Kimley»Horn

MEMORANDUM

To: Franklin Anciano, License & Permit Specialist
Texas Commission on Environmental Quality

From: Matthew Gatto, P.E.
Kimley-Horn and Associates
1251 Sadler Drive, Building K, Suite 3200
San Marcos, TX 78666

Date: March 12, 2024

Subject: TCEQ Comment Response
Project Name: Bojangles Liberty Hill CZPMOD

Mr. Anciano,

Please accept this comment response letter for the above referenced project. A copy of each comment is presented below followed by their respective responses.

TCEQ Comments:

Edwards Aquifer Application Cover Page (TCEQ-20705)

1. Line 3. Customer Name does not match the parcel/land owner as shown on the Williamson Central Appraisal District map. If the parcel/land ownership has recently changed, please provide documentation from the county.

Response: Please see owners authorization letter included with this submittal.

Modification of a Previously Approved Contributing Zone Plan Form (TCEQ-10259)

2. Line 1. Edwards Aquifer Protection Program ID Number provided is invalid. Please review and revise.

Response: The number has been corrected.

Contributing Zone Plan Application (TCEQ-10257)

3. Customer/Applicant information does not match the parcel/land owner as shown on the Williamson Central Appraisal District map. If the parcel/land ownership has recently changed, please provide documentation from the county.
4. Line 15. Table 1 – Impervious Cover. Calculation provided under the table is incomplete.
5. Attachment N - Inspection, Maintenance, Repair and Retrofit Plan. Must be signed by the Owner/Responsible Party.

Response: Please see owners authorization letter included with this submittal. The impervious cover information below the table is now complete. The inspection plan is now signed.

Agent Authorization Form (TCEQ-0599)

6. Please see Administrative NOD Item #3 above.

Response: Please see owners authorization letter included with this submittal.

Application Fee Form (TCEQ-0574)

7. Please sign form.

Response: This form is now signed.

Core Data Form (TCEQ-10400)

8. Section II: Customer Information. Please see Administrative NOD Item #3 above.
9. Lines 29, 31. Please provide information.
10. Please sign form.

Response: Please see Owners Authorization Form included with this submittal. Lines 29 and 31 have been filled out. The form is now signed.

This concludes the comment response letter. Please contact me at (737) 242-7310 or matthew.gatto@kimley-horn.com should you have any questions or required additional information pertaining to the above responses.

Sincerely,

Matthew Gatto, P.E.
Project Manager

MODIFICATION TO A CONTRIBUTING ZONE PLAN

HERITAGE RIDGE (LOT 3A)
LIBERTY HILL, WILLIAMSON COUNTY, TEXAS

Prepared For:

BOATX, LLC
12012 Wickchester, Suite 680
Houston, Texas 77079
(713) 530-2203

Prepared By:

KIMLEY-HORN AND ASSOCIATES, INC.
1251 Sadler Drive, Building K, Suite 3200
San Marcos, Texas 78666
(512) 566-4457

Firm No. 928
KHA Project No. 069423600

MARCH 12 , 2024

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SECTION 1:
EDWARDS AQUIFER APPLICATION COVER PAGE

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: Heritage Ridge						**2. Regulated Entity No.:**			
3. Customer Name: BoATX, LLC						**4. Customer No.:**			
5. Project Type: **(Please circle/check one)**	New		Modification **X**			Extension		Exception	
6. Plan Type: **(Please circle/check one)**	WPAP	CZP **X**	SCS	UST	AST	EXP	EXT	Technical Clarification	Optional Enhanced Measures
7. Land Use: **(Please circle/check one)**	Residential		Non-residential X				**8. Site (acres):**		1.58 acres/10.6 acres
9. Application Fee:	$4,000		**10. Permanent BMP(s):**					Batch Pond	
11. SCS (Linear Ft.):	N/A		**12. AST/UST (No. Tanks):**					N/A	
13. County:	Williamson		**14. Watershed:**					South Fork 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)	__	__	__
Groundwater Conservation District(s)	__Edwards Aquifer Authority __Barton Springs/ Edwards Aquifer __Hays Trinity __Plum Creek	__Barton Springs/ Edwards Aquifer	NA
City(ies) Jurisdiction	__Austin __Buda __Dripping Springs __Kyle __Mountain City __San Marcos __Wimberley __Woodcreek	__Austin __Bee Cave __Pflugerville __Rollingwood __Round Rock __Sunset Valley __West Lake Hills	__Austin __Cedar Park __Florence __Georgetown __Jerrell __Leander X_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. Matthew Gatto, P.E.
Print Name of Customer/Authorized Agent
Signature of Customer/Authorized Agent February 1, 2024 Date

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

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SECTION 2:
MODIFICATION OF A PREVIOUSLY APPROVED CONTRIBUTING ZONE PLAN FORM

Modification of a Previously Approved Contributing Zone 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 **Modification of a Previously Approved Contributing Zone Plan** is hereby submitted for TCEQ review and executive director approval. The request was prepared by:

Print Name of Customer/Agent: Matthew Gatto, P.E.

Date: 02/02/2024

Signature of Customer/Agent:

_____

Project Information

1. Current Regulated Entity Name: Heritage Ridge
   Original Regulated Entity Name: Heritage Ridge
   Assigned Regulated Entity Number(s) (RN): 11096533
   Edwards Aquifer Protection Program ID Number(s): 11002213
   ☐ The applicant has not changed and the Customer Number (CN) is: _____
   ☒ The applicant or Regulated Entity has changed. A new Core Data Form has been provided.

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

3. A modification of a previously approved plan is requested for (check all that apply):

- ☐ Any physical or operational modification of any best management practices or structure(s), including but not limited to temporary or permanent ponds, dams, berms, silt fences, and diversionary structures;
- ☐ Any change in the nature or character of the regulated activity from that which was originally approved;
- ☐ A change that would significantly impact the ability to prevent pollution of the Edwards Aquifer and hydrologically connected surface water; or
- ☒ Any development of land previously identified in a contributing zone plan as undeveloped.

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.

CZP Modification Summary	***Approved Project***	***Proposed Modification***
Acres	10.58	10.58
Type of Development	Commercial	Commercial
Number of Residential Lots	_____	_____
Impervious Cover (acres)	6.2	4.4
Impervious Cover (%)	58%	42%
Permanent BMPs	Batch Detention	Batch Detention
Other	_____	_____

AST Modification Summary	***Approved Project***	***Proposed Modification***
Number of ASTs	N/A	N/A
Other	N/A	N/A

UST Modification Summary	***Approved Project***	***Proposed Modification***
Number of USTs	N/A	N/A
Other	N/A	N/A

5. ☒ **Attachment B: Narrative of Proposed Modification**. A detailed narrative description of the nature of the proposed modification is attached. It discusses what was approved,

including previous modifications, and how this proposed modification will change the approved plan.

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

7. ☐ Acreage has not been added to or removed from the approved plan.
   ☒ Acreage has been added to or removed from the approved plan and is discussed in *Attachment B: Narrative of Proposed Modification*.

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

ORIGINAL APPROVAL LETTERS AND APPROVED MODIFICATION LETTERS

Jon Niermann, *Chairman*
Emily Lindley, *Commissioner*
Bobby Janecka, *Commissioner*
Toby Baker, *Executive Director*

TEXAS COMMISSION ON ENVIRONMENTAL QUALITY

Protecting Texas by Reducing and Preventing Pollution

January 7, 2021

Mr. Mike Beevers
Heritage Ridge Investments, LLC
6 South 1st Street
Temple, Texas 76501

Re: Edwards Aquifer, Williamson County

NAME OF PROJECT: Heritage Ridge, Located at 13001 W. State Highway 29; Liberty Hill, Texas

PLAN TYPE: Request for the Approval of a Contributing Zone Plan (CZP); 30 Texas Administrative Code (TAC) Chapter 213 Subchapter B Edwards Aquifer

Regulated Entity No. RN111096533; Additional ID No. 11002213

Dear Mr. Beevers,

The Texas Commission on Environmental Quality (TCEQ) has completed its review of the CZP application for the above-referenced project submitted to the Austin Regional Office by MRB Group P.C. on behalf of Heritage Ridge Investments, LLC on September 30, 2020. Final review of the CZP was completed after additional material was received on December 18, 2020 and December 29, 2020. As presented to the TCEQ, the Temporary and Permanent Best Management Practices (BMPs) were selected 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 commercial development will have an area of approximately 10.6 acres. The project will be phased. The initial development phase proposes the demolition of 0.2 acres of pre-rule existing residential development, the construction of a site access drive, trail, sidewalk, and installation of utilities and drainage infrastructures. The impervious cover (IC) will be 0.55 acres (5.19-percent). Project wastewater will be disposed of by conveyance to the exiting Liberty Hill Wastewater Treatment Plant owned and operated by the City of Liberty Hill.

PERMANENT POLLUTION ABATEMENT MEASURES

To prevent the pollution of stormwater runoff originating on-site or upgradient of the site and potentially flowing across and off the site after construction, a batch detention basin, designed using the TCEQ technical guidance document, Complying with the Edwards Aquifer Rules: Technical Guidance on Best Management Practices (2005), will be constructed to treat stormwater runoff. The required total suspended solids (TSS) treatment for this project is 305 lbs. from the 0.35 acres of impervious cover (IC). The approved measures meet the required 80 percent removal of the increased load in TSS caused by the project.

SPECIAL CONDITIONS

I. The permanent pollution abatement measure(s) shall be operational prior to use of any facilities.

II. All sediment and/or media removed from basin during maintenance activities shall be properly disposed of according to 30 TAC 330 or 30 TAC 335, as applicable.

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.
2. The holder of the approved Edwards Aquifer protection plan must comply with all provisions of 30 TAC Chapter 213 and all best management practices and measures contained in the approved plan. Additional and separate approvals, permits, registrations and/or authorizations from other TCEQ Programs (i.e., Stormwater, Water Rights, UIC) can be required depending on the specifics of the plan.
3. In addition to the rules of the Commission, the applicant may also be required to comply with state and local ordinances and regulations providing for the protection of water quality.

Prior to Commencement of Construction:

4. 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 Contributing Zone Plan and this notice of approval shall be maintained at the project location until all regulated activities are completed.
5. Any modification to the activities described in the referenced CZP 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.
6. 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 name of the approved plan and file number for the regulated activity, the date on which the regulated activity will commence, and the name of the prime contractor with the name and telephone number of the contact person.
7. Temporary erosion and sedimentation (E&S) controls, i.e., silt fences, rock berms, stabilized construction entrances, or other controls described in the approved Storm Water Pollution Prevention Plan (SWPPP) 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.

During Construction:

8. During the course of regulated activities related to this project, the applicant or his 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 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 significantly reduced. 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).

10. Intentional discharges of sediment laden water are not allowed. If dewatering becomes necessary, the discharge will be filtered through appropriately selected best management practices. These may include vegetated filter strips, sediment traps, rock berms, silt fence rings, etc.

11. 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.

12. 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.

13. 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. 5, above.

After Completion of Construction:

14. Owners of permanent BMPs and measures must ensure that the 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 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. Such 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 Contributing Zone Plan. If the new owner intends to commence any new

regulated activity on the site, a new Contributing Zone 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. A Contributing Zone 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 Contributing Zone 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.

This action is taken under authority delegated by the Executive Director of the Texas Commission on Environmental Quality. If you have any questions or require additional information, please contact the Edwards Aquifer Protection Program of the Austin Regional Office at (512) 339-2929.

Sincerely,

Robert Sadlier, Section Manager
Edwards Aquifer Protection Program
Texas Commission on Environmental Quality

RS/ndlg

Enclosure: Change in Responsibility for Maintenance of Permanent BMPs, Form TCEQ-10263

cc: Mr. Thomas J. Fromberger, P.E., MRB group P. C.

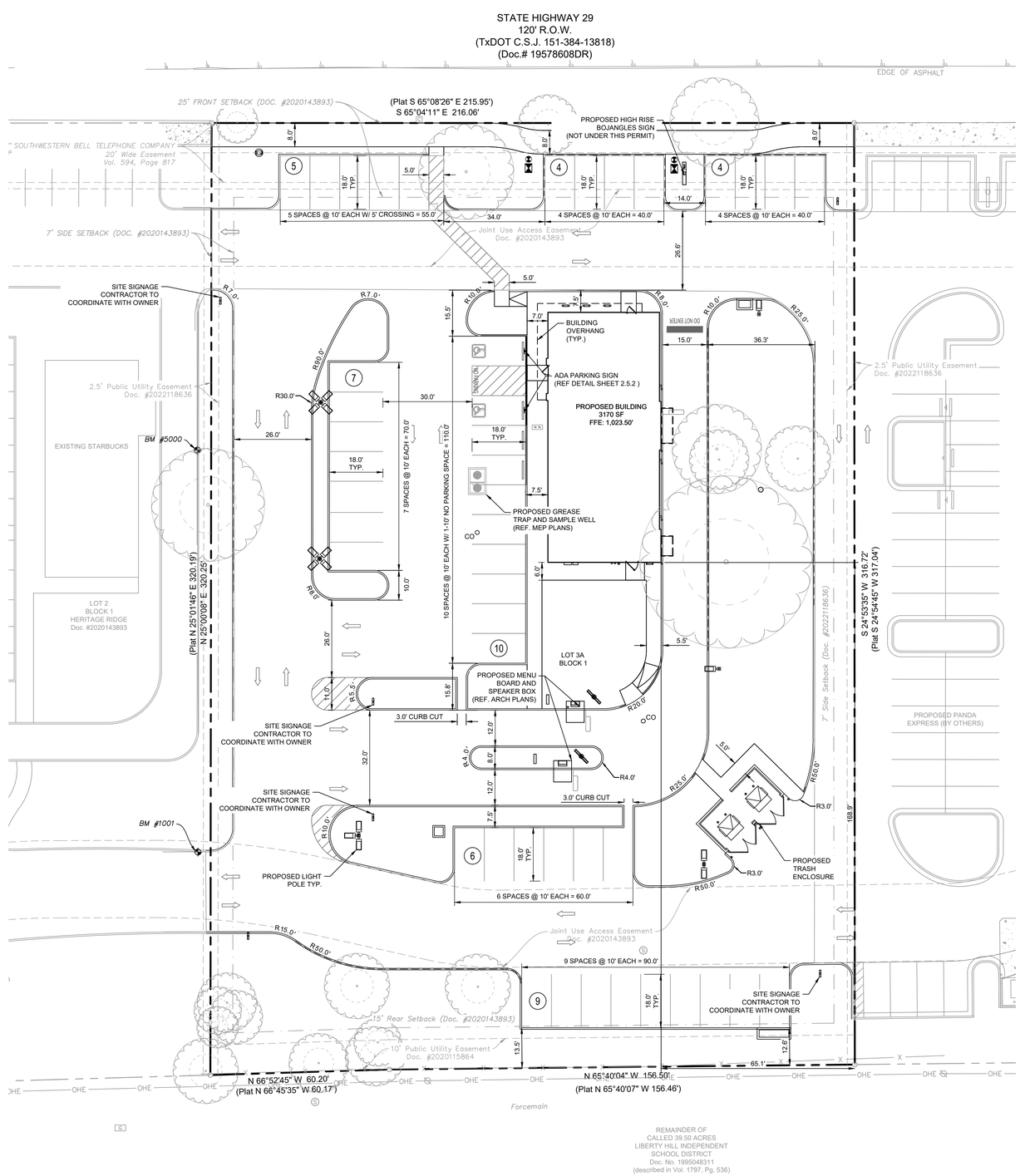
NARRATIVE OF PROPOSED MODIFICATION

Heritage Ridge was a nine lot commercial subdivision, which encompasses approximately 10.6 acres. The Heritage Ridge commercial subdivision was replatted to 6 lots on August 30, 2019 and lot 3 was subsequently split into two lots (Lot 3A and 3B, respectively) on June 2, 2022. Lot 3A is approximately 1.2 acres. The subject property is located approximately 650 LF east of the intersection of W State Hwy 29 and Championship Drive, in the City of Liberty Hill, Williamson County, Texas. The subject lot (Lot 3A) is currently undeveloped. The scope of the project consists of the following civil improvements: site paving, site utility installation (water, wastewater, electric, and gas), site grading, and storm sewer installation. The site resides within the Edwards Aquifer Contributing Zone and does not reside within the 100-year floodplain as defined by Federal Emergency Management Agency Federal Insurance Rate Map #48491C0245F, dated December 20, 2019.

A Contributing Zone Plan (EAPP ID No.1102213) was approved on January 7, 2021. The plan approved the construction of the infrastructure for the commercial subdivision including site access, water lines, sanitary sewer lines and lift station, and regional stormwater management facilities on the 10.6 acre tract of land with a total of 6.2 acres of impervious cover.

The proposed modification to the previous approved Contributing Zone Plan is the development of Lot 3A (portions of former lots 4 and 5). Lot 3A has a total area of 1.6 acres. The development of Lot 3A will result in 1.08 acres of impervious cover. The total impervious cover across Lots 1, 2, 3A, and 3B (formerly Lots 1 through 6) is 4.4 acres. This modification does not propose any additional offsite impervious cover. The Contributing Zone Plan approved on January 7, 2021 (EAPP ID No. 1102213) accounted for 6.2 acres of impervious cover.

CURRENT SITE PLAN OF THE APPROVED PROJECT



NORTH

GRAPHIC SCALE IN FEET
0 10 20 40

LEGEND

- PROPERTY BOUNDARY
- PROPOSED SAWCUT LINE
- PROPOSED CURB TRANSITION
- PROPOSED FLUSH CURB
- PROPOSED EXTENDED CURB WALL (REF. DETAIL, SHEET 2.5.2)
- PROPOSED PARKING COUNT
- PROPOSED SIGN
- PROPOSED ACCESSIBLE PARKING SPACE
- PROPOSED BARRIER FREE RAMP
- PROPOSED WHEEL STOP (REF DETAIL, SHEET 2.5.2
- EXISTING ELECTRIC METER
- PROPOSED LIGHT POLE
- PROPOSED SIDEWALK CHASE
- EXISTING WATER METER
- OHE — EXISTING OVERHEAD ELECTRIC LINE
- EXISTING POWER POLE
- EXISTING LIGHT POLE

NOTES

1. ALL DIMENSIONS ARE TO FACE OF CURB UNLESS OTHERWISE NOTED.
2. REFER TO ARCHITECTURAL CONSTRUCTION DRAWINGS FOR EXACT BUILDING DIMENSIONS. REFER TO LANDSCAPE ARCHITECT'S PLANS FOR DIMENSIONS AND DETAIL OF HARDSCAPE.
3. ALL CURB RADII ARE 5 FEET UNLESS DIMENSIONED OTHERWISE.
4. BUILDING, MECHANICAL EQUIPMENT AND SIGNS ARE SHOWN HEREON FOR REFERENCE ONLY. REFER TO CONSTRUCTION PLANS OF THOSE ITEMS FOR LOCATIONS AND DIMENSIONS.
5. ALL CONSTRUCTION SPECIFICATIONS WITHIN CITY RIGHT-OF-WAY AND EASEMENTS SHALL COMPLY WITH CITY OF LIBERTY HILL STANDARDS. PRIOR APPROVAL TO USE ANY NON-STANDARD MATERIAL IS REQUIRED.

SITE DATA TABLE

LEGAL DESCRIPTION	S13082 - HERITAGE RIDGE SUBDIVISION, BLOCK 1, LOT 3A
ZONING	GENERAL COMMERCIAL/RETAIN (C3)
SITE DATA	1.58 ACRES
ADDRESS	13003 W STATE HIGHWAY 29, LIBERTY HILL, TEXAS 78642
BUILDING DATA	
AREA	3,170 SF
HEIGHT	20'-4"
PARKING DATA	
REQUIRED PARKING SPACES (RESTAURANT W/ DRIVE THRU)	22 SPACES
STANDARD SPACES PROVIDED	43 SPACES
REQUIRED ACCESSIBLE SPACES	2 SPACES
ACCESSIBLE SPACES PROVIDED	2 SPACES
TOTAL SPACES PROVIDED	45 SPACES

BENCHMARK LIST

BM #5000
SQUARE WITH "X" SET ON TOP OF CURB
N: 10,212,988.921
E: 3,061,300.850
ELEV: 1025.01'

BM #1001
"X" SET ON TOP OF CURB
N: 10,212,866.233
E: 3,061,244.005
ELEV: 1022.52

ALL ELEVATIONS SHOWN HEREON ARE TIED TO THE NORTH AMERICAN VERTICAL DATUM OF 1988 (NAVD '88) BASED ON GPS OBSERVATIONS

CAUTION!!
EXISTING UNDERGROUND UTILITIES IN THE AREA CONTRACTOR IS RESPONSIBLE FOR DETERMINING THE HORIZONTAL AND VERTICAL LOCATION OF ALL UTILITIES PRIOR TO CONSTRUCTION. CONTRACTOR SHALL BE RESPONSIBLE FOR ANY REPAIRS TO EXISTING UTILITIES DUE TO DAMAGE INCURRED DURING CONSTRUCTION. CONTRACTOR SHALL NOTIFY THE ENGINEER OF ANY DISCREPANCIES ON THE PLANS.

811 Know what's below. Call before you dig.

REVISIONS:

SITE PLAN (DIMENSION CONTROL PLAN)

NEW RESTAURANT FOR:
Bojangles
W. State Hwy 29
Liberty Hill, TX 78642

Kimley»Horn
© 2024 KIMLEY-HORN AND ASSOCIATES, INC.
1251 SADLER EAST DRIVE,
BUILDING 1, STE 200,
SAN MARCOS, TX 78666
PHONE: 512-596-4457
WWW.KIMLEY-HORN.COM TBPE FIRM NO. 928

JORDAN P. SCHAEFER
122080
REGISTERED PROFESSIONAL ENGINEER
02/02/2024

Charles William Pope & Associates
ARCHITECTURE PLANNING CONSULTING
224 GARDENVIEW, SAN ANTONIO, TX. 78213

DATE: 02/02/2024
JOB NO: 069243600
DRAWN BY: MJG
SHEET NUMBER:
2.1.1
OF

Plotted By:Burn, Dylan January 31, 2024 02:52:32pm K:\SMA_Civil\Bojangles\069243600 - Bojangles (Liberty Hill)\CAD\PlanSheets\C-DMC-069243600.dwg
This document, together with the concepts and designs presented herein, as an instrument of service, is intended only for the specific purpose and client for which it was prepared. Reuse of and improper reliance on this document without written authorization and adaptation by Kimley-Horn and Associates, Inc. shall be without liability to Kimley-Horn and Associates, Inc.

Kimley»Horn

SECTION 3:
CONTRIBUTING ZONE PLAN APPLICATION

Contributing Zone Plan Application

Texas Commission on Environmental Quality for Regulated Activities on the Contributing Zone to the Edwards Aquifer and Relating to 30 TAC §213.24(1), 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 **Contributing Zone Plan Application** is hereby submitted for TCEQ review and Executive Director approval. The application was prepared by:

Print Name of Customer/Agent: Matthew J. Gatto, P.E.

Date: __February 1, 2024_____

Signature of Customer/Agent:

Regulated Entity Name: Heritage Ridge

Project Information

1. County: Williamson
2. Stream Basin: South Fork San Gabriel River
3. Groundwater Conservation District (if applicable): N/A
4. Customer (Applicant):

   Contact Person: David Higgins
   Entity: BoATX, LLC
   Mailing Address: 12012 Wickchester, Suite 680
   City, State: Houston, Texas Zip: 77079
   Telephone: (713) 530-2203 Fax: --------
   Email Address: David.higgins@bojangles.com

5. Agent/Representative (If any):

Contact Person: Matthew Gatto, P.E.
Entity: Kimley-Horn and Associates, Inc.
Mailing Address: 1251 Sadler Drive, Building K, Suite 3200
City, State: San Marcos, Texas Zip: 78666
Telephone: (737) 242-7310 Fax: N/A
Email Address: matthew.gatto@kimley-horn.com

6. Project Location:

☒ The project site is located inside the city limits of Liberty Hill, TX.
☐ 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.

7. ☒ The location of the project site is described below. Sufficient detail and clarity has been provided so that the TCEQ's Regional staff can easily locate the project and site boundaries for a field investigation.
The subject property is located approximately 600 LF east of the intersection of W. State Highway 29 and Championship Drive. This can be seen in the Road Map and the USGS Quadrangle Map, which are Attachments A and B, respectively.

8. ☒ **Attachment A - Road Map**. A road map showing directions to and the location of the project site is attached. The map clearly shows the boundary of the project site.

9. ☒ **Attachment B - USGS Quadrangle Map**. A copy of the official 7 ½ minute USGS Quadrangle Map (Scale: 1" = 2000') is attached. The map(s) clearly show:

☒ Project site boundaries.
☒ USGS Quadrangle Name(s).

10. ☒ **Attachment C - Project Narrative**. A detailed narrative description of the proposed project is attached. The project description is consistent throughout the application and contains, at a minimum, the following details:

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

11. Existing project site conditions are noted below:

☐ Existing commercial site

- ☐ Existing industrial site
- ☐ Existing residential site
- ☐ Existing paved and/or unpaved roads
- ☒ Undeveloped (Cleared)
- ☐ Undeveloped (Undisturbed/Not cleared)
- ☐ Other: _____

12. The type of project is:

- ☐ Residential: # of Lots:
- ☐ Residential: # of Living Unit Equivalents: ____
- ☒ Commercial
- ☐ Industrial
- ☐ Other: _____

13. Total project area (size of site): 1.58 Acres

    Total disturbed area: 1.49 Acres

14. Estimated projected population: N/A

15. The amount and type of impervious cover expected after construction is complete is shown below:

1. **Table 1 - Impervious Cover**

Impervious Cover of Proposed Project	***Sq. Ft.***	***Sq. Ft./Acre***	***Acres***
Structures/Rooftops	3,170	÷ 43,560 =	0.07
Parking	40,048	÷ 43,560 =	0.92
Other paved surfaces (Sidewalks)	3,852	÷ 43,560 =	0.09
Total Impervious Cover	47,070	÷ 43,560 =	1.08

Total Impervious Cover ÷ Total Acreage 68.35 **X 100 = % Impervious Cover**

16. ☒ **Attachment D - Factors Affecting Surface Water Quality**. A detailed description of all factors that could affect surface water quality is attached. If applicable, this includes the location and description of any discharge associated with industrial activity other than construction.

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

For Road Projects Only

Complete questions 18 - 23 if this application is exclusively for a road project.

☒ N/A

18. 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.

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

    ☐ Concrete
    ☐ Asphalt concrete pavement
    ☐ Other: _____

20. Right of Way (R.O.W.):

    Length o f R .O.W.:_____feet.

    Width o f R .O.W.:_____feet.
    L x W = _____Ft^2 ÷ 43,560 Ft^2/Acre = _____acres.

21. Pavement Area:

    Length o f R .O.W.:_____feet.

    Width o f R .O.W.:_____feet.
    L x W = _____Ft^2 ÷ 43,560 Ft^2/Acre = _____acres.
    Pavement area_____acres ÷ R .O.W. a rea____acres x 100 = ____% impervious cover.

22. ☐ A rest stop will be included in this project.
    ☐ A rest stop will not be included in this project.

23. ☐ 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

24. ☒ **Attachment E - 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 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

25. ☐ Wastewater is to be discharged in the contributing zone. Requirements under 30 TAC§213.6(c) relating to Wastewater Treatment and Disposal Systems have been satisfied.

☒ N/A

26. Wastewater will be disposed of by:

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

☐ **Attachment F - 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):

The sewage collection system will convey the wastewater to the City of Liberty Hill Wastewater Treatment Plan. The treatment facility is:

☒ Existing.
☐ Proposed.
☐ N/A

Permanent Aboveground Storage Tanks (ASTs) ≥ 500 Gallons

Complete questions 27 - 33 if this project includes the installation of AST(s) with volume(s) greater than or equal to 500 gallons.

☒ N/A

27. Tanks and substance stored:

2. **Table 2 - Tanks and Substance Storage**

AST Number	*Size (Gallons)*	*Substance to be Stored*	*Tank Material*
1			
2			
3			
4			
5			

Total x 1.5 = _____ Gallons

28. ☐ The AST will be placed within a containment structure that is sized to capture one and one-half (1 1/2) times the storage capacity of the system. For facilities with more than one tank system, the containment structure is sized to capture one and one-half (1 1/2) times the cumulative storage capacity of all systems.

☐ **Attachment G - Alternative Secondary Containment Methods**. Alternative methods for providing secondary containment are proposed. Specifications showing equivalent protection for the Edwards Aquifer are attached.

29. Inside dimensions and capacity of containment structure(s):

3. **Table 3 - Secondary Containment**

Length (L)(Ft.)	*Width(W)(Ft.)*	*Height (H)(Ft.)*	*L x W x H = (Ft3)*	*Gallons*

Total: _____ Gallons

30. Piping:

☐ All piping, hoses, and dispensers will be located inside the containment structure.
☐ Some of the piping to dispensers or equipment will extend outside the containment structure.
☐ The piping will be aboveground
☐ The piping will be underground

31. ☐ The containment area must be constructed of and in a material impervious to the substance(s) being stored. The proposed containment structure will be constructed of: _____.

32. ☐ **Attachment H - AST Containment Structure Drawings**. A scaled drawing of the containment structure is attached that shows the following:

☐ Interior dimensions (length, width, depth and wall and floor thickness).
☐ Internal drainage to a point convenient for the collection of any spillage.
☐ Tanks clearly labeled
☐ Piping clearly labeled
☐ Dispenser clearly labeled

33. ☐ Any spills must be directed to a point convenient for collection and recovery. Spills from storage tank facilities must be removed from the controlled drainage area for disposal within 24 hours of the spill.

☐ In the event of a spill, any spillage will be removed from the containment structure within 24 hours of the spill and disposed of properly.

☐ In the event of a spill, any spillage will be drained from the containment structure through a drain and valve within 24 hours of the spill and disposed of properly. The drain and valve system are shown in detail on the scaled drawing.

Site Plan Requirements

Items 34 - 46 must be included on the Site Plan.

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

    Site Plan Scale: 1" = 20 '.

35. 100-year floodplain boundaries:

    ☐ Some part(s) of the project site is located within the 100-year floodplain. The floodplain is shown and labeled.

    ☒ No part of the project site is located within the 100-year floodplain.
    The 100-year floodplain boundaries are based on the following specific (including date of material) sources(s): FEMA Map No. 48491C0245F dated December 20, 2019.

36. ☒ 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, etc. are shown on the site plan.

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

37. ☒ A drainage plan showing all paths of drainage from the site to surface streams.

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

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

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

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

42. ☐ Surface waters (including wetlands).

    ☒ N/A

43. ☐ Locations where stormwater discharges to surface water.

    ☒ There will be no discharges to surface water.

44. ☐ Temporary aboveground storage tank facilities.

    ☒ Temporary aboveground storage tank facilities will not be located on this site.

45. ☐ Permanent aboveground storage tank facilities.

☒ Permanent aboveground storage tank facilities will not be located on this site.

46. ☒ Legal boundaries of the site are shown.

Permanent Best Management Practices (BMPs)

Practices and measures that will be used during and after construction is completed.

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

☐ N/A

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

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

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

☐ N/A

49. ☒ 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

50. 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.

51. 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 I - 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.

52. ☒ **Attachment J - BMPs for Upgradient Stormwater**.

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

53. ☒ **Attachment K - BMPs for On-site Stormwater**.

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

54. ☐ **Attachment L - BMPs for Surface Streams**. A description of the BMPs and measures that prevent pollutants from entering surface streams is attached.

- ☐ N/A

55. ☒ **Attachment M - Construction Plans**. Construction plans and design calculations for the proposed permanent BMPs and measures have been prepared by or under the direct supervision of a Texas Licensed Professional Engineer, and are signed, sealed, and dated. Construction plans for the proposed permanent BMPs and measures are

attached and include: Design calculations, TCEQ Construction Notes, all proposed structural plans and specifications, and appropriate details.

☐ N/A

56. ☒ **Attachment N - Inspection, Maintenance, Repair and Retrofit Plan**. A site and BMP specific plan for the inspection, maintenance, repair, and, if necessary, retrofit of the permanent BMPs and measures is attached. The plan fulfills all of the following:

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

    ☐ N/A

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

    ☒ N/A

58. ☒ **Attachment P - 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 result in water quality degradation.

    ☐ N/A

Responsibility for Maintenance of Permanent BMPs and Measures after Construction is Complete.

59. ☐ 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.

60. ☐ 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.

Administrative Information

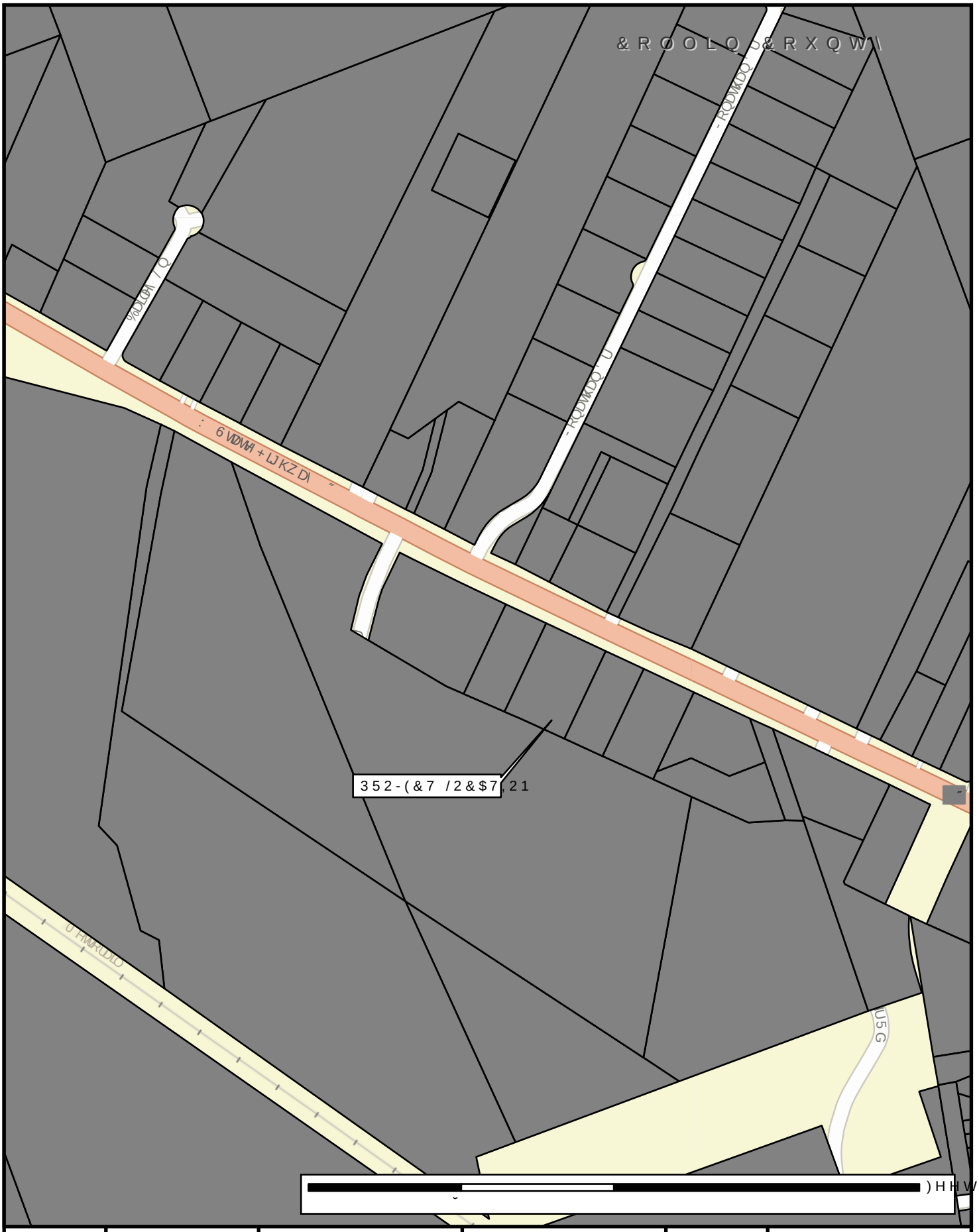
61. ☒ Submit one (1) original and one (1) copy of the application, plus additional copies as needed for each affected incorporated city, groundwater conservation district, and county in which the project will be located. The TCEQ will distribute the additional copies to these jurisdictions.

62. ☒ Any modification of this Contributing Zone Plan may require TCEQ review and Executive Director approval prior to construction, and may require submission of a revised application, with appropriate fees.

63. ☒ The site description, controls, maintenance, and inspection requirements for the storm water pollution prevention plan (SWPPP) developed under the EPA NPDES general permits for stormwater discharges have been submitted to fulfill paragraphs 30 TAC §213.24(1-5) of the technical report. All requirements of 30 TAC §213.24(1-5) have been met by the SWPPP document.

☒ The Temporary Stormwater Section (TCEQ-0602) is included with the application.

ROAD MAP



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Kimley»Horn

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UHSUHVHQWV RQ\ WKH DSSUR[LPDWH DHODWL
ERXQGDULHV

USGS QUADRANGLE MAP

PROJECT NARRATIVE

Heritage Ridge was a nine lot commercial subdivision, which encompasses approximately 10.6 acres. The Heritage Ridge commercial subdivision was replatted to 6 lots on August 30, 2019 and lot 3 was subsequently split into two lots (Lot 3A and 3B, respectively) on June 2, 2022. Lot 3A is approximately 1.2 acres. The subject property is located approximately 650 LF east of the intersection of W State Hwy 29 and Championship Drive, in the City of Liberty Hill, Williamson County, Texas. The subject lot (Lot 3A) is currently undeveloped. The scope of the project consists of the following civil improvements: site paving, site utility installation (water, wastewater, electric, and gas), site grading, and storm sewer installation. The site resides within the Edwards Aquifer Contributing Zone and does not reside within the 100-year floodplain as defined by Federal Emergency Management Agency Federal Insurance Rate Map #48491C0245F, dated December 20, 2019.

A Contributing Zone Plan (EAPP ID No.1102213) was approved on January 7, 2021. The plan approved the construction of the infrastructure for the commercial subdivision including site access, water lines, sanitary sewer lines and lift station, and regional stormwater management facilities on the 10.6 acre tract of land with a total of 6.2 acres of impervious cover.

The proposed modification to the previous approved Contributing Zone Plan is the development of Lot 3A (portions of former lots 4 and 5). Lot 3A has a total area of 1.6 acres. The development of Lot 3A will result in 1.08 acres of impervious cover. The total impervious cover across Lots 1, 2, 3A, and 3B (formerly Lots 1 through 6) is 4.4 acres. This modification does not propose any additional offsite impervious cover. The Contributing Zone Plan approved on January 7, 2021 (EAPP ID No. 1102213) accounted for 6.2 acres of impervious cover.

Based on the calculations for the batch detention pond per the Contributing Zone Plan approved on January 7, 2021 (EAPP ID No. 1102213), the batch detention pond is designed to remove a Total Suspended Solids (TSS) load of 6,316 lbs and provide a total capture volume of 22,698 cubic feet. Based on the TSS Removal Calculation spreadsheet published by the Texas Commission on Environmental Quality (TCEQ), the total TSS load removal accounting for Lots 1 through 3B is 3,656 lbs and a resulting total capture volume of 17,406 cubic feet. Both the TSS load removal and total capture volume have been accounted for during the original design of the regional batch detention pond. TCEQ calculations have been provided within the Water Quality Site Plan (Sheet 2.3.4) within the construction plans (appended herein).

FACTORS AFFECTING SURFACE WATER QUALITY

Surface water quality can be affected by disturbance during construction and by development after construction. Soil disturbance from clearing, grubbing and cut/fill operations can lead to discharge of sediment unless adequate temporary erosion control measures are in place. For this project, the use of silt fence, a temporary sediment basin and rock berms will prevent sediment from leaving the site.

During construction, surface water quality may also be affected by a spill of hydrocarbons or other hazardous substances used in construction. The most likely instances of a spill of hydrocarbons or hazardous substances are:

1. Refueling construction equipment.
2. Performing operator-level maintenance, including adding petroleum, oils, or lubricants.
3. Unscheduled or emergency repairs, such as hydraulic fluid leaks.

Every effort will be taken to be cautious and prevent spills. In the event of a fuel or hazardous substance spill as defined by the Reportable Quantities Table 1 (page 3) of the TCEQ's Small-Business Handbook for Spill Response (RG-285, December 2016), the contractor is required to clean up the spill and notify the TCEQ as required in RG-285. During business hours report spills to the TCEQ's Austin Regional Office at (512) 339-2929, after business hours call 1-800-832-8224, the Environmental Response Hotline or (512) 463-7727, the TCEQ Spill Reporting Hotline, which is also answered 24 hours a day.

After construction is complete, impervious cover for the tract of land is the major reason for degradation of water quality. Impervious cover includes building foundations, pavements, and any other non-porous additions. Oil and fuel discharge from vehicles is anticipated during and after construction.

VOLUME AND CHARACTER OF STORMWATER

The proposed BMP's for Heritage Ridge (Lot 3A) were designed and sized in the initial project phase, Heritage Ridge. The on-site flows developed within Lot 3A are accounted for in the regional batch detention basin design that was approved January 7, 2021 by TCEQ. The proposed improvements in Heritage Ridge account for a total of 6.2 acres of impervious cover, making up 58% of the project area. At this time, 4.4 acres of impervious cover (42%) is proposed within the Heritage Ridge commercial subdivision TCEQ TSS Removal calculations are provided on the Site Water Quality Plan (Sheet 2.3.4) appended herein.

SUITABILITY LETTER FROM AUTHORIZED AGENT

(NOT APPLICABLE)

BMPS FOR UPGRADIENT STORMWATER

During construction, BMP's include silt fence and rock berms to capture sediment upgradient from the construction area.

BMPs FOR ON-SITE STORMWATER

During construction, BMP's include silt fence and inlet protection to capture sediment from the construction area contained within the storm water runoff. Silt fence will be installed along the downstream portion of the property. Inlet protection will be installed on all storm sewer curb inlets existing and proposed (once constructed).

Current Plan Proposed Conditions:

Heritage Ridge (Lot 3A) has no onsite basins. The water quality pond constructed during development of the commercial subdivision will provide the required removal for Lot 3A.

Based on the calculations for the batch detention pond per the Contributing Zone Plan approved on January 7, 2021 (EAPP ID No. 1102213), the batch detention pond is designed to remove a Total Suspended Solids (TSS) load of 6,316 lbs and provide a total capture volume of 22,698 cubic feet. Based on the TSS Removal Calculation spreadsheet published by the Texas Commission on Environmental Quality (TCEQ), the total TSS load removal accounting for Lots 1 through 3B is 3,656 lbs and a resulting total capture volume of 17,406 cubic feet. Both the TSS load removal and total capture volume have been accounted for during the original design of the regional batch detention pond. TCEQ calculations have been provided within the Water Quality Site Plan (Sheet 2.3.4) within the construction plans (appended herein).

BMPs FOR SURFACE STREAMS

There are no existing surface streams or sensitive features being affected on site. All permanent BMPs have been designed to remove the increase in Total Suspended Solids as per current TCEQ requirements.

CONSTRUCTION PLANS

Please reference attached construction plans.

CIVIL ENGINEERING PLANS

FOR

BOJANGLES - LIBERTY HILL

13003 TX-29
LIBERTY HILL, TEXAS 78642

PROJECT TEAM:

ARCHITECT
CHARLES WILLIAM POPE & ASSOCIATES
224 GARDENVIEW
SAN ANTONIO, TX 78213
PHONE: 210-349-6005
EMAIL: CHARLES@CPOPE.COM
CONTACT: CHARLES POPE, AIA

CIVIL ENGINEER
KIMLEY-HORN
1251 SADLER DRIVE, BUILDING K, SUITE 3200
SAN MARCOS, TX 78666
PHONE: 737-222-7228
CONTACT: JORDAN SCHAEFER, P.E.

DEVELOPER
BOATX, LLC
225 MATLAGE WAY, SUITE 109
SUGAR LAND, TX 77487
PHONE: 713-530-2203
CONTACT: DAVID HIGGINS

LIST OF CONTACTS:

PLANNING AND DEVELOPMENT
CITY OF LIBERTY HILL
100 FORREST STREET
LIBERTY HILL, TX 78642
PHONE: 512-548-5519

WATER
CITY OF LIBERTY HILL
926 MAIN STREET
LIBERTY HILL, TX 78642
PHONE: 512-778-5449

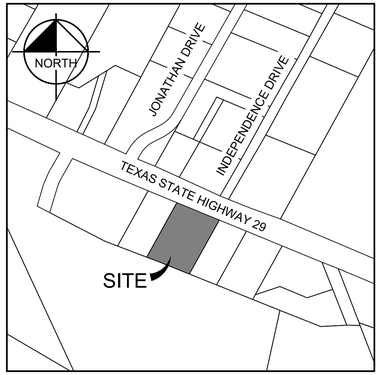
WASTEWATER
CITY OF LIBERTY HILL
926 MAIN STREET
LIBERTY HILL, TX 78642
PHONE: 512-778-5449

GAS
ATMOS ENERGY
3110 N IH 35
ROUND ROCK, TX 78681
PHONE: 512-695-9024
CONTACT: EMILY PACK

ELECTRIC
PEDERNALES ELECTRIC COOPERATIVE, INC.
P.O. BOX 2048 | 10625 WEST HIGHWAY 29
LIBERTY HILL, TX 78642
PHONE: 512-813-4487
CONTACT: CARRIE GARRETT

COMMUNICATIONS
AT&T
817 W NORTH LOOP BLVD
AUSTIN, TX 78756
PHONE: 512-968-7156
CONTACT: JOHN RODRIGUEZ

TXDOT
TXDOT AUSTIN DISTRICT
7901 N I-35
AUSTIN, TX 78753
PHONE: 512-832-7000



VICINITY MAP
N.T.S.

SUBMITTAL REVIEW LOG

2/2/2024	PERMIT SUBMITTAL

SHEET INDEX

SHEET NUMBER	SHEET TITLE
0.0	COVER SHEET
1.0	PLAT
1.1	DEMOLITION SITE PLAN
2.1.1	SITE PLAN (DIMENSION CONTROL PLAN)
2.1.2	FIRE PROTECTION SITE PLAN
2.1.3	SITE PAVING PLAN
2.1.4	SITE PAVING PLAN (ALTERNATE)
2.2.1	SITE UTILITY PLAN
2.3.1	SITE GRADING PLAN
2.3.2	PROPOSED DRAINAGE AREA MAP
2.3.3	STORM SEWER PLAN
2.3.4	SITE WATER QUALITY PLAN
2.4.1	EROSION CONTROL PLAN
2.4.2	EROSION CONTROL DETAILS
2.5.1	CIVIL GENERAL NOTES
2.5.2	MISCELLANEOUS CONSTRUCTION DETAILS
2.5.3	UTILITY DETAILS
2.5.4	STORM DETAILS
2.5.5	PAVER DETAILS

PLAN REVISION LOG

NO.	DATE	DESCRIPTION
1		
2		
3		

BENCHMARK LIST

BM #5000
SQUARE WITH "X" SET ON TOP OF CURB
N: 10,212,988.921
E: 3,061,300.850
ELEV: 1025.01'

BM #1001
"X" SET ON TOP OF CURB
N: 10,212,866.233
E: 3,061,244.005
ELEV: 1022.52

ALL ELEVATIONS SHOWN HEREON ARE TIED TO THE NORTH AMERICAN VERTICAL DATUM OF 1988 (NAVD '88) BASED ON GPS OBSERVATIONS

CAUTION!!
EXISTING UNDERGROUND UTILITIES IN THE AREA CONTRACTOR IS RESPONSIBLE FOR DETERMINING THE HORIZONTAL AND VERTICAL LOCATION OF ALL UTILITIES PRIOR TO CONSTRUCTION. CONTRACTOR SHALL BE RESPONSIBLE FOR ANY REPAIRS TO EXISTING UTILITIES DUE TO DAMAGE INCURRED DURING CONSTRUCTION. CONTRACTOR SHALL NOTIFY THE ENGINEER OF ANY DISCREPANCIES ON THE PLANS.

811 Know what's below. Call before you dig.

REVISIONS:

COVER SHEET

NEW RESTAURANT FOR:
Bojangles
W. State Hwy 29
Liberty Hill, TX 78642

Kimley»Horn
© 2024 KIMLEY-HORN AND ASSOCIATES, INC.
1251 SADLER EAST DRIVE,
BUILDING K, SUITE 3200
SAN MARCOS, TX 78666
PHONE: 512-566-4457
WWW.KIMLEY-HORN.COM TBPE FIRM NO. 928

JORDAN P. SCHAEFER
122080
REGISTERED
PROFESSIONAL ENGINEER
STATE OF TEXAS
02/02/2024

Charles William Pope & Associates
ARCHITECTURE PLANNING CONSULTING
224 GARDENVIEW, SAN ANTONIO, TX 78213

DATE: 02/02/2024
JOB NO: 069243600
DRAWN BY: MJG
SHEET NUMBER:
0.0
OF

Plotted By:Bunn, Dylan January 31, 2024 02:51:34pm K:\SMA_Civ\Bojangles\069243600 - Bojangles (Liberty Hill)\CAD\PlanSheets\C-COVR-069243600.dwg
This document, together with the concepts and designs presented herein, as an instrument of service, is intended only for the specific purpose and client for which it was prepared. Reuse of and improper reliance on this document without written authorization and adaptation by Kimley-Horn and Associates, Inc. shall be without liability to Kimley-Horn and Associates, Inc.

Doc# 2022118436

REPLAT LOT 3, BLOCK 1 – HERITAGE RIDGE

REPLATTING LOT 3, BLOCK 1 – HERITAGE RIDGE
RECORDED IN DOCUMENT NO. 2020143893
OFFICIAL PUBLIC RECORDS OF WILLIAMSON COUNTY, TEXAS
John B. Robinson Survey Abstract No. 521 ACH

STATE OF TEXAS §
§KNOW ALL MEN BY THESE PRESENTS
COUNTY OF WILLIAMSON §

WE, WADE ROWDEN AND BRAD ANDREWS, MANAGERS OF LIBERTY HILL 29, LLC, OWNERS OF LOT 3, BLOCK 1 OF HERITAGE RIDGE CONVEYED FROM HERITAGE RIDGE INVESTMENTS, LLC TO LIBERTY HILL 29, LLC BY DEED RECORDED IN DOCUMENT NUMBER 2022008495 OF THE OFFICIAL PUBLIC RECORDS OF WILLIAMSON COUNTY, TEXAS DO HEREBY DEDICATE TO THE PUBLIC THE USE OF ALL STREETS, ALLEYS, EASEMENTS AND ALL OTHER LANDS INTENDED FOR PUBLIC DEDICATION AS SHOWN HEREON TO BE KNOWN AS "REPLAT LOT 3, BLOCK 1 – HERITAGE RIDGE".

WADE ROWDEN

BRAD ANDREWS

STATE OF TEXAS
COUNTY OF WILLIAMSON

BEFORE ME, THE UNDERSIGNED AUTHORITY, ON THIS THE 22nd DAY OF September 2022, PERSONALLY APPEARED WADE ROWDEN, KNOWN BY ME TO BE THE PERSON WHOSE NAME IS SUBSCRIBED ON THE FOREGOING INSTRUMENT AND HE ACKNOWLEDGED BEFORE ME THAT SHE EXECUTED THE SAME FOR THE PURPOSES AND CONSIDERATIONS THEREIN EXPRESSED.

Brandi Spiller
NOTARY PUBLIC IN AND FOR THE STATE OF TEXAS

Brandi Spiller
PRINTED NAME

08-20-2025
DATE NOTARY COMMISSION EXPIRES

BRANDI SPILLER
Notary Public
STATE OF TEXAS
NOTARY ID # 12953002-4
My Comm. Expires 08-20-2025

STATE OF TEXAS
COUNTY OF WILLIAMSON

BEFORE ME, THE UNDERSIGNED AUTHORITY, ON THIS THE 20th DAY OF September 2022, PERSONALLY APPEARED BRAD ANDREWS, KNOWN BY ME TO BE THE PERSON WHOSE NAME IS SUBSCRIBED ON THE FOREGOING INSTRUMENT AND HE ACKNOWLEDGED BEFORE ME THAT SHE EXECUTED THE SAME FOR THE PURPOSES AND CONSIDERATIONS THEREIN EXPRESSED.

Brandi Spiller
NOTARY PUBLIC IN AND FOR THE STATE OF TEXAS

Brandi Spiller
PRINTED NAME

08-20-2025
DATE NOTARY COMMISSION EXPIRES

BRANDI SPILLER
Notary Public
STATE OF TEXAS
NOTARY ID # 12953002-4
My Comm. Expires 08-20-2025

STATE OF TEXAS §
§KNOW ALL MEN BY THESE PRESENTS
COUNTY OF WILLIAMSON §

I, FIRSTCAPITAL BANK OF TEXAS, N.A. AS THE LIEN HOLDER OF LOT 3, BLOCK 1 OF HERITAGE RIDGE CONVEYED FROM HERITAGE RIDGE INVESTMENTS, LLC TO LIBERTY HILL 29, LLC BY DEED RECORDED IN DOCUMENT NUMBER 2022008495 OF THE OFFICIAL PUBLIC RECORDS OF WILLIAMSON COUNTY, TEXAS DO HEREBY DEDICATE TO THE PUBLIC THE USE OF ALL STREETS, ALLEYS, EASEMENTS AND ALL OTHER LANDS INTENDED FOR PUBLIC DEDICATION AS SHOWN HEREON TO BE KNOWN AS "REPLAT LOT 3, BLOCK 1 – HERITAGE RIDGE".

BY: Trey Satana
FIRSTCAPITAL BANK OF TEXAS, N.A

STATE OF TEXAS
COUNTY OF WILLIAMSON

BEFORE ME, THE UNDERSIGNED AUTHORITY, ON THIS THE 22nd DAY OF September 2022, PERSONALLY APPEARED Trey Satana KNOWN BY ME TO BE THE PERSON WHOSE NAME IS SUBSCRIBED ON THE FOREGOING INSTRUMENT AND SHE ACKNOWLEDGED BEFORE ME THAT SHE EXECUTED THE SAME FOR THE PURPOSES AND CONSIDERATIONS THEREIN EXPRESSED.

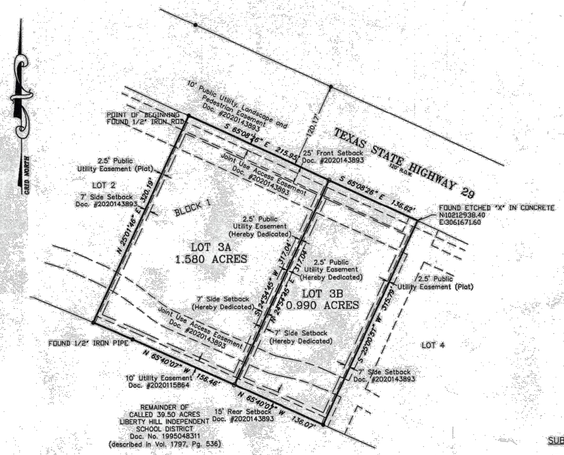
Brandi Spiller
NOTARY PUBLIC IN AND FOR THE STATE OF TEXAS

Brandi Spiller
PRINTED NAME

08-20-2025
DATE NOTARY COMMISSION EXPIRES

BRANDI SPILLER
Notary Public
STATE OF TEXAS
NOTARY ID # 12953002-4
My Comm. Expires 08-20-2025

RECORDERS MEMORANDUM
All or parts of the text on this page was not clearly legible for satisfactory recordation



STATE OF TEXAS §
§KNOW ALL MEN BY THESE PRESENTS
COUNTY OF MILAM §

I, BRADLEY LIPSCOMB, REGISTERED PROFESSIONAL LAND SURVEYOR IN THE STATE OF TEXAS, DO HEREBY CERTIFY THAT I PREPARED THIS PLAT FROM AN ACTUAL AND ACCURATE ON THE GROUND SURVEY, THE PROPERTY BOUNDARY CLOSES AS PER MINIMUM STANDARDS SET FORTH BY THE TEXAS BOARD OF PROFESSIONAL ENGINEERS AND LAND SURVEYORS CODE, AS AMENDED, SPECIFICALLY SECTIONS 663.13–663.23 WHICH INCLUDES PROVISIONS REQUIRING 1:10,000 + 0.10' (URBAN) PRECISIONS FOR MONUMENTS FOUND OR SET WITHIN THE CORPORATE LIMITS OF ANY CITY, AND THAT THE CORNER MONUMENTS SHOWN THEREON WERE PROPERLY PLACED UNDER MY PERSONAL SUPERVISION, IN ACCORDANCE WITH CHAPTER 5, SUBDIVISIONS, PUBLIC IMPROVEMENTS, CITY OF LIBERTY HILL UNIFIED DEVELOPMENT CODE.

TO CERTIFY WHICH, WITNESS MY HAND AND SEAL AT ROCKDALE, TEXAS THIS THE [illegible] DAY OF [illegible], 20[illegible]

BRADLEY L. LIPSCOMB
REGISTERED PROFESSIONAL LAND SURVEYOR NO. 5952
STATE OF TEXAS

STATE OF TEXAS
BRADLEY LIPSCOMB
5952
LAND SURVEYOR

STATE OF TEXAS §
§KNOW ALL MEN BY THESE PRESENTS
COUNTY OF WILLIAMSON §

I, NICHOLAS SANDLIN, REGISTERED PROFESSIONAL ENGINEER IN THE STATE OF TEXAS, DO HEREBY CERTIFY THAT THIS PLAT COMPLIES WITH CHAPTER 5, SUBDIVISIONS, PUBLIC IMPROVEMENTS, CITY OF LIBERTY HILL UNIFIED DEVELOPMENT CODE AND THE DESIGN AND CONSTRUCTION STANDARDS ADOPTED BY THE CITY OF LIBERTY HILL, TEXAS.

NICHOLAS SANDLIN 9/6/2022
REGISTERED PROFESSIONAL ENGINEER NO. 124404 DATE
STATE OF TEXAS

STATE OF TEXAS
NICHOLAS R. SANDLIN
124404
LICENSED
PROFESSIONAL ENGINEER

CITY APPROVAL

I, JERRY MILLARD, DIRECTOR OF PLANNING, DESIGNEE, OF THE CITY OF LIBERTY HILL, TEXAS, UNDER THE AUTHORITY GRANTED ME IN SECTION 3.09.02 OF THE UNIFIED DEVELOPMENT CODE, IN ACCORDANCE WITH THE TEXAS LOCAL GOVERNMENT CODE, DO HEREBY CERTIFY THIS PLAT AS APPROVED FOR FILING OF RECORD WITH THE COUNTY CLERK OF WILLIAMSON COUNTY, TEXAS.

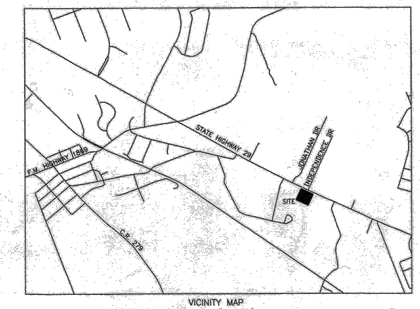
9-28-22
JERRY MILLARD, DIRECTOR OF PLANNING DATE

STATE OF TEXAS §
§KNOW ALL MEN BY THESE PRESENTS
COUNTY OF WILLIAMSON §

I, Nancy Rister, Clerk of the County Court of said County, do hereby certify that the foregoing instrument in writing, with its certificate of authentication was filed for record in my office on the 14th day of October, 2022 A.D., at 10:00 o'clock, A M., and duly recorded this the 24 day of October, 2022 A.D., at 11:12 o'clock, A M., in the Official Public Records of said County in Instrument No. 2022118436.
TO CERTIFY WHICH, WITNESS my hand and seal at the County Court of said County, at my office in Georgetown, Texas, the date last shown above written.

NANCY E. RISTER, CLERK COUNTY COURT
OF WILLIAMSON COUNTY, TEXAS
BY: Diane Lain DEPUTY

COUNTY COURT WILLIAMSON COUNTY, TEXAS



VICINITY MAP
SCALE: 1"=2000'

SUBJECT PROPERTY (AS SURVEYED)

All that certain tract or parcel of land situated in the City of Liberty Hill, Williamson County, Texas, being all of Lot 3, Block 1 of Heritage Ridge recorded in a map or plat thereof recorded in Document Number 2020143893 of the Official Public Records of Williamson County, Texas, and being more particularly described by metes and bounds as follows to wit:

BEGINNING at a found ½" iron rod on the south Right-of-Way line of State Highway 29, at the northeast corner of Lot 2, Block 1 of the said Heritage Ridge, for the northwest corner of this tract;

THENCE S65°08'26"E - 352.57' along the said south Right-of-Way line of State Highway 29 to a found etched "X" in concrete at the northwest corner of Lot 4, Block 1 of the said Heritage Ridge, for the northeast corner of this tract;

THENCE S25°00'51"W - 315.79' along the west line of the said Lot 4 to a found 5/8" iron rod with orange plastic cap marked "ACS" on the north line of the residue of a called 39.50 Acre tract conveyed to the Liberty Hill Independent School District in Document No. 1995048311 (Described in Volume 1797, Page 536), at the southwest corner of the said Lot 4, for the southeast corner of this tract;

THENCE along the said north line of the residue of the 39.50 Acre tract for the following courses and distances:

N65°40'07"W - 292.53' to a found ½" iron pipe for an interior ell corner of this tract;
N66°45'35"W - 60.17' to a found 5/8" iron rod with orange plastic cap marked "ACS" at the southeast corner of the said Lot 2, for the southwest corner of this tract;

THENCE N25°01'46"E - 320.19' along the east line of the said Lot 2 to the **POINT OF BEGINNING** containing within these metes and bounds 2.570 Acres of land.

