CONSTRUCTION PROCEDURES WITHIN THE SCOPE OF THIS CONTRACT SHALL BE APPROVED BY THE SAN ANTONIO WATER SYSTEM (SAWS) AND COMPLY WITH THE PLANS, SPECIFICATIONS, GENERAL CONDITIONS AND WITH THE FOLLOWING AS APPLICABLE:
A. CURRENT TEXAS COMMISSION ON ENVIRONMENTAL QUALITY (TCEQ) "DESIGN CRITERIA FOR DOMESTIC WASTEWATER SYSTEM", TEXAS ADMINISTRATIVE CODE (TAC) TITLE 30 PART 1 CHAPTER 217 AND "PUBLIC DRINKING WATER", TAC TITLE 30 PART 1 CHAPTER 290.
B. CURRENT TXDOT "STANDARD SPECIFICATIONS FOR CONSTRUCTION OF HIGHWAYS, STREETS AND DRAINAGE".
C. CURRENT "SAN ANTONIO WATER SYSTEM STANDARD SPECIFICATIONS FOR WATER AND SANITARY SEWER CONSTRUCTION".
D. CURRENT CITY OF SAN ANTONIO "STANDARD SPECIFICATIONS FOR PUBLIC WORKS CONSTRUCTION".
E. CURRENT CITY OF SAN ANTONIO "UTILITY EXCAVATION CRITERIA MANUAL" (UECM).
2. THE CONTRACTOR SHALL NOT PROCEED WITH ANY PIPE INSTALLATION WORK UNTIL THEY OBTAIN A COPY OF THE APPROVED COUNTER PERMIT OR GENERAL CONSTRUCTION PERMIT (GCP) FROM THE CONSULTANT AND HAS BEEN NOTIFIED BY SAWS CONSTRUCTION INSPECTION DIVISION TO PROCEED WITH THE WORK AND HAS ARRANGED A MEETING WITH THE INSPECTOR AND CONSULTANT FOR THE WORK REQUIREMENTS. WORK COMPLETED BY THE CONTRACTOR WITHOUT AN APPROVED COUNTER PERMIT AND/OR A GCP WILL BE SUBJECT TO REMOVAL AND REPLACEMENT AT THE EXPENSE OF THE CONTRACTORS AND/OR THE DEVELOPER.
3. THE CONTRACTOR SHALL OBTAIN THE SAWS STANDARD DETAILS FROM THE SAWS WEBSITE, HTTP://WWW.SAWS.ORG/BUSINESS_CENTER/SPECS. UNLESS OTHERWISE NOTED WITHIN THE DESIGN PLANS.
4. THE CONTRACTOR IS TO MAKE ARRANGEMENTS WITH THE SAWS CONSTRUCTION INSPECTION DIVISION AT 210-233-2973, ON NOTIFICATION PROCEDURES THAT WILL BE USED TO NOTIFY AFFECTED HOME RESIDENTS AND/OR PROPERTY OWNERS 48 HOURS PRIOR TO BEGINNING ANY WORK.
5. LOCATION AND DEPTH OF EXISTING UTILITIES AND SERVICE LATERALS SHOWN ON THE PLANS ARE UNDERSTOOD TO BE APPROXIMATE. ACTUAL LOCATIONS AND DEPTHS MUST BE FIELD VERIFIED BY THE CONTRACTOR AT LEAST 1 WEEK PRIOR TO CONSTRUCTION. IT SHALL BE THE CONTRACTOR'S RESPONSIBILITY TO LOCATE UTILITY SERVICE LINES AS REQUIRED FOR CONSTRUCTION AND TO PROTECT THEM DURING CONSTRUCTION AT NO COST TO SAWS.
6. THE CONTRACTOR SHALL VERIFY THE EXACT LOCATION OF UNDERGROUND UTILITIES AND DRAINAGE STRUCTURES FOR AT LEAST 1-2 WEEKS PRIOR TO CONSTRUCTION WHETHER SHOWN ON PLANS OR NOT. PLEASE ALLOW UP TO 7 BUSINESS DAYS FOR LOCATES REQUESTING PIPE LOCATION MARKERS ON SAWS FACILITIES. THE FOLLOWING CONTACT INFORMATION ARE SUPPLIED FOR VERIFICATION PURPOSES:
SAWS UTILITY LOCATES: HTTP://WWW.SAWS.ORG/SERVICE/LOCATES
(210) 207-0724 OR (210) 207-6026
COSA DRAINAGE (210) 206-8480
COSA TRAFFIC SIGNAL OPERATIONS (210) 207-3951
TEXAS STATE WIDE ONE CALL LOCATOR 1-800-545-6005 OR 811
7. THE CONTRACTOR SHALL BE RESPONSIBLE FOR RESTORING EXISTING FENCES, CURBS, STREETS, DRIVEWAYS, SIDEWALKS, LANDSCAPING AND STRUCTURES TO ITS ORIGINAL OR BETTER CONDITION IF DAMAGES ARE MADE AS A RESULT OF THE PROJECT'S CONSTRUCTION.
8. ALL WORK IN TEXAS DEPARTMENT OF TRANSPORTATION (TXDOT) AND/OR BEXAR COUNTY RIGHT-OF-WAY SHALL BE DONE IN ACCORDANCE WITH RESPECTIVE CONSTRUCTION SPECIFICATIONS AND PERMIT REQUIREMENTS.
9. THE CONTRACTOR SHALL COMPLY WITH CITY OF SAN ANTONIO OR OTHER GOVERNING MUNICIPALITY'S TREE ORDINANCES WHEN EXCAVATING NEAR TREES.
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11. HOLIDAY WORK: CONTRACTORS WILL NOT BE ALLOWED TO PERFORM SAWS WORK ON SAWS RECOGNIZED HOLIDAYS. REQUEST SHOULD BE SENT TO CONSTWKRREQ@SAWS.ORG. WEEKEND WORK: CONTRACTORS ARE REQUIRED TO NOTIFY THE SAWS INSPECTION CONSTRUCTION DEPARTMENT 48 HOURS IN ADVANCE TO REQUEST WEEKEND WORK. REQUEST SHOULD BE SENT TO CONSTWKRREQ@SAWS.ORG. ANY AND ALL SAWS UTILITY WORK INSTALLED WITHOUT HOLIDAY/WEEKEND APPROVAL WILL BE SUBJECT TO BE UNCOVERED FOR PROPER INSPECTION.
12. COMPACTION NOTE (ITEM 804): THE CONTRACTOR SHALL BE RESPONSIBLE FOR MEETING THE COMPACTION REQUIREMENTS ON ALL TRENCH BACKFILL AND FOR PAYING FOR THE TESTS PERFORMED BY A THIRD PARTY. COMPACTION TESTS WILL BE DONE AT ONE LOCATION POINT RANDOMLY SELECTED, OR AS INDICATED BY THE SAWS INSPECTOR AND/OR THE TEST ADMINISTRATOR, PER EACH 12-INCH LOOSE LIFT PER 400 LINEAR FEET AT A MINIMUM. THIS PROJECT WILL NOT BE ACCEPTED AND FINALIZED BY SAWS WITHOUT THIS REQUIREMENT BEING MET AND VERIFIED BY PROVIDING ALL NECESSARY DOCUMENTED TEST RESULTS.
13. A COPY OF ALL TESTING REPORTS SHALL BE FORWARDED TO SAWS CONSTRUCTION INSPECTION DIVISION.

SEWER: UPPER - EAST SEWERSHED - DOS RIOS/ LEON CREEK

Developer's Name, Address, City, State, Zip, Phone, Fax, SAWS Block Map #, Total EDU's, Total Acreage, Total Linear Footage of Pipe, Number of Lots, SAWS Job No.

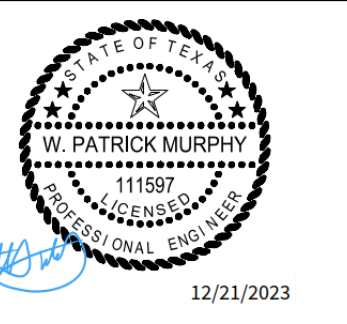


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P:(210) 681.2951 F:(210) 523.7112

HIDDEN CANYON SUBDIVISION
UNIT 2A P.U.D.
SEWAGE COLLECTION SYSTEM SITE PLAN

DATE 01/06/2022
PROJECT NO. P01564.004
DRAWN BY R.M., A.B.B.
CHECKED BY W.P.M./J.R.T.

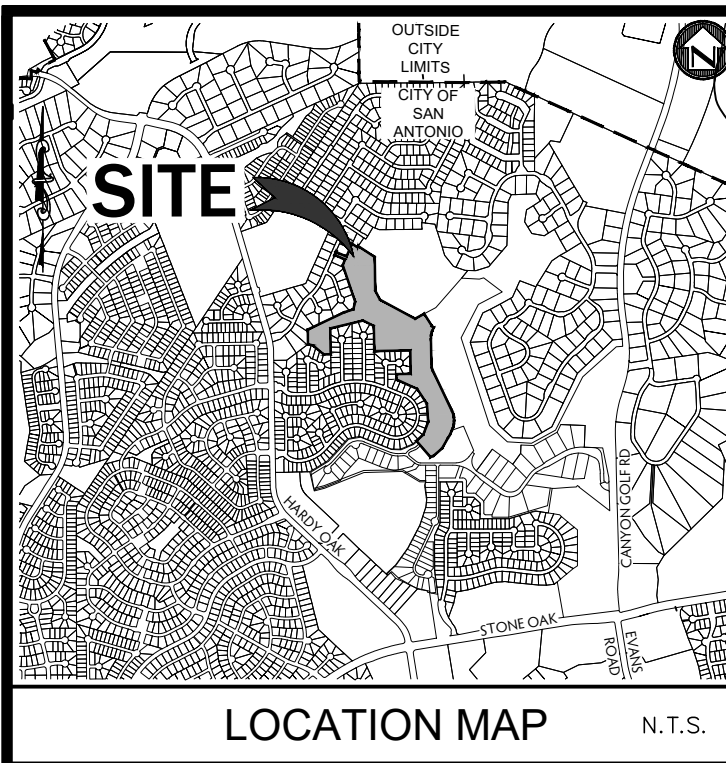
REVISIONS
1. 2022-11-22 - ADDED SEWER LATERALS
2. 2022-05-05 - WATER SERVICES ADJUSTED FOR ELECTRICAL
3. 2022-05-05 - WATER SERVICES ADJUSTED FOR ELECTRICAL
4. 2022-05-05 - WATER SERVICES ADJUSTED FOR ELECTRICAL
5. 2022-11-20 - SAWS COMMENTS



CUDE ENGINEERS
TBPE No. 455

PLAT # 23-11800095
SAWS # 23-1622

C36



LEGEND

- PROPERTY LINE
EXISTING CONTOURS
BMP ITEM NUMBER
TEMPORARY CONSTRUCTION ENTRANCE/EXIT
SILT FENCE
50' ENVELOPE
FLOW ARROW
HIGH SERVICE ROCK BERM
STAGING AREA

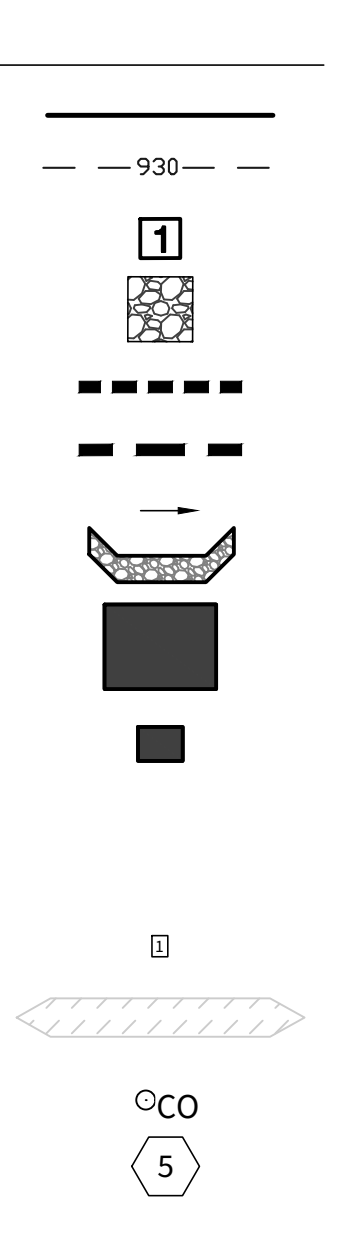
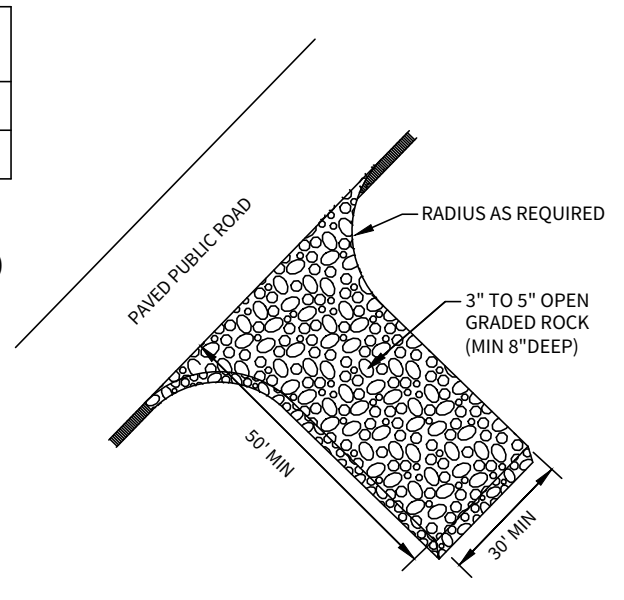


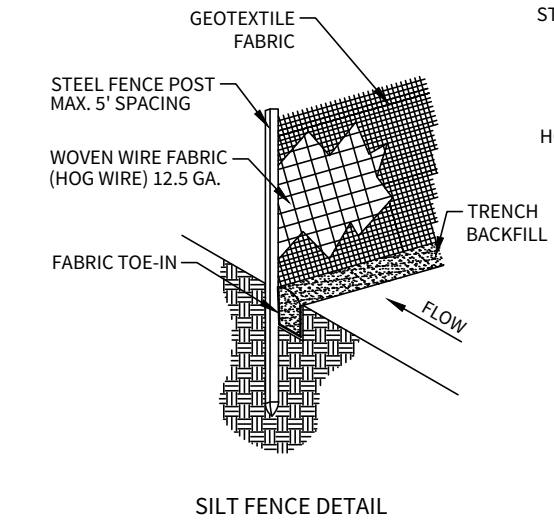
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Values: 1.00, 223.15; TOTAL, 223.15

SANITARY SEWER TO BE ABANDONED

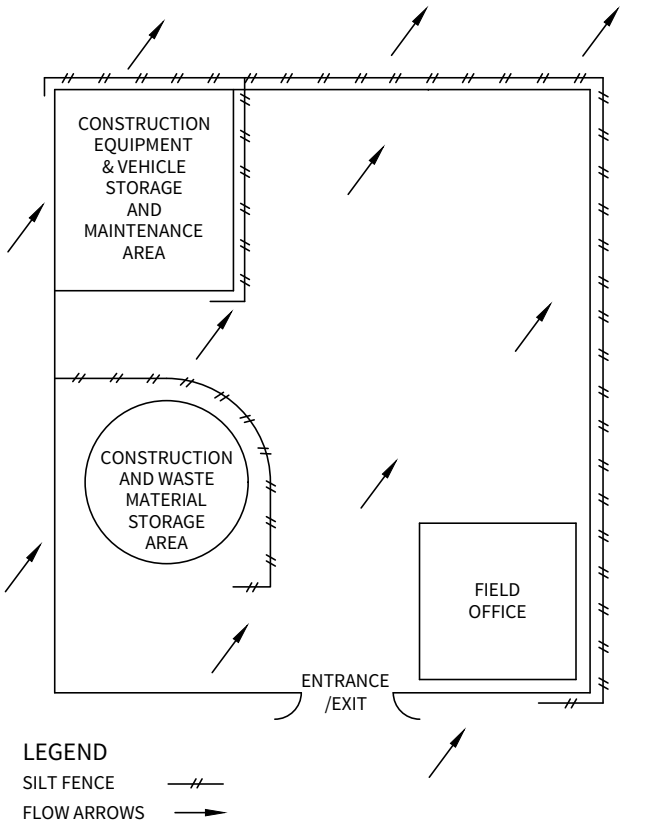
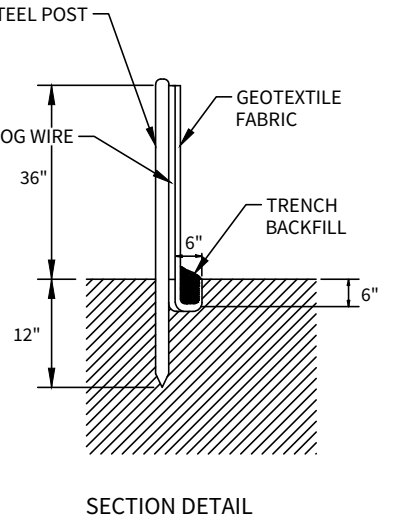


- STABILIZED CONSTRUCTION EXIT NOTES
1. WHEN NECESSARY, WHEELS SHALL BE CLEANED TO REMOVE SEDIMENT PRIOR TO ENTRANCE ON PUBLIC ROADWAY.
2. THE EXIT SHALL BE MAINTAINED IN A CONDITION WHICH WILL PREVENT TRACKING OR FLOWING OF SEDIMENT ONTO PUBLIC ROADWAYS.

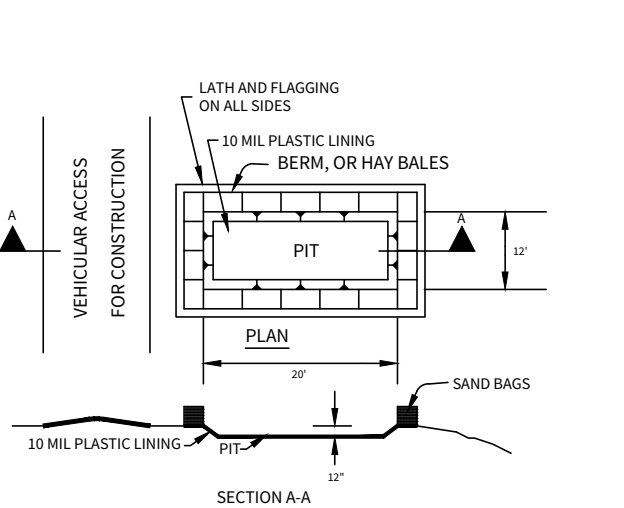
STABILIZED CONSTRUCTION ENTRANCE/EXIT



STANDARD SILT FENCE

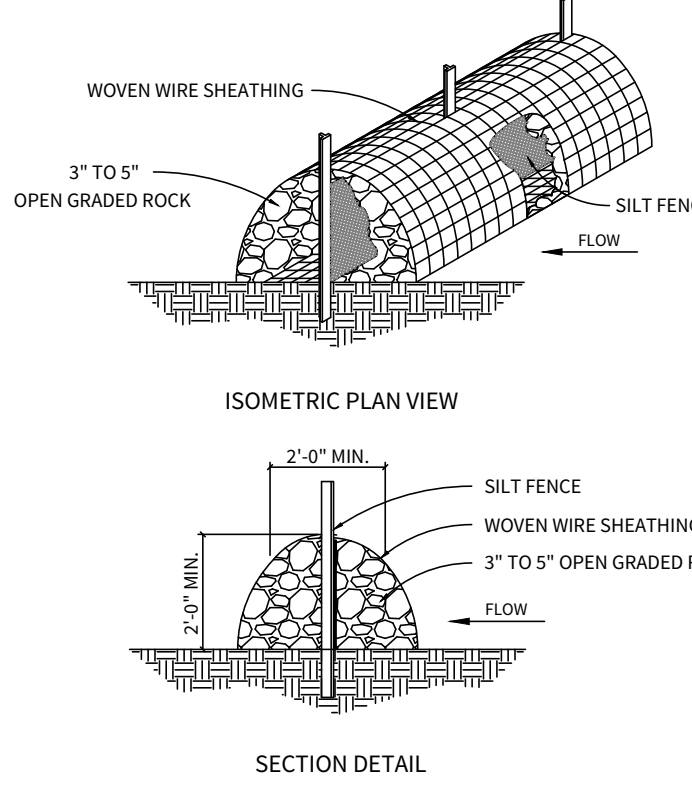


TYP. CONSTRUCTION STAGING AREA



- GENERAL NOTES:
- DETAIL ABOVE ILLUSTRATES MINIMUM DIMENSIONS. PIT CAN BE INCREASED IN SIZE DEPENDING ON EXPECTED FREQUENCY OF USE.
- IF HAY BALES ARE USED, THEY SHALL BE PLACED IN ACCORDANCE WITH DETAILS SHOWN ON EXHIBIT FOR HAY BALES.

CONCRETE TRUCK WASHOUT PIT



HIGH-SERVICE ROCK BERM

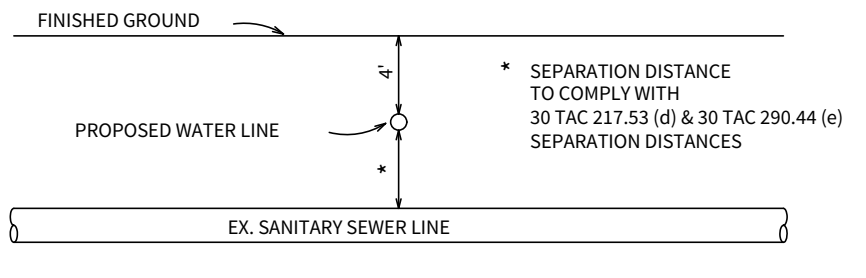
- INSTALLATION:
- CLEAR THE GROUND OF DEBRIS, ROCKS OR VEGETATION THAT WILL INTERFERE WITH INSTALLATION.
- PLACE WOVEN WIRE FABRIC ON THE GROUND ALONG THE PROPOSED INSTALLATION LOCATION WITH ENOUGH OVERLAP TO COMPLETELY ENCLOSE THE FINISHED SIZE OF THE BERM.
- INSTALL THE SILT FENCE ALONG THE CENTER OF THE PROPOSED BERM PLACEMENT.
- PLACE THE ROCK ALONG THE CENTER OF THE WIRE AND BOTH SIDES OF THE SILT FENCE TO THE DESIGNATED HEIGHT.

- INSPECTION AND MAINTENANCE GUIDELINES:
- INSPECTION SHALL BE MADE WEEKLY AND AFTER EACH RAINFALL EVENT BY THE CONTRACTOR. FOR THE INSTALLATIONS IN STREAMBEDS, ADDITIONAL DAILY INSPECTIONS SHALL BE MADE ON ROCK BERMS. 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 SHALL BE RESHAPED AS NEEDED DURING INSPECTION. THE ROCK BERM SHALL BE LEFT IN PLACE UNTIL ALL UPSTREAM AREAS ARE STABILIZED AND ACCUMULATED SILT REMOVED.

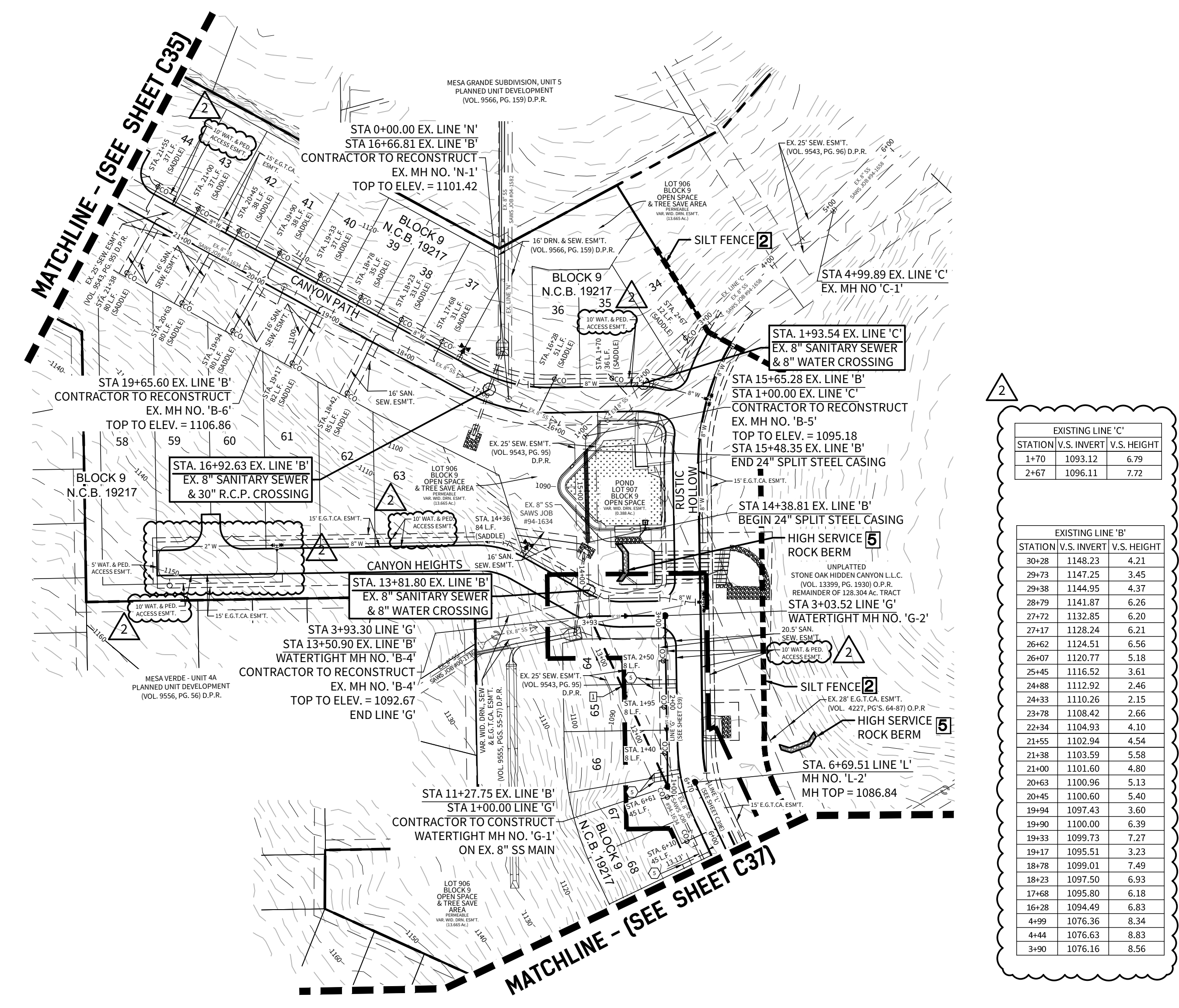
DEVELOPER:
STONE OAK HIDDEN CANYON, LLC
CONTACT PERSON: RAJEEV PURI
6002 CAMP BULLIS ROAD
SAN ANTONIO, TEXAS 78257
TEL: (210) 698-3004
FAX: (210) 698-3014

NOTE:
EXISTING MANHOLE TOP ADJUSTMENT, WHERE REQUIRED, MUST BE TO FINAL FIELD FINISH GRADE FOR MANHOLES LOCATED IN PAVEMENT OR CONCRETE AND TO 4" ABOVE FINISHED GRADE IF LOCATED OUTSIDE OF OTHER IMPROVEMENTS

CAUTION!
CONTRACTOR SHALL BE AWARE THAT EXISTING 8" SEWER RUNS ALONG CANYON PATH, EXISTING 8" SEWER CROSSES RUSTIC HOLLOW, EXISTING 10" SEWER RUNS ALONG RUSTIC HOLLOW, OVERHEAD ELECTRIC EXISTS CROSSING RUSTIC HOLLOW. IT IS THE RESPONSIBILITY OF THE CONTRACTOR TO HAVE THESE UTILITIES LOCATED PRIOR TO COMMENCING CONSTRUCTION. THE CONTRACTOR SHALL USE EXTREME CAUTION WHEN WORKING IN THIS AREA. ANY DAMAGE DONE TO THESE EXISTING FACILITIES WILL BE THE SOLE RESPONSIBILITY OF THE CONTRACTOR TO REPAIR.



TYPICAL SANITARY SEWER/ WATER CROSSING DETAIL "A"



SAWS GENERAL NOTES:

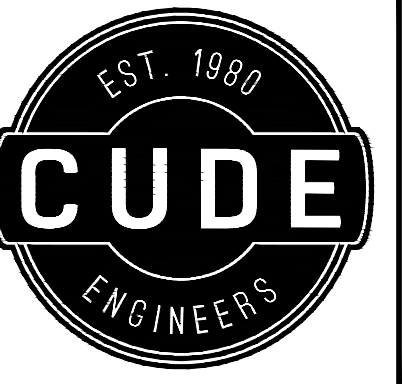
- 1. ALL MATERIALS AND CONSTRUCTION PROCEDURES WITHIN THE SCOPE OF THIS CONTRACT SHALL BE APPROVED BY THE SAN ANTONIO WATER SYSTEM (SAWS) AND COMPLY WITH THE PLANS, SPECIFICATIONS, GENERAL CONDITIONS AND WITH THE FOLLOWING AS APPLICABLE:
A. CURRENT TEXAS COMMISSION ON ENVIRONMENTAL QUALITY (TCEQ) "DESIGN CRITERIA FOR DOMESTIC WASTEWATER SYSTEM", TEXAS ADMINISTRATIVE CODE (TAC) TITLE 30 PART 1 CHAPTER 217 AND "PUBLIC DRINKING WATER", TAC TITLE 30 PART 1 CHAPTER 290.
B. CURRENT TxDOT "STANDARD SPECIFICATIONS FOR CONSTRUCTION OF HIGHWAYS, STREETS AND DRAINAGE".
C. CURRENT "SAN ANTONIO WATER SYSTEM STANDARD SPECIFICATIONS FOR WATER AND SANITARY SEWER CONSTRUCTION".
D. CURRENT CITY OF SAN ANTONIO "STANDARD SPECIFICATIONS FOR PUBLIC WORKS CONSTRUCTION".
E. CURRENT CITY OF SAN ANTONIO "UTILITY EXCAVATION CRITERIA MANUAL" (UECM).

Table: EXISTING LINE 'C' STATION V.S. INVERT V.S. HEIGHT

Table: EXISTING LINE 'B' STATION V.S. INVERT V.S. HEIGHT

TRENCH EXCAVATION SAFETY PROTECTION

CONTRACTOR AND/OR CONTRACTOR'S INDEPENDENTLY RETAINED EMPLOYEE OR STRUCTURAL DESIGN/GEOTECHNICAL/SAFETY/EQUIPMENT CONSULTANT, IF ANY, SHALL REVIEW THESE PLANS AND AVAILABLE GEOTECHNICAL INFORMATION AND THE ANTICIPATED INSTALLATION SITE(S) WITHIN THE PROJECT WORK AREA IN ORDER TO IMPLEMENT CONTRACTOR'S TRENCH EXCAVATION SAFETY PROTECTION SYSTEMS, PROGRAMS AND/OR PROCEDURES FOR THE PROJECT DESCRIBED IN THE CONTRACT DOCUMENTS. THE CONTRACTOR'S IMPLEMENTATION OF THESE SYSTEMS, PROGRAMS AND/OR PROCEDURES SHALL PROVIDE FOR ADEQUATE TRENCH EXCAVATION SAFETY PROTECTION THAT COMPLY WITH AS A MINIMUM, OSHA STANDARDS FOR TRENCH EXCAVATIONS. SPECIFICALLY, CONTRACTOR AND/OR CONTRACTOR'S INDEPENDENTLY RETAINED EMPLOYEE OR SAFETY CONSULTANT SHALL IMPLEMENT A TRENCH SAFETY PROGRAM IN ACCORDANCE WITH OSHA STANDARDS GOVERNING THE PRESENCE AND ACTIVITIES OF INDIVIDUALS WORKING IN AND AROUND TRENCH EXCAVATION.

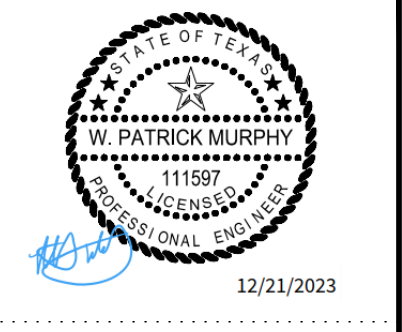


4122 Pond Hill Road, Suite 101
San Antonio, Texas 78231
P:(210) 681.2951 F:(210) 523.7112

HIDDEN CANYON SUBDIVISION
UNIT 2A P.U.D.
SEWAGE COLLECTION SYSTEM SITE PLAN

DATE
01/06/2022
PROJECT NO.
P01564.004
DRAWN BY
R.M., A.B.B.
CHECKED BY
W.P.M./J.R.T.

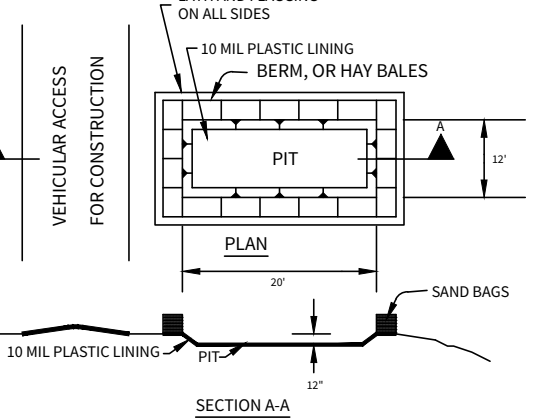
REVISIONS
1. 2022-02-24: WITH REVISIONS FOR CONSTRUCTION PERMITS.
2. 2022-02-24: WITH REVISIONS FOR CONSTRUCTION PERMITS.
3.
4.
5.
6.
7.
8.
9.



