The Villas at Timberwood Offsite Sanitary Sewer Extension Sewage Collection System



The Villas at Timberwood Offsite Sanitary Sewer Extension Sewage Collection System

January 2025







January 2, 2025

Mr. Robert Sadlier Texas Commission on Environmental Quality (TCEQ) Region 13 14250 Judson Road San Antonio, Texas 78233-4480

Re: The Villas at Timberwood Offsite Sanitary Sewer Extension Sewage Collection System

Dear Mr. Sadlier:

Please find attached two (2) hard copies, one (1) digital copy of the Villas at Timberwood Sewage Collection System (SCS). This SCS has been prepared to be consistent with the regulations of the Texas Commission on Environmental Quality (30 TAC 213) and current policies for development over the Edwards Aquifer Recharge Zone.

This Sewage Collection System Application applies to the 5,497 linear feet of sewer main proposed as part of this project. Please review the plan information for the items it is intended to address, and, if acceptable, provide a written approval of the plan in order that construction may begin at the earliest opportunity.

Appropriate review fee (\$2,748.50 SCS fee) and fee application are included. If you have questions or require additional information, please do not hesitate to contact me at your earliest convenience.

Sincerely, Pape-Dawson Engineers, Inc.

Caleb Chance, P.E. Senior Vice President

Attachments

P:\133\70\00\Word\Reports\SCS\02 - WPAP Modification Cover Letter.docx

Transportation | Water Resources | Land Development | Surveying | Environmental

EDWARDS AQUIFER APPLICATION COVER PAGE (TCEQ-20705)

Texas Commission on Environmental Quality Edwards Aquifer Application Cover Page

Our Review of Your Application

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

Administrative Review

1. <u>Edwards Aquifer applications</u> 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: <u>http://www.tceq.texas.gov/field/eapp</u>.

- 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:							2. Regulated Entity No.:				
3. Customer Name:						4. Customer No.:					
5. Project Type: (Please circle/check one)	New		Modif	icatior	1	Extension		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)	Resider	ntial	Non-r	esiden	tial		8. Sit	e (acres):			
9. Application Fee:			10. Permanent BMP(s):								
11. SCS (Linear Ft.):			12. AST/UST (No. 7				nks):				
13. County:			14. W	aters	hed:						

Application Distribution

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

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

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

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

San Antonio Region						
County:	Bexar	Comal	Kinney	Medina	Uvalde	
Original (1 req.)						
Region (1 req.)						
County(ies)						
Groundwater Conservation District(s)	Edwards Aquifer Authority Trinity-Glen Rose	Edwards Aquifer Authority	Kinney	EAA Medina	EAA Uvalde	
City(ies) Jurisdiction	Castle Hills Fair Oaks Ranch Helotes Hill Country Village Hollywood Park San Antonio (SAWS) Shavano Park	Bulverde Fair Oaks Ranch Garden Ridge New Braunfels Schertz	NA	San Antonio ETJ (SAWS)	NA	

O:\Public\WORD\Reports-Covers-Dividers\TCEQ\CZP\f-20705_Edwards_Aquifer_application_cover.pdf

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.	

Caleb Chance, P.E.

Print Name of Customer/Authorized Agent

Signature of Customer/Authorized Agent

1

1/8/25 Date

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

GENERAL INFORMATION FORM (TCEQ-0587)

General Information Form

Texas Commission on Environmental Quality

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

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

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

Signature

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

Print Name of Customer/Agent: Caleb Chance, P.E.

Date: 1/8/25

Signature of Customer/Agent:

Project Information

- 1. Regulated Entity Name: The Villas at Timberwood Offsite Sanitary Sewer Extension
- 2. County: <u>Bexar</u>
- 3. Stream Basin: Salado Creek
- 4. Groundwater Conservation District (If applicable): Edwards Aquifer Authority
- 5. Edwards Aquifer Zone:



6. Plan Type:

	WPAP
\boxtimes	SCS
	Modification

AST UST Exception Request

TCEQ-0587 (Rev. 02-11-15)

1 of 4

7. Customer (Applicant):

Contact Person: Roy Block

 Entity: The Villas at Timberwood Homeowners Association

 Mailing Address: 20540 State Highway 46 W, STE 115 C/O 497

 City, State: Spring Branch, Tx
 Zip: 78070

 Telephone: _____
 FAX: _____

 Email Address:
 Email Address:

8. Agent/Representative (If any):

Contact Person: Caleb Chance, P.E.Entity: Pape-Dawson Engineers, Inc.Mailing Address: 2000 NW Loop 410City, State: San Antonio, TexasTelephone: (210) 375-9000Email Address: cchance@pape-dawson.com

Zip: <u>78213</u> FAX: <u>(210) 375-9010</u>

9. Project Location:

The project site is located inside the city limits of ______

The project site is located outside the city limits but inside the ETJ (extra-territorial jurisdiction) of <u>San Antonio</u>.

- 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.

<u>From TCEQ's regional office, head north on Judson Road 2.5 miles to Loop 1604. Travel</u> west approximately 4.0 miles to US-281. Head north on 281 approximately 4 miles, <u>Exit Overlook Parkway head west on Overlook Parkway for approximately 1.5</u> <u>miles.head north on Canyon Golf Rd. approximately 0.25 miles. Head north onto</u> <u>Misty Water Ln approximately 0.25 miles. Finally head west approximately 0.5 miles</u>

- 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

TCEQ-0587 (Rev. 02-11-15)

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: When advised by TCEQ of site visit

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:

\boxtimes	Area of the site
	Offsite areas
	Impervious cover
	Permanent BMP(s)
\boxtimes	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
\boxtimes	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. \square 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.

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

ATTACHMENT A

THE VILLAS AT TIMBERWOOD OFFSITE SANITARY SEWER EXTENSION SCS Plan





ATTACHMENT B

THE VILLAS AT TIMBERWOOD OFFSITE SANITARY SEWER EXTENSION SCS Plan



Pape-Dawson Engineers, Inc.



ATTACHMENT C

THE VILLAS AT TIMBERWOOD OFFSITE SEWER EXTENSION SEWAGE COLLECTION SYSTEM

Attachment C – Project Description

The Villas at Timberwood Offsite Sewer Extension Sewage Collection System (SCS) Application proposes the construction of a total of 5,497 linear feet (LF) of sewer main to serve an existing single-family residential development known as The Villas at Timberwood. Approximately, 2,769 LF is located within the Recharge Zone and 2,728 LF is located within the Contributing Zone of the Edwards Aquifer. A SCS has been prepared for the entire limits of construction. The proposed alignment will consist of 5,497 LF of 8-inch (8") PVC, SDR 26 gravity sewer main and 18 manholes. Regulated activities proposed include clearing, construction of sewer mains, backfill, and compaction. Approximately 5.99 acre project site may be disturbed as identified by the limits shown on the plans.

The contributing acreage for inflow and infiltration is 5.99 acres. The proposed development will generate approximately 15,000 gallons per day (average flow) of additional domestic wastewater based on the assumption of 200 GPD/LUE for 75 EDUs. Potable water services are also provided by san Antonio Water Systems (SAWS). Wastewater treatment and disposal for the area will be provided by the existing Steven M. Clouse Water Recycling Center (WRC) operated by SAWS. Refer to included EDR and SCS application for additional details.

GEOLOGIC ASSESSMENT FORM (TCEQ-0585)

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.

215.		
Print Name of Geologist: Henry E. Stultz III, P.G.	Telephone: 210-375-9000	
Date: December 20,2024	Fax: 210-375-9090	
Representing: Pape-Dawson Engineers, Inc., TBPG	registration number 50351	
Signature of Geologist:	TE OF TELAS	
25-	HENRY STULTZ III D GEOLOGY 12121 CENSE ONAL & GEO	
Regulated Entity Name: <u>The Villas at Timberwood</u>	Offsite Sanitary Sewer Extension	
Project Information		
1. Date(s) Geologic Assessment was performed: Determined Determine	ecember 13, 2024	
2. Type of Project:		
WPAP SCS 3. Location of Project:	AST UST	
 Recharge Zone Transition Zone Contributing Zone within the Transition Zone 	~	
TCEQ-0585 (Rev.02-11-15)	1	L of 3

- 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.

Soil Name	Group*	Thickness(feet)
Crawford, stony and Bexar soils, 0-5% slopes (Cb)	D	3-4
Krum clay, 1-5% slopes (Kr)	С	6-7
Brackett-Eckrant association, 20-60% slopes (BtE)	D	1-2

Table 1 - Soil Units, Infiltration Characteristics and Thickness

* 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. X 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" = <u>50'</u> Site Geologic Map Scale: 1" = <u>50'</u> Site Soils Map Scale (if more than 1 soil type): 1" = <u>500'</u>

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

Administrative Information

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

ATTACHMENT A Geologic Assessment Table

GEOLO	GIC ASSES	SMENT T	ABLE		1200	2	PROJECT NAME: The Villas at Timberwood Offsite						rwood Offsite Sanitary Sewer Extension							
	LOCATION				1000		FE.	ATUR	E CHARA	CTERI	STICS		11/24	100	EV/	EVALUATION PHYSIC			YSICAL	SETTING
1A	1B *	1C*	2A	2B	3		4	4 5		5A	6	7	8A	8B	9		10	1	11	12
FEATURE ID	LATITUDE	LONGITUDE	FEATURE TYPE	POINTS	FORMATION	DIME	INSIONS	FEET)	TREND (DEGREES)	DOM	DENSITY (NO/FT)	APERTURE (FEET)	INFILL	RELATIVE INFILTRATION RATE	TOTAL	SENS	ITIVITY	CATCHM (AC	ENT AREA RES)	TOPOGRAPHY
	1.1.1					х	Y	Z		10			100			<40	<u>≥40</u>	<1.6	≥1.6	
S-1	29.68071	-98.48152	MB	30	Kek								F,C	20	50		50	X		Hillside
S-2	29.68439	-98.48639	F	20	Kgr/Kek				N65E	10			F	5	35	35			X	Drainage
S-3	29.68264	-98.48510	F	20	Kgr/Kek				N65E	10			F	5	35	35			X	Drainage

** DATUM: NAD 83

R GEOLOGY	Chin to the states	TE OF TE	A C A A
NAL ASCE	PROFESS	GEOLOGY 12121 CENSE	C. T. NTIST

2A TYPE	TYPE	2B POINTS		8A INFILLING
с	Cave	30	N	None, exposed bedrock
SC	Solution cavity	20	C	Coarse - cobbles, breakdown, sand, gravel
SF	Solution-enlarged fracture(s)	20	0	Loose or soft mud or soil, organics, leaves, sticks, dark colors
F	Fault	20	F	Fines, compacted clay-rich sediment, soil profile, gray or red colors
0	Other natural bedrock features	5	V	Vegetation. Give details in narrative description
MB	Manmade feature in bedrock	30	FS	Flowstone, cements, cave deposits
SW	Swallow hole	30	×	Other materials
SH	Sinkhole	20	-	
CD	Non-karst closed depression	5		12 TOPOGRAPHY
Z	Zone, clustered or aligned features	30	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.

12/20/2024 Date

ATTACHMENT B Stratigraphic Column

THE VILLAS AT TIMBERWOOD OFFSITE SANITARY SEWER EXTENSION Geologic Assessment (TCEQ-0585)

Period	Epoch	Group	Formation	Member	Thickness	Lithology	Hydro- logic Unit	Hydro- stratigraphic Unit		Hydrologic Function	Porosity	Cavern Development
Cretaceous Early Cretaceous Early Cretaceous				Grainstone	40–50	Hard, dense limestone that consists mostly of a tightly cemented miliolid skeletal fragment grainstone; contains interspersed chalky mudstone and wackestone; chert as beds and nodules; crossbedding and ripple marks are common primarily at the contact with the overlying regional dense bed		v		Aquifer	IP, IG, BU, FR, BP, CV	Few
		rds		Kirsch-berg Evaporite	40–50	Highly altered crystalline limestone and chalky mudstone with occasional grainstone associated with tidal channels; chert as beds and nodules, boxwork molds are common, matrix recrystallized to a coarse grain spar; intervals of collapse breccia and travertine deposits	Aquifer	VI		Aquifer	IG, MO, VUG, FR, BR, CV	Probably extensive cave development
		Edwa	Kainer	Dolomitic	90–120	Hard, dense to granular, dolomitic limestone; chert as beds and nodules (absent in lower 20 ft); <i>Toucasia</i> sp. abundant; lower three-fourths composed of sucrosic dolomites and grainstones with hard, dense limestones interspersed; upper one-fourth composed mostly of hard, dense mudstone, wackestone, packstone, grainstone, and recrystallized dolomites with bioturbated beds	Edwards .	VII		Aquifer	IP, IC, IG, MO, BU, VUG, FR, BP, CV	Cave development as shafts with minor horizontal extent
				Basal nodular	40–50	Moderately hard, shaly, nodular, burrowed mudstone to miliolid grainstone that also contains dolomite; contains dark, spherical textural features known as black rotund bodies; <i>Ceratostreon texana</i> , <i>Caprina</i> sp., miliolids, and gastropods		VIII		Aquifer, confining unit in areas without caves	IP, MO, BU, BP, FR, CV	Large lateral caves at surface
			Glen Rose Limestone	Upper Glen Rose	0–120 (absent in northern Comal Co.)			Cavernous		Aquifer	MO, BR, BP, FR, CV	
	snoa				120–230 (thicker in northern Comal Co.)	Alternating resistant and nonresistant beds of blue shale, nodular marl, and impure, fossiliferous limestone; gray to yellowish gray; stair-step topography; contains two distinct evaporite zones; distinct <i>Corbula</i> sp. bed marks the contact with the underlying lower member of the Gien Rose Limestone; <i>Orbitulina texana</i>	dwards aquifer	Camp	mp Bullis	Confining	BU, BP, FR, occasional CV	I Some surface cave development
	Early Cretac				0-10		Jpper Trinity unit to the E	Upper ev	aporite	Aquifer	IP, MO, BU, BR	
					0–40		L confining	Fossil-	Upper	Aquifer	MO, BU, FR, CV	
					80-150			licious	Lower	Confining	MO, BU, FR	
					8–10			Lower evaporite		Aquifer	IP, MO, BU, BR	
		Trinity			30–40 (typ. 30)			Bulverde		Semi- confining	MO, BR BP, FR	
					30–40 (typ. 30)			Little Blanco		Aquifer	MO, BU, BP, FR	
				Lower Glen Rose	10–66 (typ. 30)	Massive, fossiliferous limestone grading upward into thin beds of limestone, dolomite, marl, and shale; numerous caves and reefs occur in the lower portion of the member; Orbitulina texana, Caprina sp., Toucasia sp., Trigonia sp., Turritella sp., miliolids, and various corals common;	Middle Trinity	Twin Sisters		Semi- confining, confining shale beds	IP	_
					40-80 (typ. 40)	contains trace fossil burrows, oysters, pectens, and shell fragments		Doeppen- schmidt		Aquifer	IP, MO, BU, BP, FR, CV	
					40-70 (typ. 40)			Rust		Semi- confining	IP, FR, CV	
					45–60 (typ. 55)			Honey	Creek	Aquifer	IP, MO, BU, BP, FR, CH, CV	

Attachment B – Stratigraphic Column

Source: Clark, Golab, and Morris (2016); Cavern development modified from Stein and Ozuna (1995). Porosity types - Fabric selective: IP, interparticle porosity; IG, intergranular porosity; Cl, intercrystalline porosity; SH, shelter porosity; MO, moldic porosity; BU, burrowed porosity; FF, fenestral; BP, bedding plane porosity; SH, shelter porosity; CH, channel porosity; CH, shannel porosity; RB, breccia; VUG, vug porosity; CV, cave porosity. CH

ATTACHMENT C Site Geology

THE VILLAS AT TIMBERWOOD OFFSITE SANITARY SEWER EXTENSION Geologic Assessment

Attachment C – Site Geology

SUMMARY

The Villas at Timberwood Offsite Sanitary Sewer Extension site is located in northern Bexar County, northwest of the Deer Cross Ln and White Eagle Dr. intersection.

Based on the results of the field survey conducted in accordance with *Instructions for Geologists for Geologic Assessments in the Edwards Aquifer Recharge/Transition Zones (TCEQ-0585 Instructions),* no naturally occurring sensitive features were identified on site. The site generally follows the Timberline drainage channel. No springs were identified on site. The overall potential for fluid migration to the Edwards Aquifer for the site is low.