GENERAL NOTES:

1. THIS SUBDIVISION IS WHOLLY CONTAINED WITHIN THE CURRENTLY CORPORATE LIMITS OF THE CITY OF LIBERTY HILL, TEXAS.
2. NO LOT IN THIS SUBDIVISION SHALL BE OCCUPIED UNTIL CONNECTED TO PERMITTED WATER DISTRIBUTION AND WASTEWATER COLLECTION FACILITIES.
3. A BUILDING PERMIT IS REQUIRED FROM THE CITY OF LIBERTY HILL PRIOR TO CONSTRUCTION OF ANY BUILDING OR SITE IMPROVEMENT(S) ON ANY LOT WITHIN THIS SUBDIVISION.
4. SIDEWALKS SHALL BE CONSTRUCTED IN ACCORDANCE WITH CHAPTER 5, SUBDIVISIONS & PUBLIC IMPROVEMENTS, CITY OF LIBERTY HILL UNIFIED DEVELOPMENT CODE.
5. ALL EASEMENTS ON PRIVATE PROPERTY SHALL BE MAINTAINED BY THE PROPERTY OWNER OR HIS OR HER ASSIGNS.
6. NO PORTION OF THIS TRACT LIES WITHIN A SPECIAL FLOOD HAZARD AREA AS SHOWN ON THE FLOOD INSURANCE RATE MAP PANEL 48491C0245F FOR WILLIAMSON COUNTY, TEXAS, EFFECTIVE DECEMBER 20, 2019.
7. NO OBSTRUCTIONS, INCLUDING BUT NOT LIMITED TO FENCING OR STORAGE, SHALL BE PERMITTED IN ANY DRAINAGE EASEMENTS SHOWN HEREON

OWNERS:

LIBERTY HILL 29, LLC
8001 QUAKER AVE., SUITE K
LUBBOCK, TX 79424

ACREAGE:

2.570 ACRES

SURVEYOR:

TRIAD SURVEYING, INC. (F-100007900)
P.O. BOX 1489
ROCKDALE, TX 76567
(512) 446-3457

ENGINEER:

SANDLIN SERVICES, LLC
8500 N MOPAC, STE 804
AUSTIN, TX 78759
TBPELS FIRM REGISTRATION #21356

LINEAR FEET OF NEW STREETS:

NONE

BENCHMARK INFORMATION:

TBM – "X" FOUND ETCHED IN A CONCRETE SLAB ON THE SOUTH RIGHT-OF-WAY LINE OF STATE HIGHWAY 29, AT THE NORTHWEST CORNER OF THE SHOWN LOT 4, AT THE NORTHEAST CORNER OF THE SHOWN LOT 3 HAVING AN ELEVATION OF: 1020.22'

LEGEND
● – 5/8" IRON ROD FOUND WITH ORANGE CAP MARKED "ACS" UNLESS OTHERWISE NOTED
○ – 1/2" IRON ROD SET WITH RED CAP MARKED "TRIAD RPLS 5952"

BEARINGS ARE BASED ON THE TEXAS STATE PLANE COORDINATE SYSTEM OF 1983, TEXAS CENTRAL ZONE

50 0 50 100 150 200 250 300
SCALE: 1" = 100 FEET

TRIAD SURVEYING
SURVEYING, INC. FIRM REGISTRATION NO. 10007900
528 COUNTY ROAD 325 P.O. BOX 1489 ROCKDALE, TX. 76567

REPLAT LOT 3, BLOCK 1 – HERITAGE RIDGE
CITY OF LIBERTY HILL
WILLIAMSON COUNTY, TEXAS

Completion Date: 8/2/22		Drawn by:	BL
Scale:	1"=100'	Surveyed by:	LS
PROJECT NO.	S22-133	Checked by:	BL

REVISIONS:

PLAT

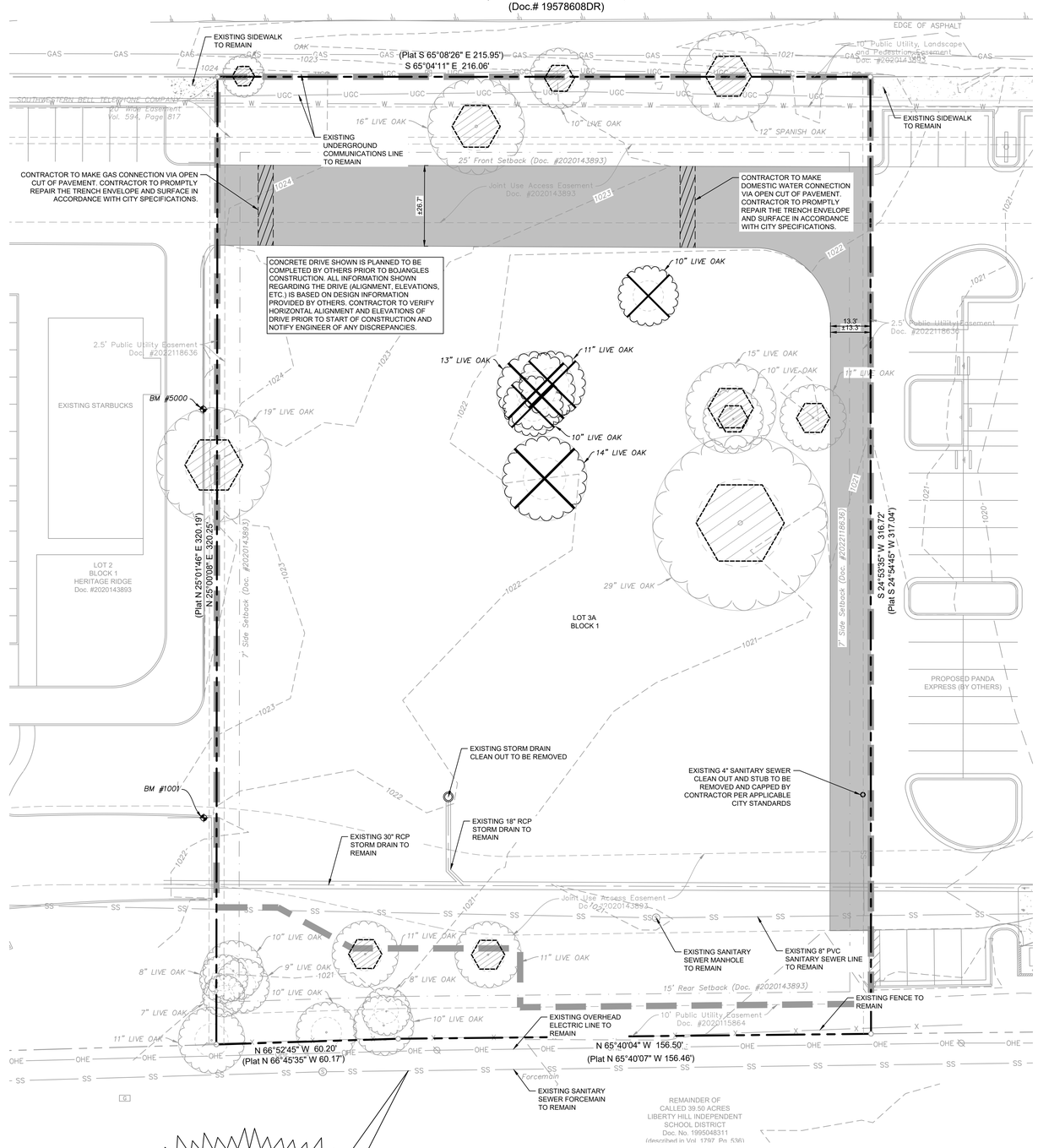
NEW RESTAURANT FOR:
Pojangles
W. State Hwy 29
Liberty Hill, TX 78642

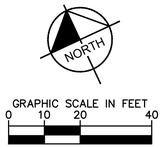
Kimley»Horn
© 2024 KIMLEY-HORN AND ASSOCIATES, INC.
1251 SADLER EAST DRIVE,
BUILDING 1, SUITE 100
SAN MARCOS, TX 78666
PHONE: 512-566-4457
WWW.KIMLEY-HORN.COM TBPE FIRM NO. 928

Charles William Pope & Associates
ARCHITECTURE PLANNING CONSULTING
2224 GARDENVIEW, SAN ANTONIO, TX. 78213

DATE: 02/02/2024
JOB NO: 069243600
DRAWN BY: MJG
SHEET NUMBER:
1.0
OF

Plotted By:Burns, Dylan - January 31, 2024 - 02:51:53pm K:\SMA_Civil\Bojangles\069243600 - Bojangles (Liberty Hill)\CAD\PlanSheets\C-DEMO-069243600.dwg
This document together with the concepts and designs presented herein, as an instrument of service, is intended only for the specific purpose and client for which it was prepared. Reuse of and improper reliance on this document without written authorization and adaptation by Kimley-Horn and Associates, Inc. shall be without liability to Kimley-Horn and Associates, Inc.





NOTES

1. THE CONTRACTOR SHALL COORDINATE WITH THE CITY OF LIBERTY HILL AND FRANCHISED UTILITY COMPANIES TO MAINTAIN SERVICES AT ALL TIMES TO NEIGHBORING PROPERTIES. THE CONTRACTOR SHALL MAINTAIN COMPLETE RECORDS INDICATING HOW THE WASTE FROM THE SITE HAS BEEN HANDLED. ALL FACILITIES TO BE REMOVED SHALL BE UNDERCUT TO SUITABLE MATERIAL AND BROUGHT TO GRADE WITH SUITABLE COMPACTED FILL MATERIAL PER THE SPECIFICATIONS IN THE GEOTECHNICAL REPORT. THE SITE, AFTER DEMOLITION SHALL BE GRADED TO ELIMINATE DEPRESSIONS, HOLES, BERMS, DIRT PILES, ETC. THE SITE IS TO BE GRADED UNTIL RELATIVELY SMOOTH AND ATTRACTIVE IN APPEARANCE PRIOR TO STABILIZATION OF EARTH. ANY FILL MATERIAL/FILL AREAS SHALL BE COMPACTED TO 95% OF STANDARD PROCTOR DENSITY AT A MOISTURE AT, OR ABOVE, OPTIMUM MOISTURE CONTENT IN MAXIMUM 8" LIFTS. CONTRACTOR SHALL PROVIDE PROOF IN THE FORM OF LAB TEST KITS THAT THIS HAS BEEN ACHIEVED.
2. THE CONTRACTOR SHALL BE RESPONSIBLE TO CLEAR, GRUB, AND STRIP ALL EXISTING IMPROVEMENTS, TREES, VEGETATION, AND TOP SOIL WITHIN THE LIMITS OF DISTURBANCE UNLESS OTHERWISE NOTED.
3. THE CONTRACTOR IS RESPONSIBLE FOR REMOVING ALL DEBRIS FROM THE SITE AND DISPOSING THE DEBRIS IN A LAWFUL MANNER. THE CONTRACTOR IS RESPONSIBLE FOR OBTAINING ALL PERMITS REQUIRED FOR DEMOLITION AND DISPOSAL. CONTRACTOR SHALL BE RESPONSIBLE FOR REVIEWING THE PHASE I ENVIRONMENTAL SITE ASSESSMENT.
4. LOCATIONS OF PUBLIC AND PRIVATE UTILITIES SHOWN ARE APPROXIMATE AND MAY NOT BE COMPLETE. CONTRACTOR SHALL CALL 811 AT LEAST 48 HOURS PRIOR TO COMMENCING DEMOLITION OR CONSTRUCTION ACTIVITIES. CONTRACTOR SHALL CONTACT ANY OTHER UTILITY COMPANIES WHO DO NOT SUBSCRIBE TO THE TESS PROGRAM FOR LINE MARKINGS. THE CONTRACTOR BEARS SOLE RESPONSIBILITY FOR VERIFYING LOCATIONS OF EXISTING UTILITIES, SHOWN OR NOT SHOWN, AND FOR ANY DAMAGE DONE TO THESE FACILITIES.
5. ALL EXISTING UTILITIES SHOWN ARE LOCATED ACCORDING TO THE INFORMATION AVAILABLE TO THE ENGINEER AT THE TIME THE DRAWINGS WERE PREPARED AND HAVE NOT BEEN INDEPENDENTLY VERIFIED BY THE OWNER OR THE ENGINEER. GUARANTEE IS NOT MADE THAT ALL EXISTING UNDERGROUND UTILITIES ARE SHOWN OR THAT THE LOCATION OF THOSE SHOWN ARE ACCURATE. FINDING THE ACTUAL LOCATION OF ANY EXISTING UTILITIES IS THE CONTRACTORS RESPONSIBILITY AND SHALL BE DONE BEFORE THEY COMMENCE ANY WORK, IN THE VICINITY. FURTHMORE, THE CONTRACTOR SHALL BE SOLELY RESPONSIBLE FOR ANY AND ALL DAMAGE DUE TO THE CONTRACTORS FAILURE TO EXACTLY LOCATE AND PRESERVE ANY AND ALL UNDERGROUND UTILITIES. THE OWNER OR ENGINEER WILL ASSUME NO LIABILITY FOR ANY DAMAGES SUSTAINED OR COST INCURRED BECAUSE OF THE OPERATIONS IN THE VICINITY OF EXISTING UTILITIES OR STRUCTURES, NOR FOR TEMPORARY BRACING AND SHORING OF SAME. IF IT IS NECESSARY TO SHORE, BRACE, SWING OR RELOCATE A UTILITY, THE UTILITY COMPANY OR DEPARTMENT AFFECTED SHALL BE CONTACTED BY THE CONTRACTOR AND THEIR PERMISSION OBTAINED REGARDING THE METHOD TO USE FOR SUCH WORK.
6. IT IS THE CONTRACTORS RESPONSIBILITY TO CONTACT THE VARIOUS UTILITY COMPANIES WHICH MAY HAVE BURIED OR AERIAL UTILITIES WITHIN OR NEAR THE CONSTRUCTION AREA BEFORE COMMENCING WORK. THE CONTRACTOR SHALL PROVIDE 72 HOURS MINIMUM NOTICE TO ALL UTILITY COMPANIES PRIOR TO BEGINNING CONSTRUCTION.
7. THE CONTRACTOR SHALL HAVE AVAILABLE AT THE JOB SITE AT ALL TIMES ONE COPY OF THE CONTRACT DOCUMENTS INCLUDING PLANS, SPECIFICATIONS AND SPECIAL CONDITIONS, COPIES OF ANY REQUIRED CONSTRUCTION PERMITS, AND EROSION CONTROL PLANS.
8. ANY DISCREPANCIES ON THE DRAWINGS SHALL BE IMMEDIATELY BROUGHT TO THE ATTENTION OF THE OWNER BEFORE COMMENCING WORK. NO FIELD CHANGES OR DEVIATIONS FROM DESIGN ARE TO BE MADE WITHOUT PRIOR APPROVAL OF THE OWNER AND NOTIFICATION TO THE ENGINEER. NO CONSIDERATION WILL BE GIVEN TO CHANGE ORDERS FOR WHICH THE OWNER WAS NOT CONTACTED PRIOR TO CONSTRUCTION OF THE AFFECTED ITEM.
9. CONTRACTOR IS RESPONSIBLE FOR TRAFFIC CONTROL DEVICES FOR ANY STREET WORK.
10. THE CONTRACTOR SHALL COORDINATE WITH RESPECTIVE UTILITY COMPANIES PRIOR TO THE REMOVAL AND/OR RELOCATION OF UTILITIES. THE CONTRACTOR SHALL COORDINATE WITH THE UTILITY COMPANY CONCERNING PORTIONS OF WORK WHICH MAY BE PERFORMED BY THE UTILITY COMPANY'S FORCES AND ANY FEES WHICH ARE TO BE PAID TO THE UTILITY COMPANY FOR THEIR SERVICES. THE DEVELOPER IS RESPONSIBLE FOR PAYING ALL FEES AND CHARGES.
11. CONTRACTOR MUST PROTECT THE PUBLIC AT ALL TIMES WITH FENCING, BARRICADES, ENCLOSURES, ETC., ACCORDING TO STANDARD BEST PRACTICES.
12. PRIOR TO DEMOLITION OCCURRING, ALL EROSION CONTROL DEVICES AROUND THE SITE PERIMETER ARE TO BE INSTALLED.
13. DAMAGE TO ALL EXISTING CONDITIONS TO REMAIN WILL BE REPLACED AT CONTRACTOR'S EXPENSE.
14. CONTRACTOR SHALL COMPLY TO THE FULLEST EXTENT WITH ALL REGULATIONS GOVERNING THE DEMOLITION, REMOVAL, TRANSPORTATION AND DISPOSAL OF ALL DEMOLITION DEBRIS.
15. CONTRACTOR SHALL COMPLY TO THE FULLEST EXTENT WITH THE LATEST OSHA STANDARDS FOR EXCAVATION AND TRENCHING PROCEDURES. CONTRACTOR SHALL USE SUPPORT SYSTEMS, SLOPING, BENCHING, ETC. AS NECESSARY FOR THESE OPERATIONS, AND SHALL COMPLY WITH ALL OSHA PERFORMANCE CRITERIA.
16. ANY RECYCLED MATERIAL TO BE STOCKPILED ON THE SITE SHALL BE STORED IN AS SMALL AN AREA AS PRACTICABLE AND THE LOCATION OF ANY STOCKPILE SHALL BE WELL CLEAR OF THE BUILDING PAD AREA AND THE LOCATION MUST BE PRE-APPROVED BY THE OWNER PRIOR TO STOCKPILING.
17. FILL MATERIAL SHALL BE PLACED IN ACCORDANCE WITH THE GEOTECH REPORT.
18. W. MILITARY ROAD HAS BEEN DEEMED TO HAVE A PAVEMENT CONDITION INDEX (PCI) OF 51-85 ON 6/15/2023 BY THE CITY OF SAN ANTONIO PUBLIC WORKS DEPARTMENT/ROW MANAGEMENT. IN THE EVENT OF AN EXCAVATION IN A STREET OR RIGHT OF WAY HAVING A PCI OF 51-85, THE RIGHT OF WAY USER EXCAVATOR SHALL PROMPTLY REPAIR THE TRENCH ENVELOPE AND SURFACE IN ACCORDANCE WITH THE SPECIFICATIONS SET FORTH IN THE RIGHT-OF-WAY MANAGEMENT OFFICE. IN THE EVENT OF FAILURE OF THE REPAIR DURING THE GUARANTY PERIOD, THE RIGHT-OF-WAY/USER EXCAVATOR SHALL REIMBURSE THE CITY FOR ITS PAVEMENT RESTORATION COST AND PAY THE PAVEMENT DEGRADATION RECOVERY FEE, CALCULATED AS SET FORTH IN THE RIGHT-OF-WAY MANAGEMENT ORDINANCE. CONTRACTOR TO COORDINATE WITH ANTHONY CANAVACHOLO (210-309-0097) PRIOR TO CONSTRUCTION TO DETERMINE TRUE LIMITS OF PAVEMENT RECONSTRUCTION.

LEGEND

	PROPERTY BOUNDARY
	LIMITS OF DISTURBANCE
	PROPOSED SAWCUT LIMITS
	BENCHMARK
	PROPERTY CORNER
UGC	EXISTING UNDERGROUND COMMUNICATIONS LINE TO REMAIN
W	EXISTING WATER LINE TO REMAIN
GAS	EXISTING GAS LINE TO REMAIN
SS	PROPOSED SANITARY SEWER LINE EXTENSION (BY OTHERS)
X	EXISTING METALLIC FENCE TO REMAIN
OHE	EXISTING OVERHEAD TO REMAIN
OHE	EXISTING OVERHEAD TO BE REMOVED
	PROPOSED CONCRETE PAVEMENT BY PANDA EXPRESS
	EXISTING SIGN
	EXISTING ELECTRIC EQUIPMENT
	EXISTING UTILITY POLE
	EXISTING LIGHT POLE
	EXISTING CLEANOUT
	EXISTING GAS METER
	EXISTING GAS VALVE
	EXISTING WATER METER
	EXISTING TREE TO BE REMOVED
	EXISTING TREE TO REMAIN CONTRACTOR TO PROTECT IN PLACE (REF. LANDSCAPE PLANS FOR TREE PROTECTION DETAILS AND MITIGATION CALCULATIONS)

CAUTION!!

EXISTING UNDERGROUND UTILITIES IN THE AREA CONTRACTOR IS RESPONSIBLE FOR DETERMINING THE HORIZON AND VERTICAL LOCATION OF ALL UTILITIES PRIOR TO CONSTRUCTION. CONTRACTOR SHALL BE RESPONSIBLE FOR ANY REPAIRS TO EXISITNG UTILITIES DUE TO DAMAGE INCURRED DURING CONSTRUCTION. CONTRACTOR SHALL NOTIFY THE ENGINEER OF ANY DISCREPANCIES ON THE PLANS.

ADVISORY NOTES

1. KIMLEY-HORN AND ASSOCIATES, INC. IS NOT RESPONSIBLE FOR THE MEANS AND METHODS EMPLOYED BY THE CONTRACTOR TO IMPLEMENT THIS DEMOLITION PLAN. THIS DEMOLITION PLAN SIMPLY INDICATES THE KNOWN OBJECTS ON THE SUBJECT TRACTS THAT ARE TO BE DEMOLISHED AND REMOVED FROM THE SITE. KIMLEY-HORN AND ASSOCIATES, INC. DOES NOT WARRANT OR REPRESENT THAT THE PLAN, WHICH WAS PREPARED BASED ON SURVEY AND UTILITY INFORMATION PROVIDED BY OTHERS, SHOWS ALL IMPROVEMENTS AND UTILITIES, THAT THE IMPROVEMENTS AND UTILITIES ARE SHOWN ACCURATELY, OR THAT THE UTILITIES SHOWN CAN BE REMOVED. THE CONTRACTOR IS RESPONSIBLE FOR PERFORMING HIS OWN SITE RECONNAISSANCE TO SCOPE HIS WORK AND TO CONFIRM WITH THE OWNERS OF IMPROVEMENTS AND UTILITIES THE ABILITY AND PROCESS FOR THE REMOVAL OF THEIR FACILITIES. THIS PLAN IS INTENDED TO GIVE A GENERAL GUIDE TO THE CONTRACTOR, NOTHING MORE. THE GOAL OF THE DEMOLITION IS TO LEAVE THE SITE IN A STATE SUITABLE FOR THE CONSTRUCTION OF THE PROPOSED DEVELOPMENT. REMOVAL OR PRESERVATION OF IMPROVEMENTS, UTILITIES, ETC. TO ACCOMPLISH THIS GOAL ARE THE RESPONSIBILITY OF THE CONTRACTOR.
2. THE CONTRACTOR IS STRONGLY CAUTIONED TO REVIEW ANY AVAILABLE REPORTS DESCRIBING SITE CONDITIONS PRIOR TO BIDDING AND IMPLEMENTING THE DEMOLITION PLAN.
3. CONTRACTOR SHALL COMPLY WITH ALL LOCAL, STATE, AND FEDERAL REGULATIONS REGARDING THE DEMOLITION OF OBJECTS ON THE SITE AND THE DISPOSAL OF THE DEMOLISHED MATERIALS OFF-SITE. IT IS THE CONTRACTOR'S RESPONSIBILITY TO REVIEW THE SITE, DETERMINE THE APPLICABLE REGULATIONS, RECEIVE THE REQUIRED PERMITS AND AUTHORIZATIONS, AND COMPLY.
4. KIMLEY-HORN AND ASSOCIATES, INC. DOES NOT WARRANT OR REPRESENT THAT THE REPORTS AND SURVEYS REFERENCED ABOVE ARE ACCURATE, COMPLETE, OR COMPREHENSIVE.

BENCHMARK LIST

BM #5000
SQUARE WITH "X" SET ON TOP OF CURB
N: 10,212,988.921
E: 3,061,300.850
ELEV: 1025.01'

BM #1001
"X" SET ON TOP OF CURB
N: 10,212,866.233
E: 3,061,244.005
ELEV: 1022.52

ALL ELEVATIONS SHOWN HEREON ARE TIED TO THE NORTH AMERICAN VERTICAL DATUM OF 1988 (NAVD '88) BASED ON GPS OBSERVATIONS

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811 Know what's below. Call before you dig.

REVISIONS:

DEMOLITION SITE PLAN

NEW RESTAURANT FOR:

Bojangles
W. State Hwy 29
Liberty Hill, TX 78642

Kimley»Horn

© 2024 KIMLEY-HORN AND ASSOCIATES, INC.
1251 SADLER EAST DRIVE,
SUITE 175, 78258
SAN MARCOS, TX 78666
PHONE: 512-566-4457
WWW.KIMLEY-HORN.COM TBPE FIRM NO. 928

STATE OF TEXAS
JORDAN P. SCHAEFER
122080
REGISTERED PROFESSIONAL ENGINEER
02/02/2024

Charles William Pope & Associates
ARCHITECTURE, PLANNING CONSULTING
224 GARDENVIEW, SAN ANTONIO, TX. 78213

DATE: 02/02/2024
JOB NO: 069243600
DRAWN BY: MJG
SHEET NUMBER:
1.1
OF

Plotted By:Burns, Dylan January 31, 2024 02:52:05pm K:\SMA_Civil\Bojangles\069243600 - Bojangles (Liberty Hill)\CAD\PlanSheets\C-DEMO-069243600.dwg
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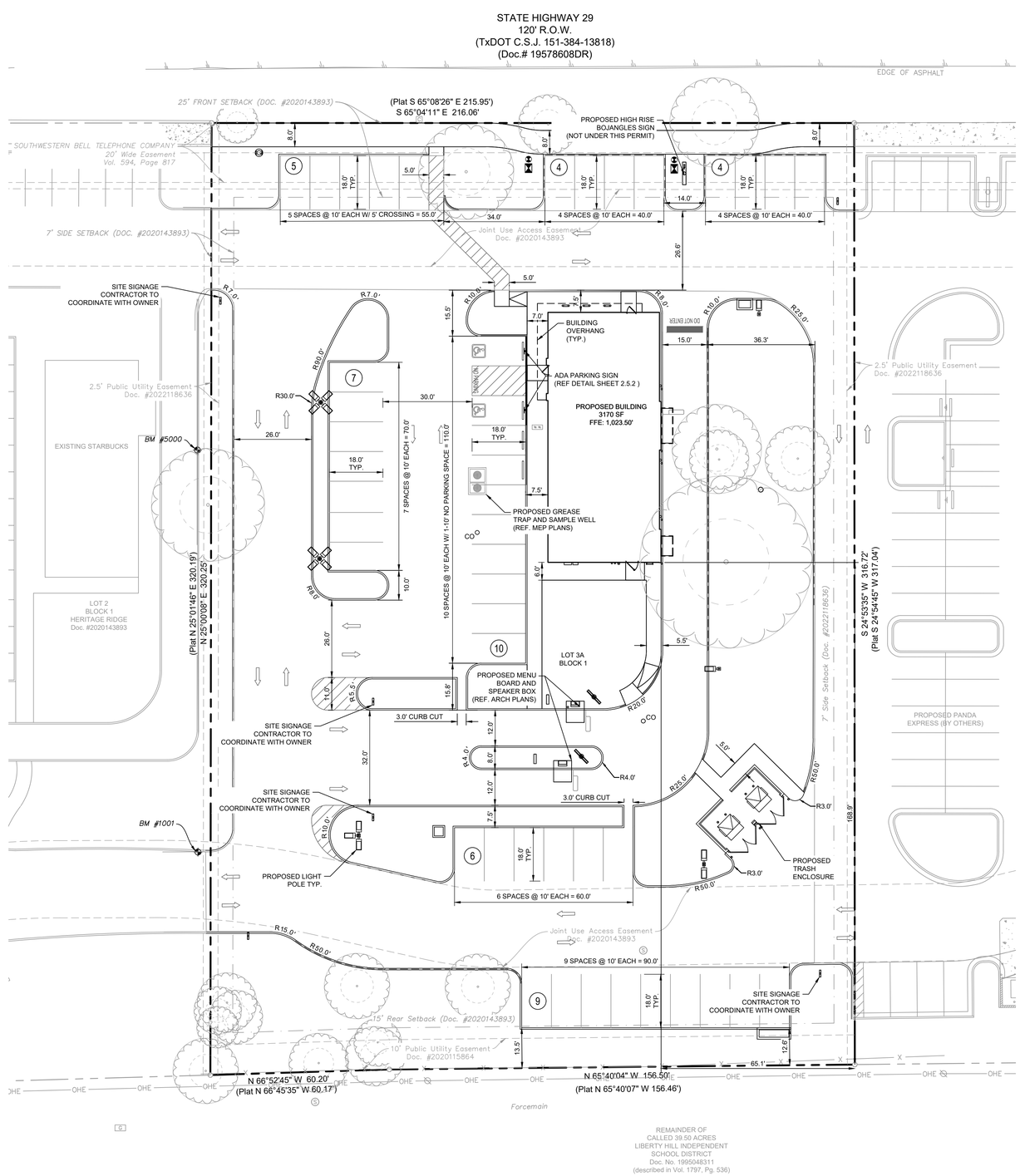

NORTH

GRAPHIC SCALE IN FEET
0 10 20 40

LEGEND

- PROPERTY BOUNDARY
- PROPOSED SAWCUT LINE
- PROPOSED CURB TRANSITION
- PROPOSED FLUSH CURB
- PROPOSED EXTENDED CURB WALL (REF. DETAIL, SHEET 2.5.2)
- PROPOSED PARKING COUNT
- PROPOSED SIGN
- PROPOSED ACCESSIBLE PARKING SPACE
- PROPOSED BARRIER FREE RAMP
- PROPOSED WHEEL STOP (REF DETAIL, SHEET 2.5.2
- EXISTING ELECTRIC METER
- PROPOSED LIGHT POLE
- PROPOSED SIDEWALK CHASE
- EXISTING WATER METER
- OHE — EXISTING OVERHEAD ELECTRIC LINE
- EXISTING POWER POLE
- EXISTING LIGHT POLE

NOTES

1. ALL DIMENSIONS ARE TO FACE OF CURB UNLESS OTHERWISE NOTED.
2. REFER TO ARCHITECTURAL CONSTRUCTION DRAWINGS FOR EXACT BUILDING DIMENSIONS. REFER TO LANDSCAPE ARCHITECT'S PLANS FOR DIMENSIONS AND DETAIL OF HARDSCAPE.
3. ALL CURB RADII ARE 5 FEET UNLESS DIMENSIONED OTHERWISE.
4. BUILDING, MECHANICAL EQUIPMENT AND SIGNS ARE SHOWN HEREON FOR REFERENCE ONLY. REFER TO CONSTRUCTION PLANS OF THOSE ITEMS FOR LOCATIONS AND DIMENSIONS.
5. ALL CONSTRUCTION SPECIFICATIONS WITHIN CITY RIGHT-OF-WAY AND EASEMENTS SHALL COMPLY WITH CITY OF LIBERTY HILL STANDARDS. PRIOR APPROVAL TO USE ANY NON-STANDARD MATERIAL IS REQUIRED.

SITE DATA TABLE

LEGAL DESCRIPTION	S13082 - HERITAGE RIDGE SUBDIVISION, BLOCK 1, LOT 3A
ZONING	GENERAL COMMERCIAL/RETAIN (C3)
SITE DATA	1.58 ACRES
ADDRESS	13003 W STATE HIGHWAY 29, LIBERTY HILL, TEXAS 78642
BUILDING DATA	
AREA	3,170 SF
HEIGHT	20'-4"
PARKING DATA	
REQUIRED PARKING SPACES (RESTAURANT W/ DRIVE THRU)	22 SPACES
STANDARD SPACES PROVIDED	43 SPACES
REQUIRED ACCESSIBLE SPACES	2 SPACES
ACCESSIBLE SPACES PROVIDED	2 SPACES
TOTAL SPACES PROVIDED	45 SPACES

BENCHMARK LIST

BM #5000
SQUARE WITH "X" SET ON TOP OF CURB
N: 10,212,988.921
E: 3,061,300.850
ELEV: 1025.01'

BM #1001
"X" SET ON TOP OF CURB
N: 10,212,866.233
E: 3,061,244.005
ELEV: 1022.52

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CAUTION!!
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811 Know what's below. Call before you dig.

REVISIONS:

SITE PLAN (DIMENSION CONTROL PLAN)

NEW RESTAURANT FOR:
Bojangles
W. State Hwy 29
Liberty Hill, TX 78642

Kimley»Horn
© 2024 KIMLEY-HORN AND ASSOCIATES, INC.
1251 SADLER EAST DRIVE,
BUILDING 1, STE 200,
SAN MARCOS, TX 78666
PHONE: 512-596-4457
WWW.KIMLEY-HORN.COM TBPE FIRM NO. 928

JORDAN P. SCHAEFER
122080
REGISTERED PROFESSIONAL ENGINEER
02/02/2024

Charles William Pope & Associates
ARCHITECTURE PLANNING CONSULTING
224 GARDENVIEW, SAN ANTONIO, TX. 78213

DATE: 02/02/2024
JOB NO: 069243600
DRAWN BY: MJG
SHEET NUMBER:
2.1.1
OF

Plotted By:Burn, Dylan January 31, 2024 02:52:32pm K:\SMA_Civil\Bojangles\069243600 - Bojangles (Liberty Hill)\CAD\PlanSheets\C-DMC-069243600.dwg
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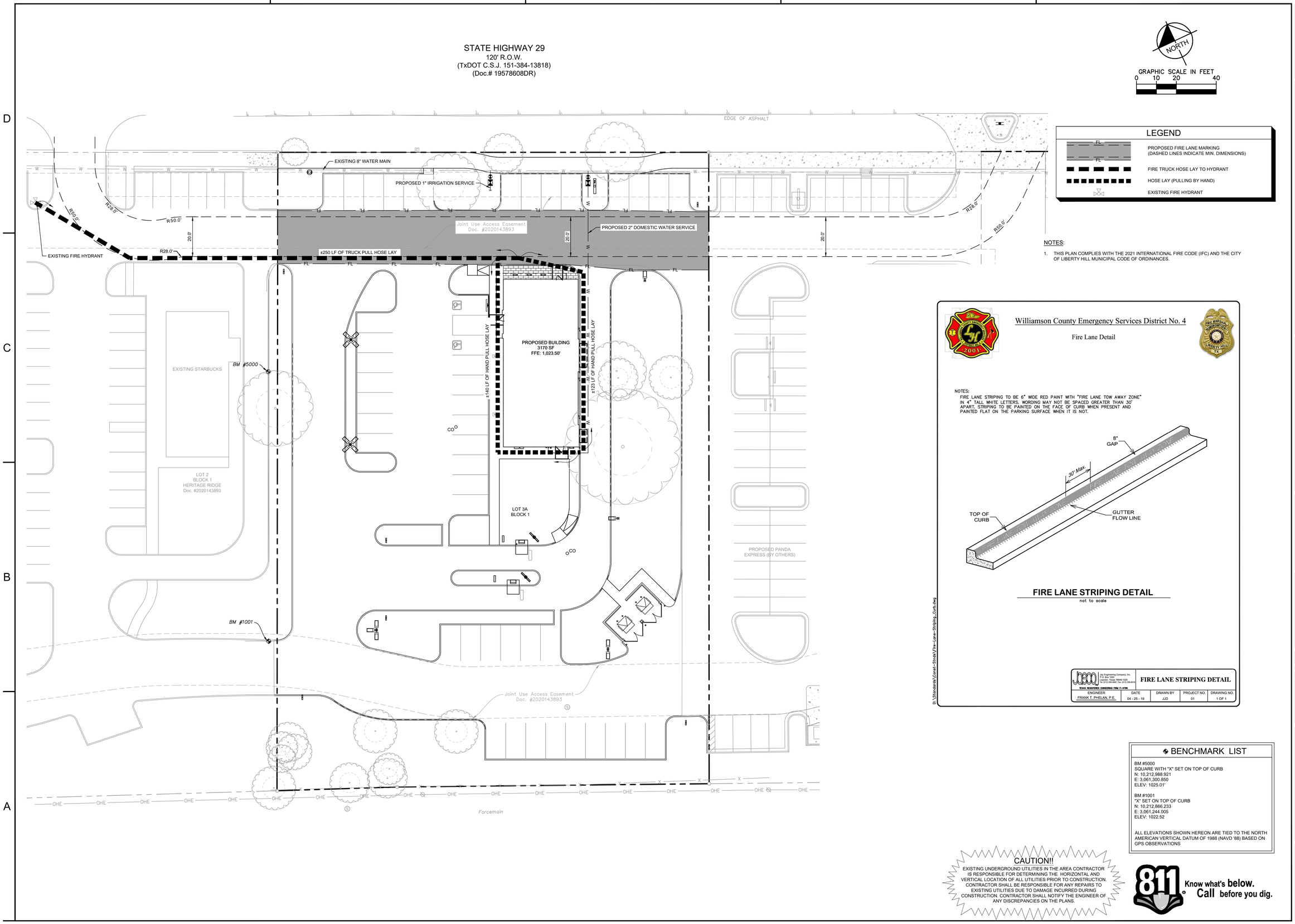

REVISIONS:

FIRE PROTECTION SITE PLAN

NEW RESTAURANT FOR:

Pojangles
W. State Hwy 29
Liberty Hill, TX 78642

Kimley»Horn
© 2024 KIMLEY-HORN AND ASSOCIATES, INC.
1251 SADLER EAST DRIVE,
BUILDING 1, SUITE 200
SAN MARCOS, TX 78666
PHONE: 512-566-4457
WWW.KIMLEY-HORN.COM TBPE FIRM NO. 928

JORDAN P. SCHAEFER
122080
REGISTERED PROFESSIONAL ENGINEER
04/01/2024

Charles William Pope & Associates
ARCHITECTURE PLANNING CONSULTING
224 GARDENVIEW, SAN ANTONIO, TX. 78213

DATE: 02/02/2024
JOB NO: 069243600
DRAWN BY: MJG
SHEET NUMBER:
2.1.2
OF

Plotted By:Bunn, Dylan January 31, 2024 02:52:57pm K:\SMA_Civil\Bojangles\069243600 - Bojangles (Liberty Hill)\CAD\PlanSheets\C-FIRE-069243600.dwg
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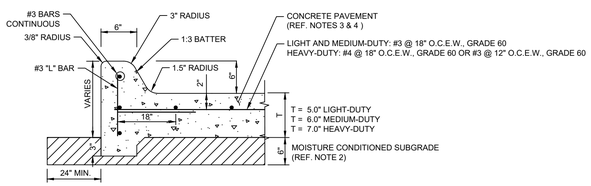
FOR ADDITIONAL INFORMATION REFER TO GEOTECHNICAL ENGINEERING REPORT PREPARED BY TERRACON CONSULTANTS INC., NO.AC235065, DATED 10/05/2023.

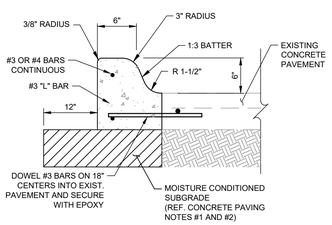


CONCRETE PAVEMENT SECTION W/ MOISTURE CONDITIONED SUBGRADE

N.T.S.

CONCRETE PAVEMENT NOTES:

1. PRIOR TO PLACING ANY FILL, ANY VEGETATION, LOOSE TOPSOIL, AND ANY OTHERWISE UNSUITABLE MATERIALS SHALL BE REMOVED FROM THE NEW PAVEMENT AREAS. AFTER STRIPPING, THE SUBGRADE SHALL BE PROOF-ROLLED WHERE POSSIBLE TO AID IN LOCATING LOOSE OR SOFT AREAS. PROOF-ROLLING CAN BE PERFORMED WITH A 15-TON ROLLER OR FULLY LOADED DUMP TRUCK. WET, SOFT, LOW-DENSITY OR DRY MATERIAL SHALL EITHER BE REMOVED OR MOISTURE CONDITIONED AND RECOMPACTED TO THE MOISTURE CONTENTS AND DENSITIES DESCRIBED BELOW PRIOR TO PLACING FILL.
2. OVER-EXCAVATE ANY CONFIRMED WEAK YIELDING ZONES, BOTH VERTICALLY AND HORIZONTALLY, TO EXPOSE COMPETENT SOIL. THE EXPOSED SUBGRADE SHALL BE MOISTURE CONDITIONED BETWEEN -2 AND +3 PERCENTAGE POINTS OF THE OPTIMUM MOISTURE CONTENT AND THEN COMPACT TO AT LEAST 95 PERCENT OF THE MAXIMUM DRY DENSITY DETERMINED IN ACCORDANCE WITH ASTM D 698.
3. CONCRETE SHALL HAVE A MINIMUM 28-DAY DESIGN COMPRESSIVE STRENGTH OF 3,500 PSI.
4. REFERENCE GEOTECHNICAL REPORT FOR CONCRETE PAVEMENT JOINT RECOMMENDATIONS.
5. REFERENCE GEOTECHNICAL REPORT FOR ALTERNATIVES TO THE MOISTURE CONDITIONED SUBGRADE. CONTRACTOR TO INSTALL MOST COST EFFECTIVE OPTION.



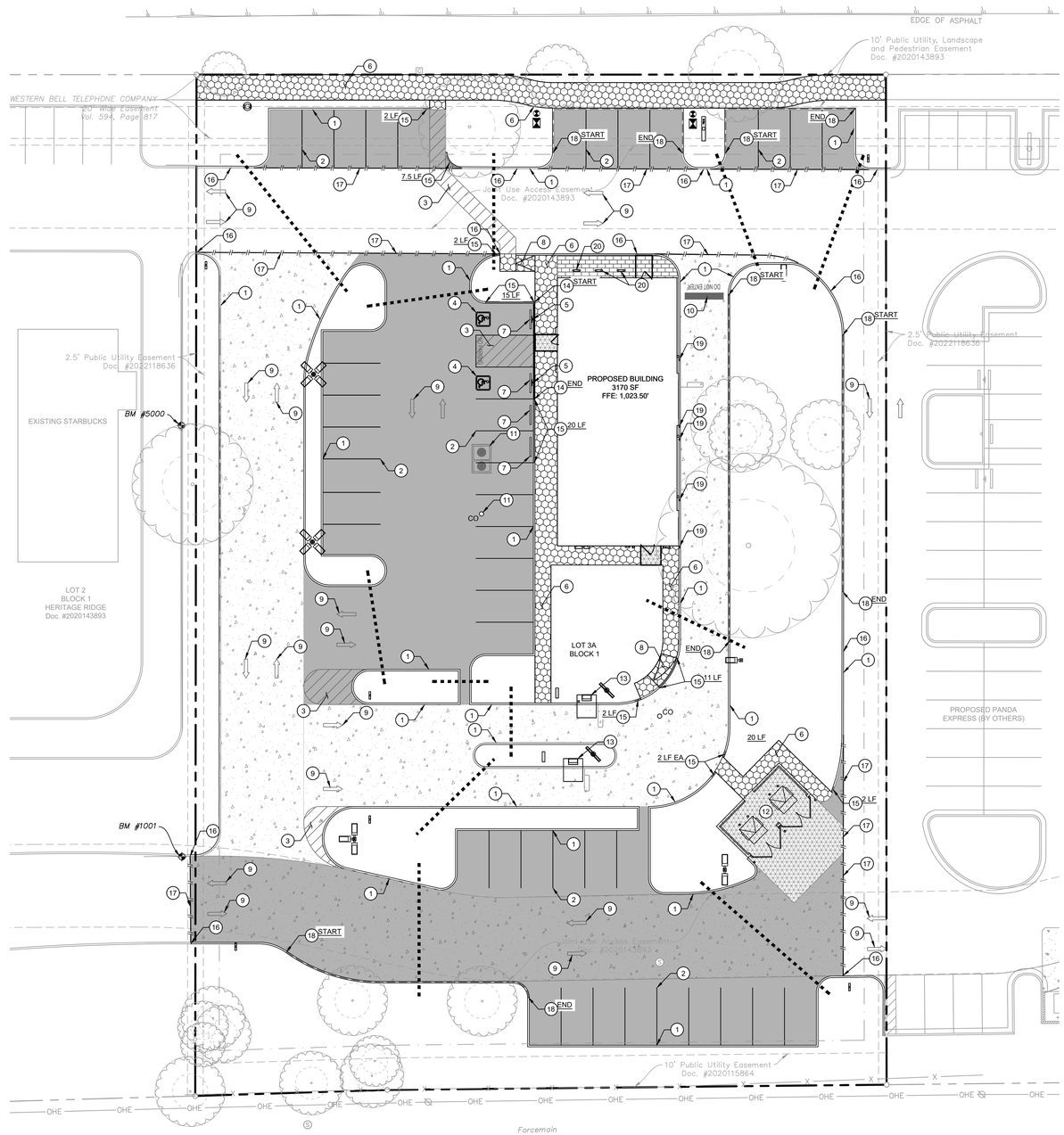
PROPOSED CONCRETE CURB/ EXISTING PAVEMENT CONNECTION

N.T.S.

TAS NOTE

GROUND AND FLOOR SURFACES ALONG ACCESSIBLE ROUTES AND IN ACCESSIBLE ROOMS AND SPACES INCLUDING FLOORS, WALKS, RAMPS, STAIRS, AND CURB RAMPS, SHALL BE STABLE, FIRM, SLIP-RESISTANT, AND SHALL COMPLY WITH SECTION 302 OF THE TEXAS ACCESSIBILITY STANDARDS.

STATE HIGHWAY 29
120' R.O.W.
(TxDOT C.S.J. 151-384-13818)
(Doc.# 19578608DR)



LEGEND

1	PROPOSED 6" CONCRETE CURB. CURBS TO BE PAINTED YELLOW ADJACENT TO BUILDING ENTRANCE (REF. DETAIL, THIS SHEET)
2	4" PAINTED STRIPE (TYP.)
3	4" PAINTED STRIPING, 2' O.C. @ 45°
4	ACCESSIBLE PARKING SYMBOL (REF. DETAIL, SHEET 2.5.2)
5	ACCESSIBLE PARKING SIGN (REF. DETAIL, SHEET 2.5.2)
6	CONSTRUCT ON-SITE CONCRETE SIDEWALK (REF. DETAIL, SHEET 2.5.2)
7	CONCRETE WHEEL STOP (REF. DETAIL, SHEET 2.5.2)
8	CONSTRUCT ON-SITE BARRIER FREE RAMP (REF. DETAIL, SHEET 2.5.2)
9	PROPOSED DIRECTIONAL ARROW STRIPING. CONTRACTOR TO PROVIDE SHOP DRAWING OF PAVEMENT MARKINGS FOR APPROVAL PRIOR TO INSTALLATION
10	PROPOSED "DO NOT ENTER" STRIPING AND STOP BAR. CONTRACTOR TO PROVIDE SHOP DRAWING OF PAVEMENT MARKINGS FOR APPROVAL PRIOR TO INSTALLATION
11	PROPOSED GREASE TRAP AND SAMPLE WELL (REF. MEP PLANS)
12	PROPOSED TRASH ENCLOSURE (REF. ARCH PLANS)
13	PROPOSED MENU AND PREVIEW BOARD (REF. ARCH PLANS)
14	PROPOSED FLUSH CURB
15	PROPOSED CURB TRANSITION (0" - 6" OVER REFERENCED DISTANCE)
16	DOWEL CONNECT PROPOSED CONCRETE PAVEMENT / CURB TO EXISTING CONCRETE PAVEMENT / CURB (REF. DETAIL, THIS SHEET)
17	PROPOSED BUTT JOINT (REF. DETAIL, SHEET 2.5.2)
18	PROPOSED CURB WALL (REF. DETAIL, SHEET 2.5.2)
19	PROPOSED BOLLARD (REF. ARCH PLANS FOR DETAIL)
20	PROPOSED BIKE RACK (REF. DETAIL, SHEET 2.5.2)
	PROPOSED ON-SITE SIDEWALK (REF. DETAIL, SHEET 2.5.2)
	PROPOSED LIGHT-DUTY CONCRETE (REF. DETAIL, THIS SHEET)
	PROPOSED MEDIUM-DUTY CONCRETE (REF. DETAIL, THIS SHEET)
	PROPOSED HEAVY-DUTY CONCRETE (REF. DETAIL, THIS SHEET)
	PROPOSED STRUCTURAL PAVING/ SLAB (REF. STRUCTURAL PLANS)
	PROPOSED PAVERS (REF. DETAIL, SHEET 2.5.5) CONTRACTOR TO COORDINATE PRODUCT WITH OWNER AND ENGINEER.
	PROPOSED PVC CONDUIT LOCATION (REFERENCE NOTE #3, THIS SHEET)
	PROPOSED BUTT JOINT (REF. DETAIL, SHEET 2.5.2)
	PROPERTY BOUNDARY
	PROPOSED CURB TRANSITION (0" - 6" OVER REFERENCED DISTANCE)
	PROPOSED FLUSH CURB
	PROPOSED ACCESSIBLE PARKING SPACE (REF. DETAIL, SHEET 2.5.2)
	PROPOSED BARRIER FREE RAMP (REF. DETAIL, SHEET 2.5.2)
	PROPOSED SIGN
	PROPOSED LIGHT POLE
	PROPOSED EXTENDED CURB WALL (REF. DETAIL, SHEET 2.5.2)
OHE	EXISTING OVERHEAD ELECTRIC LINE
	EXISTING POWER POLE
	EXISTING LIGHT POLE

NOTES

1. REFERENCE GEOTECHNICAL REPORT FOR ADDITIONAL PAVING AND SOIL PREPARATION NOTES.
2. REFERENCE SITE PLAN (DIMENSION CONTROL PLAN) ON SHEET 2.1.1 FOR CURB RADII AND LAYOUT INFORMATION
3. REFERENCE IRRIGATION AND MEP PLANS FOR CONDUIT SIZES AND LOCATIONS UNLESS OTHERWISE NOTED ON THIS SHEET.
4. EXPANSION JOINTS SHALL BE USED WHEREVER THE PAVEMENT WILL ABUT A STRUCTURAL ELEMENT SUBJECT TO DIFFERENT MAGNITUDE OF MOVEMENT, E.G., LIGHT POLES, RETAINING WALLS, EXISTING PAVEMENT, STAIRWAYS, ENTRYWAY PIERS, BUILDING WALLS, OR MANHOLES
5. EXISTING MANHOLE TOPS, VALVE BOXES, ETC. ARE TO BE ADJUSTED AS REQUIRED TO MATCH PROPOSED GRADES. IF NECESSARY, ADJUSTMENTS SHALL BE PERFORMED UPON COMPLETION OF PAVING AND FINE GRADING TO ENSURE A SMOOTH TRANSITION.
6. PAVEMENT WITHIN THE DRIVE-THRU AND TRASH PICK UP AREA MUST BE CONSTRUCTED WITH HEAVY-DUTY CONCRETE PAVEMENT.
7. WHEEL STOPS TO BE YELLOW OR PAINTED YELLOW.

BENCHMARK LIST

BM #5000
SQUARE WITH "X" SET ON TOP OF CURB
N: 10,212,988.921
E: 3,061,300.850
ELEV: 1025.01'

BM #1001
"X" SET ON TOP OF CURB
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REVISIONS:

SITE PAVING PLAN

NEW RESTAURANT FOR:
Bojangles
W. State Hwy 29
Liberty Hill, TX 78642

Kimley»Horn
© 2024 KIMLEY-HORN AND ASSOCIATES, INC.
1251 BADLER EAST DRIVE, SUITE 100
SAN MARCOS, TX 78666
PHONE: 512-596-4457
WWW.KIMLEY-HORN.COM TBPE FIRM NO. 928

JORDAN P. SCHAEFER 122080 REGISTERED PROFESSIONAL ENGINEER 01/01/2024

Charles William Pope & Associates
ARCHITECTURE PLANNING CONSULTING
224 GARDENVIEW, SAN ANTONIO, TX. 78213

DATE: 02/02/2024
JOB NO: 069243600
DRAWN BY: MJG
SHEET NUMBER:
2.1.3
OF

Plotted By:Bunn, Dylan January 31, 2024 02:53:09pm K:\SMA_Civil\Bojangles\069243600 - Bojangles (Liberty Hill)\CAD\PlanSheets\C-FAVI-069243600.dwg
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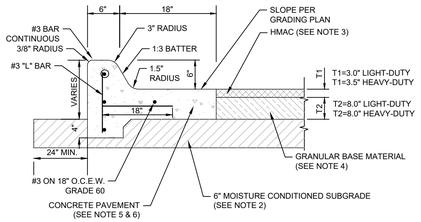


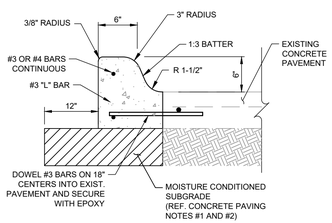
***ALTERNATE ***

ASPHALT AND CONCRETE CURB PAVEMENT SECTION

N.T.S.

ASPHALT PAVING NOTES:

1. PRIOR TO PLACING ANY FILL, ANY VEGETATION, LOOSE TOPSOIL, AND ANY OTHERWISE UNSUITABLE MATERIALS SHALL BE REMOVED FROM THE NEW PAVEMENT AREAS. AFTER STRIPPING, THE SUBGRADE SHALL BE PROOF-ROLLED WHERE POSSIBLE TO AID IN LOCATING LOOSE OR SOFT AREAS. PROOF-ROLLING CAN BE PERFORMED WITH A 15-TON ROLLER OR FULLY LOADED DUMP TRUCK. WET, SOFT, LOW-DENSITY OR DRY MATERIAL SHALL EITHER BE REMOVED OR MOISTURE CONDITIONED AND RECOMPACTED TO THE MOISTURE CONTENTS AND DENSITIES DESCRIBED BELOW PRIOR TO PLACING FILL.
2. OVER-EXCAVATE ANY CONFIRMED WEAK YIELDING ZONES, BOTH VERTICALLY AND HORIZONTALLY, TO EXPOSE COMPETENT SOIL. THE EXPOSED SUBGRADE SHALL BE MOISTURE CONDITIONED BETWEEN -3 AND +3 PERCENTAGE POINTS OF THE OPTIMUM MOISTURE CONTENT AND THEN COMPACT TO AT LEAST 95 PERCENT OF THE MAXIMUM DRY DENSITY DETERMINED IN ACCORDANCE WITH ASTM D 698.
3. THE ASPHALTIC CONCRETE SURFACE COURSE SHALL BE PLANT MIXED, HOT LAID TYPE C OR D SURFACE AND SHALL MEET THE MASTER SPECIFICATION REQUIREMENTS OF THE 2014 TXDOT STANDARD SPECIFICATIONS ITEM 341, ITEM SS 3224 (2011) AND SPECIFIC CRITERIA FOR THE JOB MIX FORMULA. THE MIX SHALL BE COMPACTED BETWEEN 91 AND 95 PERCENT OF THE MAXIMUM THEORETICAL DENSITY AS MEASURED BY TEX-227-F. THE ASPHALT CEMENT CONTENT BY PERCENT OF TOTAL MIXTURE WEIGHT SHALL FALL WITHIN A TOLERANCE OF ±0.3 PERCENT ASPHALT CEMENT FROM THE SPECIFIC MIX. IN ADDITION, THE MIX SHALL BE DESIGNED SO 75 TO 85 PERCENT OF THE VOIDS IN THE MINERAL AGGREGATE (VMA) ARE FILLED WITH ASPHALTIC CEMENT. THE GRADE OF THE ASPHALT CEMENT SHALL BE PG 70-22 OR HIGHER PERFORMANCE GRADE. AGGREGATES KNOWN TO BE PRONE TO STRIPPING SHALL NOT BE USED IN THE HOT MIX. IF SUCH AGGREGATES ARE USED MEASURES SHALL BE TAKEN TO MITIGATE THIS CONCERN. THE MIX SHALL HAVE AT LEAST 70 PERCENT STRENGTH RETENTION WHEN TESTED IN ACCORDANCE WITH TEX-531-C.
4. BASE MATERIAL SHALL BE COMPOSED OF CRUSHED LIMESTONE BASE MEETING ALL OF THE REQUIREMENTS OF 2014 TXDOT ITEM 247, TYPE A, GRADE 1-2, INCLUDING TRIAXIAL STRENGTH. THE MATERIAL SHALL BE COMPACTED TO AT LEAST 100 PERCENT OF THE MAXIMUM DRY DENSITY AS DETERMINED IN ACCORDANCE WITH TXDOT TEX-113-E AT MOISTURE CONTENTS RANGING FROM -3 AND +3 PERCENTAGE POINTS OF THE OPTIMUM MOISTURE CONTENT.
5. CONCRETE SHALL HAVE A MINIMUM 28-DAY DESIGN COMPRESSIVE STRENGTH OF 3,500 PSI.
6. REFERENCE GEOTECHNICAL REPORT FOR ALTERNATIVES TO THE MOISTURE CONDITIONED SUBGRADE. CONTRACTOR TO INSTALL MOST COST EFFECTIVE OPTION.



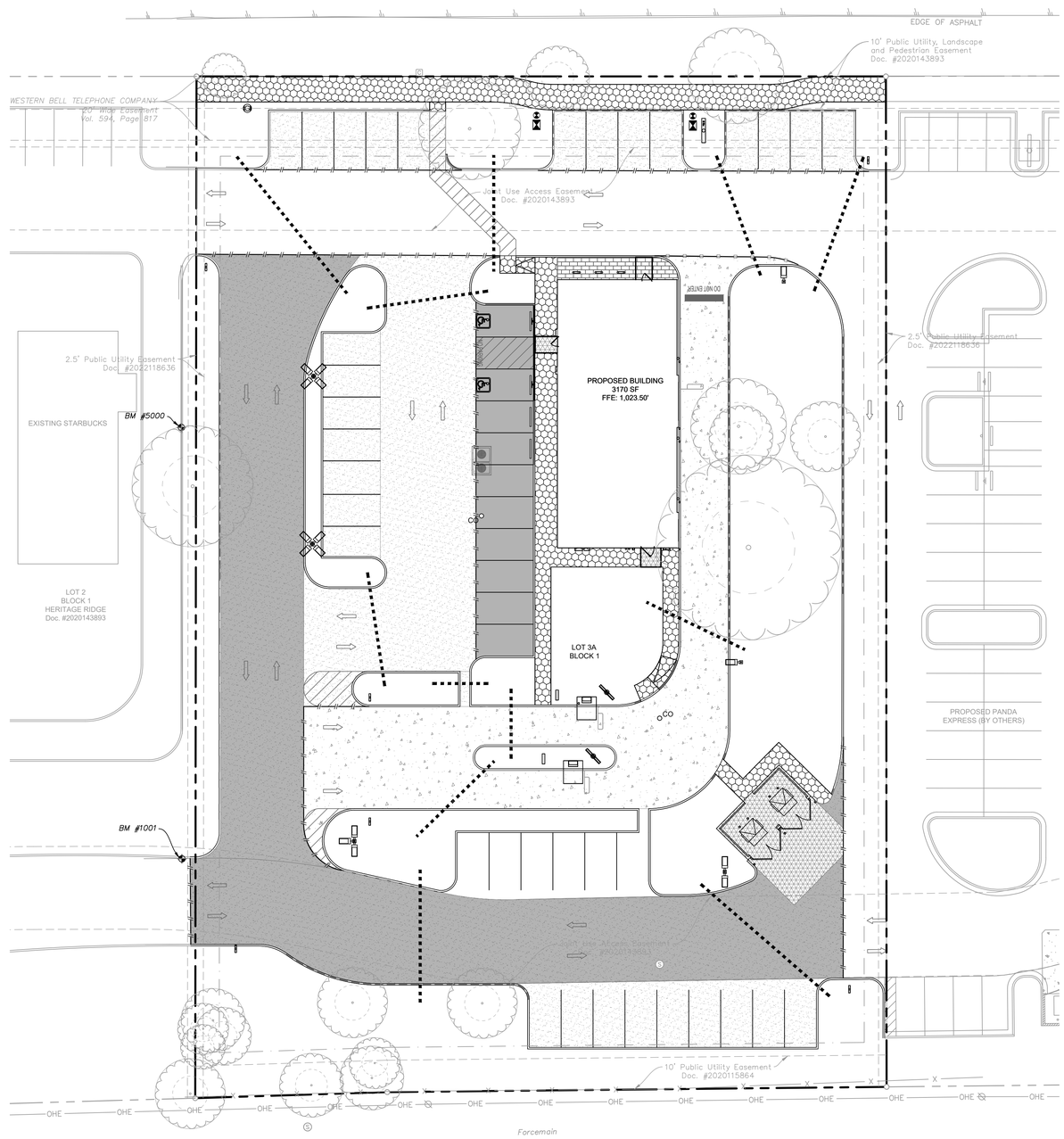
PROPOSED CONCRETE CURB/ EXISTING PAVEMENT CONNECTION

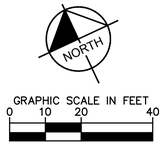
N.T.S.

TAS NOTE

GROUND AND FLOOR SURFACES ALONG ACCESSIBLE ROUTES AND IN ACCESSIBLE ROOMS AND SPACES INCLUDING FLOORS, WALKS, RAMPS, STAIRS, AND CURB RAMPS, SHALL BE STABLE, FIRM, SLIP-RESISTANT, AND SHALL COMPLY WITH SECTION 302 OF THE TEXAS ACCESSIBILITY STANDARDS.