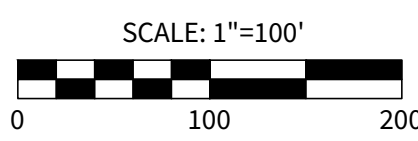
CUDE ENGINEERS
TBPE No. 455

PLAT #
23-11800095
SAWS #
23-1622

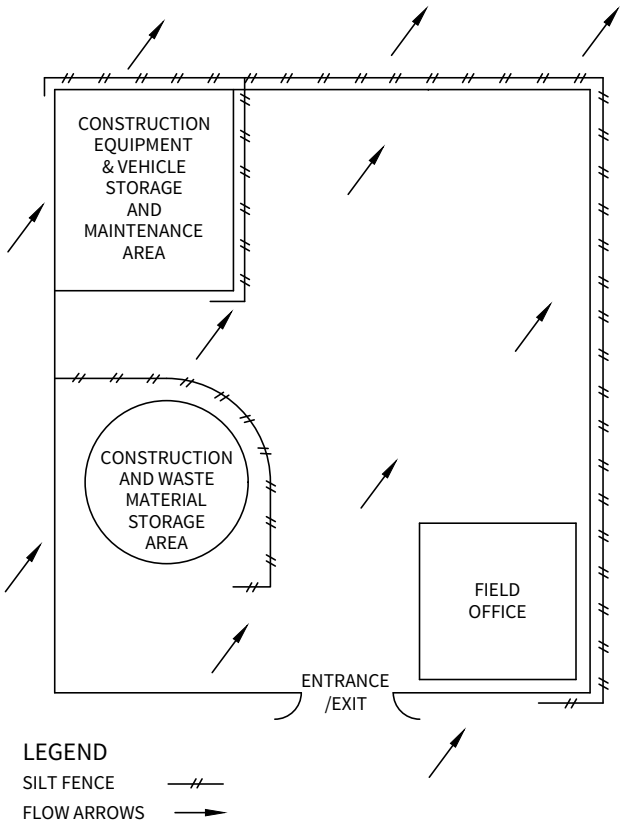
C37



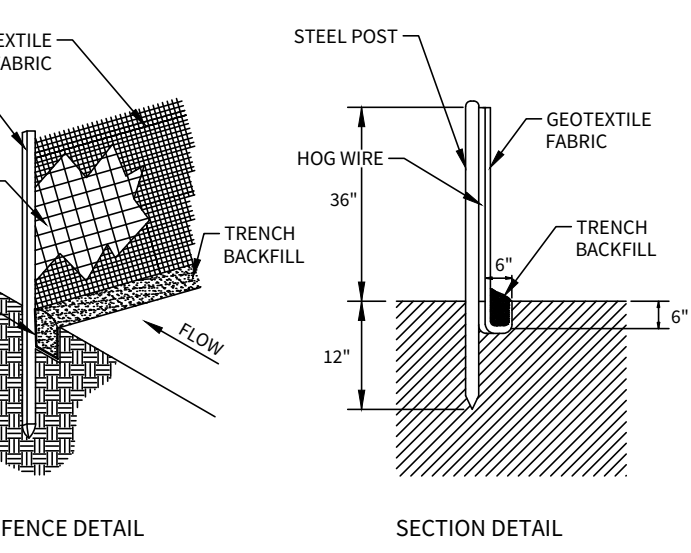
GENERAL NOTES:
- DETAIL ABOVE ILLUSTRATES MINIMUM DIMENSIONS. PIT CAN BE INCREASED IN SIZE DEPENDING ON EXPECTED FREQUENCY OF USE.
- IF HAY BALES ARE USED, THEY SHALL BE PLACED IN ACCORDANCE WITH DETAILS SHOWN ON EXHIBIT FOR HAY BALES.
- WASHOUT PIT SHALL BE LOCATED IN AN AREA EASILY ACCESSIBLE TO CONSTRUCTION TRAFFIC.
- WASHOUT PIT SHALL NOT BE LOCATED IN AREAS SUBJECT TO INUNDATION FROM STORMWATER RUNOFF.
- WASHOUT PIT SHALL BE LINED WITH 10-MIL THICK POLYETHYLENE SHEETING FREE OF HOLES, TEARS AND OTHER DEFECTS.
- THE ROCK BERM SHALL BE LEFT IN PLACE UNTIL ALL UPSTREAM AREAS ARE STABILIZED AND ACCUMULATED SILT REMOVED.



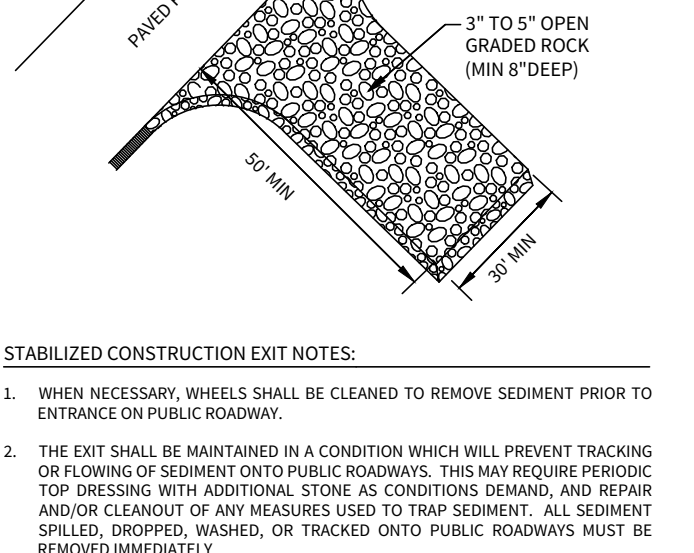
CONCRETE TRUCK WASHOUT PIT 4
N.T.S.



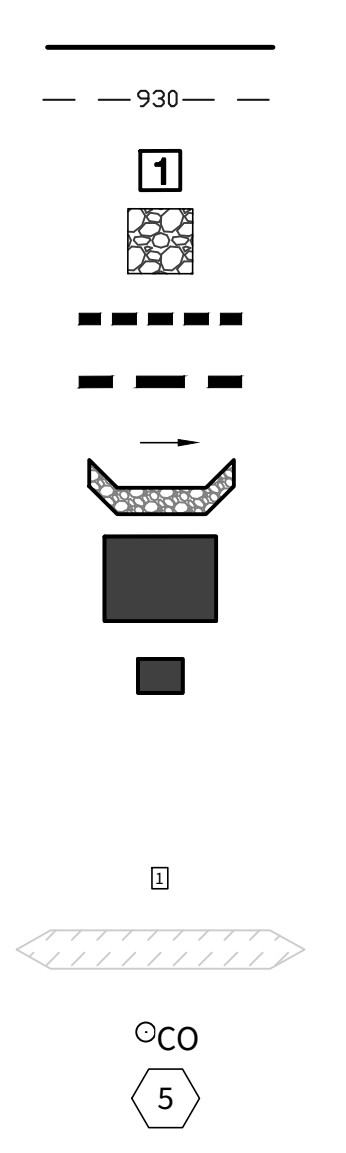
TYP. CONSTRUCTION STAGING AREA 3
N.T.S.



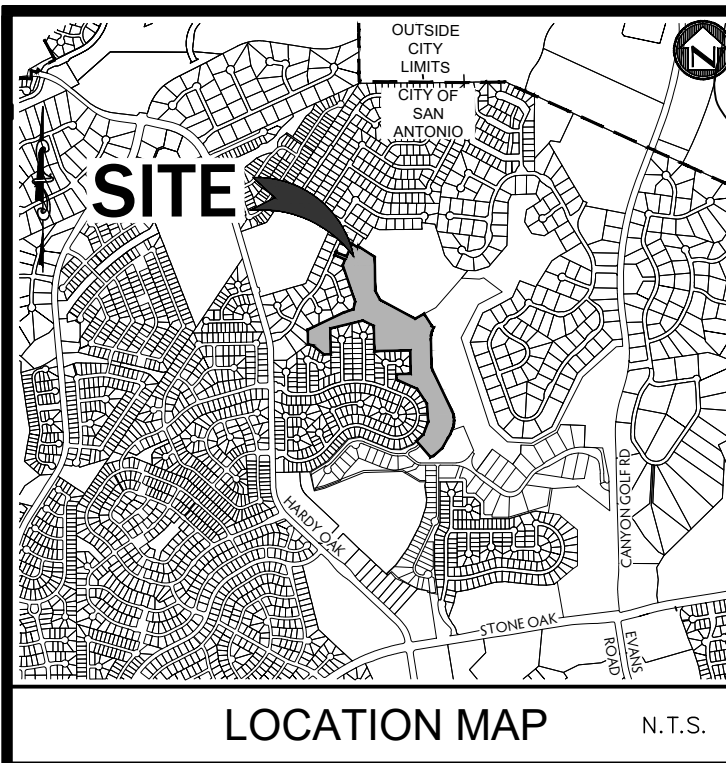
STANDARD SILT FENCE 2
N.T.S.



STABILIZED CONSTRUCTION ENTRANCE/EXIT 1
N.T.S.



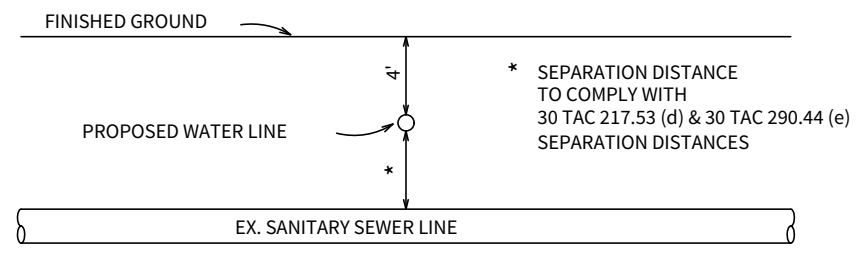
LEGEND



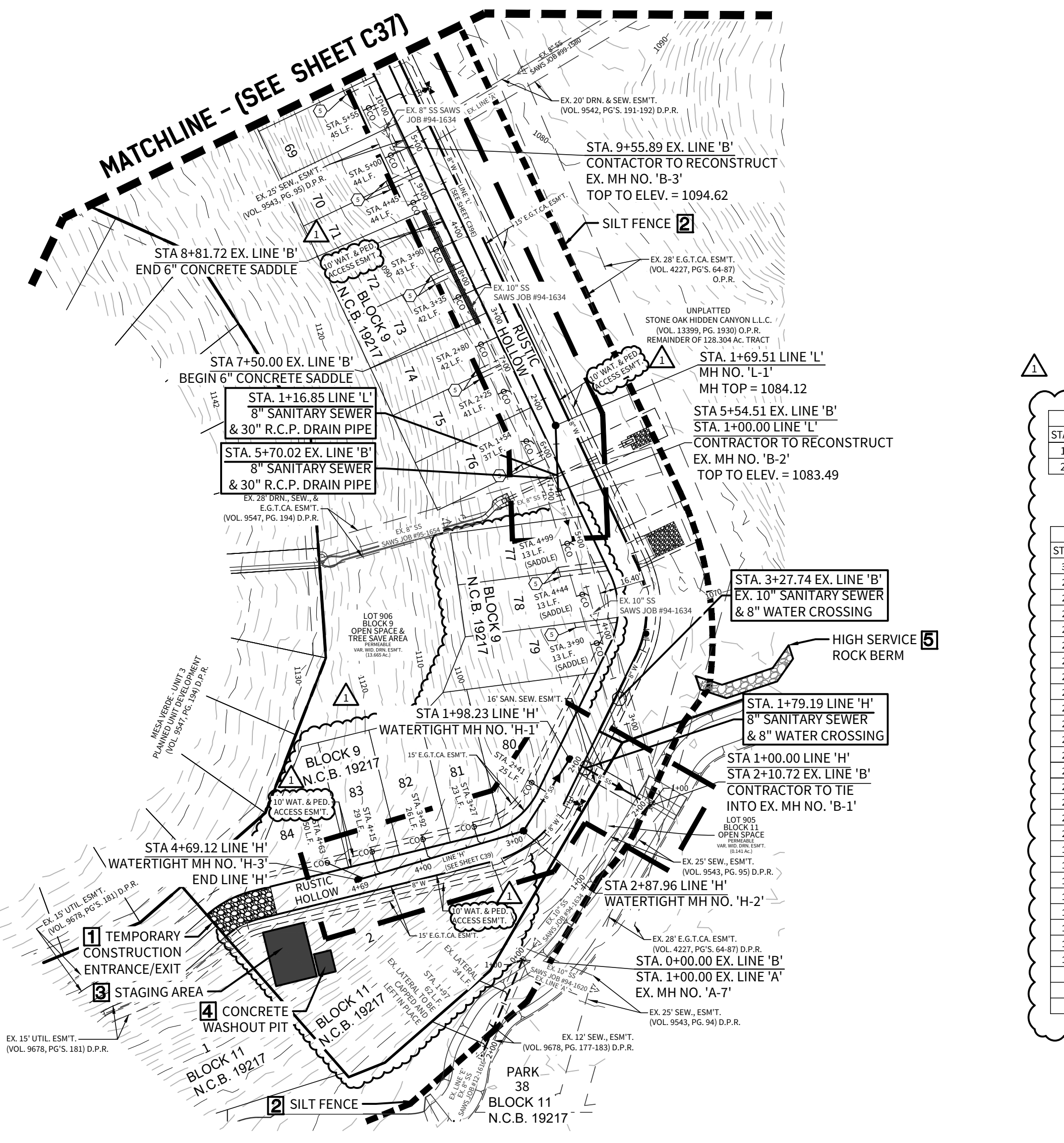
DEVELOPER:
STONE OAK HIDDEN CANYON, LLC
CONTACT PERSON: RAJEEV PURI
6002 CAMP BULLIS ROAD
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TEL: (210) 698-3004
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NOTE:
EXISTING MANHOLE TOP ADJUSTMENT, WHERE REQUIRED, MUST BE TO FINAL FIELD FINISH GRADE FOR MANHOLES LOCATED IN PAVEMENT OR CONCRETE AND TO 4\"/>

CAUTION!
CONTRACTOR SHALL BE AWARE THAT EXISTING 8\"/>



TYPICAL SANITARY SEWER/ WATER CROSSING DETAIL \"A\"
N.T.S.



EXISTING LINE 'C'

STATION	V.S. INVERT	V.S. HEIGHT
1+70	1093.12	6.79
2+67	1096.11	7.72

EXISTING LINE 'B'

STATION	V.S. INVERT	V.S. HEIGHT
30+28	1148.23	4.21
29+73	1147.25	3.45
29+38	1144.95	4.37
28+79	1141.87	6.26
27+72	1132.85	6.20
27+17	1128.24	6.21
26+62	1124.51	6.56
26+07	1120.77	5.18
25+45	1116.52	3.61
24+88	1112.92	2.46
24+33	1110.26	2.15
23+78	1108.42	2.66
22+94	1104.93	4.10
21+55	1102.94	4.54
21+38	1103.59	5.58
21+00	1101.60	4.80
20+63	1100.96	5.13
20+45	1100.60	5.40
19+94	1097.43	3.60
19+90	1100.00	6.39
19+33	1099.73	7.27
19+17	1095.51	3.23
18+78	1099.01	7.49
18+23	1097.50	6.93
17+68	1095.80	6.18
16+28	1094.49	6.83
4+99	1076.36	8.34
4+44	1076.63	8.83
3+90	1076.16	8.56

SAWS GENERAL NOTES:

- ALL MATERIALS AND CONSTRUCTION PROCEDURES WITHIN THE SCOPE OF THIS CONTRACT SHALL BE APPROVED BY THE SAN ANTONIO WATER SYSTEM (SAWS) AND COMPLY WITH THE PLANS, SPECIFICATIONS, GENERAL CONDITIONS AND WITH THE FOLLOWING AS APPLICABLE:
A. CURRENT TEXAS COMMISSION ON ENVIRONMENTAL QUALITY (TCEQ) "DESIGN CRITERIA FOR DOMESTIC WASTEWATER SYSTEM", TEXAS ADMINISTRATIVE CODE (TAC) TITLE 30 PART 1 CHAPTER 217 AND "PUBLIC DRINKING WATER", TAC TITLE 30 PART 1 CHAPTER 290.
B. CURRENT TXDOT "STANDARD SPECIFICATIONS FOR CONSTRUCTION OF HIGHWAYS, STREETS AND DRAINAGE".
C. CURRENT "SAN ANTONIO WATER SYSTEM STANDARD SPECIFICATIONS FOR WATER AND SANITARY SEWER CONSTRUCTION".
D. CURRENT CITY OF SAN ANTONIO "STANDARD SPECIFICATIONS FOR PUBLIC WORKS CONSTRUCTION".
E. CURRENT CITY OF SAN ANTONIO "UTILITY EXCAVATION CRITERIA MANUAL" (UECM).
2. THE CONTRACTOR SHALL NOT PROCEED WITH ANY PIPE INSTALLATION WORK UNTIL THEY OBTAIN A COPY OF THE APPROVED COUNTER PERMIT OR GENERAL CONSTRUCTION PERMIT (GCP) FROM THE CONSULTANT AND HAS BEEN NOTIFIED BY SAWS CONSTRUCTION INSPECTION DIVISION TO PROCEED WITH THE WORK AND HAS ARRANGED A MEETING WITH THE INSPECTOR AND CONSULTANT FOR THE WORK REQUIREMENTS. WORK COMPLETED BY THE CONTRACTOR WITHOUT AN APPROVED COUNTER PERMIT AND/OR A GCP WILL BE SUBJECT TO REMOVAL AND REPLACEMENT AT THE EXPENSE OF THE CONTRACTORS AND/OR THE DEVELOPER.
3. THE CONTRACTOR SHALL OBTAIN THE SAWS STANDARD DETAILS FROM THE SAWS WEBSITE, [HTTP://WWW.SAWS.ORG/BUSINESS_CENTER/SPECS](http://www.saws.org/business_center/specs). UNLESS OTHERWISE NOTED WITHIN THE DESIGN PLANS.
4. THE CONTRACTOR IS TO MAKE ARRANGEMENTS WITH THE SAWS CONSTRUCTION INSPECTION DIVISION AT 210-233-2973, ON NOTIFICATION PROCEDURES THAT WILL BE USED TO NOTIFY AFFECTED HOME RESIDENTS AND/OR PROPERTY OWNERS 48 HOURS PRIOR TO BEGINNING ANY WORK.
5. LOCATION AND DEPTH OF EXISTING UTILITIES AND SERVICE LATERALS SHOWN ON THE PLANS ARE UNDERSTOOD TO BE APPROXIMATE. ACTUAL LOCATIONS AND DEPTHS MUST BE FIELD VERIFIED BY THE CONTRACTOR AT LEAST 1 WEEK PRIOR TO CONSTRUCTION. IT SHALL BE THE CONTRACTOR'S RESPONSIBILITY TO LOCATE UTILITY SERVICE LINES AS REQUIRED FOR CONSTRUCTION AND TO PROTECT THEM DURING CONSTRUCTION AT NO COST TO SAWS.
6. THE CONTRACTOR SHALL VERIFY THE EXACT LOCATION OF UNDERGROUND UTILITIES AND DRAINAGE STRUCTURES AT LEAST 1-2 WEEKS PRIOR TO CONSTRUCTION WHETHER SHOWN ON PLANS OR NOT. PLEASE ALLOW UP TO 7 BUSINESS DAYS FOR LOCATES REQUESTING PIPE LOCATION MARKERS ON SAWS FACILITIES. THE FOLLOWING CONTACT INFORMATION IS SUPPLIED FOR VERIFICATION PURPOSES:
SAWS UTILITY LOCATES: [HTTP://WWW.SAWS.ORG/SERVICE/LOCATES](http://www.saws.org/service/locates) (210) 207-0724 OR (210) 207-6026
COSA DRAINAGE (210) 206-8480
COSA TRAFFIC SIGNAL OPERATIONS (210) 206-8480
COSA TRAFFIC SIGNAL DAMAGES (210) 207-3951
TEXAS STATE WIDE ONE CALL LOCATOR 1-800-545-6005 OR 811
7. THE CONTRACTOR SHALL BE RESPONSIBLE FOR RESTORING EXISTING FENCES, CURBS, STREETS, DRIVEWAYS, SIDEWALKS, LANDSCAPING AND STRUCTURES TO ITS ORIGINAL OR BETTER CONDITION IF DAMAGES ARE MADE AS A RESULT OF THE PROJECT'S CONSTRUCTION.
8. ALL WORK IN TEXAS DEPARTMENT OF TRANSPORTATION (TXDOT) AND/OR BEXAR COUNTY RIGHT-OF-WAY SHALL BE DONE IN ACCORDANCE WITH RESPECTIVE CONSTRUCTION SPECIFICATIONS AND PERMIT REQUIREMENTS.
9. THE CONTRACTOR SHALL COMPLY WITH CITY OF SAN ANTONIO OR OTHER GOVERNING MUNICIPALITY'S TREE ORDINANCES WHEN EXCAVATING NEAR TREES.
10. THE CONTRACTOR SHALL NOT PLACE ANY WASTE MATERIALS IN THE 100-YEAR FLOOD PLAIN WITHOUT FIRST OBTAINING AN APPROVED FLOOD PLAIN PERMIT.
11. HOLIDAY WORK: CONTRACTORS WILL NOT BE ALLOWED TO PERFORM SAWS WORK ON SAWS RECOGNIZED HOLIDAYS. REQUEST SHOULD BE SENT TO CONSTWKRREQ@SAWS.ORG. WEEKEND WORK: CONTRACTORS ARE REQUIRED TO NOTIFY THE SAWS INSPECTION CONSTRUCTION DEPARTMENT 48 HOURS IN ADVANCE TO REQUEST WEEKEND WORK. REQUEST SHOULD BE SENT TO CONSTWKRREQ@SAWS.ORG. ANY AND ALL SAWS UTILITY WORK INSTALLED WITHOUT HOLIDAY/WEEKEND APPROVAL WILL BE SUBJECT TO BE UNCOVERED FOR PROPER INSPECTION.
12. COMPACTION NOTE (ITEM 804): THE CONTRACTOR SHALL BE RESPONSIBLE FOR MEETING THE COMPACTION REQUIREMENTS ON ALL TRENCH BACKFILL AND FOR PAYING FOR THE TESTS PERFORMED BY A THIRD PARTY. CONSTRUCTION TESTS WILL BE DONE AT ONE LOCATION POINT RANDOMLY SELECTED, OR AS INDICATED BY THE SAWS INSPECTOR AND/OR THE TEST ADMINISTRATOR, PER EACH 12-INCH LOOSE LIFT PER 400 LINEAR FEET AT A MINIMUM. THIS PROJECT WILL NOT BE ACCEPTED AND FINALIZED BY SAWS WITHOUT THIS REQUIREMENT BEING MET AND VERIFIED BY PROVIDING ALL NECESSARY DOCUMENTED TEST RESULTS.
13. A COPY OF ALL TESTING REPORTS SHALL BE FORWARDED TO SAWS CONSTRUCTION INSPECTION DIVISION.

TRENCH EXCAVATION SAFETY PROTECTION

CONTRACTOR AND/OR CONTRACTOR'S INDEPENDENTLY RETAINED EMPLOYEE OR STRUCTURAL DESIGN/GEOTECHNICAL/SAFETY/EQUIPMENT CONSULTANT, IF ANY, SHALL REVIEW THESE PLANS AND AVAILABLE GEOTECHNICAL INFORMATION AND THE ANTICIPATED INSTALLATION SITE(S) WITHIN THE PROJECT WORK AREA IN ORDER TO IMPLEMENT CONTRACTOR'S TRENCH EXCAVATION SAFETY PROTECTION SYSTEMS, PROGRAMS AND/OR PROCEDURES FOR THE PROJECT DESCRIBED IN THE CONTRACT DOCUMENTS. THE CONTRACTOR'S IMPLEMENTATION OF THESE SYSTEMS, PROGRAMS AND/OR PROCEDURES SHALL PROVIDE FOR ADEQUATE TRENCH EXCAVATION SAFETY PROTECTION THAT COMPLY WITH AS A MINIMUM, OSHA STANDARDS FOR TRENCH EXCAVATIONS. SPECIFICALLY, CONTRACTOR AND/OR CONTRACTOR'S INDEPENDENTLY RETAINED EMPLOYEE OR SAFETY CONSULTANT SHALL IMPLEMENT A TRENCH SAFETY PROGRAM IN ACCORDANCE WITH OSHA STANDARDS GOVERNING THE PRESENCE AND ACTIVITIES OF INDIVIDUALS WORKING IN AND AROUND TRENCH EXCAVATION.

GENERAL CONSTRUCTION NOTES:

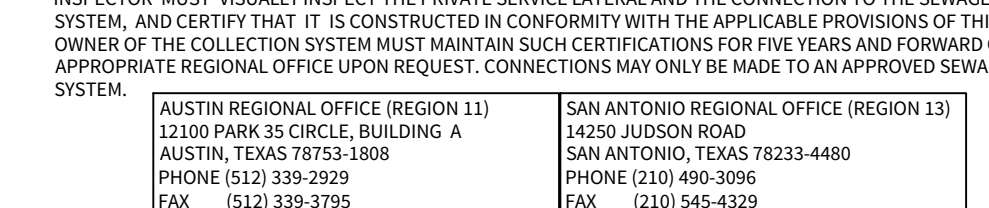
- THIS ORGANIZED SEWAGE COLLECTION SYSTEM (SCS) MUST BE CONSTRUCTED IN ACCORDANCE WITH 30 TEXAS ADMINISTRATIVE CODE (TAC) §213.50. THE TEXAS COMMISSION ON ENVIRONMENTAL QUALITY'S (TCEQ) EDWARDS AQUIFER RULES AND ANY LOCAL GOVERNMENT STANDARD SPECIFICATIONS.
- ALL CONTRACTORS CONDUCTING REGULATED ACTIVITIES ASSOCIATED WITH THIS PROPOSED REGULATED PROJECT MUST BE PROVIDED WITH COPIES OF THE SCS PLAN AND THE TCEQ LETTER INDICATING THE SPECIFIC CONDITIONS OF ITS APPROVAL. DURING THE COURSE OF THESE REGULATED ACTIVITIES, THE CONTRACTORS MUST BE REQUIRED TO KEEP ON-SITE COPIES OF THE PLAN AND THE APPROVAL LETTER.
- A WRITTEN NOTICE OF CONSTRUCTION MUST BE SUBMITTED TO THE PRESIDING TCEQ REGIONAL OFFICE AT LEAST 48 HOURS PRIOR TO THE START OF ANY REGULATED ACTIVITIES. THIS NOTICE MUST INCLUDE:
 - THE NAME OF THE APPROVED PROJECT;
 - THE ACTIVITY START DATE; AND
 - THE CONTACT INFORMATION OF THE PRIME CONTRACTOR.
- 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.
- PRIOR TO BEGINNING ANY CONSTRUCTION ACTIVITY, ALL TEMPORARY EROSION AND SEDIMENTATION (E&S) CONTROL MEASURES MUST BE PROPERLY INSTALLED AND MAINTAINED IN ACCORDANCE WITH THE MANUFACTURER'S SPECIFICATIONS. THESE CONTROLS MUST REMAIN IN PLACE UNTIL THE DISTURBED AREAS HAVE BEEN PERMANENTLY STABILIZED.
- IF ANY SENSITIVE FEATURES ARE DISCOVERED DURING THE WASTEWATER LINE TRENCHING ACTIVITIES, ALL REGULATED ACTIVITIES NEAR THE SENSITIVE FEATURE MUST BE SUSPENDED IMMEDIATELY. THE APPLICANT MUST IMMEDIATELY NOTIFY THE APPROPRIATE REGIONAL OFFICE OF THE TCEQ OF THE FEATURE DISCOVERED. A GEOLOGIST'S ASSESSMENT OF THE LOCATION OR EXTENT OF THE FEATURE DISCOVERED MUST BE REPORTED TO THAT REGIONAL OFFICE IN WRITING AND THE APPLICANT MUST SUBMIT A PLAN FOR ENSURING THE STRUCTURAL INTEGRITY OF THE SEWER LINE OR FOR MODIFYING THE PROPOSED COLLECTION SYSTEM ALIGNMENT AROUND THE FEATURE. THE REGULATED ACTIVITIES NEAR THE SENSITIVE FEATURE MAY NOT PROCEED UNTIL THE EXECUTIVE DIRECTOR HAS REVIEWED AND APPROVED THE METHODS PROPOSED TO PROTECT THE SENSITIVE FEATURE AND THE EDWARDS AQUIFER FROM ANY POTENTIALLY ADEVERSE IMPACTS TO WATER QUALITY WHILE MAINTAINING THE STRUCTURAL INTEGRITY OF THE LINE.
- 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 CAPED WITH CONCRETE TO PREVENT SCOURING OF BACKFILL, AND THE SEWER LINES MUST BE ENCASED IN CONCRETE. ALL CONCRETE SHALL HAVE A MINIMUM THICKNESS OF 6 INCHES.
- 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.
- ALL MANHOLES CONSTRUCTED OR REHABILITATED ON THIS PROJECT MUST HAVE WATER-TIGHT SIZE JOINTS. SIZE RESILIENT CONNECTORS ALLOWED FOR DIFFERENTIAL SETTLEMENT. IF MANHOLES ARE CONSTRUCTED WITH 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 TAC §213.53 ARE INCLUDED ON PLAN SHEET 9 OF 9.
- IT IS SUGGESTED THAT ENTRANCE INTO MANHOLES IN EXCESS OF FOUR FEET DEEP BE ACCOMPLISHED BY MEANS OF A PORTABLE LADDER. THE INSTALLATION OF STEPS IN A MANHOLE IS PROHIBITED.
- 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).
- WHERE SEWERS LINES DEVIATE FROM STRAIGHT ALIGNMENT AND UNIFORM GRADE ALL CURVATURE OF SEWER PIPE MUST BE ACHIEVED BY THE FOLLOWING PROCEDURE WHICH IS RECOMMENDED BY THE PIPE MANUFACTURER:
 - IF PIPE FLEXURE IS PROVIDED, 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.
- 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 ARE NOT DESIGATED BY THIS PLAN MUST BE CONNECTED TO AN EXISTING SEWER LINE OR TO AN EXISTING SEWER LINE NOT FURNISHED WITH STUB OUTS MUST BE CONNECTED USING A MANUFACTURED SADDLE AND AN IN CONNECTION WITH ACCEPTED PLUMBING TECHNIQUES.
- IF NO STUB OUT IS PRESENT AN ALTERNATE METHOD OF JOINING LATERALS IS SHOWN IN THE DETAIL ON PLAN SHEET 9 OF 9. FOR POTENTIAL FUTURE LATERALS.
- THE PRIVATE SERVICE LATERAL STUB OUTS MUST BE INSTALLED AS SHOWN ON THE PLAN AND PROFILE SHEETS ON PLAN SHEET 9 OF 9. AND MARKED AFTER BACKFILLING AS SHOWN IN THE DETAIL ON PLAN SHEET 9 OF 9.
- 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 A, B, II OR III. RIGID PIPE BEDDING MUST COMPLY WITH THE REQUIREMENTS OF ASTM C 12 (ANSI A 106.2) CLASSES A, B OR C.
- 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 MANHOLE TO 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 §213.50(3)(E).
- 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 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:
 - FOR A COLLECTION SYSTEM PIPE THAT WILL TRANSPORT WASTEWATER BY GRAVITY FLOW, THE DESIGN MUST SPECIFY AN INFILTRATION AND EXFILTRATION TEST OR LOW-PRESSURE AIR TEST. A TEST MUST CONFORM TO THE FOLLOWING REQUIREMENTS:
 - LOW PRESSURE AIR TEST
 - A LOW PRESSURE AIR TEST MUST FOLLOW THE PROCEDURES DESCRIBED IN AMERICAN SOCIETY FOR TESTING AND MATERIALS (ASTM) C-828, ASTM C-824, 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)(I) OF THIS PARAGRAPH.
 - 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.
 - 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 COMPRISED FROM THE FOLLOWING EQUATION:

$$\text{EQUATION C.3} \quad T = \frac{0.085 \times \text{DIA}^2}{Q}$$
 - 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, 0.0018 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:

