Sonterra Road Extension Project

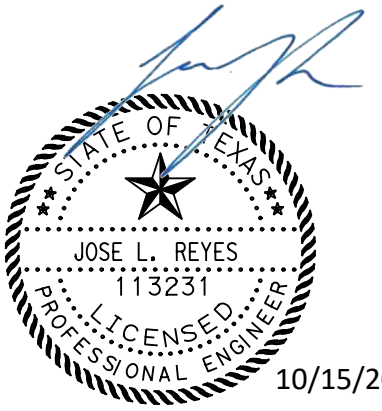
WPAP Modification

October 2024

Prepared for:

City of San Antonio

Public Works Department



10/15/2024

This sealed plan set is for permitting purposes only.

Prepared by:

MAESTAS

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: Sonterra Road Extension Project						**2. Regulated Entity No.:**			
3. Customer Name: City of San Antonio						**4. Customer No.:** 600130652			
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):**			4.439
9. Application Fee:	$4,000		**10. Permanent BMP(s):**			Batch Detention			
11. SCS (Linear Ft.):	-		**12. AST/UST (No. Tanks):**						
13. County:	Bexar		**14. Watershed:**			Salado Creek			

Application Distribution

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

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

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

Austin Region			
County:	**Hays**	**Travis**	**Williamson**
Original (1 req.)	___	___	___
Region (1 req.)	___	___	___
County(ies)	___	___	___
Groundwater Conservation District(s)	___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.)	_x_	___	___	___	___
Region (1 req.)	_x_	___	___	___	___
County(ies)	_x_	___	___	___	___
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. Jose L. Reyes, PE
Print Name of Customer/Authorized Agent
Signature of Customer/Authorized Agent 10/15/2024 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: Jose L. Reyes, PE

Date: 10/15/2024

Signature of Customer/Agent:

Project Information

1. Regulated Entity Name: Sonterra Road Extension Project
2. County: Bexar
3. Stream Basin: Salado Creek Basin
4. Groundwater Conservation District (If applicable): N/A
5. Edwards Aquifer Zone:

   ☒ Recharge Zone
   ☐ Transition Zone

6. Plan Type:

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

7. Customer (Applicant):

   Contact Person: Sean D. Strong, PE
   Entity: City of San Antonio
   Mailing Address: 100 W. Houston St., 15th Floor
   City, State: San Antonio, Texas Zip: 78205
   Telephone: 210-207-8037 FAX: 210-207-4406
   Email Address: sean.strong@sanantonio.gov

8. Agent/Representative (If any):

   Contact Person: Jose L. Reyes, PE
   Entity: Maestas & Associates, LLC.
   Mailing Address: 8122 Datapoint Drive, Suite 840
   City, State: San Antonio, Texas Zip: 78229
   Telephone: 210-366-1988 FAX: 210-366-1980
   Email Address: jreyes@maesce.com

9. Project Location:

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

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

    The project is located in between E Sonterra Blvd & Gold Canyon Rd at the N loop 1604 E Access Rd and Gold Canyon Rd intersection.

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: Tentative

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.

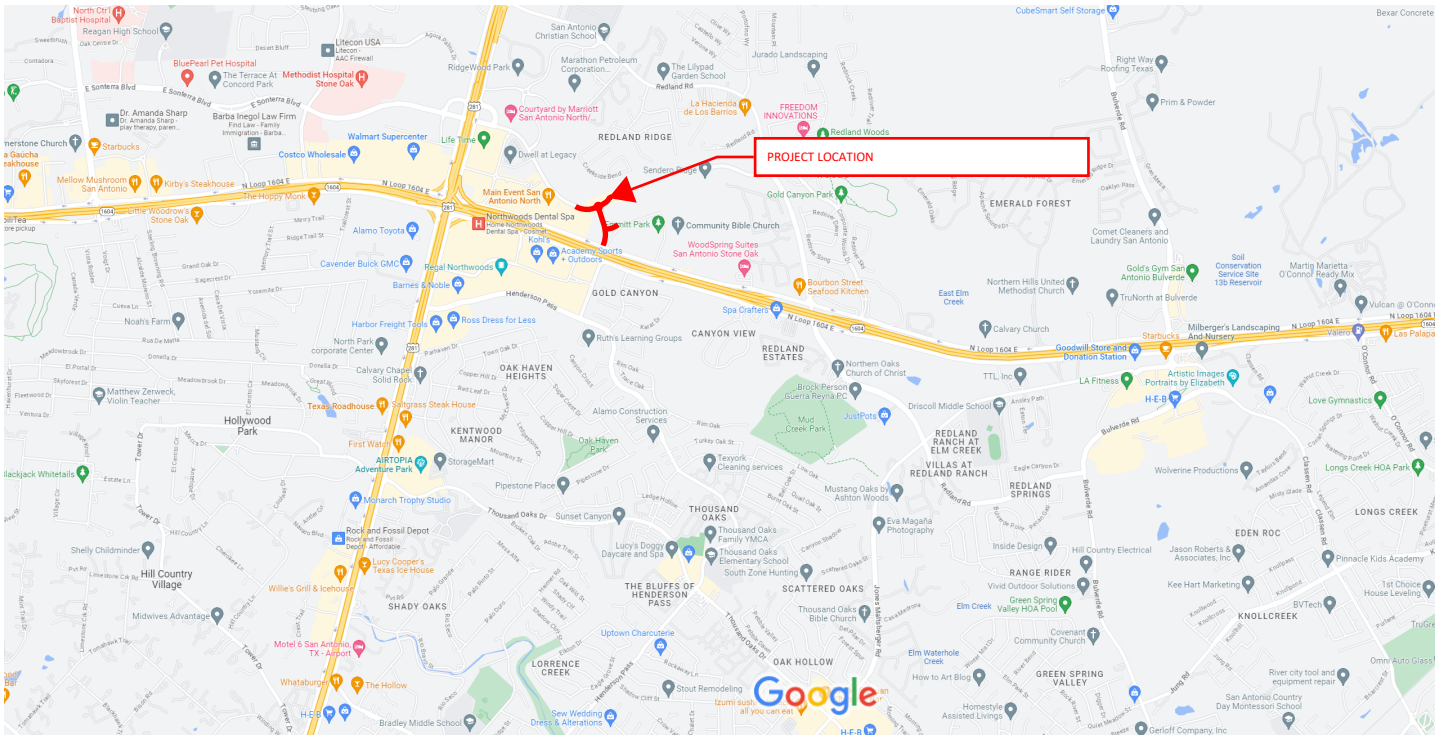
19. ☒ Application fees are due and payable at the time the application is filed. If the correct fee is not submitted, the TCEQ is not required to consider the application until the correct fee is submitted. Both the fee and the Edwards Aquifer Fee Form have been sent to the Commission's:

☐ 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.

Sonterra Road Extension Project



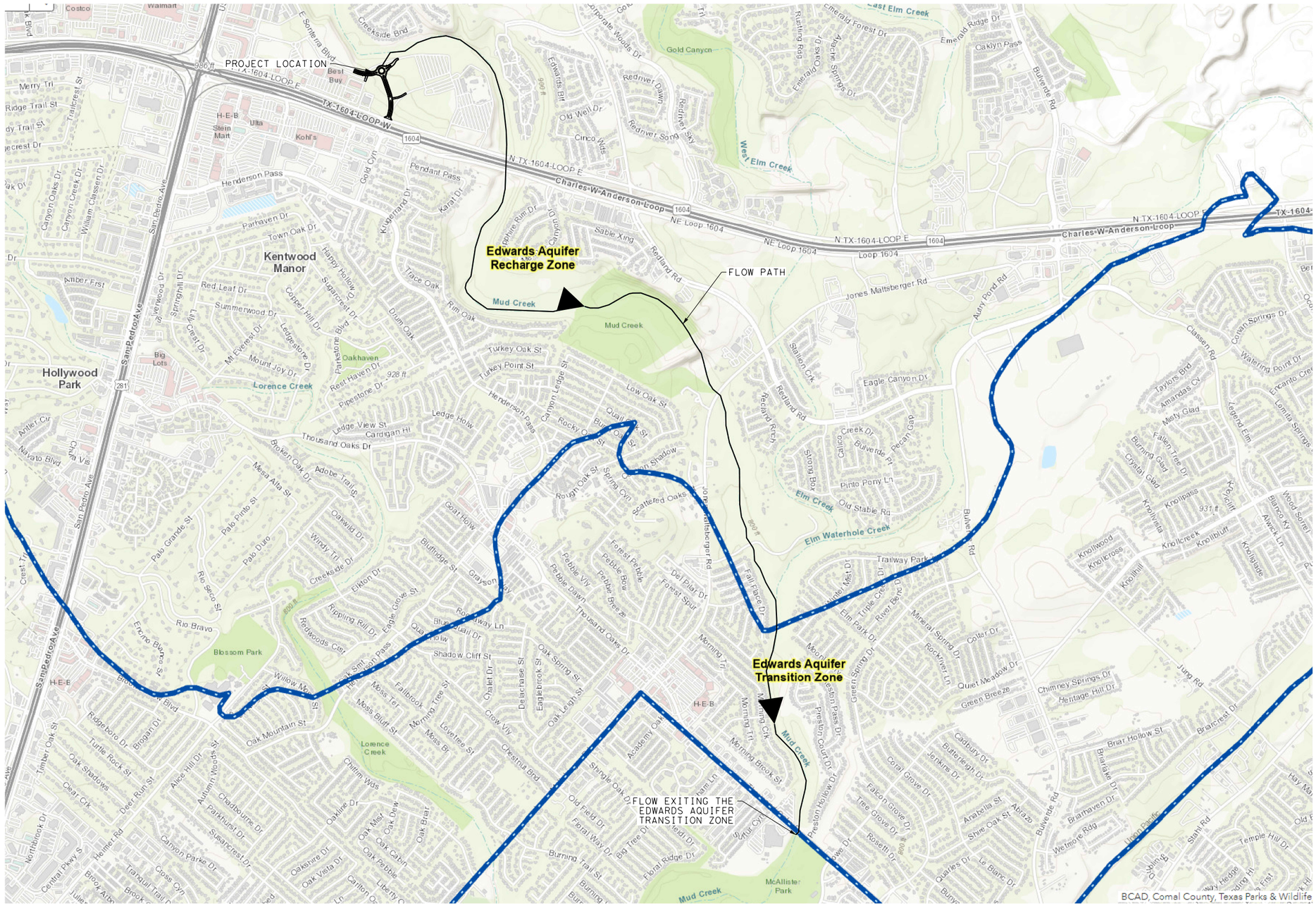
LEGEND

WPAP PROJECT SITE

ATTACHMENT A

PROJECT LOCATION

SONTERRA ROAD EXTENSION PROJECT



N

SCALE
1" = 2000'

LEGEND

FLOW PATH FROM PROJECT TO BOUNDARY OF TRANSITION ZONE

MAESTAS

8122 DATAPOINT DR., STE. 840
SAN ANTONIO, TX 78229
(210) 366-1988
TBPE No.: F-333
TBPLS No.: 10194506

JOSE L. REYES
113231
8/3/2023

NO:	DATE	REVISION	APPROVED BY

Freese and Nichols, Inc.
Texas Registered Engineering Firm F-2144

FREESE AND NICHOLS

9601 McAllister Freeway, Suite 1008
San Antonio, Texas 78216
Phone - (210) 298-3800
web - www.freese.com

CITY OF SAN ANTONIO
PUBLIC WORKS DEPARTMENT

SONTERRA ROAD EXTENSION

ATTACHMENT B
USGS QUADRANGLE: LONGHORN

SHEET 1 OF 1

PRELIMINARY	PROJECT NO.:	23-01849	DATE: 8/3/2023
DRWN. BY:	DSGN. BY:	CHKD. BY:	SHEET 1 OF 1

Date: 8/3/2023

Date: 8/3/2023 User: USER File: Z:\Projects\M242 Sonterra Gold Canyon Extension\06 - CADD Files\06.60 - Environmental\M242-USGS-01.dgn

GENERAL INFORMATION FORM ATTACHMENTS

ATTACHMENT A – ROAD MAP

Attached.

ATTACHMENT B – USGS/EDWARDS AQUIFER RECHARGE ZONE MAP

Attached.

ATTACHMENT C - PROJECT DESCRIPTION

The City of San Antonio is proposing to extend Sonterra Blvd. approximately 450 LF northeast and Gold Canyon approximately 950 LF north to intersect each other with a roundabout. In addition to extending these roadways are variable width sidewalks on both sides of the roadway and driveway extensions to tie-in to the proposed roadway. The purpose of the project is to provide access to Sonterra Blvd. by way of Gold Canyon Rd, and to place the intersection for future development.

The entire project area is within the Recharge Zone. The project consists of 148,534 square feet of roadway reconstruction including proposed curbs, sidewalk, and batch detention. All elements of the proposed improvements drain to Mud Creek.

The proposed BMPs are a batch detention pond located northeast of the roundabout, and 15 foot vegetated filter strips along driveway 4-1. Additionally, the 3ft of grassy area between the divorced sidewalk and the roadway will be maintained as shared-use path vegetated filter strip.

The existing pavement was treated by an existing sand filtration pond which prevents off-site runoff from affecting the new impervious cover and proposed batch detention. The portion of Sonterra Blvd. that is being re-constructed (System B) drains to an existing sand filtration basin that corresponds to Legacy Shopping Center Phase 2 WPAP (RN102747409).

The total project area is 3.35 acres, an additional 7.07ac of treated off-site runoff is captured in the proposed drainage system. Approximately 125,453 square feet of new impervious cover will be added, resulting in 2.88 acres of total impervious cover and a post development impervious cover of 86%. To meet 80% removal of increase in TSS load resulting from the development of this site, the proposed BMPS must remove **2,350 lbs** of TSS.

Drainage basin 1 consists of the proposed roadway and is approximately 2.95 acres with 2.15 acres of post-development impervious cover. This basin drains to the proposed detention pond for a total of **1,909 lbs** of TSS removal. Drainage basin 2 consists of approx. 6ft of proposed sidewalk along each side of the proposed roadway (where 12ft sidewalks are proposed, only approx. 6ft is assumed to be treated in this basin). Basin 2 is approximately 0.33 acres with 0.33 acres of post-development impervious cover. This area drains towards the 3-foot vegetated filter strip in between the proposed divorced sidewalk and the proposed roadway for a total of **291 lbs** of TSS removal. Drainage basin 3 consists of Driveway 4-1 and Driveway 2-1 which are not captured in the detention basin. Basin 3 is approximately 0.40 acres with 0.40 acres of post-development impervious cover. Approximately 0.17 acres of driveway 4-1 drains towards the proposed 15ft vegetated filter strip around driveway 4-1 for a total of **150 lbs** of TSS removal. The detention basin and the VFS around driveway 4-1 provide over-treatment to account for the required removal from driveway 2-1. The proposed detention pond and the proposed VFS remove a total of **2,350 lbs** of TSS. These areas are depicted in the drainage area map.

Geologic Assessment

Texas Commission on Environmental Quality

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

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

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

Signature

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

Print Name of Geologist: Stephen Norair II, P.G.

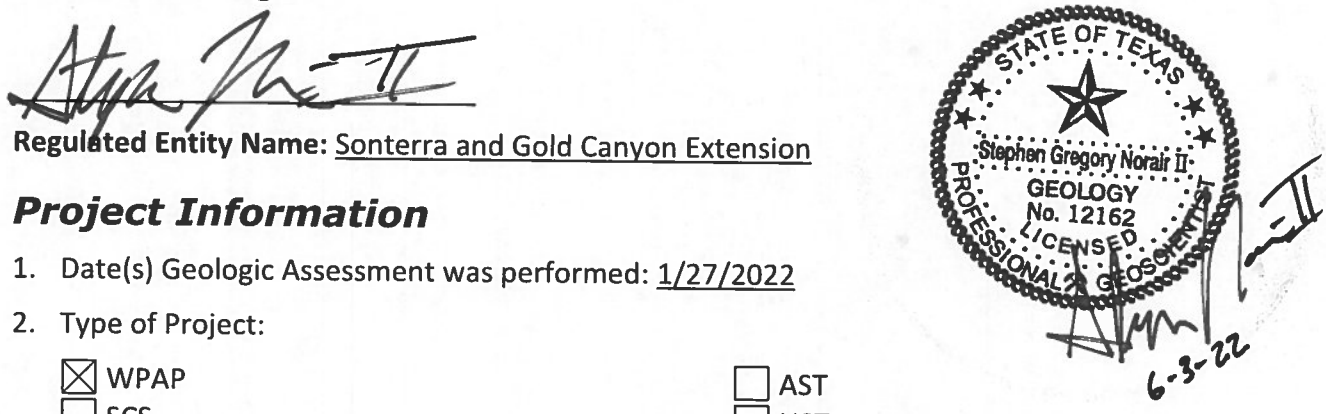
Telephone: 817-735-7278

Fax: N/A

Date: 6/3/2022

Representing: Freese and Nichols, Inc. P.G. No. 12162 (Name of Company and TBPG or TBPE registration number)

Signature of Geologist:



Regulated Entity Name: Sonterra and Gold Canyon Extension

Project Information

1. Date(s) Geologic Assessment was performed: 1/27/2022
2. Type of Project:

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

   ☒ Recharge Zone
   ☐ Transition Zone
   ☐ Contributing Zone within the Transition Zone

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

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

Table 1 - Soil Units, Infiltration Characteristics and Thickness

Soil Name	Group*	Thickness(feet)
Anhalt clay (Ca)	D	2.3-5
Eckrant very cobbly clay (TaC)	D	1 - 2.5
Tinn and Frio soils (Tf)	D	>6.7

** Soil Group Definitions (Abbreviated)*

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

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

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

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

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

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

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

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

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.

GEOLOGIC ASSESSMENT TABLE — PROJECT NAME:

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)	DIP	DENSITY (NO/FT)	APERTURE (FEET)	INFILL	RELATIVE INFILTRATION RATE	TOTAL	SENSITIVITY		CATCHMENT AREA (ACRES)		TOPOGRAPHY
						X	Y	Z		10						<40	≥40	<1.6	≥1.6	
F-1	-98.45645	29.609978	MB	30	Ked	3	3		N80E				X	5	35	✓			✓	Streambed

* DATUM:

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

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

12 TOPOGRAPHY

Hilltop, Hillside, Drainage, Floodplain, Streambed

I have read, I understood, and I have followed the Texas Commission on Environmental Quality's Instructions to Geologists. The information presented here complies with that document and is a true representation of the conditions observed in the field.

My signature certifies that I am qualified as a geologist as defined by 30 TAC Chapter 213.

Date: 6-3-2022

Sheet _____ of _____

STATE OF TEXAS
Stephen Gregory Norair II
GEOLOGY
No. 12162
LICENSED
PROFESSIONAL GEOSCIENTIST

6-3-22

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

Attachment B

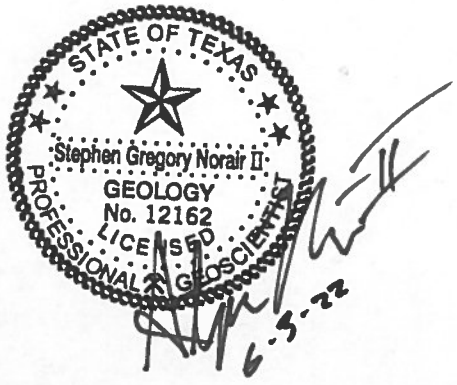
Stratigraphic Collumn[1, 2, 3]

System	Series	Group	Formation	Member	Thickness (ft)
Lower Cretaceous	Commanchian	Edwards Group/Edwards Limestone Undivided (Ke)	Person Formation	Leached and collapsed member	70 – 100
				Regional dense member	16 – 24
			Kainer Formation	Grainstone member	50 – 60
				Kirscheberg evaporite member	50 – 60
				Dolomitic member	110 – 140
				Basal nodular member	20 – 70
		Trinity	Glen Rose Formation	Upper (Kgru)	400 – 900
				Lower (Kgrl)	

[1]Blome, C.D., Faith, J.R., Pedraza, D.E., Ozuna, G.B., Cole, J.C., Clark, A.K., Small, T.A., and Morris, R.R. 2005. Geologic Map of the Edwards Aquifer Recharge Zone, South-Central Texas. U.S. Geological Survey, U.S. Department of the Interior. Scientific Investigations Map 2873. Version 1.1. Scale 1:200,00

[2]Texas Water Science Center (USGS TWSC). Geologic Database of Texas, 2014-02-01. Web. 2022-01-05.

[3]University of Texas at Austin. Bureau of Economic Geology (1974). Geologic Atlas of Teas, San Antonio Sheet. The Bureau, 1974. Robert Hamilton Cuyler Memorial ed.a



Attachment C

Narrative Description of Site Specific Geology

Project Description

FNI has been contracted to develop plans, specifications, and estimates for a roadway extension between the current limits of Sonterra Blvd and Loop 1604, with the goal being to extend and connect Gold Canyon Road to the aforementioned roadways per San Antonio's Major Thoroughfare Plan. This plan includes curbs, sidewalks, driveway approaches, intersection improvements, and drainage improvements.

The history of this project location begins in the 1960's when Loop 1604 was constructed south of the project area. Between 1995 and 2002, the Community Bible Church complex (commercial land use) was constructed to the immediate east of the project location. By 2008, adjacent strip malls (commercial land use) and Sonterra Blvd were completed, and the current site conditions were achieved. The remainder of the site remains undeveloped and has not been cleared in its history.

Geologic Stratigraphy and Structural Characteristics

The stratigraphy within the project area for Sonterra-Gold Canyon Extension consists solely of the Cretaceous-aged Ewards Limestone with thicknesses between 170 and 300 feet. The Edwards limestone at the project site can be divided into two lithostratigraphic subunits, the Person Formation and the Kainer Formation. These members can be further subdivided into three members, the leached and collapsed member, the regional dense member, and the grainstone member. The leached and collapsed member is a crystalline limestone and mudstone to grainstone with chert that has been identified with bioturbated beds separated by massive limestone beds. Underlying this is the regionally dense member that is a vertical boundary to flow through the Edwards Group. The lowest potential hydrostratigraphic unit within the project area is the grainstone member, which is a white, chert-bearing grainstone and mudstone. The lower members have a greater likelihood of being present at the site closer to Mud Creek. Lastly, according to geologic maps, a normal fault may be present between 0.4 to 1.4 miles southeast of the project location.

Soil Profiles

There are three soils within the project site: the Eckrant very cobbly clay, the Anhalt Clay, and the Tinn and Frio soils. The Eckrant very cobbly clay (TaC; with 5 to 15 percent slopes) is located at the highest elevations of the project site. This soil unit has a depth of 12 to 30 inches before reaching bedrock, is in hydrologic soil group D, and is well drained. It is derived from the residuum of weathered limestone and is associated with ridge backslopes and side slopes. The Anhalt Clay (Ca; with 0 to 2 percent slopes) unit has a depth of 28 to 60 inches before reaching bedrock. It is in hydrologic soil group D, is well drained, and is also associated with the toe and base of hillslopes. It is formed from the clayey residuum of weathered limestone. The Tinn and Frio soils (Tf; with slopes of 0 to 1%) follow the alignment of Mud Creek. This soil unit has a depth greater than 80 inches due to its association with floodplains and is derived from calcareous clayey alluvium.

Site Assessment

FNI conducted a geologic site assessment on January 27th, 2022. This site assessment was focused on identifying geologic and karstic features within the project area. The topography of the site consists of a hill that gently slopes down from its highest elevation at the southern end of the project area to a terrace followed by another slope that continues down to the floodplain of Mud Creek. All fluid movement at the site appears to flow southwest to northeast into Mud Creek via surface flow.

The area south of the existing Gold Cayon road is undeveloped and is a mix of cedar and oak forest and grassland. Talus and bedrock are intermittently present at the surface in forested areas, while grassland areas are predominantly soil. No karst or geologic features were identified.

Along the southern alignment of Gold Canyon Road, a drainage swale is present that flows west to east then north through a culvert and into Mud Creek. This bottom of the swale is composed of exposed bedrock in some locations. The bedrock looks well consolidated and does not appear to have hydrologic interactions with the subsurface.

On the north side of Gold Canyon Road, a rock outcrop that trends east-west is present. This outcrop makes up the 20-foot elevation loss between the terrace and the floodplain of Mud Creek. The outcrop is composed of massive grey limestone. Although local cracking and weathering was observed. No evidence indicated a karstic or structural geologic connection to the subsurface.

The northern most portion of the project location is within the Mud Creek floodplain. One geologic feature was observed consisting of a sewer manhole (surficial evidence of a sewer line that runs east-west following Mud Creek). This feature was typed as “Manmade feature in bedrock” and is a low sensitivity feature due to its encasement in concrete and absence of expedited infiltration rates.

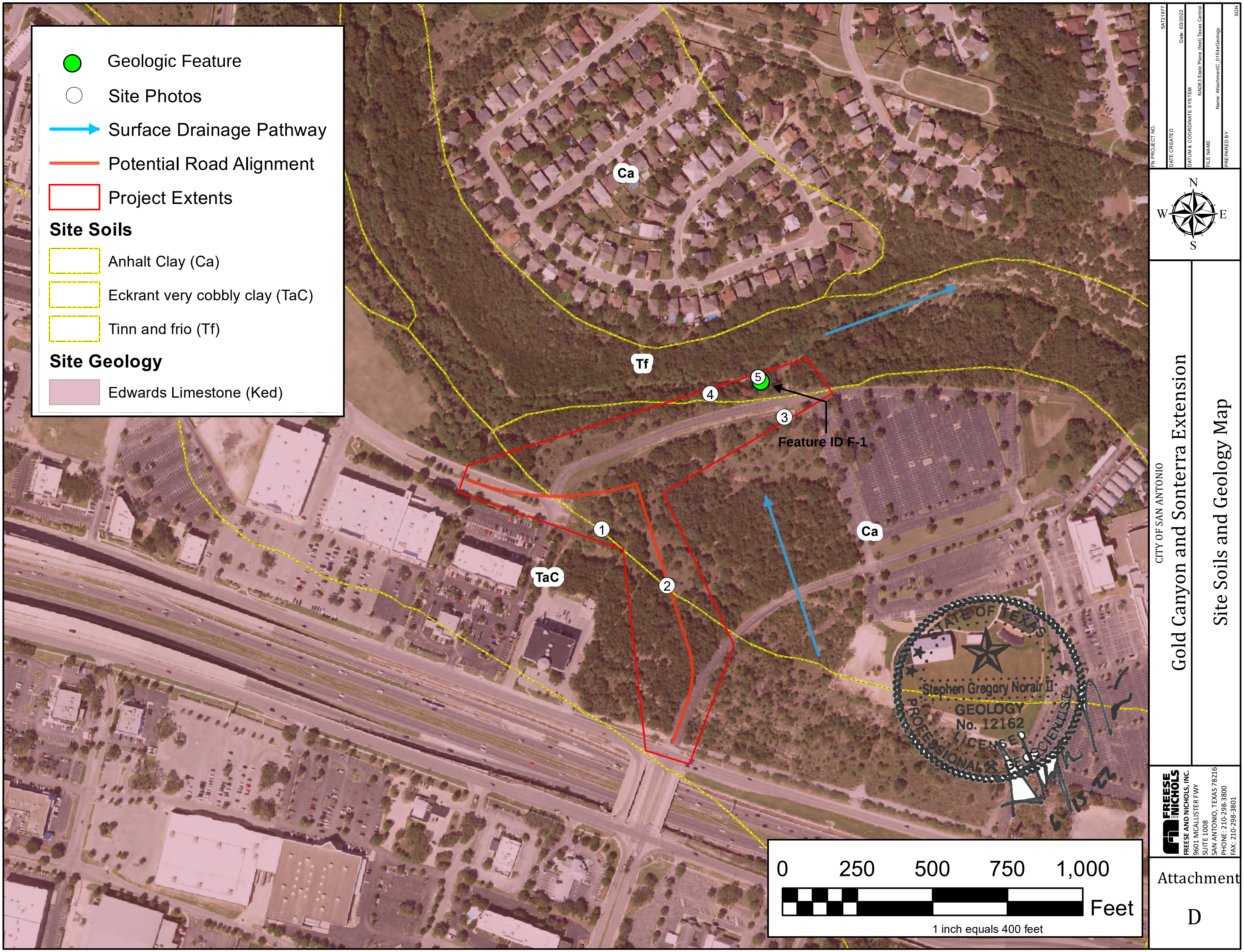
Photo 1. Representative view of undeveloped areas south of Gold Canyon Road within project location covered with grasses.

Photo 2. Representative view of undeveloped forested areas south of Gold Canyon Road within project location.

Photo 3. View looking west along Gold Canyon Road from culvert at bedrock lined drainage swale.

Photo 4. Representative view of bedrock outcrop that trends east-west north of Gold Canyon Road (facing south). This is what the slope down to Mud Creek looks like through much of the area.

Photo 5. View of the geologic feature F-1, sewer manhole, adjacent to Mud Creek.


Geologic Feature
Site Photos
Surface Drainage Pathway
Potential Road Alignment
Project Extents
Site Soils
Anhalt Clay (Ca)
Eckrant very cobbly clay (TaC)
Tinn and frio (Tf)
Site Geology
Edwards Limestone (Ked)
Ca
Tf
TaC
Ca
1
2
3
4
5
Feature ID F-1
0 250 500 750 1,000
Feet
1 inch equals 400 feet
STATE OF TEXAS
Stephen Gregory Norair II
GEOLOGY
No. 12162
LICENSED
PROFESSIONAL GEOSCIENTIST
6-13-22
FN PROJECT NO. SAT21877
DATE CREATED Date: 6/3/2022
DATUM & COORDINATE SYSTEM NAD83 State Plane (feet) Texas Central
FILE NAME Name: AttachmentC_01SiteGeology
PREPARED BY SGN
N
W
E
S
CITY OF SAN ANTONIO
Gold Canyon and Sonterra Extension
Site Soils and Geology Map
FREESE AND NICHOLS
FREESE AND NICHOLS, INC.
9601 MCALLISTER FWY
SUITE 1008
SAN ANTONIO, TEXAS 78216
PHONE: 210-298-3800
FAX: 210-298-3801
Attachment
D

Modification of a Previously Approved Plan

Texas Commission on Environmental Quality

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

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

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

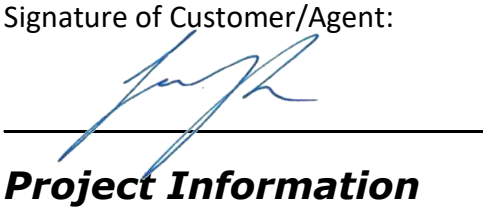
Signature

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

Print Name of Customer/Agent: Jose L. Reyes, PE

Date: 10/15/2024

Signature of Customer/Agent:



Project Information

1. Current Regulated Entity Name: Sonterra Road Extension Project
   Original Regulated Entity Name: Sonterra Road Extension Project
   Regulated Entity Number(s) (RN): 111789400
   Edwards Aquifer Protection Program ID Number(s): _____
   ☒ The applicant has not changed and the Customer Number (CN) is: 13001801
   ☐ The applicant or Regulated Entity has changed. A new Core Data Form has been provided.

2. ☒ **Attachment A: Original Approval Letter and Approved Modification Letters**. A copy of the original approval letter and copies of any modification approval letters are attached.

3. A modification of a previously approved plan is requested for (check all that apply):
   - ☐ Physical or operational modification of any water pollution abatement structure(s) including but not limited to ponds, dams, berms, sewage treatment plants, and diversionary structures;
   - ☐ Change in the nature or character of the regulated activity from that which was originally approved or a change which would significantly impact the ability of the plan to prevent pollution of the Edwards Aquifer;
   - ☒ Development of land previously identified as undeveloped in the original water pollution abatement plan;
   - ☐ Physical modification of the approved organized sewage collection system;
   - ☐ Physical modification of the approved underground storage tank system;
   - ☐ Physical modification of the approved aboveground storage tank system.

4. ☒ Summary of Proposed Modifications (select plan type being modified). If the approved plan has been modified more than once, copy the appropriate table below, as necessary, and complete the information for each additional modification.

WPAP Modification Summary	***Approved Project***	***Proposed Modification***
Acres	3.32	3.35
Type of Development	Commercial	Commercial
Number of Residential Lots	0	0
Impervious Cover (acres)	2.85	2.88
Impervious Cover (%	86	86
Permanent BMPs	Batch Detention, VFS	Batch Detention, VFS
Other	_____	_____

SCS Modification Summary	***Approved Project***	***Proposed Modification***
Linear Feet	_____	_____
Pipe Diameter	_____	_____
Other	_____	_____

AST Modification Summary	*Approved Project*	*Proposed Modification*
Number of ASTs	_____	_____
Volume of ASTs	_____	_____
Other	_____	_____

UST Modification Summary	*Approved Project*	*Proposed Modification*
Number of USTs	_____	_____
Volume of USTs	_____	_____
Other	_____	_____

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

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

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

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

MODIFICATION OF A PREVIOUSLY APPROVED PLAN ATTACHMENTS

ATTACHMENT A – ORIGINAL APPROVAL LETTER

The Original Approval is attached. There are no previous modifications to this WPAP.

TEXAS COMMISSION ON ENVIRONMENTAL QUALITY

Protecting Texas by Reducing and Preventing Pollution

November 10, 2023

Mr. Sean D. Strong, P.E.
City of San Antonio
100 W. Houston St., 15th Floor
San Antonio, Texas, 78205

Re: Approval of a Water Pollution Abatement Plan (WPAP)
Sonterra Road Extension Project; Located on the northeast side of Loop 1604 and US HWY 281 interchange; San Antonio, Bexar County, Texas
Edwards Aquifer Protection Program ID: 13001801, Regulated Entity No. RN111789400

Dear Mr. Strong:

The Texas Commission on Environmental Quality (TCEQ) has completed its review on the application for the above-referenced project submitted to the Edwards Aquifer Protection Program (EAPP) by Maestas & Associates, LLC. on behalf of the applicant, City of San Antonio on August 21, 2023. Final review of the application was completed after additional material was received on October 11, 2023, and October 31, 2023.

As presented to the TCEQ, the application was prepared in general compliance with the requirements of 30 Texas Administrative Codes (TAC) Chapter §213. The permanent best management practices (BMPs) and measures represented in the application were prepared by a Texas licensed professional engineer (PE). All construction plans and design information were sealed, signed, and dated by a Texas licensed PE. Therefore, the application for the construction of the proposed project and methods to protect the Edwards Aquifer are **approved,** subject to applicable state rules and the conditions in this letter.

This approval expires two years from the date of this letter, unless, prior to the expiration date, more than 10 percent of the construction has commenced on the project or an extension of time has been officially requested. This approval or extension will expire, and no extension will be granted if more than 50 percent of the project has not been completed within ten years from the date of this letter.

The applicant or a person affected may file with the chief clerk a motion for reconsideration of the executive director's final action on this Edwards Aquifer protection plan. A motion for reconsideration must be filed in accordance with 30 TAC §50.139.

PROJECT DESCRIPTION

The proposed commercial project will have an area of approximately 3.32-acres. The project will include extending Sonterra Blvd. approximately 450 linear feet northeast and Gold Canyon approximately 950 linear feet north to intersect each other with a roundabout. In addition to extending these roadways are variable width sidewalks on both sides of the roadway and driveway extensions to tie-in to the proposed roadway. The impervious cover will be 2.85-acres (86 percent). No wastewater will be generated by this project.

PERMANENT POLLUTION ABATEMENT MEASURES

To prevent the pollution of stormwater runoff originating on-site or upgradient of the site and potentially flowing across and off the site after construction, one (1) batch detention pond and two (2) vegetative filter strips, designed using the TCEQ technical guidance, *RG-348, Complying with the Edwards Aquifer Rules: Technical Guidance on Best Management Practices,* will be constructed to treat stormwater runoff. The required total suspended solids (TSS) treatment for this project is 2,326 pounds of TSS generated from the 2.85-acres of impervious cover. The approved permanent BMPs and measures meet the required 80 percent removal of the increased load in TSS caused by the project.