STATE HIGHWAY 29
120' R.O.W.
(TxDOT C.S.J. 151-384-13818)
(Doc.# 19578608DR)





LEGEND

- PROPOSED ON-SITE SIDEWALK (REF. DETAIL, SHEET 2.5.2)
- PROPOSED LIGHT-DUTY ASPHALT PAVEMENT (REF. DETAIL, THIS SHEET)
- PROPOSED HEAVY-DUTY ASPHALT PAVEMENT (REF. DETAIL, THIS SHEET)
- PROPOSED LIGHT-DUTY CONCRETE (REF. DETAIL, SHEET 2.1.3)
- PROPOSED MEDIUM-DUTY CONCRETE (REF. DETAIL, SHEET 2.1.3)
- PROPOSED PAVERS (REF. DETAIL, SHEET 2.5.5) CONTRACTOR TO COORDINATE PRODUCT WITH OWNER AND ENGINEER.
- PROPOSED STRUCTURAL PAVING/ SLAB (REF. STRUCTURAL PLANS)
- PROPOSED PVC CONDUIT LOCATION (REFERENCE NOTE #3, THIS SHEET)
- ASPHALT/CONCRETE PAVEMENT TRANSITION (REF. DETAIL, SHEET 2.5.2)
- PROPOSED BUTT JOINT (REF. DETAIL, SHEET 2.5.2)
- PROPERTY BOUNDARY
- PROPOSED CURB TRANSITION (0" - 6" OVER REFERENCED DISTANCE)
- PROPOSED FLUSH CURB
- PROPOSED ACCESSIBLE PARKING SPACE (REF. DETAIL, SHEET 2.5.2)
- PROPOSED BARRIER FREE RAMP (REF. DETAIL, SHEET 2.5.2)
- PROPOSED SIGN
- PROPOSED LIGHT POLE
- PROPOSED EXTENDED CURB WALL (REF. DETAIL, SHEET 2.5.2)
- OHE — EXISTING OVERHEAD ELECTRIC LINE
- EXISTING POWER POLE
- EXISTING LIGHT POLE

NOTES

1. REFERENCE GEOTECHNICAL REPORT FOR ADDITIONAL PAVING AND SOIL PREPARATION NOTES.
2. REFERENCE SITE PLAN (DIMENSION CONTROL PLAN) ON SHEET 2.1.1 FOR CURB RADII AND LAYOUT INFORMATION
3. REFERENCE IRRIGATION AND MEP PLANS FOR CONDUIT SIZES AND LOCATIONS UNLESS OTHERWISE NOTED ON THIS SHEET.
4. EXPANSION JOINTS SHALL BE USED WHEREVER THE PAVEMENT WILL ABUT A STRUCTURAL ELEMENT SUBJECT TO DIFFERENT MAGNITUDE OF MOVEMENT, E.G., LIGHT POLES, RETAINING WALLS, EXISTING PAVEMENT, STAIRWAYS, ENTRYWAY PIERS, BUILDING WALLS, OR MANHOLES
5. EXISTING MANHOLE TOPS, VALVE BOXES, ETC. ARE TO BE ADJUSTED AS REQUIRED TO MATCH PROPOSED GRADES. IF NECESSARY, ADJUSTMENTS SHALL BE PERFORMED UPON COMPLETION OF PAVING AND FINE GRADING TO ENSURE A SMOOTH TRANSITION.
6. PAVEMENT WITHIN THE DRIVE-THRU AND TRASH PICK UP AREA MUST BE CONSTRUCTED WITH HEAVY-DUTY CONCRETE PAVEMENT.
7. WHEEL STOPS TO BE YELLOW OR PAINTED YELLOW.

BENCHMARK LIST

BM #5000
SQUARE WITH "X" SET ON TOP OF CURB
N: 10,212,988.921
E: 3,061,300.850
ELEV: 1025.01'

BM #1001
"X" SET ON TOP OF CURB
N: 10,212,866.233
E: 3,061,244.005
ELEV: 1022.52

ALL ELEVATIONS SHOWN HEREON ARE TIED TO THE NORTH AMERICAN VERTICAL DATUM OF 1988 (NAVD '88) BASED ON GPS OBSERVATIONS

CAUTION!!

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811 Know what's below. Call before you dig.

REVISIONS:

SITE PAVING PLAN (ALTERNATE)

NEW RESTAURANT FOR:

Bojangles
W. State Hwy 29
Liberty Hill, TX 78642

Kimley»Horn
© 2024 KIMLEY-HORN AND ASSOCIATES, INC.
1251 SADLER EAST DRIVE,
BUILDING 1, SUITE 200
SAN MARCOS, TX 78666
PHONE: 512-566-4457
WWW.KIMLEY-HORN.COM TBPE FIRM NO. 928

STATE OF TEXAS
JORDAN P. SCHAEFER
122080
REGISTERED PROFESSIONAL ENGINEER
02/02/2024

Charles William Pope & Associates
ARCHITECTURE PLANNING CONSULTING
224 GARDENVIEW, SAN ANTONIO, TX. 78213

DATE: 02/02/2024
JOB NO: 069243600
DRAWN BY: MJG
SHEET NUMBER:
2.1.4
OF

Plotted By:Burns, Dylan - January 31, 2024 - 02:53:39pm - K:\SMA_Civil\Bojangles\069243600 - Bojangles (Liberty Hill)\CAD\PlanSheets\C-PAVI-ALT-069243600.dwg
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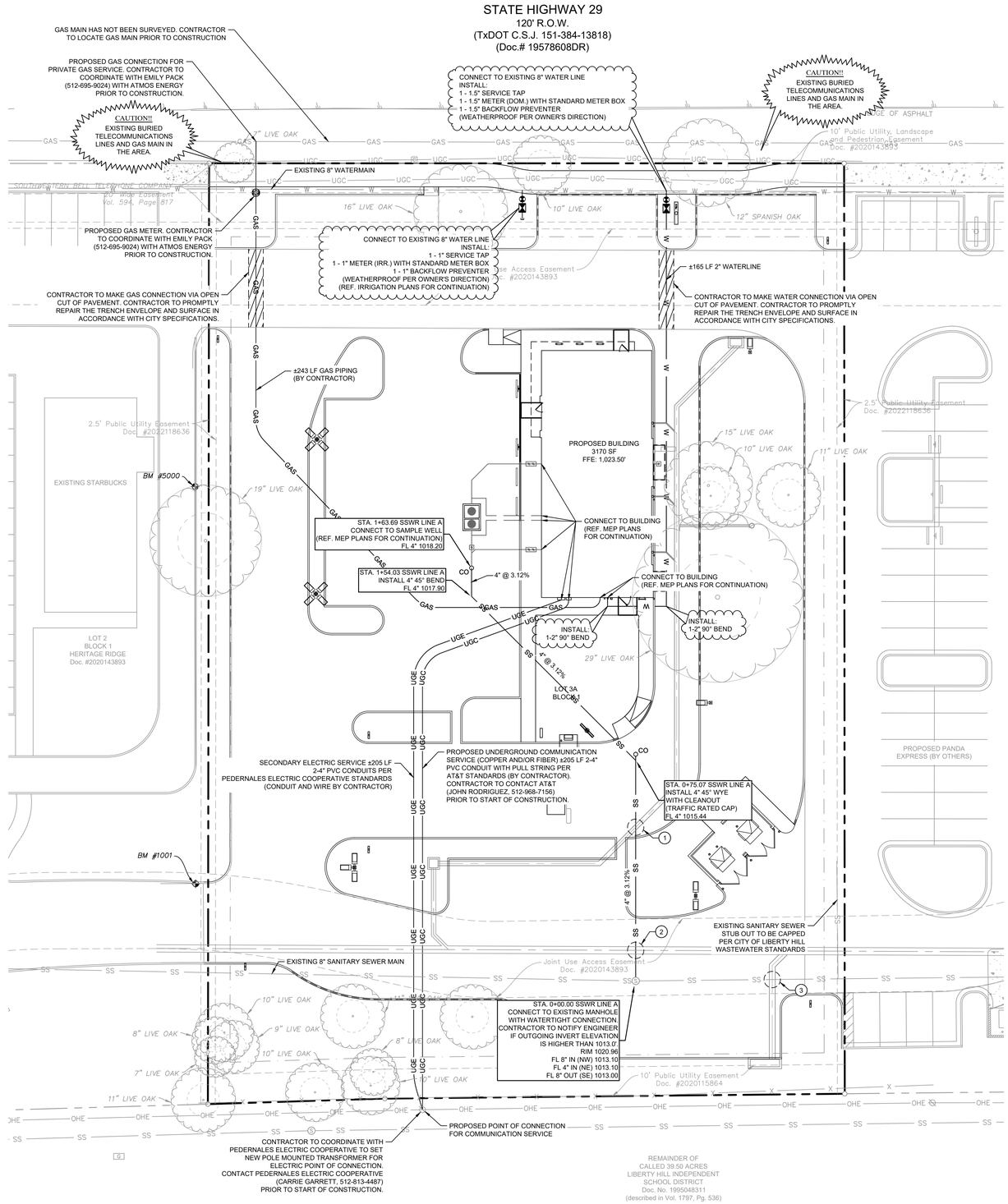

GRAPHIC SCALE IN FEET
0 10 20 40

LEGEND

SS	PROPOSED SANITARY SEWER LINE
W	PROPOSED WATER LINE
GAS	PROPOSED GAS LINE
UGE	PROPOSED UNDERGROUND ELECTRIC LINE
UGC	PROPOSED UNDERGROUND COMMUNICATION LINE
SS	EXISTING SANITARY SEWER LINE
W	EXISTING WATER LINE
GAS	EXISTING GAS LINE
OHE	EXISTING OVERHEAD ELECTRIC LINE
CO	PROPOSED CLEANOUT
	PROPOSED BACKFLOW PREVENTER
	PROPOSED WATER METER
	PROPOSED WATER VALVE
	EXISTING SANITARY SEWER MANHOLE
	EXISTING UTILITY POLE

NOTES

1. ALL DIMENSIONS ARE TO CENTERLINE OF PIPE UNLESS NOTED OTHERWISE.
2. REFERENCE WATER AND SANITARY SEWER NOTES ON SHEET 2.5.1 FOR ADDITIONAL REQUIREMENTS.
3. CONTRACTOR TO FIELD VERIFY LOCATION OF ALL UTILITIES PRIOR TO CONSTRUCTION. CONTACT ENGINEER IF FIELD CONDITIONS VARY.
4. REFERENCE ARCHITECTURAL AND MEP PLANS FOR EXACT UTILITY TIE-IN LOCATIONS AT BUILDING.
5. REFER TO TCEQ CHAPTERS 290 AND 217 FOR REQUIREMENTS AT ALL SANITARY SEWER AND WATER UTILITY CROSSINGS.
6. REFERENCE SHEET 2.5.3 FOR WATER AND SEWER STANDARD DETAILS.

TRENCH EXCAVATION SAFETY PROTECTION

CONTRACTOR AND/OR CONTRACTOR'S INDEPENDENTLY RETAINED EMPLOYEE OR STRUCTURAL DESIGN/GEOTECHNICAL/SAFETY/EQUIPMENT CONSULTANT, IF ANY, SHALL REVIEW THESE PLANS AND AVAILABLE GEOTECHNICAL INFORMATION AND THE ANTICIPATED INSTALLATION SITE(S) WITHIN THE PROJECT WORK AREA IN ORDER TO IMPLEMENT CONTRACTOR'S TRENCH EXCAVATION SAFETY PROTECTION SYSTEMS, PROGRAMS AND/OR PROCEDURES FOR THE PROJECT DESCRIBED IN THE CONTRACT DOCUMENTS. THE CONTRACTOR'S IMPLEMENTATION OF THESE SYSTEMS, PROGRAMS AND/OR PROCEDURES SHALL PROVIDE FOR ADEQUATE TRENCH EXCAVATION SAFETY PROTECTION THAT COMPLY WITH AS A MINIMUM, OSHA STANDARDS FOR TRENCH EXCAVATIONS. SPECIFICALLY, CONTRACTOR AND/OR CONTRACTOR'S INDEPENDENTLY RETAINED EMPLOYEE OR SAFETY CONSULTANT SHALL IMPLEMENT A TRENCH SAFETY PROGRAM IN ACCORDANCE WITH OSHA STANDARDS GOVERNING THE PRESENCE AND ACTIVITIES OF INDIVIDUALS WORKING IN AND AROUND TRENCH EXCAVATION.

UTILITY CROSSING

	STORM DRAIN	SANITARY SEWER
1	PR. 18": ±1016.9'	PR. 4": ±1015.1'
2	EX. 30": ±1015.4'	PR. 4": ±1013.8'
3	PR. 18": ±1016.0'	EX. 8": ±1013.3'

BENCHMARK LIST

BM #5000
SQUARE WITH "X" SET ON TOP OF CURB
N: 10,212,988.921
E: 3,061,300.850
ELEV: 1025.01'

BM #1001
"X" SET ON TOP OF CURB
N: 10,212,866.233
E: 3,061,244.005
ELEV: 1022.52

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REVISIONS:

SITE UTILITY PLAN

NEW RESTAURANT FOR:
Bojangles
W. State Hwy 29
Liberty Hill, TX 78642

Kimley»Horn
© 2024 KIMLEY-HORN AND ASSOCIATES, INC.
1251 SADLER EAST DRIVE,
SUITE 100, KYLE, TX 78640
SAN MARCOS, TX 78666
PHONE: 512-396-4457
WWW.KIMLEY-HORN.COM TBPE FIRM NO. 928

JORDAN P. SCHAEFER
122080
REGISTERED PROFESSIONAL ENGINEER
02/02/2024

Charles William Pope & Associates
ARCHITECTURE PLANNING CONSULTING
224 GARDENVIEW, SAN ANTONIO, TX. 78213

DATE: 02/02/2024
JOB NO: 069243600
DRAWN BY: MJG
SHEET NUMBER:
2.2.1
OF

Plotted By:Burns, Dylan January 31, 2024 02:54:09pm K:\SMA_Civil\Bojangles\069243600 - Bojangles (Liberty Hill)\CAD\PlanSheets\C-UTIL-069243600.dwg
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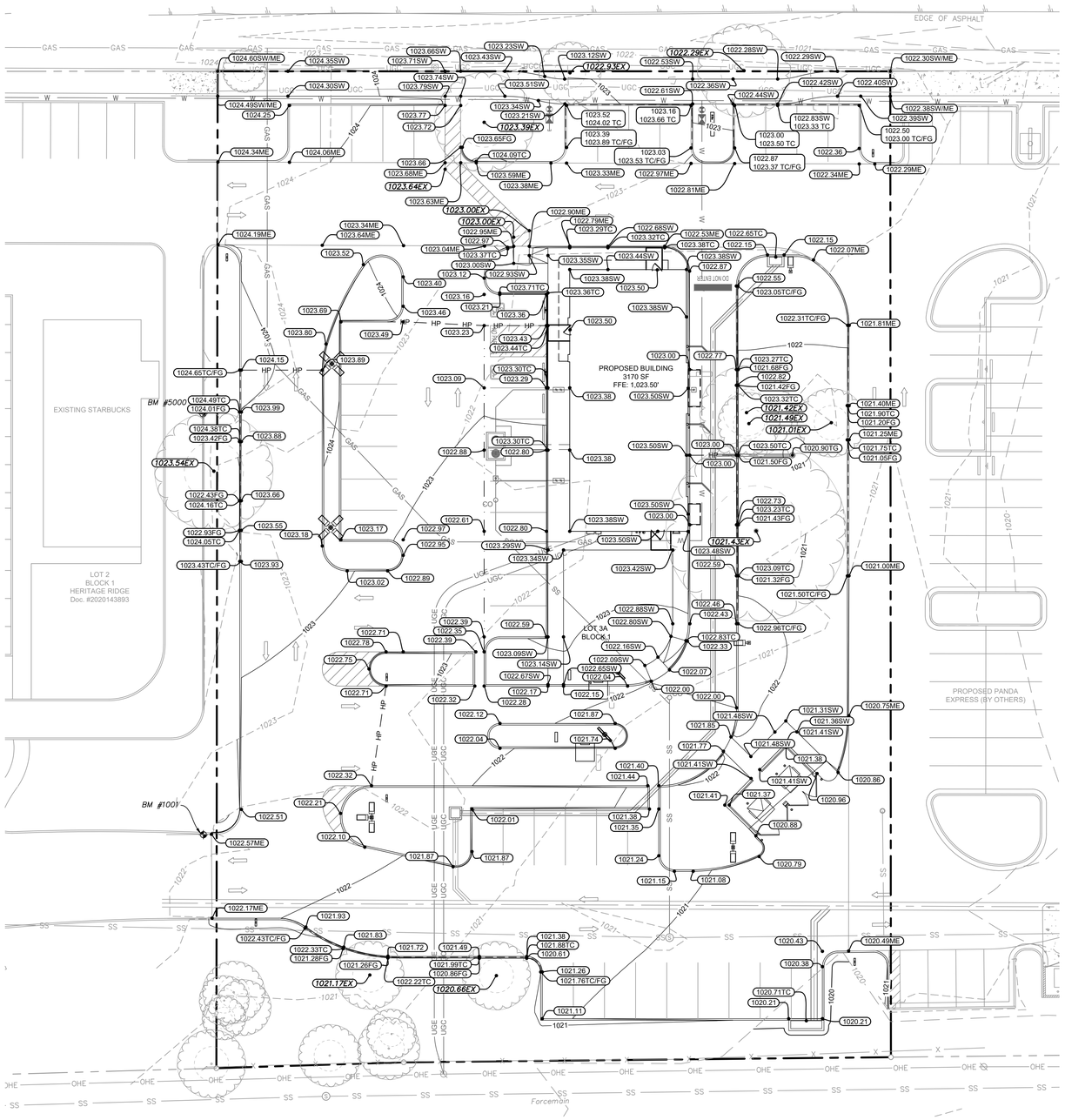
STATE HIGHWAY 29
120' R.O.W.
(TxDOT C.S.J. 151-384-13818)
(Doc.# 19578608DR)



GRAPHIC SCALE IN FEET
0 10 20 40

LEGEND

XXX.XX	PROPOSED SPOT ELEVATION
SW	SIDEWALK
FG	FINISHED GRADE
TC	TOP OF CURB
EX	EXISTING SPOT ELEVATION
ME	MATCH EXISTING
TG	TOP OF GRATE
1022	PROPOSED CONTOURS
1022	EXISTING CONTOURS
	PROPOSED CURB TRANSITION
	PROPOSED FLUSH CURB
	EXTENDED CURB WALL (REF. DETAIL, SHEET 2.5.2)
HP HP HP	PROPOSED HIGH POINT
	PROPOSED VALLEY
	PROPOSED BARRIER FREE RAMP
	PROPOSED LIGHT POLE
CO	PROPOSED SANITARY CLEANOUT
	PROPOSED BACKFLOW PREVENTER
	PROPOSED WATER METER
	EXISTING POWER POLE

NOTES

1. ALL SPOT GRADES ARE TO TOP OF PAVEMENT (TP) OR TOP OF GRATE (TG), UNLESS OTHERWISE NOTED AS TC (TOP OF CURB). CONTRACTOR TO ADD 6" FOR TOP OF CURB AS NECESSARY.
2. ALL WALL SPOTS REPRESENT TOP OF FINISHED GRADE, NOT FOOTING.
3. NO EARTHEN SLOPE SHALL BE GREATER THAN 3:1, UNLESS OTHERWISE NOTED.
4. MAXIMUM SLOPE IN ACCESSIBLE PARKING SPACES, LOADING ZONES AND SIDEWALK LANDINGS SHALL NOT EXCEED 2.0% IN ALL DIRECTIONS.
5. MAXIMUM RUNNING SLOPE SHALL NOT EXCEED 5% AND CROSS SLOPE SHALL NOT EXCEED 2% ON ALL SIDEWALKS UNLESS OTHERWISE NOTED. RUNNING SLOPE MAY EXCEED 5% IN PUBLIC R.O.W. IF EXISTING ROAD SLOPE EXCEEDS 5%. SIDEWALK SHALL NOT EXCEED RUNNING SLOPE OF EXISTING ROADWAY.
6. GENERAL CONTRACTOR TO REFERENCE NOTE 1 REGARDING SPOT ELEVATIONS, COORDINATE WITH DIRT AND LANDSCAPE SUBCONTRACTORS REGARDING PROPOSED SOD AND HYDROMULCH LOCATIONS TO ENSURE ADEQUATE CUT FOR FUTURE VEGETATION.
7. EXISTING MANHOLE TOPS, VALVE BOXES, ETC. ARE TO BE ADJUSTED AS REQUIRED TO MATCH PROPOSED GRADES. IF NECESSARY, READJUSTMENTS SHALL BE PERFORMED UPON COMPLETION OF PAVING AND FINE GRADING TO ENSURE A SMOOTH TRANSITION.

TAS EXISTING SIDEWALK NOTE
ALL SIDEWALKS, CURBS, RAMPS, AND DRIVE APPROACHES IN THE RIGHT-OF-WAY SHALL BE IN COMPLIANCE WITH CURRENT TEXAS ACCESSIBILITY STANDARDS AND CITY OF LIBERTY HILL DESIGN STANDARDS PRIOR TO THE FINAL INSPECTION AND APPROVAL.

BENCHMARK LIST

BM #5000
SQUARE WITH "X" SET ON TOP OF CURB
N: 10,212,988.921
E: 3,061,300.850
ELEV: 1025.01'

BM #1001
"X" SET ON TOP OF CURB
N: 10,212,866.233
E: 3,061,244.005
ELEV: 1022.52

ALL ELEVATIONS SHOWN HEREON ARE TIED TO THE NORTH AMERICAN VERTICAL DATUM OF 1988 (NAVD '88) BASED ON GPS OBSERVATIONS

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811 Know what's below. Call before you dig.

REVISIONS:

SITE GRADING PLAN

NEW RESTAURANT FOR:
Bojangles
W. State Hwy 29
Liberty Hill, TX 78642

Kimley»Horn
© 2024 KIMLEY-HORN AND ASSOCIATES, INC.
1251 SADLER EAST DRIVE,
BUILDING 1, SUITE 100
SAN MARCOS, TX 78666
PHONE: 512-566-4457
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STATE OF TEXAS
JORDAN P. SCHAEFER
122080
REGISTERED PROFESSIONAL ENGINEER
02/02/2024

Charles William Pope & Associates
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224 GARDENVIEW, SAN ANTONIO, TX. 78213

DATE: 02/02/2024
JOB NO: 069243600
DRAWN BY: MJG
SHEET NUMBER:
2.3.1
OF

Plotted By:Burns, Dylan January 31, 2024 02:54:38pm K:\SMA_Civil\Bojangles\069243600 - Bojangles (Liberty Hill)\CAD\PlanSheets\C-GRAD-069243600.dwg
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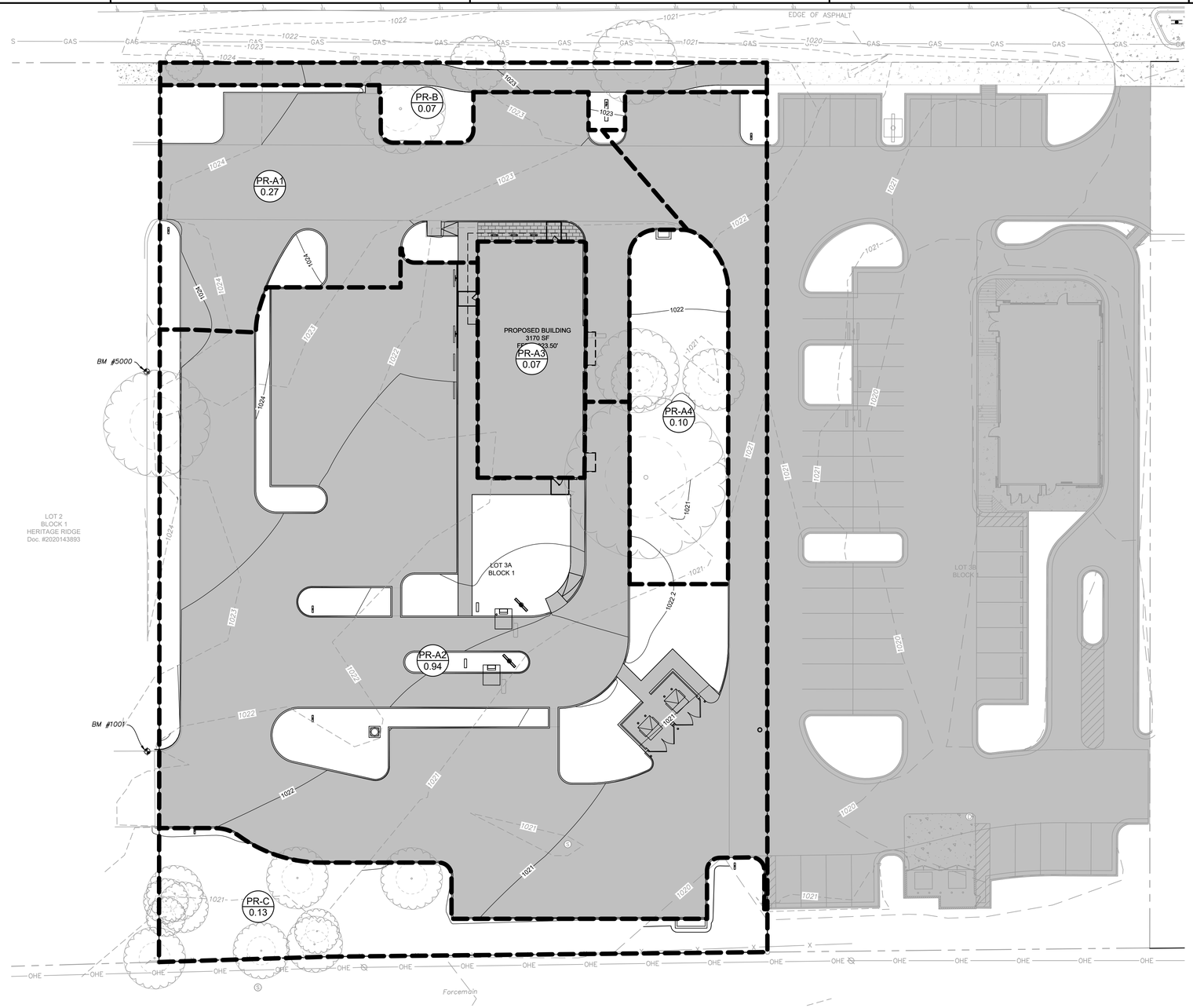

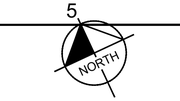

GRAPHIC SCALE IN FEET
0 10 20 40

LEGEND

1023	EXISTING CONTOURS
1023	PROPOSED CONTOURS
	DRAINAGE BOUNDARY
	FLOW DIRECTION
PR-A1 0.26	DRAINAGE BASIN NAME / DRAINAGE BASIN AREA
	IMPERVIOUS COVER (REF. NOTE #2)

DRAINAGE NOTES:

1. DRAINAGE CRITERIA FOR THIS DRAINAGE AREA MAP IS BASED ON THE CITY OF ROUND ROCK DESIGN AND CONSTRUCTION STANDARDS DRAINAGE SPECIFICATIONS (REVISED JANUARY 2021).

BY DIRECTIONAL METHOD:

Q = CIA

C RUNOFF COEFFICIENT

VARIES PER TIME OF CONCENTRATION (ATLAS 14 VALUES)

5-MIN. STORM INTENSITIES

I I_2 = 6.14 in/hr (2-YR)
I_{10} = 9.22 in/hr (10-YR)
I_{25} = 11.23 in/hr (25-YR)
I_{100} = 14.76 in/hr (100-YR)

A DRAINAGE BASIN AREA

2. LOTS 3A AND 3B COMPRISES LOTS 4, 5, AND 6 FROM THE OUTDATED LOT LAYOUT SHOWN IN THE HERITAGE RIDGE SUBDIVISION DRAINAGE STUDY PROPOSED DRAINAGE AREA MAP. LOTS 4, 5, AND 6 INCLUDES 1.97 AC OF IMPERVIOUS COVER. LOT 3B (PANDA EXPRESS DEVELOPMENT) IS PROPOSING 0.79 ACRES OF IMPERVIOUS COVER. LOT 3A (THE BOJANGLES DEVELOPMENT) IS PROPOSING 1.08 ACRES OF IMPERVIOUS COVER. LOTS 3A AND 3B ARE PROPOSING A TOTAL OF 1.87 ACRES OF IMPERVIOUS COVER WHICH IS 0.10 ACRES LESS THAN WHAT WAS INITIALLY DESIGNED. THEREFORE, THE SUBJECT PROPERTY CONFORMS TO THE DRAINAGE ANALYSIS AS OUTLINED IN THE DRAINAGE STUDY APPROVED WITH HERITAGE RIDGE SUBDIVISION COMPLETED ON AUGUST 12TH, 2020 BY MRB GROUP.

INLET CAPACITY CALCULATIONS

CURB INLET
$Q=CLh^{3/2}$

C= WEIR COEFFICIENT
L= LENGTH OF WEIR (FT)
h= HEAD ABOVE WEIR (FT)

5' CURB INLET
C=3.0
L=5 FT
h=0.50 FT
Q_{CAP}= 6.34 CFS
Q_{100}= 3.56 CFS

10' CURB INLET
C=3.0
L=10 FT
h=0.50 FT
Q_{CAP}= 10.61 CFS
Q_{100}= 12.25 CFS

GRATE INLET
$Q=CA(2gh)^{1/2}$

C=0.70
*ASSUMED AREA WITH 50% CLOGGING IN INLETS

12" DOME INLET (NYOPLAST 1299CGD)
OPEN AREA* 35.19 SQ. IN
h=0.25 FT
Q_{CAP}= 0.69 CFS
Q_{100}= 0.68 CFS

PEAK FLOW CALCULATIONS

Basin	Tc (min)	A (ac)	C-2	C-10	C-25	C-100	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)	Collection Point
PR-A1	5.0	0.27	0.68	0.76	0.81	0.89	6.14	9.22	11.23	14.76	1.13	1.89	2.45	3.56	5' CURB INLET
PR-A2	5.0	0.94	0.67	0.75	0.80	0.88	6.14	9.22	11.23	14.76	3.87	6.49	8.41	12.25	10' CURB INLET
PR-A3	5.0	0.07	0.75	0.83	0.88	0.97	6.14	9.22	11.23	14.76	0.32	0.54	0.69	1.00	DOWNSPOUTS
PR-A4	5.0	0.10	0.29	0.35	0.39	0.46	6.14	9.22	11.23	14.76	0.18	0.32	0.44	0.68	12" LANDSCAPE INLET
PR-B	5.0	0.07	0.55	0.62	0.67	0.75	6.14	9.22	11.23	14.76	0.24	0.40	0.53	0.78	SH 29 ROW
PR-C	5.0	0.13	0.29	0.35	0.39	0.46	6.14	9.22	11.23	14.76	0.23	0.42	0.57	0.88	SOUTHERN PROPERTY

BENCHMARK LIST

BM #5000
SQUARE WITH "X" SET ON TOP OF CURB
N: 10,212,988.921
E: 3,061,300.850
ELEV: 1025.01'

BM #1001
"X" SET ON TOP OF CURB
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REVISIONS:

PROPOSED DRAINAGE AREA MAP

NEW RESTAURANT FOR:
Bojangles
W. State Hwy 29
Liberty Hill, TX 78642

Kimley»Horn
© 2024 KIMLEY-HORN AND ASSOCIATES, INC.
1251 SADLER EAST DRIVE,
SUITE 100, 78665
SAN MARCOS, TX 78666
PHONE: 512-396-4457
WWW.KIMLEY-HORN.COM TBPE FIRM NO. 928

JORDAN P. SCHAEFER
122080
REGISTERED PROFESSIONAL ENGINEER
02/02/2024

Charles William Pope & Associates
ARCHITECTURE PLANNING CONSULTING
224 GARDENVIEW, SAN ANTONIO, TX. 78213

DATE: 02/02/2024
JOB NO: 069243600
DRAWN BY: MJG
SHEET NUMBER:
2.3.2
OF

Plotted By:Burns, Dylan January 31, 2024 02:55:19pm K:\SMA_Civil\Bojangles\069243600 - Bojangles (Liberty Hill)\CAD\PlanSheets\C-DAMP-069243600.dwg
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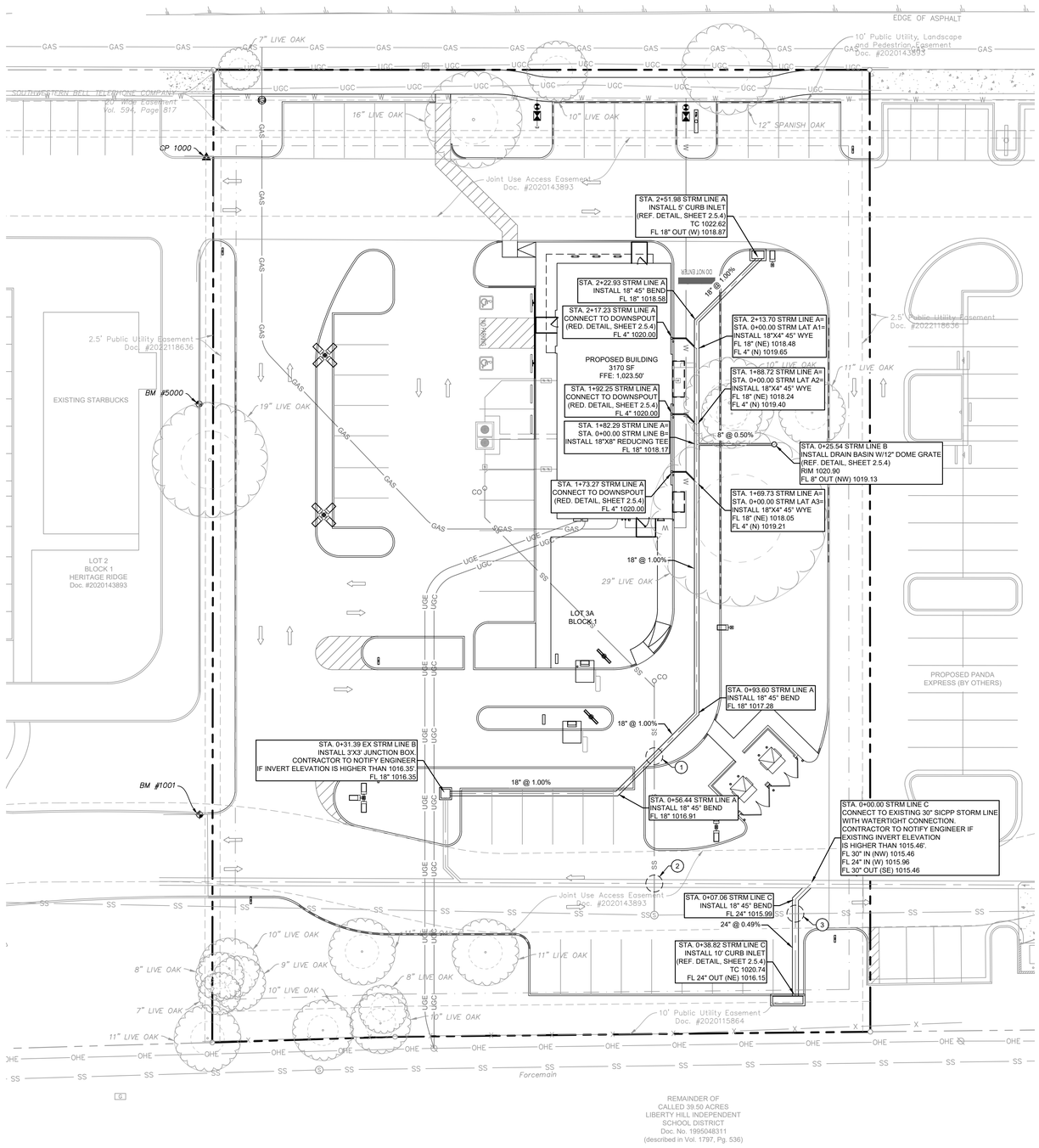

NORTH

GRAPHIC SCALE IN FEET
0 10 20 40

LEGEND

SS	PROPOSED SANITARY SEWER LINE
W	PROPOSED WATER LINE
UGE	PROPOSED UNDERGROUND ELECTRIC LINE
UGT	PROPOSED UNDERGROUND COMMUNICATION LINE
	PROPOSED STORM DRAIN LINE
SS	EXISTING SANITARY SEWER LINE
W	EXISTING WATER LINE
OHE	EXISTING OVERHEAD ELECTRIC LINE
SD	EXISTING STORM DRAIN LINE
UGT	EXISTING UNDERGROUND COMMUNICATIONS LINE
CO	PROPOSED CLEANOUT
	PROPOSED FIRE HYDRANT
	PROPOSED WATER METER
	PROPOSED BACKFLOW PREVENTER
	PROPOSED WATER VALVE
	PROPOSED FITTING
	PROPOSED SLOPED HEADWALL
	PROPOSED LIGHT POLE (REF. MEP PLANS FOR DETAILS)
	PROPOSED STORM INLET (REF. DETAILS, SHEET 2.3.5)
	EXISTING POWER POLE

NOTES

1. ALL DIMENSIONS ARE TO CENTERLINE OF PIPE UNLESS NOTED OTHERWISE.
2. REFERENCE STORM SEWER NOTES ON SHEET 2.5.1 FOR PIPE MATERIAL REQUIREMENTS.
3. REFERENCE SHEET 2.5.3 FOR STORM SEWER DETAILS.
4. CONTRACTOR TO FIELD VERIFY LOCATION OF ALL UTILITIES PRIOR TO CONSTRUCTION. CONTACT ENGINEER IF FIELD CONDITIONS VARY.
5. REFERENCE ARCHITECTURAL PLANS FOR ROOF DRAIN DETAILS.
6. ALL PROPOSED STORM SEWER PIPE JOINTS AND JUNCTION BOX STRUCTURE CONNECTIONS TO BE WATER TIGHT.

UTILITY CROSSING

	STORM DRAIN	SANITARY SEWER
1	PR. 18": ±1016.9'	PR. 4": ±1015.1'
2	EX. 30": ±1015.4'	PR. 4": ±1013.8'
3	PR. 18": ±1016.0'	EX. 8": ±1013.3'

BENCHMARK LIST

BM #5000
SQUARE WITH "X" SET ON TOP OF CURB
N: 10,212,988.921
E: 3,061,300.850
ELEV: 1025.01'

BM #1001
"X" SET ON TOP OF CURB
N: 10,212,866.233
E: 3,061,244.005
ELEV: 1022.52

ALL ELEVATIONS SHOWN HEREON ARE TIED TO THE NORTH AMERICAN VERTICAL DATUM OF 1988 (NAVD '88) BASED ON GPS OBSERVATIONS

CAUTION!!
EXISTING UNDERGROUND UTILITIES IN THE AREA CONTRACTOR IS RESPONSIBLE FOR DETERMINING THE HORIZONTAL AND VERTICAL LOCATION OF ALL UTILITIES PRIOR TO CONSTRUCTION. CONTRACTOR SHALL BE RESPONSIBLE FOR ANY REPAIRS TO EXISTING UTILITIES DUE TO DAMAGE INCURRED DURING CONSTRUCTION. CONTRACTOR SHALL NOTIFY THE ENGINEER OF ANY DISCREPANCIES ON THE PLANS.

811 Know what's below. Call before you dig.

REVISIONS:

STORM SEWER PLAN

NEW RESTAURANT FOR:
Bojangles
W. State Hwy 29
Liberty Hill, TX 78642

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1251 BADLER EAST DRIVE,
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2.3.3
OF

Plotted By:Burns, Dylan - January 31, 2024 - 02:55:53pm K:\SMA_Civil\Bojangles\069243600 - Bojangles (Liberty Hill)\CAD\PlanSheets\C-STRM-069243600.dwg
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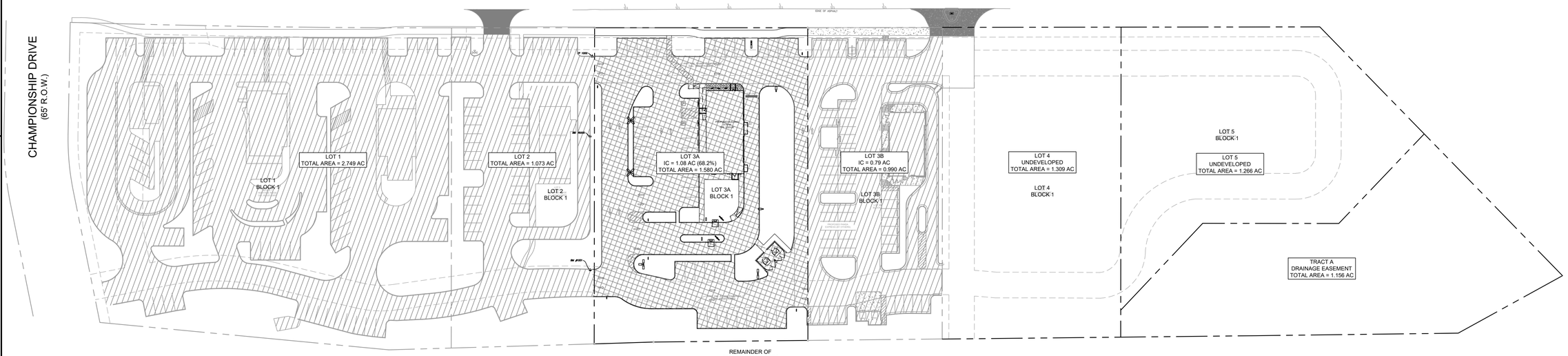
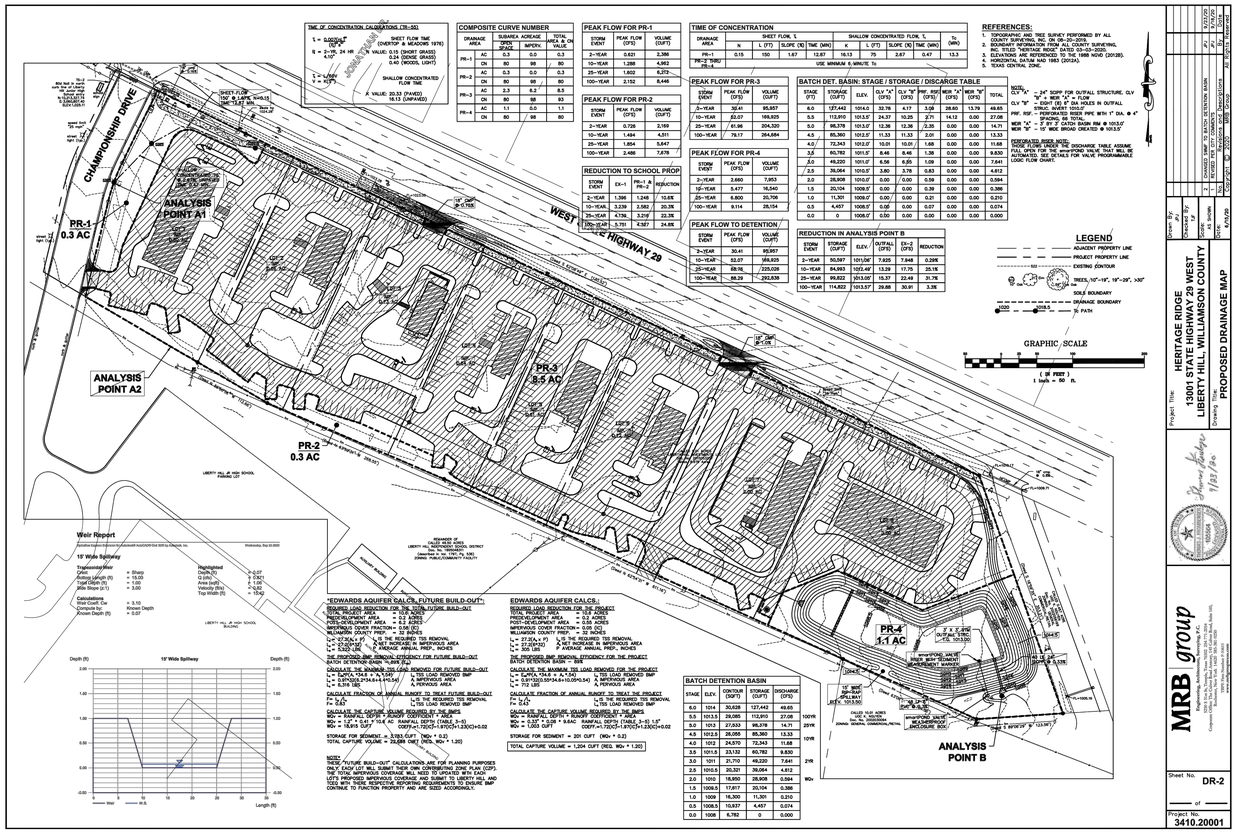


REMAINDER OF
CALLED 39.50 ACRES
LIBERTY HILL INDEPENDENT
SCHOOL DISTRICT
Doc. No. 1995048311
(described in Vol. 1797, Pg. 536)

ORIGINAL TCEQ CALCULATIONS - FOR REFERENCE ONLY



TIME OF CONCENTRATION CALCULATIONS (TR-55)

DRAINAGE AREA	SUMMER SEASON OPEN SPACE	IMPERV.	TOTAL AREA, A (ac)	VALUE
PR-1	AC	0.3	0.0	0.3
	CN	80	98	80
PR-2	AC	0.3	0.0	0.3
	CN	80	98	80
PR-3	AC	3.3	5.2	8.5
	CN	80	98	83
PR-4	AC	1.1	0.0	1.1
	CN	80	98	80

SHEET FLOW TIME (OVERTOP & MEADOWS 1978)
n VALUE: 0.15 (SHORT GRASS)
0.24 (DENSE GRASS)
0.40 (WOODS, LIGHT)
$T_t = \frac{0.007(nL)^{0.8}}{(P_2)^{0.5}(S)^{0.4}}$

SHALLOW CONCENTRATED FLOW TIME
K VALUE: 20.33 (PAVED)
10.13 (UNPAVED)
$V = K(S)^{0.5}$

COMPOSITE CURVE NUMBER

STORM EVENT	PEAK FLOW (CFS)	VOLUME (CUFT)
2-YEAR	0.621	2,386
10-YEAR	1.288	4,863
25-YEAR	1.602	6,272
100-YEAR	2.152	8,446

PEAK FLOW FOR PR-1

STORM EVENT	PEAK FLOW (CFS)	VOLUME (CUFT)
2-YEAR	0.726	2,169
10-YEAR	1.484	4,511
25-YEAR	1.854	5,647
100-YEAR	2.486	7,578

PEAK FLOW FOR PR-2

STORM EVENT	PEAK FLOW (CFS)	VOLUME (CUFT)
2-YEAR	3.640	7,953
10-YEAR	5.477	16,540
25-YEAR	6.800	20,706
100-YEAR	9.114	28,154

PEAK FLOW FOR PR-3

STORM EVENT	PEAK FLOW (CFS)	VOLUME (CUFT)
2-YEAR	2.660	7,953
10-YEAR	5.477	16,540
25-YEAR	6.800	20,706
100-YEAR	9.114	28,154

PEAK FLOW FOR PR-4

STORM EVENT	PEAK FLOW (CFS)	VOLUME (CUFT)
2-YEAR	0.621	2,386
10-YEAR	1.288	4,863
25-YEAR	1.602	6,272
100-YEAR	2.152	8,446

REDUCTION TO SCHOOL PROP

STORM EVENT	EX-1	PR-1 & PR-2	REDUCTION
2-YEAR	3,339	2,582	20.3%
10-YEAR	4,786	3,216	32.8%
25-YEAR	5,751	4,387	24.8%
100-YEAR	7,578	5,747	24.2%

PEAK FLOW TO DETENTION

STORM EVENT	PEAK FLOW (CFS)	VOLUME (CUFT)
2-YEAR	30.41	93,957
10-YEAR	52.07	164,825
25-YEAR	69.16	225,028
100-YEAR	88.29	292,630

TIME OF CONCENTRATION

DRAINAGE AREA	n	L (FT)	SLOPE (%)	TIME (MIN)
PR-1	0.15	150	1.67	12.67
PR-2				16.13
PR-3		USE MINIMUM 5 MINUTE Tc		
PR-4				

SHEET FLOW, T_t			SHALLOW CONCENTRATED FLOW, T_t			T_c
n	L (FT)	SLOPE (%)	TIME (MIN)	K	L (FT)	SLOPE (%)	TIME (MIN)	(MIN)
0.15	150	1.67	12.67	10.13	75	2.67	0.47	13.3

REFERENCES:
1. TOPOGRAPHIC AND TREE SURVEY PERFORMED BY ALL COUNTY SURVEYING, INC. ON JULY 2009.
2. BOUNDARY SURVEY PERFORMED BY ALL COUNTY SURVEYING, INC. TITLED "HERITAGE RIDGE" DATED 03-03-2020.
3. ELEVATIONS ARE REFERENCED TO THE 1988 NGVD (2012B).
4. HORIZONTAL DATUM IS NAD 1983 (2012A).
5. TEXAS CENTRAL ZONE.

PEAK FLOW FOR PR-3

STORM EVENT	PEAK FLOW (CFS)	VOLUME (CUFT)
2-YEAR	32.41	95,957
10-YEAR	53.57	166,825
25-YEAR	61.96	204,320
100-YEAR	79.17	264,664

BATCH DET. BASIN: STAGE / STORAGE / DISCARGE TABLE

STAGE (FT)	ELEV.	Qo'a "A" (CFS)	Qo'b "B" (CFS)	Qo'c "C" (CFS)	Qo'd "D" (CFS)	TOTAL
6.0	1274.42	10.14	33.76	4.17	3.58	55.65	13.79	48.65
5.5	112.910	10.13	24.37	10.25	2.71	14.12	0.00	27.08
5.0	95,378	10.13	12.36	12.36	2.35	0.00	0.00	14.71
4.5	85,360	10.12	11.33	11.33	2.01	0.00	0.00	13.33
4.0	72,343	10.12	10.01	10.01	1.68	0.00	0.00	11.68
3.5	63,782	10.11	8.46	8.46	1.39	0.00	0.00	9.850
3.0	49,222	10.11	6.56	6.65	1.09	0.00	0.00	7.641
2.5	36,064	10.10	3.80	3.78	0.83	0.00	0.00	4.612
2.0	28,908	10.10	0.00	0.00	0.59	0.00	0.00	0.594
1.5	20,104	10.09	0.00	0.00	0.39	0.00	0.00	0.388
1.0	11,301	10.09	0.00	0.00	0.21	0.00	0.00	0.210
0.5	4,457	10.08	0.00	0.00	0.07	0.00	0.00	0.074
0.0	1008.0	0.00	0.00	0.00	0.00	0.00	0.00	0.000

NOTE:
Qo'a = 24" SCPP FOR OUTFALL STRUCTURE, CLY "B" = WEIR "A" = FLOW
CLY "B" = EVENT (B) 8" DIA ORIFICE IN OUTFALL PIPE, WEIR "B" = FLOW
PRF. RSF. = PERFORATED RISER PIPE WITH 1" DIA. @ 4" SPACING, SR TOTAL:
WEIR "A" = 3' BY 3' CATCH BASIN RIM @ 1013.0'
WEIR "B" = 10' WIDE BROAD CREASTED @ 1013.0'

PERFORATED RISER NOTE:
WHEN FLOWS UNDER THE DISCHARGE TABLE ASSUME FULL OPEN. THE "Q" IN THE "WHEIRFORD VALVE THAT WILL BE ADJUSTED TO THE VALUES FOR VALVE PROGRAMMABLE LOAD FLOW CHART.

REDUCTION IN ANALYSIS POINT B

STORM EVENT	STORAGE (CUFT)	ELEV.	OUTFALL (CFS)	EX-2 (CFS)	REDUCTION
2-YEAR	50,987	1011.04'	7.420	7.848	0.39%
10-YEAR	84,993	1012.44'	13.29	17.75	25.1%
25-YEAR	99,822	1013.07'	15.37	22.49	31.7%
100-YEAR	114,822	1013.57'	22.68	30.81	3.3%

BATCH DETENTION BASIN

STAGE	ELEV.	CONTOUR (SQFT)	STORAGE (CUFT)	DISCHARGE (CFS)
6.0	1014	30,438	127,443	48.65
5.5	1013.5	26,095	112,910	27.08
5.0	1013	21,533	95,378	14.71
4.5	1012.5	26,095	85,360	13.33
4.0	1012	24,570	72,343	11.68
3.5	1011.5	23,132	63,782	9.850
3.0	1011	21,710	49,222	7.641
2.5	1010.5	20,323	36,064	4.612
2.0	1010	18,950	28,908	0.594
1.5	1009.5	17,617	20,104	0.388
1.0	1009	16,300	11,301	0.210
0.5	1008.5	15,037	4,457	0.074
0.0	1008	6,782	0	0.000

LEGEND
ADJACENT PROPERTY LINE
PROJECT PROPERTY LINE
EXISTING CONTOUR
TREES, (10"-19", 18"-29", >30"
SOLE BOUNDARY
DRAINAGE BOUNDARY
TCEQ 100-YR FLOOD PATH

Weir Report
Author Kimley-Horn and Associates Created 4:00:00 PM on Monday, Oct. 31, 2022 Wednesday, Sep 20 2023

15' Wide Spillway
Trapezoidal Weir
Crest = Sharp
Crest Length (ft) = 15.00
Total Depth (ft) = 1.00
Weir Slope (z:1) = 3.00
Contraction
Side Chnnl Cntr = 3.10
Compute by: Known Depth
Known Depth (ft) = 0.07
Highlighted
Depth (ft) = 0.07
Flow (cfs) = 0.32
Area (sqft) = 1.00
Velocity (ft/s) = 0.62
Top Width (ft) = 15.42

LIBERTY HILL JR HIGH SCHOOL BUILDING

"EDWARDS AQUIFER CALCS. FUTURE BUILD-OUT":
REQUIRED LOAD REDUCTION FOR THE TOTAL FUTURE BUILD-OUT
TOTAL PROJECT AREA = 10.8 ACRES
PRE-DEVELOPMENT IMPERVIOUS AREA = 0.0 ACRES
POST-DEVELOPMENT IMPERVIOUS AREA = 8.2 ACRES
IMPERVIOUS COVER FRACTION= 0.76 (IC)
L_M = 27.2(A$_N$ x 34.6) + (A$_N$ x 0.54)
L_M = 27.2(A$_N$ x 34.6) L M: THE REQUIRED TSS REMOVAL
L_M = 27.2(8.2 x 34.6) A$_I$ NET INCREASE IN IMPERVIOUS AREA
L_M = 5,323 LBS A$_P$ AVERAGE ANNUAL PREP., INCHES
THE PROPOSED BMP REMOVAL EFFICIENCY FOR THE PROJECT
BATCH DETENTION BASIN = 80%
CALCULATE THE MAXIMUM TSS LOAD REMOVED FOR THE FUTURE BUILD-OUT
L_R = (BMP EFFICIENCY)(A$_I$ x P x P$_J$ x 34.6 + A$_P$ x 0.54)
L_R = (0.8)*(10.20)(P.34.6+A.P.0.54)
L_R = 6,314 LBS A$_I$ IMPERVIOUS AREA
A$_P$ PERVIOUS AREA
CALCULATE FRACTION OF ANNUAL RUNOFF TO TREAT FUTURE BUILD-OUT
F= L_R/L_M L_R THE TSS LOAD REMOVED BMP
F= 0.67 L_M TSS LOAD REMOVED BMP
CALCULATE THE CAPTURE VOLUME REQUIRED BY THE INPUT
MOD = 1.2* (0.81)*(8.4)* RAINFALL DEPTH (TABLE 5-5) 1.5"
MOD = 16,915 CUFT CDF(F)=1.72CC-1.8*(CC)+1.23(CC)^2+0.02
STORAGE FOR SEGMENT = 3,193 CUFT (MOD * 0.2)
TOTAL CAPTURE VOLUME = 22,004 CUFT (REQ. MOD * 1.20)

NOTE:
THESE "FUTURE BUILD-OUT" CALCULATIONS ARE FOR PLANNING PURPOSES ONLY. EACH LOT WILL SUBMIT THEIR OWN CORRESPONDING ZONE PLAN (CCP). THE CCP WILL ADDRESS THE ACTUAL BMPS TO BE INSTALLED ON THE LOT. LOT'S PROPOSED IMPERVIOUS COVERAGE AND SUBMIT TO LIBERTY HILL AND TCEQ WITH THEIR RESPECTIVE REPORTING REQUIREMENTS TO ENSURE BMP CONTINUE TO FUNCTION PROPERTY AND ARE SIZED ACCORDINGLY.

EDWARDS AQUIFER CALCS.:
REQUIRED LOAD REDUCTION FOR THE PROJECT
TOTAL PROJECT AREA = 10.8 ACRES
PRE-DEVELOPMENT IMPERVIOUS AREA = 0.0 ACRES
POST-DEVELOPMENT AREA = 8.0 ACRES
IMPERVIOUS COVER FRACTION= 0.05 (IC)
L_M = 27.2(A$_N$ x 34.6) + (A$_N$ x 0.54)
L_M = 27.2(A$_N$ x 34.6) L M: THE REQUIRED TSS REMOVAL
L_M = 27.2(8.0 x 34.6) A$_I$ NET INCREASE IN IMPERVIOUS AREA
L_M = 505 LBS A$_P$ AVERAGE ANNUAL PREP., INCHES
THE PROPOSED BMP REMOVAL EFFICIENCY FOR THE PROJECT
BATCH DETENTION BASIN = 80%
CALCULATE THE MAXIMUM TSS LOAD REMOVED FOR THE PROJECT
L_R = (BMP EFFICIENCY)(A$_I$ x P x P$_J$ x 34.6 + A$_P$ x 0.54)
L_R = (0.8)*(0.05)(P.34.6+A.P.0.54)
L_R = 112 LBS A$_I$ IMPERVIOUS AREA
A$_P$ PERVIOUS AREA
CALCULATE FRACTION OF ANNUAL RUNOFF TO TREAT THE PROJECT
F= L_R/L_M L_R THE REQUIRED TSS REMOVAL
F= 0.43 L_M TSS LOAD REMOVED BMP
CALCULATE THE CAPTURE VOLUME REQUIRED BY THE INPUT
MOD = 1.2* (0.81)*(8.4)* RAINFALL DEPTH (TABLE 5-5) 1.5"
MOD = 1,003 CUFT CDF(F)=1.72CC-1.8*(CC)+1.23(CC)^2+0.02
STORAGE FOR SEGMENT = 201 CUFT (MOD * 0.2)
TOTAL CAPTURE VOLUME = 1,204 CUFT (REQ. MOD * 1.20)

Texas Commission on Environmental Quality
TSS Removal Calculations 04-20-2009
Project Name: Bojangles (Liberty Hill)
Date Prepared: 1/24/2024
Additional information is provided for cells with a red triangle in the upper right corner. Place the cursor over the cell.
Text shown in blue indicate location of instructions in the Technical Guidance Manual - RG-348.
Characters shown in red are data entry fields.
Characters shown in black (Bold) are calculated fields. Changes to these fields will remove the equations used in the spreadsheet.

1. The Required Load Reduction for the total project: Calculations from RG-348 Pages 3-27 to 3-30
Page 3-30 Equation 3.3: L_M = 27.2(A_N x 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 * = 10.80 acres
Predevelopment impervious area within the limits of the plan * = 0.20 acres
Total post-development impervious area within the limits of the plan * = 4.40 acres
Total post-development impervious cover fraction * = 0.42
P = 32 inches
L_M TOTAL PROJECT = 3696 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 = 10.60 acres
Predevelopment impervious area within drainage basin/outfall area = 0.20 acres
Post-development impervious area within drainage basin/outfall area = 4.40 acres
Post-development impervious fraction within drainage basin/outfall area = 0.42
L_M this basin = 3696 lbs

3. Indicate the proposed BMP Code for this basin.
Proposed BMP = Batch Pond
Removal efficiency = 91 percent
Aqualogic Cartridge Filter
Bioretention
Austech StormFilter
Constructed Wetland
Extended Detention
Grassy Swale
Retention / Irrigation
Sand Filter
Stormwater Treatment Filter Strips
Vegecha
Wet Basin
Wet Vault
Batch Pond

4. Calculate Maximum TSS Load Removed (L_R) for this Drainage Basin by the selected BMP Type.
RG-348 Page 3-35 Equation 3.7: L_R = (BMP efficiency) x (P x (A_I x 34.6 + A_P x 0.54)
where:
A_T = 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_T = 10.60 acres
A_I = 4.40 acres
A_P = 6.20 acres
L_R = 4631 lbs

5. Calculate Fraction of Annual Runoff to Treat the drainage basin / outfall area
Desired L_R this basin = 3696 lbs
F = 0.81

6. Calculate Capture Volume required by the BMP Type for this drainage basin / outfall area. Calculations from RG-348 Pages 3-34 to 3-38
Rainfall Depth = 1.12 inches
Post Development Runoff Coefficient = 0.31
On-site Water Quality Volume = 13838 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 = 2768
Total Capture Volume (required water quality volume(s) x 1.20) = 19246 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 D45 will show NA.

LEGEND
PROPERTY BOUNDARY
IMPERVIOUS COVER (COVERED UNDER THIS CZP MODIFICATION)
IMPERVIOUS COVER (COVERED UNDER ORIGINAL CZP / SUBSEQUENT CZP MODIFICATIONS)
EXISTING IMPERVIOUS COVER

CZP COMPLIANCE NOTE
LOTS 3A AND 3B COMPRISES LOTS 4, 5, AND 6 FROM THE OUTDATED LOT LAYOUT SHOWN IN THE ORIGINAL TCEQ CALCULATIONS. REFER TO SHEET 1.0 FOR CURRENT PLAT. TOTAL RELATED PLAN INCLUDES 1.97 AC OF IMPERVIOUS COVER.