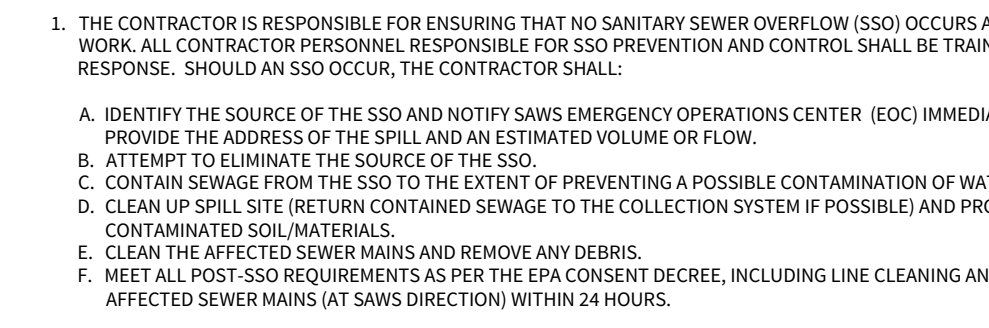
Pipe Diameter (inches)	Minimum Time (seconds)	Length for Minimum Time (feet)	Time for Longer Length (seconds)
6	340	308	0,655(C)
8	454	298	1,520(C)
10	567	239	2,374(C)
12	680	199	3,410(C)
15	820	159	5,342(C)
18	1020	133	7,693(C)
21	1190	114	10,470(C)
24	1360	100	14,136(C)
27	1530	88	17,309(C)
30	1700	80	21,390(C)
33	1870	72	25,826(C)
 - AN OWNER MAY STOP A TEST IF NO PRESSURE LOSS HAS OCCURRED DURING THE FIRST 25% OF THE CALCULATED TESTING TIME. IF ANY PRESSURE LOSS OR LEAKAGE HAS OCCURRED DURING THE FIRST 25% OF A TESTING PERIOD, THEN THE TEST MUST CONTINUE FOR THE ENTIRE TEST DURATION AS OUTLINED ABOVE OR UNTIL FAILURE.
 - WASTEWATER COLLECTION SYSTEM PIPES WITH 27 INCH OR LARGER AVERAGE INSIDE DIAMETER MAY BE AIR TESTED AT EACH JOINT INSTEAD OF FOLLOWING THE PROCEDURE OUTLINED IN THIS SECTION.
 - A TESTING PROCEDURE FOR PIPE WITH AN INSIDE DIAMETER GREATER THAN 33 INCHES MUST BE APPROVED BY THE EXECUTIVE DIRECTOR.
 - INFILTRATION/EXFILTRATION TEST.
 - 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.
 - AN OWNER SHALL USE AN INFILTRATION TEST IN LIEU OF AN EXFILTRATION TEST WHEN PIPES ARE INSTALLED BELOW THE GROUNDWATER LEVEL.
 - 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.
 - FOR CONSTRUCTION WITHIN A 25-YEAR FLOODPLAIN, THE INFILTRATION OR EXFILTRATION MUST NOT EXCEED 10 GALLONS PER INCH DIAMETER PER MILE OF PIPE PER 24 HOURS AT THE SAME MINIMUM TEST HEAD AS IN SUBPARAGRAPH (C) OF THIS PARAGRAPH.
 - 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 TEST A PIPE FOLLOWING THE PROCEDURES DESCRIBED IN THIS SECTION.
 - IF A GRAVITY COLLECTION PIPE IS COMPOSED OF FLEXIBLE PIPE, DEFLECTION TESTING IS ALSO REQUIRED WITH THE FOLLOWING PROCEDURES MUST BE OBSERVED:
 - FOR A COLLECTION PIPE WITH INSIDE DIAMETER LESS THAN 27 INCHES, DEFLECTION MEASUREMENT REQUIRES A RIGID MANDEL.
 - A RIGID MANDEL 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.
 - IF A MANDEL SIZING DIAMETER IS NOT SPECIFIED IN THE APPROPRIATE STANDARD, THE MANDEL 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 MANDEL, MUST EQUAL BE THE AVERAGE OUTSIDE DIAMETER MINUS TWO MINIMUM WALL THICKNESSES FOR OD CONTROLLED PIPE AND THE AVERAGE INSIDE DIAMETER FOR UNCONTROLLED PIPE.
 - ALL DIMENSIONS MUST MEET THE APPROPRIATE STANDARD.
 - MANDEL DESIGN.
 - A RIGID MANDEL MUST BE CONSTRUCTED OF A METAL OR A RIGID PLASTIC MATERIAL THAT CAN WITHSTAND 200 PSI WITHOUT BEING DEFORMED.
 - A MANDEL 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 MANDEL MUST USE A SEPARATE PROVING RING.
 - AN ADJUSTABLE OR FLEXIBLE MANDEL IS PROHIBITED.
 - A TEST MAY NOT USE TELEVISION INSPECTION AS A SUBSTITUTE FOR A DEFLECTION TEST.
 - (II) IF REQUESTED, THE EXECUTIVE DIRECTOR MAY APPROVE THE USE OF A DEFLECTOMETER OR A MANDEL WITH REMOVABLE LEGS OR RUNNERS ON A CASE-BY-CASE BASIS.
 - FOR A GRAVITY COLLECTION SYSTEM PIPE WITH AN INSIDE DIAMETER 27 INCHES OR GREATER, OTHER TEST METHODS MAY BE USED TO DETERMINE VERTICAL DEFLECTION.
 - A DEFLECTION TEST METHOD MUST BE ACCURATE TO WITHIN PLUS OR MINUS 0.2% DEFLECTION.
 - AN OWNER SHALL NOT CONDUCT A DEFLECTION TEST UNTIL AT LEAST 30 DAYS AFTER THE FINAL BACKFILL.
 - GRAVITY COLLECTION SYSTEM PIPE DEFLECTION MUST NOT EXCEED FIVE PERCENT (5%).
 - 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.
 - ALL MANHOLES MUST BE TESTED TO MEET OR EXCEED THE REQUIREMENTS OF 30 TAC §217.58.
 - ALL MANHOLES MUST PASS A LEAKAGE TEST.
 - AN OWNER SHALL TEST EACH MANHOLE (AFTER ASSEMBLY AND BACKFILLING) FOR LEAKAGE, SEPARATE AND INDEPENDENT OF THE COLLECTION SYSTEM PIPES, BY HYDROSTATIC EXFILTRATION, TESTING, VACUUM TESTING, OR OTHER METHOD APPROVED BY THE EXECUTIVE DIRECTOR.
 - HYDROSTATIC TESTING.
 - THE MAXIMUM LEAKAGE FOR HYDROSTATIC TESTING OR ANY ALTERNATIVE TEST METHODS IS 0.025 GALLONS PER FOOT DIAMETER PER FOOT OF MANHOLE DEPTH PER HOUR.
 - TO PERFORM A HYDROSTATIC TEST, AN OWNER SHALL SEAL ALL WASTEWATER PIPES COMING INTO A MANHOLE WITH AN INTERNAL PIPE PLUG, FILL THE MANHOLE WITH WATER, AND MAINTAIN THE TEST FOR AT LEAST ONE HOUR.
 - A TEST FOR CONCRETE MANHOLES MAY USE A 24-HOUR WETTING PERIOD BEFORE TESTING TO ALLOW SATURATION OF THE CONCRETE.
 - VACUUM TESTING.
 - TO PERFORM A VACUUM TEST, AN OWNER SHALL PLUG ALL LIFT HOLES AND EXTERIOR JOINTS WITH A NON-SHRINK GROUT AND PLUG ALL PIPES ENTERING A MANHOLE.
 - NO GROUT MUST BE PLACED IN HORIZONTAL JOINTS BEFORE TESTING.
 - STUB OUTS, MANHOLE BOOT, AND PIPE INCHES MUST BE SECURED TO PREVENT MOVEMENT WHILE A VACUUM IS DRAWN.
 - AN OWNER SHALL USE A MINIMUM 60 INCH LB TORQUE WRENCH TO TIGHTEN THE EXTERNAL CLAMPS THAT SECURE A TEST COVER TO THE TOP OF A MANHOLE.
 - A TEST HEAD MUST BE PLACED AT THE INSIDE OF THE TOP OF A CONE SECTION, AND THE SEAL INFLATED IN ACCORDANCE WITH THE MANUFACTURER'S RECOMMENDATIONS.
 - THERE MUST BE A VACUUM OF 10 INCHES OF MERCURY INSIDE A MANHOLE TO PERFORM A VALID TEST.
 - A TEST DOES NOT BEGIN UNTIL AFTER THE VACUUM PUMP IS OFF.
 - A MANHOLE PASSES THE TEST IF AFTER 20 MINUTES AND WITH ALL VALVES CLOSED, THE VACUUM IS AT LEAST 9.0 INCHES OF MERCURY.
 - ALL PRIVATE SERVICE LATERALS MUST BE INSPECTED AND CERTIFIED IN ACCORDANCE WITH 30 TAC §213.50(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 CONFORMING WITH THE APPLICABLE PROVISIONS OF THIS SECTION. THE OWNER OF THE COLLECTION SYSTEM MUST MAINTAIN SUCH CERTIFICATIONS FOR FIVE YEARS AND FORWARD COPIES TO THE APPROPRIATE REGIONAL OFFICE UPON REQUEST. CONNECTIONS MAY ONLY BE MADE TO AN APPROVED SEWAGE COLLECTION SYSTEM.

AUSTIN REGIONAL OFFICE (REGION 11)	SAN ANTONIO REGIONAL OFFICE (REGION 13)
12100 PARK 35 CIRCLE, BUILDING A	14350 JURDSON ROAD
AUSTIN, TEXAS 78753-1808	SAN ANTONIO, TEXAS 78233-4480
PHONE (512) 339-2929	PHONE (210) 490-3096
FAX (512) 339-3795	FAX (210) 545-4329
 - THE CONTRACTOR IS RESPONSIBLE FOR ENSURING THAT NO SANITARY SEWER OVERFLOW (SSO) OCCURS AS A RESULT OF THEIR WORK. ALL CONTRACTOR PERSONNEL MUST BE TRAINED IN SSO PREVENTION AND CONTROL. SHALL BE IMMEDIATELY ON-PERSON RESPONSE. SHOULD AN SSO OCCUR, THE CONTRACTOR SHALL:
 - IDENTIFY THE SOURCE OF THE SSO AND NOTIFY SAWS'S EMERGENCY OPERATIONS CENTER (EOC) IMMEDIATELY AT (210) 233-2014. PROVIDE THE ADDRESS OF THE SPILL AND AN ESTIMATED VOLUME OR FLOW.
 - ATTEMPT TO ISOLATE THE SOURCE OF THE SSO.
 - CONTAIN SEWAGE FROM THE SSO TO THE EXTENT OF PREVENTING A POSSIBLE CONTAMINATION OF WATERWAYS.
 - CLEAN UP SPILL SITE (RETURN CONTAINED SEWAGE TO THE COLLECTION SYSTEM IF POSSIBLE) AND PROPERLY DISPOSE OF CONTAMINATED SOIL MATERIALS.
 - CLEAN THE AFFECTED SEWER MAINS AND REMOVE ANY DEBRIS.
 - MEET ALL POST-SSO REQUIREMENTS AS PER THE EPA CONSOLIDATED DECREE, INCLUDING LINE CLEANING AND TELEVISION THE AFFECTED SEWER MAINS AT SAWS DISCRETION WITHIN 24 HOURS.
 - SHOULD THE CONTRACTOR FAIL TO ADDRESS AN SSO IMMEDIATELY AND TO SAWS'S SATISFACTION, THEY WILL BE RESPONSIBLE FOR ALL COSTS INCURRED BY SAWS, INCLUDING ANY FINES FROM EPA, TCEQ AND/OR ANY OTHER FEDERAL, STATE OR LOCAL AGENCIES. NO SEPARATE MEASUREMENT OR PAYMENT SHALL BE MADE FOR THIS WORK. ALL WORK SHALL BE DONE ACCORDING TO GUIDELINES SET BY THE TCEQ AND SAWS.
 - IF BYPASS PUMPING IS REQUIRED, THE CONTRACTOR SHALL PERFORM SUCH WORK IN ACCORDANCE WITH SAWS STANDARD SPECIFICATION FOR WATER AND SANITARY SEWER CONSTRUCTION, ITEM NO. 864, "BYPASS PUMPING".
 - PRIOR TO TIE-INS, ANY SHUTDOWNS OF EXISTING FORCE MAINS OF ANY SIZE MUST BE COORDINATED WITH THE SAWS CONSTRUCTION INSPECTION DIVISION AT (210) 233-2973 AT LEAST ONE WEEK IN ADVANCE OF THE SHUTDOWN. THE CONTRACTOR MUST ALSO PROVIDE A SCHEDULE OF WORK AS RELATED TO THE TIE-INS THAT IS AT NO ADDITIONAL COST TO SAWS OR THE PROJECT AND IT IS THE RESPONSIBILITY OF THE CONTRACTOR TO SCHEDULE THE WORK ACCORDINGLY.
 - SEWER PIPE WHERE WATER LINE CROSSES SHALL BE 160 PSI AND MEET THE REQUIREMENTS OF ASTM D2242, TAC 213.53 AND TCEQ 290.44(E)(4)(B). CONTRACTOR SHALL CENTER 20" JOINT OF 160 PSI PRESSURE RATED PVC AT THE PROPOSED WATER CROSSING.
 - ELEVATIONS POSTED FOR TOP OF MANHOLES ARE FOR REFERENCE ONLY. IT SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR TO MAKE ALLOWANCES AND ADJUSTMENTS FOR TOP OF MANHOLES TO MATCH THE FINISHED GRADE OF THE PROJECT'S IMPROVEMENTS. (NSP)
 - SPILLS, OVERFLOWS, OR DISCHARGES OF WASTEWATER: ALL SPILLS, OVERFLOWS, OR DISCHARGES OF WASTEWATER, RECYCLED WATER, PETROLEUM PRODUCTS, OR CHEMICALS MUST BE REPORTED IMMEDIATELY TO THE SAWS INSPECTOR ASSIGNED TO THE CONTRACT PERMIT OR GENERAL CONSTRUCTION PERMIT (GCP). THIS REQUIREMENT APPLIES TO EVERY SPILL, OVERFLOW, OR DISCHARGE REGARDLESS OF SIZE.
 - MANHOLE AND ALL PIPE TESTING (INCLUDING THE TV INSPECTION) MUST BE PERFORMED AND PASSED PRIOR TO FINAL FIELD ACCEPTANCE BY SAWS CONSTRUCTION INSPECTION DIVISION, AS PER THE SAWS SPECIFICATIONS FOR WATER AND SANITARY SEWER CONSTRUCTION.
 - CASING PIPE FOR A COLLECTION SYSTEM PIPE THAT CROSSES ABOVE A WATER SUPPLY PIPE MUST BE CONSTRUCTED OF AT LEAST 150 PSI PRESSURE CLASS PIPE THAT IS:
 - SEALED AT BOTH ENDS WITH CEMENT GROUT OR A MANUFACTURED SEAL;
 - AT LEAST TWO NOMINAL SIZES LARGER THAN THE WASTEWATER COLLECTION PIPE; AND
 - SUPPORTED BY SPACERS BETWEEN THE COLLECTION SYSTEM PIPE AND THE ENCASED PIPE AT A MAXIMUM OF FIVE-FOOT INTERVALS.
 - A COLLECTION SYSTEM PIPE THAT CROSSES ABOVE A WATER SUPPLY PIPE MUST BE CONSTRUCTED OF AT LEAST 150 PSI PRESSURE CLASS, CORROSION-RESISTANT, NON-BRITTLE PIPE AND MUST USE MANUFACTURER-APPROVED ADAPTERS, GASKETS, JOINTS, COMPRESSION JOINTS, AND OTHER NON-BONDED JOINTS MUST BE DESIGNED TO SEAL AT ATMOSPHERIC PRESSURE.
 - PVC PIPE OVER 14 FEET OF COVER SHALL BE EXTRA STRENGTH WITH MINIMUM PIPE STIFFNESS OF 135 PSI

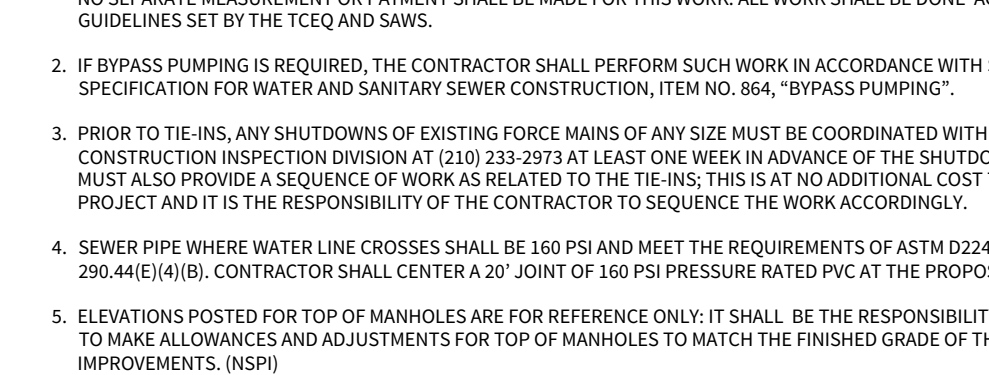
2 BAGGED GRAVEL INLET FILTER NOTES



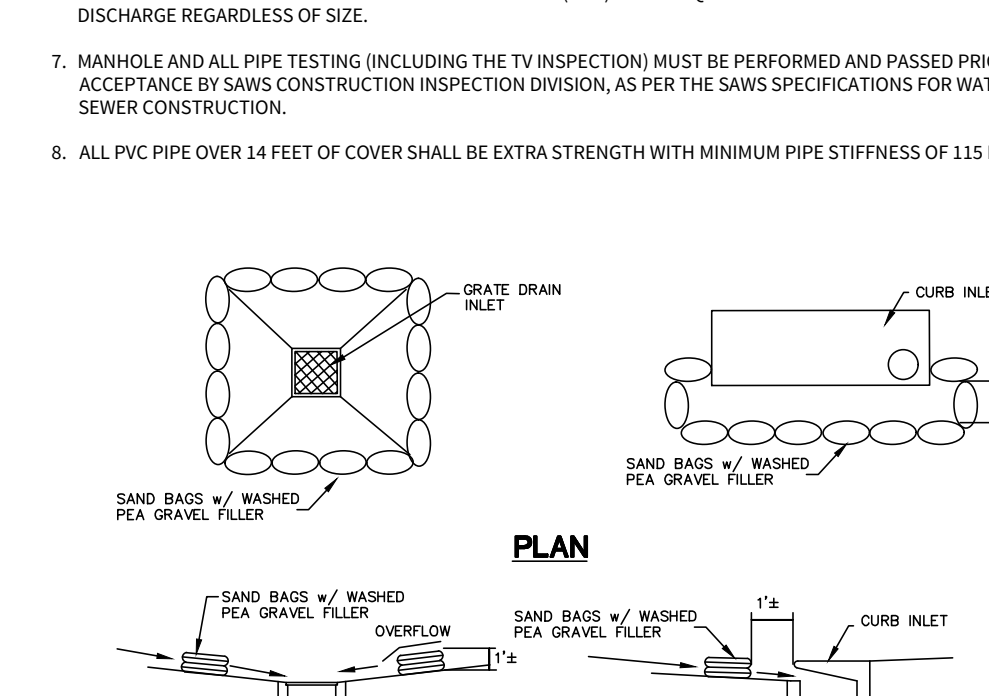
3 HIGH-SERVICE ROCK BERM



4 CONCRETE TRUCK WASHOUT PIT



5 TYP. CONSTRUCTION STAGING AREA



6 TEMPORARY CONSTRUCTION ENTRANCE/EXIT NOTES

- LENGTH SHALL BE AS SHOWN ON THE CONSTRUCTION DRAWINGS BUT NOT LESS THAN 50 FEET.
- THICKNESS SHALL BE NOT LESS THAN 8 INCHES.
- WIDTH SHALL BE NOT LESS THAN FULL WIDTH OF ALL POINTS OF INGRESS OR EGRESS.
- STABILIZED AREA MAY BE WIDENED OR LENGTHENED TO ACCOMMODATE A TRUCK WASHING AREA WHEN SHOWN ON THE CONSTRUCTION DRAWING. AN OUTLET SEDIMENT TRAP MUST BE PROVIDED FOR THE TRUCK WASHING AREA.
- STONE MATERIAL SHALL CONSIST OF 3 TO 5 INCH OPEN GRADED ROCK AND SHALL BE PLACED IN A LAYER OF AT LEAST 8 INCHES THICKNESS.
- THE AGGREGATE SHOULD CONSIST OF 4 TO 8 INCH WASHED STONE OVER A STABLE FOUNDATION.
- THE AGGREGATE SHOULD BE PLACED WITH A MINIMUM THICKNESS OF 8 INCHES.
- THE GEOTEXTILE FABRIC SHOULD BE DESIGNED SPECIFICALLY FOR USE AS A SOIL FILTRATION MEDIA WITH AN APPROXIMATE WEIGHT OF 6 OZ/LY 2. A MINIMUM BURST STRENGTH OF 140 LB/LY 2, AND AN EQUIVALENT OPENING SIZE GREATER THAN A NUMBER 50 SIEVE.
- AVOID CURVES ON PUBLIC ROADS AND STEEP SLOPES. REMOVE VEGETATION AND OTHER OBJECTIONABLE MATERIAL FROM THE FOUNDATION AREA. GRADE CROWN FUNDATION FOR POSITIVE DRAINAGE.
- THE MINIMUM WIDTH OF THE ENTRANCE/EXIT SHOULD BE 12 FEET OR THE FULL WIDTH OF EXIT ROADWAY, WHICHEVER IS GREATER.
- THE CONSTRUCTION ENTRANCE SHOULD BE AT LEAST 50 FEET LONG.
- PLACE GEOTEXTILE FABRIC AND GRADE FOUNDATION TO IMPROVE STABILITY, ESPECIALLY WHERE WET CONDITIONS ARE ANTICIPATED.
- PLACE STONE TO DIMENSIONS AND GRADE SHOWN. LEAVE SURFACE SMOOTH AND SLOPE FOR DRAINAGE.
- 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 THE CONTRACTOR.
- WHEN NECESSARY, WHEELS SHOULD BE CLEANED TO REMOVE SEDIMENT PRIOR TO ENTRANCE ONTO PUBLIC RIGHT-OF-WAY.
- WHEN WASHING IS REQUIRED, IT SHOULD BE DONE ON AN AREA STABILIZED WITH CRUSHED STONE THAT DRAINS INTO AN APPROVED SEDIMENT TRAP OR SEDIMENT BASIN.
- ALL SEDIMENT SHOULD BE PREVENTED FROM ENTERING ANY STORM DRAIN, DITCH OR WATER COURSE.

SAWS GENERAL NOTES:

- ALL MATERIALS AND CONSTRUCTION PROCEDURES WITHIN THE SCOPE OF THIS CONTRACT SHALL BE APPROVED BY THE SAN ANTONIO WATER SYSTEM (SAWS) AND COMPLY WITH THE PLANS, SPECIFICATIONS, GENERAL CONDITIONS AND WITH THE FOLLOWING AS APPLICABLE:
 - PLANS
 - CURRENT TEXAS COMMISSION ON ENVIRONMENTAL QUALITY (TCEQ) "DESIGN CRITERIA FOR DOMESTIC WASTEWATER SYSTEM", TEXAS ADMINISTRATIVE CODE (TAC) TITLE 30 PART 1 CHAPTER 217 AND "PUBLIC DRINKING WATER", TAC TITLE 30 PART 1 CHAPTER 290.
 - CURRENT TCEQ STANDARD SPECIFICATIONS FOR CONSTRUCTION OF HIGHWAYS, STREETS AND DRAINAGE.
 - CURRENT "SAN ANTONIO WATER SYSTEM STANDARD SPECIFICATIONS FOR WATER AND SANITARY SEWER CONSTRUCTION".
 - CURRENT CITY OF SAN ANTONIO STANDARD SPECIFICATIONS FOR PUBLIC WORKS CONSTRUCTION".
 - CURRENT CITY OF SAN ANTONIO "UTILITY EXCAVATION CRITERIA MANUAL" (UECM).
- THE CONTRACTOR SHALL NOT PROCEED WITH ANY PIPE INSTALLATION WORK UNTIL THEY OBTAIN A COPY OF THE APPROVED COUNTER PERMIT OR GENERAL CONSTRUCTION PERMIT (GCP) FROM THE CONSULTANT AND HAS BEEN NOTIFIED BY SAWS CONSTRUCTION INSPECTION DIVISION TO PROCEED WITH THE WORK AND HAS ARRANGED A MEETING WITH THE INSPECTOR AND CONSULTANT FOR THE WORK REQUIREMENTS. WORK COMPLETED BY THE CONTRACTOR WITHOUT AN APPROVED COUNTER PERMIT AND/OR GCP WILL BE SUBJECT TO REMOVAL AND REPLACEMENT AT THE EXPENSE OF THE CONTRACTORS AND/OR THE DEVELOPER.
- THE CONTRACTOR SHALL OBTAIN THE SAWS STANDARD DETAILS FROM THE SAWS WEBSITE, HTTP://WWW.SAWS.ORG/BUSINESS_CENTER/SPCS. UNLESS OTHERWISE NOTED WITHIN THE DESIGN PLANS.
- THE CONTRACTOR IS TO MAKE ARRANGEMENTS WITH THE SAWS CONSTRUCTION INSPECTION DIVISION AT 210-233-2973, ON NOTIFICATION PROCEDURES THAT WILL BE USED TO NOTIFY AFFECTED HOME RESIDENTS AND/OR PROPERTY OWNERS 48 HOURS PRIOR TO BEGINNING ANY WORK.
- LOCATION AND DEPTH OF EXISTING UTILITIES AND SERVICE LATERALS SHOWN ON THE PLANS ARE UNDERSTOOD TO BE APPROXIMATE. ACTUAL LOCATIONS AND DEPTHS MUST BE FIELD VERIFIED BY THE CONTRACTOR AT LEAST 1 WEEK PRIOR TO CONSTRUCTION. IT SHALL BE THE CONTRACTOR'S RESPONSIBILITY TO LOCATE UTILITY SERVICE LINES AS REQUIRED FOR CONSTRUCTION AND TO PROTECT THEM DURING CONSTRUCTION AT NO COST TO SAWS.
- THE CONTRACTOR SHALL VERIFY THE EXACT LOCATION OF UNDERGROUND UTILITIES AND DRAINAGE STRUCTURES AT LEAST 1 WEEKS PRIOR TO CONSTRUCTION WHETHER SHOWN ON PLANS OR NOT. PLEASE ALLOW UP TO 7 BUSINESS DAYS FOR LOCATES REQUESTING PIPE LOCATION MARKERS ON SAWS FACILITIES. THE FOLLOWING CONTACT INFORMATION ARE SUPPLIED FOR VERIFICATION PURPOSES:

SAWS UTILITY LOCATES:	HTTP://WWW.SAWS.ORG/SERVICE/LOCATES
COSA DRAINAGE	(210) 205-4724 OR (210) 207-6026
COSA TRAFFIC SIGNAL OPERATOR	(210) 206-8480
COSA TRAFFIC SIGNAL DRAMAGES	(210) 207-3995
TEXAS STATE WIDE ONE CALL LOCATOR	1-800-468-6888 OR 811
- THE CONTRACTOR SHALL BE RESPONSIBLE FOR RESTORING EXISTING FENCES, CURBS, STREETS, DRIVEWAYS, SIDEWALKS, LANDSCAPING AND STRUCTURES TO ITS ORIGINAL OR BETTER CONDITION IF DAMAGES ARE MADE AS A RESULT OF THE PROJECT'S CONSTRUCTION.
- ALL WORK IN TEXAS DEPARTMENT OF TRANSPORTATION (TxDOT) AND/OR TEXAS COUNTY RIGHT-OF-WAY SHALL BE DONE IN ACCORDANCE WITH RESPECTIVE CONSTRUCTION SPECIFICATIONS AND PERMIT REQUIREMENTS.
- THE CONTRACTOR SHALL COMPLY WITH CITY OF SAN ANTONIO OR OTHER GOVERNING MUNICIPALITY'S TREE ORDINANCES WHEN EXCAVATING NEAR TREES.
- THE CONTRACTOR SHALL NOT PLACE ANY WASTE MATERIALS IN THE 100-YEAR FLOOD PLAN WITH FIRST OBTAINING AN APPROVED FLOOD PLAN PERMIT.
- HOLIDAY WORK: CONTRACTORS WILL NOT BE ALLOWED TO PERFORM SAWS WORK ON SAWS RECOGNIZED HOLIDAYS. REQUEST SHOULD BE SENT TO CONSTWORKE@SAWS.ORG. WEEKEND WORK: CONTRACTORS ARE REQUIRED TO NOTIFY THE SAWS INSPECTION CONSTRUCTION DEPARTMENT 48 HOURS IN ADVANCE TO REQUEST WEEKEND WORK. REQUEST SHOULD BE SENT TO CONSTWORKE@SAWS.ORG. ANY AND ALL SAWS UTILITY WORK INSTALLED WITHOUT HOLIDAY/WEEKEND APPROVAL WILL BE SUBJECT TO BE UNCOVERED FOR PROPER INSPECTION.
- CONSTRUCTION NOTE ITEM 804: THE CONTRACTOR SHALL BE RESPONSIBLE FOR MEETING THE COMPACTION REQUIREMENTS ON ALL TRENCH BACKFILL AND FOR PACKING THE TRENCHES PERFORMED BY A THIRD PARTY. COMPACTED TRENCHES SHALL BE FIELD VERIFIED BY THE CONTRACTOR, OR AS INDICATED BY THE SAWS INSPECTOR AND/OR THE TEST ADMINISTRATOR, PER EACH 12-INCH LIFT PER 400 LINEAR FEET AT A MINIMUM. THIS PROJECT WILL NOT BE ACCEPTED AND FINALIZED BY SAWS WITHOUT THIS REQUIREMENT BEING MET AND VERIFIED BY PROVIDING ALL NECESSARY DOCUMENTED TEST RESULTS.
- A COPY OF ALL TESTING REPORTS SHALL BE FORWARDED TO SAWS CONSTRUCTION INSPECTION DIVISION.

§217.58. TESTING REQUIREMENTS FOR MANHOLES.

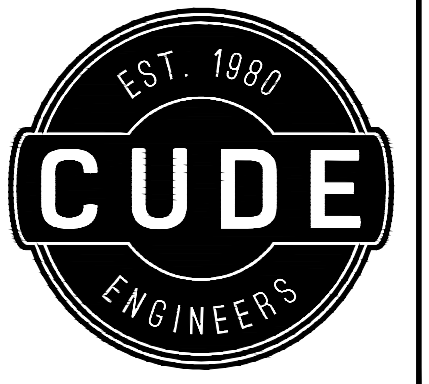
- ALL MANHOLES MUST PASS A LEAKAGE TEST.
 - AN OWNER SHALL TEST EACH MANHOLE (AFTER ASSEMBLY AND BEFORE BACKFILLING, FOR LEAKAGE USING HYDROSTATIC EXFILTRATION TESTING, VACUUM TESTING, OR ANY OTHER METHOD APPROVED IN WRITING BY THE EXECUTIVE DIRECTOR. A MANHOLE MUST BE TESTED SEPARATELY AND INDEPENDENTLY FROM THE COLLECTION SYSTEM PIPES.
 - HYDROSTATIC TESTING.
 - THE MAXIMUM LEAKAGE RATE FOR HYDROSTATIC TESTING OR AN ALTERNATIVE TEST METHODS IS 0.025 GALLONS PER FOOT DIAMETER PER FOOT OF MANHOLE DEPTH PER HOUR.
 - TO PERFORM A HYDROSTATIC TEST, AN OWNER SHALL SEAL ALL WASTEWATER PIPES COMING INTO THE MANHOLE WITH AN INTERNAL PIPE PLUG, FILL THE MANHOLE WITH WATER, AND MAINTAIN THE TEST FOR AT LEAST ONE HOUR.
 - A TEST FOR CONCRETE MANHOLES MAY USE A 24-HOUR WETTING PERIOD BEFORE TESTING TO ALLOW SATURATION OF THE CONCRETE.
 - VACUUM TESTING.
 - AN OWNER MUST PERFORM VACUUM TESTING ACCORDING TO EITHER SUBPARAGRAPH (A) OR (B) OF THIS PARAGRAPH. IF A MANHOLE FAILS THE VACUUM TEST, THE OWNER MUST APPLY GROUT TO THE EXTERIOR OF THE EXCAVATED MANHOLE BEFORE RETESTING THE MANHOLE.
 - TEXAS TEST.
 - TO PERFORM A VACUUM TEST, AN OWNER SHALL PLUG ALL LIFT HOLES AND EXTERIOR JOINTS WITH A NON-SHRINK GROUT AND PLUG ALL PIPES ENTERING A MANHOLE.
 - GROUT MAY NOT BE PLACED IN HORIZONTAL JOINTS BEFORE TESTING.
 - STUB OUTS, MANHOLE BOOT, AND PIPE INCHES MUST BE SECURED TO PREVENT MOVEMENT WHILE A VACUUM IS DRAWN.
 - AN OWNER SHALL USE A MINIMUM 60 INCH LB TORQUE WRENCH TO TIGHTEN THE EXTERNAL CLAMPS THAT SECURE A TEST COVER TO THE TOP OF A MANHOLE.
 - A TEST HEAD MUST BE PLACED AT THE INSIDE OF THE TOP OF A CONE SECTION, AND THE SEAL MUST BE INFLATED IN ACCORDANCE WITH THE MANUFACTURER'S RECOMMENDATIONS.
 - THERE MUST BE A VACUUM OF 10 INCHES OF MERCURY INSIDE A MANHOLE TO PERFORM A VALID TEST.
 - A TEST DOES NOT BEGIN UNTIL AFTER THE VACUUM PUMP IS OFF.
 - IF A MANHOLE PASSES THE TEST IF AFTER 20 MINUTES AND WITH ALL VALVES CLOSED, THE VACUUM IS AT LEAST 9.0 INCHES OF MERCURY.
 - AMERICAN SOCIETY FOR TESTING AND MATERIALS (ASTM) TEST. THE OWNER MAY REQUIRE MANHOLE TESTING THAT MEETS THE REQUIREMENTS OF ASTM D1244-11.
- TEXAS TEST.
 - A DESIGN MUST, TO THE EXTENT PRACTICABLE, AVOID CONFINED SPACES AS DEFINED IN 29 FEDERAL CODE OF REGULATIONS §1910.146.
 - A VENTILATED MANHOLE MUST BE EQUIPPED WITH A CONNECTION FOR A PORTABLE VENTILATOR.
 - CONFINED SPACE ENTRY MUST BE CONDUCTED ACCORDING TO THE REQUIREMENTS OF 29 CODE OF FEDERAL REGULATIONS §1910.146.

§217.53 SUBCHAPTER M SAFETY - CONFINED SPACES

- A DESIGN MUST, TO THE EXTENT PRACTICABLE, AVOID CONFINED SPACES AS DEFINED IN 29 FEDERAL CODE OF REGULATIONS §1910.146.
- A VENTILATED MANHOLE MUST BE EQUIPPED WITH A CONNECTION FOR A PORTABLE VENTILATOR.
- CONFINED SPACE ENTRY MUST BE CONDUCTED ACCORDING TO THE REQUIREMENTS OF 29 CODE OF FEDERAL REGULATIONS §1910.146.

