MAVERICK CREEK GREENWAY

WATER POLLUTION ABATEMENT PLAN

PARKS & RECREATION
SAN ANTONIO

PREPARED FOR:

City of San Antonio – Parks & Recreation
5800 Enrique Barrera Pkwy
San Antonio, Texas 78227

PREPARED BY:

100 NE LOOP 410, SUITE 701
SAN ANTONIO, TEXAS 78216
HALFF ASSOCIATES, INC.
TBPELS ENGINEERING FIRM No. 312

APRIL 2024

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

Recharge and Transition Zone Exception Request Form (TCEQ-0628)

Attachment A - Nature of Exception
Attachment B - Documentation of Equivalent Water Quality Protection

Temporary Stormwater Section (TCEQ-0602)

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

Permanent Stormwater Section (TCEQ-0600)

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

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

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)

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: Blossom Park						**2. Regulated Entity No.:**			
3. Customer Name: City of San Antonio – Public Works Deparment						**4. Customer No.:**			
5. Project Type: **(Please circle/check one)**	New		Modification			Extension		Exception	
6. Plan Type: **(Please circle/check one)**	WPAP	CZP	SCS	UST	AST	EXP	EXT	Technical Clarification	Optional Enhanced Measures
7. Land Use: **(Please circle/check one)**	Residential		Non-residential			**8. Site (acres):**			19.85 ac (864666 sq.ft.)
9. Application Fee:	$500		**10. Permanent BMP(s):**			N/A			
11. SCS (Linear Ft.):	N/A		**12. AST/UST (No. Tanks):**			N/A			
13. County:	Bexar		**14. Watershed:**			Maverick 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)	___Edwards Aquifer Authority ___Barton Springs/ Edwards Aquifer ___Hays Trinity ___Plum Creek	___Barton Springs/ Edwards Aquifer	NA
City(ies) Jurisdiction	___Austin ___Buda ___Dripping Springs ___Kyle ___Mountain City ___San Marcos ___Wimberley ___Woodcreek	___Austin ___Bee Cave ___Pflugerville ___Rollingwood ___Round Rock ___Sunset Valley ___West Lake Hills	___Austin ___Cedar Park ___Florence ___Georgetown ___Jerrell ___Leander ___Liberty Hill ___Pflugerville ___Round Rock

San Antonio Region					
County:	**Bexar**	**Comal**	**Kinney**	**Medina**	**Uvalde**
Original (1 req.)	___	___	___	___	___
Region (1 req.)	___	___	___	___	___
County(ies)	___	___	___	___	___
Groundwater Conservation District(s)	_X_ Edwards Aquifer Authority ___Trinity-Glen Rose	___Edwards Aquifer Authority	___Kinney	___EAA ___Medina	___EAA ___Uvalde
City(ies) Jurisdiction	___Castle Hills ___Fair Oaks Ranch ___Helotes ___Hill Country Village ___Hollywood Park _X_San Antonio (SAWS) ___Shavano Park	___Bulverde ___Fair Oaks Ranch ___Garden Ridge ___New Braunfels ___Schertz	NA	___San Antonio ETJ (SAWS)	NA

I certify that to the best of my knowledge, that the application is complete and accurate. This application is hereby submitted to TCEQ for administrative review and technical review. Luis Cardona, P.E.
Print Name of Customer/Authorized Agent Luis A. Cardona 3/18/2024
Signature of Customer/Authorized Agent Date

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

General Information Form

Texas Commission on Environmental Quality

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

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

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

Signature

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

Print Name of Customer/Agent: Luis Cardona, P.E.

Date: 1/31/24

Signature of Customer/Agent:

Project Information

1. Regulated Entity Name: Maverick Creek Greenway from UTSA Blvd to Loop 1604
2. County: Bexar
3. Stream Basin: Leon Creek
4. Groundwater Conservation District (If applicable): Edwards Aquifer Authority
5. Edwards Aquifer Zone:

   ☒ Recharge Zone
   ☐ Transition Zone

6. Plan Type:

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

7. Customer (Applicant):

   Contact Person: Samuel Sanchez
   Entity: CIty of San Antonio Greenway Trails Division
   Mailing Address: P.O. Box 839966
   City, State: San Antonio, TX Zip: 78283
   Telephone: (210) 207-4091 FAX: (210) 207-3101
   Email Address: samuel.sanchez@sanantonio.gov

8. Agent/Representative (If any):

   Contact Person: Luis Cardona, P.E.
   Entity: Halff
   Mailing Address: 100 NE Interstat 410 Loop St.701
   City, State: San Antonio, TX Zip: 78216
   Telephone: (210) 798-1379 FAX: 210) 798-1896
   Email Address: lcardona@halff.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.

    Maverick Greenway from UTSA Blvd to Loop 1604

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: XXXX 2024

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

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

15. Existing project site conditions are noted below:

- ☐ Existing commercial site
- ☐ Existing industrial site
- ☐ Existing residential site
- ☐ Existing paved and/or unpaved roads
- ☐ Undeveloped (Cleared)
- ☒ Undeveloped (Undisturbed/Uncleared)
- ☐ Other: _____

Prohibited Activities

16. ☒ I am aware that the following activities are prohibited on the Recharge Zone and are not proposed for this project:

(1) Waste disposal wells regulated under 30 TAC Chapter 331 of this title (relating to Underground Injection Control);

(2) New feedlot/concentrated animal feeding operations, as defined in 30 TAC §213.3;

(3) Land disposal of Class I wastes, as defined in 30 TAC §335.1;

(4) The use of sewage holding tanks as parts of organized collection systems; and

(5) New municipal solid waste landfill facilities required to meet and comply with Type I standards which are defined in §330.41(b), (c), and (d) of this title (relating to Types of Municipal Solid Waste Facilities).

(6) New municipal and industrial wastewater discharges into or adjacent to water in the state that would create additional pollutant loading.

17. ☒ I am aware that the following activities are prohibited on the Transition Zone and are not proposed for this project:

(1) Waste disposal wells regulated under 30 TAC Chapter 331 (relating to Underground Injection Control);

(2) Land disposal of Class I wastes, as defined in 30 TAC §335.1; and

(3) New municipal solid waste landfill facilities required to meet and comply with Type I standards which are defined in §330.41 (b), (c), and (d) of this title.

Administrative Information

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

- ☐ For a Water Pollution Abatement Plan or Modification, the total acreage of the site where regulated activities will occur.
- ☐ For an Organized Sewage Collection System Plan or Modification, the total linear footage of all collection system lines.
- ☐ For a UST Facility Plan or Modification or an AST Facility Plan or Modification, the total number of tanks or piping systems.
- ☒ A request for an exception to any substantive portion of the regulations related to the protection of water quality.
- ☐ A request for an extension to a previously approved plan.

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

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

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

21. ☒ No person shall commence any regulated activity until the Edwards Aquifer Protection Plan(s) for the activity has been filed with and approved by the Executive Director.

FORM TCEQ-0587 ATTACHMENTS

ATTACHMENT A – ROAD MAP

Attached following this page.

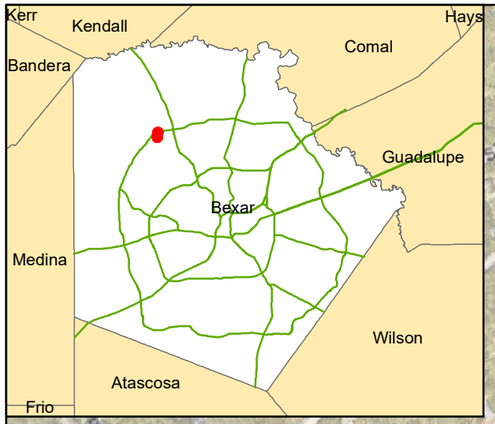
ATTACHMENT B – USGS/EDWARDS AQUIFER RECHARGE ZONE MAP

Attached following this page.

ATTACHMENT C – PROJECT DESCRIPTION

The City of San Antonio (COSA) – Parks and Recreation is proposing improvements to Maverick Creek Greenway Trail, located west of Highway I -10 at UTSA Blvd, in Bexar County.

This project would construct 3,751 of 10’ shared use paths along the length of Maverick Creek Trail and would add approximately 54,450 square feet (1.25 acres) of impervious surfaces over the Recharge Zone. The approximate project acreage is 3.72 acres (162,043 square feet) and the project will only disturb within this area for trail construction. Due to the minimal addition of impervious surface, the construction of shared us path vegetative filter strips will be constructed, and an Exception Request will be completed.



Printing Date: 1/8/2024 11:31:16 AM
File A:\53000s\53845\001\PW\GIS\Exhibits\RoadMap_Exhibit.mxd

The information contained in this map is offered as is with no claim or warranty as to its accuracy or completeness. The maps are for reference only and should not be considered to be of survey precision.

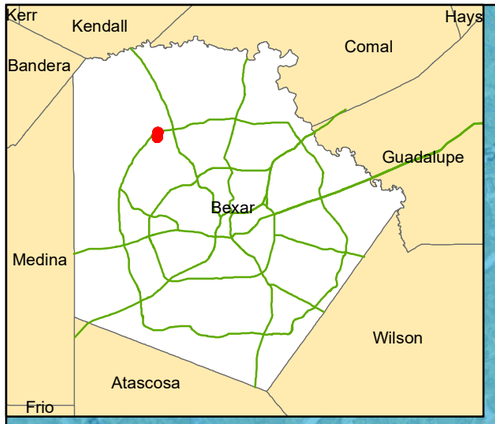
halff
100 NE Intestate 410 Loop Suite 200
San Antonio, TX 78216

N
W E
S

ATTACHMENT A: ROAD MAP

0 300 600
SCALE IN FEET

Maverick Creek Greenway
From UTSA Blvd to Loop 1604



Edwards Aquifer Recharge Zone (Blue)

Edwards Aquifer Contributing Zone within the Transition Zone (Pink)

Legend

- Project Location
- Edwards Aquifer Contributing Zone
- Edwards Aquifer Recharge Zone
- Edwards Aquifer Contributing Zone
- Edwards Aquifer Contributing Zone within the Transition Zone
- Edwards Aquifer Transition Zone
- USGS 10 ft Contour

Printing Date: 1/8/2024 11:28:11 AM
File:A:\53000s\53845\001\PW\GIS\Exhibits\EdwardsZone_Exhibit.mxd

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halff

100 NE Intestate 410 Loop Suite 200
San Antonio, TX 78216

N W E S

ATTACHMENT B: USGS/EDWARD'S AQUIFER RECHARGE ZONE MAP

0 300 600
SCALE IN FEET

Maverick Creek Greenway
From UTSA Blvd to Loop 1604

Geotechnical Engineering Study

COSA - Maverick Creek Greenway
San Antonio, Texas

Arias Job No. 2022-1354

Prepared For
T-Core Engineers, LLC.
March 12, 2023

142 Chula Vista, San Antonio, Texas 78232 • Phone: (210) 308-5884 • Fax: (210) 308-5886

March 12, 2023
Arias Job No. 2022-1354

VIA Email: jtyler@tc0re.com

Mr. Jeff Tyler, P.E, CFM,
T-Core Engineers, LLC.
118 Broadway, Suite 201
San Antonio, TX 78205

RE: Geotechnical Engineering Study
COSA – Maverick Creek Greenway
San Antonio, Texas

Dear Mr. Tyler:

This report presents the results of a Geotechnical Engineering Study for the proposed Maverick Creek Greenway Trail for the City of San Antonio in San Antonio, Texas. This study was authorized on May 15, 2023, as part of the signing of Standard Subcontract for Services Agreement between Arias and Associated, Inc. (Arias) and T-Core Engineers, LLC (T-Core).

The purpose of this geotechnical engineering study was to establish engineering properties of the subsurface soil and groundwater conditions present at the site. The scope of the study is to provide geotechnical engineering criteria for use by design engineers in preparing the foundation and pavement designs. Our findings and recommendations should be incorporated into the design and construction documents for the proposed development.

The long-term success of the project will be affected by the quality of materials used for construction and the adherence of the construction to the project plans and specifications. The quality of construction can be evaluated by implementing Quality Assurance (QA) testing. As the Geotechnical Engineer of Record (GER), we recommend that the earthwork, foundations, and pavement construction be tested and observed by Arias in accordance with the report recommendations. A summary of our qualifications to provide QA testing is discussed in the "Quality Assurance Testing" section of this report. Furthermore, a message to the Owner with regard to QA testing is provided in the GBA publication included in Appendix E.

We appreciate the opportunity to serve you during this stage of site development. If we may be of further service, please call.

Sincerely,
ARIAS & ASSOCIATES, INC. **3/12/2024**
TBPE Registration No. F-32

Sandeep K. Malla, E.I,T
Geotechnical Engineer

STATE OF TEXAS
MARK J. O'CONNOR
79252
REGISTERED
PROFESSIONAL ENGINEER

Mark J. O'Connor, P.E.
Senior Geotechnical Engineer

List of Tables

GEOTECHNICAL REPORT

PROJECT DESCRIPTION

This Geotechnical Engineering Study is for the concrete greenway trail planned along the Maverick Creek in San Antonio, Texas. The proposed trail will be constructed from UTSA Boulevard to Loop 1604 and will measure approximately 4,000 feet. The trail will branch out at two locations to connect UTSA. Additionally, three culvert crossings are proposed along the trail. This study was authorized on May 15, 2023, as part of the signing of the Standard Subcontract for Services Agreement between Arias and T-Core.

A Site Vicinity Map is provided in Appendix A as Figure 1 of this report, and a boring location map is provided as Figure 2.

SCOPE OF SERVICES

The scope of services for this Project was to:

- Perform five (5) borings to obtain soil samples for subsequent laboratory testing, as well as to characterize subsurface stratigraphic and groundwater conditions.
- perform geotechnical laboratory testing on recovered samples to evaluate engineering properties of the subgrade materials, as well as for subsurface material characterization.
- present the results of the field and laboratory test data in this report along with the requested recommendations for installation of the proposed field lighting and the trail.

Environmental studies were not a part of our scope of services, nor was the completion of local or global stability analysis of any retaining walls. However, Geologic Assessment was performed as a separate study and the report is attached to this report as Appendix E.

SOIL BORING AND LABORATORY TESTING

Boring Location and Depths

Two (2) borings were drilled within the park area as shown in Table 1 below and on the Boring Location Plan provided in Appendix A as Figure 2.

Table 1: Boring Depths and Locations

Boring No.	Latitude	Longitude	Depth, feet
B-1	29° 34’ 40.09” N	98° 37’ 52.51” W	15
B-2	29° 34’ 43.22” N	98° 37’ 50.87” W	10
B-3	29° 34’ 57.78” N	98° 37’ 52.28” W	20
B-4	29° 35’ 7.23” N	98° 37’ 48.34” W	20
B-5	29° 35’ 7.03” N	98° 37’ 46.91” W	10

The borings were sampled in accordance with ASTM D1586 procedures for Split Spoon sampling techniques as described in Appendix C. An all-terrain vehicle-mounted drill rig using air rotary technique together with the sampling tool noted was used to secure the subsurface soil samples. Photographs are included in Appendix A, as Figure 4.

Soil classifications and borehole logging were conducted during the exploration by our engineering technician working under the supervision of the Project Geotechnical Engineer. Final soil classifications, as seen on the boring logs included in Appendix B, were determined by the Senior Geotechnical Engineer based on laboratory and field test results and applicable ASTM procedures. A key to the terms and symbols used on the boring logs is also included in Appendix B.

Laboratory Tests

As a supplement to the field exploration, laboratory testing was performed to determine water content, Atterberg Limits, percent passing the US Standard No. 200 sieve, and unconfined compressive strength of soils.

The laboratory testing for this project was performed in accordance with applicable ASTM procedures with the specifications and definitions for these tests listed in Appendix C. Remaining samples recovered from this exploration will be routinely discarded following submittal of this report. Results of the laboratory testing are depicted on the logs in Appendix B.

SUBSURFACE CONDITIONS

Generalized stratigraphy and groundwater conditions are discussed in the following sections. The subsurface and groundwater conditions are based on observations at the boring locations to the depths explored during our field operations.

Soil conditions may vary between the sample boring locations. Transition boundaries, or contacts, noted on the boring logs to separate soil types, are approximate. Actual contacts may be gradual and vary at different locations. If conditions encountered during construction indicate more variation than established as a result of this study, we should be contacted to evaluate the significance of the changed conditions relative to our recommendations.

Geology

The earth materials underlying the project site have been regionally mapped as Edwards Limestone (Ked). Edwards Limestone (Ked) is Cretaceous age limestone consisting of relatively soft to extremely hard limestone, dolomitic limestone, and dolomite. The limestone is typically described as vuggy, honeycombed, and porous, having solution cavities and voids (karst), as well as nodules and lenticular layers of very hard chert. The voids are often infilled with red clay and brecciated limestone. The dolomite and dolomitic limestone of the Edwards are typically softer

and when exposed to weathering, may take on a soil-like consistency. Surficial weathered remnants of the parent limestone consist of clayey soils with various amounts of sand and limestone fragment content.

Site Conditions

Detailed laboratory and stratigraphy summaries for the Borings are presented in Table 2.

Table 2: Generalized Subsurface Conditions

Depth (ft.)	Material Description	PI Range	- 200 Range	N Range
0 – 2 to 3	Dark Brown, **Clayey Sand with Gravel (SC)**, **CLAYEY GRAVEL with Sand (GC)**, dense to very dense; Dark Brown, **Gravelly *Lean Clay with Sand (CL),*** very hard	15 - 24	17 - 51	45 – 50/4”
2 to 3 – 3 to 13	Tan, **Weathered Limestone** highly weathered	--	66	27 - **50/6”
3 to 13 – 10 to 20	Tan, **Limestone, moderately** weathered	--	--	**50/2” - **50/0”

Where: Pi: Plasticity Index
- 200: Percent passing #200 sieve, %
N: Standard Penetration Test (SPT) value, blows per foot
PP: Pocket Penetrometer, tsf
** : Blows during seating penetration
^: Only test in stratum
-- : Not applicable

Groundwater

A dry soil sampling method was used to obtain the soil samples at the project site. Groundwater was not encountered during our field exploration on August 17, 2023. The open boreholes were backfilled using mixture of bentonite and soil cuttings generated from the drilling process.

Groundwater levels will often change significantly over time and should be verified immediately prior to construction. Water levels in open boreholes may require several hours to several days to stabilize depending on the permeability of the soils. Groundwater levels at this site may differ during construction because fluctuations in groundwater levels can result from seasonal conditions, rainfall, drought, or temperature effects. Pockets or seams of gravels, sands, silts or open fractures and joints can store and transmit “perched” groundwater flow or seepage. Should dewatering become necessary, it is considered means and methods and is solely the responsibility of the contractor.

MOISTURE VARIATIONS AND ESTIMATED MOVEMENT

The native soils have moderate to high expansion (shrink/swell) characteristics. Expansive clays shrink when they lose water and swell or grow in volume when they gain water. The potential of expansive clays to shrink and swell is typically related to the Plasticity Index (PI). Clays with a higher PI generally have a greater potential for soil volume changes due to moisture content variations. Change in soil moisture is a highly important factor affecting the shrinking and swelling of clays. More pronounced movements are commonly observed when soils are exposed to extreme moisture fluctuations that occur between drought conditions and wet seasons.

We estimated potential vertical movement for this site using the Tex-124-E method outlined by the Texas Department of Transportation (TxDOT). The Tex-124-E method provides an estimate of potential vertical rise (PVR) using the liquid limits, plasticity indices, and existing water contents for soils. The PVR is estimated in the seasonally active zone, which was estimated at a 15-foot depth for this site. Based on this method, we estimate that the PVR is 1 **inch *or less*** at this site for the existing conditions.

Estimated PVRs are based upon assumed changes in soil moisture content from a dry to a wet condition; however, soil movements in the field depend on the actual changes in moisture content. Thus, actual soil movements could be less than that calculated if little soil moisture variations occur or the actual movement could exceed the estimated values if actual soil moisture content changes exceed the wet limits outlined by the PVR method. Such moisture conditions that exceed the limits of the PVR method may be the result of extended droughts, flooding, perched groundwater infiltration, poor surface drainage, and/or leaking irrigation or plumbing lines.

DESIGN RECOMMENDATIONS

IBC Site Classification and Seismic Design Coefficients

Section 1613 of the International Building Code (2021) requires that every structure be designed and constructed to resist the effects of earthquake motions, with the seismic design category to be determined in accordance with Section 1613 or ASCE 7. Site classification according to the International Building Code (2021) is based on the soil profile encountered to the 100-foot depth. The stratigraphy at the site location was explored to a maximum 25-foot depth.

Soils having similar consistency were extrapolated to be present between the 25 and 100-foot depths. On the basis of the site class definitions included in the 2021 Code and the encountered generalized stratigraphy, we characterize the site as Site Class C.

Seismic design coefficients were determined using the on-line software. Analyses were performed considering the 2021 International Building Code. Input included GPS coordinates and Site Class C. Seismic design parameters for the site are summarized in Table 3.

Table 3: Seismic Design Parameters

Site Class	F_a	F_v	S_s	S_1
C	1.30	1.50	0.049g	0.023g

Where: Fa = Site coefficient
Fv = Site coefficient
Ss = Mapped spectral response acceleration for short periods
S_1 = Mapped spectral response acceleration for a 1-second period

TRAIL DESIGN CONSIDERATIONS

We understand that the proposed trails and pathways will be limited to pedestrian and bicycle traffic. We anticipate that maintenance and light-duty service vehicles may be required to use new trails. The current plan is to use rigid concrete for the trail design. However, we have provided both rigid and flexible options for the trail design so that the design team can use the flexible pavement section if deemed necessary.

Moisture Fluctuations Beneath Pavements

Dependent upon the pavement/pathway width, it is common for subsurface moisture content values to remain more constant beneath the middle of the structure. The moisture levels in the subgrade soils located near the edge of structure are more susceptible to changes in moisture that occur due to natural seasonal moisture fluctuations. The edges will dry and shrink during drought conditions, relative to the center of the structure. During wet climate periods, the edges will swell relative to the center of the structure. The shrinking and swelling of subgrade soils near the edge of pavements will result in longitudinal, surface cracking that occurs parallel to the structure. To help reduce the chances for moisture content variations of the subgrade soils, curbs should be extended a minimum of 6 inches to penetrate native soils to reduce lateral seepage behind the curbs into the base materials.

Landscaping along the pavement/pathway will increase the potential for moisture fluctuations along the pavement edges. Careful consideration should be provided by the designers to provide positive drainage away from adjoining landscapes. Ponding of water should not be allowed either on or near the edges of the planned pavements. Backfill behind curbs should consist of compacted, low-permeability clay. The use of landscape mulch or topsoil could provide an easy avenue for surface water to infiltrate behind and beneath curbs. This infiltration could adversely impact curb and pavement performance.

Trail Pavement Recommendations

Based on the results of the field exploration and the laboratory testing, the subgrade within the alignment of the proposed pathway/pavement may consist of clayey sand (SC), clayey gravel (GC), and gravelly lean clay (CL), with varying amounts of clay, sand and gravel on each. The design of the trail sections should adequately handle the anticipated pedestrian and light-duty

traffic use. The pavement recommendations were prepared in accordance with the 1993 AASHTO Guide for the Design of Pavement Structures for asphalt and the ACI Design Guide for Design and Construction of Concrete Parking Lots for concrete. The following design parameters and assumptions were used in our analysis:

Table 4: Pavement Design Assumptions

Pavement Type	(1) Concrete-Paved Hike and Bike Trail (preferred) (2) Asphalt-Paved Hike and Bike Trail (optional)
Traffic Load for Light-Duty Pavement	15,000 equivalent single axle loads (ESALs)
Concrete Compressive Strength	3,000 psi
Raw Subgrade California Bearing Ratio (CBR)	3 for compacted soil subgrade
Raw Subgrade Modulus of Subgrade Reaction, k in pci	100 for compacted soil subgrade and Weathered Rock Subgrade

Based on our experience with similar projects constructed on similar soils and our design assumptions, we recommend the following minimum thickness values be used to construct the planned trails.

Table 5: Recommended Pavement Sections for Trails

Layer	Material	Flexible Asphaltic Concrete	Rigid Concrete
Surface	HMAC/PCC	2”	5”
Base	Flexible Base	6”	--
Subgrade	Moisture Conditioned	6”	6”

Rigid Concrete Pavement Joints

Placement of expansion joints in concrete paving on potentially expansive subgrade or on granular subgrade subject to piping often results in horizontal and vertical movement at the joint. Many times, concrete spalls adjacent to the joint and eventually a failed concrete area results. This problem is primarily related to water infiltration through the joint.

One method to mitigate the problem of water infiltration through the joints is to eliminate all expansion joints that are not absolutely necessary. It is our opinion that expansion or isolation

joints are needed only adjacent to where the pavement abuts intersecting drive lanes and other structures. Elimination of all expansion joints within the main body of the pavement area would significantly reduce access of moisture into the subgrade. Regardless of the type of expansion joint sealant used, eventually openings in the sealant occur resulting in water infiltration into the subgrade.

The use of sawed and sealed joints should be designed in accordance with current Portland Cement Association (PCA) or American Concrete Institute (ACI) guidelines. Research has proven that joint design and layout can have a significant effect on the overall performance of concrete pavement.

Recommendations presented herein are based on the use of reinforced concrete pavement. Local experience has shown that the use of distributed steel placed at a distance of 1/3 slab thickness from the top is of benefit in crack control for concrete pavements. Improved crack control also reduces the potential for water infiltration. It is recommended that the pavement be reinforced with #4 bars at 18 inches on center, each way. The dowels should be 12 inches long at 12 inches on center and lubricated on both sides, with 6” of embedment.

The use of a perimeter turned down beam should also be strongly considered for the rigid concrete section.

Performance Considerations

Some shrink/swell movements due to moisture variations in the underlying soils should be anticipated over the life of the trails. The shrinking and swelling of the soils will provide movements in subgrade soils beneath the new trails. The relatively narrow width of the paths will make an asphalt section highly susceptible to shrink/swell movements. Longitudinal cracking along the pavement edges of asphalt trails will likely occur within a few years of construction due to seasonal moisture fluctuations. If the owner selects to use an asphalt surfaced trail, the owner should understand that the site pavements will likely crack due to the shrinking and swelling of the subgrade soils.

Although the initial construction cost of concrete paths will be somewhat higher than an asphalt-surfaced trail, the long-term performance of concrete will require less maintenance and up-keep when compared to an asphalt surface. Perimeter turn-down beams should also be considered to protect against erosion and scour at locations that will be prone to flooding.

The owner should recognize that over a period of time, pavements may crack and undergo some deterioration and loss of serviceability. As a result, some maintenance should be planned over the life of the pavement.

Pavement Subgrade and Section Materials

Recommendations for subgrade preparation in the planned pavement areas are summarized in Table 6.

Table 6: Pavement Subgrade and Section Materials

Stripping Depth	6 inches or as needed to remove roots and organics
Reuse Excavated Soils	Provided they are free of roots and debris and meet the general fill material requirements.
Undercut Extent	2 feet beyond the paving limits
Exposed Subgrade Treatment	Proof roll with rubber tired vehicle weighting at least 15 tons such as a loaded dump truck with Geotechnical Engineer's representative present during proof rolling
Pumping/Rutting Areas Discovered During Proofrolling	Remove to firmer materials and replace with compacted general or select fill under direction of geotechnical engineer representative
General Fill Type	On-site material free of roots, debris and other deleterious material with a maximum particle size of 4 inches
Maximum General Fill Loose Lift Thickness	9 inches
Flexible Base Material Type	TxDOT Item 247, Type A, Grade 1 or 2
Maximum Flexible Base Loose Lift Thickness	9 inches
Hot Mix Asphaltic Concrete (HMAC) Type	TxDOT Standard Specifications Item 340, Type D
Portland cement concrete (PCC)	28-day compressive strength of 3,000 psi; 4 to 6-inch slump

To prevent degradation of the prepared subgrade and base material, paving preferably should be placed within 14 days. If pavement placement is delayed, protection of the base surface with an emulsion-based sealer should be considered. Alternately, the paving section could be slightly overbuilt so blading performed to remove distressed sections does not reduce the base thickness.

We understand that a planned parking lot at the Mission Road trailhead will be provided as part of a separate project. Therefore, it was not part of our scope of services to provide pavement recommendations for said planned parking lot.

BOX CULVERT STRUCTURES

Three low water crossing structures, culverts, are planned along the trail. **Shallow bedrock was encountered throughout the site. Rock excavation techniques and methods will be required during the construction of the culvert structures. It is our opinion that the weathered rock may be excavated using the ripping buckets mounted on heavy machinery and competent limestone may require chipping and milling.**

Allowable Bearing Pressure

The detailed information regarding the culverts was not available at the time of the preparation of this report. Additionally, the bearing depths of the culverts are not known; however, we anticipate that the culvert will bear at the depth of at least 5 feet below the existing grade.

The net allowable bearing pressure of 4,000 psf can be utilized for the design of the box culvert over the weathered rock.

Earthwork, Bedding, and Compaction Requirements

The base of the foundations should be free of clay seams. The clay seams should be replaced with properly compacted select structural fill.

Fill placed over the bedding/seal slab should consist of select structural fill that meets the material requirements of TxDOT Item 247, Type A, Grade 1 or 2. The base material should be placed in maximum 9-inch loose lifts, moisture conditioned to between -2 to +3 percent of optimum moisture, and compacted to at least 95 percent of the maximum dry density.

Soil backfill above the concrete box culverts should consist of Select Fill material meeting the following criteria: (1) free and clean of organic or other deleterious material (e.g., debris, trash, etc.), (2) have a liquid limit (LL) ≤ 40, (3) plasticity index (PI) ≤ 20, (3) ≥ 50 percent passing the No. 200 sieve, and (4) not contain particles exceeding 3 inches in maximum dimension.

Select Fill should be placed in lifts not to exceed 8 inches in loose measure, moisture conditioned to between -1 and +3 percentage points of optimum moisture content, and then compacted to at least 98 percent of the standard proctor density as per Table 9.

Backfill directly behind the box culvert walls should consist of well graded, free draining, gravel. A minimum of 12 inches of this material should surround the sides of the boxes. A minimum of 6 inches of clean gravel or lean concrete should be placed beneath the boxes as previously discussed. We recommend that all of this backfill material consist of 1-inch clean TxDOT concrete gravel Grade #5 (ASTM C-33 #67).

To help prevent the migration of finer grained soils into the voids of the open-graded backfill, geotextile filter fabric (TxDOT DMS-6200 Type 1 or approved equivalent) should be used to separate the gravel from the adjacent soil. Migration of soil fines into clean trench backfill can

lead to ground subsidence (trench settlement), pavement distress, and/or the potential development of voids. Plate or vibratory compaction methods should be performed in maximum 1-foot lifts. Hand operated type compaction equipment should be utilized within 3 feet of the box culvert walls. A representative of Arias should observe the backfill and compaction processes.

Only light-weight hand operated compaction equipment should be used within 3 feet of the concrete box walls, and a representative of Arias should observe the bedding and backfill placement and compaction operations.

Lateral Pressures and Buoyancy Considerations

Lateral pressures that may act on the box culvert walls can be evaluated by using the equivalent fluid density values provided subsequently in Table 7 for the select backfill. The equivalent fluid density values are based on "at-rest" earth pressure conditions (i.e. assumes the rigid walls are restricted from moving).

Table 7: Lateral At-Rest Pressures for Box Culvert Walls

Backfill Type	Estimated Total Soil Unit Weight, (pcf)	Effective Soil Unit Weight, (pcf)	At-Rest Earth Pressure Coefficient, (k_o)	Equivalent Fluid Density (EFD)	
				Dry Condition, (pcf)	Submerged Condition, (pcf)
Clean Gravel	105	43	0.40	42	80
TxDOT Item 247, Type A, Grade 1 or 2	142	80	0.39	56	94
Select Fill	125	63	0.55	69	97
Native Soil	125	63	0.5	63	94
Weathered Limestone/Limestone	135	73	0.43	58	94

Notes:

1. The equivalent fluid unit density (EFD) values are for triangular distribution of lateral earth pressures on the wall.
2. We do not recommend expansive soils (e.g., fat clay) with liquid limit (LL) and plasticity index (PI) values greater than 40 and 20, respectively, be used as backfill, or be situated immediately behind the walls. Expansive soils located immediately behind the walls will not provide good wall drainage and may exert excessive lateral earth pressures due to swelling.
3. The equivalent fluid density values given above are based on the backfill being placed between the box culvert wall and a plane extending upward and outward from the bottom of the culvert wall at a 45-degree angle or flatter from the horizontal. If less backfill is placed

(i.e. plane more than 45 degrees), the equivalent fluid density used in design should correspond to the appropriate in situ material such as the clayey sand and silty sand noted above.

