TEXAS COMMISSION ON ENVIRONMENTAL QUALITY

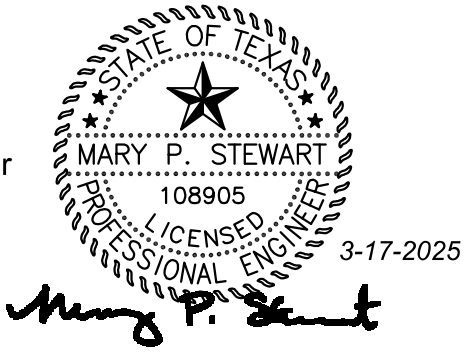
WATER POLUTION ABATEMENT PLAN MODIFICATION (WPAP MOD)

CITY OF GEORGETOWN FIRE STATION 1
624 FM - 1460
Georgetown, Texas 78626

KCI Job No.: 762308274
March 2025

Prepared by:

Mary P. Stewart, P.E.
Regional Practice Leader



KCI TECHNOLOGIES
2806 WEST BITTER ROAD, SUITE 218
SAN ANTONIO, TEXAS 78248
(210) 641-9999 FAX: (210) 641-6440
REGISTRATION # F-10573

Prepared for:

Jennifer Bettiol
CIP Manager Public Works

CITY OF GEORGETOWN

Modification of a Previously Approved Plan Checklist

X **Edwards Aquifer Application Cover Page (TCEQ-20705)**

X **General Information Form (TCEQ-0587)**

Attachment A - Road Map
Attachment B - USGS / Edwards Recharge Zone Map
Attachment C - Project Description

X **Geologic Assessment Form (TCEQ-0585)**

Attachment A - Geologic Assessment Table (TCEQ-0585-Table)
Attachment B - Stratigraphic Column
Attachment C - Site Geology
Attachment D - Site Geologic Map(s)

X **Modification of a Previously Approved Plan (TCEQ-0590)**

Attachment A - Original Approval Letter and Approved Modification Letters
Attachment B - Narrative of Proposed Modification
Attachment C - Current Site Plan of the Approved Project

X **Application Form (include any applicable to the proposed modification):**

Aboveground Storage Tank Facility Plan (TCEQ-0575)
Organized Sewage Collection System Application (TCEQ-0582)
Underground Storage Tank Facility Plan (TCEQ-0583)
Water Pollution Abatement Plan Application (TCEQ-0584)
Lift Station / Force Main System Application (TCEQ-0624)

X **Temporary Stormwater Section (TCEQ-0602)**

X **Water Pollution Abatement Plan Application Form (TCEQ-0584)**

Attachment A - Factors Affecting Surface Water Quality
Attachment B - Volume and Character of Stormwater
Attachment C - Suitability Letter from Authorized Agent (if OSSF is proposed)
Attachment D - Exception to the Required Geologic Assessment (if requested)
Site Plan

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

X **Permanent Stormwater Section (TCEQ-0600), if necessary**

Attachment A - 20% or Less Impervious Cover Declaration (if requested for multi-family, school, or small business site)
Attachment B - BMPs for Upgradient Stormwater

Attachment C - BMPs for On-site Stormwater
Attachment D - BMPs for Surface Streams
Attachment E - Request to Seal Features, if sealing a feature
Attachment F - Construction Plans
Attachment G - Inspection, Maintenance, Repair and Retrofit Plan
Attachment H - Pilot-Scale Field Testing Plan (if requested)
Attachment I -Measures for Minimizing Surface Stream Contamination

X **Agent Authorization Form (TCEQ-0599), if application submitted by agent**

X **Application Fee Form (TCEQ-0574)**

– **Check Payable to the "Texas Commission on Environmental Quality"**

X **Core Data Form (TCEQ-10400)**

X **Water Pollution Abatement Plan Application Form (TCEQ-0584)**

Attachment A - Factors Affecting Surface Water Quality
Attachment B - Volume and Character of Stormwater
Attachment C - Suitability Letter from Authorized Agent (if OSSF is proposed)
Attachment D - Exception to the Required Geologic Assessment (if requested)
Site Plan

Texas Commission on Environmental Quality

Edwards Aquifer Application Cover Page

Our Review of Your Application

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

Administrative Review

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

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

2. This Edwards Aquifer Application Cover Page form (certified by the applicant or agent) must be included in the application and brought to the administrative review meeting.

3. Administrative reviews are scheduled with program staff who will conduct the review. Applicants or their authorized agent should call the appropriate regional office, according to the county in which the project is located, to schedule a review. The average meeting time is one hour.

4. In the meeting, the application is examined for administrative completeness. Deficiencies will be noted by staff and emailed or faxed to the applicant and authorized agent at the end of the meeting, or shortly after. Administrative deficiencies will cause the application to be deemed incomplete and returned.

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

5. If an application is received by mail, courier service, or otherwise submitted without a review meeting, the administrative review will be conducted within 30 days. The applicant and agent will be contacted with the results of the administrative review. If the application is found to be administratively incomplete, it can be retrieved from the regional office or returned by regular mail. If returned by mail, the regional office may require arrangements for return shipping.

6. If the geologic assessment was completed before October 1, 2004 and the site contains “possibly sensitive” features, the assessment must be updated in accordance with the *Instructions to Geologists* (TCEQ-0585 Instructions).

Technical Review

1. When an application is deemed administratively complete, the technical review period begins. The regional office will distribute copies of the application to the identified affected city, county, and groundwater conservation district whose jurisdiction includes the subject site. These entities and the public have 30 days to provide comments on the application to the regional office. All comments received are reviewed by TCEQ.

2. A site assessment is usually conducted as part of the technical review, to evaluate the geologic assessment and observe existing site conditions. The site must be accessible to our staff. The site boundaries should be

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

3. We evaluate the application for technical completeness and contact the applicant and agent via Notice of Deficiency (NOD) to request additional information and identify technical deficiencies. There are two deficiency response periods available to the applicant. There are 14 days to resolve deficiencies noted in the first NOD. If a second NOD is issued, there is an additional 14 days to resolve deficiencies. If the response to the second notice is not received, is incomplete or inadequate, or provides new information that is incomplete or inadequate, the application must be withdrawn or will be denied. Please note that because the technical review is underway, whether the application is withdrawn or denied **the application fee will be forfeited**.

4. The program has 90 calendar days to complete the technical review of the application. If the application is technically adequate, such that it complies with the Edwards Aquifer rules, and is protective of the Edwards Aquifer during and after construction, an approval letter will be issued. Construction or other regulated activity may not begin until an approval is issued.

Mid-Review Modifications

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

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

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

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

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

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

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

1. Regulated Entity Name: City of Georgetown New Fire Station 1						**2. Regulated Entity No.:** RN104712013			
3. Customer Name: City of Georgetown						**4. Customer No.:** CN600412043			
5. Project Type: **(Please circle/check one)**	New		Modification			Extension		Exception	
6. Plan Type: **(Please circle/check one)**	WPAP	CZP	SCS	UST	AST	EXP	EXT	Technical Clarification	Optional Enhanced Measures
7. Land Use: **(Please circle/check one)**	Residential		Non-residential			**8. Site (acres):**		3.14 Acres	
9. Application Fee:	$4,000		**10. Permanent BMP(s):**			Existing Extended Detention Basins; Proposed VFS & Grassy Swale			
11. SCS (Linear Ft.):	N/A		**12. AST/UST (No. Tanks):**			N/A			
13. County:	Williamson		**14. Watershed:**			Smith Branch - San Gabriel River			

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.)	__	__	_x_
Region (1 req.)	__	__	_x_
County(ies)	__	__	_x_
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 _x_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

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. Mary P. Stewart Print Name of Customer/Authorized Agent Signature of Customer/Authorized Agent 3/14/2025 Date

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

General Information Form

Texas Commission on Environmental Quality

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

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

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

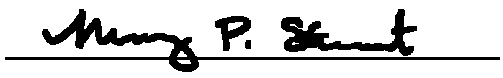
Signature

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

Print Name of Customer/Agent: Mary P. Stewart

Date: 3/14/2025

Signature of Customer/Agent:



Project Information

1. Regulated Entity Name: City of Georgetown New Fire Station 1
2. County: Williamson
3. Stream Basin: Smith Branch - San Gabriel River
4. Groundwater Conservation District (If applicable): N/A
5. Edwards Aquifer Zone:

   [X] Recharge Zone
   [ ] Transition Zone

6. Plan Type:

   [X] WPAP
   [ ] SCS
   [X] Modification
   [ ] AST
   [ ] UST
   [ ] Exception Request

7. Customer (Applicant):

Contact Person: Jennifer Bettiol
Entity: City of Georgetown
Mailing Address: 300 Industrial Ave.
City, State: Georgetown, Tx Zip: 78626
Telephone: (512) 930-3640 FAX: _____
Email Address: Jennifer.Bettiol@georgetown.org

8. Agent/Representative (If any):

Contact Person: Mary P. Stewart, P.E.
Entity: KCI Technologies
Mailing Address: 2806 West Bitters Rd, Suite 218
City, State: San Antonio, Tx Zip: 78248
Telephone: (210) 641-9999 FAX: _____
Email Address: Mary.Stewart@kci.com

9. Project Location:

[X] The project site is located inside the city limits of Georgetown
[ ] The project site is located outside the city limits but inside the ETJ (extra-territorial jurisdiction) of _____.
[ ] The project site is not located within any city's limits or ETJ.

10. [X] 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.

301 Industrial Ave., Georgetown, TX 78262

11. [X] **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. [X] **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:

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

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

[X] Survey staking will be completed by this date: Nov. 2023

14. [X] **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:

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

15. Existing project site conditions are noted below:

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

Prohibited Activities

16. [X] 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. [X] 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:

- [X] 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. [X] 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:

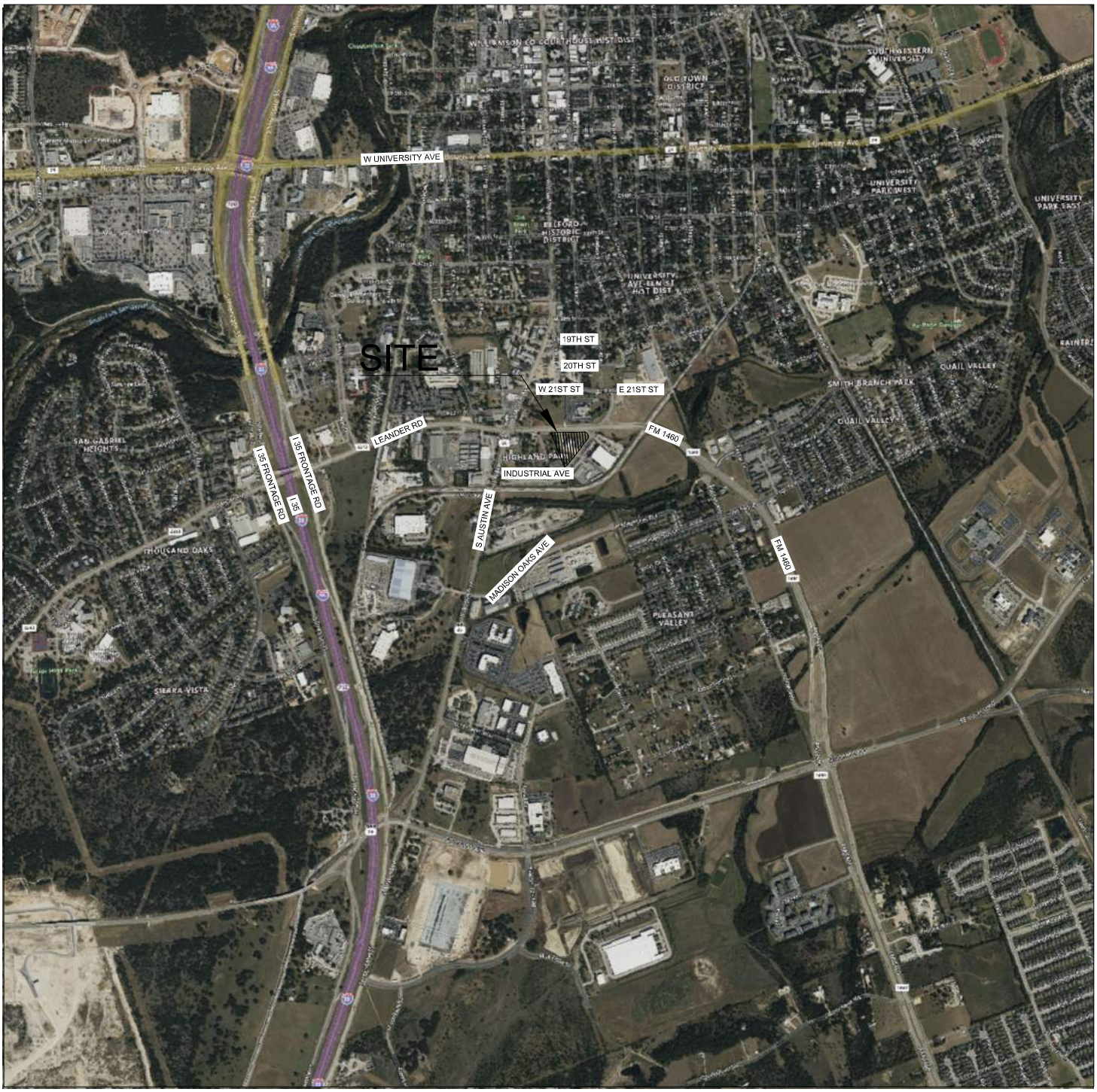
- [ ] TCEQ cashier
- [X] Austin Regional Office (for projects in Hays, Travis, and Williamson Counties)
- [ ] San Antonio Regional Office (for projects in Bexar, Comal, Kinney, Medina, and Uvalde Counties)

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

Attachment A

Road Map and Site
City of Georgetown New Fire Station 1



0 1000 2000 4000

SCALE: 1" = 2000'

N

REV	DATE	DESCRIPTION

GEORGETOWN FIRE STATION 1 RENOVATION

AERIAL MAP

KCI TECHNOLOGIES, INC.
2806 BITTERS RD, SUITE 218
SAN ANTONIO, TEXAS 78248
PHONE: (210) 641-9999
FAX: (210) 641-6440
REGISTRATION #F-10573 / #101943-65

SEAL:

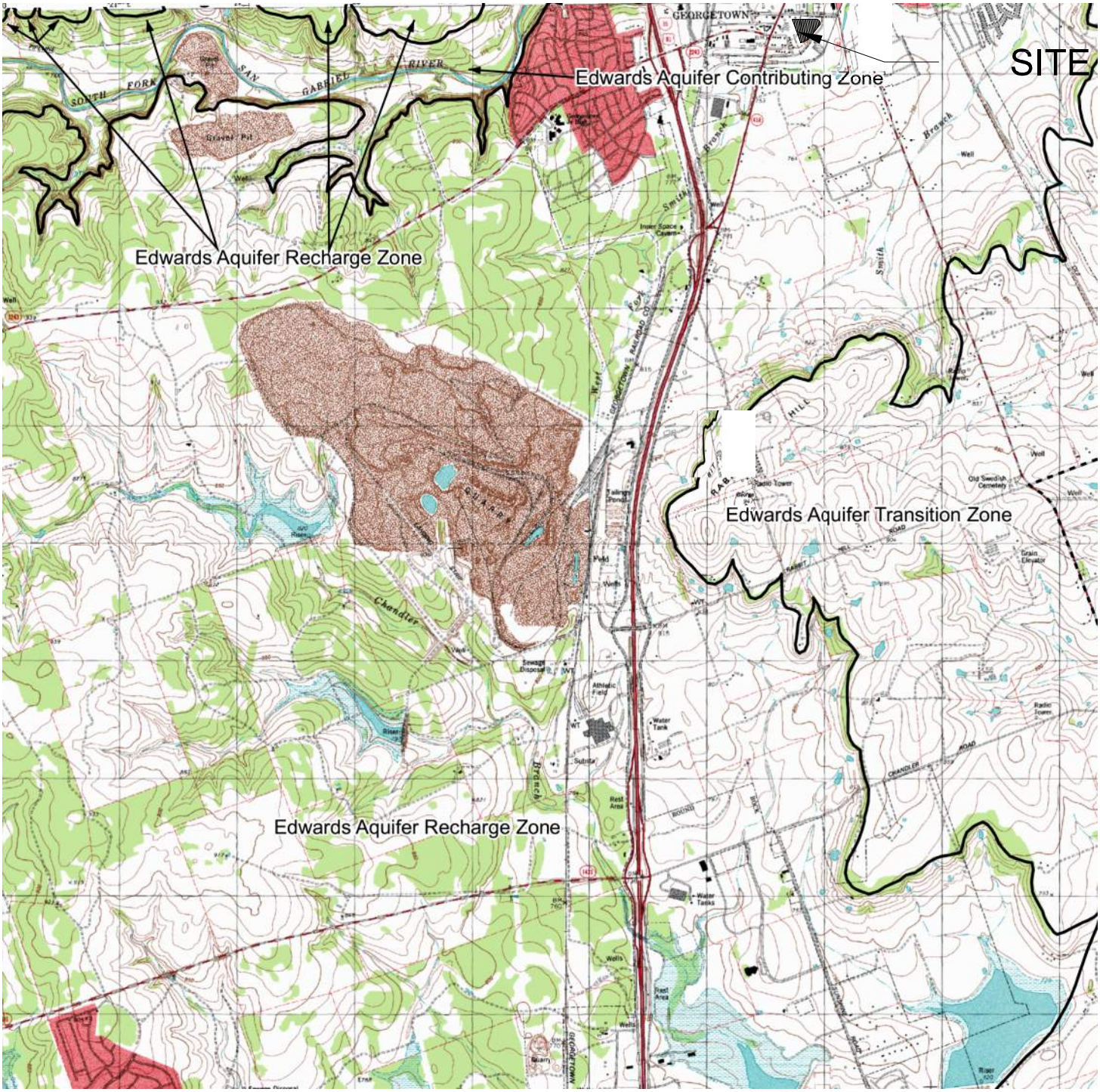
FOR REVIEW ONLY
Not for construction, bidding or permit purposes.

DRAFTING:	N.O.
DESIGN:	M.P.S.
"EXHIBIT"	
DATE:	03/2025
KCI JOB #:	762308274
SHEET:	A1

Date: Mar 07, 2025, 2:17pm User ID: Nicholas.Ogg File: K:\data\BCS\Proj_2023_KCI\762308274_Georgetown_Fire_Station_1_Renovation\CADD\Exhibits\A1 AERIAL MAP.dwg

Attachment B

USGS / Edwards Recharge Zone Map
City of Georgetown New Fire Station 1



USGS TOPOGRAPHIC MAP
ROUND ROCK, TX
7.5 X 7.5 MINUTE

0 2500 5000 10000

SCALE: 1" = 5000'

N

REV	DATE	DESCRIPTION

GEORGETOWN FIRE STATION 1 RENOVATION

USGS/EDWARDS RECHARGE ZONE MAP

KCI TECHNOLOGIES, INC.
2806 BITTERS RD, SUITE 218
SAN ANTONIO, TEXAS 78248
PHONE: (210) 641-9999
FAX: (210) 641-6440
REGISTRATION #F-10573 / #101943-65

SEAL:

FOR REVIEW ONLY
Not for construction, bidding or permit purposes.

DRAFTING:	N.O.
DESIGN:	M.P.S.
"EXHIBIT"	
DATE:	03/2025
KCI JOB #:	762308274
SHEET:	B1

Date: Mar 07, 2025, 10:34am User ID: Nicholas.Ogg File: K:\data\BCS\Proj_2023_KCI\762308274_Georgetown_Fire_Station_1_Renovation\CADD\Exhibits\B1 USGS EDWARDS RECHARGE ZONE MAP.dwg

Attachment C

Project Description
City of Georgetown New Fire Station 1

This project is approximately 3.14 acre of existing development known as City of Georgetown New Fire Station 1. The fire station is located at the southwest corner of Industrial Avenue/FM 1460 intersection, Williamson County, Texas (301 Industrial Ave., Georgetown, Texas 78262).

On March 1, 2006 a WPAP was approved for a site of 3.14 acres with 1.21 acres (38.6%) of impervious cover. The approval included the construction of:

- A one-story building
- Parking spaces, sidewalks, and other paved areas
- Associated utility, access, stormwater management, and landscape improvements

Extended detention basins and vegetated filtered strips were approved to treat the site.

The proposed impervious cover for the 3.14 acre site will be 1.40 acres (44.5%). Proposed modification includes additional building to the existing building and sidewalks. The proposed permanent BMP included the existing extended detention basin, proposed vegetative filter strips, and grassy swale. No changes will be made to the existing extended detention basin. Project wastewater will be disposed of by the existing San Gabriel wastewater treatment plant. The proposed 1.40 acres of impervious cover for the 3.14 acre site will generate 160 lbs. of Total Suspended Solids.

The project will treat no offsite drainage areas. The site currently drains from the northwest to the southeast. The site will maintain the existing drainage patterns and will drain to the existing low of the site.

The TSS computations for the project area have been completed with the approved spreadsheet for TCEQ. All calculations are in Attachment F of the Permanent Stormwater Section within this report.

Geologic Assessment

Texas Commission on Environmental Quality

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

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

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

Signature

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

Print Name of Geologist: M. Kevin Denson Telephone: 512 442-1122

Date: June 27, 2024 Fax: 512-442-1181

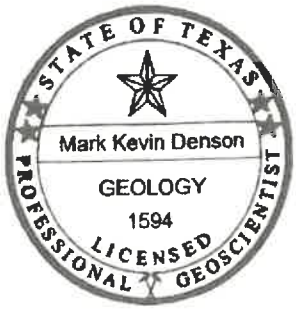
Representing: Terracon Consultants, Inc. (Name of Company and TBPG or TBPE registration number)

Signature of Geologist:

M Kevin Denson

Regulated Entity Name: Fire Station 1, 2.71 Acre Tract, 301 Industrial Avenue, Georgetown, Williamson County, Texas

Project Information



1. Date(s) Geologic Assessment was performed: June 18, 2024
2. Type of Project:
   - ☒ WPAP
   - ☐ SCS
   - ☐ AST
   - ☐ UST
3. Location of Project:
   - ☒ Recharge Zone
   - ☐ Transition Zone
   - ☐ Contributing Zone within the Transition Zone

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

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

Table 1 - Soil Units, Infiltration Characteristics and Thickness

Soil Name	Group*	Thickness(feet)
HoB	D	6-7

** Soil Group Definitions (Abbreviated)*

A. *Soils having a high infiltration rate when thoroughly wetted.*
B. *Soils having a moderate infiltration rate when thoroughly wetted.*
C. *Soils having a slow infiltration rate when thoroughly wetted.*
D. *Soils having a very slow infiltration rate when thoroughly wetted.*

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

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

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

   Applicant's Site Plan Scale: 1" = _'
   Site Geologic Map Scale: 1" = 20'
   Site Soils Map Scale (if more than 1 soil type): 1" = 125 '

9. Method of collecting positional data:

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

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

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

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

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

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

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

    ☐ There are _____ (#) wells present on the project site and the locations are shown and labeled. (Check all of the following that apply.)
    - ☐ The wells are not in use and have been properly abandoned.
    - ☐ The wells are not in use and will be properly abandoned.
    - ☐ The wells are in use and comply with 16 TAC Chapter 76.

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

Administrative Information

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

ATTACHMENT A

NO FEATURES OBSERVED

GEOLOGIC ASSESSMENT TABLE

PROJECT NAME: Fire Station 1 - 2.71 Acre Trect, 301 Industrial Avenue, Georgetown, Texas

LOCATION			FEATURE CHARACTERISTICS												EVALUATION			PHYSICAL SETTING		
1A	1B *	1C*	2A	2B	3	4			5	6A	6	7	8A	8B	9	10		11		12
FEATURE ID	LATITUDE	LONGITUDE	FEATURE TYPE	POINTS	FORMATION	DIMENSIONS (FEET)			TREND (DEGREES)	DOM	DENSITY (NO/FT)	APERTURE (FEET)	INFILL	RELATIVE INFILTRATION RATE	TOTAL	SENSITIVITY		CATCHMENT AREA (ACRES)		TOPOGRAPHY
						X	Y	Z		10						<40	>40	<1.6	>1.6	

* DATUM NAD27

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

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

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

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

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

Kevin Denson

Date 6/27/2024

TNRCC-0585-Table (Rev. 5-1-02)

Sheet 1 of 1

STATE OF TEXAS
Mark Kevin Denson
GEOLOGY
1594
LICENSED
PROFESSIONAL GEOSCIENTIST

ATTACHMENT B

Stratigraphic Column
Fire Station 1 - 2.71 Acre Tract
301 Industrial Avenue
Georgetown, Williamson County, Texas

HYDROGEOLOGIC SUBDIVISION	FORMATION	THICKNESS (feet)	LITHOLOGY
Edwards Aquifer	Georgetown Formation	65	Nodular, fossiliferous limestone interbedded with marl

Source: Senger, Collins and Kreitler, 1990

6/27/2024

STATE OF TEXAS
Mark Kevin Denson
GEOLOGY
1594
LICENSED PROFESSIONAL GEOSCIENTIST

ATTACHMENT C
SITE-SPECIFIC GEOLOGY

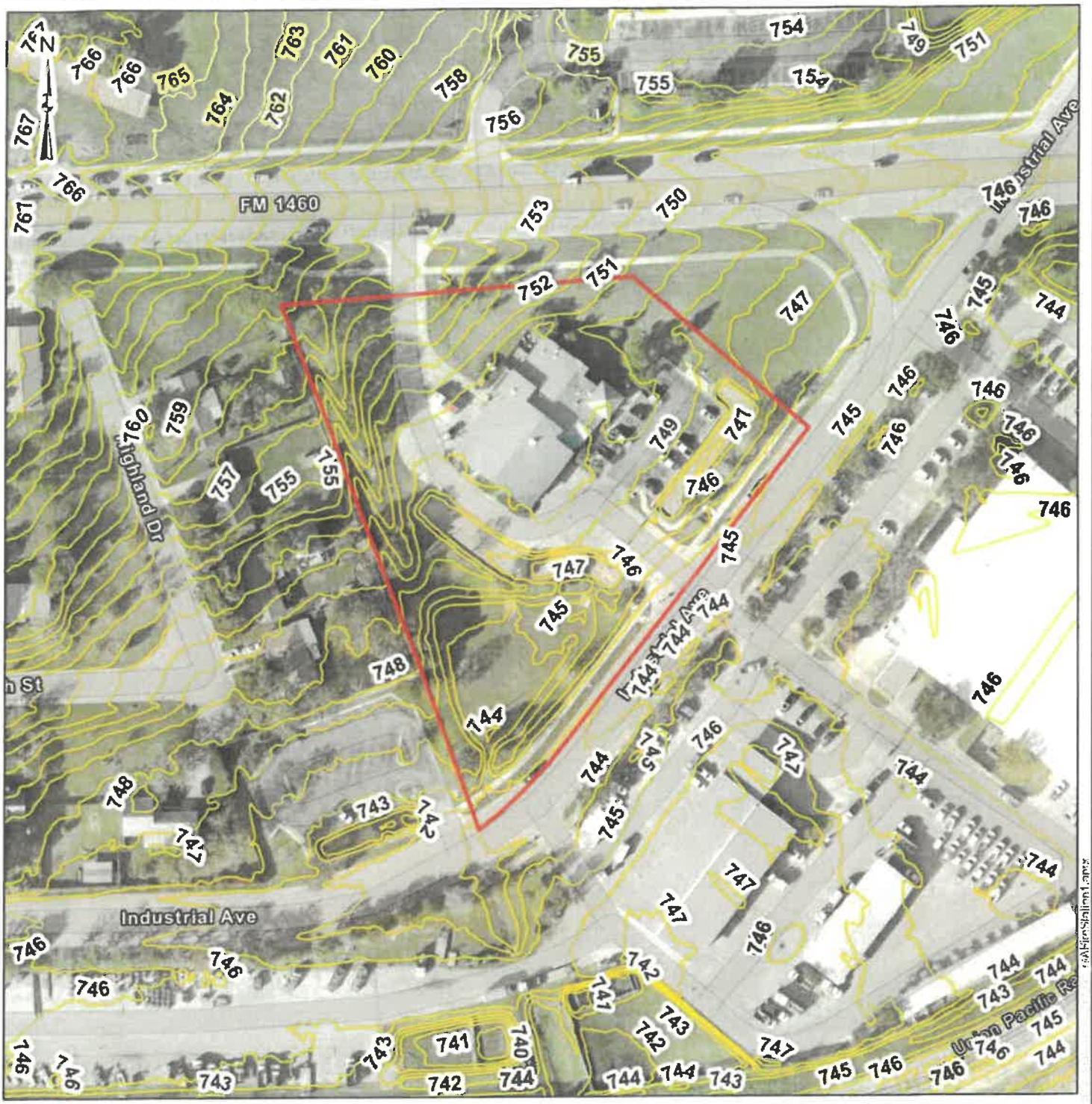
The Geologic Assessment (GA) of the Fire Station 1 site was performed by Kevin Denson, P.G. of Terracon on June 18, 2024. The site is an approximate 2.71-acre tract of land located at the southwest corner (SWC) of FM 1460 and Industrial Avenue in Georgetown, Williamson County, Texas. The site is improved with Fire Station 1 and associated driveways and parking areas.

Exhibit 1 (attached) is a site location map depicting the site in relation to the surrounding area. The areas immediately surrounding the site are a mix of undeveloped, residential, and commercial properties. The site is characterized as gently sloping to the southeast and site elevation ranges from about 759 to 744 feet above mean sea level (msl).

The surficial geologic unit present at the site has been identified as the Georgetown Formation (Kgt). Exhibit 2 (attached) is a geologic map of the site. The site is located entirely within the recharge zone of the Edwards aquifer, and the recharge zone boundary is located approximately 4,000 feet northwest of the site. The Georgetown Formation overlies the Edwards Group and is the uppermost formation of the Edwards aquifer. Attachment B (attached) is a stratigraphic column prepared for the site. Exposure of this unit is generally obscured by the soil and vegetation present at the site. No evidence of faulting was observed on the site. Additionally, a review of aerial photographs did not reveal lineations, which typically indicate the presence of faulting. Based on a review of the Geologic Atlas of Texas Austin Sheet, the closest mapped fault is located about 1,500 feet west of the site. The fault trends to the northeast and is associated with the Balcones fault zone, which is comprised of normal, high-angle faults, that are generally down-thrown to the southeast. The Balcones fault zone represents the dominant structural trend of the area.

No geologic features were observed on the site. The completed Geologic Assessment form is attached as Attachment A. Due to the lack of significant sensitive recharge features observed on the site and the presence of a relatively impermeable soil cover present, the potential for fluid movement to the Edwards aquifer beneath the site is considered low.

No springs were observed onsite. A review of the site maps contained in the City of Georgetown Ordinance 2015-14 indicated there are no known springs occupied by the Georgetown Salamander on the site and the nearest known occupied site is located approximately two miles northeast of the site (San Gabriel Spring).



