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: De Zavala ROW in Shavano Park						**2. Regulated Entity No.:**			
3. Customer Name: City of Shavano Park						**4. Customer No.: 600659338**			
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):**			8.36
9. Application Fee:	$5,000		**10. Permanent BMP(s):**			Vegetated Filter Strip			
11. SCS (Linear Ft.):	N/A		**12. AST/UST (No. Tanks):**			N/A			
13. County:	Bexar		**14. Watershed:**			Salado Creek			

Application Distribution

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

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

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

Austin Region			
County:	**Hays**	**Travis**	**Williamson**
Original (1 req.)	___	___	___
Region (1 req.)	___	___	___
County(ies)	___	___	___
Groundwater Conservation District(s)	___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) _x_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.

Riley John

Print Name of Customer/Authorized Agent

2/22/23

Signatu  horized Agent Date

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

WATER POLLUTION ABATEMENT PLAN

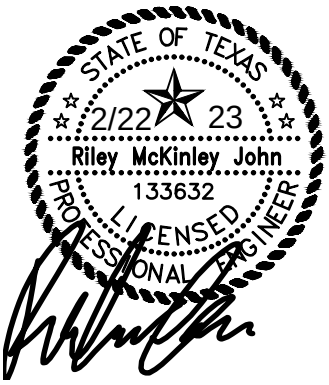
DE ZAVALA ROW IN SHAVANO PARK

SHAVANO PARK, TX

KFW JOB NO. 622-13-01

FEBRUARY 2023

FIRM #: 9513



BY: Riley John, P.E.

3421 Paesanos Pkwy. Ste 200 San Antonio, Texas 78231 ● Phone: (210) 979-8444 ● Fax: (210) 979-8441 ● www.kfwengineers.com

February 20, 2023

Mr. George Ortiz
TCEQ Region 13
14250 Judson Rd.
San Antonio, Texas 78233-4480

Re: De Zavala ROW in Shavano Park
Water Pollution Abatement Plan

Dear Mr Ortiz:

Attached is the digital version of the Water Pollution Abatement Plan Application for “De Zavala ROW in Shavano Park ” including the appropriate review fees ($5,000). This application has been prepared according to the guidelines set forth in 30 TAC Chapter 213 Subchapter B. Please review the application for completeness and compliance with the applicable regulations for development over the Recharge Zone of the Edwards Aquifer. Upon acceptance, we request that written approval be provided to our office.

Thank you for your time and consideration in this matter. Should you have any questions or need further information please feel free to contact our office.

Sincerely,
KFW Engineers,

Riley John, P.E.
Project Manager

Table of Contents

SECTION 1
GENERAL INFORMATION

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: Riley John

Date: 2/17/23

Signature of Customer/Agent:

Project Information

1. Regulated Entity Name: De Zavala Road
2. County: Bexar
3. Stream Basin: Upper San Antonio
4. Groundwater Conservation District (If applicable): Edwards Aquifer Authority
5. Edwards Aquifer Zone:

   ☒ Recharge Zone
   ☐ Transition Zone

6. Plan Type:

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

7. Customer (Applicant):

   Contact Person: Bill Hill
   Entity: City of Shavano Park
   Mailing Address: 900 Saddletree Court
   City, State: Shavano Park, Texas Zip: 78231
   Telephone: _____ FAX: _____
   Email Address: Citymanager@shavanopark.org

8. Agent/Representative (If any):

   Contact Person: Riley John
   Entity: KFW Engineers
   Mailing Address: 3421 Paesanos Pkwy. Ste 200
   City, State: San Antonio, TX Zip: 78231
   Telephone: 210-979-8444 FAX: _____
   Email Address: rjohn@kfwengineers.com

9. Project Location:

   ☒ The project site is located inside the city limits of Shavano Park.
   ☐ 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.

    This project area location consists of the De Zavala ROW between Northwest Military Highway and Lockhill Selma

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: Already Complete

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.

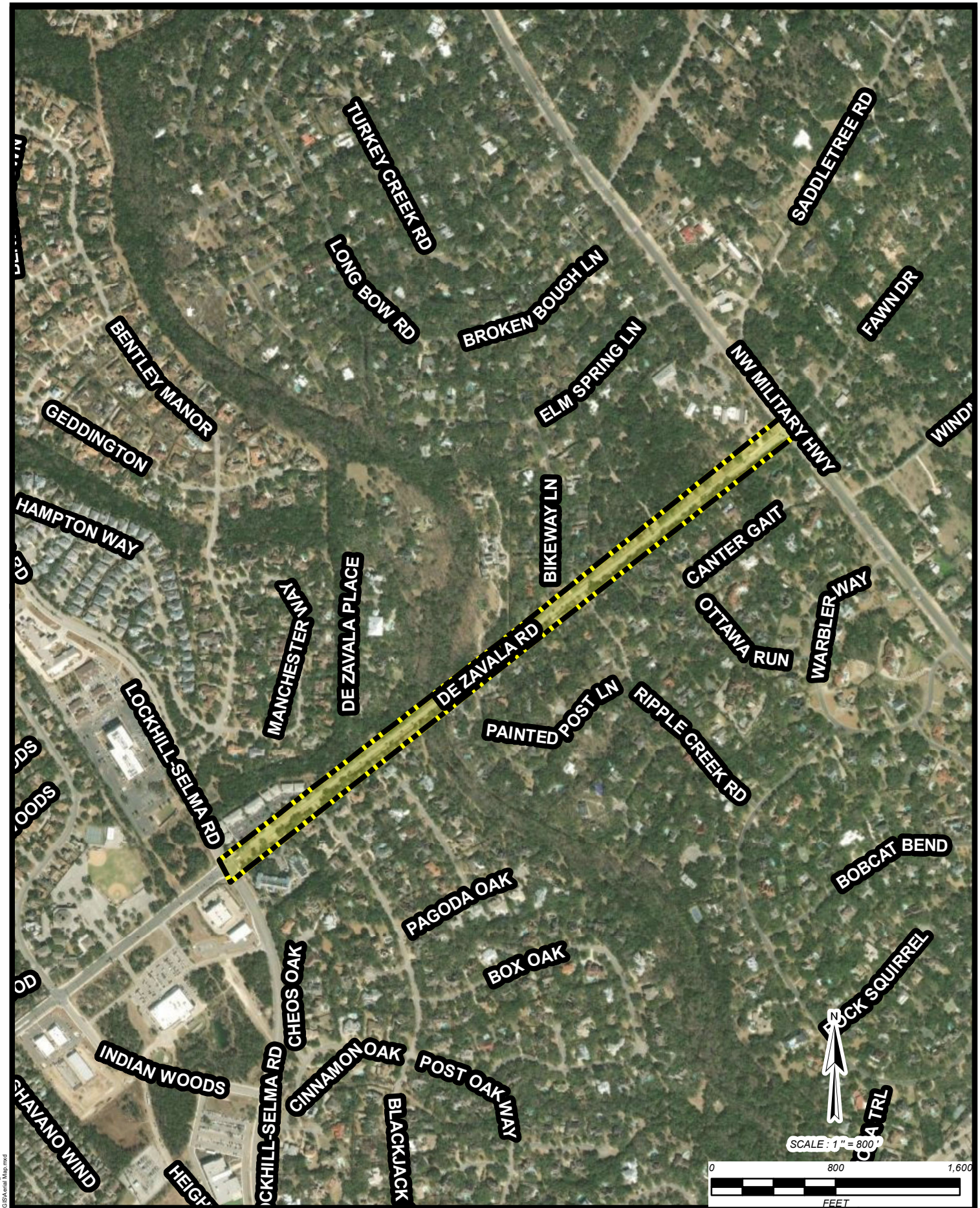
19. ☒ Application fees are due and payable at the time the application is filed. If the correct fee is not submitted, the TCEQ is not required to consider the application until the correct fee is submitted. Both the fee and the Edwards Aquifer Fee Form have been sent to the Commission's:

☐ 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.

AERIAL AND LOCATION MAP



KFW
ENGINEERS + SURVEYING
FIRM# 9513 FIRM# 10122300
3421 PAESANOS PKWY. SUITE 200 PHONE (210) 979-8444
SAN ANTONIO, TEXAS 78231 FAX (210) 979-8441

Reconstruction of De Zavala Road

Aerial Map

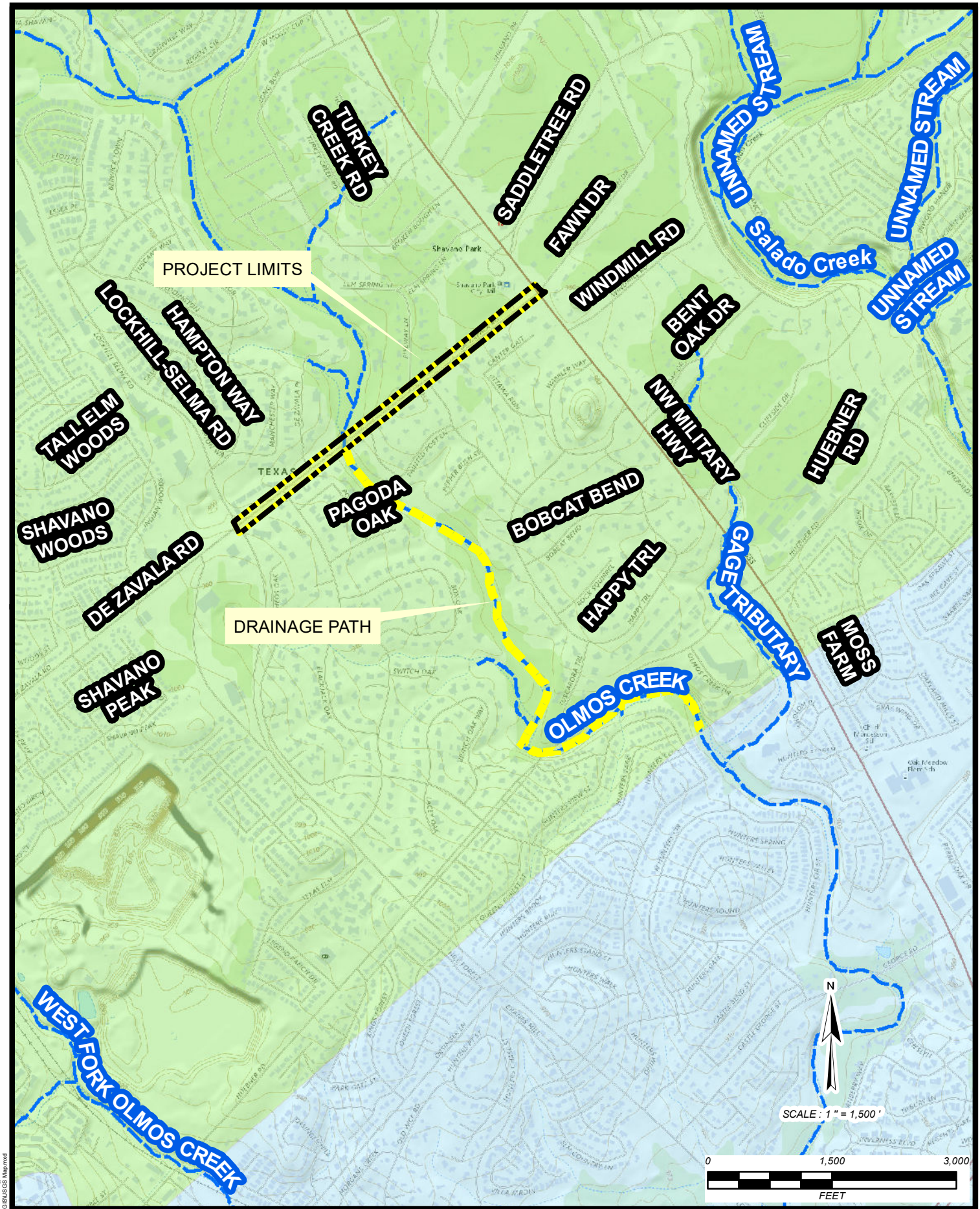
Site Map

REVISIONS:	ISSUE DATE:
JOB NO. 622-13-01	
DATE: January 2023	DESIGNER:
DRAWN: JJ	CHECKED: RJ

SHEET: EX-1

Date: Jan 20, 2023, 11:43:00 AM User ID: jjohns
File: M:\622\13\01\Design\Exhibits\GIS\Aerial Map.mxd

USGS/EDWARDS RECHARGE ZONE MAP



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SAN ANTONIO, TEXAS 78231 FAX (210) 979-8441

Reconstruction of De Zavala Road

USGS MAP/EARZ MAP

REVISIONS:	ISSUE DATE:
JOB NO. 622-13-01	
DATE: February 2023	DESIGNER:
DRAWN: JJ	CHECKED: RJ

SHEET: EX-1

Date: Feb 20, 2023, 9:13:21 AM User ID: jjohns
File: M:\622\13\01\Design\Exhibits\GIS\USGS Map.mxd

PROJECT DESCRIPTION

The De Zavala ROW in Shavano Park project is currently public road located between Northwest Military Highway and Lockhill Selma within the city limits of Shavano Park, Bexar County, Texas. The project area (8.63 acres) consists solely of the subject site and no off-site areas. The entire property is within the Edwards Aquifer Recharge Zone. In addition, a section of the property is located within the 100-yr floodplain as per the Flood Emergency Management Agency (FEMA) Flood Insurance Rate Map (FIRM) #48029C0235G, dated September 29, 2010 as part of an existing creek crossing.

The property is currently a functioning public road with a rough roadway width of 41'. The existing Impervious cover on the site consists of 4552 LF of public roadway with a typical width of 41'.

The scope of work proposed under this WPAP includes a mill ad overlay of the existing pavement, and the addition of curb and sidewalks. As part of the addition of the sidewalks the impervious cover cross section will increase from 41' to 45.5'. The proposed sidewalk will slope away from the street to utilize a vegetated filter strip to treat the increased impervious cover. The proposed improvements will result in a total increase of 0.627 acres of impervious cover (7.49% impervious cover). The vegetative filter strips and grassy swales are interim in nature and are being utilized for erosion control measure and to treat a portion of the impervious cover until the full development of the proposed lots occurs. Vegetated filter strips will be used as the permanent treatment method to treat the added sidewalk. Due to the addition of the 5' side walk, a minimum 3.1' Vegetated filter strip will be added along the length of the project for each side of the road.

It is anticipated that approximately 4.75 acres will be disturbed by construction activities. These activities will be subject to TPDES requirements. A Storm Water Pollution Prevention Plan will be maintained for the site and temporary BMP's will be implemented to prevent erosion until completion of construction.

There will not be any on-site storage of regulated quantities of hazardous materials.

SECTION 2
GEOLOGIC ASSESSMENT

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: Roman C. Pineda, P.G.

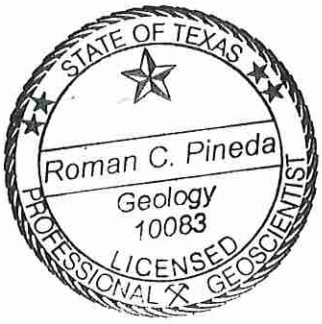
Telephone: (210) 979-8444

Fax: (210) 979-8441

Date: 2/17/2023

Representing: KFW Engineers, TBPE Firm #9513 (Name of Company and TBPG or TBPE registration number)

Signature of Geologist:



Regulated Entity Name: De Zavala Road Reconstruction

Project Information

1. Date(s) Geologic Assessment was performed: February 9th, 2023
2. Type of Project:
   - ☒ WPAP
   - ☐ SCS
   - ☐ AST
   - ☐ UST
3. Location of Project:
   - ☒ Recharge Zone
   - ☐ Transition Zone
   - ☐ Contributing Zone within the Transition Zone

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

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

Table 1 - Soil Units, Infiltration Characteristics and Thickness

Soil Name	Group*	Thickness(feet)

Soil Name	Group*	Thickness(feet)
Crawford, stony and Bexar soils, 0 to 5 percent slopes (Cb)	D	0-3

** Soil Group Definitions (Abbreviated)*

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

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

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

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

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

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

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

   Applicant's Site Plan Scale: 1" = 60'
   Site Geologic Map Scale: 1" = 60'
   Site Soils Map Scale (if more than 1 soil type): 1" = N/A'

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: DE ZAVALA ROAD RECONSTRUCTION

LOCATION			FEATURE CHARACTERISTICS												EVALUATION			PHYSICAL SETTING		
1A	1B *	1C*	2A	2B	3	4			5	5A	6	7	8A	8B	9	10		11		12
FEATURE ID	LATITUDE	LONGITUDE	FEATURE TYPE	POINTS	FORMATION	DIMENSIONS (FEET)			TREND (DEGREES)	DOM	DENSITY (NO/FT)	APERTURE (FEET)	INFILL	RELATIVE INFILTRATION RATE	TOTAL	SENSITIVITY		CATCHMENT AREA (ACRES)		TOPOGRAPHY
						X	Y	Z		10						<40	>40	<1.6	>1.6	
S-1	29.57855	-98.562253	MB	30	Kep	25.46				0			O,C,F	15	45		X	X		Hillside

* DATUM: NAD 83

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

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

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

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

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

Date 2-17-2023

Sheet __1__ of __1__

Attachment A

STATE OF TEXAS
Roman C. Pineda
Geology
10083
LICENSED
PROFESSIONAL GEOSCIENTIST

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

DE ZAVALA ROAD RECONSTRUCTION

Stratigraphic Column

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

Hydrogeologic subdivision			Group, formation, or member			Hydrologic function	Thickness (feet)	Lithology	Field Identification	Cavern development	Porosity/permeability type
Lower Cretaceous	I	*Edwards Aquifer*	Georgetown Fonnation (Kgt)			Karst AQ; nokarst CU	2-20	Reddish-brown, gray to light tan marly limestone	Marker fossil; *Waconella wacoensis*	None	Low porosity/low permeability
	II		*Edwards Group*	*Person Formation (Kep)*	Cyclic and marine members, undivided	AQ	80-90	Mudstone to packstone; *miliolid* grainstone; chert	Thin graded cycles; massive beds to telatively thin beds; crossbeds	Many subsurface; might be associated with earlier karst development	Laterally extensive; both fabric and not fabric/water-yielding
	III				Leached and collapsed members, undivided	AQ	70-90	Crystalline limestone; mudstone to grainstone; chert; collapsed breccia	Bioturbated iron-stained beds separated by massive limestone beds; stromatolitic limestone	Extensive lateral development; large rooms	Majority not fabric/one of the most permeable
	IV				Regional dense member	CU	20-24	Dense, argillaceous mudstone	Wispy iron-oxide stains	Very few; only vertical fracture enlargement	Not fabric/low permeability; vertical barrier
	V			*Kainer Formation (Kek)*	Grainstone member	AQ	50-60	*Miliolid* grainstone; mudstone to wackestonc; chert	White crossbedded grainstone	Few	Not fabric/recrystallization reduces permeability
	VI				Kirschberg evaporite member	AQ	50-60	Highly altered crystalline limestone; chalky mudstone; chert	Boxwork voids, with neospar and travertine frame	Probably extensive cave development	Majority fabricone of the most permeable
	VII				Dolomite member	AQ	110-130	Mudstone to grainstone; crystalline limestone; chert	Massively bedded light gray, *Toucasia* abundant	Caves related to structure or bedding planes	Mostly not fabric; some bedding plane fabric/water-yielding
	VIII				Basal nodular member	Karst AQ; not karst CU	50-60	Shaly, nodular limestone mudstone and miliolid grainstone	Massive, nodular and mottled, *Exogyra texana*	Large lateral caves at surface; a few caves near Cibolo Creek	Fabric; stratigraphically controlled/large conduit now at surface; no permeability in subsurface

(Modified from Small and Hanson, 1994)

ATTACHMENT B

DE ZAVALA ROAD RECONSTRUCTION

Narrative Description of Site Geology

The overall potential for fluid migration to the Edwards Aquifer on the site is moderate. This site is located within outcrop areas of the cyclic and marine members of the Person Formation (Kep). The project limits is comprised of non-contiguous areas 11-ft wide totaling approximately 7,700 linear feet within the right-of-way along De Zavala Road. The dominant trend for the site is N62°E, based on an average of the trends of faults within the surrounding area and from published maps (Stein & Ozuna, 1995).

The cyclic and marine members are characterized by thin graded cycles, along with bed size varying from massive to relatively thin. Lithology includes pelletal limestone, mudstone, miliolid, grainstone, packstone, and chert. Karst development in the Kepcm is characterized by few small sinkholes, and caves developed as vertical shafts. No caves or sinkholes were identified on site.

Feature S-1

Feature is an existing 18” sanitary sewer line that is not located beneath pavement. The line has been trenched through bedrock and backfilled with a mix of fine and coarse material that may be more permeable than surrounding undisturbed areas. Therefore, the probability for rapid infiltration is intermediate.