SITE GEOLOGY

As observed through field evidence, the geologic units which outcrop at the surface within the subject site are the basal nodular (Kekbn) member of the Kainer formation and the upper member of the Glen Rose (Kgru) formation. A description of the units observed onsite is provided below:

- The Kekbn is a massive, shaly, mudstone to grainstone, nodular limestone. Karst development within the Kekbn is characterized by vertical shafts as well as large lateral caves.
- The Kgru is characterized as yellowish-tan thinly bedded limestone and marl. Karst development within the Kgru is characterized by cave formation, with predominantly lateral large rooms.

The predominant trend of faults in the vicinity of the site is approximately N65°E, based on faults identified during the previous mapping of the area.

FEATURE DESCRIPTIONS:

A description of the features observed onsite is provided below:

THE VILLAS AT TIMBERWOOD OFFSITE SANITARY SEWER EXTENSION Geologic Assessment

Feature S-1

Feature S-1 is an existing sewer line that is not located beneath pavement within the site. The sewer line has been trenched through bedrock and backfilled with a mix of fine and course fill material that may be more permeable than surrounding undisturbed areas. Therefore, the probability of rapid infiltration is intermediate.

Feature S-2

Feature S-2 is an interformational fault that juxtaposes the Kgru to the north-northwest with the Kgt and Kdr to the south-southeast. It was identified by review of aerial photography and published maps. Lack of evidence of enhanced permeability and the presence of fine-grained soil cover suggests a low probability for rapid infiltration.

Feature S-3

Feature S-3 is an interformational fault that juxtaposes the Kgru to the west-southwest with the Kek to the east-northeast. It was identified by review of aerial photography and published maps. Lack of evidence of enhanced permeability and the presence of fine-grained soil cover suggests a low probability for rapid infiltration.

REFERENCES

Clark, A.K., Golab, J.A., Morris, R.R., and Pedraza, D.E., 2023, Geologic framework and hydrostratigraphy of the Edwards and Trinity aquifers within northern Bexar and Comal Counties, Texas: U.S. Geological Survey Scientific Investigations Map 3510, 1 sheet, scale 1:24,000, 24-p. pamphlet, https://doi.org/10.3133/sim3510

Nationwide Environmental Title Research, LLC. Historical Aerials, HistoricAerials.com. https://www.historicaerials.com/viewer, May 10, 2021.

Soil Survey Staff, Natural Resources Conservation Service, United States Department of Agriculture. Web Soil Survey. http://websoilsurvey.sc.egov.usda.gov/, May 10, 2021.

Stein, W.G., and Ozuna, G.B., 1995, Geologic framework and hydrogeologic characteristics of the Edwards Aquifer recharge zone, Bexar County, Texas: U.S. Geological Survey Water-Resources Investigations Report 95–4030, 8 p.

THE VILLAS AT TIMBERWOOD OFFSITE SANITARY SEWER EXTENSION Geologic Assessment

Texas Water Development Board, Wells in TWDB Groundwater Database Viewer, https://www3.twdb.texas.gov/apps/waterdatainteractive/groundwaterdataviewer, May 10, 2021.

U.S. Geological Survey, National Water Information System: Mapper, https://maps.waterdata.usgs.gov/mapper/index.html, May 10, 2021. December 20, 2024.

ATTACHMENT D Site Geologic Map(s)



Date: Dec 19, 2024 1:34 PM User: hstultz File: P:\133\70\00\ENV\GA\GIS\Working.aprx







: Dec 19, 2024, 1:13pm User ID: hstultz P:\133\20\00\FN\\GA\CAD\GA1337000 dw
ORGANIZED SEWAGE COLLECTION SYSTEM PLAN (TCEQ-0582)

Organized Sewage Collection System Application

Texas Commission on Environmental Quality

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

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

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

Regulated Entity Name: The Villas at Timberwood Offsite Sanitary Sewer Extension

 Attachment A – SCS Engineering Design Report. This Engineering Design Report is provided to fulfill the requirements of 30 TAC Chapter 217, including 217.10 of Subchapter A, §§217.51 – 217.70 of Subchapter C, and Subchapter D as applicable, and is required to be submitted with this SCS Application Form.

Customer Information

 The entity and contact person responsible for providing the required engineering certification of testing for this sewage collection system upon completion (including private service connections) and every five years thereafter to the appropriate TCEQ region office pursuant to 30 TAC §213.5(c) is:

Contact Person: <u>Roy Block</u>		
Entity: <u>The Villas at Timberwood Homeowners Association, Inc.</u>		
Mailing Address: 20540 State Highway 46 W,	<u>STE 115 C/O 497,</u>	
City, State: <u>Spring Branch, Tx</u>	Zip: <u>78070</u>	
Telephone:	Fax:	
Email Address:		

The appropriate regional office must be informed of any changes in this information within 30 days of the change.

3. The engineer responsible for the design of this sewage collection system is:

Contact Person: <u>Caleb Chance, P.E.</u> Texas Licensed Professional Engineer's Number: <u>98401</u> Entity: <u>Pape-Dawson Engineers, Inc.</u> Mailing Address: <u>2000 NW Loop 410</u> City, State:<u>San Antonio, TX</u> Zip: <u>78213</u> Telephone:(<u>210) 375-9000</u> Fax:(<u>210) 375-9010</u> Email Address:<u>cchance@pape-dawson.com</u>

Project Information

4. Anticipated type of development to be served (estimated future population to be served, plus adequate allowance for institutional and commercial flows):

\boxtimes	Residential: Number of single-family lots: 75
	Multi-family: Number of residential units:
	Commercial
	Industrial
	Off-site system (not associated with any development)
	Other:

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

<u>100</u> % Domestic	<u>15,000</u> gallons/day
% Industrial	gallons/day
% Commingled	gallons/day
Total gallons/day: <u>15,000 (75 EDU * 200</u>) <u>GPD/EDU) = 15,000 GPD</u>

- 6. Existing and anticipated infiltration/inflow is <u>1,830</u> gallons/day. This will be addressed by: <u>adequate sizing of sewer main</u>.
- 7. A Water Pollution Abatement Plan (WPAP) is required for construction of any associated commercial, industrial or residential project located on the Recharge Zone.

The WPAP application for this development was approved by letter dated _____. A copy of the approval letter is attached.

The WPAP application for this development was submitted to the TCEQ on _____, but has not been approved.

A WPAP application is required for an associated project, but it has not been submitted. There is no associated project requiring a WPAP application.

8. Pipe description:

Table 1 - Pipe Description

Pipe Diameter(Inches)	Linear Feet (1)	Pipe Material (2)	Specifications (3)
8" Gravity	5,457	PVC, SDR 26	ASTM D3034, ASTM D3212
8" Pressure-Rated (160-psi)	40	PVC, SDR 26	ASTM D2241, Class 160, ASTM C1173, ASTM D3139

Total Linear Feet: 5,497

- (1) Linear feet Include stub-outs and double service connections. Do not include private service laterals.
- (2) Pipe Material If PVC, state SDR value.
- (3) Specifications ASTM / ANSI / AWWA specification and class numbers should be included.
- 9. The sewage collection system will convey the wastewater to the Steven M. Clouse Water Recycling Center (name) Treatment Plant. The treatment facility is:



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

The City of <u>San Antonio (SAWS)</u> standard specifications. Other. Specifications are attached.

11. 🖂 No force main(s) and/or lift station(s) are associated with this sewage collection system.

A force main(s) and/or lift station(s) is associated with this sewage collection system and the Lift Station/Force Main System Application form (TCEQ-0624) is included with this application.

Alignment

- 12. There are no deviations from uniform grade in this sewage collection system without manholes and with open cut construction.
- 13. There are no deviations from straight alignment in this sewage collection system without manholes.
 - Attachment B Justification and Calculations for Deviation in Straight Alignment without Manholes. A justification for deviations from straight alignment in this sewage collection system without manholes with documentation from pipe manufacturer allowing pipe curvature is attached.

For curved sewer lines, all curved sewer line notes (TCEQ-0596) are included on the construction plans for the wastewater collection system.

Manholes and Cleanouts

14. X Manholes or clean-outs exist at the end of each sewer line(s). These locations are listed below: (Please attach additional sheet if necessary)

Table 2 - Manholes and Cleanouts

Line	Shown on Sheet	Station	Manhole or Clean- out?
A	C5.06 Of C5.06	55+76.45	M.H. "A19"
	Of		
	Of		
	Of		

Line	Shown on Sheet	Station	Manhole or Clean- out?
	Of		

- 15. Manholes are installed at all Points of Curvature and Points of Termination of a sewer line.
- 16. The maximum spacing between manholes on this project for each pipe diameter is no greater than:

Pipe Diameter (inches)	Max. Manhole Spacing (feet)
6 - 15	500
16 - 30	800
36 - 48	1000
≥54	2000

- Attachment C Justification for Variance from Maximum Manhole Spacing. The maximum spacing between manholes on this project (for each pipe diameter used) is greater than listed in the table above. A justification for any variance from the maximum spacing is attached, and must include a letter from the entity which will operate and maintain the system stating that it has the capability to maintain lines with manhole spacing greater than the allowed spacing.
- 17. All manholes will be monolithic, cast-in-place concrete.
 - The use of pre-cast manholes is requested for this project. The manufacturer's specifications and construction drawings, showing the method of sealing the joints, are attached.

Site Plan Requirements

Items 18 - 25 must be included on the Site Plan.

18. \square The Site Plan must have a minimum scale of 1" = 400'.

Site Plan Scale: 1" = <u>50</u>'.

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

- 20. Lateral stub-outs:
 - The location of all lateral stub-outs are shown and labeled.
 - No lateral stub-outs will be installed during the construction of this sewer collection system.
- 21. Location of existing and proposed water lines:
 - The entire water distribution system for this project is shown and labeled.
 - If not shown on the Site Plan, a Utility Plan is provided showing the entire water and sewer systems.
 - There will be no water lines associated with this project.
- 22. 100-year floodplain:
 - After construction is complete, no part of this project will be in or cross a 100-year floodplain, either naturally occurring or manmade. (Do not include streets or concrete-lined channels constructed above of sewer lines.)
 - After construction is complete, all sections located within the 100-year floodplain will have water-tight manholes. These locations are listed in the table below and are shown and labeled on the Site Plan. (Do not include streets or concrete-lined channels constructed above sewer lines.)

Table 3 - 100-Year Floodplain

Line	Sheet	Station
А	C5.03 of C5.03	17+41.73 to 17+41.73
А	C5.04 of C5.04	26+24.18 to 26+24.18
А	C5.04 of C5.04	28+68.56 to 28+68.56
А	C5.04 of C5.04	31+77.37 to 31+77.37

- 23. 5-year floodplain:
 - After construction is complete, no part of this project will be in or cross a 5-year floodplain, either naturally occurring or man-made. (Do not include streets or concrete-lined channels constructed above sewer lines.)
 - After construction is complete, all sections located within the 5-year floodplain will be encased in concrete or capped with concrete. These locations are listed in the table below and are shown and labeled on the Site Plan. (Do not include streets or concrete-lined channels constructed above sewer lines.)

Table 4 - 5-Year Floodplain

Line	Sheet	Station
	of	to

- 24. \boxtimes Legal boundaries of the site are shown.
- 25. The *final plans and technical specifications* are submitted for the TCEQ's review. Each sheet of the construction plans and specifications are dated, signed, and sealed by the Texas Licensed Professional Engineer responsible for the design on each sheet.

Items 26 - 33 must be included on the Plan and Profile sheets.

26. All existing or proposed water line crossings and any parallel water lines within 9 feet of sewer lines are listed in the table below. These lines must have the type of pressure rated pipe to be installed shown on the plan and profile sheets. Any request for a variance from the required pressure rated piping at crossings must include a variance approval from 30 TAC Chapter 290.

There will be no water line crossings.

There will be no water lines within 9 feet of proposed sewer lines.

Table 5 - Water Line Crossings

Line	Station or Closest Point	Crossing or Parallel	Horizontal Separation Distance	Vertical Separation Distance
А	28+88.58	Crossing	n/a	2.0 FT
A	29+34.68	Crossing	n/a	2.0 FT

27. Vented Manholes:

No part of this sewer line is within the 100-year floodplain and vented manholes are not required by 30 TAC Chapter 217.

A portion of this sewer line is within the 100-year floodplain and vented manholes will be provided at less than 1500 foot intervals. These water-tight manholes are listed in the table below and labeled on the appropriate profile sheets.

A portion of this sewer line is within the 100-year floodplain and an alternative means of venting shall be provided at less than 1500 feet intervals. A description of the alternative means is described on the following page.

A portion of this sewer line is within the 100-year floodplain; however, there is no interval longer than 1500 feet located within. No vented manholes will be used.

Table 6 - Vented Manholes

Line	Manhole	Station	Sheet

Line	Manhole	Station	Sheet

28. Drop manholes:

There are no drop manholes associated with this project.

Sewer lines which enter new or existing manholes or "manhole structures" higher than 24 inches above the manhole invert are listed in the table below and labeled on the appropriate profile sheets. These lines meet the requirements of 30 TAC §217.55(I)(2)(H).

Table 7 - Drop Manholes

Line	Manhole	Station	Sheet

29. Sewer line stub-outs (For proposed extensions):

] The placement and markings of all sewer line stub-outs are shown and labeled.

No sewer line stub-outs are to be installed during the construction of this sewage collection system.

30. Lateral stub-outs (For proposed private service connections):

The placement and markings of all lateral stub-outs are shown and labeled.

No lateral stub-outs are to be installed during the construction of this sewage collection system.

31. Minimum flow velocity (From Appendix A)

Assuming pipes are flowing full; all slopes are designed to produce flows equal to or greater than 2.0 feet per second for this system/line.

32. Maximum flow velocity/slopes (From Appendix A)

Assuming pipes are flowing full, all slopes are designed to produce maximum flows of less than or equal to 10 feet per second for this system/line.

Attachment D – Calculations for Slopes for Flows Greater Than 10.0 Feet per Second. Assuming pipes are flowing full, some slopes produce flows which are greater than 10 feet per second. These locations are listed in the table below. Calculations are attached.

Table 8 - Flows Greater Than 10 Feet per Second										
Line	Profile Sheet	Station to Station	FPS	% Slope						

Table	8 -	Flows	Greater	Than	10	Feet	ber	Second
	-						·	

33. Assuming pipes are flowing full, where flows are \geq 10 feet per second, the provisions noted below have been made to protect against pipe displacement by erosion and/or shock under 30 TAC §217.53(I)(2)(B).

Concrete encasement shown on appropriate Plan and Profile sheets for the locations listed in the table above.

Steel-reinforced, anchored concrete baffles/retards placed every 50 feet shown on appropriate Plan and Profile sheets for the locations listed in the table above. $\times N/A$

Administrative Information

- 34. 🖂 The final plans and technical specifications are submitted for TCEQ review. Each sheet of the construction plans and specifications are dated, signed, and sealed by the Texas Licensed Professional Engineer responsible for the design on each sheet.
- 35. 🖂 Standard details are shown on the detail sheets, which are dated, signed, and sealed by the Texas Licensed Professional Engineer, as listed in the table below:

Standard Details	Shown on Sheet
Lateral stub-out marking [Required]	N/A of
Manhole, showing inverts comply with 30 TAC §217.55(I)(2) [Required]	DD-852-01 of C5.10
Alternate method of joining lateral to existing SCS line for potential future connections [Required]	N/A of
Typical trench cross-sections [Required]	DD-804-01 of C5.10
Bolted manholes [Required]	DD-852-07 of C5.10
Sewer Service lateral standard details [Required]	N/A of
Clean-out at end of line [Required, if used]	N/A of

Table 9 - Standard Details

Erosion/Shock

Protection

Standard Details	Shown on Sheet
Baffles or concrete encasement for shock/erosion protection [Required, if flow velocity of any section of pipe >10 fps]	N/A of
Detail showing Wastewater Line/Water Line Crossing [Required, if crossings are proposed]	C5.01 of C5.01
Mandrel detail or specifications showing compliance with 30 TAC §217.57(b) and (c) [Required, if Flexible Pipe is used]	N/A of
Drop manholes [Required, if a pipe entering a manhole is more than 24 inches above manhole invert]	N/A of

^{36.} All organized sewage collection system general construction notes (TCEQ-0596) are included on the construction plans for this sewage collection system.