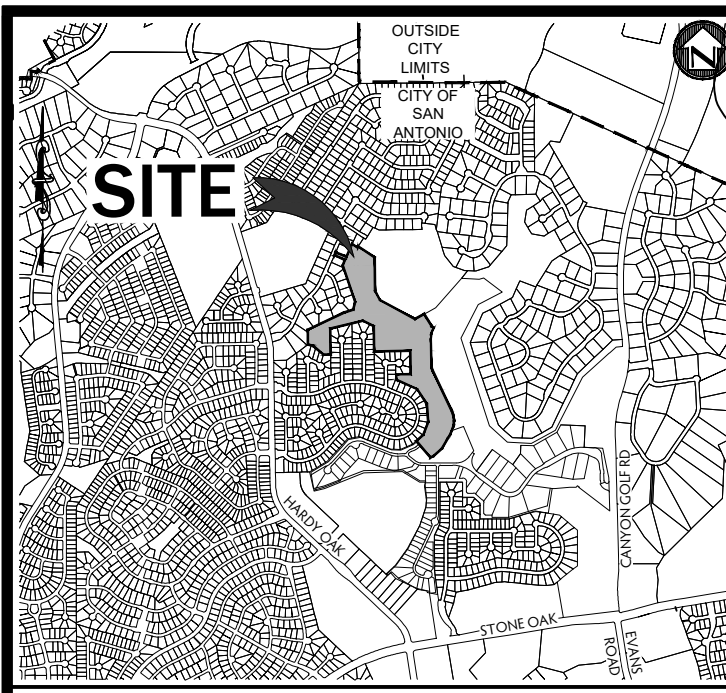
§217.53 PIPE DESIGN

- SEPARATION DISTANCES.
 - COLLECTION SYSTEM PIPES MUST BE INSTALLED IN TRENCHES SEPARATE FROM WATER SUPPLY TRENCHES.
 - WHENVER POSSIBLE, A COLLECTION SYSTEM PIPE MUST BE LOCATED BELOW A WATER SUPPLY PIPE. IF A COLLECTION SYSTEM PIPE CANNOT BE LOCATED BELOW A WATER SUPPLY PIPE, THE OWNER MUST JUSTIFY IN THE ENGINEERING REPORT WHY IT IS NOT POSSIBLE TO LOCATE THE COLLECTION SYSTEM PIPE BELOW THE PUBLIC WATER SUPPLY PIPE.
 - WHENVER POSSIBLE, COLLECTION SYSTEM PIPES AND MANHOLES MUST BE LOCATED AT LEAST NINE FEET FROM ALL WATER SUPPLY PIPES. IF A COLLECTION SYSTEM PIPE OR MANHOLE CANNOT BE LOCATED AT LEAST NINE FEET AWAY FROM A WATER SUPPLY PIPE, THE OWNER MUST JUSTIFY IN THE ENGINEERING REPORT WHY IT IS NOT POSSIBLE TO PROVIDE AT LEAST NINE FEET OF SEPARATION. TABLE C.1, IN FIGURE 30 TAC §217.53(D)(3) PROVIDES A REFERENCE TO PARAGRAPHS IN THIS SUBSECTION THAT APPLY IF A COLLECTION SYSTEM PIPE OR MANHOLE CANNOT BE LOCATED AT LEAST NINE FEET AWAY FROM A WATER SUPPLY PIPE.
 - IF A COLLECTION SYSTEM PIPE IS LOCATED ABOVE A WATER SUPPLY PIPE AND RUNS PARALLEL TO THE WATER SUPPLY PIPE, EACH PORTION OF THE COLLECTION SYSTEM PIPE WITHIN NINE FEET OF THE WATER SUPPLY PIPE MUST BE ENCASED. THE ENCASED PIPE MUST BE CONSTRUCTED OF AT LEAST 150 PER SQUARE INCH (PSI) PRESSURE CLASS PIPE THAT:
 -



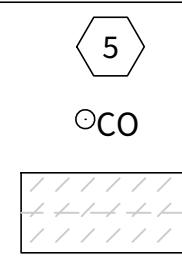
4122 Pond Hill Road, Suite 101
San Antonio, Texas 78231
P:(210) 681.2951 F:(210) 523.7112

HIDDEN CANYON SUBDIVISION
UNIT 2A P.U.D.
SANITARY SEWER PLAN & PROFILE - LINE 'G' & LINE 'H'



LEGEND

- 5' E.G.T.C.A. EASEMENT
- SANITARY SEWER CLEANOUT LOCATION
- SANITARY SEWER TO BE ABANDONED

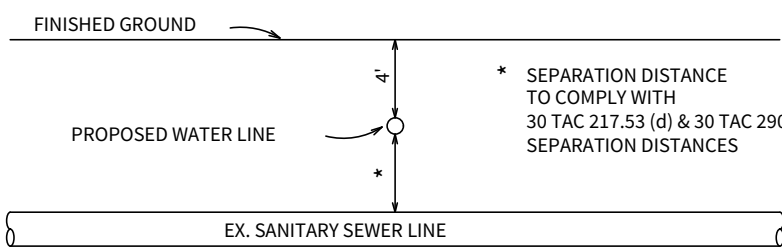
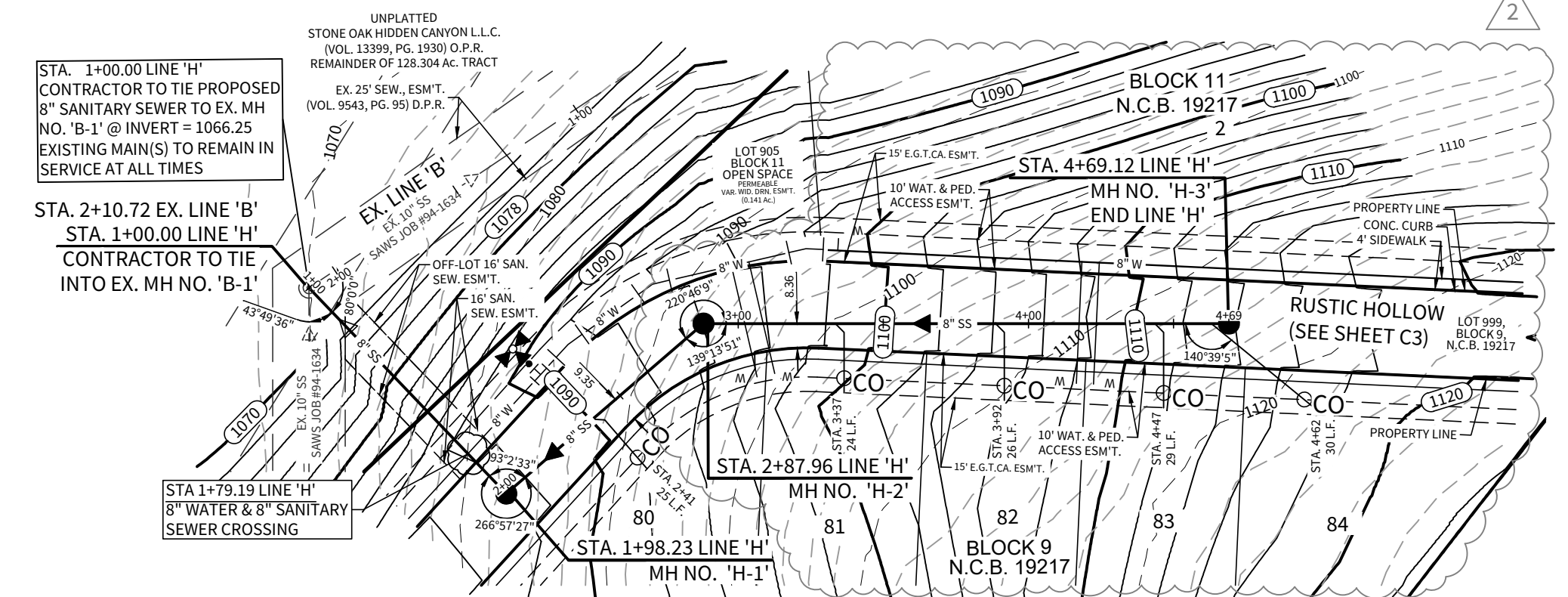
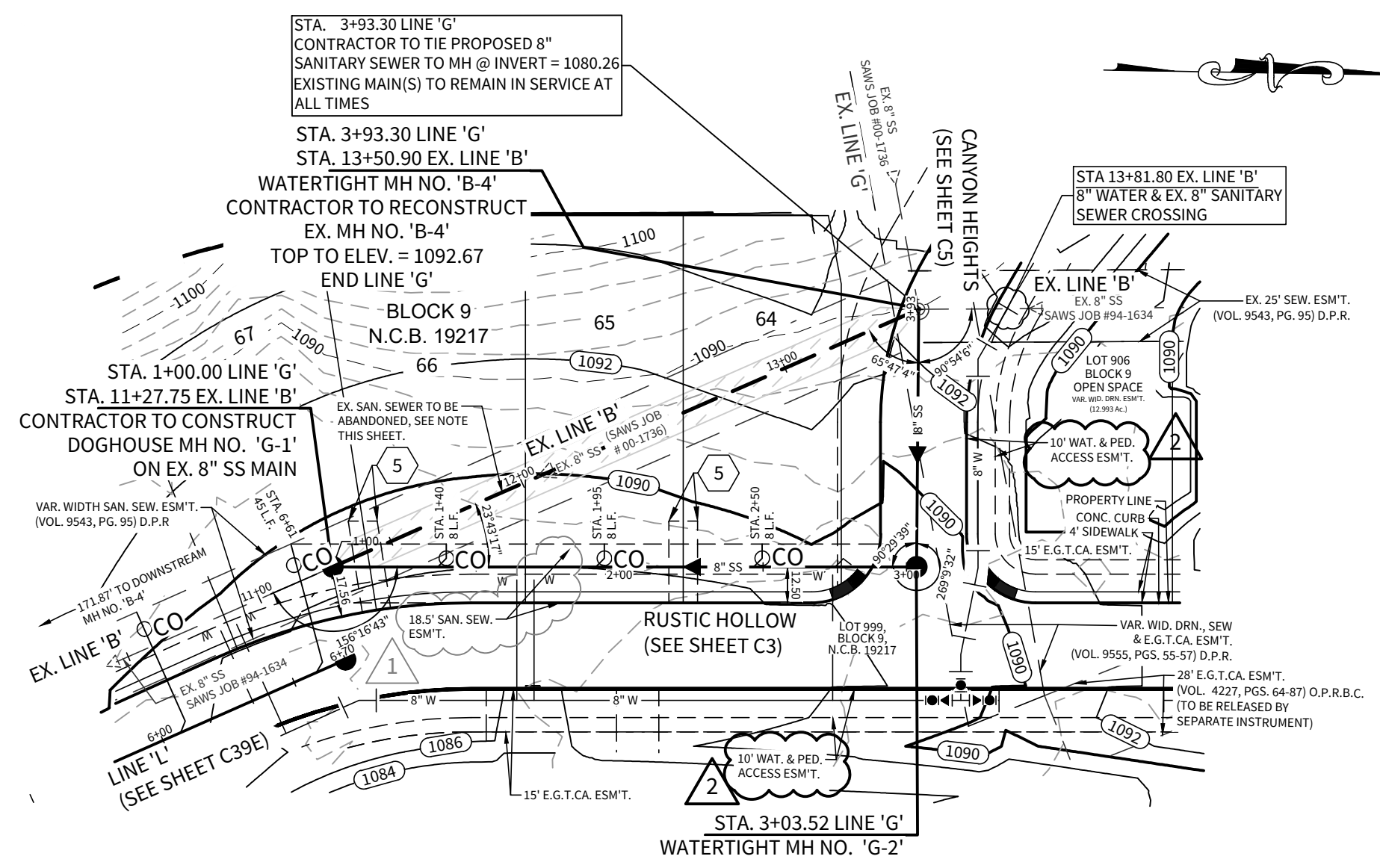


PRIVATE STREET DESIGNATION:
LOT 999, BLOCK 9, N.C.B. 19217, IS A PRIVATE STREET AND IS DESIGNATED AS AN UNDERGROUND AND AT-GRADE INFRASTRUCTURE AND SERVICE FACILITIES EASEMENT FOR GAS, ELECTRIC, STREET LIGHT, TELEPHONE CABLE TELEVISION, DRAINAGE, PEDESTRIAN, PUBLIC WATER, WASTEWATER, AND RECYCLED WATER MAINS.

MANHOLE B-4 TIE-IN NOTE:
THE CONTRACTOR SHALL OBSERVE THE FLOW CONDITION IN THE MANHOLE 'B-4' INVERT CHANNEL AND SHALL NOT MAKE THE LINE 'G' CONNECTION TO MANHOLE 'B-4' IF THE MANHOLE INVERT CHANNEL IS FLOWING FULL NOR SHALL CONTRACTOR BE ALLOWED TO MAKE THE LINE 'G' TIE-IN DURING ANTICIPATED PEAK FLOW CONDITIONS (TYPICALLY MORNING AND EVENING HOURS) AND/OR WITHIN 72 HOURS OF A RAINFALL EVENT. CONSULT SAWS INSPECTION DEPARTMENT FOR FURTHER DETAILS.

DEVELOPER:
STONE OAK HIDDEN CANYON, LLC
CONTACT PERSON: RAJEEV PURI
6002 CAMP BULLIS ROAD
SAN ANTONIO, TEXAS 78257
TEL: (210) 698-3004
FAX: (210) 698-3014

NOTE:
SANITARY SEWER MAIN & MANHOLES TO BE ABANDONED PER SAWS ITEM #862 (GROUT IN PLACE)



TYPICAL SANITARY SEWER/ WATER CROSSING
DETAIL "A" N.T.S.

SEWER: UPPER - EAST SEWERSHED - DOS RIOS / LEON CREEK

Developer's Name	STONE OAK HIDDEN CANYON, L.L.C.		
Developer's Address	6002 CAMP BULLIS ROAD		
City	SAN ANTONIO	State	TEXAS
Zip	78257		
Phone #	(210) 698-3004	Fax #	(210) 698-3014
SAWS Block Map #	162660	Total EDU's	52
Total Acreage	29.067 Ac.		
Total Linear Footage of Pipe	1,231.93 L.F. OF 8" Plat No. 23-11800095		
Number of Lots	52	SAWS Job No.	23-1622

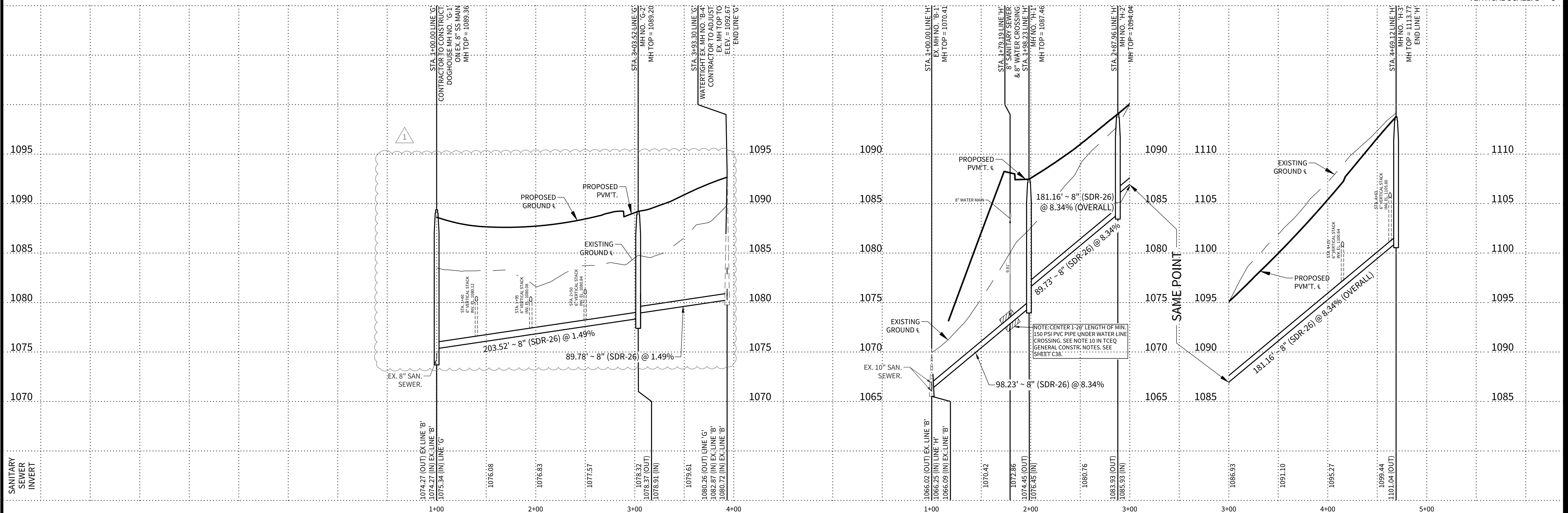
LINE G

STA. 1+00.00 TO STA. 3+93.30

LINE H

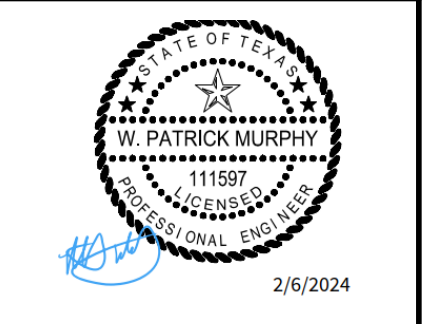
STA. 1+00.00 TO STA. 4+69.12

HORIZONTAL SCALE: 1" = 50'
VERTICAL SCALE: 1" = 5'



DATE	01/06/2022
PROJECT NO.	P01564.004
DRAWN BY	R.M., A.B.B.
CHECKED BY	W.P.M./J.R.T.

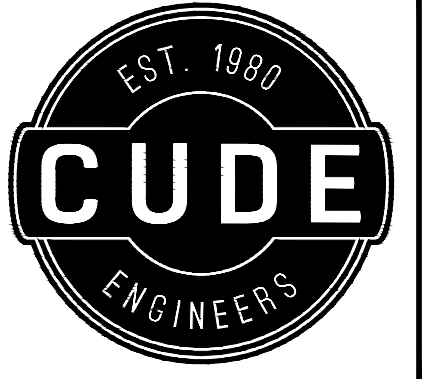
REVISIONS	
1.	2022-11-22 - REVISED PIPE ELEVATION, ADDRESS EASEMENT LABEL
2.	2023-10-25 - WATER SERVICES ADJUSTED FOR ELECTRIC TRANSFORMER CONFLICTS, LOT LAYOUT REVISIONS, INT. & PED. ESMT. REVISIONS
3.	2023-12-21 - SAWS COMMENTS
4.	2024-01-31 - ADD MANHOLE 'B-4' TIE-IN NOTE
5.	
6.	
7.	
8.	
9.	



CUDE ENGINEERS
TBPE No. 455

PLAT #
23-11800095
SAWS #
23-1622

C39

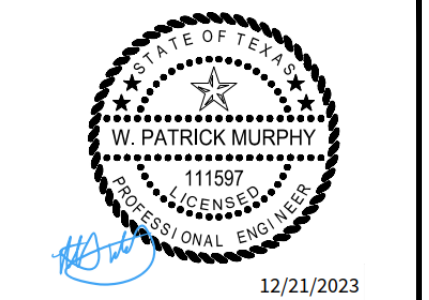


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P:(210) 681.2951 F:(210) 523.7112

HIDDEN CANYON SUBDIVISION
UNIT 2A P.U.D.
SANITARY SEWER PLAN & PROFILE - EX. LINE 'B'

DATE
01/06/2022
PROJECT NO.
P01564.004
DRAWN BY
R.M., A.B.B.
CHECKED BY
W.P.M./J.R.T.

REVISIONS
1. 2023-12-21 - SAWS COMMENTS
2.
3.
4.
5.
6.
7.
8.
9.



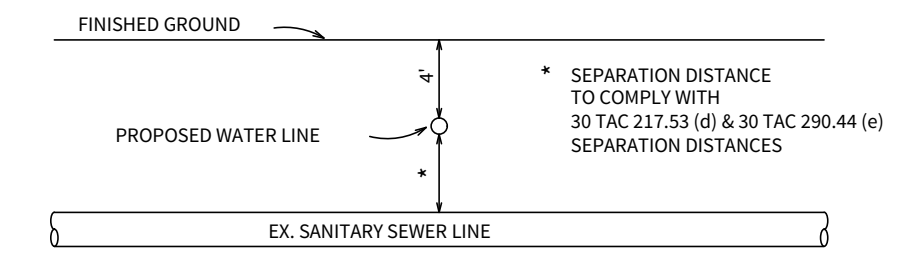
CUDE ENGINEERS
TBPE No. 455

PLAT #
23-1180095
SAWS #
23-1622

C39A

SEWER: UPPER - EAST SEWERSHED - DOS RIOS/ LEON CREEK

Developer's Name: STONE OAK HIDDEN CANYON, L.L.C.
Developer's Address: 6002 CAMP BULLIS ROAD
City: SAN ANTONIO State: TEXAS Zip: 78257
Phone #: (210) 698-3004 Fax #: (210) 698-3014
SAWS Block Map #: 162660 Total EDU's: 52 Total Acreage: 29.067 Ac.
Total Linear Footage of Pipe: 1,231.93 L.F. OF 8" Plot No.: 23-1180095
Number of Lots: 52 SAWS Job No.: 23-1622



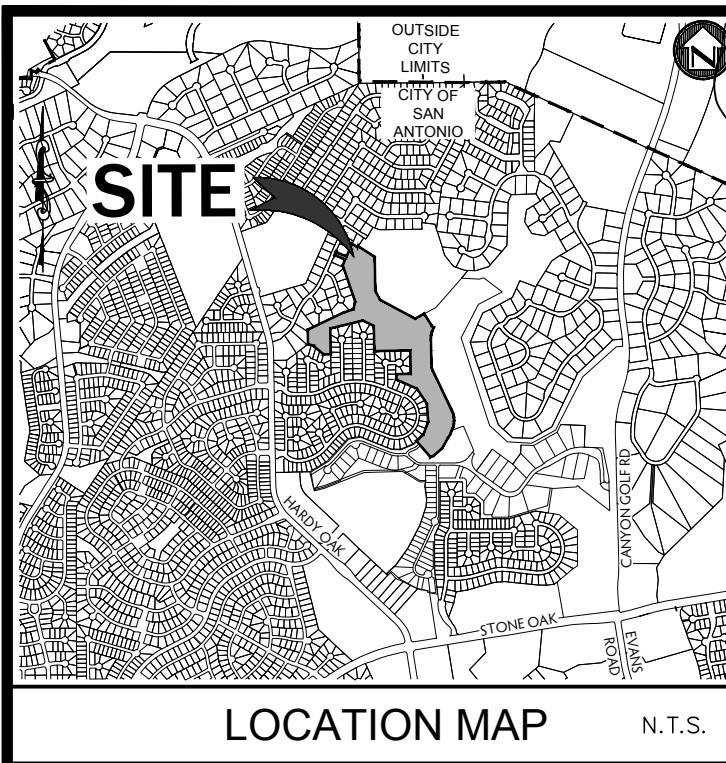
TYPICAL SANITARY SEWER/ WATER CROSSING
DETAIL "A"

LEGEND

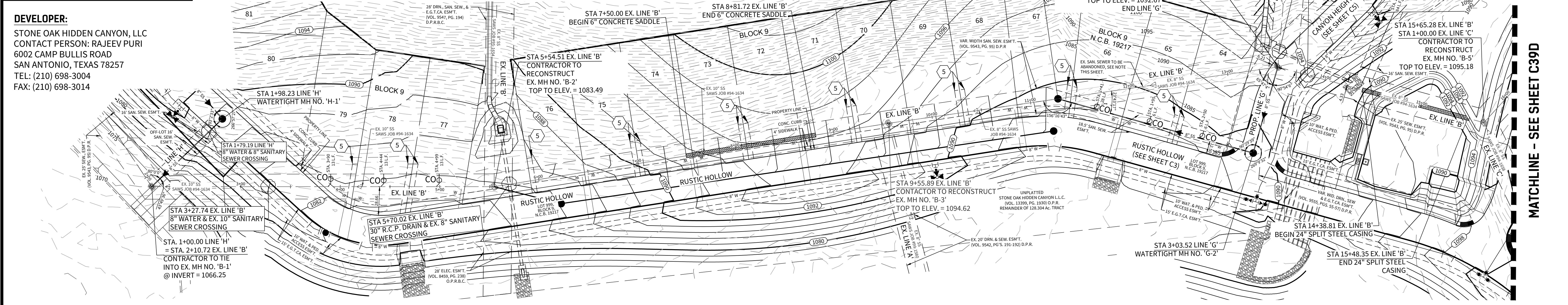
- 5' E.G.T.C.A. EASEMENT
- SANITARY SEWER CLEANOUT LOCATION
- SANITARY SEWER TO BE ABANDONED

PRIVATE STREET DESIGNATION:
LOT 999 - BLOCK 9, N.C.B. 19217, IS A PRIVATE STREET AND IS DESIGNATED AS AN UNDERGROUND AND AT-GRADE INFRASTRUCTURE AND SERVICE FACILITIES EASEMENT FOR GAS, ELECTRIC, STREET LIGHT, TELEPHONE CABLE TELEVISION, DRAINAGE, PEDESTRIAN, PUBLIC WATER, WASTEWATER, AND RECYCLED WATER MAINS.

NOTE:
SANITARY SEWER MAIN & MANHOLES TO BE ABANDONED PER SAWS ITEM #862 (GROUT IN PLACE)



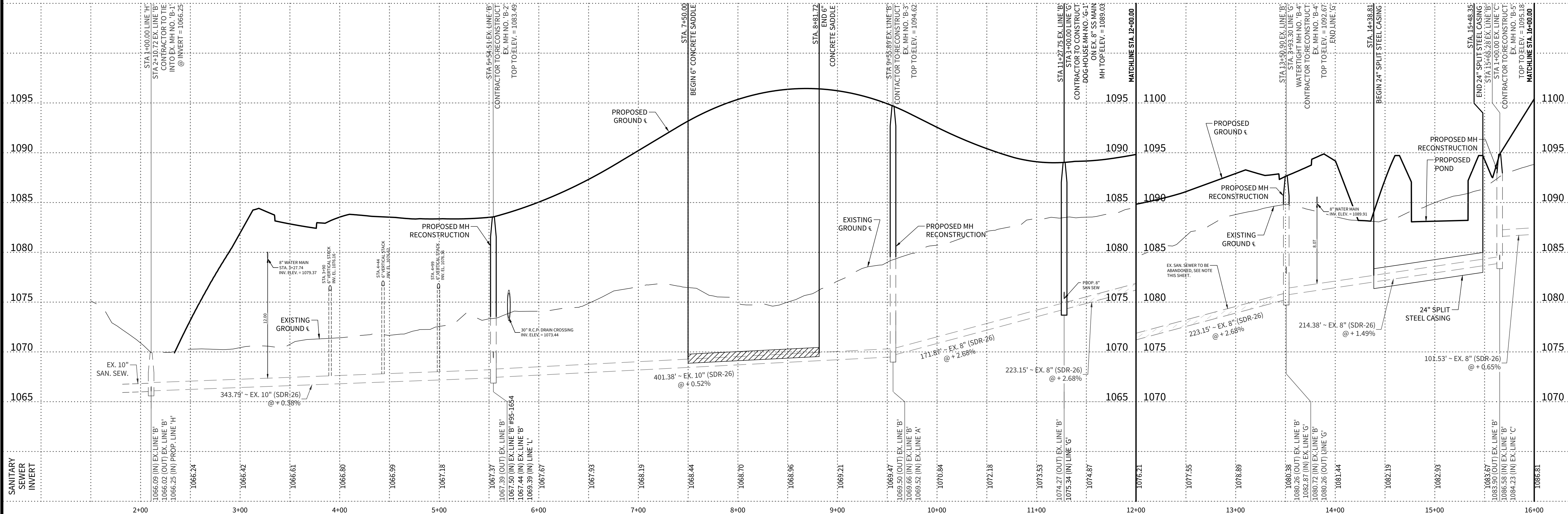
DEVELOPER:
STONE OAK HIDDEN CANYON, L.L.C
CONTACT PERSON: RAJEEV PURI
6002 CAMP BULLIS ROAD
SAN ANTONIO, TEXAS 78257
TEL: (210) 698-3004
FAX: (210) 698-3014

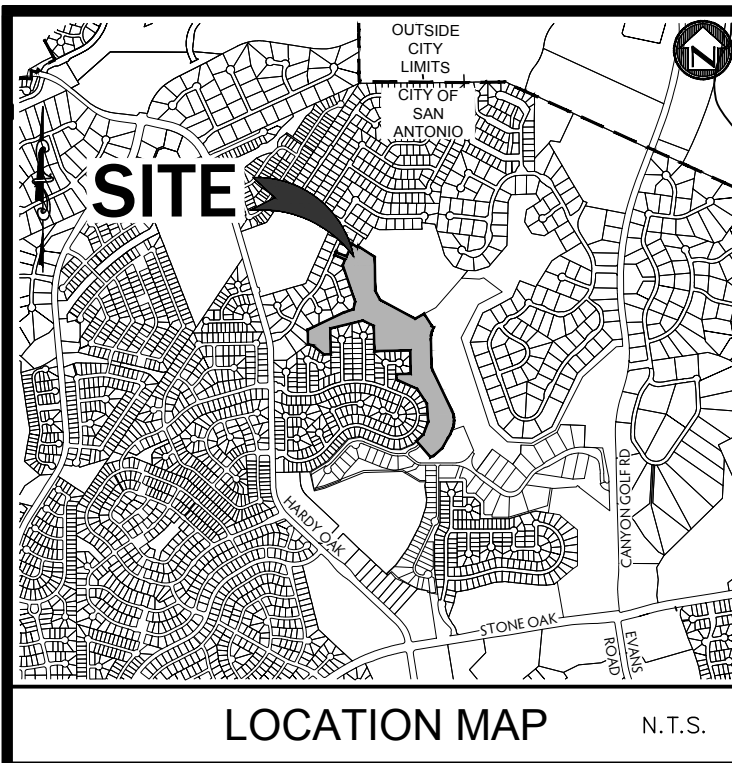


EX. LINE "B"

STA. 2+10.72 TO STA. 16+00.00

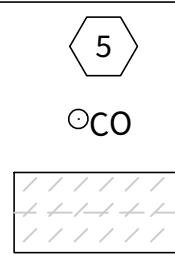
HORIZONTAL SCALE: 1" = 50'
VERTICAL SCALE: 1" = 5'





LEGEND

- 5' E.G.T.C.A. EASEMENT
- SANITARY SEWER CLEANOUT LOCATION
- SANITARY SEWER TO BE ABANDONED

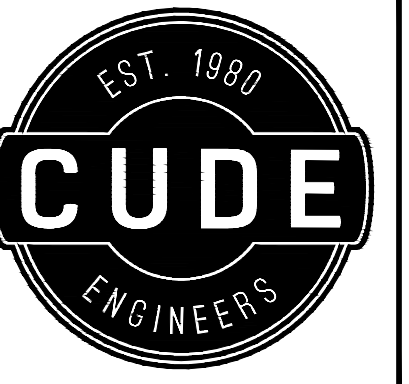


PRIVATE STREET DESIGNATION:
 LOT 999, BLOCK 9, N.C.B. 19217, IS A PRIVATE STREET AND IS DESIGNATED AS AN UNDERGROUND AND AT-GRADE INFRASTRUCTURE AND SERVICE FACILITIES EASEMENT FOR GAS, ELECTRIC, STREET LIGHT, TELEPHONE CABLE TELEVISION, DRAINAGE, PEDESTRIAN, PUBLIC WATER, WASTEWATER, AND RECYCLED WATER MAINS.