The “EFD - submerged condition” values in Table 7 should be used if there is a chance for hydrostatic forces to develop; otherwise, the “EFD – dry condition values” can be used. However, we highly recommend that a wall drainage system (e.g. wall drain within free-draining backfill that is wrapped in filter fabric) be designed to prevent hydrostatic conditions from developing behind the culvert wall. If free-draining backfill is provided behind the wall, we recommend that a positive slope grade coupled with concrete surface paving, or the use of a clay cap, be provided to help reduce the chances for surface water infiltration behind the wall. Furthermore, backflow prevention should be provided for any weep holes if there is a chance that the weep holes could be inundated during flooding.

Surcharge loads including equipment loads, traffic, and soil stockpiles should also be considered in the analysis of culverts walls. The lateral pressures due to surcharge loading, which act as uniform pressures on the walls, should be calculated by multiplying the surcharge pressure by the applicable lateral earth pressure coefficients given previously in Table 7.

Measures should be taken to design against buoyancy forces. One way is to provide effective drainage along the walls and under the slab such that the water level in the backfill and bedding material corresponds to the receding floodwater level. Another method involves providing sufficient weight to resist buoyancy forces. The weight could include the structure, backfill over the structure, and/or backfill over slab extensions beyond the walls. The following design measures can be considered to reduce the risk of water entering backfill or becoming trapped under the box culvert:

- A clay cap should be installed over the granular backfill at grade to reduce surface water infiltration.
- Concrete riprap aprons can be placed upstream and downstream of the box culvert, and “turn-down” reinforced concrete beams can be constructed to depths of at least 24 inches at the toes of the concrete aprons if soil is encountered. The concrete beams and aprons are expected to be cast monolithically, so that there are no joints that water could possibly migrate through.
- Stone riprap, or other designed energy dissipater, can be placed upstream of the concrete apron to reduce flow velocities.

Depending on seasonal weather conditions, the excavations provided to install the planned box culverts could possibly encounter groundwater. If groundwater is encountered during construction, depending on the volume, conventional sump and pumping methods may be an effective means to temporarily dewater the base of the excavation to remain sufficiently dry to allow for concrete placement. The dewatering requirements will depend upon the site conditions at the time of construction. Groundwater control and dewatering techniques are considered construction means and methods to accomplish the work, and thus, are the sole responsibility of the Contractor.

Retaining Wall Recommendations

Based on the information provided by T-Core, retaining walls are planned to facilitate the grade change of the trail; however, the detailed information was not available to Arias at the time of this report. Additionally, the global stability analysis of the wall is not included in this scope of work.

The lateral earth pressures presented in Table 7 and recommendations presented in Section "**Lateral Earth Pressure and Buoyancy Considerations**" can be utilized for the design of the retaining wall.

CONSTRUCTION CRITERIA

Site Preparation

Strip away any surficial material, topsoil, grass, organics, soft or wet materials, and deleterious debris as needed and dispose outside of the trail pavement areas. Undercut to the required depth and extent as noted in the main report. Additional excavation may also be necessary due to encountering deleterious materials such as buried debris and/or rubble, or undesirable soft and wet subgrade conditions and/or existing fill materials. The site representative of the geotechnical engineer should observe undercutting operations. Unless passing density reports are provided for a specific area, existing fill soils found during the excavation should be considered as uncertified and removed to suitable natural soils.

After the surface materials are removed, the exposed subgrade surface should be proof rolled with a heavily loaded dump truck weighing at least 20 tons. Any areas which excessively yield or pump under the wheel loading should be undercut to the depth specified by the geotechnical engineer's representative and replaced with compacted select fill to existing grade as specified. The voids in undercut areas can be backfilled and compacted with on-site general fill materials.

Table 8: Site Work (Non-Structural/General Fill) Requirements

Stripping Depth	6-inch minimum or as needed to remove any existing asphalt, concrete, and vegetation
Non-Structural/General Fill Type	On-site material free of roots, debris and other deleterious material with a maximum particle size of 4 inches
Maximum Non-Structural/General Fill Loose Lift Thickness	9 inches

The backfill should be placed and compacted in accordance with Table 9.

Table 9: Project Compaction, Moisture and Testing Requirements

Material	Percent Compaction	Optimum Moisture Content	Testing Requirement
	According to Standard Proctor ASTM D 698		
Scarified Subgrade Soil	95% to 100%	0% to +4%	1 per 2,500 SF; min. 3 tests
Select Fill (LL<=40 & PI<=20) (Pit Run Select Fill Body; Crushed Limestone Base Cap)	≥ 98%	-1 to +3%	1 per 2,500 SF; min. 3 tests per lift
Scarified, Moisture Conditioned On-site Soil (Subgrade)	≥ 95%	0 to +4%	1 per 2,500 SF; min. 3 tests
General Fill (Onsite Material)	≥ 95%	0 to +4%	1 per 2,500 SF; min. 3 tests per lift

At least one (1) density test should be conducted per 2,500 square feet of building pad per lift of prepared fill and subgrade or a minimum of three (3) density tests should be taken per lift within the building pad area.

Drainage

Good positive drainage during and after construction is very important to reduce expansive soil volume changes that can detrimentally affect the performance of the planned development. Proper attention to surface and subsurface drainage details during the design and construction phase of development can aid in preventing many potential soil shrink-swell related problems during and following the completion of the project.

GENERAL COMMENTS

This report was prepared as an instrument of service for this project exclusively for the use of T-Core Engineers and the project design team. If the development plans change relative to layout, anticipated traffic loads, or if different subsurface conditions are encountered during construction, we should be informed and retained to ascertain the impact of these changes on our recommendations. We cannot be responsible for the potential impact of these changes if we are not informed.

Design Review

Arias should be given the opportunity to review the design and construction documents. The purpose of this review is to check to see if our recommendations are properly interpreted into the

project plans and specifications. Please note that design review was not included in the authorized scope and additional fees may apply.

Subsurface Variations

Soil and groundwater conditions may vary away from the sample boring locations. Transition boundaries or contacts, noted on the boring logs to separate soil types, are approximate. Actual contacts may be gradual and vary at different locations. The contractor should verify that similar conditions exist throughout the proposed area of excavation. If different subsurface conditions or highly variable subsurface conditions are encountered during construction, we should be contacted to evaluate the significance of the changed conditions relative to our recommendations.

Quality Assurance Testing

The long-term success of the project will be affected by the quality of materials used for construction and the adherence of the construction to the project plans and specifications. As Geotechnical Engineer of Record (GER), we should be engaged by the Owner to provide Quality Assurance (QA) testing. Our services will be to evaluate the degree to which constructors are achieving the specified conditions they're contractually obligated to achieve and observe that the encountered materials during earthwork for foundation and pavement installation are consistent with those encountered during this study. In the event that Arias is not retained to provide QA testing, we should be immediately contacted if differing subsurface conditions are encountered during construction. Differing materials may require modification to the recommendations that we provided herein. A message to the Owner with regard to the project QA is provided in the GBA publication included in Appendix E.

Arias has an established in-house laboratory that meets the standards of the American Standard Testing Materials (ASTM) specifications of ASTM E-329 defining requirements for Inspection and Testing Agencies for soil, concrete, steel and bituminous materials as used in construction. We maintain soils, concrete, asphalt, and aggregate testing equipment to provide the testing needs required by the project specifications. All of our equipment is calibrated by an independent testing agency in accordance with the National Bureau of Standards. In addition, Arias is accredited by the American Association of State Highway & Transportation Officials (AASHTO), the United States Army Corps of Engineers (USACE) and the Texas Department of Transportation (TxDOT), and also maintains AASHTO Materials Reference Laboratory (AMRL) and Cement and Concrete Reference Laboratory (CCRL) proficiency sampling, assessments and inspections.

Furthermore, Arias employs a technical staff certified through the following agencies: the National Institute for Certification in Engineering Technologies (NICET), the American Concrete Institute (ACI), the American Welding Society (AWS), the Precast/Prestressed Concrete Institute (PCI), the Mine & Safety Health Administration (MSHA), the Texas Asphalt Pavement Association (TXAPA) and the Texas Board of Professional Engineers (TBPE). Our services are conducted under the guidance and direction of a Professional Engineer (P.E.) licensed to work in the State of Texas, as required by law.

Standard of Care

Subject to the limitations inherent in the agreed scope of services as to the degree of care and amount of time and expenses to be incurred, and subject to any other limitations contained in the agreement for this work, Arias has performed its services consistent with that level of care and skill ordinarily exercised by other professional engineers practicing in the same locale and under similar circumstances at the time the services were performed.

Information about this geotechnical report is provided in the GBA publication included in Appendix E.

APPENDIX A: FIGURES

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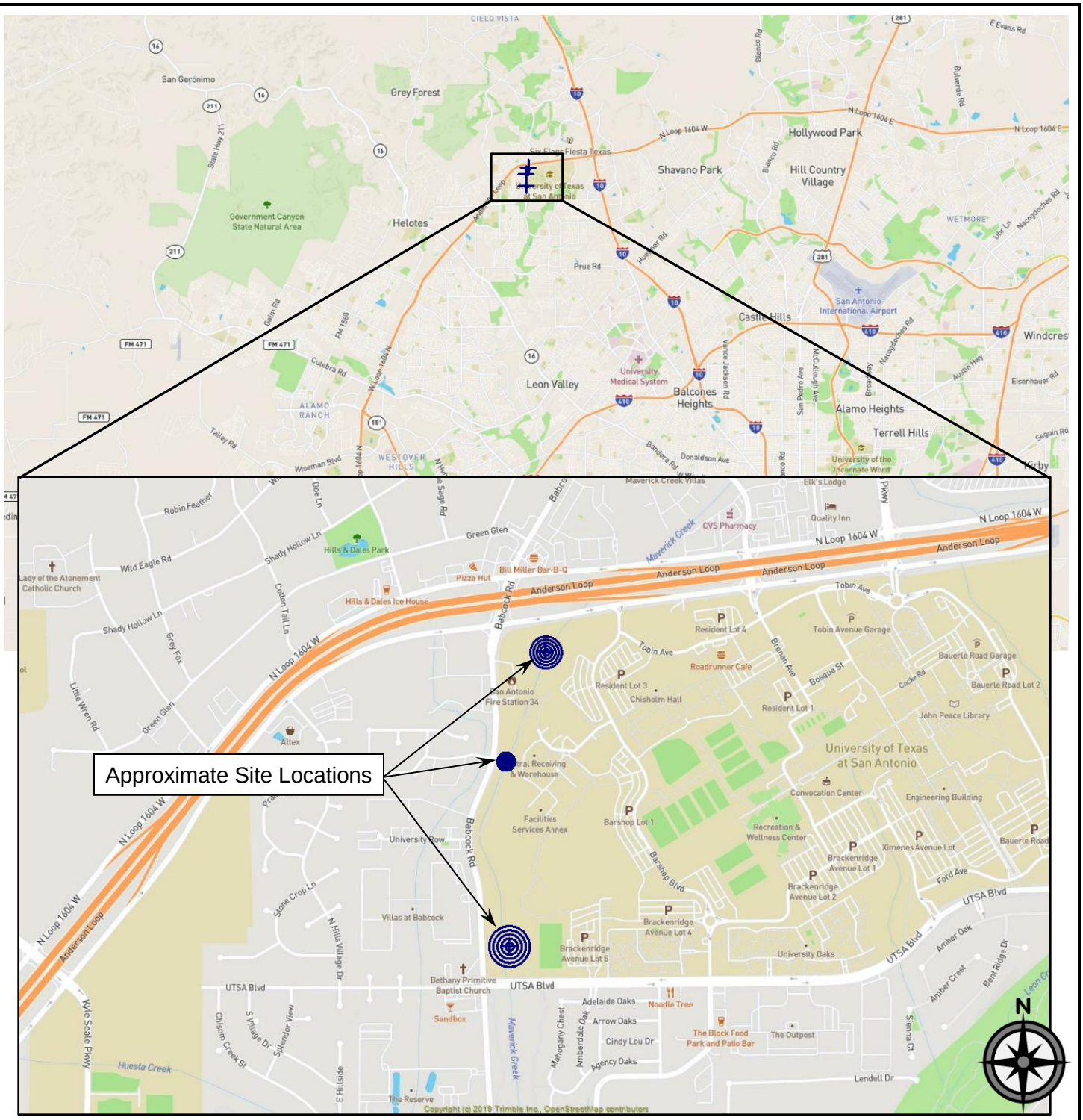

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VICINITY MAP

Maverick Creek Greenway
Babcock Rd and N Loop 1604
San Antonio, Texas

Date: March 12, 2024	Job No.: 2022-1354
Drawn By: MEB	Checked By: SKM
Approved By: SKM	Scale: N.T.S.

Figure 1

DISCLAIMER: This drawing is for illustration only and should not be used for design or construction purposes. All locations are approximate.

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BORING LOCATION PLAN

Maverick Creek Greenway
Babcock Dr and N Loop 1604
San Antonio, Texas

Date: March 12, 2024	Job No.: 2022-1354
Drawn By: MEB	Checked By: SKM
Approved By: SKM	Scale: N.T.S.

REVISIONS:

No.:	Date:	Description:

Figure 2

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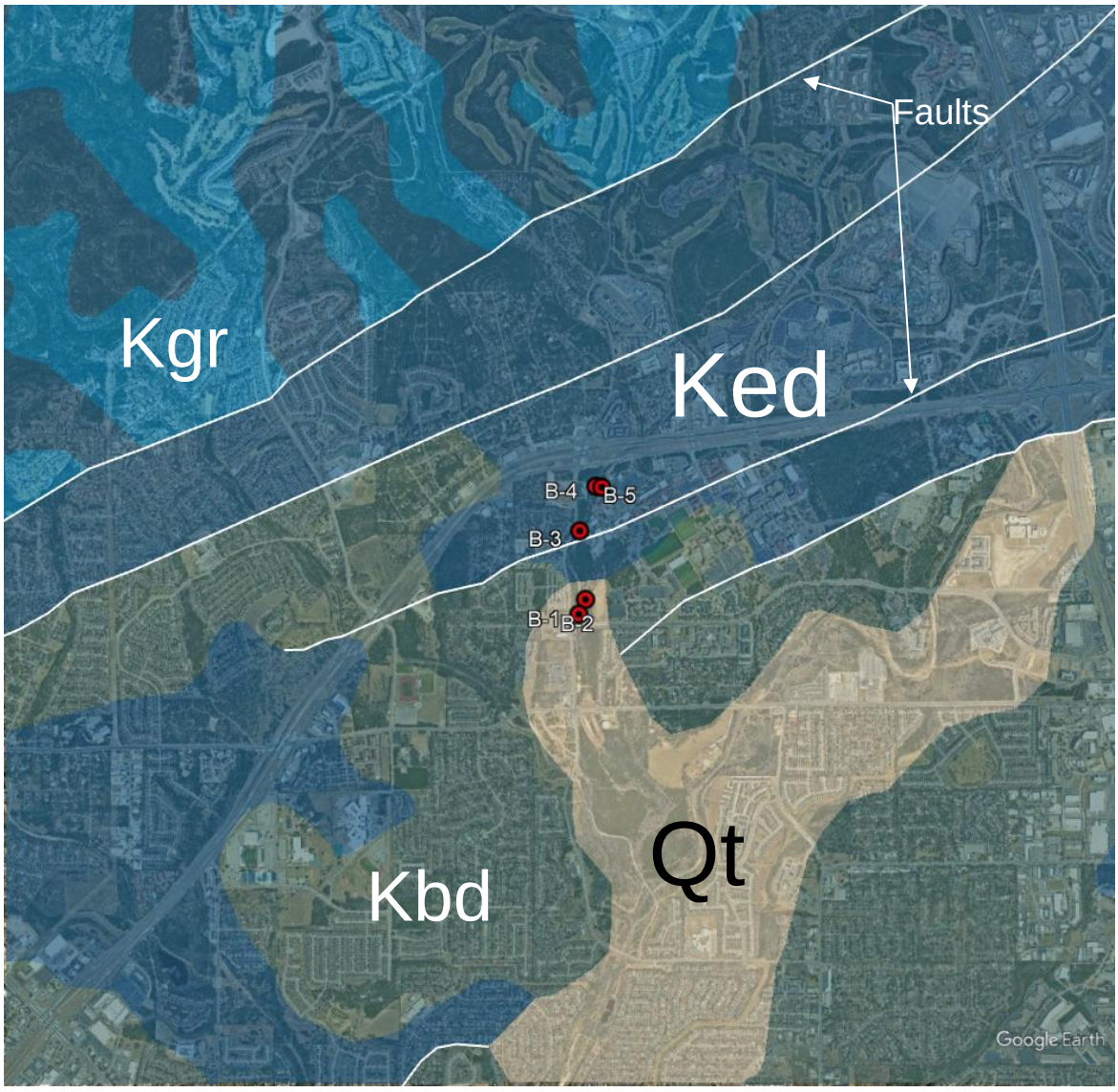

LEGEND

Symbol	Name	Age
Qt	Fluviatile Terrace Deposits	Quaternary Period / Holocene
Ked	Edwards Limestone	Cretaceous Period / Early
Kdb	Buda Limestone & Del Rio Clay undivided	Cretaceous Period / Late
Kgr	Glen Rose Limestone	Cretaceous Period / Early

N

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GEOLOGIC MAP

Maverick Creek Greenway
Babcock Dr and N Loop 1604
San Antonio, Texas

Date: March 12, 2024	Job No.: 2022-1354
Drawn By: MEB	Checked By: SKM
Approved By: SKM	Scale: N.T.S.

Figure 3

DISCLAIMER: This drawing is for illustration only and should not be used for design or construction purposes. All locations are approximate.

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Photo 1 – View looking at site for boring B-1

Photo 2 – View looking near site for boring B-3

Photo 3 – View looking at site for boring B-5

Photo 4 – View looking at creek bed

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SITE PHOTOS

Maverick Creek Greenway
Babcock Rd and N Loop 1604
San Antonio, Texas

Date: March 12, 2024	Job No.: 2022-1354
Drawn By: MEB	Checked By: SKM
Approved By: SKM	Scale: N.T.S.

Appendix A

DISCLAIMER: This drawing is for illustration only and should not be used for design or construction purposes. All locations are approximate.

APPENDIX B: BORING LOGS AND KEY TO THE TERMS

Boring Log No. B-1

Project: **Maverick Creek Greenway**
Babcock Rd and N Loop 1604
San Antonio, Texas

Location: See Boring Location Plan

Sampling Date: 8/17/23

Coordinates: N29°34'40.09" W98°37'52.51"

Backfill: Cuttings

Soil Description	Depth (ft)	SN	WC	PL	LL	PI	N	-200
CLAYEY SAND with Gravel (SC), dense to very dense, dark brown, with limestone materials		SS	5	17	39	22	45	36
		SS	1				58/11"	
Weathered LIMESTONE, tan, highly weathered, very weak rock, with clay seams	5	SS	3				27	
		SS	4				**50/2"	
		SS	6				50/4"	
	10	GB						
LIMESTONE, tan, moderately weathered, moderately strong rock, with clay seams		SS	7				**50/1"	
	15							
Borehole terminated at 15 feet								

Groundwater Data:
During drilling: Not encountered

Field Drilling Data:
Coordinates: Hand-held GPS Unit
Logged By: L. Arizola
Driller: Terra Power Drilling
Equipment: Truck-mounted drill rig

Air rotary: 0 - 15 ft

Nomenclature Used on Boring Log

Split Spoon (SS)
Grab Sample (GB)

WC = Water Content (%)
PL = Plastic Limit
LL = Liquid Limit
PI = Plasticity Index
N = SPT Blow Count

** = Blow Counts During Seating Penetration
-200 = % Passing #200 Sieve

GINT.GPJ 9/8/23 (BORING LOG SA13-02.ARIASSA13-02.GDT.ARIAS-ARWA LIBRARY.GLB)

Arias and Associates, Inc.

Job No.: 202-1354

Boring Log No. B-2

Project: **Maverick Creek Greenway**
Babcock Rd and N Loop 1604
San Antonio, Texas

Location: See Boring Location Plan

Sampling Date: 8/17/23

Coordinates: N29°34'43.22" W98°37'50.87"

Backfill: Cuttings

Soil Description	Depth (ft)		SN	WC	PL	LL	PI	N	-200
CLAYEY GRAVEL with Sand (GC), very dense, dark brown, with limestone material			SS	3	16	36	20	**50/5"	30
Weathered LIMESTONE, tan, highly weathered, very weak rock, with clay seams			SS	2				**50/2"	
LIMESTONE, tan, moderately weathered, moderately strong rock, with clay seams			SS	2				**50/2"	
	5		SS	2				**50/2"	
			SS	6				**50/2"	
	10								
Borehole terminated at 10 feet									

Groundwater Data:
During drilling: Not encountered

Field Drilling Data:
Coordinates: Hand-held GPS Unit
Logged By: L. Arizola
Driller: Terra Power Drilling
Equipment: Truck-mounted drill rig

Air rotary: 0 - 10 ft

Nomenclature Used on Boring Log

Split Spoon (SS)

WC = Water Content (%)
PL = Plastic Limit
LL = Liquid Limit
PI = Plasticity Index
N = SPT Blow Count

** = Blow Counts During Seating Penetration
-200 = % Passing #200 Sieve

GINT.GPJ 9/8/23 (BORING LOG SA13-02.ARIASSA13-02.GDT.ARIAS-ARWA LIBRARY.GLB)

Arias and Associates, Inc.

Job No.: 202-1354

Boring Log No. B-3

Project: **Maverick Creek Greenway**
Babcock Rd and N Loop 1604
San Antonio, Texas

Location: See Boring Location Plan

Sampling Date: 8/17/23

Coordinates: N29°34'57.78" W98°37'52.28"

Backfill: Cuttings

Soil Description	Depth (ft)	SN	WC	PL	LL	PI	N	-200
CLAYEY GRAVEL with Sand (GC), dense, dark brown, with limestone material		SS	4	15	30	15	46	17
Weathered LIMESTONE, tan, highly weathered, very weak rock, with clay seams		SS	1				50	
	5	SS	1				31	
		SS	1				**50/2"	
LIMESTONE, tan, moderately weathered, moderately strong rock, with clay seams		SS	4				**50/2"	
	10	SS	3				**50/1"	
		SS	4				**50/2"	
	15							
		SS	4				**50/1"	
	20							
Borehole terminated at 20 feet								

Groundwater Data:
During drilling: Not encountered

Field Drilling Data:
Coordinates: Hand-held GPS Unit
Logged By: L. Arizola
Driller: Terra Power Drilling
Equipment: Truck-mounted drill rig

Air rotary: 0 - 20 ft

Nomenclature Used on Boring Log

Split Spoon (SS)

WC = Water Content (%)
PL = Plastic Limit
LL = Liquid Limit
PI = Plasticity Index
N = SPT Blow Count

** = Blow Counts During Seating Penetration
-200 = % Passing #200 Sieve

GINT.GPJ 9/8/23 (BORING LOG SA13-02.ARIASSA13-02.GDT.ARIAS-ARWA LIBRARY.GLB)

Arias and Associates, Inc.

Job No.: 202-1354

Boring Log No. B-4

Project: **Maverick Creek Greenway**
Babcock Rd and N Loop 1604
San Antonio, Texas

Location: See Boring Location Plan

Sampling Date: 8/17/23

Coordinates: N29°35'7.23" W98°37'48.34"

Backfill: Cuttings

Soil Description	Depth (ft)	SN	WC	PL	LL	PI	N	-200
GRAVELLY LEAN CLAY with Sand (CL), very hard, dark brown, with limestone gravel		SS	4	19	41	22	50/4"	51
Weathered LIMESTONE, tan, highly weathered, very weak rock, with clay seams		SS	1				**50/6"	
		SS	1				**50/2"	
	5							
LIMESTONE, tan, moderately weathered, moderately strong rock, with clay seams		SS	1				**50/2"	
		SS	2				**50/2"	
	10	SS	2				**50/2"	
		SS	2				**50/1"	
	15							
		SS	1				**50/1"	
	20							
Borehole terminated at 20 feet								

Groundwater Data:
During drilling: Not encountered

Field Drilling Data:
Coordinates: Hand-held GPS Unit
Logged By: L. Arizola
Driller: Terra Power Drilling
Equipment: Truck-mounted drill rig

Air rotary: 0 - 20 ft

Nomenclature Used on Boring Log

Split Spoon (SS)

WC = Water Content (%)
PL = Plastic Limit
LL = Liquid Limit
PI = Plasticity Index
N = SPT Blow Count

** = Blow Counts During Seating Penetration
-200 = % Passing #200 Sieve

GINT.GPJ 9/8/23 (BORING LOG SA13-02.ARIASSA13-02.GDT.ARIAS-ARWA LIBRARY.GLB)

Arias and Associates, Inc.

Job No.: 202-1354

Boring Log No. B-5

Project: **Maverick Creek Greenway**
Babcock Rd and N Loop 1604
San Antonio, Texas

Location: See Boring Location Plan

Sampling Date: 8/17/23

Coordinates: N29°35'7.03" W98°37'46.91"

Backfill: Cuttings

Soil Description	Depth (ft)	SN	WC	PL	LL	PI	N	-200
CLAYEY GRAVEL with Sand (GC), very dense, light brown, with limestone material		SS	4	16	40	24	60	37
Weathered LIMESTONE, tan, highly weathered, very weak rock, with clay seams		SS	4				**50/5"	
LIMESTONE, tan, moderately weathered, moderately strong rock, with clay seams		SS	2				**50/0"	
	5							
- with clay pockets from 6'-8'		SS	2				**50/1"	
		SS	0				**50/0"	
	10							

Borehole terminated at 10 feet

Groundwater Data:
During drilling: Not encountered

Field Drilling Data:
Coordinates: Hand-held GPS Unit
Logged By: H. Bowman
Driller: Terra Power Drilling
Equipment: Truck-mounted drill rig

Air rotary: 0 - 10 ft

Nomenclature Used on Boring Log

Split Spoon (SS)

WC = Water Content (%)
PL = Plastic Limit
LL = Liquid Limit
PI = Plasticity Index
N = SPT Blow Count

** = Blow Counts During Seating Penetration
-200 = % Passing #200 Sieve

GINT.GPJ 9/8/23 (BORING LOG SA13-02.ARIASSA13-02.GDT.ARIAS-ARWA LIBRARY.GLB)

Arias and Associates, Inc.

Job No.: 202-1354

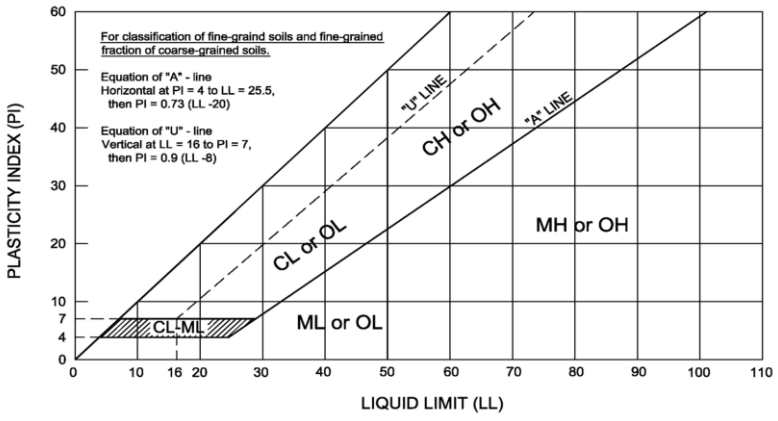
KEY TO TERMS AND SYMBOLS USED ON BORING LOGS

MAJOR DIVISIONS					GROUP SYMBOLS		DESCRIPTIONS
COARSE-GRAINED SOILS	More than half of material LARGER than No. 200 Sieve size	GRAVELS	More than Half of Coarse fraction is LARGER than No. 4 Sieve size	Clean Gravels (little or no Fines)	GW		Well-Graded Gravels, Gravel-Sand Mixtures, Little or no Fines
					GP		Poorly-Graded Gravels, Gravel-Sand Mixtures, Little or no Fines
				Gravels with Fines (Appreciable amount of Fines)	GM		Silty Gravels, Gravel-Sand-Silt Mixtures
					GC		Clayey Gravels, Gravel-Sand-Clay Mixtures
		SANDS	More than half of Coarse fraction is SMALLER than No. 4 Sieve size	Clean Sands (little or no Fines)	SW		Well-Graded Sands, Gravelly Sands, Little or no Fines
					SP		Poorly-Graded Sands, Gravelly Sands, Little or no Fines
				Sands with Fines (Appreciable amount of Fines)	SM		Silty Sands, Sand-Silt Mixtures
					SC		Clayey Sands, Sand-Clay Mixtures
FINE-GRAINED SOILS	More than half of material SMALLER than No. 200 Sieve size	SILTS & CLAYS		Liquid Limit less than 50	ML		Inorganic Silts & Very Fine Sands, Rock Flour, Silty or Clayey Fine Sands or Clayey Silts with Slight Plasticity
					CL		Inorganic Clays of Low to Medium Plasticity, Gravelly Clays, Sandy Clays, Silty Clays, Lean Clays
		SILTS & CLAYS		Liquid Limit greater than 50	MH		Inorganic Silts, Micaceous or Diatomaceous Fine Sand or Silty Soils, Elastic Silts
					CH		Inorganic Clays of High Plasticity, Fat Clays
FORMATIONAL MATERIALS		SANDSTONE					Massive Sandstones, Sandstones with Gravel Clasts
		MARLSTONE					Indurated Argillaceous Limestones
		LIMESTONE					Massive or Weakly Bedded Limestones
		CLAYSTONE					Mudstone or Massive Claystones
		CHALK					Massive or Poorly Bedded Chalk Deposits
		MARINE CLAYS					Cretaceous Clay Deposits
		GROUNDWATER					Indicates Final Observed Groundwater Level Indicates Initial Observed Groundwater Location

Density of Granular Soils	
Number of Blows per ft., N	Relative Density
0 - 4	Very Loose
4 - 10	Loose
10 - 30	Medium
30 - 50	Dense
Over 50	Very Dense

Consistency and Strength of Cohesive Soils		
Number of Blows per ft., N	Consistency	Unconfined Compressive Strength, q_u (tsf)
Below 2	Very Soft	Less than 0.25
2 - 4	Soft	0.25 - 0.5
4 - 8	Medium (Firm)	0.5 - 1.0
8 - 15	Stiff	1.0 - 2.0
15 - 30	Very Stiff	2.0 - 4.0
Over 30	Hard	Over 4.0

PLASTICITY CHART (ASTM D 2487-11)



Arias Geoprofessionals

KEY TO TERMS AND SYMBOLS USED ON BORING LOGS

TABLE 1 Soil Classification Chart (ASTM D 2487-11)