37. All proposed sewer lines will be sufficiently surveyed/staked to allow an assessment prior to TCEQ executive director approval. If the alignments of the proposed sewer lines are not walkable on that date, the application will be deemed incomplete and returned.

Survey staking was completed on this date: Once advised of TCEQ site visit

- 38. Submit one (1) original and one (1) copy of the application, plus additional copies as needed for each affected incorporated city, groundwater conservation district, and county in which the project will be located. The TCEQ will distribute the additional copies to these jurisdictions. The copies must be submitted to the appropriate regional office.
- 39. Any modification of this SCS application will require TCEQ approval, prior to construction, and may require submission of a revised application, with appropriate fees.

Signature

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

Print Name of Licensed Professional Engineer: Caleb Chance, P.E.

Date: 1/20/25

Place engineer's seal here:



Signature of Licensed Professional Engineer:

TCEQ-0582 (Rev. 02-11-15)

Appendix A-Flow Velocity Table

Flow Velocity (Flowing Full) All gravity sewer lines on the Edwards Aquifer Recharge Zone shall be designed and constructed with hydraulic slopes sufficient to give a velocity when flowing full of not less than 2.0 feet per second, and not greater than 10 feet per second. The grades shown in the following table are based on Manning's formula and an n factor of 0.013 and shall be the minimum and maximum acceptable slopes unless provisions are made otherwise.

Pipe Diameter(Inches)	% Slope required for minimum flow velocity of 2.0 fps	% Slope which produces flow velocity of 10.0 fps
6	0.50	12.35
8	0.33	8.40
10	0.25	6.23
12	0.20	4.88
15	0.15	3.62
18	0.11	2.83
21	0.09	2.30
24	0.08	1.93
27	0.06	1.65
30	0.055	1.43
33	0.05	1.26
36	0.045	1.12
39	0.04	1.01
>39	*	*

Table 10 - Slope Velocity

*For lines larger than 39 inches in diameter, the slope may be determined by Manning's formula (as shown below) to maintain a minimum velocity greater than 2.0 feet per second when flowing full and a maximum velocity less than 10 feet per second when flowing full.

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

Figure 1 - Manning's Formula

Where:

v = velocity (ft/sec)
n = Manning's roughness coefficient
(0.013)
Rh = hydraulic radius (ft)
S = slope (ft/ft)

CORE DATA FORM (TCEQ-10400)



TCEQ Core Data Form

For detailed instructions regarding completion of this form, please read the Core Data Form Instructions or call 512-239-5175.

SECTION I: General Information

1. Reason for Submission (If other is checked please describe in space provided.)							
New Permit, Registration or Authorization (Core Data Form should be submitted with the program application.)							
Renewal (Core Data Form should be submitted	Other						
2. Customer Reference Number (if issued)	Follow this link to search	3. Regulated Entity Reference Number (if issued)					
CN 604095778	for CN or RN numbers in Central Registry**	RN 104814959					

SECTION II: Customer Information

4. General C	ustomer I	nformation	5. Effective Date	e for Cus	tomer	Inform	ation Updates (mm/dd/yyyy)				
New Cust	omer Legal Nar	ne (Verifiable wit	Upda 🗌 Upda	ate to Cus tary of Sta	tomer ate or ⁻	Informa Texas (ition Comp	troller	Change i Change i of Public Account	n Regulated E	Entity Ownership
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) <u>If new Customer, enter previous Customer below:</u>											
The Villas	The Villas at Timberwood Homeowners Association										
Inc.											
7. TX SOS/CI	PA Filing	Number	8. TX State Tax	ID (11 digit	s)		9	. Fede	eral Tax ID (9 digits)	10. DUN	S Number (if applicable)
11. Type of C	on		Individ	ual		P					
Government:	City 🗌	County 🔲 Federal 🗌] State 🗌 Other		Sole P	roprieto	rship	hip Dther:			
12. Number (of Employ 21-100	rees	251-500	501 an	ıd high	er	1 [3. Inde	ependently Owners	ed and Opera o	ited?
14. Custome	r Role (Pr	oposed or Actual) -	- as it relates to the F	Regulated	Entity li	isted on	this fo	orm. Ple	ease check one of th	e'following	
	nallicone	Operat	or nsible Party		wner &	Opera	or	nnlican	nt 🗌 Othor:		
			TISIDle Faity		Juntar	y Clean	up A	pplical			
dr. Malling	20540	State Highw	ay 46 W, STE	E 115 C	/0 49	97					
Address:											
	City	Spring Brar	nch	State	ΤX		ZIP	780	070	ZIP + 4	
16. Country	Mailing In	formation (if outsi	de USA)			17. E-	Mail	Addre	ess (if applicable)		
18. Telephor	e Numbe	r	19.	Extensio	on or (Code			20. Fax Num	per (if applicat	ble)
(210)37	5-9000								()	-	

SECTION III: Regulated Entity Information

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

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

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

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

The Villas at Tim	berwo	od I	Homeowners A	Asso	ciation							
23. Street Address of	205	40 S	tate Highway	46	W, STE 1	15 C.	/0 49	97				
the Regulated Entity:												
<u>(No PO Boxes)</u>	City		Spring Bran	ch	State	T	X	ZIP	780	70	ZIP + 4	
24. County	Bex	ar										
		E	Enter Physical Lo	catio	n Descriptic	on if no	o stree	t address i	is provi	ided.		
25. Description to Physical Location:	Nor	thwe	est of the Deer	r Cro	oss Ln and	d Wh	ite Ea	agle Dr.	Inters	ection		
26. Nearest City	1		· · · · · · · · · · · · · · · · · · ·						State		Ne	earest ZIP Code
27. Latitude (N) In Decimal:						28. L	.ongitude ((W) In E	Decimal:			
Degrees	Minute	S		Seco	nds		Degre	es		Minutes		Seconds
29. Primary SIC Code digits)	rimary SIC Code (4 30. Secondary SIC Co				4 digits)	31. (5 d	Prima or 6 digit	rimary NAICS Code 32. Secondary NAICS Code (5 or 6 digits)				NAICS Code
1623	.623				237110							
33. What is the Prima	ry Busin	iess o	of this entity? (I	Do not	repeat the SIC o	or NAICS	S descrip	otion.)		···· •		······································
Offsite Sewer Ex	tensior	n Se	wage Collecti	on S	ystem							
04 Mailing				2	0540 State	Highw	ay 46	W, STE 11	5 C/O 4	97		
34. Mailing Δddress												
Addresser	Ci	ty	SpringBranch		State		ТΧ	ZIP		78070	ZIP + 4	1
35. E-Mail Addres	s:											
36. Tel	ephone	Numl	per		37. Extens	ion or	or Code 38. Fax Number				nber <i>(if ap</i>	plicable)
(21	0)375-9	9000								() -	
9. TCEQ Programs and orm. See the Core Data For	l ID Num m instruc	ibers tions f	Check all Programs or additional guidant	and w ce.	rite in the per	mits/reg	gistratio	n numbers th	nat will b	e affected by	y the update	s submitted on this
Dam Safety		Distric	ots		Edwards Aqui	fer	er 🔲 Emissions Inventory Air			tory Air	Industri	al Hazardous Waste
Municipal Solid Waste		New S	Source Review Air		DSSF			Petroleu	m Storaç	ge Tank	PWS	
		<u></u>			T'11 37 41			r=1 -,				**
	<u> </u>	Storm) water		I IIIe V AIr						Used O	
Voluntary Cleanup		Waste	e Water	$ _{\Box}$	Wastewater A	aricultu	re	Water Bi	ahts		Other:	
- tolaradiy oroundp						Jugan			9110			
				L								
ECHONIV: P	repar	er I	niormation					1				
40. Dreater T	م الم م ا	. D	F			A1 T	"Ho.	Vier	hand 1	ont		

40. Name: Brooke Lindholm, P.E.		41. Title:	Vice President
42. Telephone Number 43. Ext./Code	44. Fax Number	45. E-Mail /	Address
(210) 375-9000	(210)375-9010	BLindho	lm@pape-dawson.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: Pape-Dawson Consulting Engineers, LLC Job Title: Senior Vice President	
---------------------------------------------------------------------------------	--

Name (In Print):	Caleb Chance, P.E.	Phone:	(210) 375- 9000
Signature:	all	Date:	2/10/25

ATTACHMENT A (Engineering Design Report)

TABLE OF CONTENTS

PURPOSE	. 1
PROJECT INFORMATION	. 1
GRAVITY SANITARY SEWER PIPING: FLOW & CAPACITY ANALYSIS	. 2
Odor Control	. 2
Flow Calculation	. 2
Capacity Calculation	.3
Conclusion	.3
GENERAL STRUCTURAL COMPONENTS	.4
Project Materials (Pipe and Joints):	.4
Project Materials (Bedding):	.5
Project Materials (Manholes):	6
Project Materials (Manhole Covers):	6
Minimum and Maximum Slopes	6
Backfill	. 7
Trenching	.7
Minimum and Maximum Trench Width	.7
Corrosion Prevention	.7
Manholes (General)	. 8
Manholes (Inverts)	. 8
Manholes (Ventilation)	. 8
FLEXIBLE PIPE COMPUTATIONS	.9
Live Load Calculations	.9
Buckling Pressure Calculations	.9
Allowable Buckling Pressure:	.9
Pressure Under Installed Conditions1	1
Installation Temperature Effects1	1
Tensile Strength1	1
Strain1	12
Modulus of Soil Reaction1	12
Zeta Calculation1	13
Pipe Stiffness1	13
Deflection1	4



PURPOSE

This Engineering Design Report has been prepared to comply with the Texas Commission on Environmental Quality's Design Criteria for Domestic Wastewater Systems (30 TAC 217), and regulations over the Edwards Aquifer Recharge Zone (30 TAC 213). Please note, throughout this application, the more stringent of SAWS, CoSA or TCEQ regulations shall apply.

PROJECT INFORMATION

The Villas at Timberwood Offsite Sanitary Sewer Extension is a proposed offsite sewer extension. The site is located within the City of San Antonio, in Bexar County, Texas, northwest of the Deer Cross Ln and White Eagle Dr. intersection.. The site is uncleared and undeveloped and a portion of the site contains 100-Year FEMA floodplain. This project is located entirely within the Edwards Aquifer Recharge Zone. No naturally occurring sensitive geological features were identified on the site.

The Villas at Timberwood Offsite Sanitary Sewage Collection System (SCS) Application submitted proposes the construction of a total of approximately 5,497 linear feet (LF) of sanitary sewer main to serve the proposed residential development. The proposed alignment will consist of approximately 5,497 linear feet (LF) of 8-inch (8") polyvinyl chloride (PVC), SDR 26 gravity sewer main. The proposed sanitary sewer main will tie into an existing San Antonio Water System (SAWS) 8" PVC, SDR 26 pipe. Regulated activities proposed include excavation, construction of sewer mains, manholes, backfill, and compaction. Approximately 5.99 acres may be disturbed as identified by the limits shown on the plans.

This project will result in an estimated additional 75 Equivalent Dwelling Units (EDUs). The permanent population within the proposed development that will be served by the proposed sewage collection system is estimated to be 300 people, based on four (4) persons per lot (75 lots (EDU) * 4 = 300 people). Approximately 15,000 gallons per day (gpd) of average domestic wastewater flow is estimated to be generated by this project. Wastewater treatment and disposal for the area will be provided by the existing Steven M. Clouse Water Recycling Center (WRC) operated by SAWS.

Please refer to Sheet C5.00 and C5.01 of the attached sewer plans, which shows the proposed service area and its topographic features. This system is designed to have a minimum structural life of 50 years. Safety considerations are the responsibility of the contractor. Refer to SAWS Item Nos. 550 and 902 for construction safety information. Safety protection shall be accomplished in accordance with the most recent requirements of the Occupational Safety and Health Administration (OSHA) Standards and Interpretations.

GRAVITY SANITARY SEWER PIPING: FLOW & CAPACITY ANALYSIS

Basis for average flow used for design of collection system (check one or more):

Per Capita Contributions:	
Service Connections:	\checkmark
Land Area and Use:	✓
Fixture Analysis:	

Odor Control

Odor Control is not necessary on this project as it is a gravity line and there will be no conditions where sewage is standing and will become septic.

Flow Calculation

 Peaking Factor used for design:
 2.5

 Peaking Factor is based on:
 SAWS Specifications for peak dry weather flow (from SAWS USR 13.3.4)

Total EDUs = 75 EDUs

1 EDU = 200 gallons per day (average sewage flow)

= 500 gallons per day (peak flow) Infiltration = 600 gallons per acre served

```
Average Flow= \underline{75} EDUs x (200 gpd/EDU) + [(600 gpd/acre) x 5.99 acres] = \underline{18,594} gpd = \underline{12.9} gpmPeak Flow= \underline{75} EDUs x (500 gpd/EDU) + [(600 gpd/acre) x 5.99 acres] = \underline{41,094} gpd = \underline{28.5} gpm
```

Please note that capacities are determined using Manning's equation for pipes flowing full with an "n" value of 0.013. A reference for Manning's Equation can be found in "The Uni-Bell Handbook of PVC Pipe: Design and Construction".

Capacity Calculation

<u>Characteristics of 8" ASTM D3034, SDR 26, PVC Sewer Pipe:</u> Nominal Size = 8" Outer Diameter (D_o) = 8.40" Minimum Wall Thickness (t) = 0.323" Inner Diameter (D_i) = 7.75"

Manning's Equation:

 $Q = (k/n)(A)(R^{2/3})(S^{1/2})$

v = Q/A

Where:

Q = Discharge (cfs)

```
k = Constant [(1.49 ft<sup>1/3</sup>)/sec.]
```

n = Manning's roughness coefficient (unitless)

```
A = Flow area (ft^2)
```

R = Hydraulic Radius (ft)

= A/P = Cross sectional area of flow (ft^2)/Wetted perimeter (ft.)

S = Slope (ft/ft)

v = Velocity of flow (ft/s)

P:\133\70\00\Word\Reports\SCS\08a - EDR.docx

n = 0.013 [as required by 30 TAC 213.53 A(i)]

Calculations for 8" ASTM D3034, SDR 26, PVC Sewer Pipe:

 $A = \pi(D_i^2)/4 = \pi(7.75 \text{ in})^2/4 = 47.17 \text{ in}^2 = 0.33 \text{ ft}^2$

 $P = \pi(D_i) = \pi(7.75 \text{ in}) = 24.35 \text{ in} = 2.03 \text{ ft}$

 $R = A/P = 0.33 ft^2/2.03 ft.=0.16 ft$

S = 0.004

 $Q = [(1.49 \, ft^{1/3}/sec)/0.013](0.33 \, ft^2)(0.16 \, ft)^{2/3}(0.004)^{1/2}$

 $Q = 0.71 cfs = 319 gpm = Q_{full}$

v = 0.71 *cfs*/0.33 *ft*²=**2.15** *ft***/s**

Qmax = 0.71 cfs (0.90)(7.48 gallons/1 cf)(60 sec/1 min.)=287 gpm

Nominal Main Size (in)	Outer Diameter (in)	Minimum Slope (%)	Area (ft²)	Hydraulic Radius (A/P) ft	R ^{2/3}	S ^{1/2}	Q-Full (cfs)	Max Pipe (%)	Velocity (ft/s)	Q-Max (gpm)
8	8.40	0.40	0.33	0.16	0.29	0.063	0.71	90	2.15	287

Conclusion

The proposed 8" SDR 26 (NR & Class 160) PVC with a minimum slope of 0.40% has sufficient capacity to convey the projected average peak flows.

GENERAL STRUCTURAL COMPONENTS

Project Materials (Pipe and Joints):

Nominal Pipe Diameter (in)	Linear Feet	Pipe Material	National Standard Specification for Pipe Material	National Standard for Pipe Joints
8	5,497	PVC SDR 26	ASTM D3034	ASTM D3212

Note: Section 217.53 (j)(4) requires a minimum pipe diameter of 6 inches for all gravity sanitary sewer collection system piping.

Watertight, size on size resilient connectors conforming to ASTM C-923 have been specified for connecting pipe to manholes. See SAWS or GBRA Standard Specification for Construction Detail.

Where a collection system parallels a water supply pipe and a nine-foot separation distance cannot be achieved, Section 217.53 (d)(3)(A)(i) requires a collection system pipe be constructed of cast iron, ductile iron, or PVC meeting ASTM specifications with at least a 150 pounds per square inch (psi) rating for both the pipe and joints. The proposed project will comply with these requirements.