NOTE:
 SANITARY SEWER MAIN & MANHOLES TO BE ABANDONED PER SAWS ITEM #862 (GROUT IN PLACE)

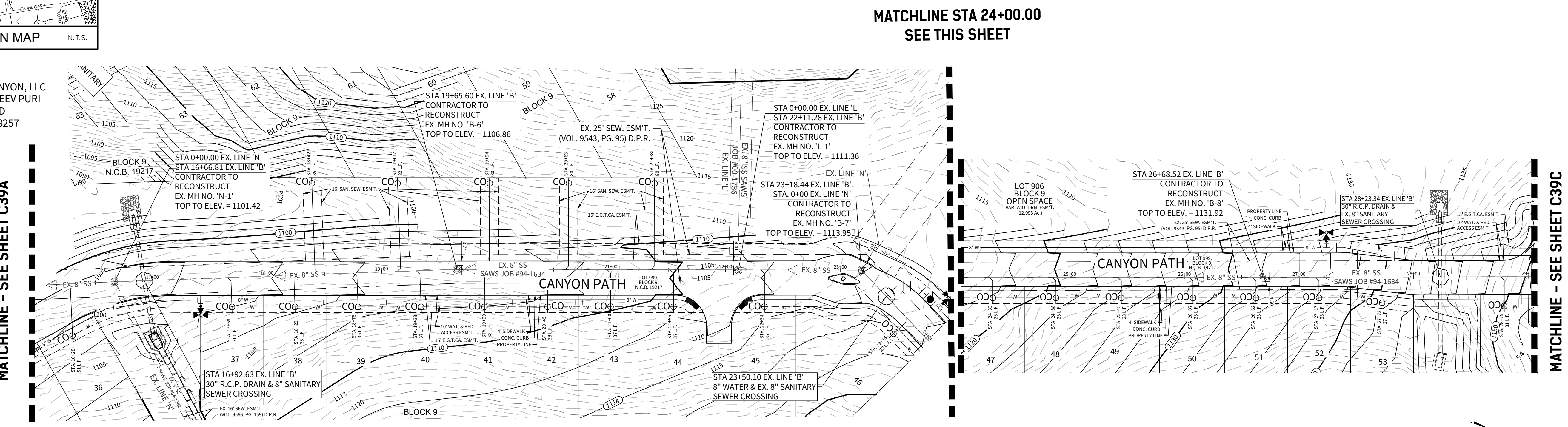
SEWER: UPPER - EAST SEWERSHED - DOS RIOS / LEON CREEK

Developer's Name: STONE OAK HIDDEN CANYON, L.L.C.
 Developer's Address: 6002 CAMP BULLIS ROAD
 City: SAN ANTONIO State: TEXAS Zip: 78257
 Phone #: (210) 698-3004 Fax #: (210) 698-3014
 SAWS Block Map #: 162660 Total EDU's: 52 Total Acreage: 29.067 Ac.
 Total Linear Footage of Pipe: 1,231.93 L.F. OF 8" Plat No.: 23-11800095
 Number of Lots: 52 SAWS Job No.: 23-1622



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 P: (210) 681.2951 F: (210) 523.7112

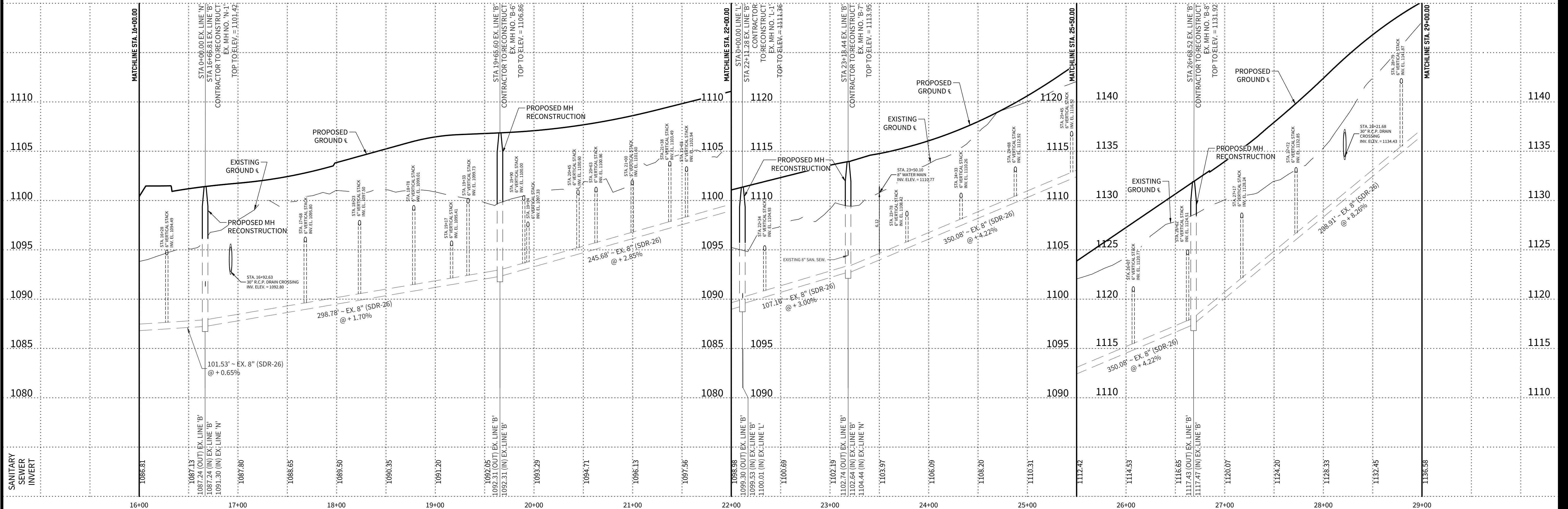
DEVELOPER:
 STONE OAK HIDDEN CANYON, L.L.C.
 CONTACT PERSON: RAJEEV PURI
 6002 CAMP BULLIS ROAD
 SAN ANTONIO, TEXAS 78257
 TEL: (210) 698-3004
 FAX: (210) 698-3014



EX. LINE "B"

STA. 16+00.00 TO STA. 29+00.00

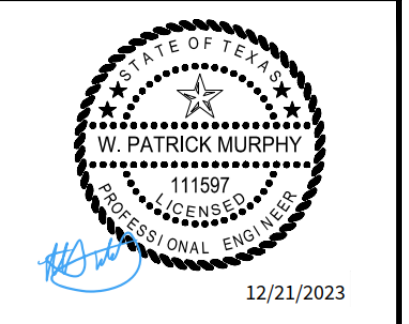
HORIZONTAL SCALE: 1" = 50'
 VERTICAL SCALE: 1" = 5'



HIDDEN CANYON SUBDIVISION
UNIT 2A P.U.D.
 SANITARY SEWER PLAN & PROFILE - EX. LINE 'B'

DATE	01/06/2022
PROJECT NO.	P01564.004
DRAWN BY	R.M., A.B.B.
CHECKED BY	W.P.M./J.R.T.

REVISIONS
1. 2023-12-21 - SAWS COMMENTS
2.
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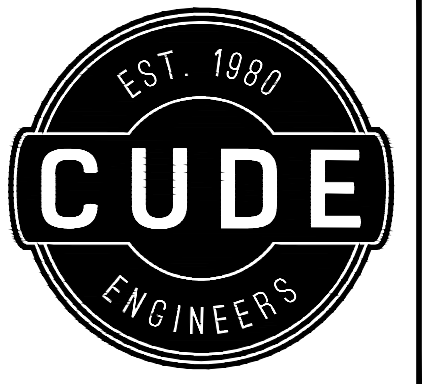
CUDE ENGINEERS
 TBPE No. 455

PLAT #
 23-11800095

SAWS #
 23-1622

C39B

REPRODUCTION OF THE ORIGINAL SIGNED AND SEALED PLAN AND/OR ELECTRONIC MEDIA MAY HAVE BEEN INADVERTENTLY ALTERED. CONTRACTOR IS RESPONSIBLE FOR VERIFYING THE SCALE OF THE DOCUMENT AND CONTACTING CUDE ENGINEERS TO VERIFY DISCREPANCIES PRIOR TO CONSTRUCTION.



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 San Antonio, Texas 78231
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HIDDEN CANYON SUBDIVISION
 UNIT 2A P.U.D.
 SANITARY SEWER PLAN & PROFILE - EX. LINE B

DATE
01/06/2022

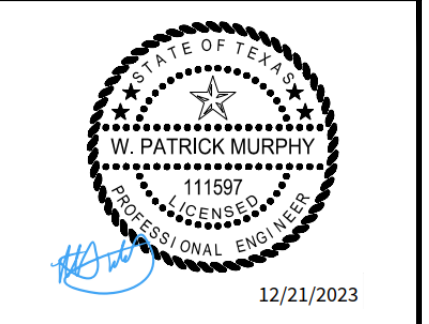
PROJECT NO.
P01564.004

DRAWN BY
R.M., A.B.B.

CHECKED BY
W.P.M./J.R.T.

REVISIONS

1.	2023-12-21 - SAWS COMMENTS
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CUDE ENGINEERS
 TBPE No. 455

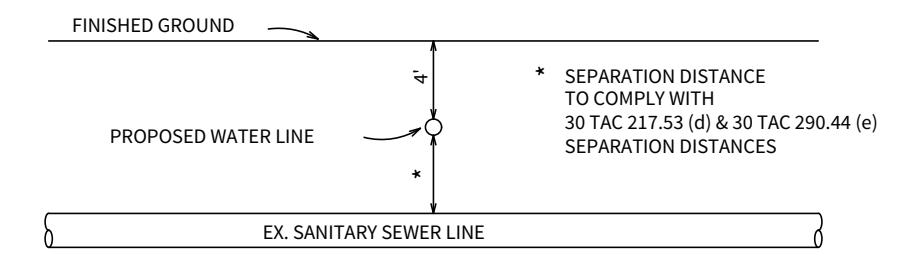
PLAT #
23-11800095

SAWS #
23-1622

C39C

SEWER: UPPER - EAST SEWERSHED - DOS RIOS/ LEON CREEK

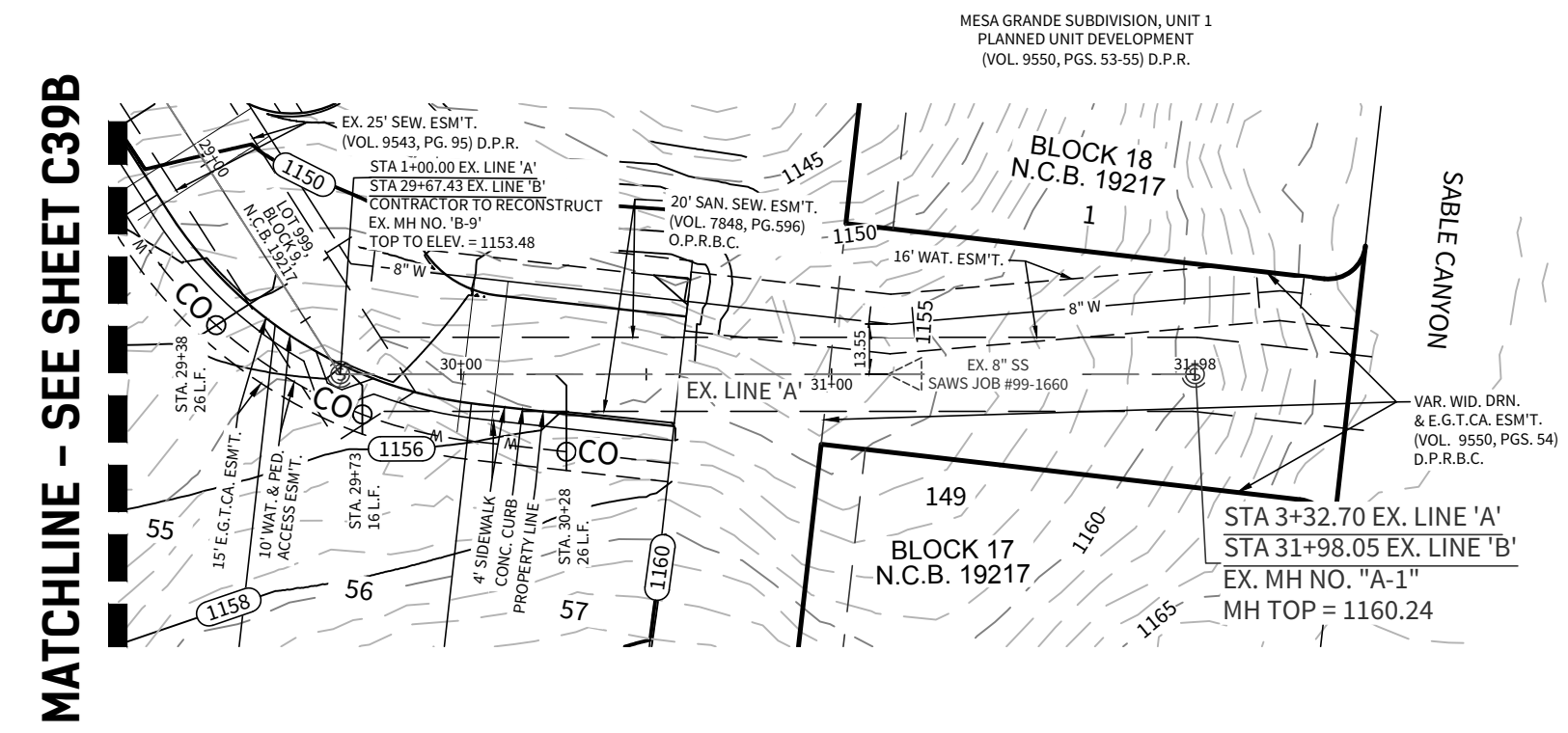
Developer's Name: STONE OAK HIDDEN CANYON, L.L.C.
 Developer's Address: 6002 CAMP BULLIS ROAD
 City: SAN ANTONIO State: TEXAS Zip: 78257
 Phone #: (210) 698-3004 Fax #: (210) 698-3014
 SAWS Block Map #: 162660 Total EDU's: 52 Total Acreage: 29.067 Ac.
 Total Linear Footage of Pipe: 1,231.93 L.F. OF 8" Plat No.: 23-11800095
 Number of Lots: 52 SAWS Job No.: 23-1622



TYPICAL SANITARY SEWER/ WATER CROSSING
 DETAIL "A" N.T.S.

PRIVATE STREET DESIGNATION:
 LOT 999 - BLOCK 9, N.C.B. 19217, IS A PRIVATE STREET AND IS DESIGNATED AS AN UNDERGROUND AND AT-GRADE INFRASTRUCTURE AND SERVICE FACILITIES EASEMENT FOR GAS, ELECTRIC, STREET LIGHT, TELEPHONE CABLE TELEVISION, DRAINAGE, PEDESTRIAN, PUBLIC WATER, WASTEWATER, AND RECYCLED WATER MAINS.

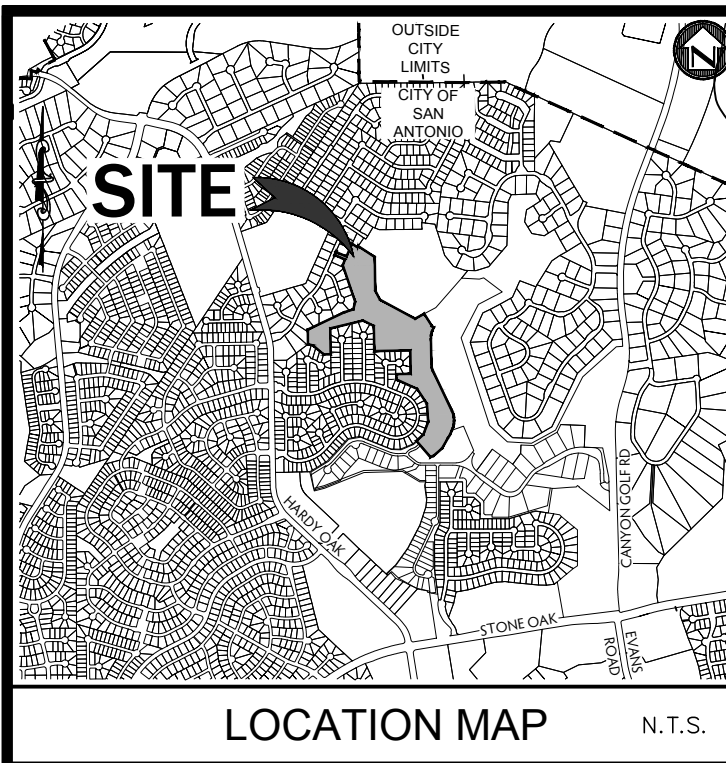
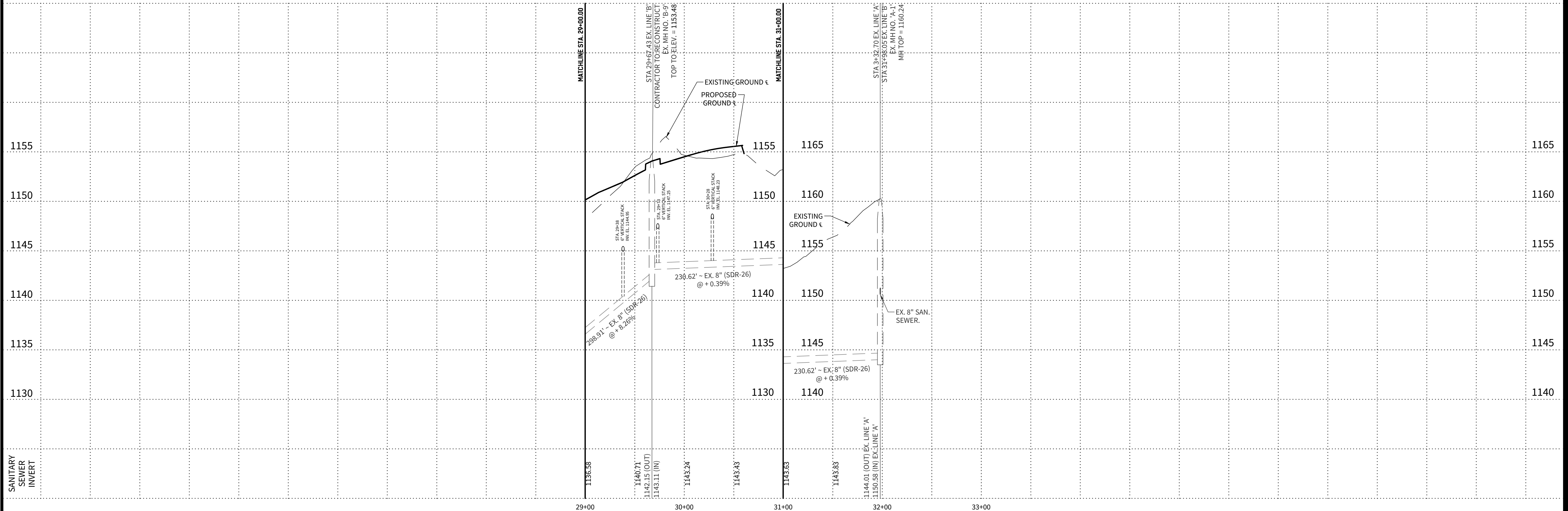
NOTE:
 SANITARY SEWER MAIN & MANHOLES TO BE ABANDONED PER SAWS ITEM #862 (GROUT IN PLACE)



EX. LINE "B"

STA. 29+00.00 TO STA. 31+98.05

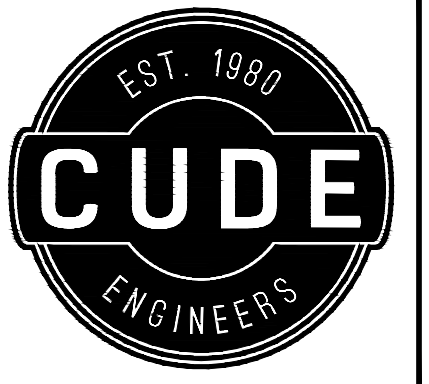
HORIZONTAL SCALE: 1" = 50'
 VERTICAL SCALE: 1" = 5'



LEGEND

- 5' E.G.T.C.A. EASEMENT
- SANITARY SEWER CLEANOUT LOCATION
- SANITARY SEWER TO BE ABANDONED

DEVELOPER:
 STONE OAK HIDDEN CANYON, LLC
 CONTACT PERSON: RAJEEV PURI
 6002 CAMP BULLIS ROAD
 SAN ANTONIO, TEXAS 78257
 TEL: (210) 698-3004
 FAX: (210) 698-3014

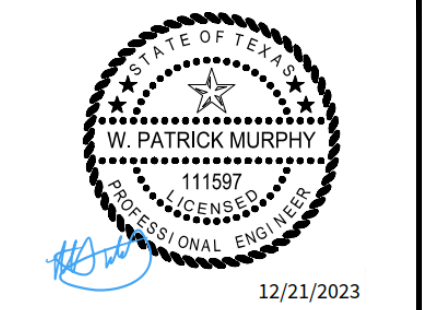


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San Antonio, Texas 78231
P: (210) 681.2951 F: (210) 523.7112

HIDDEN CANYON SUBDIVISION
UNIT 2A P.U.D.
SANITARY SEWER PLAN & PROFILE - EX. LINE 'C'

DATE: 01/06/2022
PROJECT NO.: P01564.004
DRAWN BY: R.M., A.B.B.
CHECKED BY: W.P.M./J.R.T.

REVISIONS
1. 2023-12-20 - SAWS COMMENTS
2.
3.
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9.



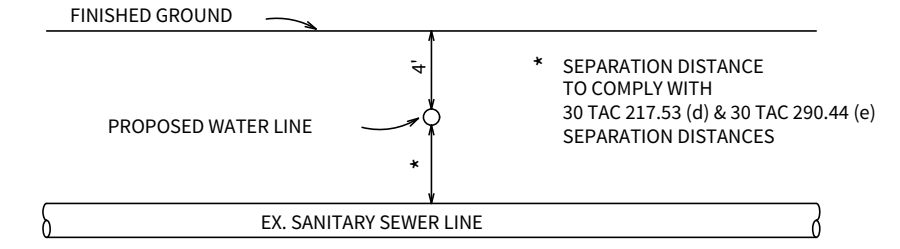
CUDE ENGINEERS
TBPE No. 455

PLAT # 23-11800095
SAWS # 23-1622

C39D

SEWER: UPPER - EAST SEWERSHED - DOS RIOS/ LEON CREEK

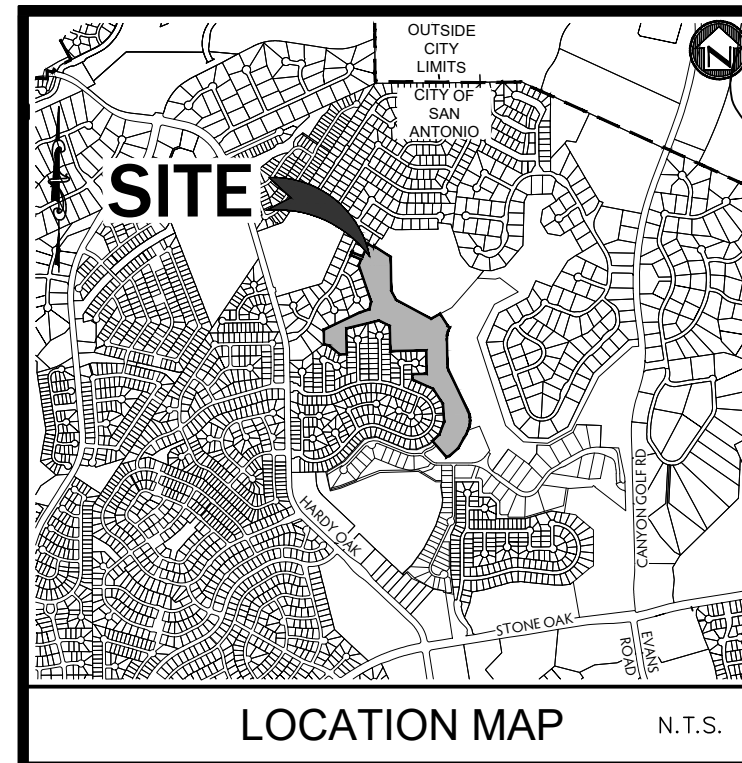
Developer's Name: STONE OAK HIDDEN CANYON, L.L.C.
Developer's Address: 6002 CAMP BULLIS ROAD
City: SAN ANTONIO State: TEXAS Zip: 78257
Phone #: (210) 698-3004 Fax #: (210) 698-3014
SAWS Block Map #: 162660 Total EDU's: 52 Total Acreage: 29.067 Ac.
Total Linear Footage of Pipe: 1,231.93 L.F. OF 8" Plat No.: 23-11800095
Number of Lots: 52 SAWS Job No.: 23-1622



TYPICAL SANITARY SEWER/ WATER CROSSING
DETAIL "A" N.T.S.

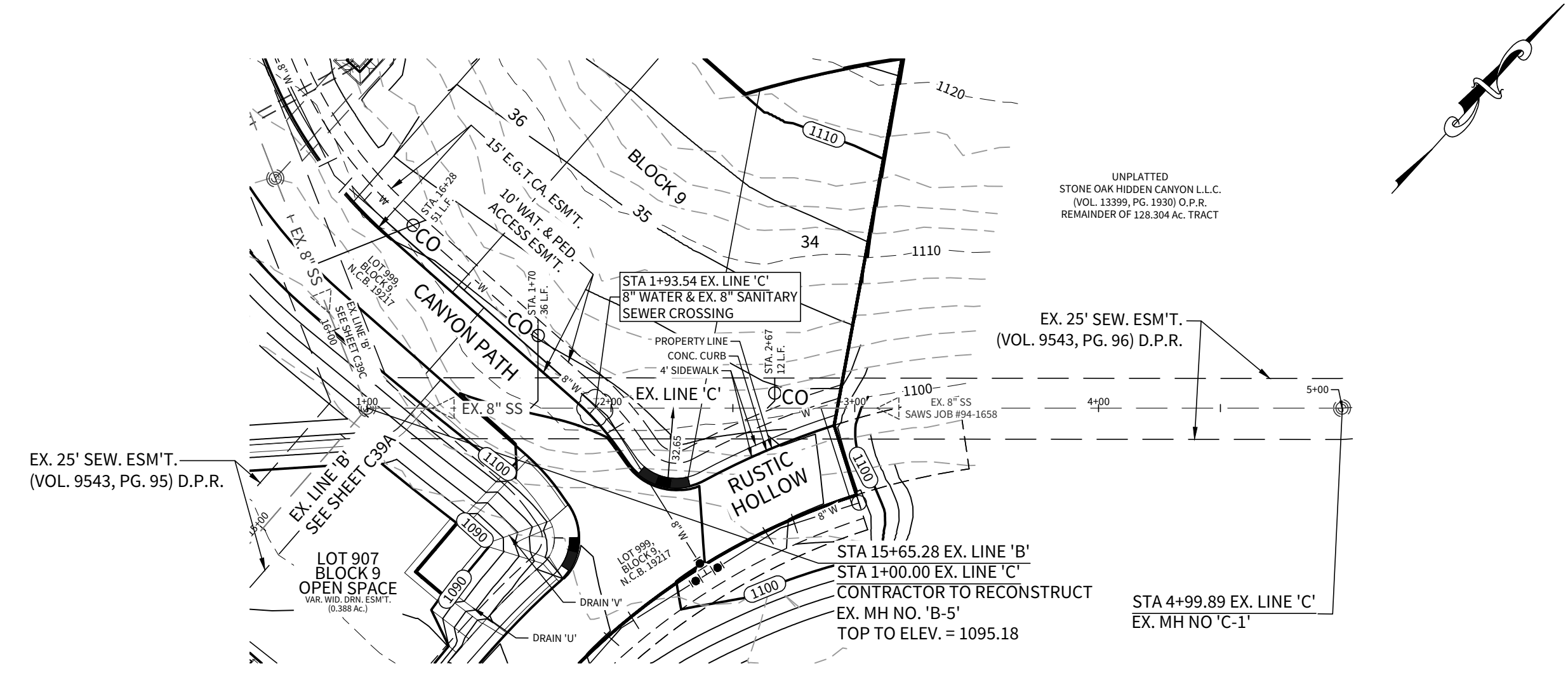
PRIVATE STREET DESIGNATION:
LOT 999, BLOCK 9, N.C.B. 19211, IS A PRIVATE STREET AND IS DESIGNATED AS AN UNDERGROUND AND AT-GRADE INFRASTRUCTURE AND SERVICE FACILITIES EASEMENT FOR GAS, ELECTRIC, STREET LIGHT, TELEPHONE CABLE TELEVISION, DRAINAGE, PEDESTRIAN, PUBLIC WATER, WASTEWATER, AND RECYCLED WATER MAINS.

[Hatched Box] = SANITARY SEWER MAIN & MANHOLES TO BE ABANDONED PER SAWS ITEM #862 (GROUT IN PLACE)



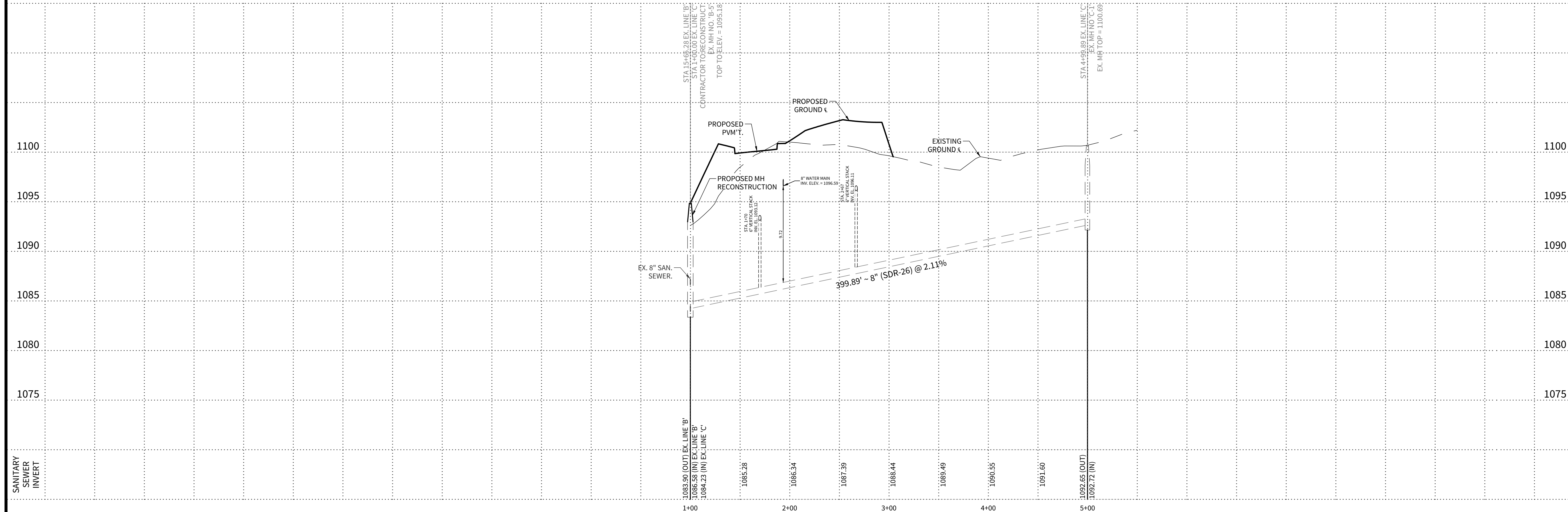
LOCATION MAP N.T.S.

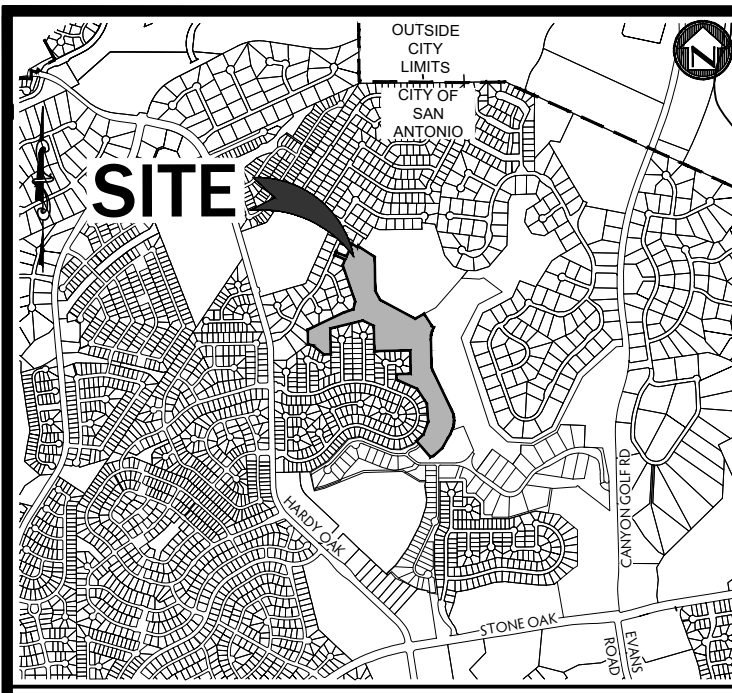
DEVELOPER:
STONE OAK HIDDEN CANYON, LLC
CONTACT PERSON: RAJEEV PURI
6002 CAMP BULLIS ROAD
SAN ANTONIO, TEXAS 78257
TEL: (210) 698-3004
FAX: (210) 698-3014



EX. LINE 'C'
STA. 1+00.00 TO STA. 4+99.89

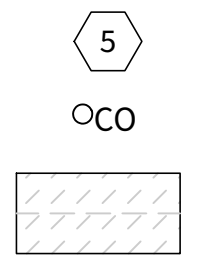
HORIZONTAL SCALE: 1" = 50'
VERTICAL SCALE: 1" = 5'



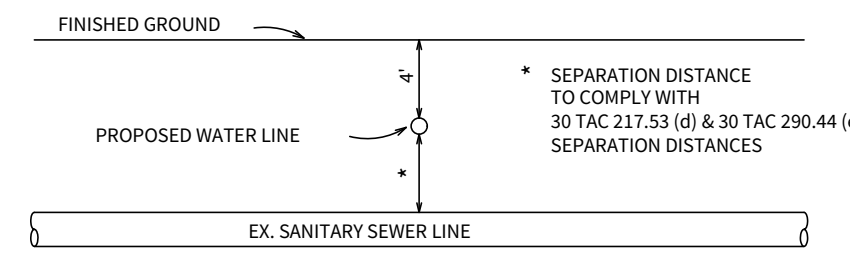


LEGEND

- 5' E.G.T.C.A. EASEMENT
- SANITARY SEWER CLEANOUT LOCATION
- SANITARY SEWER MAIN & MANHOLES TO BE ABANDONED PER SAWS ITEM #862 (GROUT IN PLACE)



PRIVATE STREET DESIGNATION:
 LOT 999 - BLOCK 9, N.C.B. 19217, IS A PRIVATE STREET AND IS DESIGNATED AS AN UNDERGROUND AND AT-GRADE INFRASTRUCTURE AND SERVICE FACILITIES EASEMENT FOR GAS, ELECTRIC, STREET LIGHT, TELEPHONE CABLE TELEVISION, DRAINAGE, PEDESTRIAN, PUBLIC WATER, WASTEWATER, AND RECYCLED WATER MAINS.