Approximate Project Boundary

Williamson CAD 1-ft Topography

Feet
0 62.5 125 250

Scale: 1:1,500

DATA SOURCES:
Williamson County TX, Maxar, Microsoft, Esri Community Maps Contributors, Baylor University, City of Austin, County of Williamson, Texas Parks & Wildlife, © OpenStreetMap, Microsoft, CONANP, Esri, TomTom, Garmin, SafeGraph, GeoTechnologies, Inc, METI/NASA, USGS, EPA, NPS, US Census Bureau, USDA, USFWS

Project No.:	96247297
Date:	Jun 2024
Drawn By:	RC
Reviewed By:	KD

Terracon
5307 Industrial Oaks Blvd. - #160 Austin, TX 78735
PH. (512) 442-1122 terracon.com

Site Specific Topography

Fire Station 1 - 2.71 Acres

301 Industrial Avenue
Georgetown, Williamson County, Texas

Exhibit

1.0

Approximate Project Boundary

Houston Black clay, 1 to 3 percent slopes (HoB)

Feet
0 62.5 125 250

Scale: 1:1,500

DATA SOURCES:
Williamson County TX, Maxar, Microsoft, Esri Community Maps Contributors, Baylor University, City of Austin, County of Williamson, Texas Parks & Wildlife, © OpenStreetMap, Microsoft, CONANP, Esri, TomTom, Garmin, SafeGraph, GeoTechnologies, Inc, METI/NASA, USGS, EPA, NPS, US Census Bureau, USDA, USFWS

Project No.:	96247297
Date:	Jun 2024
Drawn By:	RC
Reviewed By:	KD

Terracon
5307 Industrial Oaks Blvd. - #160 Austin, TX 78735
PH. (512) 442-1122 terracon.com

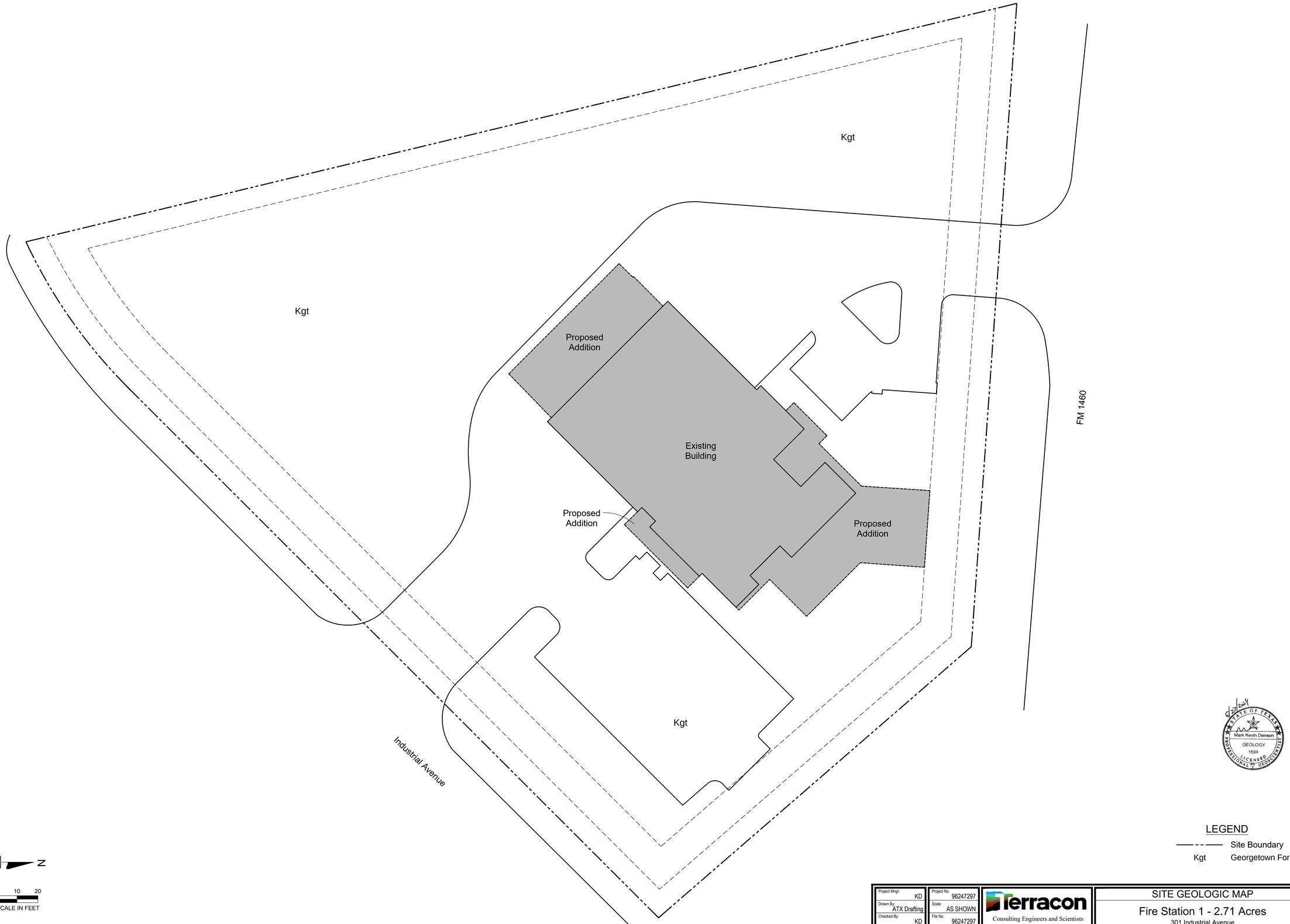
USDA Site Soil Map

Fire Station 1 - 2.71 Acres

301 Industrial Avenue
Georgetown, Williamson County, Texas

Exhibit

2.0



N

20 0 10 20

APPROXIMATE SCALE IN FEET

LEGEND

Site Boundary

Kgt Georgetown Formation

Project Mngr: KD Drawn By: ATX Drafting Checked By: KD Approved By: KD	Project No. 96247297 Scale: AS SHOWN File No. 96247297 Date: Jun 05, 2024	Terracon Consulting Engineers and Scientists 5307 INDUSTRIAL OAKS BLVD. - #160 AUSTIN, TX 78735 PH. (512) 442-1122 FAX (512) 442-1181	SITE GEOLOGIC MAP Fire Station 1 - 2.71 Acres 301 Industrial Avenue Georgetown, Williamson County, Texas	EXHIBIT 3

Approximate Project Boundary

TCEQ Edwards Aquifer Zone Data

Edwards Aquifer Contributing Zone

Edwards Aquifer Recharge Zone

Feet

0 750 1,500 3,000

Scale: 1:15,000

DATA SOURCES:
Esri Community Maps Contributors, Baylor University, City of Austin, County of Williamson, Texas Parks & Wildlife, CONANP, Esri, TomTom, Garmin, SafeGraph, GeoTechnologies, Inc, METI/NASA, USGS, EPA, NPS, US Census Bureau, USDA, USFWS, Williamson County TX, Maxar

Project No.:	96247297
Date:	Jun 2024
Drawn By:	RC
Reviewed By:	KD

Terracon

5307 Industrial Oaks Blvd. - #160 Austin, TX 78735

PH. (512) 442-1122 terracon.com

Edwards Aquifer Zones

Fire Station 1 - 2.71 Acres

301 Industrial Avenue
Georgetown, Williamson County, Texas

Exhibit

4.0

Modification of a Previously Approved Plan

Texas Commission on Environmental Quality

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

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

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

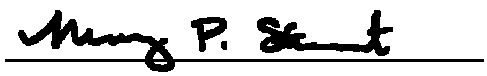
Signature

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

Print Name of Customer/Agent: Mary P. Stewart

Date: 3/14/2025

Signature of Customer/Agent:



Project Information

1. Current Regulated Entity Name: City of Georgetown New Fire Station 1
   Original Regulated Entity Name: City of Georgetown New Fire Station 1
   Regulated Entity Number(s) (RN): RN104712013
   Edwards Aquifer Protection Program ID Number(s): 05072201
   [X] The applicant has not changed and the Customer Number (CN) is: CN600412043
   [ ] The applicant or Regulated Entity has changed. A new Core Data Form has been provided.

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

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

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

WPAP Modification Summary	***Approved Project***	***Proposed Modification***
Acres	3.14 Ac	3.14 Ac
Type of Development	Commercial	Commercial
Number of Residential Lots	N/A	N/A
Impervious Cover (acres)	1.21 Ac	1.40 Ac
Impervious Cover (%	38.6%	44.5%
Permanent BMPs	Extended Detention Basin; VFS	Existing Extended Detention Basin; Proposed VFS & Grassy Swale
Other		

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

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

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

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

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

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

8. [X] 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

Original Approval Letter
City of Georgetown New Fire Station 1

Summary of Proposed Modifications

Approval Letters Dated

March 1, 2006

TEXAS COMMISSION ON ENVIRONMENTAL QUALITY

Protecting Texas by Reducing and Preventing Pollution

March 1, 2006

Mr. Terry Jones
City of Georgetown
300 Industrial Drive
Georgetown, Texas 78626

Re: Edwards Aquifer, Williamson County
NAME OF PROJECT: City of Georgetown New Fire Station 1; Southwest Corner of Industrial Drive and FM 1460; Georgetown, Texas
TYPE OF PLAN: Request for Approval of a Water Pollution Abatement Plan (WPAP); 30 Texas Administrative Code (TAC) Chapter 213 Edwards Aquifer
Edwards Aquifer Protection Program ID No. 05072201

Dear Mr. Jones:

The Texas Commission on Environmental Quality (TCEQ) has completed its review of the WPAP application for the referenced project submitted to the Austin Regional Office by Raymond Chan & Associates, Inc. on behalf of the City of Georgetown on July 22, 2005. Final review of the WPAP submittal was completed after additional material was received on November 4, and December 20, 2005, and February 21, 2006. As presented to the TCEQ, the Temporary and Permanent Best Management Practices (BMPs) and construction plans were prepared by a Texas Licensed Professional Engineer to be in general compliance with the requirements of 30 TAC Chapter 213. These planning materials were sealed, signed, and dated by a Texas Licensed Professional Engineer. Therefore, based on the engineer's concurrence of compliance, the planning materials for construction of the proposed project and pollution abatement measures are hereby approved subject to applicable state rules and the conditions in this letter. The applicant or a person affected may file with the chief clerk a motion for reconsideration of the executive director's final action on this Edwards Aquifer protection plan. A motion for reconsideration must be filed no later than 23 days after the date of this approval letter. *This approval expires two (2) years from the date of this letter unless, prior to the expiration date, more than 10 percent of the construction has commenced on the project or an extension of time has been requested.*

PROJECT DESCRIPTION

The proposed fire station project will have an area of approximately 3.14 acres. It will include the construction of a 12,349 square foot building, along with associated parking and drives. The impervious cover will be 1.21 acres (38.6 percent). Project wastewater will be disposed of by conveyance to the existing San Gabriel Sewage Treatment Plant owned by the City of Georgetown.

PERMANENT POLLUTION ABATEMENT MEASURES

To prevent pollution of approximately 1.52 acres of stormwater runoff that originates upgradient from the site, the runoff will be allowed to flow onto the site and where it will be conveyed to extended detention ponds #2 and #3. To prevent pollution of stormwater originating on-site, three extended detention ponds and a vegetated filter strip will be constructed to treat stormwater runoff. Extended detention pond #1 will capture 2,255 cubic feet, pond #2 will capture 1,580 cubic feet, and pond #3 will capture 2,814 cubic feet of stormwater runoff. Each of the ponds will have a 45 mil thick liner that is ultraviolet light resistant. The liner will be placed in between fabric layers that will serve as a cushion. Rounded gravel will be placed on top of the liner and fabric materials. Concrete trickle channels will be installed in the middle of the ponds to help water drain. The maximum sediment depth that will trigger required sediment removal (a maintenance activity) is approximately 0.3 feet above the bottom of the ponds. This will be indicated by a painted line on the outlet risers. A vegetated filter strip will treat stormwater runoff that originates from the southwest parking lot. The length of the strip will be approximately 60 feet. The approved measures meet the required 80 percent removal of the increased load in total suspended solids caused by the project. Oil and grease that will be generated from truck washing will be treated by "Smart Sponge" absorbers. The absorbers will be placed in all of the risers in the extended detention pond. All maintenance items for the permanent pollution abatement measures are detailed in a separate maintenance schedule that was last updated with material dated February 21, 2006.

GEOLOGY

According to the geologic assessment included with the application, the Georgetown Formation outcrops on the site. No sensitive geologic or manmade features were identified in the assessment. The Austin Regional Office site investigation of August 29, 2005, revealed that the site is generally as described by the geologic assessment.

SPECIAL CONDITIONS

I. Intentional discharges of sediment laden stormwater during construction are not allowed. If dewatering excavated areas and/or areas of accumulated stormwater becomes necessary, the discharge shall be filtered through appropriately selected temporary best management

practices. These may include vegetative filter strips, sediment traps, rock berms, silt fence rings, etc.

II. This approval does not authorize the installation of temporary aboveground storage tanks on this project. If the contractor desires to install a temporary aboveground storage tank for use during construction, an application to modify this approval must be submitted and approved prior to installation. The application must include information related to tank location and spill containment. Refer to Standard Condition No. 4 below.

STANDARD CONDITIONS

1. Pursuant to Chapter 7 Subchapter C of the Texas Water Code, any violations of the requirements in 30 TAC Chapter 213 may result in administrative penalties.

Prior to Commencement of Construction:

2. Within 60 days of receiving written approval of an Edwards Aquifer protection plan, the applicant must submit to the Austin Regional Office, proof of recordation of notice in the county deed records, with the volume and page number(s) of the county deed records of the county in which the property is located. A description of the property boundaries shall be included in the deed recordation in the county deed records. A suggested form (Deed Recordation Affidavit, TCEQ-0625) that you may use to deed record the approved WPAP is enclosed.

3. All contractors conducting regulated activities at the referenced project location shall be provided a copy of this notice of approval. At least one complete copy of the approved WPAP and this notice of approval shall be maintained at the project location until all regulated activities are completed.

4. Modification to the activities described in the referenced WPAP application following the date of approval may require the submittal of a plan to modify this approval, including the payment of appropriate fees and all information necessary for its review and approval prior to initiating construction of the modifications.

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

person. The executive director will use the notification to determine if the approved plan is eligible for an extension.

6. Temporary erosion and sedimentation (E&S) controls, i.e., silt fences, rock berms, stabilized construction entrances, or other controls described in the approved WPAP, must be installed prior to construction and maintained during construction. Temporary E&S controls may be removed when vegetation is established and the construction area is stabilized. If a water quality pond is proposed, it shall be used as a sedimentation basin during construction. The TCEQ may monitor stormwater discharges from the site to evaluate the adequacy of temporary E&S control measures. Additional controls may be necessary if excessive solids are being discharged from the site.

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

During Construction:

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

9. If any sensitive feature (caves, solution cavities, sink holes, etc.) is discovered during construction, all regulated activities near the feature must be suspended immediately. The applicant or his agent must immediately notify the Austin Regional Office of the discovery of the feature. Regulated activities near the feature may not proceed until the executive director has reviewed and approved the methods proposed to protect the feature and the aquifer from potentially adverse impacts to water quality. The plan must be sealed, signed, and dated by a Texas Licensed Professional Engineer.

10. No wells exist on the site. All water wells, including injection, dewatering, and monitoring wells must be in compliance with the requirements of the Texas Department of Licensing and Regulation under Title 16 TAC Chapter 76 (relating to Water Well Drillers and Pump Installers) and all other locally applicable rules, as appropriate.

11. If sediment escapes the construction site, the sediment must be removed at a frequency sufficient to minimize offsite impacts to water quality (e.g., fugitive sediment in street being

washed into surface streams or sensitive features by the next rain). Sediment must be removed from sediment traps or sedimentation ponds not later than when design capacity has been reduced by 50 percent. Litter, construction debris, and construction chemicals shall be prevented from becoming stormwater discharge pollutants.

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

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

After Completion of Construction:

14. A Texas Licensed Professional Engineer must certify in writing that the permanent BMPs or measures were constructed as designed. The certification letter must be submitted to the Austin Regional Office within 30 days of site completion.

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

16. Upon legal transfer of this property, the new owner(s) is required to comply with all terms of the approved Edwards Aquifer protection plan. If the new owner intends to commence any new regulated activity on the site, a new Edwards Aquifer protection plan that specifically addresses the new activity must be submitted to the executive director. Approval of the plan for the new regulated activity by the executive director is required prior to commencement of the new regulated activity.

17. An Edwards Aquifer protection plan approval or extension will expire and no extension will be granted if more than 50 percent of the total construction has not been completed within ten years from the initial approval of a plan. A new Edwards Aquifer protection plan must be submitted to the Austin Regional Office with the appropriate fees for review and approval by the executive director prior to commencing any additional regulated activities.

18. At project locations where construction is initiated and abandoned, or not completed, the site shall be returned to a condition such that the aquifer is protected from potential contamination.

If you have any questions or require additional information, please contact Ms. Heather L. Beatty, P.G., of the Edwards Aquifer Protection Program of the Austin Regional Office at (512) 339-2929.

Sincerely,

Glenn Shankle
Executive Director

GS/hlb

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

cc: Mr. Andrew Johnston, P.E., Raymond Chan & Associates, Inc.
The Honorable John C. Doerfler, County Judge, Williamson County
Mr. Paulo C. Pinto, B.S., R.S., Director of Environmental Services, Williamson County & Cities Health District
Mr. David Munk, P.E., Development Engineer, Development Services, City of Georgetown
TCEQ Central Records

Attachment B

Narrative of Proposed Modification
City of Georgetown New Fire Station 1

This project is approximately 3.14 acre of existing development known as City of Georgetown New Fire Station 1. The fire station is located at the southwest corner of Industrial Avenue/FM 1460 intersection, Williamson County, Texas (301 Industrial Ave., Georgetown, Texas 78262).

On March 1, 2006 a WPAP was approved for a site of 3.14 acres with 1.21 acres (38.6%) of impervious cover. The approval included the construction of:

- A one-story building
- Parking spaces, sidewalks, and other paved areas
- Associated utility, access, stormwater management, and landscape improvements

Extended detention basins and vegetated filtered strips were approved to treat the site.

The proposed impervious cover for the 3.14 acre site will be 1.40 acres (44.5%). Proposed modification includes additional building to the existing building and sidewalks. The proposed permanent BMP included the existing extended detention basin, proposed vegetative filter strips, and grassy swale. No changes will be made to the existing extended detention basin. Project wastewater will be disposed of by the existing San Gabriel wastewater treatment plant. The proposed 1.40 acres of impervious cover for the 3.14 acre site will generate 160 lbs. of Total Suspended Solids.

Attachment C

Current Site Plan of Approved Project
City of Georgetown New Fire Station 1

LEGEND

- EXISTING SURFACE FEATURES
- EXISTING CONTOURS
- PROPOSED CONTOURS
- EXISTING ROW/PROPERTY LINES
- EXISTING STORM DRAIN LINE
- EXISTING WATER LINE
- EXISTING WASTEWATER LINE WITH MANHOLE
- EXISTING GAS LINE
- EXISTING TREE (TO REMAIN)
- EXISTING TREE (TO BE REMOVED)
- PROPOSED STORM DRAIN LINE
- PROPOSED WATER LINE
- PROPOSED WASTEWATER LINE WITH MANHOLE

Scale 1" = 30'

IMPERVIOUS COVER:

SITE AREA (ACRES)	2.709
SITE AREA (SQUARE FEET)	118,004
TOTAL SQUARE FEET OF BUILDING	10,300
ASPHALT	24,264
CONCRETE DRIVEWAY	2,262
CURBS	2,273
SIDEWALK	1,354
MECHANICAL PADS	332
TOTAL IMPERIOUS COVER (SF.)	40,785
PERCENT IMPERVIOUS COVER	34.6%

NOTES:

1. PROJECT SITE IS NOT IN THE 100-YEAR FLOODPLAIN.
2. THERE ARE NO NATURAL FEATURES ON-SITE PER GEOLOGICAL ASSESSMENT.
3. THE STORMWATER PLAN WAS PREPARED BY A LICENSED PROFESSIONAL ENGINEER AND MEETS THE REQUIREMENTS OF THE UDC DEVELOPMENT MANUAL.
4. A WATER POLLUTION ABATEMENT PLAN (WPAP) HAS BEEN SUBMITTED TO THE TEXAS COMMISSION ON ENVIRONMENTAL QUALITY.
5. A PORTION OF THIS SITE IS WITHIN THE 100-YEAR FLOODPLAIN PER FEMA FIRM MAP #48491C0230 C, DATED SEPTEMBER 27, 1991. THE PROPOSED FIRE STATION FFE: 751.00 IS APPROXIMATELY 7 FT. ABOVE THE FEMA 100-YEAR ELEVATION OF 744.0.

WATER SERVICE:

6" FIRE LINE CONNECTION WITH 6" C.O.G. APPROVED DCDA BACKFLOW PREVENTER

2 1/2" DOMESTIC SERVICE WITH 2" METER

2" IRRIGATION METER WITH STUB OUT AND BACKFLOW PREVENTER

SP-2006-002 "I"

SITE PLAN REVIEW

STATE OF TEXAS
W. ANDREW JOHNSTON
42810
LICENSED PROFESSIONAL ENGINEER
3/2/06

CROSLIN AND ASSOCIATES
A DIVISION OF PBS&J
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IN ASSOCIATION WITH:

Civil:	Raymond Chan & Associates
Structure:	Rojas Carrillo Associatees
MEP:	Myers and Associates
Landscape:	Alexander Boedy Associates
Contractor:	Satterfield & Pontikes Const.

CITY OF GEORGETOWN
NEW FIRE STATION 1
301 INDUSTRIAL AVENUE
GEORGETOWN, TX 78626

CHECKED

DATE
11 JANUARY 2006

JOB NO.
A70002.01

DWG NAME
E/S CONTROL PLAN

REVISIONS
1/11/2006 ORIGINAL ISSUE

SHEET
SPR2

CITY OF GEORGETOWN FIRE STATION 1

DRAINAGE/ SITE PLAN

Water Pollution Abatement Plan Application

Texas Commission on Environmental Quality

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

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

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

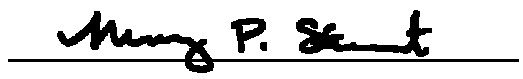
Signature

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

Print Name of Customer/Agent: Mary P. Stewart

Date: 3/14/2025

Signature of Customer/Agent:



Regulated Entity Name: City of Georgetown New Fire Station 1

Regulated Entity Information

1. The type of project is:

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

2. Total site acreage (size of property): 3.14 Acres

3. Estimated projected population: N/A

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

Table 1 - Impervious Cover Table

Impervious Cover of Proposed Project	Sq. Ft.	Sq. Ft./Acre	Acres
Structures/Rooftops	14,111	÷ 43,560 =	0.324
Parking	31,169	÷ 43,560 =	0.715
Other paved surfaces	15,574	÷ 43,560 =	0.358
Total Impervious Cover	60,854	÷ 43,560 =	1.4

Total Impervious Cover 60,854 **÷ Total Acreage** 3.14 **X 100 =** 44.5 **% Impervious Cover**

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

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

For Road Projects Only

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

7. Type of project:

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

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

   [ ] Concrete
   [ ] Asphaltic concrete pavement
   [ ] Other: _____

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

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

10. Length of pavement area: _____ feet.

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

11. [ ] A rest stop will be included in this project.

    [ ] A rest stop will not be included in this project.

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

Stormwater to be generated by the Proposed Project

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

Wastewater to be generated by the Proposed Project

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

X % Domestic	100,800 Gallons/day
_____ % Industrial	_____ Gallons/day
_____ % Commingled	_____ Gallons/day
TOTAL gallons/day 100,800	

15. Wastewater will be disposed of by:

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

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

☒ Sewage Collection System (Sewer Lines):

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

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

[X] The sewage collection system will convey the wastewater to the San Gabriel Wastewater (name) Treatment Plant. The treatment facility is:

[X] Existing.
[ ] Proposed.

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

Site Plan Requirements

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

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

Site Plan Scale: 1" = 30'.

18. 100-year floodplain boundaries:

[ ] Some part(s) of the project site is located within the 100-year floodplain. The floodplain is shown and labeled.
[X] No part of the project site is located within the 100-year floodplain.

The 100-year floodplain boundaries are based on the following specific (including date of material) sources(s): The Federal Emergency Management Agency (F.E.M.A.) Flood Insurance Rate Map (FIRM), Map Number 48491C0485F, effective on 12/20/2019

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

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

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

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

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

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

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

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

22. [X] The drainage patterns and approximate slopes anticipated after major grading activities.

23. [X] Areas of soil disturbance and areas which will not be disturbed.

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

25. [X] Locations where soil stabilization practices are expected to occur.

26. [X] Surface waters (including wetlands).

    [ ] N/A

27. [X] Locations where stormwater discharges to surface water or sensitive features are to occur.

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

28. [X] Legal boundaries of the site are shown.

Administrative Information

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

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

Attachment A

Factors Affecting Water Quality
City of Georgetown New Fire Station 1

During construction activity factors that could affect surface water quality are as follows:

1) Onsite fueling operations by portable fuel trucks providing fuel to construction equipment. Fuel will not be stored onsite.
2) Automotive and Fuel Powered Equipment (including backhoes and generators) may be used during construction.
3) Sediment erosion from grading operations and/or topsoil placement prior to completion of vegetative restoration.
4) Ready Mix concrete truck washout activities.
5) Hydrocarbons from asphalt paving operations.
6) Excavation and trenching activities for the installation of utilities, drainage structures, lighting, and building construction.
7) Trash/refuse from general construction activities.
8) Sewage spills from portable toilets.

After construction activity factors that could affect surface water quality are as follows:

1) General trash from littering by personnel using the facility.
2) Runoff from vehicular traffic will have small amounts of total suspended solids (TSS) and oil and grease (O&G).

Attachment B

Volume and Character of Stormwater
Georgetown Fire Station No. 1 Renovation

This project is within the Smith Branch – San Gabriel River watershed. The city of Georgetown Drainage Criteria Manual requires the use of the Soil Conservation Service Methodology (SCS) to determine Q; Williamson County Rainfall Intensities and Curve Numbers are used. The following areas and volumes were calculated:

Existing
Project Area = 3.14 Acres
Curve Number = 90
Slopes = 2-5%
Impervious Cover = 1.21 Acres
Percent Impervious = 38.6%
Q_2 = 9.1 cfs
Q_{10} = 16.2 cfs
Q_{25} = 19.6 cfs
Q_{100} = 25.3 cfs

Proposed
Project Area = 3.14 Acres
Curve Number = 91
Slopes = 2-5%
Impervious Cover = 1.40 Acres
Percent Impervious = 44.5%
Q_2 = 9.5 cfs
Q_{10} = 16.5 cfs
Q_{25} = 19.6 cfs
Q_{100} = 24.9 cfs

Refer to Section TCEQ-0602 Attachment F for "Existing and Proposed Impervious Cover" depicting the breakdown of the impervious areas and refer to "Attachment G – Drainage Area Map" in the Temporary Stormwater Section for the drainage calculations as noted above.

Character

The current site is an existing development with 38.6% impervious cover. The proposed improvements will increase the amount of impervious cover to 44.5%. The runoff from construction and post construction could include sediment, oils, and organics that should be captured by the temporary BMP's. By the implementation of temporary BMP's the quality of water downstream of the project site is not expected to be impacted during and following construction of the project. The project site downstream will include temporary BMP's that can be found on Erosion Control Plan/SWPPP.

Character of post-construction storm water runoff will include small amounts of Total Suspended Solids (TSS) and Oil & Grease (O&G) from vehicular traffic, and roof of buildings. Water Quality should be typical for a commercial development.

Refer to the WPAP Plan for locations of proposed impervious cover as a function of this project.

Attachment C

Suitability Letter from Authorized Agent
City of Georgetown New Fire Station 1

N/A

Attachment D

Exception to the Required Geologic Assessment
City of Georgetown New Fire Station 1

N/A

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

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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: Mary P. Stewart

Date: 3/14/2025

Signature of Customer/Agent:

Regulated Entity Name: City of Georgetown New Fire Station 1

Project Information

Potential Sources of Contamination

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

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

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

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

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

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

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

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

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

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

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

Sequence of Construction

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

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

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

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

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:

[X] 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.

[X] 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.

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

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

8. [X] 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.

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

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

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

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

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

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

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

[X] 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.

    [X] N/A

12. [X] **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. [X] 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. [X] 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. [X] 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. [X] 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. [X] **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. [X] 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. [X] Stabilization practices must be initiated as soon as practicable where construction activities have temporarily or permanently ceased.

Administrative Information

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

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

Attachment A

Spill Response Actions
City of Georgetown New Fire Station 1

Spill Prevention and Control

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

The following steps will help reduce the stormwater impacts of leaks and spills:

Education

(1) Be aware that different materials pollute in different amounts. Make sure that each employee knows what a "significant spill" is for each material they use, and what is the appropriate response for "significant" and "insignificant" spills. Employees should also be aware of when spill must be reported to the TCEQ. Information available in 30 TAC 327.4 and 40 CFR 302.4.

(2) Educate employees and subcontractors on potential dangers to humans and the environment from spills and leaks.

(3) Hold regular meetings to discuss and reinforce appropriate disposal procedures (incorporate into regular safety meetings).

(4) Establish a continuing education program to indoctrinate new employees.

(5) Have contractor's superintendent or representative oversee and enforce proper spill prevention and control measures.

General Measures

(1) To the extent that the work can be accomplished safely, spills of oil, petroleum products, substances listed under 40 CFR parts 110,117, and 302, and sanitary and septic wastes should be contained and cleaned up immediately.

(2) Store hazardous materials and wastes in covered containers and protect from vandalism.

(3) Place a stockpile of spill cleanup materials where it will be readily accessible.

(4) Train employees in spill prevention and cleanup.

(5) Designate responsible individuals to oversee and enforce control measures.

(6) Spills should be covered and protected from stormwater runon during rainfall to the extent that it doesn't compromise clean up activities.

(7) Do not bury or wash spills with water.

(8) Store and dispose of used clean up materials, contaminated materials, and recovered spill material that is no longer suitable for the intended purpose in conformance with the provisions in applicable BMPs.

(9) Do not allow water used for cleaning and decontamination to enter storm drains or watercourses. Collect and dispose of contaminated water in accordance with applicable regulations.

(10) Contain water overflow or minor water spillage and do not allow it to discharge into drainage facilities or watercourses.

(11) Place Material Safety Data Sheets (MSDS), as well as proper storage, cleanup, and spill reporting instructions for hazardous materials stored or used on the project site in an open, conspicuous, and accessible location.

(12) Keep waste storage areas clean, well organized, and equipped with ample cleanup supplies as appropriate for the materials being stored. Perimeter controls, containment structures, covers, and liners should be repaired or replaced as needed to maintain proper function.

Cleanup

(1) Clean up leaks and spills immediately.

(2) Use a rag for small spills on paved surfaces, a damp mop for general cleanup, and absorbent material for larger spills. If the spilled material is hazardous, then the used cleanup materials are also hazardous and must be disposed of as hazardous waste.

(3) Never hose down or bury dry material spills. Clean up as much of the material as possible and dispose of properly. See the waste management BMPs in this section for specific information.

Minor Spills

(1) Minor spills typically involve small quantities of oil, gasoline, paint, etc. which can be controlled by the first responder at the discovery of the spill.

(2) Use absorbent materials on small spills rather than hosing down or burying the spill.

(3) Absorbent materials should be promptly removed and disposed of properly.

(4) Follow the practice below for a minor spill:

(5) Contain the spread of the spill.

(6) Recover spilled materials.

(7) Clean the contaminated area and properly dispose of contaminated materials.

Semi-Significant Spills

Semi-significant spills still can be controlled by the first responder along with the aid of other personnel such as laborers and the foreman, etc.

Spills should be cleaned up immediately:

(1) Contain spread of the spill.

(2) Notify the project foreman immediately.

(3) If the spill occurs on paved or impermeable surfaces, clean up using "dry" methods (absorbent materials, cat litter and/or rags). Contain the spill by encircling with absorbent materials and do not let the spill spread widely.

(4) If the spill occurs in dirt areas, immediately contain the spill by constructing an earthen dike. Dig up and properly dispose of contaminated soil.

(5) If the spill occurs during rain, cover spill with tarps or other material to prevent contaminating runoff.

Significant/Hazardous Spills

For significant or hazardous spills that are in reportable quantities:

(1) Notify the TCEQ by telephone as soon as possible and within 24 hours at 512- 339-2929 (Austin) or 210-490-3096 (San Antonio) between 8 AM and 5 PM. After hours, contact the Environmental Release Hotline at 1-800-832-8224. It is the contractor's responsibility to have all emergency phone numbers at the construction site.

(2) For spills of federal reportable quantities, in conformance with the requirements in 40 CFR parts 110,119, and 302, the contractor should notify the National Response Center at (800) 424-8802.

(3) Notification should first be made by telephone and followed up with a written report.

(4) The services of a spills contractor or a Haz-Mat team should be obtained immediately. Construction personnel should not attempt to clean up until the appropriate and qualified staffs have arrived at the job site.

(5) Other agencies which may need to be consulted include, but are not limited to, the City Police Department, County Sheriff Office, Fire Departments, etc.

More information on spill rules and appropriate responses is available on the TCEQ website at: https://www.tceq.texas.gov/response/spills/spill_rules.html

Vehicle and Equipment Maintenance

(1) If maintenance must occur onsite, use a designated area and a secondary containment, located away from drainage courses, to prevent the runon of stormwater and the runoff of spills.

(2) Regularly inspect onsite vehicles and equipment for leaks and repair immediately

(3) Check incoming vehicles and equipment (including delivery trucks, and employee and subcontractor vehicles) for leaking oil and fluids. Do not allow leaking vehicles or equipment onsite.

(4) Always use secondary containment, such as a drain pan or drop cloth, to catch spills or leaks when removing or changing fluids.

(5) Place drip pans or absorbent materials under paving equipment when not in use.

(6) Use absorbent materials on small spills rather than hosing down or burying the spill. Remove promptly and dispose of properly.

(7) Promptly transfer used fluids to the proper waste or recycling drums. Don't leave full drip pans or other open containers lying around.

(8) Oil filters disposed of in trashcans or dumpsters can leak oil and pollute stormwater. Place the oil filter in a funnel over a waste oil-recycling drum to drain excess oil before disposal.

(9) Store cracked batteries in a non-leaking secondary container.

Vehicle and Equipment Fueling

(1) If fueling must occur on site, use designated areas, located away from drainage courses, to prevent the runon of stormwater and the runoff of spills.

(2) Discourage "topping off" of fuel tanks.

(3) Always use secondary containment, such as a drain pan, when fueling to catch spills/ leaks.

Product Specific Practices

(1) Petroleum Products: All on site vehicles will be monitored for leaks and will receive regular preventive maintenance to reduce the chance of leakage. If petroleum products will be present at the site, they will be stored in tightly sealed containers which are clearly labeled. Any asphalt substances used on site will be applied according to the manufacturer's recommendations.

(2) Concrete trucks: Ready/Transit Mix Trucks will be allowed to wash out or discharge surplus concrete or drum wash water except in the designated location on site as shown on the SW3P site plan.

(3) Paints: All containers will be tightly sealed and stored when not required for use. Excess paint will not be poured into the storm sewer system or drainage channels but will be properly disposed of according to manufacturers' instructions or state/local regulations.

(4) Fertilizers: Fertilizers will be applied only in the minimum amounts recommended by the manufacturer. Once applied, fertilizer will be worked into the soil to limit exposure to storm water. The fertilizer will be stored in a covered area, and any partially used bags will be transferred to a sealable plastic bin to avoid spills.

Attachment B

Potential Sources of Contamination
City of Georgetown New Fire Station 1

Potential Source:	Stock piled top soil, and fill material.
Preventive Measure:	Stock piles shall be placed away from any steep slopes, sensitive features, surface or groundwater. The down gradient side shall be protected with silt fencing.
Potential Source:	Miscellaneous litter and debris from construction workers and construction materials.
Preventive Measure:	Trash receptacles will be placed on site for proper disposal. Receptacles will be emptied or replaced by a registered trash hauler as necessary.
Potential Source:	Petroleum Products (diesel, oil, hydraulic fluid, gun grease).
Preventive Measure:	All on site vehicles will be monitored for leaks and will receive regular preventive maintenance to reduce the chance of leakage. No petroleum products will be stored onsite. Service vehicles will come on site to fuel all equipment. All oil, and hydraulic fluid will be stored on work or service vehicles in original sealed containers.
Potential Source:	Concrete.
Preventive Measure:	Concrete trucks: Ready/Transit Mix Trucks will not be allowed to wash out or discharge surplus concrete or drum wash water except in the designated concrete washout area as shown on the SW3P site plan.
Potential Source:	Paint.
Preventive Measure:	All containers will be tightly sealed and stored when not required for use. Excess paint will not be poured into the storm sewer system or drainage channels, but will be properly disposed of according to manufacturers' instructions or state/local regulations.
Potential Source:	Asphalt & Asphaltic Products.
Preventive Measure:	All asphalt paving, roofing, and sealers may be brought onsite only as it is being applied. Application will be in accordance to the manufacturer's recommendations and City of San Antonio specifications.
Potential Source:	Fertilizer.
Preventive Measure:	Fertilizers will be applied only in the minimum amounts recommended by the manufacturer. Revegetated areas that are seeded and fertilized will be protected by a hydraulic mulch, hay and tackifier or binder, or erosion control mat. Fertilizer will not be stored onsite.
Potential Source:	Sewage from Portable Toilets.
Preventive Measure:	Sewage from the units will be properly removed on a regular basis, will be inspected on a regular basis, and will be disposed of by a licensed waste collection service. Note that any spills should be contained within the respective BMP installed and any spill outside the containment area will be cleaned up in accordance with current state / local regulations as well as reported to TCEQ.