Where a collection system pipe crosses a water supply line and a nine-foot separation distance cannot be achieved, Section 217.53(d)(3)(B)(i) requires the collection system pipe be constructed of cast iron, ductile iron, or PVC with a minimum pressure rating of 150 psi. The proposed project will comply with this requirement and that of 217.53(d)(3)(B)(iii).

Project Materials (Bedding):

The specified bedding will comply with ASTM D2321-11 Class I, II or III for materials and densification. A minimum of 6 inches of bedding is required for all pipe.

Pipe Diameter (in)	Pipe Material	Bedding Class
8	PVC	Class I & Class III

The selection of bedding class is based on SAWS detail DD-804-01 for sanitary sewer pipe laid in a trench. Initial backfill for the pipe sizes shown above will be Class I. Secondary backfill will be Class III. See Table 2 of ASTM D2321-11 "Soil Classes" in Appendix A of this subsection.



Project Materials (Manholes):

Section 217.55 (f) prohibits the use of bricks to adjust a manhole cover to grade or construct a manhole. The proposed project will comply with this requirement.

The inside diameter of a manhole must be no less than 48 inches.

Section 217.55 (n) requires watertight, size-on-size resilient connectors that allow for differential settlement and must conform to American Society for Testing and Materials C-923. The proposed project complies with this requirement.

Under 30 TAC 213.5(C)(3)(A), all manholes over the Recharge Zone must be watertight, with watertight rings and covers. The proposed project complies with this requirement.

The materials specified for manhole construction are precast concrete.

Project Materials (Manhole Covers):

Manhole covers must be constructed of impervious materials. If personnel entry is required, a minimum 30-inch diameter clear opening must be provided. Inclusion of steps in a manhole is prohibited. If a manhole must be located within a 100-year flood plain, then a means of preventing inflow is required. A manhole cover that is located in a roadway must meet or exceed the American Association of State Highways and Transportation Officials Standard M-306 for load bearing.

Under 30 TAC 213.5 (c)(3)(A), all manholes over the Edwards Aquifer Recharge Zone must be watertight, with watertight rings and covers. This proposed project complies with this requirement.

Minimum and Maximum Slopes

Note: All pipes are designed with a slope that will provide a velocity of at least 2 ft/s flowing full, as calculated using Manning's equation with an "n" value of 0.013. Additionally, the collection system is designed to ensure that, with pipes flowing full, the velocities will be less than 10 feet per second.



The following are the minimum and maximum slopes for each pipe diameter:Pipe Diameter:**8" (NR and 160 psi)**Min. Slope:**0.40%**Max. Slope:**0.40%**

Backfill

Note: The backfill will be free of stones greater than 6 inches in diameter and free of organic or any other unstable material. See SAWS Item No. 804 for additional specifications.

Trenching

Note: The trench width will be minimized while still allowing adequate width for proper compaction of backfill, and while still ensuring that at least 6 inches of backfill exists below and on each side of the pipe. The trench walls will be vertical to at least one foot above the pipe.

Trenching will occur over the Recharge Zone and will comply with 30 TAC 213.5.

Minimum and Maximum Trench Width

Based on SAWS Standard Drawing DD-804-01 and 30 TAC 217.54:

Pipe Diameter: <u>8" (NR)</u> Min. Trench Width: <u>22"</u> Max. Trench Width: <u>34"</u>

These trench widths account for the bell diameter.

Corrosion Prevention

Proposed collection system components (pipes, manholes, etc.) will not be susceptible to deterioration through the corrosive effects of an anaerobic sewage environment. The interior of the manholes, however, are to be coated with a SAWS approved sewer structural coating per SAWS June 2009 Standard Specifications (Item No. 52, Section 852.2, Item 6). Epoxy coating specifically approved. The epoxy coating on the interior walls of the manhole provide interior corrosion protection.



Manholes (General)

Note: Manholes are provided at all changes in size, grade or alignment of pipe, at the intersection of all pipes and at the end of all lines that may be extended at a future date. A clean-out with watertight plugs may be installed instead of a manhole if no extensions are anticipated. Clean outs must pass all testing requirements outlined for gravity collection pipes.

Pipe Diameter (in)	Max. Manhole Spacing (ft)
6 - 15	500
18 - 30	800
36 - 48	1000
54 or larger	2000

The project complies with the maximum manhole spacing allowed by the TCEQ:

Manhole Spacing:

Pipe Diameter: **8**" Max. Spacing: **500 LF**

See SAWS Standard Specification in Appendix C for additional manhole specifications.

Manholes (Inverts)

The bottom of a manhole must contain a U-shaped channel, which is a smooth continuation of the inlet, and outlet pipes. The bench above the channel must be sloped a minimum of 0.5 inches per foot. See SAWS detail DD-852-01, which complies with these requirements. Note, a manhole connected to a pipe less than 15 inches in diameter must have a channel depth equal to at least half the largest pipe's diameter.

Manholes (Ventilation)

Vented manholes are not proposed for this SCS. When required every third manhole will be vented to minimize inflow. Please see SAWS Detail DD-852-02 when proposed.

FLEXIBLE PIPE COMPUTATIONS

Please note, all flexible pipe computations are based on engineering principles and practices for the design of buried PVC pipe systems. Equations used can be found in "The Uni-Bell PVC Pipe Association Handbook of PVC Pipe: Design and Construction". Please note, the equations used may be in a different format than shown in the Uni-Bell Handbook. Throughout this application "160 psi" pipe refers to the pressure rating of the ASTM 2241, Class 160, SDR 26 pipe used throughout the SCS.

Live Load Calculations

Minimum burial depth without concrete encasement is six (6) feet. Based on Table 6-6 Live Loads on PVC pipe (from Uni-Bell Handbook of PVC Pipe) for this sewer line would be 1.39 lb/in².

Buckling Pressure Calculations

This area of the Edwards Aquifer is unsaturated; consequently, there are no anticipated areas where sewer pipe will be placed below the water table. The value of hw=0 as there will be no height or time period of perched water or groundwater above the pipe crowns of the proposed sewer line.

The value of H for use in these calculations is fourteen (10) feet as it exceeds the maximum design burial depth. The value of γ_s equals 143 pcf which is a conservative value based on a dry unit weight of 135 pcf and a moisture content of 6%. This value is conservative as it corresponds to saturated unit weights of commonly used backfill materials. Please see information from Raba-Kistner provided in Appendix C.

Allowable Buckling Pressure:

$$q_{a} = 0.4 * \sqrt{32 * R_{w} * B' * E_{b} * (E * I / D^{3})}$$

$$q_{a} = 0.4 * \sqrt{32 * 1 * 0.32 * 400 * (400,000 * .003 / 8.08^{3})} = 38.61 \text{ psi} (8'' PVC SDR 26, NR)$$

$$q_{a} = 0.4 * \sqrt{32 * 1 * 0.32 * 400 * (400,000 * .003 / 8.29^{3})} = 37.15 \text{ psi} (8'' PVC SDR 26, 160 \text{ psi})$$



$R_w = 1 - 0.33 * (h_w/h)$	Equation 2
$R_w = 1 - 0.33 * (0/240) = 1$	
$B' = \frac{1}{1 + 4 \cdot e^{065 \cdot H}}$	Equation 3
$B' = \frac{1}{1 + 4 * e^{065 * 10}} = 0.32$	
$L = (43/12) \cdot (in choose 4/1)$	Founding 4
$I = (t^{\circ}/12) * (inches^{\circ}/iinear inch)$	Equation 4
$I = .323^3/12 = .003in^3 (8'' PVC SDR 26, NR)$	
$I = .332^3/12 = .003in^3 (8'' PVC SDR 26, 160psi)$	

$$D = D_o - t$$

 $D = 8.40 \text{ inches} - 0.323 \text{ inches} = 8.08 \text{ inches} (8'' PVC SDR 26, NR)$
 $D = 8.625 \text{ inches} - 0.332 \text{ inches} = 8.29 \text{ inches} (8'' PVC SDR 26, 160psi)$

Where:

- q_a = Allowable buckling pressure, pounds per square inch (psi)
- h = Height of soil surface above top of pipe in inches (in)
- h_w = Height of water surface above top of pipe in inches (in) (groundwater elevation)
- R_w = Water buoyancy factor. If hw = 0, Rw = 1. If $0 \le hw \le h$ (groundwater elevation is between the top of the pipe and the ground surface), calculate Rw with Equation 2
- H = Depth of burial in feet (ft) from ground surface to crown of pipe.
- B' = Empirical coefficient of elastic support
- E_b = Modulus of soil reaction for the bedding material (psi)
- E = Modulus of elasticity of the pipe material (psi)
- Moment of inertia of the pipe wall cross section per linear inch of pipe, inch4/lineal inch = inch3. For solid wall pipe, "I" can be calculated with Equation 4
- t = Pipe structural wall thickness (in)
- D = Mean pipe diameter (in)

D_o = Pipe outer diameter (in)

Pressure Under Installed Conditions

 $q_p = \gamma_w * h_w + R_w * (W_c/D) + L_l$ $q_p = 0.361 * 0 + 1 * (83.45/8.08) + 1.39 = 11.72 \text{ psi} (8'' \text{ PVC SDR 26, NR})$ $q_p = 0.361 * 0 + 1 * (85.62/8.29) + 1.39 = 11.72 \text{ psi} (8'' \text{ PVC SDR 26, 160psi})$

Where:

- q_p = Pressure applied to pipe under installed conditions (psi)
- γ_w = 0.0361 pounds per cubic inch (pci), specific weight of water
- W_c = Vertical soil load on the pipe per unit length in pounds per linear inch (lb/in)
- L_I = Live load (psi)

 $W_c = \gamma_s * H * (D + t)/144$ $W_c = 143 * 10 * (8.08 + 0.323)/144 = 83.45 lb/in^2(8'' PVC SDR 26, NR)$ $W_c = 143 * 10 * (8.29 + 0.332)/144 = 85.62lb/in^2(8'' PVC SDR 26, 160psi)$ Equation 1.10 = 1.10 = 1.10 = 1.10 = 1.10 = 1.10 = 1.10 = 1.10 = 1.10 = 1.10 = 1.10 = 1.10 = 1.10 = 1.10 = 1.10 = 1.10 = 1.10 = 1.10 = 1.10 = 1.10 = 1.10 = 1.10 = 1.10 = 1.10 = 1.10 = 1.10 = 1.10 = 1.10 = 1.10 = 1.10 = 1.10 = 1.10 = 1.10 = 1.10 = 1.10 = 1.10 = 1.10 = 1.10 = 1.10 = 1.10 = 1.10 = 1.10 = 1.10 = 1.10 = 1.10 = 1.10 = 1.10 = 1.10 = 1.10 = 1.10 = 1.10 = 1.10 = 1.10 = 1.10 = 1.10 = 1.10 = 1.10 = 1.10 = 1.10 = 1.10 = 1.10 = 1.10 = 1.10 = 1.10 = 1.10 = 1.10 = 1.10 = 1.10 = 1.10 = 1.10 = 1.10 = 1.10 = 1.10 = 1.10 = 1.10 = 1.10 = 1.10 = 1.10 = 1.10 = 1.10 = 1.10 = 1.10 = 1.10 = 1.10 = 1.10 = 1.10 = 1.10 = 1.10 = 1.10 = 1.10 = 1.10 = 1.10 = 1.10 = 1.10 = 1.10 = 1.10 = 1.10 = 1.10 = 1.10 = 1.10 = 1.10 = 1.10 = 1.10 = 1.10 = 1.10 = 1.10 = 1.10 = 1.10 = 1.10 = 1.10 = 1.10 = 1.10 = 1.10 = 1.10 = 1.10 = 1.10 = 1.10 = 1.10 = 1.10 = 1.10 = 1.10 = 1.10 = 1.10 = 1.10 = 1.10 = 1.10 = 1.10 = 1.10 = 1.10 = 1.10 = 1.10 = 1.10 = 1.10 = 1.10 = 1.10 = 1.10 = 1.10 = 1.10 = 1.10 = 1.10 = 1.10 = 1.10 = 1.10 = 1.10 = 1.10 = 1.10 = 1.10 = 1.10 = 1.10 = 1.10 = 1.10 = 1.10 = 1.10 = 1.10 = 1.10 = 1.10 = 1.10 = 1.10 = 1.10 = 1.10 = 1.10 = 1.10 = 1.10 = 1.10 = 1.10 = 1.10 = 1.10 = 1.10 = 1.10 = 1.10 = 1.10 = 1.10 = 1.10 = 1.10 = 1.10 = 1.10 = 1.10 = 1.10 = 1.10 = 1.10 = 1.10 = 1.10 = 1.10 = 1.10 = 1.10 = 1.10 = 1.10 = 1.10 = 1.10 = 1.10 = 1.10 = 1.10 = 1.10 = 1.10 = 1.10 = 1.10 = 1.10 = 1.10 = 1.10 = 1.10 = 1.10 = 1.10 = 1.10 = 1.10 = 1.10 = 1.10 = 1.10 = 1.10 = 1.10 = 1.10 = 1.10 = 1.10 = 1.10 = 1.10 = 1.10 = 1.10 = 1.10 = 1.10 = 1.10 = 1.10 = 1.10 = 1.10 = 1.10 = 1.10 = 1.10 = 1.10 = 1.10 = 1.10 = 1.10 = 1.10 = 1.10 = 1.10 = 1.10 = 1.10 = 1.10 = 1.10 = 1.10 = 1.10 = 1.10 = 1.10 = 1.10 = 1.10 = 1.10 = 1.10 = 1.10 = 1.10 = 1.10 = 1.10 = 1.10 = 1.10 = 1.10 = 1.10 = 1.10 = 1.10 = 1.10 = 1.10 = 1.10 = 1.10 = 1.10 = 1.10 = 1.10 = 1.10 = 1.10 = 1.10 = 1.10 =

Equation 7

Equation 6

- γs = Specific weight of soil in pounds per cubic foot (pcf)
- D = Mean pipe diameter (in)

Pipe Diameter: <u>8" (NR)</u> Pipe Material: <u>PVC, SDR 26</u> q_a: <u>38.61</u> q_p: <u>11.72</u>

Since $q_a \ge q_p$, the specified pipes are acceptable for the proposed installation.

Installation Temperature Effects

Flexible pipe will be installed under favorable ambient conditions, per pipe manufacturer's specifications.

Tensile Strength

The information below is from "The Uni-Bell Handbook of PVC Pipe: Design and Construction" Table 2.1 pages 14-15.

Pipe Material: <u>PVC SDR 26</u> Tensile Strength: <u>7,000</u> Cell Class (PVC only) <u>12454</u>

Strain

The conditions of this installation are such that strain-related failure will not be a problem. Strain is generally not a performance-limiting factor for buried PVC pipe or a design-limiting criterion for PVC pipes according to the Uni-Bell Handbook of PVC Pipe (Chapter VII, Pages 255 and 257). As pipe deflection will be below 5%, strain-related failure is not anticipated.

Modulus of Soil Reaction

The modulus of soil reaction for the bedding material, $E_{b,}$ is <u>400 psi</u>.

This value was determined using "Table 1: Classes of Embedment and Backfill Materials" from ASTM D2321-05 and "Average Values of Modulus of Soil Reaction, E" Table 7.3 from "The Uni-Bell Handbook of PVC Pipe: Design and Construction" attached at the end of Appendix B. Based on SAWS detail DD-804-01, Class III material was chosen. As the secondary backfill (Class III) has a lower Modulus of Soil Reaction than initial backfill (Class IA), its value was used in the calculations that follow. Class III on Table 1 corresponds to coarse-grained soils with fines (GM, SM or SC). On Table 7.3, coarse-grained soils with fines at a slight compaction have an E' equal to 400 psi.

The modulus of soil reaction for the in-situ soil, E'n, is **3,000 psi**

This value was determined using "Table 1: Classes of Embedment and Backfill Materials" from ASTM D 2321-05 and "Average Values of Modulus of Soil Reaction, E" Table 7.3 from "The Uni-Bell Handbook of PVC Pipe: Design and Construction" attached at the end of Appendix B. Based on SAWS detail DD-804-01, Class IA material was chosen, which includes crushed rock as shown on Table 1. Compacted crushed rock on Table 7.3 has an E' equal to 3,000 psi.