The permanent BMPS shall be operational prior to occupancy or use of the proposed project. Inspection, maintenance, repair, and retrofit of the permanent BMPs shall be in accordance with the approved application.

GEOLOGY

According to the Geologic Assessment (GA) included with the application, the surficial units of the site are the Person Formation of the Edwards Aquifer. No sensitive geologic features were identified in the GA. The site assessment conducted on September 20, 2023, by TCEQ staff determined the site to be generally as described by the GA.

STANDARD CONDITIONS

1. The plan holder (applicant) must comply with all provisions of 30 TAC Chapter §213 and all technical specifications in the approved plan. The plan holder should also acquire and comply with additional and separate approvals, permits, registrations or authorizations from other TCEQ Programs (i.e., Stormwater, Water Rights, Dam Safety, Underground Injection Control) as required based on the specifics of the plan.

2. In addition to the rules of the Commission, the plan holder must also comply with state and local ordinances and regulations providing for the protection of water quality as applicable.

Prior to Commencement of Construction:

3. Within 60 days of receiving written approval of an Edwards Aquifer protection plan, the plan holder must submit to the EAPP proof of recordation of notice in the county deed records, with the volume and page number(s) of the county record. A description of the property boundaries shall be included in the deed recordation in the county deed records. TCEQ form, Deed Recordation Affidavit (TCEQ-0625), may be used.

4. The plan holder of any approved Edwards Aquifer protection plan must notify the EAPP and obtain approval from the executive director prior to initiating any modification to the activities described in the referenced application following the date of the approval.

5. The plan holder must provide written notification of intent to commence construction, replacement, or rehabilitation of the referenced project. Notification must be submitted to the EAPP no later than 48 hours prior to commencement of the regulated activity. Notification must include the date on which the regulated activity will commence, the name of the approved plan and program ID number for the regulated activity, and the name of the prime contractor with the name and telephone number of the contact person.

6. Temporary erosion and sedimentation (E&S) controls as described in the referenced application, must be installed prior to construction, and maintained during construction. Temporary E&S controls may be removed when vegetation is established, and the construction area is stabilized. The TCEQ may monitor stormwater discharges from the site

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

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

During Construction:

8. This approval does not authorize the installation of temporary or permanent aboveground storage tanks on this project that will have a total storage capacity of five hundred gallons or more of static hydrocarbons or hazardous substances without prior approval of an Aboveground Storage Tank facility application.

9. If any sensitive feature is encountered during construction, replacement, or rehabilitation on this project, all regulated activities must be **immediately** suspended near it and notification must be made to TCEQ EAPP staff. Temporary BMPs must be installed and maintained to protect the feature from pollution and contamination. Regulated activities near the feature may not proceed until the executive director has reviewed and approved the methods proposed to protect the feature and the aquifer from potentially adverse impacts to water quality.

10. All water wells, including injection, dewatering, and monitoring wells shall be identified in the geologic assessment and must be in compliance with the requirements of the Texas Department of Licensing and Regulation 16 TAC Chapter §76 and all other locally applicable rules, as appropriate.

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

12. Intentional discharges of sediment laden water are not allowed. If dewatering becomes necessary, the discharge must be filtered through appropriately selected BMPs.

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

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

After Completion of Construction:

15. Owners of permanent BMPs and temporary measures must ensure that the BMPs and measures are constructed and function as designed. A Texas licensed PE must certify in writing that the **permanent** BMPs or measures were constructed as designed. The certification letter must be submitted to the EAPP within 30 days of site completion.

16. The applicant shall be responsible for maintaining the permanent BMPs after construction until such time as the maintenance obligation is either assumed in writing by another entity having ownership or control of the property or the ownership of the property is transferred to the entity. A copy of the transfer of responsibility must be filed with the executive director through the EAPP within 30 days of the transfer. TCEQ form, Change in Responsibility for Maintenance on Permanent BMPs and Measures (TCEQ-10263), may be used.

The holder of the approved Edwards Aquifer protection plan is responsible for compliance with Chapter §213 and any condition of the approved plan through all phases of plan implementation. Failure to comply with any condition within this approval letter is a violation of Chapter §213 and is subject to administrative rule or orders and penalties as provided under §213.10 of this title (relating to Enforcement). Such violations may also be subject to civil penalties and injunction. Upon legal transfer of this property, the new owner is required to comply with all terms of the approved Edwards Aquifer protection plan.

This action is taken as delegated by the executive director of the Texas Commission on Environmental Quality. If you have any questions or require additional information, please contact Mr. Hunter Patterson of the Edwards Aquifer Protection Program at (210) 403-4026 or the regional office at 512-339-2929.

Sincerely,

Lillian Butler

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

LIB/hhp

cc: Jose L. Reyes, P.E., Maestas & Associates, LLC.

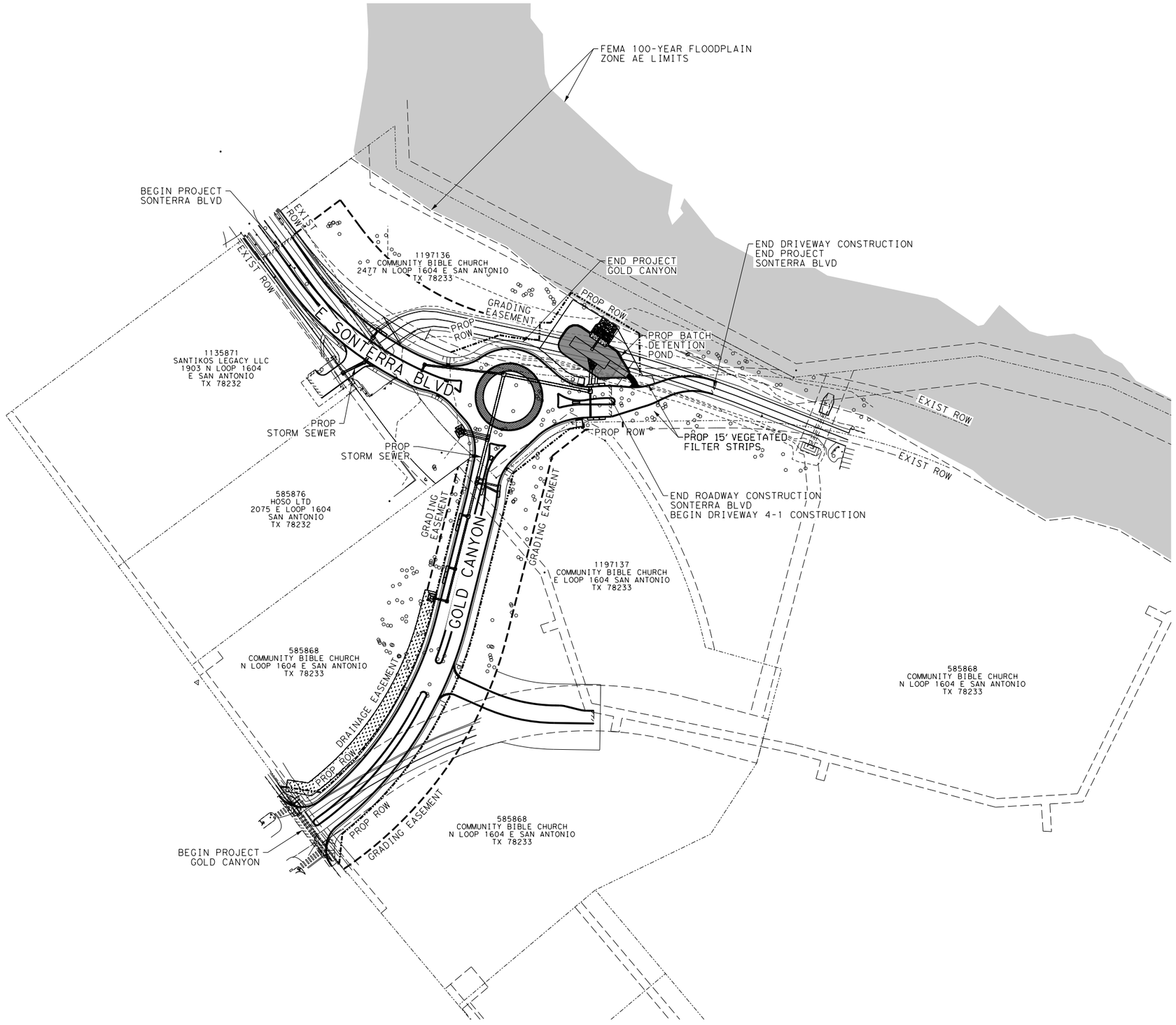
ATTACHMENT B – NARRATIVE OF PROPOSED MODIFICATION

The City of San Antonio proposed the extension of Sonterra Blvd. and Gold Canyon Rd. to included sidewalks and driveway extensions. These improvements and corresponding Water Pollution Prevention Plan were originally submitted and approved by TCEQ in November of 2023. The WPAP for this project site documented the total project area as 3.32 acres, including 2.85 acres of impervious cover (86% impervious cover). The approved construction has commenced and has not been completed.

The proposed modification to the approved site plan includes the addition of a turn lane to driveway 2-1. This modification yields an increase of 0.03 acres of impervious cover. The total impervious cover for the site will increase from 2.85 acres to 2.88 acres. The total site acreage will increase from 3.32 acres to 3.35 acres. The percent impervious cover remains at 86%. It is proposed that the extra treatment from the previously submitted sidewalk VFS and batch detention pond will cover the treatment required for this increase in impervious cover. The TCEQ Technical Guidance Manual (TGM) was used to design the permanent BMPs and measures for this site.

ATTACHMENT C – CURRENT SITE PLAN OF THE APPROVED PROJECT

Attached. The approved construction has commenced and has not been completed. This site plan illustrates that, thus far, the site was constructed as approved.



PLAN VIEW LEGEND

- PROP. STORM SEWER
- PROP. CONCRETE CURB
- PROP. EDGE OF PAVEMENT
- PROP. RIGHT OF WAY
- EXIST RIGHT OF WAY
- PROP. DRAINAGE EASEMENT
- EXIST EASEMENT LINES
- FEMA 100-YEAR FLOOPLAIN ZONE AE

N

0 50' 100' 200'
SCALE IN FEET

MAESTAS
8122 DATAPOINT DR., STE. 840
SAN ANTONIO, TX 78229
(210) 366-1988
TBPE No.: F-333
TBPLS No.: 10194506

STATE OF TEXAS
JOSE L. REYES
113231
LICENSED
PROFESSIONAL ENGINEER

10/15/2024

NO:	DATE	REVISION	APPROVED BY

Freese and Nichols, Inc.
Texas Registered Engineering Firm F-2144
FREESE AND NICHOLS
9601 McAllister Freeway, Suite 1008
San Antonio, Texas 78216
Phone - (210) 298-3800
web - www.freese.com

CITY OF SAN ANTONIO

PUBLIC WORKS DEPARTMENT

SONTERRA ROAD EXTENSION

SITE LAYOUT

PRELIMINARY	PROJECT NO.: 23-01849		DATE: 10/15/2024
DRWN. BY: GC	DSGN. BY: GC	CHKD. BY: JR	SHEET 1 OF 1

Water Pollution Abatement Plan Application

Texas Commission on Environmental Quality

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

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

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

Signature

To the best of my knowledge, the responses to this form accurately reflect all information requested concerning the proposed regulated activities and methods to protect the Edwards Aquifer. This **Water Pollution Abatement Plan Application Form** is hereby submitted for TCEQ review and Executive Director approval. The form was prepared by:

Print Name of Customer/Agent: Jose L. Reyes, PE

Date: 10/15/2024

Signature of Customer/Agent:

_____

Regulated Entity Name: City of San Antonio

Regulated Entity Information

1. The type of project is:

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

2. Total site acreage (size of property):3.35 ac

3. Estimated projected population:N/A

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

Table 1 - Impervious Cover Table

Impervious Cover of Proposed Project	Sq. Ft.	Sq. Ft./Acre	Acres
Structures/Rooftops	0	÷ 43,560 =	
Parking	0	÷ 43,560 =	
Other paved surfaces	125,453	÷ 43,560 =	2.88
Total Impervious Cover	125,453	÷ 43,560 =	2.88

Total Impervious Cover 2.88 **÷ Total Acreage** 3.35 **X 100 =** 86**% Impervious Cover**

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

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

For Road Projects Only

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

7. Type of project:

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

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

☐ Concrete
☒ Asphaltic concrete pavement
☐ Other: _____

9. Length of Right of Way (R.O.W.): 1765 feet.

Width of R.O.W.: 86 feet.
L x W = 151,790 Ft^2 ÷ 43,560 Ft^2/Acre = 3.48 acres.

10. Length of pavement area: 1765 feet.

Width of pavement area: 48 feet.
L x W = 127,080 Ft^2 ÷ 43,560 Ft^2/Acre = 2.92 acres.
Pavement area 2.92 acres ÷ R.O.W. area 3.48 acres x 100 = 84% impervious cover.

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

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

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

Stormwater to be generated by the Proposed Project

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

Wastewater to be generated by the Proposed Project

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

_____% Domestic	_____Gallons/day
_____% Industrial	_____Gallons/day
_____% Commingled	_____Gallons/day

TOTAL gallons/day N/A

15. Wastewater will be disposed of by:

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

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

☐ Sewage Collection System (Sewer Lines):

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

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

☐ The sewage collection system will convey the wastewater to the _____ (name) Treatment Plant. The treatment facility is:

☐ Existing.
☐ Proposed.

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

Site Plan Requirements

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

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

Site Plan Scale: 1" = 400'.

18. 100-year floodplain boundaries:

☐ Some part(s) of the project site is located within the 100-year floodplain. The floodplain is shown and labeled.
☒ No part of the project site is located within the 100-year floodplain.
The 100-year floodplain boundaries are based on the following specific (including date of material) sources(s): FIRM Map Panel 48029C0255G

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

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

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

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

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

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

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

☒ All sensitive geologic or manmade features identified in the Geologic Assessment are shown and labeled.
☐ No sensitive geologic or manmade features were identified in the Geologic Assessment.
☐ **Attachment D - Exception to the Required Geologic Assessment**. A request and justification for an exception to a portion of the Geologic Assessment is attached.

22. ☒ The drainage patterns and approximate slopes anticipated after major grading activities.

23. ☒ Areas of soil disturbance and areas which will not be disturbed.

24. ☒ Locations of major structural and nonstructural controls. These are the temporary and permanent best management practices.

25. ☒ Locations where soil stabilization practices are expected to occur.

26. ☐ Surface waters (including wetlands).

    ☒ N/A

27. ☐ Locations where stormwater discharges to surface water or sensitive features are to occur.

    ☒ There will be no discharges to surface water or sensitive features.

28. ☒ Legal boundaries of the site are shown.

Administrative Information

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

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

Attachment A

Factors Affecting Surface Water Quality

Sources of potential pollution during construction consists of:

- Soil erosion due to clearing of site
- Contamination from construction equipment and vehicles, fuel, oil, and grease.
- Hydrocarbons from asphalt paving.
- Trash and litter from material wrapping and construction workers.
- Concrete truck washout
- potential spills from portable waste facilities

Water Pollution Abatement Plan Application

Attachment B

Volume and Character of Stormwater

Stormwater runoff from the site will increase as a result of development. For the 25-yr storm event, the site will generate approximately 105 cfs post development. Pre development runoff for this site is 96 cfs. The runoff coefficient for the site changes from approximately 0.93 before development to 0.97 after development. All values are based on the Rational Method using runoff coefficients from the San Antonio Unified Development Code.

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.

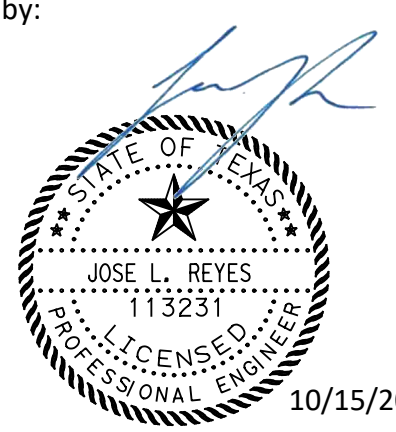
Signature

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: Jose L. Reyes, PE

Date: 10/15/2024

Signature of Customer/Agent:



10/15/2024

Regulated Entity Name: Sonterra Road Extension Project

Project Information

Potential Sources of Contamination

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

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

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

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

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

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

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

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

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

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

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

Sequence of Construction

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

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

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

6. ☒ Name the receiving water(s) at or near the site which will be disturbed or which will receive discharges from disturbed areas of the project: Mud Creek

Temporary Best Management Practices (TBMPs)

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

☒ N/A

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

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

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

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

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

Soil Stabilization Practices

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

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

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

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

Administrative Information

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

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

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

TEMPORARY STORMWATER SECTION ATTACHMENTS

ATTACHMENT A — Spill Response Actions

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

*To the National Response Center at (800) 424-8802,
*To the Edwards Aquifer Authority at (210) 222-2204,
*To the San Antonio Water Systems (SAWS) at (210) 704-7297 and one of the following:

To the State Emergency Response Center (800) 832-8224 (if after hours), or to the TCEQ San Antonio Regional Office (210) 490-3096 (if during business hours).

This section describes measures to prevent or reduce the discharge of pollutants to drainage systems or watercourses from leaks and spills by reducing the chance for spills, stopping the source of spills, containing, and cleaning up spills, properly disposing of spill materials, and training employees.

The following steps will help reduce the storm water impacts of leaks and spills:
Education

(1) Be aware that different materials pollute in different amounts. Make sure that each employee knows what a “significant spill” is for each material they use, and what is the appropriate response for “significant” and “insignificant” spills. Employees should also be aware of when spill must be reported to the TCEQ. Information available in 30 TAC 327.4 and 40 CFR 302.4.
(2) Educate employees and subcontractors on potential dangers to humans and the environment from spills and leaks.
(3) Hold regular meetings to discuss and reinforce appropriate disposal procedures (incorporate into regular safety meetings).
(4) Establish a continuing education program to indoctrinate new employees.
(5) Have contractor’s superintendent or representative oversee and enforce proper spill prevention and control measures.

General Measures

(1) To the extent that the work can be accomplished safely, spills of oil, petroleum products, and substances listed under 40 CFR parts 110,117, and 302, and sanitary and septic wastes should be contained and cleaned up immediately.
(2) Store hazardous materials and wastes in covered containers and protect from vandalism.
(3) Place a stockpile of spill cleanup materials where it will be readily accessible.
(4) Train employees in spill prevention and cleanup.

(5) Designate responsible individuals to oversee and enforce control measures.
(6) Spills should be covered and protected from storm water runoff during rainfall to the extent that it does not compromise clean-up activities.
(7) Do not bury or wash spills with water.
(8) Store and dispose of used clean up materials, contaminated materials, and recovered spill material that is no longer suitable for the intended purpose in conformance with the provisions in applicable BMPs.
(9) Do not allow water used for cleaning and decontamination to enter storm drains or watercourses. Collect and dispose of contaminated water in accordance with applicable regulations.
(10) Contain water overflow or minor water spillage and do not allow it to discharge into drainage facilities or watercourses.
(11) Place Material Safety Data Sheets (MSDS), as well as proper storage, cleanup, and spill reporting instructions for hazardous materials stored or used on the project site in an open, conspicuous, and accessible location.
(12) Keep waste storage areas clean, well-organized, and equipped with ample cleanup supplies as appropriate for the materials being stored. Perimeter controls, containment structures, covers, and liners should be repaired or replaced as needed to maintain proper function.

Cleanup

(1) Clean up leaks and spills immediately.
(2) Use a rag for small spills on paved surfaces, a damp mop for general cleanup, and absorbent material for larger spills. If the spilled material is hazardous, then the used cleanup materials are also hazardous and must be disposed of as hazardous waste.
(3) Never hose down or bury dry material spills. Clean up as much of the material as possible and dispose of properly. See the waste management BMPs in this section for specific information.

Minor Spills

(1) Minor spills typically involve small quantities of oil, gasoline, paint, etc. which can be controlled by the first responder at the discovery of the spill.
(2) Use absorbent materials on small spills rather than hosing down or burying the spill.
(3) Absorbent materials should be promptly removed and disposed of properly.
(4) Follow the practice below for a minor spill:
(5) Contain the spread of the spill.
(6) Recover spilled materials.
(7) Clean the contaminated area and properly dispose of contaminated materials.

Semi-Significant Spills

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

Spills should be cleaned up immediately:

(1) Contain spread of the spill.
(2) Notify the project foreman immediately.
(3) If the spill occurs on paved or impermeable surfaces, clean up using "dry" methods (absorbent materials, cat litter and/or rags). Contain the spill by encircling with absorbent materials and do not let the spill spread widely.
(4) If the spill occurs in dirt areas, immediately contain the spill by constructing an earthen dike. Dig up and properly dispose of contaminated soil.
(5) If the spill occurs during rain, cover spill with tarps or other material to prevent contaminating runoff.

Significant/Hazardous Spills

For significant or hazardous spills that are in reportable quantities:

(1) Notify the TCEQ by telephone as soon as possible and within 24 hours at 210-490-3096 (San Antonio) between 8 AM and 5 PM. After hours, contact the Environmental Release Hotline at 1-800-832-8224. It is the contractor's responsibility to have all emergency phone numbers at the construction site.
(2) For spills of federal reportable quantities, in conformance with the requirements in 40 CFR parts 110,119, and 302, the contractor should notify the National Response Center at (800) 424-8802.
(3) Notification should first be made by telephone and followed up with a written report.
(4) The services of a spill's contractor or a Haz-Mat team should be obtained immediately. Construction personnel should not attempt to clean up until the appropriate and qualified staffs have arrived at the job site.
(5) Other agencies which may need to be consulted include, but are not limited to, the City Police Department, County Sheriff Office, Fire Departments, etc.

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

Vehicle and Equipment Maintenance

(1) If maintenance must occur onsite, use a designated area and a secondary containment, located away from drainage courses, to prevent the run-on of storm water and the runoff of spills.
(2) Regularly inspect onsite vehicles and equipment for leaks and repair immediately
(3) Check incoming vehicles and equipment (including delivery trucks, and employee and subcontractor vehicles) for leaking oil and fluids. Do not allow leaking vehicles or equipment onsite.
(4) Always use secondary containment, such as a drain pan or drop cloth, to catch spills or leaks when removing or changing fluids.
(5) Place drip pans or absorbent materials under paving equipment when not in use.
(6) Use absorbent materials on small spills rather than hosing down or burying the spill. Remove the absorbent materials promptly and dispose of properly.

(7) Promptly transfer used fluids to the proper waste or recycling drums. Do not leave full drip pans or other open containers lying around.
(8) Oil filters disposed of in trashcans or dumpsters can leak oil and pollute storm water. Place the oil filter in a funnel over a waste oil-recycling drum to drain excess oil before disposal. Oil filters can also be recycled. Ask the oil supplier or recycler about recycling oil filters.
(9) Store cracked batteries in a non- leaking secondary container. Do this with all cracked batteries even if you think all the acid has drained out. If you drop a battery, treat it as if it is cracked. Put it into the containment area until you are sure it is not leaking.

Vehicle and Equipment Fueling

(1) If fueling must occur on site, use designated areas, located away from drainage courses, to prevent the run-on of storm water and the runoff of spills.
(2) Discourage “topping off” of fuel tanks.
(3) Always use secondary containment, such as a drain pan, when fueling to catch spills/ leaks.

ATTACHMENT B — Potential Sources of Contamination

Potential sources of contamination include the hydrocarbons, hydraulic fluid 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. Additional sources of contamination include spills associated with vehicle accidents that might occur within the boundaries of the project.

ATTACHMENT C — Sequence of Major Events

1. Install erosion and sedimentation controls down-slope of work area and initiate SWPPP inspection and maintenance activities. Post the required SWPPP site notification.

2. Provide written notification to the TCEQ 48 hours prior to commencement of construction. Schedule an on-site pre-construction coordination meeting, if applicable.

3. Begin phased construction including the following:
   - **Phase 1:** Erect barricades closing Sonterra Blvd at the project limits. Driveway 2-1 is closed during construction and traffic will be redirected to other driveways from within the property. Driveway 3-1 is open to allow traffic through community bible church property and Gold Canyon. Driveway 4-1 will be closed and community bible church will redirect traffic within their property to other driveways on the property. Construct roadway and storm drain along Sonterra Blvd., the roundabout, the drainage outfall, and driveways 3-1 and 4-1. Gold Canyon to remain open during this phase. Sonterra will be reopened at the completion of phase 1 existing traffic signal operations at loop 1604 WB Frontage Road to remain. Contractor to construct water lines and sewer lines as shown in saws joint bid plans.
   - **Phase 2:** Construct full width of the proposed Gold Canyon extension roadway and storm drain from loop 1604 WB Frontage Rd to through the north of driveway 2-1 connection to the roundabout connection. Traffic control devices are placed through Sonterra to allow access along Sonterra but access through Gold Canyon is closed.
   - **Phase 3 Step 1:** Erect warning signs at Lp 1604 WB Frontage Rd and Gold Canyon bridge. Erect traffic control devices that close the outside lane of the Lp 1604 WB Frontage Rd. Install operational temporary traffic signal assembly at northwest corner of the intersection between Gold Canyon and the Lp 1604 WB Frontage Road to control new northbound traffic conditions from the Gold Canyon/Lp 1604 bridge. Place temporary striping through the intersection of Gold Canyon and Lp 1604 WB Frontage Rd. Maintain northbound traffic on existing driveway 2-1. Place traffic control devices southbound driveway 2-1 directing traffic within community bible church. Construct west half of proposed Gold Canyon roadway to station 13+82.16, just south of proposed driveway 2-1. Construct proposed pedestrian signal poles at the north-east corner of the intersection between Gold Canyon and the Lp 1604 WB Frontage Rd.
   - **Phase 3 Step 2:** Switch traffic onto recently constructed west half of Gold Canyon. Reconfigure temporary traffic signal assembly at the intersection between Gold Canyon and WB Lp 1604 Frontage Road to the edge of work zone. Place temporary striping through the intersection of Gold Canyon and WB Lp 1604 Frontage Rd. Access will be closed to existing driveway with placement of traffic control devices at community bible church

fence/boundary. Demolish remaining pavement of existing driveway 2-1 south of proposed tie in location. Proposed driveway 2-1 to be constructed, signing and barricades will be implemented. Contractor to place advance signing of closure along Gold Canyon that will be constructed. Construct east half of the Gold Canyon from the WB Lp 1604 Frontage Rd to station 13+82.16 including roadway, sidewalk, and center median. Construct traffic signal pole and pedestrian signal pole at the north-east corner of the intersection between Gold Canyon and the Wb Lp 1604 Frontage Road.

- **Phase 4:** Open full access of the Gold Canyon extension. Place proposed traffic signal infrastructure into operation. Place final course of asphalt paving, final landscaping, and final signing and pavement markings. Remove traffic control devices and temporary traffic signal from Lp 1604 Frontage Rd.

4. Remove temporary erosion/sedimentation controls once disturbed areas are re-vegetated. Restore all areas disturbed by the removal of E&S controls.

5. Provide final notification of completion of construction in compliance with TCEQ and SWPPP requirements.

The receiving waters are Mud Creek.

ATTACHMENT D – Temporary Best Management Practices

During the construction phase, the BMPs selected for the water quality protection include the following:

- Silt fences on the upstream side of disturbed areas to route flow around work area limiting the flow over the work area.
- Curb Inlet Gravel Filter installed along the gutter line of E. Sonterra Blvd and Gold Canyon Rd to limit pollutants leaving the site along the curb and gutter.
- Rock Filter Dams installed around the 4-way inlets located along the Gold Canyon Rd to limit pollutants leaving the site.
- Erosion Control Matting installed along the proposed ROW on the west side of the Gold Canyon Rd to mitigate high velocities and reduce erosion.
- Construction exits will be used to minimize offsite tracking of sediment. The locations of all temporary BMPs are shown on the Temporary Erosion and Sedimentation Control Plan sheets. Standard details show information relevant to BMP installation and maintenance. The locations of staging areas will be determined by the contractor. Appropriate erosion controls will be utilized to prevent sediment discharges from the staging areas.

The locations of all temporary BMPs are shown on the WPAP SW3P plan sheets. Standard details show information relevant to BMP installation and maintenance. The locations of staging areas will be determined by the contractor. Appropriate erosion control will be utilized to prevent sediment discharges from staging areas.

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 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 no 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 excavated material that will be stored on-site must have 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 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 should 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's 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 best management practices (BMPs) or structure(s), including but not limited to temporary or permanent ponds, dams, berms, silt fences, and diversionary structures;
    B. any change in the nature or character of the regulated activity from that which was originally approved;
    C. any change that would significantly impact the ability to prevent pollution of the Edwards Aquifer; or
    D. any development of land previously identified as undeveloped in the approved contributing zone plan.

Austin Regional Office 12100 Park 35 Circle, Bldg 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

MAESTAS
8122 DATAPOINT DR., STE. 840
SAN ANTONIO, TX 78229
(210) 366-1988
TBPE No.: F-333
TBPLS No.: 10194506

STATE OF TEXAS
JOSE L. REYES
113231
LICENSED
PROFESSIONAL ENGINEER
8/3/2023

NO:	DATE	REVISION	APPROVED BY

Freese and Nichols, Inc.
Texas Registered Engineering Firm F-2144
FREESE AND NICHOLS
9601 McAllister Freeway, Suite 1008
San Antonio, Texas 78216
Phone - (210) 298-3800
web - www.freese.com

CITY OF SAN ANTONIO
PUBLIC WORKS DEPARTMENT

SONTERRA ROAD EXTENSION
TEMPORARY STORMWATER POLLUTION PREVENTION PLAN NOTES

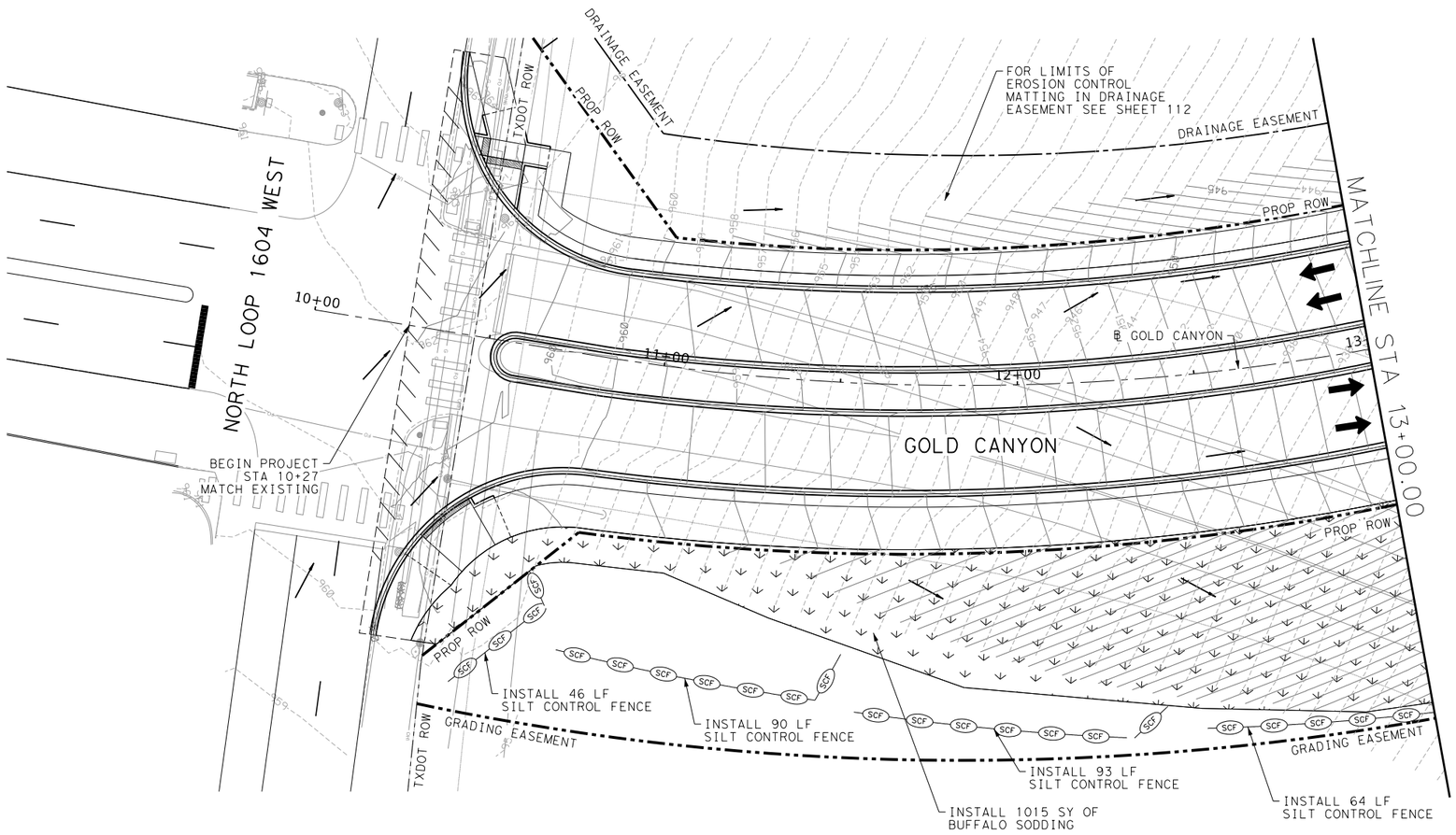
SHEET 1 OF 1

PRELIMINARY	PROJECT NO.: 23-01849	DATE: 8/3/2023
DRWN. BY: GC	DSGN. BY: GC	CHKD. BY: JR	SHEET 1 OF 1

Date: 8/3/2023

SW3P QUANTITIES			
ITEM NO	DESCRIPTION	UNIT	QUANTITY
516.3	BUFFALO SODDING	SY	1015
540.6	CONSTRUCTION EXITS (INSTALL/REMOVE)	SY	156
540.9	TEMPORARY SEDIMENT CONTROL FENCE	LF	293

NOTE: CONSTRUCTION EXITS WILL BE PAID FOR BY COSA ITEM 540.6 "CONSTRUCTION EXITS (INSTALL/REMOVE)". THE LOCATIONS OF THE CONSTRUCTION EXITS WILL BE DETERMINED IN THE FIELD AND APPROVED BY COSA INSPECTION.