Attachment C

Sequence of Major Activities
City of Georgetown New Fire Station 1

Construction Sequencing:

A. Installation of Temporary BMPs as shown on Erosion Control Plan/SWPPP.
B. Site clearing including the removal of select landscaping and rough grading of the proposed addition eastern tract. (Approximately 0.25 Acre)
C. Grading and drainage work associated with this project. (Approximately 0.18 Acre)
D. Trenching for services / extension of utilities to the site. (Approximately 0.18 Acre)
    a. Install of underground storm sewer system
    b. Reestablishment of vegetation in areas beyond the grading/construction envelope.
E. Construction of Buildings, Sidewalks, Pavement and Finish Grading as indicated on plans. (Approximately 0.25 Acre)
F. Landscaping / Sodding to reestablish vegetation on all remaining disturbed areas.
G. Removal of temporary BMPs once area is established or when the particular temporary BMP measure is no longer required (i.e. Slit Fence)

Attachment D

Temporary Best Management Practices and Measures
City of Georgetown New Fire Station 1

PART 1 - GENERAL

1.01 SECTION INCLUDES

A. Slit Fence
B. Rock Berm
C. Gravel Filter Bags
D. Stabilized Construction Access

1.02 REGULATORY REQUIREMENTS

A. Conform to applicable City, State, and Federal codes for environmental requirements of erosion and sediment control.

B. Contractor will be required to keep a log on site with recordings of rainfall, SWPPP maintenance procedures, and other events affecting the erosion and pollution control facilities. Sample forms will be provided by the Engineer. As part of record keeping the Contractor shall maintain a rain gauge at the site and log all rainfall events.

C. No work shall begin until both the Owner and Contractor have submitted NOI's (form furnished by Engineer) to the TCEQ and the San Antonio Water System. Contractor shall submit annual renewals as required.

D. SWPPP shall be posted on site adjacent to a public right-of-way and the supporting documentation shall be maintained on site.

1.03 SUBMITTALS

A. Provide Engineer with copy of complete NOI and NOT.
B. Provide copies of manufacturer's data on filter fabric for approval
C. Provide Engineer with any revisions to SWPPP Plan for informational purposes only.

1.04 RELATED SECTIONS

A. Section 02230 – Site Clearing

PART 2 - PRODUCTS

2.01 FILTER FABRIC

A. Woven Polypropylene Fabric conforming to the following specifications:

1.	Grab Tensile Strength	120 lbs.
2.	Grab Tensile Elongation	30% (Max)
3.	Burst Strength	280 PSI
4.	Trapezoid Tear Strength	65 lbs.
5.	Water Flow Rate	35 GPM/ft2
6.	Thickness	17 Mils
7.	Weight	3.0 oz/sy

B. The fabric shall conform to the following test methods:

1. ASTM D-4632
2. ASTM D-4533
3. ASTM D-3786
4. ASTM D-4833
5. ASTM D-3776
6. ASTM D-4491

7. ASTM D-4751
8. ASTM D-4355

2.02 ROCK BERM

A. Rock:
Open graded rock four inches (4”) to eight inches (8”) in diameter.

B. Wire Fabric:
20 gauge woven wire with one inch (1”) openings.

2.03 STABILIZED CONSTRUCTION ACCESS

A. Rock:
Open graded rock four inches (4”) to eight inches (8”) in diameter.

PART 3 - EXECUTION

3.01 IMPLEMENTATION

This item shall govern the implementation of the erosion and sedimentation control plan and schedule.

A. Phasing:
Construction phasing within specified work areas shall be the responsibility of the Contractor. Contractor shall prepare a Phasing Plan that will be acceptable to the Architect and Owner. Should the Contractor realize a need to deviate from this plan, it will be his/her responsibility to provide a revised plan complete with any required revisions to the erosion and sediment control plan. It will be his/her sole responsibility to insure that all revisions comply with the Storm Water Pollution Prevention Plan and “Part II Environmental Protection Agency Final NPDES General Permits for Storm Water Discharge from Construction Sites”. The revised plan shall be reviewed by the Engineer. Any costs associated with the revisions shall be borne by the Contractor. The Contractor shall maintain a log of all installations and revisions.

B. Hazardous and Excess Material Storage:
Prior to the start of construction, the Contractor shall submit a plan showing the method for hazardous and excess material storage. The plan shall comply with the provisions shown on the drawings and as a minimum, show the site location, size, topography, drainage channels, adjacent streets, and other pertinent features required to properly evaluate the plan. No work shall commence until this plan has been approved by the Owner.

C. Maintenance:
On a weekly basis, and after every measurable rainfall, the Contractor shall inspect and identify all erosion and sediment controls which require cleaning, repair, or other maintenance. Items identified as requiring maintenance shall immediately be repaired or cleaned as needed. This provision applies to all site controls as well as controls installed for the material storage site. Contractor shall keep a log of the inspections, noting any repairs and cleaning of controls.

D. Filter Fabric Fence (Silt Fence):
Provide filter fabric fence systems in such a manner that surface runoff will percolate through the system in sheet flow fashion and allow sediment to be retained and accumulated. Attach the filter fabric to one inch (1”) x two inch (2”) wooden stakes or metal stakes spaced a maximum of 3 feet apart and embedded a minimum of twelve inches (12”). The wooden stakes shall be installed at a slight angle toward the source of anticipated runoff. Trench in the toe of the filter fabric fence with a spade or mechanical trencher so that the downward face of the trench is flat and perpendicular to the direction of flow or the V-trench configuration. Lay filter fabric along edges of the trench. Backfill and compact trench. The filter fabric should be spliced together only at a support post with a minimum six inch (6”) overlap and sealed securely. Inspect sediment filter fabric barrier systems after each rainfall, daily during periods of prolonged rainfall, and at minimum once a week. Repair or replace damaged section immediately to restore the requirements of this item. Remove sediment deposits when silt has reached one-third the height of the fence in depth.

E. Rock Berms:
Prior to the start of construction, all rock berm components of the erosion/sedimentation control system shall be installed in accordance with the following:
1. Excavate thirty-six inch (36") x three inch (3") trench along rock berm alignment.
2. Place woven wire fabric centered along trench.
3. Place rock along trench alignment and on top of wire fabric.
4. Wrap wire fabric around rock, maintaining shape of berm.
5. Overlap wire fabric and tie securely with wire ties.

F. Gravel Filter Bags
1. The gravel filter bags shall be installed in accordance with the SWPPP details and shall be used at inlet locations and other locations as determined by the contractor.
2. Inspect systems after each rainfall, daily during periods of prolonged rainfall, and at minimum once a week. Repair or replace damaged section immediately to restore the requirements of this item. Remove sediment deposits when silt has reached one-third the height of the bag in depth.

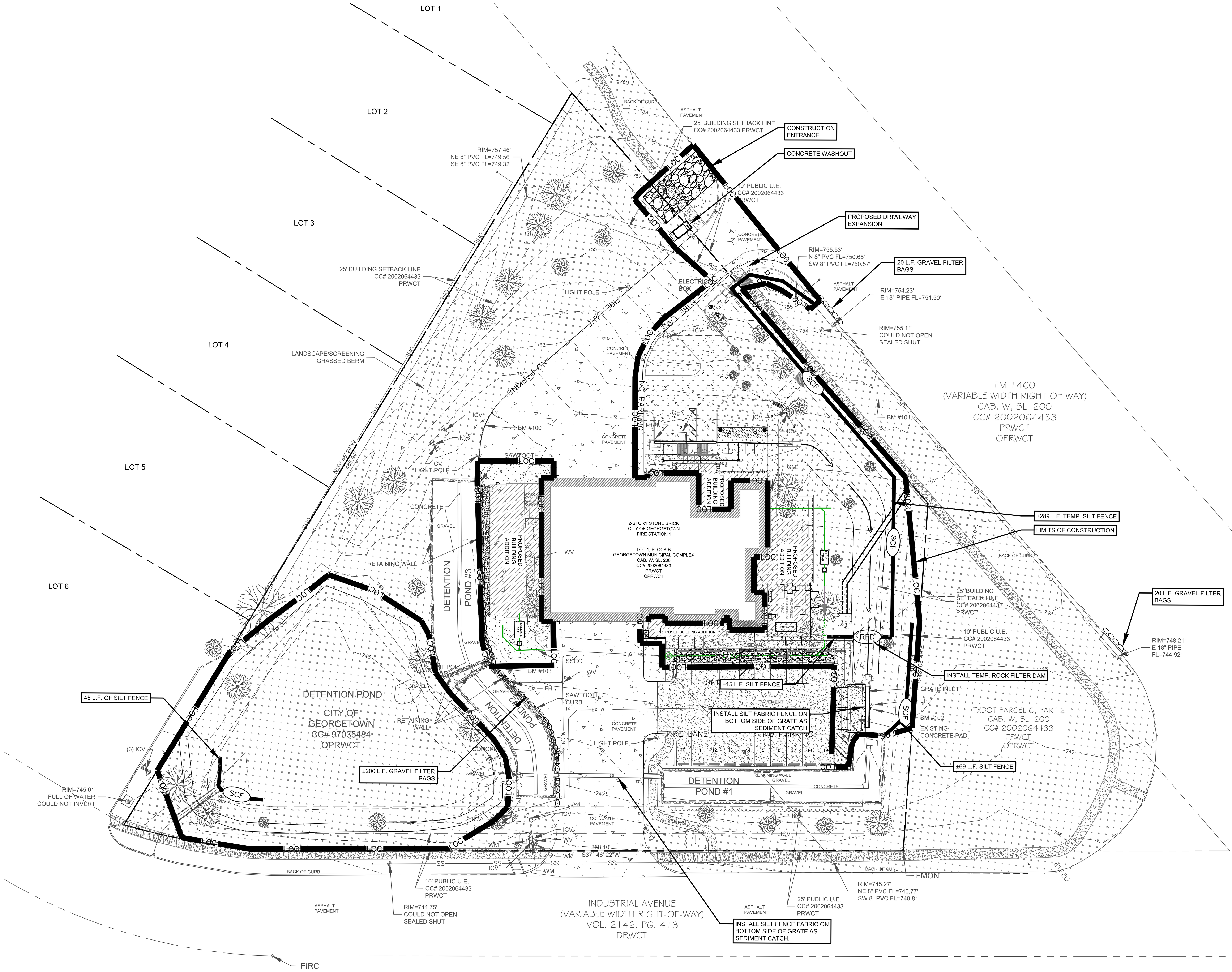
G. Stabilized Construction Access:
The Stabilized Construction Access shall be at least eight inches (8") thick and of full width for all points of ingress and egress. Length shall be a minimum of 30 feet.
1. When mud-tracking conditions exist, traffic shall not be allowed to cross or leave the construction site and move directly onto a public roadway, alley, sidewalk, parking area, other right-of-way in areas other than at locations of construction exits. Stabilized construction access must be properly graded to incorporate a drainage swale to prevent runoff from leaving the construction site.
2. The stabilized construction access shall be maintained in a condition which will prevent tracking or flowing of sediment onto public rights-of-way. This may require periodic top dressing with additional stone as conditions demand and repair and/or clean out of any measures used to trap sediment. All sediment spilled, dropped, washed, or tracked onto public streets outside of the project limits must be removed immediately by the Contractor. When necessary, wheels must be cleaned to remove sediment prior to entrance onto public rights-of-way. When washing is required, it shall be done on an area stabilized with crushed stone which drains into an approved sediment trap or sediment basin. All sediment shall be prevented from entering any storm drain, ditch, or watercourse using approved methods.

3.02 FINAL CLEANUP

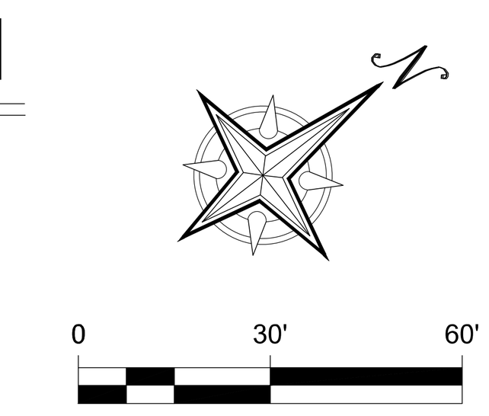
A. Upon completion and acceptance of the project and prior to final payment, the Contractor shall remove and legally dispose of all components of the erosion/sedimentation control system, together with any and all dirt, material, and debris accumulated along the system during construction.

3.03 NOI, NOT

A. The Engineer will furnish NOI and NOT forms with the project information on them to the Contractor. It shall be the Contractor's responsibility to complete and submit the NOI prior to commencing work and to submit the NOT upon completion and acceptance of the work covered by that contract. The Owner will submit a separate NOI and NOT as necessary.



EROSION CONTROL PLAN



LEGEND

- TEMPORARY SEDIMENT CONTROL FENCE — SCF
- TEMPORARY ROCK FILTER DAM — RFD
- GRAVEL FILTER BAGS
- EXISTING CONCRETE
- EXISTING SIDEWALK
- EXISTING ASPHALT - GRAVEL MIX
- EXISTING BUILDING
- EXISTING GRASS
- LIMITS OF CONSTRUCTION — LOC

STORM WATER MANHOLE	CREPE MYRTLE
PP POWER POLE	TREE
STEEL POST	SHRUB
FIRE HYDRANT	CONCRETE LINE
TELE-MANHOLE	EASEMENT LINE
GUY WIRE	BOUNDARY LINE
SANITARY MANHOLE	GUTTER LINE
BOL BOLLARD	CURB LINE
CI CURB INLET	COMM. LINE
RISER (ER)	ASPHALT LINE
CVLT COMM. VAULT	WATER LINE
EB ELECTRIC BOX	NATURAL GAS LINE
EM ELECTRIC METER	FIBER OPTIC LINE
EMP ELECTRIC METER POLE	TELEPHONE LINE
FF FINISHED FLOOR	STORM SEWER LINE
FIRC FOUND IRON ROD W/ CAP	SANITARY SEWER LINE
FIR FOUND IRON ROD	WALL LINE
FOCS FIBER OPTIC CABLE SIGN	OVERHEAD ELECTRIC LINE
FMON FOUND TXDOT MONUMENT	UNDERGROUND ELECTRIC LINE
GI GRATE INLET	OVERHEAD TELEPHONE LINE
GM GAS METER	PLANTER LINE
ICV IRRIGATION CONTROL VALVE	WOOD FENCE LINE
JBE JUNCTION BOX ELEC.	PAINT STRIPE LINE
LIGHT POLE	FIRE LANE LINE
SIGN (SGN)	RIGHT OF WAY LINE
SSCO SANITARY SEWER CLEANOUT	LIMITS OF CONSTRUCTION
TELEPHONE SERVICE BOX	
TPED TELEPHONE PEDESTAL	
TRAN TRANSFORMER	
WM WATER METER	
WATER VALVE (WV)	
WVLT WATER VAULT	
HANDICAP (HC) CAR SPACE	
FP FUEL PUMPS	
RCP REINFORCED CONCRETE PIPE	
WATER MANHOLE	
LS LANDSCAPE	
UMH UNKNOWN UTILITY MANHOLE	

DESCRIPTION OF CONTROLS

EROSION AND SEDIMENT CONTROL:
1. SILT FENCE
2. ROCK CONSTRUCTION ENTRANCE
3. SEDIMENT TRAP
4. GRAVEL FILTER BAGS

INSTALL EROSION & SEDIMENT CONTROL DEVICES PER DETAILS HEREON.

SEDIMENT MUST BE REMOVED FROM SEDIMENT CONTROL DEVICES PRIOR TO SEDIMENT REACHING 1/2 THE HEIGHT OF THE DEVICE OR STRUCTURE.

IF SEDIMENT ESCAPES FROM THE SITE AREA, ACCUMULATIONS MUST BE REMOVED AT A FREQUENCY TO MINIMIZE FURTHER NEGATIVE EFFECTS, AND WHENEVER FEASIBLE, PRIOR TO THE NEXT RAIN EVENT.

STABILIZATION PRACTICES:
TEMPORARY STABILIZATION: ALL STOCK PILED AND OTHER DISTURBED AREAS WHERE CONSTRUCTION ACTIVITIES TEMPORARILY CEASE FOR AT LEAST 21 DAYS WILL BE SEEDED NO LATER THAN 14 DAYS FROM THE LAST CONSTRUCTION ACTIVITY IN THAT AREA.

PERMANENT STABILIZATION:
ALL DISTURBED AREAS WHERE CONSTRUCTION ACTIVITIES PERMANENTLY CEASE SHALL BE HYDROMULCH SEEDED (AS PER PLAN) FOR PERMANENT EROSION CONTROL NO LATER THAN 14 DAYS FROM THE LAST CONSTRUCTION ACTIVITY IN ACCORDANCE WITH TXDOT 162/164. PRIOR TO FINAL REVEGETATION, CONTRACTOR IS TO REPLACE TOPSOIL TO A DEPTH OF 6". TOPSOIL IS TO BE DISKED TO A DEPTH OF AT LEAST 4" AND LIGHTLY COMPACTED.

HYDROMULCH:
TO BE "EXCEL FIBERMULCH II W/ TACKIFIER - APPLICATION RATE OF 2500 LBS/ACRE.
GRASS SEED AND FERTILIZER TO BE INCORPORATED INTO SLURRY.
GRASS SEED MIX: SUMMER-HULLED COMMON BUFFALO GRASS, MIN. 85% PURE LIVE SEED @ 90 lbs. PER ACRE.
WINTER-UNHULLED COMMON BUFFALO GRASS, MIN. 85% PURE LIVE SEED @ 90 lbs. PER ACRE + ANNUAL RYE GRASS, MIN. 85% PURE LIVE SEED @ 175 lbs. PER ACRE.
FERTILIZER: 3-1-2 RATIO FERTILIZER W/ SULFUR & TRACE ELEMENTS @ 350 lbs PER ACRE.
GRASS TO MATCH EXISTING BUFFALO GRASS.

MAINTENANCE:
SHALL CONSIST OF WEEDING, FERTILIZING, INSECT CONTROL, WATERING, REPLANTING, MOVING, MAINTAINING OF EXISTING GRADES, AND REPAIR OF ANY EROSION DAMAGES FOR ALL AREAS WHERE SEEDING AND MULCHING WORK IS COMPLETED. MAINTENANCE TO BE CONDUCTED DURING THE PLANTING PERIOD THRU 90 DAYS AFTER THE WORK IS COMPLETED, INSPECTED AND APPROVED BY THE ENGINEER AND OWNER.

GUARANTEE:
CONTRACTOR IS RESPONSIBLE FOR WATERING, MAINTENANCE AND ESTABLISHMENT OF GRASS FOR A PERIOD OF 90 DAYS AFTER FINAL REVEGETATION APPLICATION FOR PERMANENT EROSION CONTROL. CONTRACTOR IS TO GUARANTEE ALL PLANTED MATERIAL GROWTH AND COVERAGE FOR A PERIOD OF 6 MONTHS. GROWTH AND COVERAGE SHALL BE DEFINED AS 95% OF THE PLANTED AREA WITH UNIFORM COVERAGE OF GRASS GREATER THAN 1" IN HEIGHT WITH NO BARE SPOTS GREATER THAN 2 SQUARE FEET.

-PROVIDE A SECOND APPLICATION OF SPECIFIED HYDROMULCH SEEDING (AS PER PLAN) TO BARE AREAS NOT MEETING SPECIFIED COVERAGE - TO BE PERFORMED WITHIN 60 DAYS OF INITIAL APPLICATION AND IMMEDIATELY UPON NOTIFICATION BY THE ENGINEER TO REPLANT.

RECORD KEEPING:
CONTRACTOR IS RESPONSIBLE FOR RECORDING & MAINTAINING THE FOLLOWING:
1. DATES WHEN MAJOR GRADING ACTIVITIES OCCUR
2. DATES WHEN CONSTRUCTION ACTIVITIES TEMPORARILY OR PERMANENTLY CEASE ON A PORTION OF THE SITE.
3. DATES WHEN STABILIZATION MEASURES ARE INITIATED.

RECORDS MUST BE KEPT WITH THE SWP3 AND MADE READILY AVAILABLE UPON REQUEST TO THE PARTIES IN PART III.D.1 OF THE TPDES GENERAL PERMIT TXR150000.

STRUCTURAL CONTROL PRACTICES:
TEMPORARY EROSION CONTROLS TO INCLUDE INSTALLATION OF SILT FENCE, GRAVEL FILTER BAGS AND CONSTRUCTION ENTRANCE(S). CONTRACTOR SHALL PREVENT TRANSPORT OF SEDIMENT TO DOWNSTREAM AREAS AND IS RESPONSIBLE FOR CLEANUP AND RESTORATION IF SUCH SHOULD OCCUR.

SILT FENCE TO BE INSTALLED PER DETAIL AT TOE OF DOWNHILL SLOPES AS SHOWN ON PLAN.

ALL EROSION CONTROL DEVICES ARE TO BE MAINTAINED UNTIL ESTABLISHMENT OF GRASS OCCURS.

PERMANENT STORM WATER CONTROLS:
STORM WATER WILL DRAIN TO THE EXISTING DRAINAGE FACILITY.

OTHER CONTROLS:
OFFSITE VEHICLE TRACKING:
CONTRACTOR IS TO ENSURE NO CONSTRUCTION DEBRIS OR MUD IS TRACKED OR DISCARDED ONTO ANY PUBLIC OR PRIVATE STREETS OR LANDS AND IS RESPONSIBLE FOR CLEANUP AFTER EACH DAYS WORK. INSTALL ROCK CONSTRUCTION ENTRANCE AS INDICATED WITH CURB PROTECTION. CONTRACTOR IS RESPONSIBLE TO RESTORE ANY DAMAGE DONE TO EXISTING STREETS OR INFRASTRUCTURE.

WASTE MATERIALS:
ALL WASTE MATERIALS ARE TO BECOME PROPERTY OF THE CONTRACTOR AND ARE TO BE REMOVED AND DISPOSED OF OFF-SITE. NO ON-SITE BURYING OF WASTE MATERIALS IS ALLOWED. AT THE END OF EACH WORKING DAY, THE CONTRACTOR SHALL GATHER AND COLLECT ALL RUBBISH AND DEBRIS AND STORE IN AN ACCEPTABLE MANNER WHICH PREVENTS MATERIALS FROM BEING BLOWN OR OTHERWISE REDISTRIBUTED ACROSS THE SITE OR ADJACENT LANDS OR WATER COURSES.

HAZARDOUS WASTE:
ALL HAZARDOUS WASTE MATERIALS SHALL BE DISPOSED OF AS PER LOCAL OR STATE REGULATIONS AND IN ACCORDANCE WITH MFR'S SPECIFICATIONS.

TIMING OF CONTROLS/MEASURES
> INSTALL SILT FENCING.
> INSTALL ROCK CONSTRUCTION ENTRANCE
> DISTURBED AREAS WHERE CONSTRUCTION ACTIVITY TEMPORARILY CEASES FOR MORE THAN 21 DAYS ARE TO BE STABILIZED WITH HYDROMULCH SEEDING OR BROADCAST SEEDING (AS PER PLAN) NO LATER THAN 14 DAYS FROM THE LAST CONSTRUCTION ACTIVITY IN THAT AREA.
> DURING CLEARING/GRADING ACTIVITIES, SEDIMENT COLLECTING AT CHECK STRUCTURES AND SILT FENCE SHALL BE REMOVED AS IT REACHES 1/2 THE HEIGHT OF THE STRUCTURE.
> ALL DISTURBED AREAS WHERE CONSTRUCTION ACTIVITIES PERMANENTLY CEASE SHALL BE HYDROMULCH SEEDED (AS PER PLAN) FOR PERMANENT EROSION CONTROL NO LATER THAN 14 DAYS FROM THE LAST CONSTRUCTION ACTIVITY.

INSPECTION OF CONTROLS:
IN THE EVENT OF FLOODING OR OTHER UNCONTROLLABLE SITUATIONS WHICH PROHIBIT ACCESS TO THE INSPECTION SITES, INSPECTIONS MUST BE CONDUCTED AS SOON AS ACCESS IS PRACTICABLE.

CONTRACTOR PERSONNEL FAMILIAR WITH THE SWP3 MUST INSPECT DISTURBED AREAS THAT HAVE NOT BEEN FINALLY STABILIZED, AREAS USED FOR STORAGE OF MATERIALS EXPOSED TO PRECIPITATION, AND STRUCTURAL CONTROLS FOR EVIDENCE OF, OR POTENTIAL FOR, POLLUTANTS ENTERING THE DRAINAGE SYSTEM. SEDIMENT & EROSION CONTROL DEVICES MUST BE INSPECTED TO ENSURE PROPER OPERATION. VEHICLE ENTRANCE/EXIT LOCATIONS MUST BE INSPECTED FOR EVIDENCE OF OFF-SITE SEDIMENT TRACKING.

INSPECTIONS MUST BE CONDUCTED AT LEAST ONCE EVERY SEVEN (7) CALENDAR DAYS OR ONCE EVERY FOURTEEN (14) CALENDAR DAYS AND WITHIN TWENTY FOUR (24) HOURS OF THE END OF A STORM EVENT OF 0.5 INCHES OR GREATER.

THE SWP3 MUST BE MODIFIED BASED ON RESULTS OF INSPECTIONS, AS NECESSARY, TO BETTER CONTROL POLLUTANTS IN RUNOFF. REVISIONS TO THE SWP3 TO BE COMPLETED WITHIN SEVEN (7) CALENDAR DAYS FOLLOWING THE INSPECTION IN ACCORDANCE WITH THE TPDES GENERAL PERMIT.

A REPORT IN ACCORDANCE WITH THE TPDES GENERAL PERMIT MUST BE MAINTAINED BY THE CONTRACTOR AND RETAINED AS PART OF THE SWP3.

GENERAL NOTES

1. ALL UTILITIES AND SERVICE LINES SHOWN ARE TAKEN FROM RECORD INFORMATION SUPPLIED BY THE UTILITY OWNER OR HORIZONTALLY LOCATED BY INDEPENDENT LOCATORS. CONTRACTOR IS RESPONSIBLE TO REPORT ANY CONFLICTS BETWEEN PLAN AND ACTUAL CONDITIONS PRIOR TO CONSTRUCTION. OWNER AND ENGINEER SHALL NOT BE RESPONSIBLE FOR THE ACCURACY OR COMPLETENESS OF INFORMATION OR DATA RELIED ON TO DEPICT UNDERGROUND FACILITIES. CONTRACTOR IS TO CONTACT OWNERS OF ALL UTILITIES AND SERVICE LINES WITHIN THE PROJECT AREA AND NOTIFY OF INTENT AT LEAST 1 WEEK PRIOR TO CONSTRUCTION. CONTRACTOR IS RESPONSIBLE FOR COORDINATING WITH FACILITY OWNERS. CONTRACTOR IS TO VERIFY THE EXACT LOCATION AND VERTICAL POSITIONING OF ALL PIPELINES, EXISTING UTILITIES, AND SERVICE LINES WITHIN THE PROJECT AREA WHETHER SHOWN ON THE PLANS OR NOT, AT LEAST 48 HOURS PRIOR TO CONSTRUCTION. CONTRACTOR IS TO MAINTAIN STRUCTURAL INTEGRITY OF ALL PIPELINES, ELECTRIC TRANSMISSION POLES AND LINES, PERMANENT AND TEMPORARY UTILITIES. CONTRACTOR IS RESPONSIBLE FOR ANY DAMAGE DONE TO EXISTING UTILITY FACILITIES, PAVEMENT, ETC. AS A RESULT OF CLEARING/DIRTWORK ACTIVITIES.

2. CONTRACTOR TO CONTACT 811 48 HOURS PRIOR TO CONSTRUCTION. SPECIFIC ATTENTION SHOULD BE PAID TO FRANCHISE UTILITIES, VERIZON, GTE, ECT. SHOULD A CONFLICT ARISE BETWEEN THE PROPOSED CONSTRUCTION AND AN EXISTING UTILITY, CONTACT KCI 48 HOURS PRIOR TO CONSTRUCTION.

3. ALL DISTURBED AREAS NOT TO BE PAVED ARE TO HAVE ESTABLISHMENT OF GRASS AS OUTLINED IN THE DESCRIPTION OF CONTROLS, STABILIZATION PRACTICES NOTES.

4. ALL SWALE AREAS (BOTTOM WIDTHS & SIDE SLOPES) ARE TO BE PREPARED AND HYDROMULCHED FOR PERMANENT ESTABLISHMENT OF VEGETATION. PRIOR TO HYDROMULCHING OPERATIONS, CONTRACTOR TO REPLACE TOPSOIL TO A DEPTH OF 6". TOPSOIL IS TO BE DISKED TO A DEPTH OF AT LEAST 4" AND LIGHTLY COMPACTED. FINAL GRADES WITH ESTABLISHED VEGETATION SHALL BE AS CALLED OUT ON THE GRADING PLAN.

5. CONTRACTOR IS TO MAINTAIN EROSION CONTROL THROUGHOUT DURATION OF THE PROJECT AND UNTIL VEGETATION IS ESTABLISHED. ENSURE SEDIMENT IS NOT TRANSPORTED DOWNSTREAM FROM PROJECT VIA HAY BALES, BRUSH PILE AND SILT FENCE INSTALLATIONS. IF EXCESSIVE EROSION IS OBSERVED IN THE FIELD, ADDITIONAL EROSION CONTROLS SHALL BE INSTALLED.

6. CONTRACTOR SHALL NOT ALLOW SEDIMENT TO ENTER THE DOWNSTREAM CHANNEL. CONTRACTOR SHALL BE RESPONSIBLE FOR CLEANING OF THE DOWNSTREAM CHANNEL AREAS AND RESTORING TO ORIGINAL CONDITION, INCLUDING ESTABLISHMENT OF REVEGETATION SHOULD CONSTRUCTION SEDIMENT BE FOUND OUTSIDE THE LIMITS OF CONSTRUCTION.

7. CONSTRUCTION EXITS AND ASSOCIATED SEDIMENT TRAPS ARE TO BE CLEANED REGULARLY, CONTRACTOR TO INSURE NO MUD IS TRACKED ON TO EXISTING CITY OR STATE ROADWAYS. IF TRACKING OCCURS CONTRACTOR IS TO INSURE THAT MUD IS NOT ALLOWED TO REMAIN BEYOND THE END OF EACH WORK DAY.

8. SEDIMENT IS TO BE CLEANED FROM SILT FENCING OR OTHER SEDIMENT CONTROL DEVICES WHEN DEPTH OF SEDIMENT REACHES ~1/2 TOTAL HEIGHT OF DEVICE. CONTRACTOR IS TO INSURE EROSION CONTROL DEVICES ARE CONSISTENTLY INSTALLED AND PROPERLY MAINTAINED.

9. PRIOR TO FINAL COMPLETION, ALL STORM SEWER INLETS ARE TO BE CLEANED OF DEBRIS AND SEDIMENT.

SITE DESCRIPTION

OWNER INFORMATION: CITY OF GEORGETOWN
301 INDUSTRIAL AVENUE
GEORGETOWN, TX 78626

PROJECT NAME: GEORGETOWN FIRE STATION NO. 1 RENOVATION

PROJECT LOCATION: PROJECT SITE IS LOCATED AT THE WESTERN CORNER OF THE INTERSECTION OF FM 1460 AND INDUSTRIAL AVENUE.

LATITUDE: N 30°37'19.16"

LONGITUDE: W 97°40'37.89"

TOTAL SITE AREA: 2.71 ACRES

TOTAL AREA OF SITE EXPECTED TO BE DISTURBED: 1.23 ACRES

EXISTING SITE CONDITIONS

LAND USE: GENERAL COMMERCIAL
LAND COVER: GRASS COVER.
AVERAGE GROUND SLOPE: 5.0%
TR-55 CURVE NUMBER: 90
RECEIVING WATERS: WEST FORK OF SMITH BRANCH TRIBUTARY

SOIL INFORMATION:
HOUSTON BLACK CLAY, 1 TO 5 PERCENT SLOPES (DoC- USGA SOIL SURVEY)

HYDROLOGIC SOIL GROUP: D

POST DEVELOPED SITE CONDITIONS

LAND USE: GENERAL COMMERCIAL
PRIMARY STANDARD INDUSTRIAL CLASSIFICATION CODE (SIC): 1542
SECONDARY STANDARD INDUSTRIAL CLASSIFICATION CODE (SIC): 1623
TR-55 CURVE NUMBER:91

NATURE OF ACTIVITIES:
STRIPPING OF TOPSOIL; SITE CUT/FILL OPERATIONS, CONSTRUCTION OF BUILDING W/ ASSOCIATED PARKING & UTILITIES; REPLACEMENT OF TOPSOIL & REVEGETATION.

SEQUENCE OF MAJOR ACTIVITIES:
1. INSTALL SILT FENCE AND GRAVEL FILTER BAGS AT DOWNSTREAM LIMITS OF CONSTRUCTION, CURB INLETS & STOCK PILE AREAS
2. INSTALL ROCK CONSTRUCTION ENTRANCE
3. CLEAR SITE
4. EARTHWORK: SITE CUT/FILL, GRADING, UTILITY INSTALLATION, PAVING OPERATIONS
5. AFTER ESTABLISHMENT OF GRASS, REMOVE ALL TEMPORARY EROSION CONTROL (SILT-FENCE/ROCK FILTER DAM); RE-SOD ALL AREAS NOT HAVING PERMANENT GRASS COVERAGE AS DEFINED.

CERTIFICATIONS & RESPONSIBLE PARTIES

CERTIFICATION OF COMPLIANCE WITH
FEDERAL, STATE, AND LOCAL REGULATIONS

THIS EROSION CONTROL AND STORM WATER POLLUTION PREVENTION PLAN HAS BEEN PREPARED IN ACCORDANCE WITH CURRENT: CITY OF COLLEGE STATION DRAINAGE POLICY, CITY OF COLLEGE STATION STORM WATER POLLUTION PREVENTION POLICY, EPA REQUIREMENTS FOR STORM WATER DISCHARGES ASSOCIATED WITH CONSTRUCTION ACTIVITY UNDER A NPDES GENERAL PERMIT, USACE 33 CFR, & SECTION 404 OF THE CLEAN WATER ACT & TEXAS POLLUTANT DISCHARGE ELIMINATION SYSTEM (TPDES) GENERAL PERMIT No. TXR150000 AS ADMINISTERED BY THE TEXAS COMMISSION ON ENVIRONMENTAL QUALITY (TCEQ).