Values in Table 7.3 are based on empirical data and derived from laboratory and field tests for buried pipe.



Bedding to in-situ soil modulus of soil reaction ratio = $E_b/E'_n = \frac{400 \text{ psi/3,000 psi} = 0.13}{100 \text{ psi}}$

Zeta Calculation

Where native soil is significantly weaker than bedding material, or where predicted deflection approaches 5%, the effect of native soil must be quantified using Leonhardt's Zeta factor. If the ration of bedding modulus to soil modulus is not equal to 1.0, a zeta factor must be calculated by using the equations below, where zeta is a factor, which corrects for the effect of in-situ soil on pipe stability (Uni-Bell Handbook of Pipe, page 267). To calculate zeta, directly use the formulas below. The calculations that are done to determine the zeta factors for the different pipe diameters must be included with this submittal.

$$zeta = \frac{1.44}{f + (1.44 - f)^* (E_b / E_{n'})}$$
(Equation 9)

$$zeta = \frac{1.44}{1.22 + (1.44 - 1.22) * 0.13} = 1.15 (8" PVC SDR 26, NR)$$

$$zeta = \frac{1.44}{1.22 + (1.44 - 1.22) * 0.13} = 1.15 (8" PVC SDR 26, 160 psi)$$

$$f = \frac{b/d_a - 1}{1.154 + 0.444 * (b/d_a - 1)}$$
(Equation 10)

$$f = \frac{34/8.40 - 1}{1.154 + 0.444 * (34/8.40 - 1)} = 1.22 (8" PVC, SDR 26, NR)$$

$$f = \frac{35/8.625 - 1}{1.154 + 0.444 * (35/8.625 - 1)} = 1.22 (8" PVC, SDR 26, 160 psi)$$

Where:

f = Pipe/trench width coefficient

b = Trench width (in)

d_a = Pipe diameter (in)

E_b = Modulus of soil reaction for the bedding material (psi)

 E'_n = Modulus of soil reaction for the in-situ soil (psi)

Pipe Diameter: **8" (NR)** Trench Width: **34**" Zeta: **1.15**

Pipe Stiffness

Ps is based on National Reference Standards and manufacturer's data. Please see Table 7.1 of the "The Uni-Bell Handbook of PVC Pipe: Design and Construction" listing the pipe stiffness of 8" PVC SDR 26 as 115 psi for E = 400,000 psi.

Pipe Diameter: <u>8"</u> Pipe Material: <u>PVC SDR 26</u> Ps: <u>115 psi</u>

Deflection

Maximum allowable deflection in installed lines is 5% (per 30 TAC 217), as determined by the deflection analysis and verified by a mandrel test. It is recommended that the percent of vertical deflection is below this range; however, a 7.5% deflection limit (recommended by ASTM D3034) provides a conservative factor of safety against structural failure (Handbook of PVC Pipe, page 249).

Note: Per Table 7.2 attached in Appendix A of the SCS Application, K = 0.096 when the bedding angle is 90 degrees. A bedding angle of 90 degrees is required as shown on SAWS detail DD-804-01.

$$\Delta Y/D(\%) = \frac{K*(L_p+L_1)*100}{(0.149*P_s)+(0.61*zeta*E_b)}$$
Equation 11
$$\Delta Y/D(\%) = \frac{0.096^*(9.93+1.39)*100}{(0.149*115)+(0.061*1.15*400)} = 2.40\%(8'' \text{ PVC SDR 26, NR})$$
$$\Delta Y/D(\%) = \frac{0.096^*(9.93+1.39)*100}{(0.149*115)+(0.061*1.15*400)} = 2.40\%(8'' \text{ PVC SDR 26, 160psi})$$

$$L_p = \frac{\gamma_s * H}{144}$$
$$L_p = \frac{143 * 10}{144} = 9.93 \, psi$$

Equation 12

P:\133\70\00\Word\Reports\SCS\08a - EDR.docx



- $\Delta Y/D$ = Predicted % vertical deflection under load
- ΔY = Change in vertical pipe diameter under load
- D = Undeflected mean pipe diameter (in)
- K = Bedding angle constant
- γ_s = Unit weight of soil (pcf)
- H = Depth of burial (ft) from ground surface to crown of pipe
- L_p = Prism load (psi)

Type of Pipe Material	P₅ (psi)	Zeta Factor Assumed or Calculated	E₅ (psi)	% Deflection	
8" PVC SDR 26	115	1.15	400	2.40%	

All pipes proposed for this project have a maximum predicted deflection below 5.0%

Signature, Seal and Date of the Texas Professional Engineer Below:





TABLE 6.6 LIVE LOADS ON PVC PIPE From Uni-Bell Handbook of PVC Pipe: Design and Construction, Fourth Edition (2001)

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

¹ Simulates 20 ton truck traffic + impact (Source: ASTM A 796)

² Simulates 80,000 lb/ft railway load + impact (Source: ASTM A 796)

³ 180,000 lbs. dual tandem gear assembly. 26 inch spacing between tires and 66 inch center-to-center

spacing between fore and aft tires under a rigid pavement 12 inches thick + impact.

* Negligible live load influence.



FIGURE 7.4 BEDDING ANGLE From Uni-Bell Handbook of PVC Pipe: Design and Construction, Fourth Edition (2001)



TABLE 7.2 VALUES OF BEDDING CONSTANT, K

BEDDING ANGLE (DEGREES)	<u>K</u>
0	0.110
30	0.108
45	0.105
60	0.102
90	0.096
120	0.090
180	0.083




TABLE 7.3

AVERAGE VALUES OF MODULUS OF SOIL REACTION, E' (For Initial Flexible Pipe Deflection) From Uni-Bell Handbook of PVC Pipe: Design and Construction, Fourth Edition (2001)

	E' for Degree of Compaction of Bedding in pounds per square inch						
		Slight	Moderate	High			
		< 85%	85%-95%	595%			
		< 05%	Proctor	Proctor			
		~10%	40%-70%	N00001,			
Soil type-nine hedding material		rolativo	rolativo	rolativo			
(Unified Classification System ^a)	Dumped	doncity	donsity	doncity			
(1)	Dumped (2)			(E)			
	(2)	(5)	(4)	(5)			
Fine-grained Solis (LL>50) ^o	N						
Solis with medium to high plasticity,	No dat	a avallable; c	onsult a com	petent			
СН, МН, СН-МН	soils e	engineer; Oth	erwise use E	= 0			
Fine-grained Soils (LL<50)							
Soils with medium to no plasticity, CL,							
ML, ML-CL, with less than 25% coarse-							
grained particles	50	200	400	1,000			
Fine-grained Soils (LL<50)							
Soils with medium to no plasticity, CL,							
ML, ML-CL, with more than 25%							
coarse-grained particles	100	400	1,000	2,000			
Coarse-grained Soils with Fines							
GM, GC, SM, SC ^c contains more than 12%							
fines							
Coarse-grained Soils with Little or no Fines							
GW, GP, SW, SP ^c contains less than 12%							
fines	200	1,000	2,000	3,000			
Crushed Rock	1,000	3,000	3,000	3,000			
Accuracy in Terms of Percentage Deflection ^d	± 2	± 2	±1	± 0.5			
^a ASTM Designation D 2487, USBR Designation E	-3.						
^b LL = Liquid limit.							
^o Or any borderline soil beginning with one of these symbols (i.e. GM-GC, GC-SC).							
<code>^dFor \pm 1% accuracy and predicted deflection of 3%, actual deflection would be between 2%</code>							
and 4%							
Noto, Values applicable only for fills loss them	FO ft /1 F m		a matinaluda	any cofoty			

Note: Values applicable only for fills less than 50 ft (15 m). Table does not include any safety factor. For use in predicting initial deflections only, appropriate Deflection Lag Factor must be applied for long-term deflections. If bedding falls on the borderline between two compaction categories, select lower E' value or average the two values. Percentage Proctor based on laboratory maximum dry density from test standards using about 12,500 ft-lb/cu ft (598,000 J/m³) (ASTM D 698, AASHTO T-99, USBR Designation E-11). 1 psi = 6.9 kPa.

SOURCE: "Soil Reaction for Buried Flexible Pipe" by Amster K. Howard, U.S. Bureau of Reclamation, Denver, Colorado. Reprinted with permission from American Society of Civil Engineers.







SOIL CLASSIFICATION CHART

From ASTM D2321-11: Standard Practice for Underground Installation of Thermoplastic Pipe for Sewers and Other Gravity-Flow Applications

TABLE 1 Soil Classification Chart (see Classification D2487)

	Criteria for Assigning Group Syml	ools and Group Names I	Jsing Laboratory Tests ^A		Soil Classification		
					Group Symbol	Group Name ^B	
Coarse-Grained Soils	Gravels	Clean gravels	C ≥ 4 and 1 ≤ Cc ≤ 3 ^C		GW	Well-graded gravel ^D	
More than 50% retained on No. 200 sieve	More than 50% of coarse fraction retained on No. 4 sieve	n 50% Less than Cu < 4 and/or 1> Cc>3 ^C fraction retained on 5% of fines ^E			GP	Poorly graded gravel ^D	
	-	Gravels with	Fines classify as ML or MH		GM	Silty gravel ^{DFG}	
		more than 12% fines ^E	Fines classify as CL or CH		GC	Clayey gravel ^{DFG}	
	Sands	Clean sands	Cu \geq 6 and 1 \leq Cc \leq 3 ^C		SW	Well-graded sand ^H	
	50% or more of coarse fraction passes on No. 4 sieve	Less than 5% fines [/]	Cu < 6 and/or 1 > Cc > 3 ^C		SP	Poorly graded sand ^H	
	-	Sand with fines	Fines classify as ML or MH		SM	Silty sand ^{FGH}	
		More than 12% fines [/]	Fines classify as CL or CH		SC	Clayey sand ^{FGH}	
Fine-Grained Soils	Silts and clays	Inorganic	PI > 7 and plots on or above "A" line ^{J}		CL	Lean clay ^{KLM}	
50% or more passes the No. 200 Sieve	Liquid limit less than 50	-	PI < 4 and plots below "A" line ^J		ML	silt ^{<i>KLM</i>}	
	-	Organic	Liquid Limit-Oven dried	<0.75	OL	Organic clay ^{KLMN}	
		-	Liquid Limit-Not dried	_		Organic silt ^{KLMO}	
	Silts and clays	Inorganic	PI plots on or above "A" line		СН	Fat clay ^{KLM}	
	Liquid limit 50 or more	-	Plots below "A" line	_	MH	Elastic silt ^{KLM}	
	-	Organic	Liquid Limit-Oven Dried	<0.75	OH	Organic clay ^{KLMP}	
		-	Liquid Limit-Not Dried			Organic silt ^{KLMQ}	
Highly organic soils	Primarily organic matter, dark in c	olor, and organic odor			PT	peat	

^A Based on the material passing the 3-in. (75-mm) sieve.

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

 C Cu = D₆₀ / D₁₀

 $Cc = \frac{(D_3_0)^2}{D_1_0 D_{6_0}}$

^D If soil contains \geq 15 % sand, add "with sand" to group name.

^EGravels with 5 to 12 % fines require dual symbols:

GW-GM well-graded gravel with silt:

- GW-GC well-graded gravel with clay
- GP-GM poorly graded gravel with silt
- GP-GC poorly graded gravel with clay

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

^G If fines are organic, add "with organic fines" to group name.

^{*H*} If soil contains \geq 15 % gravel, add "with gravel" to group name. ⁷Sands with 5 to 12 % fines require dual symbols:

SW-SM well graded sand with silt SW-SC well-graded sand with clay

SP-SM poorly graded sand with silt

SP-SC poorly graded sand with clay

^J If Atterberg limits plot in hatched area, soil is a CL-ML, silty clay (see Test Method D4318).

^k If soil contains 15 to 29 % plus No. 200, add "with sand" or "with gravel", whichever is predominant.

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

^M If soil contains > 30 % plus No. 200, predominantly gravel, add "gravelly" to group name.

^N PI \geq 4 and plots on or above "A" line.

^o PI < 4 or plots below "A" line.

^P PI plots on or above "A" line.

^Q PI plots below "A" line.



SOIL CLASSIFICATION CHART

From ASTM D2321-11: Standard Practice for Underground Installation of Thermoplastic Pipe for Sewers and Other Gravity-Flow Applications

	TABLE 2 Soli Classes	
Soil Group ^{AB}	Soil Class	American Association of State Highway and Transportation Officials (AASHTO) Soil Groups ^c
Crushed rock, angular ^{<i>b</i>} , 100% passing 1-1/2 in. sieve, =15 %<br passing #4 sieve, = 25 % passing 3/8<br in. sieve and = 12 % passing #200<br sieve	Class I	
Clean, coarse grained soils: SW, SP, GW, GP or any soil beginning with one of these symbols with = 12<br % passing #200 sieve ^{<i>E,F</i>}	Class II	A1, A3
Coarse grained soils with fines: GM, GC, SM, SC or any soil beginning with one of these symbols, containing > 12 % passing #200 sieve; Sandy or gravelly fine-grained soils: CL, ML, or any soil beginning with one of these symbols, with >/= 30 % retained on #200 sieve	Class III	A-2-4, A-2-5, A-2-6, or A-4 or A-6 soils with more than 30% retained on #200 sieve
Fine-grained soils: CL, ML, or any soil beginning with one of these symbols, with <30 % retained on #200 sieve	Class IV	A-2-7, or A-4, or A-6 soils with 30% or less retained on #200 sieve
MH, CH, OL, OH, PT	Class V Not for use as embedment	A5, A7

TABLE 2 Soil Classes

^A See Classification D2487, Standard Classification of Soils for Engineering Purposes (Unified Soil Classification System).

⁸ Limits may be imposed on the soil group to meet project or local requirements if the specified soil remains within the group. For example, some project applications require a Class I material with minimal fines to address specific structural or hydraulic conditions and the specification may read "Use Class I soil with a maximum of 5% passing the #200 sieve."

^c AASHTO M145, Classification of Soils and Soil Aggregate Mixtures.

^D All particle face shall be fractured.

^{*E*} Materials such as broken coral, shells, and recycled concrete, with \leq = 12% passing a No. 200 sieve, are considered to be Class II materials. These materials should only be used when evaluated and approved by the Engineer.

^F Uniform fine sands (SP) with more than 50% passing a No. 100 sieve (0.006 in., 0.15 mm) are very sensitive to moisture and should not be used as backfill unless specifically allowed in the contract documents. If use of these materials is allowed, compaction and handling procedures should follow the guidelines for Class III materials.



SOIL CLASSIFICATION CHART

From ASTM D2321-11: Standard Practice for Underground Installation of Thermoplastic Pipe for Sewers and Other Gravity-Flow Applications

Soil Class ⁴	Class I ^B	Class II	Class III	Class IV
General Recommendations and Restrictions	Acceptable and common where no migration is probable or when combined with a geotextile filter media. Suitable for use as a drainage blanket and under drain where adjacent material is suitably graded or when used with a geotextile filter fabric (see X1.8).	Where hydraulic gradient exists check gradation to minimize migration. Clean groups are suitable for use as a drainage blanket and underdrain (see Table 2). Uniform fine sands (SP) with more than 50 % passing a #100 sieve (0.006 in., 0.15 mm) behave like silts and should be treated as Class IV soils.	Do not use where water conditions in trench prevent proper placement and compaction. Not recommended for use with pipes with stiffness of 9 psi or less.	Difficult to achieve high-soil stiffness. Do not use where water conditions in trench prevent proper placement and compaction. Not recommended for use with pipes with stiffness of 9 psi or less.
Foundation	Suitable as foundation and for replacing over-excavated and unstable trench bottom as restricted above.	Suitable as foundation and for replacing over-excavated and unstable trench bottom as restricted above. Install and compact in 12 in. (300 mm) maximum layers.	Suitable for replacing over- excavated trench bottom as restricted above. Install and compact in 6 in. (150 mm) maximum layers.	Suitable for replacing over- excavated trench bottom as restricted above. Install and compact in 6-in (150 mm) maximum layers.
Pipe Embedment	Suitable as restricted above. Work material under pipe to provide uniform haunch support.	Suitable as restricted above. Work material under pipe to provide uniform haunch support.	Suitable as restricted above. Difficult to place and compact in the haunch zone.	Suitable as restricted above. Difficult to place and compact in the haunch zone.
Embedment Compaction: Min Recommended Percent Compaction, SPD ^p	See Note ^c	85 % (SW and SP soils) For GW and GP soils See Note [£]	90 %	95 %
Relative Compactive Effort Required to Achieve Minimum Percent Compaction	Low	Moderate	High	Very high
Compaction Methods	Vibration or impact	Vibration or impact	Impact	Impact
Required Moisture Control	None	None	Maintain near optimum to minimize compactive effort	Maintain near optimum to minimize compactive effort

TABLE 3 Recommendations for Installation and Use of Soils and Aggregates for Foundation and Pipe-Zone Embedment

^A Class V materials are unsuitable as embedment. They may be used as final backfill as permitted by the engineer.