PROJECT LIMITS

DE ZAVALA ROAD

LOCKHILL-SELMA RD

BLACKJACK OAK

Olmos Creek

1% AC ULTIMATE FLOODPLAIN PER STUDY PREPARED BY FEMA- ZONE AE

MATCHLINE STA. 20+50 SEE THIS SHEET

PROJECT LIMITS

BIKEWAY LANE

DE ZAVALA ROAD

MATCHLINE STA. 20+50 SEE THIS SHEET

MATCHLINE STA. 39+00 SEE THIS SHEET

PAINTED POST LANE

RIPPLE CREEK ROAD

MATCHLINE STA. 39+00 SEE THIS SHEET

PROJECT LIMITS

DE ZAVALA ROAD

NW MILITARY RD

DE ZAVALA ROAD

LEGEND

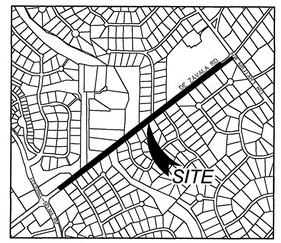
Qal	ALLUVIUM
Kpg	PECAN GAP CHALK
Kbu	BUDA LIMESTONE
Kdr	DEL RIO CLAY
Kep	PERSON FORMATION
Kek	KAINER FORMATION
Kgru	GLEN ROSE FORMATION
S-1	POTENTIAL RECHARGE FEATURE
	DRAINAGE PATHWAY
	CONTACT, LOCATED APPROXIMATELY
	FAULT, LOCATED APPROXIMATELY (D,DOWNTHROWN SIDE;U,UPTHROWN SIDE)
	FAULT EXISTENCE UNCERTAIN
	POSSIBLE FAULT (AS LOCATED BY AERIAL PHOTOGRAPHS)
	STRIKE AND DIP OF BEDDING
	STRIKE AND DIP OF JOINTS
	STRIKE OF VERTICAL JOINTS
	CAVE
	NON-KARST CLOSED DEPRESSION
	SWALLOW HOLE
	SOLUTION CAVITY
	OTHER NATURAL BEDROCK FEATURES: VUGGY ROCK, SOLUTION-ENLARGED FRACTURES
	ZONE
MB	MAN-MADE FEATURE IN BEDROCK
W	WATER WELL
	PROPOSED SANITARY SEWER LINE
	EXISTING SANITARY SEWER LINE
	50' SEWER ENVELOPE
	PROPOSED MANHOLE
	EXISTING MANHOLE

NOTE: THE GEOSCIENTIST SEAL HAS BEEN AFFIXED TO THIS SHEET ONLY FOR PURPOSES OF GEOLOGIC INFORMATION. ALL OTHER INFORMATION SHOULD BE ACQUIRED FROM THE APPROPRIATE SIGNED AND SEALED CIVIL ENGINEERING DRAWINGS

SCALE : 1"=60'

0' 60' 180'

120'



LOCATION MAP
N.T.S.

KFW
ENGINEERS + SURVEYING
Texas Joined Colleges Engineering & Design
3421 Paesanos Parkway, Suite 200 • San Antonio, TX 78231
Phone #: (210) 979-8444 • Fax #: (210) 979-8441
TBPE Firm #: 8813 • TBPLS Firm #: 10122300

ISSUE DATE

REVISIONS

STATE OF TEXAS
ROMAN C. PINEDA
GEOLOGY
10083
LICENSED
PROFESSIONAL GEOSCIENTIST
7-17-2023

DE ZAVALA ROAD RECONSTRUCTION
SHAVANO PARK, TEXAS
SITE GEOLOGIC MAP

JOB NO. 822-13-01
DATE: FEB 2023
DRAWN: EU CHECKED: RCP

ATTACHMENT
D

Date: Feb 17, 2023, 10:28am User ID: aurigwe
File: M:\822\13\01\Design\Environmental\GA\GIS\De Zavala GA (WPAP).dwg

DE ZAVALA ROAD RECONSTRUCTION

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SECTION 3
WATER POLLUTION ABATEMENT PLAN

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: Riley John

Date: 3/1/23

Signature of Customer/Agent:

Regulated Entity Name: _____

Regulated Entity Information

1. The type of project is:

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

2. Total site acreage (size of property):8.36

3. Estimated projected population:0

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		÷ 43,560 =	
Parking		÷ 43,560 =	
Other paved surfaces	27,312	÷ 43,560 =	0.627
Total Impervious Cover	27,312	÷ 43,560 =	0.627

Total Impervious Cover 0.627 **÷ Total Acreage** 8.36 **X 100 =** 7.49**% 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.): 4552 feet.

Width of R.O.W.: 80 feet.
L x W = 364,160 Ft^2 ÷ 43,560 Ft^2/Acre = 8.36 acres.

10. Length of pavement area: 4552 feet.

Width of pavement area: 6 feet.
L x W = 27,312 Ft^2 ÷ 43,560 Ft^2/Acre = 0.63 acres.
Pavement area 0.63 acres ÷ R.O.W. area 8.36 acres x 100 = 7.49% 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:

0% Domestic	0Gallons/day
0% Industrial	0Gallons/day
0% Commingled	0Gallons/day
TOTAL gallons/day 0	

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" = 40'.

18. 100-year floodplain boundaries:

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

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.

FACTORS AFFECTING WATER QUALITY

Materials that are anticipated to be used on site that could be a potential source of contamination include the following:

During Construction:

1. Concrete and Masonry Materials
2. Wood, plastic, and metal Materials
3. Oil, Grease, fuel, and hydraulic fluid from construction equipment and vehicle drippings
4. Fertilizers, Herbicides, and Pesticides
5. Cleaning solutions and detergents
6. Miscellaneous construction trash and debris
7. Soil erosion and sedimentation due to construction activity

Ultimate Use:

1. Fertilizers, Herbicides, and pesticides used to maintain landscaping
2. Miscellaneous trash and debris generated from the public

(This is not intended to be an all-inclusive list)

All practical management practices will be used to reduce the risk of spills and other exposure of any contaminant to surface or groundwater.

VOLUME AND CHARACTER OF STORMWATER

Existing Conditions

The existing on site drainage areas total 5.10 acres with the longest time of concentration being 15.7 min with a weighted runoff coefficient of 0.90. The total area has a peak discharge of 20.9cfs, 28.8cfs and 35.8cfs for the 5, 25 and 100 year storms respectively. An existing condition drainage area map is given at the end of this report. (***Exhibit 3***).

Proposed Conditions

The proposed on site drainage areas total 5.01 acres with the longest time of concentration being 15.7 min with a weighted runoff coefficient of 1.0. The total area has a peak discharge of 22.6cfs, 31.2 cfs and 38.7cfs for the 5, 25 and 100 year storms respectively. The main roadway drainage areas remained unchanged. A proposed condition drainage area map is given at the end of this report. (***Exhibit 4***). The Drainage areas 1-8 describe the existing impervious cover areas While drainage areas 1S-8S

The proposed storm water runoff for the subject site consists of 9.53 acres of partially developed property with and average slope of 2-3%, and a weighted runoff coefficient of 0.66. The proposed site was divided into 4 drainage areas based on the permanent BMP treatment method. Drainage Area 1 (0.89 Acres) is located in the northwest corner of the site and will remain undeveloped except the addition of approximately 175 LF of retaining wall. This impervious cover will not be treated and runoff from Drainage Area two will be over treated to account for this. Drainage Area 2 (0.55 Acres) contain the portion of the proposed access drive that will drain to a grate inlet and be treated by a permanent JellyFish Filter System. Drainage Area 3 (0.42 Acres) is the portion of the proposed access drive that will drain in a southeastern direction where the runoff will sheet flow over proposed interim Vegetative Filter Strips. Drainage Area 4 (7.67 Acres) will remain undeveloped except for the addition of 450 LF of fill retaining walls and an access drive and will be treated with interim Vegetative Filter Strips. The peak discharge rates for stormwater are 27.53cfs, 36.22cfs, and 47.01cfs for the 5, 25, & 100 year storm respectively. A proposed condition drainage area map is given at the end of this report **(Exhibit 4).**

SUITABILITY LETTER FROM AUTHORIZED AGENT

An on-site sewage facility will **not** be used to treat and dispose of the wastewater. Therefore, the appropriate licensing authority's (authorized agent) written approval is not required.

EXCEPTION TO THE REQUIRED GEOLOGIC ASSESSMENT

A Geologic Assessment was conducted for this project, and has been included in Section 2 of this report. Therefore, an exception to the Geologic Assessment requirement will not be requested.

SECTION 4
TEMPORARY STORMWATER

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.

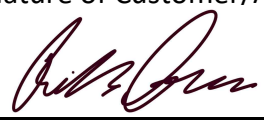
Signature

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: Riley John

Date: 2/17/23

Signature of Customer/Agent:



Regulated Entity Name: _____

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: Salado Creek

Temporary Best Management Practices (TBMPs)

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

☒ N/A

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

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

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

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

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

Soil Stabilization Practices

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

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

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

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

Administrative Information

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

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

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

SPILL RESPONSE ACTIONS

If there is an accidental spill on site, the contractor shall respond with appropriate action. The contractor will be required to contact the owner and in turn the owner will contact the TCEQ in the event of a spill on site. In addition to the following guidance, reference the latest version of TCEQ's Technical Guidance Manual (TGM) RG-348 Section 1.4.16.

The following steps 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 is 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 waste 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 run-off during rainfall to the extent that it doesn't compromise cleanup activities.
7. Do not bury or wash spills with water.

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:
   - Contain the spread of the spill.
   - Recover spilled materials.
   - Clean the contaminated area and properly dispose of contaminated materials.

SEMI-SIGNIFICANT SPILLS

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

Spills should be cleaned up immediately:

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

SIGNIFICANT/HAZARDOUS SPILLS

For significant or hazardous spills that are in reportable quantities:

1. Notify the TCEQ by telephone as soon as possible and within 24 hours at (512)339-2929 (Austin) or 210-490-3096 (San Antonio) between 8 AM and 5 PM. After hours, contact the Environmental Release Hotline at 1-800-832-8224. It is the contractor's responsibility to have all emergency phone numbers at the construction site.
2. For spills of federal reportable quantities, in conformance with the requirements in 40 CFR parts 110,119, and 302, the contractor should notify the National Response Center at (800) 424-8802.
3. Notification should first be made by telephone and followed up with a written report.
4. The services of a spills contractor or a Haz-Mat team should be obtained immediately. Construction personnel should not attempt to clean up until the appropriate and qualified staffs have arrived at the job site.
5. Other agencies which may need to be consulted include, but not limited to, the City Police Department, County Sheriff Office, Fire Departments, etc.

VEHICLE AND EQUIPMENT MAINTENANCE

1. If maintenance must occur onsite, use a designated area and a secondary containment, located away from drainage courses, to prevent the runoff of stormwater and the runoff of spills.
2. Regularly inspect onsite vehicles and equipment for leaks and repair immediately
3. Check incoming vehicles and equipment (including delivery trucks, and employee and subcontractor vehicles) for leaking oil and fluids. Do not allow leaking vehicles or equipment onsite.
4. Always use secondary containment, such as a drain pan or drop cloth, to catch spills or leaks when removing or changing fluids.
5. Place drip pans or absorbent materials under paving equipment when not in use.
6. Use absorbent materials on small spills rather than hosing down or burying the spill. Remove the absorbent materials promptly and dispose of properly.
7. Promptly transfer used fluids to the proper waste or recycling drums. Don't leave full drip pans or other open containers lying around.
8. Oil filters disposed of in trashcans or dumpsters can leak oil and pollute stormwater. Place the oil filter in a funnel over a waste oil-recycling drum to drain excess oil before disposal. Oil filters can also be recycled. Ask the oil supplier or recycler about recycling oil filters.
9. Store cracked batteries in a non- leaking secondary container. Do this with all cracked batteries even if you think all the acid has drained out. If you drop a battery, treat it as if it is cracked. Put it into the containment area until you are sure it is not leaking.

VEHICLE AND EQUIPMENT FUELING

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

POTENTIAL SOURCES OF CONTAMINATION

Potential Source: Oil, grease, fuel, and hydraulic fluid contamination from construction equipment and vehicle dripping.

> *Preventative Measures: Vehicle maintenance when possible will be performed within the construction staging area or a local maintenance shop.*

Potential Source: Miscellaneous trash and litter from construction workers and material wrappings.

> *Preventative Measures: Trash containers will be placed throughout the site to encourage proper disposal of trash.*

Potential Source: Silt leaving the site.

> *Preventative Measures: Contractor will install all temporary best management practices prior to start of construction including the stabilized construction entrance to prevent tracking onto adjoining streets.*

Potential Source: Construction Debris.

> *Preventative Measures: Construction debris will be monitored daily by contractor. Debris will be collected weekly and placed in disposal bins. Situations requiring immediate attention will be addressed on a case by case basis.*

Potential Source: Soil and Mud from Construction Vehicle tires as they leave the site.

> *Preventative Measures: A stabilized construction exit shall be utilized as vehicles leave the site. Any soil, mud, etc. carried from the project onto public roads shall be cleaned up within 24 hours.*

Potential Source: Sediment from soil, sand, gravel and excavated materials stock piled on site.

> *Preventative Measures: Silt fence shall be installed on the down gradient side of the stock piled materials. Reinforced rock berms shall be installed at all downstream discharge locations.*

Potential Source: Portable toilet spill.

> *Preventative Measures: Toilets on the site will be emptied on a regular basis by the contracted toilet company.*

SEQUENCE OF MAJOR ACTIVITIES

Intended Schedule or Sequence of Major Activities:

1. Installation of BMPs (8.36 Acres)
   - Appropriate Temporary BMPs:
     - Stabilized Construction Entrance/Exit
     - Construction Staging Area
2. Site clearing Activities (8.36 Acres)
   - Appropriate Temporary BMPs:
     - Stabilized Construction Entrance/Exit
     - Silt Fence
     - Inlet Protection/Rock Berm
     - Construction Staging Area
3. Earthwork & Grading (8.36 Acres)
   - Appropriate Temporary BMPs:
     - Stabilized Construction Entrance/Exit
     - Silt Fence
     - Inlet Protection/Rock Berm
     - Construction Staging Area
4. Install Storm Drains (0.76 Acres)
   - Appropriate Temporary BMPs:
     - Stabilized Construction Entrance/Exit
     - Construction Staging Area
     - Silt Fence
     - Inlet Protection/ Rock Berms
5. Mill & Overlay of Pavement (4.12 Acres)
   - Appropriate Temporary BMPs:
     - Stabilized Construction Entrance/Exit
     - Silt Fence
     - Inlet Protection
     - Construction Staging Area
6. Sidewalk Paving Activities(0.63 Acres)
   - Appropriate Temporary BMPs:
     - Stabilized Construction Entrance/Exit
     - Silt Fence
     - Construction Staging Area
     - Concrete Washout Pit
     - Inlet Protection
7. Soil Stabilization (8.36 Acres)
   - Appropriate Temporary BMPs:
     - Stabilized Construction Entrance/Exit
     - Silt Fence
     - Inlet Protection/Rock Berm
     - Construction Staging Area
8. Site cleanup and Removal of BMPs (8.36 Acres)
   - Appropriate Temporary BMPs:
     - Stabilized Construction Entrance/Exit
     - Construction Staging Area

TEMPORARY BEST MANAGEMENT PRACTICES AND MEASURES

A: Surface and ground water do not originate up-gradient from the site. Therefore, additional Temporary Best Management Practices and Measures to prevent pollution of surface and ground water will not be required.

Perimeter swales, dikes and slope drains will not be required due to no amount of storm water originating up-gradient from the site. Existing trees and vegetation will be protected to help maintain a stable ground surface and prevent loss of valuable topsoil. Stabilizing measures will be applied, to the maximum extent practicable, after the removal of any vegetative cover and/or altering the soil structure by clearing, grading, and compacting.

B: Surface and ground water does not originate from on-site or flows off-site. Therefore, additional Temporary Best Management Practices and Measures to prevent pollution of surface and ground water will not be required.

Temporary Best Management Practices and Measures will be installed prior to soil disturbing construction activity to prevent pollution caused by contaminated storm water runoff from the site. Silt fencing will be placed along the down-gradient sides of the property to prevent silt from escaping the construction area. Inlet protection will be placed on all inlets. A temporary construction entrance will be placed on site to reduce vehicle "tracking" onto adjoining streets. A concrete washout pit will be used to collect all excess concrete during construction. A construction staging area will be used for equipment storage and vehicle maintenance.

Practices may also be implemented on site for interim and permanent stabilization. Stabilization practices may include but are not limited to: establishment of temporary vegetation, establishment of permanent vegetation, mulching, geotextiles, sod stabilization, vegetative buffer strips, protection of existing trees and vegetation, and other similar measures.

C: As identified in the Geologic Assessment one (1) feature was found within the boundaries of the project. However, no naturally-occurring sensitive features were identified, therefore, Temporary Best Management Practices and Measures to prevent pollutants from entering sensitive features will not be required at this time. The temporary on-site Temporary Best Management Practices and Measures will be used to treat stormwater runoff before it leaves the project and prevent pollutants from entering into surface streams or any sensitive features off-site.

D: According to the Geologic Assessment zero (0) naturally occurring geologic feature were identified during the geologic assessment. Temporary Best Management Practices and Measures used for maintaining flow to naturally –occurring sensitive features identified in the geologic assessment will not be required. The owner, geologist and engineer of record shall be notified immediately if any naturally-occurring sensitive features identified in either an executive director review, or during excavation, blasting, or construction. A Solution Feature Discovery Notification Form will then be submitted to the Texas Commission of Environmental Quality for review.

REQUEST TO TEMPORARILY SEAL A FEATURE

As identified in the Geologic Assessment one (1) Man made geologic feature, a Sewer line, was found within the boundaries of the project. However, this feature is manmade. Therefore, a request to temporarily seal a naturally-occurring sensitive feature will not be required.

STRUCTURAL PRACTICES

Structural practices will be installed to prevent pollution caused by contaminated storm water runoff discharge from exposed areas of the site. Perimeter swales, dikes and slope drains used to divert flows away from exposed soils will not be required due to the small amount of storm water that originates up-gradient from the site. All structural practices will be installed prior to the removal of any vegetative cover and/or altering the soil structure by clearing, grading, and compacting. The location of all structural practices for the subject site is shown on the WPAP Site Plan *(**Exhibit 1**).* Details and specifications for the selected structural practices are provided on ***Exhibit 2***. The following describes the structural practices used.

CONCRETE WASHOUT AREAS

The purpose of concrete washout areas is to prevent or reduce the discharge of pollutants to storm water from concrete waste by conducting washout offsite, performing onsite washout in a designated area, and training employees and subcontractors.

The following steps will help reduce storm water pollution from concrete wastes:

1. Incorporate requirements for concrete waste management into material supplier and subcontractor agreements.
2. Avoid mixing excess amounts of fresh concrete.
3. Perform washout of concrete trucks in designated areas only.
4. Do not wash out concrete trucks into storm drains, open ditches, streets, or streams.
5. Do not allow excess concrete to be dumped onsite, except in designated areas.

For onsite washout:

1. Locate washout area at least 50 feet from sensitive features, storm drains, open ditches, or water bodies. Do not allow runoff from this area by constructing a temporary pit or bermed area large enough for liquid and solid waste.
2. Wash out wastes into the temporary pit where the concrete can set, be broken up, and then disposed properly.

Below grade concrete washout facilities are typical. These consist of a lined excavation sufficiently large to hold expected volume of washout material. Above grade facilities are used if excavation is not practical. Temporary concrete washout facility (type above grade) should be constructed as shown on the details at the end of this section, with sufficient quantity and volume to contain all liquid and concrete waste generated by washout operations. Plastic lining material should be a minimum of 10mil in polyethylene sheeting and should be free of holes, tears, or other defects that compromise the impermeability of the material.

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

SILT FENCE

A silt fence is a barrier consisting of geotextile fabric supported by metal posts to prevent soil and sediment loss from a site. When properly used, silt fences can be highly effective at controlling sediment from disturbed areas. They cause runoff to pond, allowing heavier solids to settle out. If not properly installed, silt fences are not likely to be effective.

The purpose of a silt fence is to intercept and detain water-borne sediment from unprotected areas of a limited extent. Silt fence is used during the period of construction near the perimeter of a disturbed area to intercept sediment while allowing water to percolate through. This fence should remain in place until the disturbed area is permanently stabilized. Silt fence should not be used where there is a concentration of water in a channel or drainage way. If concentrated flow occurs after installation, corrective action must be taken such as placing a rock berm in the areas of concentrated flow.

Silt fencing within the site may be temporarily moved during the day to allow construction activity provided it is replaced and properly anchored to the ground at the end of the day. Silt fences on the perimeter of the site or around drainage ways should not be moved at any time.

Materials:

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

Installation:

1. Steel posts, which support the silt fence, should be installed on a slight angle toward the anticipated runoff source. Post must be embedded a minimum of 1-foot deep and spaced not more than 8 feet on center. Where water concentrates, the maximum spacing should be 6 feet.
2. Lay out fencing down-slope of disturbed area, following the contour as closely as possible. The fence should be sited so that the maximum drainage area is ¼ acre/100 feet of fence.
3. The toe of the silt fence should be trenched in with a spade or mechanical trencher, so that the down-slope face of the trench is flat and perpendicular to the line of flow. Where fence cannot be trenched in (e.g., pavement or rock outcrop), weight fabric flap with 3 inches of pea gravel on uphill side to prevent flow from seeping under fence.
4. The trench must be a minimum of 6 inches deep and 6 inches wide to allow for the silt fence fabric to be laid in the ground and backfilled with compacted material.
5. Silt fence should be securely fastened to each steel support post or to woven wire, which is in turn attached to the steel fence post. There should be a 3-foot overlap, securely fastened where ends of fabric meet.
6. Silt fence should be removed when the site is completely stabilized so as not to block or impede storm flow or drainage.