Criteria of Assigning Group Symbols and Group Names Using Laboratory Tests[A]				Soil Classification	
				Group Symbol	Group Name[B]
COARSE-GRAINED SOILS	Gravels (More than 50% of coarse fraction retained on No. 4 sieve)	Clean Gravels (Less than 5% fines[C])	Cu ≥ 4 and 1 ≤ Cc ≤ 3[D]	GW	Well-Graded Gravel[E]
			Cu < 4 and/or [Cc < 1 or Cc > 3][D]	GP	Poorly-Graded Gravel[E]
		Gravels with Fines (More than 12% fines[C])	Fines classify as ML or MH	GM	Silty Gravel[E,F,G]
			Fines classify as CL or CH	GC	Clayey Gravel[E,F,G]
More than 50% retained on No. 200 sieve	Sands (50% or more of coarse fraction passes No. 4 sieve)	Clean Sands (Less than 5% fines[H])	Cu ≥ 6 and 1 ≤ Cc ≤ 3[D]	SW	Well-Graded Sand[I]
			Cu < 6 and/or [Cc < 1 or Cc > 3][D]	SP	Poorly-Graded Sand[I]
		Sands with Fines (More than 12% fines[H])	Fines classify as ML or MH	SM	Silty Sand[F,G,I]
			Fines classify as CL or CH	SC	Clayey Sand[F,G,I]
FINE-GRAINED SOILS	Silts and Clays Liquid limit less than 50	inorganic	PI > 7 and plots on or above "A" line[J]	CL	Lean Clay[K,L,M]
			PI < 4 or plots below "A" line[J]	ML	Silt[K,L,M]
		organic	Liquid limit - oven dried / Liquid limit - not dried < 0.75	OL	Organic Clay[K,L,M,N] / Organi Silt[K,L,M,O]
50% or more passes the No. 200 sieve	Silts and Clays Liquid limit 50 or more	inorganic	PI plots on or above "A" line	CH	Fat Clay[K,L,M]
			PI plots on or below "A" line	MH	Elastic Silt[K,L,M]
		organic	Liquid limit - oven dried / Liquid limit - not dried < 0.75	OH	Organic Clay[K,L,M,P] / Organic Silt[K,L,M,Q]
HIGHLY ORGANIC SOILS	Primarily organic matter, dark in color, and organic odor			PT	Peat

[A] Based on the material passing the 3-inch (75mm) sieve

[B] If field sample contained cobbles or boulders, or both, add "with cobbles or boulders, or both" to group name

[C] Gravels with 5% to 12% fines require dual symbols:
- GW-GM well-graded gravel with silt
- GW-GC well-graded gravel with clay
- GP-GM poorly-graded gravel with silt
- GP-GC poorly-graded gravel with clay

[D] $Cu = D_{60}/D_{10}$ $\quad Cc = \frac{(D_{30})^2}{D_{10} \times D_{60}}$

[E] If soil contains ≥ 15% sand, add "with sand" to group name

[F] If fines classify as CL-ML, use dual symbol GC-GM, or SC-SM

[G] If fines are organic, add "with organic fines" to group name

[H] Sand with 5% to 12% fines require dual symbols:
- SW-SM well-graded sand with silt
- SW-SC well-graded sand with clay
- SP-SM poorly-graded sand with silt
- SP-SC poorly-graded sand with clay

[I] If soil contains ≥ 15% gravel, add "with gravel" to group name

[J] If Atterberg limits plot in hatched area, soil is a CL-ML, silty clay

[K] If soil contains 15% to < 30% plus No. 200, add "with sand" or "with gravel," whichever is predominant

[L] If soil contains ≥ 30% plus No. 200, predominantly sand, add "sandy" to group name

[M] If soil contains ≥ 30% plus No. 200, predominantly gravel, add "gravelly" to group name

[N] PI ≥ 4 and plots on or above "A" line

[O] PI < 4 or plots below "A" line

[P] PI plots on or above "A" line

[Q] PI plots below "A" line

TERMINOLOGY

Boulders	Over 12-inches (300mm)	**Parting**	Inclusion < 1/8-inch thick extending through samples
Cobbles	12-inches to 3-inches (300mm to 75mm)	**Seam**	Inclusion 1/8-inch to 3-inches thick extending through sample
Gravel	3-inches to No. 4 sieve (75mm to 4.75mm)	**Layer**	Inclusion > 3-inches thick extending through sample
Sand	No. 4 sieve to No. 200 sieve (4.75mm to 0.075mm)		
Silt or Clay	Passing No. 200 sieve (0.075mm)		
Calcareous	Containing appreciable quantities of calcium carbonate, generally nodular		

Stratified	Alternating layers of varying material or color with layers at least 6mm thick
Laminated	Alternating layers of varying material or color with the layers less than 6mm thick
Fissured	Breaks along definite planes of fracture with little resistance to fracturing
Slickensided	Fracture planes appear polished or glossy sometimes striated
Blocky	Cohesive soil that can be broken down into small angular lumps which resist further breakdown
Lensed	Inclusion of small pockets of different soils, such as small lenses of sand scattered through a mass of clay
Homogeneous	Same color and appearance throughout

KEY TO TERMS AND SYMBOLS USED ON BORING LOGS

Hardness Classification of Intact Rock

Class	Hardness	Field Test		Approximate Range of Uniaxial Compression Strength kg/cm² (tons/ft²)
I	Extremely hard	Many blows with geologic hammer required to break intact specimen.		> 2,000
II	Very hard	Hand held specimen breaks with hammer end of pick under more than one blow.		2,000 – 1,000
III	Hard	Cannot be scraped or pealed with knife, hand held specimen can be broken with single moderate blow with pick.		1,000 – 500
IV	Soft	Can just be scraped or peeled with knife. Indentations 1mm to 3mm show in specimen with moderate blow with pick.		500 – 250
V	Very soft	Material crumbles under moderate blow with sharp end of pick and can be peeled with a knife, but is too hard to hand-trim for triaxial test specimen.		250 – 10

Rock Weathering Classifications

Grade	Symbol	Diagnostic Features
Fresh	F	No visible sign of Decomposition or discoloration. Rings under hammer impact.
Slightly Weathered	WS	Slight discoloration inwards from open fractures, otherwise similar to F.
Moderately Weathered	WM	Discoloration throughout. Weaker minerals such as feldspar decomposed. Strength somewhat less than fresh rock, but cores cannot be broken by hand or scraped by knife. Texture preserved.
Highly Weathered	WH	Most minerals somewhat decomposed. Specimens can be broken by hand with effort or shaved with knife. Core stones present in rock mass. Texture becoming indistinct, but fabric preserved.
Completely Weathered	WC	Minerals decomposed to soil, but fabric and structure preserved (Saprolite). Specimens easily crumbled or penetrated.
Residual Soil	RS	Advanced state of decomposition resulting in plastic soils. Rock fabric and structure completely destroyed. Large volume change.

Rock Discontinuity Spacing

Description for Structural Features: Bedding, Foliation, or Flow Banding	Spacing	Description for Joints, Faults or Other Fractures
Very thickly (bedded, foliated, or banded)	More than 6 feet	Very widely (fractured or jointed)
Thickly	2 – 6 feet	Widely
Medium	8 – 24 inches	Medium
Thinly	2½ – 8 inches	Closely
Very thinly	¾ – 2½ inches	Very closely
Description for Micro-Structural Features: Lamination, Foliation, or Cleavage	**Spacing**	**Descriptions for Joints, Faults, or Other Fractures**
Intensely (laminated, foliated, or cleaved)	¼ – ¾ inch	Extremely close
Very intensely	Less than ¼ inch	

Engineering Classification for in Situ Rock Quality

RQD %	Velocity Index	Rock Mass Quality
90 – 100	0.80 – 1.00	Excellent
75 – 90	0.60 – 0.80	Good
50 – 75	0.40 – 0.60	Fair
25 – 50	0.20 – 0.40	Poor
0 – 25	0 – 0.20	Very Poor

APPENDIX C: LABORATORY AND FIELD TEST PROCEDURES

FIELD AND LABORATORY EXPLORATION

The field exploration program included drilling at selected locations within the site and intermittently sampling the encountered materials. The boreholes were drilled using single flight augers (ASTM D 1452). Samples of encountered materials were obtained using a split-barrel sampler while performing the Standard Penetration Test (ASTM D 1586) and with a thin-walled Shelby Tube Sampler (ASTM D 1587). The sample depth interval and type of sampler used is included on the soil boring log. Arias' field representative visually logged each recovered sample and placed a portion of the recovered sampled into a plastic bag for transport to our laboratory.

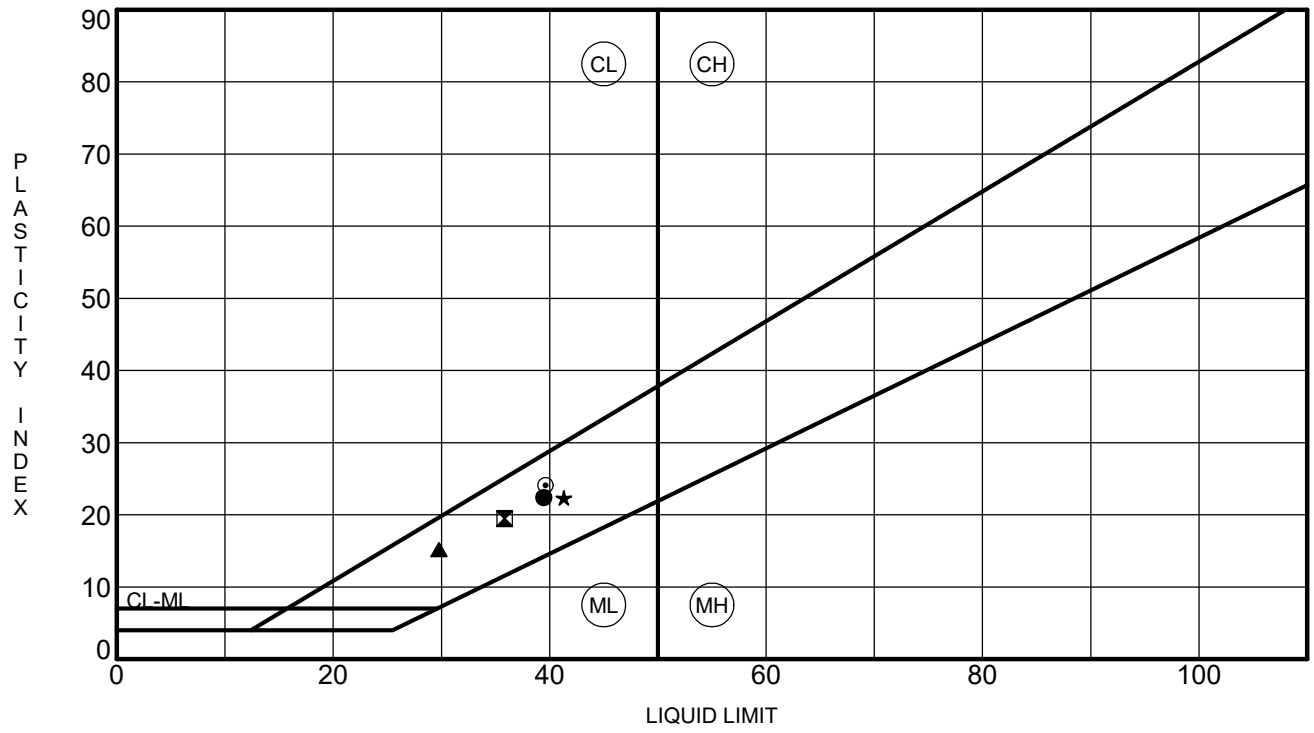
SPT N values and blow counts for those intervals where the sampler could not be advanced for the required 18-inch penetration are shown on the soil boring log. If the test was terminated during the 6-inch seating interval or after 10 hammer blows were applied used and no advancement of the sampler was noted, the log denotes this condition as blow count during seating penetration. Penetrometer readings recorded for thin-walled tube samples that remained intact also are shown on the soil boring logs.

Arias performed soil mechanics laboratory tests on selected samples to aid in soil classification and to determine engineering properties. Tests commonly used in geotechnical exploration, the method used to perform the test, and the designation on the boring log where data are reported are summarized as follows:

Test Name	Test Method	Log Designation
Water (moisture) content of soil and rock by mass	ASTM D 2216	WC
Liquid limit, plastic limit, and plasticity index of soils	ASTM D 4318	PL, LL, PI
Amount of material in soils finer than the No. 200 sieve	ASTM D 1140	-200

The laboratory results are reported on the soil boring logs.

APPENDIX D: GRAIN SIZE CURVES



Boring		Depth	LL	PL	PI	Fines	Classification
●	1	0.0	39	17	22	36	CLAYEY SAND with GRAVEL (SC)
⊠	2	0.0	36	16	20	30	CLAYEY GRAVEL with SAND (GC)
▲	3	0.0	30	15	15	17	CLAYEY GRAVEL with SAND (GC)
★	4	0.0	41	19	22	51	GRAVELLY LEAN CLAY with SAND (CL)
⊙	5	0.0	40	16	24	37	CLAYEY GRAVEL with SAND (GC)

142 Chula Vista
San Antonio, Texas 78232
Phone: (210) 308-5884
Fax: (210) 308-5886

ATTERBERG LIMITS RESULTS

Project: Maverick Creek Greenway

Location: See Boring Location Plan

Job No.: 202-1354

GINT.GPJ 9/8/23 (ATTERBERG LIMITS SUMMARY GRAPH.ARIASSA13-02.GDT.ARIAS-ARWA LIBRARY.GLB)

APPENDIX E: GEOLOGIC ASSESSMENT REPORT

Geologic Assessment

Texas Commission on Environmental Quality

For Regulated Activities on The Edwards Aquifer Recharge/transition Zones and Relating to 30 TAC §213.S(b)(3), Effective June l, 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: Douglas McGookey, P.G. **Telephone**: (210) 694-4545

Date: September 20, 2023 **Fax:** (210) 694-4577

Representing: Medina Consulting Co., Inc. TBPG No.50118

Signature of Geologist:

Regulated Entity Name: Maverick Creek Trail

Project Information

1. Date(s) Geologic Assessment was performed: August 14, 15, & 17, 2023
2. Type of Project:
   - ☒ WPAP
   - ☒ SCS
   - ☐ AST
   - ☐ UST
3. Location of Project:
   - ☒ Recharge Zone
   - ☐ Transition Zone
   - ☐ Contributing Zone within the Transition Zone

3/11/24

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)
Crawford, stony & Bexar soils, 0-5% slopes	D	2.25-2.83
Lewisville silty clay, 1-3% slopes	B	5.75+
Patrick soils, 1-3% slopes, rarely flooded	B	5+

** Soil Group Definitions (Abbreviated)*

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

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

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

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

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

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

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

   Applicant's Site Plan Scale: 1" = 280'
   Site Geologic Map Scale: 1" = 280'
   Site Soils Map Scale (if more than 1 soil type): 1" = 280'

9. Method of collecting positional data:

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

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

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

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

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

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

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

    ☐ There are_____(#) 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.

Attachment A
Geologic Assessment Table

GEOLOGIC ASSESSMENT TABLE

PROJECT NAME: Ramendu at Lyndon Ln Investment LLC

LOCATION			FEATURE CHARACTERISTICS											EVALUATION			PHYSICAL SETTING		
1A	1B"	1C"	2A	2B	3	4			5	5A	6	7	8A	8B	9	10		11		12
FEATURE ID	LATITUDE	LONGITUDE	FEATURE TYPE	POINTS	FORMATION	DIMENSIONS (FEET)			TREND (DEGREES)	DOM	DENSITY (NO/FT)	APERTURE (FEET)	INFILL	RELATIVE INFILTRATION RATE	TOTAL	SENSITIVITY		CATCHMENT AREA (ACRES)		TOPOGRAPHY
						X	Y	Z		0, 10						<40	≥40	<1.6	≥1.6	
B1	29.58475°	-98.63046°	O	5	Kplc	1	5	unkn.	15	0	NA	None	N	5	10	X		X		Hillside
M1	29.57709°	-98.63122°	MB	30	Kg	1	105	unkn.	NA	NA	NA	NA	C,O,V	5	35	X			X	Drainage
M2	29.57709°	-98.63122°	MB	30	Kg	1	105	unkn.	NA	NA	NA	NA	C,O,V	5	35	X			X	Drainage

• DATUM: WGS 84

2A TYPE	TYPE	28 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 rock
C	Coarse – cobbles, breakdown, sand, gravel
O	Loose or soft mud or soil, organics, leaves, dark colors
F	Fines, compacted clay-rich sediment, soil profile, gray or red colors
V	Vegetation. Give details in narrative description
FS	Flowstone, cements, cave deposits
X	Other materials

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

STATE OF TEXAS
Douglas A. McGookey
Geologist
License Number 368
LICENSED PROFESSIONAL GEOSCIENTIST

I have read, I understood, and I have followed the Texas Commission on Environmental Quality's *Instructions to Geologists*. Th 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.

Douglas McGookey, P.G. Date September 20, 2023

3/11/24

Sheet 1 of 1

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

Attachment B
Stratigraphic Column

Maverick Creek Trail

Time Period (Epoch)	Hydrologic Subdivision	Group	Formation/ Member		Hydrologic Function	Thickness (ft)	Lithology	Cavern Development	Porosity/ Permeability type
Erosional Surface									
Late Cretaceous	Upper Confining Units		Del Rio Clay		CU	40-50	Blue-green to yellow-brown clay	None	None (primary upper confining unit)
			Georgetown		CU	20-30	Reddish-brown and gray to light-tan, marly limestone w/ biomicritic texture; commonly contains fossils	Little to none	very low porosity and permeability
Early Cretaceous	Edwards Aquifer	Edwards	Person Fm	Cyclic & marine members undivided	AQ	80-90	Mudstone to packstone, miliolid grainstone, chert	Many subsurface	Laterally extensive, water yielding
				Leached and collapsed members	AQ	70-90	Limestone: Crystalline, mudstone to grainstone, chert, collapsed breccia	Extensive lateral development, large rooms	Permeable, most not fabric porosity
				Regional dense member	CU	20-24	Limestone: dense argillaceous mudstone	Very few, only vertical fracture development	Not fabric, low permeability, vertical barrier
			Kainer Fm	Grainstone member	AQ	40-50	Limestone: miliolid grainstone, mudstone to wackestone, chert	Few	Not fabric, recrystallization reduces permeability
				Kirschberg evaporite member	AQ	40-50	Limestone: highly altered, crystalline, chalky mudstone, chert	Probably extensive cave development	Most fabric, one of the most permeable
				Dolomitic member	AQ	90-120	Limestone: mudstone to grainstone, crystalline, chert	Caves related to structure or bedding planes	Mostly not fabric, some bedding plane fabric
				Basal nodular member	CU, or Karst AQ	40-50	Limestone: shaly, nodular, mudstone to miliolid grainstone	Large lateral caves at surface	Fabric, stratigraphically controlled
	Lower Confining Unit	Trinity	Glen Rose limestone/upper member		CU; AQ (if evaporite beds)	208-560	Limestone: yellowish tan, thinly bedded, marl	Some surface cave development	Some water production at evaporite beds/Relatively impermeable

Notes: AQ = Aquifer, CU = Confining Unit

Source: *Geologic Framework and Hydrostratigraphy of the Edwards and Trinity Aquifers Within Northern Bexar and Comal Counties, Texas, Clark, et al., 2016*

Mapped surficial geology

3/11/24

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Attachment C
Site Geology

Geology Narrative

The site lies in the recharge zone of the Edwards Aquifer. The attached figures show the location of the site, floodplain, topography, and geologic units.

Site Soils

Soil Units: The project site lies on Crawford, stony & Bexar soils, 0-5% slopes (Cb), Lewisville silty clay, 1-3% slopes (LvB), and Patrick soils, 1-3% slopes, rarely flooded (PaB). The following paragraphs describe the soil units and are partially quoted from the *Soil Survey of Bexar County, Texas* (USDA, issued June 1966) and the Web Soil Service map unit descriptions.

Cb: This soil is primarily made up of Crawford, stony (51%) and Bexar (36%). "These soils occur as large areas, generally several hundred acres in size, and form a nearly continuous belt extending westward from the northeastern part of the county to a little south of Helotes. Crawford and similar soils make up approximately 64 percent of the acreage. Approximately 90 percent of this consists of soils that are stony clay in texture and are shallow to moderately deep over hard limestone. The surface layer is very dark gray to dark reddish-brown, noncalcareous clay and is 8 or 9 inches thick. From 10 to 40 percent of this layer consists of chert and limestone fragments. These fragments, which are on the surface and in the surface layer, range from a quarter of an inch to 24 inches in diameter. The subsurface layer generally contains a few chert fragments or small flags of cherty limestone. The surface layer of these soils ranges from cherty clay loam to gravelly loam in texture and from 14 to 22 inches in thickness. The subsoil is cherty clay and ranges from 6 to 14 inches in thickness. Cb soils are well-drained, and runoff class is Very High (Crawford component) to High (Bexar component). The depth to the water table is more than 80 inches. The capacity of the most limiting layer to transmit water (K_{sat}) is very low to moderately low (0.00 to 0.06 in/hr; Crawford) to moderately low to moderately high (0.06 to 0.20 in/hr; Bexar).

LvB: "The Lewisville series consists of moderately deep, dark-colored, nearly level alluvial soils. These soils occur mainly on terraces bordering the San Antonio and Medina Rivers and their main tributaries. The surface layer is very dark grayish-brown to brown silty clay and is about 24 inches thick. It has fine subangular blocky or blocky structure, is firm and crumbly when moist, and is easily worked. This layer contains a few fine concretions of lime carbonate. The subsurface layer is brown silty clay and is about 20 inches thick. It has fine, subangular blocky or blocky structure and is very firm but crumbly when moist. This layer is limy. The underlying material is reddish-yellow silty clay. It has weak, blocky structure, is very firm when moist, and contains large amounts of lime. Beneath this layer, there may be deep beds of water-rounded limestone gravel." The LvB soil is well-drained with a High runoff class. The depth to the water table is more than 80 inches. The K_{sat} is moderately low to moderately high (0.06 to 0.20 in/hr).

PaB: “The Patrick series consists of shallow, dark-colored, nearly level and gently sloping soils. These soils occur as terraces along streams that drain the limestone prairies of the county.” “The surface layer is clay loam, gravelly clay loam, silty clay, or light clay and about 12 inches thick. This layer has granular structure. It is moderately permeable, firm to friable when moist, and calcareous.” “The subsurface layer is brown, clay loam, loam, or light clay. It is about 5 inches thick. This layer also is friable when moist and calcareous. The substratum consists of waterworn, lime-coated limestone gravel.” The PaB soil is well-drained with a Low runoff class. The depth to the water table is more than 80 inches. The K_{sat} is moderately high to high (0.57 to 1.98 in/hr).

Site Geology

Literature Review: In Figure 7 (Clark, et al., 2016) and attachment D, the site is mapped in the Del Rio Clay (Kdr), Georgetown Formation (Kg), and Person Formation, leached and collapsed member (Kplc). One fault is mapped as passing through the site. An older map, Figure 6, shows geology of the area from the Blome, et al. (2005) geologic map. On this map, the site is mapped in the Kainer Formation, dolomitic member (Kkd) and the Person Formation, cyclic & marine member (Kpcm). Two faults (one is inferred) are mapped as passing through the site. We are using the 2016 map for our site-specific map because it matches observations. The following descriptions were taken from the Clark, et al. (2016) descriptions in the map’s accompanying pamphlet.

Kdr: “The Del Rio Clay of the Washita Group is typically 40–50 ft thick in the study area. It is a fossiliferous, blue-green to yellow-brown clay with thin beds of packstone. The Del Rio Clay of the Washita Group contains iron nodules and the index fossil *Ilymatogyra arietina*. The contact between the Del Rio Clay and the overlying Buda Limestone is unconformable (Martin, 1967) and easily recognized, with the Buda Limestone blocks often slumping down hillsides over the Del Rio Clay outcrops (Clark and others, 2013).”

Kg: “The Georgetown Formation of the Washita Group is typically 20–30 ft thick in the study area and is a reddish- brown, gray to light tan, shaly mudstone and wackestone. It commonly contains black dendrites, iron nodules, and iron staining and often resembles the Buda Limestone. According to Maclay and Small (1976), the Georgetown Formation overlies the Person Formation of the Edwards Group unconformably. The Georgetown Formation contains dispersed pyrite and organic material in beds of dense, shaly limestone that suggest a condition of undisturbed deposition in a reducing environment (Maclay and Small, 1976). The Georgetown Formation is often fossiliferous with *Plesioturrilites brazoensis* and *Waconella wacoensis* common. *Waconella wacoensis* is the index fossil for the Georgetown Formation. The Del Rio Clay overlies the Georgetown Formation unconformably.”

Kplc: “The leached and collapsed members (undivided) are typically 70–90 ft thick in the study area and consist of a hard, dense, recrystallized limestone (Maclay and Small, 1976; Stein and Ozuna, 1995). The member is generally a mudstone, wackestone, packstone, and grainstone containing chert and occasional collapse breccias. These units are heavily bioturbated with iron-stained beds (Stein and Ozuna, 1995) separated by more massive limestone beds. The leached and collapsed members are often stromatolitic and contain chert both as beds and as large nodules. Fossils and fragments of *Toucasia* sp. are often found just above the contact with the underlying regional dense member. Although rare, the coral *Montastrea roemeriana* and oysters can be found.”

Observations: The site lies on land that is forested with small clearings/areas with less tree cover. Numerous boulders, cobbles, and leaf litter cover most of the forested ground surface with some grasses, weeds, and small cacti present where more sunlight can penetrate (Photographs 1 to 4). The boulders appear to be part of the soil profile. The site is very uneven (i.e., “lumpy and bumpy”), especially between the current and former streambeds.

The pre-scoping layout (pdf) by T-Core Engineers shows SAWS sewer lines passing under the site in a few places. Manholes were observed near the site, but not on it. The manholes were on elevated cement collars that were in good condition with vegetated soil overlapping so that the piping under the collars was not exposed).

One fault was shown on the site in the geologic map (Figure 7 and attachment D), but it was not observed at the site (i.e., no cracks, disruptions, or layer discontinuities visible on the ground surface). No significant pavement cracking outside the site, on both sides, was observed. Some minor cracking along UTSA’s West Campus Rd/Service Rd was visible. Since it occurs along most of that road, mostly along the edges, it can be attributed to heavy vehicles and inadequate road construction.

No sensitive geologic or manmade features were identified on the site. The bedrock feature and two related manmade features are listed in the Geologic Assessment Table is described below.

B1 (Photograph 1) - Possible exposed bedrock (not obviously a surfacing boulder): The surface has a number of exposed bioturbation holes, none of which are deep, and superficial surface cracking. It is possible that this is another surfacing boulder in an area with many surface and surfacing boulders, which are common in the Cb soil type. No rapid infiltration infilling was observed (the whole area is covered with leaf litter).

M1 and M2 (Photograph 2) - These are the UTSA Blvd road supports that the trail will pass between. It is possible that they extend downward into the bedrock. No rapid infiltration infilling was observed.

If features are discovered during construction, work should stop and the Texas Commission on Environmental Quality (TCEQ) notified so that the feature can be evaluated.

Figures

Source: ESRI Standard

Medina Consulting Company, Inc.

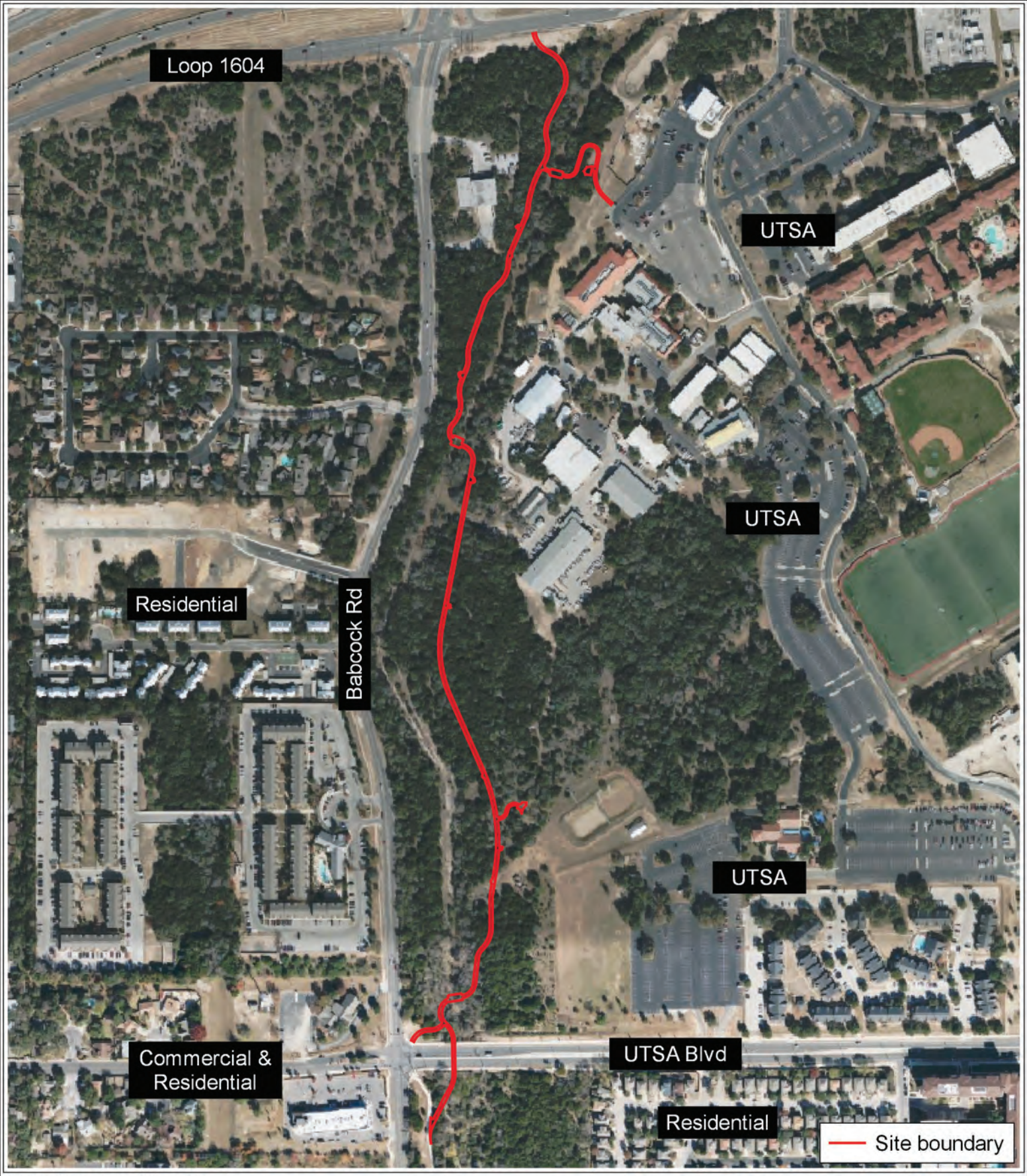
Figure 1: Project Area Location
Maverick Creek Trail
Geologic Assessment
San Antonio, Bexar County, TX

N

Author: Dawne M. Butler 8/22/23

525 0 525 ft

1:8000



Source: Bing Maps Satellite Imagery

Medina Consulting Company, Inc.