⁸ Class I materials have higher stiffness than Class II materials, but data on specific soil stiffness of placed, uncompacted Class I materials can be taken equivalent to Class II materials compacted to 95% of maximum standard Proctor density (SPD95), and the soil stiffness of compacted Class I materials can be taken equivalent to Class II materials compacted to 100% of maximum standard Proctor density (SPD100). Even if placed uncompacted (that is, dumped), Class I materials should always be worked into the haunch zone to assure completed placement.

^c Suitable compaction typically achieved by dumped placement (that is, uncompacted but worked into haunch zone to ensure complete placement).

^D SPD is standard Proctor density as determined by Test Method D698.

^E Place and compact GW and GP soils with at least two passes of compaction equipment.



APPENDIX B



January 14, 2009

Raba-Kistner Consultants, Inc. 12821 W. Golden Lane P.O. Box 690287, San Antonio, TX 78269-0287 (210) 699-9090 • FAX (210) 699-6426 www.rkci.com

Charles P. "Frosty" Forster, P.E., P.G. Pape Dawson Engineers 555 East Ramsey San Antonio, Texas 78216

RE: Soil Unit Weight Values for Backfill Materials Various Projects San Antonio, Texas

Dear Mr. Forster:

Raba-Kistner Consultants Inc. (R-K) is pleased to submit this letter providing general guidance for selecting design soil unit weights for use in utility trench design.

In general, the following table contains a list of the frequently used trench backfill materials in the San Antonio area. The table also contains approximate values for the soil dry unit weight, moist unit weight and saturated unit weight for these materials assuming 90 to 95 percent compaction utilizing a standard Proctor (ASTM D 698.)

MATERIAL DESCRIPTION	DRY UNIT WEIGHT, PCF	MOIST UNIT WEIGHT, PCF	SATURATED UNIT WEIGHT, PCF
TxDOT TEX-113E Type A, Gr. 1 or 2	130	137	143
TxDOT TEX-113E Type A, Gr. 3 thru 5	128	135	143
Limestone Millings	115	124	134
Gravelly Clay	110	120	132
Clay	100	120	127
Clayey Sand	95	106	123
Gravel (Clean)	115	120	134
Sand (Clean)	92	98	120
Pit Run Gravel	127	137	142

We appreciate the opportunity to be of service to you. If you have any questions or need additional assistance, please call.

Very truly yours, RABA-KISTNER CONSU Chris L. Schultz, P Senior Vice Presider CLS/mem

APPENDIX C



PRE-CAST MANHOLE DRAWINGS & SPECIFICATIONS

























Carefully clean all dirt & foreign objects from the joining surface of the bell or groove end of pipe.

Carefully clean spigot or tongue end of pipe, including the gasket recess. Inspect the bell and spigot ends of each section to make sure they are free from cracks, chips or voids that will interfere with gasket.

Improperly prepared bell and spigot surfaces may prevent homing of the pipe or keep the gasket from sealing.



IMPORTANT

Fit the gasket carefully, equalizing the rubber gasket stretch by running a smooth, round object (inserted between the gasket & spigot) around the entire circumference several times.

Unequal stretch could cause bunching of the gasket and may cause leaks in the joint or crack the bell.

Profile Gasket

- 1. Manhole sections should be handed with extreme caution to avoid chipping of the bell or spigot ends. Proper lifting devices must be used on all sections.
- Inspect gasket sealing area for any voids or rough edges that may interfere with the seal.
- 3. Place the 4-G Gasket in the step of the spigot. (Making sure that the pointed end of the gasket is toward the end of the pipe as shown in Fig A.)
- 4. **IMPORTANI** Equalize the stretch on the gasket by pulling the sealing lube away from the spigot at least one inch and then releasing the gasket. Repeat this every three or four inches around the circumference of the pipe. Equalization of stretch makes sure that the gasket has the same stretched crosssection and tension throughout. **Do not lube the gasket or spigot end of the pipe.**
- Remove all dirt and other foreign matter from the inside surface of the bell. Apply lube to the inner surface of the bell including the

lead-in taper surface on the outer edge of the bell. Align spigot with the bell. Gasket should touch lead-in taper around the entire circumference before pushing the pipe home.

- Push the manhole section carefully, until the spigot is all the way home. (Fig B) Do not force sections together. If sections do not seat properly. unstack and contact your Hanson Sales Representative.
- 7. Every manhole will not come home exactly the same. Differences in application, consistency of lubricants, dimensions in the spigot and groove will cause variations in installation. If joining problems arise, please contact the manhole manufacturer immediately rather than forcing manhole sections together with subsequent damage to the manhole.
- All testing should be performed prior to backfill of the manhole. Problems can not be detected after the manhole is backfilled. <u>Testing the manhole after backfill voids all</u> warranties.

Lubricate bell joint surface liberally, covering entire inside surface using proper pipe gasket lubricant.



Lubricate the gasket throughly before it is placed on the spigot or tongue.

Bell and Gasket not lubricated or improperly lubricated may cause the gasket to roll and leak or possibly damage the bell.



2

Align the bell & spigot to be joined. Before homing the joint, check that the gasket is in contact with the bell end entrance taper around the entire circumference.

Do not force sections together. If sections do not seat properly, unstack and contact your Hanson Sales Representative.

Improper alignment can dislodge gasket, causing leaks or possibly breaking the bell.



Fig. A



<u>Note:</u> Manholes in excess of 30' in depth must be vacuum tested prior to backfill. The loads presented by soils and possible groundwater at 30' in addition to the load from the vacuum may exceed the design capacity of the pipe to manhole connector.

TITLE	PLANT	STATE	SECT ON. PAGE	DATE	
O-Ring & Profile Gasket Installation on Manholes	All Plants	тх	5.14	08-15-06	Hanson
Contact Hanson	Go to Index			L	EXIT





FINAL PLAN AND PROFILE SHEETS

THE VILLAS AT TIMBERWOOD OFFSITE SANITARY SEWER EXTENSION SAN ANTONIO, TEXAS

THE VILLAS AT TIMBERWOOD HOMEOWNERS ASSOCIATION, INC 20540 STATE HIGHWAY 46 W, STE 115 C/O 497 SPRING BRANCH, TEXAS 78070

CIVIL CONSTRUCTION PLANS



PREPARED FOR:

JANUARY 2025



TEXAS ENGINEERING FIRM #470 | TEXAS SUBVEYING FIRM #1002880



Sheet List Table

Sheet Title	Sheet Description	Sheet Number
COVER SHEET		C0.00
OVERALL SANITARY SEWER PLAN		C5.00
OVERALL SANITARY SEWER PLAN		C5.01
SANITARY SEWER LINE A PLAN & PROFILE	STA. 1+00.00 TO 12+00.00	C5.02
SANITARY SEWER LINE A PLAN & PROFILE	STA. 12+00.00 TO 23+00.00	C5.03
SANITARY SEWER LINE A PLAN & PROFILE	STA. 23+00.00 TO 34+00.00	C5.04
SANITARY SEWER LINE A PLAN & PROFILE	STA. 34+00.00 TO 45+00.00	C5.05
SANITARY SEWER LINE A PLAN & PROFILE	STA. 45+00.00 TO END	C5.06
SANITARY SEWER DETAILS		C5.10
SANITARY SEWER NOTES		C5.11
STORM WATER POLLUTION PREVENTION PLAN		C8.00
STORM WATER POLLUTION PREVENTION PLAN		C8.01
STORM WATER POLLUTION PREVENTION PLAN DETAILS		C8.10



SEWE	R
------	---

DEVELOPER 5 NA	ME: THE VILLAS AT		JMEOWNENC	ASSUUM	TION, INC
ADDRESS: 205	540 STATE HIGH	<u>WAY 46 W. S</u>	<u>TE 115 C</u>	<u>/0 497</u>	
CITY: SPRING	BRANCH S	TATE: TEX	AS	ZIP:	78070
PHONE#		FAX#	· <u> </u>		
SAWS BLOCK MA	Р <u>#_164670</u> тот	AL EDU'S 0	тота	L ACRE	AGE <u>3.05</u>
TOTAL LINEAR FO	OTAGE OF PIPE:	<u>8"5497 LF</u>	PLAT	NO	
NUMBER OF LOTS	s <u>0</u>	_ SAWS JOB	NO. <u>24–</u>	1631	





te: July 26, 2024, 6:17 PM — User ID: ralvare :: P:\133\70\00\Design\Civil\SSOA-1337000.c



51.	A. 1+00.00 I	012+00.0	0								HOI
		*	р M							500 ⁷	
		"¥	122.7							"A5 93.1	
			t n								
		Σ	÷"								
			76							ST≱ TOP	
			MANHOLE							RING	
SEMENT				MENT							
											/
					37	71.87 L.F.~8" SI	DR 26 PVC				
210 66 L E ~8	" SDR 26 PVC					PIPE @ 0.4	40%		295.13	L.F~8" SDR 26 F	vc /
PIPE @	0.40%									PIPE @ 0.4	0%
		F .								Ê	
م	Ŋ	2 COL		4	4	4	4	4	4		വ
<u>H6.7</u>	6.91	23 (53	17.6	17.8	18.0	18.2	18.4	18.6	32	<u> 49.1</u>
11,	11,	47.2	11/	117	117	11	117	17	17	48.	11
		_	<u> </u>							<u> </u>	
0 0.00	0.50	7.00	7.50	0.00	0.50	0.00	0.50	10.00	10.50	11.00	11.50

IS DOCUMENT HAS BEEN PRODUCED FROM MATERIAL THAT WAS STORED AND/OR TRANSMITTED ELECTRONICALLY AND MAY HAVE BEEN INADVERTENTLY ALTERED. RELY ONLY ON FINAL HARDCOPY MATERIALS BEARING THE CONSULTANT'S ORIGINAL SIGNATURE AND SEAL. AERIAL IMAGERY PROVIDED BY GOOGLE® UNLESS OTHERWISE NOTED. Imagery © 2016,CAPCOG,Digital Globe,Texas Orthoimagery Program, USDA Farm Service Agency.



5 DOCUMENT HAS BEEN PRODUCED FROM MATERIAL THAT WAS STORED AND/OR TRANSMITTED ELECTRONICALLY AND MAY HAVE BEEN INADVERTENTLY ALTERED. RELY ONLY ON FINAL HARDCOPY MATERIALS BEARING THE CONSULTANT'S ORIGINAL SIGNATURE AND SEAL AERIAL IMAGERY PROVIDED BY GOOGLE® UNLESS OTHERWISE NOTED. Imagery © 2016,CAPCOG,Digital Globe,Texas Orthoimagery Program, USDA Farm Service Agency.





5 DOCUMENT HAS BEEN PRODUCED FROM MATERIAL THAT WAS STORED AND/OR TRANSMITTED ELECTRONICALLY AND MAY HAVE BEEN INADVERTENTLY ALTERED. RELY ONLY ON FINAL HARDCOPY MATERIALS BEARING THE CONSULTANT'S ORIGINAL SIGNATURE AND SEAL AERIAL IMAGERY PROVIDED BY GOOGLE® UNLESS OTHERWISE NOTED. Imagery © 2016,CAPCOG,Digital Globe,Texas Orthoimagery Program, USDA Farm Service Agency.

SANITA STA. 2	ARY SEW 3+00.00 ⁻	/ER LINE ՝ ГО 34+00.	'A" 00								HOR
	81A: 28+35.05 TOP = ±1162.8						M.H. "A13" STA: 31+43.86 TOP = ±1166.0				
MANHOLE RING ENCASEMENT											
	3:000	2.00°	8" WATER LINE STA: 29+01.16	L.F.~8" SDR_26	PVC						333.62 L.F~8" 26 PVC PIPE @
20' JOINT PRESSUR RATED PIP		16" WATER STA: 28+5	20' JOINT PRES RATED PIPE LINE 5.07	PIPE @ 0.52%							
1156.84 1157 OF (OUT)	1157.15 (IN) 1157.23	1157.49	1157.74	1158.00	1158.26	1158.52	1158.75 (OUT) 1158.85 (IN)	1159.55	1160.18	1160.80	1161.43
-50 28+00	28+50	29+00	29+50	30+00	30+50	31+00	31+50	32+00	32+50	33+00	33+50

SANITARY SEWER LINE "A" STA. 34+00.00 TO 45+00.00

IS DOCUMENT HAS BEEN PRODUCED FROM MATERIAL THAT WAS STORED AND/OR TRANSMITTED ELECTRONICALLY AND MAY HAVE BEEN INADVERTENTLY ALTERED. RELY ONLY ON FINAL HARDCOPY MATERIALS BEARING THE CONSULTANT'S ORIGINAL SIGNATURE AND SEAL. AERIAL IMAGERY PROVIDED BY GOOGLE® UNLESS OTHERWISE NOTED. Imagery PROVIDED BY GOOGLE® UNLESS OTHORMAGENY PROVIDED BY GOOGLE® UNLESS OTHERWISE NOTED. Imagery PROVIDED BY GOOGLE® UNLESS OTHORMAGENY PROVIDED BY GOOGLE® UNLESS OTHERWISE NOTED.

EET	C5.10

NUMBER OF LOTS 0 SAWS JOB NO. 24-1631

DOCUMENT HAS BEEN PRODUCED FROM MATERIAL THAT WAS STORED AND/OR TRANSMITTED ELECTRONICALLY AND MAY HAVE BEEN INADVERTENTLY ALTERED. RELY ONLY ON FINAL HARDCOPY MATERIALS BEARING THE CONSULTANT'S ORIGINAL SIGNATURE AND SEAL AERIAL IMAGERY PROVIDED BY GOOGLE® UNLESS OTHERWISE NOTED. Imagery Program, USDA Farm Service Agency.