LEGEND

- INLET PROTECTION
- SCF — SEDIMENT CONTROL FENCE
- FLOW ARROW
- RFD1 — ROCK FILTER DAM
- BUFFALO SODDING
- -930- EXISTING CONTOURS
- —930— PROPOSED CONTOURS

N

0 10' 20' 40'
SCALE IN FEET

FREESE AND NICHOLS, INC.
TEXAS REGISTERED ENGINEERING FIRM F-2144

STATE OF TEXAS — BREGGER A. GARRISON — 122018 — LICENSED PROFESSIONAL ENGINEER
08/04/2023

NO:	DATE	REVISION	APPROVED BY

Freese and Nichols, Inc.
Texas Registered Engineering Firm F-2144
FREESE AND NICHOLS
9601 McAllister Freeway, Suite 1008
San Antonio, Texas 78216
Phone - (210) 298-3800
web - www.freese.com

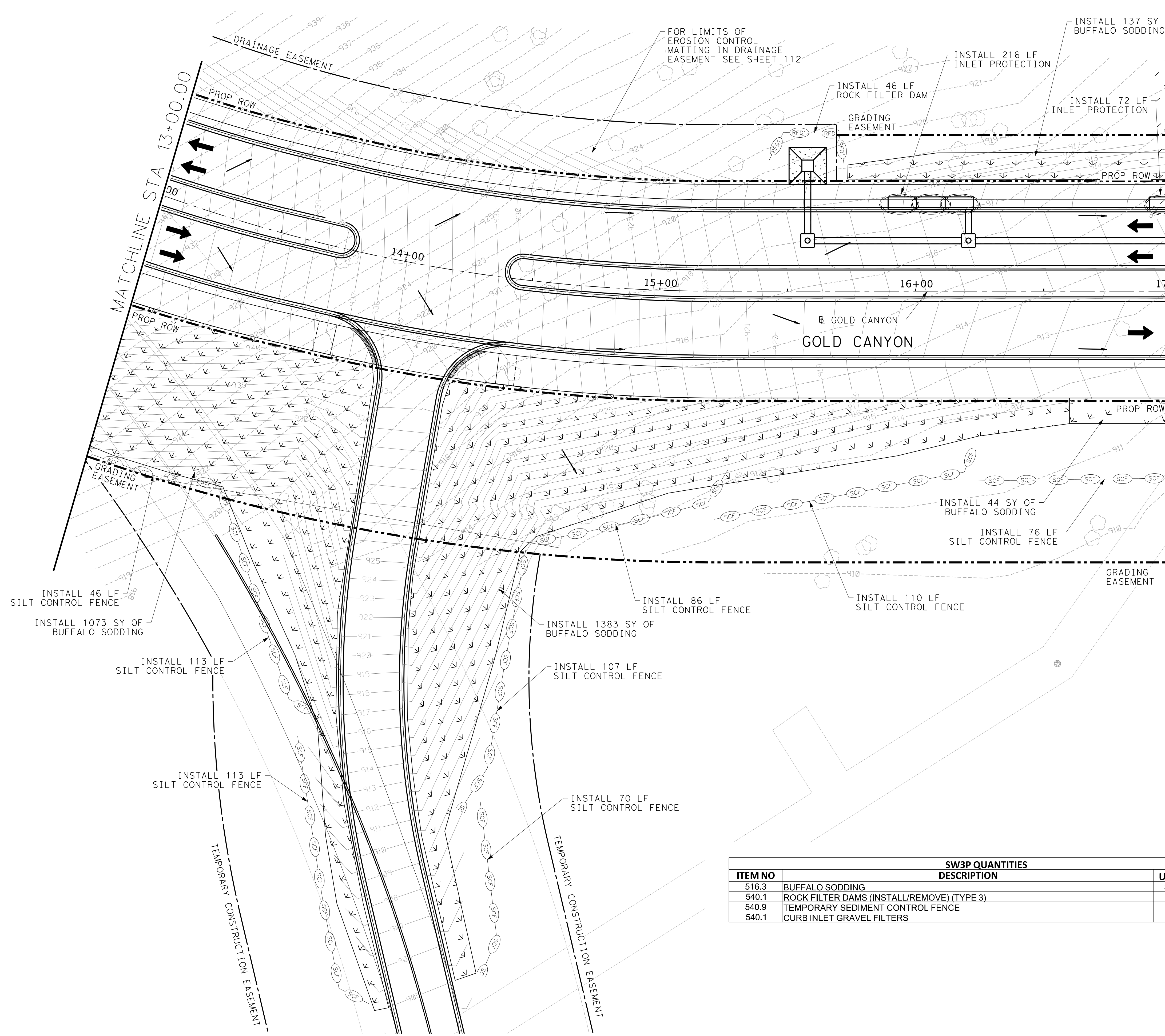
CITY OF SAN ANTONIO
PUBLIC WORKS DEPARTMENT

SONTERRA ROAD EXTENSION

STORM WATER POLLUTION PREVENTION PLAN (SW3P)

BEGIN TO STA 13+00

95% SUBMITTAL	PROJECT NO.: 23-01849		DATE: 08/03/2023
DRWN. BY: JL	DSGN. BY: NS	CHKD. BY: BAG	SHEET 134 OF 197



LEGEND

- INLET PROTECTION
- SCF — SEDIMENT CONTROL FENCE
- FLOW ARROW
- RFD1 — ROCK FILTER DAM
- BUFFALO SODDING
- 930 — EXISTING CONTOURS
- 930 — PROPOSED CONTOURS

N

0 10' 20' 40'
SCALE IN FEET

SW3P QUANTITIES

ITEM NO	DESCRIPTION	UNIT	QUANTITY
516.3	BUFFALO SODDING	SY	2637
540.1	ROCK FILTER DAMS (INSTALL/REMOVE) (TYPE 3)	LF	46
540.9	TEMPORARY SEDIMENT CONTROL FENCE	LF	721
540.1	CURB INLET GRAVEL FILTERS	LF	288

FREESE AND NICHOLS, INC.
TEXAS REGISTERED ENGINEERING FIRM F-2144

STATE OF TEXAS
BREGGER A. GARRISON
122018
LICENSED
PROFESSIONAL ENGINEER
08/04/2023

NO.	DATE	REVISION	APPROVED BY

Freese and Nichols, Inc.
Texas Registered Engineering Firm F-2144
FREESE AND NICHOLS
9601 McAllister Freeway, Suite 1008
San Antonio, Texas 78216
Phone - (210) 298-3800
web - www.freese.com

CITY OF SAN ANTONIO

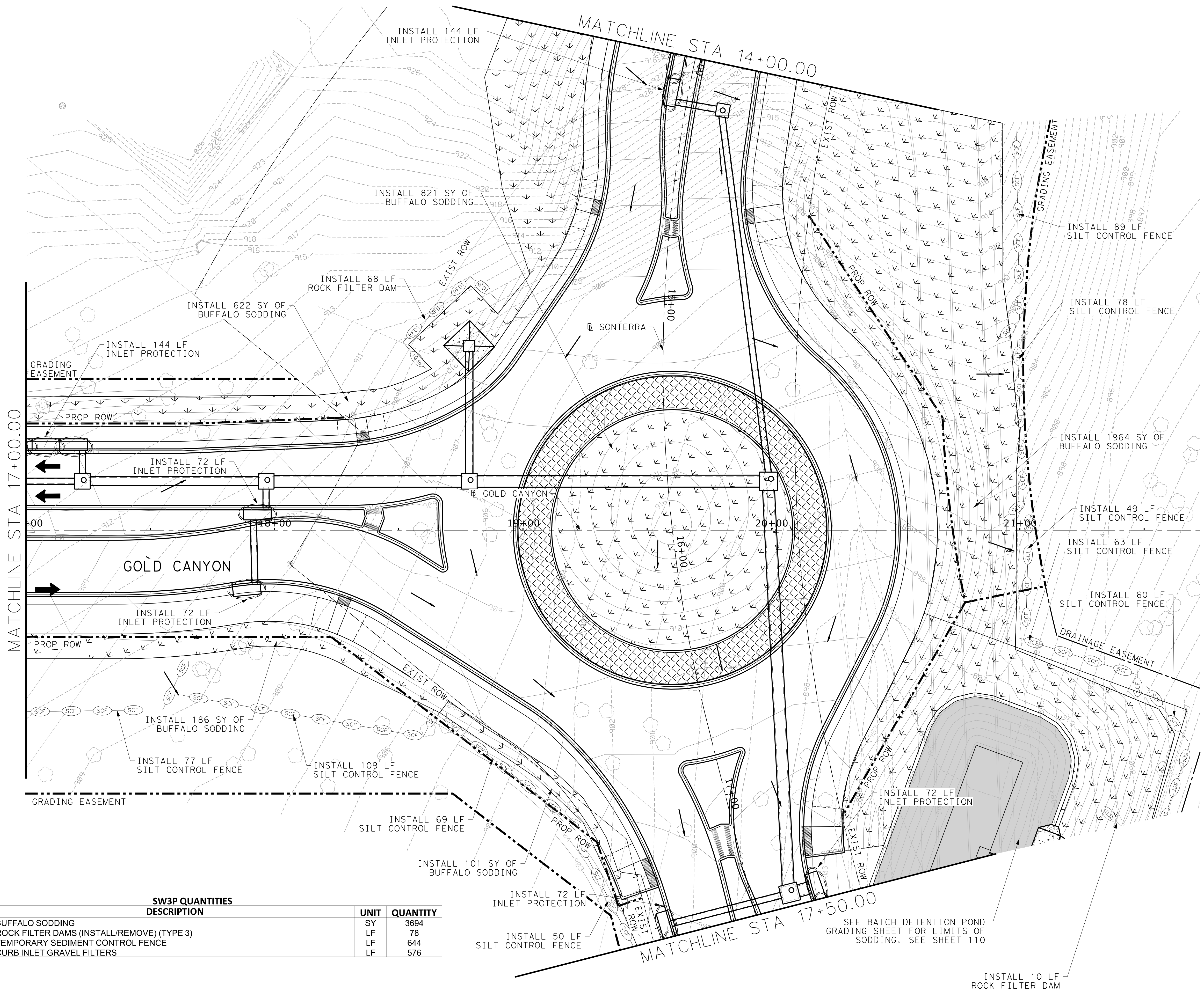
PUBLIC WORKS DEPARTMENT

SONTERRA ROAD EXTENSION

STORM WATER POLLUTION PREVENTION PLAN (SW3P)

STA 13+00 TO STA 17+00

95% SUBMITTAL	PROJECT NO.: 23-01849	DATE: 08/03/2023
DRWN. BY: JL	DSGN. BY: NS / CHKD. BY: BAG	SHEET 135 OF 197



SW3P QUANTITIES

ITEM NO	DESCRIPTION	UNIT	QUANTITY
516.3	BUFFALO SODDING	SY	3694
540.1	ROCK FILTER DAMS (INSTALL/REMOVE) (TYPE 3)	LF	78
540.9	TEMPORARY SEDIMENT CONTROL FENCE	LF	644
540.1	CURB INLET GRAVEL FILTERS	LF	576

FREESE AND NICHOLS, INC.
TEXAS REGISTERED ENGINEERING FIRM F-2144

STATE OF TEXAS
BREGGER A. GARRISON
122018
LICENSED
PROFESSIONAL ENGINEER
08/04/2023

NO:	DATE	REVISION	APPROVED BY

Freese and Nichols, Inc.
Texas Registered Engineering Firm F-2144
FREESE AND NICHOLS
9601 McAllister Freeway, Suite 1008
San Antonio, Texas 78216
Phone - (210) 298-3800
web - www.freese.com

CITY OF SAN ANTONIO
PUBLIC WORKS DEPARTMENT

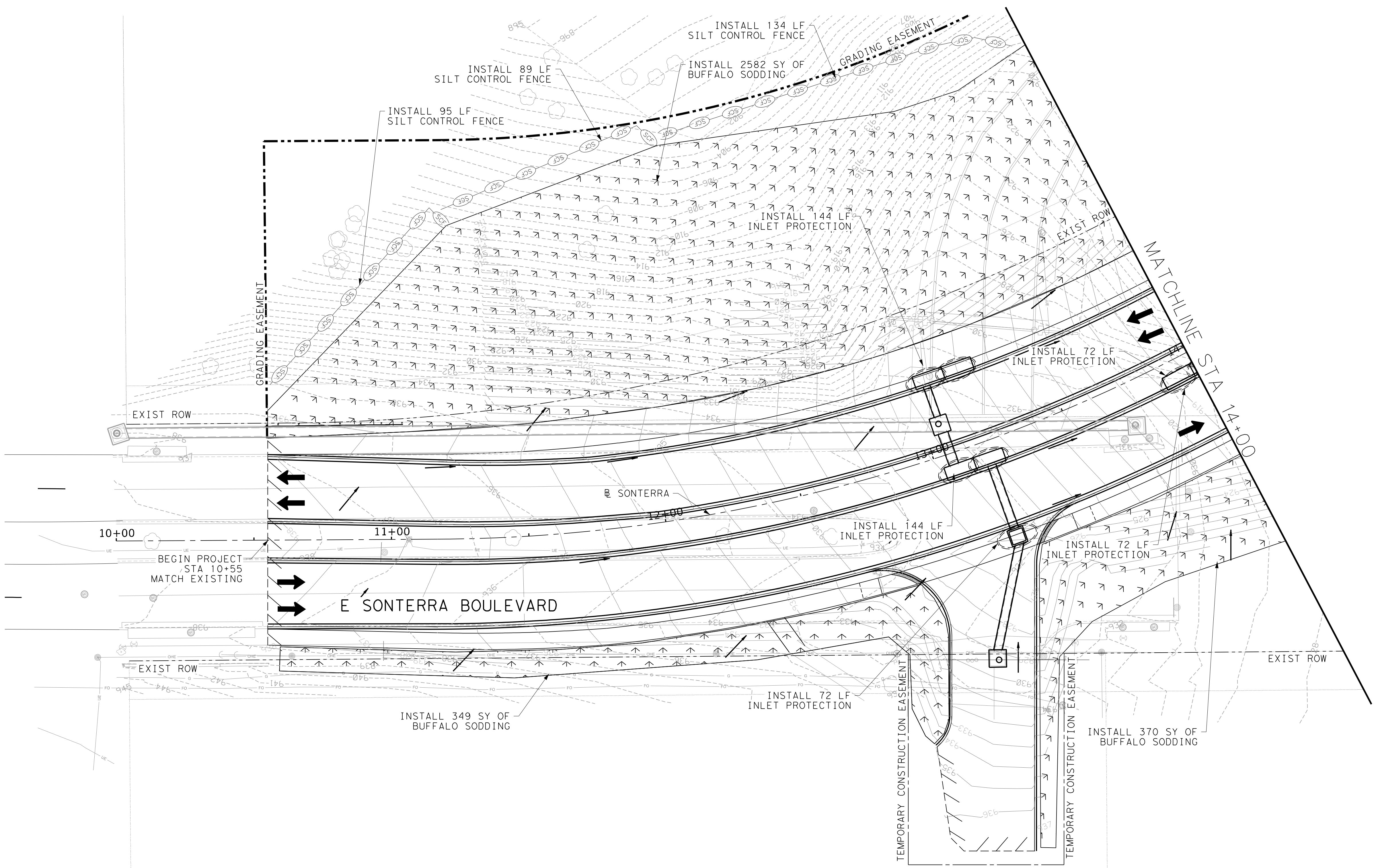
SONTERRA ROAD EXTENSION
STORM WATER POLLUTION PREVENTION PLAN (SW3P)
ROUNDABOUT

95% SUBMITTAL	PROJECT NO.: 23-01849		DATE: 08/03/2023
DRWN. BY: JL	DSGN. BY: NS	CHKD. BY: BAG	SHEET 136 OF 197

SW3P QUANTITIES			
ITEM NO	DESCRIPTION	UNIT	QUANTITY
516.3	BUFFALO SODDING	SY	3301
540.9	TEMPORARY SEDIMENT CONTROL FENCE	LF	318
540.1	CURB INLET GRAVEL FILTERS	LF	432

LEGEND

- INLET PROTECTION
- SCF — SEDIMENT CONTROL FENCE
- FLOW ARROW
- RFD1 — ROCK FILTER DAM
- BUFFALO SODDING
- -930-- EXISTING CONTOURS
- -930— PROPOSED CONTOURS



FREESE AND NICHOLS, INC.
TEXAS REGISTERED ENGINEERING FIRM F-2144

STATE OF TEXAS — BREGGER A. GARRISON — 122018 — LICENSED — PROFESSIONAL ENGINEER
08/04/2023

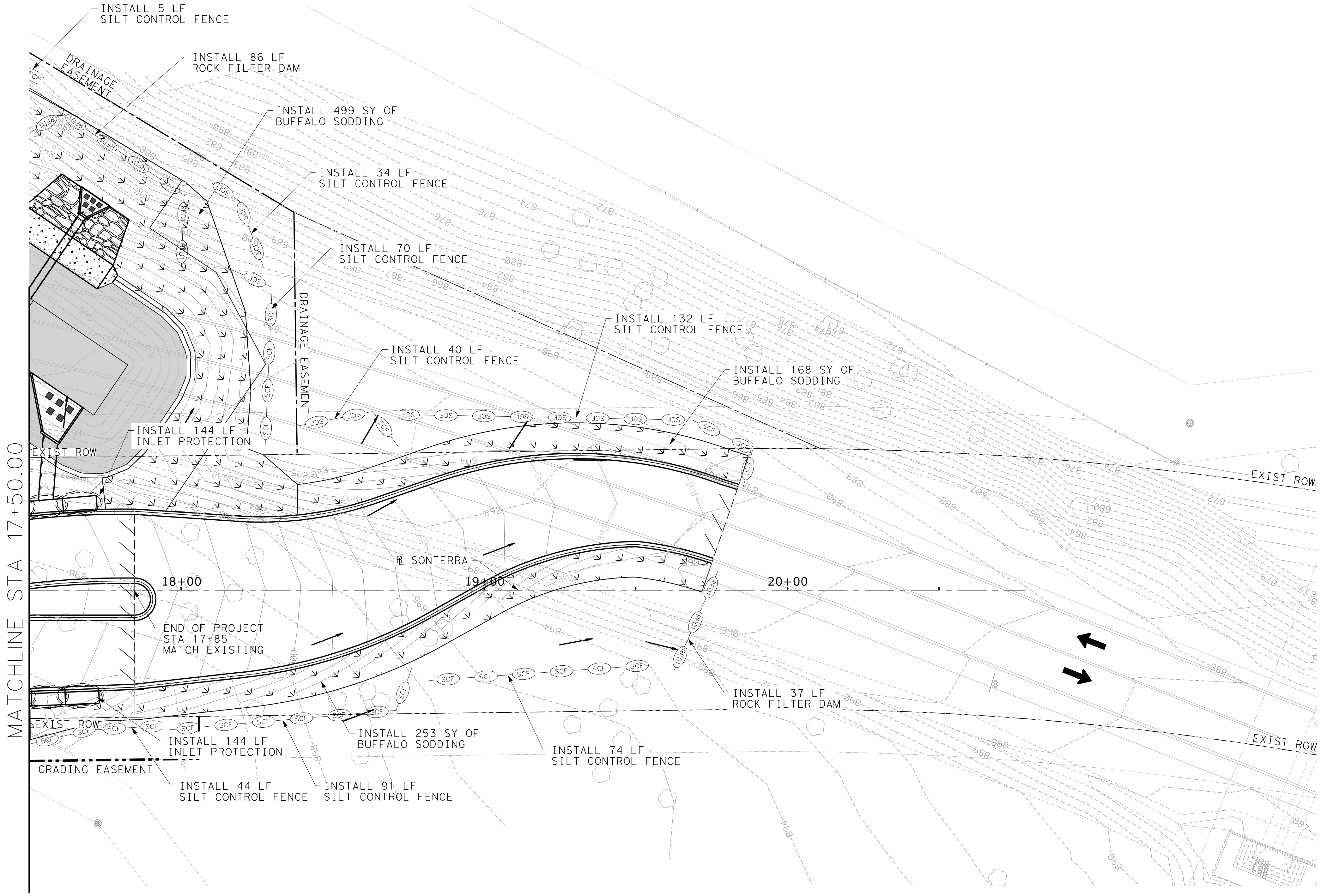
NO.	DATE	REVISION	APPROVED BY

Freese and Nichols, Inc.
Texas Registered Engineering Firm F-2144
FREESE AND NICHOLS
9601 McAllister Freeway, Suite 1008
San Antonio, Texas 78216
Phone - (210) 298-3800
web - www.freese.com

CITY OF SAN ANTONIO
PUBLIC WORKS DEPARTMENT

SONTERRA ROAD EXTENSION
STORM WATER POLLUTION PREVENTION PLAN (SW3P)
BEGIN TO STA 14+00

95% SUBMITTAL	PROJECT NO.:	23-01849	DATE: 08/03/2023
DRWN. BY: JL	DSGN. BY: NS	CHKD. BY: BAG	SHEET 137 OF 197



LEGEND

- INLET PROTECTION
- SCF — SEDIMENT CONTROL FENCE
- FLOW ARROW
- RFD1 — ROCK FILTER DAM
- BUFFALO SODDING
- 930 — EXISTING CONTOURS
- 930 — PROPOSED CONTOURS

N

0 10' 20' 40'
SCALE IN FEET

SW3P QUANTITIES			
ITEM NO	DESCRIPTION	UNIT	QUANTITY
516.3	BUFFALO SODDING	SY	920
540.1	ROCK FILTER DAMS (INSTALL/REMOVE) (TYPE 3)	LF	123
540.9	TEMPORARY SEDIMENT CONTROL FENCE	LF	490
540.1	CURB INLET GRAVEL FILTERS	LF	288

FREESE AND NICHOLS, INC.
TEXAS REGISTERED ENGINEERING FIRM F-2144

STATE OF TEXAS
BREGGER A. GARRISON
122018
LICENSED
PROFESSIONAL ENGINEER
08/04/2023

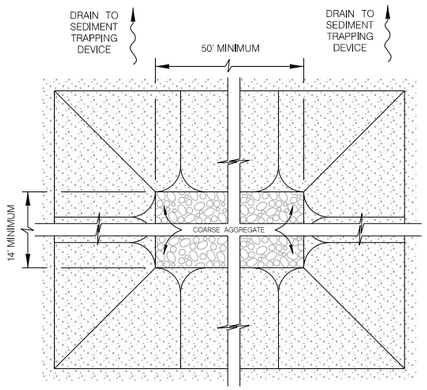
NO.	DATE	REVISION	APPROVED BY

Freese and Nichols, Inc.
Texas Registered Engineering Firm F-2144
FREESE AND NICHOLS
9601 McAllister Freeway, Suite 1008
San Antonio, Texas 78216
Phone - (210) 298-3800
web - www.freese.com

CITY OF SAN ANTONIO
PUBLIC WORKS DEPARTMENT

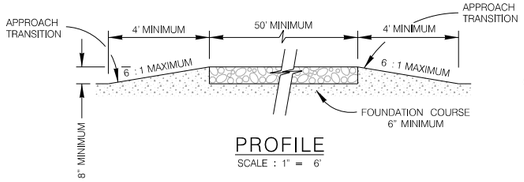
SONTERRA ROAD EXTENSION
STORM WATER POLLUTION PREVENTION PLAN (SW3P)
STA 17+50 TO END

95% SUBMITTAL	PROJECT NO.: 23-01849	DATE: 08/03/2023
DRWN. BY: JL	DSGN. BY: NS	CHKD. BY: BAG	SHEET 138 OF 197



PLAN

SCALE : 1" = 6'



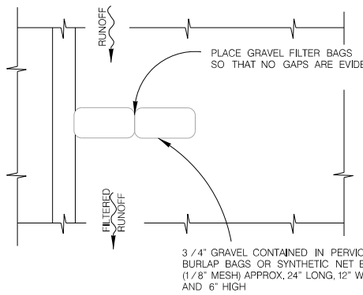
PROFILE

SCALE : 1" = 6'

GENERAL NOTES

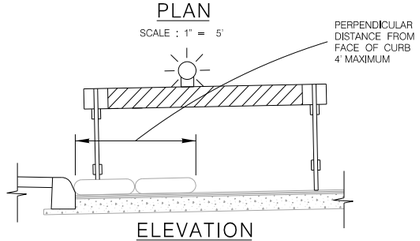
1. THE LENGTH OF THE TYPE 1 CONSTRUCTION EXIT SHALL BE AS INDICATED ON THE PLANS, BUT NOT LESS THAN 50'.
2. THE COARSE AGGREGATE SHOULD BE OPEN GRADED WITH A SIZE OF 4" TO 8".
3. THE APPROACH TRANSITIONS SHOULD BE NO STEEPER THAN 6 :1 AND CONSTRUCTED AS DIRECTED BY THE ENGINEER.
4. THE CONSTRUCTION EXIT 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



PLAN

SCALE : 1" = 5'

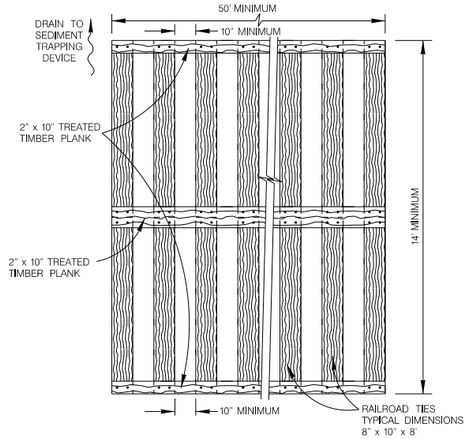


ELEVATION

SCALE : 1" = 5'

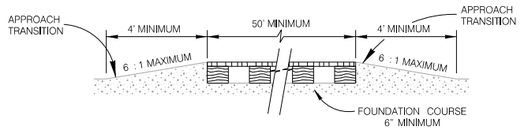
NOTE:
STRADDLE GRAVEL FILTER BAGS WITH TYPE 1 BARRICADES MOUNTED WITH TYPE "A" FLASHING WARNING LIGHT. SEE BARRICADE CONSTRUCTION SIGN DETAILS. PLACE FLASHING LIGHTS AWAY FROM GUTTER, FLUSH WITH OUTSIDE EDGE OF BAG CONFIGURATION.

GRAVEL FILTER BAGS



PLAN

SCALE : 1" = 6'



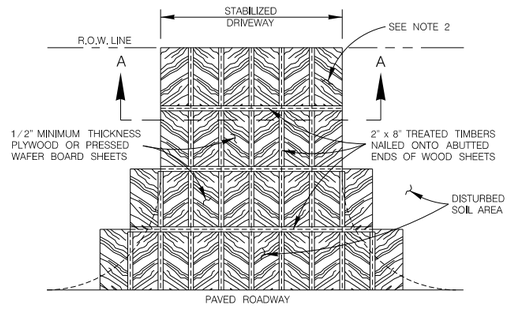
PROFILE

SCALE : 1" = 6'

GENERAL NOTES

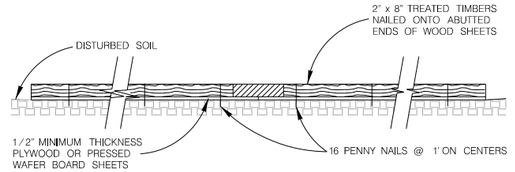
1. THE LENGTH OF THE TYPE 2 CONSTRUCTION EXIT SHALL BE AS INDICATED ON THE PLANS, BUT NOT LESS THAN 50'.
2. THE TREATED TIMBER PLANKS SHALL BE ATTACHED TO THE RAILROAD TIES WITH 1 / 2" x 6" MIN. LAG BOLTS. OTHER FASTENERS MAY BE USED AS APPROVED BY THE ENGINEER.
3. THE TREATED TIMBER PLANKS SHALL BE #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



PLAN

SCALE : 1" = 20'



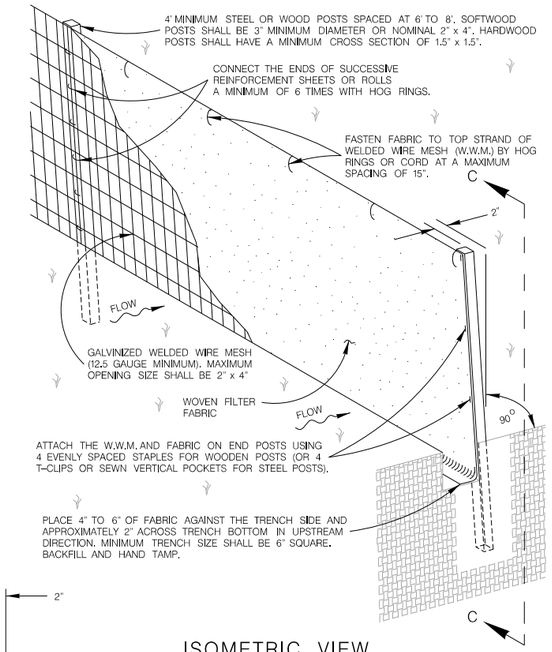
SECTION A–A

SCALE : 1" = 2'

GENERAL NOTES

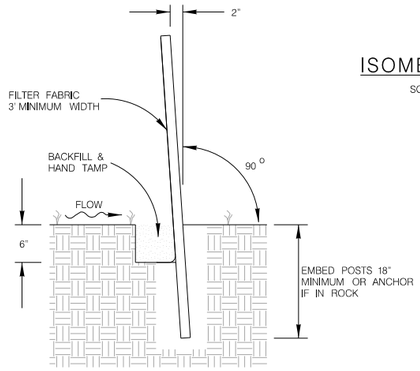
1. THE LENGTH OF THE TYPE 3 CONSTRUCTION EXIT SHALL BE AS INDICATED ON THE PLANS, OR AS DIRECTED BY THE ENGINEER.
2. THE TYPE 3 CONSTRUCTION EXIT MAY BE CONSTRUCTED FROM OPEN GRADED CRUSHED STONE WITH A SIZE OF 2 TO 4 INCHES SPREAD A MINIMUM OF 4 INCHES THICK TO THE LIMITS SHOWN ON THE PLANS.
3. THE 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



ISOMETRIC VIEW

SCALE : 1" = 2'



SECTION C–C

SCALE : 1" = 2'

SEDIMENT CONTROL FENCE USAGE GUIDELINES

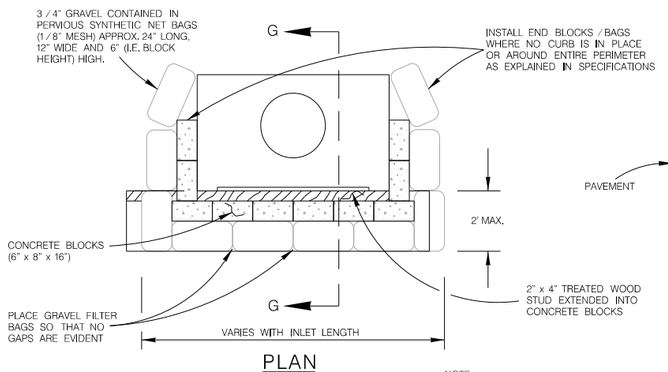
A SEDIMENT CONTROL FENCE MAY BE CONSTRUCTED NEAR THE DOWNSTREAM PERIMETER OF A DISTURBED AREA ALONG A CONTOUR TO INTERCEPT SEDIMENT FROM OVERLAND RUN–OFF. A 2 YEAR STORM FREQUENCY MAY BE USED TO CALCULATE THE FLOW RATE TO BE FILTERED.

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.

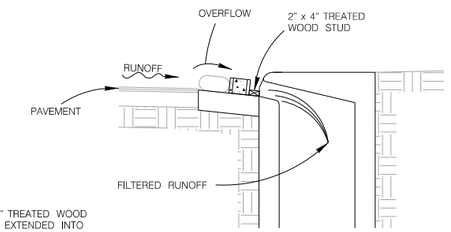
TEMPORARY SEDIMENT CONTROL FENCE



PLAN

SCALE : 1" = 5'

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



SECTION G–G

SCALE : 1" = 5'

CURB INLET GRAVEL FILTER

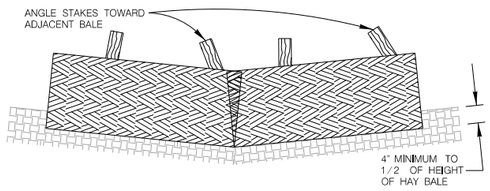
JANUARY 2005

CITY OF SAN ANTONIO

CAPITAL IMPROVEMENTS MANAGEMENT SERVICES DEPARTMENT

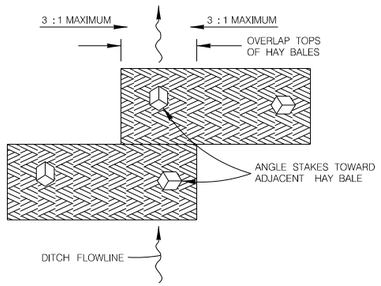
TEMPORARY EROSION, SEDIMENT & WATER POLLUTION CONTROL MEASURES STANDARDS 1

% SUBMITTAL	PROJECT NO.:		DATE:
DRWN. BY: V. VASQUEZ	DSGN. BY:	CHKD. BY:	SHEET NO.: 147 OF 197



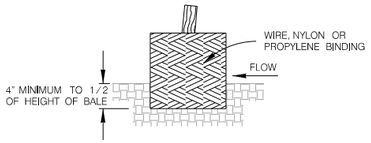
PROFILE VIEW

SCALE : 1" = 2'



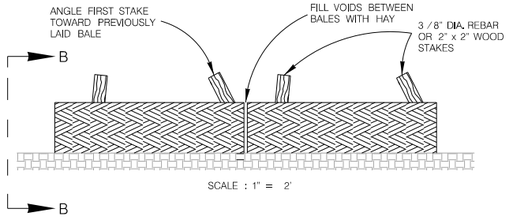
PLAN VIEW

SCALE : 1" = 2'



SECTION B–B

SCALE : 1" = 2'



SCALE : 1" = 2'

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:

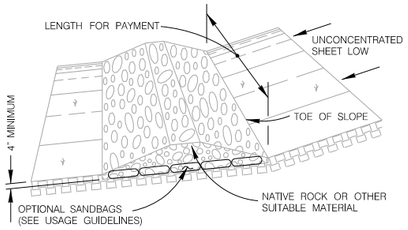
1. THE DITCH SIDESLOPES SHOULD BE GRADED AS FLAT AS POSSIBLE TO MAXIMIZE THE DRAINAGE FLOW RATE THRU THE HAY.
2. THE DITCH SHOULD BE GRADED LARGE ENOUGH TO CONTAIN THE OVERLAPPING DRAINAGE WHEN SEDIMENT HAS FILLED TO THE TOP OF THE BAILED HAY.

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

GENERAL NOTES

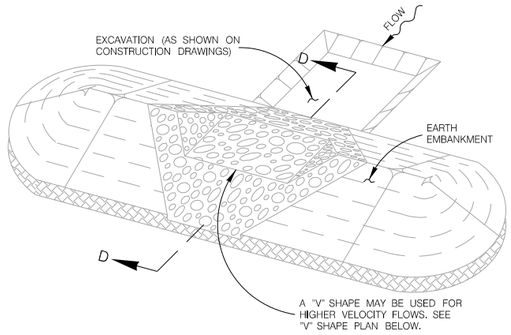
1. HAY BALES SHALL BE A MINIMUM OF 30" IN LENGTH AND WEIGH A MINIMUM OF 50 LBS.
2. HAY BALES SHALL BE BOUND BY EITHER WIRE OR NYLON OR POLYPROPYLENE STRING. THE BALES SHALL BE COMPOSED ENTIRELY OF VEGETABLE MATTER.
3. HAY BALES SHALL BE EMBEDDED IN THE SOIL A MININMUM OF 4" AND, WHERE POSSIBLE, ONE–HALF 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



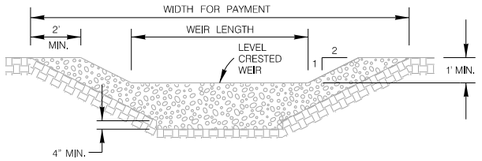
TYPE 1 FILTER DAM AT TOE OF SLOPE

SCALE : 1" = 10'



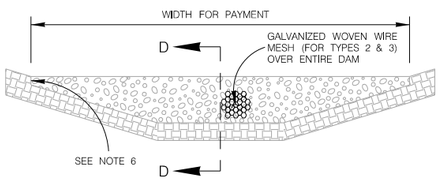
TYPE 1 & 2 FILTER DAM AT SEDIMENT TRAP

SCALE : 1" = 10'



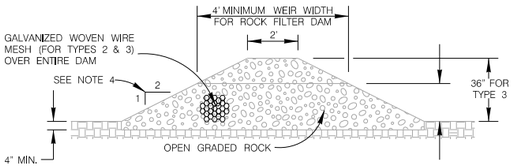
PROFILE OF TYPE 1 & 2 FILTER DAM AT SEDIMENT TRAP

SCALE : 1" = 6'



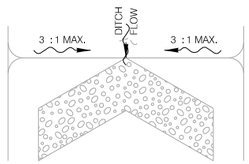
TYPE 1, 2 & 3 FILTER DAM AT CHANNEL SECTIONS

SCALE : 1" = 6'



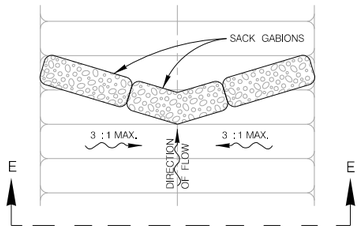
SECTION D–D

SCALE : 1" = 6'



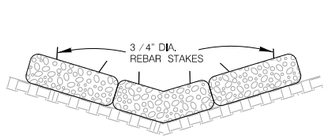
"V" SHAPE PLAN VIEW

NOT TO SCALE



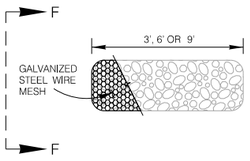
PLAN VIEW

SCALE : 1" = 10'



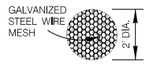
SECTION E–E

SCALE : 1" = 10'



TYPE 4 SACK GABION DETAIL

SCALE : 1" = 6'



SECTION F–F

SCALE : 1" = 6'

TYPE 4 FILTER DAM AT DITCHES & SMALLER CHANNELS PLAN VIEW

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.