Common Trouble Points:

1. Fence not installed along the contour causing water to concentrate and flow over the fence.
2. Fabric not seated securely to ground (runoff passing under fence)
3. Fence not installed perpendicular to flow line (runoff escaping around sides)

4. Fence treating too large an area, or excessive channel flow (runoff overtops or collapses fence)

TEMPORARY CONSTRUCTION ENTRANCE/EXIT

The purpose of a temporary gravel construction entrance is to provide a stable entrance/exit condition from the construction site and keep mud and sediment off public roads. A stabilized construction entrance is a stabilized pad of crushed stone located at any point traffic will be entering or leaving the construction site from a public right-of-way, street, alley, sidewalk, or parking area. The purpose of a stabilized construction entrance is to reduce or eliminate the tracking or flowing of sediment onto public rights-of-way. This practice should be used at all points of construction ingress and egress.

Excessive amounts of mud can also present a safety hazard to roadway users. To minimize the amount of sediment loss to nearby roads, access to the construction site should be limited to as few points as possible and vegetation around the perimeter should be protected were access is not necessary. A rock stabilized construction entrance should be used at all designated access points.

Materials:

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

Installation: (North Carolina, 1993)

1. Avoid curves on public roads and steep slopes. Remove vegetation and other objectionable material from the foundation area. Grade crown foundation for positive drainage.
2. The minimum width of the entrance/exit should be 12 feet or the full width of exit roadway, whichever is greater.
3. The construction entrance should be at least 50 feet long.
4. If the slope toward the road exceeds 2%, construct a ridge, 6 to 8 inches high with 3:1 (H:V) side slopes, across the foundation approximately 15 feet from the entrance to divert runoff away from the public road.
5. Place geotextile fabric and grade foundation to improve stability, especially where wet conditions are anticipated.
6. Place stone to dimensions and grade shown on plans. Leave surface smooth and slope for drainage.
7. Divert all surface runoff and drainage from the stone pad to a sediment trap or basin.
8. Install pipe under pad as needed to maintain proper public road drainage.

Common trouble points:

1. Inadequate runoff control – sediment washes onto public road.

2. Stone too small or geotextile fabric absent, results in muddy condition as stone is pressed into soil.
3. Pad too short for heavy construction traffic – extend pad beyond the minimum 50 foot length as necessary.
4. Pad not flared sufficiently at road surface, results in mud being tracked on to road and possible damage to road edge.
5. Unstable foundation – use geotextile fabric under pad and/or improve foundation drainage.

INLET PROTECTION

Storm sewers that are made operational prior to stabilization of the associated drainage areas can convey large amounts of sediment to natural drainage ways. In case of extreme sediment loading, the storm sewer itself may clog and lose a major portion of its capacity. To avoid these problems, it is necessary to prevent sediment from entering the system at the inlets. The following guidelines for inlet protection are based primarily on recommendations by the Virginia Dept. of Conservation and Recreation (1992) and the North Central Texas Council of Governments (NCTCOG, 1993b).

In developments for which drainage is to be conveyed by underground storm sewers (i.e., streets with curbs and gutters), all inlets that may receive storm runoff from disturbed areas should be protected. Temporary inlet protection is a series of different measures that provide protection against silt transport or accumulation in storm sewer systems. This clogging can greatly reduce or completely stop the flow in the pipes. The different measures are used for different site conditions and inlet types.

Care should be taken when choosing a specific type of inlet protection. Field experience has shown that inlet protection that causes excessive ponding in an area of high construction activity may become so inconvenient that it is removed or bypassed, thus transmitting sediment-laden flows unchecked. In such situations, a structure with an adequate overflow mechanism should be utilized.

It should also be noted that inlet protection devices are designed to be installed on construction sites and not on streets and roads open to the public. When used on public streets these devices will cause ponding of runoff, which can cause minor flooding and can present a traffic hazard. An example of appropriate siting would be a new subdivision where the storm drain system is installed before the area is stabilized and the streets open to the general public. When construction occurs adjacent to active streets, the sediment should be controlled on site and not on public thoroughfares. Occasionally, roadwork or utility installation will occur on public roads. In these cases, inlet protection is an appropriate temporary BMP.

The following inlet protection devices are for drainage areas of one acre or less. Runoff from larger disturbed areas should be routed to a temporary sediment trap or basin. Filter barrier protection using silt fence is appropriate when the drainage area is less than one acre and the basin slope is less than five percent. This type of protection is not applicable in paved areas.

Block and gravel protection is used when flows exceed 0.5 cubic feet per second and it is necessary to allow for overtopping to prevent flooding. This form of protection is also useful for curb type inlets as it works well in paved areas.

Wire mesh and gravel protection is used when flows exceed 0.5 cubic feet per second and construction traffic may occur over the inlet. This form of protection may be used with both curb and drop inlets.

Excavated impoundment protection around a drop inlet may be used for protection against sediment entering a storm drain inlet. With this method, it is necessary to install weep holes to allow the impoundment to drain completely. If this measure is implemented, the impoundment should be sized such that the volume of excavation is 3,600 cubic feet per acre (equivalent to 1 inch of runoff) of disturbed area entering the inlet.

Materials:

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

Guidelines for installation:

Silt Fence Drop Inlet Protection

1. Silt fence should conform to the specifications listed above and should be cut from a continuous roll to avoid joints.
2. For stakes, use 2 x 4-inch wood or equivalent metal with a minimum length of 3 feet.
3. Space stakes evenly around the perimeter of the inlet a maximum of 3 feet apart, and securely drive them into the ground, approximately 18 inches deep.
4. To provide needed stability to the installation, a frame with 2 x 4- inch wood strips around the crest of the overflow area at a maximum of 1½ feet above the drop inlet crest should be provided.
5. Place the bottom 12 inches of the fabric in a trench and backfill the trench with 12 inches of compacted soil.
6. Fasten fabric securely by staples or wire to the stakes and frame. Joints must be overlapped to the next stake.
7. It may be necessary to build a temporary dike on the down slope side of the structure to prevent bypass flow.

If the drop inlet is above the finished grade, the grate may be completely covered with filter fabric. The fabric should be securely attached to the entire perimeter of the inlet using 1"x 2" wood strips and appropriate fasteners.

Gravel and Wire Mesh Drop Inlet Sediment Filter

1. Wire mesh should be laid over the drop inlet so that the wire extends a minimum of 1 foot beyond each side of the inlet structure. Wire mesh with 1/2-inch openings should be used. If more than one strip of mesh is necessary, the strips should be overlapped.
2. Coarse aggregate should be placed over the wire mesh. The depth of stone should be at least 12 inches over the entire inlet opening. The stone should extend beyond the inlet opening at least 18 inches on all sides.
3. If the stone filter becomes clogged with sediment so that it no longer adequately performs its function, the stones must be pulled away from the inlet, cleaned and/or replaced.

Note: This filtering device has no overflow mechanism; therefore, ponding is likely especially if sediment is not removed regularly. This type of device should never be used where overflow may endanger an exposed fill slope. Consideration should also be given to the possible effects of ponding on traffic movement, nearby structures, working areas, adjacent property, etc.

Block and Gravel Drop Inlet Sediment Filter

1. Place concrete blocks lengthwise on their sides in a single row around the perimeter of the inlet, with the ends of adjacent blocks abutting. The height of the barrier can be varied, depending on design needs, by stacking combinations of 4-inch, 8-inch and 12- inch wide blocks. The barrier of blocks should be between 12 and 24 inches high.
2. Wire mesh should be placed over the outside vertical face (webbing) of the concrete blocks to prevent stone from being washed through the holes in the blocks. Wire mesh with 1/2-inch openings should be used.
3. Stone should be piled against the wire to the top of the block barrier.
4. If the stone filter becomes clogged with sediment so that it no longer adequately performs its function, the stone must be pulled away from the blocks, cleaned and replaced.

Block and Gravel Curb Inlet Sediment Filter

1. Two concrete blocks should be placed on their sides abutting the curb at either side of the inlet opening.
2. A 2”X4” stud should be cut and placed through the outer holes of each spacer block to help keep the front blocks in place.
3. Concrete blocks should be placed on their sides across the front of the inlet and abutting the spacer blocks.
4. Wire mesh should be placed over the outside vertical face (webbing) of the concrete blocks to prevent stone from being washed through the holes in the blocks. Wire mesh with 1/2-inch openings should be used.
5. Coarse aggregate should be piled against the wire to the top of the barrier.
6. If the stone filter becomes clogged with sediment so that it no longer adequately performs its function, the stone must be pulled away from the blocks, cleaned and/or replaced.

Excavated Drop Inlet Sediment Trap

1. The excavated trap should be sized to provide a minimum storage capacity calculated at 3,600 cubic feet per acre of drainage area. A trap should be no less than 1-foot nor more than 2 feet deep measured from the top of the inlet structure. Side slopes should not be steeper than 2:1.
2. The slope of the basin may vary to fit the drainage area and terrain. Observations must be made to check trap efficiency and modifications should be made as necessary to ensure satisfactory trapping of sediment. Where an inlet is located so as to receive concentrated flows, such as in a highway median, it is recommended that the basin have a rectangular shape in a 2:1 (length/width) ratio, with the length oriented in the direction of the flow.
3. Sediment should be removed and the trap restored to its original dimensions when the sediment has accumulated to one- half the design depth of the trap. Removed

sediment should be deposited in a suitable area and in a manner such that it will not erode.

Curb Inlet Protection with 2-inch x 4-inch Wooden Weir

1. Attach a continuous piece of wire mesh (30-inch minimum width x inlet throat length plus 4 feet) to the 2-inch x 4-inch wooden weir (with a total length of throat length plus 2 feet). Wood should be “construction grade” lumber.
2. Place a piece of approved filter cloth of the same dimensions as the wire mesh over the wire mesh and securely attach to the 2- inch x 4- inch weir.
3. Securely nail the 2-inch x 4-inch weir to the 9-inch long vertical spacers which are to be located between the weir and inlet face at a maximum 6- foot spacing.
4. Place the assembly against the inlet throat and nail 2-foot (minimum) lengths of 2-inch x 4- inch board to the top of the weir at spacer locations. These 2- inch x 4-inch anchors should extend across the inlet tops and be held in place by sandbags or alternate weight.
5. The assembly should be placed so that the end spacers are a minimum 1 foot beyond both ends of the throat opening.
6. Form the wire mesh and filter cloth to the concrete gutter and against the face of curb on both sides of the inlet. Place coarse aggregate over the wire mesh and filter fabric in such a manner as to prevent water from entering the inlet under or around the filter cloth.
7. This type of protection should be inspected frequently and the filter cloth and stone replaced when clogged with sediment.
8. Assure that storm flow does not bypass inlet by installing temporary earth or asphalt dikes directing flow into inlet.

Bagged Gravel Inlet Filter

Sandbags filled with pea gravel can also be used to construct a sediment barrier around curb and drain inlets. The sandbags should be filled with washed pea gravel and stacked to form a continuous barrier about 1 foot high around the inlets. The bags should be tightly abutted against each other to prevent runoff from flowing between the bags.

Common Trouble Points:

1. Gaps between the inlet protection and the curb (flows bypass around side of filter).
2. Filter fabric skirt not anchored to pavement (flows pass under filter).

DRAINAGE AREA MAP

There are no areas greater than 10 acres within a common drainage area that will be disturbed at one time. The Existing and Proposed Drainage Area Maps are provided at the end of this form, in ***Exhibit 3*** and ***Exhibit 4***, respectively. Erosion and sediment controls will be used within each disturbed drainage area as discussed in ***Attachment D.***

TEMPORARY SEDIMENT POND(S) PLANS AND CALCULATIONS

The proposed development will not disturb areas over 10 acres. Therefore, temporary sediment pond(s) plans and calculations will not be required.

INSPECTION AND MAINTENANCE FOR BMPS

MAINTENANCE

All temporary and sediment control BMPs will be maintained and repaired as needed to assure continued performance of their intended function. All maintenance and repair of BMPs will be conducted in accordance with manufacturers' specifications.

All temporary erosion and sediment control BMPs will be removed within 30 days after final site stabilization is achieved or after the temporary BMPs are no longer needed. Trapped sediment will be removed or stabilized on site. Disturbed soil areas resulting from removal of BMPs or vegetation will be permanently stabilized as soon as possible.

Erosion and sediment controls are designed to prevent soil erosion and sediment migration offsite, to the extent practicable, which may result from construction activity. This design considers local topography, soil type, and rainfall.

Control measures must be installed and maintained according to the manufacturer's specifications. If periodic inspections or other information indicates a control has been used inappropriately, or incorrectly, the permitee must replace or modify the control for site situations.

If sediment escapes the construction site, off-site accumulations of sediment must be removed at a frequency sufficient to minimize off-site impacts, and whenever feasible, prior to the next rain event.

The controls must be installed, maintained, and operated in a manner that will limit, to the extent practicable, offsite transport of litter, construction debris, and construction materials.

INSPECTIONS

An inspection will be performed by the qualified personnel, as designated by the permitee, on a weekly basis and after any rainfall event. An inspection and maintenance report shall be made per inspection. An inspection form has been included in this report and in the SWPPP. Based on the inspection results, the controls shall be corrected before the next scheduled inspection.

A log of inspection results will be maintained on-site and will include the name of the inspector, date, major observations, and necessary corrective measures. Reports of maintenance and inspection activities will be maintained on-site, in conformance with the TPDES permit conditions. Reports must identify any incidents of non-compliance. Where a report does not identify any incidents of non-compliance, the report must contain a certification that the facility or site is in compliance with the SWPPP. This report must be signed by the responsible party.

Major observations shall, at a minimum, include the following:

- The locations of discharges of sediment or other pollutants from the site;
- Locations of BMPs that need to be maintained;
- Locations of BMPs that failed to operate as designed or proved inadequate for a particular location; and
- Location where additional BMPs are needed.

All needed repairs or modifications will be reported to the contractors to permit the timely implementation of required actions. Necessary repairs of modifications will be implemented within

seven days of inspection. The SWPPP will be modified within seven days to reflect any modifications to measures as a result of inspection.
The SWPPP must be amended whenever there is a change in design, construction, operation or maintenance that has a significant effect on the discharge of pollutants to the waters of the United States that was not addressed in the SWPPP.
The SWPPP must be amended when inspections or investigations by site operations, local, state or federal officials indicate that the SWPPP is proving ineffective in eliminating or significantly minimizing pollutants from the construction site or otherwise is not achieving the general objectives of controlling pollutants in storm water discharges associated with construction activity.

INSPECTION FORM

Project Name: **Owner (s)/Operator (s):** **Permit Numbers(s):** **Inspection Date:**	***NOT APPLICABLE***	***IN COMPLIANCE***	***NEEDS CORRECTION***	***COMMENTS***
RECORD KEEPING				
SWP3 Current				
NOI and Permit Posted				
BEST MANAGEMENT PRACTICES (BMPs)				
Vegetative Buffers				
Soil Covering(Including mulch and temporary vegetation)				
Outlet Protection				
Sediment Control Basins				
Silt Fence				
Stabilized Entrances/Exits				
Construction Staging Areas				
Inlet Protection				
Gravel Filter Bags				
Vegetated Filter Strip				
Concrete Truck Washout Pit				
Trash Receptacles				
General Site Cleanliness				
Other				
Other				
Other				

MAJOR OBSERVATIONS

_____

_____

_____

CERTIFICATION

"I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations."

"I further certify I am an authorized signatory in accordance with the provisions of 30 TAC §305.128."

INSPECTOR NAME/SIGNATURE:_____ DATE:_____
(Inspector must attach a brief summary of qualifications to this report.)

OWNER NAME/SIGNATURE:_____ DATE:_____
(Inspector must attach a brief summary of qualifications to this report.)

SCHEDULE OF INTERIM AND PERMANENT SOIL STABILIZATION

Construction practices shall disturb the minimal amount of existing ground cover as required for land clearing, grading, and construction activity for the shortest amount of time possible to minimize the potential of erosion and sedimentation from the site. Existing vegetation shall be maintained and left in place until it is necessary to disturb for construction activity. For this project the following stabilization practices will be implemented:

1. Hydraulic Mulch and Seeding: Disturbed areas subject to erosion shall be stabilized with hydraulic mulch/seeding and watered to provide interim stabilization. Hydraulic mulch and seeding will begin immediately once grading activities have been completed, a minimum of 85% vegetative cover will be established to provide permanent stabilization.

2. Vegetative Filter Strips: are vegetated sections of land similar to grassy swales, except they are essentially flat with low slopes, and are designed only to accept runoff as overland sheet flow. Vegetative filter strips are to be implemented as shown on Exhibit 1 "Temporary/Permanent BMP Site Plan" of this report. The main purpose of filter strips is to treat runoff from portions of the proposed drive and also area shown to be cleared and graded.

3. Grassy Swales: are vegetated channels that convey stormwater and remove pollutants by sedimentation and infiltration through soil. They require shallow slopes and soils that drain well. Pollutant removal capability is related to channel dimensions, longitudinal slope, and amount of vegetation. Optimum design of these components will increase contact time of runoff through the swale and improve pollutant removal rates. Grassy swales are to be implemented as shown on Exhibit 1 "Temporary/Permanent BMP Site Plan" of this report. The main purpose of grassy swales is to accept runoff previously treated by the Vegetative Filter Strips and convey it to an underground storm drain system.

Records of the following shall be maintained by the permitee in the attached Project Timeline:

a) The dates when major grading activities occur;

b) The dates when construction activities temporarily or permanently cease on a portion of the site; and

c) The dates when stabilization measures are initiated.

Stabilization measures must be initiated as soon as practical in portions of the site where construction activities have temporarily or permanently ceased, and except as provided in the following, must be initiated no more that fourteen (14) days after the construction activity in that portion of the site has temporarily or permanently ceased:

Where the initiation of stabilization measures by the 14th day after construction activity temporarily or permanently ceased is precluded by snow cover or frozen ground conditions, stabilization measures must be initiated as soon as practical.

Where construction activity on a portion of the site is temporarily ceased and earth disturbing activities will be resumed within twenty-one (21) days, temporary stabilization measures do not have to be initiated on that portion of the site.

In arid areas (areas with an average rainfall of 0-10 inches), semiarid areas (areas with an average annual rainfall of 10 to 20 inches), and areas experiencing droughts where the initiation of stabilization measures by the 14th day after construction activity has temporarily or permanently ceased is precluded by seasonably arid conditions, stabilization measures must be initiated as soon as practical.

PROJECT TIMELINE

DATES WHEN MAJOR GRADING ACTIVITIES OCCUR	
Date	Construction Activity

DATES WHEN CONSTRUCTION ACTIVITIES TEMPORARILY OR PERMANENTLY CEASE	
Date	Construction Activity

DATES WHEN STABILIZATION MEASURES ARE INITIATED	
Date	Stabilization Activity

SECTION 6
PERMANENT STORMWATER

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: Riley John

Date: 2/17/23

Signature of Customer/Agent

Regulated Entity Name: City of Shavano Park

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

20% OR LESS IMPERVIOUS COVER WAIVER

The site will not be used for Multifamily residential developments, schools or small business sites therefore, a 20% or less impervious cover will not be requested for this project.

BMPS FOR UP-GRADIENT STORMWATER

While ground water do not originate up-gradient from the site, Surface water does. Up-gradient runoff currently crosses the site through a pair of culverts. Up-gradient runoff will not be exposed to the increased impervious cover as storm sewer and culverts will pick up up-gradient water prior to exposure to the increase impervious cover and discharge it after all proposed increases.

BMPS FOR ON-SITE STORMWATER

Onsite Drainage areas contain a total of 0.62 acres of additional impervious cover. This increase in impervious cover consists of sidewalk that will flank the existing roadway. This drainage area will be treated with Vegetated filter strips to treat the necessary TSS amount.

BMPS FOR SURFACE STREAMS

As identified in the Geologic Assessment One (0) naturally occurring feature were found within the boundaries of the project. Therefore, there are no measures required to prevent pollutants from entering surface streams or sensitive features.

REQUEST TO SEAL A FEATURE

As identified in the Geologic Assessment zero (0) naturally occurring geologic features were found within the boundaries of the project. Therefore, a request to permanently seal a naturally-occurring sensitive feature will not be required.

CONSTRUCTION PLANS

Calculations to meet the load removal requirements for the project and the load removal provided by the permanent BMP's are shown in the attached spreadsheet which have been signed and sealed by a professional engineer licensed in the state of Texas. The load removal requirements are derived from the equations from the technical guidance manual addendum based upon project area and increase in impervious cover. All stormwater runoff from impervious areas will be treated by the proposed permanent BMP's, removing the required 80% of the increase in Total Suspended Solids. Provided within the calculations is a summary of the amount of pollutant load required to be removed from the drainage areas and the amount of removal provided by the permanent BMP's. In addition, the table below has been provided for convenience for the TSS removal calculations per BMP type

Drainage Area	Total Developable Area (Acres)	Impervious Cover (Acres)	Impervious Cover (%)	Required TSS Reduction (lbs/year)	Actual TSS Reduction (lbs/year)	Proposed BMP's	Required Water Quality Volume (cu. ft.)
DA-A1	8.36	0.63	7.5%	651	790	Vegetative Filter Strip	3,460

Construction plans, details, specifications, and construction notes are provided in ***Exhibit 5*** which is attached at the end of this report under the appropriate tab.