NON-STORM WATER DISCHARGES: -NONE EXPECTED-

MAINTENANCE/INSPECTION PROCEDURES

EROSION AND SEDIMENT CONTROL INSPECTION AND MAINTENANCE PRACTICES:
>ALL CONTROL MEASURES TO BE INSPECTED BY CONTRACTOR AT LEAST ONCE EVERY SEVEN (7) CALENDER DAYS OR ONCE EVERY FOURTEEN (14) CALENDAR DAYS AND WITHIN TWENTY FOUR (24) HOURS OF THE END OF A STORM EVENT OF 0.5 INCHES OR GREATER
>MAINTAIN RECORDS AND REPORTS ACCORDING TO EPA CONSTRUCTION GENERAL PERMIT CHECKLIST.
>ALL MEASURES SHALL BE MAINTAINED IN GOOD WORKING ORDER WITH REPAIR BEING INITIATED WITHIN 24 HOURS OF REPORT.
>BUILT UP SEDIMENT SHALL BE REMOVED FROM CHECK STRUCTURES AND SILT FENCE WHEN IT HAS REACHED 1/2 THE HEIGHT OF THE STRUCTURE.
>SILT FENCE AND HAY BALES TO BE INSPECTED FOR PROPER INSTALLATION AND THAT NO PIPING OR UNDERMINING IS OCCURRING.
>TEMPORARY SEEDING TO BE INSPECTED FOR BARE SPOTS, WASHOUTS, AND COVERAGE - RE-SEED AS NECESSARY
>PERMANENT HYDROMULCH SEEDING & SODDING TO BE INSPECTED PER GUARANTEE.

SIGNATURE	FOR	RESPONSIBLE FOR
(NAME, TITLE, & DATE)	(COMPANY & ADDRESS)	CLEARING
		TEMPORARY CONTROLS & STABILIZATION
		PERMANENT STABILIZATION (RE-VEGETATION)

CALL BEFORE YOU DIG!
TEXAS ONE CALL PARTICIPANTS REQUEST 48 HOURS NOTICE BEFORE YOU DIG DRILL, OR BLAST - STOP, CALL!
TEXAS ONE CALL SYSTEM
811

ISSUE FOR PERMIT

BROWN REYNOLDS WATFORD ARCHITECTS
175 CENTURY SQUARE DRIVE
SUITE 350
COLLEGE STATION, TEXAS 77840
979-694-1791
WWW.BRWARCH.COM

03/17/2025
STATE OF TEXAS — MARY P. STEWART — 108905 — LICENSED PROFESSIONAL ENGINEER

KCI TECHNOLOGIES, INC.
1555 GREENS PRAIRIE ROAD
COLLEGE STATION, TEXAS 77845
PHONE: (979) 846-6212
REGISTRATION #F-10573 / #101943-65

DATE	March 17, 2025
DRAWN BY	AM/NO
CHECKED BY	MPS
BRW PROJECT NUMBER	223046.00

CITY OF GEORGETOWN
FIRE STATION 1
RENOVATION
624 FM - 1460
GEORGETOWN, TEXAS 78626

NO.	REVISION	DATE

C2.0

EROSION CONTROL PLAN

EROSION AND SEDIMENT CONTROLS

SITE DESCRIPTION

PROJECT LIMITS: 2.71 acre unit located at the western corner of the intersection of FM 1460 AND Industrial Avenue.

LATITUDE 30°37'19.16"N LONGITUDE 97°40'37.89"W

PROJECT DESCRIPTION: Construction of building expansion to the exiting fire department building, additional sidewalk, additional parking and driveway.

MAJOR SOIL DISTURBING ACTIVITIES: Soil disturbing activities will include preparing right-of-way clearing and grubbing, grading, excavation for sewer, storm sewer, and parking and sidewalk. Erosion and sediment controls.

TOTAL PROJECT AREA: 2.71 AC

TOTAL AREA TO BE DISTURBED: 1.22 AC out of 2.71 AC (45%)

WEIGHTED CURVE NUMBER (PRE-CONSTRUCTION): 90

WEIGHTED CURVE NUMBER (POST-CONSTRUCTION): 91

EXISTING CONDITION OF SOIL & VEGETATIVE COVER AND % OF EXISTING VEGETATIVE COVER: The existing topsoil is Houston Black Clay. The existing site is vegetated with patches of open area.

NAME OF RECEIVING WATERS: The storm water will flow into the West Fork of Smith Branch Tributary wiithin the San Gabriel River Watershed.

SOIL STABILIZATION PRACTICES:

- ____ TEMPORARY SEEDING
- √ PERMANENT PLANTING, SODDING, OR SEEDING
- ____ MULCHING
- ____ SOIL RETENTION BLANKET
- ____ BUFFER ZONES
- ____ PRESERVATION OF NATURAL RESOURCES

OTHER: Disturbed areas on which construction activity has ceased (temporarily or permanently) shall be stabilized within 14 days unless activities are scheduled to resume and do within 21 days.

STRUCTURAL PRACTICES:

- √ SILT FENCES
- √ HAY BALES
- √ ROCK BERMS
- ____ DIVERSION, INTERCEPTOR, OR PERIMETER DIKES
- ____ DIVERSION, INTERCEPTOR, OR PERIMETER SWALES
- ____ DIVERSION DIKE AND SWALE COMBINATIONS
- ____ PIPE SLOPE DRAINS
- ____ PAVED FLUMES
- √ ROCK BEDDING AT CONSTRUCTION EXIT
- ____ TIMBER MATTING AT CONSTRUCTION EXIT
- ____ CHANNEL LINERS
- ____ SEDIMENT TRAPS
- ____ SEDIMENT BASINS
- √ STORM INLET SEDIMENT TRAP
- ____ STONE OUTLET STRUCTURES
- ____ CURBS AND GUTTERS
- √ STORM SEWERS
- ____ VELOCITY CONTROL DEVICES

OTHER:

NARRATIVE - SEQUENCE OF CONSTRUCTION (STORM WATER MANAGEMENT) ACTIVITIES:

The order of activities will be as follows:

1. Install temporary control, establish limits of construction, install silt fence, construction entrance/exit, and concrete wash out area.
2. Clear and grub.
3. Excavate and Embank for Drains/Pond/Utilities.
4. Construct storm drain.
5. Install berm controls/ temporary BMP's.
6. Construct sewer lines.
7. Construct building expansion additions.
7. Construct permanent BMP's
8. Follow up with developer on BMP removal sequence.
9. When all construction activity is complete and the site is stabilized and approved by the project engineer, remove all temporary structural controls and stabilize areas disturbed by their removal.
10. The contractor is responsible for implementing and maintaining the storm water pollution prevention plan.

STORM WATER MANAGEMENT: Storm water drainage will be conveyed by existing drainage structures, storm sewer, and streets.

NON-STORM WATER DISCHARGE: Any water discharged on the site for approved non-storm water discharges, shall be per permit conditions.

OTHER EROSION AND SEDIMENT CONTROLS:

MAINTENANCE: All erosion and sediment controls will be maintained in good working order. If a repair is necessary, it will be done at the earliest date possible, but no later than 7 calendar days after the surrounding exposed ground has dried sufficiently to prevent further damage from heavy equipment. The areas adjacent to creeks and drainage ways shall have priority followed by devices protecting storm sewer inlets.

INSPECTION: An inspection will be performed by a designated Inspector every week as well as after every half inch or more of rain (as recorded on a non-freezing rain gauge to be located at the Project Site). An inspection and Maintenance Report will be made per each Inspection. Based on the inspection results, the controls shall be located at the Project Site). An inspection and Maintenance Report will be made per each Inspection. Based on the inspection results, the controls shall be revised per the inspection report.

WASTE MATERIALS: All waste materials will be collected and stored in a secured metal dumpster. The dumpster will meet all state and local city solid waste management regulations. All trash and construction debris from the site will be deposited in the dumpster. The dumpster will be emptied as necessary or as required by local regulations and the trash will be hauled to a local dump. No construction waste material will be buried on site.

HAZARDOUS WASTE (INCLUDING SPILL REPORTING): At a minimum, any products in the following categories are considered to be hazardous: paints, acids for cleaning masonry surfaces, cleaning solvents, asphalt products, chemical additives for soil stabilization or concrete curing compounds and additives. In the event of a hazardous material spill, the spill coordinator shall be contacted immediately.

SANITARY WASTE: All sanitary waste will be collected from portable units as necessary, or as required by local regulations by a Licensed Sanitary Waste Management Contractor.

OFFSITE VEHICLE TRACKING:

- ____ HAUL ROADS DAMPENED FOR DUST CONTROL
- ____ LOADED HAUL TRUCKS TO BE COVERED WITH TARPAULIN
- √ EXCESS DIRT ON ROAD REMOVED DAILY
- √ STABILIZED CONSTRUCTION ENTRANCE

PERMITS:

REMARKS: Disposal areas, stockpiles, and haul roads shall be constructed in a manner that will minimize and control the amount of sediment that may enter receiving waters. Disposal areas shall not be located in any wetland, waterbody or streambed. Construction staging areas and vehicle maintenance areas shall be constructed by the Contractor in a manner to minimize the runoff of pollutants. All waterways shall be cleared as soon as practicable of temporary embankment, temporary bridges, matting, falsework, piling, debris or other obstructions placed during construction operations that are not a part of the finished work.

OWNERS CERTIFICATION

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gathered and evaluated 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 that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

SIGNATURE _____ DATE _____

CONTRACTOR'S CERTIFICATION

I certify under penalty of law that I understand the terms and conditions of the general Texas Pollutant Discharge Elimination System (TPDES) permit that authorizes the storm water discharges associated with industrial activity from the construction site identified as part of this certification plan.

SIGNATURE (CONTRACTOR) _____ DATE _____

ISSUE FOR PERMIT

BROWN REYNOLDS WATFORD ARCHITECTS
175 CENTURY SQUARE DRIVE
SUITE 350
COLLEGE STATION, TEXAS 77840
979.694.1791
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03/17/2025

STATE OF TEXAS
MARY P. STEWART
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CITY OF GEORGETOWN
FIRE STATION 1
RENOVATION
624 FM - 1460
GEORGETOWN, TEXAS 78626

NO.	REVISION	DATE

C2.1

EROSION CONTROL NARRATIVE

GUIDELINES FOR DESIGN AND INSTALLATION OF TEMPORARY EROSION AND SEDIMENTATION CONTROLS

TYPE OF STRUCTURE	REACH LENGTH	MAXIMUM DRAINAGE AREA	SLOPE
SILT FENCE	N/A	2 ACRES	0 – 10%
	200 FEET	2 ACRES	10 – 20%
	100 FEET	1 ACRE	20 – 30%
	50 FEET	1/2 ACRE	> 30%
TRIANGLE FILTER DIKE	100 FEET	1/2 ACRE	< 30% SLOPE
	50 FEET	1/4 ACRE	> 30% SLOPE
ROCK BERM *, **	500 FEET	< 5 ACRES	0 – 10%

* FOR ROCK BERM DESIGN WHERE PARAMETERS ARE OTHER THAN STATED, DRAINAGE AREA CALCULATIONS AND ROCK BERM DESIGN MUST BE SUBMITTED FOR REVIEW.

** HIGH SERVICE ROCK BERMS MAY BE REQUIRED IN AREAS OF ENVIRONMENTAL SIGNIFICANCE AS DETERMINED BY THE CITY OF GEORGETOWN.

The Architect/Engineer assumes responsibility for appropriate use of this standard.

ADOPTED 6/21/2006

CITY OF GEORGETOWN CONSTRUCTION STANDARDS AND DETAILS
TEMPORARY EROSION AND SEDIMENTATION CONTROL GUIDELINES
EC01 | NTS | 1/2003 | MRS | TRB

NOTE: THIS SECTION IS INTENDED TO ASSIST THOSE PERSONS PREPARING WATER POLLUTION ABATEMENT PLANS (WPAP) OR STORM WATER POLLUTION PREVENTION PLANS (SW3P) THAT COMPLY WITH FEDERAL, STATE AND/OR LOCAL STORM WATER REGULATIONS.

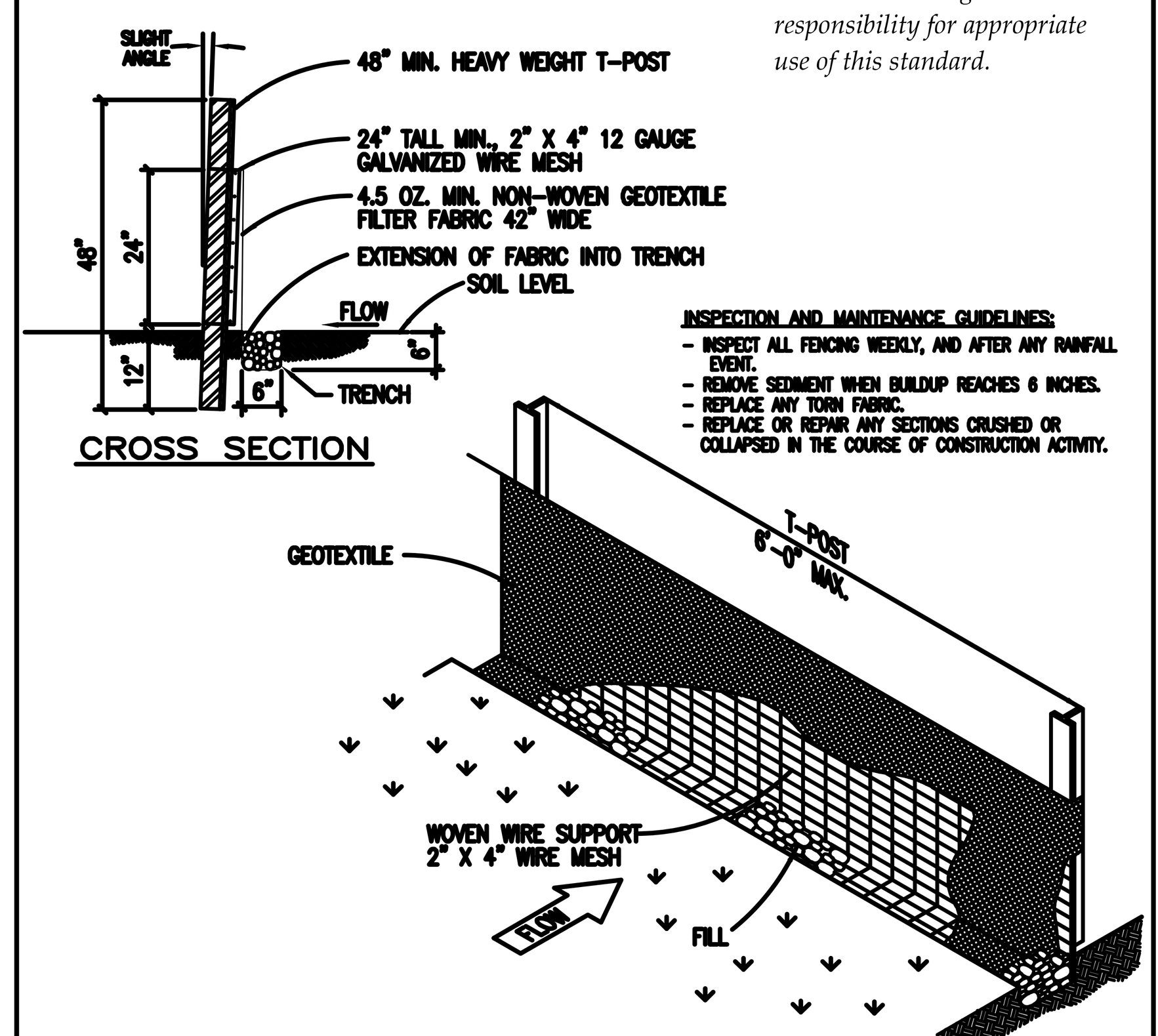
1. THE CONTRACTOR TO INSTALL AND MAINTAIN EROSION/SEDIMENTATION CONTROLS AND TREE/NATURAL AREA PROTECTIVE FENCING PRIOR TO ANY SITE PREPARATION WORK (CLEARING, GRUBBING, GRADING, OR EXCAVATION). CONTRACTOR TO REMOVE EROSION/SEDIMENTATION CONTROLS AT THE COMPLETION OF PROJECT AND GRASS RESTORATION.
2. ALL PROJECTS WITHIN THE RECHARGE ZONE OF THE EDWARD'S AQUIFER SHALL SUBMIT A BEST MANAGEMENT PRACTICES AND WATER POLLUTION AND ABATEMENT PLAN TO THE TNRCC FOR APPROVAL PRIOR TO ANY CONSTRUCTION.
3. THE PLACEMENT OF EROSION/SEDIMENTATION CONTROLS TO BE IN ACCORDANCE WITH THE APPROVED EROSION AND SEDIMENTATION CONTROL PLAN AND WATER POLLUTION ABATEMENT PLAN. DEVIATIONS FROM THE APPROVED PLAN MUST BE SUBMITTED TO AND APPROVED BY THE OWNER'S REPRESENTATIVE.
4. ALL PLANTING SHALL BE DONE BETWEEN MAY 1 AND SEPTEMBER 15 EXCEPT AS SPECIFICALLY AUTHORIZED IN WRITING. IF PLANTING IS AUTHORIZED TO BE DONE OUTSIDE THE DATES SPECIFIED, THE SEED SHALL BE PLANTED WITH THE ADDITION OF WINTER FESCUE (KENTUCKY 31) AT A RATE OF 100lb/ACRE. GRASS SHALL BE COMMON BERMUDA GRASS, HULLED, MINIMUM 82% PURE LIVE SEED. ALL GRASS SEED SHALL BE FREE FROM NOXIOUS WEED, GRADE "A" RECENT CROP, RECLEANED AND TREATED WITH APPROPRIATE FUNGICIDE AT TIME OF MIXING. SEED SHALL BE FURNISHED IN SEALED, STANDARD CONTAINERS WITH DEALER'S GUARANTEED ANALYSIS.
5. ALL DISTURBED AREAS TO BE RESTORED AS NOTED IN THE WATER POLLUTION ABATEMENT PLAN.
6. THE PLANTED AREA TO BE IRRIGATED OR SPRINKLED IN A MANNER THAT WILL NOT ERODE THE TOPSOIL, BUT WILL SUFFICIENTLY SOAK THE SOIL TO A DEPTH OF FOUR (4) INCHES. THE IRRIGATION TO OCCUR AT 10-DAY INTERVALS DURING THE FIRST TWO MONTHS TO INSURE GERMINATION AND ESTABLISHMENT OF THE GRASS . RAINFALL OCCURRENCES OF 1/2 INCH OR GREATER TO POSTPONE THE WATERING SCHEDULE ONE WEEK.
7. RESTORATION TO BE ACCEPTABLE WHEN THE GRASS HAS GROWN AT LEAST 1-1/2 INCHES HIGH WITH 95% *COVERAGE,* PROVIDED NO BARE SPOTS LARGER THAN 25 SQUARE FEET EXIST.
8. A MINIMUM OF FOUR (4) INCHES OF TOPSOIL TO BE PLACED IN ALL AREAS DISTURBED BY CONSTRUCTION.
9. THE CONTRACTOR TO HYDROMULCH OR SOD (AS SHOWN ON PLANS) ALL EXPOSED CUTS AND FILLS UPON COMPLETION OF CONSTRUCTION.
10. EROSION AND SEDIMENTATION CONTROLS TO BE INSTALLED OR MAINTAINED IN A MANNER WHICH DOES NOT RESULT IN SOIL BUILDUP WITHIN TREE DRIPLINE.
11. TO AVOID SOIL COMPACTION, CONTRACTOR SHALL NOT ALLOW VEHICULAR TRAFFIC, PARKING, OR STORAGE OF EQUIPMENT OR MATERIALS IN THE TREE DRIPLINE AREAS.
12. WHERE A FENCE IS CLOSER THAN FOUR (4) FEET TO A TREE TRUNK, PROTECT THE TRUNK WITH STRAPPED-ON PLANKING TO A HEIGHT OF EIGHT (8) FEET (OR TO THE LIMITS OF LOWER BRANCHING) IN ADDITION TO THE FENCING.
13. TREES TO BE REMOVED IN A MANNER WHICH DOES NOT IMPACT TREES TO BE PRESERVED.
14. ANY ROOT EXPOSED BY CONSTRUCTION ACTIVITY TO BE PRUNED FLUSH WITH THE SOIL. BACKFILL ROOT AREAS WITH GOOD QUALITY TOPSOIL AS SOON AS POSSIBLE. IF EXPOSED ROOT AREAS ARE NOT BACKFILLED WITHIN TWO DAYS, COVER THEM WITH ORGANIC MATERIAL IN A MANNER WHICH REDUCES SOIL TEMPERATURE AND MINIMIZES WATER LOSS DUE TO EVAPORATION.
15. CONTRACTOR TO PRUNE VEGETATION TO PROVIDE CLEARANCE FOR STRUCTURES, VEHICULAR TRAFFIC, AND EQUIPMENT BEFORE DAMAGE OCCURS (RIPPING OF BRANCHES, ETC.). ALL FINISHED PRUNING TO BE DONE ACCORDING TO RECOGNIZED, APPROVED STANDARDS OF THE INDUSTRY (REFERENCE THE "NATIONAL ARBORIST ASSOCIATION PRUNING STANDARDS FOR SHADE TREES").
16. THE CONTRACTOR IS TO INSPECT THE CONTROLS AT WEEKLY INTERVALS AND AFTER EVERY RAINFALL EXCEEDING 1/4 INCH TO VERIFY THAT THEY HAVE NOT BEEN SIGNIFICANTLY DISTURBED. ANY ACCUMULATED SEDIMENT AFTER A SIGNIFICANT RAINFALL TO BE REMOVED AND PLACED IN THE OWNER DESIGNATED SPOIL DISPOSAL SITE. THE CONTRACTOR TO CONDUCT PERIODIC INSPECTIONS OF ALL EROSION/SEDIMENTATION CONTROLS AND TO MAKE ANY REPAIRS OR MODIFICATIONS NECESSARY TO ASSURE CONTINUED EFFECTIVE OPERATION OF EACH DEVICE.
17. WHERE THERE IS TO BE AN APPROVED GRADE CHANGE, IMPERMEABLE PAVING SURFACE, TREE WELL, OR OTHER SUCH SITE DEVELOPMENT IMMEDIATELY ADJACENT TO A PROTECTED TREE, ERECT THE FENCE APPROXIMATELY TWO TO FOUR FEET (2'-4') BEHIND THE AREA IN QUESTION.
18. NO ABOVE AND/OR BELOW GROUND TEMPORARY FUEL STORAGE FACILITIES TO BE STORED ON THE PROJECT SITE.
19. IF EROSION AND SEDIMENTATION CONTROL SYSTEMS ARE EXISTING FROM PRIOR CONTRACTS, OWNER'S REPRESENTATIVE AND THE CONTRACTOR TO EXAMINE THE EXISTING EROSION AND SEDIMENTATION CONTROL SYSTEMS FOR DAMAGE PRIOR TO CONSTRUCTION. ANY DAMAGE TO PREEXISTING EROSION AND SEDIMENTATION CONTROLS NOTED TO BE REPAIRED AT OWNERS EXPENSE.
20. INTENTIONAL RELEASE OF VEHICLE OR EQUIPMENT FLUIDS ONTO THE GROUND IS NOT ALLOWED. CONTAMINATED SOIL RESULTING FROM ACCIDENTAL SPILL TO BE REMOVED AND DISPOSED OF PROPERLY.

The Architect/Engineer assumes responsibility for appropriate use of this standard.

ADOPTED 6/21/2006

CITY OF GEORGETOWN CONSTRUCTION STANDARDS AND DETAILS
EROSION AND SEDIMENTATION AND TREE PROTECTION NOTES
EC01A | NTS | 1/2003 | MRS | TRB

The Architect/Engineer assumes responsibility for appropriate use of this standard.

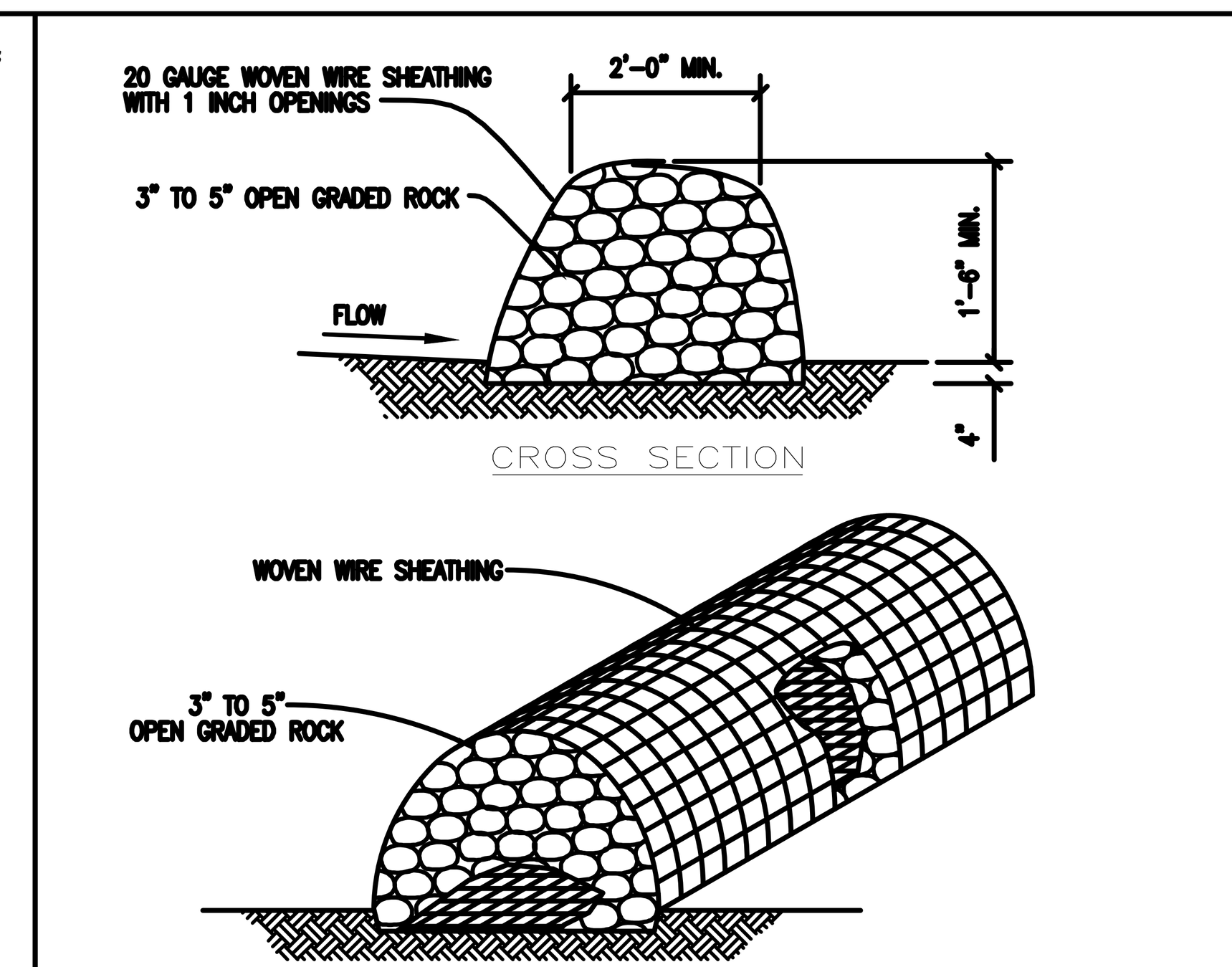


INSPECTION AND MAINTENANCE GUIDELINES:
- INSPECT ALL FENCING WEEKLY, AND AFTER ANY RAINFALL EVENT.
- REMOVE SEDIMENT WHEN BUILDUP REACHES 6 INCHES.
- REPLACE ANY TORN FABRIC.
- REPLACE OR REPAIR ANY SECTIONS CRUSHED OR COLLAPSED IN THE COURSE OF CONSTRUCTION ACTIVITY.

INSTALLATION:
- LAYOUT THE SILT FENCE FOLLOWING AS CLOSELY AS POSSIBLE TO THE CONTOUR.
- CLEAR THE GROUND OF DEBRIS, ROCKS, PLANTS (INCLUDING GRASSES TALLER THAN 2") TO PROVIDE A SMOOTH FLOW APPROACH SURFACE. EXCAVATE 6" DEEP X 6" WIDE TRENCH ON UPSTREAM SIDE OF FACE PER PLANS.
- DRIVE THE HEAVY DUTY T-POST AT LEAST 12 INCHES INTO THE GROUND AND AT A SLIGHT ANGLE TOWARDS THE FLOW.
- ATTACH THE 2" X 4" 12 GAUGE WELDED WIRE MESH TO THE T-POST WITH 11 1/2 GAUGE GALVANIZED T-POST CLIPS. THE TOP OF THE WIRE TO BE 24" ABOVE GROUND LEVEL. THE WELDED WIRE MESH TO BE OVERLAPPED 6" AND TIED AT LEAST 6 TIMES WITH HOG RINGS.
- THE SILT FENCE TO BE INSTALLED WITH A SKIRT A MINIMUM OF 6" WIDE PLACED ON THE UPHILL SIDE OF THE FENCE INSIDE EXCAVATED TRENCH. THE FABRIC TO OVERLAP THE TOP OF THE WIRE BY 1".
- ANCHOR THE SILT FENCE BY BACKFILLING WITH EXCAVATED DIRT AND ROCKS (NOT LARGER THAN 2").
- GEOTEXTILE SPLICES SHOULD BE A MINIMUM OF 18" WIDE ATTACHED IN AT LEAST 6 PLACES. SPLICES IN CONCENTRATED FLOW AREAS WILL NOT BE ACCEPTED.
- SILT FENCE SHALL BE REMOVED WHEN THE SITE IS COMPLETELY STABILIZED SO AS NOT TO BLOCK OR IMPEDE STORM FLOW OR DRAINAGE.

ADOPTED 6/21/2006

CITY OF GEORGETOWN CONSTRUCTION STANDARDS AND DETAILS
SILT FENCE DETAIL
EC02 | NTS | 1/2003 | MRS | TRB



INSTALLATION:
- LAYOUT THE ROCK BERM FOLLOWING AS CLOSELY AS POSSIBLE TO THE CONTOUR.
- CLEAR THE GROUND OF DEBRIS, ROCKS OR PLANTS THAT WILL INTERFERE WITH INSTALLATION.
- PLACE WOVEN WIRE FABRIC ON THE GROUND ALONG THE PROPOSED INSTALLATION WITH ENOUGH OVERLAP TO COMPLETELY ENCIRCLE THE FINISHED SIZE OF THE BERM.
- PLACE THE ROCK ALONG THE CENTER OF THE WIRE TO THE DESIGNATED HEIGHT.
- WRAP THE STRUCTURE WITH THE PREVIOUSLY PLACED WIRE MESH SECURE ENOUGH SO THAT WHEN WALKED ACROSS THE STRUCTURE RETAINS IT'S SHAPE.
- SECURE WITH TIE WIRE.
- THE ENDS OF THE BERM SHOULD BE TIED INTO EXISTING UPSLOPE GRADE AND THE BERM SHOULD BE BURIED IN A TRENCH APPROX. 4 INCHES DEEP TO PREVENT FAILURE OF THE CONTROL.
- THE ROCK BERM SHOULD BE LEFT IN PLACE UNTIL ALL UPSTREAM AREAS ARE STABILIZED AND ACCUMULATED SILT REMOVED.

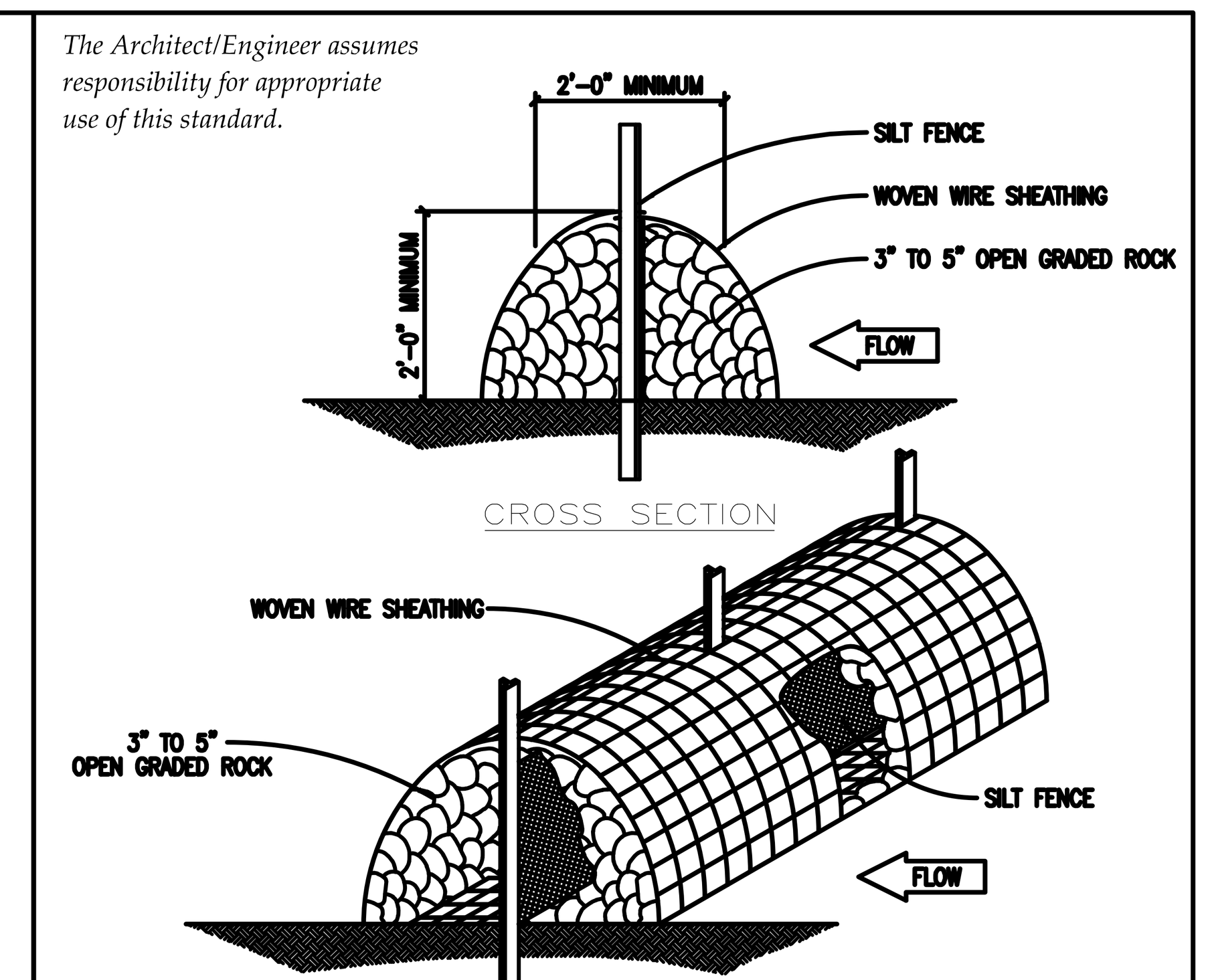
INSPECTION AND MAINTENANCE GUIDELINES:
- INSPECTION SHOULD BE MADE WEEKLY AND AFTER EACH RAINFALL EVENT BY THE RESPONSIBLE PARTY. FOR INSTALLATIONS IN STREAMBEDS, ADDITIONAL DAILY INSPECTIONS SHOULD BE MADE.
- REMOVE SEDIMENT AND OTHER DEBRIS WHEN BUILDUP REACHES 6 INCHES AND DISPOSE OF THE ACCUMULATED SILT IN AN APPROVED MANNER.
- REPAIR ANY LOOSE WIRE SHEATHING.
- THE BERM SHOULD BE RESHAPED AS NEEDED DURING INSPECTION.
- THE BERM SHOULD BE REPLACED WHEN THE STRUCTURE CEASES TO FUNCTION AS INTENDED DUE TO SILT ACCUMULATION AMONG THE ROCKS, WASHOUT, CONSTRUCTION TRAFFIC DAMAGE, ETC.