ROCK FILTER DAMS

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.: 148 OF 197

ATTACHMENT E – Request to Temporarily Seal a Feature

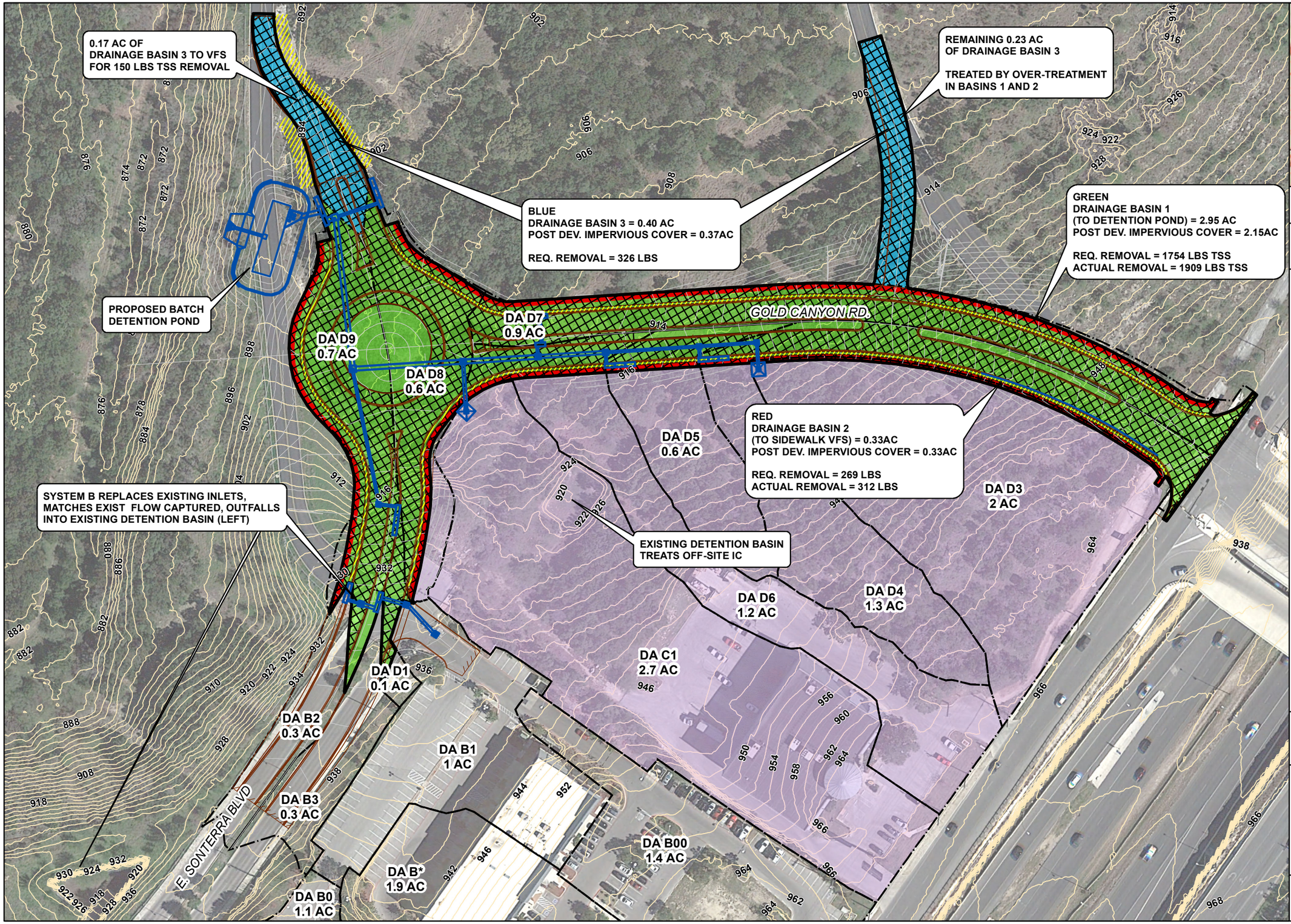
Not applicable.

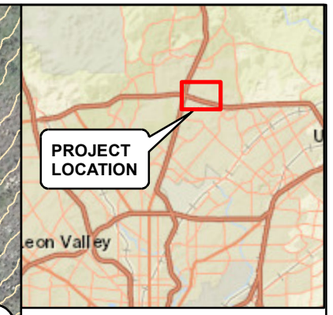
ATTACHMENT F – Structural Practices

Sediment generated by the proposed activities will be controlled through the use of silt fencing, gravel filter bags, erosion control matting and rock filter dams. Construction vehicle traffic will be routed in a manner to avoid, where possible, creating loose sediment or mud that could enter waterways.

ATTACHMENT G – Drainage Area Map

Attached – see the following sheet.





LOCATION MAP
N.T.S.

SONTERRA ROAD EXTENSION

LEGEND

- Proposed Storm Sewer
- Proposed VFS
- Proposed Roadway
- Proposed Contours
- Hydrologic Drainage Areas

1. Total Project Area = 3.35ac

- 1. Total Project Area = 3.35ac
- 1. Total Post-Dev. IC = 2.88ac
- 2. Drainage Basin 2 = 0.33ac
- 2. Drainage Basin 1 = 2.95ac
- 2. Drainage Basin 3 = 0.40ac
- 6. Offsite Area = 7.07 ac
- 2FT Contours

STATE OF TEXAS
JOSE L. REYES
113231
LICENSED
PROFESSIONAL ENGINEER
10/15/2024

TSS CALCULATION AREAS

N E S W

1 inch = 100 feet

MAESTAS

Date: 10/15/2024

\\maisrv2\data\Projects\M242 Sonterra Gold Canyon Extension\06 - CADD Files\06.25 - GIS\MXD\Exhibits WPAP\WPAP Mod\TSS Calculation Areas.mxd

ATTACHMENT H – Temporary Sediment Pond Plan and Calculations

Sediment ponds are not planned for this project.

ATTACHMENT I – Inspection and Maintenance

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 and after each rain event. Damaged BMPs will either be repaired or replaced as needed. Staging of the project activities will also be used to reduce the amount of ground damage to minimize the potential for sediment to enter the waterways. The areas adjacent to creeks and drainage ways shall have priority followed by protecting storm sewer inlets. If storms damage the BMPs, efforts will be made to immediately to restore them to original performance levels.

Silt Fence

(1) Inspection will be made weekly or after each rainfall event and repair or replacement should be made promptly as needed by the contractor.
(2) Remove sediment when buildup reaches 6 inches. Accumulated silt will be removed after each rainfall and disposed of in a manner which will not cause additional siltation.
(3) Replace any torn fabric or install a second line of fencing parallel to the torn section.
(4) Dikes will be Inspected and realigned as needed to prevent gaps between sections.
(5) Replace or repair any sections crushed or collapsed during construction activity. If a section of fence is obstructing vehicular access, consider relocating it to a spot where it will provide equal protection, but will not obstruct vehicles. A triangular filter dike may be preferable to a silt fence at common vehicle access points.
(6) When construction is complete, the sediment should be disposed of in a manner that will not cause additional siltation and the prior location of the silt fence should be revegetated. The fence itself should be disposed of in an approved landfill.

Construction Exit

(1) Inspection will be made weekly or after each rainfall event and repair or replacement should be made promptly as needed by the contractor.
(2) The entrance should be maintained in a condition, which will prevent tracking or flowing of sediment onto public rights-of-way. This may require periodic top dressing with additional stone as conditions demand and repair and/or cleanout of any measures used to trap sediment.
(3) All sediment spilled, dropped, washed, or tracked onto public rights-of-way should be removed immediately by contractor.
(4) When necessary, wheels should be cleaned to remove sediment prior to entrance onto public right-of-way.

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

Gravel Filter Bags

(1) Inspection should be made weekly and after each rainfall by the responsible party. For installations in streambeds, additional daily inspections should be made. Repair or replacement should be made promptly as needed by the contractor.
(2) Remove sediment when buildup reaches a depth of 3 inches. Removed sediment should be deposited in a suitable area and in such a manner that it will not erode.
(3) Check placement of device to prevent gaps between device and curb.
(4) Any loose gravel and torn bags will be repaired.
(5) The berm will be reshaped as needed during inspection.
(6) The berm will be replaced when the structure ceases to function as intended due to silt accumulation among the rocks, washout, construction traffic damage, etc.
(7) The rock filter bags will be left in place until all upstream areas are stabilized and accumulated silt removed.

Rock Filter Dams

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

Erosion Control Matting

(1) Inspection should be made weekly and after each rainfall by the responsible party. For installations in streambeds, additional daily inspections should be made. Repair or replacement should be made promptly as needed by the contractor.
(2) Damage from storms or normal construction activities such as tire ruts or disturbance should be repaired as soon as practical.

ATTACHMENT J – Schedule of Interim and Permanent Soil Stabilization Practices

Interim on-site stabilization measures, which are continuous, will include minimizing soil disturbances by exposing the smallest practical area of land required for the shortest period of time and maximizing use of natural vegetation. As soon as practical, all disturbed soil will be stabilized as per project specifications in accordance with pages 1-35 to 1-60 of TCEQ's Technical Guidance Manual (TGM) RG-348 (2005). Mulching, netting, erosion blankets and seeding are acceptable.

The management of land by using ground cover reduces erosion by reducing the flow rate of runoff and the raindrop impact. Bare soils should be seeded or otherwise stabilized within 14 calendar days after final grading or where construction activity has temporarily ceased for more than 21 days. Stabilization will involve simply sodding and fertilizing. Sediment that has escaped the site due to the failure of sediment and erosion controls should be removed as soon as possible to minimize offsite impacts. Permission should be obtained from adjacent landowners prior to offsite sediment removal.

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.

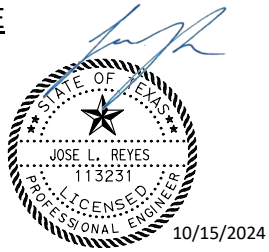
Signature

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: Jose L. Reyes, PE

Date: 10/15/2024

Signature of Customer/Agent



Regulated Entity Name: Sonterra Road Extension Project

Permanent Best Management Practices (BMPs)

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

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

   ☐ N/A

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

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

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

☐ N/A

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

   ☐ N/A

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

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

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

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

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

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

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

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

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

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

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

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

☐ N/A

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

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

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

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

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

☐ N/A

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

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

    ☐ N/A

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

    ☒ N/A

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

    ☐ N/A

Responsibility for Maintenance of Permanent BMP(s)

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

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

    ☐ N/A

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

    ☐ N/A

PERMANENT STORMWATER SECTION ATTACHMENTS

ATTACHMENT A - 20% or Less Impervious Cover Waiver

Not applicable.

ATTACHMENT B - BMPs for Upgradient Stormwater

Under proposed conditions, offsite surface water will flow into the existing sand filtration ponds on the southwest and northwest sides of the proposed Gold Canyon Rd and E. Sonterra Blvd limits. Flows from these areas will be diverted and finally allowed to enter Mud Creek. The proposed roadway along with curbs and sidewalks will slope towards the proposed batch detention on the northeast of the roundabout, allowing only the runoff from the proposed segment of roadway along with curbs and sidewalks to pass the proposed BMP.

ATTACHMENT C – BMPs for On-site Stormwater

Treatment for the runoff from the drainage area on the newly constructed streets, curbs and sidewalks shall be addressed by batch detention placed on the northeast side of the proposed roundabout at E. Sonterra Blvd and Gold Canyon Rd intersection. A portion of the project including sidewalks and proposed driveways will drain towards the proposed Vegetated Filter Strips.

ATTACHMENT D – BMPS FOR SURFACE STREAMS

No sensitive geologic features exist on the project site. The proposed project will only create new roadway, curb and sidewalk impervious cover and will treat storm-water runoff from E. Sonterra Blvd and Gold Canyon Rd prior to being discharged into Mud Creek northeast of the proposed improvements. Treatment of the roadway, curb, and sidewalk by batch detention will provide protection to surface streams.

Action plan if sensitive features are encountered:

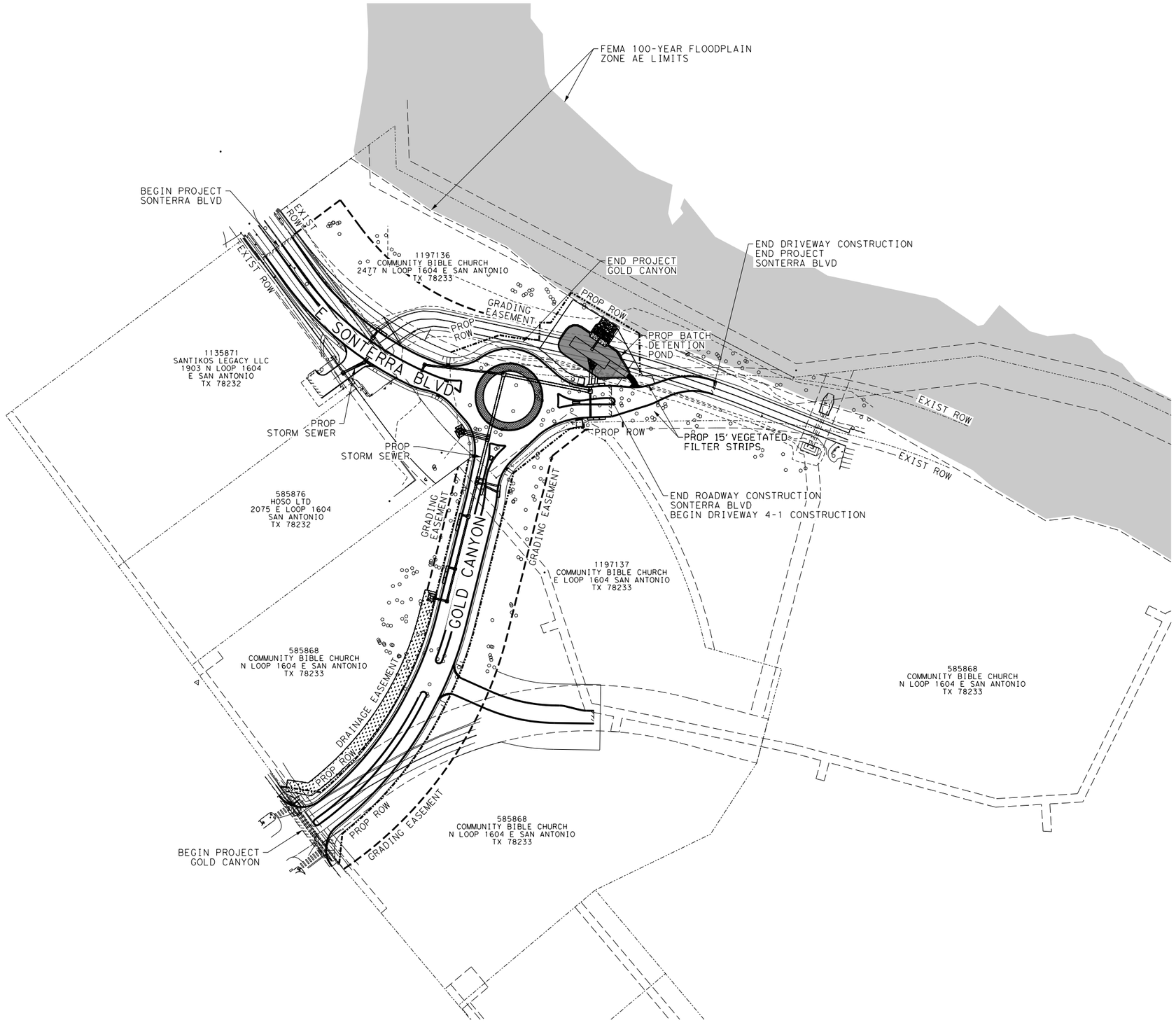
1. Immediately stop construction in the vicinity of the feature.
2. Notify TCEQ San Antonio Regional office staff.
3. Contact a qualified professional Geologist (and Karst biologist, if necessary) to assess the sensitivity of the feature.
4. If necessary, install temporary erosion and sedimentation controls to protect the feature from surface contamination.
5. Develop and submit to the TCEQ for review a feature closer and/or protection plan.
6. Commence construction in the vicinity of the feature only after the feature closure/protection plans has been approved by the TCEQ and the feature has been permanently protected from surface contamination.

ATTACHMENT E – Request to Seal Features

Not applicable.

ATTACHMENT F – Construction Plans/Design Calculations

Attached. See Site Plan and Storm Water Pollution Prevention Plan.



PLAN VIEW LEGEND

- PROP. STORM SEWER
- PROP. CONCRETE CURB
- PROP. EDGE OF PAVEMENT
- PROP. RIGHT OF WAY
- EXIST RIGHT OF WAY
- PROP. DRAINAGE EASEMENT
- EXIST EASEMENT LINES
- FEMA 100-YEAR FLOOPLAIN ZONE AE

N

0 50' 100' 200'
SCALE IN FEET

MAESTAS
8122 DATAPOINT DR., STE. 840
SAN ANTONIO, TX 78229
(210) 366-1988
TBPE No.: F-333
TBPLS No.: 10194506

STATE OF TEXAS
JOSE L. REYES
113231
LICENSED
PROFESSIONAL ENGINEER

10/15/2024

NO:	DATE	REVISION	APPROVED BY

Freese and Nichols, Inc.
Texas Registered Engineering Firm F-2144
FREESE AND NICHOLS
9601 McAllister Freeway, Suite 1008
San Antonio, Texas 78216
Phone - (210) 298-3800
web - www.freese.com

CITY OF SAN ANTONIO

PUBLIC WORKS DEPARTMENT

SONTERRA ROAD EXTENSION

SITE LAYOUT

PRELIMINARY	PROJECT NO.: 23-01849		DATE: 10/15/2024
DRWN. BY: GC	DSGN. BY: GC	CHKD. BY: JR	SHEET 1 OF 1

Texas Commission on Environmental Quality

TSS Removal Calculations 04-20-2009

Project Name: Sonterra Road Extension Basin 1 (Batch Detention)
Date Prepared: 8/24/2015

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

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

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

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

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

County =	Bexar	
Total project area included in plan * =	3.35	acres
Predevelopment impervious area within the limits of the plan * =	0.00	acres
Total post-development impervious area within the limits of the plan* =	2.88	acres
Total post-development impervious cover fraction * =	0.86	
P =	30	inches
$L_{M\ TOTAL\ PROJECT}$ =	2350	lbs.

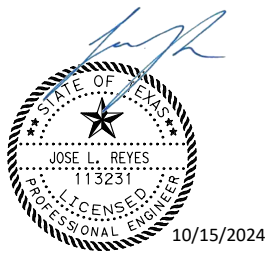
* The values entered in these fields should be for the total project area.

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

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

Drainage Basin/Outfall Area No. = 1

Total drainage basin/outfall area =	2.95	acres
Predevelopment impervious area within drainage basin/outfall area =	0.00	acres
Post-development impervious area within drainage basin/outfall area =	2.15	acres
Post-development impervious fraction within drainage basin/outfall area =	0.73	
$L_{M\ THIS\ BASIN}$ =	1754	lbs.



10/15/2024

3. Indicate the proposed BMP Code for this basin.

Proposed BMP = Batch Detention
Removal efficiency = 91 percent

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

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

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

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

A_C =	2.95	acres
A_I =	2.15	acres
A_P =	0.80	acres
L_R =	2043	lbs

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

Desired $L_{M\ THIS\ BASIN}$ = 1909 lbs.

F = 0.93

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

Rainfall Depth =	2.20	inches
Post Development Runoff Coefficient =	0.54	
On-site Water Quality Volume =	12625	cubic feet

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

Off-site area draining to BMP =	7.07	acres
Off-site Impervious cover draining to BMP =	0.00	acres
Impervious fraction of off-site area =	0.00	
Off-site Runoff Coefficient =	0.02	
Off-site Water Quality Volume =	1129	cubic feet
Storage for Sediment =	2751	
Total Capture Volume (required water quality volume(s) x 1.20) =	16505	cubic feet (0.38 Acre-ft)

The following sections are used to calculate the required water quality volume(s) for the selected BMP.
The values for BMP Types not selected in cell C45 will show NA.

7. Retention/Irrigation System Designed as Required in RG-348 Pages 3-42 to 3-46

Required Water Quality Volume for retention basin = NA cubic feet

Irrigation Area Calculations:

Soil infiltration/permeability rate =	0.1	in/hr	Enter determined permeability rate or assumed value of 0.1
Irrigation area =	NA	square feet	
	NA	acres	

8. Extended Detention Basin System Designed as Required in RG-348 Pages 3-46 to 3-51

Required Water Quality Volume for extended detention basin = NA cubic feet

9. Filter area for Sand Filters Designed as Required in RG-348 Pages 3-58 to 3-63

9A. Full Sedimentation and Filtration System

Water Quality Volume for sedimentation basin =	NA	cubic feet	
Minimum filter basin area =	NA	square feet	
Maximum sedimentation basin area =	NA	square feet	For minimum water depth of 2 feet
Minimum sedimentation basin area =	NA	square feet	For maximum water depth of 8 feet

9B. Partial Sedimentation and Filtration System

Water Quality Volume for combined basins =	NA	cubic feet	
Minimum filter basin area =	NA	square feet	
Maximum sedimentation basin area =	NA	square feet	For minimum water depth of 2 feet
Minimum sedimentation basin area =	NA	square feet	For maximum water depth of 8 feet

10. Bioretention System Designed as Required in RG-348 Pages 3-63 to 3-65

Required Water Quality Volume for Bioretention Basin = NA cubic feet

11. Wet Basins Designed as Required in RG-348 Pages 3-66 to 3-71

Required capacity of Permanent Pool =	NA	cubic feet	Permanent Pool Capacity is 1.20 times the WQV
Required capacity at WQV Elevation =	NA	cubic feet	Total Capacity should be the Permanent Pool Capacity plus a second WQV.

12. Constructed Wetlands Designed as Required in RG-348 Pages 3-71 to 3-73

Required Water Quality Volume for Constructed Wetlands = NA cubic feet

13. AquaLogic™ Cartridge System Designed as Required in RG-348 Pages 3-74 to 3-78

** 2005 Technical Guidance Manual (RG-348) does not exempt the required 20% increase with maintenance contract with AquaLogic™.

Required Sedimentation chamber capacity =	**NA**	cubic feet
Filter canisters (FCs) to treat WQV =	**NA**	cartridges
Filter basin area (RIA_F) =	**NA**	square feet

14. Stormwater Management StormFilter® by CONTECH

Required Water Quality Volume for Contech StormFilter System =	**NA**	cubic feet

THE SIZING REQUIREMENTS FOR THE FOLLOWING BMPs / LOAD REMOVALS ARE BASED UPON FLOW RATES - NOT CALCULATED WATER QUALITY VOLUMES

15. Grassy Swales Designed as Required in RG-348 Pages 3-51 to 3-54

Design parameters for the swale:

Drainage Area to be Treated by the Swale = A =	8.00	acres
Impervious Cover in Drainage Area =	4.00	acres
Rainfall intensity = i =	1.1	in/hr
Swale Slope =	0.01	ft/ft
Side Slope (z) =	3	
Design Water Depth = y =	0.33	ft
Weighted Runoff Coefficient = C =	0.54	
A_{CS} = cross-sectional area of flow in Swale =	13.17	sf
P_W = Wetted Perimeter =	40.62	feet
R_H = hydraulic radius of flow cross-section = A_{CS}/P_W =	0.32	feet
n = Manning's roughness coefficient =	0.2	

15A. Using the Method Described in the RG-348

Manning's Equation: $Q = \frac{1.49}{n} A_{CS} R_H^{2/3} S^{0.5}$

$b = \frac{0.134 \times Q}{y^{1.67} S^{0.5}} - zy$ = 38.51 feet

Q = CiA = 4.71 cfs

To calculate the flow velocity in the swale:

V (Velocity of Flow in the swale) = Q/A_{CS} = 0.36 ft/sec

To calculate the resulting swale length:

L = Minimum Swale Length = V (ft/sec) * 300 (sec) = 107.24 feet

If any of the resulting values do not meet the design requirement set forth in RG-348, the design parameters must be modified and the solver rerun.

15B. Alternative Method using Excel Solver

Design Q = CiA = 4.71 cfs

Manning's Equation Q = 0.76 cfs Error 1 = 3.95
Swale Width= 6.00 ft

Instructions are provided to the right (green comments).

Flow Velocity 0.36 ft/s
Minimum Length = 107.24 ft

Instructions are provided to the right (blue comments).

Design Width = 6 ft
Design Discharge = 0.76 cfs Error 2 = 3.95
Design Depth = 0.33 ft
Flow Velocity = 0.32 cfs
Minimum Length = 97.48 ft

If any of the resulting values do not meet the design requirement set forth in RG-348, the design parameters may be modified and the solver rerun.
If any of the resulting values still do not meet the design requirement set forth in RG-348, widening the swale bottom value may not be possible.

To solve for bottom width of the trapezoidal swale (b) using the Excel solver:
Excel can simultaneously solve the "Design Q" (C217) vs "Manning's Q" (C219) by varying the "Swale Width" (C220).
The required "Swale Width" occurs when the "Design Q" = "Manning's Q"

First, highlight Cell F219 (Error 1 value). The equation showing in the fx screen for Cell F219 should be "= C217-C219"
Then click on "Tools" and "Solver". The "Solver Parameters" screen pops up.
The value in the "Set Target cell" should be F219 "Error 1 ="
The value in the "By Changing Cells" should be C220 "Swale Width"
Click on solve.

The resulting "Swale Width" must be less than 10 feet to meet the requirements of the TGM.
If the resulting "Swale Width" exceeds 10 feet then the design parameters must be revised and the solver run again.

If there is not the option for "Solver" under "Tools"
Click on "Tools" and "Add Ins" and then check "Solver Add-in"
Then proceed as instructed above.

If you would like to increase the bottom width of the trapezoidal swale (b):
Excel can simultaneously solve the "Design Q" (C217) vs "Design Discharge" (C232) by varying the "Design Depth" (C233).
The required "Design Depth" for a 10-foot bottom width occurs when the "Design Q" (C217) = the "Design Discharge" (C232).

First set the desired bottom width in Cell C231.
Highlight Cell F232. The equation showing in the fx screen for Cell F232 should be "= C217-C232"

Click on "Tools" and "Solver". The "Solver Parameters" screen pops up.
The value in the "Set Target cell" should be F232 "Error 2"
The value in the "By Changing Cells" should be C233 "Design Depth"
Click on solve.

The resulting "Design Depth" must be equal to or less than 0.33 feet to meet the requirements of the TGM.
If the resulting "Design Depth" exceeds 0.33 feet then the design parameters must be revised and the solver run again.
First set the desired bottom width in Cell C231.
Highlight Cell F232. The equation showing in the fx screen for Cell F232 should be "= C217-C232"
Click on "Tools" and "Solver". The "Solver Parameters" screen pops up.
The value in the "Set Target cell" should be F232 "Error 2"
The value in the "By Changing Cells" should be C233 "Design Depth"
Click on solve.

The resulting "Design Depth" must be equal to or less than 0.33 feet to meet the requirements of the TGM.
If the resulting "Design Depth" exceeds 0.33 feet then the design parameters must be revised and the solver run again.

16. Vegetated Filter Strips Designed as Required in RG-348 Pages 3-55 to 3-57

There are no calculations required for determining the load or size of vegetative filter strips.
The 80% removal is provided when the contributing drainage area does not exceed 72 feet (direction of flow) and the sheet flow leaving the impervious cover is directed across 15 feet of engineered filter strips with maximum slope of 20% or across 50 feet of natural vegetation with a maximum slope of 10%. There can be a break in grade as long as no slope exceeds 20%.

If vegetative filter strips are proposed for an interim permanent BMP, they may be sized as described on Page 3-56 of RG-348.

17. Wet Vaults Designed as Required in RG-348 Pages 3-30 to 3-32 & 3-79

Required Load Removal Based upon Equation 3.3 = **NA** lbs

First calculate the load removal at 1.1 in/hour

RG-348 Page 3-30 Equation 3.4: Q = CiA

C = runoff coefficient for the drainage area = 0.56 **C = Runoff Coefficient = 0.546 (IC)^2 + 0.328 (IC) + 0.03**
i = design rainfall intensity = 1.1 in/hour
A = drainage area in acres = 1 acres

Q = flow rate in cubic feet per second = 0.61 cubic feet/sec

RG-348 Page 3-31 Equation 3.5: $V_{OR} = Q/A$

Q = Runoff rate calculated above = 0.61 cubic feet/sec
A = Water surface area in the wet vault = 150 square feet

V_{OR} = Overflow Rate = 0.00 feet/sec

Percent TSS Removal from Figure 3-1 (RG-348 Page 3-31) = 53 percent

Load removed by Wet Vault = #VALUE! lbs

If a bypass occurs at a rainfall intensity of less than 1.1 in/hours
Calculate the efficiency reduction for the actual rainfall intensity rate

Actual Rainfall Intensity at which Wet Vault bypass Occurs = 0.5 in/hour

Fraction of rainfall treated from Figure 3-2 RG-348 Page 3-32 = 0.75 percent
Efficiency Reduction for Actual Rainfall Intensity = 0.83 percent

Resultant TSS Load removed by Wet Vault = #VALUE! lbs

18. Permeable Concrete Designed as Required in RG-348 Pages 3-79 to 3-83

PERMEABLE CONCRETE MAY ONLY BE USED ON THE CONTRIBUTING ZONE

19. BMPs Installed in a Series Designed as Required in RG-348 Pages 3-32

Michael E. Barrett, Ph.D.. P.E. recommended that the coefficient for E_2 be changed from 0.5 to 0.65 on May 3, 2006

$E_{TOT} = [1 - ((1 - E_1) X (1 - 0.65E_2) x (1 - 0.25E_3))] X 100$ = 86.38 percent NET EFFICIENCY OF THE BMPs IN THE SERIES

EFFICIENCY OF FIRST BMP IN THE SERIES = E_1 = 75.00 percent

EFFICIENCY OF THE SECOND BMP IN THE SERIES = E_2 = 70.00 percent

EFFICIENCY OF THE THIRD BMP IN THE SERIES = E_3 = 0.00 percent

THEREFORE, THE NET LOAD REMOVAL WOULD BE:
(A_I AND A_P VALUES ARE FROM SECTION 3 ABOVE)

$L_R = E_{TOT} X P X (A_I X 34.6 X A_P X0.54)$ = 1938.83 lbs

20. Stormceptor

Required TSS Removal in BMP Drainage Area=	**NA**	lbs
Impervious Cover Overtreatment=	0.0000	ac
TSS Removal for Uncaptured Area =	0.00	lbs

BMP Sizing

Effective Area =	NA	EA
Calculated Model Size(s) =	#N/A	
Actual Model Size (if multiple values provided in Calculated Model Size or if you are choosing a larger model size) =	0	Model Size
Surface Area =	#N/A	ft^2

Overflow Rate =	#VALUE!	V_{or}
Rounded Overflow Rate =	#VALUE!	V_{or}
BMP Efficiency % =	#VALUE!	%
L_R Value =	#VALUE!	lbs
TSS Load Credit =	#VALUE!	lbs
Is Sufficient Treatment Available? (TSS Credit ≥ TSS Uncapt.)	#VALUE!	
TSS Treatment by BMP (LM + TSS Uncapt.) =	#VALUE!	

21. Vortech

Required TSS Removal in BMP Drainage Area=	**NA**	lbs
Impervious Cover Overtreatment=	0.0000	ac
TSS Removal for Uncaptured Area =	0.00	lbs

BMP Sizing

Effective Area =	NA	EA
Calculated Model Size(s) =	#N/A	
Actual Model Size (if choosing larger model size) =	Vx1000	Pick Model Size
Surface Area =	7.10	ft^2
Overflow Rate =	#VALUE!	V_{or}
Rounded Overflow Rate =	#VALUE!	V_{or}
BMP Efficiency % =	#VALUE!	%
L_R Value =	#VALUE!	lbs
TSS Load Credit =	#VALUE!	lbs
Is Sufficient Treatment Available? (TSS Credit ≥ TSS Uncapt.)	#VALUE!	
TSS Treatment by BMP (LM + TSS Uncapt.) =	#VALUE!	

Texas Commission on Environmental Quality

TSS Removal Calculations 04-20-2009

Project Name: Sonterra Road Extension Basin 2 (SW VFS)
Date Prepared: 8/24/2015

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

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

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

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

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

County =	Bexar	
Total project area included in plan * =	3.35	acres
Predevelopment impervious area within the limits of the plan * =	0.00	acres
Total post-development impervious area within the limits of the plan* =	2.88	acres
Total post-development impervious cover fraction * =	0.86	
P =	30	inches
$L_{M\ TOTAL\ PROJECT}$ =	2350	lbs.

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

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

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

Drainage Basin/Outfall Area No. = 2

Total drainage basin/outfall area =	0.33	acres
Predevelopment impervious area within drainage basin/outfall area =	0.00	acres
Post-development impervious area within drainage basin/outfall area =	0.33	acres
Post-development impervious fraction within drainage basin/outfall area =	1.00	
$L_{M\ THIS\ BASIN}$ =	269	lbs.

STATE OF TEXAS
JOSE L. REYES
113231
LICENSED
PROFESSIONAL ENGINEER
10/15/2024

3. Indicate the proposed BMP Code for this basin.

Proposed BMP = Vegetated Filter Strips
Removal efficiency = 85 percent

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

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

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

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

A_C =	0.33	acres
A_I =	0.33	acres
A_P =	0.00	acres
L_R =	291	lbs

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

Desired $L_{M\ THIS\ BASIN}$ = 291 lbs.

F = 1.00

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

Rainfall Depth =	4.00	inches
Post Development Runoff Coefficient =	0.82	
On-site Water Quality Volume =	3911	cubic feet

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

Off-site area draining to BMP =	7.07	acres
Off-site Impervious cover draining to BMP =	0.00	acres
Impervious fraction of off-site area =	0.00	
Off-site Runoff Coefficient =	0.02	
Off-site Water Quality Volume =	2053	cubic feet
Storage for Sediment =	1193	
Total Capture Volume (required water quality volume(s) x 1.20) =	7157	cubic feet (0.16 Acre-ft)

The following sections are used to calculate the required water quality volume(s) for the selected BMP.
The values for BMP Types not selected in cell C45 will show NA.

7. Retention/Irrigation System Designed as Required in RG-348 Pages 3-42 to 3-46

Required Water Quality Volume for retention basin = NA cubic feet

Irrigation Area Calculations:

Soil infiltration/permeability rate =	0.1	in/hr	Enter determined permeability rate or assumed value of 0.1
Irrigation area =	NA	square feet	
	NA	acres	

8. Extended Detention Basin System Designed as Required in RG-348 Pages 3-46 to 3-51

Required Water Quality Volume for extended detention basin = NA cubic feet

9. Filter area for Sand Filters Designed as Required in RG-348 Pages 3-58 to 3-63

9A. Full Sedimentation and Filtration System

Water Quality Volume for sedimentation basin =	NA	cubic feet	
Minimum filter basin area =	NA	square feet	
Maximum sedimentation basin area =	NA	square feet	For minimum water depth of 2 feet
Minimum sedimentation basin area =	NA	square feet	For maximum water depth of 8 feet

9B. Partial Sedimentation and Filtration System

Water Quality Volume for combined basins =	NA	cubic feet	
Minimum filter basin area =	NA	square feet	
Maximum sedimentation basin area =	NA	square feet	For minimum water depth of 2 feet
Minimum sedimentation basin area =	NA	square feet	For maximum water depth of 8 feet

10. Bioretention System Designed as Required in RG-348 Pages 3-63 to 3-65

Required Water Quality Volume for Bioretention Basin = NA cubic feet

11. Wet Basins Designed as Required in RG-348 Pages 3-66 to 3-71

Required capacity of Permanent Pool =	NA	cubic feet	Permanent Pool Capacity is 1.20 times the WQV
Required capacity at WQV Elevation =	NA	cubic feet	Total Capacity should be the Permanent Pool Capacity plus a second WQV.