INSPECTION, MAINTENANCE, REPAIR AND RETROFIT PLAN

INSPECTION, MAINTENANCE, REPAIR AND RETROFIT PLAN

PERMANENT BEST MANAGEMENT PRACTICES INSPECTION AND MAINTENANCE PLAN

The attached inspection and maintenance plan outlines the procedures necessary to maintain the performance of the Permanent Best Management Practices for this project. It should be noted that the plan provides guidelines that may have to be adjusted dependent on site specific and weather related conditions.

It is the responsibility of the owner to contract with a representative to provide the inspections and maintenance as outlined in the plan for the duration of the project. The owner will maintain this responsibility until it is assumed or transferred to another entity in writing. If the property is leased or sold, the responsibility for the maintenance will be required to be transferred through the lease agreement, binding covenants, closing documents, or other binding legal instrument.

I, the owner, have read and understand the requirements of the attached Inspection and Maintenance Plan for the proposed Permanent Best Management Practices for my project. I acknowledge that I will maintain responsibility for the implementation and execution of the plan until the responsibility is transferred to or assumed by another party in writing through a binding legal instrument.

Owner: Date

MAINTENANCE OF VEGETATIVE FILTER STRIPS

Once a vegetative 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 insure the health of the plants including:

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

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

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

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

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

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

PILOT-SCALE FIELD TESTING PLAN

Pilot-scale field testing will not be implemented on this project.

MEASURES FOR MINIMIZING SURFACE STREAM CONTAMINATION

Contaminated stormwater runoff from the proposed site will enter the water quality devices proposed for this project. Storm water will be filtered and the cleansed water will be released at a point consistent with existing hydrology conditions. Therefore, there will be no changes in the way in which water enters a stream as a result of the construction and development.

SECTION 7
ADDITIONAL FORMS

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

I Bill Hill,
Print Name

City Manager,
Title - Owner/President/Other

of Shavano Park,
Corporation/Partnership/Entity Name

have authorized Riley John
Print Name of Agent/Engineer

of KFW Management 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:

Bill Hill — 2/15/2023

Applicant's Signature — Date

THE STATE OF Texas §

County of Bexar §

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

GIVEN under my hand and seal of office on this 15th day of February. 2023

Marisa Knuffke

NOTARY PUBLIC

MARISA KNUFFKE
Notary Public, State of Texas
Comm. Expires 06-12-2025
Notary ID 124974607

Marisa Knuffke

Typed or Printed Name of Notary

MY COMMISSION EXPIRES: 6/12/25

Application Fee Form

Texas Commission on Environmental Quality
Name of Proposed Regulated Entity: De Zavala ROW in Shavano Park
Regulated Entity Location: Along De Zavala Rd between Northwest Military and Lockhill Selma
Name of Customer: City of Shavano Park
Contact Person: Bill Hill Phone: 210-493-3478
Customer Reference Number (if issued):CN 600659338
Regulated Entity Reference Number (if issued):RN _____

Austin Regional Office (3373)

☐ Hays ☐ Travis ☐ Williamson

San Antonio Regional Office (3362)

☒ Bexar ☐ Medina ☐ Uvalde
☐ Comal ☐ Kinney

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

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

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

Site Location (Check All That Apply):

☒ Recharge Zone ☐ Contributing Zone ☐ Transition Zone

Type of Plan	*Size*	*Fee Due*
Water Pollution Abatement Plan, Contributing Zone Plan: One Single Family Residential Dwelling	Acres	$
Water Pollution Abatement Plan, Contributing Zone Plan: Multiple Single Family Residential and Parks	Acres	$
Water Pollution Abatement Plan, Contributing Zone Plan: Non-residential	8.36 Acres	$ 5,000
Sewage Collection System	L.F.	$
Lift Stations without sewer lines	Acres	$
Underground or Aboveground Storage Tank Facility	Tanks	$
Piping System(s)(only)	Each	$
Exception	Each	$
Extension of Time	Each	$

Signature: Bill Hill Date: 2/15/2023

Application Fee Schedule

Texas Commission on Environmental Quality
Edwards Aquifer Protection Program 30 TAC Chapter 213 (effective 05/01/2008)

Water Pollution Abatement Plans and Modifications

Contributing Zone Plans and Modifications

Project	*Project Area in Acres*	*Fee*
One Single Family Residential Dwelling	< 5	$650
Multiple Single Family Residential and Parks	< 5 5 < 10 10 < 40 40 < 100 100 < 500 ≥ 500	$1,500 $3,000 $4,000 $6,500 $8,000 $10,000
Non-residential (Commercial, industrial, institutional, multi-family residential, schools, and other sites where regulated activities will occur)	< 1 1 < 5 5 < 10 10 < 40 40 < 100 ≥ 100	$3,000 $4,000 $5,000 $6,500 $8,000 $10,000

Organized Sewage Collection Systems and Modifications

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

Underground and Aboveground Storage Tank System Facility Plans and Modifications

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

Exception Requests

Project	*Fee*
Exception Request	$500

Extension of Time Requests

Project	*Fee*
Extension of Time Request	$150

Application Fee Form

Texas Commission on Environmental Quality

Name of Proposed Regulated Entity: De Zavala ROW in Shavano Park

Regulated Entity Location: Along De Zavala Rd between Northwest Military and Lockhill Selma

Name of Customer: City of Shavano Park

Contact Person: Bill Hill Phone: 210-493-3478

Customer Reference Number (if issued):CN 600659338

Regulated Entity Reference Number (if issued):RN _____

Austin Regional Office (3373)

☐ Hays ☐ Travis ☐ Williamson

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

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12100 Park 35 Circle
Building A, 3rd Floor
Austin, TX 78753
(512)239-0357

Site Location (Check All That Apply):

☒ Recharge Zone ☐ Contributing Zone ☐ Transition Zone

Type of Plan	***Size***	***Fee Due***
Water Pollution Abatement Plan, Contributing Zone Plan: One Single Family Residential Dwelling	Acres	$
Water Pollution Abatement Plan, Contributing Zone Plan: Multiple Single Family Residential and Parks	Acres	$
Water Pollution Abatement Plan, Contributing Zone Plan: Non-residential	8.36 Acres	$ 5,000
Sewage Collection System	L.F.	$
Lift Stations without sewer lines	Acres	$
Underground or Aboveground Storage Tank Facility	Tanks	$
Piping System(s)(only)	Each	$
Exception	Each	$
Extension of Time	Each	$

Signature: _____ Date: 2/22/23

Application Fee Schedule

Texas Commission on Environmental Quality
Edwards Aquifer Protection Program 30 TAC Chapter 213 (effective 05/01/2008)

Water Pollution Abatement Plans and Modifications

Contributing Zone Plans and Modifications

Project	*Project Area in Acres*	*Fee*
One Single Family Residential Dwelling	< 5	$650
Multiple Single Family Residential and Parks	< 5 5 < 10 10 < 40 40 < 100 100 < 500 ≥ 500	$1,500 $3,000 $4,000 $6,500 $8,000 $10,000
Non-residential (Commercial, industrial, institutional, multi-family residential, schools, and other sites where regulated activities will occur)	< 1 1 < 5 5 < 10 10 < 40 40 < 100 ≥ 100	$3,000 $4,000 $5,000 $6,500 $8,000 $10,000

Organized Sewage Collection Systems and Modifications

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

Underground and Aboveground Storage Tank System Facility Plans and Modifications

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

Exception Requests

Project	*Fee*
Exception Request	$500

Extension of Time Requests

Project	*Fee*
Extension of Time Request	$150

TCEQ Use Only

TCEQ Core Data Form

For detailed instructions on completing 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 600659338		**RN**

SECTION II: Customer Information

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

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

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

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

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 ☐ Local ☐ 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 ☐ VCP/BSA 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, a new permit application is also required.)*

☒ 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 Core 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.)*

Dezavala ROW in Shavano Park

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

If no Street Address is provided, fields 25-28 are required.

25. Description to Physical Location:	Regulated entity consists of the ROW for De Zavala Rd between Northwest military Highway and Lockhill Selma. Approx 0.85 miles northeast from Lockhill Selma to Northwest Military Highway				
26. Nearest City			**State**	**Nearest ZIP Code**	
Shavano Park			Tx	78231	

Latitude/Longitude are required and may be added/updated to meet TCEQ Core Data Standards. (Geocoding of the Physical Address may be used to supply coordinates where none have been provided or to gain accuracy).

27. Latitude (N) In Decimal:	29.580695		**28. Longitude (W) In Decimal:**	-98.559243	
Degrees	Minutes	Seconds	Degrees	Minutes	Seconds
29	34	50.5	98	33	33.3

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	237990

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

public roadway

34. Mailing Address:	**900 Saddle tree Ct**							
	City	**Shavano Park**	**State**	**TX**	**ZIP**	**78231**	**ZIP + 4**	
35. E-Mail Address:	**Citymanager@shavanopark.org**							

36. Telephone Number	**37. Extension or Code**	**38. Fax Number** *(if applicable)*
(210) 493-3478		( ) -

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	☐ Wastewater	☐ Wastewater Agriculture	☐ Water Rights	☐ Other:

SECTION IV: Preparer Information

40. Name:	Riley John	**41. Title:**	Project Manager

42. Telephone Number	**43. Ext./Code**	**44. Fax Number**	**45. E-Mail Address**
(210 **)** 979-8444		**(** 210 **)** 979-8441	rjohn@kfwengineers.com

SECTION V: Authorized Signature

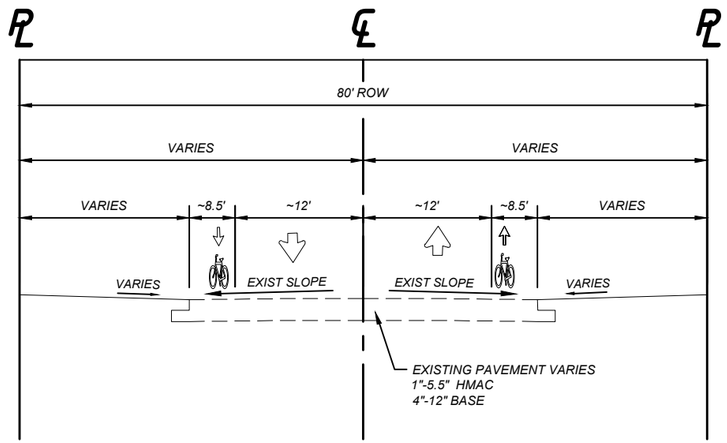
46. By my signature below, I certify, to the best of my knowledge, that the information provided in this form is true and complete, and that I have signature authority to submit this form on behalf of the entity specified in Section II, Field 6 and/or as required for the updates to the ID numbers identified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

Company:	Kfw Engineers	**Job Title:**	Project Manager	
Name *(In Print):*	Riley John		**Phone:**	**(** 210 **)** 979- **8444**
Signature:			**Date:**	2/17/23

SECTION 8
EXHIBITS

GENERAL NOTES

1. PAVEMENT DESIGN THICKNESS BASED ON THE GEOTECHNICAL REPORT BY TERRACON DATED MAY 20, 2022, TITLED "SHAVANO PARK STREET IMPROVEMENTS"
2. REFER TO MISCELLANEOUS CONSTRUCTION STANDARDS 1 - SHEET XXX OF 93 FOR STANDARD CURB DETAIL.
3. TYPICAL CROSS SECTIONS SHALL BE 2% SLOPE WITH CROWN UNLESS OTHERWISE SHOWN ON PLANS.



EXISTING TYPICAL SECTION

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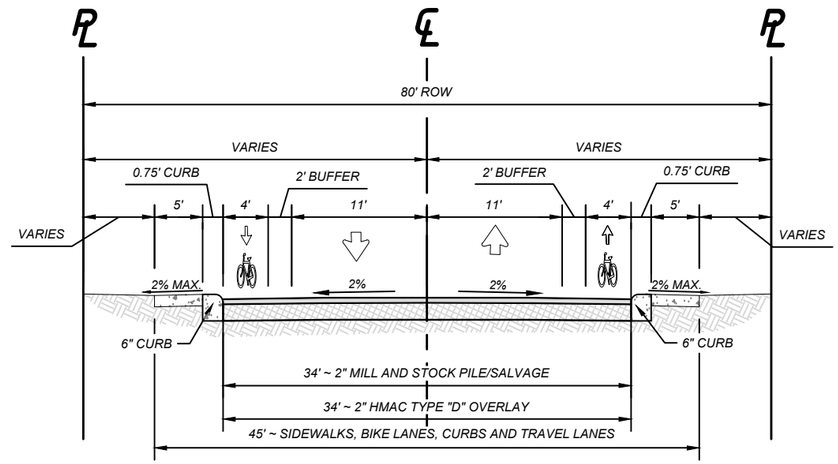


PROPOSED TYPICAL SECTION

NOT TO SCALE

STATE OF TEXAS
3/1 23
Riley McKinley John
133632
LICENSED
PROFESSIONAL ENGINEER

DATE	No.	REVISION	APPROVAL

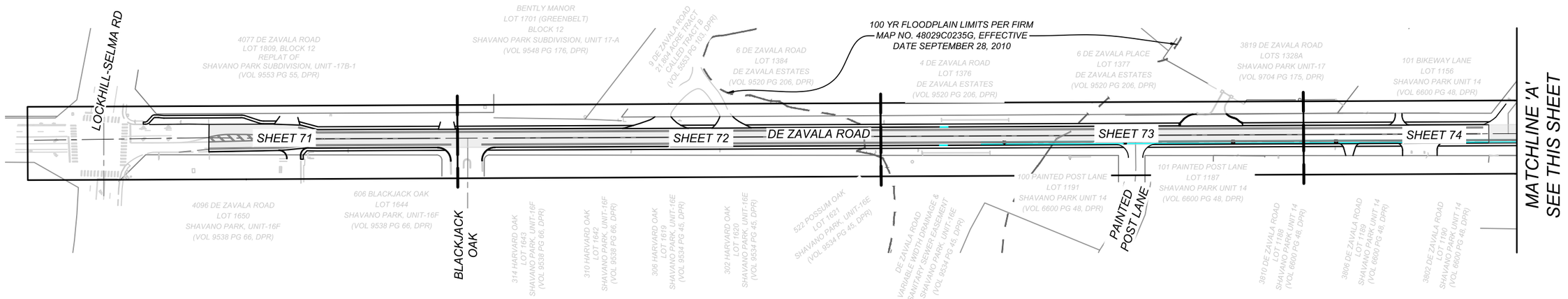
KFW ENGINEERS + SURVEYING
3421 Paesanos Pkwy, Suite 200
San Antonio, TX 78231
Phone #: (210) 979-8444
Fax #: (210) 979-8441
TBPE Firm #: 9513
TBPLS Firm #: 10122300

CITY OF SHAVANO PARK

DE ZAVALA RECONSTRUCTION & DRAINAGE IMPROVEMENTS

DE ZAVALA ROAD RECONSTRUCTION
TYPICAL PAVEMENT SECTIONS

60% SUBMITTAL	PROJECT NO.: 622-13-01		DATE: Feb-23
DRWN. BY: AB	DSGN. BY: DB	CHKD. BY: RJ	SHEET NO.: 6 OF 93



LEGEND

- PROPOSED CONSTRUCTION EQUIPTMENT, VEHICLE & MATERIALS STORAGE AREA
- PROPOSED STABILIZED CONSTRUCTION ENTRANCE AND EXIT
- 2"-4" RIVER ROCK
- HYDROMULCH AND TOP SOIL (2' BEHIND CURB ONLY, 4" DEPTH)
- ROCK BERM
- PROPOSED CONCRETE TRUCK WASHOUT PIT
- SCF — PROPOSED SEDIMENT CONTROL FENCE
- CL — EROSION CONTROL LOG
- IP — PROPOSED INLET PROTECTION
- RFD — PROPOSED ROCK FILTER DAM
- PROPOSED FLOW DIRECTION
- PROPOSED SWALE (REF. SHEET 307 FOR TYPICAL DETAIL)

SCALE : 1"=200'

0' 200' 400'

STATE OF TEXAS
3/1 23
Riley McKinley John
133632
LICENSED PROFESSIONAL ENGINEER

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CITY OF SHAVANO PARK

DE ZAVALA RECONSTRUCTION & DRAINAGE IMPROVEMENTS

DE ZAVALA ROAD RECONSTRUCTION SW3P SHEET INDEX

60% SUBMITTAL	PROJECT NO.: 622-13-01		DATE: Jan-23
DRWN. BY: AB	DSGN. BY: DB	CHKD. BY: RJ	SHEET NO.: 70 OF 93

Date: Jan 20, 2023, 9:00am User ID: rmwarren
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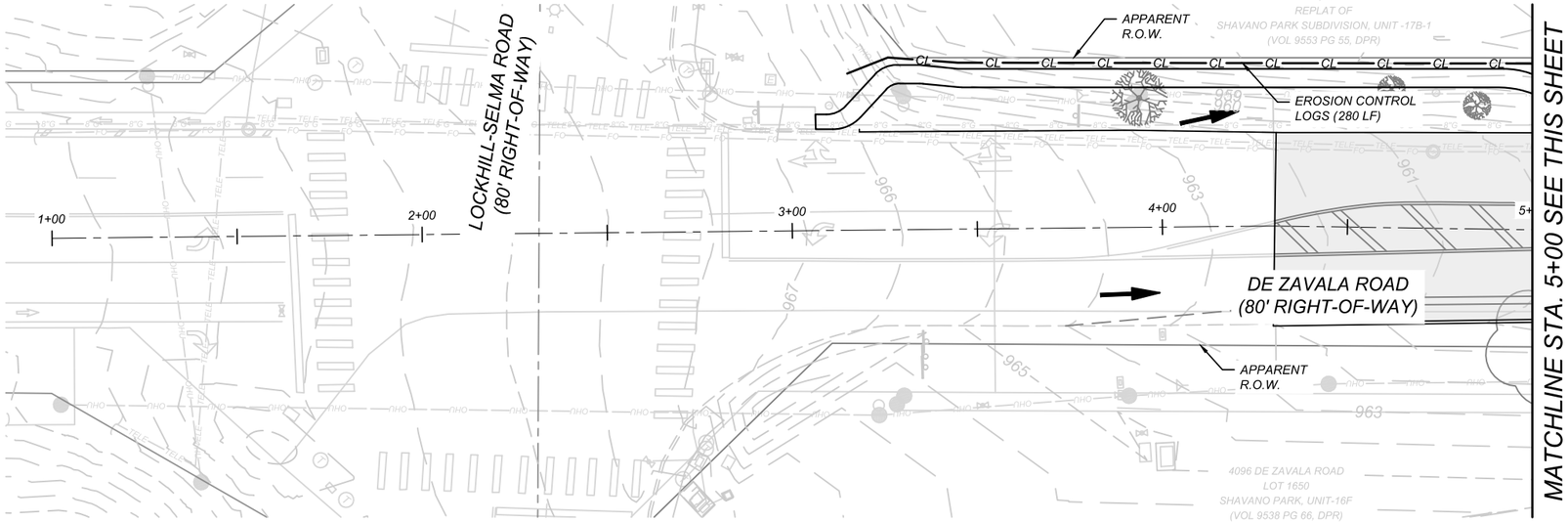

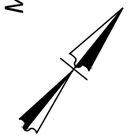

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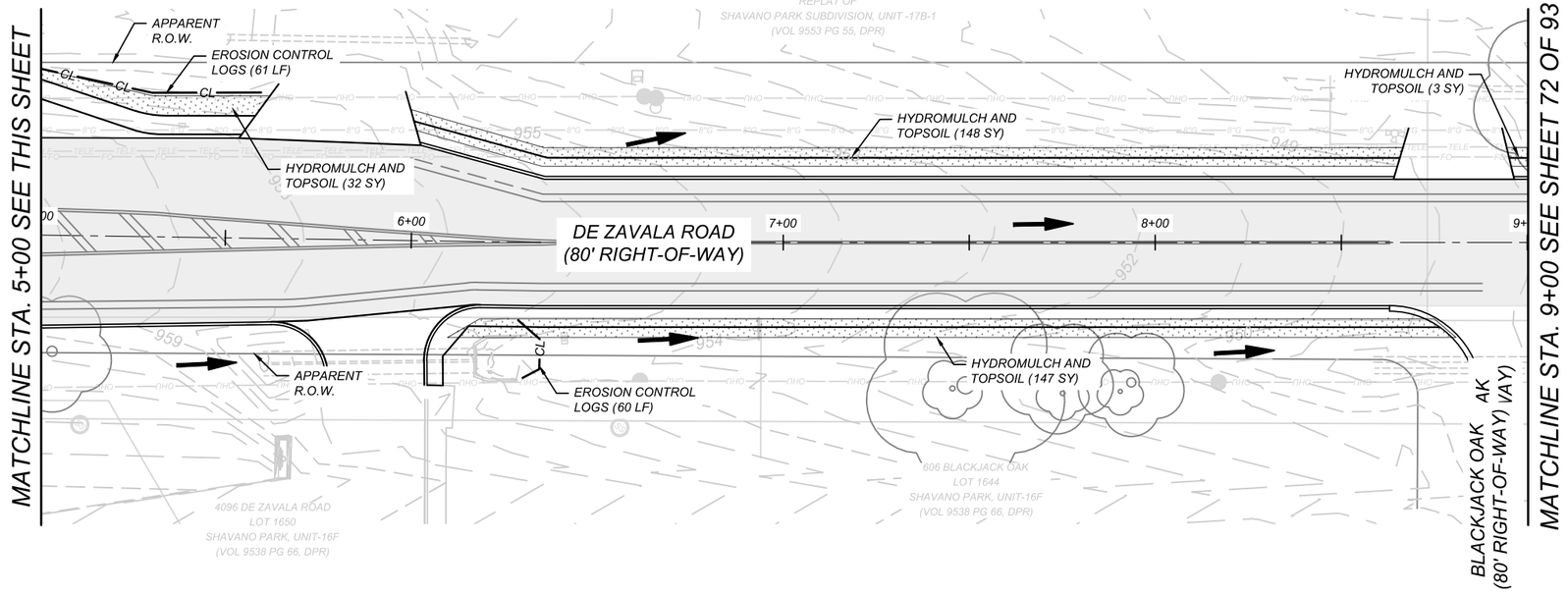