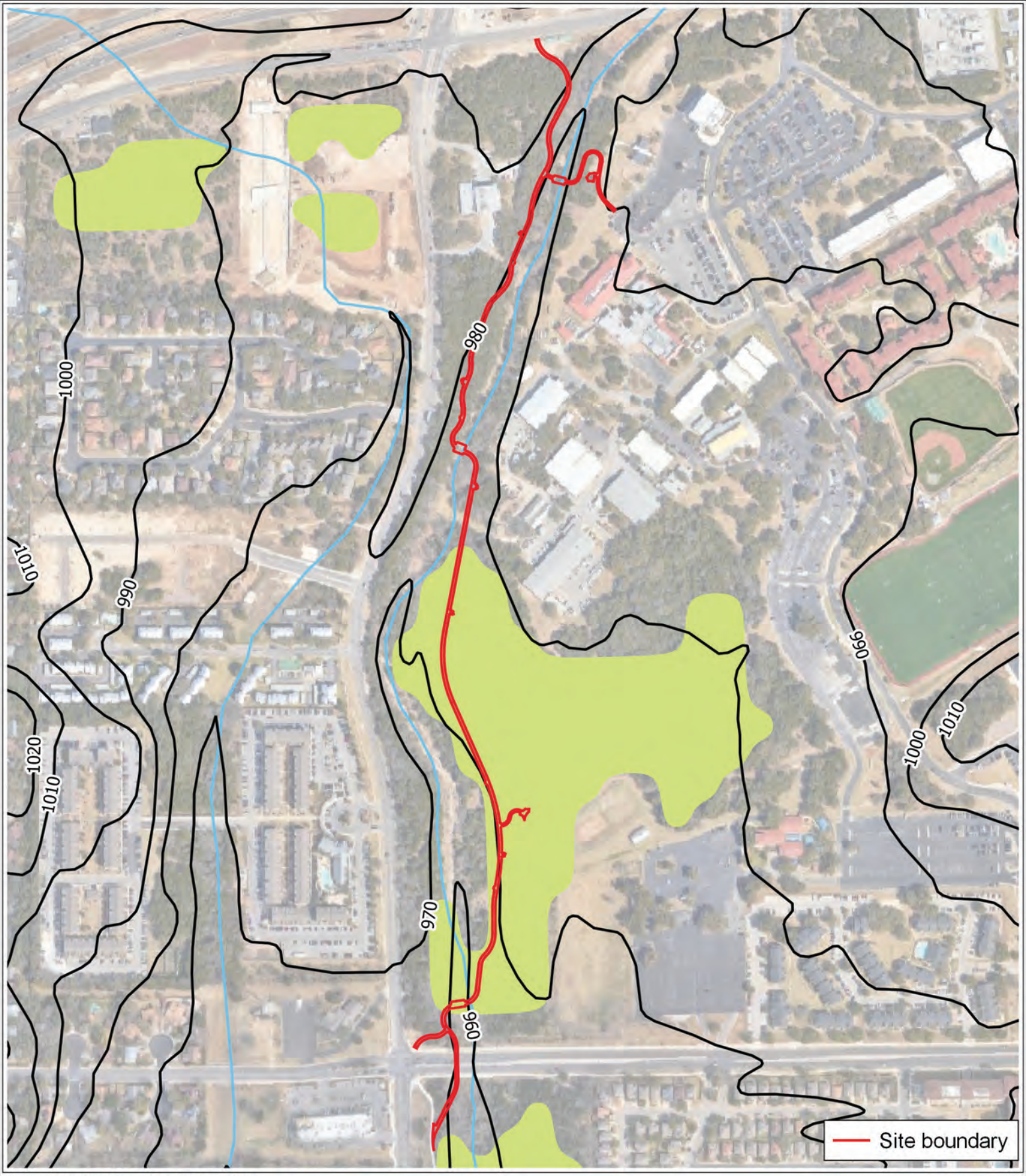
Figure 2: Site and Vicinity
Maverick Creek Trail
Geologic Assessment
San Antonio, Bexar County, TX

N

Author: Dawne M. Butler 8/22/23

325 0 325 ft

1:5100



Source: USGS Helotes, TX vector files (2022)

Medina Consulting Company, Inc.

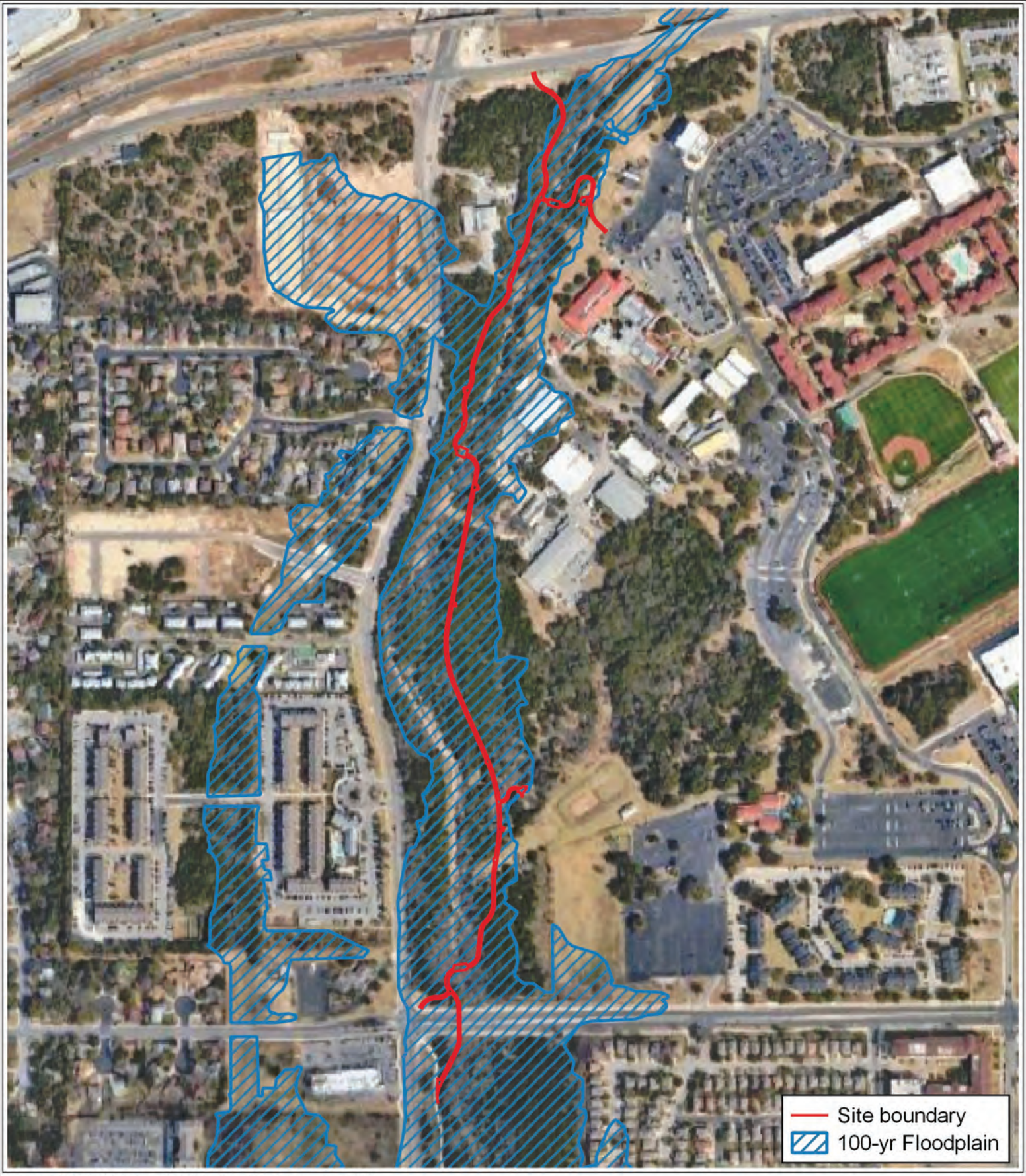
Figure 3: Site Topography
Maverick Creek Trail
Geologic Assessment
San Antonio, Bexar County, TX

N

Author: Dawne M. Butler 8/22/23

350 0 350 ft

1:5100



Sources: FEMA NFHL Data 48029C, eff. 9/29/2010; Google Satellite

Medina Consulting Company, Inc.

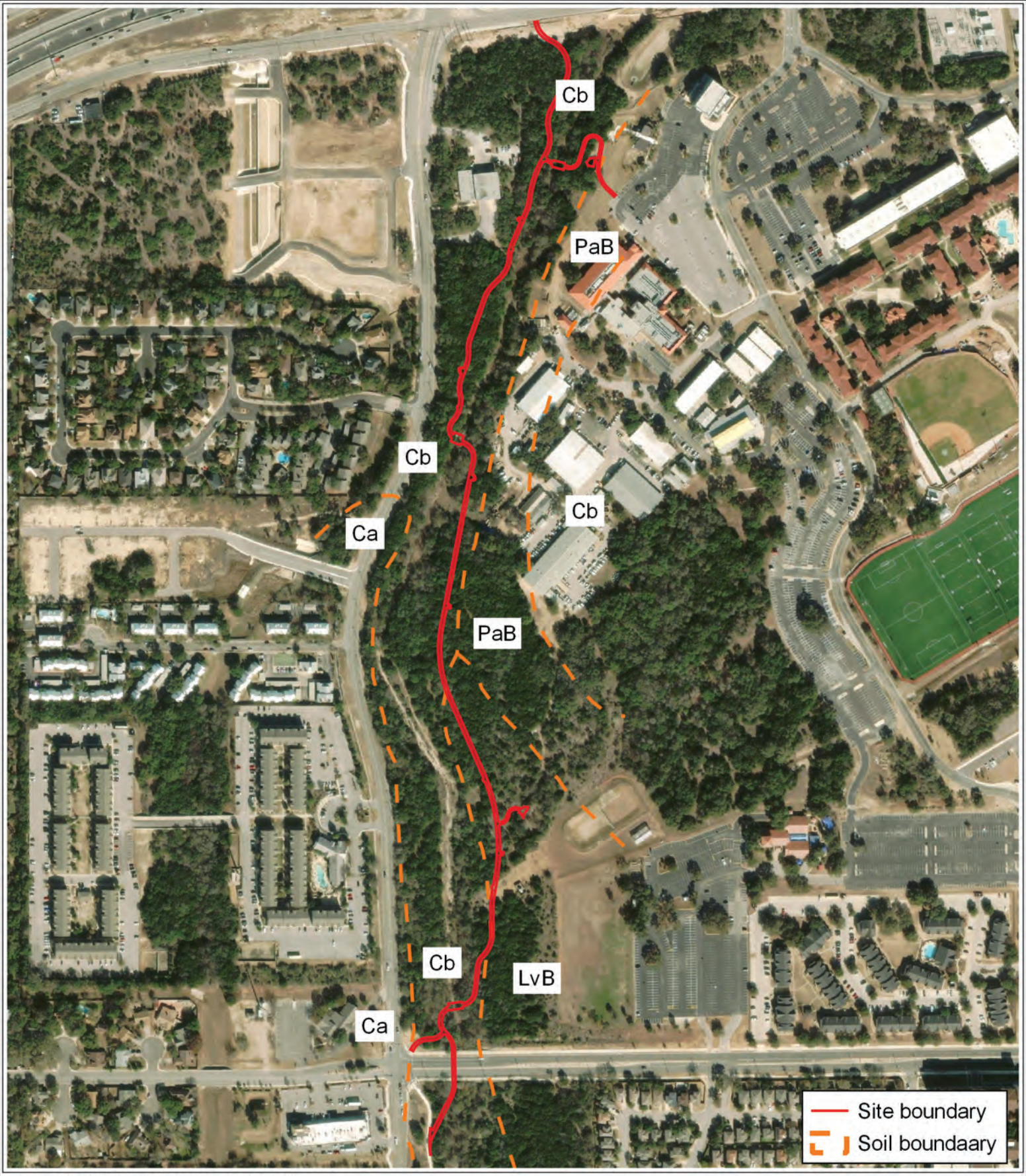
Figure 4: FEMA Flood Zone Map
Maverick Creek Trail
Geologic Assessment
San Antonio, Bexar County, TX

N

Author: Dawne M. Butler 8/2/23

400 0 400 ft

1:5500



Sources: USDA Web Soil Survey data, ESRI Satellite

Medina Consulting Company, Inc.

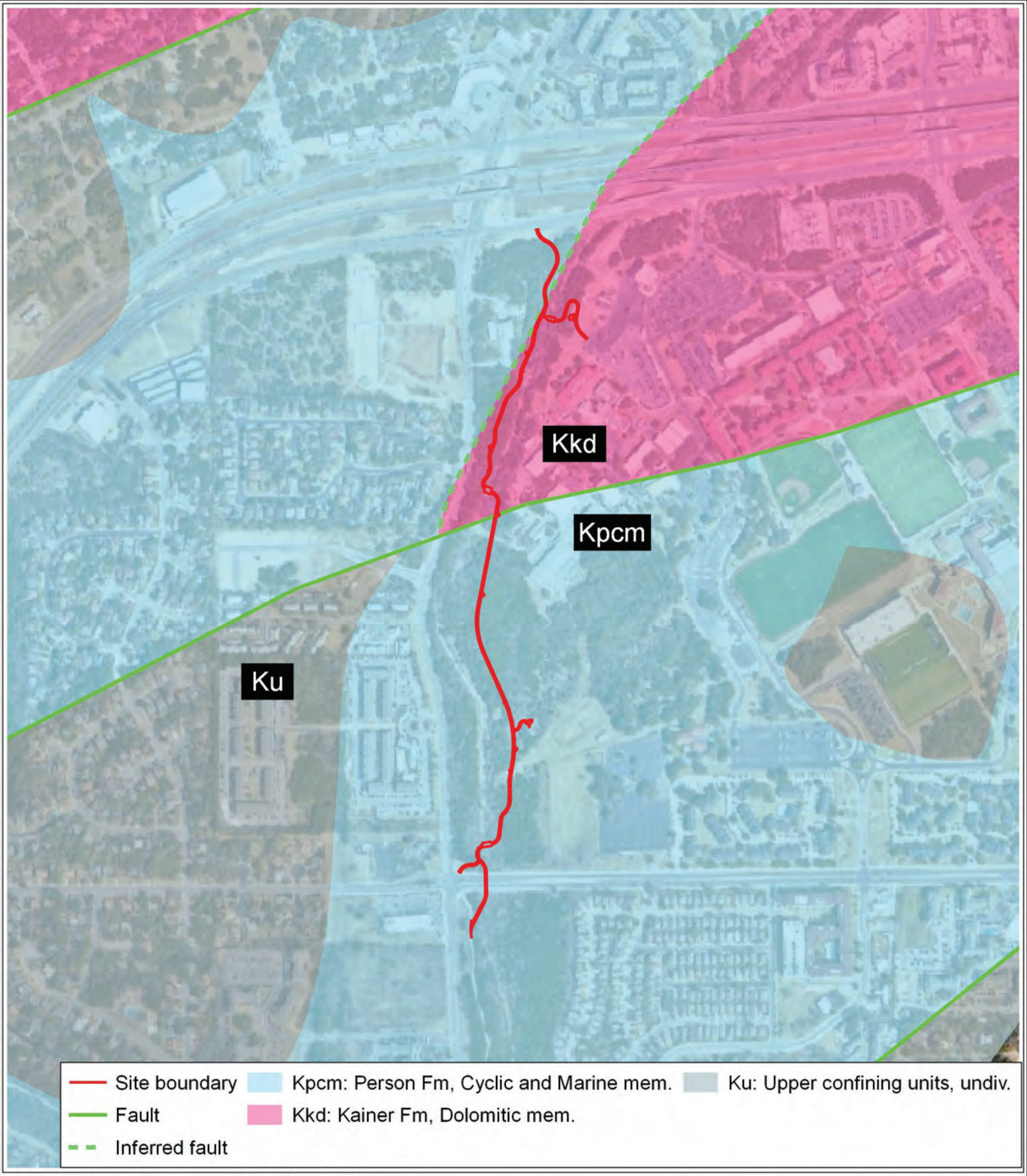
Figure 5: Soil Types
Maverick Creek Trail
Geologic Assessment
San Antonio, Bexar County, TX

N

Author: Dawne M. Butler 8/22/23

325 0 325 ft

1:5000



Sources: Blome, et al., USGS SIM 2873 (2005); Google Satellite

Medina Consulting Company, Inc.

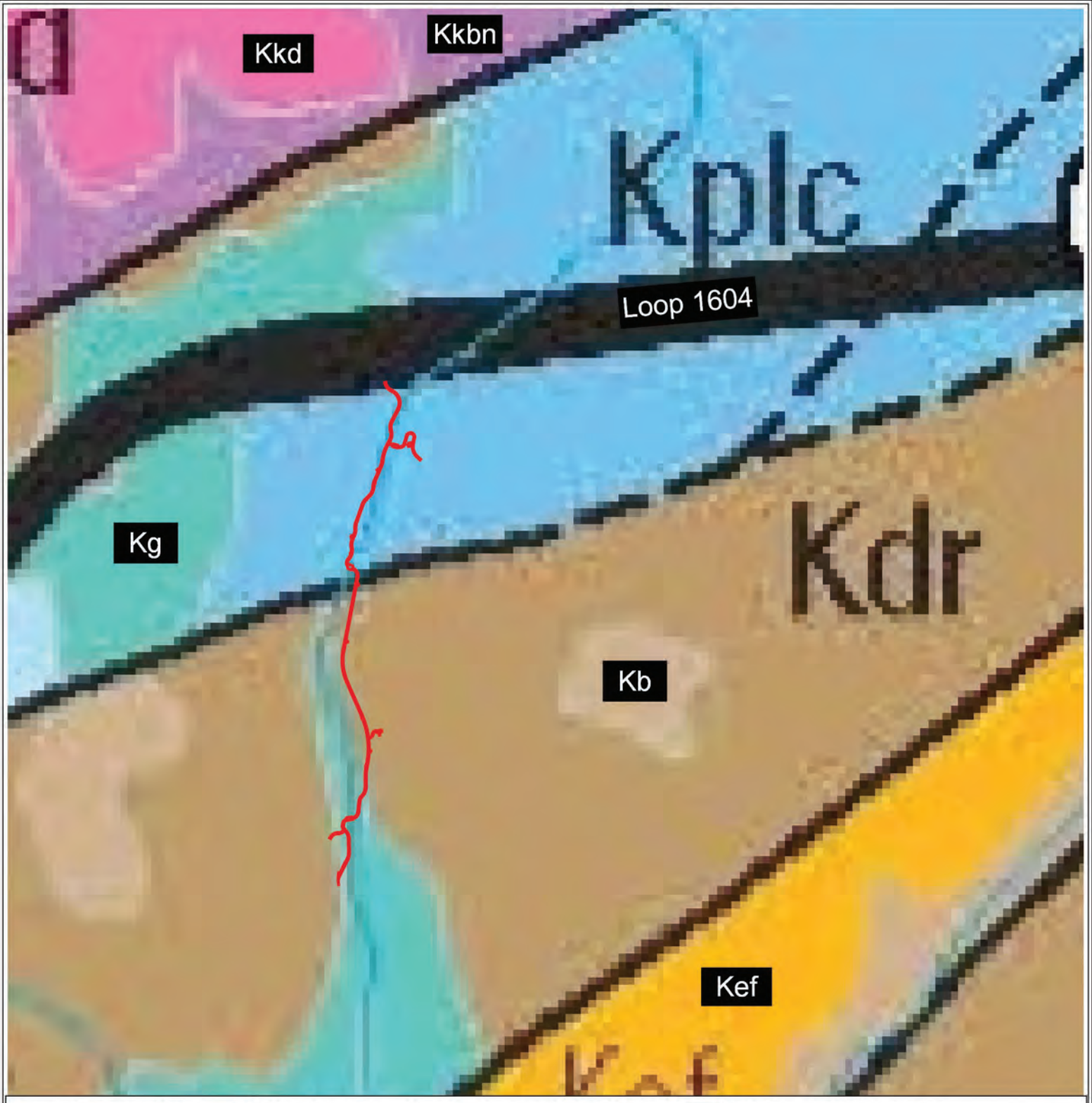
Figure 6: 2005 Site Geology
Maverick Creek Trail
Geologic Assessment
San Antonio, Bexar County, Texas

N

Author: Dawne M. Butler 8/24/23

550 0 550 ft

1:8000



Site boundary
Fault
Inferred fault
Stream

Kplc: Person Fm, Leached and collapsed mem.
Kdr: Del Rio Clay
Kg: Georgetown Fm

Kef: Eagle Ford Grouip
Kb: Buda Limestone
Kkbn: Kainer Fm, Basal nodular mem.
Kkd: Kainer Fm, Dolomitic mem.

Source: Clark, et al., USGS SIM 3366 (2016)

Medina Consulting Company, Inc.

Figure 7: 2016 Site Geology
Maverick Creek Trail
Geologic Assessment
San Antonio, Bexar County, Texas

N

Author: Dawne M. Butler 8/24/23

825 0 825 ft

1:12000

Photographs

Photograph 1 - View of possible exposed bedrock just outside the edge of the site (may be a surfacing boulder, which is common in the Cb soil type)

Photograph 2 - View of the northern side of the UTSA Blvd road supports that the trail will pass between

Photograph 3 - View of typical forest floor showing surface and surfacing boulders typical of the Cb soil type

Photograph 4 - View northeastward of soil type PaB; the parking lot will be the eastern terminus of the northern trail offshoot southwest of the UTSA Mesquite Lab

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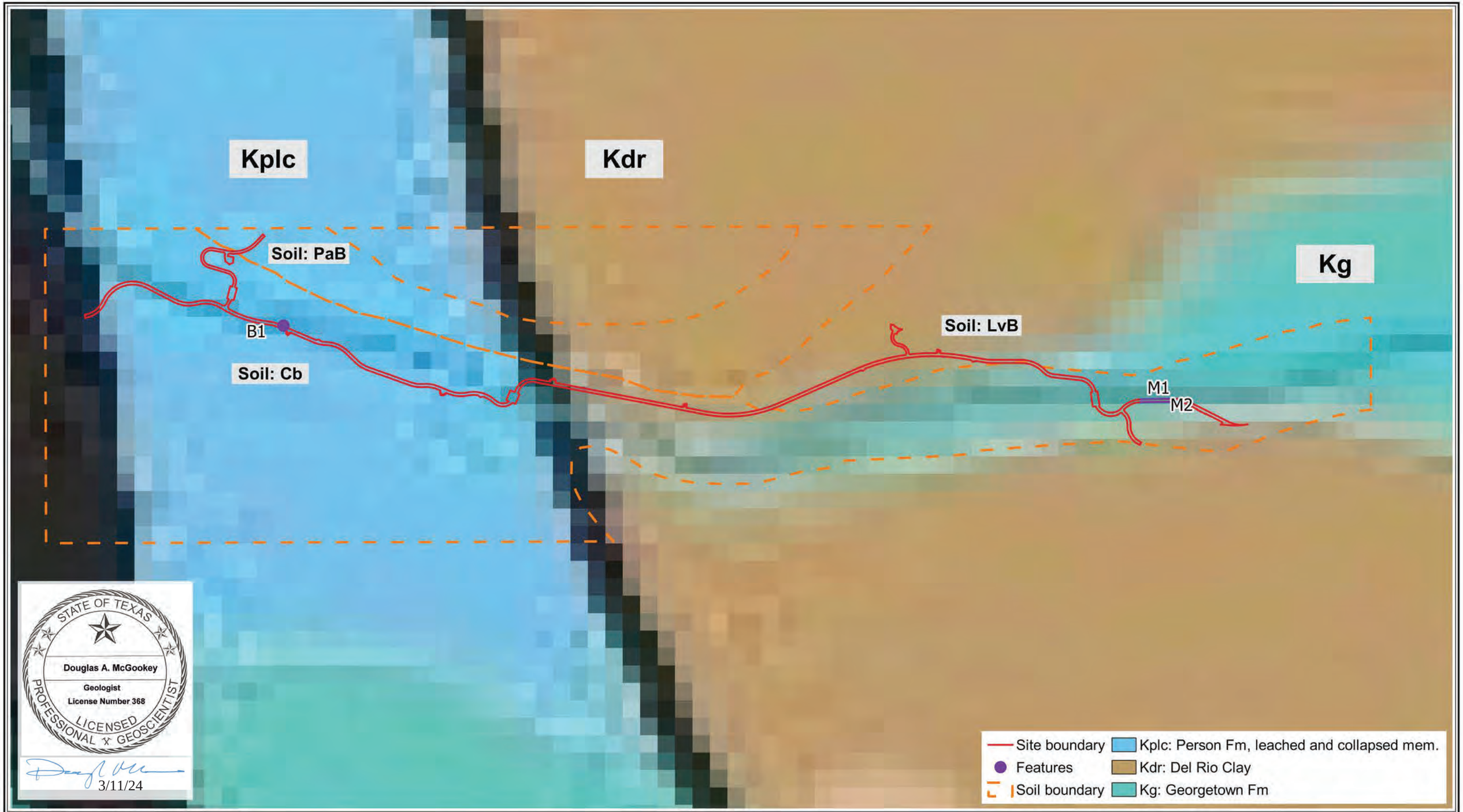
Attachment D
Site Geologic Map



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3/11/24

Sources: Clark, et al., 2016; USDA Web Soil Survey, 2023;

Medina Consulting Company, Inc.

Attachment D - Project Area Features, Soil, & Geology
Maverick Creek Trail
Geologic Assessment
San Antonio, Bexar County, Texas

Author: Dawne M. Butler 9/6/2023

280 0 280 ft

1:3360

APPENDIX F: GBA INFORMATION

Important Information about This

Geotechnical-Engineering Report

Subsurface problems are a principal cause of construction delays, cost overruns, claims, and disputes.

While you cannot eliminate all such risks, you can manage them. The following information is provided to help.

The Geoprofessional Business Association (GBA) has prepared this advisory to help you – assumedly a client representative – interpret and apply this geotechnical-engineering report as effectively as possible. In that way, clients can benefit from a lowered exposure to the subsurface problems that, for decades, have been a principal cause of construction delays, cost overruns, claims, and disputes. If you have questions or want more information about any of the issues discussed below, contact your GBA-member geotechnical engineer. Active involvement in the Geoprofessional Business Association exposes geotechnical engineers to a wide array of risk-confrontation techniques that can be of genuine benefit for everyone involved with a construction project.

Geotechnical-Engineering Services Are Performed for Specific Purposes, Persons, and Projects

Geotechnical engineers structure their services to meet the specific needs of their clients. A geotechnical-engineering study conducted for a given civil engineer will not likely meet the needs of a civil-works constructor or even a different civil engineer. Because each geotechnical-engineering study is unique, each geotechnical-engineering report is unique, prepared *solely* for the client. *Those who rely on a geotechnical-engineering report prepared for a different client can be seriously misled*. No one except authorized client representatives should rely on this geotechnical-engineering report without first conferring with the geotechnical engineer who prepared it. *And no one – not even you – should apply this report for any purpose or project except the one originally contemplated.*

Read this Report in Full

Costly problems have occurred because those relying on a geotechnical-engineering report did not read it *in its entirety*. Do not rely on an executive summary. Do not read selected elements only. *Read this report in full.*

You Need to Inform Your Geotechnical Engineer about Change

Your geotechnical engineer considered unique, project-specific factors when designing the study behind this report and developing the confirmation-dependent recommendations the report conveys. A few typical factors include:

- the client's goals, objectives, budget, schedule, and risk-management preferences;
- the general nature of the structure involved, its size, configuration, and performance criteria;
- the structure's location and orientation on the site; and
- other planned or existing site improvements, such as retaining walls, access roads, parking lots, and underground utilities.

Typical changes that could erode the reliability of this report include those that affect:

- the site's size or shape;
- the function of the proposed structure, as when it's changed from a parking garage to an office building, or from a light-industrial plant to a refrigerated warehouse;
- the elevation, configuration, location, orientation, or weight of the proposed structure;
- the composition of the design team; or
- project ownership.

As a general rule, *always* inform your geotechnical engineer of project changes – even minor ones – and request an assessment of their impact. *The geotechnical engineer who prepared this report cannot accept responsibility or liability for problems that arise because the geotechnical engineer was not informed about developments the engineer otherwise would have considered.*

This Report May Not Be Reliable

Do not rely on this report if your geotechnical engineer prepared it:

- for a different client;
- for a different project;
- for a different site (that may or may not include all or a portion of the original site); or
- before important events occurred at the site or adjacent to it; e.g., man-made events like construction or environmental remediation, or natural events like floods, droughts, earthquakes, or groundwater fluctuations.

Note, too, that it could be unwise to rely on a geotechnical-engineering report whose reliability may have been affected by the passage of time, because of factors like changed subsurface conditions; new or modified codes, standards, or regulations; or new techniques or tools. *If your geotechnical engineer has not indicated an "apply-by" date on the report, ask what it should be*, and, in general, *if you are the least bit uncertain* about the continued reliability of this report, contact your geotechnical engineer before applying it. A minor amount of additional testing or analysis – if any is required at all – could prevent major problems.

Most of the "Findings" Related in This Report Are Professional Opinions

Before construction begins, geotechnical engineers explore a site's subsurface through various sampling and testing procedures. *Geotechnical engineers can observe actual subsurface conditions only at those specific locations where sampling and testing were performed*. The data derived from that sampling and testing were reviewed by your geotechnical engineer, who then applied professional judgment to form opinions about subsurface conditions throughout the site. Actual sitewide-subsurface conditions may differ – maybe significantly – from those indicated in this report. Confront that risk by retaining your geotechnical engineer to serve on the design team from project start to project finish, so the individual can provide informed guidance quickly, whenever needed.

This Report's Recommendations Are Confirmation-Dependent

The recommendations included in this report – including any options or alternatives – are confirmation-dependent. In other words, *they are not final*, because the geotechnical engineer who developed them relied heavily on judgment and opinion to do so. Your geotechnical engineer can finalize the recommendations *only after observing actual subsurface conditions* revealed during construction. If through observation your geotechnical engineer confirms that the conditions assumed to exist actually do exist, the recommendations can be relied upon, assuming no other changes have occurred. *The geotechnical engineer who prepared this report cannot assume responsibility or liability for confirmation-dependent recommendations if you fail to retain that engineer to perform construction observation.*

This Report Could Be Misinterpreted

Other design professionals' misinterpretation of geotechnical-engineering reports has resulted in costly problems. Confront that risk by having your geotechnical engineer serve as a full-time member of the design team, to:

- confer with other design-team members,
- help develop specifications,
- review pertinent elements of other design professionals' plans and specifications, and
- be on hand quickly whenever geotechnical-engineering guidance is needed.

You should also confront the risk of constructors misinterpreting this report. Do so by retaining your geotechnical engineer to participate in prebid and preconstruction conferences and to perform construction observation.

Give Constructors a Complete Report and Guidance

Some owners and design professionals mistakenly believe they can shift unanticipated-subsurface-conditions liability to constructors by limiting the information they provide for bid preparation. To help prevent the costly, contentious problems this practice has caused, include the complete geotechnical-engineering report, along with any attachments or appendices, with your contract documents, *but be certain to note conspicuously that you've included the material for informational purposes only*. To avoid misunderstanding, you may also want to note that "informational purposes" means constructors have no right to rely on the interpretations, opinions, conclusions, or recommendations in the report, but they may rely on the factual data relative to the specific times, locations, and depths/elevations referenced. Be certain that constructors know they may learn about specific project requirements, including options selected from the report, *only* from the design drawings and specifications. Remind constructors that they may perform their own studies if they want to, and *be sure to allow enough time* to permit them to do so. Only then might you be in a position to give constructors the information available to you, while requiring them to at least share some of the financial responsibilities stemming from unanticipated conditions. Conducting prebid and preconstruction conferences can also be valuable in this respect.

Read Responsibility Provisions Closely

Some client representatives, design professionals, and constructors do not realize that geotechnical engineering is far less exact than other engineering disciplines. That lack of understanding has nurtured unrealistic expectations that have resulted in disappointments, delays, cost overruns, claims, and disputes. To confront that risk, geotechnical engineers commonly include explanatory provisions in their reports. Sometimes labeled "limitations," many of these provisions indicate where geotechnical engineers' responsibilities begin and end, to help others recognize their own responsibilities and risks. *Read these provisions closely*. Ask questions. Your geotechnical engineer should respond fully and frankly.

Geoenvironmental Concerns Are Not Covered

The personnel, equipment, and techniques used to perform an environmental study – e.g., a "phase-one" or "phase-two" environmental site assessment – differ significantly from those used to perform a geotechnical-engineering study. For that reason, a geotechnical-engineering report does not usually relate any environmental findings, conclusions, or recommendations; e.g., about the likelihood of encountering underground storage tanks or regulated contaminants. *Unanticipated subsurface environmental problems have led to project failures*. If you have not yet obtained your own environmental information, ask your geotechnical consultant for risk-management guidance. As a general rule, *do not rely on an environmental report prepared for a different client, site, or project, or that is more than six months old.*

Obtain Professional Assistance to Deal with Moisture Infiltration and Mold

While your geotechnical engineer may have addressed groundwater, water infiltration, or similar issues in this report, none of the engineer's services were designed, conducted, or intended to prevent uncontrolled migration of moisture – including water vapor – from the soil through building slabs and walls and into the building interior, where it can cause mold growth and material-performance deficiencies. Accordingly, ***proper implementation of the geotechnical engineer's recommendations will not of itself be sufficient to prevent moisture infiltration.*** Confront the risk of moisture infiltration by including building-envelope or mold specialists on the design team. ***Geotechnical engineers are not building-envelope or mold specialists.***

GEOPROFESSIONAL BUSINESS ASSOCIATION

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e-mail: info@geoprofessional.org www.geoprofessional.org

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APPENDIX G: PROJECT QUALITY ASSURANCE

A Message to Owners from ASFE/GBA

Construction-materials engineering and testing (CoMET) consultants perform quality-assurance (QA) services to evaluate how well constructors are achieving the specified conditions they're contractually obligated to achieve. Done right, QA can save you time and money while helping you manage project risks by detecting molehills before they grow into mountains you and the design team are forced to climb.