The Architect/Engineer assumes responsibility for appropriate use of this standard.

ADOPTED 6/21/2006

CITY OF GEORGETOWN CONSTRUCTION STANDARDS AND DETAILS
ROCK BERM DETAIL
EC03 | NTS | 1/2003 | MRS | TRB

The Architect/Engineer assumes responsibility for appropriate use of this standard.

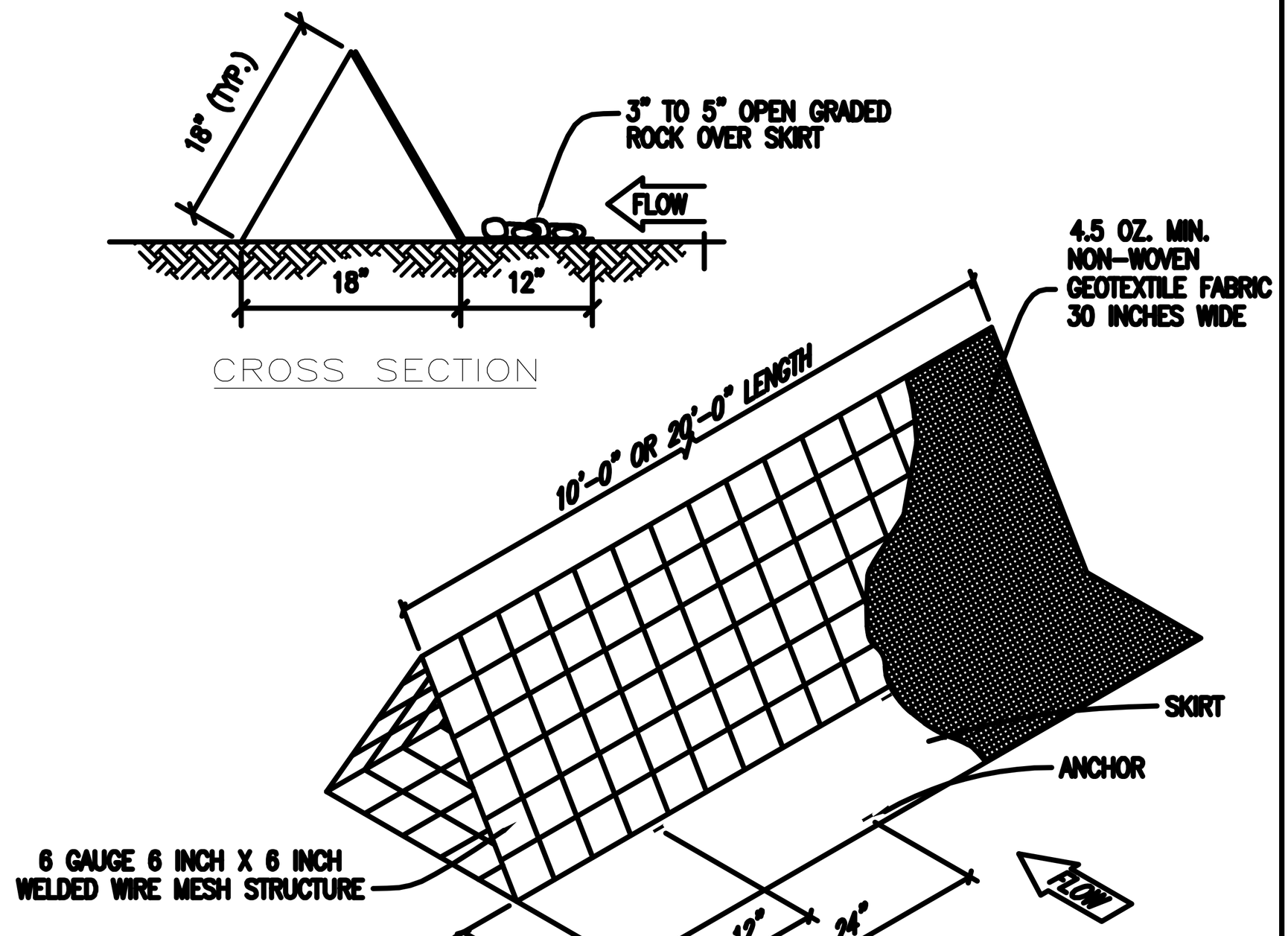


INSTALLATION:
- LAYOUT THE ROCK BERM FOLLOWING AS CLOSELY AS POSSIBLE TO THE CONTOUR.
- CLEAR THE GROUND OF DEBRIS, ROCKS OR PLANTS THAT WILL INTERFERE WITH INSTALLATION.
- PLACE WOVEN WIRE FABRIC ON THE GROUND ALONG THE PROPOSED INSTALLATION WITH ENOUGH OVERLAP TO COMPLETELY ENCIRCLE THE FINISHED SIZE OF THE BERM.
- INSTALL THE SILT FENCE ALONG THE CENTER OF THE PROPOSED BERM PLACEMENT. INSTALLATION SHOULD BE AS DESCRIBED IN DRAWING NO. EC-02 "SILT FENCE DETAIL".
- PLACE THE ROCK ALONG THE CENTER OF THE WIRE AND ON BOTH SIDES OF THE SILT FENCE TO THE DESIGNATED HEIGHT.
- WRAP THE STRUCTURE WITH THE PREVIOUSLY PLACED WIRE MESH SECURE ENOUGH SO THAT WHEN WALKED ACROSS THE STRUCTURE RETAINS IT'S SHAPE.
- SECURE WITH TIE WIRE.
- THE ROCK BERM SHOULD BE LEFT IN PLACE UNTIL ALL UPSTREAM AREAS ARE STABILIZED AND ACCUMULATED SILT REMOVED.

INSPECTION AND MAINTENANCE GUIDELINES:
- INSPECTION SHOULD BE MADE WEEKLY AND AFTER EACH RAINFALL EVENT BY THE CONTRACTOR. FOR THE INSTALLATIONS IN STREAMBEDS, ADDITIONAL DAILY INSPECTIONS SHOULD BE MADE ON ROCK BERM.
- REMOVE SEDIMENT AND OTHER DEBRIS WHEN BUILDUP REACHES 6 INCHES AND DISPOSE OF THE ACCUMULATED SILT IN AN APPROVED MANNER.
- REPAIR ANY LOOSE WIRE SHEATHING.
- THE BERM SHOULD BE RESHAPED AS NEEDED DURING INSPECTION.
- THE BERM SHOULD BE REPLACES WHEN THE STRUCTURE CEASES TO FUNCTION AS INTENDED DUE TO SILT ACCUMULATION AMONG THE ROCKS, WASHOUT, CONSTRUCTION TRAFFIC DAMAGE, ETC.

ADOPTED 6/21/2006

CITY OF GEORGETOWN CONSTRUCTION STANDARDS AND DETAILS
HIGH SERVICE ROCK BERM DETAIL
EC04 | NTS | 1/2003 | MRS | TRB



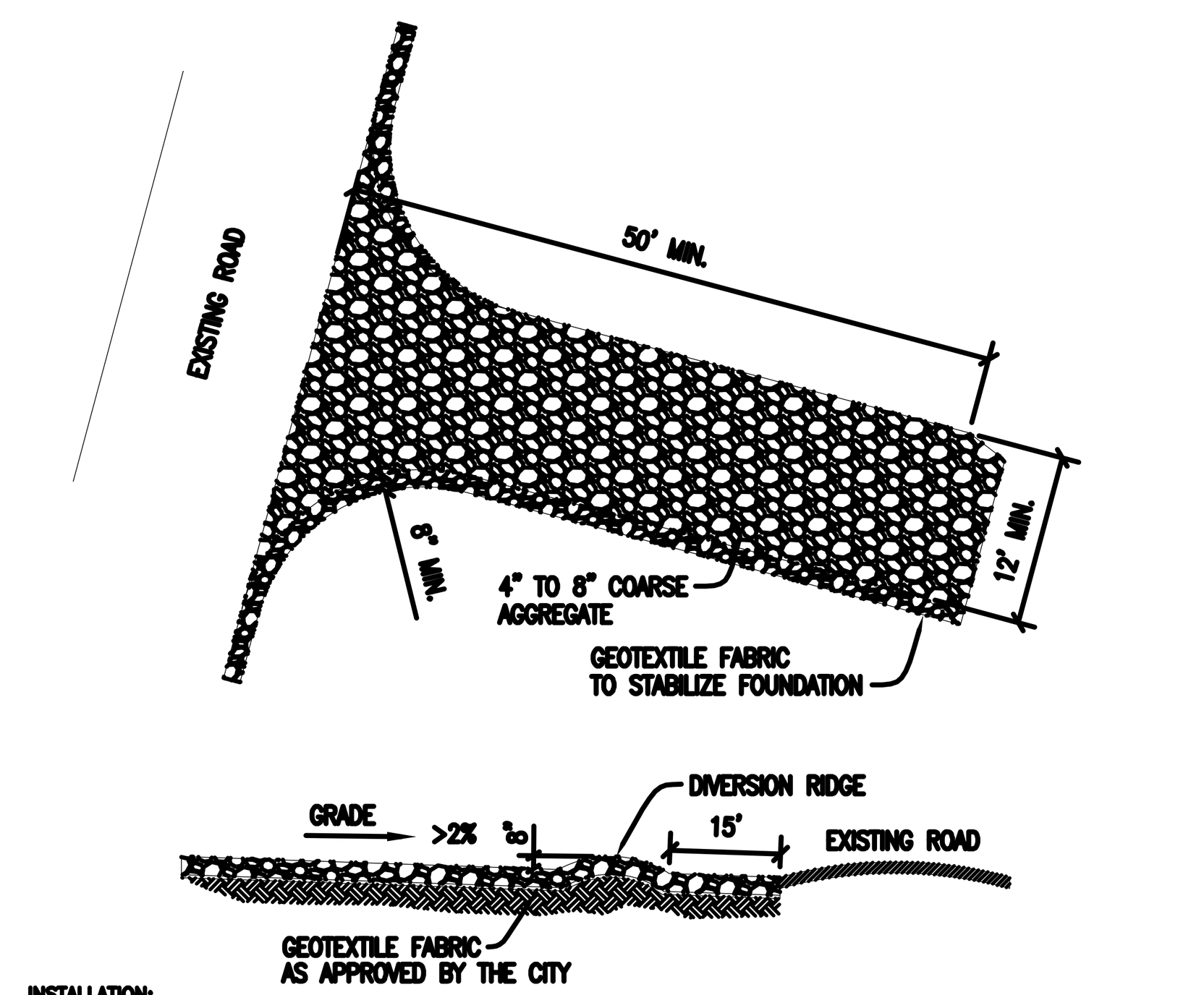
INSTALLATION:
- LAYOUT THE FILTER DIKE FOLLOWING AS CLOSELY AS POSSIBLE TO THE CONTOUR.
- CLEAR THE GROUND OF DEBRIS, ROCKS OR PLANTS THAT WILL INTERFERE WITH INSTALLATION.
- PLACE THE FILTER DIKE SECTIONS ONE AT A TIME, WITH THE SKIRT ON THE UPHILL SIDE TOWARDS THE DIRECTION OF FLOW, ANCHORING EACH SECTION TO THE GROUND BEFORE THE NEXT SECTION IS PLACED.
- ANCHORS SHOULD BE PLACED ON 2'-0" CENTERS ALTERNATING FROM FRONT TO BACK SO THAT THERE IS ACTUALLY ONLY 1'-0" IN BETWEEN ANCHORS.
- SECURELY FASTEN THE SKIRT FROM ONE SECTION OF FILTER DIKE TO THE NEXT.
- FILTER DIKES MUST MAINTAIN CONTINUOUS CONTACT WITH THE GROUND.
- AFTER THE SITE IS COMPLETELY STABILIZED, THE DIKES AND ANY REMAINING SILT SHOULD BE REMOVED. SILT SHOULD BE DISPOSED OF IN A MANNER THAT WILL NOT CONTRIBUTE TO ADDITIONAL SILTATION.

INSPECTION AND MAINTENANCE GUIDELINES:
- INSPECTION SHOULD BE MADE WEEKLY OR AFTER EACH RAINFALL EVENT AND REPAIR OR REPLACEMENT SHOULD BE MADE PROMPTLY AS NEEDED BY THE CONTRACTOR.
- INSPECT AND REALIGN BERMS AS NEEDED TO PREVENT GAPS BETWEEN THE SECTIONS.
- ACCUMULATED SILT SHOULD BE REMOVED AFTER EACH RAINFALL EVENT, AND DISPOSED OF IN A MANNER WHICH WILL NOT CAUSE ADDITIONAL SILTATION.

The Architect/Engineer assumes responsibility for appropriate use of this standard.

ADOPTED 6/21/2006

CITY OF GEORGETOWN CONSTRUCTION STANDARDS AND DETAILS
TRIANGULAR FILTER DIKE
EC05 | NTS | 1/2003 | MRS | TRB



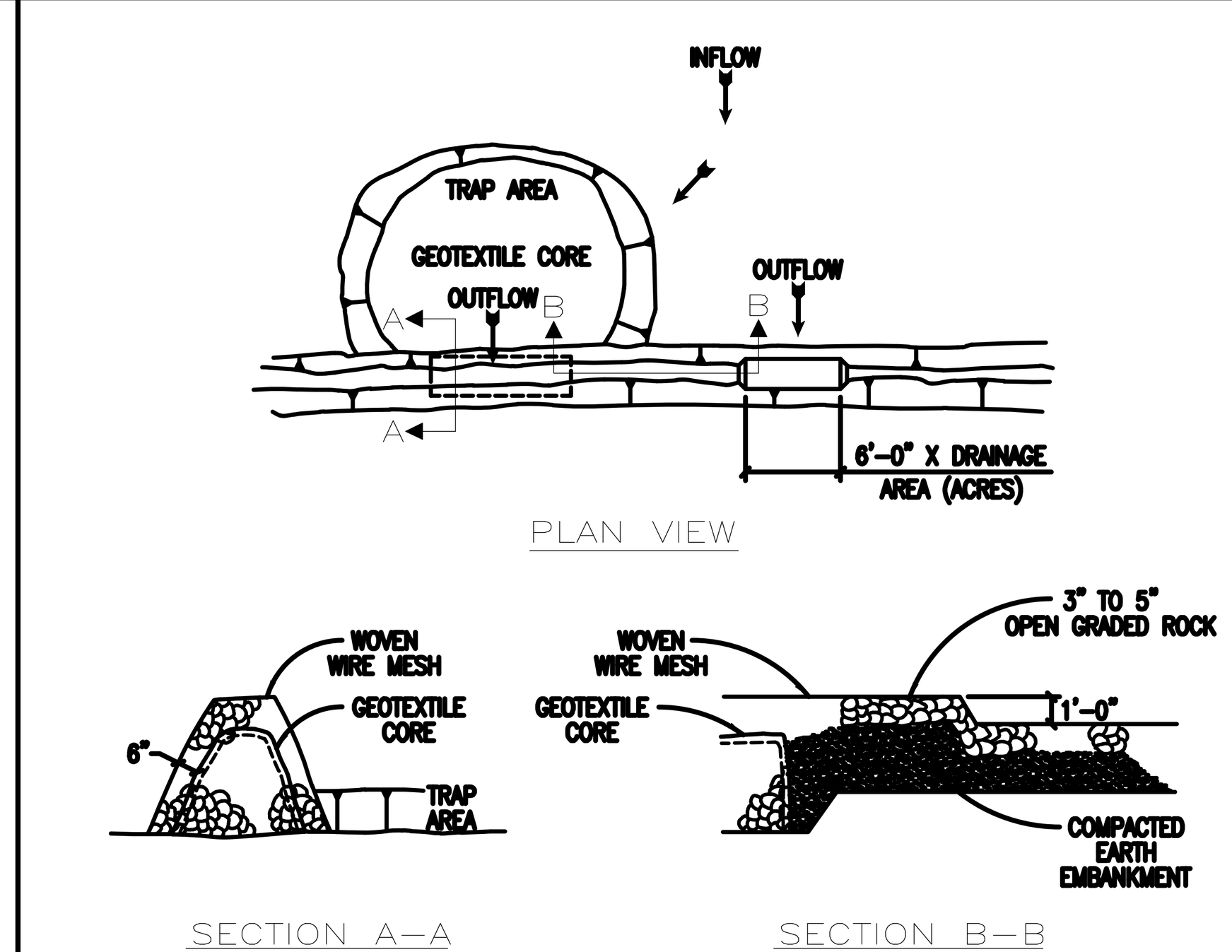
INSTALLATION:
- CLEAR THE AREA OF DEBRIS, ROCKS OR PLANTS THAT WILL INTERFERE WITH INSTALLATION.
- GRADE THE AREA FOR THE ENTRANCE TO FLOW BACK ON TO THE CONSTRUCTION SITE. RUNOFF FROM THE STABILIZED CONSTRUCTION
- PLACE GEOTEXTILE FABRIC AS APPROVED BY THE CITY.
- PLACE ROCK AS APPROVED BY THE CITY.

INSPECTIONS AND MAINTENANCE GUIDELINES:
- THE ENTRANCE SHOULD BE MAINTAINED IN A CONDITION, WHICH WILL PREVENT TRACKING OR FLOWING OF SEDIMENT ONTO PUBLIC RIGHTS-OF-WAY. THIS MAY REQUIRE PERIODIC TOP DRESSING WITH ADDITIONAL STONE AS CONDITIONS DEMAND AND REPAIR AND/OR CLEANOUT OF ANY MEASURES USED TO TRAP SEDIMENT.
- ALL SEDIMENT SPILLED, DROPPED, WASHED OR TRACKED ON TO PUBLIC RIGHTS-OF-WAY SHOULD BE REMOVED IMMEDIATELY BY CONTRACTOR.
- WHEN NECESSARY, WHEELS SHOULD BE CLEANED TO REMOVE SEDIMENT PRIOR TO ENTRANCE ONTO PUBLIC RIGHTS-OF-WAY.
- WHEN WASHING IS REQUIRED, IT SHOULD BE DONE ON AN AREA STABILIZED WITH CRUSHED STONE THAT DRAINS INTO AN APPROVED SEDIMENT TRAP OR SEDIMENT BASIN.
- ALL SEDIMENT SHOULD BE PREVENTED FROM ENTERING ANY STORM DRAIN, DITCH OR WATER COURSE BY USING APPROVED METHODS.

The Architect/Engineer assumes responsibility for appropriate use of this standard.

ADOPTED 6/21/2006

CITY OF GEORGETOWN CONSTRUCTION STANDARDS AND DETAILS
STABILIZED CONSTRUCTION ENTRANCE
EC06 | NTS | 1/2003 | MRS | TRB



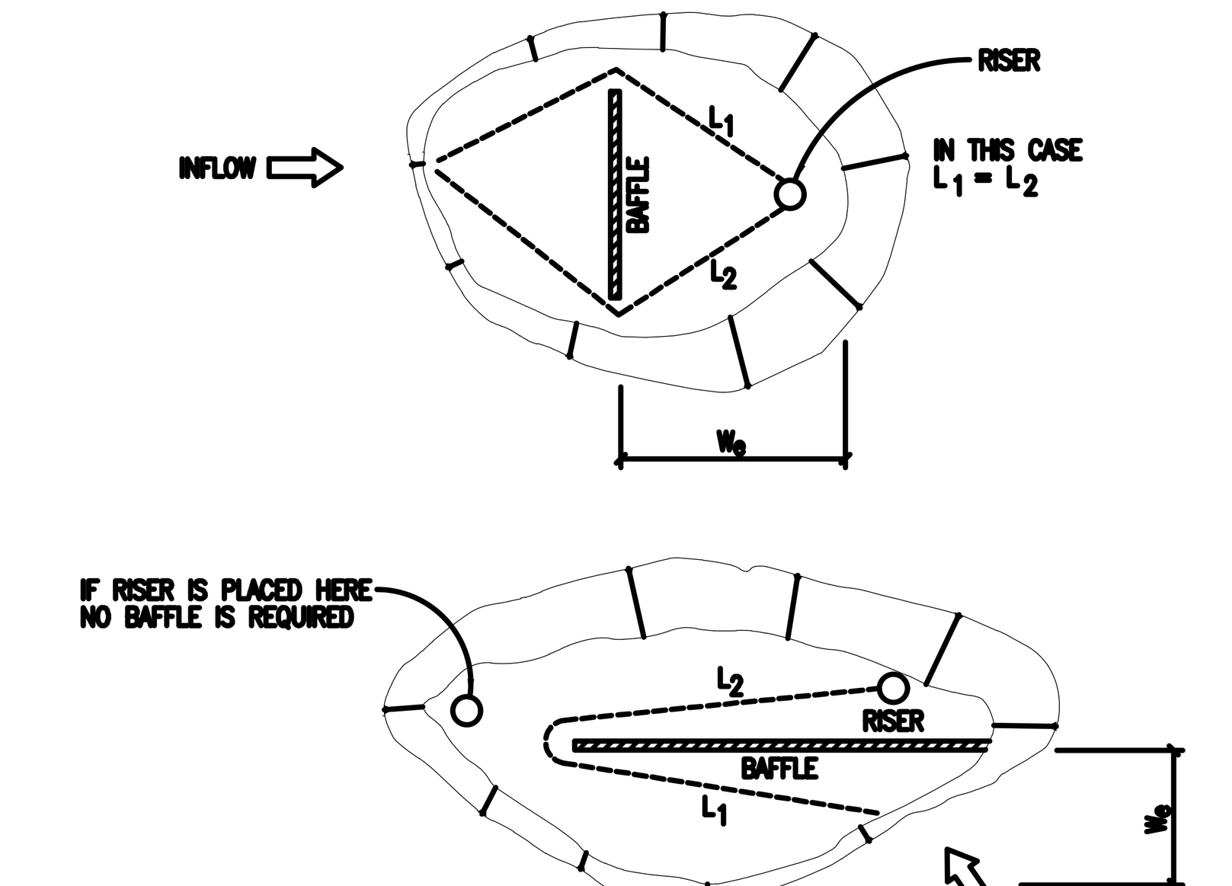
INSTALLATION:
- LOCATE THE SEDIMENT TRAP SO AS TO DISTURB AS FEW TREES AS POSSIBLE.
- CLEAR AND GRUB THE AREA UNDER THE EMBANKMENT OF ALL VEGETATION AND ROOT MATS.
- LAYOUT THE WIRE MESH AND THEN THE GEOTEXTILE FABRIC.
- CONSTRUCT THE GEOTEXTILE CORE AND CORRESPONDING ROCK EMBANKMENT TO THE DESIGNATED HEIGHT AND CONFIGURATION.
- WRAP THE STRUCTURE WITH THE PREVIOUSLY PLACED WIRE MESH SECURE ENOUGH SO THAT WHEN WALKED ACROSS THE STRUCTURE RETAINS IT'S SHAPE. SECURE WITH TIE WIRE.
- PLACE THE EMBANKMENT MATERIAL IN 8 TO 12 INCH LIFTS AND MACHINE COMPACT.

INSPECTION AND MAINTENANCE GUIDELINES:
- INSPECTION SHOULD BE MADE WEEKLY AND AFTER EACH RAINFALL. CHECK THE EMBANKMENT, SPILLWAYS, AND OUTLET FOR EROSION DAMAGE AND INSPECT THE EMBANKMENT FOR PIPING AND SETTLEMENT. REPAIR SHOULD BE MADE PROMPTLY AS NEEDED BY THE CONTRACTOR.
- TRASH AND OTHER DEBRIS SHOULD BE REMOVED AND THE TRAP RESTORED TO ITS ORIGINAL DIMENSIONS WHEN THE SEDIMENT HAS ACCUMULATED TO HALF OF THE DESIGN DEPTH OF THE TRAP.
- SEDIMENT REMOVED FROM THE TRAP SHOULD BE DEPOSITED IN AN APPROVED SPOILS AREA AND IN SUCH A MANNER THAT IT WILL NOT CAUSE ADDITIONAL SILTATION.

The Architect/Engineer assumes responsibility for appropriate use of this standard.

ADOPTED 6/21/2006

CITY OF GEORGETOWN CONSTRUCTION STANDARDS AND DETAILS
SEDIMENT TRAP DETAIL
EC07 | NTS | 1/2003 | MRS | TRB



SEDIMENT BASIN BAFFLE DESIGN

$W_e = A / (L_1 + L_2)$

W_e = EFFECTIVE WIDTH OF BASIN

A = SURFACE AREA OF BASIN WHEN FILLED TO RISER CREST

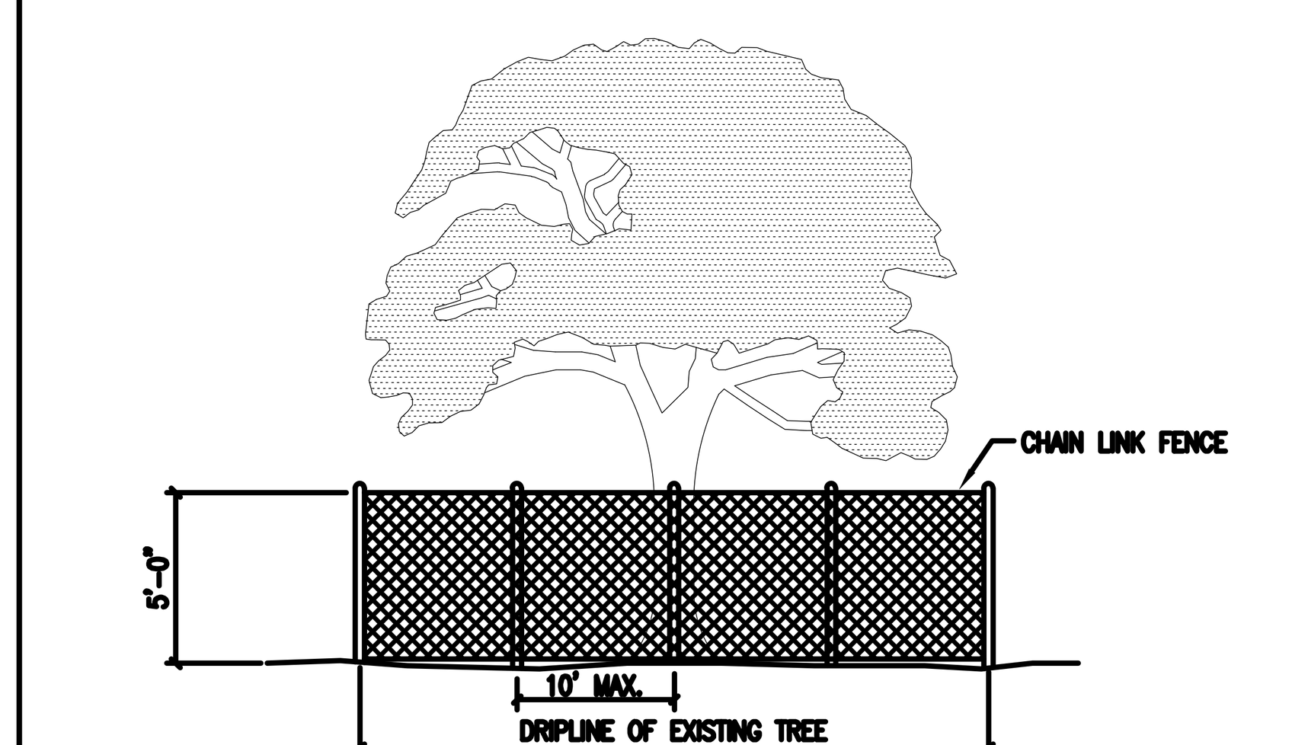
L_1, L_2 = SHORTEST TRAVEL DISTANCE AROUND THE BAFFLE FROM INLET TO OUTLET

INSPECTION AND MAINTENANCE GUIDELINES:
- INSPECTION SHOULD BE MADE WEEKLY AND AFTER EACH RAINFALL. CHECK THE EMBANKMENT, SPILLWAYS, AND OUTLET FOR EROSION DAMAGE, AND INSPECT THE EMBANKMENT FOR PIPING AND SETTLEMENT. REPAIR SHOULD BE MADE PROMPTLY AS NEEDED BY THE CONTRACTOR.
- TRASH AND OTHER DEBRIS SHOULD BE REMOVED AFTER EACH RAINFALL TO PREVENT CLOGGING OF THE OUTLET STRUCTURE.
- ACCUMULATED SILT SHOULD BE REMOVED AND THE BASIN SHOULD BE RE-GRADED TO ITS ORIGINAL DIMENSIONS AT SUCH POINT THAT THE CAPACITY OF THE IMPOUNDMENT HAS BEEN REDUCED TO 1/2 OF ITS ORIGINAL STORAGE CAPACITY.
- THE REMOVED SEDIMENT SHOULD BE STOCKPILED OR REDISTRIBUTED IN AREAS THAT ARE PROTECTED FROM EROSION.

The Architect/Engineer assumes responsibility for appropriate use of this standard.

ADOPTED 6/21/2006

CITY OF GEORGETOWN CONSTRUCTION STANDARDS AND DETAILS
SEDIMENT BASIN BAFFLE DESIGN
EC08 | NTS | 1/2003 | MRS | TRB



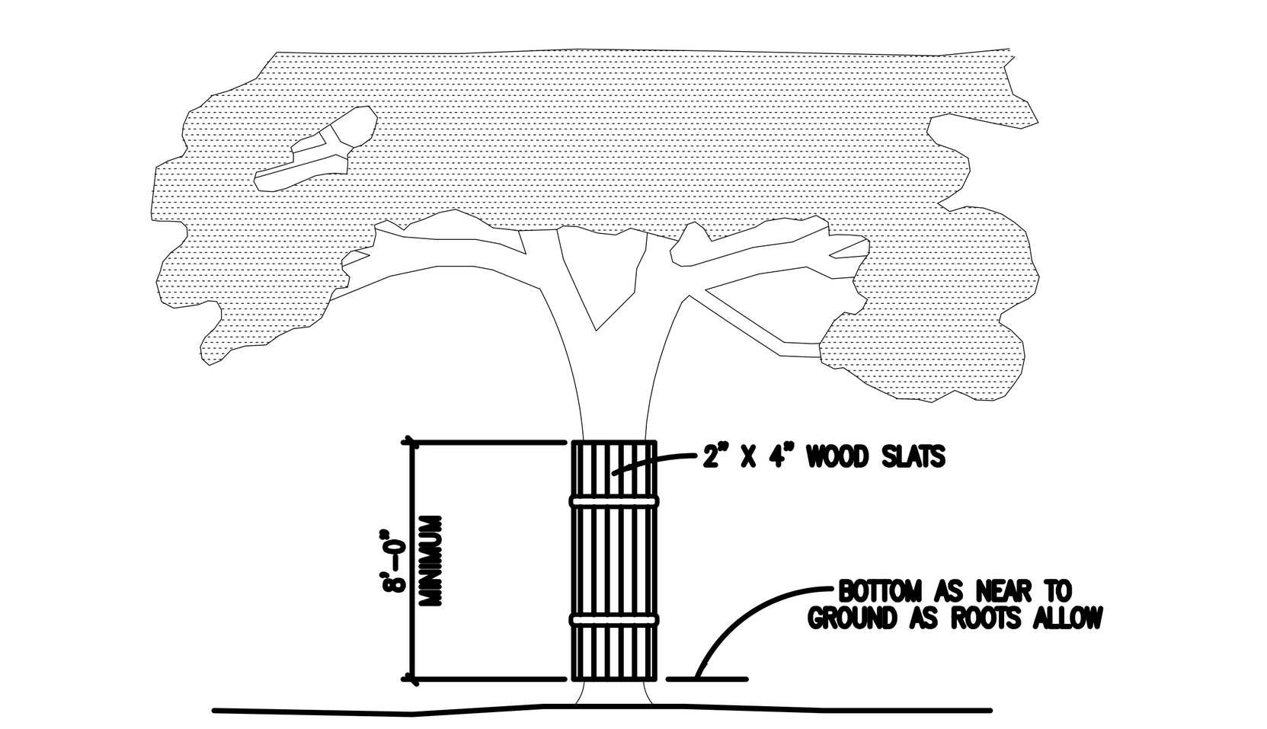
NOTES:

1. TREE PROTECTION FENCES SHALL BE INSTALLED PRIOR TO THE COMMENCEMENT OF ANY SITE PREPARATION WORK (CLEARING, GRUBBING OR GRADING).
2. FENCES SHALL COMPLETELY SURROUND THE TREE, OR CLUSTERS OF TREES; WILL BE LOCATED AT THE OUTERMOST LIMIT OF THE TREE BRANCHES (DRIPLINE), AND WILL BE MAINTAINED THROUGHOUT THE CONSTRUCTION PROJECT IN ORDER TO PREVENT THE FOLLOWING:
   A. SOIL COMPACTION IN THE ROOT ZONE AREA RESULTING FROM VEHICULAR TRAFFIC, OR STORAGE OF EQUIPMENT OR MATERIALS.
   B. ROOT ZONE DISTURBANCES DUE TO GRADE CHANGES (GREATER THAN SIX INCHES (6") CUT OR FILL, OR TRENCHING NOT REVIEWED AND AUTHORIZED BY THE CITY.
   C. WOUNDS TO EXPOSED ROOTS, TRUNKS OR LIMBS BY MECHANICAL EQUIPMENT.
   D. OTHER ACTIVITIES DETRIMENTAL TO TREES, SUCH AS CHEMICAL STORAGE, CEMENT TRUCK CLEANING AND FIRE.
3. EXCEPTIONS TO INSTALLING FENCES AT TREE DRIPLINES MAY BE PERMITTED IN THE FOLLOWING CASES:
   A. WHERE PERMEABLE PAVING IS TO BE INSTALLED, ERECT THE FENCE AT THE OUTER LIMITS OF THE PERMEABLE PAVING AREA.
   B. WHERE TREES ARE CLOSE TO PROPOSED BUILDINGS, ERECT THE FENCE NO CLOSER THAN SIX FEET (6'-0") TO BUILDING.