12. Constructed Wetlands Designed as Required in RG-348 Pages 3-71 to 3-73

Required Water Quality Volume for Constructed Wetlands = NA cubic feet

13. AquaLogic™ Cartridge System Designed as Required in RG-348 Pages 3-74 to 3-78

** 2005 Technical Guidance Manual (RG-348) does not exempt the required 20% increase with maintenance contract with AquaLogic™.

Required Sedimentation chamber capacity =	**NA**	cubic feet
Filter canisters (FCs) to treat WQV =	**NA**	cartridges
Filter basin area (RIA_F) =	**NA**	square feet

14. Stormwater Management StormFilter® by CONTECH

Required Water Quality Volume for Contech StormFilter System =	**NA**	cubic feet

THE SIZING REQUIREMENTS FOR THE FOLLOWING BMPs / LOAD REMOVALS ARE BASED UPON FLOW RATES - NOT CALCULATED WATER QUALITY VOLUMES

15. Grassy Swales Designed as Required in RG-348 Pages 3-51 to 3-54

Design parameters for the swale:

Drainage Area to be Treated by the Swale = A =	8.00	acres
Impervious Cover in Drainage Area =	4.00	acres
Rainfall intensity = i =	1.1	in/hr
Swale Slope =	0.01	ft/ft
Side Slope (z) =	3	
Design Water Depth = y =	0.33	ft
Weighted Runoff Coefficient = C =	0.54	
A_{CS} = cross-sectional area of flow in Swale =	13.17	sf
P_W = Wetted Perimeter =	40.62	feet
R_H = hydraulic radius of flow cross-section = A_{CS}/P_W =	0.32	feet
n = Manning's roughness coefficient =	0.2	

15A. Using the Method Described in the RG-348

Manning's Equation: $Q = \frac{1.49}{n} A_{CS} R_H^{2/3} S^{0.5}$

$b = \frac{0.134 \times Q}{y^{1.67} S^{0.5}} - zy$ = 38.51 feet

Q = CiA = 4.71 cfs

To calculate the flow velocity in the swale:

V (Velocity of Flow in the swale) = Q/A_{CS} = 0.36 ft/sec

To calculate the resulting swale length:

L = Minimum Swale Length = V (ft/sec) * 300 (sec) = 107.24 feet

If any of the resulting values do not meet the design requirement set forth in RG-348, the design parameters must be modified and the solver rerun.

15B. Alternative Method using Excel Solver

Design Q = CiA =	4.71 cfs		
Manning's Equation Q =	0.76 cfs	Error 1 =	3.95
Swale Width=	6.00 ft		

Instructions are provided to the right (green comments).

Flow Velocity	0.36 ft/s		
Minimum Length =	107.24 ft		

Instructions are provided to the right (blue comments).

Design Width =	6 ft		
Design Discharge =	0.76 cfs	Error 2 =	3.95
Design Depth =	0.33 ft		
Flow Velocity =	0.32 cfs		
Minimum Length =	97.48 ft		

If any of the resulting values do not meet the design requirement set forth in RG-348, the design parameters may be modified and the solver rerun.
If any of the resulting values still do not meet the design requirement set forth in RG-348, widening the swale bottom value may not be possible.

To solve for bottom width of the trapezoidal swale (b) using the Excel solver:
Excel can simultaneously solve the "Design Q" (C217) vs "Manning's Q" (C219) by varying the "Swale Width" (C220).
The required "Swale Width" occurs when the "Design Q" = "Manning's Q"

First, highlight Cell F219 (Error 1 value). The equation showing in the fx screen for Cell F219 should be "= C217-C219"
Then click on "Tools" and "Solver". The "Solver Parameters" screen pops up.
The value in the "Set Target cell" should be F219 "Error 1 ="
The value in the "By Changing Cells" should be C220 "Swale Width"
Click on solve.

The resulting "Swale Width" must be less than 10 feet to meet the requirements of the TGM.
If the resulting "Swale Width" exceeds 10 feet then the design parameters must be revised and the solver run again.

If there is not the option for "Solver" under "Tools"
Click on "Tools" and "Add Ins" and then check "Solver Add-in"
Then proceed as instructed above.

If you would like to increase the bottom width of the trapezoidal swale (b):
Excel can simultaneously solve the "Design Q" (C217) vs "Design Discharge" (C232) by varying the "Design Depth" (C233).
The required "Design Depth" for a 10-foot bottom width occurs when the "Design Q" (C217) = the "Design Discharge" (C232).

First set the desired bottom width in Cell C231.
Highlight Cell F232. The equation showing in the fx screen for Cell F232 should be "= C217-C232"

Click on "Tools" and "Solver". The "Solver Parameters" screen pops up.
The value in the "Set Target cell" should be F232 "Error 2"
The value in the "By Changing Cells" should be C233 "Design Depth"
Click on solve.

The resulting "Design Depth" must be equal to or less than 0.33 feet to meet the requirements of the TGM.
If the resulting "Design Depth" exceeds 0.33 feet then the design parameters must be revised and the solver run again.
First set the desired bottom width in Cell C231.
Highlight Cell F232. The equation showing in the fx screen for Cell F232 should be "= C217-C232"
Click on "Tools" and "Solver". The "Solver Parameters" screen pops up.
The value in the "Set Target cell" should be F232 "Error 2"
The value in the "By Changing Cells" should be C233 "Design Depth"
Click on solve.

The resulting "Design Depth" must be equal to or less than 0.33 feet to meet the requirements of the TGM.
If the resulting "Design Depth" exceeds 0.33 feet then the design parameters must be revised and the solver run again.

16. Vegetated Filter Strips Designed as Required in RG-348 Pages 3-55 to 3-57

There are no calculations required for determining the load or size of vegetative filter strips.
The 80% removal is provided when the contributing drainage area does not exceed 72 feet (direction of flow) and the sheet flow leaving the impervious cover is directed across 15 feet of engineered filter strips with maximum slope of 20% or across 50 feet of natural vegetation with a maximum slope of 10%. There can be a break in grade as long as no slope exceeds 20%.

If vegetative filter strips are proposed for an interim permanent BMP, they may be sized as described on Page 3-56 of RG-348.

17. Wet Vaults Designed as Required in RG-348 Pages 3-30 to 3-32 & 3-79

Required Load Removal Based upon Equation 3.3 =	**NA**	lbs

First calculate the load removal at 1.1 in/hour

RG-348 Page 3-30 Equation 3.4: Q = CiA

C = runoff coefficient for the drainage area =	0.90	**C = Runoff Coefficient = 0.546 (IC)^2 + 0.328 (IC) + 0.03**
i = design rainfall intensity =	1.1 in/hour	
A = drainage area in acres =	1 acres	
Q = flow rate in cubic feet per second =	0.99 cubic feet/sec	

RG-348 Page 3-31 Equation 3.5: $V_{OR} = Q/A$

Q = Runoff rate calculated above =	0.99	cubic feet/sec
A = Water surface area in the wet vault =	150	square feet
V_{OR} = Overflow Rate =	0.01	feet/sec
Percent TSS Removal from Figure 3-1 (RG-348 Page 3-31) =	53	percent
Load removed by Wet Vault =	#VALUE!	lbs

If a bypass occurs at a rainfall intensity of less than 1.1 in/hours
Calculate the efficiency reduction for the actual rainfall intensity rate

Actual Rainfall Intensity at which Wet Vault bypass Occurs =	0.5	in/hour
Fraction of rainfall treated from Figure 3-2 RG-348 Page 3-32 =	0.75	percent
Efficiency Reduction for Actual Rainfall Intensity =	0.83	percent
Resultant TSS Load removed by Wet Vault =	#VALUE!	lbs

18. Permeable Concrete Designed as Required in RG-348 Pages 3-79 to 3-83

PERMEABLE CONCRETE MAY ONLY BE USED ON THE CONTRIBUTING ZONE

19. BMPs Installed in a Series Designed as Required in RG-348 Pages 3-32

Michael E. Barrett, Ph.D.. P.E. recommended that the coefficient for E_2 be changed from 0.5 to 0.65 on May 3, 2006

$E_{TOT} = [1 - ((1 - E_1) X (1 - 0.65E_2) x (1 - 0.25E_3))] X 100$ =	86.38 percent	NET EFFICIENCY OF THE BMPs IN THE SERIES
EFFICIENCY OF FIRST BMP IN THE SERIES = E_1 =	75.00 percent	
EFFICIENCY OF THE SECOND BMP IN THE SERIES = E_2 =	70.00 percent	
EFFICIENCY OF THE THIRD BMP IN THE SERIES = E_3 =	0.00 percent	

THEREFORE, THE NET LOAD REMOVAL WOULD BE:
(A_I AND A_P VALUES ARE FROM SECTION 3 ABOVE)

$L_R = E_{TOT} X P X (A_I X 34.6 X A_P X0.54)$ = 295.87 lbs

20. Stormceptor

Required TSS Removal in BMP Drainage Area=	**NA**	lbs
Impervious Cover Overtreatment=	0.0000	ac
TSS Removal for Uncaptured Area =	0.00	lbs

BMP Sizing

Effective Area =	NA	EA
Calculated Model Size(s) =	#N/A	
Actual Model Size (if multiple values provided in Calculated Model Size or if you are choosing a larger model size) =	0	Model Size
Surface Area =	#N/A	ft^2

Overflow Rate =	#VALUE!	V_{or}
Rounded Overflow Rate =	#VALUE!	V_{or}
BMP Efficiency % =	#VALUE!	%
L_R Value =	#VALUE!	lbs
TSS Load Credit =	#VALUE!	lbs
Is Sufficient Treatment Available? (TSS Credit ≥ TSS Uncapt.)	#VALUE!	
TSS Treatment by BMP (LM + TSS Uncapt.) =	#VALUE!	

21. Vortech

Required TSS Removal in BMP Drainage Area=	**NA**	lbs
Impervious Cover Overtreatment=	0.0000	ac
TSS Removal for Uncaptured Area =	0.00	lbs

BMP Sizing

Effective Area =	NA	EA
Calculated Model Size(s) =	#N/A	
Actual Model Size (if choosing larger model size) =	Vx1000	Pick Model Size
Surface Area =	7.10	ft^2
Overflow Rate =	#VALUE!	V_{or}
Rounded Overflow Rate =	#VALUE!	V_{or}
BMP Efficiency % =	#VALUE!	%
L_R Value =	#VALUE!	lbs
TSS Load Credit =	#VALUE!	lbs
Is Sufficient Treatment Available? (TSS Credit ≥ TSS Uncapt.)	#VALUE!	
TSS Treatment by BMP (LM + TSS Uncapt.) =	#VALUE!	

Texas Commission on Environmental Quality

TSS Removal Calculations 04-20-2009

Project Name: Sonterra Road Extension Basin 3 (15' VFS)
Date Prepared: 8/24/2015

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

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

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

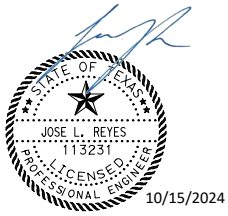
where:
$L_{M\ TOTAL\ PROJECT}$ = Required TSS removal resulting from the proposed development = 80% of increased load
A_N = Net increase in impervious area for the project
P = Average annual precipitation, inches

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

County =	Bexar	
Total project area included in plan * =	3.35	acres
Predevelopment impervious area within the limits of the plan * =	0.00	acres
Total post-development impervious area within the limits of the plan* =	2.88	acres
Total post-development impervious cover fraction * =	0.86	
P =	30	inches
$L_{M\ TOTAL\ PROJECT}$ =	2350	lbs.

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

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



10/15/2024

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

Drainage Basin/Outfall Area No. = 3

Total drainage basin/outfall area =	0.40	acres
Predevelopment impervious area within drainage basin/outfall area =	0.00	acres
Post-development impervious area within drainage basin/outfall area =	0.40	acres
Post-development impervious fraction within drainage basin/outfall area =	1.00	
$L_{M\ THIS\ BASIN}$ =	326	lbs.

3. Indicate the proposed BMP Code for this basin.

Proposed BMP = Vegetated Filter Strips
Removal efficiency = 85 percent

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

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

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

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

A_C =	0.17	acres
A_I =	0.17	acres
A_P =	0.00	acres
L_R =	150	lbs

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

Desired $L_{M\ THIS\ BASIN}$ = 150 lbs.

F = 1.00

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

Rainfall Depth =	4.00	inches
Post Development Runoff Coefficient =	0.82	
On-site Water Quality Volume =	2015	cubic feet

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

Off-site area draining to BMP =	7.07	acres
Off-site Impervious cover draining to BMP =	0.00	acres
Impervious fraction of off-site area =	0.00	
Off-site Runoff Coefficient =	0.02	
Off-site Water Quality Volume =	2053	cubic feet
Storage for Sediment =	814	
Total Capture Volume (required water quality volume(s) x 1.20) =	4882	cubic feet (0.11 Acre-ft)

The following sections are used to calculate the required water quality volume(s) for the selected BMP.
The values for BMP Types not selected in cell C45 will show NA.

7. Retention/Irrigation System Designed as Required in RG-348 Pages 3-42 to 3-46

Required Water Quality Volume for retention basin = NA cubic feet

Irrigation Area Calculations:

Soil infiltration/permeability rate =	0.1	in/hr	Enter determined permeability rate or assumed value of 0.1
Irrigation area =	NA	square feet	
	NA	acres	

8. Extended Detention Basin System Designed as Required in RG-348 Pages 3-46 to 3-51

Required Water Quality Volume for extended detention basin = NA cubic feet

9. Filter area for Sand Filters Designed as Required in RG-348 Pages 3-58 to 3-63

9A. Full Sedimentation and Filtration System

Water Quality Volume for sedimentation basin =	NA	cubic feet	
Minimum filter basin area =	NA	square feet	
Maximum sedimentation basin area =	NA	square feet	For minimum water depth of 2 feet
Minimum sedimentation basin area =	NA	square feet	For maximum water depth of 8 feet

9B. Partial Sedimentation and Filtration System

Water Quality Volume for combined basins =	NA	cubic feet	
Minimum filter basin area =	NA	square feet	
Maximum sedimentation basin area =	NA	square feet	For minimum water depth of 2 feet
Minimum sedimentation basin area =	NA	square feet	For maximum water depth of 8 feet

10. Bioretention System Designed as Required in RG-348 Pages 3-63 to 3-65

Required Water Quality Volume for Bioretention Basin = NA cubic feet

11. Wet Basins Designed as Required in RG-348 Pages 3-66 to 3-71

Required capacity of Permanent Pool = **NA** cubic feet **Permanent Pool Capacity is 1.20 times the WQV**
Required capacity at WQV Elevation = **NA** cubic feet **Total Capacity should be the Permanent Pool Capacity plus a second WQV.**

12. Constructed Wetlands Designed as Required in RG-348 Pages 3-71 to 3-73

Required Water Quality Volume for Constructed Wetlands = **NA** cubic feet

13. AquaLogic™ Cartridge System Designed as Required in RG-348 Pages 3-74 to 3-78

**** 2005 Technical Guidance Manual (RG-348) does not exempt the required 20% increase with maintenance contract with AquaLogic™.**

Required Sedimentation chamber capacity = **NA** cubic feet
Filter canisters (FCs) to treat WQV = **NA** cartridges
Filter basin area (RIA_F) = **NA** square feet

14. Stormwater Management StormFilter® by CONTECH

Required Water Quality Volume for Contech StormFilter System = **NA** cubic feet

THE SIZING REQUIREMENTS FOR THE FOLLOWING BMPs / LOAD REMOVALS ARE BASED UPON FLOW RATES - NOT CALCULATED WATER QUALITY VOLUMES

15. Grassy Swales Designed as Required in RG-348 Pages 3-51 to 3-54

Design parameters for the swale:

Drainage Area to be Treated by the Swale = A = 8.00 acres
Impervious Cover in Drainage Area = 4.00 acres
Rainfall intensity = i = 1.1 in/hr
Swale Slope = 0.01 ft/ft
Side Slope (z) = 3
Design Water Depth = y = 0.33 ft
Weighted Runoff Coefficient = C = 0.54

A_{CS} = cross-sectional area of flow in Swale = 13.17 sf
P_W = Wetted Perimeter = 40.62 feet
R_H = hydraulic radius of flow cross-section = A_{CS}/P_W = 0.32 feet
n = Manning's roughness coefficient = 0.2

15A. Using the Method Described in the RG-348

Manning's Equation: $Q = \frac{1.49}{n} A_{CS} R_H^{2/3} S^{0.5}$

$b = \frac{0.134 \times Q}{y^{1.67} S^{0.5}} - zy$ = 38.51 feet

Q = CiA = 4.71 cfs

To calculate the flow velocity in the swale:

V (Velocity of Flow in the swale) = Q/A_{CS} = 0.36 ft/sec

To calculate the resulting swale length:

L = Minimum Swale Length = V (ft/sec) * 300 (sec) = 107.24 feet

If any of the resulting values do not meet the design requirement set forth in RG-348, the design parameters must be modified and the solver rerun.

15B. Alternative Method using Excel Solver

Design Q = CiA = 4.71 cfs

Manning's Equation Q = 0.76 cfs Error 1 = 3.95
Swale Width= 6.00 ft

Instructions are provided to the right (green comments).

Flow Velocity 0.36 ft/s
Minimum Length = 107.24 ft

Instructions are provided to the right (blue comments).

Design Width = 6 ft
Design Discharge = 0.76 cfs Error 2 = 3.95
Design Depth = 0.33 ft
Flow Velocity = 0.32 cfs
Minimum Length = 97.48 ft

If any of the resulting values do not meet the design requirement set forth in RG-348, the design parameters may be modified and the solver rerun.
If any of the resulting values still do not meet the design requirement set forth in RG-348, widening the swale bottom value may not be possible.

To solve for bottom width of the trapezoidal swale (b) using the Excel solver:
Excel can simultaneously solve the "Design Q" (C217) vs "Manning's Q" (C219) by varying the "Swale Width" (C220).
The required "Swale Width" occurs when the "Design Q" = "Manning's Q"

First, highlight Cell F219 (Error 1 value). The equation showing in the fx screen for Cell F219 should be "= C217-C219"
Then click on "Tools" and "Solver". The "Solver Parameters" screen pops up.
The value in the "Set Target cell" should be F219 "Error 1 ="
The value in the "By Changing Cells" should be C220 "Swale Width"
Click on solve.

The resulting "Swale Width" must be less than 10 feet to meet the requirements of the TGM.
If the resulting "Swale Width" exceeds 10 feet then the design parameters must be revised and the solver run again.

If there is not the option for "Solver" under "Tools"
Click on "Tools" and "Add Ins" and then check "Solver Add-in"
Then proceed as instructed above.

If you would like to increase the bottom width of the trapezoidal swale (b):
Excel can simultaneously solve the "Design Q" (C217) vs "Design Discharge" (C232) by varying the "Design Depth" (C233).
The required "Design Depth" for a 10-foot bottom width occurs when the "Design Q" (C217) = the "Design Discharge" (C232).

First set the desired bottom width in Cell C231.
Highlight Cell F232. The equation showing in the fx screen for Cell F232 should be "= C217-C232"

Click on "Tools" and "Solver". The "Solver Parameters" screen pops up.
The value in the "Set Target cell" should be F232 "Error 2"
The value in the "By Changing Cells" should be C233 "Design Depth"
Click on solve.

The resulting "Design Depth" must be equal to or less than 0.33 feet to meet the requirements of the TGM.
If the resulting "Design Depth" exceeds 0.33 feet then the design parameters must be revised and the solver run again.
First set the desired bottom width in Cell C231.
Highlight Cell F232. The equation showing in the fx screen for Cell F232 should be "= C217-C232"
Click on "Tools" and "Solver". The "Solver Parameters" screen pops up.
The value in the "Set Target cell" should be F232 "Error 2"
The value in the "By Changing Cells" should be C233 "Design Depth"
Click on solve.

The resulting "Design Depth" must be equal to or less than 0.33 feet to meet the requirements of the TGM.
If the resulting "Design Depth" exceeds 0.33 feet then the design parameters must be revised and the solver run again.

16. Vegetated Filter Strips Designed as Required in RG-348 Pages 3-55 to 3-57

There are no calculations required for determining the load or size of vegetative filter strips.
The 80% removal is provided when the contributing drainage area does not exceed 72 feet (direction of flow) and the sheet flow leaving the impervious cover is directed across 15 feet of engineered filter strips with maximum slope of 20% or across 50 feet of natural vegetation with a maximum slope of 10%. There can be a break in grade as long as no slope exceeds 20%.

If vegetative filter strips are proposed for an interim permanent BMP, they may be sized as described on Page 3-56 of RG-348.

17. Wet Vaults Designed as Required in RG-348 Pages 3-30 to 3-32 & 3-79

Required Load Removal Based upon Equation 3.3 = **NA** lbs

First calculate the load removal at 1.1 in/hour

RG-348 Page 3-30 Equation 3.4: Q = CiA

C = runoff coefficient for the drainage area = 0.90 **C = Runoff Coefficient = 0.546 (IC)^2 + 0.328 (IC) + 0.03**
i = design rainfall intensity = 1.1 in/hour
A = drainage area in acres = 1 acres

Q = flow rate in cubic feet per second = 0.99 cubic feet/sec

RG-348 Page 3-31 Equation 3.5: $V_{OR} = Q/A$

Q = Runoff rate calculated above = 0.99 cubic feet/sec
A = Water surface area in the wet vault = 150 square feet

V_{OR} = Overflow Rate = 0.01 feet/sec

Percent TSS Removal from Figure 3-1 (RG-348 Page 3-31) = 53 percent

Load removed by Wet Vault = #VALUE! lbs

If a bypass occurs at a rainfall intensity of less than 1.1 in/hours
Calculate the efficiency reduction for the actual rainfall intensity rate

Actual Rainfall Intensity at which Wet Vault bypass Occurs = 0.5 in/hour

Fraction of rainfall treated from Figure 3-2 RG-348 Page 3-32 = 0.75 percent
Efficiency Reduction for Actual Rainfall Intensity = 0.83 percent

Resultant TSS Load removed by Wet Vault = #VALUE! lbs

18. Permeable Concrete Designed as Required in RG-348 Pages 3-79 to 3-83

PERMEABLE CONCRETE MAY ONLY BE USED ON THE CONTRIBUTING ZONE

19. BMPs Installed in a Series Designed as Required in RG-348 Pages 3-32

Michael E. Barrett, Ph.D., P.E. recommended that the coefficient for E_2 be changed from 0.5 to 0.65 on May 3, 2006

$E_{TOT} = [1 - ((1 - E_1) X (1 - 0.65E_2) x (1 - 0.25E_3))] X 100 =$ 86.38 percent NET EFFICIENCY OF THE BMPs IN THE SERIES

EFFICIENCY OF FIRST BMP IN THE SERIES = $E_1 =$ 75.00 percent

EFFICIENCY OF THE SECOND BMP IN THE SERIES = $E_2 =$ 70.00 percent

EFFICIENCY OF THE THIRD BMP IN THE SERIES = $E_3 =$ 0.00 percent

THEREFORE, THE NET LOAD REMOVAL WOULD BE:
(A_I AND A_P VALUES ARE FROM SECTION 3 ABOVE)

$L_R = E_{TOT} X P X (A_I X 34.6 X A_P X 0.54) =$ 152.42 lbs

20. Stormceptor

Required TSS Removal in BMP Drainage Area=	**NA**	lbs
Impervious Cover Overtreatment=	0.0000	ac
TSS Removal for Uncaptured Area =	0.00	lbs

BMP Sizing

Effective Area =	NA	EA
Calculated Model Size(s) =	#N/A	
Actual Model Size (if multiple values provided in Calculated Model Size or if you are choosing a larger model size) =	0	Model Size
Surface Area =	#N/A	ft^2
Overflow Rate =	#VALUE!	V_o
Rounded Overflow Rate =	#VALUE!	V_o
BMP Efficiency % =	#VALUE!	%
L_R Value =	#VALUE!	lbs
TSS Load Credit =	#VALUE!	lbs
Is Sufficient Treatment Available? (TSS Credit > TSS Uncapt.)	#VALUE!	
TSS Treatment by BMP (LM + TSS Uncapt.) =	#VALUE!	

21. Vortech

Required TSS Removal in BMP Drainage Area=	**NA**	lbs
Impervious Cover Overtreatment=	0.0000	ac
TSS Removal for Uncaptured Area =	0.00	lbs

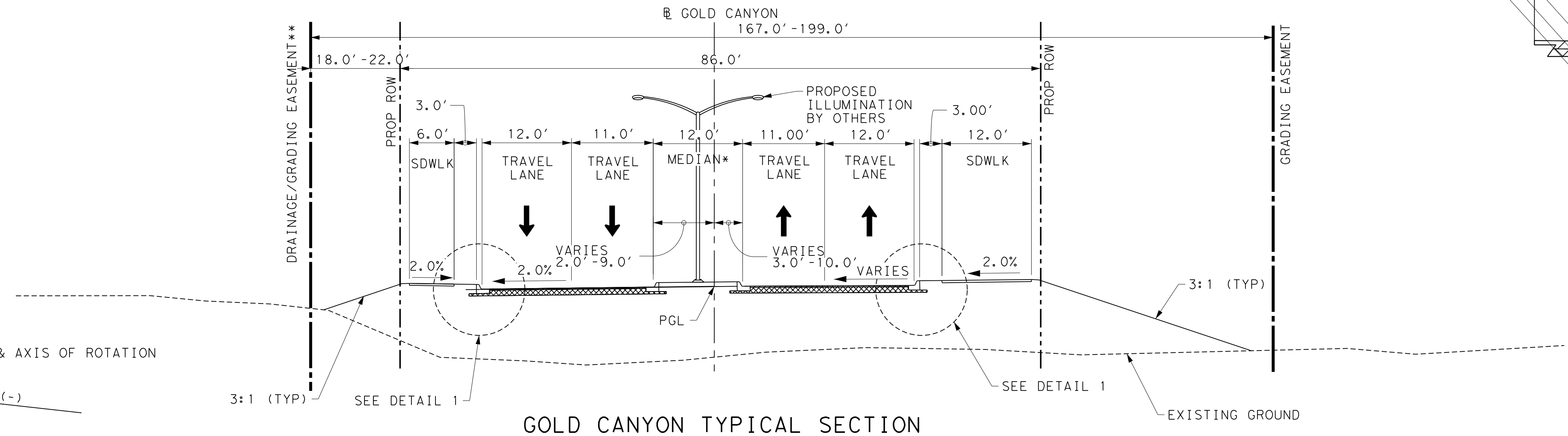
BMP Sizing

Effective Area =	NA	EA
Calculated Model Size(s) =	#N/A	
Actual Model Size (if choosing larger model size) =	Vx1000	Pick Model Size
Surface Area =	7.10	ft^2
Overflow Rate =	#VALUE!	V_o
Rounded Overflow Rate =	#VALUE!	V_o
BMP Efficiency % =	#VALUE!	%
L_R Value =	#VALUE!	lbs
TSS Load Credit =	#VALUE!	lbs
Is Sufficient Treatment Available? (TSS Credit > TSS Uncapt.)	#VALUE!	
TSS Treatment by BMP (LM + TSS Uncapt.) =	#VALUE!	

NOTE:

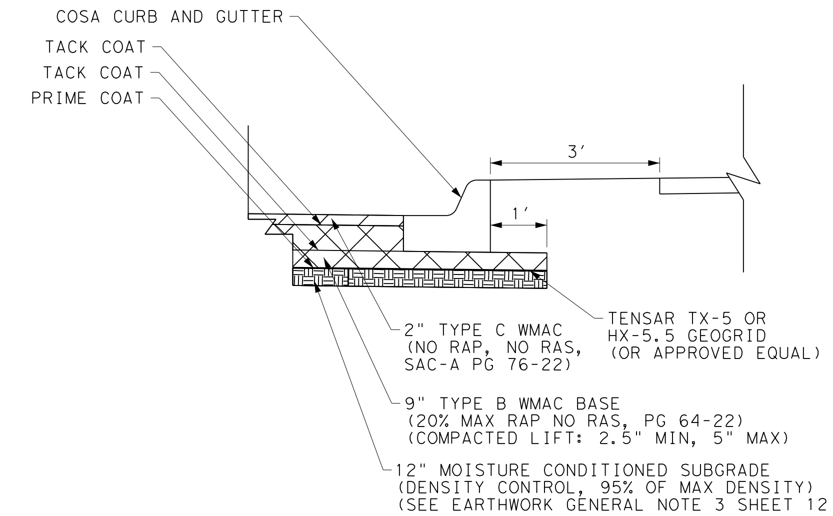
*MEDIAN MATERIAL (GOLD CANYON):
GRASS STA 10+51.00 TO STA 13+80.71 & STA 14+39.03 TO STA 16+97.97
CONCRETE STA 16+97.87 TO STA 18+69.74

**DRAINAGE EASEMENT LOCATED AT STA 10+51.28 TO STA 15+69.00
GRADING EASEMENT LOCATED AT STA 15+69.00 TO STA 18+08.90



GOLD CANYON TYPICAL SECTION

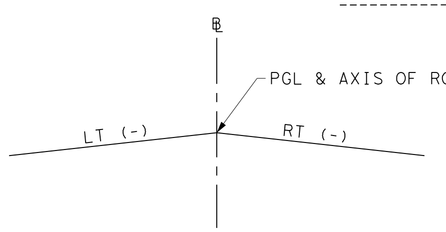
STA 10+27.00 TO 16+10.00



DETAIL 1

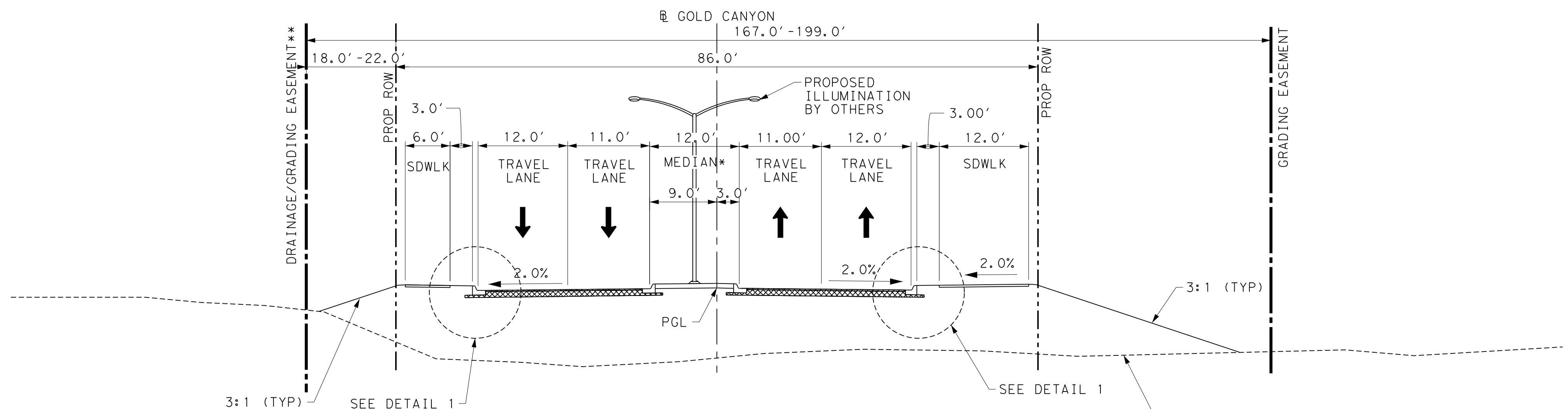
NOT TO SCALE

EXPLAINATION OF CROSS SLOPE SIGNING CONVENTION LOOKING IN THE DIRECTION OF INCREASING STATIONS



SUPERELEVATION TABLE

GOLD CANYON		
STATION (℄ GOLD CANYON)	LT	RT
10+30.00	+1.00%	-2.00%
11+45.00	-2.00%	+0.50%
15+22.55		+0.50%
16+10.00		-2.00%
17+00.00	-2.00%	-2.00%



GOLD CANYON TYPICAL SECTION

STA 16+10.00 TO 17+00.00

FREESE AND NICHOLS, INC.
TEXAS REGISTERED ENGINEERING FIRM F-2144

STATE OF TEXAS
BREGGER A. GARRISON
122018
LICENSED
PROFESSIONAL ENGINEER
9/1/2023

NO.	DATE	REVISION	APPROVED BY

Freese and Nichols, Inc.
Texas Registered Engineering Firm F-2144
FREESE AND NICHOLS
9601 McAllister Freeway, Suite 1008
San Antonio, Texas 78216
Phone - (210) 298-3800
web - www.freese.com

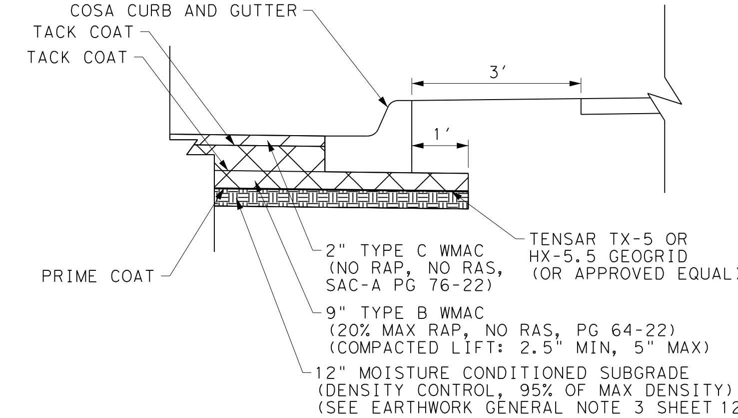
CITY OF SAN ANTONIO
PUBLIC WORKS DEPARTMENT

SONTERRA ROAD EXTENSION
TYPICAL SECTIONS
(PROPOSED)

100% SUBMITTAL	PROJECT NO.: 23-01849		DATE: 09/01/2023
DRWN. BY: JL	DSGN. BY: NS	CHKD. BY: BAG	SHEET 7 OF 201

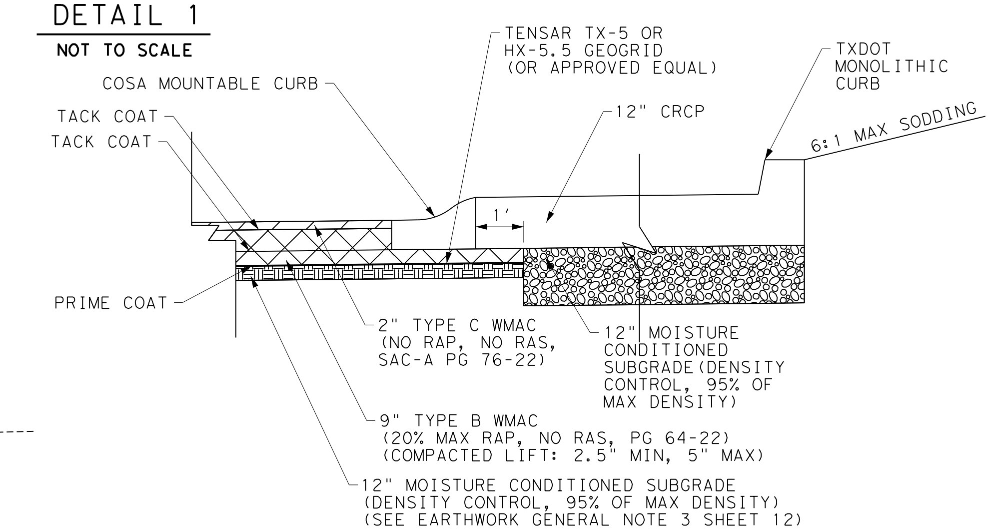
NOTE:

^MEDIAN MATERIAL (SONTERRA BLVD.):
GRASS STA 10+55.00 TO STA 13+26.24
CONCRETE STA 13+26.24 TO STA 15+00.02 & STA 16+82.89 TO STA 17+91.68