Done right, QA can save you time and money; prevent claims and disputes; and reduce risks. Many owners don't do QA right because they follow bad advice.

It's ironic that, as important as CoMET consultants can be, some owners and design professionals treat them as though they were commodities. Often referred to incorrectly as "testing labs," CoMET consultants create the last line of defense against costly construction errors and the delays, change orders, claims, disputes, and litigation that can result. Why would owners entrust such an important responsibility to the firm offering to fulfill it for the lowest fee as opposed to the one whose qualifications enable it to offer the best service and the most value? The answer: Too many owners follow bad advice; e.g., "CoMET consultants are all the same. They all follow the same standards. They all have accredited laboratories and certified personnel. Go with the low bidder." That's bad advice because there's no such thing as a standard QA scope of service, meaning that – to bid – each interested firm *must* develop its own scope…and it has to be a cheap scope in order to offer the low fee the owner apparently prefers. A cheap scope cannot help but jeopardize service quality, aggravating risk for you and the entire project team. Of course, some firms will offer what seems to be a better scope at a "low-ball," less-than-cost bid in order to win the commission and then earn a profit through multiple change orders.

You have too much at stake to follow bad advice. Consider these facts.

Fact: ***Most CoMET firms are not accredited,*** including some that say they are and some that don't even follow the correct standards, even when they say they do. And the quality of those that are accredited varies significantly; some practice at a high level; others just barely scrape by. As such, while accreditation is extremely important, it is far from being a "be-all and end-all." It signifies only that a firm's facilities or operations met the *minimum criteria* of an accrediting body whose concerns in some cases may have little to do with your project. And the condition of what an accrediting body typically evaluates – management systems, technical staff, facilities, and equipment – can change substantially between on-site accreditation assessments.

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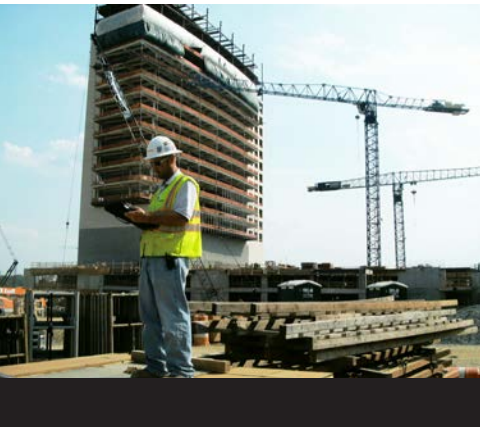
Internet: www.asfe.org



Most CoMET firms are not accredited and it's dangerous to assume CoMET personnel are certified.

Fact: ***It's dangerous to assume CoMET personnel are certified.*** Many have no credentials; some are certified by organizations of questionable merit, while others have a valid certification, but *not* for the services they're assigned. All too many have little training or none at all.

Some CoMET firms – the "low-cost providers" – *want* you to believe that price is the only difference between QA providers. It's not: Firms that sell low price typically lack:

- facilities appropriate for many of the projects they accept,
- equipment that is well maintained and properly calibrated,
- field and laboratory personnel who are well trained and appreciate the importance of their responsibilities,
- management with the education, experience, and judgment to provide technical oversight, and
- the professional-liability insurance you should require to enjoy peace of mind.

Quality-oriented firms invest in the facilities, equipment, personnel, and insurance needed to achieve quality in quality assurance.

Quality-oriented firms invest in the facilities, equipment, personnel, and insurance needed to achieve quality in quality assurance.

To derive maximum value from your QA investment, have the CoMET firm's project manager serve actively on the project team from beginning to end, a level of service that's relatively inexpensive and can pay huge dividends. During the project's planning and design stages, experienced CoMET professionals can help the design team develop consistent, cost-effective technical specifications and establish appropriate observation, testing, and instrumentation protocols. They can analyze plans and specs much as constructors do, looking for the little errors, omissions, conflicts, and ambiguities that often lead to the misunderstandings and confusion that become the basis for big extras and big claims. They can also provide guidance about operations and materials that need closer review than others, because of their criticality or potential for error or abuse, and even suggest reduced levels of review or testing for areas of a less critical nature, based on local experience. You can also benefit from a CoMET professional's frank assessments of the various constructors that have expressed interest in the project.

To derive maximum value, have the CoMET project manager serve actively on the project team from beginning to end.

CoMET consultants' construction-phase QA services focus on two distinct issues:

- those that relate to geotechnical engineering and
- those that relate to the other elements of construction.

Geotechnical-engineering issues are critically important because they are essential to the "observational method" geotechnical engineers use to help their clients save time and money while maintaining a "healthy respect" for the unknown in the underground.

In essence, the observational method is an overall approach that begins during the earliest element of the design phase and carries through

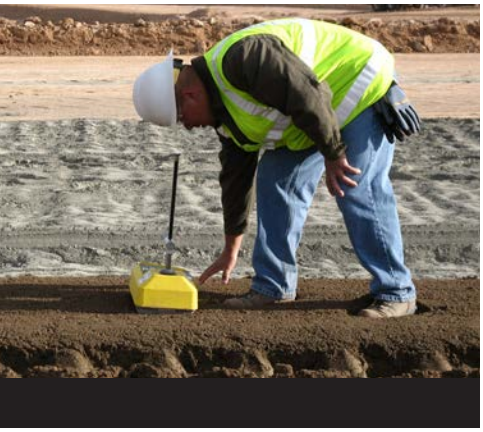
to the construction phase. Geotechnical engineers initiate this approach by applying their knowledge of local geological conditions to develop an economical subsurface-sampling plan. Proper execution of the plan should derive just enough samples from just enough areas to permit an experienced geotechnical engineer to develop an assumed-subsurface profile. Because so much depends on the reliability of each sample, quality-focused geotechnical engineers often insist that their own personnel perform or oversee the sampling process, from obtaining the samples to packaging, storing, and transporting them to a trusted laboratory, using their own equipment and facilities or relying on others' they know they can trust.

Combining the assumed subsurface profile with knowledge of what is being constructed – e.g., its dimensions, weight, anticipated use, and performance objectives – geotechnical engineers develop *provisional* recommendations for the structure's foundations and for the specifications of various "geo" elements, like excavations, site grading, foundation-bearing grades, and roadway and parking-lot preparation and surfacing. When geotechnical engineers know that their personnel will be on site observing subsurface conditions as they are exposed, they usually will recommend the most cost-effective design their assumptions make practical, knowing that – if their assumed-subsurface profile is "off" in any significant way – the variances will be caught (that's what they teach their field personnel to do), permitting them to "tweak" their recommendations in the field. *It is essential to realize that geotechnical engineers cannot finalize their recommendations until they or their field representatives are on site to observe what's excavated to verify that the subsurface conditions the engineers predicted are those that actually exist.*

Geotechnical engineers cannot finalize their recommendations until they are on site to verify that the subsurface conditions they predicted are those that actually exist. Entrusting geotechnical field observation to someone other than the geotechnical engineer of record creates a significant risk.

Insofar as **other elements of construction** are concerned, many geotechnical-engineering firms have obliged their clients by expanding their field-services mix, so they're able to perform overall construction QA, encompassing – in addition to geotechnical issues – reinforced concrete, structural steel, structural masonry, fireproofing, and so on. Unfortunately, that's caused some confusion. Believing that all CoMET consultants are alike, some owners take bids for the overall CoMET package, including the geotechnical field observation, thus curtailing services of the geotechnical engineer of record (GER). ***Entrusting geotechnical field observation to someone other than the GER creates a significant risk.***

GERs have developed a variety of protocols to optimize the quality of their field-observation procedures. Quality-focused GERs meet with their field representatives before the representatives leave for a project site, to brief them on what to look for and where, when, and how to look. (***No one can duplicate this briefing***, because no one else knows as much about a project's geotechnical issues.) And once they arrive at a project site, the field representatives know to maintain timely, effective communication with the GER, because that's what the GER has trained them to do. By contrast, it's extremely rare for a different



firm's field personnel to contact the GER, even when they're concerned or confused about what they observe, because they regard the GER's firm as "the competition." Convoluted project-communications protocols can make this communications breakdown even worse.

A different firm is often willing to perform on-site geotechnical review for less money than the GER, frequently because it treats geotechnical field services as a "loss leader" in order to obtain the far larger, overall CoMET commission. Given the significant risk that supplanting the GER creates, accepting the offer is almost always penny-wise and pound-foolish. Still, because some owners accept bad advice, it's commonly done, helping to explain why ***"geo" issues are the number-one source of construction-industry claims and disputes.***

Divorcing the GER from geotechnical field operations is almost always penny-wise and pound-foolish, helping to explain why "geo" issues are the number-one source of construction-industry claims and disputes.

To derive the biggest bang for the QA buck, identify three or even four quality-focused CoMET consultants. (If you don't know any, use the "Find a Geoprofessional" service available free at www.asfe.org.) Ask about the firms' ongoing and recent projects and the clients and client representatives involved; *insist upon receiving verification of all claimed accreditations, certifications, licenses, and insurance coverages.*

Insist upon receiving verification of all claimed accreditations, certifications, licenses, and insurance coverages.

Once you identify the two or three most qualified firms, meet with their key personnel, preferably at their own facility, so you can inspect their laboratory, speak with management and technical staff, and form an opinion about the firm's capabilities and attitude.

Insist that each firm's designated project manager and lead field representative participate in the meeting. You will benefit when those individuals are seasoned QA professionals familiar with construction's rough-and-tumble. Ask about others the firm will assign, too. There's no substitute for experienced, certified personnel who are familiar with the codes and standards involved and know how to:

- read and interpret plans and specifications;
- perform the necessary observation, inspection, and testing;
- document their observations and findings;
- interact with constructors' personnel; and
- respond to the unexpected.

Important: Many of the services CoMET QA field representatives perform – like observing operations and outcomes – require the good judgment afforded by extensive training and experience. Who will be on hand when the unexpected occurs: a 15-year "veteran" or a rookie?

Many of the services CoMET QA field representatives perform require good judgment.

Also consider the tools CoMET personnel use. Some firms are fanatical about proper maintenance and calibration; others, less so. Ask to see the firm's calibration records. If the firm doesn't have any, or if they are not current, be cautious: *You cannot trust test results derived using equipment that may be out of calibration.* Also ask if the firm's laboratory participates in

proficiency testing, relying on a program like the one sponsored by the American Association of State Highway and Transportation Officials (AASHTO). And be sure to ask a firm's representatives about their reporting practices, including report distribution and timeliness, how they handle notifications of nonconformance, and how they resolve complaints.

Once you identify your preferred firm, meet with its representatives again. Provide the approved plans and specifications and other pertinent materials, like a construction schedule, and discuss what's needed to finalize a scope of service that reflects what will be happening on site and when it will occur. Recognize that most CoMET services are performed periodically or randomly, not continuously. Also recognize that a CoMET consultant's field representatives cannot be in all places at all times, an important issue when multiple activities are ongoing simultaneously. Ask for guidance about appropriate staffing levels and discuss the trade-offs that may be available.

Creating a detailed scope of CoMET QA service can help avoid surprises. Still, scope flexibility is needed to deal promptly with the unanticipated, like the additional services required to check the rework performed because of an error caught in QA.

Scope flexibility is needed to deal promptly with the unanticipated.

For financing purposes, some owners require the constructor to pay for CoMET services. ***Consider an alternative approach*** so you don't convert the constructor into the CoMET consultant's client. If it's essential for you to fund QA via the constructor, have the CoMET fee included as an allowance in the bid documents. This arrangement ensures that you remain the CoMET consultant's client, and it prevents the CoMET fee from becoming part of the constructor's bid-price competition. (Note that the International Building Code (IBC) *requires the owner to pay* for Special Inspection (SI) services commonly performed by the CoMET consultant as a service separate from QA, to help ensure the independence of the SI process. Because failure to comply could result in denial of an occupancy or use permit, having a contractual agreement that conforms to local code requirements is essential.)

If it's essential for you to fund QA via the constructor, have the CoMET fee included as an allowance in the bid documents. Note, too, that the International Building Code (IBC) requires you to pay for Special Inspection (SI) services.

CoMET consultants can usually quote their fees as unit fees, unit fees with estimated total (invoiced on a unit-fee basis), or lump-sum (invoiced on a percent-completion basis referenced to a schedule of values). No matter which method is used, estimated quantities need to be realistic. Some CoMET firms lower their total-fee estimates by using quantities they know are too low and then request change orders long before construction and the need for QA are complete.

Once you and the CoMET consultant settle on the scope of service and fee, enter into a written contract. Established CoMET firms have their own contracts; most owners sign them. Some owners prefer to use different contracts, but that can be a mistake when the contract was prepared for construction services. *Professional services are different.* Wholly avoidable problems occur when a contract includes provisions that don't apply to the services involved and fails to include those that do.

Some owners create wholly avoidable problems by using a contract prepared for construction services.

This final note: CoMET consultants perform QA for owners, not constructors. While constructors are commonly given review copies of QA reports *as a courtesy*, you need to make it clear that constructors do *not* have a legal right to rely on those reports; i.e., if constructors want to forgo their own observation and testing and rely on results derived from a scope created to meet *only* the needs of the owner, they *must do so at their own risk.* In all too many cases where owners have failed to make that clear, constructors have alleged that they *did* have a legal right to rely on QA reports and, as a result, the CoMET consultant – not they – are responsible for their failure to deliver what they contractually promised to provide. The outcome can be delays and disputes that entangle you and all other principal project participants. Avoid that. Rely on CoMET professionals with the resources and attitude needed to manage this and other risks as an element of a quality-focused service. Involve them early. Keep them engaged. And listen to what they say. Good CoMET consultants can provide great value.

For more information, speak with representatives of a firm that's part of ASFE/ The Geoprofessional Business Association (GBA) or contact GBA staff. In either case, your inquiries will be warmly welcomed.

ASFE THE GEOPROFESSIONAL BUSINESS ASSOCIATION

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Recharge and Transition Zone Exception Request Form

Texas Commission on Environmental Quality
30 TAC §213.9 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 **Recharge and Transition Zone Exception Request Form** is hereby submitted for TCEQ review and executive director approval. The request was prepared by:

Print Name of Customer/Agent: Luis Cardona, P.E.
Date: 1/31/24
Signature of Customer/Agent:

Regulated Entity Name: COSA Maverick Creek Trail from UTSA Blvd to Loop 1604

Exception Request

1. ☒ **Attachment A - Nature of Exception**. A narrative description of the nature of each exception requested is attached. All provisions of 30 TAC §213 Subchapter A for which an exception is being requested have been identified in the description.
2. ☒ **Attachment B - Documentation of Equivalent Water Quality Protection**. Documentation demonstrating equivalent water quality protection for the Edwards Aquifer is attached.

Administrative Information

3. ☒ 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.
4. ☒ The applicant understands that no exception will be granted for a prohibited activity in Chapter 213.
5. ☒ The applicant understands that prior approval under this section must be obtained from the executive director for the exception to be authorized.

FORM TCEQ-0628 ATTACHMENTS

ATTACHMENT A — NATURE OF EXCEPTION

The City of San Antonio (COSA) – Parks and Recreation is proposing improvements to Maverick Creek Greenway Trail, located west of Highway I -10 at UTSA Blvd, in Bexar County.

This project would construct 3,751 of 10’ shared use paths along the length of Maverick Creek Trail and would add approximately 54,450 square feet (1.25 acres) of impervious surfaces over the Recharge Zone. The approximate project acreage is 3.72 acres (162,043 square feet) and the project will only disturb within this area for trail construction. Due to the minimal addition of impervious surface, the construction of shared us path vegetative filter strips will be constructed, and an Exception Request will be completed.

ATTACHMENT B — DOCUMENTATION OF EQUIVALENT WATER QUALITY PROTECTION

Equivalent water quality protection will include adding 5’ of vegetative filter strips for the 10’ trail section, along both sides of proposed trail. The existing established outside of the area of disturbance will be protected and utilized as an established vegetative filter strip. See attached Environmental Layout

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: Luis Caronda, P.E.

Date: 1/31/24

Signature of Customer/Agent:

Regulated Entity Name: Maverick Creek Greenway from UTSA Blvd to Loop 1604

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: Maverick 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.

FORM TCEQ-0602 ATTACHMENTS

ATTACHMENT A — SPILL RESPONSE ACTIONS

Should an accidental release occur, it will be immediately contained by earthen dikes, berms or other appropriate measures. Free liquids will be stabilized promptly using bulking agents, absorbent pads, booms, soil or other appropriate material. Once no free liquids are present in the containment area, the released material will be picked up mechanically or by personnel wearing proper protective equipment and stored in 55 gallon steel drums or on plastic sheeting. Released material will be covered to prevent contact with stormwater. Stormwater runoff will be diverted around the stored material if necessary. Traffic will be routed around and away from any spill to avoid spreading the spilled material to other areas.

The Contractor is required to remediate any spills, and to immediately report spills (including sanitary sewer discharge) of reportable quantities to the following:

- National Response Center at (800) 424-8802
- Edwards Aquifer Authority at (210) 222-2204
- To the San Antonio Water Systems at (210) 704-7297 and one of the following:
    - State Emergency Response Center (800) 832-8224 (if after hours)
    - TCEQ Regional Office **(210) 490-3096** (if during business hours)

Spills shall be reported within 24 hours unless other regulations require more expedient notification.

ATTACHMENT B — POTENTIAL SOURCES OF CONTAMINATION

Potential sources of contamination include the hydrocarbons and fuels required to service and operate the construction equipment, the materials and liquids used to conduct paving operations, various paints and solvents, and soil disturbed and mobilized during excavation.

ATTACHMENT C — SEQUENCE OF MAJOR ACTIVITIES

The sequence of major activities are as follows:

1. Prep trail alignment, by excavating eight (8) inches of existing ground.
2. Construct proposed trail section.
3. Install vegetative filter strips along trail alignment.

ATTACHMENT D – TEMPORARY BEST MANAGEMENT PRACTICES AND MEASURES

General timing or sequence for implementation of BMPs shall be as required and/or as directed/approved by the Engineer to provide adequate controls. BMPs shown on the plan sheets are considered “proposed” unless/until install date is shown.

At the beginning of the construction phase, compost logs will be installed downstream of trail cross slope, and along proposed trail alignment. All temporary BMPs will remain until the end of construction.

Runoff generated from construction limits and through these temporary BMPs, preventing pollution of surface water, groundwater, or stormwater.

The locations of temporary BMPs are shown on the Erosion Control Plan sheet. Standard details show information relevant to BMP installation and maintenance.

ATTACHMENT E – REQUEST TO TEMPORARILY SEAL A FEATURE

Not applicable.

ATTACHMENT F – STRUCTURAL PRACTICES

Sediment derived from excavation and grading will be controlled through the use of compost logs.

ATTACHMENT G – DRAINAGE AREA MAP

Attached – Drainage Area Map & Site Plan sheet.

ATTACHMENT H – TEMPORARY SEDIMENT POND(S) PLAN AND CALCULATIONS

Sediment ponds are not planned for this project.

ATTACHMENT I – INSPECTION AND MAINTENANCE FOR BMPS

The key to maintaining the performance of and efficiency of the temporary BMPs is inspection and repair when needed. The project will use an established schedule of inspection to identify the weak or failing sections of the sediment controls and institute repairs immediately to ensure the continued performance of the installed BMPs. BMPs will be inspected at least weekly. If storms damage the BMPs, efforts will be made to immediately restore them to original performance levels.

ATTACHMENT J – SCHEDULE OF INTERIM AND PERMANENT SOIL STABILIZATION PRACTICES

Disturbed areas on which construction activities have ceased, temporarily or permanently, shall be stabilized within fourteen (14) calendar days unless they are scheduled to and do resume within 21 calendar days. The schedule for major soil disturbing activities includes the following:

1. Install controls down-slope of work area and initiate inspection and maintenance activities.

2. Begin construction with interim stabilization practices. Adjust erosion and sedimentation controls during construction to meet requirements and changing conditions and as directed/approved by the Engineer.

3. Major soil disturbing activities may include, but are not limited to: preparation of trail alignment – including excavating 8” down for preparation of proposed trail section.

SITE DESCRIPTION

1. PROJECT NAME AND LOCATION: MAVERICK CREEK GREENWAY (UTSA BOULEVARD TO LOOP 1604)
PROJECT: THE SITE IS LOCATED 2.0 MILES WEST OF THE INTERSECTION OF IH-10 WEST AND LOOP 1604, AND APPROXIMATELY 1.4 MILES SOUTH OF LOOP 1604 ALONG BABCOCK ROAD.

2. CONTACT AND PHONE NO.: SAMUEL SANCHEZ, AIA, LEED-AP: CITY OF SAN ANTONIO 210-207-4091

3. PROJECT DESCRIPTION: THE PROJECT CONSISTS OF CONSTRUCTING 0.73 MILES OF GREENWAY TRAIL FROM UTSA BOULEVARD TO JUST SOUTH OF LOOP 1604.

4. __X__ LINEAR ROW OR _____ NON-LINEAR ROW

5. POTENTIAL POLLUTANT SOURCES AT THE CONSTRUCTION PROJECT MAY INCLUDE (CHECK ALL THAT APPLY):

X DUST	__ LITTER/TRASH	__ CONTAMINATED SOILS
X VEHICLE FLUIDS	X AGGREGATE, BASE, SAND	__ FERTILIZERS/HERBICIDES
X OIL AND GREASE	__ SAND SPOILS (DESCRIBE)	__ CONCRETE WASHOUT
__ VEHICLE WASH WATER	__ OTHER CHEMICALS (DESCRIBE)	

6. MAJOR SOIL DISTURBING ACTIVITIES:
   1. CLEARING & GRUBBING;
   2. CUT AND/OR FILL FOR GREENWAY TRAIL;
   4. FINAL GRADING AND PLACEMENT OF TOPSOIL;
   5. LANDSCAPING.

TOTAL PROJECT AREA (ACRES): 6.0 MATERIAL STORAGE AREAS (ACRES): ______ SUPPORTING ASPHALT PLANT: ______
TOTAL AREA TO BE DISTURBED: 2.1 ACRES SUPPORTING CONCRETE BATCH PLANT: ______ SUPPORTING BARROW PIT: ______
LAYDOWN YARDS: ______ OTHER: ______

7. WEIGHTED RUNOFF COEFFICIENT (AFTER CONSTRUCTION):

8. EXISTING CONDITION OF SOIL, SOIL TYPE, VEGETATIVE COVER AND % OF VEGETATIVE COVER:
EXISTING SITE IS APPROXIMATELY 75% VEGETATIVE AND 25% DISTURBED AREA FROM PREVIOUS OPERATIONS.

9. DESCRIPTION OF WATER DISCHARGED NOT ASSOCIATED WITH CONSTRUCTION:
THE SITE LIES WITHIN THE LEON CREEK WATERSHED AND IS LOCATED WITHIN THE RECHARGE ZONE OF THE EDWARDS AQUIFER. THE SITE GENERALLY SLOPES FROM NORTH TO SOUTH AT 2%.

10. NAMES AND SEGMENT NUMBERS OF RECEIVING WATERS THAT WILL RECEIVE DISCHARGES FROM DISTURBED AREAS OF THE PROJECT:
MAVERICK CREEK (UPPER LEON CREEK WATERSHED)
UPPER LEON CREEK (1907)

11. IDENTIFY STORMWATER DISCHARGE POINTS:
STORMWATER WILL BE DISCHARGED POST-CONSTRUCTION VIA SHEET FLOW THROUGH VEGETATIVE FILTER STRIPS INTO MAVERICK CREEK AND ULTIMATELY INTO LEON CREEK.

12. DESCRIPTION AND TIME FRAME FOR INSTALLATION OF STABILIZATION PRACTICES IN CONJUNCTION WITH CONSTRUCTION:
ALL SW3P MEASURES FOR EACH RESPECTIVE PHASE SHALL BE INSTALLED PRIOR TO COMMENCING CONSTRUCTION ACTIVITIES.

EROSION AND SEDIMENTATION CONTROLS

1. SOIL STABILIZATION PRACTICES:

X HYDROMULCHING	X PRESERVATION OF NATURAL RESOURCES
__ TEMPORARY SEEDING	__ FLEXIBLE CHANNEL LINER
X PERMANENT PLANTING, SODDING OR SEEDING	__ RIGID CHANNEL LINER
__ MULCHING	__ COMPOST MANUFACTURED TOPSOIL
X SOIL RETENTION BLANKET	__ OTHER (BIO LOGS)
__ BUFFER ZONES	

OTHER:
DISTURBED AREAS ON WHICH CONSTRUCTION ACTIVITY HAS CEASED TEMPORARILY OR PERMANENTLY, SHALL BE STABILIZED WITHIN 14 DAYS UNLESS ACTIVITIES ARE SCHEDULED TO RESUME AND DONE WITHIN 21 DAYS.

2. STRUCTURAL PRACTICES:
- X SILT FENCES
- __ HAY BALES
- X GRAVEL FILTRATION BAGS
- X ROCK BERMS
- __ DIVERSION, INTERCEPTOR OR PERIMETER DIKES
- __ DIVERSION, INTERCEPTOR OR PERIMETER SWALES
- __ DIVERSION, DIKE AND SWALE COMBINATIONS
- __ PAVED FLUMES
- X ROCK BEDDING AT CONSTRUCTION EXIT (STABILIZED ENTRANCE)
- __ TIMBER MATTING AT CONSTRUCTION EXIT (STABILIZED ENTRANCE)
- __ CHANNEL LINERS
- __ SEDIMENT TRAPS
- __ SEDIMENT BASINS
- __ STORM INLET SEDIMENT TRAP
- __ STONE OUTLET SEDIMENT STRUCTURES
- __ CURBS AND GUTTERS
- __ STORM SEWERS
- __ VELOCITY CONTROL STRUCTURES
- __ GEOTEXTILES

OTHER:

3. NARRATIVE - SEQUENCE OF CONSTRUCTION (STORMWATER MANAGEMENT) ACTIVITIES:
INSTALL SW3P MEASURES, INSTALL TREE PROTECTION, INSTALL LOW WATER CROSSING AND DRAINAGE INFRASTRUCTURE, ROUGH GRADE TRAIL ROUTE, INSTALL TRAIL AND FLATWORK, INSTALL SIGNAGE, INSTALL LANDSCAPING, VEGETATE TO ESTABLISHMENT, REMOVE SW3P MEASURES.

4. A DESCRIPTION OF MAINTENANCE PROCEDURES FOR CONTROL MEASURES USED:
SEE MAINTENANCE NOTE

5. STORMWATER MANAGEMENT (POST CONSTRUCTION):
AS PER SW3P PLANS (DURING CONSTRUCTION ACTIVITIES)

6. A DESCRIPTION OF PERMANENT STORM WATER MANAGEMENT CONTROLS:
STORMWATER BMP, STORMWATER DETENTION, PERMANENT SEEDING AND SODDING

7. THE FOLLOWING ITEMS SHOULD BE UPDATED AS NECESSARY AND BE INCLUDED AS PART OF THE WEEKLY INSPECTION REPORTS.

SCHEDULE OF CONSTRUCTION ACTIVITIES IS MAINTAINED BY ____________ AND CAN BE ACCESSED BY CONTACTING ______________ (NAME) AT ____________ (PHONE).

INSTALLATION OF STORMWATER CONTROL MEASURES (INSTALL DATE, OPERATIONAL DATE, DEVIATION FROM MANUFACTURE SPEC):

COMMENCEMENT AND DURATION OF EARTH WORK, FINAL GRADING, CREATION OF SOIL AND VEGETATION STOCKPILES REQUIRING STABILIZATION:

CESSATION OF CONSTRUCTION ACTIVITIES WITHIN A PORTION OF THE SITE (TEMPORARY AND PERMANENT):

FINAL AND TEMPORARY STABILIZATION AREAS OF EXPOSED SOILS:

REMOVAL OF TEMPORARY STORMWATER CHANNELS, CONTROL MEASURES, CONSTRUCTION EQUIPMENT AND VEHICLES, AND CESSATION OF ANY POLLUTANT-GENERATING ACTIVITIES:

INVENTORY OF EXPOSED MATERIALS:

LOG OF SPILLS AND LEAKS:

NOTE:
SW3P NARRATIVE TO ACCOMPANY SITE MAP AND PROJECT DESIGN SHEETS THAT INCLUDE IDENTIFYING EARTH DISTURBING ACTIVITIES, EXISTING AND PROPOSED SLOPES OF GRADING ACTIVITIES, CONSTRUCTION AND SOIL STOCKPILE LOCATIONS,SURFACE WATER CROSSINGS, DESIGNATED EXIT POINTS, STRUCTURES AND IMPERVIOUS SURFACES TO BE CONSTRUCTED, CONSTRUCTION SUPPORT ACTIVITY AREAS, LOCATION OF ALL SURFACE WATERS IN VICINITY, BOUNDARIES OF NATURAL BUFFERS, AREAS OF FEDERALLY LISTED CRITICAL HABITAT, TOPOGRAPHY, VEGETATIVE COVER AND DRAINAGE PATTERNS OF FLOWS ONTO, OVER AND FROM THE PROJECT SITE, STORMWATER AND ALLOWABLE NON STORMWATER DISCHARGE LOCATIONS, ALL STORM INLETS ON AND IN VICINITY OF THE SITE, LOCATION OF ALL POTENTIAL POLLUTANT GENERATING ACTIVITIES, AND LOCATION OF STORMWATER CONTROL MEASURES.

OCTOBER 2014
CITY OF SAN ANTONIO
PUBLIC WORKS DEPARTMENT
STORM WATER POLLUTION PREVENTION PLAN (SW3P) NARRATIVE
SHEET 1 OF 2

95 % SUBMITTAL	PROJECT NO.: 23-04027		DATE: 3/19/2024
DRWN. BY: CT	DSGN. BY: JT	CHKD. BY: JT	SHEET NO.: ___ OF xx

BEST MANAGEMENT PRACTICES

1. NATURAL BUFFER SECTION:
_________ 50-FOOT (OR MORE) BUFFER ZONE
_________ LESS THAN 50-FOOT BUFFER ZONE
___X___ LINEAR CONSTRUCTION PROJECT; DOES NOT REQUIRE 50-FOOT BUFFER ZONE

2. GENERAL REQUIREMENTS:
   1. INSTALL PERIMETER CONTROLS TO RETAIN SEDIMENT ON-SITE TO THE EXTENT PRACTICABLE WITH CONSIDERATION FOR LOCAL TOPOGRAPHY, SOIL TYPE, AND RAINFALL.
   2. MINIMIZE SEDIMENT TRACK OUT ONTO OFF-SITE STREETS, OR OTHER PAVED AREAS AND SIDEWALKS. RESTRICT VEHICLE USE TO PROPERTY THROUGH DESIGNATED ACCESS POINTS. USE APPROPRIATE STABILIZATION MEASURES. REMOVE SEDIMENT FROM TIRES, WHEN PRACTICABLE.
   3. CONTROL DISCHARGES FROM STOCKPILED SEDIMENT BY:
      1) LOCATING PILES OUTSIDE OF NATURAL BUFFERS AND PHYSICALLY SEPARATING PILES FROM OTHER STORMWATER CONTROLS
      2) USE A TEMPORARY PERIMETER SEDIMENT BARRIER
      3) PROVIDE COVER OR TEMPORARY STABILIZATION, WHERE PRACTICABLE
      4) USE DRY CLEAN UP METHODS TO REMOVE ACCUMULATED SEDIMENT FROM PAVED AREAS
      5) PROTECT FROM WIND WHERE FEASIBLE
   4. MINIMIZE DUST THROUGH THE APPROPRIATE APPLICATION OF WATER.
   5. MINIMIZE SLOPE STEEPNESS OF EXPOSED SOILS THROUGH PHASED DISTURBANCE AND IMPLEMENTATION OF BMP'S.
   6. MINIMIZE SOIL COMPACTION IN AREAS WHERE RE-VEGETATION IS PLANNED BY RESTRICTING VEHICLE USE AND CONDITION SOIL PRIOR TO RE-VEGETATION.
   7. PROTECT STORM DRAIN INLETS PRIOR TO LAND DISTURBANCE.