The Architect/Engineer assumes responsibility for appropriate use of this standard.

ADOPTED 6/21/2006

CITY OF GEORGETOWN CONSTRUCTION STANDARDS AND DETAILS
TREE PROTECTION – CHAIN LINK FENCE
EC09 | NTS | 1/2003 | MRS | TRB



NOTES:

1. WHERE ANY EXCEPTIONS RESULT IN A FENCE BEING CLOSER THAN FOUR FEET (4'-0") TO A TREE TRUNK; PROTECT THE TRUNK WITH STRAPPED-ON-PLANKING TO A HEIGHT OF EIGHT FEET (8'-0"), OR TO THE LIMITS OF LOWER BRANCHING IN ADDITION TO THE REDUCED FENCING PROVIDED.
2. ANY ROOTS EXPOSED BY CONSTRUCTION ACTIVITY SHALL BE PRUNED FLUSH WITH THE SOIL. BACKFILL ROOT AREAS WITH GOOD QUALITY TOP SOIL AS SOON AS POSSIBLE. IF EXPOSED ROOT AREAS ARE NOT BACKFILLED WITHIN TWO (2) DAYS, COVER THEM WITH ORGANIC MATERIAL IN A MANNER WHICH REDUCES SOIL TEMPERATURE, AND MINIMIZES WATER LOSS DUE TO EVAPORATION.
3. PRIOR EXCAVATION OR GRADE CUTTING WITHIN TREE DRIPLINE. MAKE A CLEAN CUT BETWEEN THE DISTURBED AND UNDISTURBED ROOT ZONES WITH A ROCK SAW OR SIMILAR EQUIPMENT, TO MINIMIZE DAMAGE TO REMAINING ROOTS.
4. TREES MOST HEAVILY IMPACTED BY CONSTRUCTION ACTIVITIES SHOULD BE WATERED DEEPLY ONCE A WEEK DURING PERIODS OF HOT, DRY WEATHER. TREE CROWNS SHOULD BE SPRAYED WITH WATER PERIODICALLY TO REDUCE DUST ACCUMULATION ON THE LEAVES.
5. ANY TRENCHING REQUIRED FOR THE INSTALLATION OF LANDSCAPE IRRIGATION SHALL BE PLACED AS FAR FROM EXISTING TREE TRUNKS AS POSSIBLE.
6. NO LANDSCAPE TOPSOIL DRESSING GREATER THE FOUR INCHES (4") SHALL BE PERMITTED WITHIN THE DRIPLINE OF A TREE. NO SOIL IS PERMITTED ON THE ROOT FLARE OF ANY TREE.
7. PRUNING TO PROVIDE CLEARANCE FOR STRUCTURES, VEHICULAR TRAFFIC AND EQUIPMENT SHALL TAKE PLACE BEFORE CONSTRUCTION BEGINS.

The Architect/Engineer assumes responsibility for appropriate use of this standard.

ADOPTED 6/21/2006

CITY OF GEORGETOWN CONSTRUCTION STANDARDS AND DETAILS
TREE PROTECTION – WOOD SLATS
EC10 | NTS | 1/2003 | MRS | TRB

ISSUE FOR PERMIT

BROWN REYNOLDS WATFORD ARCHITECTS
175 CENTURY SQUARE DRIVE
SUITE 350
COLLEGE STATION, TEXAS 77840
979-694-1791
WWW.BRWARCH.COM

03/17/2025
STATE OF TEXAS
MARY P. STEWART
108905
LICENSED PROFESSIONAL ENGINEER

KCI TECHNOLOGIES, INC.
1555 GREENS PRAIRIE ROAD
COLLEGE STATION, TEXAS 77845
PHONE: (979) 846-6212
REGISTRATION #F-10573 / #101943-65

DATE	March 17, 2025
DRAWN BY	AM/NO
CHECKED BY	MPS
BRW PROJECT NUMBER	223046.00

CITY OF GEORGETOWN
FIRE STATION 1
RENOVATION
624 FM - 1460
GEORGETOWN, TEXAS 78626

NO.	REVISION	DATE

C11.0

EROSION CONTROL DETAILS

Attachment E

Request to Temporarily Seal a Feature
City of Georgetown New Fire Station 1

N/A

Attachment F

Structural Practices
City of Georgetown New Fire Station 1

On-site structural practices, which are continuous (on-going) until the site is permanently stabilized, may include the following (Erosion Control Plan/SWPPP):

i) Erection of silt fences, inlet protection, rock berms, and construction entrance/exit.

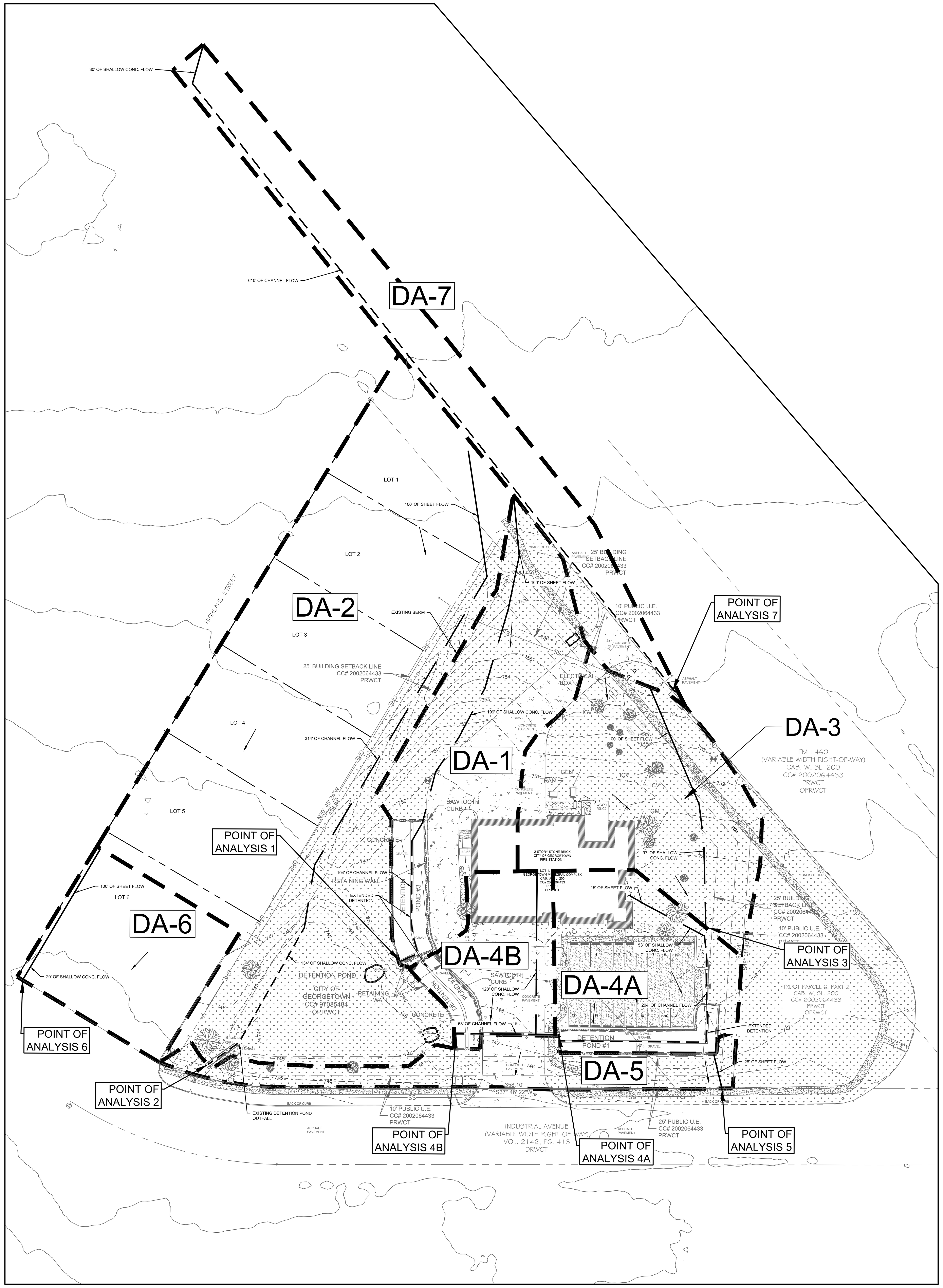
These storm water pollution control features will slow the velocity of runoff thereby enhancing sedimentation and capture of contaminants that may accumulate in the storm water runoff exiting this construction site. There are no structures to divert storm water and no structures to store storm water on this project.

It is to be understood that modifications to the Storm Water Pollution Prevention Plan may have to be made in the field to adjust for field conditions and to provide the intended effect. All changes to the plan must be shown on the SWPPP sheets, dated and signed by the responsible party or described and included in the Plan Modifications section of this Storm Water Pollution Prevention Plan.

Attachment G

Drainage Area Map
City of Georgetown New Fire Station 1

Refer to attached Drainage Area Map.



EXISTING DRAINAGE AREA MAP

PRE-PROJECT IMPERVIOUS COVER	AREA (S.F.)
EXISTING IMPERVIOUS COVER	39,770
EXISTING IMPERVIOUS COVER OFF-SITE	11,842
TOTAL SITE EX. IMPERVIOUS COVER	51,612
TOTAL SITE AREA (2.71 ACRES)	118,048
TOTAL % IMPERVIOUS COVER	44%
EX. BUILDING % IMPERVIOUS COVER	8%

GEORGETOWN FIRE STATION
NRCS METHOD
DRAINAGE AREA CALCULATION SHEET (EXISTING CONDITIONS)

DRAINAGE AREA	DRAINAGE AREA	TOTAL ACRES (HSG D)	TOTAL SQUARE MILES	Open space (lawns, parks, golf courses, cemeteries, etc.): Poor condition (grass cover < 50%)	Fair condition (grass cover 50% to 75%)	Good condition (grass cover > 75%)	Impervious areas: Paved parking lots, roofs, driveways, etc.	Streets and roads: Paved; curbs and storm sewers (excluding right-of-way)	Paved; open ditches (including right-of-way)	Gravel (including right-of-way)	Residential districts by average lot size: 1/3 acre	TOTAL CN
	SF	AC.	MI^2	89	84	80	98	98	93	91	86	
1	28117.48	0.65	0.0010		0.39		0.26					89.58
2	89834.72	2.06	0.0032		0.73		0.02				1.32	85.39
3	26429.19	0.61	0.0009		0.46		0.15					87.45
4a	17924.37	0.41	0.0006		0.15		0.26					92.83
4b	10888.02	0.25	0.0004		0.04		0.21					95.56
5	11404.19	0.26	0.0004		0.21		0.06					86.95
6	15641.40	0.36	0.0006		0.11		0.25					93.60

LEGEND

- DRAINAGE AREA
- SHEET FLOW Tc
- SHALLOW CONCENTRATED Tc
- CHANNEL Tc

DRAINAGE NOTES:

1. EXISTING DRAINAGE AREAS SHOWN ARE BASED ON RECORD DRAWINGS FOR THIS SITE DATED MARCH 3, 2006.
2. DRAINAGE ANALYSIS COMPLIES WITH CITY OF GEORGETOWN DESIGN GUIDELINES AND ORDINANCES.

GEORGETOWN FIRE STATION No. 1 RENOVATION
NRCS METHOD
TIME OF CONCENTRATION CALCULATIONS (EXSITING CONDITIONS)

Overland flow: $T_1 = \{0.42(nL)^{0.8} / (P2)^{0.5}S^{0.4}\}$; Shallow concentrated flow: $V_{paved}=16.1345/S^{0.5}$, $V_{unpaved}=20.3282/S^{0.5}$; Channel flow: $T_3 = L / (60V)$

PT. NO.	OVERLAND FLOW LENGTH (FT)	MANNING'S N	SLOPE (FT/FT)	TRAVEL TIME (MIN)	SHALLOW CONC. FLOW LENGTH (FT)	SLOPE (FT/FT)	PAVED / UNPAVED	VELOCITY (FT/S)	TRAVEL TIME (MIN)	SHALLOW CONC. FLOW LENGTH (FT)	SLOPE (FT/FT)	PAVED / UNPAVED	VELOCITY (FT/S)	TRAVEL TIME (MIN)	CHANNEL FLOW LENGTH (FT)	MANNING'S N	SLOPE (FT/FT)	VELOCITY (FT/S)	TRAVEL TIME (MIN)	TIME OF CONCENTRATION (MIN)	LAG TIME (MIN) = 0.6*TOC
1	90	0.150	0.049	5.5	199	0.030	UNPAVED	2.8	1.2	0	0.010	UNPAVED	1.6	0.0	104	0.016	0.005	6.0	0.3	7.0	4.18
2	100	0.150	0.055	5.7	134	0.050	UNPAVED	3.6	0.6	0	0.010	UNPAVED	1.6	0.0	314	0.016	0.016	6.0	0.9	7.2	4.32
3	100	0.150	0.039	6.5	97	0.024	UNPAVED	2.5	0.6	0	0.010	UNPAVED	1.6	0.0	0	0.016	0.018	6.0	0.0	7.2	4.32
4a	15	0.145	0.017	1.9	53	0.020	UNPAVED	2.3	0.4	0	0.010	UNPAVED	1.6	0.0	204	0.240	0.018	6.0	0.6	2.9	1.74
4b	0	0.145	0.010	0.0	40	0.100	PAVED	6.4	0.1	88	0.029	PAVED	3.5	0.4	63	0.240	0.008	6.0	0.2	0.7	0.42
5	28	0.150	0.026	2.8	0	0.005	PAVED	1.4	0.0	0	0.010	UNPAVED	1.6	0.0	0	0.016	0.018	6.0	0.0	2.8	1.67
6	100	0.150	0.030	7.3	20	0.030	UNPAVED	2.8	0.1	0	0.010	UNPAVED	1.6	0.0	0	0.016	0.018	6.0	0.0	7.4	4.43

EXISTING CONDITIONS - PEAK FLOWS

DRAINAGE AREA	AREA (MI^2)	CURVE NUMBER (CN)	IMPERVIOUS COVER (%)	LAG TIME (MIN)	2-YR PEAK FLOW (CFS)	10-YR PEAK FLOW (CFS)	25-YR PEAK FLOW (CFS)	100-YR PEAK FLOW (CFS)
D.A. 1	0.0010	90	40	4.18	3.9	4.3	5.2	6.3
D.A. 2	0.0032	85	65	4.32	12.7	13.7	16.4	20.0
D.A. 3	0.0009	87	25	4.32	2.9	3.6	4.3	5.4
D.A. 4A	0.0006	93	63	1.74	3.5	3.1	3.7	4.4
D.A. 4B	0.0004	96	83	0.42	2.7	2.2	2.5	3.1
D.A. 5	0.0004	87	21	1.67	1.7	1.8	2.2	2.7
D.A. 6	0.0006	94	69	4.43	2.7	2.8	3.2	3.9

DETENTION POND-RESULTS SUMMARY TABLE

RAIN EVENT	2-YR	10-YR	25-YR	100-YR
EXISTING PEAK INFLOW (CFS)	12.9	18.8	25.2	34.3
EXISTING PEAK DISCHARGE (CFS)	9.1	16.2	19.6	25.3
MAXIMUM WATER SURFACE ELEVATION (FT)	744.5	745.0	745.2	745.6

DETENTION POND - STAGE-STORAGE TABLE

ELEVATION (FT)	AREA (sq. ft.)	AVERAGE AREA (sq. ft.)	DEPTH DIFF. (ft.)	STORAGE (c.f.)	STORAGE (ac. Ft.)	SUMMED STORAGE (ac. Ft.)
743.34	0	0	0	0	0	0
744.00	314	157	0.66	104	104	0.002
745.00	10,272	5293	1.00	5293	5397	0.124
746.00	13,262	11735	1.00	11735	17132	0.393
746.50	14,078	13668	0.50	6834	23965	0.550
747.00	14,914	14494	0.50	7247	31212	0.717

DETENTION POND #1-RESULTS SUMMARY TABLE

RAIN EVENT	2-YR	10-YR	25-YR	100-YR
EXISTING PEAK INFLOW (CFS)	5.8	6.3	7.7	9.4
EXISTING PEAK DISCHARGE (CFS)	2.3	5.0	6.2	8.0
MAXIMUM WATER SURFACE ELEVATION (FT)	747.1	747.5	747.6	747.8

DETENTION POND #2-RESULTS SUMMARY TABLE

RAIN EVENT	2-YR	10-YR	25-YR	100-YR
EXISTING PEAK INFLOW (CFS)	2.9	6.3	7.8	10.2
EXISTING PEAK DISCHARGE (CFS)	2.4	5.9	7.7	10.0
MAXIMUM WATER SURFACE ELEVATION (FT)	747.0	747.2	747.3	747.3

DETENTION POND #3-RESULTS SUMMARY TABLE

RAIN EVENT	2-YR	10-YR	25-YR	100-YR
EXISTING PEAK INFLOW (CFS)	3.9	4.3	5.2	6.3
EXISTING PEAK DISCHARGE (CFS)	0.1	2.2	3.5	5.4
MAXIMUM WATER SURFACE ELEVATION (FT)	748.5	747.8	748.9	749.0

EXTENDED DETENTION POND #1 - STAGE-STORAGE TABLE

ELEVATION (FT)	AREA (sq. ft.)	AVERAGE AREA (sq. ft.)	DEPTH DIFF. (ft.)	STORAGE (c.f.)	STORAGE (ac. Ft.)	SUMMED STORAGE (ac. Ft.)
745.38	0	0	0	0	0	0
745.50	1,880	940	0.12	113	113	0.003
746.00	2,114	1997	0.5	998	1111	0.026
746.50	2,370	2241	0.5	1120	2232	0.051
747.00	2,438	2404	0.5	1202	3434	0.079
747.12	2,454	2446	0.12	294	3727	0.086
748.00	2,662	2558	0.88	2251	5978	0.137

EXTENDED POND #2 - STAGE-STORAGE TABLE

ELEVATION (FT)	AREA (sq. ft.)	AVERAGE AREA (sq. ft.)	DEPTH DIFF. (ft.)	STORAGE (c.f.)	STORAGE (ac. Ft.)	SUMMED STORAGE (ac. Ft.)
745.00	0	0	0	0	0	0
745.50	1,233	617	0.5	308	308	0.007
746.00	1,583	1408	0.5	704	1012	0.023
746.50	1,639	1611	0.5	805	1818	0.042
746.70	1,663	1651	0.2	330	2148	0.049
747.20	1,663	1663	0.5	831	2979	0.068
747.70	1,663	1663	0.5	831	3811	0.087

EXTENDED DETENTION POND #3 - STAGE-STORAGE TABLE

ELEVATION (FT)	AREA (sq. ft.)	AVERAGE AREA (sq. ft.)	DEPTH DIFF. (ft.)	STORAGE (c.f.)	STORAGE (ac. Ft.)	SUMMED STORAGE (ac. Ft.)
746.45	0	0	0	0	0	0
747.00	1,880	940	0.55	517	517	0.012
748.00	2,760	2320	1.00	2320	2837	0.065
749.00	3,051	2904	1.00	2904	5741	0.132
749.50	3,051	3051	0.50	1525	7266	0.167

GEORGETOWN FIRE STATION NO. 1 RENOVATION
RATIONAL METHOD
DRAINAGE AREA CALCULATION SHEET (EXISTING CONDITIONS)

DRAINAGE AREA	DRAINAGE AREA	TOTAL ACRES	FOREST OR RANGE (GRASS COVER > 75%)	RANGE (GRASS COVER 50 75%)	Grass, 0-50% cover, 0/2% Slopes	AVERAGE RESIDENTIAL AREA;	LARGE LOT RESIDENTIAL AREA;	UNDEVELOPED	CLOSELY BUILT RESIDENTIAL AREAS/SCHOOL SITES:	Asphalt	BUSINESS/COMMERCIAL AREAS (90% IMPERVIOUS); O,C,	TOTAL CA
	SF	AC.	0.39	0.41	0.34	0.67	0.57	0.7	0.77	0.95	0.96	
7	22107	0.51			0.03					0.48		0.46

GEORGETOWN FIRE STATION NO. 1 RENOVATION
RATIONAL METHOD
TIME OF CONCENTRATION CALCULATIONS (EXISTING CONDITIONS)

Overland flow (Manning kinematic equation): $T_1 = \{0.42(nL)^{0.8} / (P2)^{0.5}S^{0.4}\}$; Shallow concentrated flow (NCRS method): $V_{paved}=16.1345/S^{0.5}$, $V_{unpaved}=20.3282/S^{0.5}$, $T_2=L/(60V)$; Channel flow (Manning equation): $T_3 = L / (60V)$

PT. NO.	OVERLAND LENGTH (FT)	MANNING'S N	SLOPE (FT/FT)	TRAVEL TIME (MIN)	SHALLOW LENGTH (FT)	SLOPE (FT/FT)	PAVED / UNPAVED	VELOCITY (FT/S)	TRAVEL TIME (MIN)	CHANNEL LENGTH (FT)	MANNING'S N	SLOPE (FT/FT)	VELOCITY (FT/S)	TRAVEL TIME (MIN)	TIME OF CONCENTRATION (MIN)
7	0	0.110	0.006	0.0	30	0.030	PAVED	3.5	0.1	610	0.300	0.015	6.0	1.7	1.8

P2=2-Year, 24 Hour Rainfall = 4.20 in

GEORGETOWN FIRE STATION NO. 1 RENOVATION
RATIONAL METHOD
PEAK DISCHARGE CALCULATIONS (EXISTING CONDITIONS)

POINT OF ANALYSIS	DRAINAGE AREAS (DA)	AREA (AC.)	RUNOFF COEFFICIENT C	TOTAL CA	TIME OF CONCEN-TRATION (MIN)	I_2 IN/HR	I_{10} IN/HR	I_{25} IN/HR	I_{100} IN/HR	Q_2 CFS	Q_{10} CFS	Q_{25} CFS	Q_{100} CFS
7	7	0.51	0.91	0.46	1.8	7.47	9.85	11.09	13.31	3.5	4.6	5.1	6.2

Rainfall Intensities based IDF Curves - Equation 3-5 Intensity Duration Frequency Equation

ISSUE FOR PERMIT

BROWN REYNOLDS WATFORD ARCHITECTS
175 CENTURY SQUARE DRIVE
SUITE 350
COLLEGE STATION, TEXAS 77840
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1555 GREENS PRAIRIE ROAD
COLLEGE STATION, TEXAS 77845
PHONE: (979) 846-6212
REGISTRATION #F-10573 / #101943-65

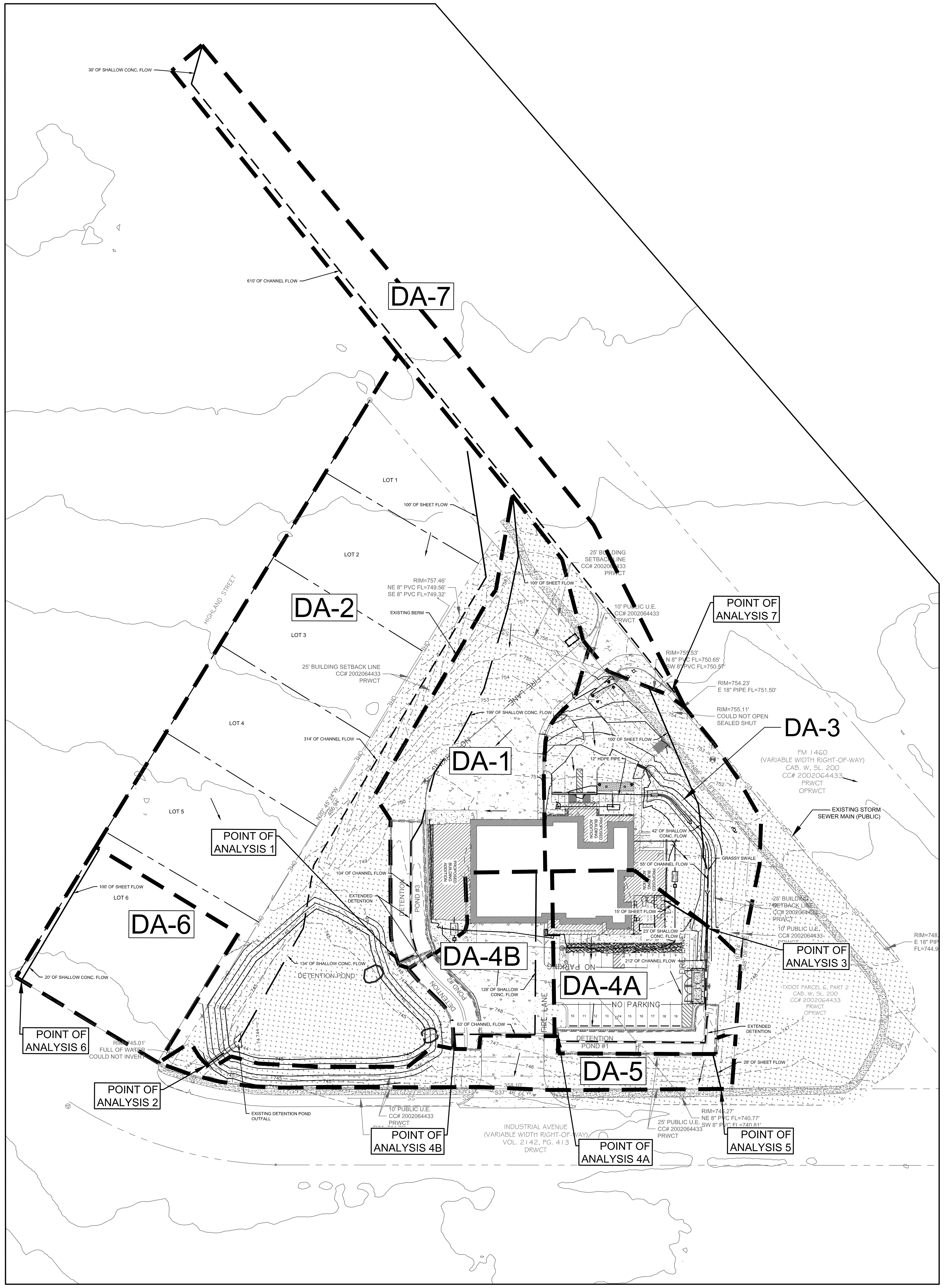
DATE	March 17, 2025
DRAWN BY	AM/NO
CHECKED BY	MPS
BRW PROJECT NUMBER	223046.00

CITY OF GEORGETOWN
FIRE STATION 1
RENOVATION
624 FM - 1460
GEORGETOWN, TEXAS 78626

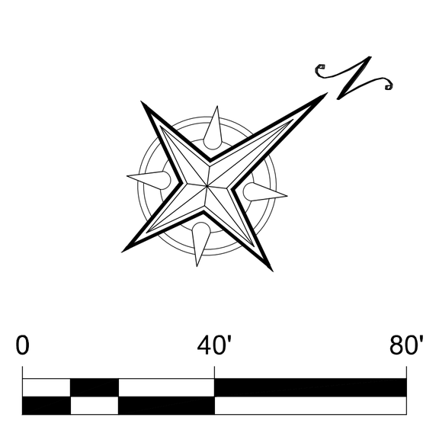
NO.	REVISION	DATE

C3.0

DRAINAGE PLAN



PROPOSED DRAINAGE AREA MAP



POST-PROJECT IMPERVIOUS COVER	AREA (S.F.)
PROPOSED	8,032
EXISTNG	51,612
TOTAL IMPERVIOUS AREA	**59,644**
TOTAL SITE AREA (2.71 ACRES)	118,048
TOTAL % IMPERVIOUS COVER	**51%**

GEORGETOWN FIRE STATION
NRCS METHOD
DRAINAGE AREA CALCULATION SHEET
(PROPOSED CONDITIONS)

		HSG D		Open space (lawns, parks, golf courses, cemeteries, etc.)			Impervious areas	Streets and roads:				
DRAINAGE AREA	DRAINAGE AREA	TOTAL ACRES	TOTAL ACRES	Poor condition (grass cover < 50%)	Fair condition (grass cover 50% to 75%)	Good condition (grass cover > 75%)	Paved parking lots, roofs, driveways, etc.	Paved; curbs and storm sewers (excluding right-of-way)	Paved; open ditches (including right-of-way)	Gravel (including right-of-way)	Residential districts by average lot size: 1/3 acre	TOTAL CN
	SF	AC.	MI^2	89	84	80	98	98	93	91	86	
1	28117.48	0.65	0.0010		0.39		0.26					89.58
2	89834.72	2.06	0.0032		0.73		0.02				1.32	85.39
3	26429.19	0.61	0.0009		0.31		0.30					90.87
4a	17924.37	0.41	0.0006		0.11		0.30					94.24
4b	10888.02	0.25	0.0004		0.04		0.21					95.67
5	11404.19	0.26	0.0004		0.21		0.06					86.95
6	15641.40	0.36	0.0006		0.11		0.25					93.60

LEGEND

- DRAINAGE AREA
- SHEET FLOW Tc
- SHALLOW CONCENTRATED Tc
- CHANNEL Tc

DRAINAGE NOTES:

1. EXISTING DRAINAGE AREAS SHOWN ARE BASED ON RECORD DRAWINGS FOR THIS SITE DATED MARCH 3, 2006.
2. DRAINAGE ANALYSIS COMPLIES WITH CITY OF GEORGETOWN DESIGN GUIDELINES AND ORDINANCES.

GEORGETOWN FIRE STATION No. 1 RENOVATION
NRCS METHOD
TIME OF CONCENTRATION CALCULATIONS (PROPOSED CONDITIONS)

PT. NO.	OVERLAND FLOW $T_1 = \{0.42(nL)^{0.8} / (P2)^{0.5}S^{0.4}\}$				SHALLOW CONCENTRATED FLOW $V_{paved}=16.1345/S^{0.5}$, $V_{unpaved}=20.3282/S^{0.5}$,					SHALLOW CONCENTRATED FLOW $V_{paved}=16.1345/S^{0.5}$, $V_{unpaved}=20.3282/S^{0.5}$,					CHANNEL FLOW $T_3= L / (60V)$					TIME OF CONCENTRATION (MIN)	LAG TIME (MIN)
	LENGTH (FT)	MANNING'S N	SLOPE (FT/FT)	TRAVEL TIME (MIN)	LENGTH (FT)	SLOPE (FT/FT)	PAVED / UNPAVED	VELOCITY (FT/S)	TRAVEL TIME (MIN)	LENGTH (FT)	SLOPE (FT/FT)	PAVED / UNPAVED	VELOCITY (FT/S)	TRAVEL TIME (MIN)	LENGTH (FT)	MANNING'S N	SLOPE (FT/FT)	VELOCITY (FT/S)	TRAVEL TIME (MIN)		
1	90	0.150	0.049	5.5	199	0.030	UNPAVED	2.8	1.2	0	0.010	UNPAVED	1.6	0.0	104	0.016	0.005	6.0	0.3	7.0	4.18
2	100	0.150	0.055	5.7	134	0.050	UNPAVED	3.6	0.6	0	0.010	UNPAVED	1.6	0.0	314	0.240	0.016	6.0	0.9	7.2	4.32
3	100	0.150	0.039	6.5	42	0.024	UNPAVED	2.5	0.3	0	0.010	UNPAVED	1.6	0.0	55	0.016	0.018	6.0	0.2	7.0	4.19
4a	15	0.145	0.017	1.9	0	0.020	PAVED	2.9	0.0	23	0.010	UNPAVED	1.6	0.2	212	0.016	0.018	6.0	0.6	2.8	1.66
4b	0	0.145	0.010	0.0	40	0.100	PAVED	6.4	0.1	88	0.029	PAVED	3.5	0.4	63	0.016	0.008	6.0	0.2	0.7	0.42
5	28	0.150	0.026	2.8	0	0.005	PAVED	1.4	0.0	0	0.010	UNPAVED	1.6	0.0	0	0.016	0.018	6.0	0.0	2.8	1.67
6	100	0.150	0.030	7.3	20	0.030	UNPAVED	2.8	0.1	0	0.010	UNPAVED	1.6	0.0	0	0.016	0.018	6.0	0.0	7.4	4.43

PROPOSED CONDITIONS - PEAK FLOWS

DRAINAGE AREA	AREA (MI^2)	CURVE NUMBER (CN)	IMPERVIOUS COVER (%)	LAG TIME (MIN)	2-YR PEAK FLOW (CFS)	10-YR PEAK FLOW (CFS)	25-YR PEAK FLOW (CFS)	100-YR PEAK FLOW (CFS)
D.A. 1	0.0010	90	40	4.18	3.9	4.3	5.2	6.3
D.A. 2	0.0032	85	65	4.32	12.7	13.7	16.4	20.0
D.A. 3	0.0009	91	49	4.19	3.8	4.0	4.8	5.8
D.A. 4A	0.0006	94	73	1.66	3.7	3.2	3.7	4.5
D.A. 4B	0.0004	96	83	0.42	2.7	2.2	2.5	3.1
D.A. 5	0.0004	87	21	1.67	1.7	1.8	2.2	2.7
D.A. 6	0.0006	94	69	4.43	2.7	2.8	3.2	3.9

DETENTION POND-RESULTS SUMMARY TABLE

RAIN EVENT	2-YR	10-YR	25-YR	100-YR
PROPOSED PEAK INFLOW (CFS)	12.9	20.0	25.7	34.7
PROPOSED PEAK DISCHARGE (CFS)	9.5	16.5	19.6	24.9
MAXIMUM WATER SURFACE ELEVATION (FT)	744.5	745.0	745.2	745.6

DETENTION POND - STAGE-STORAGE TABLE

ELEVATION (FT)	AREA (sq. ft.)	AVERAGE AREA (sq. ft.)	DEPTH DIFF. (ft.)	STORAGE (c.f.)	STORAGE (ac. Ft.)	SUMMED STORAGE (ac. Ft.)
743.34	0	0	0	0	0	0
744.00	44	22	0.66	15	15	0.000
745.00	12,387	6216	1.00	6216	6230	0.143
746.00	14,231	13298	1.00	13298	19528	0.448
746.50	15,182	14704	0.50	7352	26880	0.617
747.00	16,161	15669	0.50	7834	34715	0.797

DETENTION POND DISCHARGE CALCULATIONS

RECTANGULAR WEIR		
25 yr Weir Length		ft.
25 yr Weir Elevation		ft.
100 yr Weir Length	2.5	ft.
100 yr Weir Elevation	743.34	ft.