DETAIL 1

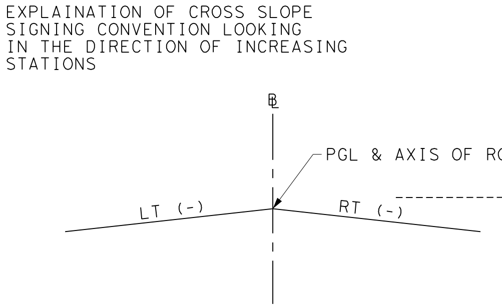
NOT TO SCALE

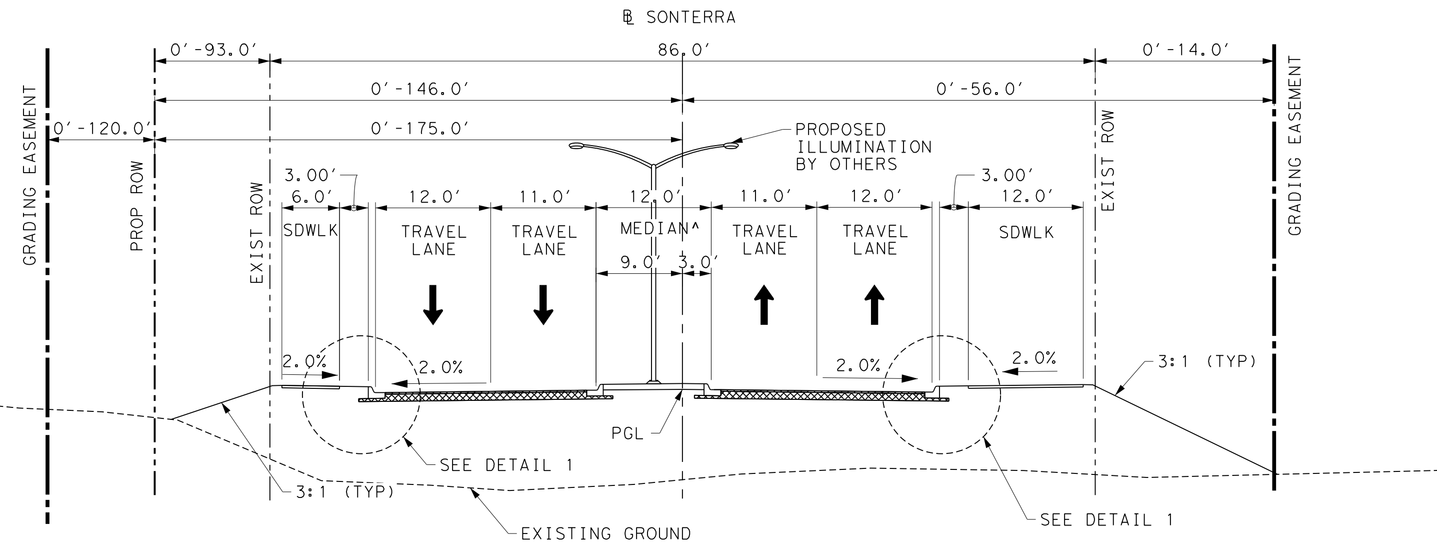


DETAIL 2

NOT TO SCALE

0 10' 20'
SCALE IN FEET



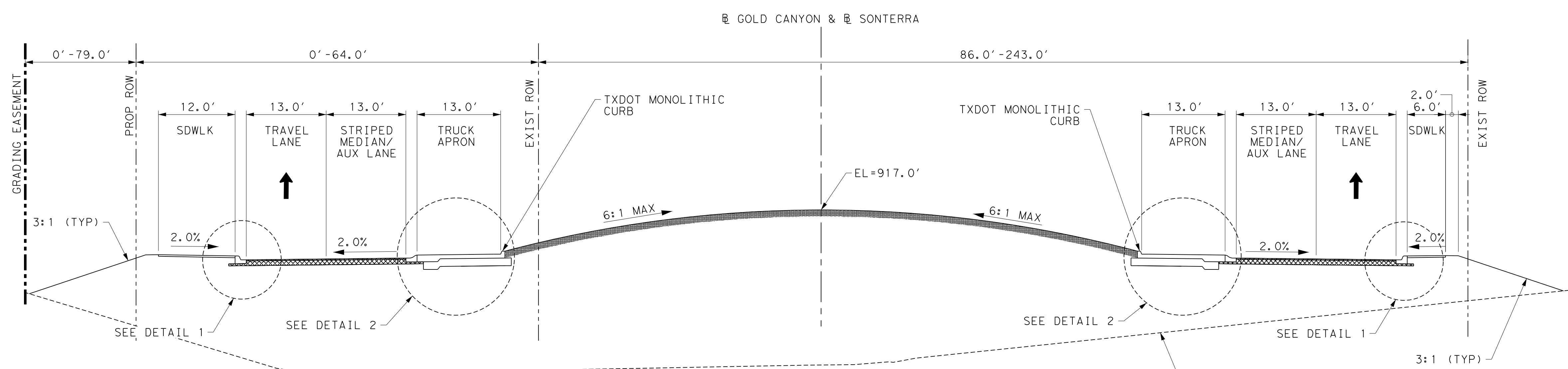


E SONTERRA BLVD TYPICAL SECTION

STA 10+50.00 TO 14+66.00
STA 17+54.00 TO 18+10.00

SUPERELEVATION TABLE

SONTERRA		
STATION (℄ SONTERRA)	LT	RT
10+55.00	-2.00%	-2.00%
12+66.00		+3.00%
14+00.00	-2.00%	+3.00%



ROUNDABOUT TYPICAL SECTION

FREESE AND NICHOLS, INC.
TEXAS REGISTERED ENGINEERING FIRM F-2144

9/1/2023

NO.	DATE	REVISION	APPROVED BY

Freese and Nichols, Inc.
Texas Registered Engineering Firm F-2144

FREESE AND NICHOLS
9601 McAllister Freeway, Suite 1008
San Antonio, Texas 78216
Phone - (210) 298-3800
web - www.freese.com

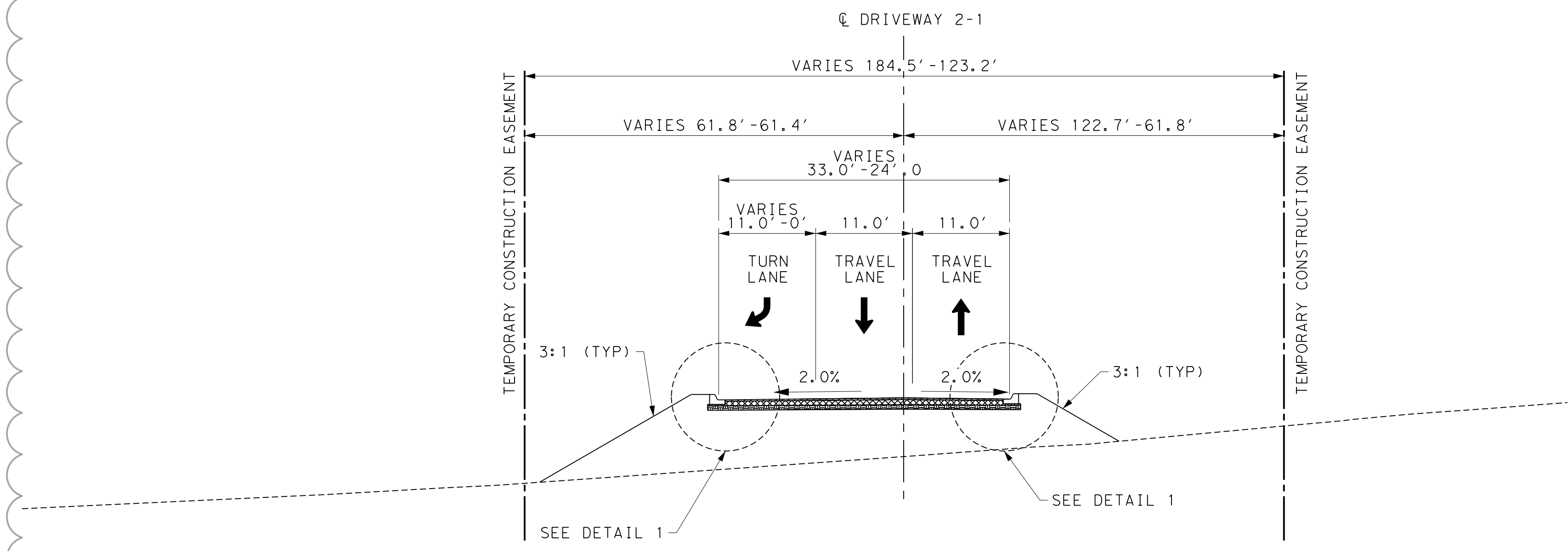
CITY OF SAN ANTONIO
PUBLIC WORKS DEPARTMENT

SONTERRA ROAD EXTENSION
TYPICAL SECTIONS
(PROPOSED)

100% SUBMITTAL	PROJECT NO.: 23-01849		DATE: 09/01/2023
DRWN. BY: JL	DSGN. BY: NS	CHKD. BY: BAG	SHEET 8 OF 201

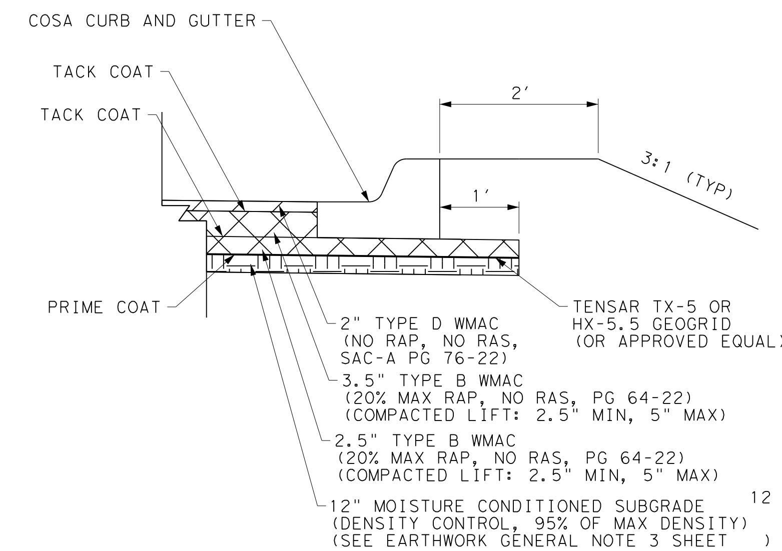
MicroStation V8 User: 02911 Office:
Plotter: c:\pwworkingdir\freese-pw.bentley.com\freese-pw-01\dms18945\PDF-Mono.pltcfg
Plot Scale: 20.0000 ' in. Model: Default
Date: Sep. 01, 2023 - 01:27:54 PM Project: Freese and Nichols, Inc.

Office: Date: Sep. 01, 2023 - 01:27:54 PM User: 02911 File: pw:\\freese-pw.bentley.com:freese-pw-01\Documents\FNI - Texas\SAT21921 (Transportation)\2 Drawings\2.04 Infrastructure\2.04.02 Sheets\2.04.02.01 General\CV-TRT-PL-PRTYP SEC02



DRIVEWAY 2-1 TYPICAL SECTION

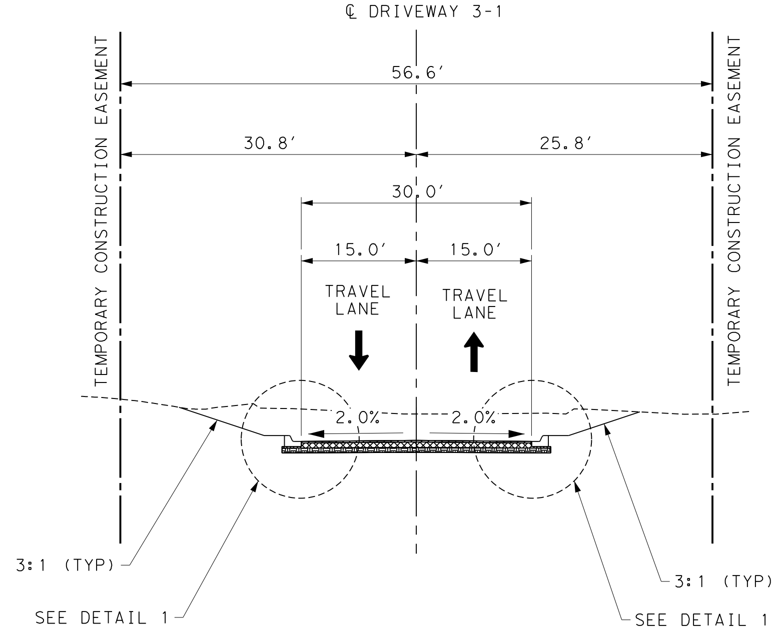
STA 10+00 TO END



DETAIL 1

NOT TO SCALE

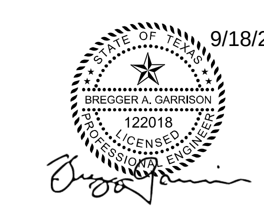
0 10' 20'
SCALE IN FEET



DRIVEWAY 3-1 TYPICAL SECTION

STA 10+00 TO END

FREESE AND NICHOLS, INC.
TEXAS REGISTERED ENGINEERING FIRM F-2144



9/18/24

NO.	DATE	REVISION	APPROVED BY
⚠	9/6/2024	DWY 2-1 REVISION	BG

Freese and Nichols, Inc.
Texas Registered Engineering Firm F-2144

FREESE AND NICHOLS
9601 McAllister Freeway, Suite 1008
San Antonio, Texas 78216
Phone - (210) 298-3800
web - www.freese.com

CITY OF SAN ANTONIO
PUBLIC WORKS DEPARTMENT

SONTERRA ROAD EXTENSION

TYPICAL SECTIONS
(PROPOSED)

100% SUBMITTAL	PROJECT NO.: 23-01849		DATE: 03/28/2024
DRWN. BY: JL	DSGN. BY: NS	CHKD. BY: BAG	SHEET 9A OF 208

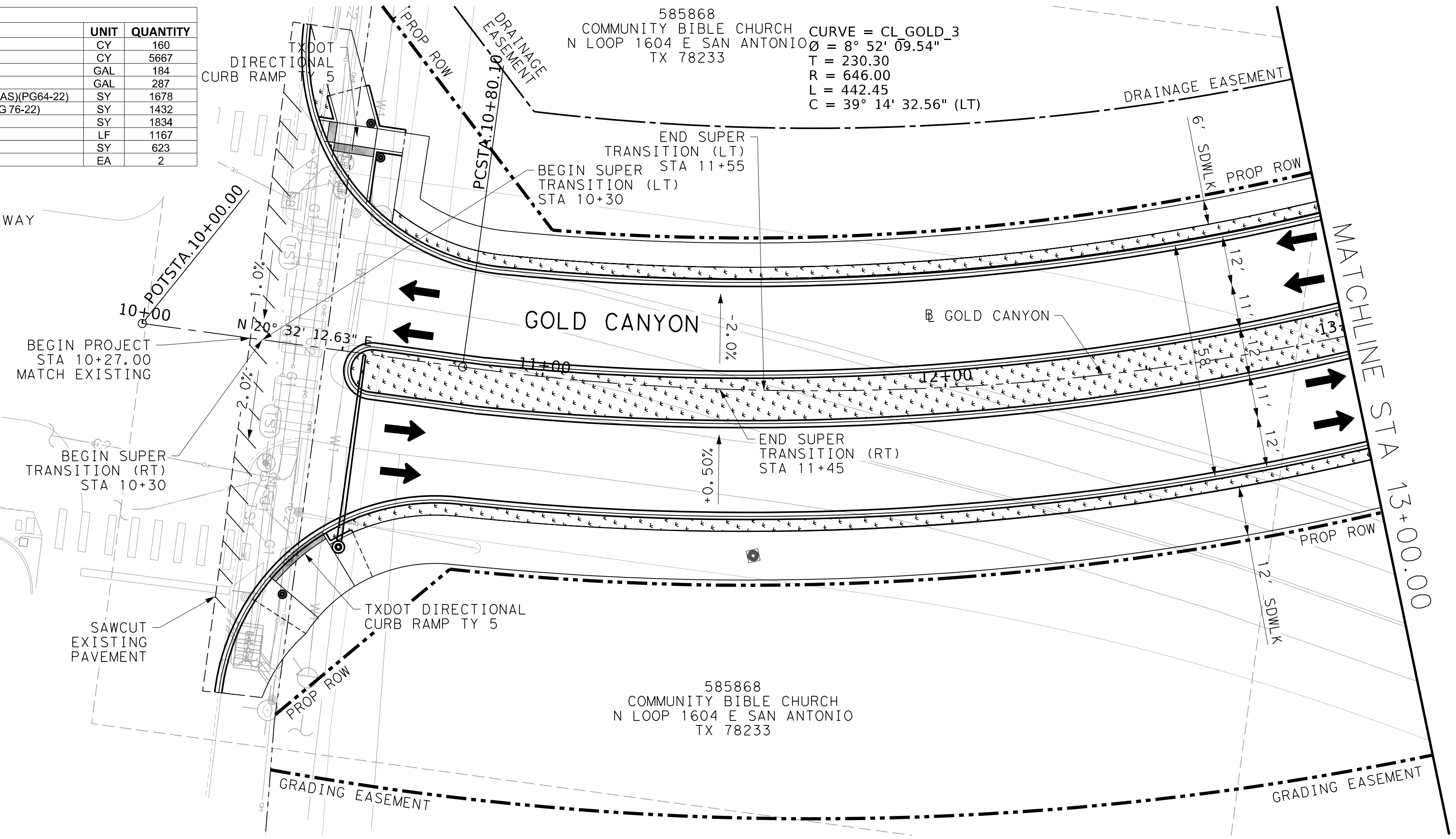
MicroStation V8 User: 02911 Office:
pw:\\freese-pw.bentley.com:freese-pw-01\Documents\FNI - Texas\SAT21921 (Transportation)\2 Drawings\2.04 Infrastructure\2.04.02 Sheets\2.04.02.01 General\CV-TRT-PL-PRTYP SEC03
Plotter: c:\pwworkingdir\freese-pw.bentley.com_freese-pw-01\dms18945\PDF-Mono.pltcfg
Plot Scale: 20.0000 ' / in. Model: Default
Date: Sep. 06, 2024 01:33:32 PM Project: Freese and Nichols, Inc.

Office: Date: Sep. 06, 2024 - 01:33:32 PM User: 02911 File: pw:\\freese-pw.bentley.com:freese-pw-01\Documents\FNI - Texas\SAT21921 (Transportation)\2 Drawings\2.04 Infrastructure\2.04.02 Sheets\2.04.02.01 General\CV-TRT-PL-PRTYP SEC03

ROADWAY QUANTITIES

ITEM NO	DESCRIPTION	UNIT	QUANTITY
104.1	STREET EXCAVATION	CY	160
107.1	EMBANKMENT (FINAL)(DENS CONT)(TY B)(SELECT FILL)	CY	5667
203.1	PRIME COAT (0.1GAL/SY)	GAL	184
203.1	TACK COAT (0.1GAL/SY)	GAL	287
205-01.2	WARM MIX ASPHALTIC PAVEMENT, TYPE B (9" COMP. DEPTH)(20% MAX RAP)(NO RAS)(PG64-22)	SY	1678
205-01.3	WARM MIX ASPHALTIC PAVEMENT, TYPE C (2" COMP. DEPTH)(NO RAP)(NO RAS)(PG 76-22)	SY	1432
234.1	BASE REINFORCEMENT	SY	1834
500.4	CONCRETE CURB AND GUTTER	LF	1167
502.1	CONCRETE SIDEWALKS	SY	623
5316010	CURB RAMPS (TY 7)	EA	2

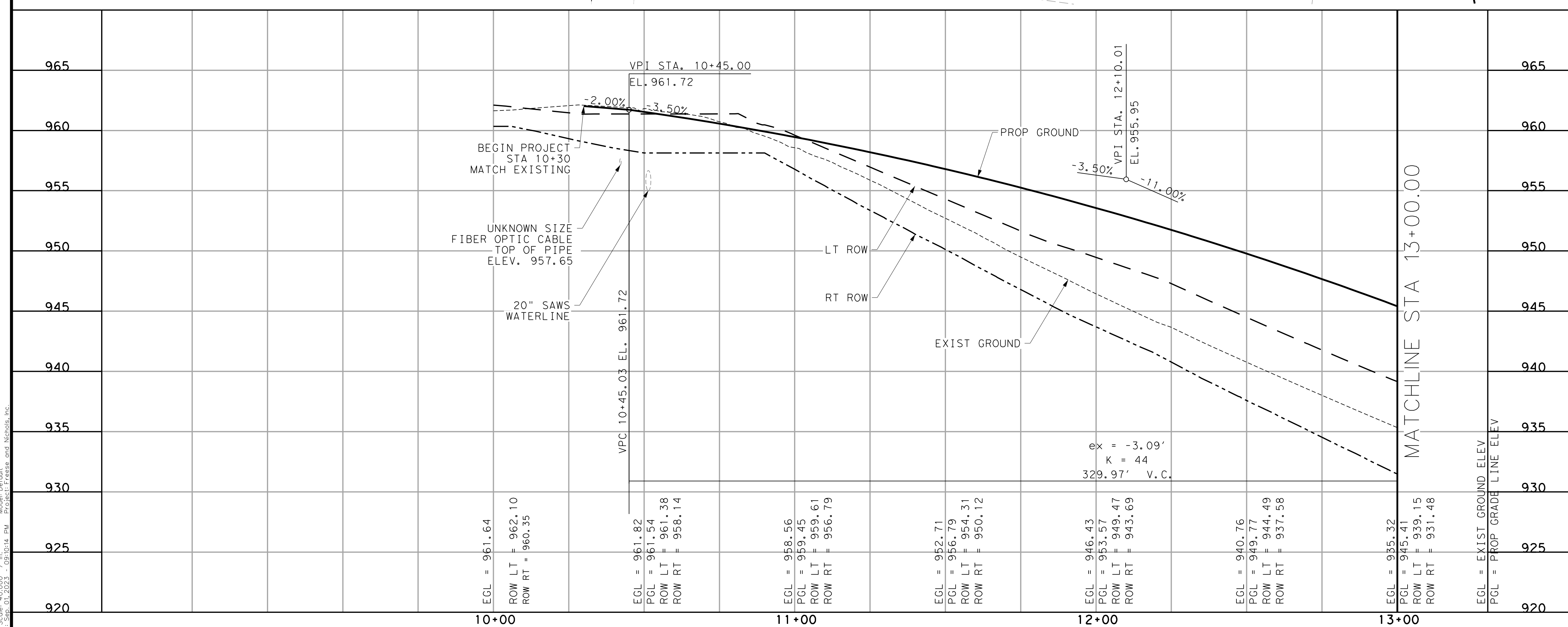
NOTE:
1) QUANTITY FOR TOPSOIL AND SODDING IN MEDIAN AND PARKWAY ARE PROVIDED ON SW3P LAYOUTS



LEGEND

- TRAFFIC FLOW
- (x-x) DRIVEWAY NUMBER
- PROPOSED ROW
- EXIST ROW
- CONSTRUCTION LIMITS
- SODDING
- CONCRETE MEDIAN
- TRUCK APRON (9" CRCP)
- CONCRETE RIP RAP

HORIZONTAL SCALE: 0 10' 20' 40'
VERTICAL SCALE: 0 5' 10'



FREESE AND NICHOLS, INC.
TEXAS REGISTERED ENGINEERING FIRM F-2144

STATE OF TEXAS
BREGGER A. GARRISON
122018
LICENSED
PROFESSIONAL ENGINEER
9/1/2023

NO.	DATE	REVISION	APPROVED BY

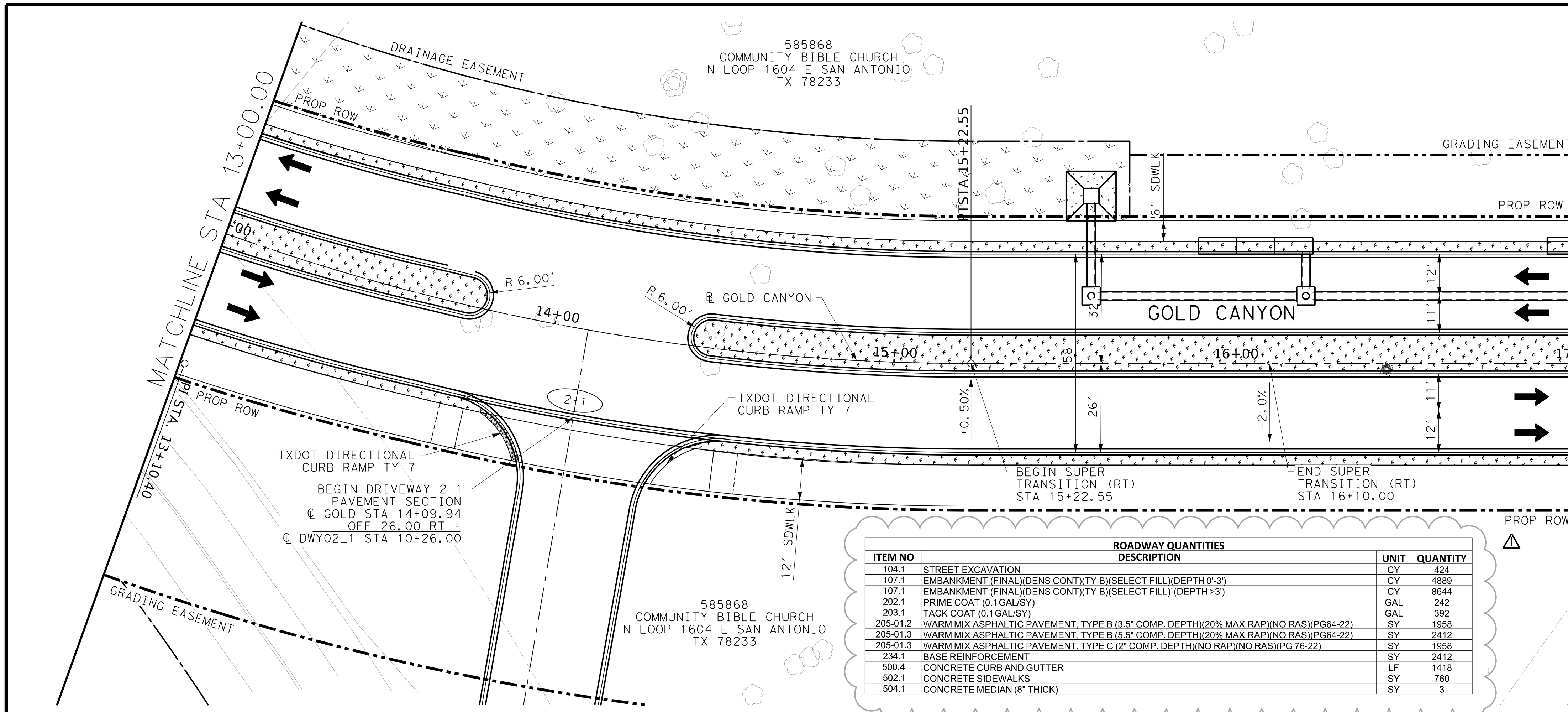
Freese and Nichols, Inc.
Texas Registered Engineering Firm F-2144
FREESE AND NICHOLS
9601 McAllister Freeway, Suite 1008
San Antonio, Texas 78216
Phone - (210) 298-3800
web - www.freese.com

CITY OF SAN ANTONIO
PUBLIC WORKS DEPARTMENT

SONTERRA ROAD EXTENSION
GOLD CANYON

PLAN & PROFILE LAYOUT
BEGIN TO STA 13+00

100% SUBMITTAL	PROJECT NO.: 23-01849		DATE: 09/01/2023
DRWN. BY: JL	DSGN. BY: NS	CHKD. BY: BAG	SHEET 72 OF 201



ROADWAY QUANTITIES

ITEM NO	DESCRIPTION	UNIT	QUANTITY
104.1	STREET EXCAVATION	CY	424
107.1	EMBANKMENT (FINAL)(DENS CONT)(TY B)(SELECT FILL)(DEPTH 0'-3')	CY	4889
107.1	EMBANKMENT (FINAL)(DENS CONT)(TY B)(SELECT FILL)`(DEPTH >3')	CY	8644
202.1	PRIME COAT (0.1GAL/SY)	GAL	242
203.1	TACK COAT (0.1GAL/SY)	GAL	392
205-01.2	WARM MIX ASPHALTIC PAVEMENT, TYPE B (3.5" COMP. DEPTH)(20% MAX RAP)(NO RAS)(PG64-22)	SY	1958
205-01.3	WARM MIX ASPHALTIC PAVEMENT, TYPE B (5.5" COMP. DEPTH)(20% MAX RAP)(NO RAS)(PG64-22)	SY	2412
205-01.3	WARM MIX ASPHALTIC PAVEMENT, TYPE C (2" COMP. DEPTH)(NO RAP)(NO RAS)(PG 76-22)	SY	1958
234.1	BASE REINFORCEMENT	SY	2412
500.4	CONCRETE CURB AND GUTTER	LF	1418
502.1	CONCRETE SIDEWALKS	SY	760
504.1	CONCRETE MEDIAN (8" THICK)	SY	3

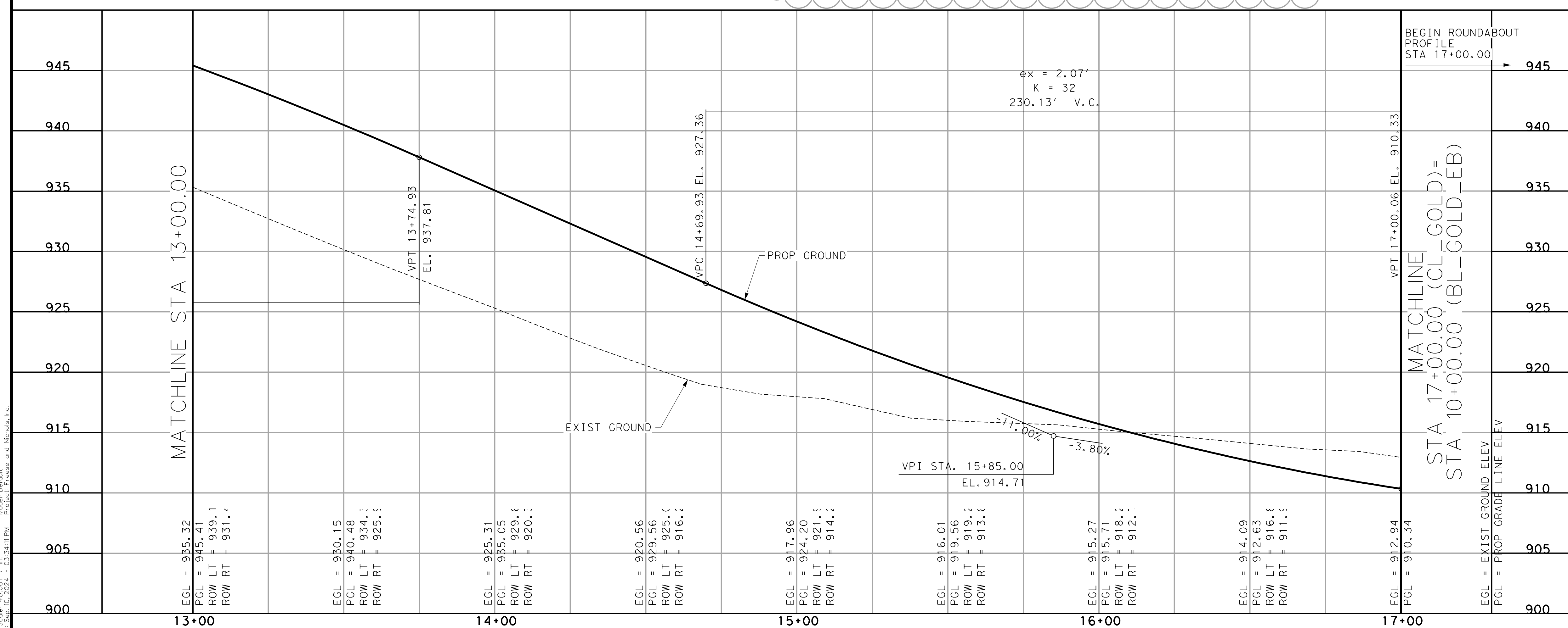
LEGEND

- TRAFFIC FLOW
- x-x DRIVEWAY NUMBER
- PROPOSED ROW
- EXIST ROW
- CONSTRUCTION LIMITS
- SODDING
- CONCRETE MEDIAN
- TRUCK APRON (12" REINFORCED CONCRETE PAVEMENT)
- CONCRETE RIP RAP

NOTE:
1) QUANTITY FOR TOPSOIL AND SODDING IN MEDIAN AND PARKWAY ARE PROVIDED ON SW3P LAYOUTS

N

0 10' 20' 40'
HORIZONTAL SCALE
0 5' 10'
VERTICAL SCALE



FREESE AND NICHOLS, INC.
TEXAS REGISTERED ENGINEERING FIRM F-2144

9/18/24
STATE OF TEXAS
BREGGER A. GARRISON
122018
LICENSED PROFESSIONAL ENGINEER

NO.	DATE	REVISION	APPROVED BY
⚠	9/10/2024	DWY 2-1 REVISION	BG

Freese and Nichols, Inc.
Texas Registered Engineering Firm F-2144
FREESE AND NICHOLS
9601 McAllister Freeway, Suite 1008
San Antonio, Texas 78216
Phone - (210) 298-3800
web - www.freese.com