3. SEDIMENTATION BASINS:
SEDIMENTATION BASINS (CHECK ALL THAT APPLY)
____ DRAINAGE AREA > 10 ACRES (SEDIMENTATION BASIN DESIGN ON SHEET _______)
____ DRAINAGE AREA > 10 ACRES (SEDIMENTATION BASIN INFEASIBLE-ALTERNATE EQUIVALENT CONTROL DESIGN ON SHEET _______)
____ DRAINAGE AREA < 10 ACRES (SEDIMENT TRAPS AND BASINS)
_X_ DRAINAGE AREA < 10 ACRES (PERIMETER CONTROLS)

4. DEWATERING PRACTICES:
   1. DO NOT DISCHARGE VISIBLE FLOATING SOLIDS OR FOAM; USE AN OIL-WATER SEPARATOR OR SUITABLE FILTRATION DEVICE THAT IS DESIGNED TO REMOVE OIL, GREASE, OR OTHER PRODUCTS IF DEWATERING WATER IS FOUND TO CONTAIN THESE MATERIALS.
   2. UTILIZE VEGETATED UPLAND AREAS OF THE SITE TO INFILTRATE DEWATERING WATER BEFORE DISCHARGE, WHERE FEASIBLE.
   3. DISCHARGE DEWATERING WATER ONTO A VELOCITY DISSIPATION DEVICE.
   4. MANAGE BLACKWASH WATER AS A WASTE OR RETURN IT TO THE BEGINNING OF THE TREATMENT PROCESS.
   5. REPLACE AND CLEAN FILTER MEDIA USED IN DEWATERING DEVICE ACCORDING TO MANUFACTURE'S SPECIFICATIONS.
   6. DO NOT USE TREATMENT CHEMICALS WITHOUT PRIOR WRITTEN CONSENT FROM COSA. A WRITTEN MANAGEMENT PLAN IS REQUIRED FOR USE OF TREATMENT CHEMICALS.

5. NON STORM WATER DISCHARGES:
THE FOLLOWING NON-STORMWATER DISCHARGES ARE AUTHORIZED FOR DISCHARGE BY THE GENERAL PERMIT. PROJECT SITE MAPS MUST REFLECT THE LOCATIONS OF ANY NON-STORMWATER DISCHARGES. NON-STORMWATER DISCHARGES MUST BE MANAGED BY STORMWATER BMP'S TO PROTECT RECEIVING WATER QUALITY.
   1. DISCHARGES FROM FIRE FIGHTING ACTIVITIES AND/OR FIRE HYDRANT FLUSHING.
   2. VEHICLE, EXTERNAL BUILDING, AND PAVEMENT WASH WATER WHERE DETERGENTS AND SOAPS ARE NOT USED AND WHERE SPILLS OR LEAKS OF TOXIC OR HAZARDOUS MATERIALS HAVE NOT OCCURRED (UNLESS ALL SPILLED MATERIAL HAS BEEN REMOVED).
   3. PLAIN WATER USED TO CONTROL DUST.
   4. PLAIN WATER ORIGINATING FROM POTABLE WATER SOURCES.
   5. UNCONTAMINATED GROUNDWATER, SPRING WATER, OR ACCUMULATED STORMWATER.
   6. FOUNDATION OR FOOTING DRAINS WHERE FLOWS ARE NOT CONTAMINATED WITH PROCESS MATERIALS SUCH AS SOLVENTS.
   7. UNCONTAMINATED AIR CONDITIONING CONDENSATE.
   8. LAWN WATERING AND SIMILAR DRAINAGE.
   9. OTHER

6. PROHIBITED STORM WATER DISCHARGES:
   1. WASTEWATER FROM WASH OUT OF CONCRETE TRUCKS.
   2. WASTEWATER FROM WASH OUT AND CLEAN OUT OF STUCCO, PAINT, FORM RELEASE OILS, CUTTING COMPOUNDS, AND OTHER CONSTRUCTION MATERIALS.
   3. FUELS, OILS, OR OTHER POLLUTANTS USED IN VEHICLE AND EQUIPMENT OPERATIONS AND MAINTENANCE.
   4. SOAPS OR SOLVENTS USED IN VEHICLE AND EQUIPMENT WASHING.

NOTE - DO NOT USE TREATMENT CHEMICALS WITHOUT PRIOR WRITTEN CONSENT FROM COSA. A WRITTEN MANAGEMENT PLAN IS REQUIRED FOR USE OF TREATMENT CHEMICALS.

7. CONCRETE TRUCK WASH WATER DISCHARGES ON THE SITE SHOULD BE PROHIBITED OR MINIMIZED. IF ALLOWED BY THE ENGINEER, THEY MUST BE MANAGED IN A MANNER SO AS NOT TO CONTAMINATE SURFACE WATER. THEY MUST NOT BE LOCATED IN AREAS OF CONCENTRATED FLOW. CONCRETE TRUCK WASH-OUT LOCATIONS MUST BE SHOWN ON THE SW3P LAYOUT AND INCLUDED IN THE INSPECTIONS. HAZARDOUS MATERIAL SPILL/LEAK SHALL BE PREVENTED OR MINIMIZED. AT A MINIMUM, THIS INCLUDES ASPHALT PRODUCTS, FUELS, OILS, LUBRICANTS, SOLVENTS, PAINTS, ACIDS, CONCRETE CURING COMPOUNDS, AND CHEMICAL ADDITIVES FOR SOIL STABILIZATION. BMP'S SHALL BE IMPLEMENTED TO THE STORAGE OF THESE PRODUCTS. ALL SPILLS MUST BE CLEANED AND DISPOSED PROPERLY AND REPORTED TO THE ENGINEER. REPORT ANY RELEASE AT OR ABOVE THE REPORTABLE QUANTITY DURING A 24 HOUR PERIOD TO THE NATIONAL RESPONSE CENTER AT 1-800-424-8802.

8. MATERIAL MANAGEMENT PRACTICES:
CONTRACTOR MUST MAINTAIN AN INVENTORY OF CONSTRUCTION AND WASTE MATERIALS EXPECTED TO BE STORED ON-SITE AND A DESCRIPTION OF CONTROLS IMPLEMENTED TO MINIMIZE POLLUTANTS FROM THESE SOURCES.

9. COMPLIANCE WITH APPROVED STATE AND LOCAL PLANS:
THIS SW3P SHALL CONFORM TO APPLICABLE LOCAL RULES AND REGULATIONS FOR WATER QUALITY, INCLUDING BUT NOT LIMITED TO THOSE ESTABLISHED BY COSA, SAWS, BEXAR COUNTY, EAA, OR OTHERS, AS APPLICABLE.

OTHER REQUIREMENTS AND PRACTICES

1. MAINTENANCE:
ALL EROSION AND SEDIMENT CONTROLS SHALL BE MAINTAINED IN GOOD WORKING ORDER. IF A REPAIR IS NECESSARY, IT SHALL BE PERFORMED BY CLOSE OF THE NEXT DAY FOLLOWING DISCOVERY. RECOMMENDATIONS FOR NEW BMP'S OR SIGNIFICANT REPAIRS TO EXISTING BMP'S MADE BY INSPECTORS OF THIS SWPPP OR BY THE EPA WILL BE INSTALLED WITHIN SEVEN (7) CALENDAR DAYS FROM THE DATE OF INSPECTION OR PRIOR TO THE NEXT RAIN EVENT, WHICHEVER IS SOONER. CORRECTIVE ACTIONS, SUCH AS TEMPORARY BMP'S, SHALL BE IMMEDIATELY TAKEN IN THE EVENT THAT A DISCHARGE OF POLLUTANTS IS DISCOVERED TO MINIMIZED OR PREVENT FURTHER DISCHARGE UNTIL A PERMANENT SOLUTION IS INSTALLED. WHEN CORRECTIVE ACTIONS RESULT IN CHANGES TO STORMWATER CONTROLS OR PROCEDURES, AMEND THE SWPPP.

2. INSPECTIONS:
FOR AREAS OF THE CONSTRUCTION SITE THAT HAVE NOT BEEN FINALLY STABILIZED, AREAS USED FOR STORAGE OF MATERIALS,STRUCTURAL CONTROL MEASURES, AND LOCATION WHERE VEHICLES ENTER OR EXIT THE SITE.

3. WASTE MATERIALS:
ALL NON-HAZARDOUS MUNICIPAL WASTE MATERIALS SUCH AS LITTER, RUBBISH, AND GARBAGE LOCATED ON OR ORIGINATING FROM THE PROJECT SHALL BE COLLECTED AND STORED IN A SECURELY LIDDED METAL DUMPSTER PROVIDED BY THE CONTRACTOR. THE DUMPSTER SHALL BE EMPTIED AS NECESSARY OR AS REQUIRED BY LOCAL REGULATION AND THE TRASH SHALL BE HAULED TO A PERMITTED DISPOSAL FACILITY. THE BURYING OF NON-HAZARDOUS MUNICIPAL WASTE ON THE PROJECT SHALL NOT BE PERMITTED. CONSTRUCTION MATERIAL WASTE SITES, STOCKPILES, AND HAUL ROADS SHALL BE CONSTRUCTED TO MINIMIZE AND CONTROL THE AMOUNT OF SEDIMENT THAT MAY ENTER RECEIVING WATERS. CONSTRUCTION MATERIALS WASTE SITES SHALL NOT BE LOCATED IN ANY WETLAND, WATER BODY, OR STREAM BED. CONSTRUCTION STAGING AREAS AND VEHICLE MAINTENANCE AREAS SHALL BE CONSTRUCTED IN A MANNER TO MINIMIZE THE RUNOFF OF POLLUTANTS.

4. OFFSITE VEHICLE TRACKING:
OFFSITE VEHICLE TRACKING OF SEDIMENT AND THE GENERATION OF DUST MUST BE MINIMIZED. EXCESS SEDIMENTS ON ROAD SHALL BE REMOVED ON A REGULAR BASIS AS DIRECTED/APPROVED BY THE ENGINEER.

5. SUPPORTING CONCRETE BATCH PLANTS:
THE CONTRACTOR SHOULD DEVELOP A SEPARATE SW3P FOR OPERATIONS ASSOCIATED WITH A SUPPORTING CONCRETE BATCH PLANT IN CONFORMANCE WITH THE TCEQ TPDES CONSTRUCTION GENERAL PERMIT, PART IV RELATING TO STORM WATER RUNOFF FROM CONCRETE BATCH PLANTS. THIS SW3P DOES NOT PROVIDE ADEQUATE CONTROLS FOR THIS ACTIVITY.

6. SANITARY WASTE:
PORT-A-POT (PLACED OUTSIDE OF FLOODPLAIN)

7. OFFSITE EXCAVATION SOURCE LOCATION:
CONTRACTOR TO REMOVE AND PLACE SPOILS DAILY.

8. OFFSITE FILL SOURCE LOCATION:
CONTRACTOR TO REMOVE AND PLACE SPOILS DAILY.

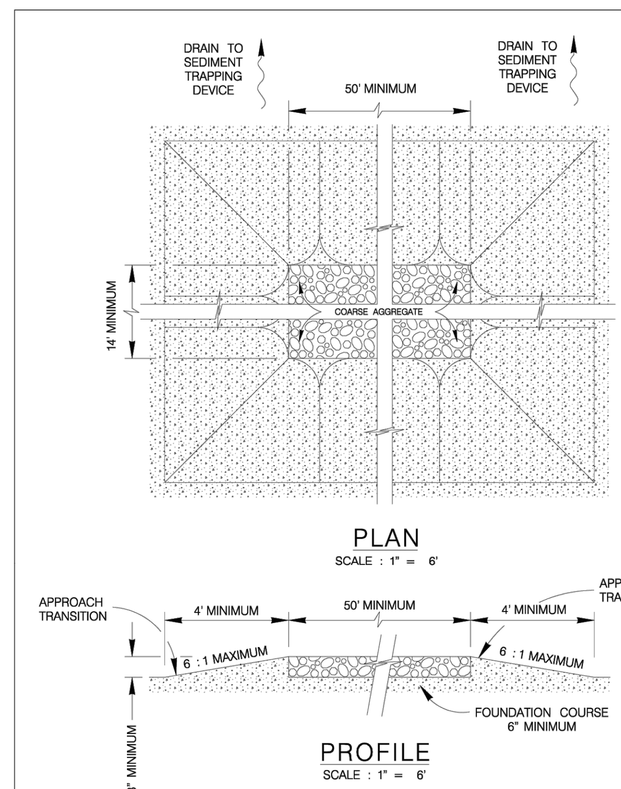
9. GENERAL NOTES
   1. THE CONTROL MEASURES CONTAINED HEREON (AND IS FURTHER DESCRIBED BY THE STANDARD SPECIFICATIONS) SHALL BE INSTALLED AND MAINTAINED THROUGHOUT THE CONSTRUCTION CONTRACT TO ASSURE EFFECTIVE AND CONTINUOUS WATER POLLUTION CONTROL DURING CONSTRUCTION AND POST CONSTRUCTION (SEE SPEC ITEM 540).
   2. THE CONTRACTOR SHALL CLEAN PAVED SURFACES (ADJACENT TO THE CONSTRUCTION AREAS) AS NECESSARY TO REMOVE SEDIMENT WHICH HAS ACCUMULATED ON THE ROADWAY DUE TO STORMWATER FLOWS AND VEHICULAR TRAFFIC THROUGH AND ACROSS THE CONSTRUCTION SITE (SEE SPEC ITEM 540).
   3. IN CASE OF FAILURE ON THE PART OF THE CONTRACTOR TO PREVENT AND CONTROL SOIL EROSION, SEDIMENTATION AND WATER POLLUTION WHICH MAY DEGRADE RECEIVING WATERS, THE ENGINEER RESERVES THE RIGHT TO EMPLOY OUTSIDE ASSISTANCE OR USE CITY FORCES TO PROVIDE THE NECESSARY CORRECTIVE MEASURES. ALL COSTS (INCLUDING ENGINEERING) WILL BE DEDUCTED FROM ANY MONEYS DUE TO OR BECOME DUE TO THE CONTRACT (SEE SPEC ITEM 540).
   4. UPON COMPLETION OF CONSTRUCTION AND INSTALLATION OF PERMANENT EROSION CONTROL METHODS, A FINAL EROSION CONTROL INSPECTION WILL BE PERFORMED AS A PART OF ACCEPTANCE OF THE PROJECT BY THE CITY. IN THE EVENT THAT THE PERMANENT EROSION CONTROL IS INADEQUATE DUE TO IMPROPER DESIGN OR INSTALLATION, THE PERMANENT EROSION CONTROL MEASURES MUST BE CORRECTED OR REDESIGNED TO FUNCTION PROPERLY PRIOR TO SUBMITTAL OF A NOTICE OF TERMINATION (SEE SPEC ITEM 540).
   5. THE CONTRACTOR SHALL PROVIDE SAWS AND COSA TCI COPIES OF REVISED DRAWINGS INDICATING THE LOCATIONS OF POTENTIAL POLLUTANT SOURCES (E.G. CONCRETE WASHOUT AREAS, CONSTRUCTION MATERIALS STAGING AREAS, SUPPORTING CONSTRUCTION ACTIVITIES, ETC.) TWO WEEKS PRIOR TO THE CONTRACTOR INITIATING THE CHANGE.
   6. CONSTRUCTION ACTIVITIES OCCURING OVER THE EDWARDS AQUIFER RECHARGE ZONE, CONTRIBUTING ZONE, AND/OR TRANSITION ZONE MUST COMPLY WITH ADDITIONAL REQUIREMENTS OF THE PROTECTION OF WATER QUALITY ESTABLISHED BY THE TCEQ (30 TAC CHAPTER 213) AND THE EDWARDS AQUIFER AUTHORITY (EAA).

SPILL PREVENTION AND RESPONSE PROCEDURES (CONTRACTOR TO COMPLETE)
1. IDENTIFY PROCEDURES FOR STOPPING, CONTAINING, AND CLEANING UP SPILLS, LEAKS AND OTHER RELEASE:
2. IDENTIFY THE NAME OR POSITION OF THE PERSON RESPONSIBLE FOR DETECTION AND RESPONSE OF SPILLS AND LEAKS:
3. IDENTIFY PROCEDURES FOR NOTIFICATION OF APPROPRIATE FACILITY PERSONNEL, REGULATORY AGENCIES, ETC:

REMARKS:
DISPOSAL AREAS, STOCKPILES AND HAUL ROADS SHALL BE CONSTRUCTED IN A MANNER THAT WILL MINIMIZE AND CONTROL THE AMOUNT OF SEDIMENT THAT ENTERS RECEIVING WATERS. DISPOSAL AREAS SHALL NOT BE LOCATED IN ANY WETLAND, BODY OF WATER, STREAMBED, OR FLOODPLAIN. CONSTRUCTION STAGING AREAS AND VEHICLE MAINTENANCE AREAS SHALL BE CONSTRUCTED BY THE CONTRACTOR IN A MANNER TO MINIMIZE THE RUNOFF OF POLLUTANTS. ALL WATERWAYS SHALL BE CLEARED AS SOON AS POSSIBLE OF TEMPORARY EMBANKMENT, TEMPORARY BRIDGES, MATTING, FALSEWORK, PILING DEBRIS, OR OTHER OBSTRUCTION PLACED DURING CONSTRUCTION OPERATIONS THAT ARE NOT PART OF THE FINISHED WORK.

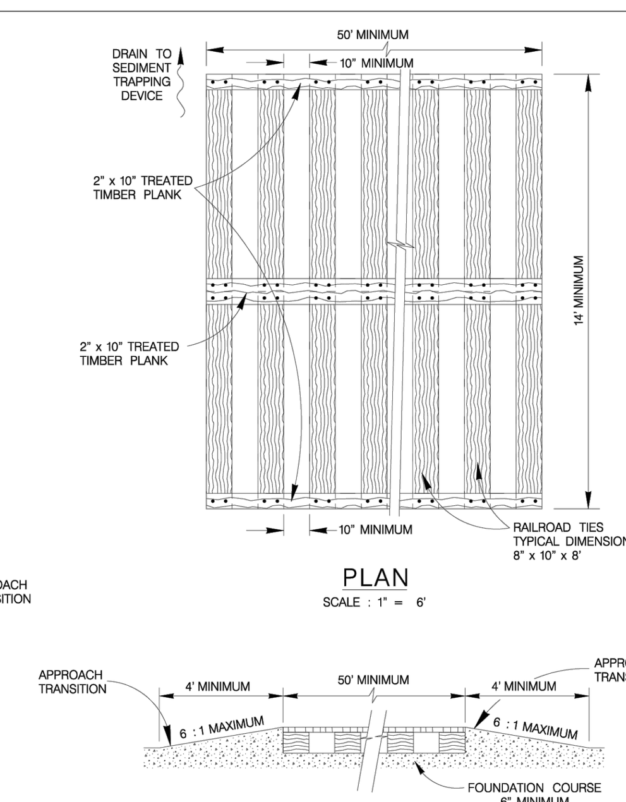
OCTOBER 2014
CITY OF SAN ANTONIO
PUBLIC WORKS DEPARTMENT
STORM WATER POLLUTION PREVENTION PLAN (SW3P) NARRATIVE
SHEET 2 OF 2

95 % SUBMITTAL	PROJECT NO.: 23-04027		DATE: 3/19/2024
DRWN. BY: CT	DSGN. BY: JT	CHKD. BY: JT	SHEET NO.: ___ OF xx



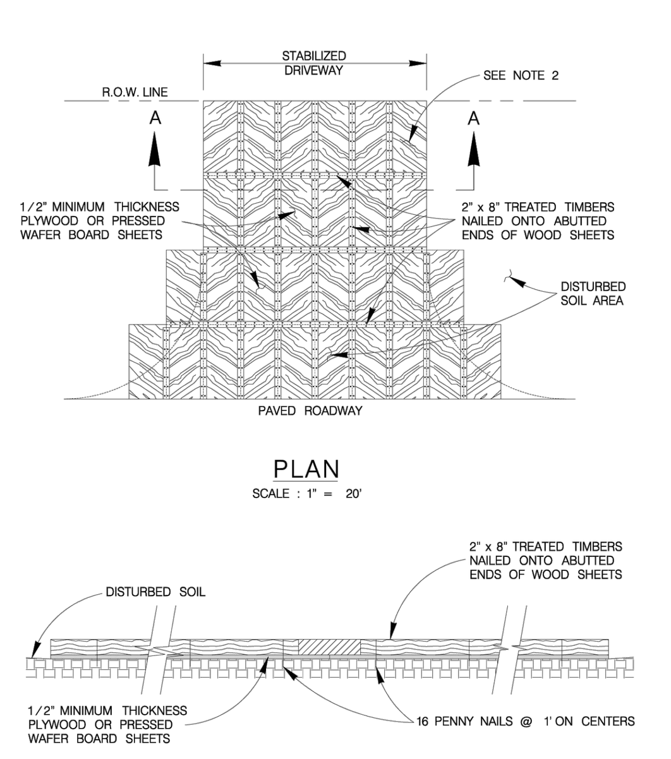
GENERAL NOTES
1. THE LENGTH OF THE TYPE 1 CONSTRUCTION EXIT SHALL BE AS INDICATED ON THE PLANS, BUT NOT LESS THAN 50'.
2. THE COARSE AGGREGATE SHOULD BE OPEN GRADED WITH A SIZE OF 4" TO 8".
3. THE APPROACH TRANSITIONS SHOULD BE NO STEEPER THAN 6 : 1 AND CONSTRUCTED AS DIRECTED BY THE ENGINEER.
4. THE CONSTRUCTION EXIT FOUNDATION COURSE SHALL BE FLEXIBLE BASE, BITUMINOUS CONCRETE, PORTLAND CEMENT CONCRETE OR OTHER MATERIAL AS APPROVED BY THE ENGINEER.
5. THE CONSTRUCTION EXIT SHALL BE GRADED TO ALLOW DRAINAGE TO A SEDIMENT TRAPPING DEVICE.
6. THE GUIDELINES SHOWN HEREON ARE SUGGESTIONS ONLY AND MAY BE MODIFIED BY THE ENGINEER.

CONSTRUCTION EXIT - TYPE 1



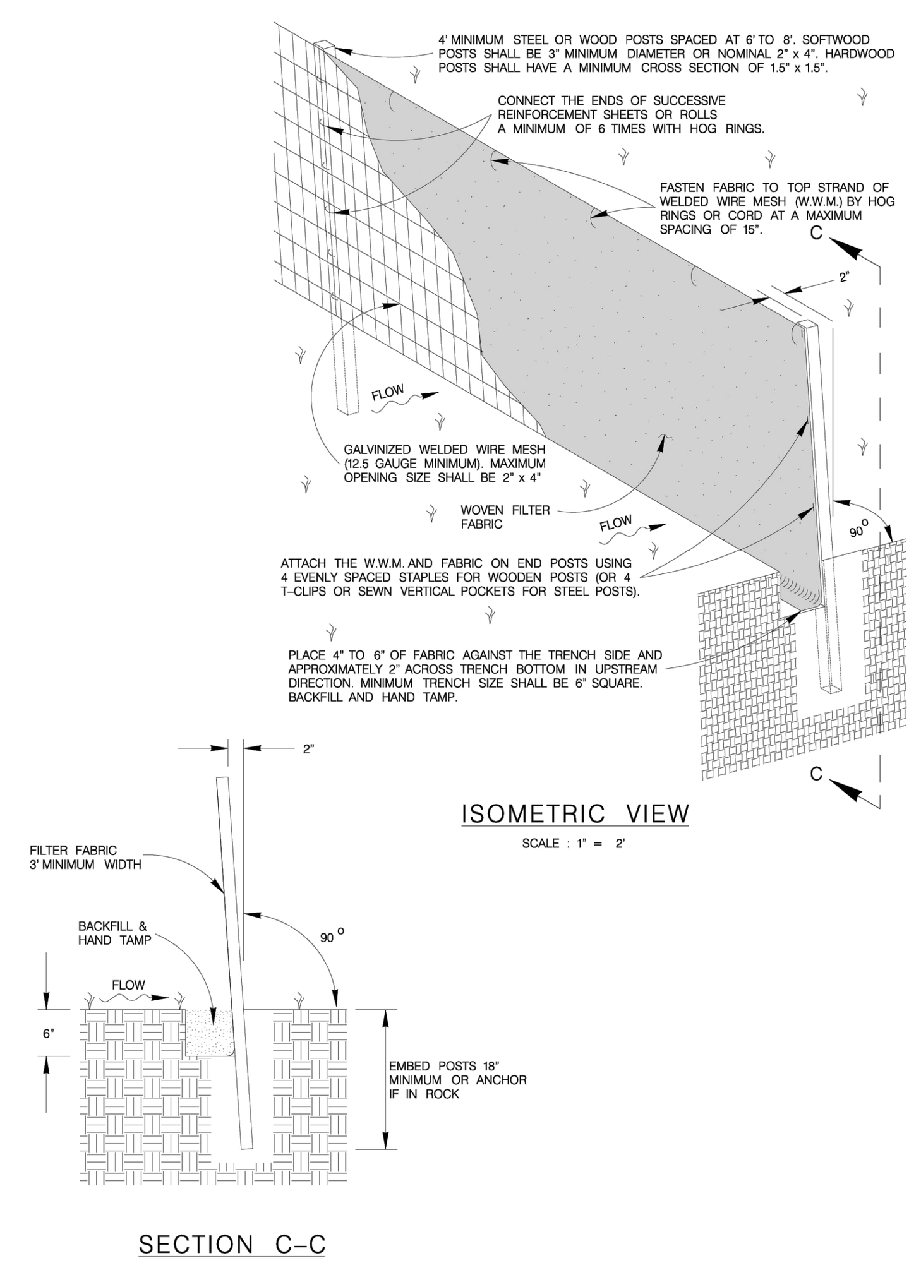
GENERAL NOTES
1. THE LENGTH OF THE TYPE 2 CONSTRUCTION EXIT SHALL BE AS INDICATED ON THE PLANS, BUT NOT LESS THAN 50'.
2. THE TREATED TIMBER PLANKS SHALL BE ATTACHED TO THE RAILROAD TIES WITH 1/2" x 6" MIN. LAG BOLTS. OTHER FASTENERS MAY BE USED AS APPROVED BY THE ENGINEER.
3. THE TREATED TIMBER PLANKS SHALL BE #2 GRADE MIN., AND SHOULD BE FREE FROM LARGE AND LOOSE KNOTS.
4. THE APPROACH TRANSITIONS SHOULD BE NO STEEPER THAN 6 : 1 AND CONSTRUCTED AS DIRECTED BY THE ENGINEER.
5. THE CONSTRUCTION EXIT FOUNDATION COURSE SHALL BE FLEXIBLE BASE, BITUMINOUS CONCRETE, PORTLAND CEMENT CONCRETE OR OTHER MATERIAL AS APPROVED BY THE ENGINEER.
6. THE CONSTRUCTION EXIT SHOULD BE GRADED TO ALLOW DRAINAGE TO A SEDIMENT TRAPPING DEVICE.
7. THE GUIDELINES SHOWN HEREON ARE SUGGESTIONS ONLY AND MAY BE MODIFIED BY THE ENGINEER.

CONSTRUCTION EXIT - TYPE 2



GENERAL NOTES
1. THE LENGTH OF THE TYPE 3 CONSTRUCTION EXIT SHALL BE AS INDICATED ON THE PLANS, OR AS DIRECTED BY THE ENGINEER.
2. THE TYPE 3 CONSTRUCTION EXIT MAY BE CONSTRUCTED FROM OPEN GRADED CRUSHED STONE WITH A SIZE OF 2 TO 4 INCHES SPREAD A MINIMUM OF 4 INCHES THICK TO THE LIMITS SHOWN ON THE PLANS.
3. THE TREATED TIMBER PLANKS SHALL BE #2 GRADE MIN., AND SHOULD BE FREE FROM LARGE AND LOOSE KNOTS.
4. THE GUIDELINES SHOWN HEREON ARE SUGGESTIONS ONLY AND MAY BE MODIFIED BY THE ENGINEER.

CONSTRUCTION EXIT - TYPE 3



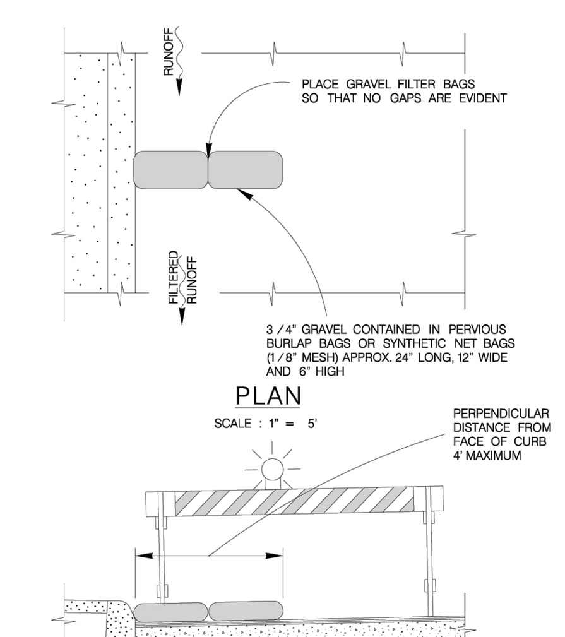
SEDIMENT CONTROL FENCE USAGE GUIDELINES

A SEDIMENT CONTROL FENCE MAY BE CONSTRUCTED NEAR THE DOWNSTREAM PERIMETER OF A DISTURBED AREA ALONG A CONTOUR TO INTERCEPT SEDIMENT FROM OVERLAND RUN-OFF. A 2 YEAR STORM FREQUENCY MAY BE USED TO CALCULATE THE FLOW RATE TO BE FILTERED.

SEDIMENT CONTROL FENCE SHOULD BE SIZED TO FILTER A MAXIMUM FLOW THRU RATE OF 100 GPM /FT SQUARED. SEDIMENT CONTROL FENCE IS NOT RECOMMENDED TO CONTROL EROSION FROM A DRAINAGE AREA LARGER THAN 2 ACRES.

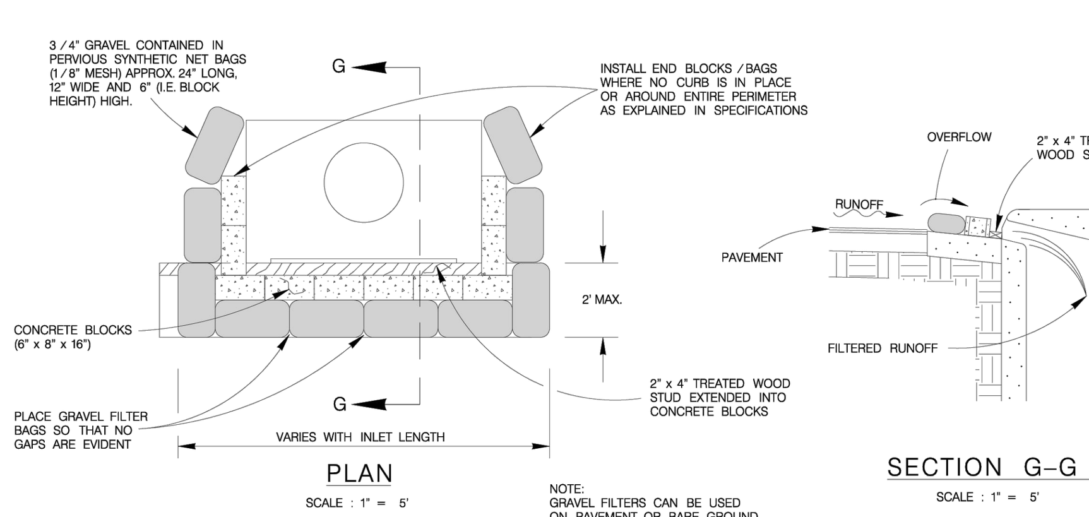
GENERAL NOTES
1. THE GUIDELINES SHOWN HEREON ARE SUGGESTIONS ONLY AND MAY BE MODIFIED BY THE ENGINEER.