LOT 3A PROPOSED IMPERVIOUS COVER: 1.08 AC
LOT 3B IMPERVIOUS COVER: 0.79 AC
TOTAL: 1.87 AC

TOTAL IMPERVIOUS COVER (LOTS 1, 2, 3A, AND 3B): 4.44 AC
TOTAL ALLOWABLE IMPERVIOUS COVER (ORIGINAL CZP): 6.2 AC

PROPOSED LOT 3A DEVELOPMENT IS IN COMPLIANCE WITH THE ORIGINAL CZP AND NO ADDITIONAL STORMWATER TREATMENT IS REQUIRED.

BENCHMARK LIST
BM #5000
SQUARE WITH "X" SET ON TOP OF CURB
N: 10,212,888.921
E: 3,061,300.850
ELEV: 1025.01'

BM #1001
"X" SET ON TOP OF CURB
N: 10,212,866.233
E: 3,061,244.005
ELEV: 1022.52

ALL ELEVATIONS SHOWN HEREON ARE TIED TO THE NORTH AMERICAN VERTICAL DATUM OF 1988 (NAVD '88) BASED ON GPS OBSERVATIONS

CAUTION!!
EXISTING UNDERGROUND UTILITIES IN THE AREA CONTRACTOR IS RESPONSIBLE FOR DETERMINING THE HORIZONTAL AND VERTICAL LOCATION OF ALL UTILITIES PRIOR TO CONSTRUCTION. CONTRACTOR SHALL BE RESPONSIBLE FOR ANY REPAIRS TO EXISTING UTILITIES DUE TO DAMAGE INCURRED DURING CONSTRUCTION. CONTRACTOR SHALL NOTIFY THE ENGINEER OF ANY DISCREPANCIES ON THE PLANS.

811 Know what's below. Call before you dig.

REVISIONS:

SITE WATER QUALITY PLAN
NEW RESTAURANT FOR:
Bojangles
W. State Hwy 29
Liberty Hill, TX 78642

Kimley»Horn
© 2024 KIMLEY-HORN AND ASSOCIATES, INC.
1251 SADLER EAST DRIVE,
BUDA, TEXAS 78610
SAN MARCOS, TX 78666
PHONE: 512-396-4457
WWW.KIMLEY-HORN.COM TBPE FIRM NO. 928

JORDAN P. SCHAEFER
122080
REGISTERED PROFESSIONAL ENGINEER
01/31/2024

Charles William Pope & Associates
ARCHITECTURE PLANNING CONSULTING
224 GARDENVIEW, SAN ANTONIO, TX. 78213

DATE: 02/02/2024
JOB NO: 069243600
DRAWN BY: MJG
SHEET NUMBER:
2.3.4
OF

MRB group
Texas Registered Engineering Firm F-14
12800 Hill Country Blvd, Suite H-190, Austin, TX 78738
Contact: Brian Mc Donald, P.E. 512-351-1620
Date: 1/24/2024
Project Manager: B. Mc Donald
Drawn by: J. Hernandez
Checked by: B. Mc Donald

Rev.	Description	Date
1	CHANGE SHAPE OF BATCH RETENTION BASIN	1/12/24
2	ADDED ANALYSIS POINT B	1/24/24

Project Title: HERITAGE RIDGE
13001 STATE HIGHWAY 29 WEST
LIBERTY HILL, WILLIAMSON COUNTY
Drawing: PROPOSED DRAINAGE MAP
Drawn By: JH
Scale: 1" = 60' 24 X 36 SHEET
Date: 1/24/24
Sheet No. DR-2
of
Project No. 3410.20001

Plotted By:Burns, Dylan January 31, 2024 02:56:26pm K:\SMA_Civil\Bojangles\069243600 - Bojangles (Liberty Hill)\CAD\PlanSheets\C-WQ-069243600.dwg
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SITE MAPS - SITE SPECIFIC NOTES

1. CONSTRUCTION ENTRANCE SHALL BE LOCATED SO AS TO PROVIDE THE LEAST AMOUNT OF DISTURBANCE TO THE FLOW OF TRAFFIC IN AND OUT OF THE SITE. ADDITIONALLY, CONSTRUCTION ENTRANCE SHALL BE LOCATED TO COINCIDE WITH THE PHASING OF THE PAVEMENT REPLACEMENT.
2. THE NATURE OF THIS SITE'S CONSTRUCTION CONSISTS OF:
   A. CLEARING AND GRUBBING
   B. PRELIMINARY GRADING
   C. UTILITY INSTALLATION
   D. PAVEMENT CONSTRUCTION
   E. BUILDING CONSTRUCTION
   F. FINAL GRADING AND STABILIZATION
3. THE SUBSURFACE CONDITIONS ON-SITE CONSIST GENERALLY OF FAT CLAY AND CLAYEY SAND, UNDERLAIN BY LIMESTONE. THE EXISTING PAVEMENT SECTION CONSISTS OF 4 TO 7 INCHES OF CONCRETE OVER 3 TO 5 INCHES OF BASE MATERIAL. LIMESTONE WAS ENCOUNTERED IN ALL OF THE BORINGS TO A DEPTH OF 11 FEET BELOW EXISTING PAVEMENT PER REPORT NO.AC234065, PREPARED BY TERRACON ON 10/05/2023. STORM WATER ON-SITE WILL LEAVE THE SITE VIA UNDERGROUND STORM SEWER.
4. POST CONSTRUCTION STORM WATER POLLUTION CONTROL MEASURES INCLUDE STABILIZATION BY PERMANENT PAVING, OR LANDSCAPING.
5. DISTURBED PORTIONS OF SITE MUST BE STABILIZED. STABILIZATION PRACTICES MUST BE INITIATED WITHIN 14 DAYS IN PORTIONS OF THE SITE WHERE CONSTRUCTION HAS BEEN EITHER TEMPORARILY OR PERMANENTLY CEASED, UNLESS EXCEPTED WITHIN THE TPDES PERMIT. CONTRACTOR SHALL REMOVE TEMPORARY EROSION CONTROL DEVICES UPON COMPLETION OF STABILIZATION OR PERMANENT DRAINAGE FACILITIES.
6. ACCORDING TO COMMUNITY PANEL NO.48491C0245F, DATED 12/20/2019 OF THE FEDERAL EMERGENCY MANAGEMENT AGENCY (FEMA) FLOOD INSURANCE RATE MAP (FIRM), THIS PROPERTY IS WITHIN ZONE "X" (UN-SHADED) DEFINED BY FEMA AS "AREAS DETERMINED TO BE OUTSIDE THE 0.2% ANNUAL CHANCE FLOODPLAIN."
7. CONTRACTOR IS RESPONSIBLE FOR MODIFYING THE SWPPP/SITE MAP TO INCLUDE BMP'S FOR ANY OFF-SITE MATERIAL WASTE, BORROW OR EQUIPMENT STORAGE AREAS.
8. CONTRACTOR SHALL INSPECT DISTURBED AREAS, MATERIAL STORAGE AREAS EXPOSED TO PRECIPITATION, STRUCTURAL CONTROL MEASURES, AND VEHICLE ENTRY AND EXIT AREAS AT LEAST ONCE EVERY 14 CALENDAR DAYS AND WITHIN 24 HOURS OF A STORM EVENT OF 0.5 INCHES OR GREATER.

TEMPORARY EROSION CONTROL NOTES

1. THE CONTRACTOR SHALL INSTALL EROSION/SEDIMENTATION CONTROLS AND TREE/NATURAL AREA PROTECTIVE FENCING PRIOR TO ANY SITE PREPARATION WORK (CLEARING, GRUBBING OR EXCAVATION).
2. THE PLACEMENT OF EROSION/SEDIMENTATION CONTROLS SHALL BE IN ACCORDANCE WITH THE APPROVED EROSION AND SEDIMENTATION CONTROL PLAN.
3. THE PLACEMENT OF TREE/NATURAL AREA PROTECTIVE FENCING SHALL BE IN ACCORDANCE WITH STANDARD NOTES FOR TREE AND NATURAL AREA PROTECTION AND THE APPROVED GRADING/TREE AND NATURAL AREA PLAN.
4. A PRE-CONSTRUCTION CONFERENCE SHALL BE HELD ON-SITE WITH THE CONTRACTOR, DESIGN ENGINEER/PERMIT APPLICANT AND ENVIRONMENTAL INSPECTOR AFTER INSTALLATION OF THE EROSION/SEDIMENTATION CONTROLS AND TREE/NATURAL AREA PROTECTION MEASURES AND PRIOR TO BEGINNING ANY SITE PREPARATION WORK. THE CONTRACTOR SHALL NOTIFY THE CITY AT LEAST THREE (3) DAYS PRIOR TO THE MEETING DATE.
5. ANY MAJOR VARIATION IN MATERIALS OR LOCATIONS OF CONTROLS OR FENCES FROM THOSE SHOWN ON THE APPROVED PLANS WILL REQUIRE A REVISION AND MUST BE APPROVED BY THE REVIEWING ENGINEER, ENVIRONMENTAL SPECIALIST, OR ARBORIST AS APPROPRIATE. MAJOR REVISIONS MUST BE APPROVED BY THE PLANNING AND DEVELOPMENT DEPARTMENT AND THE DRAINAGE UTILITY DEPARTMENT. MINOR CHANGES OR ADDITIONAL CONTROL MEASURES TO BE MADE AS FIELD REVISIONS TO THE EROSION AND SEDIMENTATION CONTROL PLAN MAY BE REQUIRED BY THE ENVIRONMENTAL INSPECTOR DURING THE COURSE OF CONSTRUCTION TO CORRECT CONTROL INADEQUACIES AT NO ADDITIONAL COST TO THE OWNER.
6. THE CONTRACTOR IS REQUIRED TO INSPECT THE CONTROLS AND FENCES AT WEEKLY INTERVALS AND AFTER SIGNIFICANT RAINFALL EVENTS TO INSURE THAT THEY ARE FUNCTIONING PROPERLY. THE PERSON(S) RESPONSIBLE FOR MAINTENANCE OF CONTROLS AND FENCES SHALL IMMEDIATELY MAKE ANY NECESSARY REPAIRS TO DAMAGED AREAS. SILT ACCUMULATION AT CONTROLS MUST BE REMOVED WHEN THE DEPTH REACHES SIX (6) INCHES.

PERMANENT EROSION CONTROL NOTES

ALL DISTURBED AREAS SHALL BE RESTORED AS NOTED BELOW.

1. A. A MINIMUM OF FOUR (4) INCHES OF TOPSOIL SHALL BE PLACED IN ALL DRAINAGE CHANNELS (EXCEPT ROCK) AND BETWEEN THE CURB AND THE RIGHT-OF-WAY LINE.

   B. THE SEEDING FOR PERMANENT EROSION CONTROL SHALL BE APPLIED OVER AREAS DISTURBED BY CONSTRUCTION AS FOLLOWS:

BROADCAST SEEDING:

1. FROM SEPTEMBER 15 TO MARCH 1, SEEDING SHALL BE WITH A COMBINATION OF 2 POUNDS PER 1000 SQUARE FEET OF UNHULLED BERMUDA AND 7 POUNDS PER 1000 SQUARE FOOT OF WINTER RYE WITH A PURITY OF 95% WITH 90% GERMINATION.
2. FROM MARCH 2 TO SEPTEMBER 14, SEEDING SHALL BE WITH HULLED BERMUDA AT A RATE OF 2 POUNDS PER 1000 SQUARE FEET WITH A PURITY OF 95% WITH 85% GERMINATION.

   A. FERTILIZER SHALL BE A PELLETED OR GRANULAR SLOW RELEASE WITH AN ANALYSIS OF 15-15-15 TO BE APPLIED ONCE AT PLANTING AND ONCE DURING THE PERIOD OF ESTABLISHMENT AT THE RATE OF 1 POUND PER 1000 SQUARE FEET.

   B. MULCH TYPE USED SHALL BE HAY, STRAW OR MULCH APPLIED AT A RATE OF 45 POUNDS PER 1000 SQUARE FEET.

HYDRAULIC SEEDING:

1. FROM SEPTEMBER 15 TO MARCH 1, SEEDING SHALL BE WITH A COMBINATION OF 1 POUND PER 1000 SQUARE FEET OF UNHULLED BERMUDA AND 7 POUNDS PER 1000 SQUARE FOOT OF WINTER RYE WITH A PURITY OF 95% WITH 90% GERMINATION.
2. FROM MARCH 2 TO SEPTEMBER 14, SEEDING SHALL BE WITH HULLED BERMUDA AT A RATE OF 1 POUND PER 1000 SQUARE FEET WITH A PURITY OF 95% WITH 85% GERMINATION.

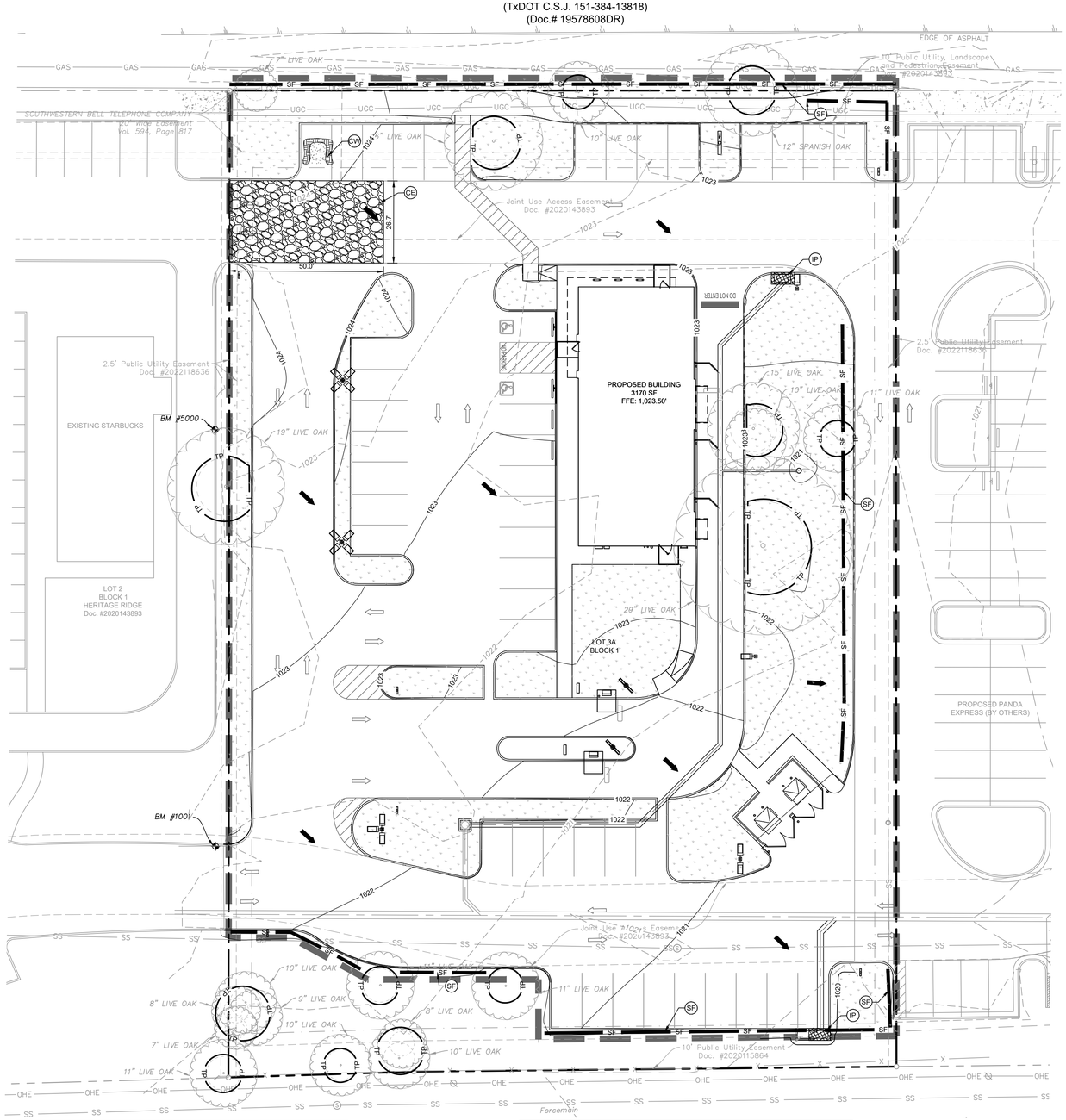
   A. FERTILIZER SHALL BE A WATER SOLUBLE FERTILIZER WITH AN ANALYSIS OF 15-15-15 AT THE RATE OF 1.5 POUNDS PER 1000 SQUARE FEET.

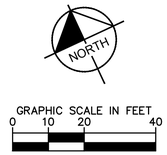
   B. MULCH TYPE USED SHALL BE HAY, STRAW OR MULCH APPLIED AT A RATE OF 45 POUNDS PER 1000 SQUARE FEET, WITH SOIL TACKIFIER AT A RATE OF 1.4 POUNDS PER 1000 SQUARE FEET.

   C. THE PLANTED AREA SHALL BE IRRIGATED OR SPRINKLED IN A MANNER THAT WILL NOT ERODE THE TOPSOIL, BUT WILL SUFFICIENTLY SOAK THE SOIL TO A DEPTH OF SIX (6) INCHES. THE IRRIGATION SHALL OCCUR AT TEN-DAY INTERVALS DURING THE FIRST TWO MONTHS. RAINFALL OCCURRENCES OF 1/2 INCH OR MORE SHALL POSTPONE THE WATERING SCHEDULE FOR ONE WEEK.

   D. RESTORATION SHALL BE ACCEPTABLE WHEN THE GRASS HAS GROWN AT LEAST 1-1/2 INCHES HIGH WITH 95% COVERAGE, PROVIDED NO BARE SPOTS LARGER THAN 16 SQUARE FEET EXIST.

   E. WHEN REQUIRED, NATIVE GRASS SEEDING SHALL COMPLY WITH





LEGEND

	PROPERTY BOUNDARY
1415	EXISTING CONTOUR
1415	PROPOSED CONTOUR
	PROPOSED LIMITS OF DISTURBANCE (APPROXIMATE)
	DIRECTION OF OVERLAND FLOW W/GRADE
SF	SILT FENCE (SEE DETAIL SHEET 2.4.2)
TP	TREE PROTECTION (REF. LANDSCAPE PLANS)
IP	INLET PROTECTION (SEE DETAIL SHEET 2.4.2)
CE	CONSTRUCTION EXIT (SEE DETAIL SHEET 2.4.2)
PS	PERMANENT STABILIZATION
CW	CONCRETE WASHOUT PIT (SEE DETAIL SHEET 2.4.2)
	TREE TO REMAIN

NOTES

1. AREAS CONTAINED WITHIN THE PROPERTY BOUNDARIES WILL BE AREAS OF DISTURBANCE AND SOIL STABILIZATION. ALL SOILS WITHIN THESE LIMITS SHALL BE STABILIZED BY VEGETATION OR STRUCTURE.
2. ALL CONSTRUCTION-RELATED VEHICLES MUST PARK INSIDE THE LIMITS OF CONSTRUCTION AND SERVED BY APPROPRIATE TEMPORARY CONTROLS, OR ON CITY-APPROVED SURFACES OUTSIDE THE LIMITS OF CONSTRUCTION.
3. CONTRACTOR SHALL REMOVE ALL SEDIMENT AND DEBRIS FROM CONSTRUCTED STORM SEWER SYSTEM UPON COMPLETION OF WORK.
4. IT SHALL BE THE CONTRACTOR'S RESPONSIBILITY TO USE WHATEVER MEANS ARE NECESSARY TO CONTROL AND LIMIT SILT AND SEDIMENT LEAVING THE SITE. SPECIFICALLY, THE CONTRACTOR SHALL PROTECT ALL PUBLIC STREETS, ALLEYS, STREAMS, STORM DRAIN SYSTEMS AND INLETS FROM EROSION DEPOSITS. THE CONTRACTOR RESPONSIBLE FOR MAINTAINING EROSION CONTROL SHALL PROVIDE STREET CLEANING ON PUBLIC STREETS IF ANY EARTH MATERIAL IS TRANSPORTED FROM THE CONSTRUCTION SITE AT THE END OF EACH DAY. EARTH MATERIAL SHALL NOT BE ALLOWED TO ACCUMULATE ON CITY AND TXDOT ROADS.

SITE DATA

TOTAL LOT AREA	68,808 SF	1.579 ACRES
TOTAL AREA DISTURBED *	64.152 SF	1.493 ACRES
PAVED AREA	47,070 SF	1.055 ACRES
ROOFED AREA	3,170 SF	.073 ACRES
NEW LANDSCAPED AREA	14,807 SF	.365 ACRES

* DOES NOT INCLUDE ANY OFF-SITE DISPOSAL OR BORROW AREAS - CONTRACTOR TO UPDATE AS NECESSARY DURING CONSTRUCTION.

* NO SINGLE DRAINAGE AREA EXCEEDS 10 ACRES, THEREFORE SEDIMENTATION BASIN IS NOT REQUIRED.

SITE MAP - GENERAL NOTES

1. CONTRACTOR IS SOLELY RESPONSIBLE FOR SELECTION, IMPLEMENTATION, MAINTENANCE, AND EFFECTIVENESS OF ALL SWPPP CONTROLS - CONTROLS SHOWN ON THIS SITE MAP ARE SUGGESTED CONTROLS ONLY.
2. CONTRACTOR SHALL RECORD INSTALLATION, MAINTENANCE OR MODIFICATION, AND REMOVAL DATES FOR EACH BMP EMPLOYED (WHETHER CALLED OUT ON ORIGINAL SWPPP OR NOT) DIRECTLY ON THE SITE MAP.
3. DRAINAGE PATTERNS ARE SHOWN ON THIS PLAN BY PROPOSED AND EXISTING CONTOURS, FLOW ARROWS, AND SLOPES.
4. TEMPORARY AND PERMANENT STABILIZATION PRACTICES AND BMP'S SHALL BE INSTALLED AT THE EARLIEST POSSIBLE TIME DURING THE CONSTRUCTION SEQUENCE. AS AN EXAMPLE, PERIMETER SILT FENCE SHALL BE INSTALLED BEFORE COMMENCEMENT OF ANY GRADING ACTIVITIES. OTHER BMP'S SHALL BE INSTALLED AS SOON AS PRACTICABLE AND SHALL BE MAINTAINED UNTIL FINAL SITE STABILIZATION IS ATTAINED. CONTRACTOR SHALL ALSO REFERENCE CIVIL AND LANDSCAPE PLANS SINCE PERMANENT STABILIZATION IS PROVIDED BY LANDSCAPING, THE BUILDING(S), AND SITE PAVING.
5. BMP'S HAVE BEEN LOCATED AS INDICATED ON THIS PLAN IN ACCORDANCE WITH GENERALLY ACCEPTED ENGINEERING PRACTICES IN ORDER TO MINIMIZE SEDIMENT TRANSFER. FOR EXAMPLE: SILT FENCES LOCATED AT TOE OF SLOPE AND INLET PROTECTION FOR INLETS RECEIVING SEDIMENT FROM SITE RUN-OFF.
6. SANITARY SEWER EFFLUENT IS DISPOSED OF VIA AN ONSITE SEWER SYSTEM CONNECTED TO A MUNICIPAL SEWER SYSTEM.

EROSION CONTROL SCHEDULE AND SEQUENCING

I.	ROUGH GRADING/ DEMOLITION	CONSTRUCTION ENTRANCE/EXIT AND SILT FENCE PROTECTION SHALL BE INSTALLED PRIOR TO THE INITIATION OF ROUGH GRADING AND DEMOLITION, AS NEEDED.
II.	UTILITY INSTALLATION	ALL PRIOR EROSION CONTROL MEASURES INSTALLED ABOVE TO BE MAINTAINED AS NECESSARY DURING UTILITY INSTALLATION.
III.	PAVING	ALL PRIOR EROSION CONTROL MEASURES INSTALLED ABOVE TO BE MAINTAINED AS NECESSARY DURING PAVING AND THROUGHOUT THE REMAINDER OF THE PROJECT.
IV.	FINAL GRADING/ SOIL STABILIZATION/ LANDSCAPING	ALL TEMPORARY EROSION CONTROL MEASURES TO BE REMOVED AT THE CONCLUSION OF THE PROJECT AS DIRECTED BY THE CITY OR COUNTY.

NOTE:
THE SEQUENCE OF CONSTRUCTION SHOWN ABOVE IS A GENERAL OVERVIEW AND IS INTENDED TO CONVEY THE GENERAL CONCEPTS OF THE EROSION CONTROL DESIGN AND SHOULD NOT BE RELIED UPON FOR CONSTRUCTION PURPOSES. THE CONTRACTOR IS SOLELY RESPONSIBLE FOR DETAILED PHASING AND CONSTRUCTION SEQUENCING NECESSARY TO CONSTRUCT THE PROPOSED IMPROVEMENTS INCLUDED IN THESE PLANS. THE CONTRACTOR SHALL NOTIFY ENGINEER IN WRITING IMMEDIATELY, PRIOR TO AND/OR DURING CONSTRUCTION IF ANY ADDITIONAL INFORMATION ON THE CONSTRUCTION SEQUENCE IS NECESSARY. CONTRACTOR IS SOLELY RESPONSIBLE FOR COMPLYING WITH THE REQUIREMENTS OF THE AUTHORITY HAVING JURISDICTION AND ALL OTHER APPLICABLE LAWS.

BENCHMARK LIST

BM #5000
SQUARE WITH "X" SET ON TOP OF CURB
N: 10,212.988.921
E: 3,061,300.850
ELEV: 1025.01'

BM #1001
"X" SET ON TOP OF CURB
N: 10,212.866.233
E: 3,061,244.005
ELEV: 1022.52

ALL ELEVATIONS SHOWN HEREON ARE TIED TO THE NORTH AMERICAN VERTICAL DATUM OF 1988 (NAVD '88) BASED ON GPS OBSERVATIONS

CAUTION!!
EXISTING UNDERGROUND UTILITIES IN THE AREA CONTRACTOR IS RESPONSIBLE FOR DETERMINING THE HORIZONTAL AND VERTICAL LOCATION OF ALL UTILITIES PRIOR TO CONSTRUCTION. CONTRACTOR SHALL BE RESPONSIBLE FOR ANY REPAIRS TO EXISTING UTILITIES DUE TO DAMAGE INCURRED DURING CONSTRUCTION. CONTRACTOR SHALL NOTIFY THE ENGINEER OF ANY DISCREPANCIES ON THE PLANS.

811 Know what's below. Call before you dig.

REVISIONS:

EROSION CONTROL PLAN

NEW RESTAURANT FOR: Pojangles
W. State Hwy 29
Liberty Hill, TX 78642

Kimley»Horn
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1251 BADLER EAST DRIVE,
SUITE 100, KYLE, TX 78640
SAN MARCOS, TX 78666
PHONE: 512-566-4457
WWW.KIMLEY-HORN.COM TBPE FIRM NO. 928

JORDAN P. SCHAEFER 122080 REGISTERED PROFESSIONAL ENGINEER 02/02/2024

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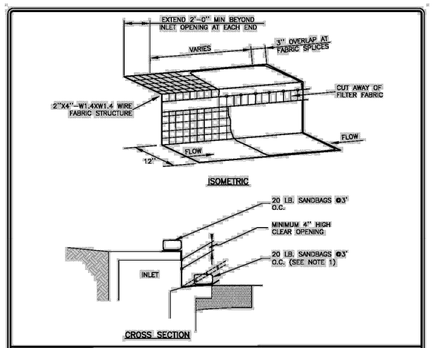


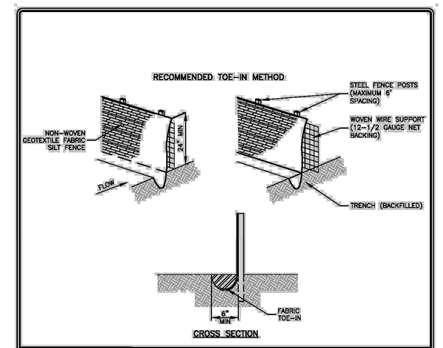
NOTES:

1. WHERE MINIMUM CLEARANCES CAUSE TRAFFIC TO DRIVE IN THE GUTTER, THE CONTRACTOR MAY SUBSTITUTE A 1" X 4" BOARD SECURED WITH CONCRETE NAILS 3' O.C. NAILED INTO THE GUTTER IN LIEU OF SANDBAGS TO HOLD THE FILTER DIKE IN PLACE. UPON REMOVAL, CLEAN ANY DIRT/DEBRIS FROM NAILING LOCATIONS, APPLY CHEMICAL SANDING AGENT AND APPLY NON-SHRINK GROUT FLUSH WITH SURFACE OF GUTTER.
2. A SECTION OF FILTER FABRIC SHALL BE REMOVED AS SHOWN ON THIS DETAIL OR AS DIRECTED BY THE ENGINEER OR DESIGNATED REPRESENTATIVE. FABRIC MUST BE SECURED TO WIRE BACKING WITH CLIPS OR HOG RINGS AT THIS LOCATION.
3. DAILY INSPECTION SHALL BE MADE BY THE CONTRACTOR AND SILT ACCUMULATION MUST BE REMOVED WHEN DEPTH REACHES 2".
4. CONTRACTOR SHALL MONITOR THE PERFORMANCE OF INLET PROTECTION DURING EACH RAINFALL EVENT AND IMMEDIATELY REMOVE THE INLET PROTECTIONS IF THE STORM-WATER BEGINS TO OVERTOP THE CURB.
5. INLET PROTECTIONS SHALL BE REMOVED AS SOON AS THE SOURCE OF SEDIMENT IS STABILIZED.

RECORD SIGNED COPY ON FILE AT PUBLIC WORKS APPROVED 03-25-11 DATE THE ARCHITECT/ENGINEER ASSUMES RESPONSIBILITY FOR THE APPROPRIATE USE OF THIS DETAIL. (NOT TO SCALE)	CITY OF ROUND ROCK CURB INLET PROTECTION DETAIL	DRAWING NO: EC-14

INLET PROTECTION DETAIL

TO BE LOCATED AT (IP) SYMBOL



NOTES:

1. STEEL POSTS WHICH SUPPORT THE SILT FENCE SHALL BE INSTALLED ON A SLIGHT ANGLE TOWARD THE ANTICIPATED RUNOFF SOURCE. POST MUST BE EMBEDDED A MIN. OF ONE (1') FOOT.
2. THE TOE OF THE SILT FENCE SHALL BE TRENCHED IN WITH A SPADE OR MECHANICAL TRENCHER, SO THAT THE DOWNSLOPE FACE OF THE TRENCH IS FLAT AND PERPENDICULAR TO THE LINE OF FLOW. WHERE FENCE CANNOT BE TRENCHED IN (E.G. PAVEMENT) WEIGHT FABRIC FLAP WITH WASHED GRAVEL ON UPHILL SIDE TO PREVENT FLOW UNDER FENCE.
3. THE TRENCH MUST BE A MINIMUM OF 6 INCHES DEEP AND 6 INCHES WIDE TO ALLOW FOR THE SILT FENCE FABRIC TO BE LAID IN THE GROUND AND BACKFILLED WITH COMPACTED MATERIAL.
4. SILT FENCE SHALL BE SECURELY FASTENED TO EACH STEEL SUPPORT POST OR TO WOVEN WIRE, WHICH IN TURN IS SECURELY FASTENED TO THE STEEL FENCE POSTS.
5. INSPECTION SHALL BE MADE WEEKLY OR AFTER EACH RAINFALL EVENT AND REPAIR OR REPLACEMENT SHALL BE MADE PROMPTLY AS NEEDED.
6. SILT FENCE SHALL BE REMOVED WHEN THE SITE IS COMPLETELY STABILIZED SO AS NOT TO BLOCK OR IMPEDE STORM FLOW OR DRAINAGE.
7. ACCUMULATED SILT SHALL BE REMOVED WHEN IT REACHES A DEPTH OF 6 INCHES. THE SILT SHALL BE DISPOSED OF IN AN APPROVED SITE AND IN SUCH A MANNER AS TO NOT CONTRIBUTE TO ADDITIONAL SILTATION.
8. SILT FENCE SHALL BE REMOVED AS SOON AS THE SOURCE OF SEDIMENT IS STABILIZED

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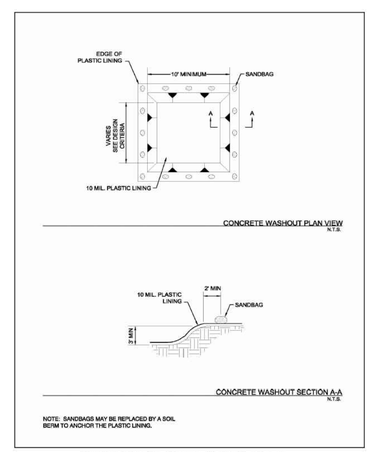
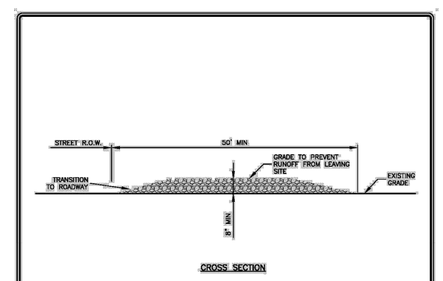
SILT FENCE DETAIL

TO BE LOCATED AT (SF) SYMBOL



CONCRETE WASHOUT PIT

TO BE LOCATED AT (CW) SYMBOL



NOTES:

1. STONE SIZE SHALL BE 3" — 8" OPEN GRADED ROCK.
2. THICKNESS OF CRUSHED STONE PAD TO BE NOT LESS THAN 8".
3. LENGTH SHALL BE A MINIMUM OF 50' FROM ACTUAL ROADWAY, AND WIDTH NOT LESS THAN FULL WIDTH OF INGRESS/EGRESS.
4. ENTRANCE SHALL BE PROPERLY GRADED TO PREVENT RUNOFF FROM LEAVING THE CONSTRUCTION SITE.
5. THE ENTRANCE SHALL BE MAINTAINED IN A CONDITION WHICH WILL PREVENT TRACKING OR FLOWING OF SEDIMENT ONTO PUBLIC RIGHTS OF WAY. ALL SEDIMENT SPILLED, DROPPED, WASHED OR TRACKED ONTO PUBLIC RIGHTS OF WAY MUST BE REMOVED IMMEDIATELY BY CONTRACTOR.
8. AS NECESSARY, WHEELS MUST BE CLEANED TO REMOVE SEDIMENT PRIOR TO ENTRANCE ONTO PUBLIC RIGHT 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.

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CONSTRUCTION ENTRANCE DETAIL

TO BE LOCATED AT (CE) SYMBOL

CAUTION!!

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REVISIONS:

EROSION CONTROL DETAILS

NEW RESTAURANT FOR:

Pojangles
W. State Hwy 29
Liberty Hill, TX 78642

Kimley»Horn
© 2024 KIMLEY-HORN AND ASSOCIATES, INC.
1251 SADLER EAST DRIVE,
BUILDING 1, STE 2000
SAN MARCOS, TX 78666
PHONE: 512-566-4457
WWW.KIMLEY-HORN.COM TBPE FIRM NO. 928

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122080
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KH GENERAL NOTES

OVERALL:

1. ALL CONSTRUCTION AND MATERIALS SHALL BE IN ACCORDANCE WITH THESE PLANS, CITY (OR TOWN) STANDARD DETAILS AND SPECIFICATIONS, THE FINAL GEOTECHNICAL REPORT AND ALL ISSUED ADDENDA, AND COMMONLY ACCEPTED CONSTRUCTION STANDARDS. THE CITY SPECIFICATIONS SHALL GOVERN WHERE OTHER SPECIFICATIONS DO NOT EXIST. IN CASE OF CONFLICTING SPECIFICATIONS OR DETAILS, THE MORE RESTRICTIVE SPECIFICATION AND DETAIL SHALL BE FOLLOWED.
2. THE CONTRACTOR SHALL COMPLY WITH CITY (OR TOWN) "GENERAL NOTES" FOR CONSTRUCTION, IF EXISTING AND REQUIRED BY THE CITY. FOR INSTANCES WHERE THEY CONFLICT WITH THESE KH GENERAL NOTES, THEN THE MORE RESTRICTIVE SHALL APPLY.
3. THE CONTRACTOR SHALL FURNISH ALL MATERIAL AND LABOR TO CONSTRUCT THE FACILITY AS SHOWN AND DESCRIBED IN THE CONSTRUCTION DOCUMENTS IN ACCORDANCE WITH THE APPROPRIATE AUTHORITIES' SPECIFICATIONS AND REQUIREMENTS.
4. THE CONTRACTOR SHALL VISIT THE SITE PRIOR TO BIDDING TO DETERMINE EXISTING CONDITIONS.
5. THE EXISTING CONDITIONS SHOWN ON THESE PLANS WERE PROVIDED BY THE TOPOGRAPHIC SURVEY PREPARED BY THE PROJECT SURVEYOR, AND ARE BASED ON THE BENCHMARKS SHOWN. THE CONTRACTOR SHALL REFERENCE THE SAME BENCHMARKS.
6. THE CONTRACTOR SHALL REVIEW AND VERIFY THE EXISTING TOPOGRAPHIC SURVEY SHOWN ON THE PLANS REPRESENTS EXISTING FIELD CONDITIONS PRIOR TO CONSTRUCTION, AND SHALL REPORT ANY DISCREPANCIES FOUND TO THE OWNER AND ENGINEER IMMEDIATELY.
7. IF THE CONTRACTOR DOES NOT ACCEPT THE EXISTING TOPOGRAPHIC SURVEY AS SHOWN ON THE PLANS, WITHOUT EXCEPTION, THEN THE CONTRACTOR SHALL SUPPLY AT THEIR OWN EXPENSE, A TOPOGRAPHIC SURVEY BY A REGISTERED PROFESSIONAL LAND SURVEYOR TO THE OWNER AND ENGINEER FOR REVIEW.
8. CONTRACTOR SHALL PROVIDE ALL CONSTRUCTION SURVEYING AND STAKING.
9. CONTRACTOR SHALL VERIFY HORIZONTAL AND VERTICAL CONTROL, INCLUDING BENCHMARKS PRIOR TO COMMENCING CONSTRUCTION OR STAKING OF IMPROVEMENTS. PROPERTY LINES AND CORNERS SHALL BE HELD AS THE HORIZONTAL CONTROL.
10. THE CONTRACTOR SHALL REVIEW AND VERIFY ALL DIMENSIONS, ELEVATIONS, AND FIELD CONDITIONS THAT MAY AFFECT CONSTRUCTION. ANY DISCREPANCIES ON THE DRAWINGS SHALL BE IMMEDIATELY BROUGHT TO THE ATTENTION OF THE ARCHITECT AND ENGINEER BEFORE COMMENCING WORK. NO FIELD CHANGES OR DEVIATIONS FROM DESIGN ARE TO BE MADE WITHOUT PRIOR APPROVAL OF THE ARCHITECT, ENGINEER, AND IF APPLICABLE THE CITY AND OWNER. NO CONSIDERATION WILL BE GIVEN TO CHANGE ORDERS FOR WHICH THE CITY, ENGINEER, AND OWNER WERE NOT CONTACTED PRIOR TO CONSTRUCTION OF THE AFFECTED ITEM.
11. CONTRACTOR SHALL THOROUGHLY CHECK COORDINATION OF CIVIL, LANDSCAPE, MEP, ARCHITECTURAL, AND OTHER PLANS PRIOR TO COMMENCING CONSTRUCTION. OWNER/ENGINEER SHALL BE NOTIFIED OF ANY DISCREPANCY PRIOR TO COMMENCING WITH CONSTRUCTION.
12. IT IS THE CONTRACTOR'S RESPONSIBILITY TO CONTACT THE VARIOUS UTILITY COMPANIES WHICH MAY HAVE BURIED OR AERIAL UTILITIES WITHIN OR NEAR THE CONSTRUCTION AREA BEFORE COMMENCING WORK TO HAVE THEM LOCATE THEIR EXISTING UTILITIES PRIOR TO CONSTRUCTION. THE CONTRACTOR SHALL PROVIDE AN ADEQUATE MINIMUM NOTICE TO ALL UTILITY COMPANIES PRIOR TO BEGINNING CONSTRUCTION.
13. CONTRACTOR SHALL CALL TEXAS 811 AN ADEQUATE AMOUNT OF TIME PRIOR TO COMMENCING CONSTRUCTION OR ANY EXCAVATION.
14. CONTRACTOR SHALL USE EXTREME CAUTION AS THE SITE CONTAINS VARIOUS KNOWN AND UNKNOWN PUBLIC AND PRIVATE UTILITIES.
15. THE LOCATIONS, ELEVATIONS, DEPTH, AND DIMENSIONS OF EXISTING UTILITIES SHOWN ON THE PLANS WERE OBTAINED FROM AVAILABLE UTILITY COMPANY RECORDS AND ARE CONSIDERED APPROXIMATE AND INCOMPLETE. IT SHALL BE THE CONTRACTORS' RESPONSIBILITY TO VERIFY THE PRESENCE, LOCATION, ELEVATION, DEPTH, AND DIMENSION OF EXISTING UTILITIES SUFFICIENTLY IN ADVANCE OF CONSTRUCTION SO THAT ADJUSTMENTS CAN BE MADE TO PROVIDE ADEQUATE CLEARANCES. THE ENGINEER SHALL BE NOTIFIED WHEN A PROPOSED IMPROVEMENT CONFLICTS WITH AN EXISTING UTILITY.
16. THE CONTRACTOR IS RESPONSIBLE FOR COORDINATING ANY ADJUSTMENTS AND RELOCATIONS OF EXISTING UTILITIES THAT CONFLICT WITH THE PROPOSED IMPROVEMENTS, INCLUDING BUT NOT LIMITED TO, ADJUSTING EXISTING MANHOLES TO MATCH PROPOSED GRADE, RELOCATING EXISTING POLES AND GUY WIRES THAT ARE LOCATED IN PROPOSED DRIVEWAYS, ADJUSTING THE HORIZONTAL OR VERTICAL ALIGNMENT OF EXISTING UNDERGROUND UTILITIES TO ACCOMMODATE PROPOSED GRADE OR SPACING WITH A PROPOSED UTILITY, AND ANY OTHERS THAT MAY BE ENCOUNTERED THAT ARE UNKNOWN AT THIS TIME AND NOT SHOWN ON THESE PLANS.
17. CONTRACTOR SHALL ARRANGE FOR OR PROVIDE, AT ITS EXPENSE, ALL GAS, TELECOMMUNICATIONS, CABLE, OVERHEAD AND UNDERGROUND POWER LINE, AND UTILITY POLE ADJUSTMENTS NEEDED.
18. CONTRACTOR IS RESPONSIBLE FOR COORDINATING INSTALLATION OF FRANCHISE UTILITIES THAT ARE NECESSARY FOR ON-SITE AND OFF-SITE CONSTRUCTION, AND SERVICE TO THE PROPOSED DEVELOPMENT.
19. THE CONTRACTOR SHALL BE FULLY RESPONSIBLE FOR ALL DAMAGES DUE TO THE CONTRACTORS' FAILURE TO EXACTLY LOCATE AND PRESERVE ALL UTILITIES. THE OWNER OR ENGINEER WILL ASSUME NO LIABILITY FOR ANY DAMAGES SUSTAINED OR COST INCURRED BECAUSE OF THE OPERATIONS IN THE VICINITY OF EXISTING UTILITIES OR STRUCTURES. IF IT IS NECESSARY TO MOVE, BRACE, SHORING OR RELOCATE A UTILITY, THE UTILITY COMPANY OR DEPARTMENT AFFECTED SHALL BE CONTACTED BY THE CONTRACTOR AND THEIR PERMISSION OBTAINED REGARDING THE METHOD TO USE FOR SUCH WORK.
20. BRACING OR BRACING POLES MAY BE REQUIRED BY THE UTILITY COMPANIES WHEN TRENCHING OR EXCAVATING IN CLOSE PROXIMITY TO THE POLES. THE COST OF BRACING POLES WILL BE BORNE BY THE CONTRACTOR, WITH NO SEPARATE PAY ITEM FOR THIS WORK. THE COST IS INCIDENTAL TO THE PAY ITEM.
21. CONTRACTOR SHALL USE ALL NECESSARY SAFETY PRECAUTIONS TO AVOID CONTACT WITH OVERHEAD AND UNDERGROUND POWER LINES. CONTRACTOR SHALL COMPLY WITH ALL APPLICABLE LOCAL, STATE, FEDERAL AND UTILITY OWNER REGULATIONS PERTAINING TO WORK SETBACKS FROM POWER LINES.
22. THE CONTRACTOR SHALL BE RESPONSIBLE TO OBTAIN ALL REQUIRED CONSTRUCTION PERMITS, APPROVALS, AND BONDS PRIOR TO CONSTRUCTION.
23. THE CONTRACTOR SHALL HAVE AVAILABLE AT THE JOB SITE AT ALL TIMES A COPY OF THE CONTRACT DOCUMENTS INCLUDING PLANS, GEOTECHNICAL REPORT AND ADDENDA, PROJECT AND CITY SPECIFICATIONS, AND SPECIAL CONDITIONS, COPIES OF ANY REQUIRED CONSTRUCTION PERMITS, EROSION CONTROL PLANS, SWPPP AND INSPECTION REPORTS.
24. ALL SHOP DRAWINGS AND OTHER DOCUMENTS THAT REQUIRE ENGINEER REVIEW SHALL BE SUBMITTED BY THE CONTRACTOR SUFFICIENTLY IN ADVANCE OF CONSTRUCTION OF THAT ITEM, SO THAT NO LESS THAN 10 BUSINESS DAYS FOR REVIEW AND RESPONSE IS AVAILABLE.
25. ALL NECESSARY INSPECTIONS AND/OR CERTIFICATIONS REQUIRED BY CODES, JURISDICTIONAL AGENCIES, AND/OR UTILITY SERVICE COMPANIES SHALL BE PERFORMED PRIOR TO USE OF THE FACILITY AND THE FINAL CONNECTION OF SERVICES.
26. CONTRACTOR SHALL ARRANGE FOR REQUIRED CITY INSPECTIONS.
27. CONTRACTOR'S BID PRICE SHALL INCLUDE ALL INSPECTION FEES.
28. ALL SYMBOLS SHOWN ON THESE PLANS (E.G. FIRE HYDRANT, METERS, VALVES, INLETS, ETC….) ARE FOR PRESENTATION PURPOSES ONLY AND ARE NOT TO SCALE. CONTRACTOR SHALL COORDINATE FINAL SIZES AND LOCATIONS WITH APPROPRIATE CITY INSPECTOR.
29. THE SCOPE OF WORK FOR THE CIVIL IMPROVEMENTS SHOWN ON THESE PLANS TERMINATES 5-FEET FROM THE BUILDING. REFERENCE THE BUILDING PLANS (E.G. ARCHITECTURAL, STRUCTURAL, MEP) FOR AREAS WITHIN 5-FEET OF THE BUILDING AND WITHIN THE BUILDING FOOTPRINT.
30. REFER TO ARCHITECTURAL AND STRUCTURAL PLANS FOR ALL FINAL BUILDING DIMENSIONS.
31. THE PROPOSED BUILDING FOOTPRINT(S) SHOWN IN THESE PLANS WAS PROVIDED TO KIMLEY-HORN AND ASSOCIATES, INC. (KH) BY THE PROJECT ARCHITECT AT THE TIME THESE PLANS WERE PREPARED. IT MAY NOT BE THE FINAL CORRECT VERSION BECAUSE THE BUILDING DESIGN WAS ONGOING. THE CONTRACTOR IS SOLELY RESPONSIBLE FOR CONFIRMING THE FINAL CORRECT VERSION OF THE BUILDING FOOTPRINT WITH THE ARCHITECT AND STRUCTURAL ENGINEER PRIOR TO LAYOUT. DIMENSIONS AND/OR COORDINATES SHOWN ON THESE PLANS WERE BASED ON THE ABOVE STATED ARCHITECTURAL FOOTPRINT, AND ARE THEREFORE A PRELIMINARY LOCATION OF THE BUILDING. THE CONTRACTOR IS SOLELY RESPONSIBLE TO VERIFY WHAT PART OF THE BUILDING THE ARCHITECT'S FOOTPRINT REPRESENTS (E.G. SLAB, OUTSIDE WALL, MASONRY LEDGE, ETC….) AND TO CONFIRM ITS FINAL POSITION ON THE SITE BASED ON THE FINAL ARCHITECTURAL FOOTPRINT, CIVIL DIMENSION CONTROL PLAN, SURVEY BOUNDARY AND/OR PLAT. ANY DIFFERENCES FOUND SHALL BE REPORTED TO KH IMMEDIATELY.
32. ALL CONSTRUCTION SHALL COMPLY WITH THE PROJECT'S FINAL GEOTECHNICAL REPORT (OR LATEST EDITION), INCLUDING SUBSEQUENT ADDENDA.
33. CONTRACTOR IS RESPONSIBLE FOR ALL MATERIALS TESTING AND CERTIFICATION, UNLESS SPECIFIED OTHERWISE BY OWNER. ALL MATERIALS TESTING SHALL BE COORDINATED WITH THE APPROPRIATE CITY INSPECTOR AND COMPLY WITH CITY STANDARD SPECIFICATIONS AND GEOTECHNICAL REPORT. TESTING SHALL BE PERFORMED BY AN APPROVED INDEPENDENT AGENCY FOR TESTING MATERIALS. OWNER SHALL APPROVE THE AGENCY NOMINATED BY THE CONTRACTOR FOR MATERIALS TESTING.
34. ALL COPIES OF MATERIALS TEST RESULTS SHALL BE SENT TO THE OWNER, ENGINEER AND ARCHITECT DIRECTLY FROM THE TESTING AGENCY.
35. IT SHALL BE THE CONTRACTORS RESPONSIBILITY TO SHOW, BY THE STANDARD TESTING PROCEDURES OF THE MATERIALS, THAT THE WORK CONSTRUCTED MEETS THE PROJECT REQUIREMENTS AND CITY SPECIFICATIONS.
36. DUE TO THE POTENTIAL FOR DIFFERENTIAL SOIL MOVEMENT ADJACENT TO THE BUILDING, THE CONTRACTOR SHALL ADHERE TO GEOTECHNICAL REPORT'S RECOMMENDATION FOR SUBGRADE PREPARATION SPECIFIC TO FLATWORK ADJACENT TO THE PROPOSED BUILDING. THE OWNER AND CONTRACTOR ARE ADVISED TO OBTAIN A GEOTECHNICAL ENGINEER RECOMMENDATION SPECIFIC TO FLATWORK ADJACENT TO THE BUILDING, IF NONE IS CURRENTLY EXISTING.
37. ALL CONTRACTORS MUST CONFINE THEIR ACTIVITIES TO THE WORK AREA. NO ENCROACHMENTS OUTSIDE OF THE WORK AREA WILL BE ALLOWED. ANY DAMAGE RESULTING THEREFROM SHALL BE CONTRACTOR'S SOLE RESPONSIBILITY TO REPAIR.
38. THE CONTRACTOR SHALL PROTECT ALL EXISTING STRUCTURES, UTILITIES, MANHOLES, POLES, GUY WIRES, VALVE COVERS, VAULT LIDS, FIRE HYDRANTS, COMMUNICATION BOXES/PEDESTALS, AND OTHER FACILITIES TO REMAIN AND SHALL REPAIR ANY DAMAGES AT NO COST TO THE OWNER.
39. THE CONTRACTOR SHALL IMMEDIATELY REPAIR OR REPLACE ANY PHYSICAL DAMAGE TO PRIVATE PROPERTY OR PUBLIC IMPROVEMENTS, INCLUDING BUT NOT LIMITED TO: FENCES, WALLS, SIGNS, PAVEMENT, CURBS, UTILITIES, SIDEWALKS, GRASS, TREES, LANDSCAPING, AND IRRIGATION SYSTEMS, ETC…. TO ORIGINAL CONDITION OR BETTER AT NO COST TO THE OWNER.
40. ALL AREAS IN EXISTING RIGHT-OF-WAY DISTURBED BY SITE CONSTRUCTION SHALL BE REPAIRED TO ORIGINAL CONDITION OR BETTER, INCLUDING AS NECESSARY GRADING, LANDSCAPING, CULVERTS, AND PAVEMENT.
41. THE CONTRACTOR SHALL SALVAGE ALL EXISTING POWER POLES, SIGNS, WATER VALVES, FIRE HYDRANTS, METERS, ETC… THAT ARE TO BE RELOCATED DURING CONSTRUCTION.
42. CONTRACTOR SHALL MAINTAIN ADEQUATE SITE DRAINAGE DURING ALL PHASES OF CONSTRUCTION, INCLUDING MAINTAINING EXISTING DITCHES OR CULVERTS FREE OF OBSTRUCTIONS AT ALL TIMES.
43. THE CONTRACTOR IS RESPONSIBLE FOR OBTAINING AND SUBMITTING A TRENCH SAFETY PLAN, PREPARED BY A PROFESSIONAL ENGINEER IN THE STATE OF TEXAS, TO THE CITY PRIOR TO CONSTRUCTION. CONTRACTOR IS RESPONSIBLE FOR MAINTAINING TRENCH SAFETY REQUIREMENTS IN ACCORDANCE WITH CITY, STATE, AND FEDERAL REQUIREMENTS, INCLUDING OSHA FOR ALL TRENCHES. NO OPEN TRENCHES SHALL BE ALLOWED OVERNIGHT WITHOUT PRIOR WRITTEN APPROVAL OF THE CITY.
44. THE CONTRACTOR SHALL KEEP TRENCHES FREE FROM WATER.
45. SITE SAFETY IS SOLELY THE RESPONSIBILITY OF THE CONTRACTOR.
46. THESE PLANS DO NOT EXTEND TO OR INCLUDE DESIGNS OR SYSTEMS PERTAINING TO THE SAFETY OF THE CONTRACTOR OR ITS EMPLOYEES, AGENTS OR REPRESENTATIVES IN THE PERFORMANCE OF THE WORK. THE ENGINEER'S SEAL HEREON DOES NOT EXTEND TO ANY SUCH SAFETY SYSTEM. THE CONTRACTOR SHALL BE RESPONSIBLE FOR IMPLEMENTATION OF ALL REQUIRED SAFETY PROCEDURES AND PROGRAMS.
47. SIGNS RELATED TO SITE OPERATION OR SAFETY ARE NOT INCLUDED IN THESE PLANS.
48. CONTRACTOR OFFICE AND STAGING AREA SHALL BE AGREED ON BY THE OWNER AND CONTRACTOR PRIOR TO BEGINNING OF CONSTRUCTION. CONTRACTOR IS RESPONSIBLE FOR ALL PERMITTING REQUIREMENTS FOR THE CONSTRUCTION OFFICE, TRAILER, STORAGE, AND STAGING OPERATIONS AND LOCATIONS.
49. LIGHT POLES, SIGNS, AND OTHER OBSTRUCTIONS SHALL NOT BE PLACED IN ACCESSIBLE ROUTES.
50. ALL SIGNS, PAVEMENT MARKINGS, AND OTHER TRAFFIC CONTROL DEVICES SHALL CONFORM TO THE "TEXAS MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES".
51. TOP RIM ELEVATIONS OF ALL EXISTING AND PROPOSED MANHOLES SHALL BE COORDINATED WITH TOP OF PAVEMENT OR FINISHED GRADE AND SHALL BE ADJUSTED TO BE FLUSH WITH THE ACTUAL FINISHED GRADE AT THE TIME OF PAVING.
52. CONTRACTOR SHALL ADJUST ALL EXISTING AND PROPOSED VALVES, FIRE HYDRANTS, AND OTHER UTILITY APPURTENANCES TO MATCH ACTUAL FINISHED GRADES AT THE TIME OF PAVING.
53. THE CONTRACTOR IS RESPONSIBLE FOR CONSTRUCTION SEQUENCING AND PHASING, AND SHALL CONTACT THE APPROPRIATE CITY OFFICIALS, INCLUDING BUILDING OFFICIAL, ENGINEERING INSPECTOR, AND FIRE MARSHALL TO LEARN OF ANY REQUIREMENTS.
54. CONTRACTOR IS RESPONSIBLE FOR PREPARATION, SUBMITTAL, AND APPROVAL BY THE CITY OF A TRAFFIC CONTROL PLAN PRIOR TO THE START OF CONSTRUCTION, AND THEN THE IMPLEMENTATION OF THE PLAN.
55. CONTRACTOR SHALL KEEP A NEAT AND ACCURATE RECORD OF CONSTRUCTION, INCLUDING ANY DEVIATIONS OR VARIANCES FROM THE PLANS.
56. THE CONTRACTOR SHALL BE RESPONSIBLE FOR PROVIDING AS-BUILT PLANS TO THE ENGINEER AND CITY IDENTIFYING ALL DEVIATIONS AND VARIATIONS FROM THESE PLANS MADE DURING CONSTRUCTION.