STATE OF TEXAS
3/1 23
Riley McKinley John
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LICENSED
PROFESSIONAL ENGINEER

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KFW ENGINEERS + SURVEYING
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CITY OF SHAVANO PARK

DE ZAVALA RECONSTRUCTION & DRAINAGE IMPROVEMENTS

DE ZAVALA ROAD RECONSTRUCTION
SW3P STA. 1+00 - 9+00

60% SUBMITTAL	PROJECT NO.: 622-13-01	DATE: Jan-23
DRWN. BY: AB	DSGN. BY: DB	CHKD. BY: RJ	SHEET NO.: 71 OF 93

Date: Jan 20, 2023, 9:02am User ID: mwarren
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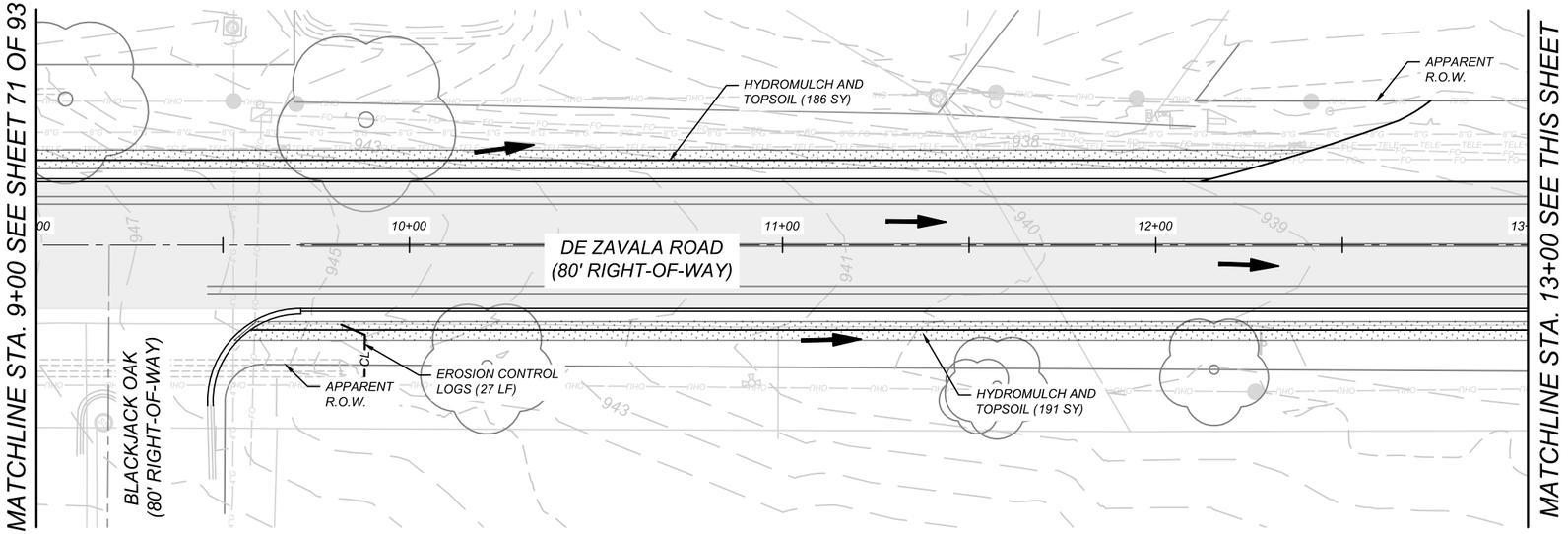

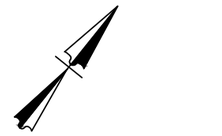

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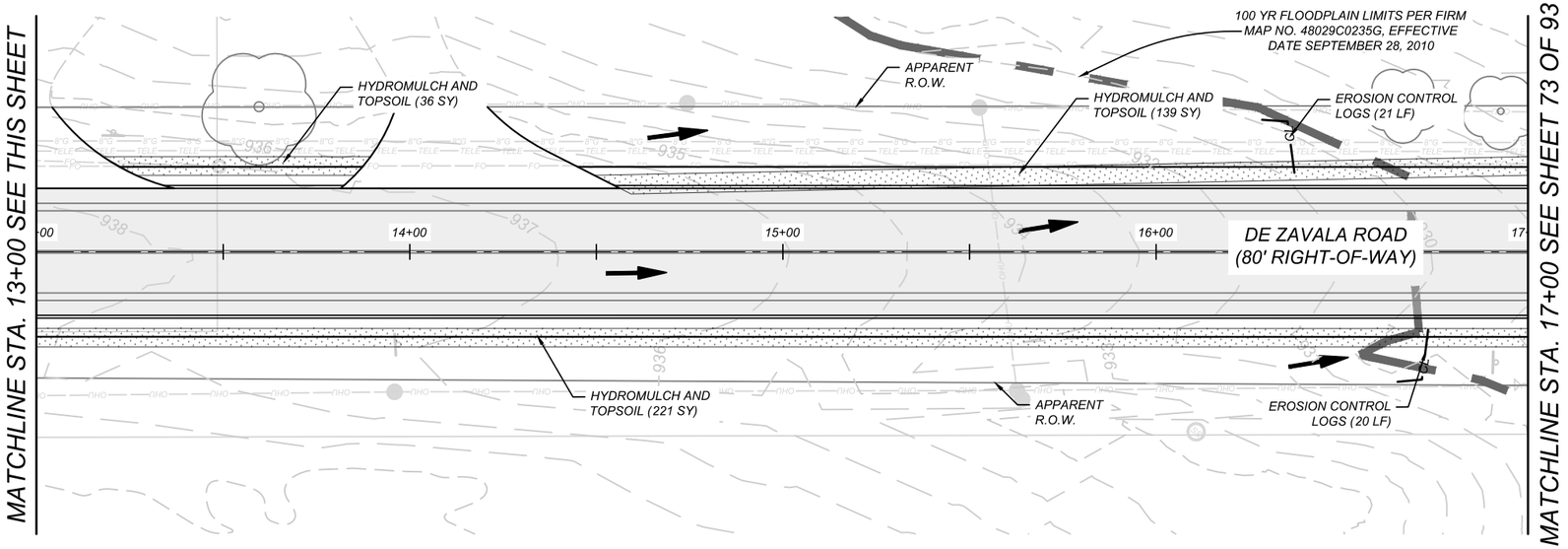

STATE OF TEXAS
3/1 23
Riley McKinley John
133632
LICENSED
PROFESSIONAL ENGINEER

DATE	No.	REVISION	APPROVAL

KFW ENGINEERS + SURVEYING
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Fax #: (210) 979-8441
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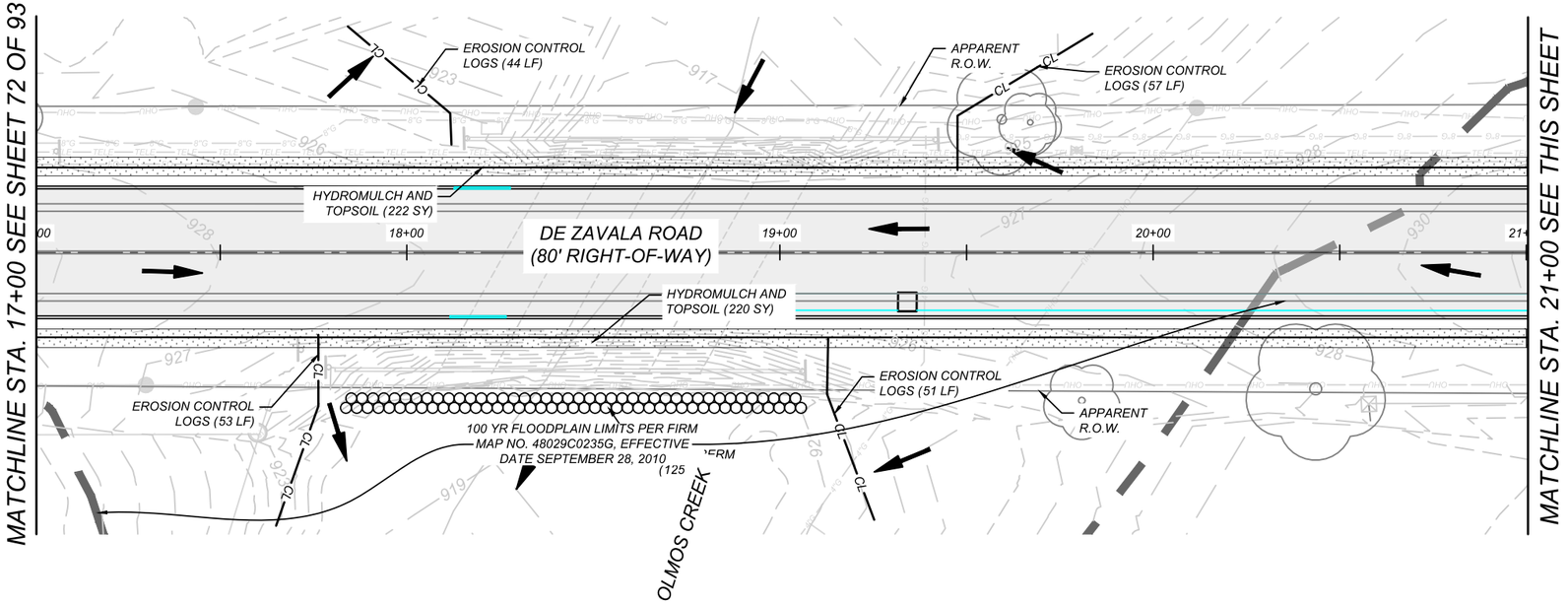
TBPLS Firm #: 10122300

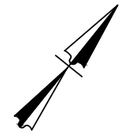
CITY OF SHAVANO PARK

DE ZAVALA RECONSTRUCTION & DRAINAGE IMPROVEMENTS

DE ZAVALA ROAD RECONSTRUCTION
SW3P STA. 9+00 - 17+00

60% SUBMITTAL	PROJECT NO.: 622-13-01		DATE: Jan-23
DRWN. BY: AB	DSGN. BY: DB	CHKD. BY: RJ	SHEET NO.: 72 OF 93





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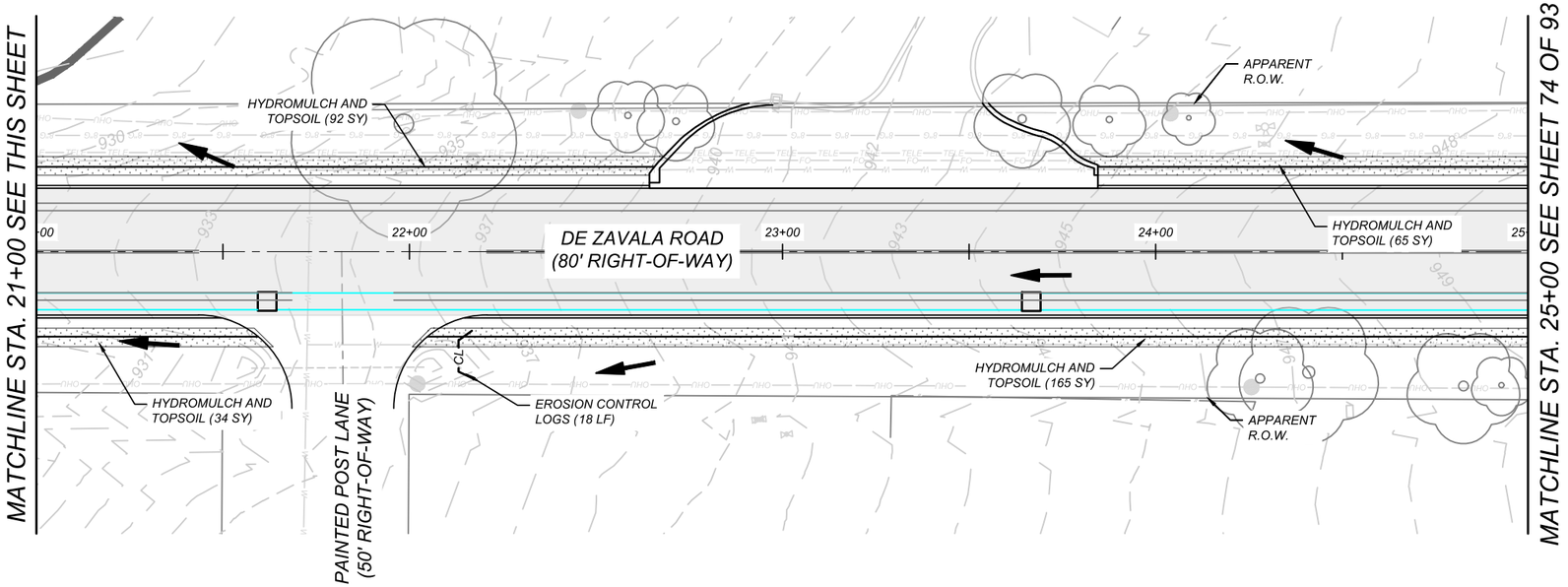

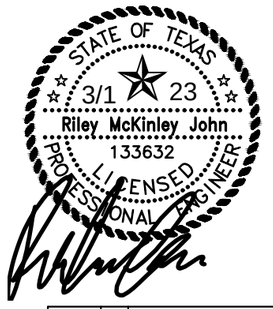

DATE	No.	REVISION	APPROVAL

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San Antonio, TX 78231
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Fax #: (210) 979-8441
TBPE Firm #: 9513
TBPLS Firm #: 10122300

CITY OF SHAVANO PARK

DE ZAVALA RECONSTRUCTION & DRAINAGE IMPROVEMENTS

DE ZAVALA ROAD RECONSTRUCTION
SW3P STA. 17+00 - 25+00

60% SUBMITTAL	PROJECT NO.: 622-13-01		DATE: Jan-23
DRWN. BY: AB	DSGN. BY: DB	CHKD. BY: RJ	SHEET NO.: 73 OF 93

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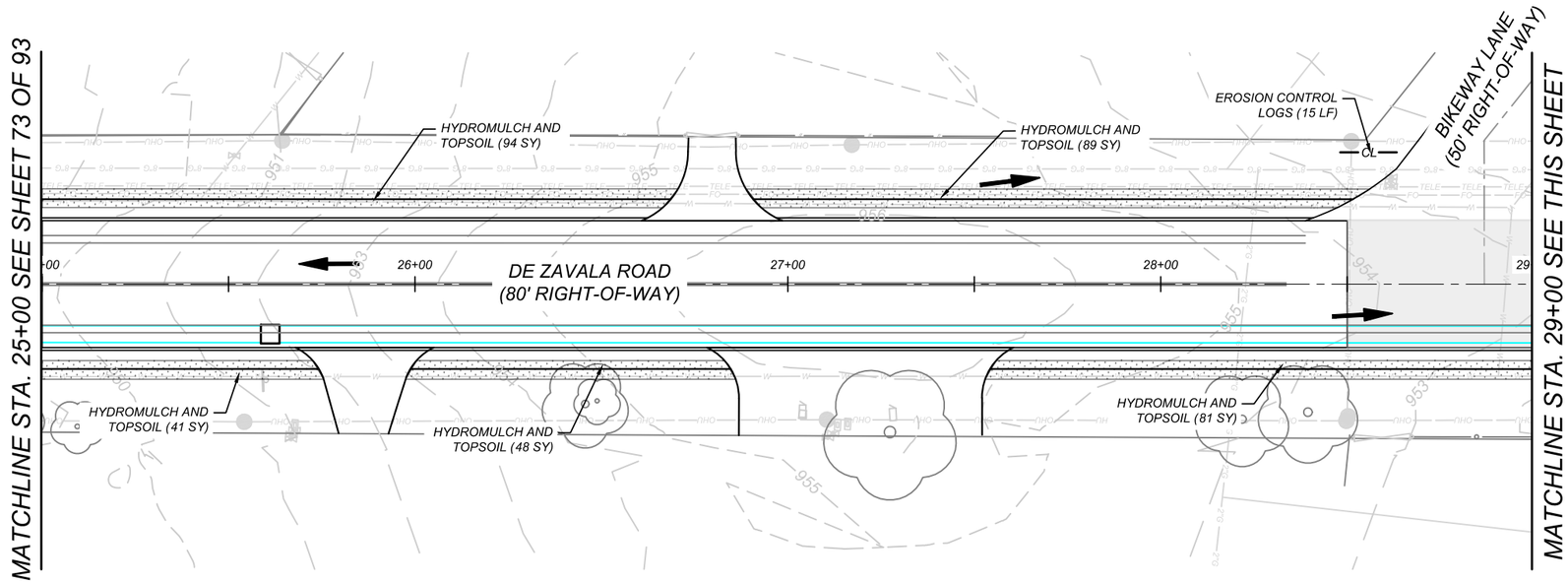

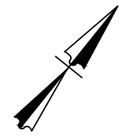

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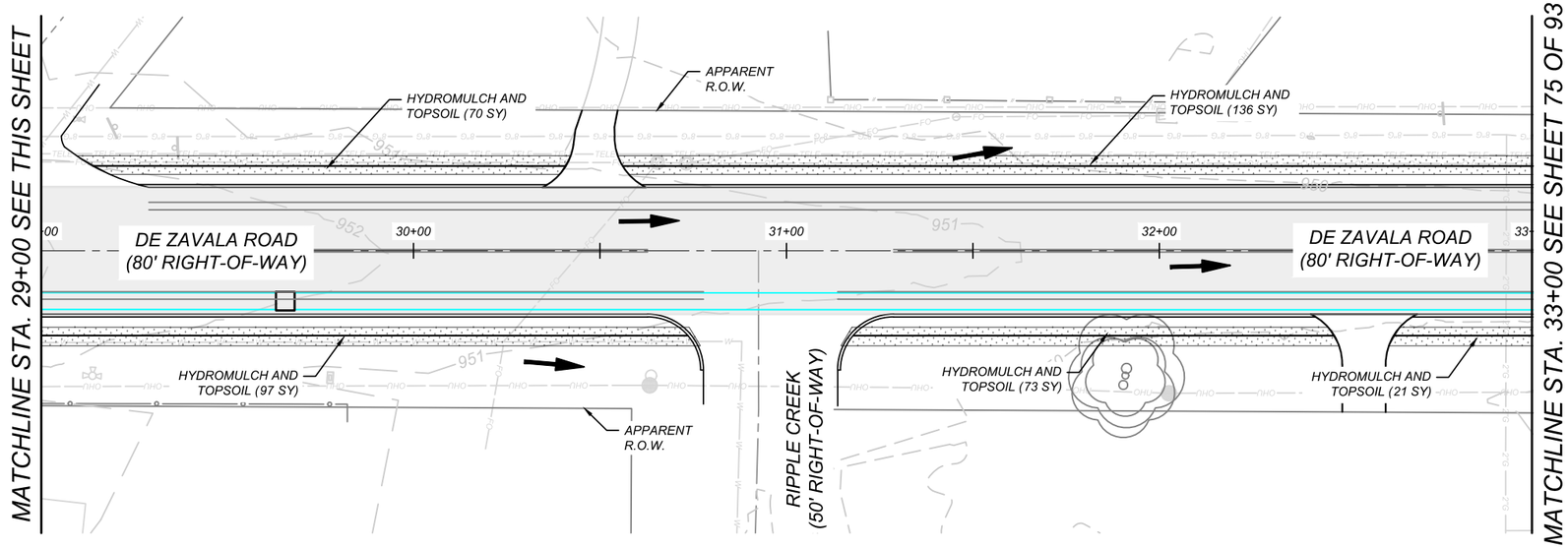

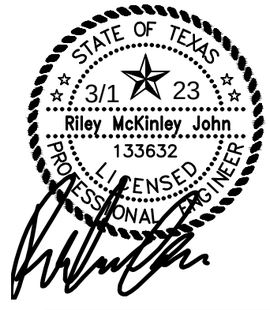

DATE	No.	REVISION	APPROVAL

KFW ENGINEERS + SURVEYING
3421 Paesanos Pkwy, Suite 200
San Antonio, TX 78231
Phone #: (210) 979-8444
Fax #: (210) 979-8441
TBPE Firm #: 9513
TBPLS Firm #: 10122300