TEMPORARY SEDIMENT CONTROL FENCE



NOTE:
STRADDLE GRAVEL FILTER BAGS WITH TYPE 1 BARRICADES MOUNTED WITH TYPE "A" FLASHING WARNING LIGHT. SEE BARRICADE CONSTRUCTION SIGN DETAILS. PLACE FLASHING LIGHTS AWAY FROM GUTTER, FLUSH WITH OUTSIDE EDGE OF BAG CONFIGURATION.

GRAVEL FILTER BAGS

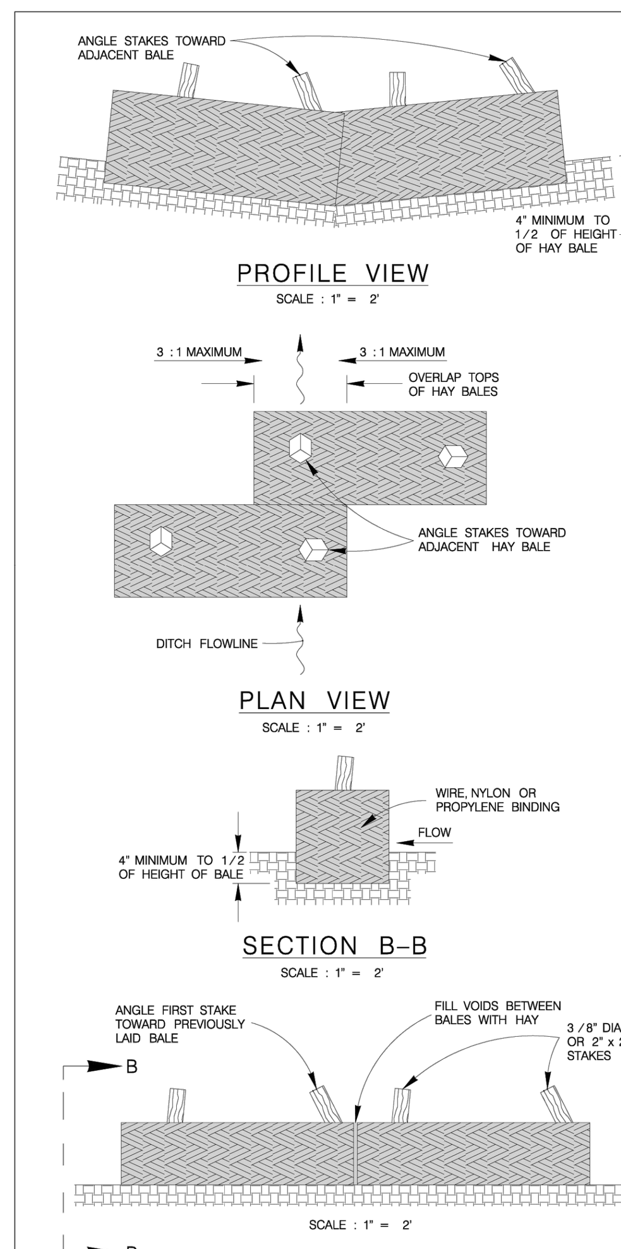


NOTE:
GRAVEL FILTERS CAN BE USED ON PAVEMENT OR BARE GROUND.

CURB INLET GRAVEL FILTER

JANUARY 2005
CITY OF SAN ANTONIO
CAPITAL IMPROVEMENTS MANAGEMENT SERVICES DEPARTMENT
TEMPORARY EROSION, SEDIMENT & WATER POLLUTION CONTROL MEASURES STANDARDS 1

___ % SUBMITTAL	PROJECT NO.: ______		DATE: ______
DRWN. BY: V. VASQUEZ	DSGN. BY: ______	CHKD. BY: ______	SHEET NO.: ___ OF ___



BALED HAY USAGE GUIDELINES

A BAILED HAY INSTALLATION MAY BE CONSTRUCTED NEAR THE DOWNSTREAM PERIMETER OF A DISTURBED AREA ALONG A CONTOUR TO INTERCEPT SEDIMENT FROM OVERLAND RUNOFF. A TWO YEAR STORM FREQUENCY MAY BE USED TO CALCULATE THE FLOW RATE TO BE FILTERED. THE INSTALLATION SHOULD BE SIZED TO FILTER A MAXIMUM FLOW THRU RATE OF 5 GPM /FT SQUARED OF CROSS SECTIONAL AREA. BALED HAY MAY BE USED AT THE FOLLOWING LOCATIONS:

1. WHERE THE RUNOFF APPROACHING THE BALED HAY FLOWS OVER DISTURBED SOIL FOR LESS THAN 100'. IF THE SLOPE OF THE DISTURBED SOIL EXCEEDS 10 %, THE LENGTH OF SLOPE UPSTREAM OF THE BAILED HAY SHOULD BE LESS THAN 50'.
2. WHERE THE INSTALLATION WILL BE REQUIRED FOR LESS THAN 3 MONTHS.
3. WHERE THE CONTRIBUTING DRAINAGE AREA IS LESS THAN 1/2 ACRE.

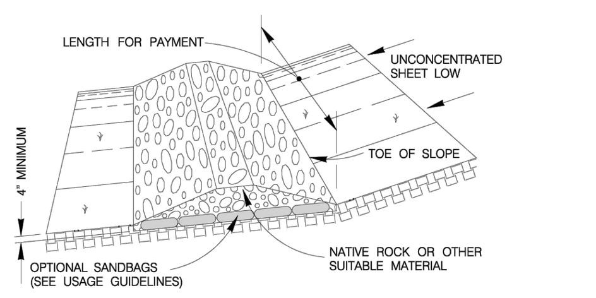
FOR BALED HAY INSTALLATIONS IN SMALL DITCHES, THE FOLLOWING ADDITIONAL CONDITIONAL CONSIDERATIONS APPLY:

1. THE DITCH SIDESLOPES SHOULD BE GRADED AS FLAT AS POSSIBLE TO MAXIMIZE THE DRAINAGE FLOW RATE THRU THE HAY.
2. THE DITCH SHOULD BE GRADED LARGE ENOUGH TO CONTAIN THE OVERLAPPING DRAINAGE WHEN SEDIMENT HAS FILLED TO THE TOP OF THE BAILED HAY.

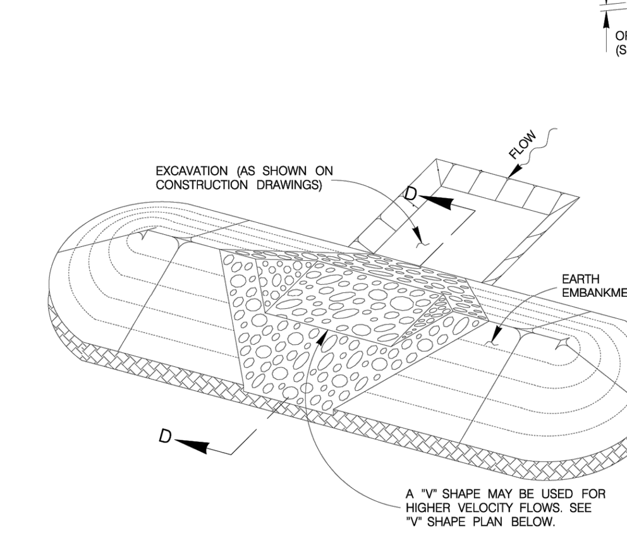
BALES SHOULD BE REPLACED USUALLY EVERY 2 MONTHS OR MORE OFTEN DURING WET WEATHER WHEN LOSS OF STRUCTURAL INTERGRITY IS ACCELERATED.

GENERAL NOTES
1. HAY BALES SHALL BE A MINIMUM OF 30" IN LENGTH AND WEIGH A MINIMUM OF 50 LBS.
2. HAY BALES SHALL BE BOUND BY EITHER WIRE OR NYLON OR POLYPROPYLENE STRING. THE BALES SHALL BE COMPOSED ENTIRELY OF VEGETABLE MATTER.
3. HAY BALES SHALL BE EMBEDDED IN THE SOIL A MININMUM OF 4" AND, WHERE POSSIBLE, ONE-HALF THE HEIGHT OF THE BALE.
4. HAY BALES SHALL BE PLACED IN A ROW WITH ENDS TIGHTLY ABUTTING THE ADJACENT BALES. THE BALES SHALL BE PLACED WITH BINDINGS PARALLEL TO THE GROUND.
5. HAY BALES SHALL BE SECURELY ANCHORED IN PLACE WITH 3/8" DIA. REBAR OR 2" x 2" WOOD STAKES DRIVEN THROUGH THE BALES. THE FIRST STAKE SHALL BE ANGLED TOWARDS THE PREVIOUSLY LAID BALE TO FORCE THE BALES TOGETHER.
6. THE GUIDELINES SHOWN HEREON ARE SUGGESTIONS ONLY AND MAY BE MODIFIED BY THE ENGINEER.

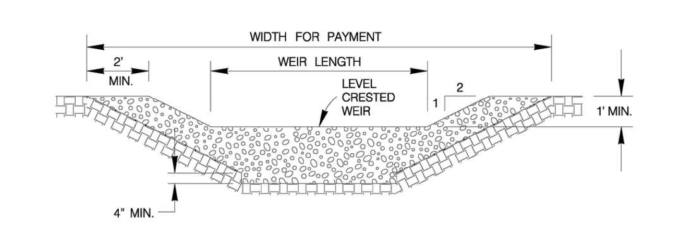
BALED HAY FOR EROSION CONTROL



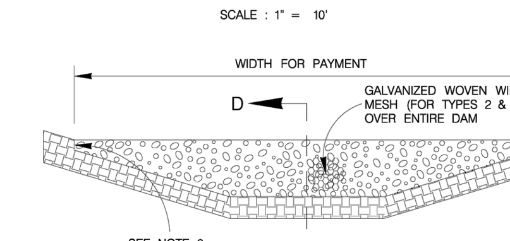
TYPE 1 FILTER DAM AT TOE OF SLOPE
SCALE : 1" = 10'



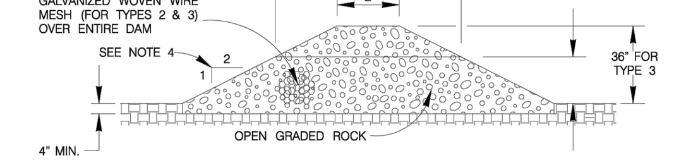
TYPE 1 & 2 FILTER DAM AT SEDIMENT TRAP
SCALE : 1" = 10'



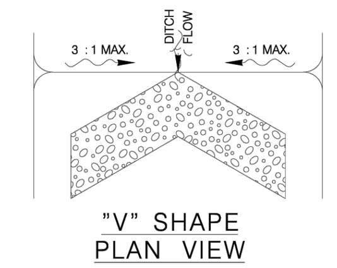
PROFILE OF TYPE 1 & 2 FILTER DAM AT SEDIMENT TRAP
SCALE : 1" = 6'



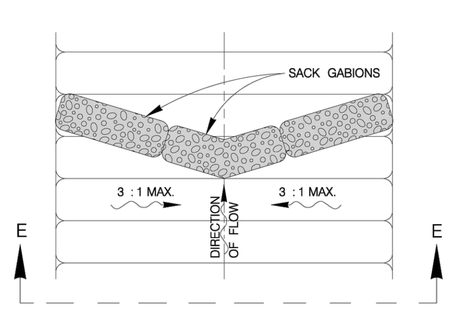
TYPE 1, 2 & 3 FILTER DAM AT CHANNEL SECTIONS
SCALE : 1" = 6'



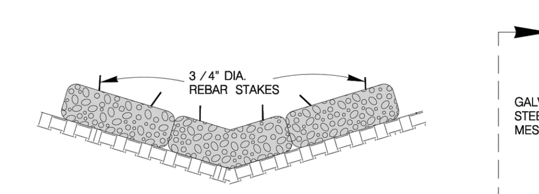
SECTION D-D
SCALE : 1" = 6'



"V" SHAPE PLAN VIEW
NOT TO SCALE

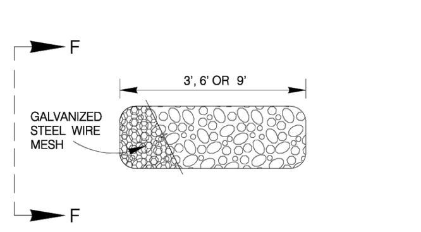


PLAN VIEW
SCALE : 1" = 10'

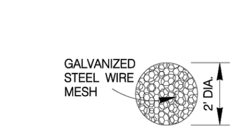


SECTION E-E
SCALE : 1" = 10'

TYPE 4 FILTER DAM AT DITCHES & SMALLER CHANNELS PLAN VIEW



TYPE 4 SACK GABION DETAIL
SCALE : 1" = 6'



SECTION F-F
SCALE : 1" = 6'

ROCK FILTER DAMS

ROCK FILTER DAM USAGE GUIDELINES

ROCK FILTER DAMS SHOULD BE CONSTRUCTED DOWNSTREAM FROM DISTURBED AREAS TO INTERCEPT SEDIMENT FROM OVERLOAD RUNOFF AND /OR CONCENTRATED FLOW. THE DAMS SHOULD BE SIZED TO FILTER A MAXIMUM FLOW THRU RATE OF 60 GPM /FT SQUARED OF CROSS SECTIONAL AREA.. A 2 YEAR STORM FREQUENCY MAY BE USED TO CALCULATE THE FLOW RATE.

TYPE 1 (18" HIGH WITH NO WIRE MESH) :

TYPE 1 MAY BE USED AT THE TOE OF SLOPES, AROUND INLETS, IN SMALL DITCHES AND AT DIKE OR SWALE OUTLETS. THIS TYPE OF DAM IS RECOMMENDED TO CONTROL EROSION FROM A DRAINAGE AREA OF 5 ACRES OR LESS. TYPE 1 MAY NOT BE USED IN CONCENTRATED HIGH VELOCITY FLOWS (APPROXIMATELY 8 FT./SEC. OR MORE) IN WHICH AGGREGATE WASH OUT MAY OCCUR. SANDBAGS MAY BE USED AT THE EMBEDDED FOUNDATION (4" DEEP MIN.) FOR BETTER FILTERING EFFICIENCY OF LOW FLOWS IF CALLED FOR ON THE PLANS OR AS DIRECTED BY THE ENGINEER.

TYPE 2 (18" HIGH WITH WIRE MESH) :

TYPE 2 MAY BE USED IN DITCHES AND AT DIKE OR SWALE OUTLETS.

TYPE 3 (36" HIGH WITH WIRE MESH) :

TYPE 3 MAY BE USED IN STREAM FLOW AND SHOULD BE SECURED TO THE STREAM BED.

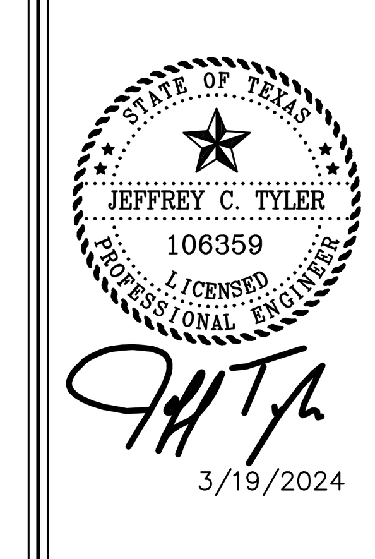
TYPE 4 (SACK GABIONS) :

TYPE 4 MAY BE USED IN DITCHES AND SMALLER CHANNELS TO FORM AN EROSION CONTROL DAM.

GENERAL NOTES
1. IF SHOWN ON THE PLANS OR DIRECTED BY THE ENGINEER, FILTER DAMS SHOULD BE PLACED NEAR THE TOE OF SLOPES WHERE EROSION IS ANTICIPATED, UPSTREAM AND / OR DOWNSTREAM AT DRAINAGE STRUCTURES, AND IN ROADWAY DITCHES AND CHANNELS TO COLLECT SEDIMENT.
2. MATERIALS (AGGREGATE, WIRE MESH, SANDBAGS, ETC.) SHALL BE AS INDICATED BY THE SPECIFICATION FOR ROCK FILTER DAMS FOR EROSION AND SEDIMENTATION CONTROL.
3. THE ROCK FILTER DAM DIMENSIONS SHALL BE AS INDICATED ON THE STORM WATER POLLUTION PREVENTION PLANS.
4. SIDE SLOPES SHOULD BE 2 : 1 OR FLATTER. DAMS WITHIN THE SAFETY ZONE SHALL HAVE SIDE SLOPES OF 6 : 1 OR FLATTER.
5. MAINTAIN A MINIMUM OF 1' BETWEEN TOP OF ROCK FILTER DAM WEIR AND TOP OF EMBANKMENT FOR FILTER DAMS AT SEDIMENT TRAPS.
6. FILTER DAMS SHOULD BE EMBEDDED A MINIMUM OF 4" INTO THE EXISTING GROUND.
7. THE SEDIMENT TRAP FOR PONDING OF SEDIMENT LADEN RUNOFF SHALL BE OF THE DIMENSIONS SHOWN ON THE PLANS.
8. ROCK FILTER DAM TYPES 2 & 3 SHALL BE SECURED WITH 20 GAUGE GALVANIZED WOVEN WIRE MESH WITH 1" DIAMETER HEXAGONAL OPENINGS. THE AGGREGATE SHALL BE PLACED ON THE MESH TO THE HEIGHT AND SLOPES SPECIFIED. THE MESH SHALL BE FOLDED AT THE UPSTREAM SIDE OVER THE AGGREGATE AND TIGHTLY SECURED TO ITSELF ON THE DOWNSTREAM SIDE USING WIRE TIES OR HOG RINGS. IN STREAM USE, THE MESH SHOULD BE SECURED OR STAKED TO THE STREAM BED PRIOR TO AGGREGATE PLACEMENT.
9. SACK GABIONS SHOULD BE STAKED DOWN WITH 3/4" DIA. REBAR STAKES.
10. FLOW OUTLET SHOULD BE ONTO A STABILIZED AREA (VEGETATION, ROCK, ETC.).
11. THE GUIDELINES SHOWN HEREON ARE SUGGESTIONS ONLY AND MAY BE MODIFIED BY THE ENGINEER.

JANUARY 2005
CITY OF SAN ANTONIO
CAPITAL IMPROVEMENTS MANAGEMENT SERVICES DEPARTMENT
TEMPORARY EROSION, SEDIMENT & WATER POLLUTION CONTROL MEASURES STANDARDS 2

___ % SUBMITTAL	PROJECT NO.: ______		DATE: ______
DRWN. BY: V. VASQUEZ	DSGN. BY: ______	CHKD. BY: ______	SHEET NO.: ___ OF ___



SUBMITTAL: 100% CONSTRUCTION DOCUMENTS

SWPPP NOTES AND DETAILS

T-Core Engineers
84 NE Loop 410, Ste 103 ♦ San Antonio, Texas 78216 ♦ 210.900.2448
TBPE Registration No. F-18275 ♦ www.tc0re.com

MAVERICK CREEK GREENWAY
UTSA BOULEVARD TO LOOP 1604
SAN ANTONIO, TEXAS, 78249

JOB NUMBER:	23-04027
DESIGNED BY:	JT
DRAWN BY:	CT
CHECKED BY:	JT
DATE:	3/19/2024
SHEET:	**SP 1.01**

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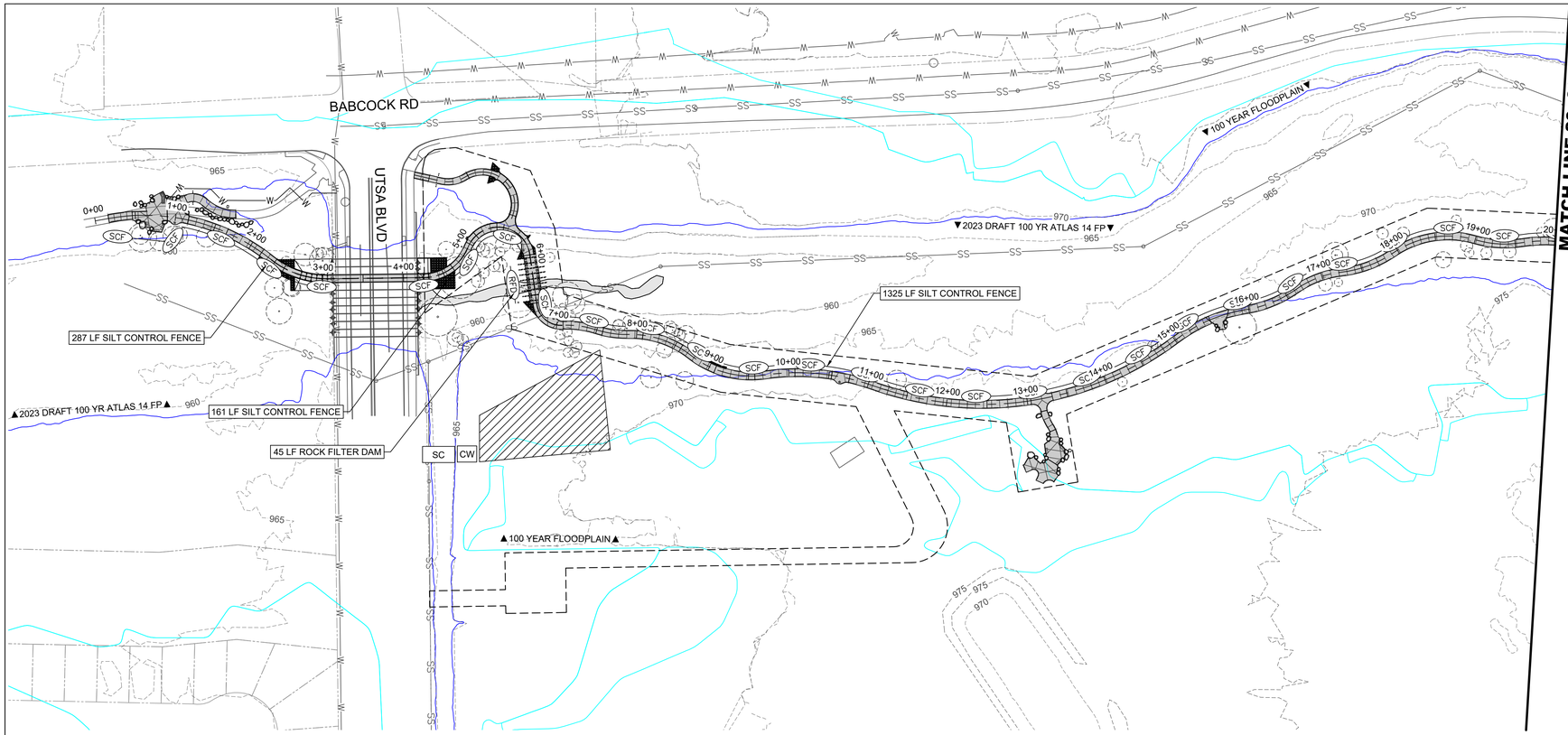

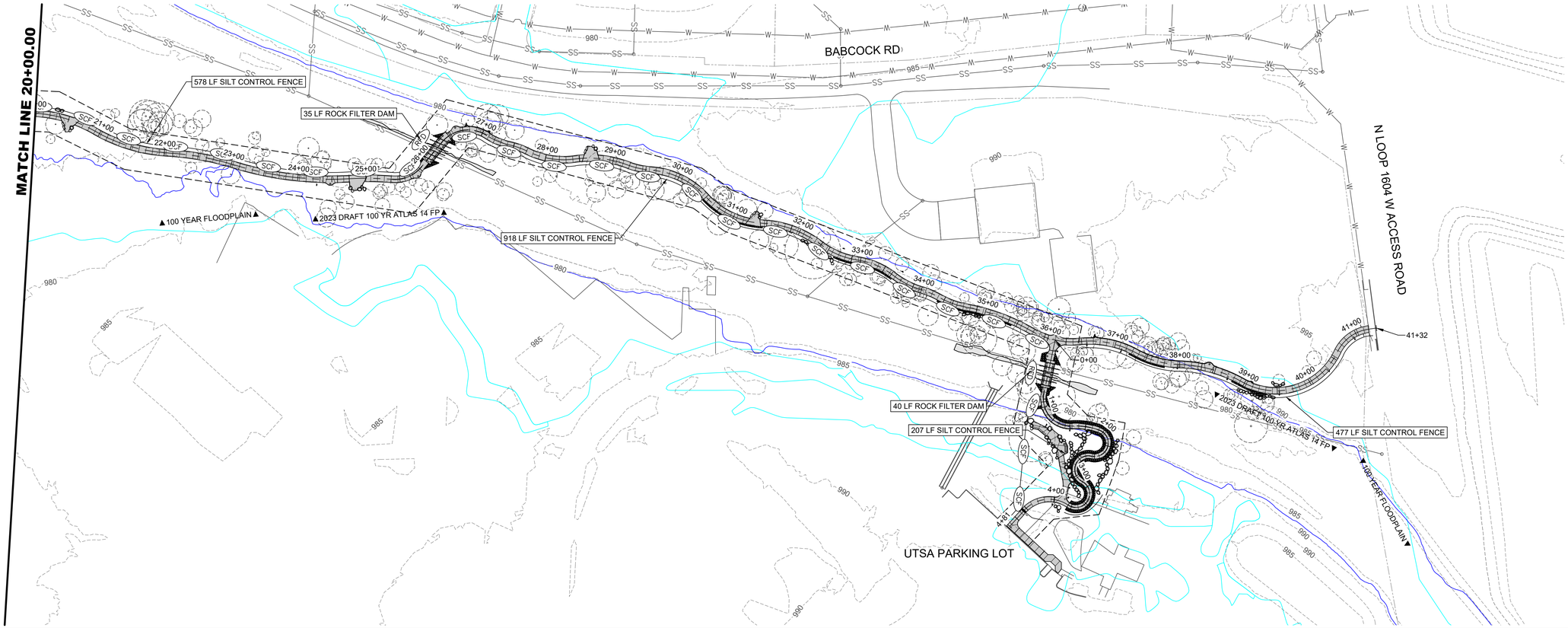

0 40 80 120 160
SCALE: 1"=80'

LEGEND

- =PROPOSED TRAIL
- 950 =EXISTING MAJOR CONTOUR
- 995 =EXISTING MINOR CONTOUR
- =TEMPORARY CONSTRUCTION LIMITS
- SS =EXISTING SANITARY SEWER
- W W =EXISTING WATER
- W W =PROPOSED WATER
- SCF =PROPOSED SILT CONTROL FENCE
- RFD =PROPOSED ROCK FILTER DAM
- =100 YEAR FLOODPLAIN
- =2023 DRAFT 100 YR ATLAS 14 FP
- SC =CONSTRUCTION ENTRANCE/EXIT
- =STAGING AREA
- CW =CONCRETE WASHOUT

REVISIONS

STATE OF TEXAS
JEFFREY C. TYLER
106359
LICENSED
PROFESSIONAL ENGINEER
3/19/2024

SUBMITTAL: 100% CONSTRUCTION DOCUMENTS

SWPPP LAYOUT

T-Core Engineers
84 NE Loop 410, Ste 103 • San Antonio, Texas 78216 • 210.900.2448
TBPE Registration No. F-18275 • www.tcfirc.com

MAVERICK CREEK GREENWAY
UTSA BOULEVARD TO LOOP 1604
SAN ANTONIO, TEXAS, 78249

JOB NUMBER:	23-04027
DESIGNED BY:	JT
DRAWN BY:	CT
CHECKED BY:	JT
DATE:	3/19/2024
SHEET:	**SP 1.02**

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Texas Commission on Environmental Quality
Water Pollution Abatement Plan
General Construction Notes

1. A written notice of construction must be submitted to the TCEQ regional office at least 48 hours prior to the start of any regulated activities. This notice must include:
- the name of the approved project;
- the activity start date; and
- the contact information of the prime contractor.

2. All contractors conducting regulated activities associated with this project must be provided with complete copies of the approved Water Pollution Abatement Plan (WPAP) and the TCEQ letter indicating the specific conditions of its approval. During the course of these regulated activities, the contractors are required to keep on-site copies of the approved plan and approval letter.

3. If any sensitive feature(s) (caves, solution cavity, sink hole, etc.) is discovered during construction, all regulated activities near the sensitive feature must be suspended immediately. The appropriate TCEQ regional office must be immediately notified of any sensitive features encountered during construction. Construction activities may not be resumed until the TCEQ has reviewed and approved the appropriate protective measures in order to protect any sensitive feature and the Edwards Aquifer from potentially adverse impacts to water quality.

4. No temporary or permanent hazardous substance storage tank shall be installed within 150 feet of a water supply source, distribution system, well, or sensitive feature.

5. Prior to beginning any construction activity, all temporary erosion and sedimentation (E&S) control measures must be properly installed and maintained in accordance with the approved plans and manufacturers specifications. If inspections indicate a control has been used inappropriately, or incorrectly, the applicant must replace or modify the control for site situations. These controls must remain in place until the disturbed areas have been permanently stabilized.

6. Any sediment that escapes the construction site must be collected and properly disposed of before the next rain event to ensure it is not washed into surface streams, sensitive features, etc.

7. Sediment must be removed from the sediment traps or sedimentation basins not later than when it occupies 50% of the basin's design capacity.

8. Litter, construction debris, and construction chemicals exposed to stormwater shall be prevented from being discharged offsite.

9. All spoils (excavated material) generated from the project site must be stored on-site with proper E&S controls. For storage or disposal of spoils at another site on the Edwards Aquifer Recharge Zone, the owner of the site must receive approval of a water pollution abatement plan for the placement of fill material or mass grading prior to the placement of spoils at the other site.

10. If portions of the site will have a temporary or permanent cease in construction activity lasting longer than 14 days, soil stabilization in those areas shall be initiated as soon as possible prior to the 14th day of inactivity. If activity will resume prior to the 21st day, stabilization measures are not required. If drought conditions or inclement weather prevent action by the 14th day, stabilization measures shall be initiated as soon as possible.

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

12. The holder of any approved Edward Aquifer protection plan must notify the appropriate regional office in writing and obtain approval from the executive director prior to initiating any of the following:

A. any physical or operational modification of any water pollution abatement structure(s), including but not limited to ponds, dams, berms, sewage treatment plants, and diversionary structures;

B. any change in the nature or character of the regulated activity from that which was originally approved or a change which would significantly impact the ability of the plan to prevent pollution of the Edwards Aquifer;

C. any development of land previously identified as undeveloped in the original water pollution abatement plan.

Austin Regional Office
12100 Park 35 Circle, Building A
Austin, Texas 78753-1808
Phone(512) 339-2929
Fax (512) 339-3795

San Antonio Regional Office
14250 Judson Road
San Antonio, Texas 78233-4480
Phone(210) 490-3096
Fax (210) 545-4329

THESE GENERAL CONSTRUCTION NOTES MUST BE INCLUDED ON THE CONSTRUCTION PLANS PROVIDED TO THE CONTRACTOR AND ALL SUBCONTRACTORS.

REVISIONS

STATE OF TEXAS
LUIS A. CARDONA
139673
LICENSED PROFESSIONAL ENGINEER
3/15/2024

THE SEAL APPEARING ON THIS DOCUMENT WAS AUTHORIZED BY LUIS A. CARDONA, PE# 139673 ON 3-15-2024. ALTERATION OF A SEALED DOCUMENT WITHOUT PROPER NOTIFICATION TO THE RESPONSIBLE ENGINEER IS AN OFFENSE UNDER THE TEXAS ENGINEERING PRACTICE ACT. THE RECORD COPY OF THIS DRAWING IS ON FILE AT THE OFFICES OF HALFF 100 NE. INTERSTATE 410 LOOP, SUITE 200, SAN ANTONIO, TEXAS 78216. TBPELS FIRM #F-312.