EROSION CONTROL:

1. THE CONTRACTOR SHALL COMPLY WITH ALL LOCAL, STATE, AND FEDERAL EROSION CONTROL AND WATER QUALITY REQUIREMENTS, LAWS, AND ORDINANCES THAT APPLY TO THE CONSTRUCTION SITE LAND DISTURBANCE.
2. CONTRACTOR SHALL COMPLY WITH THE REQUIREMENTS OF THE "TCEQ GENERAL PERMIT TO DISCHARGE UNDER THE TEXAS POLLUTANT DISCHARGE ELIMINATION SYSTEM TXR 150000".
3. EROSION CONTROL DEVICES SHOWN ON THE EROSION CONTROL PLAN FOR THE PROJECT SHALL BE INSTALLED PRIOR TO THE START OF LAND DISTURBANCE.
4. ALL EROSION CONTROL DEVICES ARE TO BE INSTALLED IN ACCORDANCE WITH THE APPROVED PLANS AND SPECIFICATIONS FOR THE PROJECT.
5. CONTRACTOR IS SOLELY RESPONSIBLE FOR INSTALLATION, IMPLEMENTATION, MAINTENANCE, AND EFFECTIVENESS OF ALL EROSION CONTROL DEVICES, BEST MANAGEMENT PRACTICES (BMPS) AND FOR UPDATING THE EROSION CONTROL PLAN DURING CONSTRUCTION AS FIELD CONDITIONS CHANGE.
6. CONTRACTOR SHALL DOCUMENT THE DATES OF INSTALLATION, MAINTENANCE OR MODIFICATION, AND REMOVAL FOR EACH BMP EMPLOYED IN THE STORM WATER POLLUTION PREVENTION PLAN (SWPPP) IF APPLICABLE.
7. AS STORM SEWER INLETS ARE INSTALLED ON-SITE, TEMPORARY EROSION CONTROL DEVICES SHALL BE INSTALLED AT EACH INLET PER APPROVED DETAILS.
8. THE EROSION CONTROL DEVICES SHALL REMAIN IN PLACE UNTIL THE AREA IT PROTECTS HAS BEEN PERMANENTLY STABILIZED.
9. CONTRACTOR SHALL PROVIDE ADEQUATE EROSION CONTROL DEVICES NEEDED DUE TO PROJECT PHASING.
10. CONTRACTOR SHALL OBSERVE THE EFFECTIVENESS OF THE EROSION CONTROL DEVICES AND MAKE FIELD ADJUSTMENTS AND MODIFICATIONS AS NEEDED TO PREVENT SEDIMENT FROM LEAVING THE SITE. IF THE EROSION CONTROL DEVICES DO NOT EFFECTIVELY CONTROL EROSION AND PREVENT SEDIMENTATION FROM WASHING OFF THE SITE, THEN THE CONTRACTOR SHALL NOTIFY THE ENGINEER.
11. OFF-SITE SOIL BORROW, SPOIL, AND STORAGE AREAS (IF APPLICABLE) ARE CONSIDERED AS PART OF THE PROJECT SITE AND MUST ALSO COMPLY WITH THE EROSION CONTROL REQUIREMENTS FOR THIS PROJECT. THIS INCLUDES THE INSTALLATION OF BMP'S TO CONTROL EROSION AND SEDIMENTATION AND THE ESTABLISHMENT OF PERMANENT GROUND COVER ON DISTURBED AREAS PRIOR TO FINAL APPROVAL OF THE PROJECT. CONTRACTOR IS RESPONSIBLE FOR MODIFYING THE SWPPP AND EROSION CONTROL PLAN TO INCLUDE BMPS FOR ANY OFF-SITE THAT ARE NOT ANTICIPATED OR SHOWN ON THE EROSION CONTROL PLAN.
12. ALL STAGING, STOCKPILES, SPOIL, AND STORAGE SHALL BE LOCATED SUCH THAT THEY WILL NOT ADVERSELY AFFECT STORM WATER QUALITY. PROTECTIVE MEASURES SHALL BE PROVIDED IF NEEDED TO ACCOMPLISH THIS REQUIREMENT, SUCH AS COVERING OR ENCIRCLING THE AREA WITH AN APPROPRIATE BARRIER.
13. CONTRACTORS SHALL INSPECT ALL EROSION CONTROL DEVICES, BMPS, DISTURBED AREAS, AND VEHICLE ENTRY AND EXIT AREAS WEEKLY AND WITHIN 24 HOURS OF ALL RAINFALL EVENTS OF 0.5 INCHES OR GREATER, AND KEEP A RECORD OF THIS INSPECTION IN THE SWPPP BOOKLET IF APPLICABLE, TO VERIFY THAT THE DEVICES AND EROSION CONTROL PLAN ARE FUNCTIONING PROPERLY.
14. CONTRACTOR SHALL CONSTRUCT A STABILIZED CONSTRUCTION ENTRANCE AT ALL PRIMARY POINTS OF ACCESS IN ACCORDANCE WITH CITY SPECIFICATIONS. CONTRACTOR SHALL ENSURE THAT ALL CONSTRUCTION TRAFFIC USES THE STABILIZED ENTRANCE AT ALL TIMES FOR ALL INGRESS/EGRESS.
15. SITE ENTRY AND EXITS SHALL BE MAINTAINED IN A CONDITION THAT WILL PREVENT THE TRACKING AND FLOWING OF SEDIMENT AND DIRT ONTO OFF-SITE ROADWAYS. ALL SEDIMENT AND DIRT FROM THE SITE THAT IS DEPOSITED ONTO AN OFF-SITE ROADWAY SHALL BE REMOVED IMMEDIATELY
16. THE CONTRACTOR IS RESPONSIBLE FOR REMOVING ALL SILT AND DEBRIS FROM THE AFFECTED OFF-SITE ROADWAYS THAT ARE A RESULT OF THE CONSTRUCTION, AS REQUESTED BY OWNER AND CITY. AT A MINIMUM, THIS SHOULD OCCUR ONCE PER DAY FOR THE OFF-SITE ROADWAYS.
17. WHEN WASHING OF VEHICLES IS REQUIRED TO REMOVE SEDIMENT PRIOR TO EXITING THE SITE, IT SHALL BE DONE IN AN AREA STABILIZED WITH CRUSHED STONE THAT DRAINS INTO AN APPROVED SEDIMENT TRAP BMP.
18. CONTRACTOR SHALL INSTALL A TEMPORARY SEDIMENT BASIN FOR ANY ON-SITE DRAINAGE AREAS THAT ARE GREATER THAN 10 ACRES, PER TCEQ AND CITY STANDARDS. IF NO ENGINEERING DESIGN HAS BEEN PROVIDED FOR A SEDIMENTATION BASIN ON THESE PLANS, THEN THE CONTRACTOR SHALL ARRANGE FOR AN APPROPRIATE DESIGN TO BE PROVIDED.
19. ALL FINES IMPOSED FOR SEDIMENT OR DIRT DISCHARGED FROM THE SITE SHALL BE PAID BY THE RESPONSIBLE CONTRACTOR.
20. WHEN SEDIMENT OR DIRT HAS CLOGGED THE CONSTRUCTION ENTRANCE VOID SPACES BETWEEN STONES OR DIRT IS BEING TRACKED ONTO A ROADWAY, THE AGGREGATE PAD MUST BE WASHED DOWN OR REPLACED. RUNOFF FROM THE WASH-DOWN CONSTRUCTION SHALL NOT BE ALLOWED TO DRAIN DIRECTLY OFF SITE WITHOUT FIRST FLOWING THROUGH ANOTHER BMP TO CONTROL SEDIMENTATION. PERIODIC RE-GRADING OR NEW STONE MAY BE REQUIRED TO MAINTAIN THE EFFECTIVENESS OF THE CONSTRUCTION ENTRANCE.
21. TEMPORARY OR PERMANENT WATER STABILIZATION SHALL BE INITIATED WITHIN 14 DAYS OF THE LAST DISTURBANCE OF ANY AREA, UNLESS ADDITIONAL CONSTRUCTION IN THE AREA IS EXPECTED WITHIN 21 DAYS OF THE LAST DISTURBANCE.
22. CONTRACTOR SHALL FOLLOW GOOD HOUSEKEEPING PRACTICES DURING CONSTRUCTION, ALWAYS CLEANING UP DIRT, LOOSE MATERIAL, AND TRASH AS CONVENIENTLY AS POSSIBLE.
23. UPON COMPLETION OF FINE GRADING, ALL SURFACES OF DISTURBED AREAS SHALL BE PERMANENTLY STABILIZED. STABILIZATION IS ACHIEVED WHEN THE AREA IS EITHER COVERED BY PERMANENT IMPERVIOUS STRUCTURES, SUCH AS BUILDINGS, SIDEWALK, PAVEMENT, OR A UNIFORM BY TEXTURE GRASS, VEGETATION COVER.
24. AT THE CONCLUSION OF THE PROJECT, ALL INLETS, DRAIN PIPE, CHANNELS, DRAINAGEWAYS AND BORROW DITCHES AFFECTED BY THE CONSTRUCTION SHALL BE DREDGED, AND THE SEDIMENT GENERATED BY THE PROJECT SHALL BE REMOVED AND DISPOSED IN ACCORDANCE WITH APPLICABLE REGULATIONS.

STORM WATER DISCHARGE AUTHORIZATION:

1. CONTRACTOR SHALL COMPLY WITH ALL TCEQ AND EPA STORM WATER POLLUTION PREVENTION REQUIREMENTS.
2. CONTRACTOR SHALL COMPLY WITH THE REQUIREMENTS OF THE TCEQ GENERAL PERMIT TO DISCHARGE UNDER THE TEXAS POLLUTANT DISCHARGE ELIMINATION SYSTEM TXR 150000.
3. THE CONTRACTOR SHALL ENSURE THAT ALL PRIMARY OPERATORS SUBMIT A NOI TO TCEQ AT LEAST SEVEN DAYS PRIOR TO COMMENCING CONSTRUCTION (IF APPLICABLE), OR IF UTILIZING ELECTRONIC SUBMITTAL, PRIOR TO COMMENCING CONSTRUCTION. ALL PRIMARY OPERATORS SHALL PROVIDE A COPY OF THE SIGNED NOI TO THE OPERATOR OF ANY MS4 (TYPICALLY THE CITY) RECEIVING DISCHARGE FROM THE SITE.
4. CONTRACTOR SHALL BE RESPONSIBLE FOR THE IMPLEMENTATION OF THE STORM WATER POLLUTION PREVENTION PLAN (SWPPP) IF APPLICABLE, INCLUDING POSTING SITE NOTICE, INSPECTIONS, DOCUMENTATION, AND SUBMISSION OF ANY INFORMATION REQUIRED BY THE TCEQ AND EPA (E.G. NOI).
5. ALL CONTRACTORS AND SUBCONTRACTORS PROVIDING SERVICES RELATED TO THE SWPPP SHALL SIGN THE REQUIRED CONTRACTOR CERTIFICATION STATEMENT ACKNOWLEDGING THEIR RESPONSIBILITIES AS SPECIFIED IN THE SWPPP.
6. A COPY OF THE SWPPP, INCLUDING NOI, SITE NOTICE, CONTRACTOR CERTIFICATIONS, AND ANY REVISIONS, SHALL BE SUBMITTED TO THE CITY BY THE CONTRACTOR AND SHALL BE KEPT ON-SITE DURING CONSTRUCTION.
7. A NOTICE OF TERMINATION (NOT) SHALL BE SUBMITTED TO TCEQ BY ANY PRIMARY OPERATOR WITHIN 30 DAYS AFTER ALL SOIL DISTURBING ACTIVITIES AT THE SITE HAVE BEEN COMPLETED AND A UNIFORM VEGETATIVE COVER HAS BEEN ESTABLISHED ON ALL UNPAVED AREAS AND AREAS NOT COVERED BY STRUCTURES, A TRANSFER OF OPERATIONAL CONTROL HAS OCCURRED, OR THE OPERATOR HAS OBTAINED ALTERNATIVE AUTHORIZATION UNDER A DIFFERENT PERMIT. A COPY OF THE NOT SHALL BE PROVIDED TO THE OPERATOR OF ANY MS4 RECEIVING DISCHARGE FROM THE SITE.

DEMOLITION:

1. KH IS NOT RESPONSIBLE FOR THE MEANS AND METHODS EMPLOYED BY THE CONTRACTOR TO IMPLEMENT THIS DEMOLITION PLAN. THIS PRELIMINARY DEMOLITION PLAN SIMPLY INDICATES THE KNOWN OBJECTS ON THE SUBJECT TRACT THAT ARE TO BE DEMOLISHED AND REMOVED FROM THE SITE.
2. KH DOES NOT WARRANT OR REPRESENT THAT THE PLAN, WHICH WAS PREPARED BASED ON SURVEY AND UTILITY INFORMATION PROVIDED BY OTHERS, SHOWS ALL IMPROVEMENTS AND UTILITIES, THAT THE IMPROVEMENTS AND UTILITIES ARE SHOWN ACCURATELY, OR THAT THE UTILITIES SHOWN ARE ABANDONED. THE CONTRACTOR IS RESPONSIBLE FOR PERFORMING ITS OWN SITE RECONNAISSANCE TO SCOPE ITS WORK AND TO CONFIRM WITH THE OWNERS OF IMPROVEMENTS AND UTILITIES THE ABILITY AND PROCESS FOR THE REMOVAL OF THEIR FACILITIES.
3. THIS PLAN IS INTENDED TO GIVE A GENERAL GUIDE TO THE CONTRACTOR, NOTHING MORE. THE GOAL OF THE DEMOLITION IS TO LEAVE THE SITE IN A STATE SUITABLE FOR THE CONSTRUCTION OF THE PROPOSED DEVELOPMENT. REMOVAL OR PRESERVATION OF IMPROVEMENTS, UTILITIES, ETC. TO ACCOMPLISH THIS GOAL ARE THE RESPONSIBILITY OF THE CONTRACTOR.
4. CONTRACTOR IS STRONGLY CAUTIONED TO REVIEW THE FOLLOWING REPORTS DESCRIBING SITE CONDITIONS PRIOR TO BIDDING AND IMPLEMENTING THE DEMOLITION PLAN:
   a. ENVIRONMENTAL SITE ASSESSMENT PROVIDED BY THE OWNER,
   b. ASBESTOS BUILDING INSPECTION REPORT PROVIDED BY THE OWNER,
   c. GEOTECHNICAL REPORT PROVIDED BY THE OWNER,
   d. OTHER REPORTS THAT ARE APPLICABLE AND AVAILABLE.
5. CONTRACTOR SHALL CONTACT THE OWNER TO VERIFY WHETHER ADDITIONAL REPORTS OR AMENDMENTS TO THE ABOVE CITED REPORTS HAVE BEEN PREPARED AND TO OBTAIN/REVIEW/AND COMPLY WITH THE RECOMMENDATION OF SUCH STUDIES PRIOR TO STARTING ANY WORK ON THE SITE.
6. CONTRACTOR SHALL COMPLY WITH ALL LOCAL, STATE, AND FEDERAL REGULATIONS REGARDING THE DEMOLITION OF OBJECTS ON THE SITE AND THE DISPOSAL OF THE DEMOLISHED MATERIALS OFF-SITE. IT IS THE CONTRACTOR'S SOLE RESPONSIBILITY TO REVIEW THE SITE, DETERMINE THE APPLICABLE REGULATIONS, RECEIVE THE REQUIRED PERMITS AND AUTHORIZATIONS, AND COMPLY.
7. KH DOES NOT REPRESENT THAT THE REPORTS AND SURVEYS REFERENCED ABOVE ARE ACCURATE, COMPLETE, OR COMPREHENSIVE SHOWING ALL ITEMS THAT WILL NEED TO BE DEMOLISHED OR REMOVED.
8. SURFACE PAVEMENT INDICATED MAY OVERLAY OTHER HIDDEN STRUCTURES, SUCH AS ADDITIONAL LAYERS OF PAVEMENT, FOUNDATIONS OR WALLS, THAT ARE ALSO TO BE REMOVED.

GRADING:

1. THE CONTRACTOR AND GRADING SUBCONTRACTOR SHALL VERIFY THE SUITABILITY OF EXISTING AND PROPOSED SITE CONDITIONS INCLUDING GRADES AND DIMENSIONS BEFORE START OF CONSTRUCTION. THE CIVIL ENGINEER SHALL BE NOTIFIED IMMEDIATELY OF ANY DISCREPANCIES.
2. CONTRACTOR SHALL OBTAIN ANY REQUIRED GRADING PERMITS FROM THE CITY.
3. UNLESS OTHERWISE NOTED, PROPOSED CONTOURS AND SPOT ELEVATIONS SHOWN IN PAVED AREA REFLECT TOP OF PAVEMENT SURFACE. IN LOCATIONS ALONG A CURB LINE, ADD 6-INCHES (OR THE HEIGHT OF THE CURB) TO THE PAVING GRADE FOR TOP OF CURB ELE

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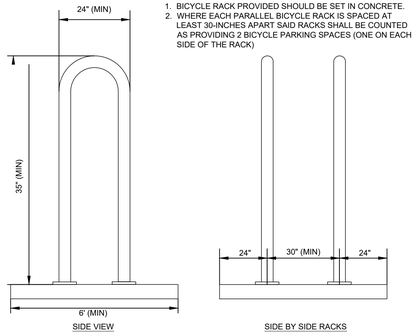
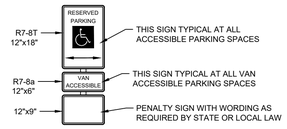
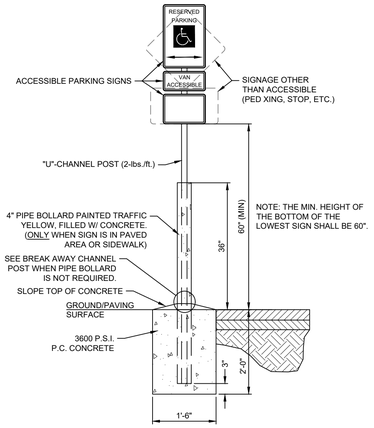
NOTES:

1. BICYCLE RACK PROVIDED SHOULD BE SET IN CONCRETE.
2. WHERE EACH PARALLEL BICYCLE RACK IS SPACED AT LEAST 30-INCHES APART SAID RACKS SHALL BE COUNTED AS PROVIDING 2 BICYCLE PARKING SPACES (ONE ON EACH SIDE OF THE RACK)

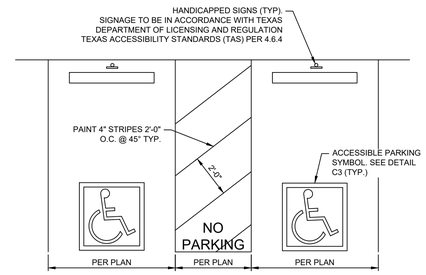


D1 BIKE RACK
N.T.S.





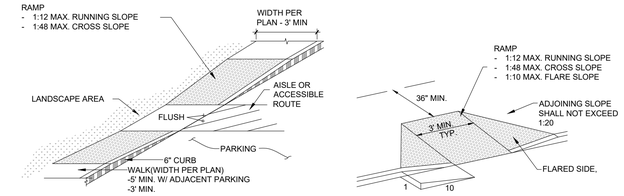
C2 SIGN BASE & ACCESSIBLE PARKING SIGN DETAIL
N.T.S.



NOTES:

1. DIMENSIONS MAY VARY REFER TO DIMENSIONAL CONTROL PLAN
2. SIGNAGE AND MARKINGS TO BE IN ACCORDANCE WITH FEDERAL STATE AND LOCAL REGULATIONS.

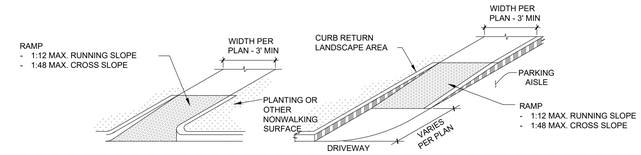
D3 ADA STRIPING
N.T.S.



DETAIL 1
CURB RAMP - SIDEWALK LANDING

DETAIL 2
CURB RAMP - FLARED

CONTRASTING SURFACE



DETAIL 3
TYPICAL RAMP UP CURB OPENING

DETAIL 4
CURB RAMP - RETURNED CURB

TEXAS ACCESSIBILITY STANDARDS (EFFECTIVE 03/15/2012)

405.2 - SLOPE - RAMP RUNS SHALL HAVE A RUNNING SLOPE NOT STEEPER THAN 1:12.

405.3 - CROSS SLOPE - CROSS SLOPE OF RAMPS SHALL NOT BE STEEPER THAN 1:48.

405.5 - CLEAR WIDTH - THE CLEAR WIDTH OF A RAMP RUN AND, WHERE HANDRAILS ARE PROVIDED, THE CLEAR WIDTH BETWEEN HANDRAILS SHALL BE 36-INCHES.

406.2 - COUNTER SLOPE - COUNTER SLOPES OF ADJOINING GUTTERS AND ROAD SURFACES IMMEDIATELY ADJACENT TO THE CURB RAMP SHALL NOT BE STEEPER THAN 1:20.

406.3 - SIDES OF CURB RAMPS - WHERE PROVIDED, CURB RAMP FLARES SHALL NOT BE STEEPER THAN 1:10.

406.4 - LANDINGS - LANDINGS SHALL BE PROVIDED AT THE TOPS OF CURB RAMPS. THE LANDING CLEAR LENGTH SHALL BE 36 INCHES MINIMUM. THE LANDING CLEAR WIDTH SHALL BE AT LEAST AS WIDE AS THE CURB RAMP, EXCLUDING FLARED SIDES, LEADING TO THE RAMP.

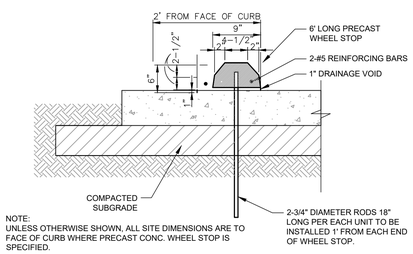
406.5 - LOCATION - CURB RAMPS AND THE FLARED SIDES OF CURB RAMPS SHALL BE LOCATED SO THAT THEY DO NOT PROJECT INTO VEHICULAR TRAFFIC LANES, PARKING SPACES, OR PARKING ACCESS AISLES.

406.6 - DIAGONAL CURB RAMPS - DIAGONAL OR CORNER TYPE CURB RAMPS WITH RETURNED CURBS OR OTHER WELL DEFINED EDGES SHALL HAVE THE EDGES PARALLEL TO THE DIRECTION OF PEDESTRIAN FLOW. THE BOTTOM OF DIAGONAL CURB RAMPS SHALL HAVE A CLEAR SPACE OF 48-INCHES MINIMUM OUTSIDE ACTIVE TRAFFIC LANES OF THE ROADWAY. DIAGONAL CURB RAMPS PROVIDED AT MARKED CROSSINGS SHALL PROVIDE THE 48-INCHES MINIMUM CLEAR SPACE WITHIN THE MARKINGS. DIAGONAL CURB RAMPS WITH FLARED SIDES SHALL HAVE A SEGMENT OF CURB 24-INCHES LONG MINIMUM LOCATED ON EACH SIDE OF THE CURB RAMP AND WITHIN THE MARKED CROSSING.

406.7 - ISLANDS - RAISED ISLANDS IN CROSSINGS SHALL BE CUT THROUGH LEVEL WITH THE STREET OR HAVE CURB RAMPS ON BOTH SIDES. EACH CURB RAMP SHALL HAVE A LEVEL AREA 48-INCHES LONG MINIMUM BY 36-INCHES WIDE MINIMUM AT THE TOP OF THE CURB RAMP IN THE PART OF THE ISLAND INTERSECTED BY THE CROSSINGS.

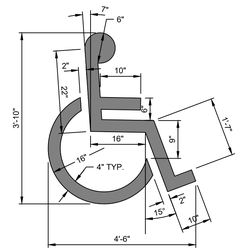
C4 ACCESSIBLE ON-SITE CURB RAMPS
N.T.S.

C



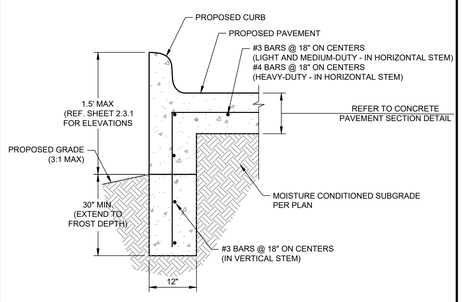
NOTE:
UNLESS OTHERWISE SHOWN, ALL SITE DIMENSIONS ARE TO FACE OF CURB WHERE PRECAST CONC. WHEEL STOP IS SPECIFIED.

C1 CONCRETE WHEEL STOP
N.T.S.

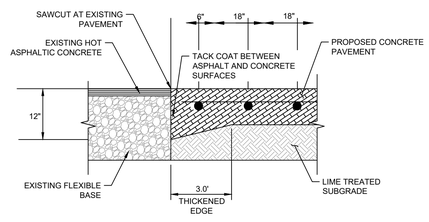


C3 ACCESSIBLE PARKING SYMBOL
N.T.S.

B

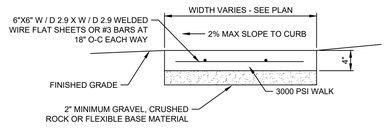


B2 CONCRETE CURB WALL
N.T.S.



B3 CONCRETE/ASPHALT PAVEMENT JUNCTION DETAIL
N.T.S.

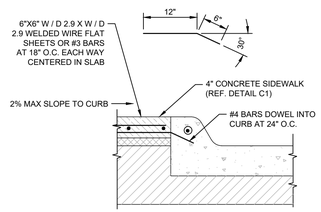
A



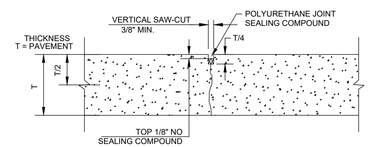
NOTES:

1. PROVIDE 3/8" GROOVED CONTROL JOINTS AT 5' CENTERS.
2. PROVIDE 1/2" EXPANSION JOINTS AT 25', MAXIMUM, SPACING AND FILLED WITH PREMOLDED BITUMINOUS EXPANSION JOINT FILLER MATERIAL OR REDWOOD. EXPANSION JOINTS SHALL HAVE #4 DOWELS, LUBRICATED, 18" LONG, AT 12" CENTERS, 6" FROM EDGE.
3. PROVIDE 1/2" BITUMINOUS EXPANSION JOINT FILLER MATERIAL WHERE WALK ABUTS EXISTING IMPROVEMENTS AND AT ALL CHANGES IN GRADE.
4. REFER TO CITY DETAILS FOR ALL PUBLIC SIDEWALKS.
5. ALL SIDEWALK IS REQUIRED TO BE DOWELED INTO ADJACENT CURB AND ENTRIES. SEE DETAIL A1 ON THIS SHEET.
6. JOINTS SHALL HAVE POURABLE GRADE TWO-PART POLYSULFIDE OR URETHANE SEALANT. PREPARED JOINT SHALL BE WIRE BRUSHED AND AIR BLASTED TO THOROUGHLY CLEAN JOINT BEFORE INSTALLING SEALANT.
7. DUE TO POTENTIAL FOR DIFFERENTIAL SOIL MOVEMENT ADJACENT TO THE BUILDING, THE CONTRACTOR SHALL ADHERE TO GEOTECHINAL REPORT'S RECOMMENDATION FOR SUBGRADE PREPARATION SPECIFIC TO FLATWORK ADJACENT TO THE PROPOSED BUILDING. THE OWNER AND CONTRACTOR ARE ADVISED TO OBTAIN A GEOTECHNICAL ENGINEER RECOMMENDATION SPECIFIC TO FLATWORK ADJACENT TO THE BUILDING, IF NONE IS CURRENTLY EXISTING.

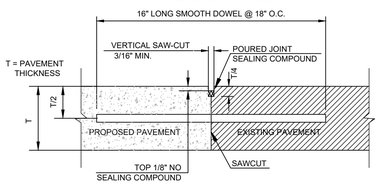
B1 ON-SITE CONCRETE SIDEWALK
N.T.S.



A1 CONCRETE SIDEWALK ABUTTING CURB
N.T.S.



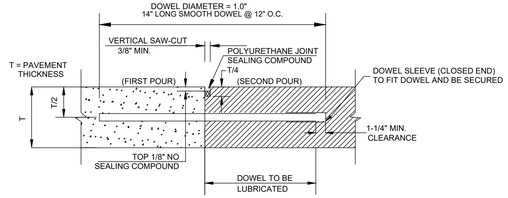
CONTROL JOINT



NOTE:

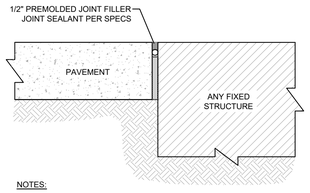
1. DOWEL BARS SHALL BE DRILLED INTO PAVEMENT HORIZONTALLY BY USE OF A MECHANICAL RIG.
2. DRILLING BY HAND IS NOT ACCEPTABLE, PUSHING DOWEL BARS INTO GREEN CONCRETE IS NOT ACCEPTABLE.
3. TO BE USED WHEREVER NEW CONCRETE PAVEMENT IS TO BE PLACED ADJACENT TO EXISTING CONCRETE PAVEMENT.
4. DOWEL DIAMETER = T/8 (IN.)

BUTT JOINT



NOTE:
1. DOWELS SHALL BE SUPPORTED BY AN APPROVED DEVICE.

CONSTRUCTION JOINT



NOTES:

ISOLATION JOINT TO BE USED FOR FIXED STRUCTURES SUCH AS BUILDINGS, RETAINING WALLS/DOCK WALLS, DROP INLETS, MANHOLES, LIGHT POLE BASES AND BOLLARDS.

PAVEMENT IS NOT CONSIDERED A FIXED STRUCTURE.

ISOLATION JOINT

NOTES:

1. ENSURE JOINTS ARE CLEAN AND DRY PRIOR TO THE APPLICATION OF THE JOINT SEALANT.
2. INSTALL CLOSED CELL BACKER ROD AFTER JOINTS HAVE BEEN CLEANED AND DRIED IN ACCORDANCE WITH SEALANT MANUFACTURER'S REQUIREMENTS.
3. INSTALL BACKER TOD AT CONSISTENT AND UNIFORM DEPTH.
4. JOINT SEALANT APPLICATION SHALL BE IN STRICT COMPLIANCE WITH SEALANT MANUFACTURER'S REQUIREMENTS.
5. CONTRACTOR SHALL HAVE A REPRESENTATIVE FROM THE SEALANT MANUFACTURER ONSITE TO INSPECT AND CONFRIM THAT THE SEALANT IS INSTALLED AS PER MANUFACTURER REQUIREMENTS AND SPECIFICATIONS.

A4 CONCRETE JOINT DETAILS
N.T.S.

REVISIONS:

MISCELLANEOUS CONSTRUCTION DETAILS

NEW RESTAURANT FOR:
Bojangles
W. State Hwy 29
Liberty Hill, TX 78642

Kimley»Horn
© 2024 KIMLEY-HORN AND ASSOCIATES, INC.
1251 SADLER EAST DRIVE,
BUILDING 1, STE 100
SAN MARCOS, TX 78666
PHONE: 512-396-4457
WWW.KIMLEY-HORN.COM TBPE FIRM NO. 928

JORDAN P. SCHAEFER
122080
REGISTERED PROFESSIONAL ENGINEER
02/02/2024

Charles William Pope & Associates
ARCHITECTURE, PLANNING, CONSULTING
224 GARDENVIEW, SAN ANTONIO, TX. 78213

DATE: 02/02/2024
JOB NO: 069243600
DRAWN BY: MJG
SHEET NUMBER:
2.5.2
OF

Plotted By:Burns, Dylan January 31, 2024 02:57:47pm K:\SMA_Civil\Bojangles\069243600 - Bojangles (Liberty Hill)\CAD\PlanSheets\C-DETL-069243600.dwg
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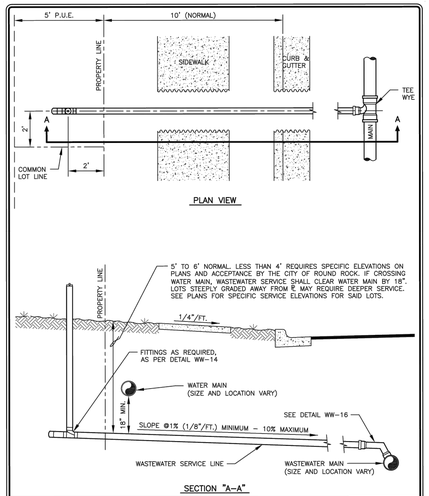
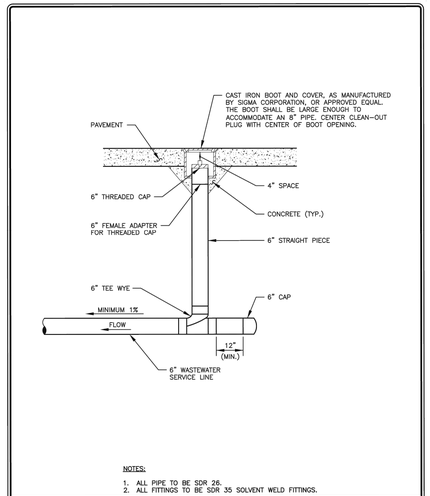
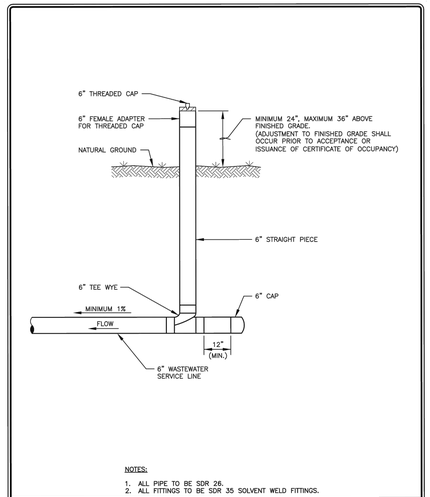


RECORD SIGNED COPY ON FILE AT U&ES DEPARTMENT	CITY OF ROUND ROCK	DRAWING NO: WW-12
APPROVED 03-01-18 DATE	WASTEWATER SERVICE DETAIL	
THE ARCHITECT/ENGINEER ASSUMES RESPONSIBILITY FOR THE APPROPRIATE USE OF THIS DETAIL. (NOT TO SCALE)		



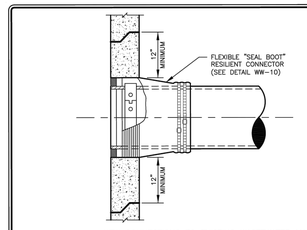
NOTES:
1. ALL PIPE TO BE SDR 26.
2. ALL FITTINGS TO BE SDR 35 SOLVENT WELD FITTINGS.

RECORD SIGNED COPY ON FILE AT U&ES DEPARTMENT	CITY OF ROUND ROCK	DRAWING NO: WW-13
APPROVED 03-01-18 DATE	WASTEWATER SERVICE CLEAN-OUT DETAIL (PAVED SURFACE)	
THE ARCHITECT/ENGINEER ASSUMES RESPONSIBILITY FOR THE APPROPRIATE USE OF THIS DETAIL. (NOT TO SCALE)		



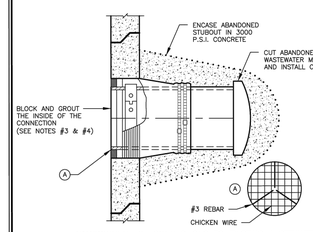
NOTES:
1. ALL PIPE TO BE SDR 26.
2. ALL FITTINGS TO BE SDR 35 SOLVENT WELD FITTINGS.

RECORD SIGNED COPY ON FILE AT U&ES DEPARTMENT	CITY OF ROUND ROCK	DRAWING NO: WW-14
APPROVED 03-01-18 DATE	WASTEWATER SERVICE CLEAN-OUT DETAIL (NON-PAVED SURFACE)	
THE ARCHITECT/ENGINEER ASSUMES RESPONSIBILITY FOR THE APPROPRIATE USE OF THIS DETAIL. (NOT TO SCALE)		



NEW CONNECTIONS TO EXISTING WASTEWATER MANHOLES

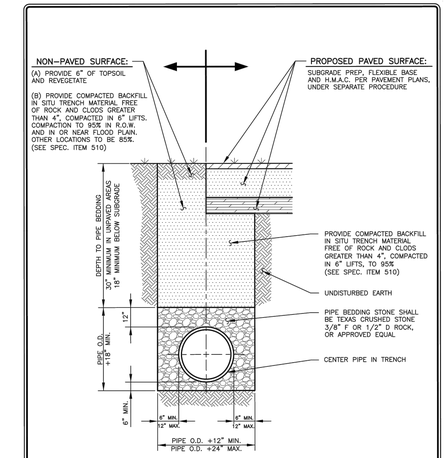
NOTES:
1. EXISTING MANHOLES TO BE VACUUM TESTED PRIOR TO ANY CONNECTIONS.
2. NEW CONNECTIONS TO HAVE MINIMUM VERTICAL AND HORIZONTAL SEPARATION OF 12" ON THE OUTSIDE FACE OF THE MANHOLE FROM ANY EXISTING PENETRATIONS AND/OR MANHOLE JOINTS.
3. CONNECTIONS MADE INTO EXISTING MANHOLES ARE TO BE CORED AND NOT DRILLED/CHISELED.
4. CUT, SHAPE AND SLOPE NEW INVERT CHANNEL IN THE EXISTING CONCRETE BENCH FOR SMOOTH FLOW FROM THE NEW WASTEWATER CONNECTION.
5. EXISTING MANHOLES TO BE RECOATED AFTER ANY NEW WASTEWATER CONNECTION IS ADDED.



NOTES:
1. THIS DETAIL IS INTENDED FOR WASTEWATER MANHOLES THAT WILL REMAIN IN SERVICE. FOR WASTEWATER MANHOLES THAT ARE TO BE ABANDONED, REFERENCE DETAIL WW-15.
2. WASTEWATER MANHOLE TO BE RECOATED AFTER GROUT IS INSTALLED.
3. BLOCK THE INLET OF THE MANHOLE WITH CHICKEN WIRE AND 3–#3 REBAR. GROUT THE INSIDE OF THE MANHOLE FLUSH WITH THE MANHOLE WALL.
4. CONNECTIONS 24" AND LARGER REQUIRE BRICK BLOCKING TO BE INSTALLED PRIOR TO GROUTING.

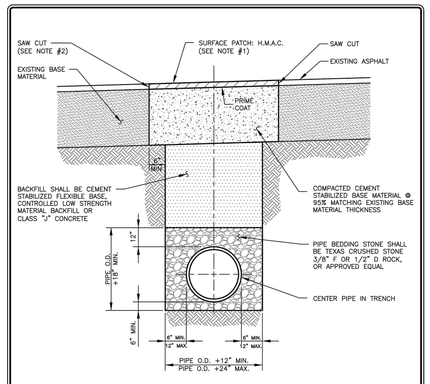
ABANDONMENT OF CONNECTIONS TO EXISTING WASTEWATER MANHOLES

RECORD SIGNED COPY ON FILE AT U&ES DEPARTMENT	CITY OF ROUND ROCK	DRAWING NO: WW-21
APPROVED 03-01-18 DATE	EXISTING WASTEWATER MANHOLE CONNECTION DETAIL	
THE ARCHITECT/ENGINEER ASSUMES RESPONSIBILITY FOR THE APPROPRIATE USE OF THIS DETAIL. (NOT TO SCALE)		



NOTE:
ALL TRENCHING AND TRENCH SAFETY SHALL COMPLY WITH APPLICABLE FEDERAL, STATE AND LOCAL REGULATIONS.

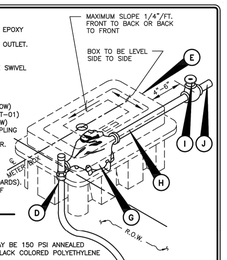
RECORD SIGNED COPY ON FILE AT U&ES DEPARTMENT	CITY OF ROUND ROCK	DRAWING NO: WW-18
APPROVED 03-01-18 DATE	WASTEWATER LINE BEDDING AND SURFACE REPAIR DETAIL (NON-PAVED & PROPOSED PAVED SURFACE)	
THE ARCHITECT/ENGINEER ASSUMES RESPONSIBILITY FOR THE APPROPRIATE USE OF THIS DETAIL. (NOT TO SCALE)		



NOTES:
1. H.M.A.C. THICKNESS SHALL MATCH EXISTING ASPHALT THICKNESS AND NOT LESS THAN 2".
2. THE CONTRACTOR SHALL SAW CUT, REMOVE AND REPLACE EXISTING PAVEMENT AND FLEXIBLE BASE A MINIMUM OF 6" BEYOND EITHER THE EDGE OF THE WATERLINE TRENCH OR THE POINT WHERE EXISTING PAVEMENT IS DAMAGED DUE TO TRENCHING OPERATIONS, WHICHEVER IS GREATER. FINISHED PATCH SHALL BE NEAT AND UNIFORM.
3. INSTALLATION OF BACKFILL, SAW CUTTING AND REMOVAL OF EXISTING PAVEMENT AND SURFACE PATCH SHALL NOT BE PAID FOR SEPARATELY. COSTS FOR THESE ITEMS SHALL BE INCLUDED IN UNIT PRICE BID FOR WATERLINE PIPE.
4. THE CONTRACTOR SHALL PROVIDE STEEL PLATES TO SPAN THE TRENCH AS NECESSARY OR TO ALLOW BACKFILL TO CURE. SUCH PLATES SHALL BE SUITABLE FOR VEHICLE PASSAGE OVER THE TRENCH AND SHALL BE SATISFACTORILY ANCHORED IN PLACE. COSTS FOR THIS ITEM SHALL BE INCLUDED IN UNIT PRICE BID FOR WATERLINE PIPE.
5. ALL TRENCHING AND TRENCH SAFETY SHALL COMPLY WITH APPLICABLE FEDERAL, STATE AND LOCAL REGULATIONS.

RECORD SIGNED COPY ON FILE AT U&ES DEPARTMENT	CITY OF ROUND ROCK	DRAWING NO: WT-07
APPROVED 03-01-18 DATE	WATERLINE BEDDING AND SURFACE REPAIR DETAIL (EXISTING PAVED SURFACE)	
THE ARCHITECT/ENGINEER ASSUMES RESPONSIBILITY FOR THE APPROPRIATE USE OF THIS DETAIL. (NOT TO SCALE)		

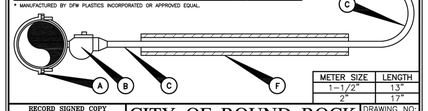
MATERIAL LIST:
A. SERVICE SADDLE REQUIRED. SERVICE SADDLE TO BE EPOXY COATED WITH DUAL STAINLESS STEEL BANDS.
B. 1 1/2" OR 2" CORPORATION STOP – SERVICE PIPE OUTLET. (SEE NOTE #2)
C. 1 1/2" OR 2" SERVICE PIPE.
D. LOCKING ANGLE METER STOP; SERVICE PIPE INLET X SWIVEL COUPLING NUT OUTLET:
- FOR 1 1/2" METERS: 1 1/2" X 1 1/2"
- FOR 2" METERS: 2" X 2"
- SEE NOTE #2
E. PLASTIC RECTANGULAR METER BOX. (SEE TABLE BELOW)
F. PIPE CASING WHERE APPLICABLE. (AS PER DETAIL WT-01)
G. WATER METER, CENTERED IN BOX. (SEE TABLE BELOW)
H. WATER METER COUPLING; MALE I.P.T. X SWIVEL COUPLING NUT:
- LENGTH OF PIPE TO BE DETERMINED BY CONTRACTOR.
- EXTEND PIPE TO 4"–6" OUTSIDE OF METER BOX.
I. BRONZE GATE VALVE: NON–RISING STEM (1 1/2" OR 2") FEMALE I.P.T. (PROPERTY OWNERS CUT–OFF OUTSIDE METER BOX IN SEPARATE VALVE CAN WITH LID AS PER CITY OF ROUND ROCK STANDARDS).
J. BUSHING (IF NECESSARY) AND PIPE MEETING CITY OF ROUND ROCK PLUMBING CODE REQUIREMENTS.



NOTES:
1. SERVICE PIPE SHALL BE COPPER TUBE SIZE. IT MAY BE 150 PSI ANNEALED SEAMLESS TYPE "K" COPPER TUBING OR 200 PSI BLACK COLORED POLYETHYLENE HAVING A DIMENSION RATIO OF 9 (DR9).
2. ALL STAINLESS STEEL INSERTS THAT COME WITH COMPRESSION FITTINGS SHALL NOT BE USED ON ANY CONNECTIONS.
3. SERVICE SADDLES SHALL BE WRAPPED COMPLETELY WITH 8 MIL. POLYETHYLENE FILM.
4. TOP OF BOXES SHALL BE 1" ABOVE FINISHED GRADE.
5. PIPING AND TUBING SHALL BE INSTALLED IN ACCORDANCE WITH SECTION 510.3 OF THE STANDARD SPECIFICATIONS. SPECIAL ATTENTION IS CALLED TO "PIPE BEDDING ENVELOPE" AND "BACKFILLING", SECTIONS 510.3 (14) AND 510.3 (25), RESPECTIVELY.
6. AXIS OF METER ASSEMBLY (LINE THROUGH METER STOP, METER, PIPING AND OWNERS CUTOFF) SHALL BE 10" BELOW TOP OF BOX.
7. SLOTS PROVIDED IN METER BOX TO ACCOMODATE PIPING INTO AND OUT OF BOX, SHALL NOT BE MODIFIED.
8. LOCATION OF METER BOXES SHALL BE SUBJECT TO THE APPROVAL OF THE C.O.R.R.

PART NUMBER	SERIES	COLOR	HEIGHT	WIDTH	LENGTH
DFW65C–14–BOO1*	65C	BLACK	14"	TOP = 18–3/4"	TOP = 30–3/8"
DFW65C–AF1EQA–LID*	65C	BLACK	1–7/8"	LID = 15–1/4"	LID = 26–7/8"
DFW65C–14–AF1EQA*	65C	BLACK	14"	BASE = 15–1/4"	BASE = 30–3/8"

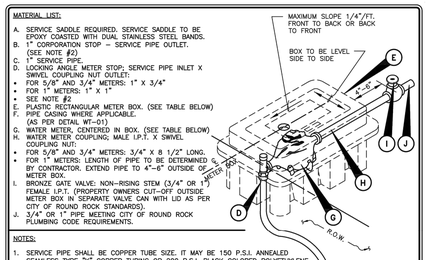
* MANUFACTURED BY DFW PLASTICS INCORPORATED OR APPROVED EQUAL



METER SIZE	LENGTH
1–1/2"	13"
2"	17"

RECORD SIGNED COPY ON FILE AT U&ES DEPARTMENT	CITY OF ROUND ROCK	DRAWING NO: WT–03
APPROVED 03-01-18 DATE	SINGLE 1–1/2" OR 2" WATER METER DETAIL	
THE ARCHITECT/ENGINEER ASSUMES RESPONSIBILITY FOR THE APPROPRIATE USE OF THIS DETAIL. (NOT TO SCALE)		

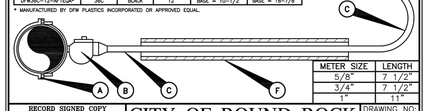
MATERIAL LIST:
A. SERVICE SADDLE REQUIRED. SERVICE SADDLE TO BE EPOXY COASTED WITH DUAL STAINLESS STEEL BANDS.
B. 1" CORPORATION STOP – SERVICE PIPE OUTLET. (SEE NOTE #2)
C. 1" SERVICE PIPE.
D. LOCKING ANGLE METER STOP; SERVICE PIPE INLET X SWIVEL COUPLING NUT OUTLET:
- FOR 5/8" AND 3/4" METERS: 1" X 3/4"
- FOR 1" METERS: 1" X 1"
- SEE NOTE #2
E. PLASTIC RECTANGULAR METER BOX. (SEE TABLE BELOW)
F. PIPE CASING WHERE APPLICABLE. (AS PER DETAIL WT–01)
G. WATER METER, CENTERED IN BOX. (SEE TABLE BELOW)
H. WATER METER COUPLING; MALE I.P.T. X SWIVEL COUPLING NUT:
- FOR 5/8" AND 3/4" METERS: 3/4" X 8 1/2" LONG.
- FOR 1" METERS: LENGTH OF PIPE TO BE DETERMINED BY CONTRACTOR. EXTEND PIPE TO 4"–6" OUTSIDE OF METER BOX.
I. BRONZE GATE VALVE: NON–RISING STEM (3/4" OR 1") FEMALE I.P.T. (PROPERTY OWNERS CUT–OFF OUTSIDE METER BOX IN SEPARATE VALVE CAN WITH LID AS PER CITY OF ROUND ROCK STANDARDS).
J. 3/4" OR 1" PIPE MEETING CITY OF ROUND ROCK PLUMBING CODE REQUIREMENTS.



NOTES:
1. SERVICE PIPE SHALL BE COPPER TUBE SIZE. IT MAY BE 150 P.S.I. ANNEALED SEAMLESS TYPE "K" COPPER TUBING OR 200 P.S.I. BLACK COLORED POLYETHYLENE HAVING A DIMENSION RATIO OF 9 (DR9).
2. ALL STAINLESS STEEL INSERTS THAT COME WITH COMPRESSION FITTINGS SHALL NOT BE USED ON ANY CONNECTIONS.
3. SERVICE SADDLES SHALL BE WRAPPED COMPLETELY WITH 8 MIL. POLYETHYLENE FILM.
4. TOP OF BOXES SHALL BE 1" ABOVE FINISHED GRADE.
5. PIPING AND TUBING SHALL BE INSTALLED IN ACCORDANCE WITH SECTION 510.3 OF THE STANDARD SPECIFICATIONS. SPECIAL ATTENTION IS CALLED TO "PIPE BEDDING ENVELOPE" AND "BACKFILLING", SECTIONS 510.3 (14) AND 510.3 (25), RESPECTIVELY.
6. AXIS OF METER ASSEMBLY (LINE THROUGH METER STOP, METER, PIPING AND OWNERS CUTOFF) SHALL BE 10" BELOW TOP OF BOX.
7. SLOTS PROVIDED IN METER BOX TO ACCOMMODATE PIPING INTO AND OUT OF BOX, SHALL NOT BE MODIFIED.
8. LOCATION OF METER BOXES SHALL BE SUBJECT TO THE APPROVAL OF THE C.O.R.R.

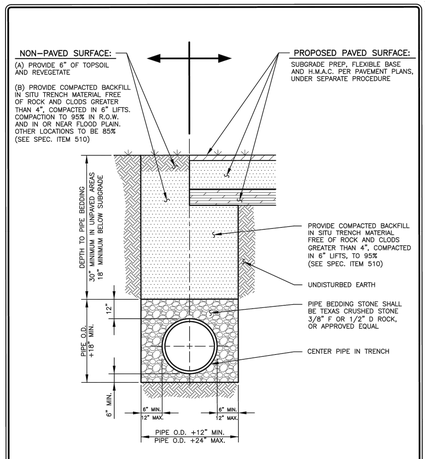
PART NUMBER	SERIES	COLOR	HEIGHT	WIDTH	LENGTH
DFW36C–12–BOO1*	36C	BLACK	12"	TOP = 13–3/4"	TOP = 18–7/8"
DFW36C–AF1EQA–LID*	36C	BLACK	1–7/8"	LID = 10–3/16"	LID = 15–9/16"
DFW36C–12–AF1EQA*	36C	BLACK	12"	BASE = 10–1/2"	BASE = 18–7/8"

* MANUFACTURED BY DFW PLASTICS INCORPORATED OR APPROVED EQUAL



METER SIZE	LENGTH
5/8"	7 1/2"
3/4"	7 1/2"
1"	11"

RECORD SIGNED COPY ON FILE AT U&ES DEPARTMENT	CITY OF ROUND ROCK	DRAWING NO: WT–02
APPROVED 03-01-18 DATE	SINGLE 5/8", 3/4" OR 1" WATER METER DETAIL	
THE ARCHITECT/ENGINEER ASSUMES RESPONSIBILITY FOR THE APPROPRIATE USE OF THIS DETAIL. (NOT TO SCALE)		



NOTE:
1. ALL TRENCHING AND TRENCH SAFETY SHALL COMPLY WITH APPLICABLE FEDERAL, STATE AND LOCAL REGULATIONS.

RECORD SIGNED COPY ON FILE AT U&ES DEPARTMENT	CITY OF ROUND ROCK	DRAWING NO: WT–08
APPROVED 03-01-18 DATE	WATERLINE BEDDING AND SURFACE REPAIR DETAIL (NON-PAVED & PROPOSED PAVED SURFACE)	
THE ARCHITECT/ENGINEER ASSUMES RESPONSIBILITY FOR THE APPROPRIATE USE OF THIS DETAIL. (NOT TO SCALE)		

REVISIONS:

UTILITY DETAILS

NEW RESTAURANT FOR: Bojangles W. State Hwy 29 Liberty Hill, TX 78642

Kimley»Horn
© 2024 KIMLEY-HORN AND ASSOCIATES, INC.
1251 SADLER EAST DRIVE, SUITE 100
SAN MARCOS, TX 78666
PHONE: 512-565-4457
WWW.KIMLEY-HORN.COM TBPE FIRM NO. 928

JORDAN P. SCHAEFER 122080 REGISTERED PROFESSIONAL ENGINEER 02/01/2024

Charles William Pope & Associates
ARCHITECTURE, PLANNING CONSULTING
224 GARDENVIEW, SAN ANTONIO, TX. 78213

DATE: 02/02/2024
JOB NO: 069243600
DRAWN BY: MJG
SHEET NUMBER:
2.5.3
OF

Plotted By:Burn, Dylan January 31, 2024 02:57:52pm K:\SMA_Civ\Bojangles\069243600 – Bojangles (Liberty Hill)\CAD\PlanSheets\C-DETL-069243600.dwg
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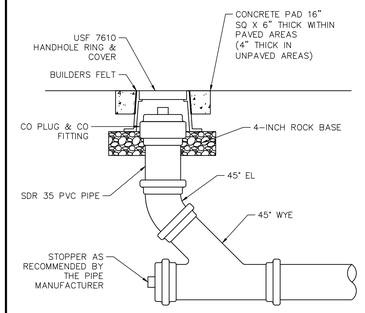
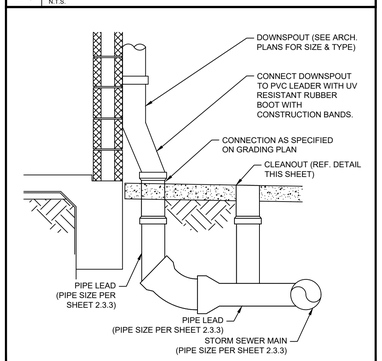
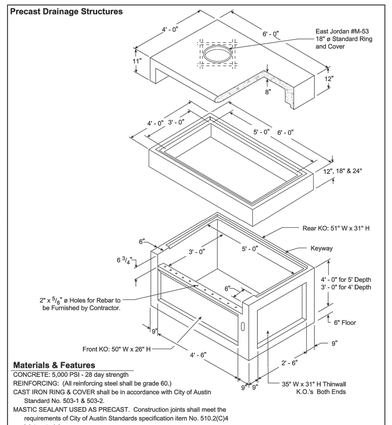


B6 TYP. CLEANOUT DETAIL
N.T.S.



A6 TYP. DOWNSPOUT CONNECTION DETAIL
N.T.S.

Precast Drainage Structures



Materials & Features

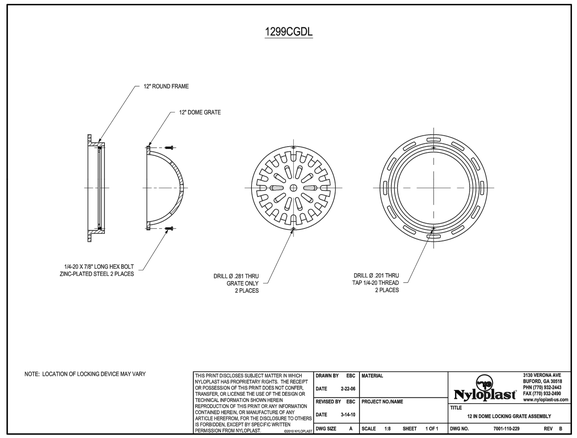
CONCRETE: 5,000 PSI - 28 day strength
REINFORCING: (All reinforcing steel shall be grade 60.)
CAST IRON RING & COVER shall be in accordance with City of Austin Standard No. 503-1 & 503-2.
MASTIC SEALANT USED AS PRECAST. Construction joints shall meet the requirements of City of Austin Standards specification item No. 510.2(C)4 joint material.
BOLT-TOGETHER UNITS for 15' inlets to be connected with 8" x 18" x 3/8" plates. 1/2" expansion anchors (4 per plate.)
Rebar for connection to paving shall be provided & installed by the contractor. 5/8" holes 2" deep will be provided by manufacturer.
The inlet as designed exceed the requirements of ASTM C478.
RISERS AVAILABLE: 12", 18" & 24".

-No Scale-
All dimensions subject to allowable specification tolerances.

TITLE	PLANT	STATE	SECTION/PAGE	DATE
5' Curb Inlet City of Austin	Waco	TX	10.b.1	Feb 2016

FORTERRA

OR APPROVED EQUAL



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DRAWN BY	ESC	MATERIAL	
DATE	2-22-06		
REVISED BY	ESC	PROJECT NO./NAME	
DATE	3-14-18		
DWG SIZE	A	SCALE 1:8	SHEET 1 OF 1

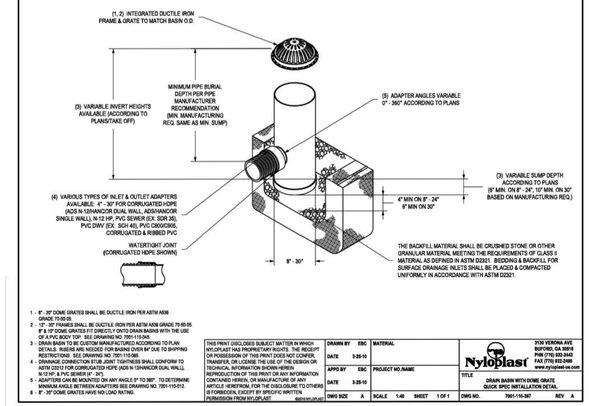
Nyloplast 3130 VERONA AVE. BUFORD, GA 30518 PHN (770) 932-2443 FAX (770) 932-2490 www.nyloplast-us.com

TITLE 12 IN DOME LOCKING GRATE ASSEMBLY

DWG NO. 7001-110-229 REV B

OR APPROVED EQUAL

NYLOPLAST DRAIN BASIN WITH DOME GRATE



1 - 8" - 30" DOME GRATES SHALL BE DUCTILE IRON PER ASTM A536 GRADE 70-50-05.
2 - 12" - 30" FRAMES SHALL BE DUCTILE IRON PER ASTM A536 GRADE 70-50-05. 8" & 10" DOME GRATES FIT DIRECTLY ONTO DRAIN BASINS WITH THE USE OF A PVC BODY TOP. SEE DRAWING NO. 7001-115-045.
3 - DRAIN BASIN BODY AND BOTTOM SECTION TO BE ACCORDING TO PLAN DETAILS. INSTALL PER MANUFACTURER'S INSTRUCTIONS FOR BASINS OF THIS SIZE TO SHIPPING RESTRICTIONS. SEE DRAWING NO. 7001-115-045.
4 - DRAINAGE CONNECTION STUB JOINT TIGHTNESS SHALL CONFORM TO ASTM D3212 FOR CORRUGATED HDPE (ADS N-12/HANCOR DUAL WALL), N-12 HP, & PVC SEWER (8" - 24").
5 - ADAPTERS CAN BE MOUNTED ON ANY ANGLE 0° TO 360°. TO DETERMINE MINIMUM ANGLE BETWEEN ADAPTERS SEE DRAWING NO. 7001-115-012.
6 - 8" - 30" DOME GRATES HAVE NO LOAD RATING.

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DRAWN BY	ESC	MATERIAL	
DATE	3-09-10		
APPD BY	ESC	PROJECT NO./NAME	
DATE	3-26-10		
DWG SIZE	A	SCALE 1:48	SHEET 1 OF 1

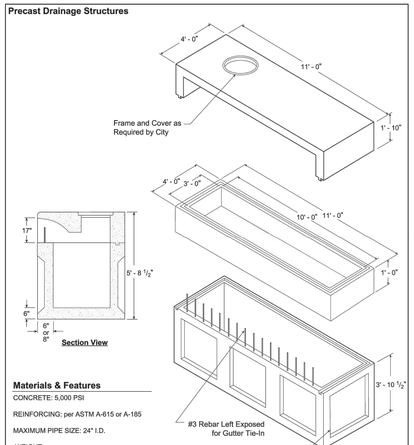
Nyloplast 3130 VERONA AVE. BUFORD, GA 30518 PHN (770) 932-2443 FAX (770) 932-2490 www.nyloplast-us.com

TITLE DRAIN BASIN WITH DOME GRATE QUICK SPEC INSTALLATION DETAIL

DWG NO. 7001-110-307 REV A

OR APPROVED EQUAL

Precast Drainage Structures



Materials & Features

CONCRETE: 5,000 PSI
REINFORCING: per ASTM A-615 or A-185
MAXIMUM PIPE SIZE: 24" I.D.
WEIGHT:

BASE	10,300 Lbs.
EXTENSION	2,100 Lbs.
TOP	5,000 Lbs.
	17,400 Lbs. Total

Note:
1.) *10' Curb Inlet Top not available from Houston Plant.

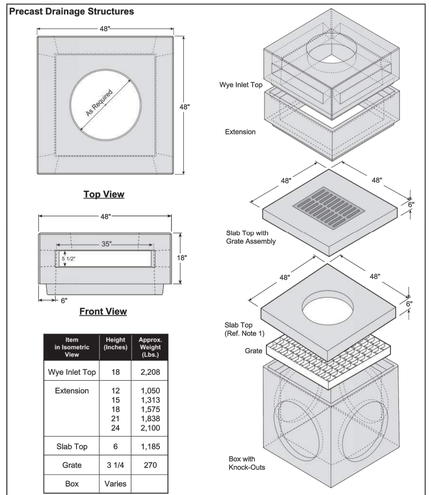
-No Scale-
All dimensions subject to allowable specification tolerances.

TITLE	PLANT	STATE	SECTION/PAGE	DATE
10' Curb Inlet - Dallas / Fort Worth	Grand Prairie Houston*	TX	10.a.5	Feb 2016

FORTERRA

OR APPROVED EQUAL

Precast Drainage Structures



Item in Isometric View	Height (Inches)	Approx. Weight (Lbs.)
Wye Inlet Top	18	2,208
Extension	12	1,050
	15	1,313
	18	1,575
	21	1,838
	24	2,100
Slab Top	6	1,185
Grate	3 1/4	270
Box	Varies	

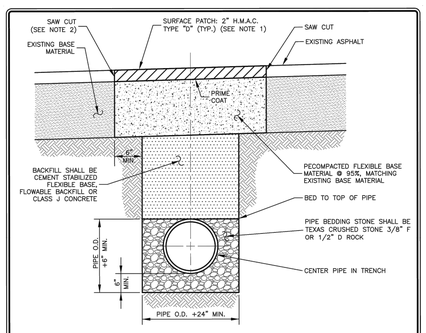
Note:
1.) Customer to specify opening size or cast iron ring and cover.

-No Scale-
All dimensions subject to allowable specification tolerances.

TITLE	PLANT	STATE	SECTION/PAGE	DATE
Top Options for 3' x 3' Precast Box	Grand Prairie Houston	TX	9.1	Feb 2016

FORTERRA

OR APPROVED EQUAL



NOTES:

1. H.M.A.C. SHOWN IN THIS DETAIL IS SEPARATE FROM ANY ADDITIONAL THICKNESS CREATED BY ANY OVERLAY ITEM IN CONTRACT.
2. THE CONTRACTOR SHALL SAW CUT, REMOVE AND REPLACE EXISTING PAVEMENT AND FLEXIBLE BASE A MINIMUM OF 6" BEYOND EITHER THE EDGE OF THE STORM SEWER TRENCH OR THE POINT WHERE EXISTING PAVEMENT IS DAMAGED DUE TO TRENCHING OPERATIONS, WHICHEVER IS GREATER.
3. INSTALLATION OF BACKFILL, SAW CUTTING AND REMOVAL OF EXISTING PAVEMENT AND SURFACE PATCH, SHALL NOT BE PAID FOR SEPARATELY. COSTS FOR THESE ITEMS SHALL BE INCLUDED IN UNIT PRICE BIDS FOR STORM SEWER PIPE.
4. THE CONTRACTOR SHALL PROVIDE STEEL PLATES TO SPAN THE TRENCH AS NECESSARY OR TO ALLOW BACKFILL TO CURE. SUCH PLATES SHALL BE SUITABLE FOR VEHICLE PASSAGE OVER THE TRENCH AND SHALL BE SATISFACTORILY ANCHORED IN PLACE. COSTS FOR THIS ITEM SHALL BE INCLUDED IN UNIT PRICE BIDS FOR STORM SEWER PIPE.
5. ALL TRENCHING AND TRENCH SAFETY SHALL COMPLY WITH APPLICABLE FEDERAL, STATE AND LOCAL REGULATIONS.