CITY OF SHAVANO PARK

DE ZAVALA RECONSTRUCTION & DRAINAGE IMPROVEMENTS

DE ZAVALA ROAD RECONSTRUCTION
SW3P STA. 25+00 - 33+00

60% SUBMITTAL	PROJECT NO.: 622-13-01		DATE: Jan-23
DRWN. BY: AB	DSGN. BY: DB	CHKD. BY: RJ	SHEET NO.: 74 OF 93

Date: Jan 20, 2023, 9:03am User ID: mwarren
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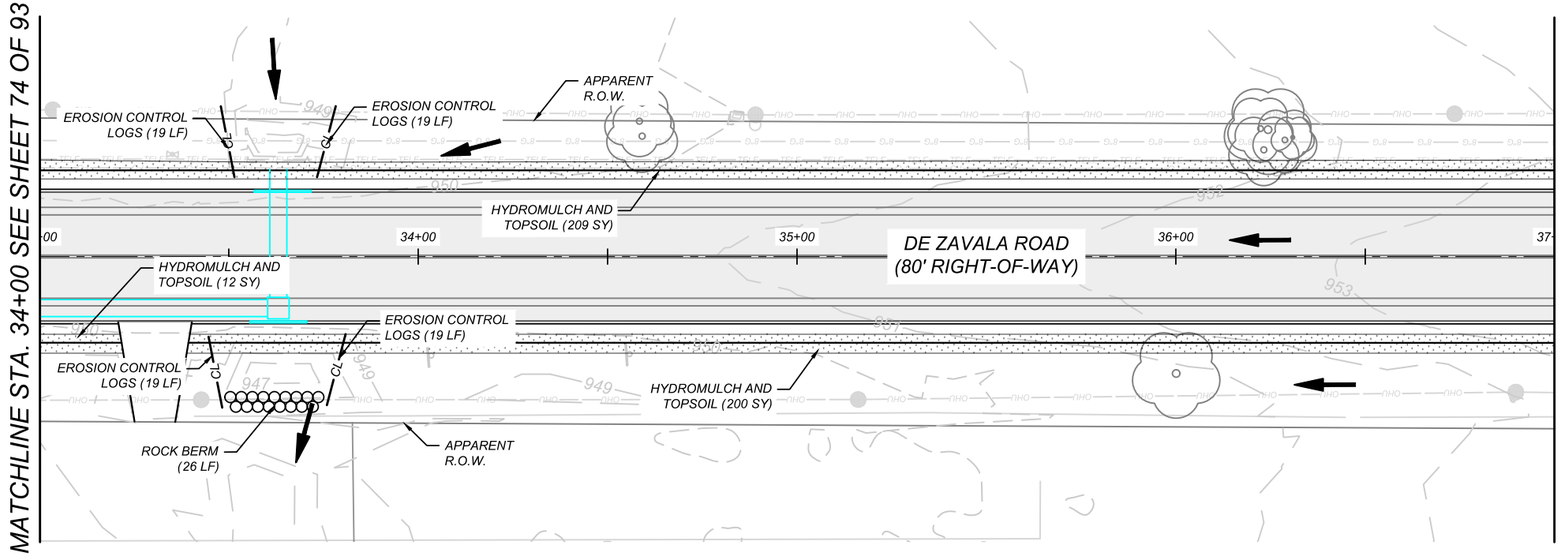

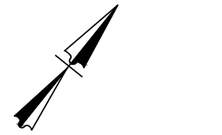

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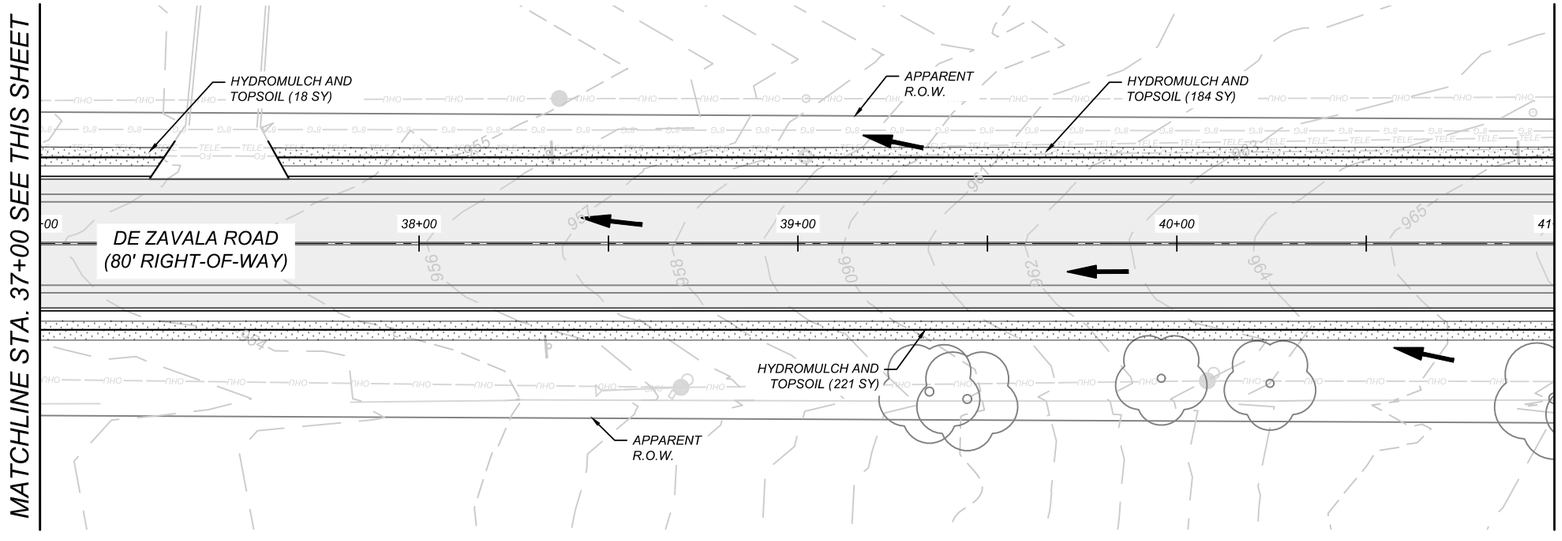

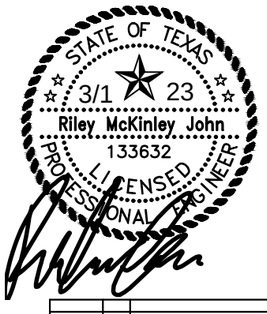

DATE	No.	REVISION	APPROVAL

KFW ENGINEERS + SURVEYING
3421 Paesanos Pkwy, Suite 200
San Antonio, TX 78231
Phone #: (210) 979-8444
Fax #: (210) 979-8441
TBPE Firm #: 9513
TBPLS Firm #: 10122300

CITY OF SHAVANO PARK

DE ZAVALA RECONSTRUCTION & DRAINAGE IMPROVEMENTS

DE ZAVALA ROAD RECONSTRUCTION
SW3P STA. 33+00 - 41+00

60% SUBMITTAL	PROJECT NO.: 622-13-01		DATE: Jan-23
DRWN. BY: AB	DSGN. BY: DB	CHKD. BY: RJ	SHEET NO.: 75 OF 93

Date: Jan 20, 2023, 9:03am User ID: mwarren
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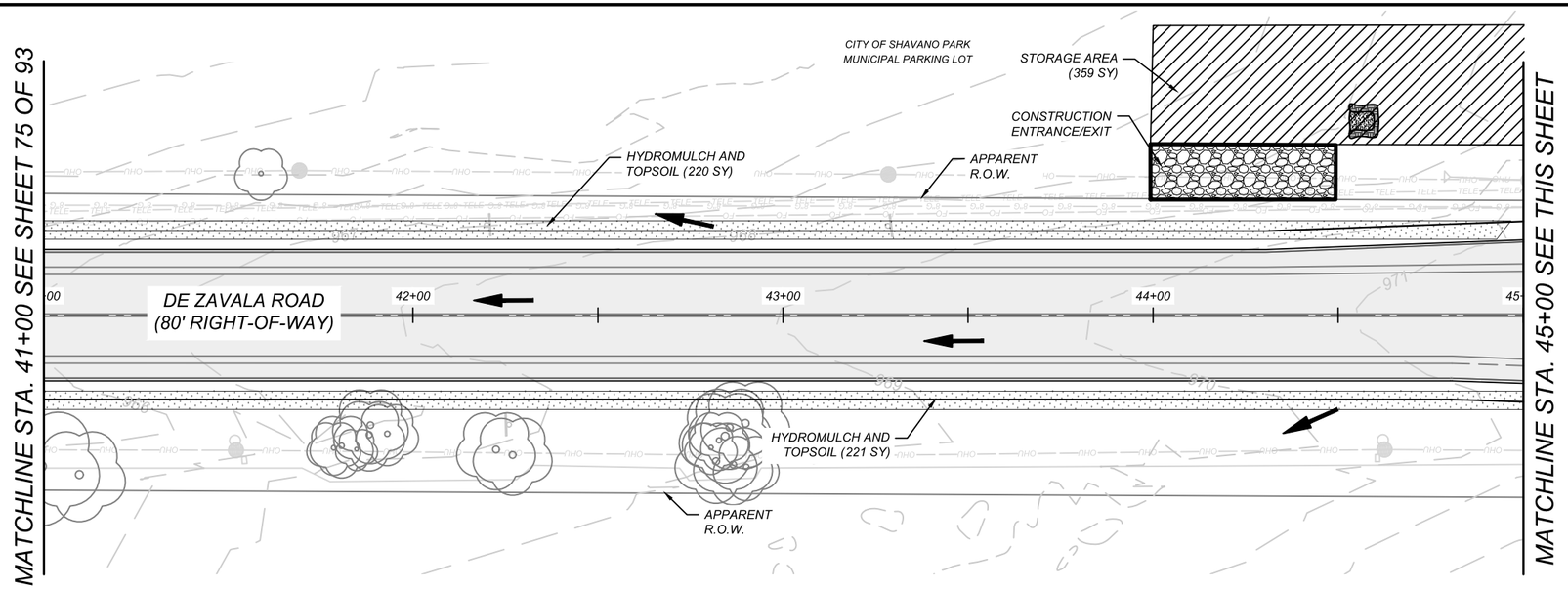

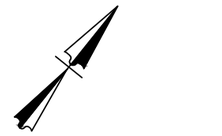

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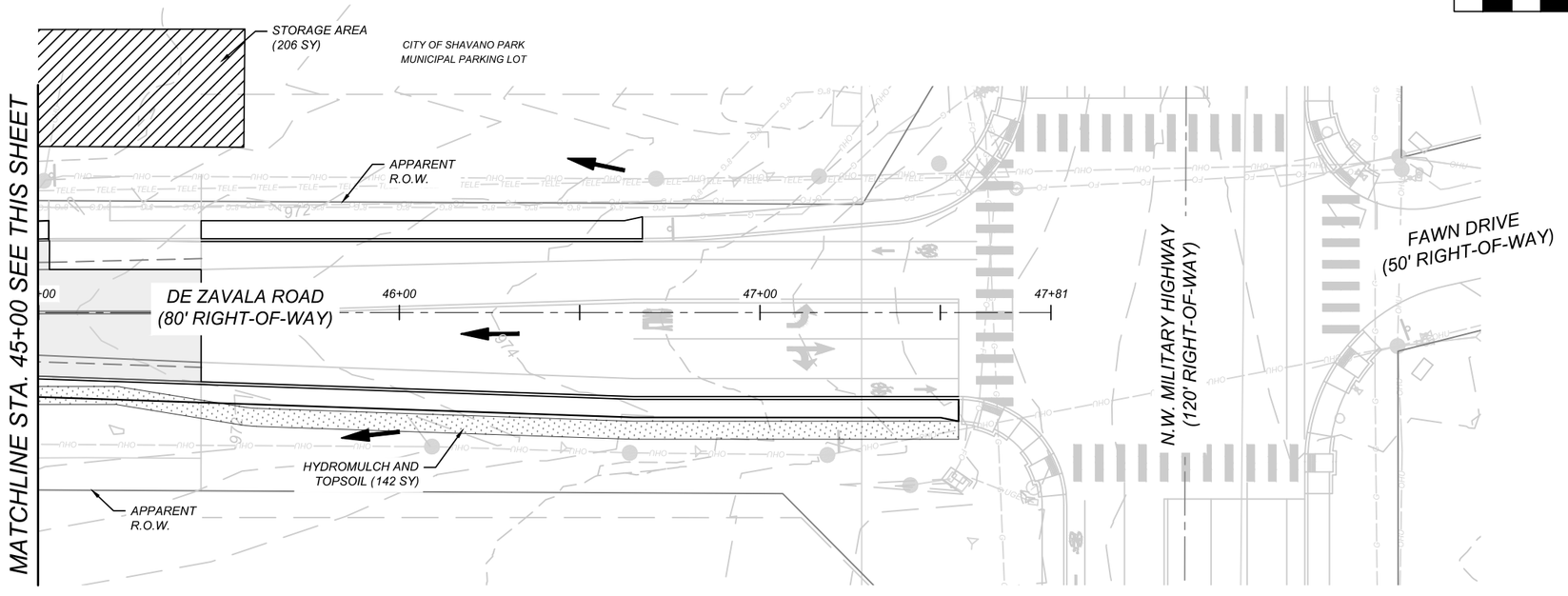

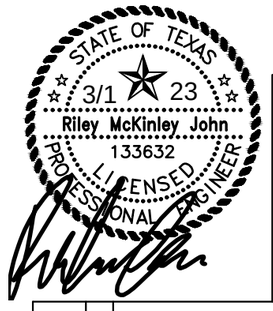

DATE	No.	REVISION	APPROVAL

KFW ENGINEERS + SURVEYING
3421 Paesanos Pkwy, Suite 200
San Antonio, TX 78231
Phone #: (210) 979-8444
Fax #: (210) 979-8441
TBPE Firm #: 9513
TBPLS Firm #: 10122300

CITY OF SHAVANO PARK

DE ZAVALA RECONSTRUCTION & DRAINAGE IMPROVEMENTS

DE ZAVALA ROAD RECONSTRUCTION
SW3P STA. 41+00 - END

60% SUBMITTAL	PROJECT NO.: 622-13-01		DATE: Jan-23
DRWN. BY: AB	DSGN. BY: DB	CHKD. BY: RJ	SHEET NO.: 76 OF 93

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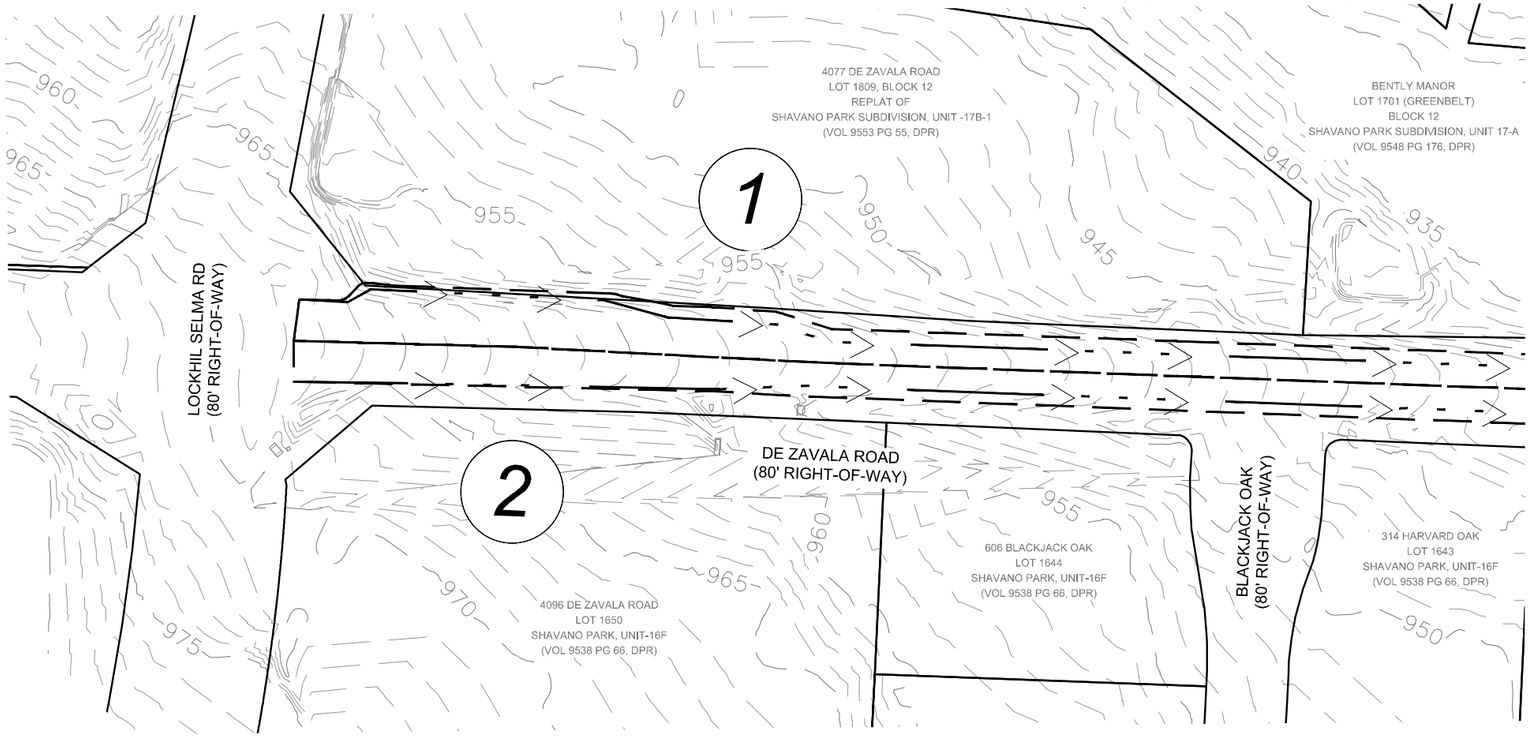

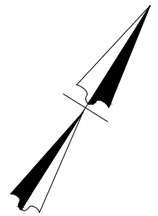

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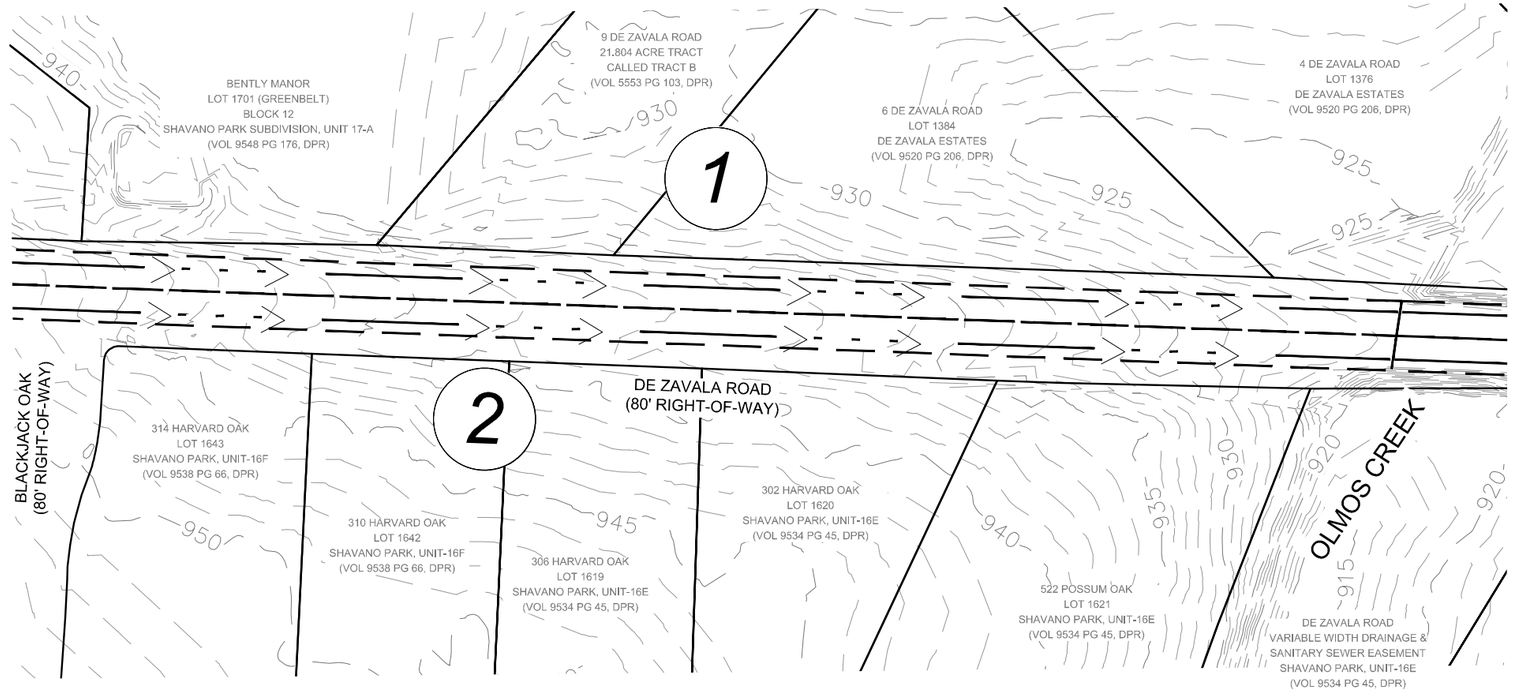
800'