SAWS CONSTRUC
SAWS GENERAL SECTION
 ALL MATERIALS AND CONSTRUCTION PROC CONTRACT SHALL BE APPROVED BY THE SAN COMPLY WITH THE PLANS, SPECIFICATIONS, FOLLOWING AS APPLICABLE:
 A. CURRENT TEXAS COMMISSION ON ENVIRE CRITERIA FOR DOMESTIC WASTEWATER CODE (TAC) TITLE 30 PART 1 CHAF WATER", TAC TITLE 30 PART 1 CHAPTER B. CURRENT TXDOT "STANDARD SPECIFIC HIGHWAYS, STREETS AND DRAINAGE". C. CURRENT "SAN ANTONIO WATER SYSTE WATER AND SANITARY SEWER CONSTRUCT D. CURRENT CITY OF SAN ANTONIO "STAN WORKS CONSTRUCTION". E. CURRENT CITY OF SAN ANTONIO "UTILI (UECM).
2. THE CONTRACTOR SHALL NOT PROCEED WITH THEY OBTAIN A COPY OF THE APPRO' CONSTRUCTION PERMIT (GCP) FROM THE CO SAWS CONSTRUCTION INSPECTION DIVISION T ARRANGED A MEETING WITH THE INSPECTO REQUIREMENTS. WORK COMPLETED BY THE COUNTER PERMIT AND/OR A GCP WILL REPLACEMENT AT THE EXPENSE OF THE CON
 THE CONTRACTOR SHALL OBTAIN THE SAWS WEBSITE, HTTP: //WWW.SAWS.ORG/BUSINESS_ NOTED WITHIN THE DESIGN PLANS.
 THE CONTRACTOR IS TO MAKE ARRANGEM INSPECTION DIVISION AT (210) 233–2973, ON NOTIFICATION PROCEDU AFFECTED HOME RESIDENTS AND/OR PROP BEGINNING ANY WORK.
5. LOCATION AND DEPTH OF EXISTING UTILITIE THE PLANS ARE UNDERSTOOD TO BE AF DEPTHS MUST BE FIELD VERIFIED BY THE CO CONSTRUCTION. IT SHALL BE THE CONTF UTILITY SERVICE LINES AS REQUIRED FOR C DURING CONSTRUCTION AT NO COST TO SAW
6. THE CONTRACTOR SHALL VERIFY THE EXACT AND DRAINAGE STRUCTURES AT LEAST 1 WHETHER SHOWN ON PLANS OR NOT. PLEASE LOCATES REQUESTING PIPE LOCATION M FOLLOWING CONTACT INFORMATION ARE SUPP
 SAWS UTILITY LOCATES: HTTP: //WWW.SA COSA DRAINAGE (210) 207-0724 OR (2 COSA TRAFFIC SIGNAL OPERATIONS (210) COSA TRAFFIC SIGNAL DAMAGES (210) 2 TEXAS STATE WIDE ONE CALL LOCATOR
 THE CONTRACTOR SHALL BE RESPONSIBLI CURBS, STREETS, DRIVEWAYS, SIDEWALKS, L ORIGINAL OR BETTER CONDITION IF DAMAGE PROJECT'S CONSTRUCTION.
8. ALL WORK IN TEXAS DEPARTMENT OF TRA COUNTY RIGHT-OF-WAY SHALL BE DONE CONSTRUCTION SPECIFICATIONS AND PERMIT I
9. THE CONTRACTOR SHALL COMPLY WITH GOVERNING MUNICIPALITY'S TREE ORDINANCES
10. THE CONTRACTOR SHALL NOT PLACE ANY FLOOD PLAIN WITHOUT FIRST OBTAINING AN A
11. HOLIDAY WORK: CONTRACTORS WILL NOT BE SAWS RECOGNIZED HOLIDAYS. REQUEST SHOU CONSTWORKREQ@SAWS.ORG.
WEEKEND WORK: CONTRACTORS ARE REQUID CONSTRUCTION DEPARTMENT 48 HOURS IN A REQUEST SHOULD BE SENT TO CONSTWORKRE
ANY AND ALL SAWS UTILITY WORK INSTALLED APPROVAL WILL BE SUBJECT TO BE UNCOVER
12. COMPACTION NOTE (ITEM 804): THE CONT MEETING THE COMPACTION REQUIREMENTS PAYING FOR THE TESTS PERFORMED BY A BE DONE AT ONE LOCATION POINT RANDOML SAWS INSPECTOR AND/OR THE TEST ADMIN LIFT PER 400 LINEAR FEET AT A MINIMUM. AND FINALIZED BY SAWS WITHOUT THIS REQ PROVIDING ALL NECESSARY DOCUMENTED TES
13. A COPY OF ALL TESTING REPORTS SHALL BI INSPECTION DIVISION.

CTION NOTES UARY 2022)

CEDURES WITHIN THE SCOPE OF THIS AN ANTONIO WATER SYSTEM (SAWS) AND GENERAL CONDITIONS AND WITH THE

RONMENTAL QUALITY (TCEQ) 'DESIGN SYSTEM", TEXAS ADMINISTRATIVE PTER 217 AND 'PUBLIC DRINKING FICATIONS FOR CONSTRUCTION OF EM STANDARD SPECIFICATIONS FOR ANDARD SPECIFICATIONS FOR PUBLIC

LITY EXCAVATION CRITERIA MANUAL"

TH ANY PIPE INSTALLATION WORK UNTIL VED COUNTER PERMIT OR GENERAL NSULTANT AND HAS BEEN NOTIFIED BY TO PROCEED WITH THE WORK AND HAS OR AND CONSULTANT FOR THE WORK CONTRACTOR WITHOUT AN APPROVED BE SUBJECT TO REMOVAL AND TRACTORS AND/OR THE DEVELOPER.

STANDARD DETAILS FROM THE SAWS _CENTER/SPECS. UNLESS OTHERWISE

URES THAT WILL BE USED TO NOTIFY OPERTY OWNERS 48 HOURS PRIOR TO

ES AND SERVICE LATERALS SHOWN ON APPROXIMATE. ACTUAL LOCATIONS AND CONTRACTOR AT LEAST 1 WEEK PRIOR TO RACTOR'S RESPONSIBILITY TO LOCATE CONSTRUCTION AND TO PROTECT THEM

LOCATION OF UNDERGROUND UTILITIES -2 WEEKS PRIOR TO CONSTRUCTION E ALLOW UP TO 7 BUSINESS DAYS FOR MARKERS ON SAWS FACILITIES. THE PLIED FOR VERIFICATION PURPOSES:

AWS.ORG/SERVICE/LOCATES

210) 207-6026 10) 206-8480

207-3951 1-800-545-6005 OR 811

_E FOR RESTORING EXISTING FENCES, ANDSCAPING AND STRUCTURES TO ITS GES ARE MADE AS A RESULT OF THE

NSPORTATION (TXDOT) AND/OR BEXAR IN ACCORDANCE WITH RESPECTIVE REQUIREMENTS.

CITY OF SAN ANTONIO OR OTHER WHEN EXCAVATING NEAR TREES. WASTE MATERIALS IN THE 100-YEAR APPROVED FLOOD PLAIN PERMIT.

OULD BE SENT TO

JIRED TO NOTIFY THE SAWS INSPECTION ADVANCE TO REQUEST WEEKEND WORK. EQ@SAWS.ORG.

WITHOUT HOLIDAY/WEEKEND ERED FOR PROPER INSPECTION.

TRACTOR SHALL BE RESPONSIBLE FOR ON ALL TRENCH BACKFILL AND FOR THIRD PARTY. COMPACTION TESTS WILL LY SELECTED, OR AS INDICATED BY THE NISTRATOR, PER EACH 12-INCH LOOSE THIS PROJECT WILL NOT BE ACCEPTED UIREMENT BEING MET AND VERIFIED BY 5. ST RESULTS.

BE FORWARDED TO SAWS CONSTRUCTION

SAWS SEWER NOTES

THE CONTRACTOR IS RESPONSIBLE FOR ENSURING THAT NO SANITARY SEWER OVERFLOW (SSO) OCCURS AS A RESULT OF THEIR WORK. ALL CONTRACTOR PERSONNEL RESPONSIBLE FOR SSO PREVENTION AND CONTROL SHALL BE TRAINED ON PROPER RESPONSE. SHOULD AN SSO OCCUR, THE CONTRACTOR SHALL:

A. IDENTIFY THE SOURCE OF THE SSO AND NOTIFY SAWS EMERGENCY OPERATIONS CENTER (EOC) IMMEDIATELY AT (210) 233-2014. PROVIDE THE ADDRESS OF THE SPILL AND AN ESTIMATED VOLUME OR FLOW. B.ATTEMPT TO ELIMINATE THE SOURCE OF THE SSO.

- C.CONTAIN SEWAGE FROM THE SSO TO THE EXTENT OF PREVENTING A POSSIBLE CONTAMINATION OF WATERWAYS. D.CLEAN UP SPILL SITE (RETURN CONTAINED SEWAGE TO THE
- COLLECTION SYSTEM IF POSSIBLE) AND PROPERLY DISPOSE OF CONTAMINATED SOIL/MATERIALS.
- E.CLEAN THE AFFECTED SEWER MAINS AND REMOVE ANY DEBRIS. F.MEET ALL POST-SSO REQUIREMENTS AS PER THE EPA CONSENT DECREE, INCLUDING LINE CLEANING AND TELEVISING THE AFFECTED SEWER MAINS (AT SAWS DIRECTION) WITHIN 24 HOURS.

SHOULD THE CONTRACTOR FAIL TO ADDRESS AN SSO IMMEDIATELY AND TO SAWS SATISFACTION, THEY WILL BE RESPONSIBLE FOR ALL COSTS INCURRED BY SAWS, INCLUDING ANY FINES FROM EPA, TCEQ AND/OR ANY OTHER FEDERAL, STATE OR LOCAL AGENCIES.

NO SEPARATE MEASUREMENT OR PAYMENT SHALL BE MADE FOR THIS WORK. ALL WORK SHALL BE DONE ACCORDING TO GUIDELINES SET BY THE TCEQ AND SAWS.

- EMENTS WITH THE SAWS CONSTRUCTION 2. IF BYPASS PUMPING IS REQUIRED, THE CONTRACTOR SHALL PERFORM SUCH WORK IN ACCORDANCE WITH SAWS STANDARD SPECIFICATION FOR WATER AND SANITARY SEWER CONSTRUCTION, ITEM NO. 864, "BYPASS PUMPING".
 - PRIOR TO TIE-INS. ANY SHUTDOWNS OF EXISTING FORCE MAINS OF ANY SIZE MUST BE COORDINATED WITH THE SAWS CONSTRUCTION INSPECTION DIVISION AT (210) 233-2973 AT LEAST ONE WEEK IN ADVANCE OF THE SHUTDOWN. THE CONTRACTOR MUST ALSO PROVIDE A SEQUENCE OF WORK AS RELATED TO THE TIE-INS; THIS IS AT NO ADDITIONAL COST TO SAWS OR THE PROJECT AND IT IS THE RESPONSIBILITY OF THE CONTRACTOR TO SEQUENCE THE WORK ACCORDINGLY.
 - SEWER PIPE WHERE WATER LINE CROSSES SHALL BE 160 PSI AND MEET THE REQUIREMENTS OF ASTM D2241, TAC 217.53 AND TCEQ 290.44(E)(4)(B). CONTRACTOR SHALL CENTER A 20' JOINT OF 160 PSI PRESSURE RATED PVC AT THE PROPOSED WATER CROSSING.
 - ELEVATIONS POSTED FOR TOP OF MANHOLES ARE FOR REFERENCE ONLY: IT SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR TO MAKE ALLOWANCES AND ADJUSTMENTS FOR TOP OF MANHOLES TO MATCH THE FINISHED GRADE OF THE PROJECT'S IMPROVEMENTS. (NSPI)
 - 6. SPILLS, OVERFLOWS, OR DISCHARGES OF WASTEWATER: ALL SPILLS, OVERFLOWS, OR DISCHARGES OF WASTEWATER, RECYCLED WATER, PETROLEUM PRODUCTS, OR CHEMICALS MUST BE REPORTED IMMEDIATELY TO THE SAWS INSPECTOR ASSIGNED TO THE COUNTER PERMIT OR GENERAL CONSTRUCTION PERMIT (GCP). THIS REQUIREMENT APPLIES TO EVERY SPILL, OVERFLOW, OR DISCHARGE RÉGARDLESS OF SIZE.
 - MANHOLE AND ALL PIPE TESTING (INCLUDING THE TV INSPECTION) MUST BE PERFORMED AND PASSED PRIOR TO FINAL FIELD ACCEPTANCE BY SAWS CONSTRUCTION INSPECTION DIVISION, AS PER THE SAWS SPECIFICATIONS FOR WATER AND SANITARY SEWER CONSTRUCTION.
 - 8. ALL PVC PIPE OVER 14 FEET OF COVER SHALL BE EXTRA STRENGTH WITH MINIMUM PIPE STIFFNESS OF 115 PSI.

ALLOWED TO PERFORM SAWS WORK ON | PROJECT SEWER NOTES

- ALL RESIDENTIAL SEWER SERVICE LATERALS ARE 6" DIA. AND SHALL BE EXTENDED TO 10' PAST THE PROPERTY LINE AND CAPPED AND SEALED. CONTRACTOR SHALL INSTALL A 2" X 4" STAKE, FOUR (4) FEET LONG, TWO (2) FEET DEEP INTO THE GROUND AT THE END OF EACH SERVICE. NO SEPARATE PAY ITEM.
- CONTRACTOR TO INSTALL CLEANOUTS AT THE END OF ALL SEWER LATERALS, PER LATERAL DETAIL SHEET CX.XX
- 3. NO VERTICAL STACKS ALLOWED FOR ANY LOTS UNLESS OTHERWISE SPECIFIED BY THE ENGINEER.
- . ALL 6" SEWER LATERALS WILL BE SET AT 2% GRADE FROM THE MAIN TO THE PROPERTY LINE.
- . WHEN HORIZONTAL DISTANCE BETWEEN SEWER PIPES AND WATER MAIN IS LESS THAN 9 FOOT OF SEPARATION, SEWER MAIN SHALL BE INSTALLED WITH 150 PSI (MIN) PRESSURE PIPE AND FITTINGS IN ACCORDANCE WITH SAWS CONSTRUCTION CRITERIA FOR CONSTRUCTION OF SEWER MAINS IN THE VICINITY OF WATER MAINS.
- 5. CONTRACTOR SHALL ENSURE THAT MANHOLES OUTSIDE OF PAVED AREAS ARE SET WITH TOP ELEVATIONS 6" ABOVE FINISHED GRADE WITH CONCRETE RING ENCASEMENT.
- 7. ALL SEWER PIPES SHALL BE 8" PVC (SDR 26), UNLESS OTHERWISE NOTED. 8. CONTRACTOR IS TO VERIFY EXISTING INVERT OF EXISTING SANITARY SEWER MAINS AND ALERT ENGINEER IMMEDIATELY OF ANY DIFFERENCE FROM
- INVERT SHOWN ON PLANS. 9. CONTRACTOR SHALL PROTECT ALL EXISTING FENCES. ANY FENCE DAMAGED
- BY THE CONTRACTOR SHALL BE REPAIRED BY THE CONTRACTOR AT THEIR EXPENSE. 10. THE CONTRACTOR WILL BE RESPONSIBLE FOR DETERMINING EXACT LOCATION
- OF ALL UTILITIES AND DRAINAGE STRUCTURES WHETHER SHOWN ON THE PLANS OR NOT. THE CONTRACTOR SHALL UNCOVER EXISTING UTILITIES PRIOR TO CONSTRUCTION TO VERIFY SIZE, GRADE, AND LOCATION. THE CONTRACTOR SHALL NOTIFY THE ENGINEER IMMEDIATELY OF ANY DEVIATIONS FROM PLANS PRIOR TO BEGINNING CONSTRUCTION. ANY DAMAGE TO EXISTING UTILITIES, WHETHER SHOWN ON THE PLANS OR NOT, SHALL BE THE CONTRACTOR'S RESPONSIBILITY TO REPAIR, AT HIS EXPENSE.
- I. CONCRETE RING ENCASEMENT TO BE INSTALLED ON ALL MANHOLES AND, WITHIN LIMITS OF PAVEMENT, BE INSTALLED TO THE TOP OF THE BASE LAYER WITH A MINIMUM OF 2" OF ASPHALT ON TOP OF THE RING ENCASEMENT.
- 12. MANHOLE OPENING INCREASED TO 30" AS PER TAC CHAPTER 217.55.
- 13. ALL SEWER PIPE LATERALS SHALL BE SDR 26 (CLASS 160) PVC PIPE.
- 14. IF THE GIVEN TOP OF MANHOLE ELEVATION DOES NOT AGREE ON ACTUAL GROUND SURFACE OR FINISH PAVEMENT, THE CONTRACTOR SHALL ADJUST ELEVATIONS SUCH THAT THE TOP OF MANHOLE SHALL BE 0.5' ABOVE EXISTING GROUND, OR FLUSH TO FINISH ASPHALT PAVEMENT.
- 15. ALL MANHOLES CONSTRUCTED OVER THE EDWARDS AQUIFER RECHARGE ZONE SHOULD BE WATERTIGHT.