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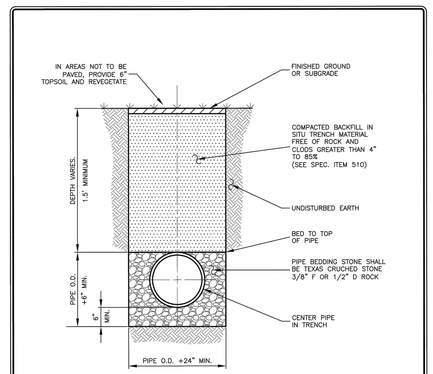
APPROVED 04-01-10
DATE
THE ARCHITECT/ENGINEER ASSUMES RESPONSIBILITY FOR THE APPROPRIATE USE OF THIS DETAIL. (NOT TO SCALE)

CITY OF ROUND ROCK
STORM SEWER LINE BEDDING DETAIL (EXISTING PAVED SURFACE)

DRAWING NO: DR-01

ROUND ROCK, TEXAS STORM SEWER MANAGER



NOTE:

ALL TRENCHING AND TRENCH SAFETY SHALL COMPLY WITH APPLICABLE FEDERAL, STATE AND LOCAL REGULATIONS.

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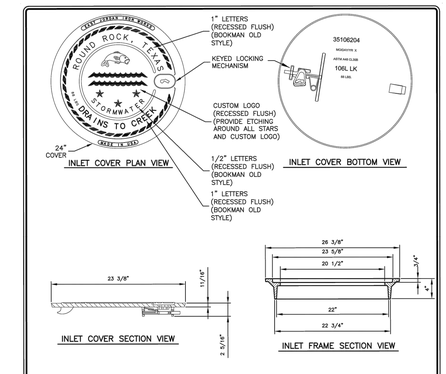
APPROVED 04-01-10
DATE
THE ARCHITECT/ENGINEER ASSUMES RESPONSIBILITY FOR THE APPROPRIATE USE OF THIS DETAIL. (NOT TO SCALE)

CITY OF ROUND ROCK
STORM SEWER LINE BEDDING DETAIL (NON-PAVED SURFACE)

DRAWING NO: DR-02

ROUND ROCK, TEXAS STORM SEWER MANAGER



NOTES:

1. COVER AND FRAME SHALL COMPLY WITH STANDARD SPECIFICATIONS FOR DRAINAGE, SEWER, UTILITY AND RELATED CASTINGS: AASHTO DESIGNATION M306-04.
2. INLET COVER SHALL BE MODEL NUMBER: 106L LK (PRODUCT NUMBER: 35106204), AS MANUFACTURED BY EAST JORDAN IRON WORKS, INCORPORATED, OR APPROVED EQUAL.
3. INLET FRAME SHALL BE MODEL NUMBER: 106L LK (PRODUCT NUMBER: 35206004), AS MANUFACTURED BY EAST JORDAN IRON WORKS, INCORPORATED, OR APPROVED EQUAL.
4. INLET COVER AND FRAME ASSEMBLY, IF ORDERED AS A SET, SHALL BE MODEL NUMBER: 106L-4L LK (PRODUCT NUMBER: 35506204), AS MANUFACTURED BY EAST JORDAN IRON WORKS, INCORPORATED, OR APPROVED EQUAL.
5. THE COVER AND FRAME SHALL HAVE 1/4" MINIMUM AND 1/8" MAXIMUM RADIUS.
6. INLET COVER SHALL BE DUCTILE IRON. HIGHT SHALL BE CAST ON BOTH TOP AND BOTTOM OF COVER.
7. FILLETS SHALL BE 1/4" RADIUS UNLESS OTHERWISE SPECIFIED.
8. MANUFACTURER SHALL REMOVE EXCESS IRON AND MACHINE FINISH SEATING SURFACES TO NOTED DIMENSIONS.
9. INLET COVER SHALL BE DIPPED IN A WATER-BASED ASPHALTIC COATING, PRIOR TO SHIPMENT FROM FOUNDRY.

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APPROVED 04-01-10
DATE
THE ARCHITECT/ENGINEER ASSUMES RESPONSIBILITY FOR THE APPROPRIATE USE OF THIS DETAIL. (NOT TO SCALE)

CITY OF ROUND ROCK
STORM SEWER INLET COVER AND FRAME DETAIL

DRAWING NO: DR-07

ROUND ROCK, TEXAS STORM SEWER MANAGER

REVISIONS:

STORM DETAILS

NEW RESTAURANT FOR: Bojangles W. State Hwy 29 Liberty Hill, TX 78642

Kimley»Horn
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1251 SADLER EAST DRIVE, SUITE 100
SAN MARCOS, TX 78666
PHONE: 512-595-4457
WWW.KIMLEY-HORN.COM TBPE FIRM NO. 928

JORDAN P. SCHAEFER 122080 REGISTERED PROFESSIONAL ENGINEER 02/02/2024

Charles William Pope & Associates
ARCHITECTURE PLANNING CONSULTING
224 GARDENVIEW, SAN ANTONIO, TX. 78213

DATE: 02/02/2024
JOB NO: 069243600
DRAWN BY: MJG
SHEET NUMBER: 2.5.4
OF

Plotted By:Burn, Dylan - January 31, 2024 02:58:07pm - K:\SMA_Civil\Bojangles\069243600 - Bojangles (Liberty Hill)\CAD\PlanSheets\C-DETL-069243600.dwg
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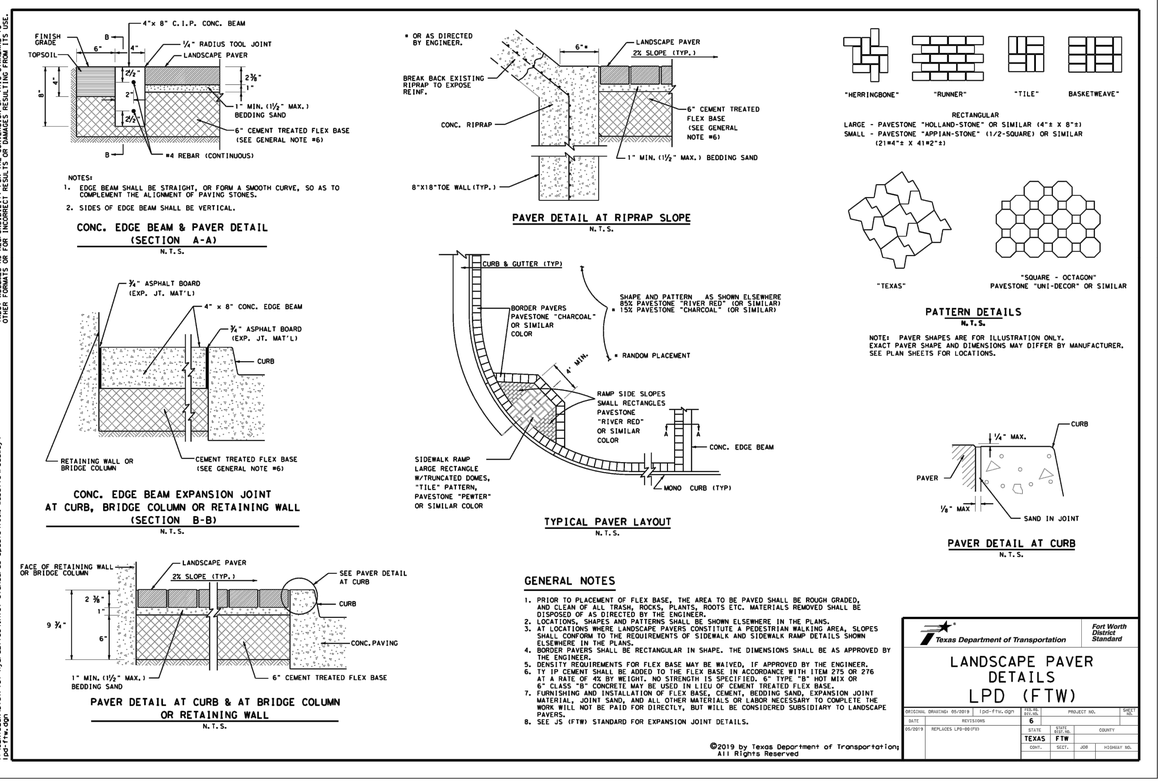

GENERAL NOTES

1. PRIOR TO PLACEMENT OF FLEX BASE, THE AREA TO BE PAVED SHALL BE ROUGH GRADED, AND CLEAN OF ALL TRASH, ROCKS, PLANTS, ROOTS ETC. MATERIALS REMOVED SHALL BE DISPOSED OF AS DIRECTED BY THE ENGINEER.
2. LOCATIONS, SHAPES AND PATTERNS SHALL BE SHOWN ELSEWHERE IN THE PLANS.
3. AT LOCATIONS WHERE LANDSCAPE PAVERS CONSTITUTE A PEDESTRIAN WALKING AREA, SLOPES SHALL CONFORM TO THE REQUIREMENTS OF SIDEWALK AND SIDEWALK RAMP DETAILS SHOWN ELSEWHERE IN THE PLANS.
4. BORDER PAVERS SHALL BE RECTANGULAR IN SHAPE. THE DIMENSIONS SHALL BE AS APPROVED BY THE ENGINEER.
5. DENSITY REQUIREMENTS FOR FLEX BASE MAY BE WAIVED, IF APPROVED BY THE ENGINEER.
6. TY IP CEMENT SHALL BE ADDED TO THE FLEX BASE IN ACCORDANCE WITH ITEM 275 OR 276 AT A RATE OF 4% BY WEIGHT. NO STRENGTH IS SPECIFIED. 6" TYPE "B" HOT MIX OR 6" CLASS "B" CONCRETE MAY BE USED IN LIEU OF CEMENT TREATED FLEX BASE.
7. FURNISHING AND INSTALLATION OF FLEX BASE, CEMENT, BEDDING SAND, EXPANSION JOINT MATERIAL, JOINT SAND, AND ALL OTHER MATERIALS OR LABOR NECESSARY TO COMPLETE THE WORK WILL NOT BE PAID FOR DIRECTLY, BUT WILL BE CONSIDERED SUBSIDIARY TO LANDSCAPE PAVERS.
8. SEE JS (FTW) STANDARD FOR EXPANSION JOINT DETAILS.

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Texas Department of Transportation — Fort Worth District Standard

LANDSCAPE PAVER DETAILS
LPD (FTW)

ORIGINAL DRAWING: 05/2019	ldd-FTW.dgn	JOB NO.	PROJECT NO.	SHEET NO.
DATE	REVISIONS	6		
05/2019	REPLACES LPD-99(FD)	STATE	STATE REG. NO.	COUNTY
		TEXAS	FTW	
		DIST.	SECT.	JOB

DGN: D:\TOP/Temp.dgn.51019.tmp.dgn/ftw/specinfo/standards/ldd.dgn
9/2/2019 11:10:08 AM
TxDOT Version 8.05 Build 1.0.0.0
ldd-ftw.dgn

OR APPROVED EQUAL

REVISIONS:

PAVER DETAILS

NEW RESTAURANT FOR:
Bojangles
W. State Hwy 29
Liberty Hill, TX 78642

Kimley»Horn
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1251 SADLER EAST DRIVE,
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STATE OF TEXAS
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REGISTERED PROFESSIONAL ENGINEER
02/02/2024

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DRAWN BY: MJG
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OF

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Inspection, Maintenance, Repair and Retrofit Plan

The following sections address inspection and maintenance taken from the TNRCC Manual, "Complying with Edward Aquifer Rules: Technical Guidance on Best Management Practices."

Silt Fence:

1. Inspection shall be made weekly and after each rainfall event, in accordance with Section 1.4.3 of RG-348.

2. Tom fabric shall be replaced or a second line of fencing parallel to the tom section shall be implemented as needed.

3. Accumulated silt shall be removed when it reaches a depth of six (6) inches. The silt shall be disposed of on an approved site and in such a manner that will not contribute to additional siltation.

4. Silt fence shall be removed when the site is completely stabilized so as not to block or impede storm flow or drainage.

Inlet Protection:

1. Daily inspection shall be made by the Contractor and silt accumulation must be removed when depth reaches 50 mm (two (2) inches).

2. Contractor shall monitor the performance of inlet protection during each rainfall event and immediately remove the inlet protections if the stormwater begins to overtop the curb.

3. Inlet protections shall be removed as soon as the source of sediment is stabilized.

Stabilized Construction Entrance:

1. The entrance shall be maintained in a condition that will prevent tracking or flowing of sediment onto public roadway. This may require periodic top dressing with additional stone as conditions demand. As well as repair and clean out of any measure device used to trap sediment. All sediments that are spilled, dropped, washed or tracked onto public roadway must be removed immediately.

2. Entrance shall be properly graded to prevent run-off from leaving the construction site.

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Concrete Washout Area:

1. Routine inspection in accordance with Section 1.4.18 of RG-348 of the area to ensure that sufficient quantity and volume remain to contain all liquid and concrete waste generated by washout operations.

2. Plastic lining material should be a minimum of 10 mil in polyethylene sheeting and should be free of holes, tears, or other defects that compromise the impermeability of the material.

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

Rock Berm

1. Inspection should be made weekly and after each rainfall in accordance to Section 1.4.5 of RG-348. If placed in streambeds, inspection should occur on a daily basis.
2. Accumulated silt shall be removed when it reaches a depth of six (6) inches. The silt shall be disposed of on an approved site and in such a manner that will not contribute to additional siltation.
3. Loose wire sheathing shall be repaired immediately when necessary and the berm shall be reshaped as needed during inspection.
4. Berm shall be replaced if the structure ceases to function as initially intended due to factors such as silt accumulation, washout, construction traffic damage, etc.
5. When all upstream areas are stabilized and the accumulated silt has been removed, the rock berm should be removed and disposed of.

Responsible Party(s) for Maintenance:

BoATX, LLC.

Contact Person(s): David Higgins
Mailing Address: 12012 Wickchester, Suite 680
City, State: Houston, TX Zip: 77079
Telephone: (713) 530-2203 Fax: --------

Signature of Responsible Party: DocuSigned by: David Higgins 9B7359067575487...

MEASURES FOR MINIMIZING SURFACE STREAM CONTAMINATION

During construction, best management practices include the use of silt fence, rock berm and inlet protection to capture sediment from the construction area contained within the storm water runoff. Silt fence will be installed along the downstream portion of the property and inlet protection will be installed around all existing and proposed inlet structures (once constructed).

After construction, all disturbed areas on the site will be re-vegetated and runoff from the proposed improvements will be captured by the proposed inlets and conveyed to BMP's. The appropriate TSS calculations are shown on the project narrative, attachment C.

Kimley»Horn

SECTION 4:
STORM WATER POLLUTION PREVENTION PLAN

STORM WATER POLLUTION PREVENTION PLAN (SWP3)

Bojangles (Liberty Hill)

13003 W SH 29
Liberty Hill, Tx. 78642

January 2024

Project Owner:

David Higgins
BoATX, LLC
12012 Wickchester
Suite 680
Houston, TX 77079
Tel. (713) 530-2203
Email: David.higgins@Bojangles.com

Project Contractor:

Prepared By:

Kimley»Horn

1251 Sadler Drive, Building K, Suite 3200
San Marcos, TX 78666
(512) 566-4457
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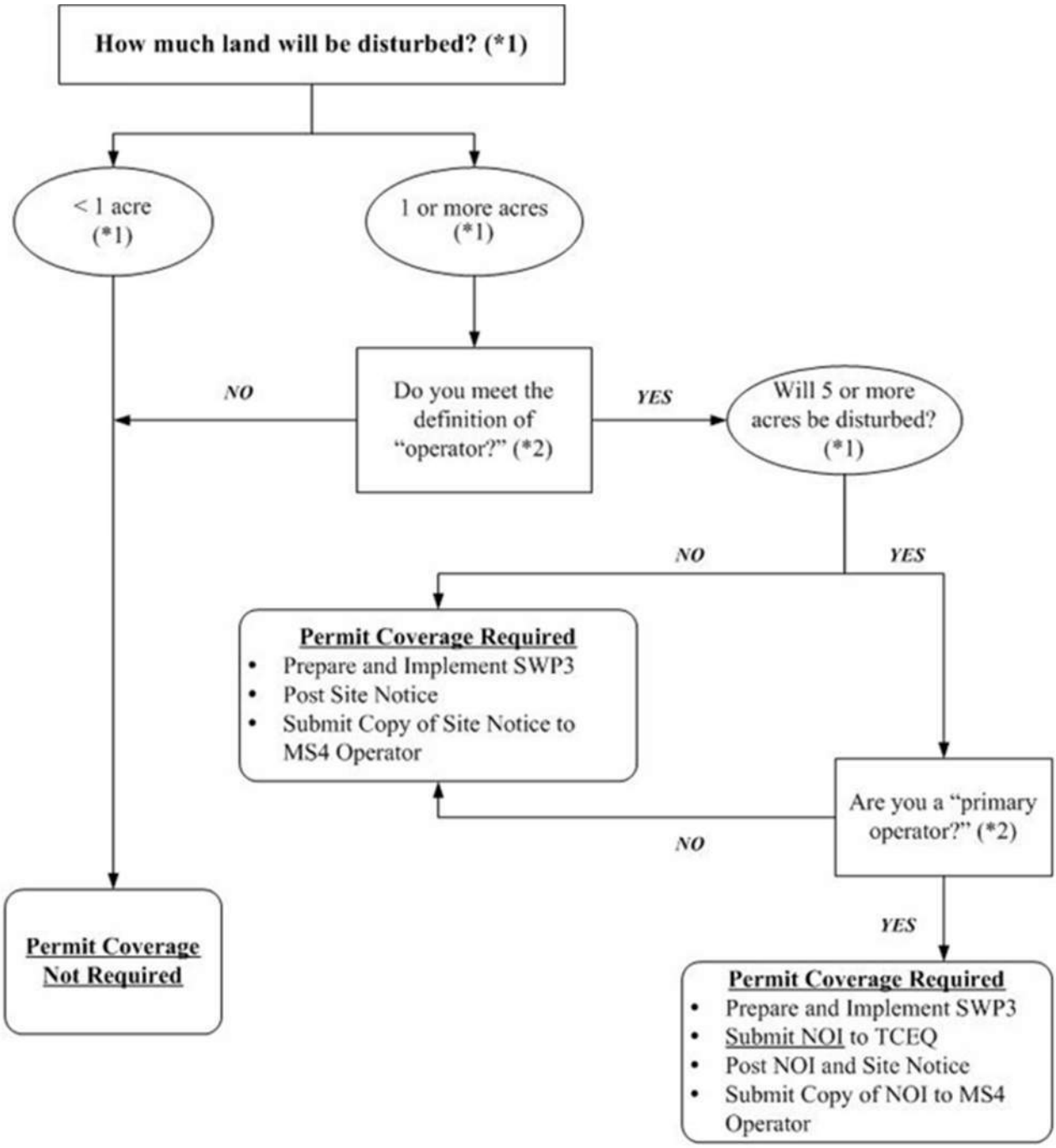


(*1) To determine the size of the construction project, use the size of the entire area to be disturbed, and include the size of the larger common plan of development or sale, if the project is part of a larger project (refer to Part I.B., "Definitions," for an explanation of "larger common plan of development or sale").

(*2) Refer to the definitions for "operator," "primary operator," and "secondary operator" in Part I., Section B. of this permit.

STORM WATER POLLUTION PREVENTION PLAN REVISIONS

Provide a general description and document the date of any revisions to the storm water pollution prevention plan during the course of this construction project. Revisions may be necessary as a result of site inspections or because of a change in the circumstances of the construction project (such as schedule change or a modification in design).

The Storm Water Pollution Prevention Plan (SWP3) must be modified based on the results of inspections, as necessary, to better control pollutants in runoff. Revisions to the SWP3 must be completed within seven (7) calendar days following the inspection. If existing best management practices (BMPs) are modified or if additional BMPs are necessary, an implementation schedule must be described in the SWP3 and wherever possible those changes implemented before the next storm event. If implementation before the next anticipated storm event is impracticable, these changes must be implemented as soon as practicable.

REVISION (Refer to attachments if necessary)	DATE	SIGNATURE

1.0 INTRODUCTION

On March 10, 2003, responsibility for the administration of storm water protection associated with construction activities in Texas was delegated by the U.S. Environmental Protection Agency (EPA) to the Texas Commission on Environmental Quality (TCEQ). The Texas Pollutant Discharge Elimination System (TPDES) program in Texas meets or exceeds the National Pollutant Discharge Elimination System (NPDES) standards established on a federal level. This SWP3 has been developed in accordance with the TPDES requirements. Additional local requirements may apply and this SWP3 should be updated accordingly (Appendix O).

The purpose of the SWP3 is to provide guidelines for preventing or minimizing sediment and other pollutants that may originate on the site from flowing into municipal storm systems or jurisdictional waters during the construction period. This plan also addresses the principal activities known to disturb significant amounts of ground surface during construction. Stabilization measures must begin within fourteen (14) days of stoppage of construction activities (Appendix I). The permit coverage requirements terminate when areas disturbed for this project reach full stabilization (i.e., when disturbed areas are paved or achieve 70 percent native background vegetative coverage). Revisions to this plan will be made as necessary to accurately reflect project activities and storm water pollution prevention measures.

The storm water management controls included in this SWP3 focus on providing control of pollutant discharges with practical approaches that use readily available techniques, expertise, materials, and equipment. The necessary forms for implementing the SWP3 are found in the appendices of this document, including the Inspector's Qualifications, Inspection Form, Notice of Intent (NOI), Notice of Termination (NOT), and construction site notice. The SWP3 must be implemented prior to the start of construction activities.

The Project Owner's and the Contractor's roles and responsibilities for implementation and maintenance of the elements of the SWP3 are shown in a checklist in Appendix F of this document. Appendix F also includes a description of primary and secondary operators, along with associated responsibilities. The Project Owner and each Contractor must complete the checklist in Appendix F and sign the included certification statement. The certification statement indicates that each operator understands and accepts their roles and responsibilities with respect to storm water pollution prevention for this project.

A. Project Name and Location

Bojangles (Liberty Hil)
Liberty Hill, Williamson County, Texas,
(See Appendix A for a project location map).

B. Owner Information

Name: BoATX, LLC
Address: 12012 Wickchester
Suite 680
Houston, TX 77079

Representative: David Higgins
12012 Wickchester, Suite 680
Houston, TX 77079
Tel. (713) 530-2203
david.higgins@Bojangles.com
Fax: _____

C. Contractor Information

Name:
Address:

Representative:
Title:
Telephone:
Fax: _____

D. Subcontractor Information

Name: _____
Address: _____
_____
Representative: _____
Title: _____
Telephone: _____
Fax: _____

Name: _____
Address: _____
_____
Representative: _____
Title: _____
Telephone: _____
Fax: _____

E. Discharges Eligible for Authorization

The general permit for construction activities allows for storm water discharges from construction activities, construction support activities, and authorized non-storm water discharges. Under the general permit, construction support activities include, but are not limited to:

- concrete and asphalt batch plants,
- rock crushers,
- equipment staging areas,
- material storage yards,
- material borrow areas, and
- excavated material disposal areas.

Storm water discharges from these construction support activities are authorized under the general permit for construction activities provided:

- the activity is located within one mile of the permitted construction site and is directly supporting the construction activities,
- the SWP3 for the permitted construction activities is developed to include the controls and measures to reduce erosion and discharge of pollutants in storm water runoff from the construction support activities, and

- the construction support activities either do not operate beyond the completion date of the construction activity or, at the time that they do, are authorized under separate Texas Pollutant Discharge Elimination System (TPDES) authorization.

The following non-storm water discharges are also authorized under the general permit for construction activities:

- Discharges from firefighting activities,
- Uncontaminated fire hydrant flushings,
- Water from routine external washing of vehicles, the external portion of buildings or structures, and pavement (where detergents and soaps are not used),
- Uncontaminated water used to control dust,
- Potable water sources, including waterline flushings,
- Uncontaminated air conditioning condensate,
- Uncontaminated groundwater or spring water, and
- Lawn watering and similar Irrigation drainage.

Part II.A.3 of the general permit contains additional information and requirements for non-storm water discharges. Discharges of storm water runoff from concrete batch plants may be authorized provided that the benchmark sampling and associated requirements located in Part V of the general permit are met. The wash out of concrete trucks associated with off-site facilities may be conducted in accordance with the requirements of Part V of the general permit. The Operator will be responsible for updating the SWP3 to meet Part V requirements, if applicable. A non-storm water discharge inventory is located in Appendix L.

F. Obtaining Coverage under the General Permit

Construction activities, including the activities associated with this project, disturbing five (5) acres or more (definition of a large construction activity) are required to comply with the following requirements of the general permit to obtain permit coverage:

a) Develop a SWP3 according to the provisions of the general permit that covers either the entire site or all portions of the site for which the applicant is the operator and implement that plan prior to commencing construction activities.

b) Primary operators must submit a NOI:

   1) at least seven days prior to commencing construction activities if mailing a paper NOI, or

   2) prior to commencing construction activities if utilizing electronic submittal.

   A copy of the NOI form is located in Appendix H. Instructions for NOI submittal relating to primary operator additions or changes are also located in Appendix H.

c) Post a site notice where it is safely and readily available for viewing by the general public, local, state, and federal authorities prior to commencing construction. The site notice must be maintained until completion of the construction activity.

   1) For linear construction activities, the site notice must be placed in a publicly accessible location near where construction is actively underway. A copy of the construction site notice is located in Appendix H.

d) All primary operators must also post a copy of the signed NOI at the construction site in a location where it is readily available for viewing by the general public, local, state, and federal authorities prior to starting construction activities until completion of the construction activity. If multiple crews will be conducting construction activities under the general permit simultaneously, copies of the signed NOI should be posted at each separate construction site.

e) All primary operators must provide a copy of the signed NOI at least seven days prior to commencement of construction activities to any secondary operator and to the operator of any municipal separate storm sewer system (MS4) receiving construction site discharge. The names and addresses of all MS4 operators receiving a copy of the NOI are to be recorded in this SWP3 (Appendix H).

f) Secondary operators are regulated under the general construction permit but are not required to submit a NOI provided that:

   1) a primary operator(s) at the site has submitted a NOI, or

   2) another operator(s) is required to submit a NOI and the secondary operator has provided notification to the operator(s) of the need to obtain coverage.

   Additional information for secondary operators seeking alternative coverage is located in the general permit.

Questions about the TPDES construction permit program can be directed to the TCEQ Storm Water and General Permits Team at (512) 239-4515. A copy of the TPDES General Permit (TXR150000) for Storm Water Discharges from Construction Activities has been included in Appendix G for reference.

G. Notice of Change Letter

If the Operator becomes aware that he/she failed to submit any relevant facts, or submitted incorrect information in a NOI, the correct information must be provided to the TCEQ in a Notice of Change (NOC) letter within fourteen (14) days after discovery. In addition, if relevant information provided in the NOI changes, a NOC letter must be submitted to the TCEQ within fourteen (14) days of the change. A copy of the NOC must be provided to the operator of any MS4 receiving discharge from the construction activity. The names and addresses of all MS4 operators receiving a copy of the NOC must be included in this SWP3 (Appendix H).

H. Notice of Termination

Authorization under the general permit must be terminated by submitting a completed and signed NOT form provided in Appendix H. The NOT must be submitted to the TCEQ, and a copy of the NOT must be provided to the operator of any municipal separate storm sewer system (MS4) receiving the discharge within thirty (30) days after final stabilization has been achieved on all portions of the site that are the responsibility of the permittee, or another permitted contractor has assumed control over all areas of the site that have not been finally stabilized. The names and addresses of all MS4 operators receiving a copy of the NOT must be recorded in this SWP3 (Appendix H).

I. Termination of Coverage for Secondary Operators

Each operator that obtained authorization of the general permit without submitting a NOI must remove the site notice and complete the applicable portion of the notice related to removal of the notice. A copy of

the completed notice must be submitted to the operator of any MS4 receiving site discharge within 30 days of any the following conditions:

a) final stabilization has been achieved on all portions of the site that are the responsibility of the permittee,

b) a transfer of operational control has occurred, or

c) the operator has obtained alternative authorization under an individual TPDES permit or alternative TPDES general permit.

J. SWP3 Availability

This SWP3 must be retained on-site at the construction site, or if the site is inactive or does not have an on-site location to store the plan, a notice must be posted describing the location of the SWP3. This SWP3 must be made readily available at the time of an on-site inspection.

K. Hazardous Materials

The following potential pollutant sources may be present at the site due to the nature of the construction activities. An inventory of materials is located in Appendix L. Controls for potential pollutants are listed and described in Appendices C and D.

- Solvents
- Stains/paints
- Fuels
- Oils
- Grease
- Pesticides
- Fertilizer
- Sediment/total suspended solids
- Trash
- Paving
- Concrete curing compound
- Glue adhesives
- Joint compound
- Concrete, painting, and brick wash
- Excavation pump-out water
- Concrete

2.0 SITE DESCRIPTION

A. General Site Description

Construction of a standalone approximately 3,170 square foot Bojangles restaurant with 45 parking spaces, a drive-thru, and associated drive lanes within the ±1.58-acre parcel. The parcel is currently undeveloped and is known as Lot 3A, Block 1 of Heritage Ridge Replat in Liberty Hill, Williamson County, Texas. The property is zoned to allow the intended use.
This site is located over the Edwards Aquifer Contributing Zone. Per FEMA flood insurance rate map 48491C0245F, map revised 12/20/2019, the project area is not located within a 100-year flood plain.
According to the National Wetland Inventory Mapper reviewed on 6/12/2020.
there are no federally regulated wetlands present on this site.
The existing zoning is C3 – General Commercial/Retail and P – Public/Community Facility for the portion of school property.

B. Nature of Construction Activity

The project consists of the Construction of a standalone Bojangles restaurant with a drive-thru within the ±1.58-acre parcel located at 13003 W Texas 29 in Liberty Hill, Texas. The adjacent water, wastewater, and storm sewer mains are adequate in size to serve the proposed use and no offsite extensions or improvements will be required. No design or study of
offsite improvements to water, wastewater, roadways, traffic signals, or any other utility or improvement is known currently and is therefore excluded.

Access improvements are limited to driveway connections only, and reconstruction of adjacent roadways will not be required. Deceleration/Acceleration or modifications to existing medians for left-turn lanes will not be required.

TxDOT permits (ROW and UIR) will not be required. The access improvements for the
The development will be limited to private connections to shared access drives and the utility connections are expected to be made outside of TxDOT ROW.

Earthwork is anticipated to include clearing and grubbing, excavations, and engineered fill placement. The following sections provide recommendations for use in the preparation of specifications for the work. Recommendations include critical quality criteria, as necessary, to render the site in the state considered in our geotechnical engineering evaluation for construction of foundations, floor slabs, pavements, and general site improvements. Trees are located within or near the footprint of the proposed buildings, which will require removal at the onset of construction.

C. Estimate of Total Site Area and Disturbed Area

The total impervious cover is 1.12. acres of the total 1.58 acres (~70.9%) for Lot 3A. Coordinates for the site are approximately 30.662220, -97.900394 (30° 39' 44", -97° 54' 1") (1983 North American Datum (NAD83) Coordinates).

D. Storm Water Discharge Locations and Quality Data

The site development is not anticipated to impact United States Army Corps of Engineers jurisdictional areas, other Environmentally Sensitive Areas, or any published FEMA floodplain

area. Detention of the site's runoff is not anticipated to be required. The subject site is assumed to be a part of the overall master drainage plan for platted subdivision.
The subject property is located within the Edwards Aquifer Recharge Zone. A Contributing Zone Plan (CZP) will be required to be filed and approved with TCEQ. However, KH assumes that the water quality requirements for the site have been met with the improvements made as part of the overall development and is submitting a CZP Modification plan to TCEQ to show compliance to the original CZP.

Landscape and irrigation plans to be provided by others for the project.

The project is located in the San Gabriel Watershed which is located within portions of the Edwards Plateau and Texas Blackland Prairie land resources areas. Only 2.59% of the watershed is considered "urban" land and approximately 89% of the acreage in the watershed is classified as brushy/open rangeland or is utilized for agriculture.

Temporary erosion and sedimentation controls will be used during construction and will be located as shown on the plans. These erosion and sedimentation controls include silt fences, inlet protection, temporary staging area, concrete washout area, and stabilized construction entrances. Permanent erosion controls will include revegetation using perennial grasses as indicated on the Erosion Control Plan and Erosion Control Detail Sheets.

E. Information on Soil Types

We identified the following model layers within the subsurface profile. Layer 1 consists of 1 is named High Plasticity Soils and is made up of Dark brown fat clays (CH) to lean clays (CL) to clayey sands (SC). Layer 2 is named Low Plasticity Soils and made up of Brown to light brown clayey sands (SC). Layer 3 is named Limestone and made up of Brown to light brown to gray to light gray weathered limestone to limestone (Glen Rose Limestone).

Groundwater seepage was not encountered within the maximum drilling depth at the time of the field exploration.

The site appears suitable for the proposed construction based upon geotechnical conditions encountered in the test borings, provided that the recommendations provided in this report are implemented in the design and construction phases of this project.
The subsurface materials generally consisted of a thin layer of moderate to high plasticity clay soils overlying coarse-grained soils overlying weathered and intact limestone bedrock. Groundwater was not encountered within the maximum depths of exploration during and at the completion of drilling.
The near surface, very stiff to hard low plasticity lean clays and high plasticity fat clays could become problematic with typical earthwork and construction traffic, especially after precipitation events. The effective drainage should be completed early in the construction sequence and maintained after construction to avoid potential issues. Additional site preparation recommendations, including subgrade improvement and fill placement, are provided in the Earthwork section.

A soils map showing the project site and surrounding area is included in Appendix A. The soils in the project area, in order of highest percent of acreage to lowest, are Eckrant cobbly clay, 1 to 8 percent slopes (EaD), 7/6 acres in AOI and 71.2% o AOI.

F. Threatened and Endangered Species

Discharges that would adversely affect a listed endangered or threatened aquatic or aquatic-dependent species or its critical habitat are not authorized by the general construction permit, unless the requirements of the Endangered Species Act are satisfied. This project does not appear to contain suitable habitat for listed species in Travis County, Texas. It is unlikely that the project has the potential to adversely affect a listed endangered or threatened species in Travis County, Texas. If information regarding the presence of protected species changes the Operator should consult with the appropriate state or federal agency.

G. Discharges to the Edwards Aquifer Recharge Zone

Discharges cannot be authorized by the general permit where prohibited by 30 Texas Administrative Code (TAC) Chapter 213.

1. New Discharges
   For new discharges located within the Edwards Aquifer Recharge Zone, or within that area upstream from the recharge zone and defined as the Contributing Zone, operators must meet all applicable requirements of, and operate according to, 30 TAC Chapter 213 (Edwards Aquifer Rule) in addition to the provisions and requirements of the general construction permit. A copy of 30 TAC Chapter 213 is located in Appendix Q.

2. Existing Discharges
   For existing discharges, the requirements of the agency-approved Water Pollution Abatement under the Edwards Aquifer Rules are in addition to the requirements of the general construction permit. Best management practices and maintenance schedules for structural storm water controls, for example, may be required as a provision of the rule. All applicable requirements of the Edwards Aquifer Rule for reductions of suspended solids in storm water runoff are in addition to the requirements in the general construction permit. A copy of the 30 TAC Chapter 213 is located in Appendix Q.

For discharges from large construction activities located on the Edwards Aquifer recharge zone or the Edwards Aquifer contributing zone, applicants must also submit a copy of the NOI to the appropriate TCEQ regional office. For discharges from large construction activities by operators not required to submit a NOI, a copy of the construction site notice must be submitted to the appropriate TCEQ regional office.

For discharges from small construction activities located on the Edwards Aquifer recharge zone or the Edwards Aquifer contributing zone, a copy of the construction site notice must be submitted to the appropriate TCEQ regional office.

Counties:	**Contact:**
Comal, Bexar, Medina, Uvalde, and Kinney	TCEQ Water Program Manager San Antonio Regional Office 14250 Judson Road San Antonio, Texas (210) 490-3096
Williamson, Travis, and Hays	TCEQ Water Program Manager Austin Regional Office 2800 South IH 35, Suite 100 Austin, Texas 78704-5712 (512) 339-2929

3.0 BEST MANAGEMENT PRACTICE MEASURES AND CONTROLS

In order to manage and reduce soil erosion, sediment loss, construction-generated waste, and construction-related toxic materials, BMPs must be utilized at the construction site. A variety of structural controls, soil stabilization techniques, storm water management controls, dust controls, waste disposal techniques, and "good housekeeping" practices that will be utilized in this construction project are documented in a checklist in Appendix C.

A detailed set of fact sheets for BMPs excerpted from the *Integrated Storm Water Design Manual for Construction* (North Central Texas Council of Governments, 2010) is located in Appendix D. These fact sheets show many examples of BMPs that may be appropriate for the site. If another BMP is being used, include the BMP information in Appendix D. The Contractor is responsible for selecting, implementing, and maintaining BMPs.

A. General Requirements

1. Erosion and sediment controls must be designed to retain sediment on-site to the extent practicable with consideration for local topography, soil type, and rainfall.

2. Control measures must be properly selected, installed, and maintained according to the manufacturer's or designer's specifications.

3. Controls must be developed to minimize the offsite transport of litter, construction debris, and construction materials.

B. Erosion Control and Stabilization Practices

1. Erosion control and stabilization practices may include but are not limited to: establishment of temporary or permanent vegetation, mulching, geotextiles, sod stabilization, vegetative buffer strips, protection of existing trees and vegetation, slope texturing, temporary velocity dissipation devices, flow diversion mechanisms, and other similar measures.

2. Control measures must be properly selected, installed, and maintained according to the manufacturer's or designer's specifications.

   a) the dates when major grading activities occur,

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

   c) the dates when stabilization measures are initiated.

   A schedule of construction activities is located in Appendix B. Appendix I contains a record of temporary/permanent ceasing of construction activities.

3. Erosion control and stabilization measures must be initiated as soon as practicable in portions of the site where construction activities have temporarily ceased. Stabilization measures that provide a protective cover must be initiated as soon as practicable in portions of the site where construction activities have permanently ceased. These measures must be initiated no more than 14 days after the construction activity in that portion of the site has temporarily or permanently ceased unless provided for in Part III.F.2.b.iii of the general permit

C. Sediment Control Practices

1. Sites with Drainage Areas of Ten or More Acres

   a) A sedimentation basin is required, where feasible, for a common drainage location that serves an area with ten (10) or more acres disturbed at one time. Sedimentation basin information is located in Appendix N.

   b) At a minimum, silt fences, vegetative buffer strips, or equivalent sediment controls are required for all down slope boundaries of the construction area, and for those side slope boundaries deemed appropriate as dictated by individual site conditions.

2. Sites with Drainage Areas Less than Ten Acres

   a) Sediment traps and sediment basins may be used to control solids in storm water runoff for drainage locations serving less than ten (10) acres. At a minimum, silt fences, vegetative buffer strips, or equivalent sediment controls are required for all down slope boundaries of the construction area, and for those side slope boundaries deemed appropriate as dictated by individual site conditions.

   b) Alternatively, a sediment basin may be utilized. Sedimentation basin information is located in Appendix N.

3. A description of any measures that will be installed during the construction process to control pollutants in storm water discharges that may occur after construction operations have been completed must be included in the SWP3. Permittees are only responsible for the installation and maintenance of storm water management measures prior to final stabilization of the site or prior to submission of an NOT.

4. Other required controls and BMPs are listed below. Best management practice checklists and fact sheets are included in Appendices C and D. A non storm water discharge inventory is located in Appendix L.

   a) Permittees shall minimize, to the extent practicable, the off-site vehicle tracking of sediments and the generation of dust. Permittees must include a description of controls utilized to accomplish this requirement.

   b) Permittees must include a description of construction and waste materials expected to be stored on-site and a description of controls to minimize pollutants from these materials.

   c) Permittees must include a description of potential pollutant sources from areas other than construction (such as storm water discharges from dedicated asphalt plants and dedicated concrete batch plants), and a description of controls and measures that will be implemented at those sites to minimize pollutant discharges.

   d) Permittees shall place velocity dissipation devices at discharge locations and along the length of any outfall channel (i.e., runoff conveyance) to provide a non-erosive flow velocity from the structure to a water course, so that the natural physical and biological characteristics and functions are maintained and protected.

   e) Permittees shall design and utilize appropriate controls to minimize the offsite transport of suspended sediments and other pollutants if it is necessary to pump or channel standing water from the site.

   f) Permittees shall ensure that all other required controls and BMPs comply with all the requirements of Part III.G of the TXR150000 general permit.

D. Erosion and Sediment Control Requirements

Any discharge regulated under the TXR150000 general permit must achieve, at a minimum, the following effluent limitations representing the degree of effluent reduction attainable by application of the best practicable control technology current available (BPT).

a) Erosion and sediment control: The permittee must design, install, and maintain effective erosion controls and sediment controls to minimize the discharge of pollutants. Such controls must be designed, installed and maintained to meet minimum requirements outlined in section III.G.1. of the general permit, provided in Appendix G.

b) Soil stabilization: Stabilization of disturbed areas must, at a minimum, be initiated immediately whenever any clearing, grading, excavating, or other earth disturbing activities have permanently creased on any portion of the site, or temporarily ceased on any portion of the site and will not resume for a period exceeding 14 calendar days. Temporary stabilization must be completed within 14 days after initiation of soil stabilization measures, and final stabilization must be achieved prior to termination of permit coverage.

c) Dewatering: Discharge from dewatering activities, including discharges from dewatering of trenches and excavations, are prohibited, unless managed by appropriate controls. Examples of appropriate controls are outlined below in Section 4.0 of this SWP3 document.

d) Pollution prevention measures: The permittee must design, install, implement, and maintain effective pollution prevention measures to minimize the discharge of pollutants. Such controls must be designed, installed, implemented, and maintained to meet requirements outlined in section III.G.4. of the general permit, provided in Appendix G.

e) Prohibited discharges: Certain discharges are not prohibited under the TXR150000 general permit. These prohibited discharges are outlined in section III.G.5. of the general permit, provided in Appendix G.

f) Surface outlets: When discharging from basins and impoundments, the permittee must utilize outlet structures that withdraw water from the surface, unless infeasible.

4.0 EXAMPLE PRACTICES

A. Example Stabilization Practices

1. Temporary Stabilization

   Top soil stock piles and disturbed portions of the site where construction activity temporarily ceases for at least 21 days will be stabilized with temporary seed and mulch no later than 14 days from the last construction activity in that area. Areas of the site which are to be paved will be temporarily stabilized until pavement can be applied.

2. Permanent Stabilization

   Disturbed portions of the site where construction activities permanently cease shall be stabilized with permanent seed no later than 14 days after the last construction activity.

B. Example Structural Practices

1. Interceptor Swale

   An interceptor swale is a small v-shaped or parabolic channel which collects runoff and directs it to a desired location. It can either have a natural grass lining or, depending upon slope and design velocity, a protective lining of erosion matting, stone or concrete. The interceptor swale can either be used to direct sediment-laden flow from disturbed areas into a controlled outlet or to direct “clean” runoff around disturbed areas. Since the swale is easy to install during early grading operations, it can serve as the first line of defense in reducing runoff across disturbed areas. As a method of reducing runoff across the disturbed construction area, it reduces the requirements of structural measures to capture sediment from runoff since the flow is reduced. By intercepting sediment-laden flow downstream of the disturbed area, runoff can be directed into a sediment basin or other BMP for sedimentation as opposed to long runs of silt fence, straw bales or other filtration method.

2. Silt Fence

   A silt fence consists of geotextile fabric supported by poultry netting or other backing stretched between either wooden or metal posts with the lower edge of the fabric securely embedded in the soil. The fence is typically located downstream of disturbed areas to intercept runoff in the form of sheet flow. Silt fence provides both filtration and time for sedimentation to reduce sediment and the velocity of the runoff. Properly designed silt fence is economical since it can be relocated during construction and reused on other projects. Silt fence is normally used as perimeter control located downstream of disturbed areas. It is only feasible for non-concentrated, sheet flow conditions.

3. Fiber Roll/Sediment Log

   Fiber rolls/sediment logs are tightly compacted tubular cylinders composed of straw, flax, coconut fiber, or other similar types of material wrapped with a fiber mesh. They must be secured with stakes. When installed at the base of an embankment or on a slope, fiber rolls are effective at controlling sediment and reducing erosion rates. They achieve this by intercepting storm water runoff, thereby reducing the velocity of the flow and dispersing concentrated runoff as sheet flows. Fiber rolls are also water-permeable and are effective at trapping eroded sediment. It is important not to crush fiber

rolls when they are installed. If more than one sock is placed in a row, the socks should be overlapped; not abutted.

4. Inlet Control

   Inlet protection consists of a variety of methods of intercepting sediment at low point inlets through the use of stone, filter fabric and other materials. This is normally located at the inlet, providing either detention or filtration to reduce sediment and floatable materials in storm water. Inlet protection is normally used as a secondary defense in site erosion control due to the limited effectiveness and applicability of the technique. It is normally used in new developments that include new inlets or roads with new curb inlets or during major repairs to existing roadways. Inlet protection has limited use in developed areas due to the potential for loading, traffic safety and pedestrian safety and maintenance problems. Inlet protection can reduce sediment in a storm sewer system by serving as a back system to onsite controls or by reducing sediment loads from controls with limited effectiveness such as straw bale dikes.

5. Check Dams

   Check dams are small barriers consisting of straw bales, rock, or earth berms placed across a drainage swale or ditch. They reduce the velocity of small concentrated flows, provide a limited barrier for sediment and help disperse concentrated flows, reducing potential erosion. Check dams are used for long drainage swales or ditches in which permanent vegetation may not be established and erosive velocities are present. They are typically used in conjunction with other techniques such as inlet protection, rip rap or other sediment reduction techniques. Check dams provide limited treatment. They are more useful in reducing flow to acceptable levels.

6. Erosion Control Mats

   An erosion control mat (ECM) is a geomembrane or biodegradable fabric placed over disturbed areas to limit the effects of erosion due to rainfall and runoff across barren soil. Erosion control mats are manufactured by a wide variety of vendors addressing a wide variety of conditions such as vegetation establishment and high velocity flow. Types of matting include organic (jute, straw) and synthetic (plastic and glass fiber) materials. Mats can provide both temporary and/or permanent stabilization for disturbed soil or barren areas. It is used for difficult areas to stabilize such as steep slopes, temporary or permanent drainage swales, embankments or high traffic (pedestrian) areas. Some mats are reusable, reducing the initial cost of the installation.

7. Stabilized Construction Entrance

   A stabilized construction entrance consists of a pad consisting of gravel, crushed stone, recycled concrete or other rock like material on top of geotextile filter cloth to facilitate the wash down and removal of sediment and other debris from construction equipment prior to exiting the construction site. For added effectiveness, a wash rack area can be incorporated into the design to further reduce sediment tracking. For long term projects, cattle guards or other type of permanent rack system can be used in conjunction with a wash rack. This directly addresses the problem of silt and mud deposition in roadways used for construction site access. Stabilized construction entrances are used primarily for sites in which significant truck traffic occurs on a daily basis. It reduces the need to remove sediment from streets. If used properly, it also directs the majority of traffic to a single

location, reducing the number and quantity of disturbed areas on the site and providing protection for other structural controls through traffic control.

8. Earth Dike

   An earth dike is constructed along the uphill perimeter of a site. A portion of the dike will divert run-on around the construction site. The remaining portion of the dike will collect runoff from the disturbed area and direct the runoff to the sediment basin.

9. Triangular Sediment Filter Dike

   A triangular sediment filter dike is a self-contained silt fence consisting of filter fabric wrapped around welded wire fabric shaped into a triangular cross section. While similar in use to a silt fence, the dike is reusable, sturdier, transportable, and can be used on paved areas in situations where it is impractical to install embedded posts for support. Triangular filter dikes are used in place of silt fence, treating sediment flow at the perimeter of construction areas and at the perimeter of the site. Also, the dikes can serve as stream protection devices by preventing sediment from entering the streams or as check dams in small swales. Triangular sediment filter dikes are especially useful for construction areas surrounded by pavement, where silt fence or hay bale installation is impracticable. Since they can be anchored without penetration (through the use of rock), pavement damage can be minimized. Triangular dikes are used to provide perimeter control by detaining sediment on a disturbed site with drainage that would otherwise flow onto adjacent properties. Triangular dikes also serve as sediment trapping devices when used in areas of sheet flow across disturbed areas or are placed along stream banks to prevent sediment-laden sheet flow from entering the stream. The dikes can be subjected to more concentrated flows and a higher flow rate than silt fence.

10. Sediment Basin

    Sediment basins are required, where feasible, for sites with drainage areas of ten (10) or more acres. Additional information for sedimentation basins is located in Appendix N.

11. Tree Protection

    Tree protection prevents the disturbance of existing trees and their roots on a construction site. Trees are not the same shape below ground as they are above, so it is difficult to predict the length or location of their roots. One common method used to identify the critical root zone is to define the tree's "drip line" – the area directly below the branches of the tree. Many roots extend beyond the longest branches a distance equal to two or more times the height of the tree. For this reason, it is recommended to protect as much of the area beyond the drip line as feasible. An example of tree protection is to tie continuous nylon string with two-foot tundra weight orange streamers to eight-foot minimum metal t-posts driven two feet into the ground. Four-foot minimum orange plastic fencing per manufacturer's recommendations will surround the critical root zone to keep equipment off the rooting area. If a fence cannot be erected, cushion the rooting area with six inches of wood chips, wood, or brick paths. Where root areas must be graded, cut large roots instead of tearing them with equipment.

C. Waste Control and Disposal

1. Waste Materials

   All waste materials will be collected and stored in a securely lidded metal dumpster rented from a local waste management company, which is a licensed solid waste management company. The dumpster will meet all local and any State solid waste management regulations. All trash and construction debris from the site will be deposited in the dumpster. The dumpster will be emptied periodically or more often if necessary, and the trash will be hauled to an appropriate waste management facility. No construction waste materials will be buried onsite. Staging areas for construction materials should have secondary containment. All personnel will be instructed regarding the correct procedure for waste disposal. Notices stating these practices will be posted in the office trailer. The individual who manages the day-to-day site operations will be responsible for seeing that these procedures are followed.

2. Hazardous Waste

   All hazardous waste materials will be disposed of in the manner specified by local or State regulations or by the manufacturer. Site personnel will be instructed in these practices and the individual who manages day-to-day site operations will be responsible for seeing that these practices are followed.

3. Sanitary Waste

   All sanitary waste will be collected from the portable units periodically by a licensed sanitary waste management contractor, as required by local regulation.

4. Offsite Vehicle Tracking and Dust Control

   A stabilized construction entrance has been provided to help reduce vehicle tracking of sediments. The paved street adjacent to the site entrance will be swept to remove any excess mud, dirt or rock tracked from the site. Dump trucks hauling material from the construction site will be covered with a tarpaulin. If dust is visible when dump trucks are leaving the site due to construction activities, dust suppression techniques such as wetting the soil will be employed.

D. Timing of Controls/Measures

The contractor and the operator shall review the SWP3 requirements prior to beginning construction activities. The following is a sample erosion control sequence:

- Site Mobilization: Prior to any construction on the site a stabilized construction entrance shall be installed.
- Clearing and Rough Grading: Prior to any grading of the site, erosion control measures shall be installed. These controls may include but are not limited to silt fences, sedimentation ponds and vegetated swales. The installation is required to prevent sediment from leaving disturbed areas.
- Storm Drain Installation: In addition to maintaining the devices installed during initial grading, supplemental control measures will need to be installed. These devices will include devices shown on the plan such as storm drain inlet protection and sediment traps. Inlet protection devices prevent sedimentation from entering the inlet and subsequently, the storm sewer system

as well as the receiving water body. Other devices may be required as shown on the erosion control plan or requested by the inspector or operator.

- Installation of Public Utilities: Additional control measures are likewise not required during installation of public utilities. However, maintenance of existing control measures installed during previous phases must continue.
- Pavement Installation: In addition to maintaining the control measures installed during initial grading and storm drain installation phases, supplemental measures should be installed. Upon completion of paving and curb backfill operations, control measures should be installed behind curbs at handicap ramps and along parkways where sediment could enter streets and/or paved areas.
- Final Grading: Additional control measures are not required during final grading. However, maintenance of existing control measures installed during previous phases will continue.
- Building Construction: In addition to maintaining previously installed control measures, a strict policy will be enacted which minimizes vehicle traffic from entering non-paved areas. Construction materials will be unloaded from existing paved surfaces where possible, thereby preventing disturbing control measures already in place and reducing sediment tracking into paved areas. Areas where construction activity temporarily ceases for more than 21 days will be stabilized with a temporary seed and mulch within 14 days of the last disturbance. Once construction activity ceases permanently in an area, that area will be stabilized with permanent seed and mulch. After the entire site is stabilized, the accumulated sediment will be removed and the erosion control measures will be removed.

5.0 RELEASES OF REPORTABLE QUANTITIES

Because construction activities may handle certain hazardous substances over the course of the project, spills of these substances in amounts that equal or exceed Reportable Quantity (RQ) levels are a possibility. Material management practice guidelines are located in Appendix K.

EPA has issued regulations that define what reportable quantity levels are for oil and hazardous substances. These regulations are found at 40 CFR Part 110 Part 117, or 40 CFR Part 302. A list of RQs are included in Appendix M. If there is a RQ release during the construction period, then you must take the following steps:

- Notify TCEQ immediately at (800) 832-8224.
- Notify the National Response Center immediately at (800) 424-8802.
- Within fourteen (14) days, submit a written description of the release to TCEQ providing the date and circumstances of the release and the steps to be taken to prevent another release.
- Modify the pollution prevention plan to include the date of release, the circumstances leading to the release, and steps taken to prevent reoccurrence of the release.

6.0 STATE AND LOCAL PROGRAMS

The TPDES program meets or exceeds the NPDES standards established on a federal level. This SWP3 has been developed in accordance with the requirements of the TPDES requirements. Information for the City of Leander has been included in Appendix O. Additional local requirements may apply and this SWP3 should be updated accordingly.

Storm water from the project construction area discharges into the storm sewer system of the City of Austin, Travis County, Texas. (MS4).

Construction projects that discharge storm water to an MS4 are required to:

- submit a copy of the signed NOI to the operator of the MS4 at least seven days prior to the commencement of construction activities,
- post a copy of the signed NOI and construction site notice at the project site at all times,
- submit a copy of any NOCs to the operator of the MS4,
- submit a copy of the NOT to the operator of the MS4, and
- keep and maintain a list of the names and address of MS4s that receive NOI, NOT, and/or NOC forms (Appendix H).

7.0 INSPECTION AND MAINTENANCE

A. Inspection Schedule

1. All disturbed areas, as well as all erosion and sediment control devices, will be inspected according to one of the following schedules:

   a) at least every fourteen (14) calendar days and within 24 hours after a rainfall of 0.5 inch or greater, or

   b) every seven (7) days on the same day of the week each week, regardless of whether or not there has been a rainfall event since the previous inspection.

2. Inspections may occur on either schedule provided that this SWP3 reflects the current schedule and that any changes are in accordance with the following:

   a) the schedule is changed a maximum of one time each month,

   b) the schedule change must be implemented at the beginning of a calendar month, and

   c) the reason for the schedule change must be documented in this SWP3 (an inspection schedule form is located in Appendix E).

B. Inspection Reports

1. Completed inspection reports (Appendix E) will include the following information:

   a) scope of the inspection,
   b) date of the inspection,
   c) name(s) of personnel making the inspection,
   d) reference to qualifications of inspection personnel,
   e) observed major construction activities, and
   f) actions taken as a result of the inspection.

2. All disturbed areas (on and off-site), areas for material storage locations where vehicles enter or exit the site, and all of the erosion and sediment controls that were identified as part of the SWP3 must be inspected. The inspection report must state whether the site was in compliance or identify any incidents of non-compliance. The report will be signed by the qualified inspector in accordance with the TPDES general permit and filed in the SWP3. A sample Inspection Report is included in Appendix E, along with an Inspector Qualification Form. All reports and inspections required by the general construction permit will be completed by a duly authorized representative. A copy of a Delegation of Signatories to Reports letter is included in Appendix J.

3. The operator should correct any damage or deficiencies as soon as practicable after the inspection, but in no case later than seven (7) calendar days after the inspection. If existing BMPs are modified or if additional BMPs are necessary, an implementation schedule must be described in the SWP3, and wherever possible, those changes implemented before the next storm event or as soon as practicable. A list of maintenance guidelines is included in Appendix E.

4. Inspection reports will be kept in the Operator's file, along with the SWP3, for at least three years from the date that the NOT is submitted to the TCEQ for the construction site.

C. Final Stabilization

Final stabilization of the construction site has been achieved when all soil disturbing activities at the site have been completed, and a uniform (e.g., evenly distributed, without large bare areas) perennial vegetative cover with a density of 70 percent of the native background vegetative cover for the area has been established on all unpaved areas and areas not covered by permanent structures. If a vegetative cover cannot be established, equivalent permanent stabilization measures (such as riprap, gabions, or geotextiles) can be employed. When these conditions have been met, BMPs can be removed from the construction area.

8.0 RECORD RETENTION

The permittee must retain the following records for a minimum period of three (3) years from the date that a NOT is submitted. Records include:

- A copy of the SWP3,
- All data used to complete the NOI, if an NOI is required for coverage under this general permit,
- All reports and actions required by this permit, including a copy of the construction site notice, and
- All records of submittal of forms submitted to the operator of any MS4 receiving the discharge and to the secondary operator of a large construction site, if applicable.

9.0 CONCRETE BATCH PLANTS (IF APPLICABLE)

A. Storm Water Runoff from Concrete Batch Plants

Discharges of storm water runoff from concrete batch plants may be authorized under the general permit provided that the requirements in Part IV of the permit are met (Appendix G). If discharges are not covered under the general permit, then discharges must be authorized under an alternative permit. Authorization for discharge or land disposal of concrete batch plant wastewater must be obtained under an alternative permit.

B. Benchmark Sampling Requirements

Operators of concrete batch plants must sample the storm water runoff from the concrete batch plant according to the requirements of the general permit. A table of benchmark monitoring values is located in Part IV.A. of the general permit. Analytical results that exceed a benchmark value are not a violation of the general construction permit. Results of analyses are indicators that modifications of the SWP3 should be assessed and may be necessary to protect water quality. Benchmark sampling records should be included in Appendix P.

C. Additional BMP and SWP3 Requirements

The following items are additional requirements for concrete batch plants. The Operator is responsible for updating the SWP3 as appropriate. Additional information for concrete batch plant requirements is located in Part IV of the general construction permit. Records and information for the concrete batch plant should be included in Appendix P.

1. A description of potential pollutant sources associated with the concrete batch plant must be kept in the SWP3.

2. The site map in Appendix A must include the following information:

    a) the location of all outfalls for storm water discharges associated with concrete batch plants;

    b) a depiction of the drainage area and the direction of flow to the outfall(s);

    c) structural controls used within the drainage area(s);

    d) the locations of the following areas associated with concrete batch plants that are exposed to precipitation: vehicle and equipment maintenance activity areas; areas used for the treatment, storage, or disposal of wastes; liquid storage tanks; material process and storage areas; and loading and unloading areas; and

    e) the locations of the following: any bag house or other dust control device(s); recycle/sedimentation pond, clarifier or other device used for the treatment of facility wastewater; areas with significant materials; and areas where major spills or leaks have occurred.

3. A list of materials handled at the concrete batch plant that may be exposed to storm water and that have a potential to affect the quality of storm water discharges associated with concrete batch plants must be kept in this SWP3.

4. A list of significant spills and leaks of toxic or hazardous pollutants that occurred in areas exposed to storm water and that drain to storm water outfalls associated with concrete batch plants must be developed, maintained, and updated.

5. A summary of existing storm water discharge sampling data must be maintained if available.

6. Good housekeeping measures must be developed and implemented in the area(s) associated with concrete batch plants.

7. Areas where potential spills that can contribute pollutants to storm water runoff, and the drainage areas from these locations must be identified. Include material handling procedures, storage requirements, and use of equipment information. Procedures for cleaning up spills must be identified and made available to the appropriate personnel.

8. Qualified facility personnel must be identified to inspect designated equipment and areas of the facility specified in this SWP3. Inspection frequency must be specified based upon a consideration of the level of concrete production, but must be a minimum of once per month while the facility is in operation. The inspection must take place while the facility is in operation and include all areas that are exposed to storm water at the site. Records of inspections must be maintained in Appendix P.

9. An employee training program must be developed to educate personnel. At a minimum, training must occur prior to the initiation of operation of the concrete batch plant.

10. A description of spills and similar incidents, plus additional information that is obtained regarding the quality and quantity of storm water discharges must be included with this SWP3.

11. Include a narrative consideration for reducing the volume of runoff from concrete batch plants by diverting runoff or otherwise managing runoff, including use of infiltration, detention ponds, retention ponds, or reusing of runoff.

12. At least once per year, one or more qualified personnel shall conduct a compliance evaluation of the plant. Evaluation requirements are listed in Part IV.B.3 of the general permit.

10.0 CONCRETE TRUCK WASH OUT (IF APPLICABLE)

The wash out of concrete trucks at the construction site is authorized, provided that the requirements in Part V of the general permit are met. Authorization is limited to the land disposal of wash out water from concrete trucks. Any other direct discharge of concrete production waste eater must be authorized under a separate general permit or individual permit.

A. Wash Out Requirements

1. Direct discharge of concrete truck wash out water to surface water in the state, including discharge to storm sewers, is prohibited by the general permit.

2. Concrete truck wash out water should be discharged to areas at the construction site where structural controls have been established to prevent direct discharge to surface waters, or to areas that have minimal slope that allow infiltration and filtering of wash out water to prevent direct discharge to surface waters. Structural controls may consist of temporary berms, temporary shallow pits, temporary storage tanks with slow rate release, or other reasonable measures to prevent runoff from the site.

3. Wash out of concrete trucks during rainfall events shall be minimized. The direct discharge of concrete wash out water is prohibited at all times, and the operator should have BMPs sufficient to prevent the discharge of concrete truck wash out as the result of rain.