CITY OF SAN ANTONIO
PUBLIC WORKS DEPARTMENT

SONTERRA ROAD EXTENSION
GOLD CANYON

PLAN & PROFILE LAYOUT
STA 13+00 TO STA 17+00

100% SUBMITTAL	PROJECT NO.:	23-01849	DATE: 03/28/2024
DRWN. BY: JL	DSGN. BY: NS	CHKD. BY: BAG	SHEET 80 OF 208

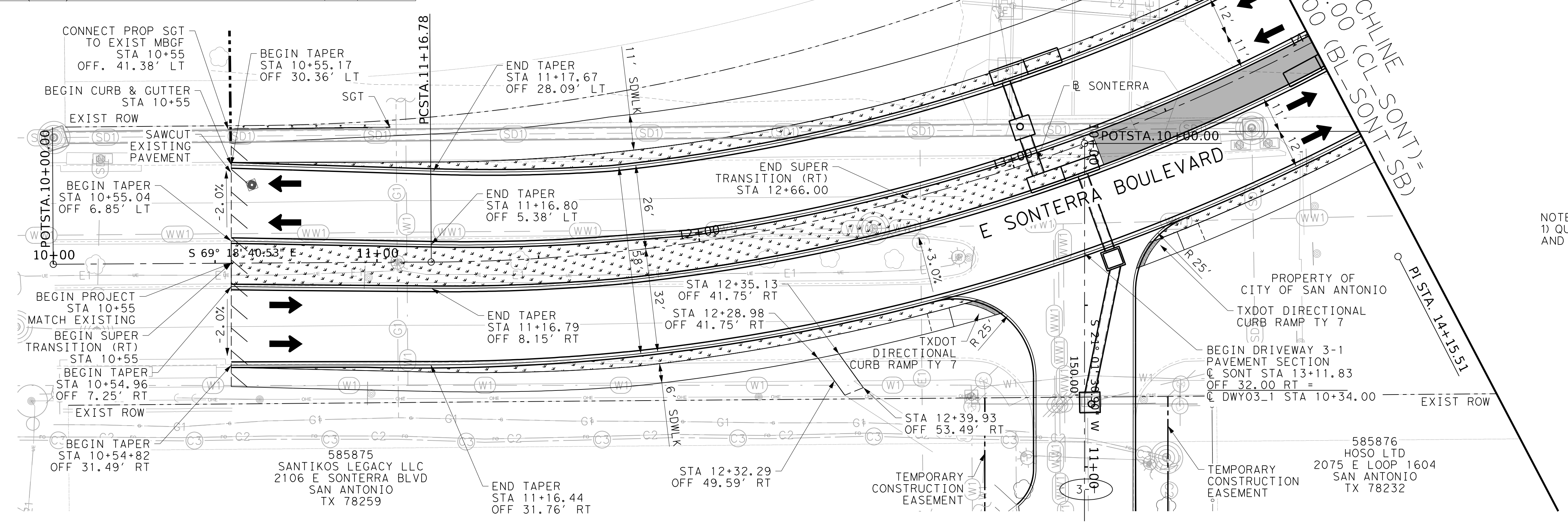
ROADWAY QUANTITIES

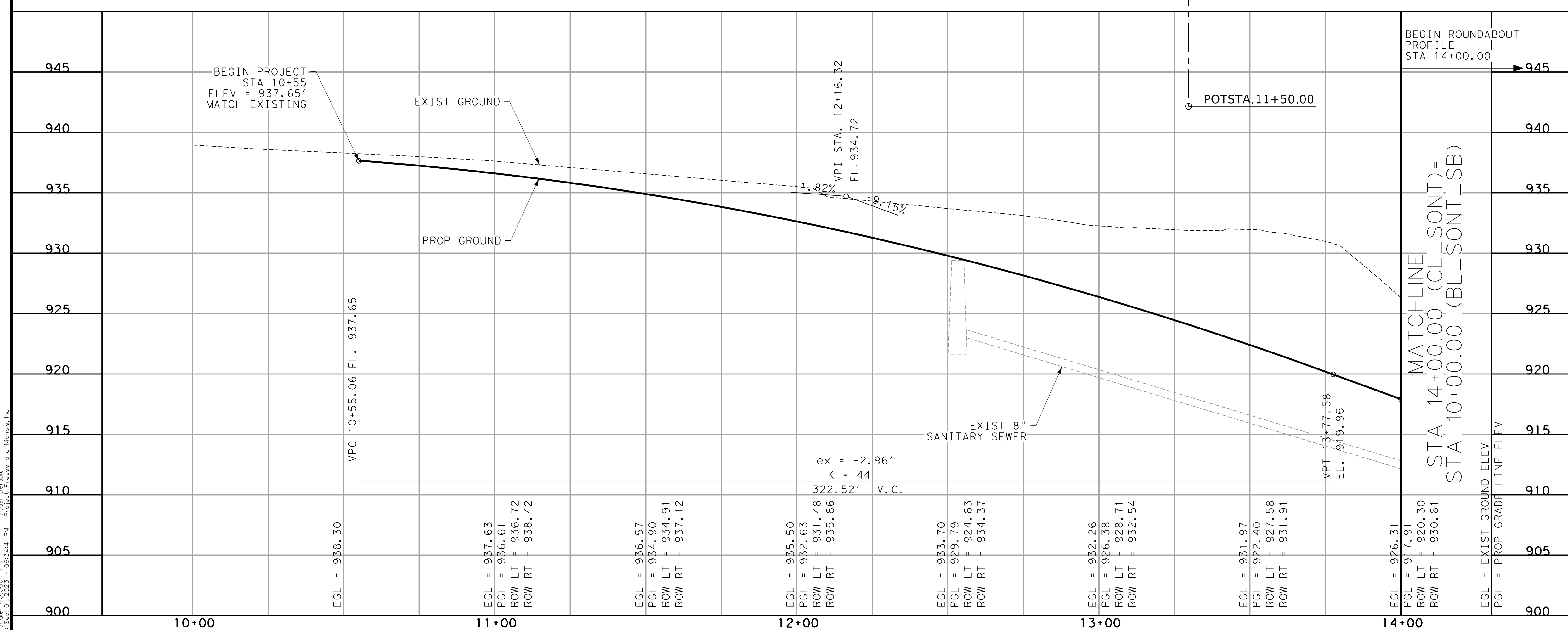
ITEM NO	DESCRIPTION	UNIT	QUANTITY
104.1	STREET EXCAVATION	CY	5503
107.1	EMBANKMENT (FINAL)(DENS CONT)(TY B)(SELECT FILL)	CY	96
202.1	PRIME COAT (0.1GAL/SY)	GAL	205
203.1	TACK COAT (0.1GAL/SY)	GAL	324
205-01.2	WARM MIX ASPHALTIC PAVEMENT, TYPE B (9" COMP. DEPTH)(20% MAX RAP)(NO RAS)(PG64-22)	SY	1879
205-01.3	WARM MIX ASPHALTIC PAVEMENT, TYPE C (2" COMP. DEPTH)(NO RAP)(NO RAS)(PG 76-22)	SY	1620
234.1	BASE REINFORCEMENT	SY	2044
500.4	CONCRETE CURB AND GUTTER	LF	1311
502.1	CONCRETE SIDEWALKS	SY	596
504.1	CONCRETE MEDIAN (8" THICK)	SY	87
5446001	GUARDRAIL END TREATMENT (INSTALL)	EA	1

CURVE = CL_SONT_3
Ø = 9° 39' 43.27"
T = 298.72
R = 593.00
L = 553.44
C = 53° 28' 23.25" (LT)

LEGEND
- TRAFFIC FLOW
- DRIVEWAY NUMBER
- PROPOSED ROW
- EXIST ROW
- CONSTRUCTION LIMITS
- SODDING
- CONCRETE MEDIAN
- TRUCK APRON (9" CRCP)
- CONCRETE RIP RAP

NOTE:
1) QUANTITY FOR TOPSOIL AND SODDING IN MEDIAN AND PARKWAY ARE PROVIDED ON SW3P LAYOUTS





FREESE AND NICHOLS, INC.
TEXAS REGISTERED ENGINEERING FIRM F-2144

STATE OF TEXAS — BREGGER A. GARRISON — 122018 — LICENSED PROFESSIONAL ENGINEER
9/1/2023

NO	DATE	REVISION	APPROVED BY

Freese and Nichols, Inc.
Texas Registered Engineering Firm F-2144
FREESE AND NICHOLS
9601 McAllister Freeway, Suite 1008
San Antonio, Texas 78216
Phone - (210) 298-3800
web - www.freese.com

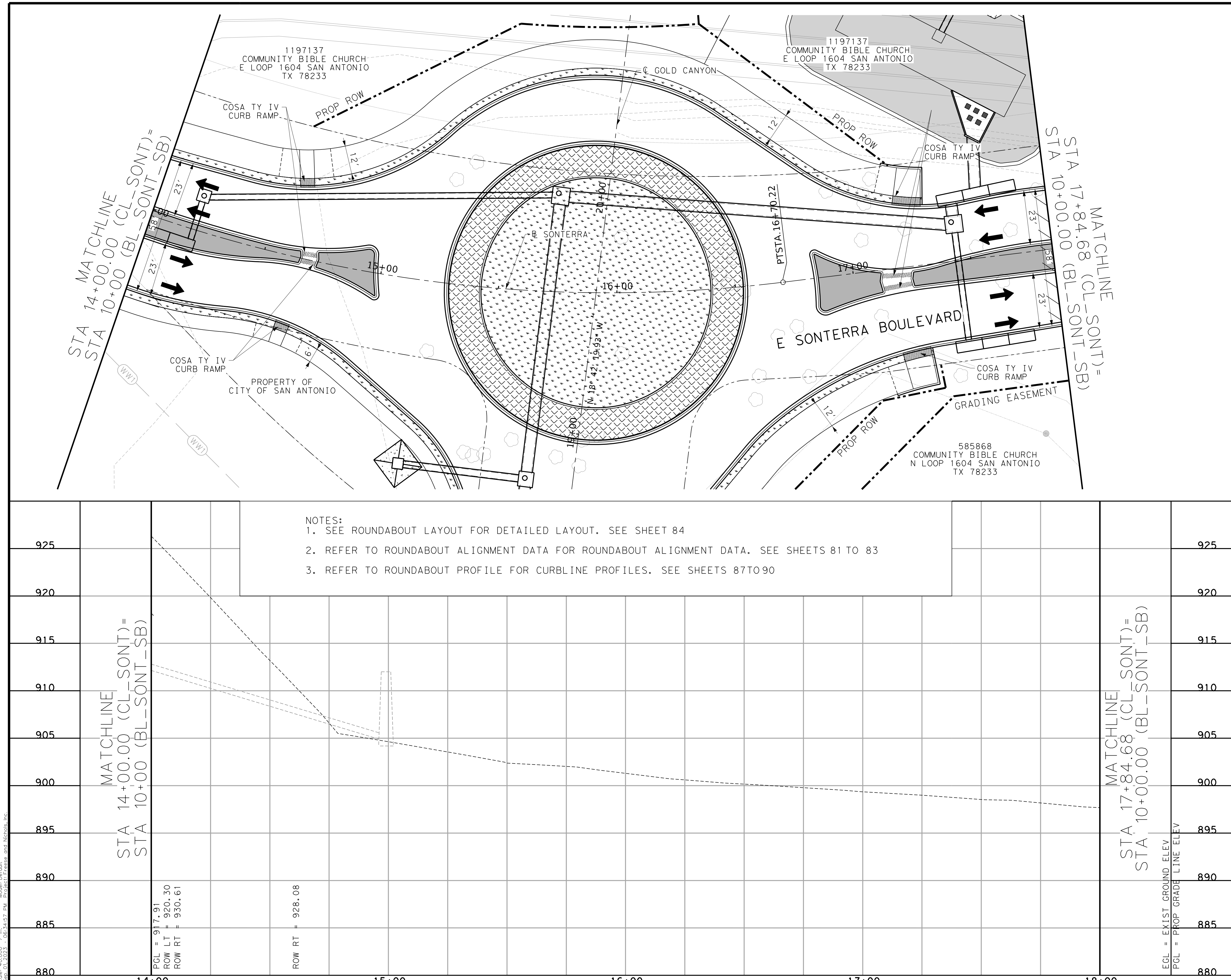
CITY OF SAN ANTONIO
PUBLIC WORKS DEPARTMENT

SONTERRA ROAD EXTENSION
SONTERRA BOULEVARD

PLAN & PROFILE LAYOUT
BEGIN TO STA 14+00

100% SUBMITTAL	PROJECT NO.: 23-01849		DATE: 09/01/2023
DRWN. BY: JL	DSGN. BY: NS	CHKD. BY: BAG	SHEET 74 OF 201

Office: Date: Sep. 01, 2023 - 06:34:41 PM User: 02858 File: pw:\\freese-pw.bentley.com:freese-pw-01\Documents\FNI- Texas\SAT21921 (Transportation)\2 Drawings\2.04 Infrastructure\2.04.02 Sheets\2.04.02.03 Roadway\CV-TRT-PP-RDWY04.dgn



LEGEND

- TRAFFIC FLOW
- DRIVEWAY NUMBER (x-x)
- PROPOSED ROW
- EXIST ROW
- CONSTRUCTION LIMITS
- SODDING
- CONCRETE MEDIAN
- TRUCK APRON (9" CRCP)
- CONCRETE RIP RAP

NOTE:
1) QUANTITY FOR TOPSOIL AND SODDING IN MEDIAN AND PARKWAY ARE PROVIDED ON SW3P LAYOUTS

0 10' 20' 40'
HORIZONTAL SCALE
0 5' 10'
VERTICAL SCALE

NOTES:
1. SEE ROUNDABOUT LAYOUT FOR DETAILED LAYOUT. SEE SHEET 84
2. REFER TO ROUNDABOUT ALIGNMENT DATA FOR ROUNDABOUT ALIGNMENT DATA. SEE SHEETS 81 TO 83
3. REFER TO ROUNDABOUT PROFILE FOR CURBLINE PROFILES. SEE SHEETS 87TO 90

FREESE AND NICHOLS, INC.
TEXAS REGISTERED ENGINEERING FIRM F-2144

STATE OF TEXAS
BREGGER A. GARRISON
122018
LICENSED
PROFESSIONAL ENGINEER
9/1/2023

NO.	DATE	REVISION	APPROVED BY

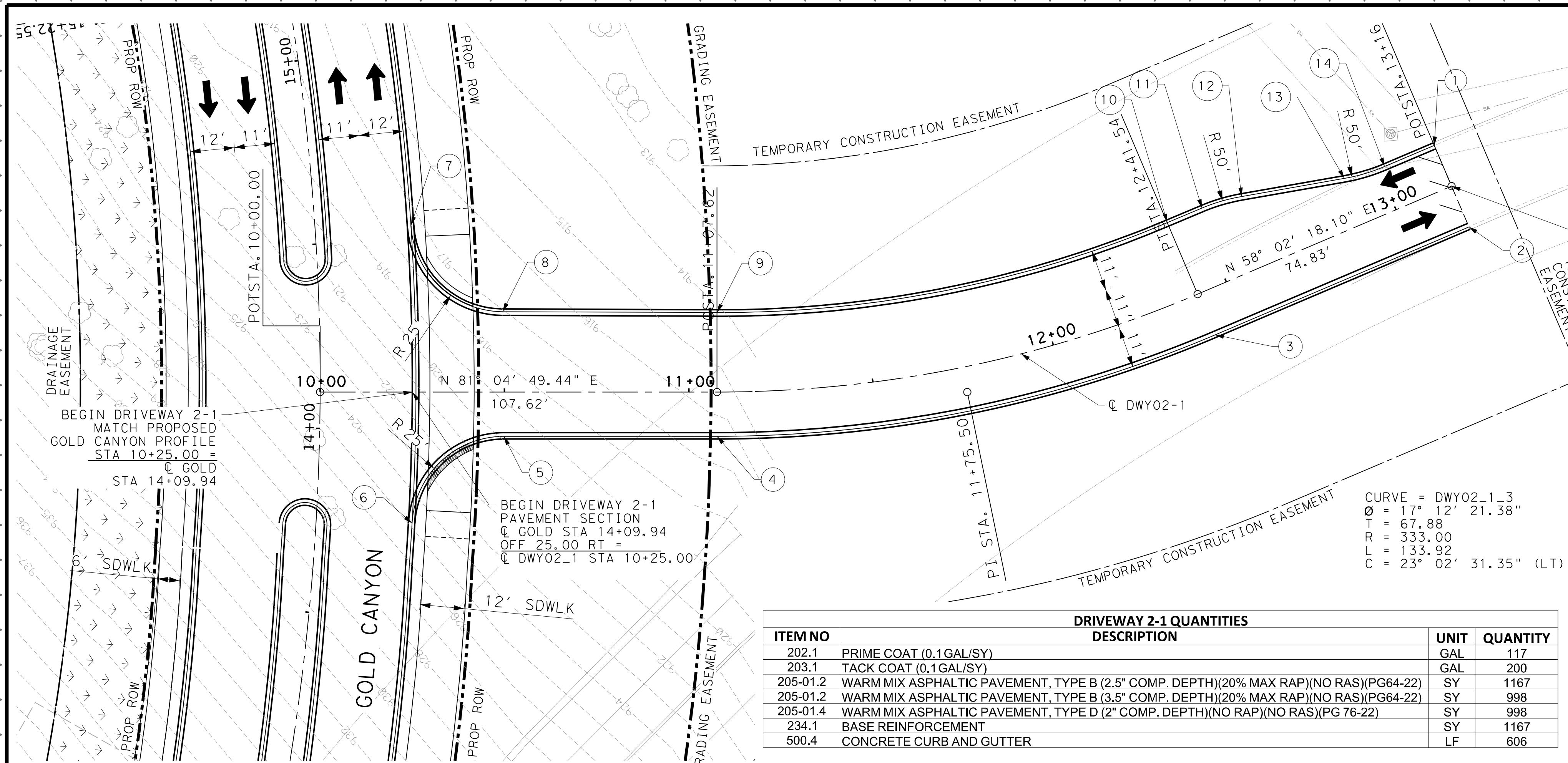
Freese and Nichols, Inc.
Texas Registered Engineering Firm F-2144
FREESE AND NICHOLS
9601 McAllister Freeway, Suite 1008
San Antonio, Texas 78216
Phone - (210) 298-3800
web - www.freese.com

CITY OF SAN ANTONIO
PUBLIC WORKS DEPARTMENT

SONTERRA ROAD EXTENSION
SONTERRA BOULEVARD

PLAN & PROFILE LAYOUT
STA 14+00 TO STA 17+85

100% SUBMITTAL	PROJECT NO.: 23-01849		DATE: 09/01/2023
DRWN. BY: JL	DSGN. BY: NS	CHKD. BY: BAG	SHEET 75 OF 201



LEGEND

- TRAFFIC FLOW
- DRIVEWAY NUMBER (x-x)
- PROPOSED ROW
- EXIST ROW
- CONSTRUCTION LIMITS
- SODDING
- CONCRETE MEDIAN
- TRUCK APRON (12" REINFORCED CONCRETE PAVEMENT)
- CONCRETE RIP RAP

DRIVEWAY 2-1

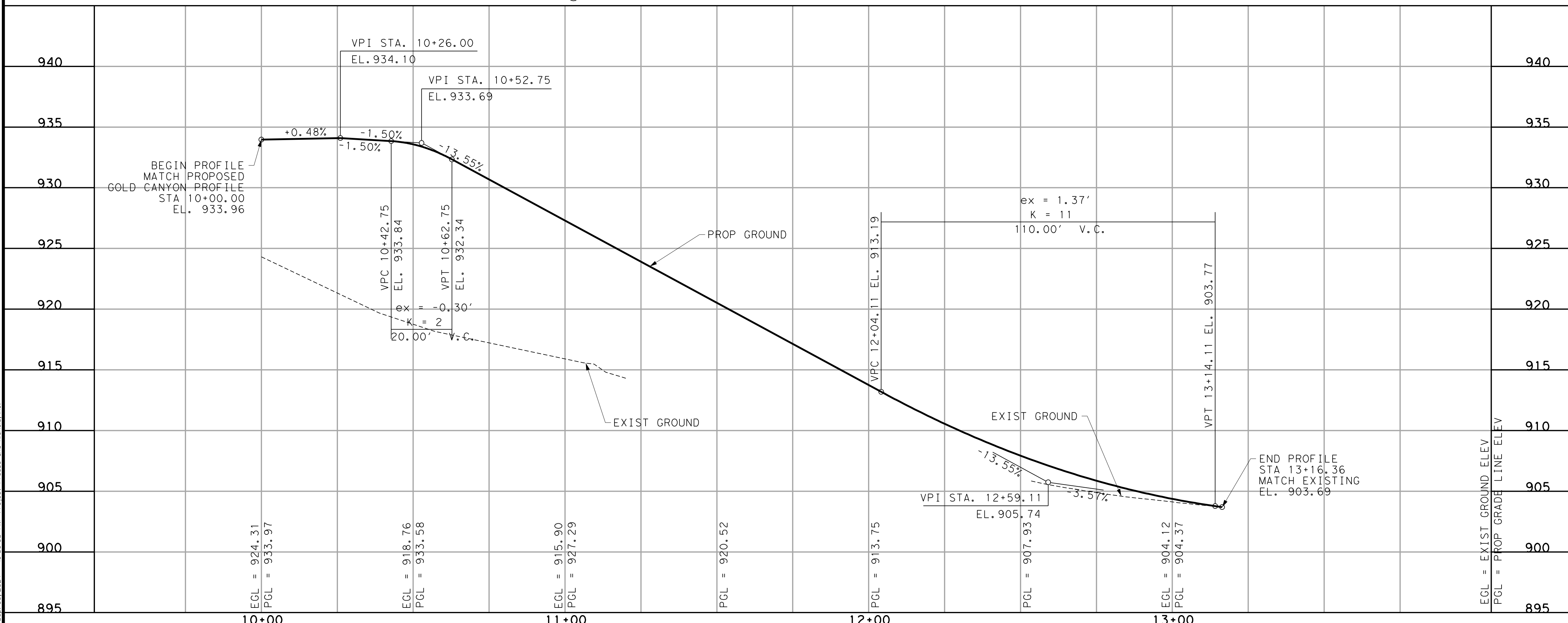
NUMBER	ALIGNMENT	STATION	OFFSET	ELEVATION
1	DWY02-1	13+16.37	12.00 LT	903.74
2	DWY02-1	13+16.37	12.00 RT	903.80
3	DWY02-1	12+41.54	12.00 RT	909.09
4	DWY02-1	11+07.62	12.00 RT	927.60
5	DWY02-1	10+49.89	12.00 RT	935.37
6	CL GOLD	13+75.71	26.00 RT	937.79
7	CL GOLD	14+53.42	26.00 RT	929.34
8	DWY02-1	10+49.48	21.80 LT	931.19
9	DWY02-1	11+07.62	21.56 LT	922.95
10	DWY02-1	12+41.54	21.04 LT	907.86
11	DWY02-1	12+51.74	21.00 LT	906.97
12	DWY02-1	12+62.86	19.70 LT	906.05
13	DWY02-1	12+90.42	13.30 LT	904.21
14	DWY02-1	13+01.74	12.00 LT	904.25

DRIVEWAY 2-1 QUANTITIES

ITEM NO	DESCRIPTION	UNIT	QUANTITY
202.1	PRIME COAT (0.1GAL/SY)	GAL	117
203.1	TACK COAT (0.1GAL/SY)	GAL	200
205-01.2	WARM MIX ASPHALTIC PAVEMENT, TYPE B (2.5" COMP. DEPTH)(20% MAX RAP)(NO RAS)(PG64-22)	SY	1167
205-01.2	WARM MIX ASPHALTIC PAVEMENT, TYPE B (3.5" COMP. DEPTH)(20% MAX RAP)(NO RAS)(PG64-22)	SY	998
205-01.4	WARM MIX ASPHALTIC PAVEMENT, TYPE D (2" COMP. DEPTH)(NO RAP)(NO RAS)(PG 76-22)	SY	998
234.1	BASE REINFORCEMENT	SY	1167
500.4	CONCRETE CURB AND GUTTER	LF	606

N

0 10' 20' 40'
HORIZONTAL SCALE
0 5' 10'
VERTICAL SCALE



FREESE AND NICHOLS, INC.
TEXAS REGISTERED ENGINEERING FIRM F-2144

9/18/24
STATE OF TEXAS
BREGGER A. GARRISON
122018
LICENSED PROFESSIONAL ENGINEER

NO	DATE	REVISION	APPROVED BY
1	9/6/2024	DWY 2-1 REVISION	BG

Freese and Nichols, Inc.
Texas Registered Engineering Firm F-2144
FREESE AND NICHOLS
9601 McAllister Freeway, Suite 1008
San Antonio, Texas 78216
Phone - (210) 298-3800
web - www.freese.com

CITY OF SAN ANTONIO
PUBLIC WORKS DEPARTMENT

SONTERRA ROAD EXTENSION
DRIVEWAY 2-1 PLAN & PROFILE

100% SUBMITTAL	PROJECT NO.: 23-01849	DATE: 03/28/2024
DRWN. BY: JL	DSGN. BY: NS / CHKD. BY: BAG	SHEET 84A OF 208

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 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 no 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 excavated material that will be stored on-site must have 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 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 should 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's 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 best management practices (BMPs) or structure(s), including but not limited to temporary or permanent ponds, dams, berms, silt fences, and diversionary structures;
    B. any change in the nature or character of the regulated activity from that which was originally approved;
    C. any change that would significantly impact the ability to prevent pollution of the Edwards Aquifer; or
    D. any development of land previously identified as undeveloped in the approved contributing zone plan.

Austin Regional Office 12100 Park 35 Circle, Bldg 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

MAESTAS
8122 DATAPOINT DR., STE. 840
SAN ANTONIO, TX 78229
(210) 366-1988
TBPE No.: F-333
TBPLS No.: 10194506

STATE OF TEXAS
JOSE L. REYES
113231
LICENSED
PROFESSIONAL ENGINEER
8/3/2023

NO:	DATE	REVISION	APPROVED BY

Freese and Nichols, Inc.
Texas Registered Engineering Firm F-2144
FREESE AND NICHOLS
9601 McAllister Freeway, Suite 1008
San Antonio, Texas 78216
Phone - (210) 298-3800
web - www.freese.com

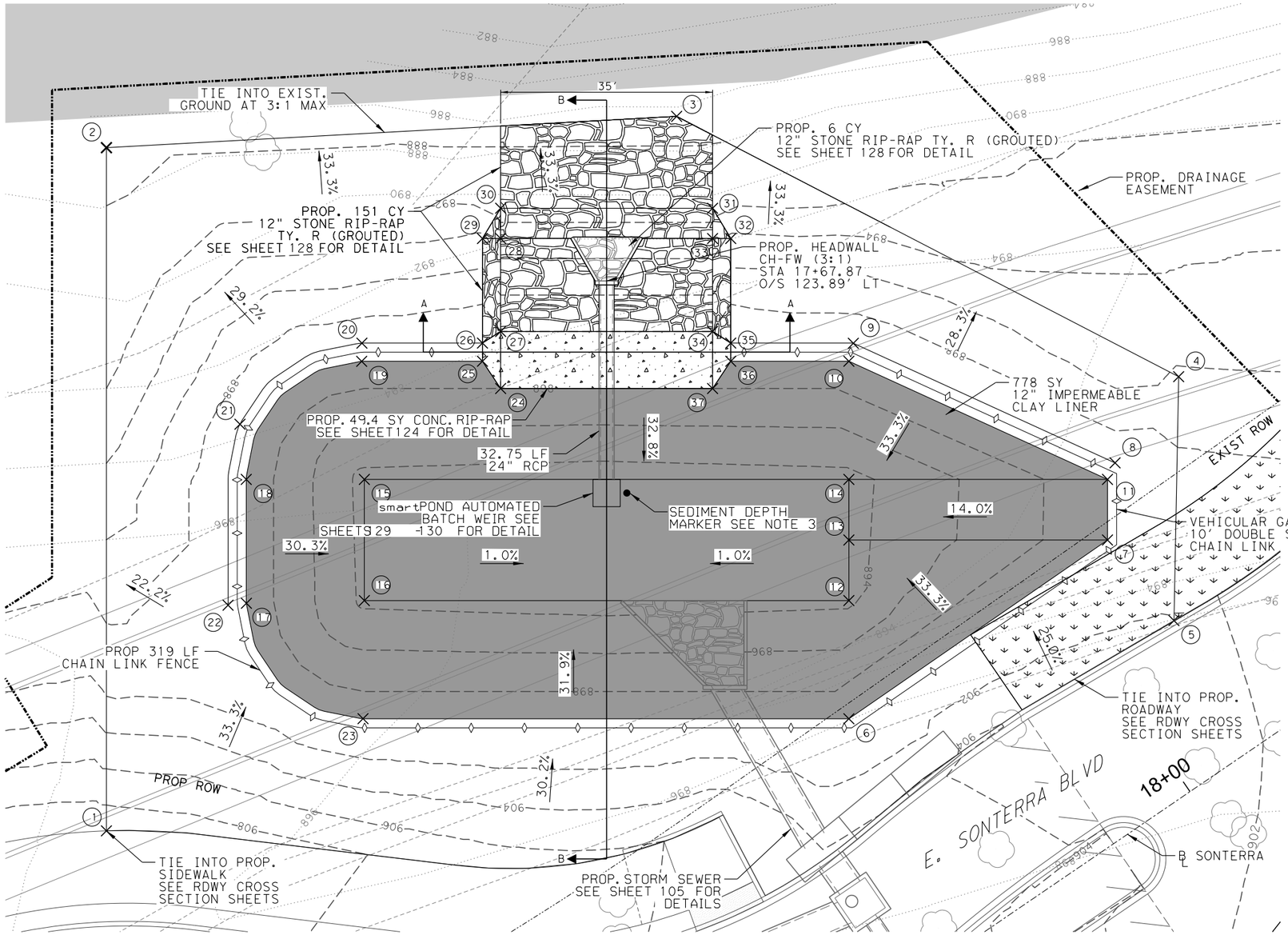
CITY OF SAN ANTONIO
PUBLIC WORKS DEPARTMENT

SONTERRA ROAD EXTENSION
PERMANENT STORMWATER POLLUTION PREVENTION PLAN NOTES

SHEET 1 OF 1

PRELIMINARY	PROJECT NO.: 23-01849		DATE: 8/3/2023
DRWN. BY: GC	DSGN. BY: GC	CHKD. BY: JR	SHEET 1 OF 1

Date: 8/3/2023



N

SCALE
HORZ: 1" = 20'

PLAN VIEW LEGEND

- PROP. STORM SEWER
- PROP. CONCRETE CURB
- PROP. EDGE OF PAVEMENT
- PROP. RIGHT OF WAY
- PROP. DRAINAGE EASMENT
- EXIST. RIGHT OF WAY
- GRADE BREAKLINE
- FEMA 100-YEAR FLOODPLAIN ZONE AE
- IMPERMEABLE CLAY LINER

NOTE:

1. SEE SECTION A-A AND B-B ON SHEET 112.

2. CLAY LINER SHOULD MEET THE SPECIFICATIONS IN TABLE 3-6 ON SHEET 112 AND HAVE A MINIMUM THICKNESS OF 12".

3. SEDIMENT DEPTH MARKER
TO BE PLACED IN THE BOTTOM OF THE POND AND EXTEND ABOVE THE GROUND AT LEAST 6". IF MARKER IS GREATER THAN 6", PLACE INDEX MARK AT 6" INTERVALS. DEPTH MARKERS CAN BE SIMILAR MATERIAL AS POND LINING TO BLEND IN. INDICATORS SHOULD BE VISIBLE FROM OUTSIDE OF THE POND.

ITEM	DESCRIPTION	UNIT	EST	FINAL
105.1	CHANNEL EXCAVATION (150 CY < X < 5,000 CY)	CY	233	
107.1	EMBANKMENT (FINAL)(DENS CONT)(TY A)	CY	955	
307.1	CONCRETE STRUCTURE (HEADWALLS)	CY	1	
401.1	REINFORCED CONCRETE PIPE (CLASS III) (24" DIA.)	LF	33	
407.4	CONCRETE COLLARS	CY	1	
505.1	CONCRETE RIPRAP (5" THICK)	SY	50	
507.2	CHAIN LINK WIRE FENCE (6')	LF	296	
507.5	GATES-VEHICULAR (DOUBLE SWINGING - CHAIN LINK)	EA	1	
SP1	smartPOND AUTOMATED BATCH WEIR	EA	1	
SP3	IMPERMEABLE CLAY LINER	SY	778	
432 6016	RIPRAP (STONE TY R)(GROUT)(12 IN)	CY	157	

POINT #	STA.	OFFSET	LT/RT	ELEV.	DESC.
1	16+44.38	94.94	LT	909.34	TIE TO SDWK
2	17+12.02	188.57	LT	886.91	TIE TO EXIST
3	17+92.72	139.82	LT	886.42	TIE TO EXIST
4	18+37.03	57.64	LT	896.34	TIE TO EXIST
5	18+13.72	24.82	LT	907.17	TIE TO EXIST
6	17+60.23	41.66	LT	899.50	EDGE OF POND
7	18+12.13	41.99	LT	899.50	EDGE OF POND
8	18+20.33	51.80	LT	899.50	TOP OF BERM
9	17+95.74	92.45	LT	899.50	TOP OF BERM
10	17+93.46	90.41	LT	899.50	TOP OF BERM
11	18+17.76	50.25	LT	899.50	TOP OF BERM
12	17+71.22	57.77	LT	893.60	POND TOE
13	17+76.85	66.03	LT	893.50	POND TOE

POINT #	STA.	OFFSET	LT/RT	ELEV.	DESC.
14	17+82.48	74.30	LT	893.40	POND TOE
15	17+16.37	119.35	LT	893.40	POND TOE
16	17+05.11	102.83	LT	893.60	POND TOE
17	16+88.77	113.43	LT	899.50	TOP OF BERM
18	17+00.26	130.34	LT	899.50	TOP OF BERM
19	17+26.98	135.70	LT	899.50	TOP OF BERM
20	17+28.70	138.16	LT	899.50	TOP OF BERM
21	17+04.53	138.44	LT	899.50	TOP OF BERM
22	16+86.09	114.88	LT	899.50	TOP OF BERM
23	16+93.95	86.85	LT	899.50	EDGE OF POND
24	17+43.42	119.08	LT	898.00	CONC RIP-RAP
25	17+43.47	124.48	LT	899.50	CONC RIP-RAP
26	17+45.16	126.96	LT	899.50	CONC RIP-RAP

POINT #	STA.	OFFSET	LT/RT	ELEV.	DESC.
27	17+48.72	126.86	LT	898.00	CONC RIP-RAP
28	17+57.35	139.53	LT	892.89	ROCK RIP-RAP
29	17+54.88	141.22	LT	894.39	ROCK RIP-RAP
30	17+60.17	143.66	LT	891.22	ROCK RIP-RAP
31	17+89.09	123.95	LT	891.22	ROCK RIP-RAP
32	17+88.75	118.13	LT	894.39	ROCK RIP-RAP
33	17+86.28	119.82	LT	892.89	ROCK RIP-RAP
34	17+77.64	107.15	LT	898.00	CONC RIP-RAP
35	17+79.04	103.87	LT	899.50	CONC RIP-RAP
36	17+77.35	101.39	LT	899.50	CONC RIP-RAP
37	17+72.34	99.36	LT	898.00	CONC RIP-RAP

MAESTAS
8122 DATAPOINT DR., STE. 840
SAN ANTONIO, TX 78229
(210) 366-1988
TBPE No.: F-333
TBPLS No.: 10194506

STATE OF TEXAS
JOSE L. REYES
113231
LICENSED
PROFESSIONAL ENGINEER
10/30/2023

NO:	DATE	REVISION	APPROVED BY

Freese and Nichols, Inc.
Texas Registered Engineering Firm F-2144
FREESE AND NICHOLS
9601 McAllister Freeway, Suite 1008
San Antonio, Texas 78216
Phone - (210) 298-3800
web - www.freese.com

CITY OF SAN ANTONIO
PUBLIC WORKS DEPARTMENT

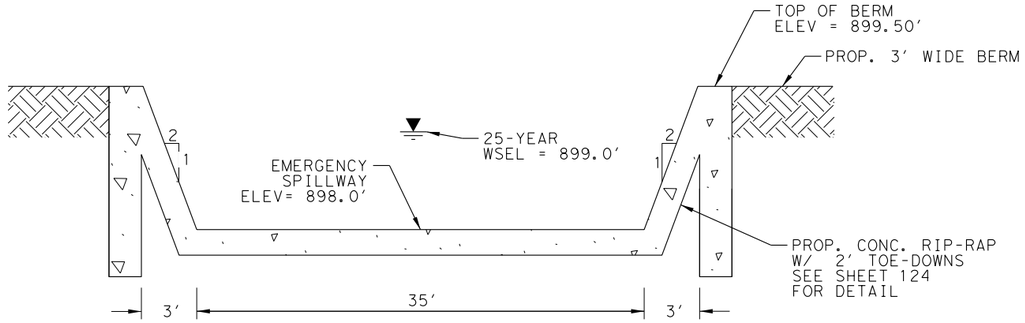
SONTERRA ROAD EXTENSION

BATCH DETENTION POND GRADING

SHEET 1 OF 1

PRELIMINARY	PROJECT NO.: 23-01849	DATE: 10/30/2023
DRWN. BY: GC	DSGN. BY: GC	CHKD. BY: JR

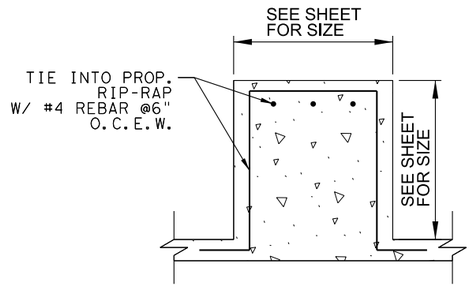
SHEET 111 OF 199



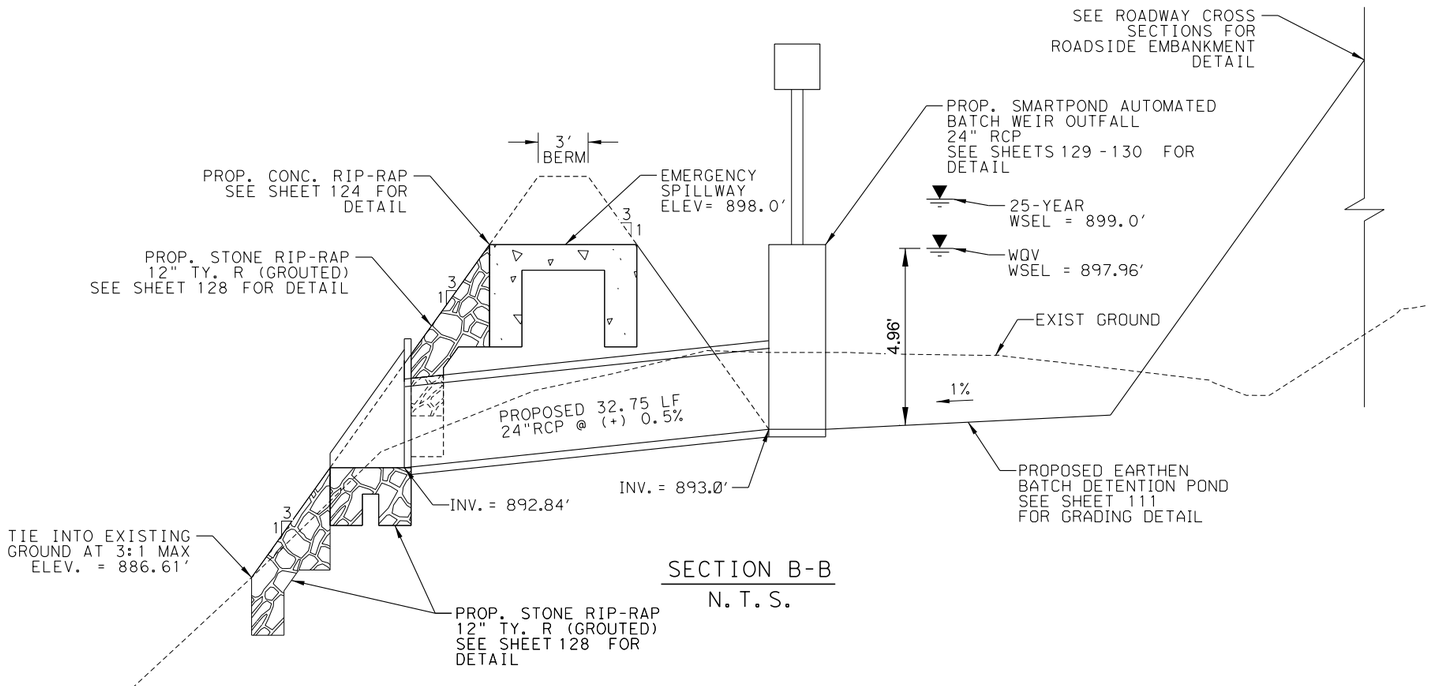
SECTION A-A
N.T.S.