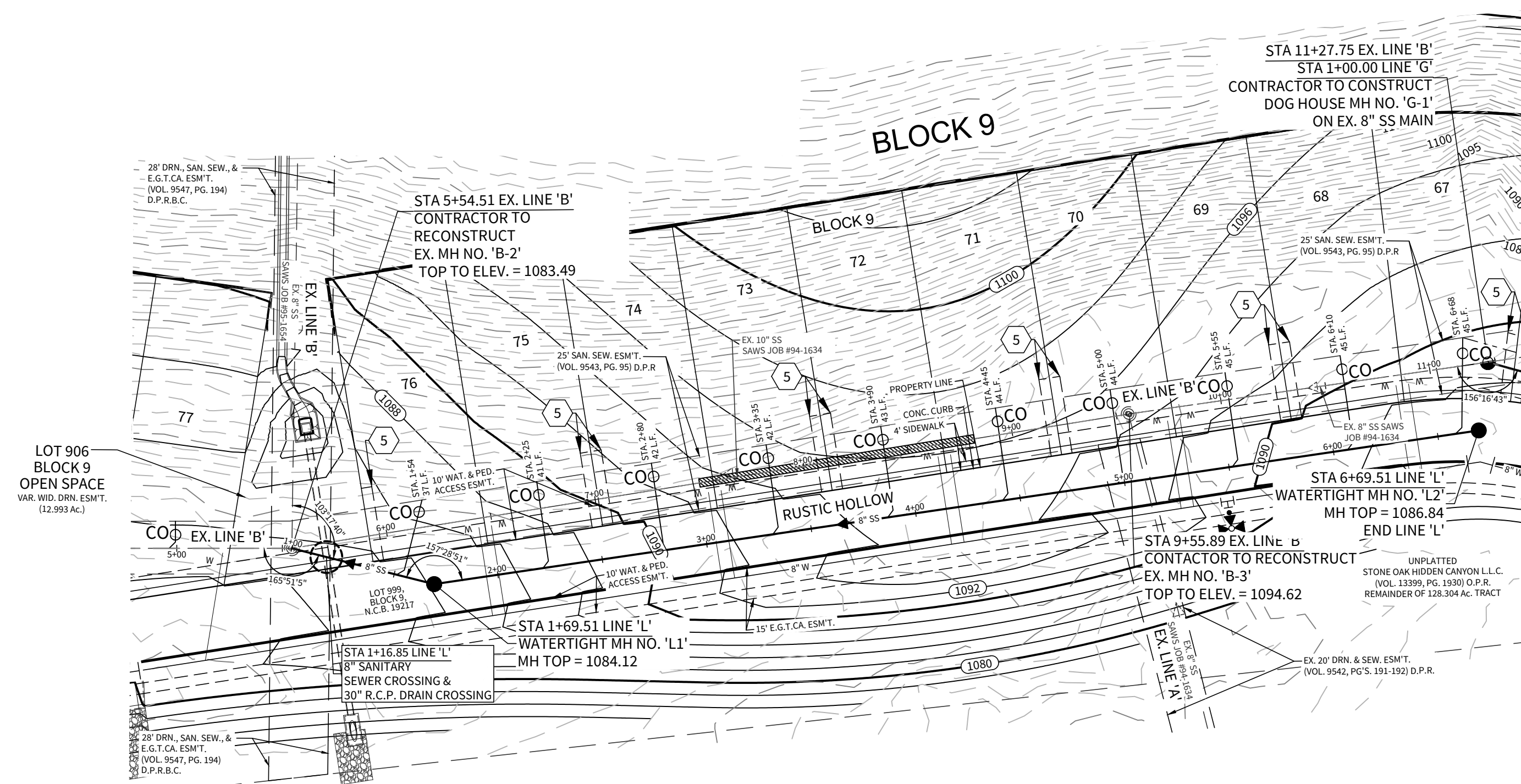
**TYPICAL SANITARY SEWER/ WATER CROSSING
 DETAIL "A"** N.T.S.

SEWER: UPPER - EAST SEWERSHED - DOS RIOS/ LEON CREEK

Developer's Name	STONE OAK HIDDEN CANYON, L.L.C.		
Developer's Address	6002 CAMP BULLIS ROAD		
City	SAN ANTONIO	State	TEXAS
Zip	78257		
Phone #	(210) 698-3004	Fax #	(210) 698-3014
SAWS Block Map #	162660	Total EDU's	52
Total Acreage	29.067 Ac.		
Total Linear Footage of Pipe	1,231.93 L.F. OF 8" Plot No. 23-11800095		
Number of Lots	52	SAWS Job No.	23-1622

DEVELOPER:
 STONE OAK HIDDEN CANYON, LLC
 CONTACT PERSON: RAJEEV PURI
 6002 CAMP BULLIS ROAD
 SAN ANTONIO, TEXAS 78257
 TEL: (210) 698-3004
 FAX: (210) 698-3014

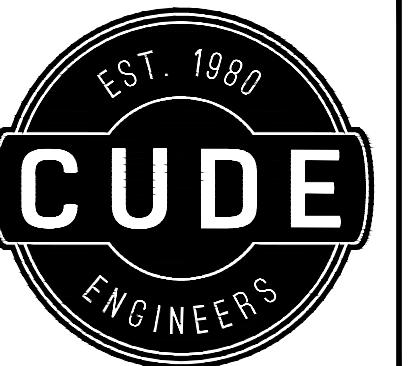
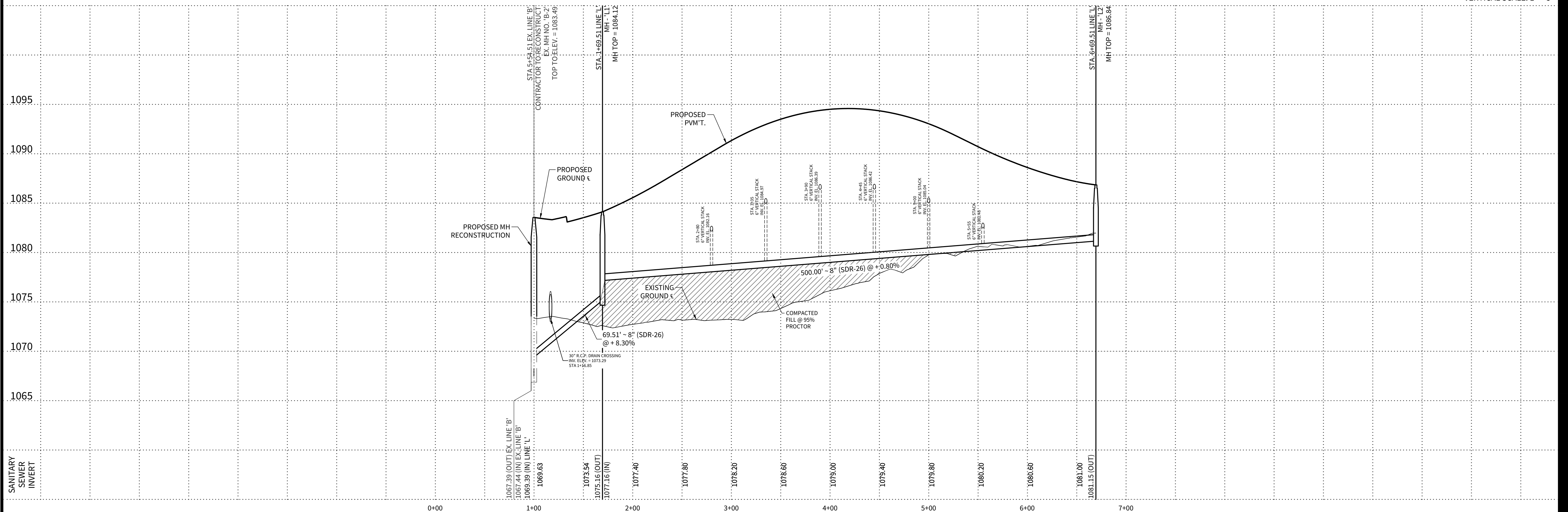
TRENCH EXCAVATION SAFETY PROTECTION
 Contractor and/or Contractor's independently retained employee or structural design/geotechnical/safety/equipment consultant, if any, shall review these plans and available geotechnical information and the anticipated installation site(s) within the project work area in order to implement Contractor's trench excavation safety protection systems, programs and/or procedures for the project described in the contract documents. The Contractor's implementation of these systems, programs and/or procedures shall provide for adequate trench excavation safety protection that complies with as a minimum, OSHA standards for trench excavations. Specifically, Contractor and/or Contractor's independently retained employee or safety consultant shall implement a trench safety program in accordance with OSHA standards governing the presence and activities of individuals working in and around trench excavation.



LINE "L"

STA. 1+00.00 TO STA. 6+69.51

HORIZONTAL SCALE: 1" = 50'
 VERTICAL SCALE: 1" = 5'



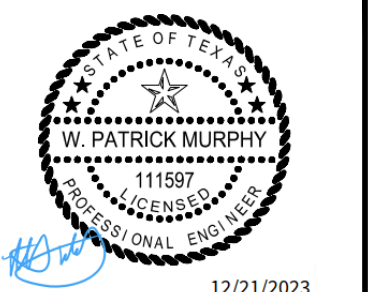
4122 Pond Hill Road, Suite 101
 San Antonio, Texas 78231
 P:(210) 681.2951 F:(210) 523.7112

HIDDEN CANYON SUBDIVISION
 UNIT 2A P.U.D.

SANITARY SEWER PLAN & PROFILE - LINE 'L'

DATE	01/06/2022
PROJECT NO.	P01564.004
DRAWN BY	R.M., A.B.B.
CHECKED BY	W.P.M./J.R.T.

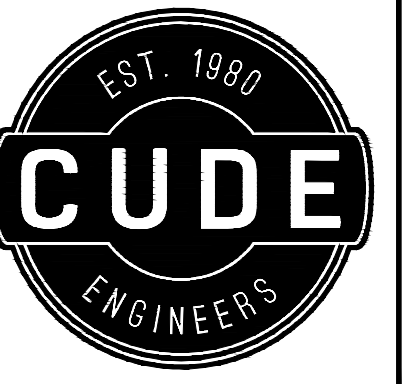
REVISIONS	
1.	
2.	
3.	
4.	
5.	
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CUDE ENGINEERS
 TBPE No. 455

PLAT #
 23-11800095
 SAWS #
 23-1622

C39E

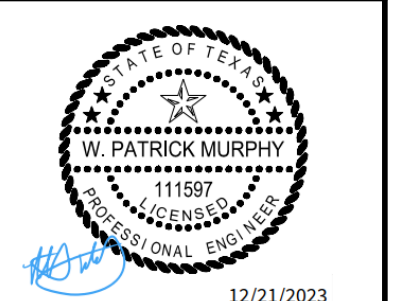


4122 Pond Hill Road, Suite 101
San Antonio, Texas 78231
P:(210) 681.2951 F:(210) 523.7112

HIDDEN CANYON SUBDIVISION
UNIT 2A P.U.D.
SANITARY SEWER STANDARD DETAILS

DATE
01/06/2022
PROJECT NO.
P01564.004
DRAWN BY
R.M., A.B.B.
CHECKED BY
W.P.M./J.R.T.

- REVISIONS
- 1. 2022-12-20 - UPDATED SAWS BLOCK
 - 2.
 - 3.
 - 4.
 - 5.
 - 6.
 - 7.
 - 8.
 - 9.



CUDE ENGINEERS
TBPE No. 455

PLAT #
23-1180095
SAWS #
23-1622

C40

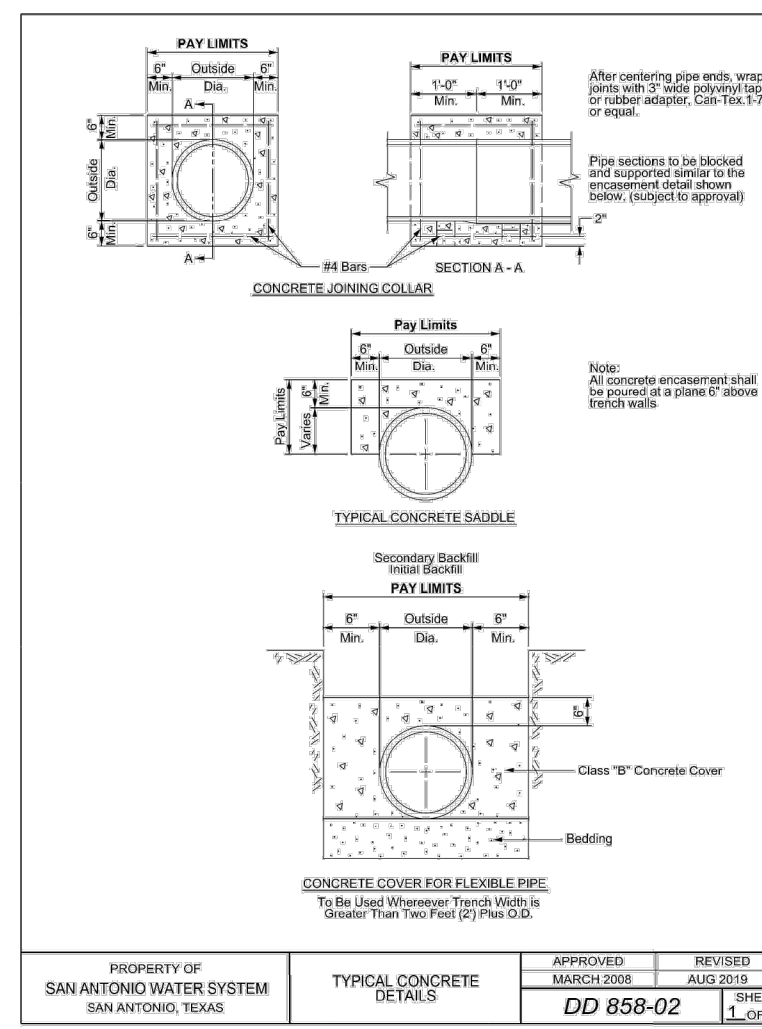


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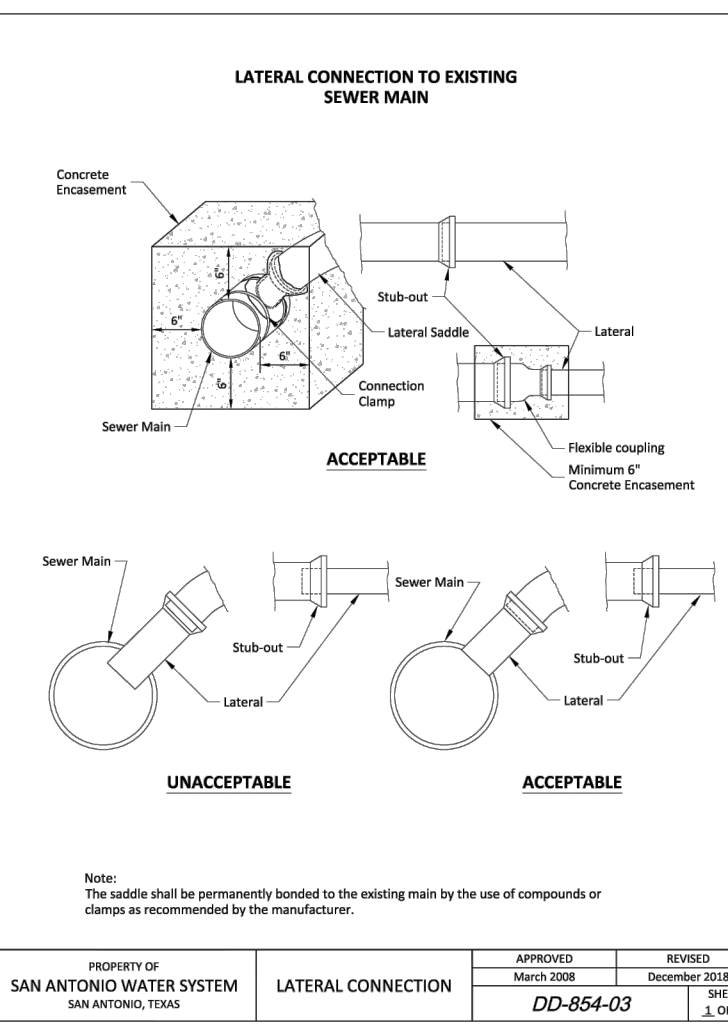


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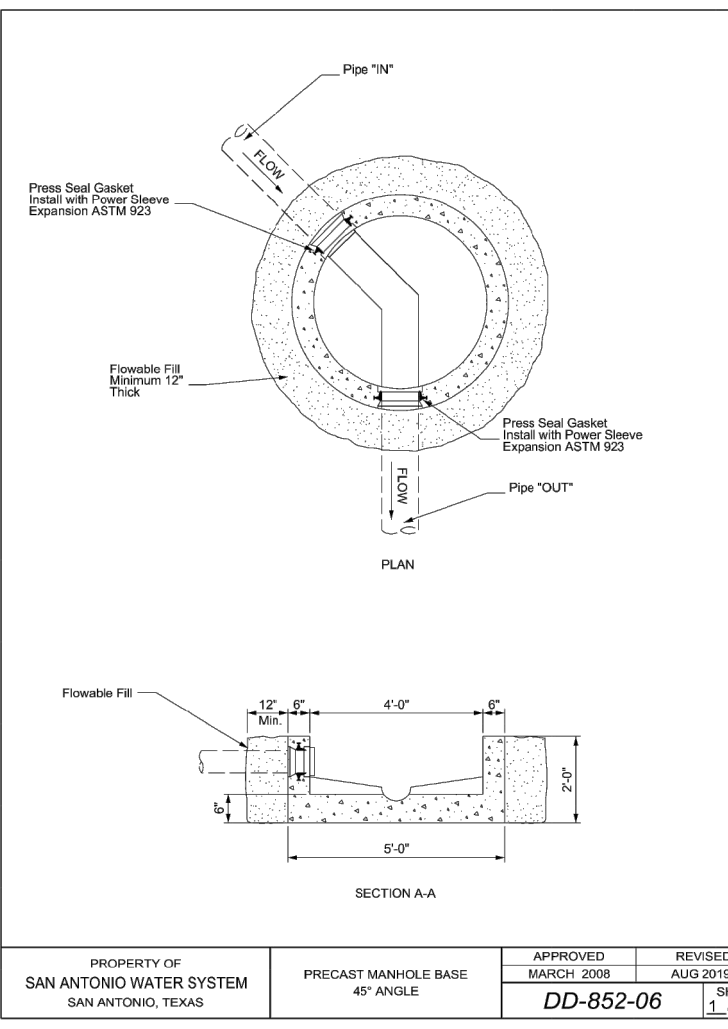


Table with columns: PROPERTY OF SAN ANTONIO WATER SYSTEM, APPROVED, REVISION, SHEET, and TITLE.

MANHOLE CHART table listing sizes, materials, and dimensions for various manhole types.

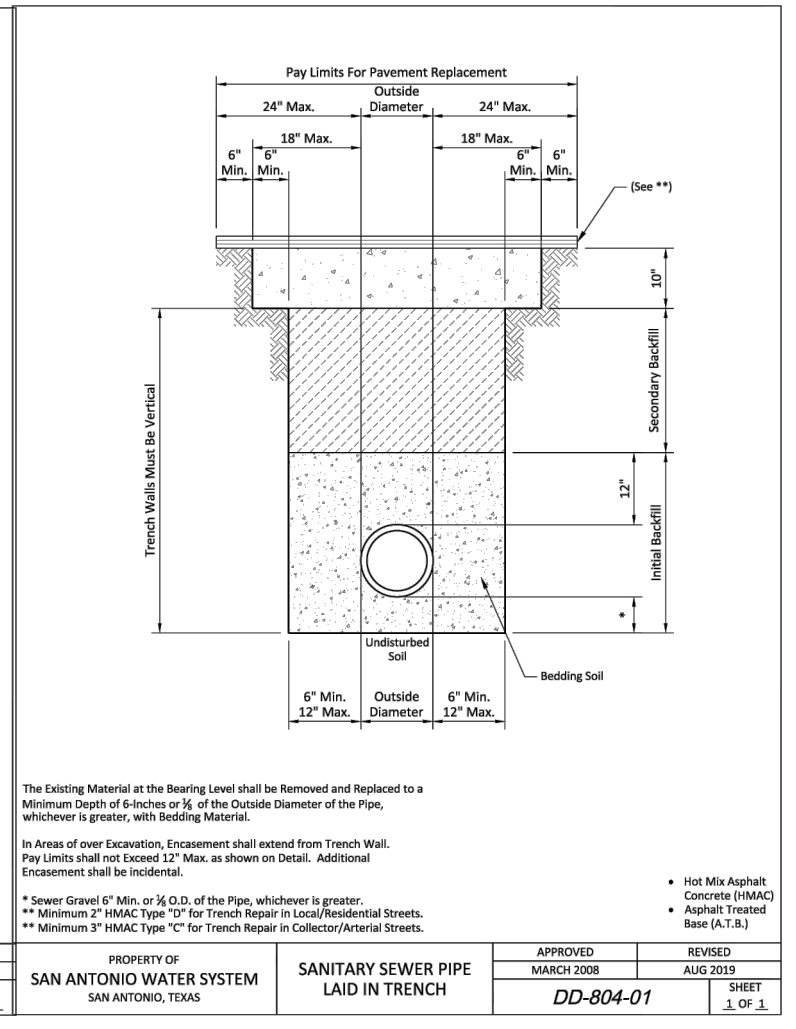


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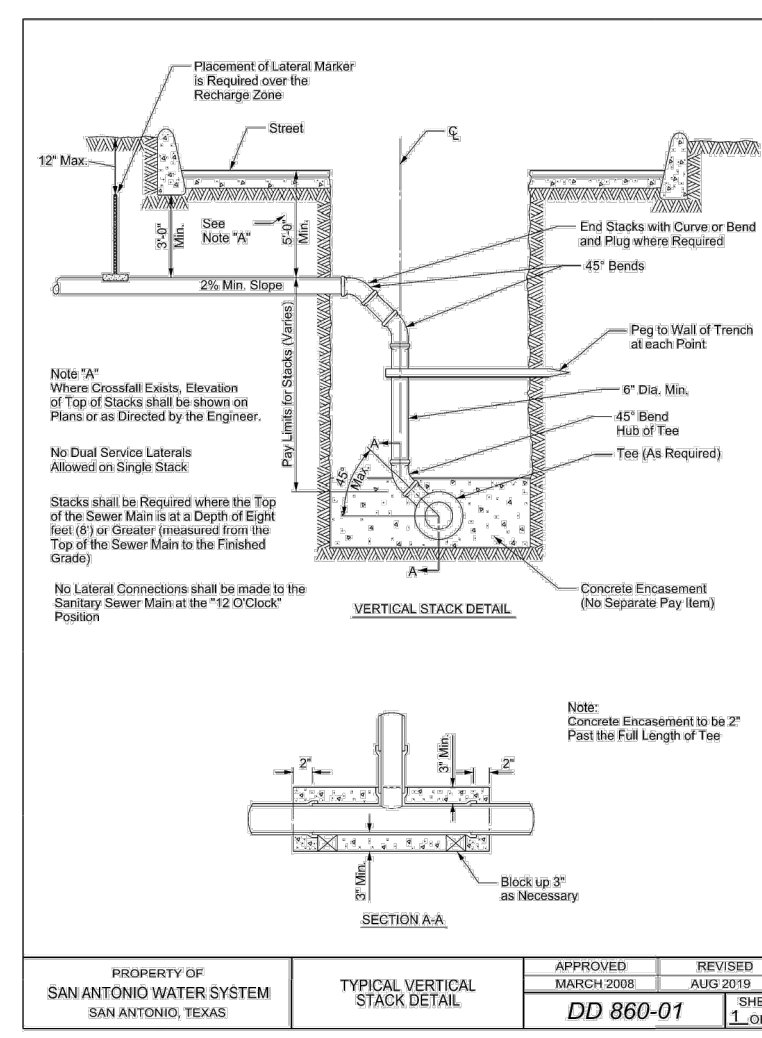


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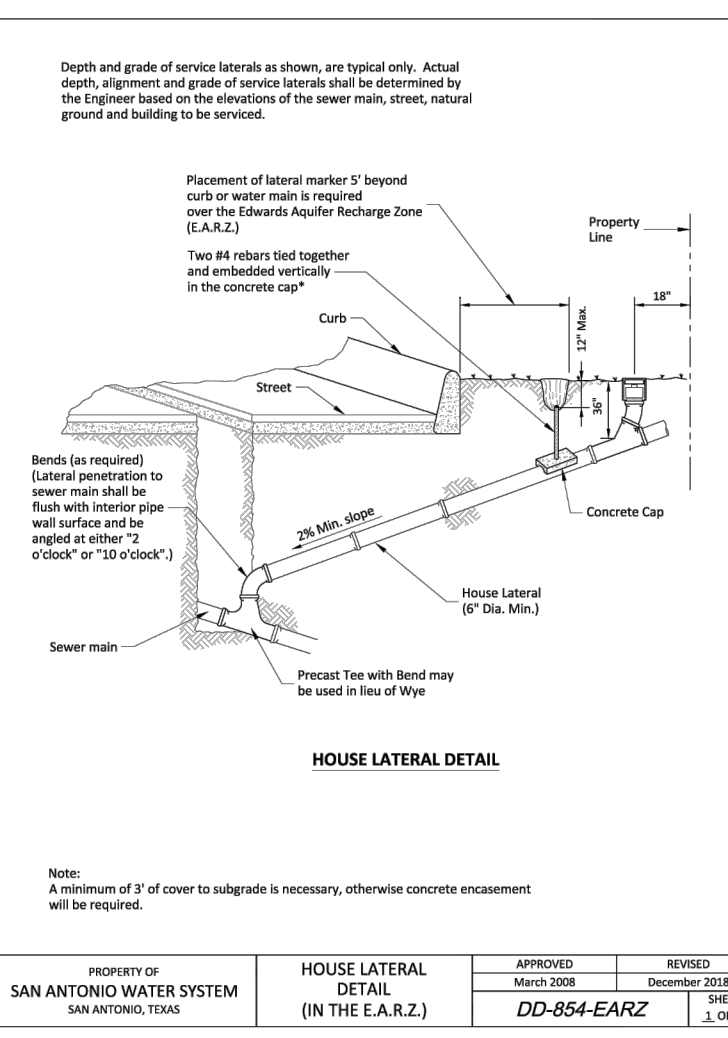


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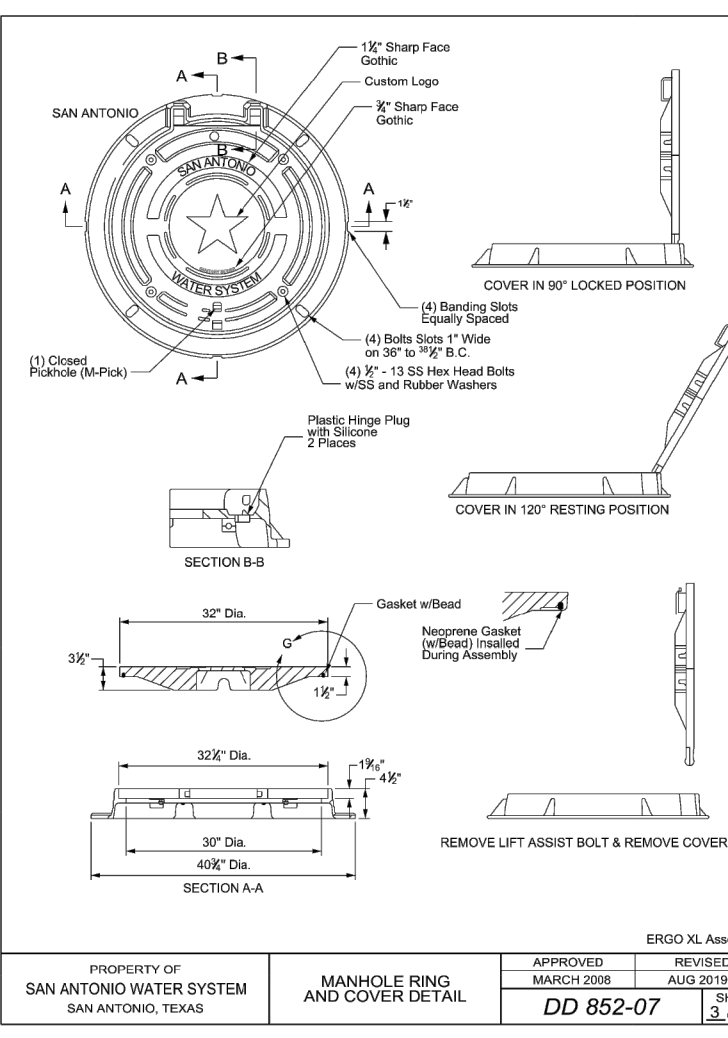


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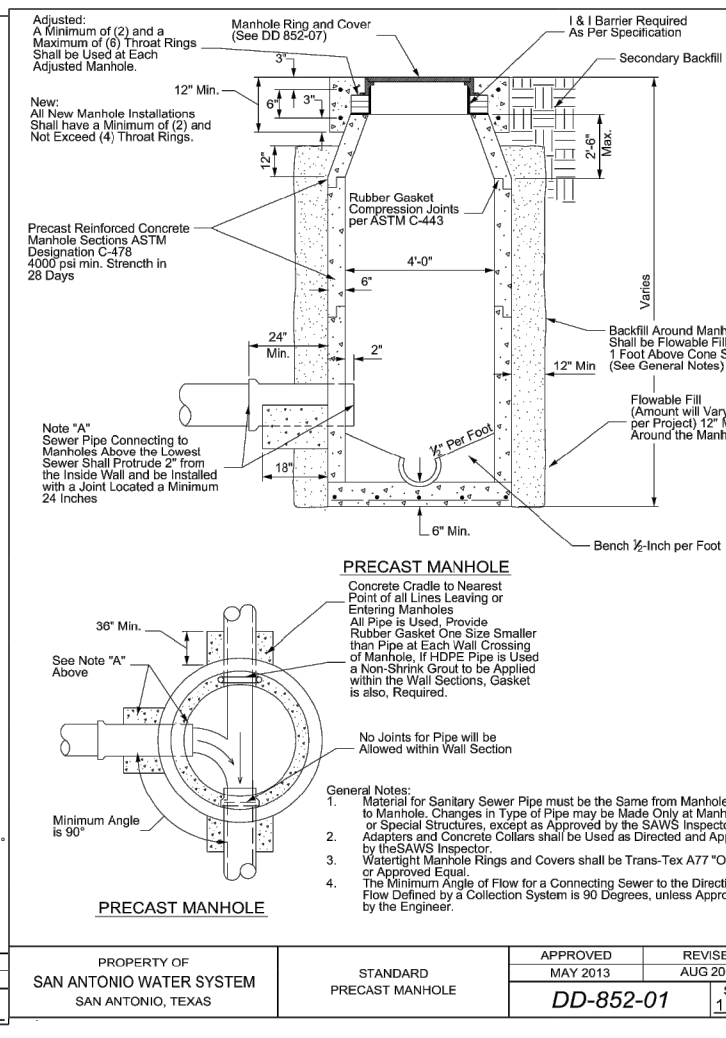


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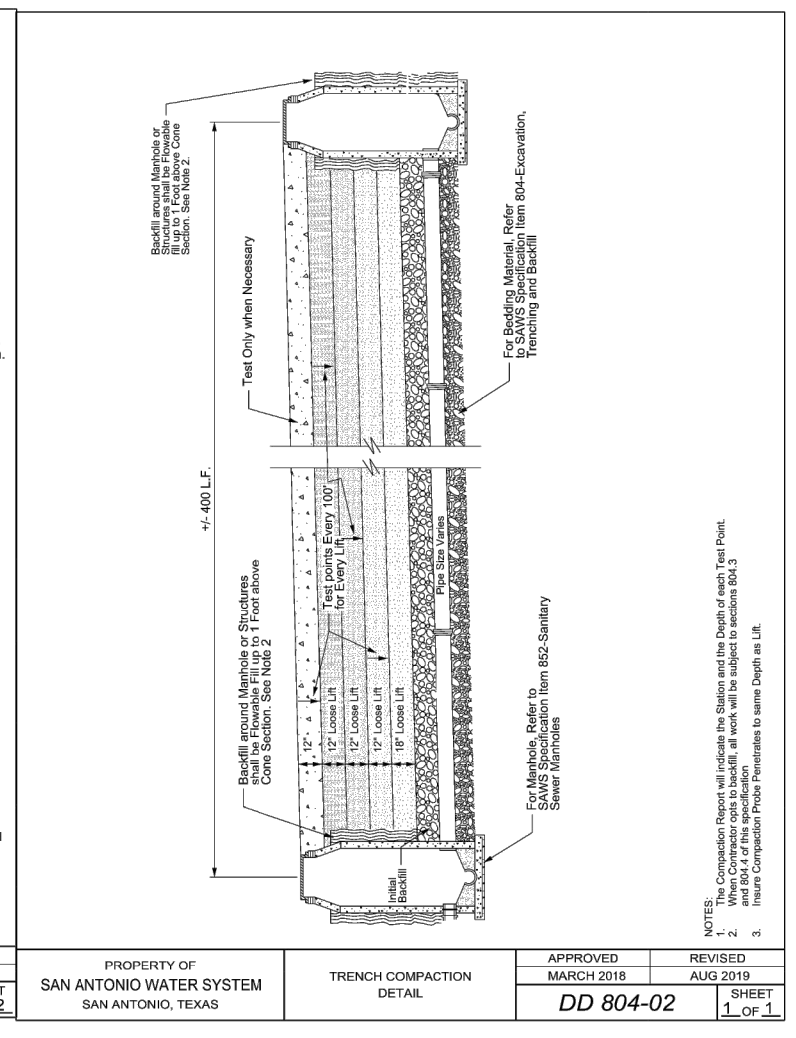


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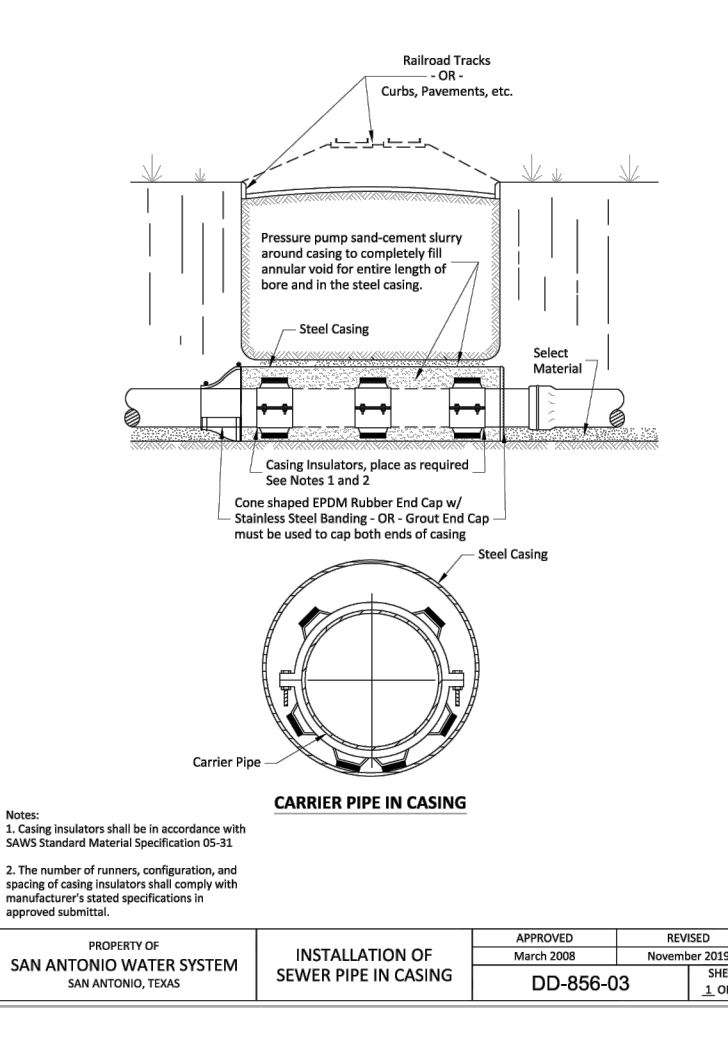