4. The discharge of wash out water should not cause or contribute to groundwater contamination.

5. The Operator is responsible for showing concrete wash out areas on a map (Appendix A).

11.0 REFERENCES

North Central Texas Council of Governments (NCTCOG). 2010. Integrated Storm Water Management Technical Manual. http://iswm.nctcog.org/technical_manual.asp.

Texas Commission on Environmental Quality (TCEQ). 2014. "2014 Texas Water Quality Inventory and 303(d) List." [Online] (accessed on June 27, 2016). Available URL: http://www.tceq.texas.gov/assets/public/waterquality/swqm/assess/14txir/2014_basin12.pdf.

United States Department of Agriculture (USDA). 2016. Soil Survey of Williamson County, Texas. "Web Soil Survey." [Online] (accessed on June 27, 2016). Available URL: http://websoilsurvey.nrcs.usda.gov/app/

APPENDIX A

PROJECT MAPS

Project Site Map

13003 W STATE HWY 29

LIBERTY HILL, TX. 78642

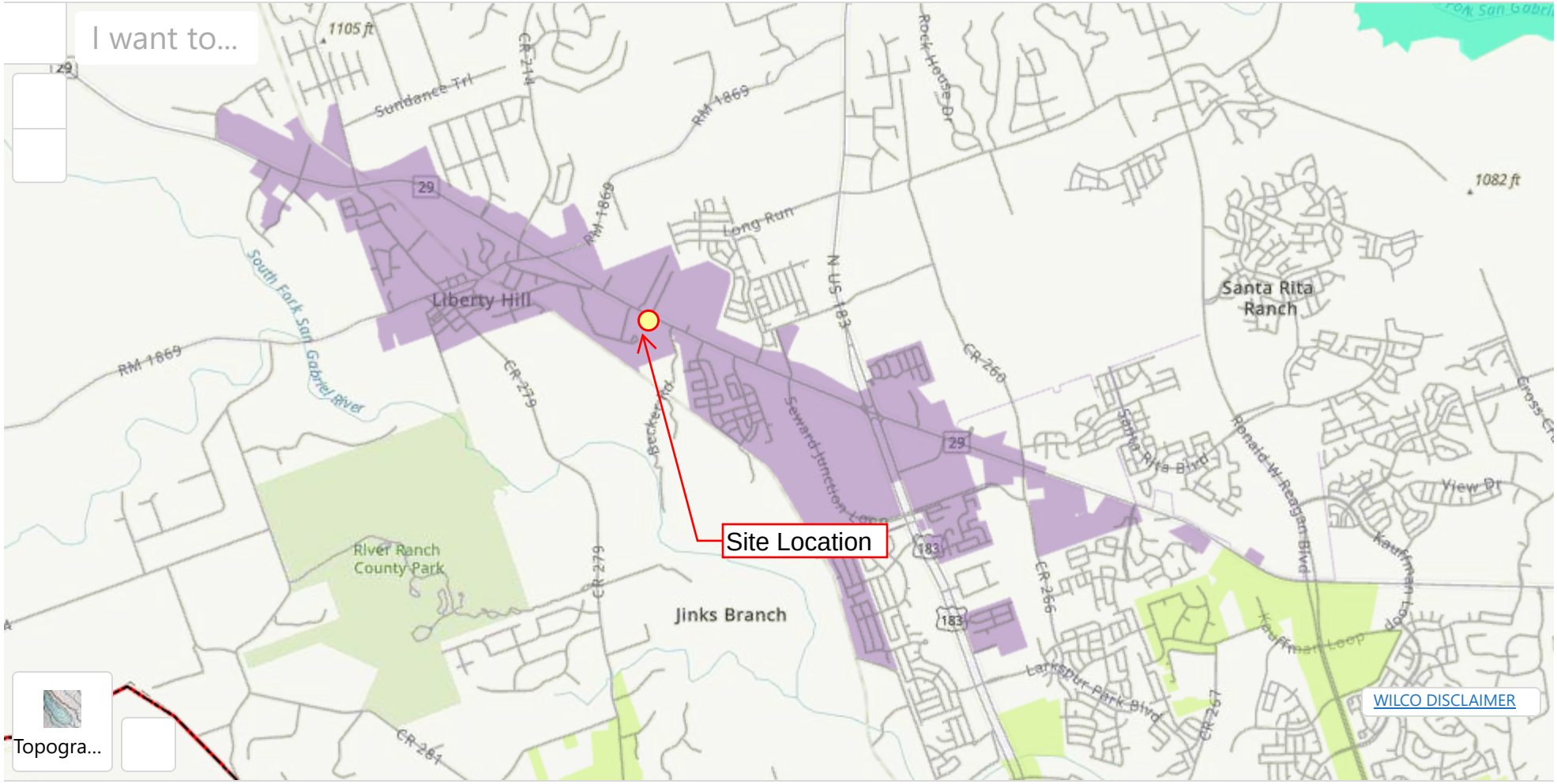
Williamson County, Texas

Enter address or street...

Navigation | Find Data | Measurement and Drawing Tools | Map Sharing Tools | Tool Labels

Point | Freehand | Line | Polygon | Rectangle

Find More County Data



No menu options.

2km
1mi

Williamson County GIS & Addressing Williamson County, TX

United States Department of Agriculture

Natural Resources Conservation Service

A product of the National Cooperative Soil Survey, a joint effort of the United States Department of Agriculture and other Federal agencies, State agencies including the Agricultural Experiment Stations, and local participants

Custom Soil Resource Report for Williamson County, Texas

Heritage Ridge – 9 Lot Subdivision

May 13, 2020

Preface

Soil surveys contain information that affects land use planning in survey areas. They highlight soil limitations that affect various land uses and provide information about the properties of the soils in the survey areas. Soil surveys are designed for many different users, including farmers, ranchers, foresters, agronomists, urban planners, community officials, engineers, developers, builders, and home buyers. Also, conservationists, teachers, students, and specialists in recreation, waste disposal, and pollution control can use the surveys to help them understand, protect, or enhance the environment.

Various land use regulations of Federal, State, and local governments may impose special restrictions on land use or land treatment. Soil surveys identify soil properties that are used in making various land use or land treatment decisions. The information is intended to help the land users identify and reduce the effects of soil limitations on various land uses. The landowner or user is responsible for identifying and complying with existing laws and regulations.

Although soil survey information can be used for general farm, local, and wider area planning, onsite investigation is needed to supplement this information in some cases. Examples include soil quality assessments (http://www.nrcs.usda.gov/wps/portal/nrcs/main/soils/health/) and certain conservation and engineering applications. For more detailed information, contact your local USDA Service Center (https://offices.sc.egov.usda.gov/locator/app?agency=nrcs) or your NRCS State Soil Scientist (http://www.nrcs.usda.gov/wps/portal/nrcs/detail/soils/contactus/?cid=nrcs142p2_053951).

Great differences in soil properties can occur within short distances. Some soils are seasonally wet or subject to flooding. Some are too unstable to be used as a foundation for buildings or roads. Clayey or wet soils are poorly suited to use as septic tank absorption fields. A high water table makes a soil poorly suited to basements or underground installations.

The National Cooperative Soil Survey is a joint effort of the United States Department of Agriculture and other Federal agencies, State agencies including the Agricultural Experiment Stations, and local agencies. The Natural Resources Conservation Service (NRCS) has leadership for the Federal part of the National Cooperative Soil Survey.

Information about soils is updated periodically. Updated information is available through the NRCS Web Soil Survey, the site for official soil survey information.

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How Soil Surveys Are Made

Soil surveys are made to provide information about the soils and miscellaneous areas in a specific area. They include a description of the soils and miscellaneous areas and their location on the landscape and tables that show soil properties and limitations affecting various uses. Soil scientists observed the steepness, length, and shape of the slopes; the general pattern of drainage; the kinds of crops and native plants; and the kinds of bedrock. They observed and described many soil profiles. A soil profile is the sequence of natural layers, or horizons, in a soil. The profile extends from the surface down into the unconsolidated material in which the soil formed or from the surface down to bedrock. The unconsolidated material is devoid of roots and other living organisms and has not been changed by other biological activity.

Currently, soils are mapped according to the boundaries of major land resource areas (MLRAs). MLRAs are geographically associated land resource units that share common characteristics related to physiography, geology, climate, water resources, soils, biological resources, and land uses (USDA, 2006). Soil survey areas typically consist of parts of one or more MLRA.

The soils and miscellaneous areas in a survey area occur in an orderly pattern that is related to the geology, landforms, relief, climate, and natural vegetation of the area. Each kind of soil and miscellaneous area is associated with a particular kind of landform or with a segment of the landform. By observing the soils and miscellaneous areas in the survey area and relating their position to specific segments of the landform, a soil scientist develops a concept, or model, of how they were formed. Thus, during mapping, this model enables the soil scientist to predict with a considerable degree of accuracy the kind of soil or miscellaneous area at a specific location on the landscape.

Commonly, individual soils on the landscape merge into one another as their characteristics gradually change. To construct an accurate soil map, however, soil scientists must determine the boundaries between the soils. They can observe only a limited number of soil profiles. Nevertheless, these observations, supplemented by an understanding of the soil-vegetation-landscape relationship, are sufficient to verify predictions of the kinds of soil in an area and to determine the boundaries.

Soil scientists recorded the characteristics of the soil profiles that they studied. They noted soil color, texture, size and shape of soil aggregates, kind and amount of rock fragments, distribution of plant roots, reaction, and other features that enable them to identify soils. After describing the soils in the survey area and determining their properties, the soil scientists assigned the soils to taxonomic classes (units). Taxonomic classes are concepts. Each taxonomic class has a set of soil characteristics with precisely defined limits. The classes are used as a basis for comparison to classify soils systematically. Soil taxonomy, the system of taxonomic classification used in the United States, is based mainly on the kind and character of soil properties and the arrangement of horizons within the profile. After the soil

scientists classified and named the soils in the survey area, they compared the individual soils with similar soils in the same taxonomic class in other areas so that they could confirm data and assemble additional data based on experience and research.

The objective of soil mapping is not to delineate pure map unit components; the objective is to separate the landscape into landforms or landform segments that have similar use and management requirements. Each map unit is defined by a unique combination of soil components and/or miscellaneous areas in predictable proportions. Some components may be highly contrasting to the other components of the map unit. The presence of minor components in a map unit in no way diminishes the usefulness or accuracy of the data. The delineation of such landforms and landform segments on the map provides sufficient information for the development of resource plans. If intensive use of small areas is planned, onsite investigation is needed to define and locate the soils and miscellaneous areas.

Soil scientists make many field observations in the process of producing a soil map. The frequency of observation is dependent upon several factors, including scale of mapping, intensity of mapping, design of map units, complexity of the landscape, and experience of the soil scientist. Observations are made to test and refine the soil-landscape model and predictions and to verify the classification of the soils at specific locations. Once the soil-landscape model is refined, a significantly smaller number of measurements of individual soil properties are made and recorded. These measurements may include field measurements, such as those for color, depth to bedrock, and texture, and laboratory measurements, such as those for content of sand, silt, clay, salt, and other components. Properties of each soil typically vary from one point to another across the landscape.

Observations for map unit components are aggregated to develop ranges of characteristics for the components. The aggregated values are presented. Direct measurements do not exist for every property presented for every map unit component. Values for some properties are estimated from combinations of other properties.

While a soil survey is in progress, samples of some of the soils in the area generally are collected for laboratory analyses and for engineering tests. Soil scientists interpret the data from these analyses and tests as well as the field-observed characteristics and the soil properties to determine the expected behavior of the soils under different uses. Interpretations for all of the soils are field tested through observation of the soils in different uses and under different levels of management. Some interpretations are modified to fit local conditions, and some new interpretations are developed to meet local needs. Data are assembled from other sources, such as research information, production records, and field experience of specialists. For example, data on crop yields under defined levels of management are assembled from farm records and from field or plot experiments on the same kinds of soil.

Predictions about soil behavior are based not only on soil properties but also on such variables as climate and biological activity. Soil conditions are predictable over long periods of time, but they are not predictable from year to year. For example, soil scientists can predict with a fairly high degree of accuracy that a given soil will have a high water table within certain depths in most years, but they cannot predict that a high water table will always be at a specific level in the soil on a specific date.

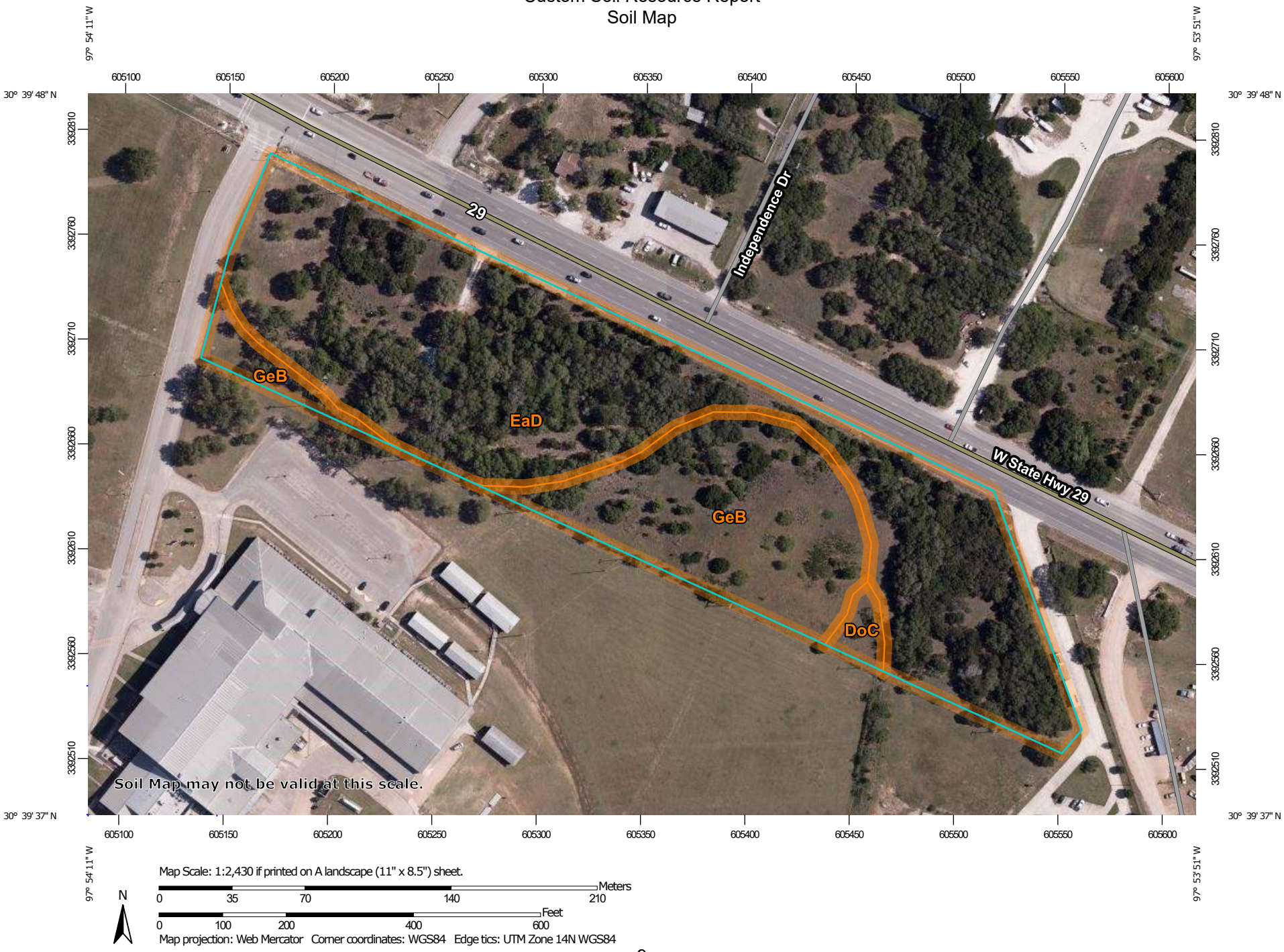
After soil scientists located and identified the significant natural bodies of soil in the survey area, they drew the boundaries of these bodies on aerial photographs and

identified each as a specific map unit. Aerial photographs show trees, buildings, fields, roads, and rivers, all of which help in locating boundaries accurately.

Soil Map

The soil map section includes the soil map for the defined area of interest, a list of soil map units on the map and extent of each map unit, and cartographic symbols displayed on the map. Also presented are various metadata about data used to produce the map, and a description of each soil map unit.

Custom Soil Resource Report
Soil Map



Map Scale: 1:2,430 if printed on A landscape (11" x 8.5") sheet.

N

Meters: 0 35 70 140 210

Feet: 0 100 200 400 600

Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 14N WGS84

MAP LEGEND

Area of Interest (AOI)

Area of Interest (AOI)

Soils

Soil Map Unit Polygons

Soil Map Unit Lines

Soil Map Unit Points

Special Point Features

Blowout

Borrow Pit

Clay Spot

Closed Depression

Gravel Pit

Gravelly Spot

Landfill

Lava Flow

Marsh or swamp

Mine or Quarry

Miscellaneous Water

Perennial Water

Rock Outcrop

Saline Spot

Sandy Spot

Severely Eroded Spot

Sinkhole

Slide or Slip

Sodic Spot

Spoil Area

Stony Spot

Very Stony Spot

Wet Spot

Other

Special Line Features

Water Features

Streams and Canals

Transportation

Rails

Interstate Highways

US Routes

Major Roads

Local Roads

Background

Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:20,000.

Warning: Soil Map may not be valid at this scale.

Enlargement of maps beyond the scale of mapping can cause misunderstanding of the detail of mapping and accuracy of soil line placement. The maps do not show the small areas of contrasting soils that could have been shown at a more detailed scale.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL:
Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: Williamson County, Texas
Survey Area Data: Version 20, Sep 12, 2019

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: May 16, 2018—May 30, 2018

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Map Unit Legend

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
DoC	Doss silty clay, moist, 1 to 5 percent slopes	0.2	1.5%
EaD	Eckrant cobbly clay, 1 to 8 percent slopes	7.6	71.2%
GeB	Georgetown clay loam, 0 to 2 percent slopes	2.9	27.3%
Totals for Area of Interest		**10.7**	**100.0%**

Map Unit Descriptions

The map units delineated on the detailed soil maps in a soil survey represent the soils or miscellaneous areas in the survey area. The map unit descriptions, along with the maps, can be used to determine the composition and properties of a unit.

A map unit delineation on a soil map represents an area dominated by one or more major kinds of soil or miscellaneous areas. A map unit is identified and named according to the taxonomic classification of the dominant soils. Within a taxonomic class there are precisely defined limits for the properties of the soils. On the landscape, however, the soils are natural phenomena, and they have the characteristic variability of all natural phenomena. Thus, the range of some observed properties may extend beyond the limits defined for a taxonomic class. Areas of soils of a single taxonomic class rarely, if ever, can be mapped without including areas of other taxonomic classes. Consequently, every map unit is made up of the soils or miscellaneous areas for which it is named and some minor components that belong to taxonomic classes other than those of the major soils.

Most minor soils have properties similar to those of the dominant soil or soils in the map unit, and thus they do not affect use and management. These are called noncontrasting, or similar, components. They may or may not be mentioned in a particular map unit description. Other minor components, however, have properties and behavioral characteristics divergent enough to affect use or to require different management. These are called contrasting, or dissimilar, components. They generally are in small areas and could not be mapped separately because of the scale used. Some small areas of strongly contrasting soils or miscellaneous areas are identified by a special symbol on the maps. If included in the database for a given area, the contrasting minor components are identified in the map unit descriptions along with some characteristics of each. A few areas of minor components may not have been observed, and consequently they are not mentioned in the descriptions, especially where the pattern was so complex that it was impractical to make enough observations to identify all the soils and miscellaneous areas on the landscape.

The presence of minor components in a map unit in no way diminishes the usefulness or accuracy of the data. The objective of mapping is not to delineate pure taxonomic classes but rather to separate the landscape into landforms or

landform segments that have similar use and management requirements. The delineation of such segments on the map provides sufficient information for the development of resource plans. If intensive use of small areas is planned, however, onsite investigation is needed to define and locate the soils and miscellaneous areas.

An identifying symbol precedes the map unit name in the map unit descriptions. Each description includes general facts about the unit and gives important soil properties and qualities.

Soils that have profiles that are almost alike make up a *soil series*. Except for differences in texture of the surface layer, all the soils of a series have major horizons that are similar in composition, thickness, and arrangement.

Soils of one series can differ in texture of the surface layer, slope, stoniness, salinity, degree of erosion, and other characteristics that affect their use. On the basis of such differences, a soil series is divided into *soil phases*. Most of the areas shown on the detailed soil maps are phases of soil series. The name of a soil phase commonly indicates a feature that affects use or management. For example, Alpha silt loam, 0 to 2 percent slopes, is a phase of the Alpha series.

Some map units are made up of two or more major soils or miscellaneous areas. These map units are complexes, associations, or undifferentiated groups.

A *complex* consists of two or more soils or miscellaneous areas in such an intricate pattern or in such small areas that they cannot be shown separately on the maps. The pattern and proportion of the soils or miscellaneous areas are somewhat similar in all areas. Alpha-Beta complex, 0 to 6 percent slopes, is an example.

An *association* is made up of two or more geographically associated soils or miscellaneous areas that are shown as one unit on the maps. Because of present or anticipated uses of the map units in the survey area, it was not considered practical or necessary to map the soils or miscellaneous areas separately. The pattern and relative proportion of the soils or miscellaneous areas are somewhat similar. Alpha-Beta association, 0 to 2 percent slopes, is an example.

An *undifferentiated group* is made up of two or more soils or miscellaneous areas that could be mapped individually but are mapped as one unit because similar interpretations can be made for use and management. The pattern and proportion of the soils or miscellaneous areas in a mapped area are not uniform. An area can be made up of only one of the major soils or miscellaneous areas, or it can be made up of all of them. Alpha and Beta soils, 0 to 2 percent slopes, is an example.

Some surveys include *miscellaneous areas*. Such areas have little or no soil material and support little or no vegetation. Rock outcrop is an example.

Williamson County, Texas

DoC—Doss silty clay, moist, 1 to 5 percent slopes

Map Unit Setting

National map unit symbol: 2s0st
Elevation: 630 to 1,840 feet
Mean annual precipitation: 30 to 36 inches
Mean annual air temperature: 66 to 68 degrees F
Frost-free period: 210 to 240 days
Farmland classification: Not prime farmland

Map Unit Composition

Doss and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Doss

Setting

Landform: Hillslopes
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Side slope
Down-slope shape: Convex
Across-slope shape: Linear
Parent material: Residuum weathered from limestone

Typical profile

A - 0 to 9 inches: silty clay
Bk - 9 to 17 inches: silty clay
Cr - 17 to 80 inches: bedrock

Properties and qualities

Slope: 1 to 5 percent
Depth to restrictive feature: 11 to 20 inches to paralithic bedrock
Natural drainage class: Well drained
Runoff class: Medium
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.57 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum in profile: 70 percent
Salinity, maximum in profile: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Available water storage in profile: Very low (about 2.4 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 4e
Hydrologic Soil Group: D
Ecological site: Shallow 29-35 PZ (R081CY574TX)
Hydric soil rating: No

Minor Components

Brackett

Percent of map unit: 7 percent
Landform: Ridges
Landform position (two-dimensional): Shoulder, backslope, footslope
Landform position (three-dimensional): Side slope
Down-slope shape: Linear
Across-slope shape: Convex
Ecological site: Steep Adobe 29-35 PZ (R081CY362TX)
Hydric soil rating: No

Bolar

Percent of map unit: 5 percent
Landform: Ridges
Landform position (two-dimensional): Shoulder
Landform position (three-dimensional): Side slope
Down-slope shape: Convex
Across-slope shape: Convex
Ecological site: Clay Loam 29-35 PZ (R081CY357TX)
Hydric soil rating: No

Purves

Percent of map unit: 1 percent
Landform: Plains
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Side slope
Down-slope shape: Convex
Across-slope shape: Linear
Ecological site: Shallow 29-35 PZ (R081CY574TX)
Hydric soil rating: No

Denton

Percent of map unit: 1 percent
Landform: Plains
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Side slope
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: Clay Loam 29-35 PZ (R081CY357TX)
Hydric soil rating: No

Eckrant

Percent of map unit: 1 percent
Landform: Ridges
Landform position (two-dimensional): Shoulder
Landform position (three-dimensional): Side slope
Down-slope shape: Convex
Across-slope shape: Convex
Ecological site: Low Stony Hill 29-35 PZ (R081CY360TX)
Hydric soil rating: No

EaD—Eckrant cobbly clay, 1 to 8 percent slopes

Map Unit Setting

National map unit symbol: 2t0sg
Elevation: 650 to 1,900 feet
Mean annual precipitation: 30 to 35 inches
Mean annual air temperature: 65 to 69 degrees F
Frost-free period: 210 to 250 days
Farmland classification: Not prime farmland

Map Unit Composition

Eckrant and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Eckrant

Setting

Landform: Ridges
Landform position (two-dimensional): Backslope, summit, shoulder
Landform position (three-dimensional): Side slope, interfluve
Down-slope shape: Convex
Across-slope shape: Convex
Parent material: Residuum weathered from limestone

Typical profile

A1 - 0 to 4 inches: cobbly clay
A2 - 4 to 11 inches: very cobbly clay
R - 11 to 80 inches: bedrock

Properties and qualities

Slope: 1 to 8 percent
Percent of area covered with surface fragments: 2.3 percent
Depth to restrictive feature: 4 to 20 inches to lithic bedrock
Natural drainage class: Well drained
Runoff class: Medium
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.57 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum in profile: 10 percent
Salinity, maximum in profile: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Sodium adsorption ratio, maximum in profile: 1.0
Available water storage in profile: Very low (about 1.0 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 6s

Hydrologic Soil Group: D
Ecological site: Low Stony Hill 29-35 PZ (R081CY360TX)
Hydric soil rating: No

Minor Components

Brackett
Percent of map unit: 7 percent
Landform: Ridges
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Side slope
Down-slope shape: Convex
Across-slope shape: Convex
Ecological site: Adobe 29-35 PZ (R081CY355TX)
Hydric soil rating: No

Bexar
Percent of map unit: 5 percent
Landform: Ridges
Landform position (two-dimensional): Footslope
Landform position (three-dimensional): Base slope
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: Redland 29-35 PZ (R081CY361TX)
Hydric soil rating: No

Krum
Percent of map unit: 3 percent
Landform: Ridges
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Base slope
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: Clay Loam 29-35 PZ (R081CY357TX)
Hydric soil rating: No

GeB—Georgetown clay loam, 0 to 2 percent slopes

Map Unit Setting
National map unit symbol: 2t273
Elevation: 620 to 1,250 feet
Mean annual precipitation: 32 to 36 inches
Mean annual air temperature: 65 to 68 degrees F
Frost-free period: 230 to 260 days
Farmland classification: Farmland of statewide importance

Map Unit Composition
Georgetown and similar soils: 90 percent
Minor components: 10 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Georgetown

Setting

Landform: Ridges
Landform position (two-dimensional): Summit
Landform position (three-dimensional): Interfluve
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Clayey residuum weathered from limestone

Typical profile

A - 0 to 7 inches: clay loam
Bt - 7 to 35 inches: cobbly clay
R - 35 to 60 inches: bedrock

Properties and qualities

Slope: 0 to 2 percent
Percent of area covered with surface fragments: 0.0 percent
Depth to restrictive feature: 20 to 40 inches to lithic bedrock
Natural drainage class: Well drained
Runoff class: Very high
Capacity of the most limiting layer to transmit water (Ksat): Very low to moderately low (0.00 to 0.06 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum in profile: 5 percent
Salinity, maximum in profile: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Available water storage in profile: Low (about 4.1 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 3s
Hydrologic Soil Group: D
Ecological site: Redland 29-35 PZ (R081CY361TX)
Hydric soil rating: No

Minor Components

Tarpley

Percent of map unit: 5 percent
Landform: Ridges
Landform position (two-dimensional): Summit
Landform position (three-dimensional): Interfluve
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: Redland 29-35 PZ (R081CY361TX)
Hydric soil rating: No

Eckrant

Percent of map unit: 5 percent
Landform: Ridges
Landform position (two-dimensional): Shoulder, backslope
Landform position (three-dimensional): Side slope, interfluve
Down-slope shape: Linear, convex

Across-slope shape: Convex
Ecological site: Low Stony Hill 29-35 PZ (R081CY360TX)
Hydric soil rating: No

Soil Information for All Uses

Soil Properties and Qualities

The Soil Properties and Qualities section includes various soil properties and qualities displayed as thematic maps with a summary table for the soil map units in the selected area of interest. A single value or rating for each map unit is generated by aggregating the interpretive ratings of individual map unit components. This aggregation process is defined for each property or quality.

Soil Qualities and Features

Soil qualities are behavior and performance attributes that are not directly measured, but are inferred from observations of dynamic conditions and from soil properties. Example soil qualities include natural drainage, and frost action. Soil features are attributes that are not directly part of the soil. Example soil features include slope and depth to restrictive layer. These features can greatly impact the use and management of the soil.

Hydrologic Soil Group (Heritage Ridge – 9 Lot Subdivision)

Hydrologic soil groups are based on estimates of runoff potential. Soils are assigned to one of four groups according to the rate of water infiltration when the soils are not protected by vegetation, are thoroughly wet, and receive precipitation from long-duration storms.

The soils in the United States are assigned to four groups (A, B, C, and D) and three dual classes (A/D, B/D, and C/D). The groups are defined as follows:

Group A. Soils having a high infiltration rate (low runoff potential) when thoroughly wet. These consist mainly of deep, well drained to excessively drained sands or gravelly sands. These soils have a high rate of water transmission.

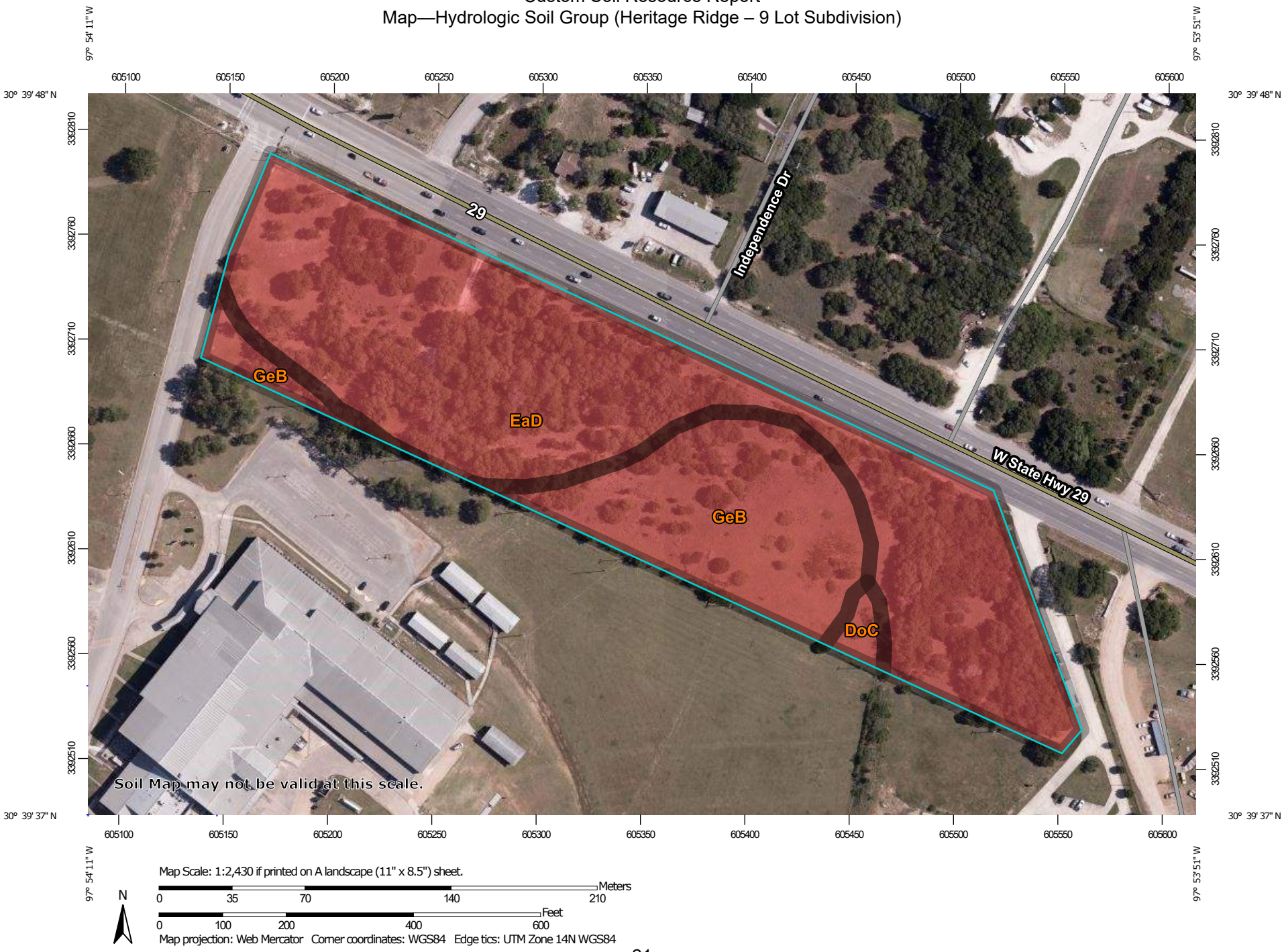
Group B. Soils having a moderate infiltration rate when thoroughly wet. These consist chiefly of moderately deep or deep, moderately well drained or well drained soils that have moderately fine texture to moderately coarse texture. These soils have a moderate rate of water transmission.

Group C. Soils having a slow infiltration rate when thoroughly wet. These consist chiefly of soils having a layer that impedes the downward movement of water or soils of moderately fine texture or fine texture. These soils have a slow rate of water transmission.

Group D. Soils having a very slow infiltration rate (high runoff potential) when thoroughly wet. These consist chiefly of clays that have a high shrink-swell potential, soils that have a high water table, soils that have a claypan or clay layer at or near the surface, and soils that are shallow over nearly impervious material. These soils have a very slow rate of water transmission.

If a soil is assigned to a dual hydrologic group (A/D, B/D, or C/D), the first letter is for drained areas and the second is for undrained areas. Only the soils that in their natural condition are in group D are assigned to dual classes.

Custom Soil Resource Report
Map—Hydrologic Soil Group (Heritage Ridge – 9 Lot Subdivision)



Map Scale: 1:2,430 if printed on A landscape (11" x 8.5") sheet.

N

Meters: 0 35 70 140 210

Feet: 0 100 200 400 600

Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 14N WGS84

MAP LEGEND

Area of Interest (AOI)

Area of Interest (AOI)

Soils

Soil Rating Polygons

- A
- A/D
- B
- B/D
- C
- C/D
- D
- Not rated or not available

Soil Rating Lines

- A
- A/D
- B
- B/D
- C
- C/D
- D
- Not rated or not available

Soil Rating Points

- A
- A/D
- B
- B/D
- C
- C/D
- D
- Not rated or not available

Water Features

Streams and Canals

Transportation

- Rails
- Interstate Highways
- US Routes
- Major Roads
- Local Roads

Background

Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:20,000.

Warning: Soil Map may not be valid at this scale.

Enlargement of maps beyond the scale of mapping can cause misunderstanding of the detail of mapping and accuracy of soil line placement. The maps do not show the small areas of contrasting soils that could have been shown at a more detailed scale.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL:
Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: Williamson County, Texas
Survey Area Data: Version 20, Sep 12, 2019

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: May 16, 2018—May 30, 2018

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Table—Hydrologic Soil Group (Heritage Ridge – 9 Lot Subdivision)

Map unit symbol	Map unit name	Rating	Acres in AOI	Percent of AOI
DoC	Doss silty clay, moist, 1 to 5 percent slopes	D	0.2	1.5%
EaD	Eckrant cobbly clay, 1 to 8 percent slopes	D	7.6	71.2%
GeB	Georgetown clay loam, 0 to 2 percent slopes	D	2.9	27.3%
Totals for Area of Interest			**10.7**	**100.0%**

Rating Options—Hydrologic Soil Group (Heritage Ridge – 9 Lot Subdivision)

Aggregation Method: Dominant Condition

Component Percent Cutoff: None Specified

Tie-break Rule: Higher

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United States Department of Agriculture, Natural Resources Conservation Service. National soil survey handbook, title 430-VI. http://www.nrcs.usda.gov/wps/portal/nrcs/detail/soils/scientists/?cid=nrcs142p2_054242

United States Department of Agriculture, Natural Resources Conservation Service. 2006. Land resource regions and major land resource areas of the United States, the Caribbean, and the Pacific Basin. U.S. Department of Agriculture Handbook 296. http://www.nrcs.usda.gov/wps/portal/nrcs/detail/national/soils/?cid=nrcs142p2_053624

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Doc# 2022118630

REPLAT LOT 3, BLOCK 1 – HERITAGE RIDGE

REPLATTING LOT 3, BLOCK 1 – HERITAGE RIDGE
RECORDED IN DOCUMENT NO. 2020143893
OFFICIAL PUBLIC RECORDS OF WILLIAMSON COUNTY, TEXAS
John B. Robinson Survey Abstract No. 521 ACH

STATE OF TEXAS §
§KNOW ALL MEN BY THESE PRESENTS
COUNTY OF WILLIAMSON §

WE, WADE ROWDEN AND BRAD ANDREWS, MANAGERS OF LIBERTY HILL 29, LLC, OWNERS OF LOT 3, BLOCK 1 OF HERITAGE RIDGE CONVEYED FROM HERITAGE RIDGE INVESTMENTS, LLC TO LIBERTY HILL 29, LLC BY DEED RECORDED IN DOCUMENT NUMBER 2022008495 OF THE OFFICIAL PUBLIC RECORDS OF WILLIAMSON COUNTY, TEXAS DO HEREBY DEDICATE TO THE PUBLIC THE USE OF ALL STREETS, ALLEYS, EASEMENTS AND ALL OTHER LANDS INTENDED FOR PUBLIC DEDICATION AS SHOWN HEREON TO BE KNOWN AS "REPLAT LOT 3, BLOCK 1 – HERITAGE RIDGE".

WADE ROWDEN

BRAD ANDREWS

STATE OF TEXAS
COUNTY OF WILLIAMSON

BEFORE ME, THE UNDERSIGNED AUTHORITY, ON THIS THE 22nd DAY OF September 2022, PERSONALLY APPEARED WADE ROWDEN, KNOWN BY ME TO BE THE PERSON WHOSE NAME IS SUBSCRIBED ON THE FOREGOING INSTRUMENT AND HE ACKNOWLEDGED BEFORE ME THAT SHE EXECUTED THE SAME FOR THE PURPOSES AND CONSIDERATIONS THEREIN EXPRESSED.

NOTARY PUBLIC IN AND FOR THE STATE OF TEXAS

Brandi Spiller
PRINTED NAME

08-20-2025
DATE NOTARY COMMISSION EXPIRES

BRANDI SPILLER
Notary Public
STATE OF TEXAS
NOTARY ID # 12953002-4
My Comm. Expires 08-20-2025

STATE OF TEXAS
COUNTY OF WILLIAMSON

BEFORE ME, THE UNDERSIGNED AUTHORITY, ON THIS THE 20th DAY OF September 2022, PERSONALLY APPEARED BRAD ANDREWS, KNOWN BY ME TO BE THE PERSON WHOSE NAME IS SUBSCRIBED ON THE FOREGOING INSTRUMENT AND HE ACKNOWLEDGED BEFORE ME THAT SHE EXECUTED THE SAME FOR THE PURPOSES AND CONSIDERATIONS THEREIN EXPRESSED.

NOTARY PUBLIC IN AND FOR THE STATE OF TEXAS

Brandi Spiller
PRINTED NAME

08-20-2025
DATE NOTARY COMMISSION EXPIRES

BRANDI SPILLER
Notary Public
STATE OF TEXAS
NOTARY ID # 12953002-4
My Comm. Expires 08-20-2025

STATE OF TEXAS §
§KNOW ALL MEN BY THESE PRESENTS
COUNTY OF WILLIAMSON §

I, FIRSTCAPITAL BANK OF TEXAS, N.A., AS THE LIEN HOLDER OF LOT 3, BLOCK 1 OF HERITAGE RIDGE CONVEYED FROM HERITAGE RIDGE INVESTMENTS, LLC TO LIBERTY HILL 29, LLC BY DEED RECORDED IN DOCUMENT NUMBER 2022008495 OF THE OFFICIAL PUBLIC RECORDS OF WILLIAMSON COUNTY, TEXAS DO HEREBY DEDICATE TO THE PUBLIC THE USE OF ALL STREETS, ALLEYS, EASEMENTS AND ALL OTHER LANDS INTENDED FOR PUBLIC DEDICATION AS SHOWN HEREON TO BE KNOWN AS "REPLAT LOT 3, BLOCK 1 – HERITAGE RIDGE".

BY: Trey Salaana
FIRSTCAPITAL BANK OF TEXAS, N.A

STATE OF TEXAS
COUNTY OF WILLIAMSON

BEFORE ME, THE UNDERSIGNED AUTHORITY, ON THIS THE 22nd DAY OF September 2022, PERSONALLY APPEARED Trey Salaana, KNOWN BY ME TO BE THE PERSON WHOSE NAME IS SUBSCRIBED ON THE FOREGOING INSTRUMENT AND SHE ACKNOWLEDGED BEFORE ME THAT SHE EXECUTED THE SAME FOR THE PURPOSES AND CONSIDERATIONS THEREIN EXPRESSED.

NOTARY PUBLIC IN AND FOR THE STATE OF TEXAS

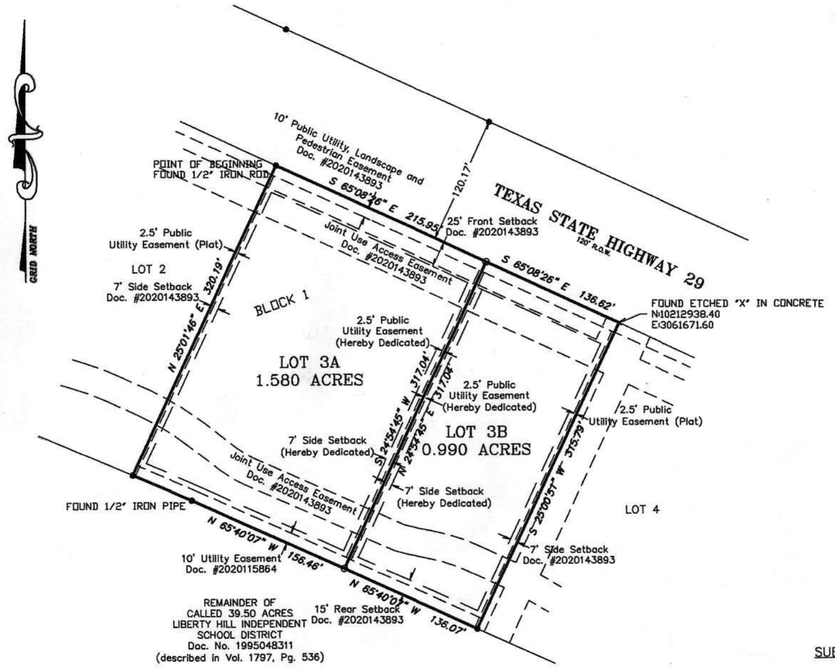
Brandi Spiller
PRINTED NAME

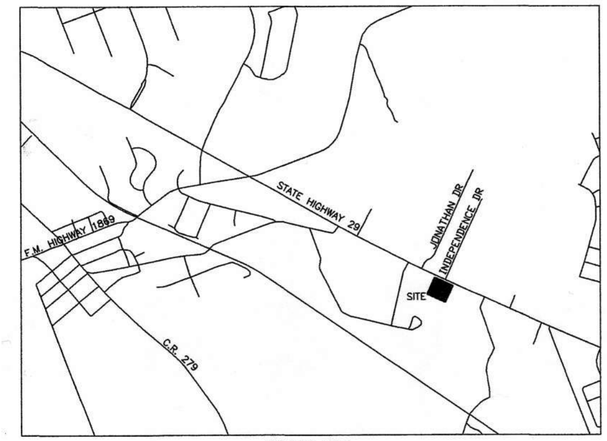
08-20-2025
DATE NOTARY COMMISSION EXPIRES

BRANDI SPILLER
Notary Public
STATE OF TEXAS
NOTARY ID # 12953002-4
My Comm. Expires 08-20-2025

COUNTY COURT WILLIAMSON COUNTY, TEXAS

RECORDERS MEMORANDUM
All or parts of the text on this page was not clearly legible for satisfactory recordation.





VICINITY MAP
SCALE: 1"=2000'

STATE OF TEXAS §
§KNOW ALL MEN BY THESE PRESENTS
COUNTY OF MILAM §

I, BRADLEY LIPSCOMB, REGISTERED PROFESSIONAL LAND SURVEYOR IN THE STATE OF TEXAS, DO HEREBY CERTIFY THAT I PREPARED THIS PLAT FROM AN ACTUAL AND ACCURATE ON THE GROUND SURVEY, THE PROPERTY BOUNDARY CLOSES AS PER MINIMUM STANDARDS SET FORTH BY THE TEXAS BOARD OF PROFESSIONAL ENGINEERS AND LAND SURVEYORS CODE, AS AMENDED, SPECIFICALLY SECTIONS 663.13–663.23 WHICH INCLUDES PROVISIONS REQUIRING 1:10,000 + 0.10' (URBAN) PRECISIONS FOR MONUMENTS FOUND OR SET WITHIN THE CORPORATE LIMITS OF ANY CITY, AND THAT THE CORNER MONUMENTS SHOWN THEREON WERE PROPERLY PLACED UNDER MY PERSONAL SUPERVISION, IN ACCORDANCE WITH CHAPTER 5, SUBDIVISIONS, PUBLIC IMPROVEMENTS, CITY OF LIBERTY HILL UNIFIED DEVELOPMENT CODE.

TO CERTIFY WHICH, WITNESS MY HAND AND SEAL AT ROCKDALE, TEXAS THIS THE 6th DAY OF SEPTEMBER, 2022.

BRADLEY L. LIPSCOMB
REGISTERED PROFESSIONAL LAND SURVEYOR NO. 5952
STATE OF TEXAS

STATE OF TEXAS REGISTERED BRADLEY L LIPSCOMB 5952 PROFESSIONAL LAND SURVEYOR

STATE OF TEXAS §
§KNOW ALL MEN BY THESE PRESENTS
COUNTY OF WILLIAMSON §

I, NICHOLAS SANDLIN, REGISTERED PROFESSIONAL ENGINEER IN THE STATE OF TEXAS, DO HEREBY CERTIFY THAT THIS PLAT COMPLIES WITH CHAPTER 5, SUBDIVISIONS, PUBLIC IMPROVEMENTS, CITY OF LIBERTY HILL UNIFIED DEVELOPMENT CODE AND THE DESIGN AND CONSTRUCTION STANDARDS ADOPTED BY THE CITY OF LIBERTY HILL, TEXAS.

NICHOLAS SANDLIN — DATE 9/6/2022
REGISTERED PROFESSIONAL ENGINEER NO. 124404
STATE OF TEXAS

STATE OF TEXAS NICHOLAS R. SANDLIN 124404 LICENSED PROFESSIONAL ENGINEER

CITY APPROVAL

I, JERRY MILLARD, DIRECTOR OF PLANNING, DESIGNEE, OF THE CITY OF LIBERTY HILL, TEXAS, UNDER THE AUTHORITY GRANTED ME IN SECTION 3.09.02 OF THE UNIFIED DEVELOPMENT CODE, IN ACCORDANCE WITH THE TEXAS LOCAL GOVERNMENT CODE, DO HEREBY CERTIFY THIS PLAT AS APPROVED FOR FILING OF RECORD WITH THE COUNTY CLERK OF WILLIAMSON COUNTY, TEXAS.

JERRY MILLARD, DIRECTOR OF PLANNING — DATE 9-28-22

STATE OF TEXAS §
§KNOW ALL MEN BY THESE PRESENTS
COUNTY OF WILLIAMSON §

I, Nancy Rister, Clerk of the County Court of said County, do hereby certify that the foregoing instrument in writing, with its certificate of authentication was filed for record in my office on the 17th day of October, 2022 A.D., at 11:00 o'clock, A.M., and duly recorded this the day of October, 2022 A.D., at 11:13 o'clock, A.M., in the Official Public Records of said County in Instrument No. 2022118630.
TO CERTIFY WHICH, WITNESS my hand and seal at the County Court of said County, at my office in Georgetown, Texas, the date last shown above written.

NANCY E. RISTER, CLERK COUNTY COURT
OF WILLIAMSON COUNTY, TEXAS
BY: Diane Lam, DEPUTY

SUBJECT PROPERTY (AS SURVEYED)

All that certain tract or parcel of land situated in the City of Liberty Hill, Williamson County, Texas, being all of Lot 3, Block 1 of Heritage Ridge recorded in a map or plat thereof recorded in Document Number 2020143893 of the Official Public Records of Williamson County, Texas, and being more particularly described by metes and bounds as follows to wit:

BEGINNING at a found ½" iron rod on the south Right-of-Way line of State Highway 29, at the northeast corner of Lot 2, Block 1 of the said Heritage Ridge, for the northwest corner of this tract;

THENCE S65°08'26"E - 352.57' along the said south Right-of-Way line of State Highway 29 to a found etched "X" in concrete at the northwest corner of Lot 4, Block 1 of the said Heritage Ridge, for the northeast corner of this tract;

THENCE S25°00'51"W - 315.79' along the west line of the said Lot 4 to a found 5/8" iron rod with orange plastic cap marked "ACS" on the north line of the residue of a called 39.50 Acre tract conveyed to the Liberty Hill Independent School District in Document No. 1995048311 (Described in Volume 1797, Page 536), at the southwest corner of the said Lot 4, for the southeast corner of this tract;

THENCE along the said north line of the residue of the 39.50 Acre tract for the following courses and distances:

N65°40'07"W - 292.53' to a found ½" iron pipe for an interior ell corner of this tract;
N66°45'35"W - 60.17' to a found 5/8" iron rod with orange plastic cap marked "ACS" at the southeast corner of the said Lot 2, for the southwest corner of this tract;

THENCE N25°01'46"E - 320.19' along the east line of the said Lot 2 to the **POINT OF BEGINNING** containing within these metes and bounds 2.570 Acres of land.

GENERAL NOTES:

1. THIS SUBDIVISION IS WHOLLY CONTAINED WITHIN THE CURRENTLY CORPORATE LIMITS OF THE CITY OF LIBERTY HILL, TEXAS.
2. NO LOT IN THIS SUBDIVISION SHALL BE OCCUPIED UNTIL CONNECTED TO PERMITTED WATER DISTRIBUTION AND WASTEWATER COLLECTION FACILITIES.
3. A BUILDING PERMIT IS REQUIRED FROM THE CITY OF LIBERTY HILL PRIOR TO CONSTRUCTION OF ANY BUILDING OR SITE IMPROVEMENT(S) ON ANY LOT WITHIN THIS SUBDIVISION.
4. SIDEWALKS SHALL BE CONSTRUCTED IN ACCORDANCE WITH CHAPTER 5, SUBDIVISIONS & PUBLIC IMPROVEMENTS, CITY OF LIBERTY HILL UNIFIED DEVELOPMENT CODE.
5. ALL EASEMENTS ON PRIVATE PROPERTY SHALL BE MAINTAINED BY THE PROPERTY OWNER OR HIS OR HER ASSIGNS.
6. NO PORTION OF THIS TRACT LIES WITHIN A SPECIAL FLOOD HAZARD AREA AS SHOWN ON THE FLOOD INSURANCE RATE MAP PANEL 48491C0245F FOR WILLIAMSON COUNTY, TEXAS, EFFECTIVE DECEMBER 20, 2019.
7. NO OBSTRUCTIONS, INCLUDING BUT NOT LIMITED TO FENCING OR STORAGE, SHALL BE PERMITTED IN ANY DRAINAGE EASEMENTS SHOWN HEREON

OWNERS:

LIBERTY HILL 29, LLC
8001 QUAKER AVE., SUITE K
LUBBOCK, TX 79424

ACREAGE:

2.570 ACRES

SURVEYOR:

TRIAD SURVEYING, INC. (F–100007900)
P.O. BOX 1489
ROCKDALE, TX 76567
(512) 446–3457

ENGINEER:

SANDLIN SERVICES, LLC
8500 N MOPAC, STE 804
AUSTIN, TX 78759
TBPELS FIRM REGISTRATION #21356

LINEAR FEET OF NEW STREETS:

NONE

BENCHMARK INFORMATION:

TBM – "X" FOUND ETCHED IN A CONCRETE SLAB ON THE SOUTH RIGHT–OF–WAY LINE OF STATE HIGHWAY 29, AT THE NORTHWEST CORNER OF THE SHOWN LOT 4, AT THE NORTHEAST CORNER OF THE SHOWN LOT 3 HAVING AN ELEVATION OF: 1020.22'

LEGEND

● – 5/8" IRON ROD FOUND WITH ORANGE CAP MARKED "ACS" UNLESS OTHERWISE NOTED
○ – 1/2" IRON ROD SET WITH RED CAP MARKED "TRIAD RPLS 5952"

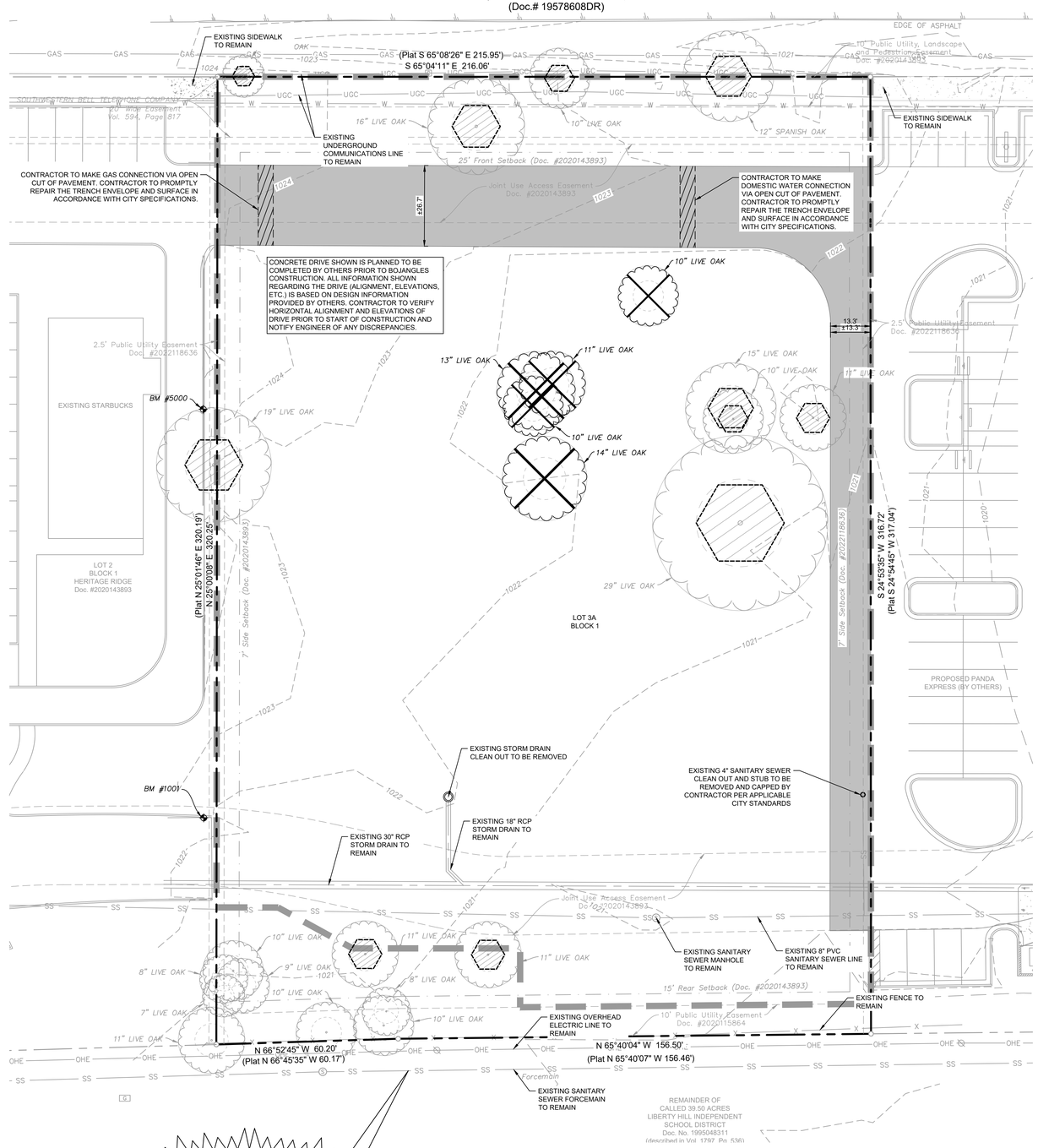
BEARINGS ARE BASED ON THE TEXAS STATE PLANE COORDINATE SYSTEM OF 1983, TEXAS CENTRAL ZONE

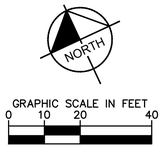
50 0 50 100 150 200 250 300
SCALE: 1" = 100 FEET

TRIAD SURVEYING
SURVEYING, INC. FIRM REGISTRATION NO. 10007900
528 COUNTY ROAD 325 P.O. BOX 1489 ROCKDALE, TX. 76567

REPLAT LOT 3, BLOCK 1 – HERITAGE RIDGE
CITY OF LIBERTY HILL
WILLIAMSON COUNTY, TEXAS

Completion Date: 6/2/22		Drawn by:	BL
Scale: 1"=100'		Surveyed by:	LS
PROJECT NO. S22–133		Checked by:	BL





NOTES

1. THE CONTRACTOR SHALL COORDINATE WITH THE CITY OF LIBERTY HILL AND FRANCHISED UTILITY COMPANIES TO MAINTAIN SERVICES AT ALL TIMES TO NEIGHBORING PROPERTIES. THE CONTRACTOR SHALL MAINTAIN COMPLETE RECORDS INDICATING HOW THE WASTE FROM THE SITE HAS BEEN HANDLED. ALL FACILITIES TO BE REMOVED SHALL BE UNDERCUT TO SUITABLE MATERIAL AND BROUGHT TO GRADE WITH SUITABLE COMPACTED FILL MATERIAL PER THE SPECIFICATIONS IN THE GEOTECHNICAL REPORT. THE SITE, AFTER DEMOLITION SHALL BE GRADED TO ELIMINATE DEPRESSIONS, HOLES, BERMS, DIRT PILES, ETC. THE SITE IS TO BE GRADED UNTIL RELATIVELY SMOOTH AND ATTRACTIVE IN APPEARANCE PRIOR TO STABILIZATION OF EARTH. ANY FILL MATERIAL/FILL AREAS SHALL BE COMPACTED TO 95% OF STANDARD PROCTOR DENSITY AT A MOISTURE AT, OR ABOVE, OPTIMUM MOISTURE CONTENT IN MAXIMUM 8" LIFTS. CONTRACTOR SHALL PROVIDE PROOF IN THE FORM OF LAB TEST KITS THAT THIS HAS BEEN ACHIEVED.
2. THE CONTRACTOR SHALL BE RESPONSIBLE TO CLEAR, GRUB, AND STRIP ALL EXISTING IMPROVEMENTS, TREES, VEGETATION, AND TOP SOIL WITHIN THE LIMITS OF DISTURBANCE UNLESS OTHERWISE NOTED.
3. THE CONTRACTOR IS RESPONSIBLE FOR REMOVING ALL DEBRIS FROM THE SITE AND DISPOSING THE DEBRIS IN A LAWFUL MANNER. THE CONTRACTOR IS RESPONSIBLE FOR OBTAINING ALL PERMITS REQUIRED FOR DEMOLITION AND DISPOSAL. CONTRACTOR SHALL BE RESPONSIBLE FOR REVIEWING THE PHASE I ENVIRONMENTAL SITE ASSESSMENT.
4. LOCATIONS OF PUBLIC AND PRIVATE UTILITIES SHOWN ARE APPROXIMATE AND MAY NOT BE COMPLETE. CONTRACTOR SHALL CALL 811 AT LEAST 48 HOURS PRIOR TO COMMENCING DEMOLITION OR CONSTRUCTION ACTIVITIES. CONTRACTOR SHALL CONTACT ANY OTHER UTILITY COMPANIES WHO DO NOT SUBSCRIBE TO THE TESS PROGRAM FOR LINE MARKINGS. THE CONTRACTOR BEARS SOLE RESPONSIBILITY FOR VERIFYING LOCATIONS OF EXISTING UTILITIES, SHOWN OR NOT SHOWN, AND FOR ANY DAMAGE DONE TO THESE FACILITIES.
5. ALL EXISTING UTILITIES SHOWN ARE LOCATED ACCORDING TO THE INFORMATION AVAILABLE TO THE ENGINEER AT THE TIME THE DRAWINGS WERE PREPARED AND HAVE NOT BEEN INDEPENDENTLY VERIFIED BY THE OWNER OR THE ENGINEER. GUARANTEE IS NOT MADE THAT ALL EXISTING UNDERGROUND UTILITIES ARE SHOWN OR THAT THE LOCATION OF THOSE SHOWN ARE ACCURATE. FINDING THE ACTUAL LOCATION OF ANY EXISTING UTILITIES IS THE CONTRACTORS RESPONSIBILITY AND SHALL BE DONE BEFORE THEY COMMENCE ANY WORK, IN THE VICINITY. FURTHMORE, THE CONTRACTOR SHALL BE SOLELY RESPONSIBLE FOR ANY AND ALL DAMAGE DUE TO THE CONTRACTORS FAILURE TO EXACTLY LOCATE AND PRESERVE ANY AND ALL UNDERGROUND UTILITIES. THE OWNER OR ENGINEER WILL ASSUME NO LIABILITY FOR ANY DAMAGES SUSTAINED OR COST INCURRED BECAUSE OF THE OPERATIONS IN THE VICINITY OF EXISTING UTILITIES OR STRUCTURES, NOR FOR TEMPORARY BRACING AND SHORING OF SAME. IF IT IS NECESSARY TO SHORE, BRACE, SWING OR RELOCATE A UTILITY, THE UTILITY COMPANY OR DEPARTMENT AFFECTED SHALL BE CONTACTED BY THE CONTRACTOR AND THEIR PERMISSION OBTAINED REGARDING THE METHOD TO USE FOR SUCH WORK.
6. IT IS THE CONTRACTORS RESPONSIBILITY TO CONTACT THE VARIOUS UTILITY COMPANIES WHICH MAY HAVE BURIED OR AERIAL UTILITIES WITHIN OR NEAR THE CONSTRUCTION AREA BEFORE COMMENCING WORK. THE CONTRACTOR SHALL PROVIDE 72 HOURS MINIMUM NOTICE TO ALL UTILITY COMPANIES PRIOR TO BEGINNING CONSTRUCTION.
7. THE CONTRACTOR SHALL HAVE AVAILABLE AT THE JOB SITE AT ALL TIMES ONE COPY OF THE CONTRACT DOCUMENTS INCLUDING PLANS, SPECIFICATIONS AND SPECIAL CONDITIONS, COPIES OF ANY REQUIRED CONSTRUCTION PERMITS, AND EROSION CONTROL PLANS.
8. ANY DISCREPANCIES ON THE DRAWINGS SHALL BE IMMEDIATELY BROUGHT TO THE ATTENTION OF THE OWNER BEFORE COMMENCING WORK. NO FIELD CHANGES OR DEVIATIONS FROM DESIGN ARE TO BE MADE WITHOUT PRIOR APPROVAL OF THE OWNER AND NOTIFICATION TO THE ENGINEER. NO CONSIDERATION WILL BE GIVEN TO CHANGE ORDERS FOR WHICH THE OWNER WAS NOT CONTACTED PRIOR TO CONSTRUCTION OF THE AFFECTED ITEM.
9. CONTRACTOR IS RESPONSIBLE FOR TRAFFIC CONTROL DEVICES FOR ANY STREET WORK.
10. THE CONTRACTOR SHALL COORDINATE WITH RESPECTIVE UTILITY COMPANIES PRIOR TO THE REMOVAL AND/OR RELOCATION OF UTILITIES. THE CONTRACTOR SHALL COORDINATE WITH THE UTILITY COMPANY CONCERNING PORTIONS OF WORK WHICH MAY BE PERFORMED BY THE UTILITY COMPANY'S FORCES AND ANY FEES WHICH ARE TO BE PAID TO THE UTILITY COMPANY FOR THEIR SERVICES. THE DEVELOPER IS RESPONSIBLE FOR PAYING ALL FEES AND CHARGES.
11. CONTRACTOR MUST PROTECT THE PUBLIC AT ALL TIMES WITH FENCING, BARRICADES, ENCLOSURES, ETC., ACCORDING TO STANDARD BEST PRACTICES.
12. PRIOR TO DEMOLITION OCCURRING, ALL EROSION CONTROL DEVICES AROUND THE SITE PERIMETER ARE TO BE INSTALLED.
13. DAMAGE TO ALL EXISTING CONDITIONS TO REMAIN WILL BE REPLACED AT CONTRACTOR'S EXPENSE.
14. CONTRACTOR SHALL COMPLY TO THE FULLEST EXTENT WITH ALL REGULATIONS GOVERNING THE DEMOLITION, REMOVAL, TRANSPORTATION AND DISPOSAL OF ALL DEMOLITION DEBRIS.
15. CONTRACTOR SHALL COMPLY TO THE FULLEST EXTENT WITH THE LATEST OSHA STANDARDS FOR EXCAVATION AND TRENCHING PROCEDURES. CONTRACTOR SHALL USE SUPPORT SYSTEMS, SLOPING, BENCHING, ETC. AS NECESSARY FOR THESE OPERATIONS, AND SHALL COMPLY WITH ALL OSHA PERFORMANCE CRITERIA.
16. ANY RECYCLED MATERIAL TO BE STOCKPILED ON THE SITE SHALL BE STORED IN AS SMALL AN AREA AS PRACTICABLE AND THE LOCATION OF ANY STOCKPILE SHALL BE WELL CLEAR OF THE BUILDING PAD AREA AND THE LOCATION MUST BE PRE-APPROVED BY THE OWNER PRIOR TO STOCKPILING.
17. FILL MATERIAL SHALL BE PLACED IN ACCORDANCE WITH THE GEOTECH REPORT.
18. W. MILITARY ROAD HAS BEEN DEEMED TO HAVE A PAVEMENT CONDITION INDEX (PCI) OF 51-85 ON 6/15/2023 BY THE CITY OF SAN ANTONIO PUBLIC WORKS DEPARTMENT/ROW MANAGEMENT. IN THE EVENT OF AN EXCAVATION IN A STREET OR RIGHT OF WAY HAVING A PCI OF 51-85, THE RIGHT OF WAY USER EXCAVATOR SHALL PROMPTLY REPAIR THE TRENCH ENVELOPE AND SURFACE IN ACCORDANCE WITH THE SPECIFICATIONS SET FORTH IN THE RIGHT-OF-WAY MANAGEMENT OFFICE. IN THE EVENT OF FAILURE OF THE REPAIR DURING THE GUARANTY PERIOD, THE RIGHT-OF-WAY/USER EXCAVATOR SHALL REIMBURSE THE CITY FOR ITS PAVEMENT RESTORATION COST AND PAY THE PAVEMENT DEGRADATION RECOVERY FEE, CALCULATED AS SET FORTH IN THE RIGHT-OF-WAY MANAGEMENT ORDINANCE. CONTRACTOR TO COORDINATE WITH ANTHONY CANAVACHOLO (210-309-0097) PRIOR TO CONSTRUCTION TO DETERMINE TRUE LIMITS OF PAVEMENT RECONSTRUCTION.