Table 3-6 Clay Liner Specifications (COA, 2004)

Property	Test Method	Unit	Specification
Permeability	ASTM D-2434	cm/sec	1×10^{-6}
Plasticity Index of Clay	ASTM D-423 & D-424	%	Not less than 15
Liquid Limit of Clay	ASTM D-2216	%	Not less than 30
Clay Particles Passing	ASTM D-422	%	Not less than 30
Clay Compaction	ASTM D-2216	%	95% of Standard Proctor Density



BAFFLE BLOCK DETAIL
(EACH WAY)
N.T.S.



SECTION B-B
N.T.S.

MAESTAS
8122 DATAPOINT DR., STE. 840
SAN ANTONIO, TX 78229
(210) 366-1988
TBPE No.: F-333
TBPLS No.: 10194506

STATE OF TEXAS
JOSE L. REYES
113231
LICENSED
PROFESSIONAL ENGINEER
10/30/2023

NO:	DATE	REVISION	APPROVED BY

Freese and Nichols, Inc.
Texas Registered Engineering Firm F-2144
FREESE AND NICHOLS
9601 McAllister Freeway, Suite 1008
San Antonio, Texas 78216
Phone - (210) 298-3800
web - www.freese.com

CITY OF SAN ANTONIO
PUBLIC WORKS DEPARTMENT

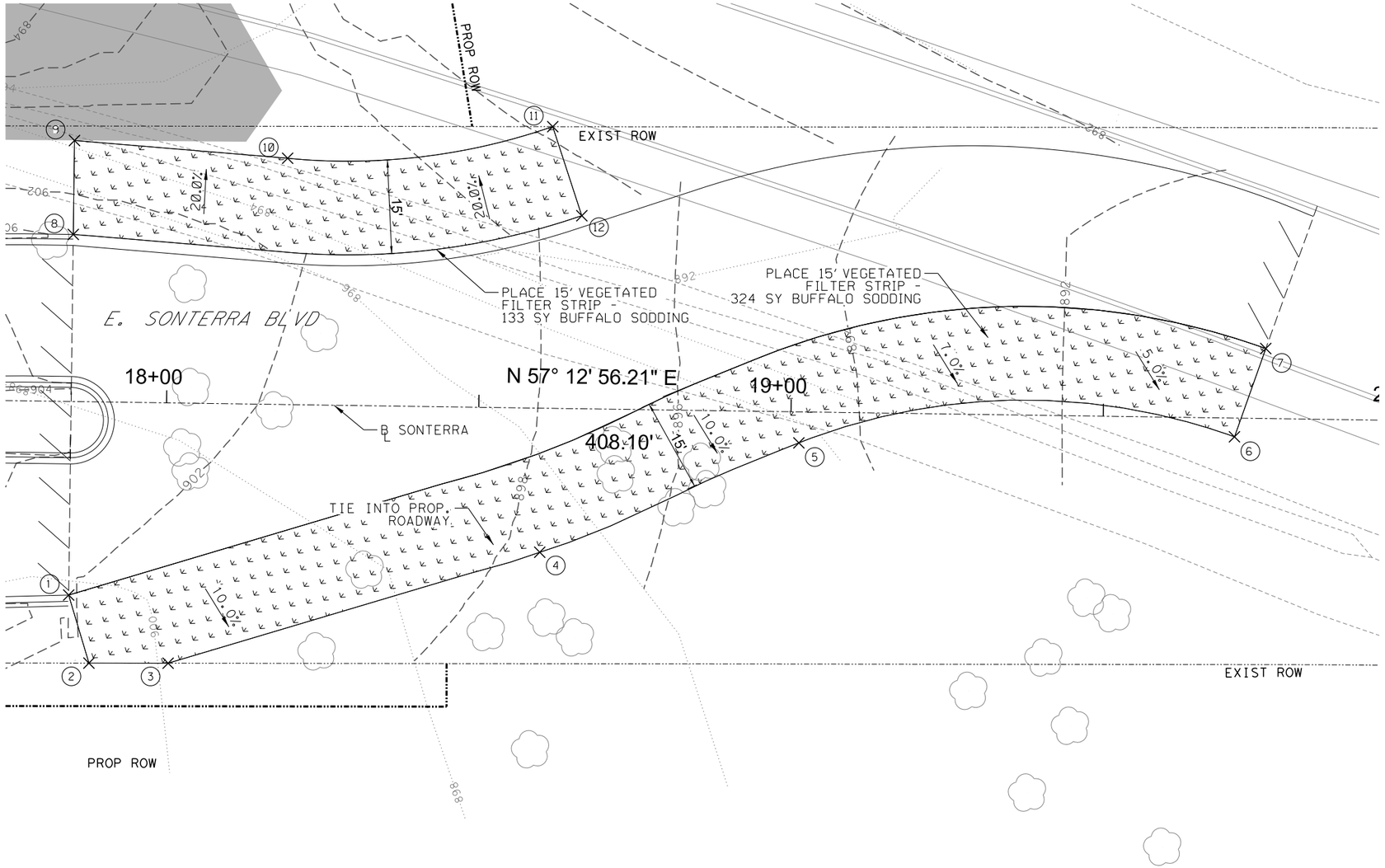
SONTERRA ROAD EXTENSION

BATCH DETENTION POND DETAILS

SHEET 1 OF 1

PRELIMINARY	PROJECT NO.: 23-01849		DATE: 10/30/2023
DRWN. BY: GC	DSGN. BY: GC	CHKD. BY: JR	SHEET 112 OF 199

Date: 10/30/2023



SCALE
HORZ: 1" = 20'

PLAN VIEW LEGEND

- PROP. STORM SEWER
- PROP. CONCRETE CURB
- PROP. EDGE OF PAVEMENT
- PROP. RIGHT OF WAY
- PROP. DRAINAGE EASMENT
- EXIST. RIGHT OF WAY
- GRADE BREAKLINE
- BUFFALO SODDING

ITEM	DESCRIPTION	UNIT	EST	FINAL
516.3	BUFFALO 609 SODDING	SY	457	

POINT #	STA.	OFFSET	LT/RT	ELEV.	DESC.
1	17+84.95	32.74	RT	903.68	EDGE PAVEMENT
2	17+86.61	47.65	RT	900.40	END OF VFS
3	18+26.36	43.18	RT	898.73	END OF VFS
4	18+87.43	23.41	RT	895.26	END OF VFS
5	19+10.19	10.77	RT	894.07	END OF VFS
6	19+70.66	5.50	RT	890.34	END OF VFS
7	19+75.05	8.84	LT	890.61	EDGE PAVEMENT
8	17+84.68	26.75	LT	903.80	EDGE PAVEMENT
9	17+84.65	41.79	LT	900.80	END OF VFS
10	18+18.82	39.43	LT	896.78	END OF VFS
11	18+61.19	45.10	LT	893.83	END OF VFS
12	18+66.05	30.91	LT	896.83	EDGE PAVEMENT

MAESTAS
8122 DATAPOINT DR., STE. 840
SAN ANTONIO, TX 78229
(210) 366-1988
TBPE No.: F-333
TBPLS No.: 10194506

STATE OF TEXAS
JOSE L. REYES
113231
LICENSED PROFESSIONAL ENGINEER
10/30/2023

NO:	DATE	REVISION	APPROVED BY

Freese and Nichols, Inc.
Texas Registered Engineering Firm F-2144
FREESE AND NICHOLS
9601 McAllister Freeway, Suite 1008
San Antonio, Texas 78216
Phone - (210) 298-3800
web - www.freese.com

CITY OF SAN ANTONIO
PUBLIC WORKS DEPARTMENT

SONTERRA ROAD EXTENSION

VEGETADED FILTER STRIP LAYOUT DRIVEWAY 4-1

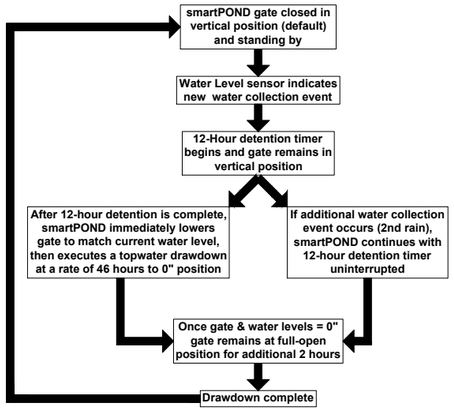
SHEET 1 OF 1

PRELIMINARY	PROJECT NO.: 23-01849	DATE: 10/30/2023
DRWN. BY: GC	DSGN. BY: GC	CHKD. BY: JR	SHEET VFS 199

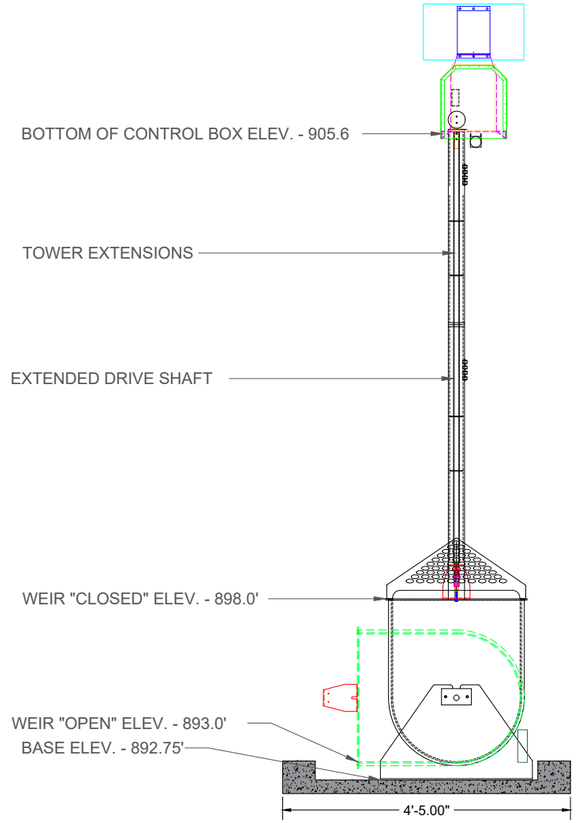
Date: 10/30/2023

Date: 10/30/2023 User: USER File: Z:\Projects\M242 Sonterra Gold Canyon Extension\06 - CADD Files\06.75 - General Civil\M242-VFS-01.dgn

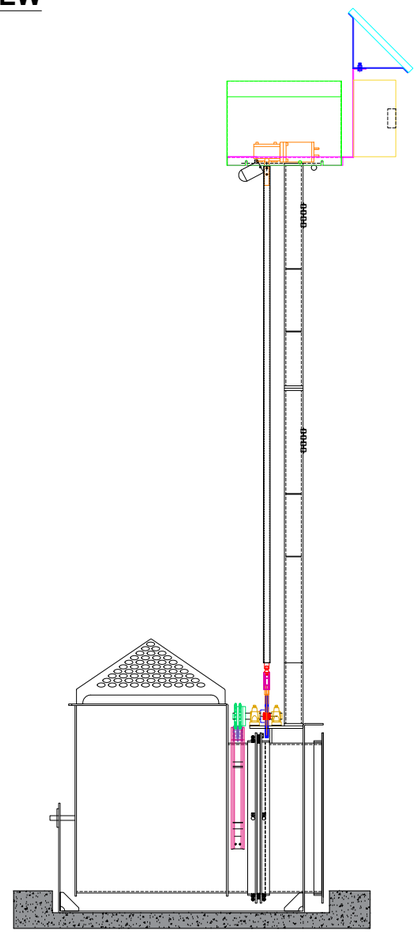
PROGRAMMABLE LOGIC FLOW CHART



FRONT VIEW



SIDE VIEW



CONSTRUCTION ECO SERVICES

smartPOND
Automated Stormwater Control.

FOR ADDITIONAL INFORMATION PLEASE CONTACT: CONSTRUCTION ECO SERVICES, 832-456-1000, www.ecosvs.com

CONVERGENT WATER TECHNOLOGIES

DATE OF ISSUE: 7/27/22

MAESTAS
8122 DATAPOINT DR., STE. 840
SAN ANTONIO, TX 78229
(210) 366-1988
TBPE No.: F-333
TBPLS No.: 10194506

STATE OF TEXAS
JOSE L. REYES
113231
LICENSED
PROFESSIONAL ENGINEER
10/30/2023

NO:	DATE	REVISION	APPROVED BY

Freese and Nichols, Inc.
Texas Registered Engineering Firm F-2144
FREESE AND NICHOLS
9601 McAllister Freeway, Suite 1008
San Antonio, Texas 78216
Phone - (210) 298-3800
web - www.freese.com

CITY OF SAN ANTONIO
PUBLIC WORKS DEPARTMENT

SONTERRA ROAD EXTENSION

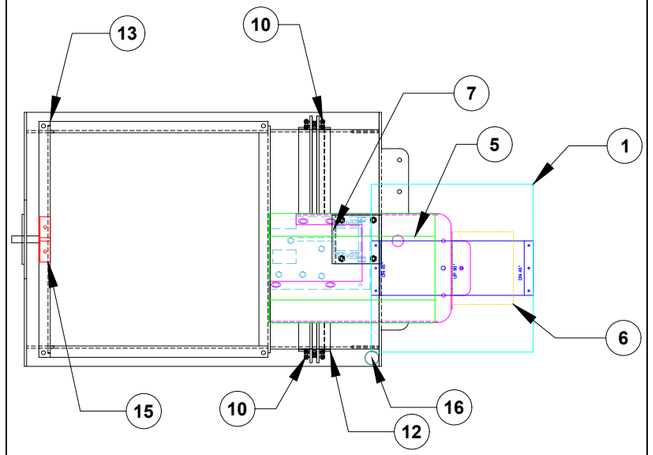
SMARTPOND AUTOMATED BATCH WEIR DETAILS

SHEET 1 OF 3

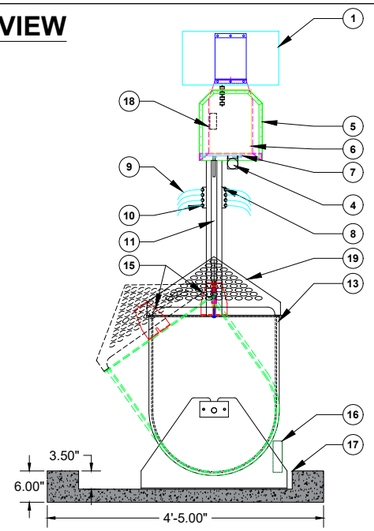
PRELIMINARY	PROJECT NO.: 23-01849	DATE: 6/5/2023
DRWN. BY: GC	DSGN. BY: GC CHKD. BY: JR	SHEET 113 OF 179

Date: 6/5/2023

TOP VIEW

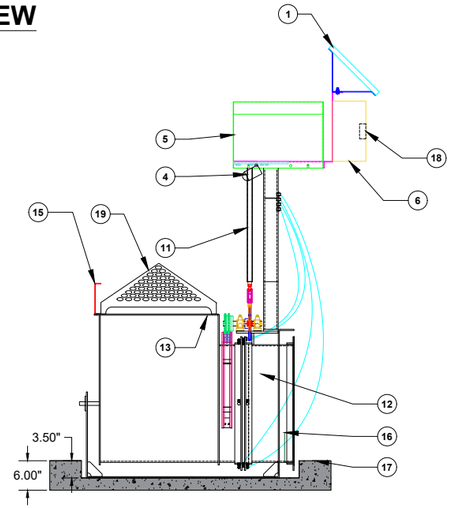


FRONT VIEW

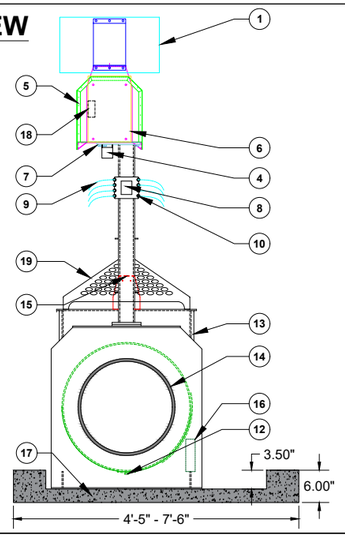


Parts List	
Item	smartPOND Components
1	12 V SOLAR PANEL WITH 30 WATT CHARGING CAPACITY
2	ANTENNA (NOT DISPLAYED)
3	CELL DATA MODEM (NOT DISPLAYED)
4	CAMERA
5	LOCKABLE WEATHERPROOF ELECTRONIC BOX
6	CONTROL BOX W/ LOCKING LATCHES
7	PEDESTAL
8	REMOTE GREASE MANIFOLD
9	GREASE TUBES
10	GREASE FITTINGS
11	EXTENDED DRIVE SHAFT
12	24" Rotary Valve
13	24" Drum (30"-70" TALL)
14	Outlet Pipe (Size TBD By Engineer, Max 24")
15	Inclinometer
16	Level Transducer
17	6" Concrete Pad (By Others, Size Varies)
18	ON/OFF SWITCH
19	TRASH RACK

SIDE VIEW



BACK VIEW



NOTES:
FOR ABOVE GROUND APPLICATIONS, THE ENTIRE SYSTEM INCLUDING ALL NECESSARY COMPONENTS FOR OPERATION ASSEMBLE INTO ONE KIT AND ARE HOUSED UNDER A SINGLE LOCKABLE STEEL ENCLOSURE WITH THE SOLAR PANEL MOUNTED ON TOP. IN THIS CONFIGURATION, THE UNIT CAN BE INSTALLED ON A STABLE, LEVEL PAD AND BE BOLTED ONTO THE BACK OF THE OUTFALL PIPE WITH SIX ¾" BOLTS AND THEN SWITCHED TO THE "ON" POSITION.

FOR UNDERGROUND APPLICATIONS, THE VALVE IS INSTALLED IN A VAULT OR CONCRETE ENCASEMENT AS NEEDED. AN EXTENDED DRIVE SHAFT CONNECTS BETWEEN THE UNDERGROUND VALVE AND THE REST OF THE COMPONENTS, INCLUDING THE MOTOR AND ALL ELECTRONICS, WHICH ARE HOUSED IN THE LOCKABLE STEEL ENCLOSURE DIRECTLY ABOVE GROUND.

CONSTRUCTION ECO SERVICES

smartPOND
Automated Stormwater Control.

FOR ADDITIONAL INFORMATION PLEASE CONTACT: CONSTRUCTION ECO SERVICES, 832-456-1000, www.ecosvs.com

CONVERGENT WATER TECHNOLOGIES

DATE OF ISSUE: 7/27/22

MAESTAS
8122 DATAPOINT DR., STE. 840
SAN ANTONIO, TX 78229
(210) 366-1988
TBPE No.: F-333
TBPLS No.: 10194506

STATE OF TEXAS
JOSE L. REYES
113231
LICENSED
PROFESSIONAL ENGINEER

10/30/2023

NO:	DATE	REVISION	APPROVED BY

Freese and Nichols, Inc.
Texas Registered Engineering Firm F-2144
FREESE AND NICHOLS
9601 McAllister Freeway, Suite 1008
San Antonio, Texas 78216
Phone - (210) 298-3800
web - www.freese.com

CITY OF SAN ANTONIO
PUBLIC WORKS DEPARTMENT

SONTERRA ROAD EXTENSION

SMARTPOND AUTOMATED BATCH WEIR DETAILS

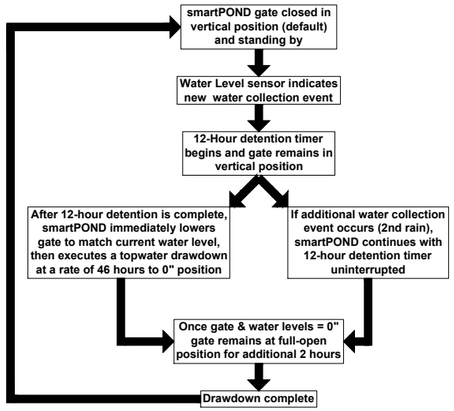
SHEET 2 OF 3

PRELIMINARY	PROJECT NO.: 23-01849		DATE: 6/5/2023
DRWN. BY: GC	DSGN. BY: GC	CHKD. BY: JR	SHEET 114 OF 179

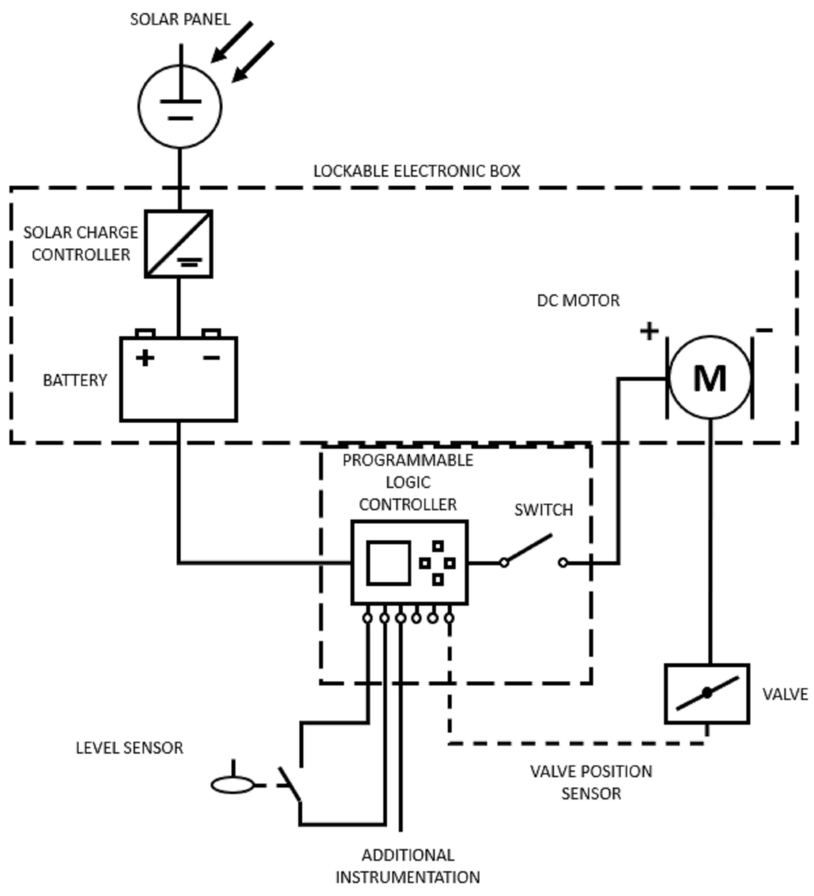
Date: 6/5/2023

Date: 6/5/2023 User: USER File: Z:\Projects\M242 Sonterra Gold Canyon Extension\06 - CADD Files\06.90 - Standard Details\06.93 - Maestas\M242-SMARTPOND DET-02.dgn

PROGRAMMABLE LOGIC FLOW CHART



BLOCK DIAGRAM



CONSTRUCTION ECO SERVICES

smartPOND
Automated Stormwater Control.

FOR ADDITIONAL INFORMATION PLEASE CONTACT: CONSTRUCTION ECO SERVICES, 832-456-1000, www.ecosvs.com

CONVERGENT WATER TECHNOLOGIES

DATE OF ISSUE: 7/27/22

MAESTAS
8122 DATAPOINT DR., STE. 840
SAN ANTONIO, TX 78229
(210) 366-1988
TBPE No.: F-333
TBPLS No.: 10194506

STATE OF TEXAS
JOSE L. REYES
113231
LICENSED
PROFESSIONAL ENGINEER

10/30/2023

NO:	DATE	REVISION	APPROVED BY

Freese and Nichols, Inc.
Texas Registered Engineering Firm F-2144
FREESE AND NICHOLS
9601 McAllister Freeway, Suite 1008
San Antonio, Texas 78216
Phone - (210) 298-3800
web - www.freese.com

CITY OF SAN ANTONIO
PUBLIC WORKS DEPARTMENT

SONTERRA ROAD EXTENSION

SMARTPOND AUTOMATED BATCH WEIR DETAILS

SHEET 3 OF 3

PRELIMINARY	PROJECT NO.: 23-01849		DATE: 6/5/2023
DRWN. BY: GC	DSGN. BY: GC	CHKD. BY: JR	SHEET 114 OF 179

Date: 6/5/2023

ATTACHMENT G – Maintenance Plan

Attached following this page.

ATTACHMENT G

PROJECT NAME: Sonterra Road Extension Project

LOCATION: Between E. Sonterra Blvd & Gold Canyon Rd at the N Loop 1604 E Access Rd and Gold Canyon Rd

CITY, STATE ZIP: San Antonio, TX 78232

SUGGESTED MAINTENANCE PLAN AND SCHEDULE FOR BATCH DETENTION BASIN

Inspections

Inspections should take place a minimum of twice a year. One inspection should take place during wet weather to determine if the basin is meeting the target detention time of 12 hours and a drawdown time of no more than 48 hours. The remaining inspections should occur between storm events so that the manual operation of the valve controller can be verified. The level sensor in the basin should be inspected and any debris or sediment in the area should be removed. The outlet structure and the trash screen should be inspected for signs of clogging. Debris and sediment should be removed from the orifice and outlets as described in previous sections. Debris obstructing the valve should be removed. During each inspection, erosion areas inside and downstream of this BMP should be identified and repaired/revegetated immediately.

Mowing

The basin, basin side-slopes, and embankment of the basin must be mowed to prevent woody growth and control weeds. A mulching mower should be used, or the grass clippings should be caught and removed. Mowing should take place at least twice a year, or more frequently if vegetation exceeds 18 inches in height. More frequent mowing to maintain aesthetic appeal may be necessary in landscaped areas.

Litter and Debris Removal

Litter and debris removal should take place at least twice a year, as part of the periodic mowing operations and inspections. Debris and litter should be removed from the surface of the basin. Particular attention should be paid to floatable debris around the outlet structure. The outlet should be checked for possible clogging or obstructions and any debris removed.

Erosion Control

The basin side slopes and embankment all may periodically suffer from slumping and erosion. To correct these problems, corrective action, such as regrading and revegetation, may be necessary. Correction of erosion control should take place whenever required based on periodic inspections.

Nuisance Control

Standing water or soggy conditions may occur in the basin. Some standing water may occur after a storm event since the valve may close with 2 to 3 inches of water in the basin. Some flow into the basin may also occur between storms due to spring flow and residential water use that enters the storm sewer system. Twice a year, the facility should be evaluated in terms of nuisance control (insects, weeds, odors, algae, etc.).

ATTACHMENT G

Structural Repairs and Replacement

With each inspection, any damage to structural elements of the basin (pipes, concrete drainage structures, retaining walls, etc.) should be identified and repaired immediately. An example of this type of repair can include patching of cracked concrete, sealing of voids, removal of vegetation from cracks and joints. The various inlet/outlet structures in a basin will eventually deteriorate and must be replaced.

Sediment Removal

A properly designed batch detention basin will accumulate quantities of sediment over time. The accumulated sediment can detract from the appearance of the facility and reduce the pollutant removal performance of the facility. The sediment also tends to accumulate near the outlet structures and can interfere with the level sensor operation. Sediment shall be removed from the basin at least every 5 years, when sediment depth exceeds 6 inches, when the sediment interferes with the level sensor or when the basin does not drain within 48 hours. Care should be taken not to compromise the basin lining during maintenance.

Logic Controller

The logic controller should be inspected as part of the twice yearly investigations. Verify that the external indicators (active, cycle in progress) are operating properly by turning the controller off and on, and by initiating a cycle by triggering the level sensor in the basin. The valve should be manually opened and closed using the open/close switch to verify valve operation and to assist in inspecting the valve for debris. The solar panel should be inspected and any dust or debris on the panel should be carefully removed. The controller and all other circuitry and wiring should be inspected for signs of corrosion, damage from insects, water leaks, or other damage. At the end of the inspection, the controller should be reset.

ATTACHMENT G

SUGGESTED MAINTENANCE PLAN AND SCHEDULE FOR VEGETATED FILTER STRIP

Vegetative filter Strips
Once a vegetated area is well established, little additional maintenance is generally necessary. The key to establishing a viable vegetated feature is the care and maintenance it receives in the first few months after it is planted. Once established, all vegetated BMPs require some basic maintenance to ensure the health of the plants including.

Inspections
BMP facilities shall be inspected at least twice a year to evaluated facility operation. Additional inspections shall occur after periods of heavy rain. The filter strip will be checked for uniformity of grass cover, debris and litter, and areas of sediment accumulation. Bare spots and areas of erosion identified during semi-annual inspections will be replanted and restored to meet specifications. Construction of a level spreader device may be necessary to reestablish shallow overland flow.

Records
The City of San Antonio shall keep records of the inspections on forms that shall be retained. Efforts will be made by the City to keep WPAP maintenance plans for WPAPs in the same region together for better coordination.
The inspection shall note at a minimum:

- uniformity of grass cover,
- debris and litter, and
- areas of sediment accumulation.
- Address if remediation was done during the inspection or if a task order needs to be established to replanting and restore filter strip to meet the specifications.
- Or other task order to remain in compliance with the WPAP permit.

Sediment Removal
Remove sediment in vegetative filter strip when they build up to 3 inches at any spot or cover vegetation. Excess sediment should be removed by hand or with flat-bottomed shovels. If areas are eroded, they should be filled, compacted, and reseeded so that the final grade is level with the bottom of the swale. Sediment removal will be performed as needed based on the inspections in the inspection section.

Pest Management
The integrated pest management plan (IMP) shall assess if there are excessive pests during each inspection. Problem insects and weeds will be controlled with minimal or no use of insecticides and herbicides.

Mowing
Grass areas in and around vegetative filter strips must be mowed at least twice annually to limit vegetation height to 18 inches. Grass cuttings should be collected and disposed of offsite, or a mulching mower can be used. Regular mowing should also include weed control practices; however, herbicide use should be kept to a minimum.

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

Grass Reseeding and Mulching:
A healthy dense grass should be maintained on the filter strip. If areas are eroded, they should be filled, compacted, and reseeded so that the final grade is level. Grass damaged during the sediment removal process should be promptly replaced using the same seed mix used during filter strip establishment.

If possible, flow should be diverted from the damaged areas until the grass is firmly established. Bare spots and areas of erosion identified during semi-annual inspections must be replanted and restored to meet specifications. Corrective maintenance, such as weeding, or replanting should be done more frequently in the first two to three years after installation to ensure stabilization. Dense vegetation may require irrigation immediately after planting, and during particularly dry periods, particularly as the vegetation is initially established.

Responsible Party: City of San Antonio
Contact Person: Steven Boylan
Mailing Address: 6927 W Commerce St, Bldg 1
City, State: San Antonio, TX Zip: 78228
Telephone: (210) 207-0727 FAX: (210) 207-7900

Steven Boylan — Signature of Responsible Party
10-27-2023 — Date

The Maintenance Plan and Schedule for Permanent Erosion Control has been prepared by Jose L. Reyes, PE and is certified to be in compliance with TCEQ regulations.

ATTACHMENT H – Pilot-Scale Field Testing Plan

Not applicable.

ATTACHMENT I – Measures for Minimizing Surface Stream Contamination

The proposed Sonterra Road Extension project improvements will create only new impervious cover for people using vehicles and pedestrians and will not increase risk to local streams. Treatment will be provided by the batch detention prior to entering the existing channel.

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

I Sean D. Strong, P.E.,
Print Name

Senior Engineer,
Title - Owner/President/Other

of The City of San Antonio,
Corporation/Partnership/Entity Name

have authorized Jose L. Reyes, PE
Print Name of Agent/Engineer

of Maestas & Associates, LLC
Print Name of Firm

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

I also understand that:

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

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

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

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

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

SIGNATURE PAGE:

Sean D. Strong, P.E. — Applicant's Signature

08/02/2023 — Date

THE STATE OF Texas §

County of Bexar §

BEFORE ME, the undersigned authority, on this day personally appeared Sean D. Strong 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 2nd day of August, 2023.

San Juana Garcia
NOTARY PUBLIC

SAN JUANA GARCIA
Notary ID #6430891
My Commission Expires
July 10, 2026

San Juana Garcia
Typed or Printed Name of Notary

MY COMMISSION EXPIRES: July 10, 2026

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 600130652		RN 111789400

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:*

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.*)

Sonterra Road Extension Project

23. Street Address of the Regulated Entity: *(No PO Boxes)*	Not Applicable						
	City		**State**		**ZIP**		**ZIP + 4**
24. County	Bexar						

Enter Physical Location Description if no street address is provided.

25. Description to Physical Location:	On the northeast side of the Loop 1604 and US-281 interchange.

26. Nearest City	**State**	**Nearest ZIP Code**
San Antonio	TX	78255

27. Latitude (N) In Decimal:	29.6066		**28. Longitude (W) In Decimal:**	-98.4574	
Degrees	Minutes	Seconds	Degrees	Minutes	Seconds
29	36	23.76	-98	27	26.64

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)
1611	1629	237310	238990

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

Roadway Improvements

34. Mailing Address:	**PO Box 839966**							
	City	**San Antonio**	**State**	**TX**	**ZIP**	**78283**	**ZIP + 4**	**3966**

35. E-Mail Address:	**Sean.Strong@sanantonio.gov**

36. Telephone Number	**37. Extension or Code**	**38. Fax Number** *(if applicable)*
(210) 207-8037		**(210) 207-4406**

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:	Jose L. Reyes	**41. Title:**	Project Manager

42. Telephone Number	**43. Ext./Code**	**44. Fax Number**	**45. E-Mail Address**
(210) 366-1988	8111	(210) 366-1980	jreyes@maesce.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:	Maestas & Associates, LLC	**Job Title:**	President
Name *(In Print):*	Jose L. Reyes	**Phone:**	(210) 366- **1988**
Signature:		**Date:**	10/15/2024