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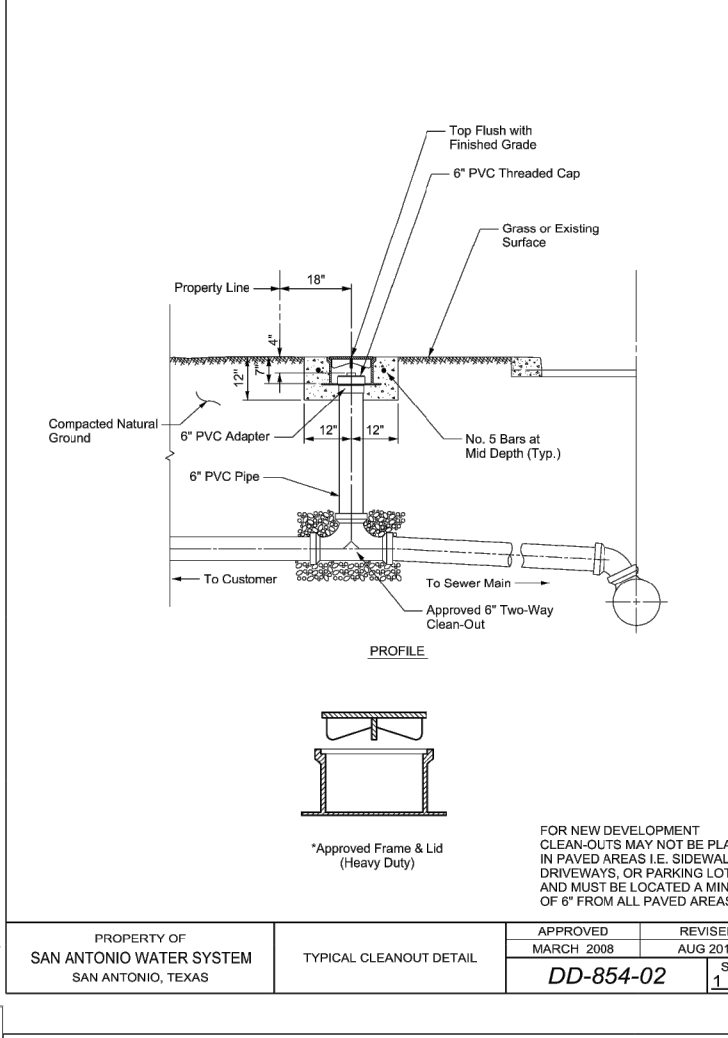


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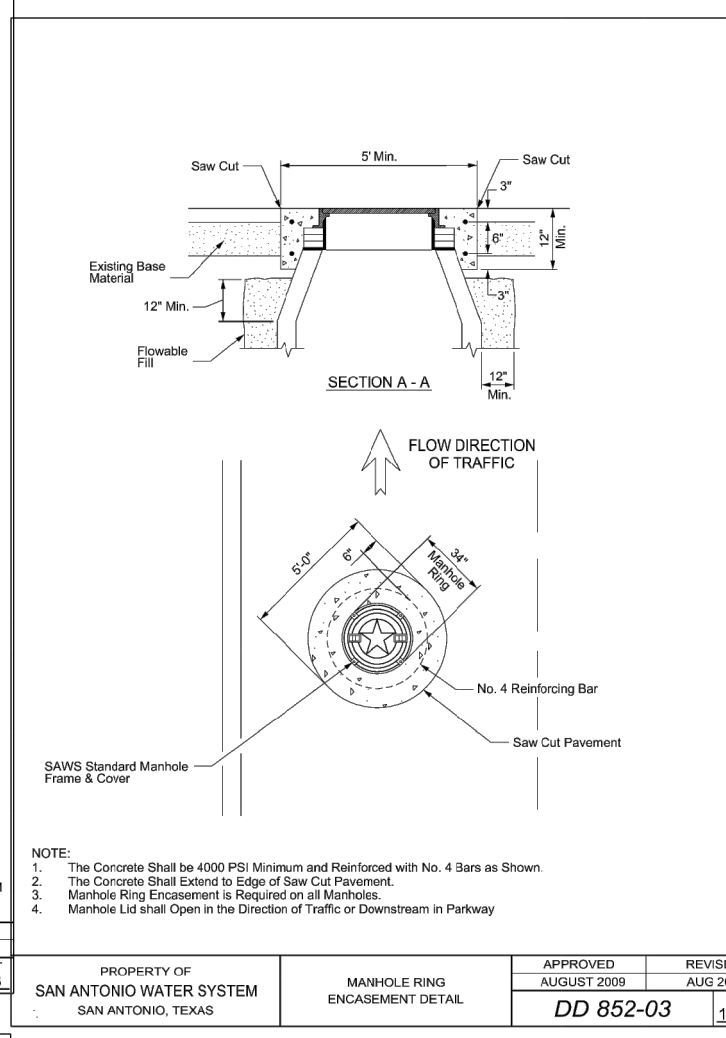


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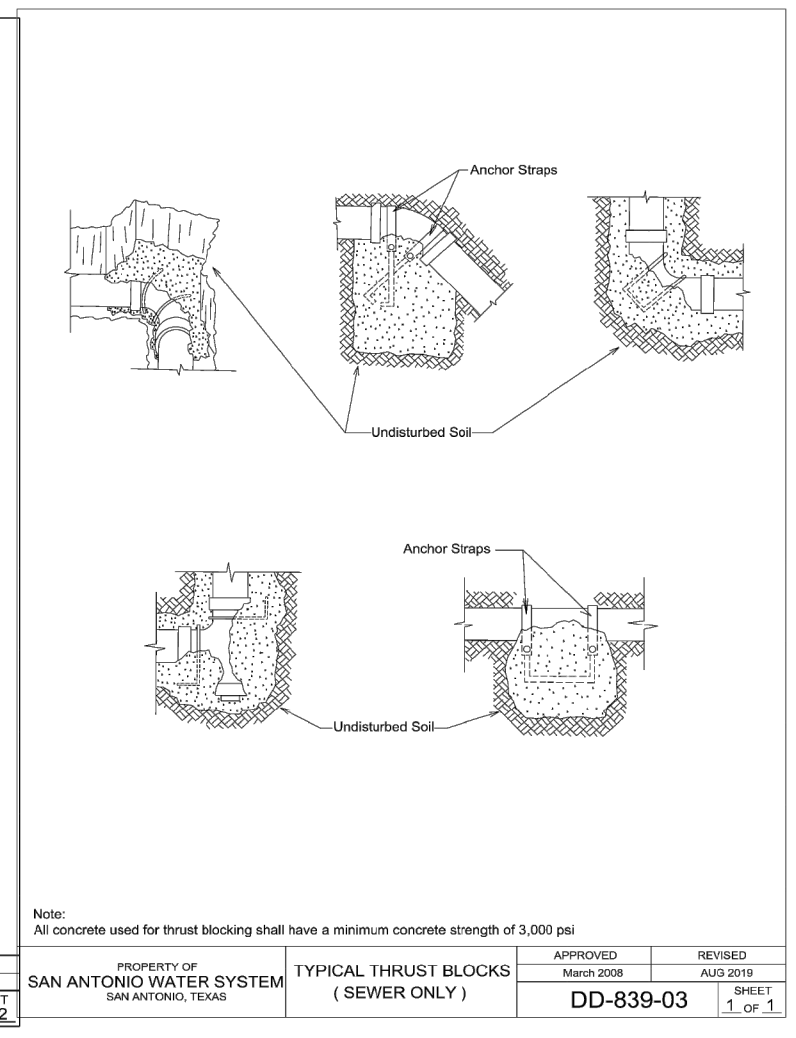
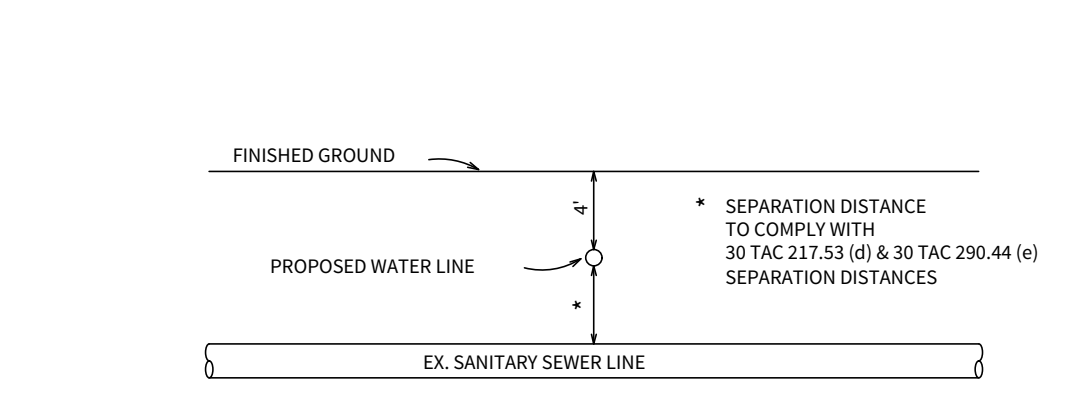


Table with columns: PROPERTY OF SAN ANTONIO WATER SYSTEM, APPROVED, REVISION, SHEET, and TITLE.

SEWER: UPPER - EAST SEWERSHED - DOS RIOS/ LEON CREEK

Developer's Name STONE OAK HIDDEN CANYON, L.L.C.
Developer's Address 6002 CAMP BULLIS ROAD
City SAN ANTONIO State TEXAS Zip 78257
Phone # (210) 698-3004 Fax # (210) 698-3014
SAWS Block Map # 162860 Total EDU's 52 Total Acreage 29.067 Ac.
Total Linear Footage of Pipe 1,231.93 L.F. OF 8" Plot No. 23-1180095
Number of Lots 52 SAWS Job No. 23-1622



TYPICAL SANITARY SEWER/ WATER CROSSING
DETAIL "A" N.T.S.



Table with columns: PROPERTY OF SAN ANTONIO WATER SYSTEM, APPROVED, REVISION, SHEET, and TITLE.

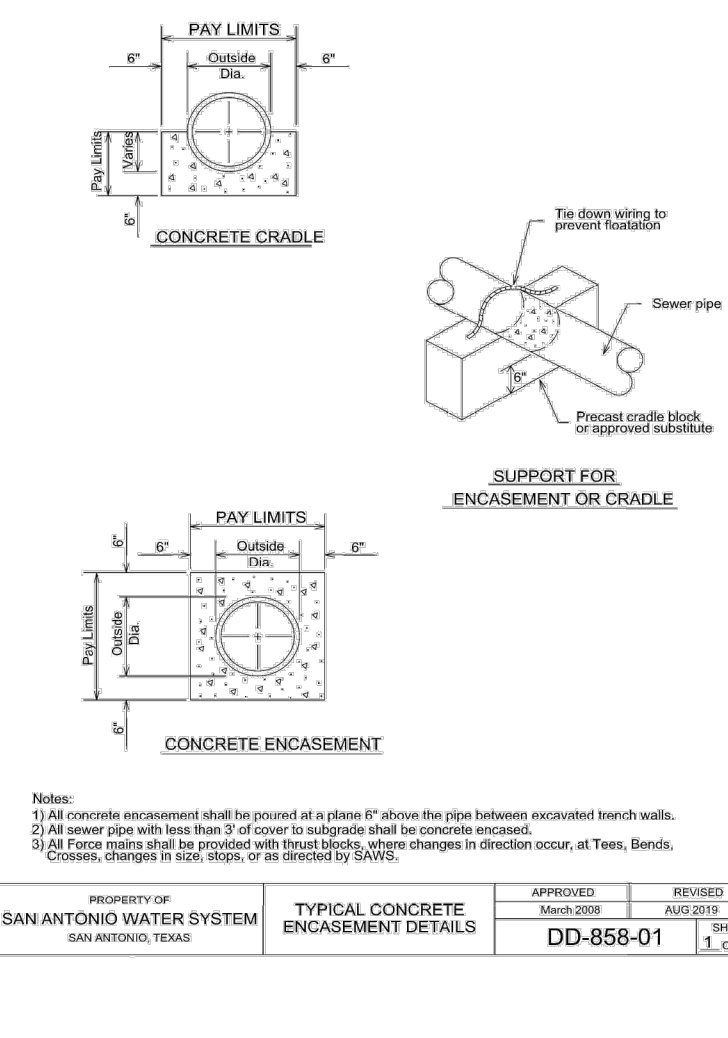


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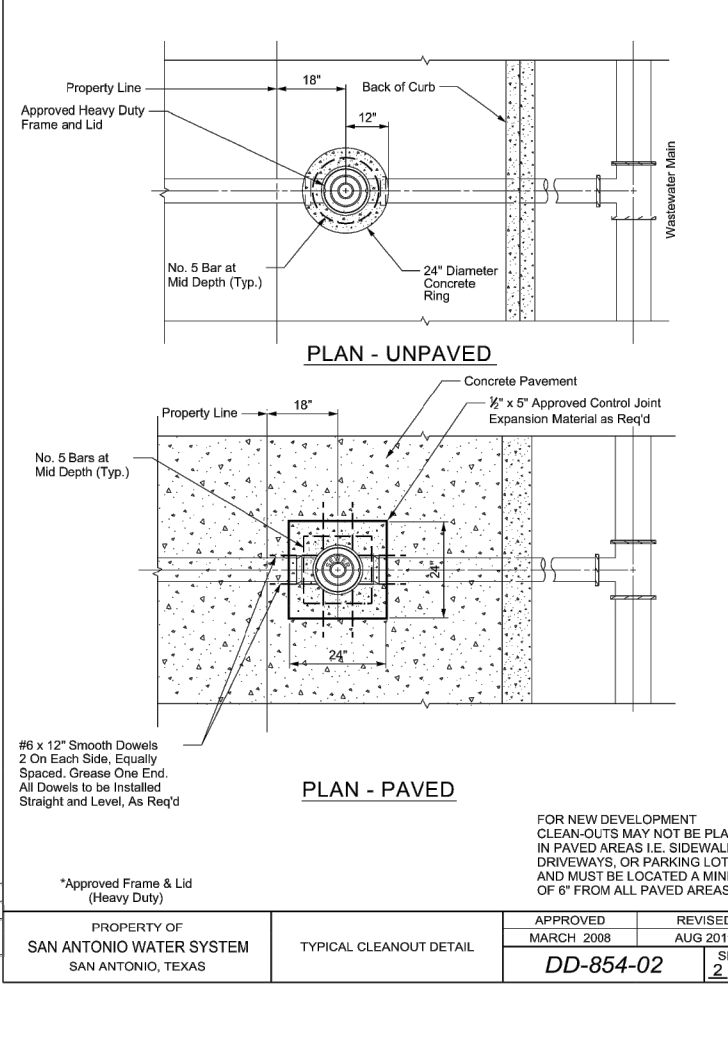


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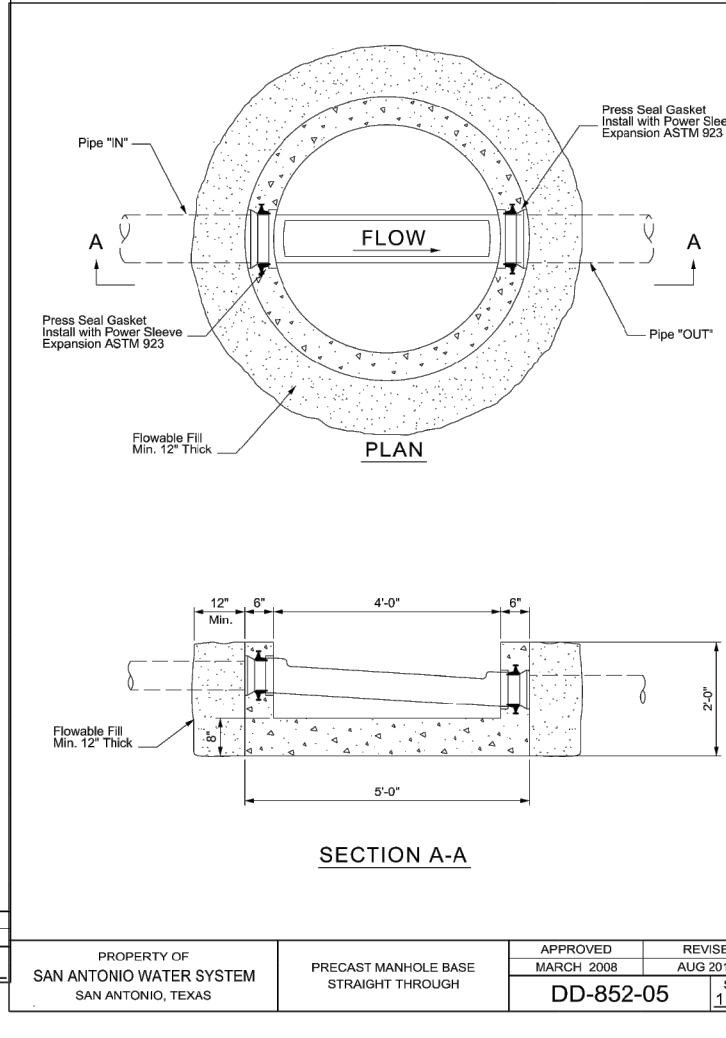


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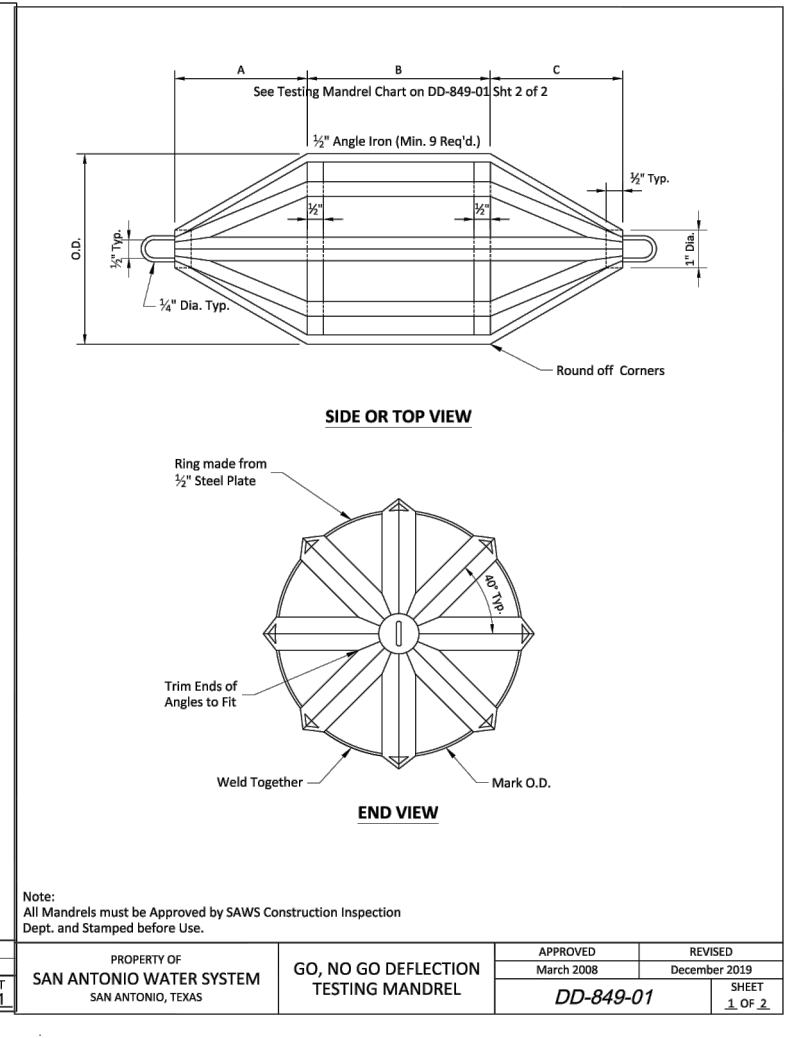
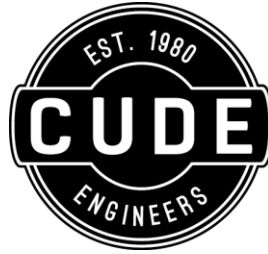


Table with columns: PROPERTY OF SAN ANTONIO WATER SYSTEM, APPROVED, REVISION, SHEET, and TITLE.



**HIDDEN CANYON SUBDIVISION,
UNIT 2A P.U.D.**

***TEMPORARY STORMWATER SECTION
(TCEQ-0602)***

Temporary Stormwater Section

Texas Commission on Environmental Quality

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

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

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

Signature

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

Print Name of Customer/Agent: W. Patrick Murphy, P.E.

Date: 02/07/2024

Signature of Customer/Agent:



Regulated Entity Name: Hidden Canyon Subdivision, Unit 2A P.U.D.

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: Mud Creek/Salado Creek

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

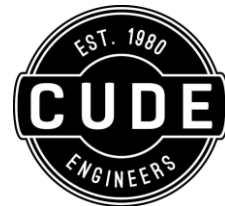
Examples: establishment of temporary vegetation, establishment of permanent vegetation, mulching, geotextiles, sod stabilization, vegetative buffer strips, protection of trees, or preservation of mature vegetation.

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

Spill Prevention and Control

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

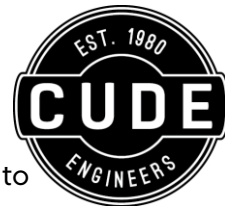
The following steps will help reduce the storm water impacts of leaks and spills:

Education

- (1) Be aware that different materials pollute in different amounts. Make sure that each employee knows what a "significant spill" is for each material they use, and what is the appropriate response for "significant" and "insignificant" spills. Employees should also be aware of when spill must be reported to the TCEQ. Information available in 30 TAC 327.4 and 40 CFR 302.4.
- (2) Educate employees and subcontractors on potential dangers to humans and the environment from spills and leaks.
- (3) Hold regular meetings to discuss and reinforce appropriate disposal procedures (incorporate into regular safety meetings).
- (4) Establish a continuing education program to indoctrinate new employees.
- (5) Have contractor's superintendent or representative oversee and enforce proper spill prevention and control measures.

General Measures

- (1) To the extent that the work can be accomplished safely, spills of oil, petroleum products, and substances listed under 40 CFR parts 110,117, and 302, and sanitary and septic wastes should be contained and cleaned up immediately.
- (2) Store hazardous materials and wastes in covered containers and protect from vandalism.
- (3) Place a stockpile of spill cleanup materials where it will be readily accessible.
- (4) Train employees in spill prevention and cleanup.
- (5) Designate responsible individuals to oversee and enforce control measures.



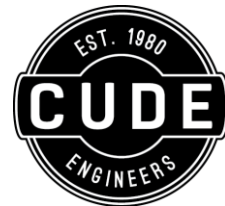
- (6) Spills should be covered and protected from stormwater runoff during rainfall to the extent that it doesn't compromise cleanup activities.
- (7) Do not bury or wash spills with water.
- (8) Store and dispose of used clean up materials, contaminated materials, and recovered spill material that is no longer suitable for the intended purpose in conformance with the provisions in applicable BMPs.
- (9) Do not allow water used for cleaning and decontamination to enter storm drains or watercourses. Collect and dispose of contaminated water in accordance with applicable regulations.
- (10) Contain water overflow or minor water spillage and do not allow it to discharge into drainage facilities or watercourses.
- (11) Place Material Safety Data Sheets (MSDS), as well as proper storage, cleanup, and spill reporting instructions for hazardous materials stored or used on the project site in an open, conspicuous, and accessible location.
- (12) Keep waste storage areas clean, organized, and equipped with ample cleanup supplies as appropriate for the materials being stored. Perimeter controls, containment structures, covers, and liners should be repaired or replaced as needed to maintain proper function.

Cleanup

- (1) Clean up leaks and spills immediately.
- (2) Use a rag for small spills on paved surfaces, a damp mop for general cleanup, and absorbent material for larger spills. If the spilled material is hazardous, then the used cleanup materials are also hazardous and must be disposed of as hazardous waste.
- (3) Never hose down or bury dry material spills. Clean up as much of the material as possible and dispose of properly. See the waste management BMPs in this section for specific information.

Minor Spills

- (1) Minor spills typically involve small quantities of oil, gasoline, paint, etc. which can be controlled by the first responder at the discovery of the spill.
- (2) Use absorbent materials on small spills rather than hosing down or burying the spill.
- (3) Absorbent materials should be promptly removed and disposed of properly.



- (4) Follow the practice below for a minor spill:
 - a) Contain the spread of the spill.
 - b) Recover spilled materials.
 - c) Clean the contaminated area and properly dispose of contaminated materials.

Semi-significant Spills

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

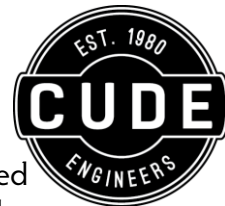
Spills should be cleaned up immediately:

- (1) Contain spread of the spill.
- (2) Notify the project foreman immediately.
- (3) If the spill occurs on paved or impermeable surfaces, clean up using "dry" methods (absorbent materials, cat litter and/or rags). Contain the spill by encircling with absorbent materials and do not let the spill spread widely.
- (4) If the spill occurs in dirt areas, immediately contain the spill by constructing an earthen dike. Dig up and properly dispose of contaminated soil.
- (5) If the spill occurs during rain, cover spill with tarps or other material to prevent contaminating runoff.

Significant/Hazardous Spills

For significant or hazardous spills that are in reportable quantities:

- (1) Notify the TCEQ by telephone as soon as possible and within 24 hours at 512-339-2929 (Austin) or 210-490-3096 (San Antonio) between 8 AM and 5 PM. After hours, contact the Environmental Release Hotline at 1-800-832-8224. It is the contractor's responsibility to have all emergency phone numbers at the construction site.
- (2) For spills of federal reportable quantities, in conformance with the requirements in 40 CFR parts 110,119, and 302, the contractor should notify the National Response Center at (800) 424-8802.
- (3) Notification should first be made by telephone and followed up with a written report.



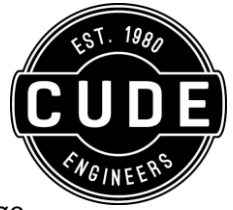
- (4) The services of a spills contractor or a Haz-Mat team should be obtained immediately. Construction personnel should not attempt to clean up until the appropriate and qualified staffs have arrived at the job site.
- (5) Other agencies which may need to be consulted include, but are not limited to, the City Police Department, County Sheriff Office, Fire Departments, etc.

More information on spill rules and appropriate responses is available on the TCEQ website at:

http://www.tnrcc.state.tx.us/enforcement/emergency_response.html.

Vehicle and Equipment Maintenance

- (1) If maintenance must occur onsite, use a designated area and a secondary containment, located away from drainage courses, to prevent the runoff of stormwater and the runoff of spills.
- (2) Regularly inspect onsite vehicles and equipment for leaks and repair immediately.
- (3) Check incoming vehicles and equipment (including delivery trucks, and employee and subcontractor vehicles) for leaking oil and fluids. Do not allow leaking vehicles or equipment onsite.
- (4) Always use secondary containment, such as a drain pan or drop cloth, to catch spills or leaks when removing or changing fluids.
- (5) Place drip pans or absorbent materials under paving equipment when not in use.
- (6) Use absorbent materials on small spills rather than hosing down or burying the spill. Remove the absorbent materials promptly and dispose of properly.
- (7) Promptly transfer used fluids to the proper waste or recycling drums. Don't leave full drip pans or other open containers lying around.
- (8) Oil filters disposed of in trashcans or dumpsters can leak O3 and pollute stormwater. Place the oil filter in a funnel over a waste oil-recycling drum to drain excess oil before disposal. Oil filters can also be recycled. Ask the oil supplier or recycler about recycling oil filters.
- (9) Store cracked batteries in a non-leaking secondary container. Do this with all cracked batteries even if you think all the acid has drained out. If you drop a battery, treat it as if it is cracked. Put it into the containment area until you are sure it is not leaking.

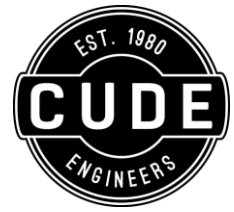


Vehicle and Equipment Fueling

- (1) If fueling must occur on site, use designated areas, located away from drainage courses, to prevent the runoff of stormwater and the runoff of spills.
- (2) Discourage "topping off" of fuel tanks.
- (3) Always use secondary containment, such as a drain pan, when fueling to catch spills/leaks.

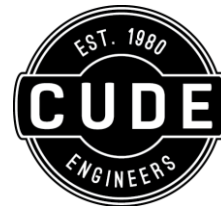
Spill Response Actions

If a spill of hydrocarbons or hazardous substances does occur, the contractor shall be required to maintain a sufficient stockpile of sand material in the staging area. This sand material shall be used to immediately isolate and provide containment of the spill by constructing dikes. Furthermore, this sand material shall act as an absorbent material that can be disposed of offsite and out of the Recharge Zone during clean-up operations. The contractor, in the event of a spill, shall also notify the owner who shall contact TCEQ. All contaminated soils resulting from an accidental release will be required to be removed and disposed of in accordance with all local, state, and federal regulations.



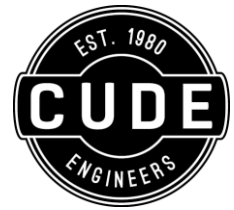
ATTACHMENT B Potential Sources of Contamination

Potential Source	Oil, grease, fuel and hydraulic fluid contamination from construction equipment and vehicle dripping.
Preventive Measure	Vehicle maintenance, when possible, will be performed within a construction staging area specified by the General Contractor.
Potential Source	Miscellaneous trash and litter from construction workers and material wrappings.
Preventive Measure	Trash containers will be placed throughout the site to encourage proper trash disposal.
Potential Source	Construction debris.
Preventive Measure	Construction debris will be monitored daily by contractor. Debris will be collected weekly and placed in disposal bins. Situations requiring immediate attention will be addressed on a case-by-case basis.
Potential Source	Stormwater contamination from excess application of fertilizers, herbicides, and pesticides.
Preventive Measure	Fertilizers, herbicides and pesticides will be applied only when necessary and in accordance with manufacturer's directions.
Potential Source	Soil and mud from construction vehicle tires as they leave the site.
Preventive Measure	A temporary construction entrance/exit shall be utilized as vehicles leave the site. Any soil, mud, etc. carried from the project onto public roads shall be cleaned up within 24 hours.
Potential Source	Sediment from soil, sand, gravel, and excavated materials stockpiled on site.
Preventive Measure	Silt fence shall be installed on the down gradient side of all stockpiled materials. Reinforced rock berms shall be installed at all downstream discharge locations.
Potential Source	Portable toilet spill
Preventive Measure	Toilets on the site will be emptied on a regular basis by the contracted toilet company.



ATTACHMENT C
Sequence of Major Activities

Sequence Item	Description	Approximate Acres Disturbed
1.	Proposed Site clearing & Grading for Infrastructure Installation	17.25
2.	Proposed Construction of Sanitary Sewer and Water lines	1.72
3.	Proposed Installation of Roadways	2.91
4.	Proposed Site grading and building construction – Final Site	17.25



ATTACHMENT D

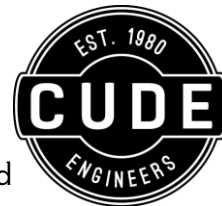
Temporary Best Management Practices and Measures

The TBMPs and measures utilized for the proposed project to prevent pollution of storm water, groundwater, and surface water during the construction phase are the following:

1. Temporary Construction Entrance/Exit – A stabilized pad of crushed stone located at any point where traffic will be entering or leaving the construction site from a public R.O.W., street, alley, sidewalk, or parking area. It shall be a minimum of 50 feet long, 12 feet wide and 8 inches thick. The rock shall be 4 to 8 inches in size.
2. Silt Fence – A barrier consisting of geotextile fabric supported by metal posts to prevent soil and sediment loss from a site. Silt fences shall be installed on the down gradient side of the proposed areas to be disturbed that have a drainage area of 2 or less acres.
3. Rock Berms – A structure of 3-inch to 5-inch diameter rock secured with a woven wire sheath to serve as a check dam in areas of concentrated flow, to intercept sediment-laden runoff, detain the sediment and release the water in sheet flow.
4. Bagged Gravel Inlet Filter – Sandbags filled with washed pea gravel and stacked to form a continuous barrier about 1 foot high around the inlets.
5. Temporary Seeding – Temporary seeding of disturbed areas shall be performed if disturbed areas are expected to have no construction activity for a period of at least 21 days.

Sequence of installation during construction process

1. The Temporary Construction Entrance/Exit shall be installed prior to disturbing any soil except at the location of the Temporary Construction Entrance/Exit. It shall stay in place and be maintained until the end of the infrastructure construction.
2. Silt Fence will be installed along the down gradient side of the proposed site prior to disturbing any soil. It shall stay in place and be maintained until the site has been properly revegetated.
3. Bagged gravel inlet filters shall be placed around all inlets following installation.
4. Rock Berms – Rock berms shall be installed around the perimeter of the project at natural low points following rough grading of the site and shall be removed once grading to the on-site stormwater drainage system with bagged gravel inlet filters



in sump is complete. Rock berms will also be utilized at the outlet of the pond while it is being constructed.

Upgradient Surface water, Groundwater, and Storm water

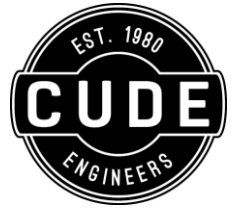
There is no surface water or ground water originating from the site. There is approximately 115.70 acres of stormwater runoff that is generated from upgradient of the site.