SEWER

	DEVELOPER'S NAME: THE VILLAS AT TIMBERWOOD HOMEOWNERS ASSOCIATION, INC
	ADDRESS: 20540 STATE HIGHWAY 46 W. STE 115 C/O 497
	CITY: SPRING BRANCH STATE: TEXAS ZIP: 78070
	PHONE# FAX#
	SAWS BLOCK MAP <u># 164670 TOTAL EDU'S 0</u> TOTAL ACREAGE <u>3.05</u>
	TOTAL LINEAR FOOTAGE OF PIPE: <u>8" 5497 LF</u> PLAT NO. <u>–</u>
	NUMBER OF LOTS 0 SAWS JOB NO. 24-1631
L	l

THE VILLAS AT TIMBERWOOD OFFSITE SANTARY SEWER EXTENSION SAN ANTONIO, TEXAS SANTARY SEWER NOTES SANTARY SEWER NOTES TEXAS RUMENTION TO TEXAS SUMPTION TEXAS SUMPARTER SUMPTION TEXAS SUMPTION TEXAS SUMPARTE	NO. REVISION DATE	CALEB M. CHANCE 98401
THE VILLAS AT TIMBERWOOD OFFSITE SANITARY SEWER EXTENSION SAN ANTONIO, TEXAS SANITARY SEWER NOTES		TEXAS ENGINEERING FIRM #10028800 TEXAS ENGINEERING FIRM #470 TEXAS ENGINEERING FIRM #470 TEXAS SURVEVING FIRM #10028800
	THE VILLAS AT TIMBERWOOD OFFSITE	SANITARY SEWER EXTENSION SAN ANTONIO, TEXAS SANITARY SEWER NOTES

C5.11

30 TAC 217 regulations will apply where more stringent than the following SAWS Specifications

Specification 852: Sanitary Sewer Manholes

https://apps.saws.org/business_center/specs/constspecs/docs/conspecs_2021/ITEM%20NO.%20852%20Sanitar y%20Sewer%20Manholes.pdf

Specification 854: Sanitary Sewer Laterals

https://apps.saws.org/business_center/specs/constspecs/docs/conspecs_2021/ITEM%20NO.%20854%20Sanitar y%20Sewer%20Laterals.pdf

Specification 804: Excavation, Trenching and Backfill

https://apps.saws.org/business_center/specs/constspecs/docs/conspecs_2021/ITEM%20NO.%20804%20Excava tion%20Trenching%20and%20Backfill.pdf
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: Caleb Chance, P.E.

Date: 1/20/25

Signature of Customer/Agent:



Regulated Entity Name: The Villas at Timberwood Offsite Sanitary Sewer Extension

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: <u>Construction</u> <u>Staging Area</u>

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.

TCEQ-0602 (Rev. 02-11-15)

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: <u>Salado Creek</u>

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.
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.
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.
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 used in combination with other erosion and sediment controls within each 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 at one time.

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. \square 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.

THE VILLAS AT TIMBERWOOD OFFSITE SANITARY SEWER EXTENSION Sewage Collection System

Attachment A – Spill Response Actions

In the event of an accidental leak or spill:

- Spill must be contained and cleaned up immediately.
- Spills will not be merely buried or washed with water.
- Contractor shall take action to contain spill. Contractor may use sand or other absorbent material stockpiled on site to absorb spill. Absorbent material should be spread over the spill area to absorb the spilled product.
- In the event of an uncontained discharge the contractor shall utilize onsite equipment to construct berms downgradient of the spill with sand or other absorbent material to contain and absorb the spilled product.
- Spill containment/absorbent materials along with impacted media must be collected and stored in such a way so as not to continue to affect additional media (soil/water). Once the spill has been contained, collected material should be placed on poly or plastic sheeting until removed from the site. The impacted media and cleanup materials should be covered with plastic sheeting and the edges weighed down with paving bricks or other similarly dense objects as the material is being accumulated. This will prevent the impacted media and cleanup materials from becoming airborne in windy conditions or impacting runoff during a rain event. The stockpiled materials should not be located within an area of concentrated runoff such as along a curb line or within a swale.
- Contaminated soils and cleanup materials will be sampled for waste characterization. When the analysis results are known the contaminated soils and cleanup materials will be removed from the site and disposed in a permitted landfill in accordance with applicable regulations.
- The contractor will be required to notify the owner, who will in turn contact TCEQ to notify them in the event of a significant hazardous/reportable quantity spill. Additional notifications as required by the type and amount of spill will be conducted by owner or owner's representative.

In the event of an accidental significant or hazardous spill:

The contractor will be required to report significant or hazardous spills in reportable quantities to:

- 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.
- 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.
- Notification should first be made by telephone and followed up with a written report.



THE VILLAS AT TIMBERWOOD OFFSITE SANITARY SEWER EXTENSION Sewage Collection System

- 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.
- Other agencies which may need to be consulted include, but are not limited to, the City Police Department, County Sheriff Office, Fire Departments, etc.
- Contaminated soils will be sampled for waste characterization. When the analysis results are known the contaminated soils will be removed from the site and disposed in a permitted landfill in accordance with applicable regulations.

Additional guidance can be obtained from TCEQ's Technical Guidance Manual (TGM) RG-348 (2005) Section 1.4.16. Contractor shall review this section.

Attachment B – Potential Sources of Contamination

Other potential sources of contamination during construction include: Potential Source Oil, grease, fuel and hydraulic fluid contamination from construction equipment and vehicle dripping. Preventative Measure Vehicle maintenance when possible will be performed within the construction staging area. Construction vehicles and equipment shall be checked regularly for leaks and repaired immediately. Potential Source Accidental leaks or spills of oil, petroleum products and substances listed under 40 CFR parts 110, 117, and 302 used or stored temporarily on site. Preventative Measure Contractor to incorporate into regular safety meetings, a discussion of spill prevention and appropriate disposal procedures. Contractor's superintendent or representative overseer shall enforce proper spill prevention and control measures. Hazardous materials and wastes shall be stored in covered containers and protected from vandalism. A stockpile of spill cleanup materials shall be stored on site where it will be readily accessible. Potential Source Miscellaneous trash and litter from construction workers and material wrappings. Preventive Measure Trash containers will be placed throughout the site to encourage proper trash disposal. Potential Source Construction debris. Preventive Measure Construction debris will be monitored daily by contractor. Debris will be collected weekly and placed in disposal bins. Situations requiring immediate attention will be addressed on a case by case basis. Potential Source • Spills/Overflow of waste from portable toilets **Preventative Measure** Portable toilets will be placed away from high traffic vehicular areas and storm drain inlets. Portable toilets will be placed on a level ground surface.

> Portable toilets will be inspected regularly for leaks and will be serviced and sanitized at time intervals that will maintain sanitary conditions.

Attachment C – Sequence of Major Activities

The sequence of major activities which disturb soil during construction is site preparation that will include installation of TBMPs as shown on Exhibit 1, clearing and grubbing of vegetation where applicable, This work and instillation of a sanitary sewer main will disturb approximately 5.99 acres.



Attachment D – Temporary Best Management Practices and Measures

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.

Due to site topography, no upgradient water will cross the site. All TBMPs are adequate for the drainage areas they serve.

b. 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.

Site preparation, which is the initiation of all activity on the project, will disturb the largest amount of soil. Therefore, before any of this work can begin, the clearing and grading contractor will be responsible for the installation of all on-site control measures. The methodology for pollution prevention of on-site stormwater will include: (1) erection of silt fences along the downgradient boundary of construction activities for temporary erosion and sedimentation controls, (2) installation of rock berms with silt fencing downgradient from areas of concentrated stormwater flow for temporary erosion control, (3) Installation of gravel bags and drain inlet protection at inlets and downgradient areas of construction activities for sediment control (4) installation of stabilized construction entrance/exit(s) to reduce the dispersion of sediment from the site, and (5) installation of construction staging area(s).

Prior to the initiation of construction, all previously installed control measures will be repaired or reestablished for their designed or intended purpose. This work, which is the remainder of all activity on the project, may also disturb additional soil. The construction contractor will be responsible for the installation of all remaining on-site control measures that includes installation of the concrete truck washout pit(s), as construction phasing warrants.

Temporary measures are intended to provide a method of slowing the flow of runoff from the construction site in order to allow sediment and suspended solids to settle out of the runoff. By containing the sediment and solids within the site, they will not enter surface streams and/or sensitive features.

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

Sensitive features within the project limits will be protected by the proposed TBMPs within this plan. Construction personnel will be educated to be aware of the features and their respective buffers. Absolutely no disturbance of any kind will take place within the proposed buffers as noted on the plan sheets.

Temporary measures are intended to provide a method of slowing the flow of runoff from the construction site in order to allow sediment and suspended solids to settle out of the runoff. By containing the sediment and solids within the site, they will not enter surface streams and/or sensitive features.



d. 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.

Sensitive features within the project limits will be protected by the proposed TBMPs within this plan. Construction personnel will be educated to be aware of the features and their respective buffers. Absolutely no disturbance of any kind will take place within the proposed buffers as noted on the plan sheets.

BMP measures utilized in this plan are intended to allow stormwater to continue downstream after passing through the BMPs. This will allow stormwater runoff to continue downgradient to streams or features that may exist downstream of the site.



Attachment F – Structural Practices

The following structural measures will be installed prior to the initiation of site preparation activities:

- Erection of silt fences along the downgradient boundary of construction activities and rock berms with silt fence for secondary protection, as located on Exhibit 1 and illustrated in Exhibit 2.
- Installation of gravel bags and drain inlet protection at inlets and downgradient areas of construction activities, as located on Exhibit 1 and illustrated in Exhibit 2.
- Installation of stabilized construction entrance/exit(s) and construction staging area(s), as located on Exhibit 1, and illustrated on Exhibit 2.

The following structural measures will be installed at the initiation of construction activities or as appropriate based on the construction sequencing:

• Installation of concrete truck washout pit(s), as required and located on Exhibit 1 and illustrated on Exhibit 2.



<u>Attachment G – Drainage Area Map</u>

No more than ten (10) acres will be disturbed within a common drainage area at one time. All TBMPs utilized are adequate for the drainage areas served.



INSPECTIONS

Designated and qualified person(s) shall inspect Pollution Control Measures weekly and within 24 hours after a storm event. An inspection report that summarizes the scope of the inspection, names and qualifications of personnel conducting the inspection, date of the inspection, major observations, and actions taken as a result of the inspection shall be recorded and maintained as part of Storm Water TPDES data for a period of three years after the Notice of Termination (NOT) has been filed. A copy of the Inspection Report Form is provided in this Storm Water Pollution Prevention Plan.

As a minimum, the inspector shall observe: (1) significant disturbed areas for evidence of erosion, (2) storage areas for evidence of leakage from the exposed stored materials, (3) structural controls (rock berm outlets, silt fences, drainage swales, etc.) for evidence of failure or excess siltation (over 6 inches deep), (4) vehicle exit point for evidence of off-site sediment tracking, (5) vehicle storage areas for signs of leaking equipment or spills, (6) concrete truck rinse-out pit for signs of potential failure, (7) embankment, spillways, and outlet of sediment basin (where applicable) for erosion damage, and (8) sediment basins (where applicable) for evidence that basin has accumulated 50% of its volume in silt. Deficiencies noted during the inspection will be corrected and documented within seven calendar days following the inspection or before the next anticipated storm event if practicable.

Contractor shall review Sections 1.3 and 1.4 of TCEQ's Technical Guidance Manual for additional BMP inspection and maintenance requirements.



Pollution	.=	Corrective Action Required	
Prevention Measure	Inspected Compliance	Description (use additional sheet if necessary)	Date Completed
Best Management Practices			
Natural vegetation buffer strips			
Temporary vegetation			
Permanent vegetation			
Sediment control basin			
Silt fences			
Rock berms			
Gravel filter bags			
Drain inlet protection			
Other structural controls			
Vehicle exits (off-site tracking)			
Material storage areas (leakage)			
Equipment areas (leaks, spills)			
Concrete washout pit (leaks, failure)			
General site cleanliness			
Trash receptacles			
Evidence of Erosion			
Site preparation			
Roadway or parking lot construction			
Utility construction			
Drainage construction			
Building construction			
Major Observations			
Sediment discharges from site			
BMPs requiring maintenance			
BMPs requiring modification			
Additional BMPs required			

_ A brief statement describing the qualifications of the inspector is included in this SWP3.

"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's Name

Inspector's Signature

Date

PROJECT MILESTONE DATES

Date when major site grading activities begin:

Construction Activity		Date	
Installation of BMPs			
<u> </u>		·	
Dates when construction activities temporarily or permar	nently o	cease on all or a portion of the proje	ect:
Construction Activity		Date	
<u> </u>			
Dates when stabilization measures are initiated:			
Stabilization Activity		Date	
Removal of BMPs			

Attachment J - Schedule of Interim and Permanent Soil Stabilization Practices

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

Stabilization measures will be initiated as soon as practicable in portions of the site where construction activities have temporarily or permanently ceased, and except as provided below, will be initiated no more than fourteen (14) days after the construction activity in that portion of the site has temporarily or permanently ceased. 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 site. In areas experiencing droughts where the initiation of stabilization measures by the 14th day after construction activity has temporarily or permanently ceased is precluded by seasonably arid conditions, stabilization measures must be initiated as soon as practicable.



AGENT AUTHORIZATION FORM (TCEQ-0599)

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

۱	Roy Block
	Print Name
	President,
	Title - Owner/President/Other
of	The Villas at Timberwood Homeowners Association, Inc. Corporation/Partnership/Entity Name
have authori	zed Pape-Dawson Engineers, Inc. Print Name of Agent/Engineer
of	Pape-Dawson Engineers, Inc. Print Name of Firm

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

I also understand that:

- 1. The applicant is responsible for compliance with 30 Texas Administrative Code Chapter 213 and any condition of the TCEQ's approval letter. The TCEQ is authorized to assess administrative penalties of up to \$10,000 per day per violation.
- 2. For those submitting an application who are not the property owner, but who have the right to control and possess the property, additional authorization is required from the owner.
- 3. Application fees are due and payable at the time the application is submitted. The application fee must be sent to the TCEQ cashier or to the appropriate regional office. The application will not be considered until the correct fee is received by the commission.
- 4. A notarized copy of the Agent Authorization Form must be provided for the person preparing the application, and this form must accompany the completed application.
- 5. No person shall commence any regulated activity on the Edwards Aquifer Recharge Zone, Contributing Zone or Transition Zone until the appropriate application for the activity has been filed with and approved by the Executive Director.

SIGNATURE PAGE:

wie

Applicant's Signature

14/25

Date

THE STATE OF TEXAS §

County of BEXAR §

BEFORE ME, the undersigned authority, on this day personally appeared Love BLOCK 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 <u>14</u> day of <u>JAN</u>	2025
Stheel	



NOTARY PUBLIC

Typed or Printed Name of Notary

MY COMMISSION EXPIRES: 10-11-2027

APPLICATION FEE FORM (TCEQ-0574)

Application Fee Form

Texas Commission on Environmental Quality				
Name of Proposed Regulated Entity:	The Villas at Timberv	vood Offsite Sanitary S	Sewer Extension	
Regulated Entity Location: Approxim	ately 0.25 miles west	of Harmony Hills and	Shady Acres	
intersection.				
Name of Customer: The Villas at Tim	berwood Homeowne	rs Association, Inc.		
Contact Person: <u>Roy Block</u>	Phone	e: <u>(210) 828-6131</u>		
Customer Reference Number (if issue	ed):CN <u>604095778</u>			
Regulated Entity Reference Number	(if issued):RN <u>104814</u>	<u>1959</u>		
Austin Regional Office (3373)				
🗌 Hays	Travis	Wil	liamson	
San Antonio Regional Office (3362)				
🖂 Bexar	Medina	Uva	alde	
Comal	 Kinnev			
Application fees must be paid by che		r money order navabl	e to the Tevas	
Commission on Environmental Qual	ity Your canceled ch	neck will serve as your	receint This	
form must be submitted with your f	ee payment. This pa	vment is being submit	ted to:	
	∑ Co	n Antonio Dogional Of	f:	
	⊠ Sa			
Mailed to: ICEQ - Cashier		vernight Delivery to: TCEQ - Cashier		
Revenues Section	12	2100 Park 35 Circle		
Mail Code 214 Bu		ailding A, 3rd Floor		
P.O. Box 13088 Au		ustin, TX 78753		
Austin, TX 78711-3088 (512)239-0357				
Site Location (Check All That Apply):				
Recharge Zone Contributing Zone		Transit	ion Zone	
Type of Plan		Size	Fee Due	
Water Pollution Abatement Plan, Contributing Zone				
Plan: One Single Family Residential Dwelling		Acres	\$	
Water Pollution Abatement Plan, Co				
Plan: Multiple Single Family Residential and Parks		Acres	\$	
Water Pollution Abatement Plan, Co				
Plan: Non-residential		Acres	\$	
Sewage Collection System		5,497 L.F.	\$ 2,748.50	
Lift Stations without sewer lines	Acres	\$		
Underground or Aboveground Stora	Tanks	\$		
Piping System(s)(only)		Each	\$	
Exception	Each	\$		

Extension of Time

\$

Each

Signature:

Date: 1/8/25

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

Organized Sewage Collection Systems and Modifications

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

Underground and Aboveground Storage Tank System Facility Plans and Modifications

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

Exception Requests

Project	Fee
Exception Request	\$500

Extension of Time Requests

Project	Fee
Extension of Time Request	\$150