STATE OF TEXAS
3/1 23
Riley McKinley John
133632
LICENSED
PROFESSIONAL ENGINEER

DATE	No.	REVISION	APPROVAL

KFW ENGINEERS + SURVEYING
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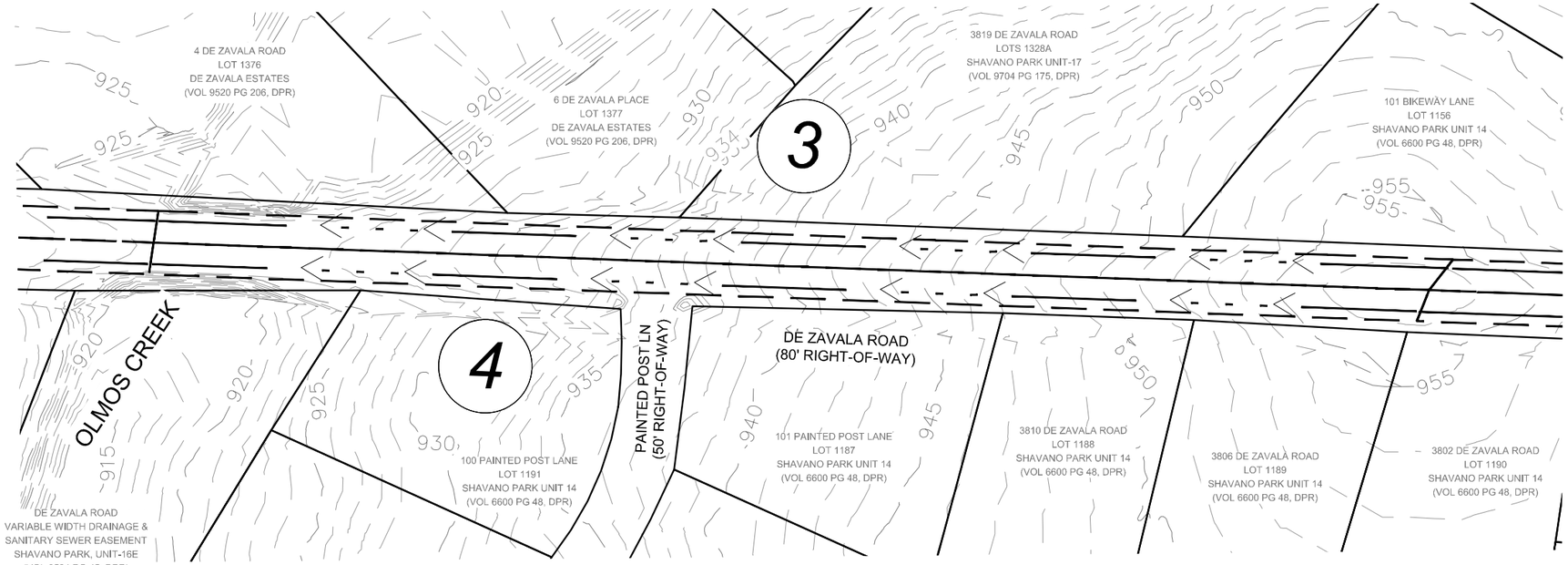
CITY OF SHAVANO PARK

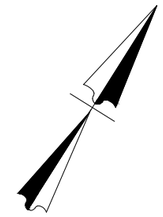
DE ZAVALA RECONSTRUCTION & DRAINAGE IMPROVEMENTS

DE ZAVALA ROAD RECONSTRUCTION PREDEVELOPMENT

60% SUBMITTAL	PROJECT NO.: 622-13-01		DATE: Feb-23
DRWN. BY: AB	DSGN. BY: DB	CHKD. BY: RJ	SHEET NO.: 44 OF 93

Date: Feb 17, 2023, 10:02am User ID: rjohn
File: M:\622\13\01\Design\Civil\Hydrology\CAD\DA_622130I_230119_streets_Predevelopment.dwg





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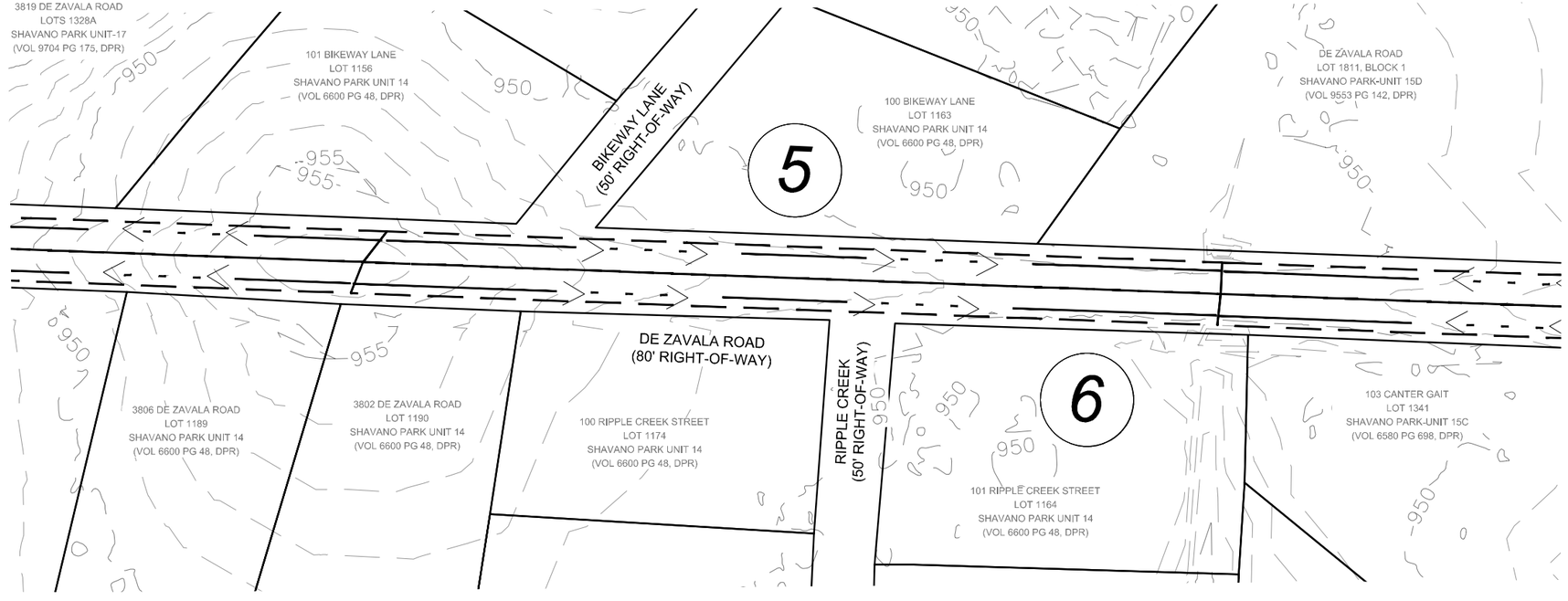

STATE OF TEXAS
3/1 23
Riley McKinley John
133632
LICENSED
PROFESSIONAL ENGINEER

DATE	No.	REVISION	APPROVAL

KFW ENGINEERS + SURVEYING
3421 Paesanos Pkwy, Suite 200
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Fax #: (210) 979-8441
TBPE Firm #: 9513
TBPLS Firm #: 10122300

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60% SUBMITTAL	PROJECT NO.: 622-13-01		DATE: Feb-23
DRWN. BY: AB	DSGN. BY: DB	CHKD. BY: RJ	SHEET NO.: 45 OF 93

Date: Feb 17, 2023, 10:04am User ID: rjohn
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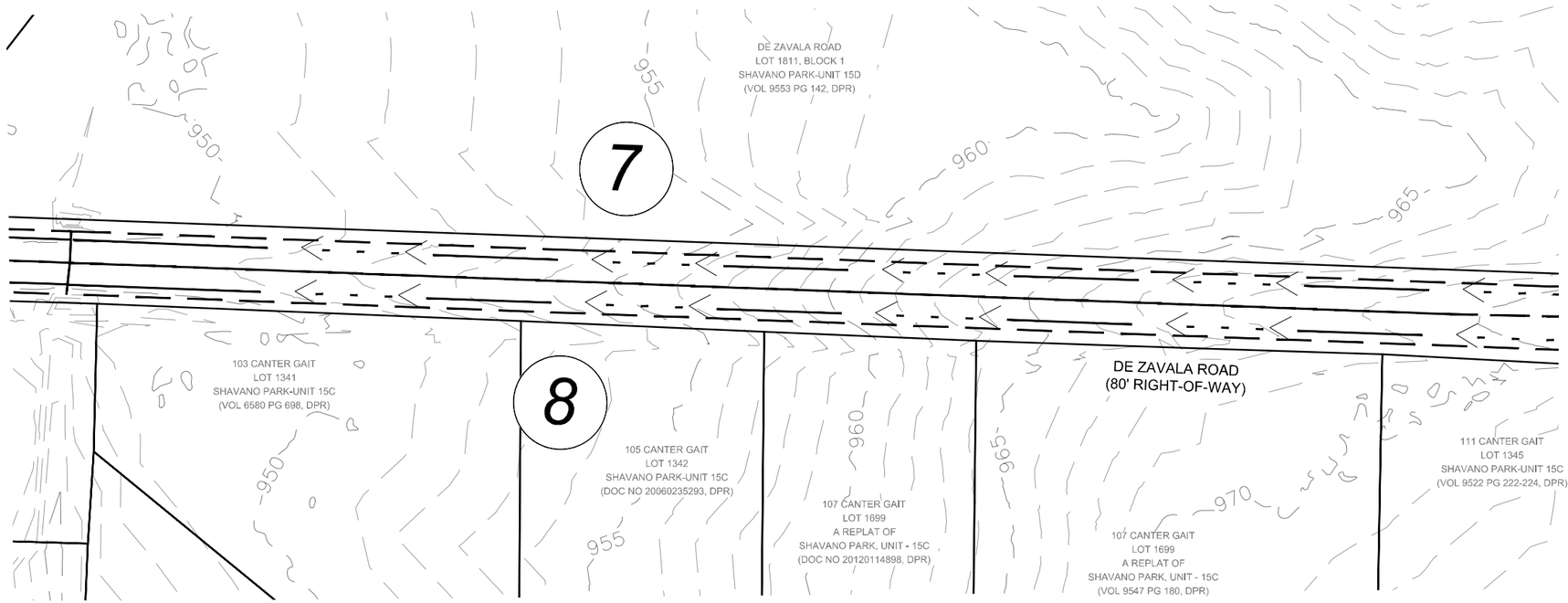

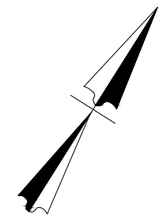

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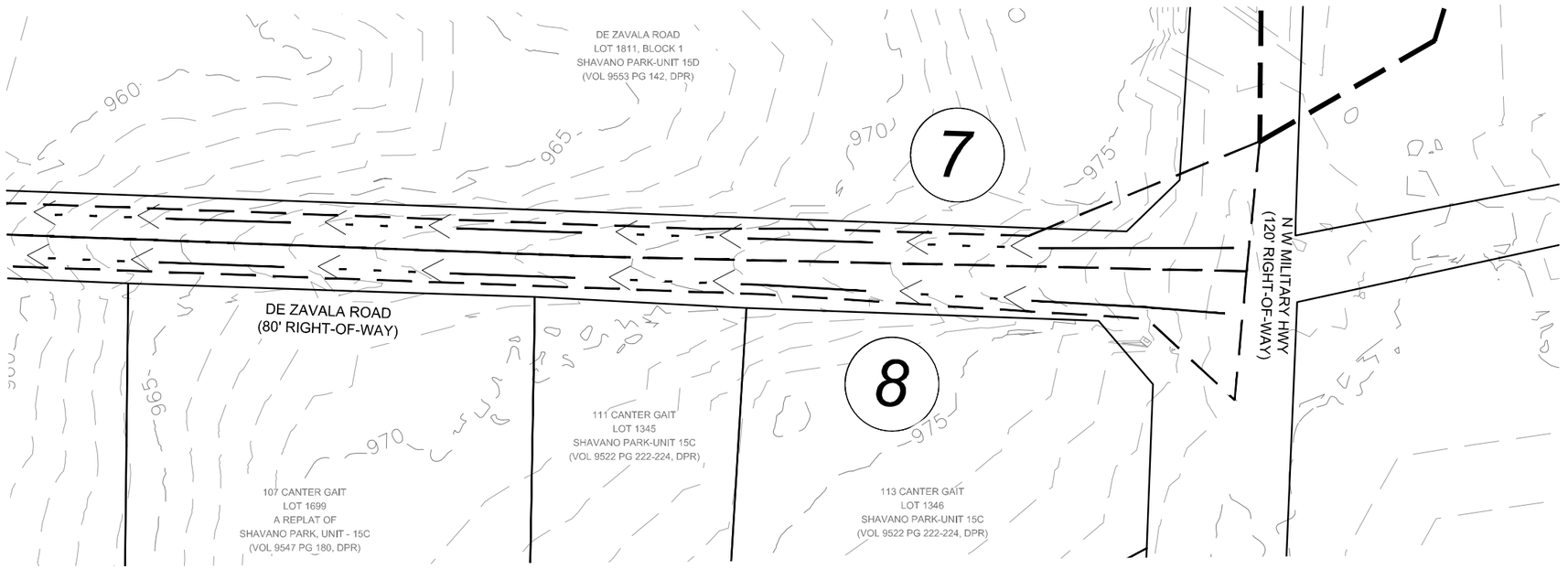

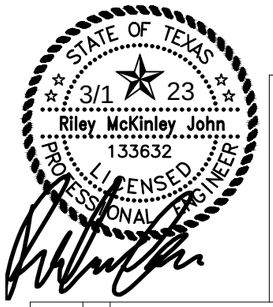

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60% SUBMITTAL	PROJECT NO.: 622-13-01		DATE: Feb-23
DRWN. BY: AB	DSGN. BY: DB	CHKD. BY: RJ	SHEET NO.: 46 OF 93

Date: Feb 17, 2023, 10:04am User ID: rjohn
File: M:\622\13\01\Design\Civil\Hydrology\CADD\A_622130120_streets_Predevelopment.dwg

EXISTING CONDITIONS

HYDROLOGY SUMMARY – RATIONAL METHOD

Study Point	(Acres)	C	T_{ovrl} (min)	T_{sc} (min)	T_{ch} (min)	T_{tot} (min)	I_5 (in/hr)	I_{25} (in/hr)	I_{100} (in/hr)	Q_5 (ft^3/s)	Q_{25} (ft^3/s)	Q_{100} (ft^3/s)
1	0.90	0.90	8.2	9.1	0.0	17.3	4.9	6.8	8.4	4.0	5.5	6.8
2	0.82	0.90	10.0	8.4	0.0	18.4	4.7	6.6	8.2	3.5	4.8	6.0
3	0.47	0.90	10.7	7.6	0.0	18.3	4.8	6.6	8.2	2.0	2.8	3.4
4	0.47	0.90	10.6	7.5	0.0	18.1	4.8	6.6	8.2	2.0	2.8	3.4
5	0.34	0.90	17.1	13.6	0.0	30.7	3.7	5.0	6.2	1.1	1.5	1.9
6	0.34	0.90	17.0	13.6	0.0	30.6	3.7	5.0	6.3	1.1	1.5	1.9
7	0.89	0.90	10.8	9.7	0.0	20.5	4.5	6.2	7.7	3.6	5.0	6.2
8	0.88	0.90	10.9	9.7	0.0	20.6	4.5	6.2	7.7	3.5	4.9	6.1

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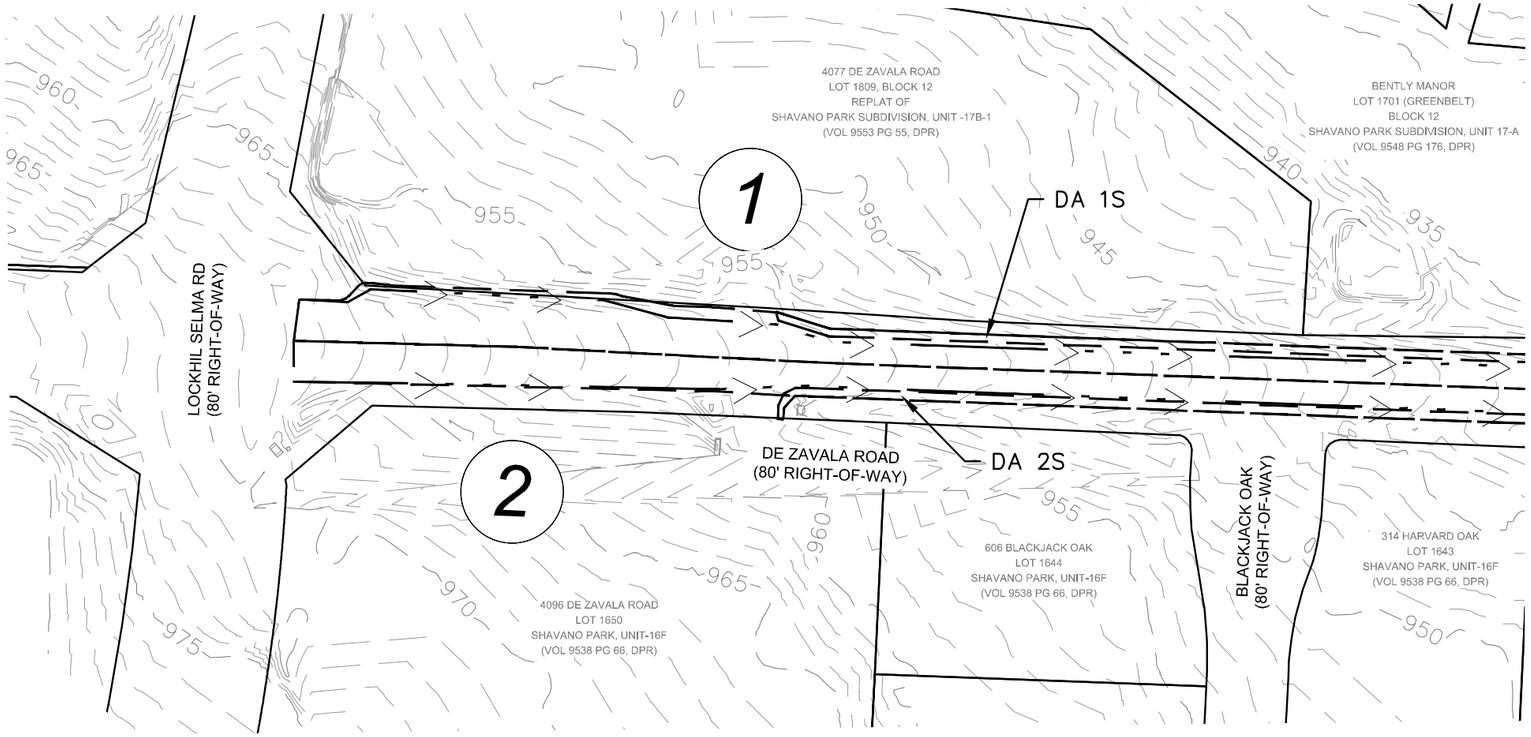
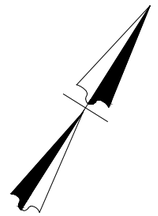
DRWN. BY: AB	DSGN. BY: DB	CHKD. BY: RJ	SHEET NO.: 47 OF 93