Elevation (ft)	Q orifice (cfs)	Q weir 25 (cfs	Q weir 100 (cfs)	Q total (cfs)
743.34	0.0	0.0	0.00	0.00
744.00	0.0	0.0	3.98	3.98
745.00	0.0	0.0	15.88	15.88
746.00	0.0	0.0	32.21	32.21
746.50	0.0	0.0	41.71	41.71
747.00	0.0	0.0	51.99	51.99

DETENTION POND #1-RESULTS SUMMARY TABLE

RAIN EVENT	2-YR	10-YR	25-YR	100-YR
PROPOSED PEAK INFLOW (CFS)	6.7	6.9	8.2	9.8
PROPOSED PEAK DISCHARGE (CFS)	3.2	5.5	6.7	8.4
MAXIMUM WATER SURFACE ELEVATION (FT)	747.3	747.6	747.7	747.9

EXTENDED DETENTION POND #1 - STAGE-STORAGE TABLE

ELEVATION (FT)	AREA (sq. ft.)	AVERAGE AREA (sq. ft.)	DEPTH DIFF. (ft.)	STORAGE (c.f.)	STORAGE (ac. Ft.)	SUMMED STORAGE (ac. Ft.)
745.38	0	0	0	0	0	0
745.50	1,880	940	0.12	113	113	0.003
746.00	2,114	1997	0.5	998	1111	0.026
746.50	2,370	2241	0.5	1120	2232	0.051
747.00	2,438	2404	0.5	1202	3434	0.079
747.12	2,454	2446	0.12	294	3727	0.086
748.00	2,662	2558	0.88	2251	5978	0.137

DETENTION POND #2-RESULTS SUMMARY TABLE

RAIN EVENT	2-YR	10-YR	25-YR	100-YR
PROPOSED PEAK INFLOW (CFS)	3.8	7.0	8.3	10.6
PROPOSED PEAK DISCHARGE (CFS)	3.3	6.8	8.3	10.5
MAXIMUM WATER SURFACE ELEVATION (FT)	747.1	747.3	747.3	747.3

EXTENDED POND #2 - STAGE-STORAGE TABLE

ELEVATION (FT)	AREA (sq. ft.)	AVERAGE AREA (sq. ft.)	DEPTH DIFF. (ft.)	STORAGE (c.f.)	STORAGE (ac. Ft.)	SUMMED STORAGE (ac. Ft.)
745.00	0	0	0	0	0	0
745.50	1,233	617	0.5	308	308	0.007
746.00	1,583	1408	0.5	704	1012	0.023
746.50	1,639	1611	0.5	805	1818	0.042
746.70	1,663	1651	0.2	330	2148	0.049
747.20	1,663	1663	0.5	831	2979	0.068
747.70	1,663	1663	0.5	831	3811	0.087

DETENTION POND #3-RESULTS SUMMARY TABLE

RAIN EVENT	2-YR	10-YR	25-YR	100-YR
PROPOSED PEAK INFLOW (CFS)	3.9	4.3	5.2	6.3
PROPOSED PEAK DISCHARGE (CFS)	0.1	2.2	3.5	5.4
MAXIMUM WATER SURFACE ELEVATION (FT)	748.5	748.8	748.9	749.0

EXTENDED DETENTION POND #3 - STAGE-STORAGE TABLE

ELEVATION (FT)	AREA (sq. ft.)	AVERAGE AREA (sq. ft.)	DEPTH DIFF. (ft.)	STORAGE (c.f.)	STORAGE (ac. Ft.)	SUMMED STORAGE (ac. Ft.)
746.45	0	0	0	0	0	0
747.00	1,880	940	0.55	517	517	0.012
748.00	2,760	2320	1.00	2320	2837	0.065
749.00	3,051	2904	1.00	2904	5741	0.132
749.50	3,051	3051	0.50	1525	7266	0.167

GEORGETOWN FIRE STATION NO. 1 RENOVATION
RATIONAL METHOD
DRAINAGE AREA CALCULATION SHEET
(PROPOSED CONDITIONS)

DRAINAGE AREA	DRAINAGE AREA	TOTAL ACRES	FOREST OR RANGE (GRASS COVER > 75%)	RANGE (GRASS COVER 50-75%)	Grass, 0-50% cover, 0/2% Slopes	AVERAGE RESIDENTIAL AREA; R-5, R-6	LARGE LOT RESIDENTIAL AREA; RE	UNDEVELOPED	CLOSELY BUILT RESIDENTIAL AREAS/SCHOOL SITES; R-4	Asphalt	BUSINESS/COMMERCIAL AREAS (90% IMPERVIOUS) O,C,I-1,I-2	TOTAL CA
	SF	AC.	0.39	0.41	0.34	0.67	0.57	0.7	0.77	0.95	0.96	
7	22107.38	0.51			0.03					0.48		0.47

GEORGETOWN FIRE STATION NO. 1 RENOVATION
RATIONAL METHOD
TIME OF CONCENTRATION CALCULATIONS (PROPOSED CONDITIONS)

PT. NO.	OVERLAND FLOW (MANNING KINEMATIC EQUATION) $T_1 = \{0.42(nL)^{0.8} / (P2)^{0.5}S^{0.4}\}$				SHALLOW CONCENTRATED FLOW (NCRS METHOD) $V_{paved}=16.1345/S^{0.5}$, $V_{unpaved}=20.3282/S^{0.5}$, $T_2=L/(60V)$					CHANNEL FLOW (MANNING EQUATION) $T_3= L / (60V)$					TIME OF CONCENTRATION (MIN)
	LENGTH (FT)	MANNING'S N	SLOPE (FT/FT)	TRAVEL TIME (MIN)	LENGTH (FT)	SLOPE (FT/FT)	PAVED / UNPAVED	VELOCITY (FT/S)	TRAVEL TIME (MIN)	LENGTH (FT)	MANNING'S N	SLOPE (FT/FT)	VELOCITY (FT/S)	TRAVEL TIME (MIN)	
7	0	0.110	0.006	0.0	30	0.030	PAVED	3.5	0.1	610	0.300	0.015	6.0	1.7	1.8

GEORGETOWN FIRE STATION NO. 1 RENOVATION
RATIONAL METHOD
PEAK DISCHARGE CALCULATIONS (PROPOSED CONDITIONS)

POINT OF ANALYSIS	DRAINAGE AREAS (DA)	AREA (AC.)	RUNOFF COEFFICIENT C	TOTAL CA	TIME OF CONCENTRATION (MIN)	INTENSITY I_2 IN/HR	I_{10} IN/HR	I_{25} IN/HR	I_{100} IN/HR	FLOW (Q=CIA) Q_2 CFS	Q_{10} CFS	Q_{25} CFS	Q_{100} CFS
7	7	0.51	0.92	0.47	1.8	7.47	9.85	11.09	13.31	3.5	4.6	5.2	6.2

ISSUE FOR PERMIT

BROWN REYNOLDS WATFORD ARCHITECTS
175 CENTURY SQUARE DRIVE
SUITE 350
COLLEGE STATION, TEXAS 77840
979-694-1791
WWW.BRWARCH.COM

03/17/2025
STATE OF TEXAS
MARY P. STEWART
108905
LICENSED PROFESSIONAL ENGINEER

KCI TECHNOLOGIES, INC.
1555 GREENS PRAIRIE ROAD
COLLEGE STATION, TEXAS 77845
PHONE: (979) 846-6212
REGISTRATION #F-10573 / #101943-65

DATE	March 17, 2025
DRAWN BY	AM/NO
CHECKED BY	MPS
BRW PROJECT NUMBER	223046.00

CITY OF GEORGETOWN FIRE STATION 1 RENOVATION
624 FM - 1460
GEORGETOWN, TEXAS 78626

NO.	REVISION	DATE

C3.1
DRAINAGE PLAN

Attachment H

Temporary Sediment Pond(s) Plans and Calculations
City of Georgetown New Fire Station 1

N/A

Attachment I

Inspections and Maintenance
City of Georgetown New Fire Station 1

There will be several types of Temporary BMPs used for this project: Silt Fencing, inlet protection, and rock berm. Items listed below must be inspected every 7 days and within 24 hours of a rainfall event of 0.5 inches or more. These inspections and if any maintenance is performed on such BMPs, it must be documented within the inspection and maintenance report form and kept on site. The forms can be found at the end of this section.

Silt Fencing, Rock Berm, Inlet Protection, and Temporary Construction Entrance/Exit

Refer to TCEQ "Edwards Aquifer Technical Guidance Manual" Rev. Jul05, pages 1-66 to 1-68 (Silt Fencing), pages 1-72 to 1-74 (Rock Berms), pages 1-89 to 1-92 (Area Inlet Protection), for standards, and also refer to "Sedimentation & Erosion Control Plan" of the construction plans for locations/details/guidance.

Contractor shall maintain log and document following items for all BMP's on site:

1) Inspection of all fencing/berms/bags/dikes weekly, and after any rainfall event.
2) Removal of sediment when buildup reaches 6" on any temporary BMP, or the installation of a second line of fencing parallel to the old fence. Dispose of the accumulated silt of in an approved manner.
3) Replacement of any torn fabric or installation of a second line of fencing parallel to the old fence.
4) Replacement/repair of any sections crushed, torn, or collapsed temporary BMPs in the course of construction activity. If a section of fence/berm is obstructing vehicular access, document the relocation to a spot where it will provide equal protection, but will not obstruct vehicles.
5) For installations of rock berms in streambeds, additional daily inspections should be made.
6) For rock berms, any lose wire sheathing shall be repaired or replaced as needed and the berm reshaped as needed during inspection.
7) Any rock berms are to be replaced when the structure ceases to function as intended due to silt accumulation among the rocks, washout, construction traffic damage, etc.
8) Any rock berm shall be left in place until all upstream areas are stabilized and accumulated silt removed.
9) Any gravel filter bags torn allowing gravel to come out of the constraints of the bag shall be replaced immediately.

These temporary BMPs as shown on the "Storm Water Pollution Prevention Plan (SWPPP) / Erosion and Sediment Control Plan / Details" will intercept any storm water borne pollutants originating onsite, including upstream offsite runoff, therefore preventing them from entering roadways, Geological Features, and drainage structures that ultimately enter Culebra Creek.

Temporary Construction Entrance/Exit

Contractor shall establish and maintain a Temporary Construction Entrance/Exit throughout the construction period to protect the site from pollutants brought onto the site from other sources or leaving the site. Contractor to ensure rocks are maintained free of trash and sediment.

Attachment J

Schedule of Interim and Permanent Soil Stabilization Practices
City of Georgetown New Fire Station 1

Interim Practices

All temporary BMPs as described in Attachment I.

Permanent Practices

Stabilization measures shall be initiated as soon as practicable in portions of the site where construction activities have temporarily or permanently ceased, but in no case more than 14 days after the construction activity in that portion of the site has temporarily or permanently ceased. Where the initiation of stabilization measures by the 14th day after construction activity temporary or permanently cease is precluded by weather conditions, stabilization measures shall be initiated as soon as practicable. Where construction activity on a portion of the site is temporarily ceased, and earth disturbing activities will be resumed within 21 days, temporary stabilization measures do not have to be initiated on that portion of the site. In areas experiencing droughts where the initiation of stabilization measures by the 14th day after construction activity has temporarily or permanently ceased is precluded by seasonal arid conditions, stabilization measures shall be initiated as soon as practicable.

Refer to "Water Pollution Abatement Plan (WPAP)" for all areas to be sodded within the project limits which includes all disturbed areas associated with this project beyond the home lots, driveways, streets, sidewalks and utility trenching.

Permanent Stormwater Section

Texas Commission on Environmental Quality

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

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

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

Signature

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

Print Name of Customer/Agent: Mary P. Stewart

Date: 3/14/2025

Signature of Customer/Agent

Regulated Entity Name: City of Georgetown New Fire Station 1

Permanent Best Management Practices (BMPs)

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

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

   [ ] N/A

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

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

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

☐ N/A

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

   ☐ N/A

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

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

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

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

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

- [X] A description of the BMPs and measures that will be used to prevent pollution of surface water, groundwater, or stormwater that originates upgradient from the site and flows across the site is attached.
- [ ] No surface water, groundwater or stormwater originates upgradient from the site and flows across the site, and an explanation is attached.
- [ ] Permanent BMPs or measures are not required to prevent pollution of surface water, groundwater, or stormwater that originates upgradient from the site and flows across the site, and an explanation is attached.

7. [X] **Attachment C - BMPs for On-site Stormwater**.

   - [X] A description of the BMPs and measures that will be used to prevent pollution of surface water or groundwater that originates on-site or flows off the site, including pollution caused by contaminated stormwater runoff from the site is attached.
   - [ ] Permanent BMPs or measures are not required to prevent pollution of surface water or groundwater that originates on-site or flows off the site, including pollution caused by contaminated stormwater runoff, and an explanation is attached.

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

   - [ ] N/A

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

   - [X] The permanent sealing of or diversion of flow from a naturally-occurring sensitive feature that accepts recharge to the Edwards Aquifer as a permanent pollution abatement measure has not been proposed.
   - [ ] **Attachment E - Request to Seal Features**. A request to seal a naturally-occurring sensitive feature, that includes, for each feature, a justification as to why no reasonable and practicable alternative exists, is attached.

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

    - [X] Design calculations (TSS removal calculations)
    - [X] TCEQ construction notes
    - [X] All geologic features
    - [X] All proposed structural BMP(s) plans and specifications

    - [ ] N/A

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

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

    [ ] N/A

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

    [X] N/A

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

    [X] N/A

Responsibility for Maintenance of Permanent BMP(s)

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

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

    [ ] N/A

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

    [ ] N/A

Attachment A

20% or Less Impervious Cover Waiver
City of Georgetown New Fire Station 1

N/A

Attachment B

BMPs for Upgradient Stormwater
City of Georgetown New Fire Station 1

The site plan shows the area upstream of the site (west of the stie, south of FM 1460 and east of Highland Street) that used to flow across the site (treated by vegetated filter strip before entering the site) now drains through a parking lot and is treated by its own BMPs. No other upgradient stormwater affects the proposed development area of the site.

Attachment C

BMPs for On-Site Stormwater
City of Georgetown New Fire Station 1

The majority of the unit that will be developed is near or at the top of the existing local high point. Please refer to the Impervious Cover and Drainage Area Exhibit for the following narrative of Permanent BMPs.

1. Drainage Area 1 has runoff from the driveway discharging towards the sawtooth curb where it will flow across a 15' vegetated filter strip (VFS 1). This runoff continues to flow towards the proposed flowline through a sidewalk drain into the grassy swale (in series).

2. Drainage Area 2 has runoff from the sidewalk discharging across a 15' vegetated filter strip (VFS 2). This runoff continues to flow towards the proposed flowline into the grassy swale (in series).

3. Drainage Area 3 has runoff from the sidewalk and proposed building discharging across a 15' vegetated filter strip (VFS 3). This runoff continues to flow towards the proposed grassy swale (in series).

4. Drainage Area 4 has runoff from proposed building, sidewalk, driveway, and parking area discharging to a grate inlet into an underground storm system (less than 72'). This runoff is conveyed through the underground storm system and daylights out towards the proposed grassy swale (147 ft).

Attachment D

BMPs for Surface Streams
City of Georgetown New Fire Station 1

No surface streams will be impacted by pollutants carried by surface runoff from this project site.

Attachment E

Request to Seal Features
City of Georgetown New Fire Station 1

N/A

Attachment F

Construction Plans
City of Georgetown New Fire Station 1
(Renovations)

Texas Commission on Environmental Quality

TSS Removal Calculations 04-20-2009

Project Name: Georgetown Fire Station 1 Renovation (Overall)
Date Prepared: 3/7/2025

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

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

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

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

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

County =	Williamson	
Total project area included in plan * =	3.14	acres
Predevelopment impervious area within the limits of the plan * =	1.21	acres
Total post-development impervious area within the limits of the plan * =	1.40	acres
Total post-development impervious cover fraction * =	0.44	
P =	32	inches
$L_{M\ TOTAL\ PROJECT}$ =	160	lbs.

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

Number of drainage basins / outfalls areas leaving the plan area = 5

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

Drainage Basin/Outfall Area No. = 0

Total drainage basin/outfall area =	3.14	acres
Predevelopment impervious area within drainage basin/outfall area =	1.21	acres
Post-development impervious area within drainage basin/outfall area =	1.40	acres
Post-development impervious fraction within drainage basin/outfall area =	0.44	
$L_{M\ THIS\ BASIN}$ =	160	lbs.

3. Indicate the proposed BMP Code for this basin.

Proposed BMP = Vegetated Filter Strips
Removal efficiency = 85 percent

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

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

RG-348 Page 3-33 Equation 3.7: L_R = (BMP efficiency) x P x (A_I x 34.6 + A_P x 0.54)

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

A_C =	0.00	acres
A_I =	0.00	acres
A_P =	0.00	acres
L_R =	0	lbs

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

Desired $L_{M\ THIS\ BASIN}$ = 0 lbs.

F = #DIV/0!

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

Rainfall Depth =	#DIV/0!	inches
Post Development Runoff Coefficient =	#DIV/0!	
On-site Water Quality Volume =	#DIV/0!	cubic feet

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

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

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

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

Required Water Quality Volume for retention basin = NA cubic feet

Irrigation Area Calculations:

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

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

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

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

9A. Full Sedimentation and Filtration System

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

9B. Partial Sedimentation and Filtration System

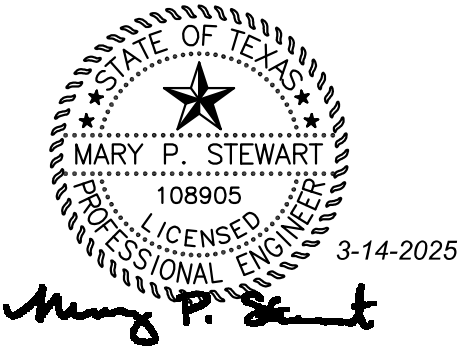
Water Quality Volume for combined basins =	NA	cubic feet	
Minimum filter basin area =	NA	square feet	
Maximum sedimentation basin area =	NA	square feet	For minimum water depth of 2 feet
Minimum sedimentation basin area =	NA	square feet	For maximum water depth of 8 feet

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

Required Water Quality Volume for Bioretention Basin = NA cubic feet

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

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



Texas Commission on Environmental Quality

TSS Removal Calculations 04-20-2009

Project Name: Georgetown Fire Station 1 Revenovation (Area 1)
Date Prepared: 3/7/2025

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

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

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

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

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

County =	Williamson	
Total project area included in plan * =	3.14	acres
Predevelopment impervious area within the limits of the plan * =	1.21	acres
Total post-development impervious area within the limits of the plan * =	1.40	acres
Total post-development impervious cover fraction * =	0.44	
P =	32	inches
$L_{M\ TOTAL\ PROJECT}$ =	160	lbs.

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

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

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

Drainage Basin/Outfall Area No. = 1

Total drainage basin/outfall area =	0.03	acres
Predevelopment impervious area within drainage basin/outfall area =	0.00	acres
Post-development impervious area within drainage basin/outfall area =	0.03	acres
Post-development impervious fraction within drainage basin/outfall area =	1.00	
$L_{M\ THIS\ BASIN}$ =	27	lbs.

3. Indicate the proposed BMP Code for this basin.

Proposed BMP = Vegetated Filter Strips
Removal efficiency = 85 percent

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

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

RG-348 Page 3-33 Equation 3.7: L_R = (BMP efficiency) x P x (A_I x 34.6 + A_P x 0.54)

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

A_C =	0.03	acres
A_I =	0.03	acres
A_P =	0.00	acres
L_R =	30	lbs

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

Desired $L_{M\ THIS\ BASIN}$ = 33 lbs.

F = 1.12

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

Rainfall Depth =	4.00	inches
Post Development Runoff Coefficient =	0.82	
On-site Water Quality Volume =	372	cubic feet

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

Off-site area draining to BMP =	0.00	acres
Off-site Impervious cover draining to BMP =	0.00	acres
Impervious fraction of off-site area =	0	
Off-site Runoff Coefficient =	0.00	
Off-site Water Quality Volume =	0	cubic feet
Storage for Sediment =	74	
Total Capture Volume (required water quality volume(s) x 1.20) =	447	cubic feet

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

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

Required Water Quality Volume for retention basin = NA cubic feet

Irrigation Area Calculations:

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

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

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

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

9A. Full Sedimentation and Filtration System

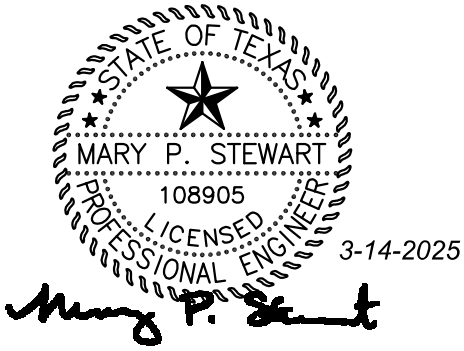
Water Quality Volume for sedimentation basin =	NA	cubic feet	
Minimum filter basin area =	NA	square feet	
Maximum sedimentation basin area =	NA	square feet	For minimum water depth of 2 feet
Minimum sedimentation basin area =	NA	square feet	For maximum water depth of 8 feet

9B. Partial Sedimentation and Filtration System

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

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

Required Water Quality Volume for Bioretention Basin = NA cubic feet



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

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

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

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

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

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

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

14. Stormwater Management StormFilter® by CONTECH

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

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

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

Design parameters for the swale:

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

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

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

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

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

Q = CiA = 4.71 cfs

To calculate the flow velocity in the swale:

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

To calculate the resulting swale length:

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

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

15B. Alternative Method using Excel Solver

Design Q = CiA = 4.71 cfs

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

Instructions are provided to the right (green comments).

Flow Velocity 0.36 ft/s
Minimum Length = 107.24 ft

Instructions are provided to the right (blue comments).

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

First calculate the load removal at 1.1 in/hour

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

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

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

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

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

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

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

Load removed by Wet Vault = #VALUE! lbs

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

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

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

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

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

PERMEABLE CONCRETE MAY ONLY BE USED ON THE CONTRIBUTING ZONE

Texas Commission on Environmental Quality

TSS Removal Calculations 04-20-2009

Project Name: Georgetown Fire Station 1 Revenovation (Area 2)
Date Prepared: 3/7/2025

Additional information is provided for cells with a red triangle in the upper right corner. Place the cursor over the cell.
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Characters shown in black (Bold) are calculated fields. Changes to these fields will remove the equations used in the spreadshe

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

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

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

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

County =	Williamson	
Total project area included in plan * =	3.14	acres
Predevelopment impervious area within the limits of the plan * =	1.21	acres
Total post-development impervious area within the limits of the plan * =	1.40	acres
Total post-development impervious cover fraction * =	0.44	
P =	32	inches
$L_{M\ TOTAL\ PROJECT}$ =	160	lbs.

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

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

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

Drainage Basin/Outfall Area No. = 1

Total drainage basin/outfall area =	0.01	acres
Predevelopment impervious area within drainage basin/outfall area =	0.00	acres
Post-development impervious area within drainage basin/outfall area =	0.01	acres
Post-development impervious fraction within drainage basin/outfall area =	1.00	
$L_{M\ THIS\ BASIN}$ =	5	lbs.

3. Indicate the proposed BMP Code for this basin.

Proposed BMP = Vegetated Filter Strips
Removal efficiency = 85 percent

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

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

RG-348 Page 3-33 Equation 3.7: L_R = (BMP efficiency) x P x (A_I x 34.6 + A_P x 0.54)

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

A_C =	0.01	acres
A_I =	0.01	acres
A_P =	0.00	acres
L_R =	6	lbs

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

Desired $L_{M\ THIS\ BASIN}$ = 33 lbs.

F = 5.97

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

Rainfall Depth =	4.00	inches
Post Development Runoff Coefficient =	0.82	
On-site Water Quality Volume =	70	cubic feet

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

Off-site area draining to BMP =	0.00	acres
Off-site Impervious cover draining to BMP =	0.00	acres
Impervious fraction of off-site area =	0	
Off-site Runoff Coefficient =	0.00	
Off-site Water Quality Volume =	0	cubic feet
Storage for Sediment =	14	
Total Capture Volume (required water quality volume(s) x 1.20) =	84	cubic feet

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

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

Required Water Quality Volume for retention basin = NA cubic feet

Irrigation Area Calculations:

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

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

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

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

9A. Full Sedimentation and Filtration System

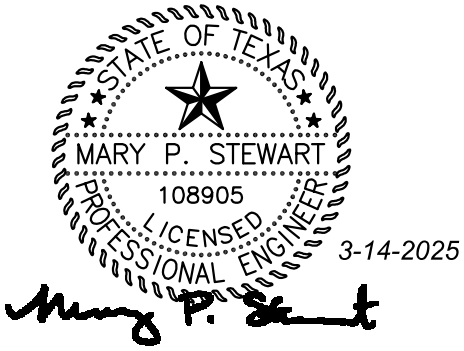
Water Quality Volume for sedimentation basin =	NA	cubic feet	
Minimum filter basin area =	NA	square feet	
Maximum sedimentation basin area =	NA	square feet	For minimum water depth of 2 feet
Minimum sedimentation basin area =	NA	square feet	For maximum water depth of 8 feet

9B. Partial Sedimentation and Filtration System

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

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

Required Water Quality Volume for Bioretention Basin = NA cubic feet



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

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

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

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

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

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

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

14. Stormwater Management StormFilter® by CONTECH

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

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

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

Design parameters for the swale:

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

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

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

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

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

Q = CiA = 4.71 cfs

To calculate the flow velocity in the swale:

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

To calculate the resulting swale length:

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

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

15B. Alternative Method using Excel Solver

Design Q = CiA = 4.71 cfs

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

Instructions are provided to the right (green comments).

Flow Velocity 0.36 ft/s
Minimum Length = 107.24 ft

Instructions are provided to the right (blue comments).

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

First calculate the load removal at 1.1 in/hour

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

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

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

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

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

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

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

Load removed by Wet Vault = #VALUE! lbs

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

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

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

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

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

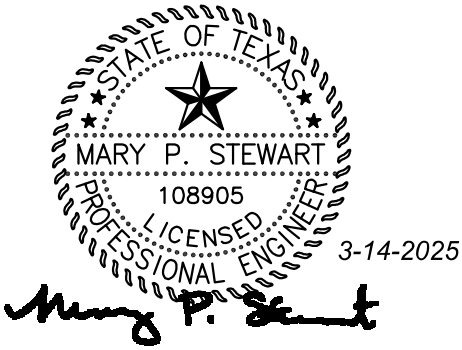
PERMEABLE CONCRETE MAY ONLY BE USED ON THE CONTRIBUTING ZONE

Texas Commission on Environmental Quality

TSS Removal Calculations 04-20-2009

Project Name: Georgetown Fire Station 1 Revenovation (Area 3)
Date Prepared: 3/7/2025

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



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

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

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

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

County =	Williamson	
Total project area included in plan * =	3.14	acres
Predevelopment impervious area within the limits of the plan * =	1.21	acres
Total post-development impervious area within the limits of the plan * =	1.40	acres
Total post-development impervious cover fraction * =	0.44	
P =	32	inches
$L_{M\ TOTAL\ PROJECT}$ =	160	lbs.

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

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

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

Drainage Basin/Outfall Area No. = 3

Total drainage basin/outfall area =	0.05	acres
Predevelopment impervious area within drainage basin/outfall area =	0.00	acres
Post-development impervious area within drainage basin/outfall area =	0.05	acres
Post-development impervious fraction within drainage basin/outfall area =	1.00	
$L_{M\ THIS\ BASIN}$ =	47	lbs.

3. Indicate the proposed BMP Code for this basin.

Proposed BMP = Vegetated Filter Strips
Removal efficiency = 85 percent

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

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

RG-348 Page 3-33 Equation 3.7: L_R = (BMP efficiency) x P x (A_I x 34.6 + A_P x 0.54)

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

A_C =	0.05	acres
A_I =	0.05	acres
A_P =	0.00	acres
L_R =	50	lbs

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

Desired $L_{M\ THIS\ BASIN}$ = 47 lbs.

F = 0.93

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

Rainfall Depth =	2.20	inches
Post Development Runoff Coefficient =	0.82	
On-site Water Quality Volume =	349	cubic feet

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

Off-site area draining to BMP =	0.00	acres
Off-site Impervious cover draining to BMP =	0.00	acres
Impervious fraction of off-site area =	0	
Off-site Runoff Coefficient =	0.00	
Off-site Water Quality Volume =	0	cubic feet
Storage for Sediment =	70	
Total Capture Volume (required water quality volume(s) x 1.20) =	419	cubic feet

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

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

Required Water Quality Volume for retention basin = NA cubic feet

Irrigation Area Calculations:

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

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

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

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

9A. Full Sedimentation and Filtration System

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

9B. Partial Sedimentation and Filtration System

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

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

Required Water Quality Volume for Bioretention Basin = NA cubic feet

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

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

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

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

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

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

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

14. Stormwater Management StormFilter® by CONTECH

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

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

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

Design parameters for the swale:

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

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

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

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

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

Q = CiA = 4.71 cfs

To calculate the flow velocity in the swale:

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

To calculate the resulting swale length:

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

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

15B. Alternative Method using Excel Solver

Design Q = CiA = 4.71 cfs

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

Instructions are provided to the right (green comments).

Flow Velocity 0.36 ft/s
Minimum Length = 107.24 ft

Instructions are provided to the right (blue comments).

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

First calculate the load removal at 1.1 in/hour

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

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

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

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

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

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

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

Load removed by Wet Vault = #VALUE! lbs

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

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

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

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

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

PERMEABLE CONCRETE MAY ONLY BE USED ON THE CONTRIBUTING ZONE

Texas Commission on Environmental Quality

TSS Removal Calculations 04-20-2009

Project Name: Georgetown Fire Station 1 Revenovation (Area 4)
Date Prepared: 3/7/2025

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

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

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

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

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

County =	Williamson	
Total project area included in plan * =	3.14	acres
Predevelopment impervious area within the limits of the plan * =	1.21	acres
Total post-development impervious area within the limits of the plan * =	1.40	acres
Total post-development impervious cover fraction * =	0.44	
P =	32	inches
$L_{M\ TOTAL\ PROJECT}$ =	160	lbs.

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

Number of drainage basins / outfalls areas leaving the plan area = 5

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

Drainage Basin/Outfall Area No. = 5

Total drainage basin/outfall area =	0.14	acres
Predevelopment impervious area within drainage basin/outfall area =	0.00	acres
Post-development impervious area within drainage basin/outfall area =	0.12	acres
Post-development impervious fraction within drainage basin/outfall area =	0.89	
$L_{M\ THIS\ BASIN}$ =	108	lbs.

3. Indicate the proposed BMP Code for this basin.

Proposed BMP = Grassy Swale
Removal efficiency = 70 percent

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

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

RG-348 Page 3-33 Equation 3.7: L_R = (BMP efficiency) x P x (A_I x 34.6 + A_P x 0.54)

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

A_C =	0.14	acres
A_I =	0.12	acres
A_P =	0.01	acres
L_R =	96	lbs

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

Desired $L_{M\ THIS\ BASIN}$ = 108 lbs.

F = 1.12

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

Rainfall Depth =	4.00	inches
Post Development Runoff Coefficient =	0.73	
On-site Water Quality Volume =	1468	cubic feet

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

Off-site area draining to BMP =	0.00	acres
Off-site Impervious cover draining to BMP =	0.00	acres
Impervious fraction of off-site area =	0	
Off-site Runoff Coefficient =	0.00	
Off-site Water Quality Volume =	0	cubic feet
Storage for Sediment =	294	
Total Capture Volume (required water quality volume(s) x 1.20) =	1762	cubic feet

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

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

Required Water Quality Volume for retention basin = NA cubic feet

Irrigation Area Calculations:

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

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

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

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

9A. Full Sedimentation and Filtration System

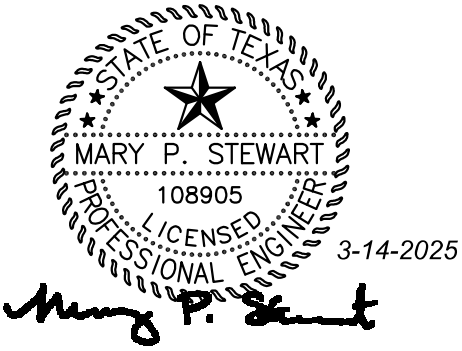
Water Quality Volume for sedimentation basin =	NA	cubic feet	
Minimum filter basin area =	NA	square feet	
Maximum sedimentation basin area =	NA	square feet	For minimum water depth of 2 feet
Minimum sedimentation basin area =	NA	square feet	For maximum water depth of 8 feet

9B. Partial Sedimentation and Filtration System

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

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

Required Water Quality Volume for Bioretention Basin = NA cubic feet



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

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

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

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

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

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

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

14. Stormwater Management StormFilter® by CONTECH

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

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

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

Design parameters for the swale:

Drainage Area to be Treated by the Swale = A = 0.23 acres
Impervious Cover in Drainage Area = 0.21 acres
Rainfall Intensity = i = 1.1 in/hr
Swale Slope = 0.01 ft/ft
Side Slope (z) = 3
Design Water Depth = y = 0.50 ft
Weighted Runoff Coefficient = C = 0.71

A_{CS} = cross-sectional area of flow in Swale = 0.38 sf
P_W = Wetted Perimeter = 2.43 feet
R_H = hydraulic radius of flow cross-section = A_{CS}/P_W = 0.16 feet
n = Manning's roughness coefficient = 0.2

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

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

$b = \frac{0.134 \times Q}{y^{1.67} S^{0.5}} - zy$ = -0.74 feet

Q = CiA = 0.18 cfs

To calculate the flow velocity in the swale:

V (Velocity of Flow in the swale) = Q/A_{CS} = 0.47 ft/sec

To calculate the resulting swale length:

L = Minimum Swale Length = V (ft/sec) * 300 (sec) = 140.71 feet

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

15B. Alternative Method using Excel Solver

Design Q = CiA = 0.18 cfs

Manning's Equation Q = 1.54 cfs Error 1 = -1.36
Swale Width= 6.00 ft

Instructions are provided to the right (green comments).

Flow Velocity 0.47 ft/s
Minimum Length = 140.71 ft

Instructions are provided to the right (blue comments).