WPAP GENERAL CONSTRUCTION NOTES

MAVERICK CREEK GREENWAY
UTSA BOULEVARD TO LOOP 1604
SAN ANTONIO, TEXAS, 78249

halff
100 NE LOOP 410, SUITE 200
SAN ANTONIO, TEXAS 78216
TEL (210) 789-1895
FAX (210) 789-1896

T-Core Engineers
84 NE Loop 410, Ste 103 • San Antonio, Texas 78216 • 210.900.2448
TBPE Registration No. F-18275 • www.tcfrc.com

JOB NUMBER:	23-04027
DESIGNED BY:	JR
DRAWN BY:	JR
CHECKED BY:	LAC
DATE:	3/24/2024
SHEET:	**EL 1.00**

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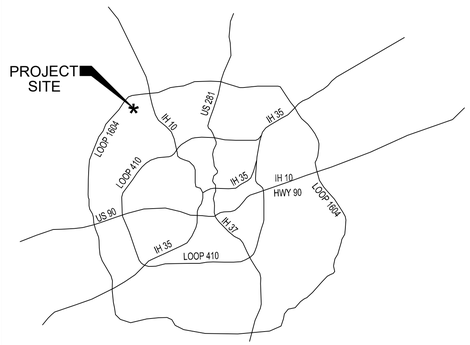


LOCATION MAP
SCALE/NOT TO SCALE

Maverick Creek Trail Site info.		
Impervious Area	Existing	Proposed
	(AC)	(AC)
Paved Trail	0	1.25
Total		1.25
Impervious Cover	0	1.25

Maverick Creek Trail BMP Info.								
Impervious Area	Drainage Area	Impervious Area	Req TSS removal	Treatment	Type of treatment	Efficiencey	IMP treated	Max. TSS removal
	(AC)	(AC)	(lbs)				(AC)	(lbs)
Paved Trail	3.72	1.25	1020	Yes	Vegetated Filter Strips	85%	1.25	1137
Total	3.72	1.25	1020				1.25	1137

SCALE 1" = 40'

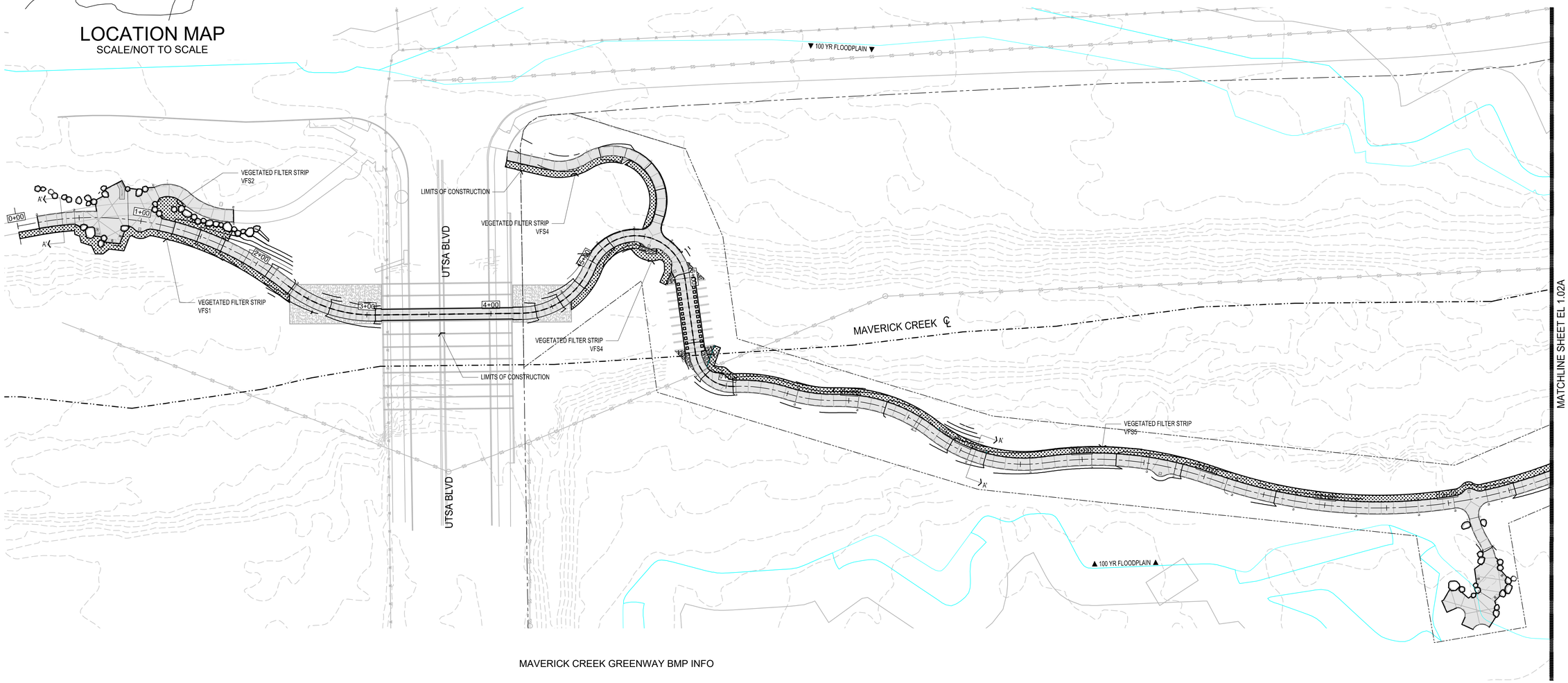
NORTH

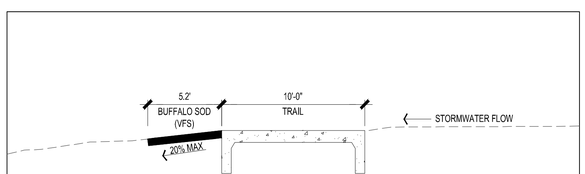
LEGEND:

100 YR FLOOD PLAIN

VEGETATED FILTER STRIP

REVISIONS





BMP TYPICAL SECTION 'A'-'A'
N.T.S.

MAVERICK CREEK GREENWAY BMP INFO

1. The Required Load Reduction for the total project: Calculations from RG-348

Page 3-29 Equation 3.3: LM = 27.2(AN x P)

where:

LM TOTAL PROJECT = Required TSS removal resulting from the prop
AN = Net increase in impervious area for the projec
P = Average annual precipitation, inches

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

County =	Bexar	
Total project area included in plan * =	3.72	acres
Predevelopment impervious area within the limits of the plan * =	0.00	acres
Total post-development impervious area within the limits of the plan* =	1.25	acres
Total post-development impervious cover fraction * =	0.34	
P =	30	inches

LM TOTAL PROJECT = 1020 lbs.

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

Number of drainage basins / outfalls areas leaving the plan area = 1

BMP - VEGETATED FILTER STRIPS

Vegetated filter strips will be implemented along the entire downstream of paved trail with no more than 20% slope. The filter strips must be a engineered vegetative filter strip and a minimum of 5.2 feet wide to achieve 80% TSS removal rate.

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

RG-348 Page 3-33 Equation 3.7: LR = (BMP efficiency) x P x (AI x 34.6 + A

where:

AC = Total On-Site drainage area in the BMP catchment
AI = Impervious area proposed in the BMP catchment
AP = Pervious area remaining in the BMP catchment
LR = TSS Load removed from this catchment area

AC =	3.72	acres
AI =	1.25	acres
AP =	2.47	acres
LR =	1137	lbs

STATE OF TEXAS
LUIS A. CARDONA
139673
LICENSED PROFESSIONAL ENGINEER
3/15/2024

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ENVIRONMENTAL LAYOUT

halff
100 NE LOOP 410, SUITE 200
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MAVERICK CREEK GREENWAY
UTSA BOULEVARD TO LOOP 1604
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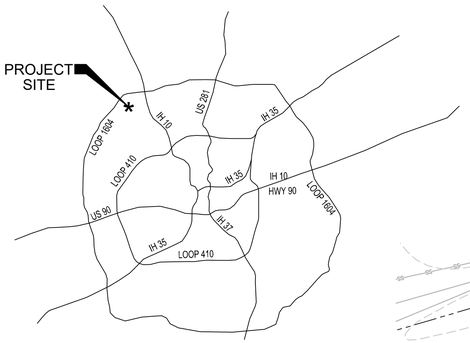

LOCATION MAP
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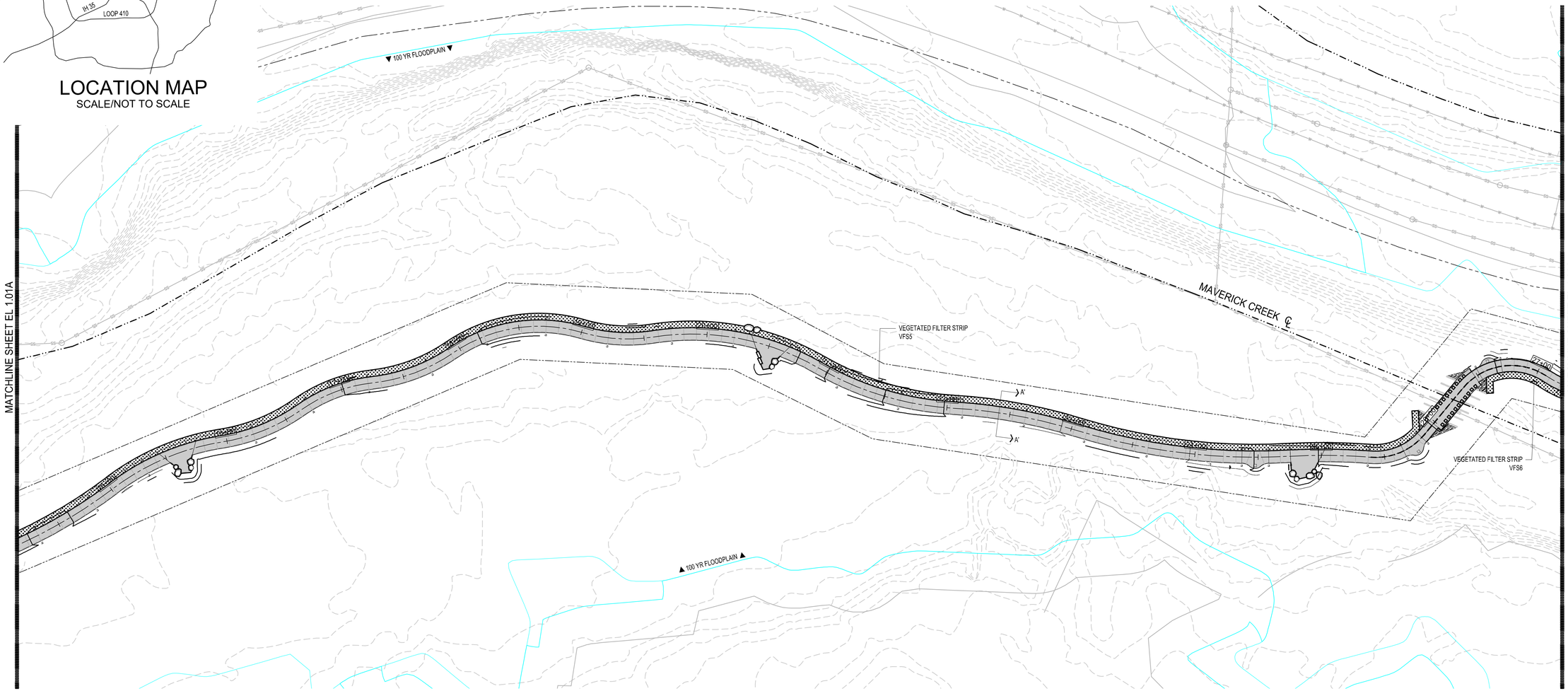
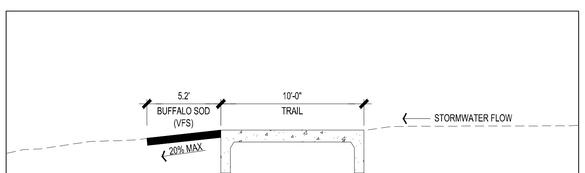
0 20 40 80
SCALE 1" = 40'

NORTH

LEGEND:
100 YR FLOOD PLAIN
VEGETATED FILTER STRIP

REVISIONS





BMP TYPICAL SECTION 'A'-'A'
N.T.S.

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AN = Net increase in impervious area for the projec
P = Average annual precipitation, inches

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

County =	Bexar	
Total project area included in plan * =	3.72	acres
Predevelopment impervious area within the limits of the plan * =	0.00	acres
Total post-development impervious area within the limits of the plan* =	1.25	acres
Total post-development impervious cover fraction * =	0.34	
P =	30	inches
LM TOTAL PROJECT =	1020	lbs.

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

Number of drainage basins / outfalls areas leaving the plan area = 1

BMP - VEGETATED FILTER STRIPS

Vegetated filter strips will be implemented along the entire downstream of paved trail with no more than 20% slope. The filter strips must be a engineered vegetative filter strip and a minimum of 5.2 feet wide to achieve 80% TSS removal rate.

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

RG-348 Page 3-33 Equation 3.7: LR = (BMP efficiency) x P x (AI x 34.6 + A

where:

AC = Total On-Site drainage area in the BMP catchment
AI = Impervious area proposed in the BMP catchment
AP = Pervious area remaining in the BMP catchment
LR = TSS Load removed from this catchment area

AC =	3.72	acres
AI =	1.25	acres
AP =	2.47	acres
LR =	1137	lbs

STATE OF TEXAS
LUIS A. CARDONA
139673
LICENSED PROFESSIONAL ENGINEER
3/15/2024

THE SEAL APPEARING ON THIS DOCUMENT WAS AUTHORIZED BY LUIS A. CARDONA, PE# 139673 ON 3-15-2024. ALTERATION OF A SEALED DOCUMENT WITHOUT PROPER NOTIFICATION TO THE RESPONSIBLE ENGINEER IS AN OFFENSE UNDER THE TEXAS ENGINEERING PRACTICE ACT. THE RECORD COPY OF THIS DRAWING IS ON FILE AT THE OFFICES OF HALFF 100 NE INTERSTATE 410 LOOP, SUITE 200, SAN ANTONIO, TEXAS 78216. TBPELS FIRM #F-312.

ENVIRONMENTAL LAYOUT

100 NE LOOP 410, SUITE 200
SAN ANTONIO, TEXAS 78216
TEL (210) 785-1895
FAX (210) 785-1896
halff

T-Core Engineers
84 NE Loop 410, Ste 101 • San Antonio, Texas 78216 • 210.900.2448
TBPE Registration No. F-18275 • www.tcfre.com

MAVERICK CREEK GREENWAY
UTSA BOULEVARD TO LOOP 1604
SAN ANTONIO, TEXAS, 78249

JOB NUMBER:	23-04027
DESIGNED BY:	JR
DRAWN BY:	JR
CHECKED BY:	LAC
DATE:	3/24/2024
SHEET:	**EL 1.02**

3/24/2024 6:58 PM

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Maverick Creek Trail Site info.		
Impervious Area	Existing	Proposed
	(AC)	(AC)
Paved Trail	0	1.25
Total		1.25
Impervious Cover	0	1.25

Maverick Creek Trail BMP Info.								
Impervious Area	Drainage Area	Impervious Area	Req TSS removal	Treatment	Type of treatment	Efficiencey	IMP treated	Max. TSS removal
	(AC)	(AC)	(lbs)				(AC)	(lbs)
Paved Trail	3.72	1.25	1020	Yes	Vegetated Filter Strips	85%	1.25	1137
Total	3.72	1.25	1020				1.25	1137

0 20 40 80
SCALE 1" = 40'

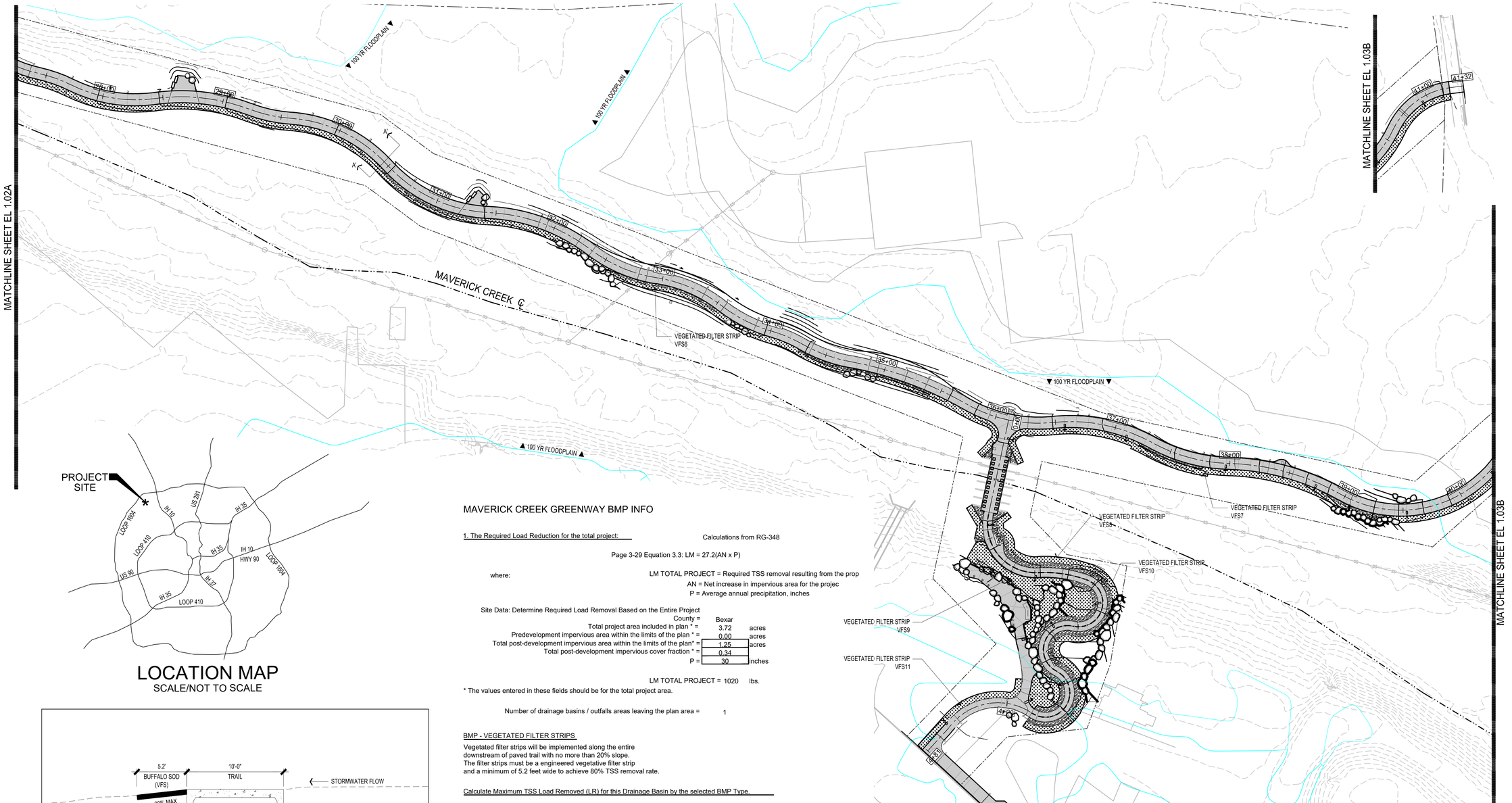
NORTH

LEGEND:

100 YR FLOOD PLAIN

VEGETATED FILTER STRIP

REVISIONS



LOCATION MAP
SCALE/NOT TO SCALE

BMP TYPICAL SECTION 'A'-'A'
N.T.S.

MAVERICK CREEK GREENWAY BMP INFO

1. The Required Load Reduction for the total project: Calculations from RG-348

Page 3-29 Equation 3.3: LM = 27.2(AN x P)

where:

LM TOTAL PROJECT = Required TSS removal resulting from the prop
AN = Net increase in impervious area for the projec
P = Average annual precipitation, inches

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

County =	Bexar	
Total project area included in plan * =	3.72	acres
Predevelopment impervious area within the limits of the plan * =	0.00	acres
Total post-development impervious area within the limits of the plan* =	1.25	acres
Total post-development impervious cover fraction * =	0.34	
P =	30	inches

LM TOTAL PROJECT = 1020 lbs.

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

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STATE OF TEXAS
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ENVIRONMENTAL LAYOUT

MAVERICK CREEK GREENWAY
UTSA BOULEVARD TO LOOP 1604
SAN ANTONIO, TEXAS, 78249

halff
100 NE LOOP 410, SUITE 200
SAN ANTONIO, TEXAS 78216
TEL (210) 789-1895
FAX (210) 789-1896

T-Core Engineers
54 NE Loop 410, Ste 1015 • San Antonio, Texas 78216 • 210.900.2448
TBPE Registration No. F-18275 • www.tcfirc.com

JOB NUMBER:	23-04027
DESIGNED BY:	JR
DRAWN BY:	JR
CHECKED BY:	LAC
DATE:	3/24/2024
SHEET:	EL 1.03

3/24/2024 6:58 PM

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Permanent Stormwater Section

Texas Commission on Environmental Quality

for Regulated Activities on the Edwards Aquifer Recharge Zone and Relating to 30 TAC §213.5(b)(4)(C), (D)(Ii), (E), and (5), Effective June 1, 1999

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

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

Signature

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

Print Name of Customer/Agent: Luis Cardona, P.E.

Date: 1/31/24

Signature of Customer/Agent

Luis A. Cardona

Regulated Entity Name: Maverick Greenway from UTSA Blvd to Loop 1604

Permanent Best Management Practices (BMPs)

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

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

   ☒ N/A

2. ☐ These practices and measures have been designed, and will be constructed, operated, and maintained to insure that 80% of the incremental increase in the annual mass loading of total suspended solids (TSS) from the site caused by the regulated activity is removed. These quantities have been calculated in accordance with technical guidance prepared or accepted by the executive director.

   ☐ The TCEQ Technical Guidance Manual (TGM) was used to design permanent BMPs and measures for this site.

☐ A technical guidance other than the TCEQ TGM was used to design permanent BMPs and measures for this site. The complete citation for the technical guidance that was used is: _____

☒ N/A

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

   ☒ N/A

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

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

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

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

6. ☐ **Attachment B - BMPs for Upgradient Stormwater**.

☐ A description of the BMPs and measures that will be used to prevent pollution of surface water, groundwater, or stormwater that originates upgradient from the site and flows across the site is attached.

☐ No surface water, groundwater or stormwater originates upgradient from the site and flows across the site, and an explanation is attached.

☒ Permanent BMPs or measures are not required to prevent pollution of surface water, groundwater, or stormwater that originates upgradient from the site and flows across the site, and an explanation is attached.

7. ☐ **Attachment C - BMPs for On-site Stormwater**.

☐ A description of the BMPs and measures that will be used to prevent pollution of surface water or groundwater that originates on-site or flows off the site, including pollution caused by contaminated stormwater runoff from the site is attached.

☒ Permanent BMPs or measures are not required to prevent pollution of surface water or groundwater that originates on-site or flows off the site, including pollution caused by contaminated stormwater runoff, and an explanation is attached.

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

☒ N/A

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

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

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

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

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

☒ N/A

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

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

    ☒ N/A

12. ☐ **Attachment H - Pilot-Scale Field Testing Plan**. Pilot studies for BMPs that are not recognized by the Executive Director require prior approval from the TCEQ. A plan for pilot-scale field testing is attached.

    ☒ N/A

13. ☐ **Attachment I -Measures for Minimizing Surface Stream Contamination**. A description of the measures that will be used to avoid or minimize surface stream contamination and changes in the way in which water enters a stream as a result of the construction and development is attached. The measures address increased stream flashing, the creation of stronger flows and in-stream velocities, and other in-stream effects caused by the regulated activity, which increase erosion that results in water quality degradation.

    ☒ N/A

Responsibility for Maintenance of Permanent BMP(s)

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

14. ☐ The applicant is responsible for maintaining the permanent BMPs after construction until such time as the maintenance obligation is either assumed in writing by another entity having ownership or control of the property (such as without limitation, an owner's association, a new property owner or lessee, a district, or municipality) or the ownership of the property is transferred to the entity. Such entity shall then be responsible for maintenance until another entity assumes such obligations in writing or ownership is transferred.

    ☒ N/A

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

    ☒ N/A

FORM TCEQ-0600 ATTACHMENTS

ATTACHMENT A — 20% OR LESS IMPERVIOUS COVER WAIVER

Not Applicable.

ATTACHMENT B — BMPS FOR UPGRADIENT STORMWATER

Not Applicable.

ATTACHMENT C — BMPS FOR ON-SITE STORMWATER

Not Applicable.

ATTACHMENT D –BMPS FOR SURFACE STREAMS

Not Applicable.

ATTACHMENT E – REQUEST TO SEAL FEATURES

Not Applicable.

ATTACHMENT F – CONSTRUCTION PLANS

Not Applicable.

ATTACHMENT G – INSPECTION, MAINTENANCE, REPAIR & RETROFIT PLAN

Not Applicable.

ATTACHMENT H – INSPECTION REPORT

Not Applicable.

ATTACHMENT I – PILOT-SCALE TESTING PLAN

Not Applicable.

ATTACHMENT J – MEASURES FOR MINIMIZING SURFACE STREAM CONTAMINATION

Not Applicable.

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

I Samuel Sanchez,
Print Name

Landscape Architect – Project Manager,
Title - Owner/President/Other

of City of San Antonio – Greenway Trails Division,
Corporation/Partnership/Entity Name

have authorized Luis Cardona, P.E.
Print Name of Agent/Engineer

of Halff
Print Name of Firm

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

I also understand that:

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

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

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

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

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

SIGNATURE PAGE:

Applicant's Signature

2-6-24
Date

THE STATE OF Texas §

County of Bexar §

BEFORE ME, the undersigned authority, on this day personally appeared Samuel Sanchez 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 6th day of February, 2024.

NOTARY PUBLIC

Tammy Moore
Typed or Printed Name of Notary

MY COMMISSION EXPIRES: 9/17/2024

Application Fee Form

Texas Commission on Environmental Quality
Name of Proposed Regulated Entity: Maverick Creek Greenway from UTSA Blvd to Loop 1604
Regulated Entity Location: San Antonio, TX
Name of Customer: City of San Antonio - Public Works Department
Contact Person: Samuel Sanchez Phone: (210) 207-4091
Customer Reference Number (if issued):CN N/A
Regulated Entity Reference Number (if issued):RN 111075701

Austin Regional Office (3373)

☐ Hays ☐ Travis ☐ Williamson

San Antonio Regional Office (3362)

☒ Bexar ☐ Medina ☐ Uvalde
☐ Comal ☐ Kinney

Application fees must be paid by check, certified check, or money order, payable to the **Texas Commission on Environmental Quality**. Your canceled check will serve as your receipt. **This form must be submitted with your fee payment**. This payment is being submitted to:

☐ Austin Regional Office
☐ Mailed to: TCEQ - Cashier
Revenues Section
Mail Code 214
P.O. Box 13088
Austin, TX 78711-3088

☒ San Antonio Regional Office
☐ Overnight Delivery to: TCEQ - Cashier
12100 Park 35 Circle
Building A, 3rd Floor
Austin, TX 78753
(512)239-0357

Site Location (Check All That Apply):

☒ Recharge Zone ☐ Contributing Zone ☐ Transition Zone

Type of Plan	***Size***	***Fee Due***
Water Pollution Abatement Plan, Contributing Zone Plan: One Single Family Residential Dwelling	Acres	$
Water Pollution Abatement Plan, Contributing Zone Plan: Multiple Single Family Residential and Parks	Acres	$
Water Pollution Abatement Plan, Contributing Zone Plan: Non-residential	Acres	$
Sewage Collection System	L.F.	$
Lift Stations without sewer lines	Acres	$
Underground or Aboveground Storage Tank Facility	Tanks	$
Piping System(s)(only)	Each	$
Exception	1 Each	$ 500
Extension of Time	Each	$

Signature: Luis A. Cocciona Date: 4/10/2024

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 5 < 10 10 < 40 40 < 100 100 < 500 ≥ 500	$1,500 $3,000 $4,000 $6,500 $8,000 $10,000
Non-residential (Commercial, industrial, institutional, multi-family residential, schools, and other sites where regulated activities will occur)	< 1 1 < 5 5 < 10 10 < 40 40 < 100 ≥ 100	$3,000 $4,000 $5,000 $6,500 $8,000 $10,000

Organized Sewage Collection Systems and Modifications

Project	*Cost per Linear Foot*	*Minimum Fee-Maximum Fee*
Sewage Collection Systems	$0.50	$650 - $6,500

Underground and Aboveground Storage Tank System Facility Plans and Modifications

Project	*Cost per Tank or Piping System*	*Minimum Fee-Maximum Fee*
Underground and Aboveground Storage Tank Facility	$650	$650 - $6,500

Exception Requests

Project	*Fee*
Exception Request	$500

Extension of Time Requests

Project	*Fee*
Extension of Time Request	$150

TCEQ 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.*)

☐ New Permit, Registration or Authorization (*Core Data Form should be submitted with the program application.*)

☐ Renewal (*Core Data Form should be submitted with the renewal form*) ☒ Other

2. Customer Reference Number *(if issued)*	Follow this link to search for CN or RN numbers in Central Registry**	3. Regulated Entity Reference Number *(if issued)*
CN 604438556		RN

SECTION II: Customer Information

4. General Customer Information | **5. Effective Date for Customer Information Updates** (mm/dd/yyyy)

☐ New Customer ☐ Update to Customer Information ☐ Change in Regulated Entity Ownership
☐ Change in Legal Name (Verifiable with the Texas Secretary of State or Texas Comptroller of Public Accounts)

The Customer Name submitted here may be updated automatically based on what is current and active with the Texas Secretary of State (SOS) or Texas Comptroller of Public Accounts (CPA).

6. Customer Legal Name (*If an individual, print last name first: eg: Doe, John*) *If new Customer, enter previous Customer below:*

City of San Antonio Public Works

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

11. Type of Customer: ☐ Corporation ☐ Individual Partnership: ☐ General ☐ Limited
Government: ☐ City ☐ County ☐ Federal ☐ State ☐ Other ☐ Sole Proprietorship ☐ Other:

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

13. Independently Owned and Operated?
☐ **Yes** ☐ **No**

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

☐ Owner ☐ Operator ☒ Owner & Operator
☐ Occupational Licensee ☐ Responsible Party ☐ Voluntary Cleanup Applicant ☐ Other:

15. Mailing Address:

City		State		ZIP		ZIP + 4	

16. Country Mailing Information *(if outside USA)*	17. E-Mail Address *(if applicable)*

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

SECTION III: Regulated Entity Information

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

☐ New Regulated Entity ☐ Update to Regulated Entity Name ☐ Update to Regulated Entity Information

The Regulated Entity Name submitted may be updated in order to meet TCEQ Agency Data Standards (removal of organizational endings such as Inc, LP, or LLC).

22. Regulated Entity Name (*Enter name of the site where the regulated action is taking place.*)

COSA Maverick Creek Trail from UTSA Blvd to Loop 1604

23. Street Address of the Regulated Entity: ***(No PO Boxes)***	Babcock Rd							
	City	San Antonio	**State**	TX	**ZIP**	78232	**ZIP + 4**	
24. County	Bexar							

Enter Physical Location Description if no street address is provided.

25. Description to Physical Location:					
26. Nearest City			**State**		**Nearest ZIP Code**

27. Latitude (N) In Decimal:	29.580822		**28. Longitude (W) In Decimal:**	-98.631853	
Degrees	Minutes	Seconds	Degrees	Minutes	Seconds
29	34	50.96	98	37	54.67

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)
1542	1623	236220	237110

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

City of San Antonio Public Works Department

34. Mailing Address:								
	City		**State**		**ZIP**		**ZIP + 4**	
35. E-Mail Address:								

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

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

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

SECTION IV: Preparer Information

40. Name:	Victoria Soltero	**41. Title:**	Graduate Engineer

42. Telephone Number	**43. Ext./Code**	**44. Fax Number**	**45. E-Mail Address**
(210) 704-1351		( ) -	vsoltero@halff.com

SECTION V: Authorized Signature

46. By my signature below, I certify, to the best of my knowledge, that the information provided in this form is true and complete, and that I have signature authority to submit this form on behalf of the entity specified in Section II, Field 6 and/or as required for the updates to the ID numbers identified in field 39.

Company:	Halff	**Job Title:**	Public Works Team Leader
Name *(In Print):*	Luis Cardona	**Phone:**	(210) 704- **1379**

Signature:		Date:	4/10/2024