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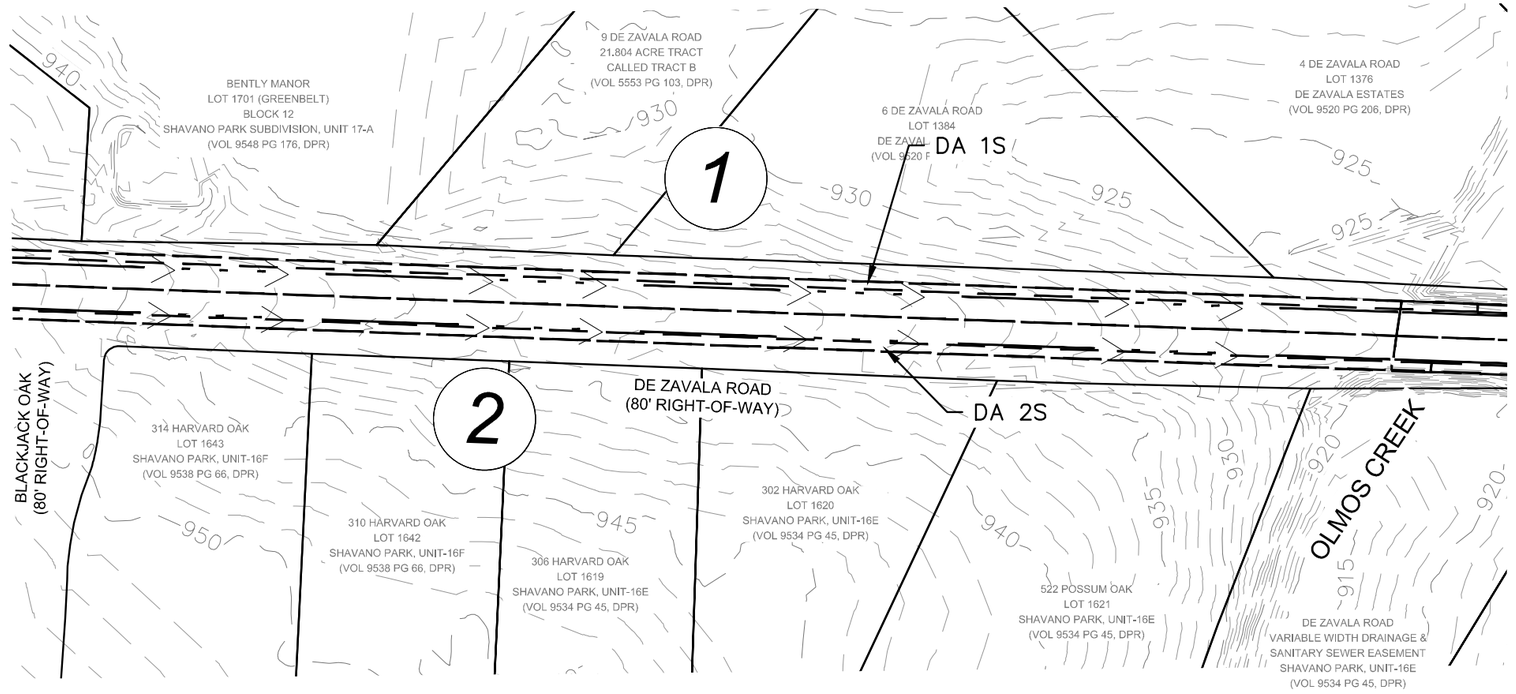

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CITY OF SHAVANO PARK

DE ZAVALA RECONSTRUCTION & DRAINAGE IMPROVEMENTS

DE ZAVALA ROAD RECONSTRUCTION POSTDEVELOPMENT

60% SUBMITTAL	PROJECT NO.: 622-13-01		DATE: Feb-23
DRWN. BY: AB	DSGN. BY: DB	CHKD. BY: RJ	SHEET NO.: 44 OF 93

Date: Feb 17, 2023, 10:08am User ID: rjohn
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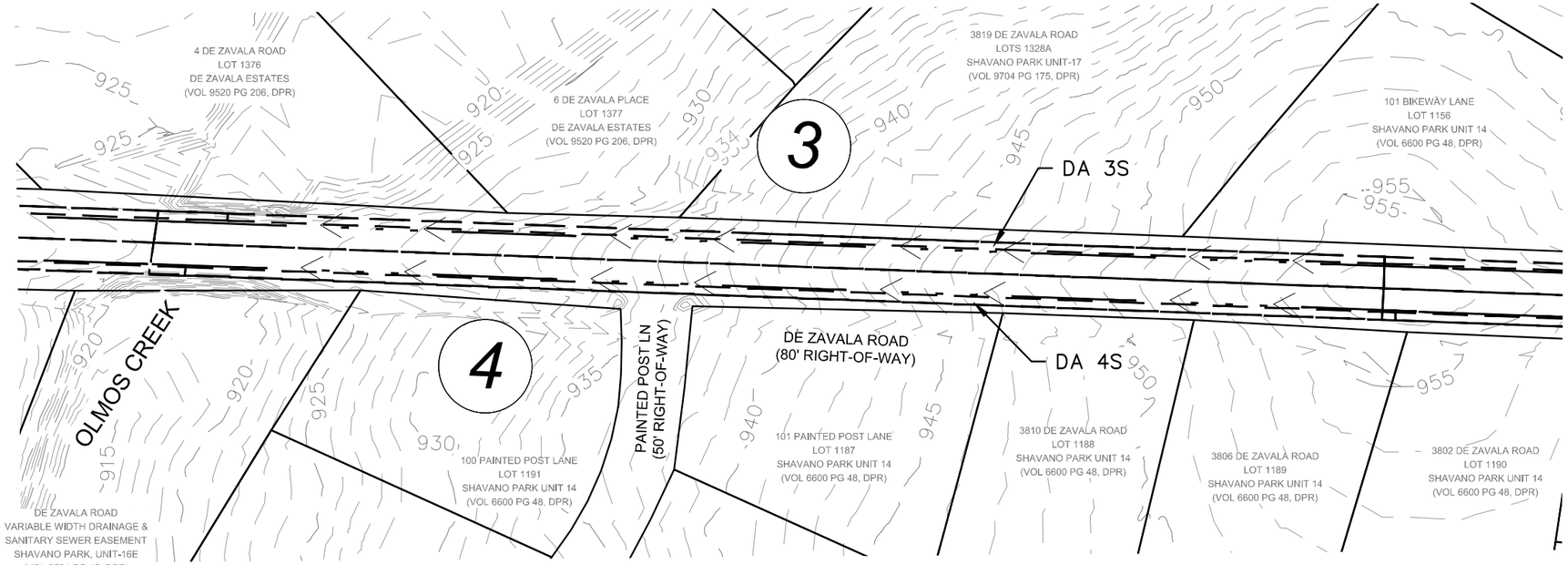

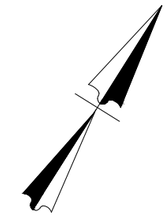

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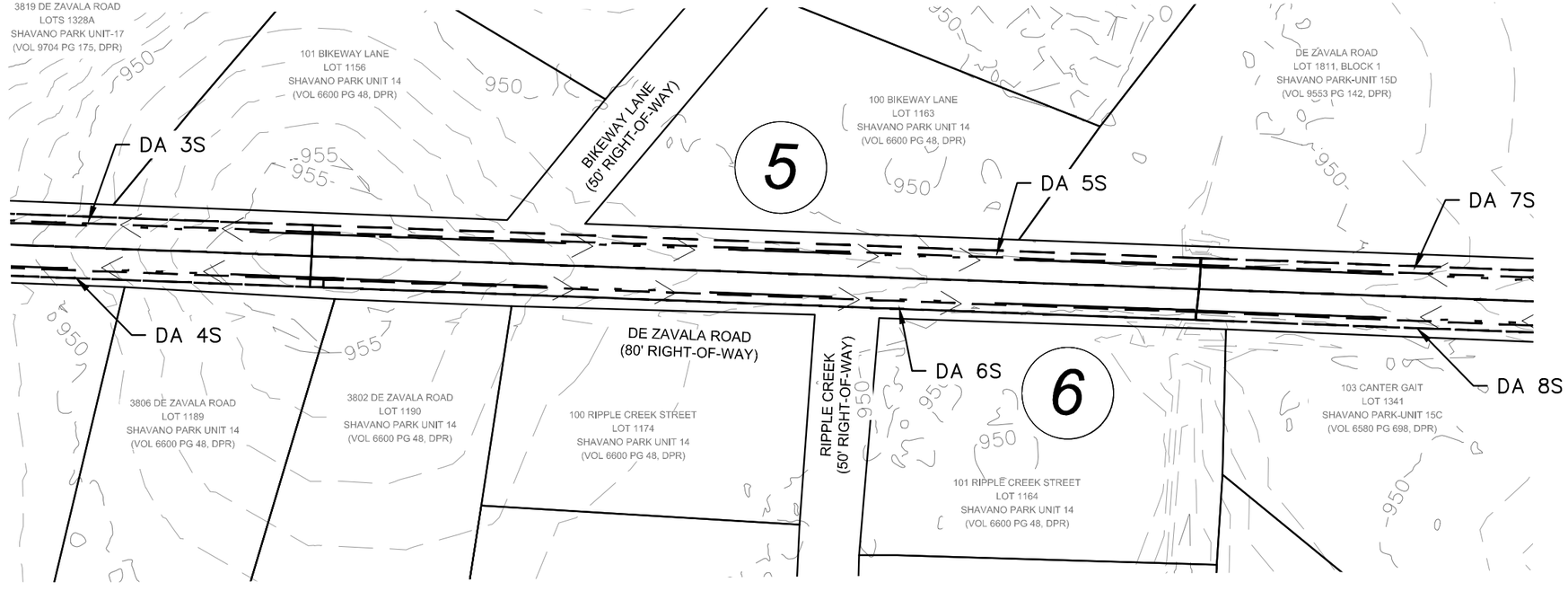

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DE ZAVALA ROAD RECONSTRUCTION POSTDEVELOPMENT

60% SUBMITTAL	PROJECT NO.: 622-13-01		DATE: Feb-23
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Date: Feb 17, 2023, 10:08am User ID: rjohn
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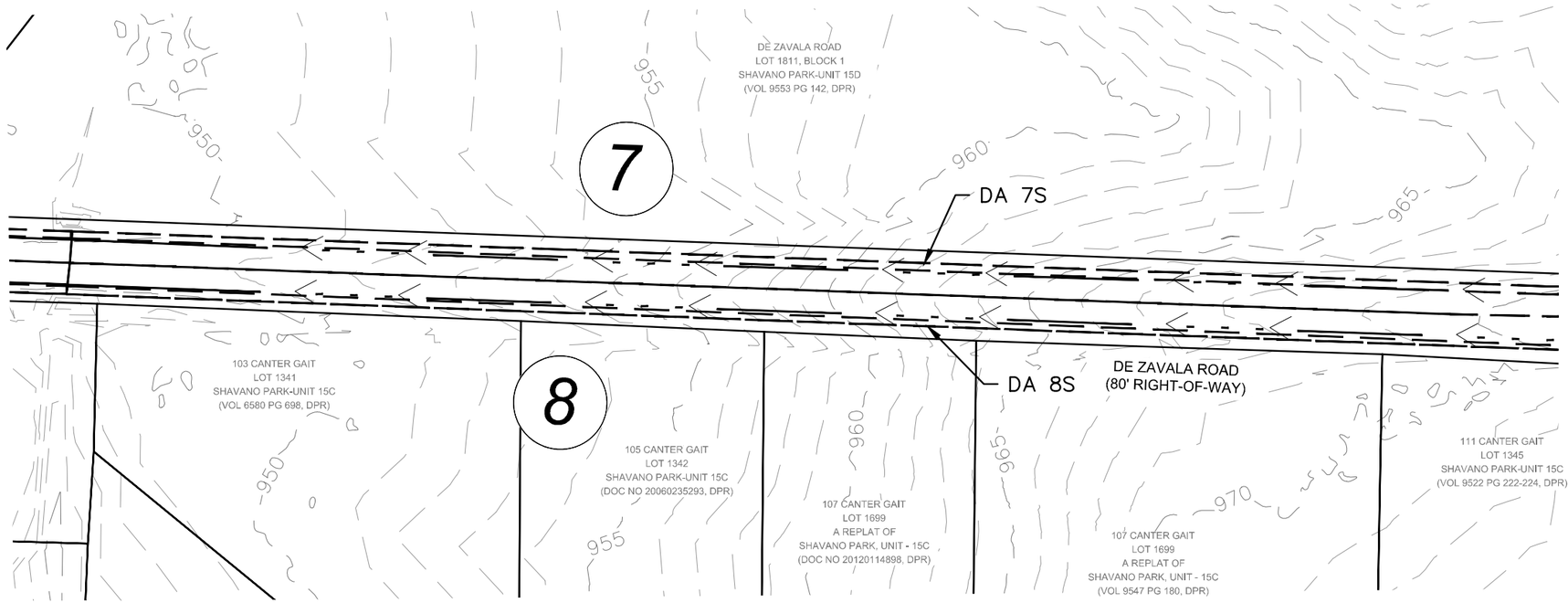

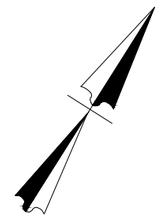

SCALE : 1" = 400'

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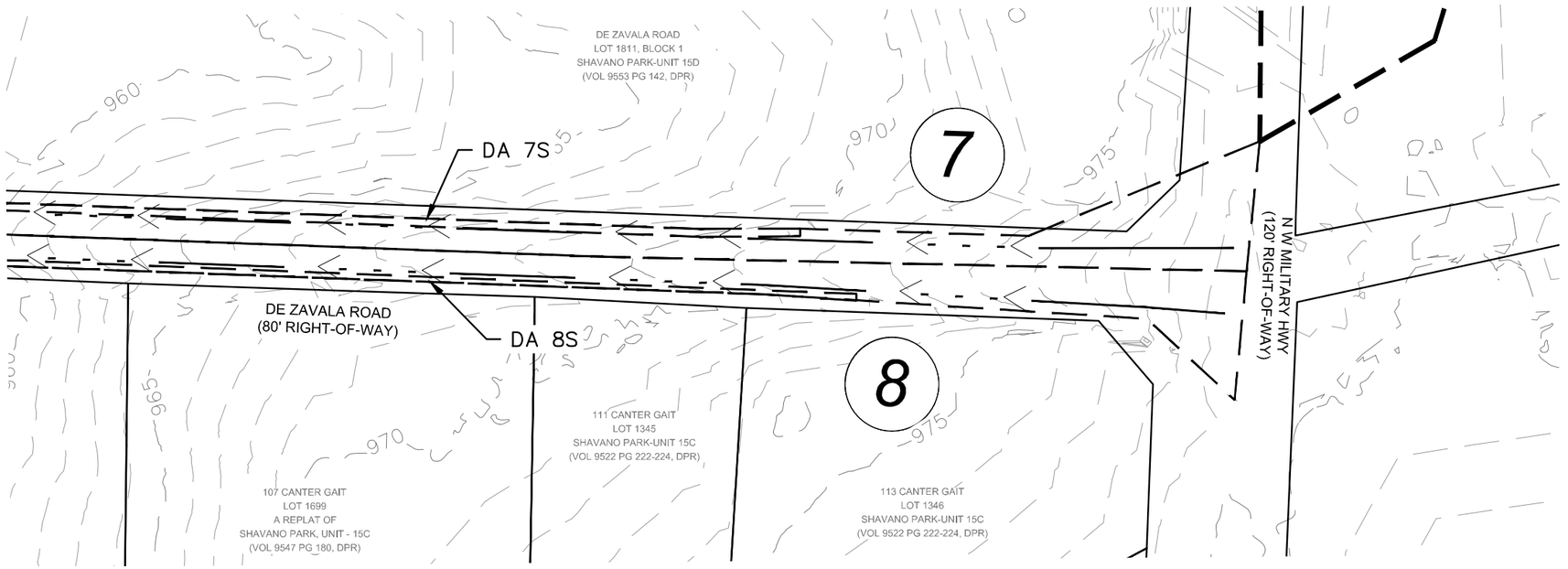

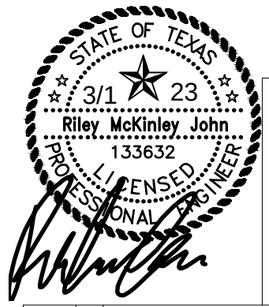

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DE ZAVALA ROAD RECONSTRUCTION POSTDEVELOPMENT

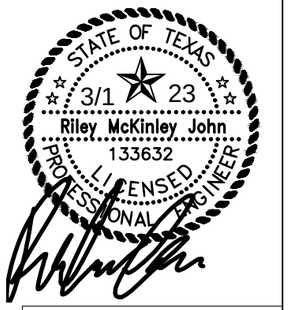
60% SUBMITTAL	PROJECT NO.: 622-13-01		DATE: Feb-23
DRWN. BY: AB	DSGN. BY: DB	CHKD. BY: RJ	SHEET NO.: 46 OF 93

Date: Feb 17, 2023, 10:07am User ID: rjohn
File: M:\622\13\01\Design\Civil\Hydrology\CAD\DA_6221301_23019_streets_Postdevelopment.dwg

PROPOSED CONDITIONS

HYDROLOGY SUMMARY – RATIONAL METHOD

Study Point	(Acres)	C	T_{ovrl} (min)	T_{sc} (min)	T_{ch} (min)	T_{tot} (min)	I_5 (in/hr)	I_{25} (in/hr)	I_{100} (in/hr)	Q_5 (ft^3/s)	Q_{25} (ft^3/s)	Q_{100} (ft^3/s)
1	0.75	1.00	8.2	9.1	0.0	17.3	4.9	6.8	8.4	3.7	5.1	6.3
2	0.66	1.00	10.0	8.4	0.0	18.4	4.7	6.6	8.2	3.1	4.3	5.4
3	0.38	1.00	10.7	7.6	0.0	18.3	4.8	6.6	8.2	1.8	2.5	3.1
4	0.36	1.00	10.6	7.5	0.0	18.1	4.8	6.6	8.2	1.7	2.4	3.0
5	0.25	1.00	17.1	13.6	0.0	30.7	3.7	5.0	6.2	0.9	1.3	1.6
6	0.24	1.00	17.0	13.6	0.0	30.6	3.7	5.0	6.3	0.9	1.2	1.5
7	0.72	1.00	10.8	9.7	0.0	20.5	4.5	6.2	7.7	3.2	4.5	5.5
8	0.70	1.00	10.9	9.7	0.0	20.6	4.5	6.2	7.7	3.1	4.3	5.4
1S	0.15	1.00	8.2	11.4	0.0	19.6	4.6	6.3	7.9	0.7	0.9	1.2
2S	0.17	1.00	10.0	10.6	0.0	20.5	4.5	6.2	7.7	0.8	1.0	1.3
3S	0.10	1.00	10.7	9.6	0.0	20.2	4.5	6.2	7.7	0.4	0.6	0.8
4S	0.12	1.00	10.6	9.5	0.0	20.1	4.5	6.3	7.8	0.5	0.7	0.9
5S	0.07	1.00	17.1	17.2	0.0	34.2	3.5	4.8	5.9	0.3	0.4	0.4
6S	0.08	1.00	17.0	17.1	0.0	34.1	3.5	4.8	5.9	0.3	0.4	0.5
7S	0.14	1.00	10.8	12.2	0.0	23.0	4.2	5.8	7.2	0.6	0.8	1.0
8S	0.12	1.00	10.9	12.2	0.0	23.1	4.2	5.8	7.2	0.5	0.7	0.9



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CITY OF SHAVANO PARK

DE ZAVALA RECONSTRUCTION & DRAINAGE IMPROVEMENTS

DE ZAVALA ROAD RECONSTRUCTION
POSTDEVELOPMENT

60% SUBMITTAL	PROJECT NO.: 622-13-01		DATE: Feb-23
DRWN. BY: AB	DSGN. BY: DB	CHKD. BY: RJ	SHEET NO.: 47 OF 93

Date: Feb 17, 2023, 10:05am User ID: john
File: M:\622\13\01\Design\Civil\Hydrology\CAD\DA_622130I_230119_streets_Poststaevelopment.dwg

PROJECT TOTALS
LENGTH OF PROJECT = 4,114.68 LF.
VEGETATED FILTER STRIP = 36,856.33 SF.

SCALE : 1"=60'
0' 60' 180'
120'

KFW
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ISSUE DATE

REVISIONS

STATE OF TEXAS
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Riley McKinley John
133632
LICENSED PROFESSIONAL ENGINEER

DE ZAVALA ROAD RECONSTRUCTION
VEGETATED FILTER STRIP

JOB NO. -
DATE: -
DRAWN: - CHECKED: -

SHEET NUMBER:
1 OF 1

Date: Feb 17, 2023, 10:06am User ID: rjohn
File: M:\022\1\01\Design\Emails\CAD\VEGD\EX_FILTER STRIP_230116.dwg

Texas Commission on Environmental Quality

TSS Removal Calculations 04-20-2009

Project Name: De zavala
Date Prepared: 2/10/2023

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

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

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

where:

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

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

County =	Bexar	
Total project area included in plan * =	8.36	acres
Predevelopment impervious area within the limits of the plan * =	4.12	acres
Total post-development impervious area within the limits of the plan* =	4.75	acres
Total post-development impervious cover fraction * =	0.57	
P =	38	inches
$L_{M\ TOTAL\ PROJECT}$ =	651	lbs.

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

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

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

Drainage Basin/Outfall Area No. = DA1

Total drainage basin/outfall area =	8.36	acres
Predevelopment impervious area within drainage basin/outfall area =	4.26	acres
Post-development impervious area within drainage basin/outfall area =	4.60	acres
Post-development impervious fraction within drainage basin/outfall area =	0.55	
$L_{M\ THIS\ BASIN}$ =	346	lbs.

3. Indicate the proposed BMP Code for this basin.

Proposed BMP = Vegetated Filter Strips
Removal efficiency = 80 percent

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

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

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

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 =	8.36	acres
A_I =	0.63	acres
A_P =	7.73	acres
L_R =	790	lbs

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

Desired $L_{M\ THIS\ BASIN}$ = 145 lbs.

F = **0.18**

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

Rainfall Depth =	**0.10**	inches
Post Development Runoff Coefficient =	**0.95**	
On-site Water Quality Volume =	**2883**	cubic feet

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

Off-site area draining to BMP =	**0.00**	acres
Off-site Impervious cover draining to BMP =	**0.00**	acres
Impervious fraction of off-site area =	**0**	
Off-site Runoff Coefficient =	**0.00**	
Off-site Water Quality Volume =	**0**	cubic feet
Storage for Sediment =	**577**	
Total Capture Volume (required water quality volume(s) x 1.20) =	**3460**	cubic feet