Design Width = 6 ft
Design Discharge = 0.76 cfs Error 2 = -0.58
Design Depth = 0.33 ft
Flow Velocity = 0.32 cfs
Minimum Length = 97.48 ft

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

First calculate the load removal at 1.1 in/hour

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

C = runoff coefficient for the drainage area = 0.76 **C = Runoff Coefficient = 0.546 (IC)^2 + 0.328 (IC) + 0.03**
i = design rainfall intensity = 1.1 in/hour
A = drainage area in acres = 1 acres

Q = flow rate in cubic feet per second = 0.83 cubic feet/sec

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

Q = Runoff rate calculated above = 0.83 cubic feet/sec
A = Water surface area in the wet vault = 150 square feet

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

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

Load removed by Wet Vault = #VALUE! lbs

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

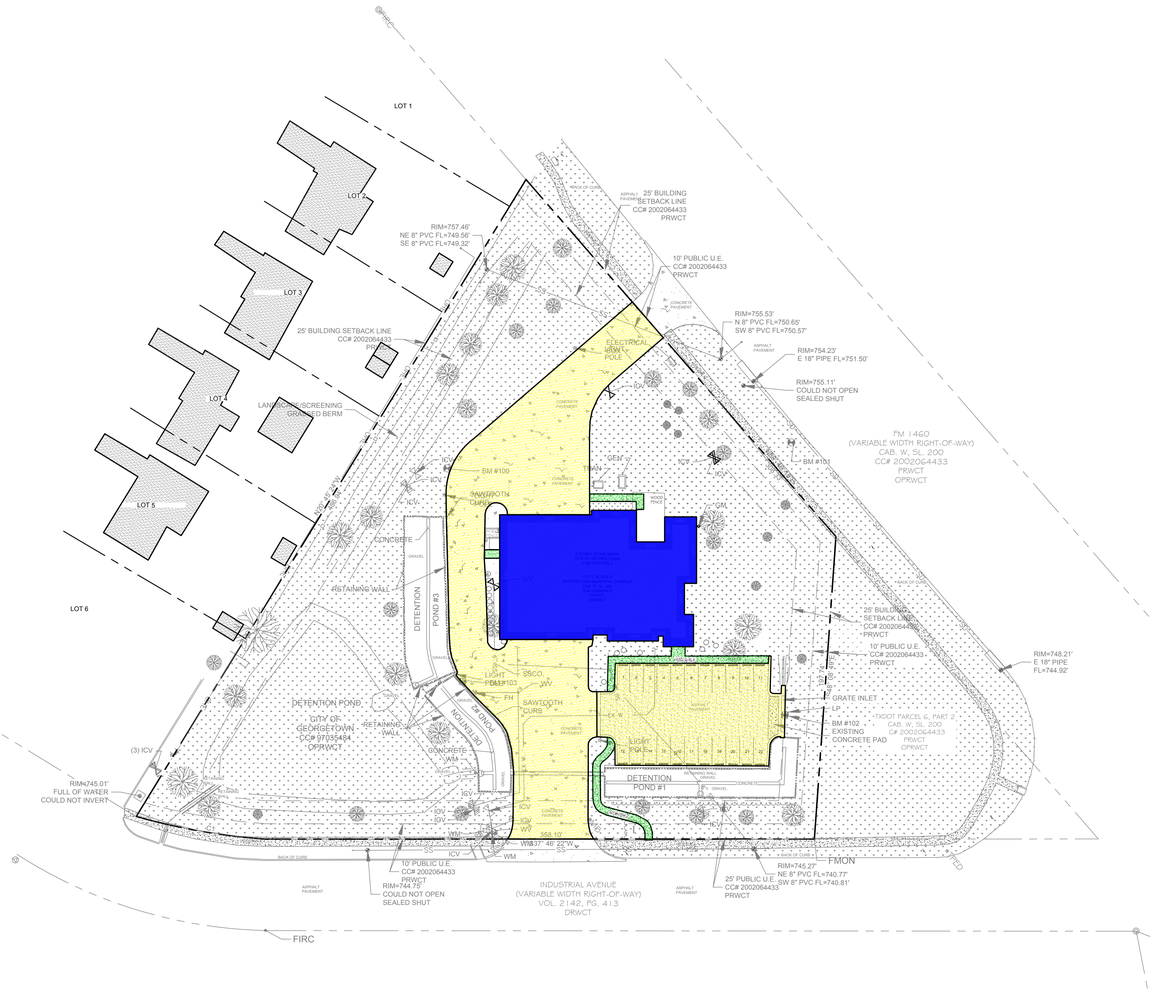
Actual Rainfall Intensity at which Wet Vault bypass Occurs = 0.5 in/hour

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

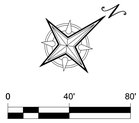
Resultant TSS Load removed by Wet Vault = #VALUE! lbs

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

PERMEABLE CONCRETE MAY ONLY BE USED ON THE CONTRIBUTING ZONE



EXISTING IMPERVIOUS COVER

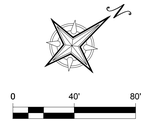


EXISTING IMPERVIOUS COVER

	EXISTING STRUCTURES/ROOFTOPS	10085 SF
	EXISTING PARKING	28359 SF
	OTHER PAVED SURFACES	1326 SF
	OTHER PAVED SURFACED (OFFSITE IMPERVIOUS COVER)	11842 SF
	TOTAL IMPERVIOUS COVER	51612 SF

NOTE: 52,822 SF (1.21 ACRES) OF IMPERVIOUS COVER APPROVED IN ORIGINAL WPAP.

PROPOSED IMPERVIOUS COVER



PROPOSED IMPERVIOUS COVER

	PROPOSED STRUCTURES/ROOFTOP	4026 SF
	PROPOSED PARKING	2810 SF
	PROPOSED OTHER SURFACES	1196 SF
	TOTAL IMPERVIOUS COVER	8032 SF

NOTE: TOTAL IMPERVIOUS COVER FOR BOTH EXISTING AND PROPOSED IS 60,854 SF (1.40 ACRES).

ISSUE FOR PERMIT

BROWN REYNOLDS WATFORD ARCHITECTS
175 CENTURY SQUARE DRIVE
SUITE 350
COLLEGE STATION, TEXAS 77840
979.694.1791
WWW.BRWARCH.COM

03/17/2025
STATE OF TEXAS
MARY P. STEWART
108905
LICENSED
PROFESSIONAL ENGINEER

KCI TECHNOLOGIES, INC.
1555 GREENS PRAIRIE ROAD
COLLEGE STATION, TEXAS 77845
PHONE: (979) 846-8212
KCI TECHNOLOGIES REGISTRATION #F-10573 / #10194365

DATE	March 17, 2025
DRAWN BY	AM/NO
CHECKED BY	MPS
BRW PROJECT NUMBER	223046.00

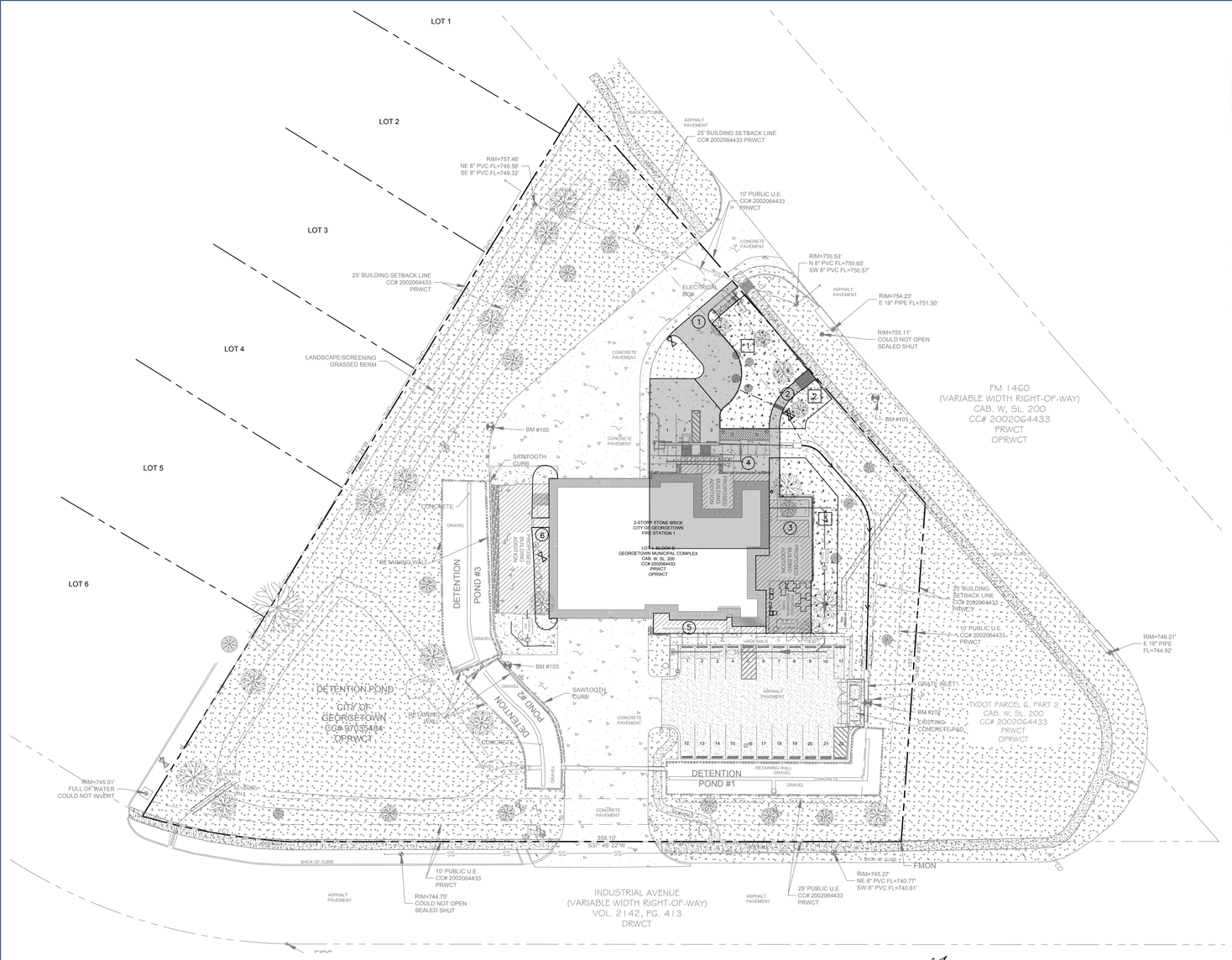
CITY OF GEORGETOWN FIRE STATION 1 RENOVATION
624 FM. 1460
GEORGETOWN, TEXAS 78626

GEORGETOWN
more than welcome

NO.	REVISION	DATE

C12.0

EXISTING & PROPOSED IMPERVIOUS COVER



EXISTING IMPERVIOUS COVER

0 30' 60'

AREA	DRAINAGE AREA	PERVIOUS COVER	IMPERVIOUS COVER	BMP TYPE	% REMOVAL EFFICIENCY	REQUIRED TSS REMOVAL (LB)	PROVIDED TSS REMOVAL (LB)	VFS AREA PROVIDED
1	1368 SF = 0.031 AC	46 SF = 0.0011 AC	1322 SF = 0.303 AC	** VFS & GRASSY SWALE	89.1 %	26 LBS	30 LBS	2216 SF
2	256 SF = 0.006 AC	0 SF = 0.000 AC	256 SF = 0.006 AC	** VFS & GRASSY SWALE	89.1 %	5 LBS	6 LBS	464 SF
3	2331 SF = 0.054 AC	0 SF = 0.000 AC	2331 SF = 0.054 AC	** VFS & GRASSY SWALE	89.1 %	47 LBS	53 LBS	1742 SF
4	6044 SF = 0.139 AC	650 SF = 0.0149 AC	* 5394 SF = 0.1238 AC	GRASSY SWALE	70 %	108 LBS	96 LBS	147 LF OF GRASSY SWALE
5	476 SF = 0.011 AC			NOT TREATED				
6	843 SF = 0.019 AC			NOT TREATED				
			TOTAL = 9303 SF TOTAL = 0.2136 AC			TOTAL = 160 LBS	TOTAL = 184 LBS	

* AREA INCLUDES BOTH EXISTING AND PROPOSED IMPERVIOUS COVER (EXISTING = 2590 SF, PROPOSED = 2804 SF

** SERIES CALCULATION: E TOTAL = [1−((1−E1)*(1−0.65*E2))] * 100 = [1−((1−0.80)*(1−0.65*0.70))] * 100 = [1−(0.20*0.545)] * 100 = 89.1%

VEGETATIVE FILTER STRIPS (VFS)

ENGINEERED FILTER STRIPS

MANY OF THE GENERAL CRITERIA APPLIED TO SWALE DESIGN APPLY EQUALLY WELL TO ENGINEERED VEGETATED FILTER STRIPS. VEGETATED ROADSIDE SHOULDERS PROVIDE ONE OF THE BEST OPPORTUNITIES FOR INCORPORATING FILTER STRIPS INTO ROADWAY AND HIGHWAY DESIGN AS SHOWN IN FIGURE 3−21. THE GENERAL DESIGN GOAL IS TO PRODUCE UNIFORM, SHALLOW OVERLAND FLOW ACROSS THE ENTIRE FILTER STRIP. LANDSCAPING ON RESIDENTIAL LOTS IS NOT CONSIDERED TO FUNCTION AS A VEGETATED FILTER STRIP BECAUSE FERTILIZERS AND PESTICIDES ARE COMMONLY APPLIED IN THESE AREAS. IN ADDITION, ALL AREAS DESIGNATED AS ENGINEERED FILTER STRIPS SHOULD BE DESCRIBED IN A LEGALLY BINDING DOCUMENT THAT RESTRICTS MODIFICATION OF THESE AREAS THROUGH AN EASEMENT, SETBACK, OR OTHER ENFORCEABLE MECHANISM.

1. THE FILTER STRIP SHOULD EXTEND ALONG THE ENTIRE LENGTH OF THE CONTRIBUTING AREA AND THE SLOPE SHOULD NOT EXCEED 20% THE MINIMUM DIMENSION OF THE FILTER STRIP (IN THE DIRECTION OF FLOW) SHOULD BE NO LESS THAN 15 FEET. THE MAXIMUM WIDTH (IN THE DIRECTION OF FLOW) OF THE CONTRIBUTING IMPERVIOUS AREA SHOULD NOT EXCEED 72 FEET. FOR ROADWAYS WITH A VEGETATED STRIP ALONG BOTH SIDES THE TOTAL WIDTH OF THE ROADWAY SHOULD NOT EXCEED 144 FEET (I.E., 72 FEET DRAINING TO EACH SIDE).
2. THE MINIMUM VEGETATED COVER FOR ENGINEERED STRIPS IS 80%.
3. THE AREA CONTRIBUTING RUNOFF TO A FILTER STRIP SHOULD BE RELATIVELY FLAT SO THAT THE RUNOFF IS DISTRIBUTED EVENLY TO THE VEGETATED AREA WITHOUT THE USE OF A LEVEL SPREADER.
4. THE AREA TO BE USED FOR THE STRIP SHOULD BE FREE OF GULLIES OR RILLS THAT CAN CONCENTRATE OVERLAND FLOW (SCHUELER, 1987).
5. THE TOP EDGE OF THE FILTER STRIP ALONG THE PAVEMENT WILL BE DESIGNED TO AVOID THE SITUATION WHERE RUNOFF WOULD TRAVEL ALONG THE TOP OF THE FILTER STRIP, RATHER THAN THROUGH IT.
6. TOP EDGE OF THE FILTER STRIP SHOULD BE LEVEL, OTHERWISE RUNOFF WILL TEND TO FORM A CHANNEL IN THE LOW SPOT. A LEVEL SPREADER SHOULD NOT BE USED TO DISTRIBUTE RUNOFF TO AN ENGINEERED FILTER STRIP.
7. FILTER STRIPS SHOULD BE LANDSCAPED AFTER OTHER PORTIONS OF THE PROJECT ARE COMPLETED.
8. NATURAL VEGETATED FILTER STRIP SLOPES SHOULD NOT EXCEED 10%, PROVIDING THAT THERE ARE NO FLOW CONCENTRATING AREAS ON THE STRIP.

LEGEND

- VEGETATED FILTER STRIP (VFS)
- PROPOSED SLOPE
- (#) IMPERVIOUS AREA TO BE TREATED
- (#) AREA OF VFS TREATING IMPERVIOUS AREA
- XXX PROPOSED MAJOR CONTOUR
- XXX PROPOSED MINOR CONTOUR
- GRASSY SWALE

GENERAL NOTES

1. ENTIRE EXTENTS OF THE GRASSY SWALES AND THE VEGETATED FILTER STRIP MUST BE SODDED.

NOTE:
ALL DISTURBED AREAS SHALL BE STABILIZED OR SODDED.

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

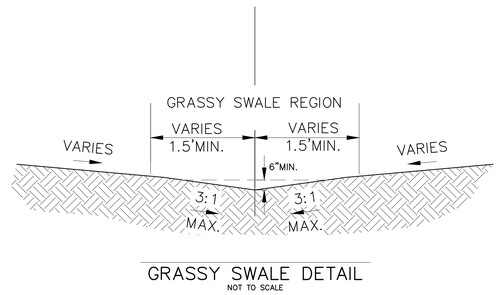
1. A written notice of construction must be submitted to the TCEQ regional office at least 48 hours prior to the start of any regulated activities. This notice must include:
   - the name of the approved project;
   - the activity start date; and
   - the contact information of the prime contractor.
2. All contractors conducting regulated activities associated with this project must be provided with complete copies of the approved Water Pollution Abatement Plan (WPAP) and the TCEQ letter indicating the specific conditions of its approval. During the course of these regulated activities, the contractors are required to keep on−site copies of the approved plan and approval letter.
3. If any sensitive feature(s) (caves, solution cavity, sink hole, etc.) is discovered during construction, all regulated activities near the sensitive feature must be suspended immediately. The appropriate TCEQ regional office must be immediately notified of any sensitive features encountered during construction. Construction activities may not be resumed until the TCEQ has reviewed and approved the appropriate protective measures in order to protect any sensitive feature and the Edwards Aquifer from potentially adverse impacts to water quality.
4. No temporary or permanent hazardous substance storage tank shall be installed within 150 feet of a water supply source, distribution system, well, or sensitive feature.
5. Prior to beginning any construction activity, all temporary erosion and sedimentation (E&S) control measures must be properly installed and maintained in accordance with the approved plans and manufacturers specifications. If inspections indicate a control has been used inappropriately, or incorrectly, the applicant must replace or modify the control for site situations. These controls must remain in place until the disturbed areas have been permanently stabilized.
6. Any sediment that escapes the construction site must be collected and properly disposed of before the next rain event to ensure it is not washed into surface streams, sensitive features, etc.
7. Sediment must be removed from the sediment traps or sedimentation basins not later than when it occupies 50% of the basin's design capacity.
8. Litter, construction debris, and construction chemicals exposed to stormwater shall be prevented from being discharged offsite.
9. All spoils (excavated material) generated from the project site must be stored on−site with proper E&S controls. For storage or disposal of spoils at another site on the Edwards Aquifer Recharge Zone, the owner of the site must receive approval of a water pollution abatement plan for the placement of fill material or mass grading prior to the placement of spoils at the other site.
10. If portions of the site will have a temporary or permanent cease in construction activity lasting longer than 14 days, soil stabilization in those areas shall be initiated as soon as possible prior to the 14th day of inactivity. If activity will resume prior to the 21st day, stabilization measures are not required. If drought conditions or inclement weather prevent action by the 14th day, stabilization measures shall be initiated as soon as possible.
11. The following records shall be maintained and made available to the TCEQ upon request:
    - the dates when major grading activities occur;
    - the dates when construction activities temporarily or permanently cease on a portion of the site; and
    - the dates when stabilization measures are initiated.
12. The holder of any approved Edward Aquifer protection plan must notify the appropriate regional office in writing and obtain approval from the executive director prior to initiating any of the following:
    A. any physical or operational modification of any water pollution abatement structure(s), including but not limited to ponds, dams, berms, sewage treatment plants, and diversionary structures;
    B. any change in the nature or character of the regulated activity from that which was originally approved or a change which would significantly impact the ability of the plan to prevent pollution of the Edwards Aquifer;
    C. any development of land previously identified as undeveloped in the original water pollution abatement plan.

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

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

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

TCEQ−0592 (Rev. July 15, 2015)



GRASSY SWALE DETAIL
NOT TO SCALE

ISSUE FOR PERMIT

BROWN REYNOLDS WATFORD ARCHITECTS
175 CENTURY SQUARE DRIVE
SUITE 350
COLLEGE STATION, TEXAS 77840
979.694.1791
WWW.BRWARCH.COM

03/17/2025
STATE OF TEXAS
MARY P. STEWART
108905
LICENSED ARCHITECT
Mary P. Stewart

KCI TECHNOLOGIES, INC.
1555 GREENS PRAIRIE ROAD
COLLEGE STATION, TEXAS 77845
PHONE: (979) 846-6212
TECHNOLOGIES REGISTRATION #F-10573 / #101943.65

DATE	DRAWN BY	CHECKED BY	BRW PROJECT NUMBER
March 17, 2025	AM/NO	MPS	223046.00

CITY OF GEORGETOWN FIRE STATION 1 RENOVATION
624 FM - 1460
GEORGETOWN, TEXAS 78626

NO.	REVISION	DATE

C12.1
WPAP PLAN & NOTES

Attachment G

Inspection, Maintenance, Repair, and Retrofit Plan
City of Georgetown New Fire Station 1

Retention/Irrigation Maintenance and Monitoring Procedures

- *Inspections:* The irrigation system, including pumps, should be inspected and tested (or observed while in operation) to assure proper operation at least 6 times annually. Two of these inspections should occur during or immediately with the irrigation system should be repaired immediately. In particular, sprinkler heads must be checked to determine if any broken clogged, or not spraying properly. All inspection and testing reports should be kept on site and accessible to inspectors.

- *Sediment Removal.* Remove sediment from cistern/tank at least two times per year or when the depth reached 3 inches.

- Irrigation Areas. To the greatest extent practicable, irrigation areas are to remain in their natural state. However, vegetation must be maintained in the irrigation area such that it does not impede the spray of water from the irrigation heads. Tree and shrub trimmings and other large debris should be removed from the irrigation area.

- Mowing. More frequent mowing to maintain aesthetic appeal may be necessary in landscaped areas. When mowing is performed, a mulching mower should be used, or grass clippings should be caught and removed.

Vegetation Filter Strips Maintenance and Monitoring Procedures

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

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

- Inspection. Inspect filter strips at least twice annually for erosion or damage to

vegetation; however, additional inspection after periods of heavy runoff is most desirable. The strip should be checked for uniformity of grass cover, debris and litter, and areas of sediment accumulation. More frequent inspections of the grass cover during the first few years after establishment will help to determine if any problems are developing, and to plan for long-term restorative maintenance needs. Bare spots and areas of erosion identified during semi-annual inspections must b replanted and restored to meet specifications. Construction of a level spreader device may be necessary to reestablish shallow overland flow.

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

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

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

Permanent Pollution Abatement Measures Maintenance Schedule and Maintenance Procedures

This document has been prepared to provide a description and schedule for the performance of maintenance on permanent pollution abatement measures. Maintenance measures to be performed will be dependent on what permanent pollution abatement measures are incorporated into the project. The project specific water pollution abatement plan should be reviewed what permanent pollution abatement measures are incorporated in to a project.

It should also be noted that the timing and procedures presented herein are general guidelines, adjustment to the timing and procedures may have to be made depending on project specific characteristics as well as weather related conditions.

Where a project is occupied by the owner, the owner may provide for maintenance with his own skilled forces or contract for recommended maintenance of Permanent Best Management Practices. Where a project is occupied of lease by a tenant, the owner shall require tenants to contract for such maintenance services either through a lease agreement, property owners association covenants, or other binding document.

I understand that I am responsible for maintenance of the Permanent Pollution Abatement Measures included in this project until such time as the maintenance obligation is either assumed in writing by another entity having ownership or control the property of ownership is transferred.

I, the owner, have read and understand the requirements of the attached Maintenance Plan and Schedule.

Owner/Developer

3/12/2025

Date

Attachment H

Pilot –Scale Field Testing Plan
City of Georgetown New Fire Station 1

N/A

Attachment I

Measures for Minimizing Surface Stream Contamination
City of Georgetown New Fire Station 1

All runoff from all offsite and onsite sources will discharge via a series of swales, storm drains, and natural lows into the existing extended detention basins. As noted in Attachment C of Section 0600, the following apply.

- Drainage Areas 1, 2, and 3 will have a TSS reduction by means of 15' Vegetative Filter Strips followed by a second BMP in series with the grassy swale.

- Drainage Area 4 will have a TSS reduction by means of the grassy swale.

- Drainage Areas 1, 2, 3, and 4 will eventually make its way to the existing extended detention basins.

During the construction phase of the project, all temporary and constructed permanent BMPs must be inspected every 7 days and within 24 hours of a rainfall event of 0.5 inches or more. These inspections and if any maintenance is performed on such BMPs, it must be documented within the inspection and maintenance report form and kept on site.

Prepared for:

Jennifer Bettiol
CIP Manager Public Works

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

I Jennifer Bettiol,
Print Name

CIP Manager Public Works,
Title - Owner/President/Other

of City of Georgetown,
Corporation/Partnership/Entity Name

have authorized Mary P. Stewart
Print Name of Agent/Engineer

of KCI Technologies
Print Name of Firm

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

I also understand that:

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

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

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

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

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

SIGNATURE PAGE:

Applicant's Signature

3/25/2025
Date

THE STATE OF Texas §

County of Williamson §

BEFORE ME, the undersigned authority, on this day personally appeared Jennifer Bethel 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 12 day of March, 25.

NOTARY PUBLIC

Danielle Dutra
Typed or Printed Name of Notary

DANIELLE DUTRA
Notary Public, State of Texas
Comm. Expires 09-28-2025
Notary ID 133358560

MY COMMISSION EXPIRES: 9/28/25

Application Fee Form

Texas Commission on Environmental Quality

Name of Proposed Regulated Entity: City of Georgetown New Fire Station 1

Regulated Entity Location: Georgetown, TX

Name of Customer: City of Georgetown

Contact Person: Jennifer Bettiol Phone: (512) 930-3640

Customer Reference Number (if issued):CN 600412043

Regulated Entity Reference Number (if issued):RN 104712013

Austin Regional Office (3373)

☐ Hays ☐ Travis ☒ Williamson

San Antonio Regional Office (3362)

☐ Bexar ☐ Medina ☐ Uvalde

☐ Comal ☐ Kinney

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

☒ Austin Regional Office

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

☐ San Antonio Regional Office

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

Site Location (Check All That Apply):

☒ Recharge Zone ☐ Contributing Zone ☐ Transition Zone

Type of Plan	*Size*	*Fee Due*
Water Pollution Abatement Plan, Contributing Zone Plan: One Single Family Residential Dwelling	Acres	$
Water Pollution Abatement Plan, Contributing Zone Plan: Multiple Single Family Residential and Parks	Acres	$
Water Pollution Abatement Plan, Contributing Zone Plan: Non-residential	3.14 Acres	$ 4,000
Sewage Collection System	L.F.	$
Lift Stations without sewer lines	Acres	$
Underground or Aboveground Storage Tank Facility	Tanks	$
Piping System(s)(only)	Each	$
Exception	Each	$
Extension of Time	Each	$

Signature: _____ Date: 3/12/2025

Application Fee Schedule

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

Water Pollution Abatement Plans and Modifications

Contributing Zone Plans and Modifications

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

Organized Sewage Collection Systems and Modifications

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

Underground and Aboveground Storage Tank System Facility Plans and Modifications

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

Exception Requests

Project	*Fee*
Exception Request	$500

Extension of Time Requests

Project	*Fee*
Extension of Time Request	$150

TCEQ Use Only

TCEQ Core Data Form

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

SECTION I: General Information

1. Reason for Submission (*If other is checked please describe in space provided.*)

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

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

2. Customer Reference Number *(if issued)*	Follow this link to search for CN or RN numbers in Central Registry**	**3. Regulated Entity Reference Number** *(if issued)*
CN 600412043		**RN 104712013**

SECTION II: Customer Information

4. General Customer Information	**5. Effective Date for Customer Information Updates** (mm/dd/yyyy)	05/28/2004

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

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

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

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

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

12. Number of Employees	**13. Independently Owned and Operated?**
☐ 0-20 ☐ 21-100 ☐ 101-250 ☐ 251-500 ☒ 501 and higher	☐ **Yes** ☒ **No**

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

☐ Owner ☐ Operator ☒ Owner & Operator
☐ Occupational Licensee ☐ Responsible Party ☐ VCP/BSA Applicant ☐ Other:

15. Mailing Address:	300 Industrial Ave.						
	City	Georgetown	**State**	TX	**ZIP**	78626	**ZIP + 4**	8445

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

18. Telephone Number	19. Extension or Code	20. Fax Number *(if applicable)*
(512) 930-3640		( ) -

SECTION III: Regulated Entity Information

21. General Regulated Entity Information *(If 'New Regulated Entity" is selected, a new permit application is also required.)*

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

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

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

City of Georgetown Fire Satation 1 Renovation

23. Street Address of the Regulated Entity: ***(No PO Boxes)***	301 Industrial Ave.							
	City	Georgetown	**State**	TX	**ZIP**	78262	**ZIP + 4**	8445
24. County	Williamson							

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

25. Description to Physical Location:	

26. Nearest City	**State**	**Nearest ZIP Code**

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

27. Latitude (N) In Decimal:			**28. Longitude (W) In Decimal:**		
Degrees	Minutes	Seconds	Degrees	Minutes	Seconds
30	37	20	97	40	39

29. Primary SIC Code (4 digits)	**30. Secondary SIC Code** (4 digits)	**31. Primary NAICS Code** (5 or 6 digits)	**32. Secondary NAICS Code** (5 or 6 digits)
1542	9224	236220	561210

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

Fire Station Renovation

34. Mailing Address:	**301 Industrial Ave.**							
	City	**Georgetown**	**State**	**TX**	**ZIP**	**78262**	**ZIP + 4**	**8445**
35. E-Mail Address:	**Jennifer.Bettiol@georgetown.org**							

36. Telephone Number	**37. Extension or Code**	**38. Fax Number** *(if applicable)*
(512) 930-3640		( ) -

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

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

SECTION IV: Preparer Information

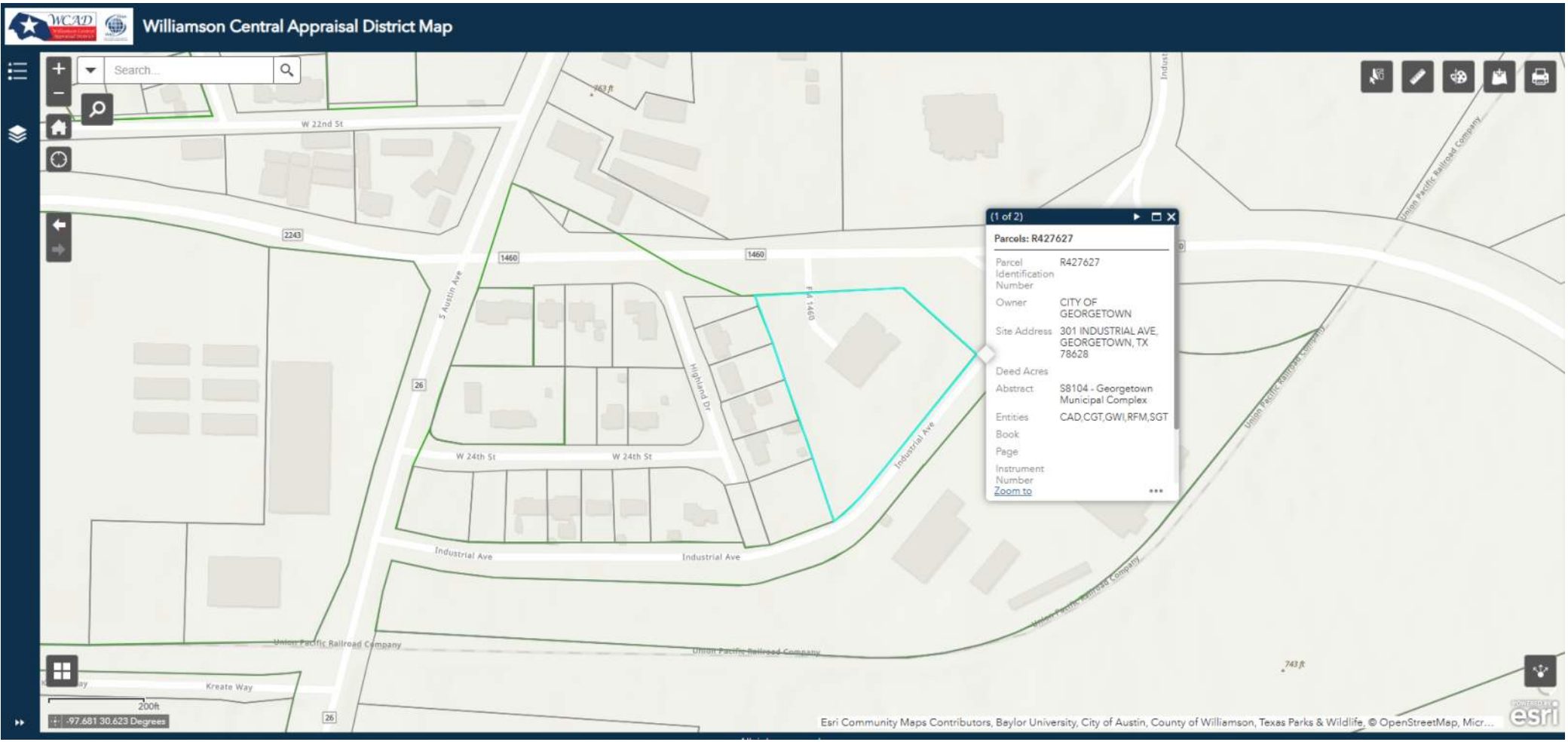
40. Name:	Mary P. Stewart, P.E.	**41. Title:**	Civil Engineer

42. Telephone Number	**43. Ext./Code**	**44. Fax Number**	**45. E-Mail Address**
(210 **)** 641-9999		**(** 210 **)** 641-6440	mary.stewart@kci.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:	KCI Technologies	**Job Title:**	Regional Practice Leader
Name *(In Print):*	Mary P. Stewart, P.E. (submitted on behalf of City of Georgetown	**Phone:**	**(** 210 **)** 641- **9999**
Signature:	Mary P. Stewart	**Date:**	*3-17-2025*



Property Identification Number: R427627