Onsite Surface water, Groundwater, and Storm water

Temporary BMPs utilized on the proposed project site to prevent pollution of onsite surface water, groundwater, and storm water are bagged gravel inlet filters at the on-site inlets, a silt fence located on property boundary line and construction exits/entrance, and rock berms at the location of concentrated flows. The silt fence will intercept and detain water-borne sediment while allowing water to percolate through the filter fabric.

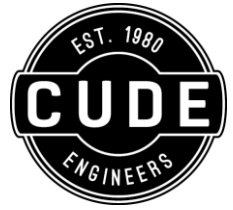
Prevention of Pollutants Entering Surface Streams, Sensitive Features, and the Aquifer

Temporary BMPs utilized on the proposed project site to prevent pollution of surface streams, sensitive features, and the aquifer are temporary construction entrance/exit, silt fences, and rock berms. The construction entrance/exit provides a stable exit from the construction site and keeps sediment and mud off public roads. The other TBMPs delineated act in like manner as previously described to protect surface streams, sensitive features, and the aquifer.



ATTACHMENT E
Request to Temporarily Seal a Feature

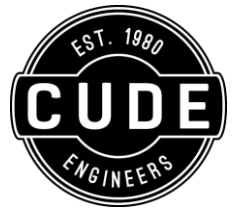
Not applicable to this project



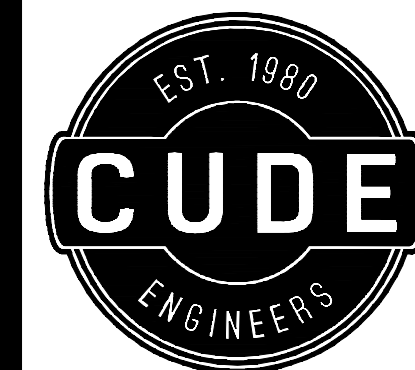
ATTACHMENT F

Structural Practices

Runoff discharge of pollutants from exposed areas of the site will be limited through the utilization of temporary BMPs. Prior to leaving the site, flows containing pollutant discharges will be treated by a silt fence, bagged gravel inlet filters, or rock berms which will limit the number of pollutants leaving the site.



ATTACHMENT G
Drainage Area Map



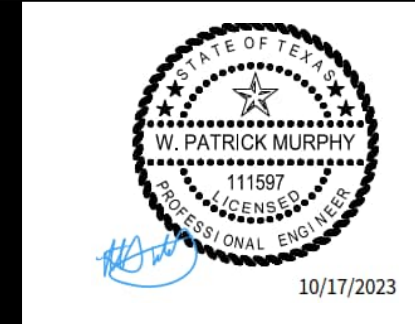
4122 Pond Hill Road, Suite 101
San Antonio, Texas 78231
P:(210) 681-2951 F:(210) 523-7112

HIDDEN CANYON SUBDIVISION
UNIT 2A P.U.D.

OVERALL MASTER GRADING & DRAINAGE PLAN

DATE
01/06/2022
PROJECT NO.
P01564.004
DRAWN BY
R.M., A.B.B.
CHECKED BY
W.P.M./J.R.T.

REVISIONS
1. 2023-09-05 - DRAINS SHOWN AND LABELED, REVISED LOT LINES
2.
3.
4.
5.
6.
7.
8.
9.



CUDE ENGINEERS
TBPE No. 455

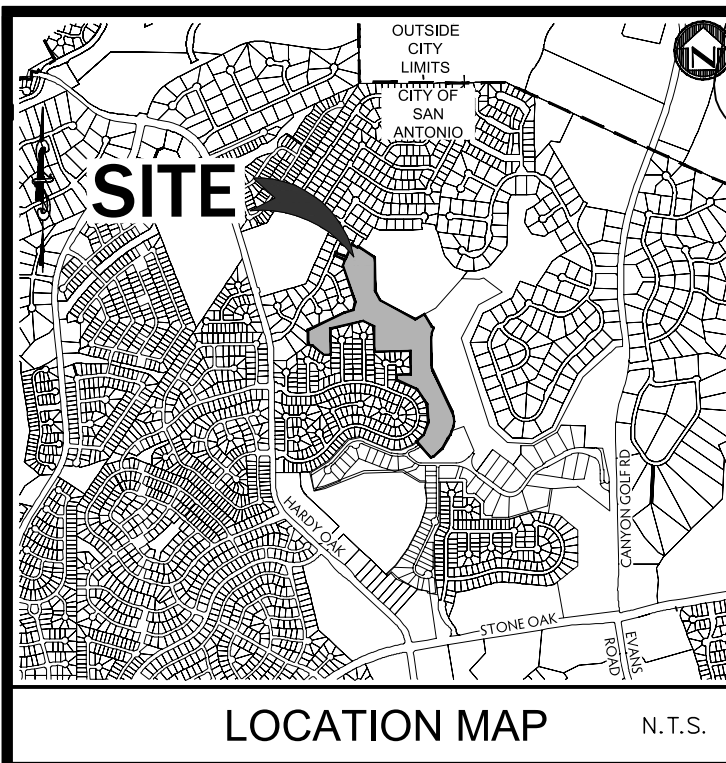
PLAT #
23-11800095

C2

Table with columns: Drainage Shed, Drainage Area (Ac.), Cumulative Area (Ac.), AREA OF ACCUMULATION (Ac.), C, Length (200'), Power (F or R), Upstream Elev., Downstream Elev., Slope, Time of Concentration, Length (650'), Power (F or R), Downstream Elev., Slope, Time of Concentration, Length, Velocity (FPM), Time of Concentration, Time of Concentration (min), Overall, INTENSITY (IS, I25, I100, I05, I25, I100), Q FLOW.

* DENOTES DRAINAGE AREA ANALYZED USING THE SCS HYDROLOGY METHOD DUE TO DRAINAGE AREA SIZE.
ALL HYDRAULIC CALCULATIONS FOR DRAINAGE STRUCTURES ASSOCIATED WITH THESE DRAINAGE AREAS SHOULD BE DERIVED FROM THE SCS METHOD HYDROLOGY CHART FOUND BELOW.

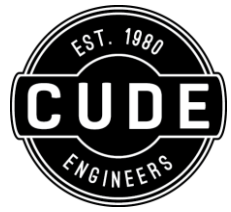
SCS METHOD HYDROLOGY table with columns: ANALYSIS POINT, DRAINAGE AREA (Ac.), TIME OF CONCENTRATION (MIN), PEAK DISCHARGE (CFS) 100 YR, 20 YR, 10 YR.



DEVELOPER:
STONE OAK HIDDEN CANYON, LLC
CONTACT PERSON: RAJEEV PURI
6002 CAMP BULLIS ROAD
SAN ANTONIO, TEXAS 78257
TEL: (210) 698-3004
FAX: (210) 698-3014

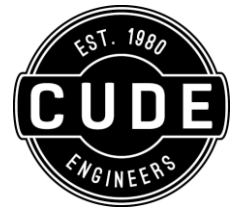


SCALE: 1" = 300'



ATTACHMENT H
Temporary Sediment Pond(s) Plans and Calculations

Not applicable to this project



ATTACHMENT I

Inspection and Maintenance for BMPs

Temporary Sediment Control Fences

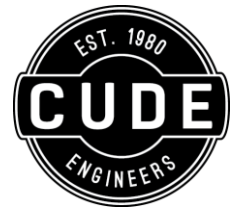
1. Inspect all fencing weekly, and after any rainfall.
2. Remove sediment when buildup reaches 6 inches.
3. Replace any torn fabric or install a second line of fencing parallel to the torn section.
4. Replace or repair any sections crushed or collapsed during construction activity. If a section of fence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

Rock Berm/High Service Rock Berm

1. Inspections should be made weekly and after each rainfall by the responsible party.
2. Remove sediment and other debris when buildup reaches 6 inches and dispose of the accumulated silt of in an approved manner.
3. Repair any loose wire sheathing.
4. The berm should be reshaped as needed during inspection.
5. The berm should be replaced when the structure ceases to function as intended due to silt accumulation among the rocks, washout, construction traffic damage, etc.
6. The rock berm should be left in place until all upstream areas are stabilized and accumulated silt removed.

Temporary Construction Entrance and Exits

1. The entrance should be maintained in a condition, which will prevent tracking or following of sediment onto public rights-of-way. This may require periodic top dressing with additional stone as conditions demand and repair and/or cleanout of any measures used to trap sediment.
2. All sediment spilled, dropped, washed, or tracked on to public rights-of-ways should be removed immediately by contractor.
3. When necessary, wheels should be cleaned to remove sediment prior to entrance onto public right-of-way.
4. When washing is required, it should be done on an area stabilized with crushed stone that drains into an approved sediment trap or sediment basin.
5. All sediment should be prevented from entering ant storm drain, ditch, or water course by using approved methods.



Bagged Gravel Inlet Filters

1. Inspections should be made weekly and after each rainfall. Repair or replacement should be made promptly as needed by the contractor.
2. Remove sediment when buildup reached a depth of 3 inches. Removed sediment should be deposited in a suitable area and in such a manner that it will not erode.
3. Check placement of device to prevent gaps between device and curb.
4. Inspect filter fabric and patch or replace if torn or missing.
5. Structures should be removed, and the area stabilized only after the remaining drainage area has been properly stabilized.

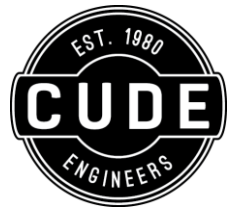
Documentation Procedures

1. A copy of the inspection report is located on the following page.
2. The inspection report must be maintained on site at all times.
3. The inspection report is incorporated as part of this SCS. The contractor is responsible for completing and updating the form in compliance with TCEQ rules.

Inspections

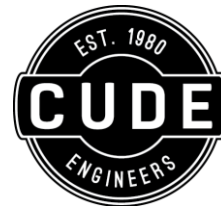
Designated and qualified person(s) shall inspect Pollution Control Measures every fourteen days and within 24 hours after a storm event greater than 0.5 inches of rainfall. An inspection report that summarizes the scope of the inspection, names and qualifications of personnel conducting the inspection, date of the inspection, major observations, and actions taken as a result of the inspection shall be recorded and maintained as part of Storm Water TPDES data for a period of three years after the date of the inspection. A copy of the Inspection Report Form is provided in this Storm Water Pollution Prevention Plan.

As a minimum, the inspector shall observe: (1) significant disturbed areas for evidence of erosion, (2) storage areas for evidence of leakage from the exposed stored materials, (3) structural controls (rock berm outlets, silt fences, drainage swales, etc.) for evidence of failure or excess siltation (over 6 inches deep), (4) vehicle exit point for evidence of off-site sediment tracking, (5) vehicle storage areas for signs of leaking equipment or spills, and (6) concrete truck rinse-out pit for signs of potential failure. Deficiencies noted during the inspection will be corrected and documented within seven (7) calendar days following the inspection or before the next anticipated storm event if practicable.



ATTACHMENT I
Inspection and Maintenance for BMPs

Note: Inspector is to attach a brief statement of his qualifications to this report.



ATTACHMENT I
Inspection and Maintenance for BMPs

Pollution Prevention Measure		Inspected	Corrective Action	
			Date	
			Description	Completed
Silt Fence	Inspections			
	Fencing			
	Sediment Removal			
	Torn Fabric			
	Crushed/Collapsed Fencing			
Gravel Construction Entrance/Exit	Inspections			
	Additional top Dressing			
	Repair/Cleanout			
	Sediment removed immediately			
Bagged Inlet Filter	Inspections			
	Sediment removal			
	Device placement			
	Torn Fabric			
Rock Berm	Inspections			
	Fencing			
	Sediment Removal			
	Torn Fabric			
	Crushed/Collapsed Fencing			

**Indicate N/A where measure does not apply.*

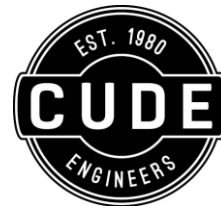
By my signature below, I certify that all items are acceptable, and the project site is in compliance with SWPPP.

 Inspector's Name

 Inspector's Signature

 Name of Owner/Operator (Firm)

 Date



ATTACHMENT I
Inspection and Maintenance for BMPs

Pollution Prevention Measure	Inspected	Corrective Action	
		Description	Date Completed
General			
Revegetation			
Erosion/Sediment Controls			
Vehicle Exits			
Material Areas			
Equipment Areas			
Concrete Rinse			
Construction Debris			
Trash Receptacles			
Infrastructure			
Roadway Clearing			
Utility Clearing			
Roadway Grading			
Utility Construction			
Drainage Construction			
Roadway Base			
Roadway Surfaces			
Site Cleanups			
Building			
Clearing for Building			
Foundation Grading			
Utility Construction			
Foundation Construction			
Building Construction			
Site Grading			
Site Cleanup			

**Indicate N/A where measure does not apply.*

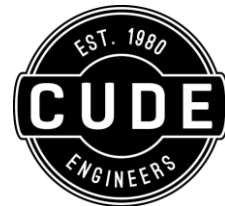
By my signature below, I certify that all items are acceptable, and the project site is in compliance with SWPPP.

 Inspector's Name

 Inspector's Signature

 Name of Owner/Operator (Firm)

 Date



ATTACHMENT I
Inspection and Maintenance for BMPs

PROJECT MILESTONE DATES:

Date when major site grading activities begin:

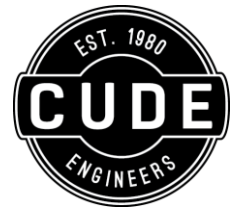
<u>Construction Activity</u>	<u>Date</u>
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____

Dates when construction activities temporarily or permanently cease on all or a portion of the project:

<u>Construction Activity</u>	<u>Date</u>
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____

Date when stabilization measures are initiated:

<u>Stabilization Activity</u>	<u>Date</u>
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____



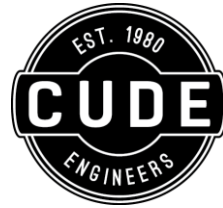
ATTACHMENT J

Schedule of Interim and Permanent Soil Stabilization Practices

1. 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 temporarily 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.
2. Permanent seeding of individually disturbed areas shall be performed when infrastructure construction has been completed.
3. Permanent sodding and mulching of landscape areas shall occur at or near the completion of the project.
4. During construction, contractors shall, to the maximum extent possible, limit their construction activities to areas of construction as noted on the plans to preserve as much natural vegetation as possible.

Seeding & Mulching Specifications

1. All seed must meet requirements of the Texas Seed Law including the labeling requirements. These labels shall show purity, germination, name, and type of seed. Seed furnished shall be of the previous season's crop for the date of the project, and the date of analysis shown on each bag shall be within nine (9) months of the time of use on the project. Bermuda grass shall be hulled and treated and have a purity of 95% and germination of no less than 90%. Each variety of seed shall be furnished and delivered in separate bags or containers. A sample of each variety of seed shall be furnished for analysis and testing when directed by the Owner.
2. Annual Rye grass will be free of Johnson grass, field bindweed, dodder seed, and free of other seed to the limits allowable under the Federal Seed Act and applicable Texas Seed Law. Annual Rye grass will be added into slurry between October 1 and March 15.
3. Wood Cellulose Fiber Mulch. Wood cellulose fiber mulch shall be natural cellulose fiber mulch produced from grinding clean, whole wood chips, or fiber produced from ground newsprint with a labeled ash content not to exceed 7%. The mulch shall be designed for use



in conventional mechanical planting, hydraulic planting of seed or hydraulic mulching of grass seed, either alone or with fertilizer and other additives. The mulch shall be that when applied, the material shall form a strong, moisture-retaining mat without the need of an asphalt binder. The mulch material will also be dyed with a green color to assist in determining coverage and to provide an immediate pleasing appearance. The wood cellulose fiber is also required to be dispersed rapidly in water to form homogeneous slurry and remain in such state when agitated in the hydraulic mulching unit with specified materials.

4. Straw Mulch or Hay Mulch. Straw mulch shall be oat, wheat, or rice straw. Hay mulch shall be prairie grass, Bermuda grass or other hay as approved by the Owner. The straw mulch or hay mulch shall be free of Johnson grass or other noxious weeds and foreign materials. It shall be kept in a dry condition and shall not be molded or rotted.

Optimum Planting Dates	Common Names	Rate, lbs./acre
February 1 – May 1	Bermuda Grass	1.5
September 1 – November 30	Tall Fescue	4.0
	Oats	21.0*
	Wheat (Red, Winter)	30.0
September 1 – November 30	Hairy Vetch	8.0
May 1 – August 31	Foxtail Millet	30.0

1.3.10 Hydraulic Mulch

Hydraulic mulch consists of applying a mixture of shredded wood fiber or a hydraulic matrix, and a stabilizing emulsion or tackifier with hydro-mulching equipment, which temporarily protects exposed soil from erosion by raindrop impact or wind. Hydraulic mulch is suitable for soil disturbed areas requiring temporary protection until permanent stabilization is established, and disturbed areas that will be re-disturbed following an extended period of inactivity. It is not appropriate for slopes of 3:1 or steeper or for use in channels.

Wood fiber hydraulic mulches are generally short lived and need 24 hours to dry before rainfall occurs to be effective. May require a second application in order to remain effective for an entire rainy season.

Materials:

Hydraulic Mulches: Wood fiber mulch can be applied alone or as a component of hydraulic matrices. Wood fiber applied alone is typically applied at the rate of 2,000 to 4,000 lb/acre. Wood fiber mulch is manufactured from wood or wood waste from lumber mills or from urban sources.

Hydraulic Matrices: Hydraulic matrices include a mixture of wood fiber and acrylic polymer or other tackifier as binder. Apply as a liquid slurry using a hydraulic application machine (i.e., hydro seeder) at the following minimum rates, or as specified by the manufacturer to achieve complete coverage of the target area: 2,000 to 4,000 lb/acre wood fiber mulch, and 5 to 10% (by weight) of tackifier (acrylic copolymer, guar, psyllium, etc.)

Bonded Fiber Matrix: Bonded fiber matrix (BFM) is a hydraulically applied system of fibers and adhesives that upon drying forms an erosion resistant blanket that promotes vegetation, and prevents soil erosion. BFMs are typically applied at rates from 3,000 lb/acre to 4,000 lb/acre based on the manufacturer's recommendation. A biodegradable BFM is composed of materials that are 100% biodegradable. The binder in the BFM should also be biodegradable and should not dissolve or disperse upon re-wetting. Typically, biodegradable BFMs should not be applied immediately before, during or immediately after rainfall if the soil is saturated. Depending on the product, BFMs typically require 12 to 24 hours to dry and become effective.

Installation:

- (1) Prior to application, roughen embankment and fill areas by rolling with a crimping or punching type roller or by track walking. Track walking shall only be used where other methods are impractical.
- (2) To be effective, hydraulic matrices require 24 hours to dry before rainfall occurs.
- (3) Avoid mulch over spray onto roads, sidewalks, drainage channels, existing vegetation, etc.

Inspection and Maintenance Guidelines:

- (1) Mulched areas should be inspected weekly and after each rain event to locate and repair any damage.
- (2) Areas damaged by storms or normal construction activities should be regraded and hydraulic mulch reapplied as soon as practical.

1.3.11 Sod

Sod is appropriate for disturbed areas which require immediate vegetative covers, or where sodding is preferred to other means of grass establishment. Locations particularly suited to stabilization with sod are waterways carrying intermittent flow, areas around drop inlets or in grassed swales, and residential or commercial lawns where quick use or aesthetics are factors.

The advantages of properly installed sod include:

- Immediate erosion control.
- An instant green surface with no dust or mud.
- Nearly year-round establishment capability.
- Less chance of failure than seed.
- Freedom from weeds.
- Quick use of the sodded surface.
- The option of buying a quality-controlled product with predictable results.

It is initially more costly to install sod than to seed. However, this cost is justified in places where sod can perform better than seed in controlling erosion. In swales and waterways where concentrated flow will occur, properly pegged sod is preferable to seed because there is no lag time between installation and the time when the channel is protected by vegetation. Drop inlets, which will be placed in grassed areas, can be kept

free of sediment, and the grade immediately around the inlet can be maintained, by framing the inlet with sod strips.

Sod can be laid during times of the year when seeded grass may fail, so long as there is adequate water available for irrigation in the early weeks. Ground preparation and proper maintenance are as important with sod as with seed. Sod is composed of living plants and those plants must receive adequate care in order to provide vegetative stabilization on a disturbed area.

Materials:

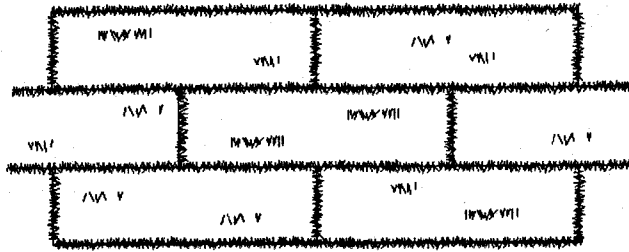
- (1) Sod should be machine cut at a uniform soil thickness of $\frac{3}{4}$ inch ($\pm \frac{1}{4}$ inch) at the time of cutting. This thickness should exclude shoot growth and thatch.
- (2) Pieces of sod should be cut to the supplier's standard width and length, with a maximum allowable deviation in any dimension of 5%. Torn or uneven pads should not be acceptable.
- (3) Standard size sections of sod should be strong enough to support their own weight and retain their size and shape when suspended from a firm grasp on one end of the section.
- (4) Sod should be harvested, delivered, and installed within a period of 36 hours.

Site Preparation:

- (1) Prior to soil preparation, areas to be sodded should be brought to final grade in accordance with the approved plan.
- (2) The surface should be cleared of all trash, debris and of all roots, brush, wire, grade stakes and other objects that would interfere with planting, fertilizing or maintenance operations.
- (3) Fertilize according to soil tests. Fertilizer needs can be determined by a soil testing laboratory or regional recommendations can be made by county agricultural extension agents. Fertilizer should be worked into the soil to a depth of 3 inches with a disc, springtooth harrow or other suitable equipment. On sloping land, the final harrowing or discing operation should be on the contour.

General Installation (VA Dept of Conservation, 1992):

- (1) Sod should not be cut or laid in excessively wet or dry weather. Sod also should not be laid on soil surfaces that are frozen.
- (2) During periods of high temperature, the soil should be lightly irrigated immediately prior to laying the sod, to cool the soil and reduce root burning and dieback.
- (3) The first row of sod should be laid in a straight line with subsequent rows placed parallel to and butting tightly against each other. Lateral joints should be staggered to promote more uniform growth and strength. Care should be exercised to ensure that sod is not stretched or overlapped and that all joints are butted tight in order to prevent voids which would cause drying of the roots (see Figure 1-22).
- (4) On slopes 3:1 or greater, or wherever erosion may be a problem, sod should be laid with staggered joints and secured by stapling or other approved methods. Sod should be installed with the length perpendicular to the slope (on the contour).
- (5) As sodding of clearly defined areas is completed, sod should be rolled or tamped to provide firm contact between roots and soil.
- (6) After rolling, sod should be irrigated to a depth sufficient that the underside of the sod pad and the soil 4 inches below the sod is thoroughly wet.
- (7) Until such time a good root system becomes developed, in the absence of adequate rainfall, watering should be performed as often as necessary to maintain moist soil to a depth of at least 4 inches.
- (8) The first mowing should not be attempted until the sod is firmly rooted, usually 2-3 weeks. Not more than one third of the grass leaf should be removed at any one cutting.



LAY SOD IN A STAGGERED PATTERN. BUTT THE STRIPS TIGHTLY AGAINST EACH OTHER. DO NOT LEAVE SPACES AND DO NOT OVERLAP. A SHARPENED MASON'S TROWEL IS A HANDY TOOL FOR TUCKING DOWN THE ENDS AND TRIMMING PIECES.



INCORRECT

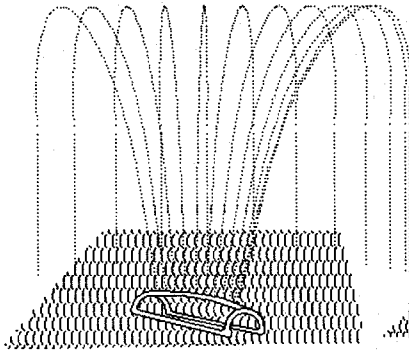


CORRECT

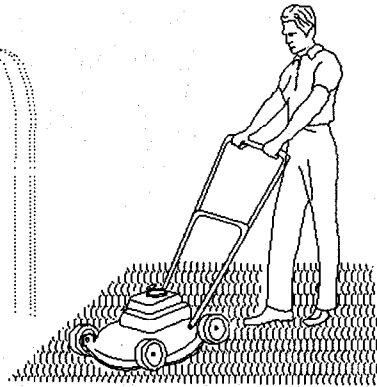
BUTTING — ANGLED ENDS CAUSED BY THE AUTO-MATIC SOD CUTTER MUST BE MATCHED CORRECTLY.



ROLL SOD IMMEDIATELY TO ACHIEVE FIRM CONTACT WITH THE SOIL.

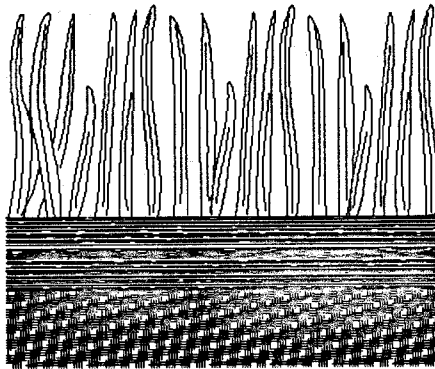


WATER TO A DEPTH OF 4" AS NEEDED. WATER WELL AS SOON AS THE SOD IS LAID.



MOW WHEN THE SOD IS ESTABLISHED — IN 2-3 WEEKS. SET THE MOWER HIGH (2"-3").

APPEARANCE OF GOOD SOD



SHOOTS OR GRASS BLADES. GRASS SHOULD BE GREEN AND HEALTHY, MOWED AT A 2"-3" CUTTING HEIGHT.

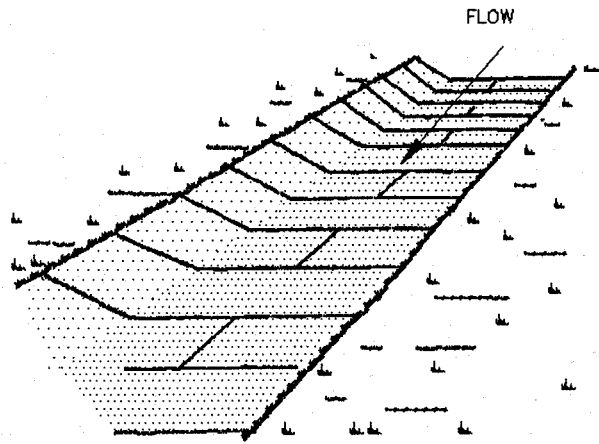
THATCH — GRASS CLIPPINGS AND DEAD LEAVES, UP TO 1/2" THICK.

ROOT ZONE — SOIL AND ROOTS. SHOULD BE 1/2"-3/4" THICK, WITH DENSE ROOT MAT FOR STRENGTH.

Figure 1-22 Proper Sod Installation Techniques (VA Dept. of Conservation, 1992)

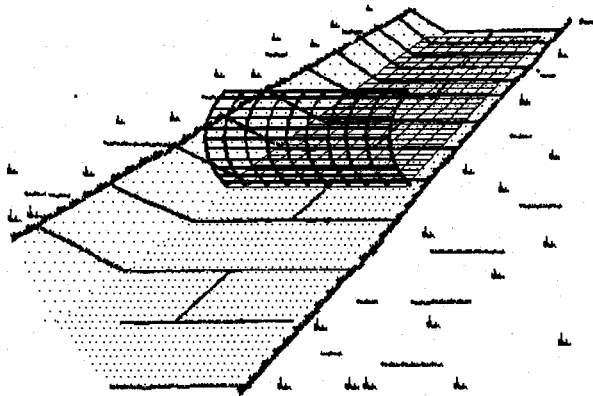
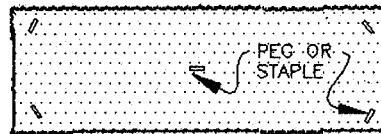
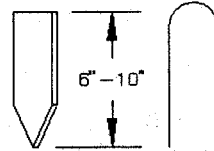
Installation in Channels:

- (1) Sod strips in waterways should be laid perpendicular to the direction of flow. Care should be taken to butt ends of strips tightly (see Figure 1-23).
- (2) After rolling or tamping, sod should be pegged or stapled to resist washout during the establishment period. Mesh or other netting may be pegged over the sod for extra protection in critical areas.



LAY SOD ACROSS THE DIRECTION OF FLOW.

USE PEGS OR STAPLES TO FASTEN SOD FIRMLY - AT THE ENDS OF STRIPS AND IN THE CENTER, OR EVERY 3-4 FEET IF THE STRIPS ARE LONG. WHEN READY TO MOW, DRIVE PEGS OR STAPLES FLUSH WITH THE GROUND.

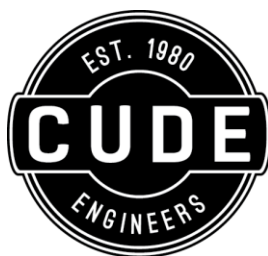


IN CRITICAL AREAS, SECURE SOD WITH NETTING. USE STAPLES.

Figure 1-23 Installation of Sod in a Channel (VA Dept. of Conservation, 1992)

Inspection and Maintenance Guidelines:

- (3) Sod should be inspected weekly and after each rain event to locate and repair any damage.
- (4) Damage from storms or normal construction activities such as tire ruts or disturbance of swale stabilization should be repaired as soon as practical.



**HIDDEN CANYON SUBDIVISION,
UNIT 2A P.U.D.**

***AGENT AUTHORIZATION FORM
(TCEQ-0599)***

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

I _____ Rajeev Puri _____
Print Name

_____ Manager _____
Title - Owner/President/Other

of _____ Stone Oak Hidden Canyon, LLC _____
Corporation/Partnership/Entity Name

have authorized _____ M.W. Cude Engineers, LLC _____
Print Name of Agent/Engineer

of _____ M.W. Cude Engineers, LLC _____
Print Name of Firm

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

I also understand that:

1. The applicant is responsible for compliance with 30 Texas Administrative Code Chapter 213 and any condition of the TCEQ's approval letter. The TCEQ is authorized to assess administrative penalties of up to \$10,000 per day per violation.
2. For those submitting an application who are not the property owner, but who have the right to control and possess the property, additional authorization is required from the owner.
3. Application fees are due and payable at the time the application is submitted. The application fee must be sent to the TCEQ cashier or to the appropriate regional office. The application will not be considered until the correct fee is received by the commission.
4. A notarized copy of the Agent Authorization Form must be provided for the person preparing the application, and this form must accompany the completed application.
5. No person shall commence any regulated activity on the Edwards Aquifer Recharge Zone, Contributing Zone or Transition Zone until the appropriate application for the activity has been filed with and approved by the Executive Director.

SIGNATURE PAGE:

Rajeev Puri
Applicant's Signature

02/21/24
Date

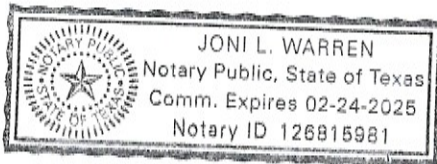
THE STATE OF Texas §

County of Bexar §

BEFORE ME, the undersigned authority, on this day personally appeared Rajeev Puri 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.

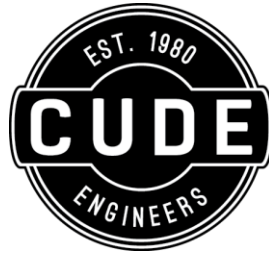
GIVEN under my hand and seal of office on this 21st day of February, 2024

Joni L. Warren
NOTARY PUBLIC



Joni L. Warren
Typed or Printed Name of Notary

MY COMMISSION EXPIRES: 2/24/2025



**HIDDEN CANYON SUBDIVISION,
UNIT 2A P.U.D.**

***APPLICATION FEE FORM
(TCEQ-0574)***

RECEIVED
TCEQ REG13

2024 FEB 26 PM 3: 26

Application Fee Form

Texas Commission on Environmental Quality

Name of Proposed Regulated Entity: Hidden Canyon Subdivision Unit 2A, P.U.D.

Regulated Entity Location: North of Stone Oak Pkwy & Canyon Golf Rd in San Antonio, TX

Name of Customer: Stone Oak Hidden Canyon, LLC

Contact Person: Rajeev Puri

Phone: 210.698.3004

Customer Reference Number (if issued): CN 603399239

Regulated Entity Reference Number (if issued): RN 111799789

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

San Antonio Regional Office

Mailed to: TCEQ - Cashier

Overnight Delivery to: TCEQ - Cashier

Revenues Section

12100 Park 35 Circle

Mail Code 214

Building A, 3rd Floor

P.O. Box 13088

Austin, TX 78753

Austin, TX 78711-3088

(512)239-0357

Site Location (Check All That Apply):

Recharge Zone

Contributing Zone

Transition Zone

Type of Plan	Size	Fee Due
Water Pollution Abatement Plan, Contributing Zone Plan: One Single Family Residential Dwelling	Acres	\$
Water Pollution Abatement Plan, Contributing Zone Plan: Multiple Single Family Residential and Parks	Acres	\$
Water Pollution Abatement Plan, Contributing Zone Plan: Non-residential	Acres	\$
Sewage Collection System	1,231.93 L.F.	\$ 650.00
Lift Stations without sewer lines	Acres	\$
Underground or Aboveground Storage Tank Facility	Tanks	\$
Piping System(s)(only)	Each	\$
Exception	Each	\$
Extension of Time	Each	\$

Signature: _____



Date: 02/19/2024

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	\$1,500
	5 < 10	\$3,000
	10 < 40	\$4,000
	40 < 100	\$6,500
	100 < 500	\$8,000
	≥ 500	\$10,000
Non-residential (Commercial, industrial, institutional, multi-family residential, schools, and other sites where regulated activities will occur)	< 1	\$3,000
	1 < 5	\$4,000
	5 < 10	\$5,000
	10 < 40	\$6,500
	40 < 100	\$8,000
	≥ 100	\$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