LEGEND

	PROPERTY BOUNDARY
	LIMITS OF DISTURBANCE
	PROPOSED SAWCUT LIMITS
	BENCHMARK
	PROPERTY CORNER
UGC	EXISTING UNDERGROUND COMMUNICATIONS LINE TO REMAIN
W	EXISTING WATER LINE TO REMAIN
GAS	EXISTING GAS LINE TO REMAIN
SS	PROPOSED SANITARY SEWER LINE EXTENSION (BY OTHERS)
X	EXISTING METALLIC FENCE TO REMAIN
OHE	EXISTING OVERHEAD TO REMAIN
OHE	EXISTING OVERHEAD TO BE REMOVED
	PROPOSED CONCRETE PAVEMENT BY PANDA EXPRESS
	EXISTING SIGN
	EXISTING ELECTRIC EQUIPMENT
	EXISTING UTILITY POLE
	EXISTING LIGHT POLE
	EXISTING CLEANOUT
	EXISTING GAS METER
	EXISTING GAS VALVE
	EXISTING WATER METER
	EXISTING TREE TO BE REMOVED
	EXISTING TREE TO REMAIN CONTRACTOR TO PROTECT IN PLACE (REF. LANDSCAPE PLANS FOR TREE PROTECTION DETAILS AND MITIGATION CALCULATIONS)

CAUTION!!

EXISTING UNDERGROUND UTILITIES IN THE AREA CONTRACTOR IS RESPONSIBLE FOR DETERMINING THE HORIZON AND VERTICAL LOCATION OF ALL UTILITIES PRIOR TO CONSTRUCTION. CONTRACTOR SHALL BE RESPONSIBLE FOR ANY REPAIRS TO EXISITNG UTILITIES DUE TO DAMAGE INCURRED DURING CONSTRUCTION. CONTRACTOR SHALL NOTIFY THE ENGINEER OF ANY DISCREPANCIES ON THE PLANS.

ADVISORY NOTES

1. KIMLEY-HORN AND ASSOCIATES, INC. IS NOT RESPONSIBLE FOR THE MEANS AND METHODS EMPLOYED BY THE CONTRACTOR TO IMPLEMENT THIS DEMOLITION PLAN. THIS DEMOLITION PLAN SIMPLY INDICATES THE KNOWN OBJECTS ON THE SUBJECT TRACTS THAT ARE TO BE DEMOLISHED AND REMOVED FROM THE SITE. KIMLEY-HORN AND ASSOCIATES, INC. DOES NOT WARRANT OR REPRESENT THAT THE PLAN, WHICH WAS PREPARED BASED ON SURVEY AND UTILITY INFORMATION PROVIDED BY OTHERS, SHOWS ALL IMPROVEMENTS AND UTILITIES, THAT THE IMPROVEMENTS AND UTILITIES ARE SHOWN ACCURATELY, OR THAT THE UTILITIES SHOWN CAN BE REMOVED. THE CONTRACTOR IS RESPONSIBLE FOR PERFORMING HIS OWN SITE RECONNAISSANCE TO SCOPE HIS WORK AND TO CONFIRM WITH THE OWNERS OF IMPROVEMENTS AND UTILITIES THE ABILITY AND PROCESS FOR THE REMOVAL OF THEIR FACILITIES. THIS PLAN IS INTENDED TO GIVE A GENERAL GUIDE TO THE CONTRACTOR, NOTHING MORE. THE GOAL OF THE DEMOLITION IS TO LEAVE THE SITE IN A STATE SUITABLE FOR THE CONSTRUCTION OF THE PROPOSED DEVELOPMENT. REMOVAL OR PRESERVATION OF IMPROVEMENTS, UTILITIES, ETC. TO ACCOMPLISH THIS GOAL ARE THE RESPONSIBILITY OF THE CONTRACTOR.
2. THE CONTRACTOR IS STRONGLY CAUTIONED TO REVIEW ANY AVAILABLE REPORTS DESCRIBING SITE CONDITIONS PRIOR TO BIDDING AND IMPLEMENTING THE DEMOLITION PLAN.
3. CONTRACTOR SHALL COMPLY WITH ALL LOCAL, STATE, AND FEDERAL REGULATIONS REGARDING THE DEMOLITION OF OBJECTS ON THE SITE AND THE DISPOSAL OF THE DEMOLISHED MATERIALS OFF-SITE. IT IS THE CONTRACTOR'S RESPONSIBILITY TO REVIEW THE SITE, DETERMINE THE APPLICABLE REGULATIONS, RECEIVE THE REQUIRED PERMITS AND AUTHORIZATIONS, AND COMPLY.
4. KIMLEY-HORN AND ASSOCIATES, INC. DOES NOT WARRANT OR REPRESENT THAT THE REPORTS AND SURVEYS REFERENCED ABOVE ARE ACCURATE, COMPLETE, OR COMPREHENSIVE.

BENCHMARK LIST

BM #5000
SQUARE WITH "X" SET ON TOP OF CURB
N: 10,212,988.921
E: 3,061,300.850
ELEV: 1025.01'

BM #1001
"X" SET ON TOP OF CURB
N: 10,212,866.233
E: 3,061,244.005
ELEV: 1022.52

ALL ELEVATIONS SHOWN HEREON ARE TIED TO THE NORTH AMERICAN VERTICAL DATUM OF 1988 (NAVD '88) BASED ON GPS OBSERVATIONS

CAUTION!!

EXISTING UNDERGROUND UTILITIES IN THE AREA CONTRACTOR IS RESPONSIBLE FOR DETERMINING THE HORIZONTAL AND VERTICAL LOCATION OF ALL UTILITIES PRIOR TO CONSTRUCTION. CONTRACTOR SHALL BE RESPONSIBLE FOR ANY REPAIRS TO EXISTING UTILITIES DUE TO DAMAGE INCURRED DURING CONSTRUCTION. CONTRACTOR SHALL NOTIFY THE ENGINEER OF ANY DISCREPANCIES ON THE PLANS.

811 Know what's below. Call before you dig.

REVISIONS:

DEMOLITION SITE PLAN

NEW RESTAURANT FOR:

Bojangles
W. State Hwy 29
Liberty Hill, TX 78642

Kimley»Horn

© 2024 KIMLEY-HORN AND ASSOCIATES, INC.
1251 SADLER EAST DRIVE,
SUITE 175, 78258
SAN MARCOS, TX 78666
PHONE: 512-566-4457
WWW.KIMLEY-HORN.COM TBPE FIRM NO. 928

STATE OF TEXAS
JORDAN P. SCHAEFER
122080
REGISTERED PROFESSIONAL ENGINEER
02/02/2024

Charles William Pope & Associates
ARCHITECTURE, PLANNING CONSULTING
224 GARDENVIEW, SAN ANTONIO, TX. 78213

DATE: 02/02/2024
JOB NO: 069243600
DRAWN BY: MJG
SHEET NUMBER:
1.1
OF

Plotted By:Burns, Dylan January 31, 2024 02:52:05pm K:\SMA_Civil\Bojangles\069243600 - Bojangles (Liberty Hill)\CAD\PlanSheets\C-DEMO-069243600.dwg
This document, together with the concepts and designs presented herein, as an instrument of service, is intended only for the specific purpose and client for which it was prepared. Reuse of and improper reliance on this document without written authorization and adaptation by Kimley-Horn and Associates, Inc. shall be without liability to Kimley-Horn and Associates, Inc.

SITE MAPS - SITE SPECIFIC NOTES

1. CONSTRUCTION ENTRANCE SHALL BE LOCATED SO AS TO PROVIDE THE LEAST AMOUNT OF DISTURBANCE TO THE FLOW OF TRAFFIC IN AND OUT OF THE SITE. ADDITIONALLY, CONSTRUCTION ENTRANCE SHALL BE LOCATED TO COINCIDE WITH THE PHASING OF THE PAVEMENT REPLACEMENT.
2. THE NATURE OF THIS SITE'S CONSTRUCTION CONSISTS OF:
   A. CLEARING AND GRUBBING
   B. PRELIMINARY GRADING
   C. UTILITY INSTALLATION
   D. PAVEMENT CONSTRUCTION
   E. BUILDING CONSTRUCTION
   F. FINAL GRADING AND STABILIZATION
3. THE SUBSURFACE CONDITIONS ON-SITE CONSIST GENERALLY OF FAT CLAY AND CLAYEY SAND, UNDERLAIN BY LIMESTONE. THE EXISTING PAVEMENT SECTION CONSISTS OF 4 TO 7 INCHES OF CONCRETE OVER 3 TO 5 INCHES OF BASE MATERIAL. LIMESTONE WAS ENCOUNTERED IN ALL OF THE BORINGS TO A DEPTH OF 11 FEET BELOW EXISTING PAVEMENT PER REPORT NO.AC234065, PREPARED BY TERRACON ON 10/05/2023. STORM WATER ON-SITE WILL LEAVE THE SITE VIA UNDERGROUND STORM SEWER.
4. POST CONSTRUCTION STORM WATER POLLUTION CONTROL MEASURES INCLUDE STABILIZATION BY PERMANENT PAVING, OR LANDSCAPING.
5. DISTURBED PORTIONS OF SITE MUST BE STABILIZED. STABILIZATION PRACTICES MUST BE INITIATED WITHIN 14 DAYS IN PORTIONS OF THE SITE WHERE CONSTRUCTION HAS BEEN EITHER TEMPORARILY OR PERMANENTLY CEASED, UNLESS EXCEPTED WITHIN THE TPDES PERMIT. CONTRACTOR SHALL REMOVE TEMPORARY EROSION CONTROL DEVICES UPON COMPLETION OF STABILIZATION OR PERMANENT DRAINAGE FACILITIES.
6. ACCORDING TO COMMUNITY PANEL NO.48491C0245F, DATED 12/20/2019 OF THE FEDERAL EMERGENCY MANAGEMENT AGENCY (FEMA) FLOOD INSURANCE RATE MAP (FIRM), THIS PROPERTY IS WITHIN ZONE "X" (UN-SHADED) DEFINED BY FEMA AS "AREAS DETERMINED TO BE OUTSIDE THE 0.2% ANNUAL CHANCE FLOODPLAIN."
7. CONTRACTOR IS RESPONSIBLE FOR MODIFYING THE SWPPP/SITE MAP TO INCLUDE BMP'S FOR ANY OFF-SITE MATERIAL WASTE, BORROW OR EQUIPMENT STORAGE AREAS.
8. CONTRACTOR SHALL INSPECT DISTURBED AREAS, MATERIAL STORAGE AREAS EXPOSED TO PRECIPITATION, STRUCTURAL CONTROL MEASURES, AND VEHICLE ENTRY AND EXIT AREAS AT LEAST ONCE EVERY 14 CALENDAR DAYS AND WITHIN 24 HOURS OF A STORM EVENT OF 0.5 INCHES OR GREATER.

TEMPORARY EROSION CONTROL NOTES

1. THE CONTRACTOR SHALL INSTALL EROSION/SEDIMENTATION CONTROLS AND TREE/NATURAL AREA PROTECTIVE FENCING PRIOR TO ANY SITE PREPARATION WORK (CLEARING, GRUBBING OR EXCAVATION).
2. THE PLACEMENT OF EROSION/SEDIMENTATION CONTROLS SHALL BE IN ACCORDANCE WITH THE APPROVED EROSION AND SEDIMENTATION CONTROL PLAN.
3. THE PLACEMENT OF TREE/NATURAL AREA PROTECTIVE FENCING SHALL BE IN ACCORDANCE WITH STANDARD NOTES FOR TREE AND NATURAL AREA PROTECTION AND THE APPROVED GRADING/TREE AND NATURAL AREA PLAN.
4. A PRE-CONSTRUCTION CONFERENCE SHALL BE HELD ON-SITE WITH THE CONTRACTOR, DESIGN ENGINEER/PERMIT APPLICANT AND ENVIRONMENTAL INSPECTOR AFTER INSTALLATION OF THE EROSION/SEDIMENTATION CONTROLS AND TREE/NATURAL AREA PROTECTION MEASURES AND PRIOR TO BEGINNING ANY SITE PREPARATION WORK. THE CONTRACTOR SHALL NOTIFY THE CITY AT LEAST THREE (3) DAYS PRIOR TO THE MEETING DATE.
5. ANY MAJOR VARIATION IN MATERIALS OR LOCATIONS OF CONTROLS OR FENCES FROM THOSE SHOWN ON THE APPROVED PLANS WILL REQUIRE A REVISION AND MUST BE APPROVED BY THE REVIEWING ENGINEER, ENVIRONMENTAL SPECIALIST, OR ARBORIST AS APPROPRIATE. MAJOR REVISIONS MUST BE APPROVED BY THE PLANNING AND DEVELOPMENT DEPARTMENT AND THE DRAINAGE UTILITY DEPARTMENT. MINOR CHANGES OR ADDITIONAL CONTROL MEASURES TO BE MADE AS FIELD REVISIONS TO THE EROSION AND SEDIMENTATION CONTROL PLAN MAY BE REQUIRED BY THE ENVIRONMENTAL INSPECTOR DURING THE COURSE OF CONSTRUCTION TO CORRECT CONTROL INADEQUACIES AT NO ADDITIONAL COST TO THE OWNER.
6. THE CONTRACTOR IS REQUIRED TO INSPECT THE CONTROLS AND FENCES AT WEEKLY INTERVALS AND AFTER SIGNIFICANT RAINFALL EVENTS TO INSURE THAT THEY ARE FUNCTIONING PROPERLY. THE PERSON(S) RESPONSIBLE FOR MAINTENANCE OF CONTROLS AND FENCES SHALL IMMEDIATELY MAKE ANY NECESSARY REPAIRS TO DAMAGED AREAS. SILT ACCUMULATION AT CONTROLS MUST BE REMOVED WHEN THE DEPTH REACHES SIX (6) INCHES.

PERMANENT EROSION CONTROL NOTES

ALL DISTURBED AREAS SHALL BE RESTORED AS NOTED BELOW.

1. A. A MINIMUM OF FOUR (4) INCHES OF TOPSOIL SHALL BE PLACED IN ALL DRAINAGE CHANNELS (EXCEPT ROCK) AND BETWEEN THE CURB AND THE RIGHT-OF-WAY LINE.

   B. THE SEEDING FOR PERMANENT EROSION CONTROL SHALL BE APPLIED OVER AREAS DISTURBED BY CONSTRUCTION AS FOLLOWS:

BROADCAST SEEDING:

1. FROM SEPTEMBER 15 TO MARCH 1, SEEDING SHALL BE WITH A COMBINATION OF 2 POUNDS PER 1000 SQUARE FEET OF UNHULLED BERMUDA AND 7 POUNDS PER 1000 SQUARE FOOT OF WINTER RYE WITH A PURITY OF 95% WITH 90% GERMINATION.
2. FROM MARCH 2 TO SEPTEMBER 14, SEEDING SHALL BE WITH HULLED BERMUDA AT A RATE OF 2 POUNDS PER 1000 SQUARE FEET WITH A PURITY OF 95% WITH 85% GERMINATION.

   A. FERTILIZER SHALL BE A PELLETED OR GRANULAR SLOW RELEASE WITH AN ANALYSIS OF 15-15-15 TO BE APPLIED ONCE AT PLANTING AND ONCE DURING THE PERIOD OF ESTABLISHMENT AT THE RATE OF 1 POUND PER 1000 SQUARE FEET.

   B. MULCH TYPE USED SHALL BE HAY, STRAW OR MULCH APPLIED AT A RATE OF 45 POUNDS PER 1000 SQUARE FEET.

HYDRAULIC SEEDING:

1. FROM SEPTEMBER 15 TO MARCH 1, SEEDING SHALL BE WITH A COMBINATION OF 1 POUND PER 1000 SQUARE FEET OF UNHULLED BERMUDA AND 7 POUNDS PER 1000 SQUARE FOOT OF WINTER RYE WITH A PURITY OF 95% WITH 90% GERMINATION.
2. FROM MARCH 2 TO SEPTEMBER 14, SEEDING SHALL BE WITH HULLED BERMUDA AT A RATE OF 1 POUND PER 1000 SQUARE FEET WITH A PURITY OF 95% WITH 85% GERMINATION.

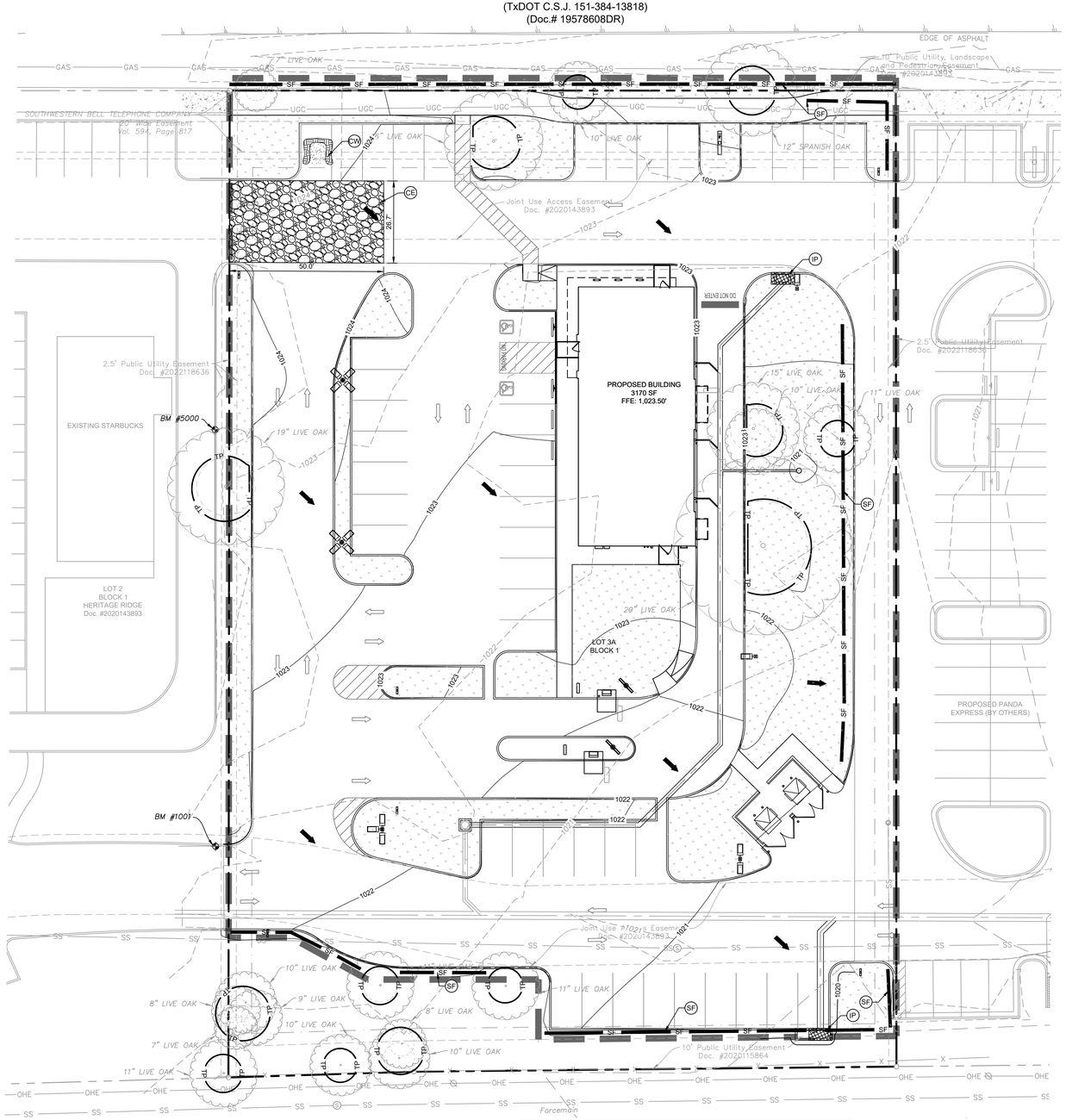
   A. FERTILIZER SHALL BE A WATER SOLUBLE FERTILIZER WITH AN ANALYSIS OF 15-15-15 AT THE RATE OF 1.5 POUNDS PER 1000 SQUARE FEET.

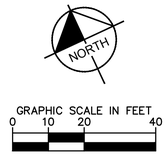
   B. MULCH TYPE USED SHALL BE HAY, STRAW OR MULCH APPLIED AT A RATE OF 45 POUNDS PER 1000 SQUARE FEET, WITH SOIL TACKIFIER AT A RATE OF 1.4 POUNDS PER 1000 SQUARE FEET.

   C. THE PLANTED AREA SHALL BE IRRIGATED OR SPRINKLED IN A MANNER THAT WILL NOT ERODE THE TOPSOIL, BUT WILL SUFFICIENTLY SOAK THE SOIL TO A DEPTH OF SIX (6) INCHES. THE IRRIGATION SHALL OCCUR AT TEN-DAY INTERVALS DURING THE FIRST TWO MONTHS. RAINFALL OCCURRENCES OF 1/2 INCH OR MORE SHALL POSTPONE THE WATERING SCHEDULE FOR ONE WEEK.

   D. RESTORATION SHALL BE ACCEPTABLE WHEN THE GRASS HAS GROWN AT LEAST 1-1/2 INCHES HIGH WITH 95% COVERAGE, PROVIDED NO BARE SPOTS LARGER THAN 16 SQUARE FEET EXIST.

   E. WHEN REQUIRED, NATIVE GRASS SEEDING SHALL COMPLY WITH





LEGEND

	PROPERTY BOUNDARY
1415	EXISTING CONTOUR
1415	PROPOSED CONTOUR
	PROPOSED LIMITS OF DISTURBANCE (APPROXIMATE)
	DIRECTION OF OVERLAND FLOW W/GRADE
SF	SILT FENCE (SEE DETAIL SHEET 2.4.2)
TP	TREE PROTECTION (REF. LANDSCAPE PLANS)
IP	INLET PROTECTION (SEE DETAIL SHEET 2.4.2)
CE	CONSTRUCTION EXIT (SEE DETAIL SHEET 2.4.2)
PS	PERMANENT STABILIZATION
CW	CONCRETE WASHOUT PIT (SEE DETAIL SHEET 2.4.2)
	TREE TO REMAIN

NOTES

1. AREAS CONTAINED WITHIN THE PROPERTY BOUNDARIES WILL BE AREAS OF DISTURBANCE AND SOIL STABILIZATION. ALL SOILS WITHIN THESE LIMITS SHALL BE STABILIZED BY VEGETATION OR STRUCTURE.
2. ALL CONSTRUCTION-RELATED VEHICLES MUST PARK INSIDE THE LIMITS OF CONSTRUCTION AND SERVED BY APPROPRIATE TEMPORARY CONTROLS, OR ON CITY-APPROVED SURFACES OUTSIDE THE LIMITS OF CONSTRUCTION.
3. CONTRACTOR SHALL REMOVE ALL SEDIMENT AND DEBRIS FROM CONSTRUCTED STORM SEWER SYSTEM UPON COMPLETION OF WORK.
4. IT SHALL BE THE CONTRACTOR'S RESPONSIBILITY TO USE WHATEVER MEANS ARE NECESSARY TO CONTROL AND LIMIT SILT AND SEDIMENT LEAVING THE SITE. SPECIFICALLY, THE CONTRACTOR SHALL PROTECT ALL PUBLIC STREETS, ALLEYS, STREAMS, STORM DRAIN SYSTEMS AND INLETS FROM EROSION DEPOSITS. THE CONTRACTOR RESPONSIBLE FOR MAINTAINING EROSION CONTROL SHALL PROVIDE STREET CLEANING ON PUBLIC STREETS IF ANY EARTH MATERIAL IS TRANSPORTED FROM THE CONSTRUCTION SITE AT THE END OF EACH DAY. EARTH MATERIAL SHALL NOT BE ALLOWED TO ACCUMULATE ON CITY AND TXDOT ROADS.

SITE DATA

TOTAL LOT AREA	68,808 SF	1.579 ACRES
TOTAL AREA DISTURBED *	64.152 SF	1.493 ACRES
PAVED AREA	47,070 SF	1.055 ACRES
ROOFED AREA	3,170 SF	.073 ACRES
NEW LANDSCAPED AREA	14,807 SF	.365 ACRES

* DOES NOT INCLUDE ANY OFF-SITE DISPOSAL OR BORROW AREAS - CONTRACTOR TO UPDATE AS NECESSARY DURING CONSTRUCTION.

* NO SINGLE DRAINAGE AREA EXCEEDS 10 ACRES, THEREFORE SEDIMENTATION BASIN IS NOT REQUIRED.

SITE MAP - GENERAL NOTES

1. CONTRACTOR IS SOLELY RESPONSIBLE FOR SELECTION, IMPLEMENTATION, MAINTENANCE, AND EFFECTIVENESS OF ALL SWPPP CONTROLS - CONTROLS SHOWN ON THIS SITE MAP ARE SUGGESTED CONTROLS ONLY.
2. CONTRACTOR SHALL RECORD INSTALLATION, MAINTENANCE OR MODIFICATION, AND REMOVAL DATES FOR EACH BMP EMPLOYED (WHETHER CALLED OUT ON ORIGINAL SWPPP OR NOT) DIRECTLY ON THE SITE MAP.
3. DRAINAGE PATTERNS ARE SHOWN ON THIS PLAN BY PROPOSED AND EXISTING CONTOURS, FLOW ARROWS, AND SLOPES.
4. TEMPORARY AND PERMANENT STABILIZATION PRACTICES AND BMP'S SHALL BE INSTALLED AT THE EARLIEST POSSIBLE TIME DURING THE CONSTRUCTION SEQUENCE. AS AN EXAMPLE, PERIMETER SILT FENCE SHALL BE INSTALLED BEFORE COMMENCEMENT OF ANY GRADING ACTIVITIES. OTHER BMP'S SHALL BE INSTALLED AS SOON AS PRACTICABLE AND SHALL BE MAINTAINED UNTIL FINAL SITE STABILIZATION IS ATTAINED. CONTRACTOR SHALL ALSO REFERENCE CIVIL AND LANDSCAPE PLANS SINCE PERMANENT STABILIZATION IS PROVIDED BY LANDSCAPING, THE BUILDING(S), AND SITE PAVING.
5. BMP'S HAVE BEEN LOCATED AS INDICATED ON THIS PLAN IN ACCORDANCE WITH GENERALLY ACCEPTED ENGINEERING PRACTICES IN ORDER TO MINIMIZE SEDIMENT TRANSFER. FOR EXAMPLE: SILT FENCES LOCATED AT TOE OF SLOPE AND INLET PROTECTION FOR INLETS RECEIVING SEDIMENT FROM SITE RUN-OFF.
6. SANITARY SEWER EFFLUENT IS DISPOSED OF VIA AN ONSITE SEWER SYSTEM CONNECTED TO A MUNICIPAL SEWER SYSTEM.

EROSION CONTROL SCHEDULE AND SEQUENCING

I.	ROUGH GRADING/ DEMOLITION	CONSTRUCTION ENTRANCE/EXIT AND SILT FENCE PROTECTION SHALL BE INSTALLED PRIOR TO THE INITIATION OF ROUGH GRADING AND DEMOLITION, AS NEEDED.
II.	UTILITY INSTALLATION	ALL PRIOR EROSION CONTROL MEASURES INSTALLED ABOVE TO BE MAINTAINED AS NECESSARY DURING UTILITY INSTALLATION.
III.	PAVING	ALL PRIOR EROSION CONTROL MEASURES INSTALLED ABOVE TO BE MAINTAINED AS NECESSARY DURING PAVING AND THROUGHOUT THE REMAINDER OF THE PROJECT.
IV.	FINAL GRADING/ SOIL STABILIZATION/ LANDSCAPING	ALL TEMPORARY EROSION CONTROL MEASURES TO BE REMOVED AT THE CONCLUSION OF THE PROJECT AS DIRECTED BY THE CITY OR COUNTY.

NOTE:
THE SEQUENCE OF CONSTRUCTION SHOWN ABOVE IS A GENERAL OVERVIEW AND IS INTENDED TO CONVEY THE GENERAL CONCEPTS OF THE EROSION CONTROL DESIGN AND SHOULD NOT BE RELIED UPON FOR CONSTRUCTION PURPOSES. THE CONTRACTOR IS SOLELY RESPONSIBLE FOR DETAILED PHASING AND CONSTRUCTION SEQUENCING NECESSARY TO CONSTRUCT THE PROPOSED IMPROVEMENTS INCLUDED IN THESE PLANS. THE CONTRACTOR SHALL NOTIFY ENGINEER IN WRITING IMMEDIATELY, PRIOR TO AND/OR DURING CONSTRUCTION IF ANY ADDITIONAL INFORMATION ON THE CONSTRUCTION SEQUENCE IS NECESSARY. CONTRACTOR IS SOLELY RESPONSIBLE FOR COMPLYING WITH THE REQUIREMENTS OF THE AUTHORITY HAVING JURISDICTION AND ALL OTHER APPLICABLE LAWS.

BENCHMARK LIST

BM #5000
SQUARE WITH "X" SET ON TOP OF CURB
N: 10,212.988.921
E: 3,061,300.850
ELEV: 1025.01'

BM #1001
"X" SET ON TOP OF CURB
N: 10,212.866.233
E: 3,061,244.005
ELEV: 1022.52

ALL ELEVATIONS SHOWN HEREON ARE TIED TO THE NORTH AMERICAN VERTICAL DATUM OF 1988 (NAVD '88) BASED ON GPS OBSERVATIONS

CAUTION!!
EXISTING UNDERGROUND UTILITIES IN THE AREA CONTRACTOR IS RESPONSIBLE FOR DETERMINING THE HORIZONTAL AND VERTICAL LOCATION OF ALL UTILITIES PRIOR TO CONSTRUCTION. CONTRACTOR SHALL BE RESPONSIBLE FOR ANY REPAIRS TO EXISTING UTILITIES DUE TO DAMAGE INCURRED DURING CONSTRUCTION. CONTRACTOR SHALL NOTIFY THE ENGINEER OF ANY DISCREPANCIES ON THE PLANS.

811 Know what's below. Call before you dig.

REVISIONS:

EROSION CONTROL PLAN

NEW RESTAURANT FOR: Pojangles
W. State Hwy 29
Liberty Hill, TX 78642

Kimley»Horn
© 2024 KIMLEY-HORN AND ASSOCIATES, INC.
1251 BADLER EAST DRIVE,
SUITE 100, KYLE, TX 78640
SAN MARCOS, TX 78666
PHONE: 512-566-4457
WWW.KIMLEY-HORN.COM TBPE FIRM NO. 928

JORDAN P. SCHAEFER 122080 REGISTERED PROFESSIONAL ENGINEER 02/02/2024

Charles William Pope & Associates
ARCHITECTURE PLANNING CONSULTING
224 GARDENVIEW, SAN ANTONIO, TX. 78213

DATE: 02/02/2024
JOB NO: 069243600
DRAWN BY: MJG
SHEET NUMBER: 2.4.1
OF

Plotted By: Bunn, Dylan January 31, 2024 02:57:05pm K:\SMA_Civil\Bojangles\069243600 - Bojangles (Liberty Hill)\CAD\Plan Sheets\C-EROS-069243600.dwg
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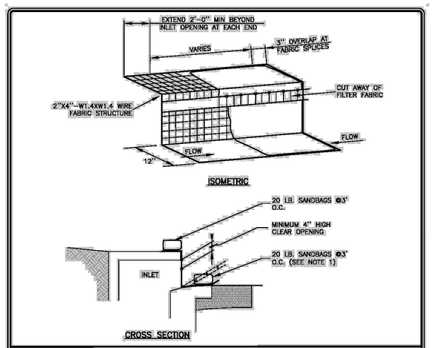


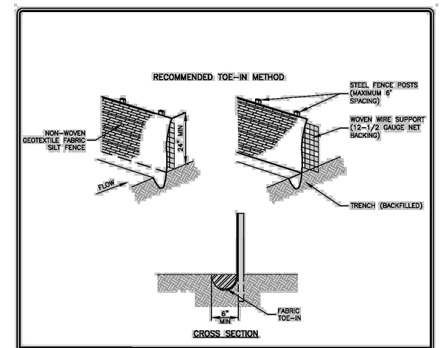
NOTES:

1. WHERE MINIMUM CLEARANCES CAUSE TRAFFIC TO DRIVE IN THE GUTTER, THE CONTRACTOR MAY SUBSTITUTE A 1" X 4" BOARD SECURED WITH CONCRETE NAILS 3' O.C. NAILED INTO THE GUTTER IN LIEU OF SANDBAGS TO HOLD THE FILTER DIKE IN PLACE. UPON REMOVAL, CLEAN ANY DIRT/DEBRIS FROM NAILING LOCATIONS, APPLY CHEMICAL SANDING AGENT AND APPLY NON-SHRINK GROUT FLUSH WITH SURFACE OF GUTTER.
2. A SECTION OF FILTER FABRIC SHALL BE REMOVED AS SHOWN ON THIS DETAIL OR AS DIRECTED BY THE ENGINEER OR DESIGNATED REPRESENTATIVE. FABRIC MUST BE SECURED TO WIRE BACKING WITH CLIPS OR HOG RINGS AT THIS LOCATION.
3. DAILY INSPECTION SHALL BE MADE BY THE CONTRACTOR AND SILT ACCUMULATION MUST BE REMOVED WHEN DEPTH REACHES 2".
4. CONTRACTOR SHALL MONITOR THE PERFORMANCE OF INLET PROTECTION DURING EACH RAINFALL EVENT AND IMMEDIATELY REMOVE THE INLET PROTECTIONS IF THE STORM-WATER BEGINS TO OVERTOP THE CURB.
5. INLET PROTECTIONS SHALL BE REMOVED AS SOON AS THE SOURCE OF SEDIMENT IS STABILIZED.

RECORD SIGNED COPY ON FILE AT PUBLIC WORKS APPROVED 03-25-11 DATE THE ARCHITECT/ENGINEER ASSUMES RESPONSIBILITY FOR THE APPROPRIATE USE OF THIS DETAIL. (NOT TO SCALE)	CITY OF ROUND ROCK CURB INLET PROTECTION DETAIL	DRAWING NO: EC-14

INLET PROTECTION DETAIL

TO BE LOCATED AT (IP) SYMBOL



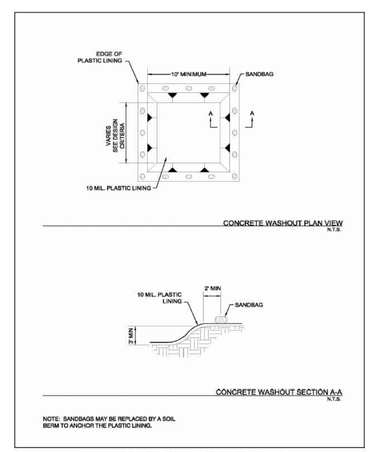
NOTES:

1. STEEL POSTS WHICH SUPPORT THE SILT FENCE SHALL BE INSTALLED ON A SLIGHT ANGLE TOWARD THE ANTICIPATED RUNOFF SOURCE. POST MUST BE EMBEDDED A MIN. OF ONE (1') FOOT.
2. THE TOE OF THE SILT FENCE SHALL BE TRENCHED IN WITH A SPADE OR MECHANICAL TRENCHER, SO THAT THE DOWNSLOPE FACE OF THE TRENCH IS FLAT AND PERPENDICULAR TO THE LINE OF FLOW. WHERE FENCE CANNOT BE TRENCHED IN (E.G. PAVEMENT) WEIGHT FABRIC FLAP WITH WASHED GRAVEL ON UPHILL SIDE TO PREVENT FLOW UNDER FENCE.
3. THE TRENCH MUST BE A MINIMUM OF 6 INCHES DEEP AND 6 INCHES WIDE TO ALLOW FOR THE SILT FENCE FABRIC TO BE LAID IN THE GROUND AND BACKFILLED WITH COMPACTED MATERIAL.
4. SILT FENCE SHALL BE SECURELY FASTENED TO EACH STEEL SUPPORT POST OR TO WOVEN WIRE, WHICH IN TURN IS SECURELY FASTENED TO THE STEEL FENCE POSTS.
5. INSPECTION SHALL BE MADE WEEKLY OR AFTER EACH RAINFALL EVENT AND REPAIR OR REPLACEMENT SHALL BE MADE PROMPTLY AS NEEDED.
6. SILT FENCE SHALL BE REMOVED WHEN THE SITE IS COMPLETELY STABILIZED SO AS NOT TO BLOCK OR IMPEDE STORM FLOW OR DRAINAGE.
7. ACCUMULATED SILT SHALL BE REMOVED WHEN IT REACHES A DEPTH OF 6 INCHES. THE SILT SHALL BE DISPOSED OF IN AN APPROVED SITE AND IN SUCH A MANNER AS TO NOT CONTRIBUTE TO ADDITIONAL SILTATION.
8. SILT FENCE SHALL BE REMOVED AS SOON AS THE SOURCE OF SEDIMENT IS STABILIZED

RECORD SIGNED COPY ON FILE AT PUBLIC WORKS APPROVED 03-25-11 DATE THE ARCHITECT/ENGINEER ASSUMES RESPONSIBILITY FOR THE APPROPRIATE USE OF THIS DETAIL. (NOT TO SCALE)	CITY OF ROUND ROCK SILT FENCE DETAIL	DRAWING NO: EC-10

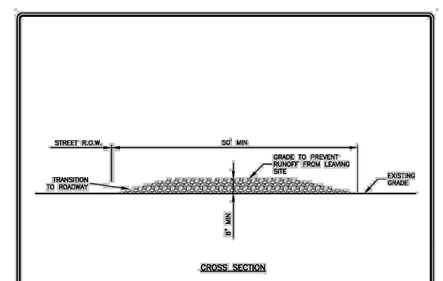
SILT FENCE DETAIL

TO BE LOCATED AT (SF) SYMBOL



CONCRETE WASHOUT PIT

TO BE LOCATED AT (CW) SYMBOL



NOTES:

1. STONE SIZE SHALL BE 3" — 8" OPEN GRADED ROCK.
2. THICKNESS OF CRUSHED STONE PAD TO BE NOT LESS THAN 8".
3. LENGTH SHALL BE A MINIMUM OF 50' FROM ACTUAL ROADWAY, AND WIDTH NOT LESS THAN FULL WIDTH OF INGRESS/EGRESS.
4. ENTRANCE SHALL BE PROPERLY GRADED TO PREVENT RUNOFF FROM LEAVING THE CONSTRUCTION SITE.
5. THE ENTRANCE SHALL BE MAINTAINED IN A CONDITION WHICH WILL PREVENT TRACKING OR FLOWING OF SEDIMENT ONTO PUBLIC RIGHTS OF WAY. ALL SEDIMENT SPILLED, DROPPED, WASHED OR TRACKED ONTO PUBLIC RIGHTS OF WAY MUST BE REMOVED IMMEDIATELY BY CONTRACTOR.
8. AS NECESSARY, WHEELS MUST BE CLEANED TO REMOVE SEDIMENT PRIOR TO ENTRANCE ONTO PUBLIC RIGHT 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.

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CONSTRUCTION ENTRANCE DETAIL

TO BE LOCATED AT (CE) SYMBOL

CAUTION!!

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BENCHMARK LIST

BM #5000
SQUARE WITH "X" SET ON TOP OF CURB
N: 10,212,988.921
E: 3,061,300.850
ELEV: 1025.01'

BM #1001
"X" SET ON TOP OF CURB
N: 10,212,866.233
E: 3,061,244.005
ELEV: 1022.52

ALL ELEVATIONS SHOWN HEREON ARE TIED TO THE NORTH AMERICAN VERTICAL DATUM OF 1988 (NAVD '88) BASED ON GPS OBSERVATIONS

811 Know what's below. Call before you dig.

REVISIONS:

EROSION CONTROL DETAILS

NEW RESTAURANT FOR:

Pojangles
W. State Hwy 29
Liberty Hill, TX 78642

Kimley»Horn
© 2024 KIMLEY-HORN AND ASSOCIATES, INC.
1251 SADLER EAST DRIVE,
BUILDING 1, STE 2000
SAN MARCOS, TX 78666
PHONE: 512-566-4457
WWW.KIMLEY-HORN.COM TBPE FIRM NO. 928

JORDAN P. SCHAEFER
122080
REGISTERED PROFESSIONAL ENGINEER
02/02/2024

Charles William Pope & Associates
ARCHITECTURE PLANNING CONSULTING
224 GARDENVIEW, SAN ANTONIO, TX. 78213

DATE: 02/02/2024
JOB NO: 069243600
DRAWN BY: MJG
SHEET NUMBER:
2.4.2
OF

Plotted By:Burn, Dylan - January 31, 2024 02:57:10pm K:\SMA_Civil\Bojangles\069243600 - Bojangles (Liberty Hill)\CAD\PlanSheets\C-EROS-069243600.dwg
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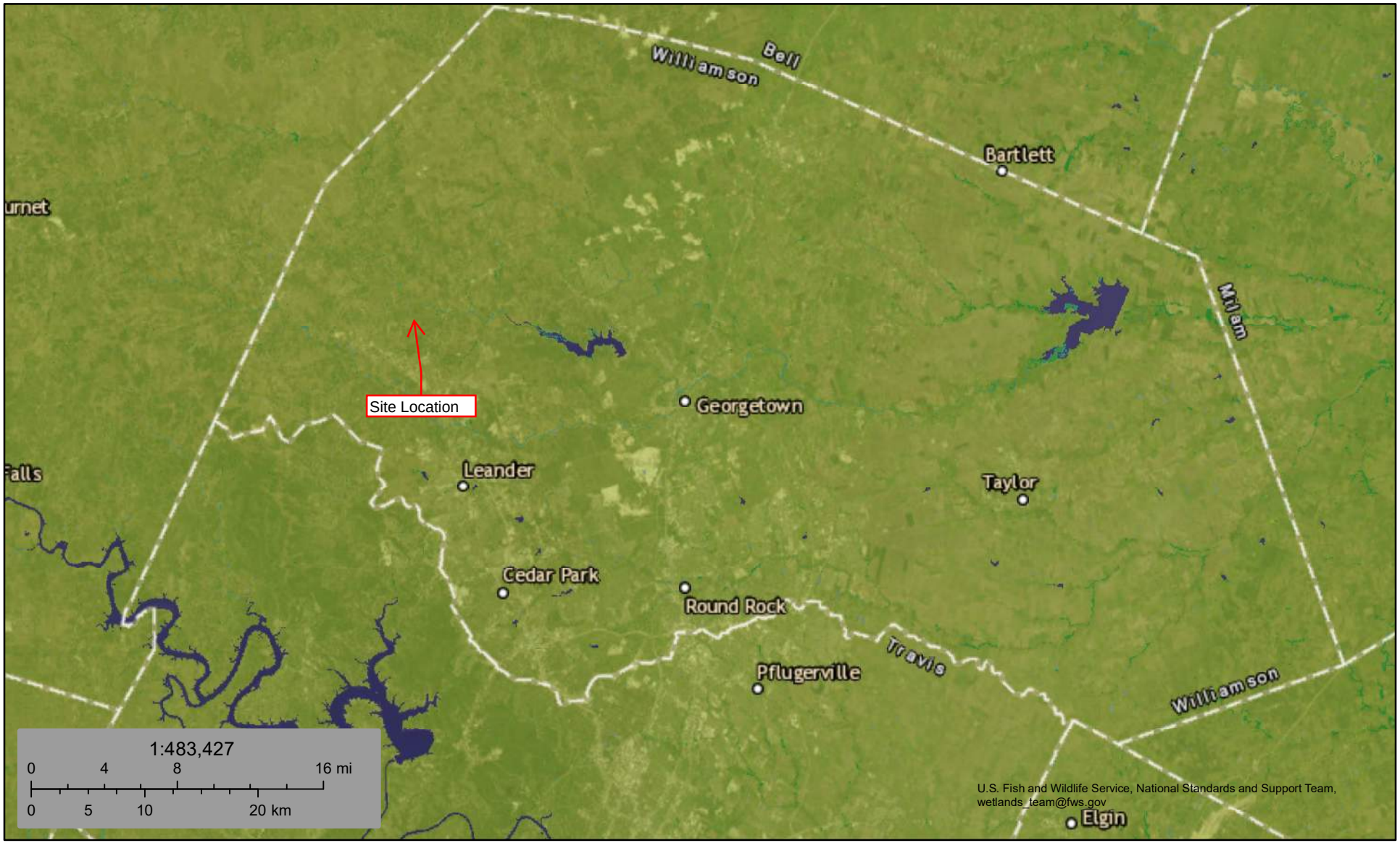
U.S. Fish and Wildlife Service
National Wetlands Inventory

Nat'l Wetlands _San Gabriel Watershed



January 24, 2024

- Estuarine and Marine Deepwater
- Estuarine and Marine Wetland
- Freshwater Emergent Wetland
- Freshwater Forested/Shrub Wetland
- Freshwater Pond
- Lake
- Other
- Riverine

This map is for general reference only. The US Fish and Wildlife Service is not responsible for the accuracy or currentness of the base data shown on this map. All wetlands related data should be used in accordance with the layer metadata found on the Wetlands Mapper web site.

National Wetlands Inventory (NWI)
This page was produced by the NWI mapper

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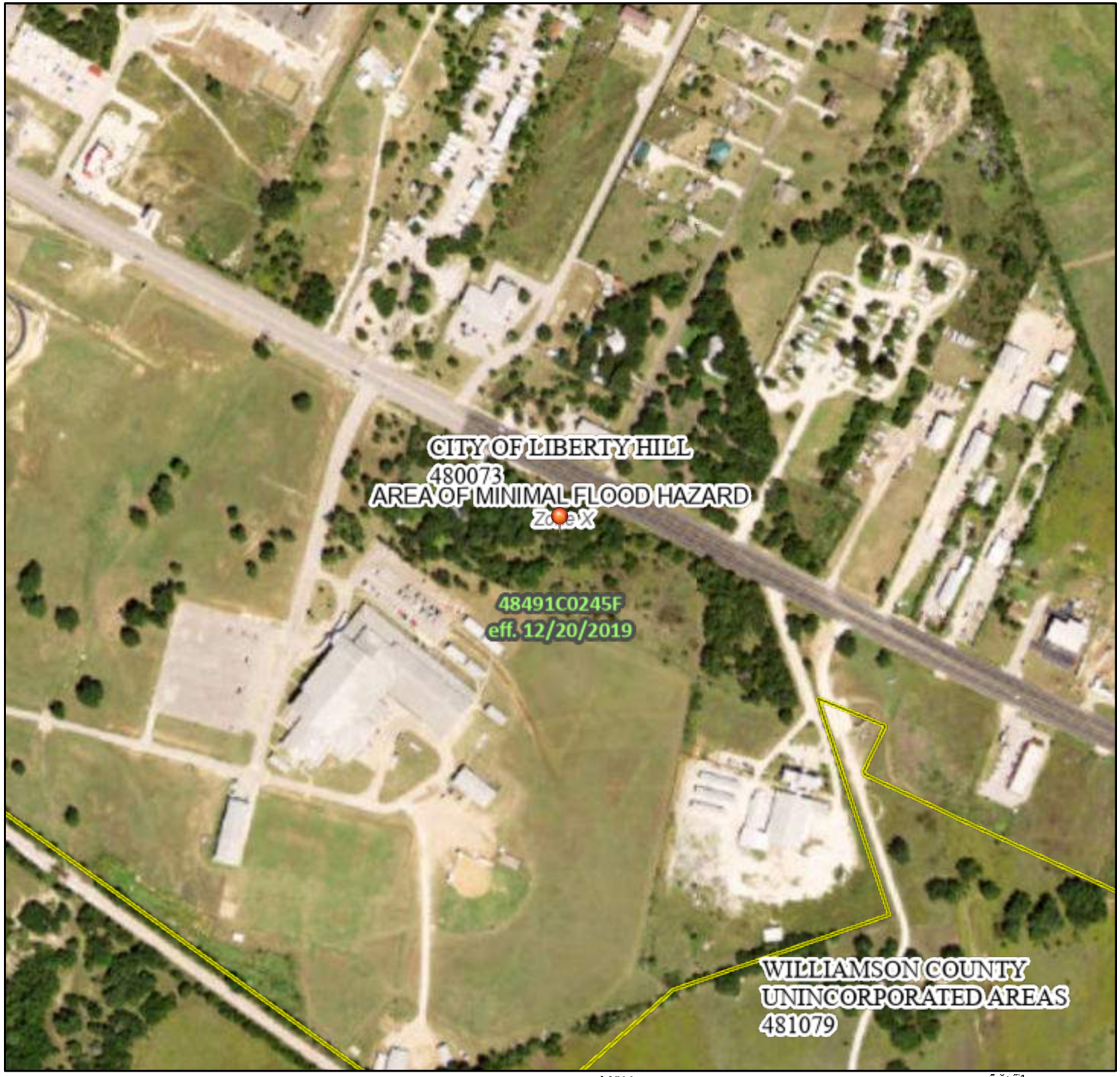
FEMA



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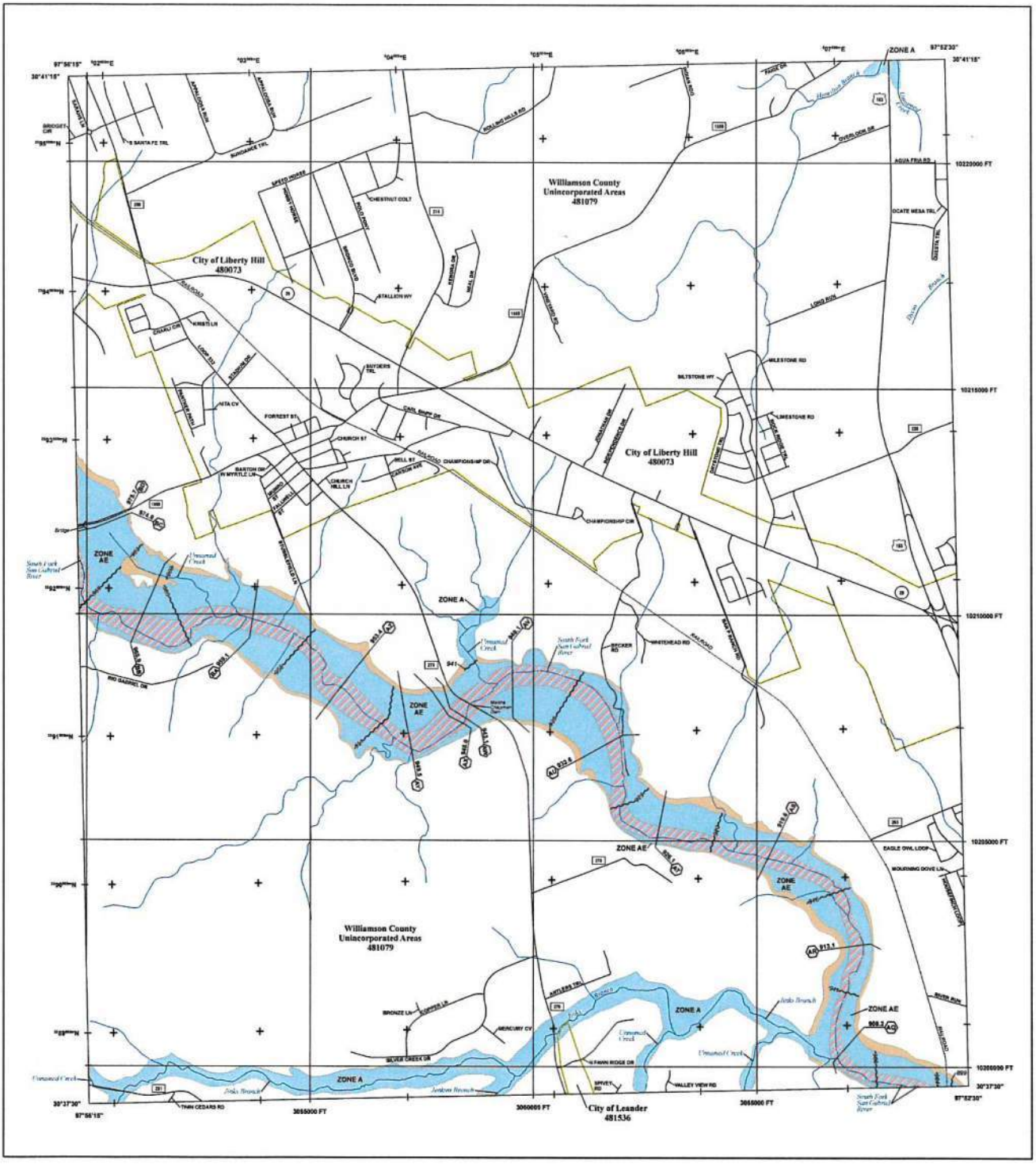

FLOOD HAZARD INFORMATION

SEE FIS REPORT FOR DETAILED LEGEND AND INDEX MAP FOR FIRM PANEL LAYOUT

THE INFORMATION DEPICTED ON THIS MAP AND SUPPORTING DOCUMENTATION ARE ALSO AVAILABLE IN DIGITAL FORMAT AT

HTTPS://MSC.FEMA.GOV

SPECIAL FLOOD HAZARD AREAS	Without Base Flood Elevation (BFE) *Zone A, V, A99*
	With BFE or Depth *Zone AE, AO, AH, VE, AR*
	Regulatory Floodway
OTHER AREAS OF FLOOD HAZARD	0.2% Annual Chance Flood Hazard, Areas of 1% annual chance flood with average depth less than one foot or with drainage areas of less than one square mile *Zone X*
	Future Conditions 1% Annual Chance Flood Hazard *Zone X*
	Area with Reduced Flood Risk due to Levee See Notes. *Zone X*
	Area with Flood Risk due to Levee *Zone D*
OTHER AREAS	NO SCREEN Area of Minimal Flood Hazard *Zone X*
	Area of Undetermined Flood Hazard *Zone D*
GENERAL STRUCTURES	Channel, Culvert, or Storm Sewer
	Levee, Dike, or Floodwall
	E 18.2 17.6 Cross Sections with 1% Annual Chance Water Surface Elevation
	Coastal Transect
	Coastal Transect Baseline
	Profile Baseline
	Hydrographic Feature
	513 Base Flood Elevation Line (BFE)
OTHER FEATURES	Limit of Study
	Jurisdiction Boundary

NOTES TO USERS

For information and questions about this Flood Insurance Rate Map (FIRM), available products associated with this FIRM, including historic versions, the current map date for each FIRM panel, how to order products, or the National Flood Insurance Program (NFIP) in general, please call the FEMA Map Information eXchange at 1-877-FEMA-MAP (1-877-336-2627) or visit the FEMA Flood Map Service Center website at https://msc.fema.gov. Available products may include previously issued Letters of Map Change, a Flood Insurance Study Report, and/or digital versions of this map. Many of these products can be ordered or obtained directly from the website.

Communities annexing land on adjacent FIRM panels must obtain a current copy of the adjacent panel as well as the current FIRM index. These may be ordered directly from the Flood Map Service Center at the number listed above.

For community and countywide map dates refer to the Flood Insurance Study Report for this jurisdiction.

To determine if flood insurance is available in this community, contact your insurance agent or call the National Flood Insurance Program at 1-800-638-6620.

Base map information shown on the FIRM was derived from digital data obtained from Texas Natural Resource Information Systems (TNRIS), dated 2000; United States Census Bureau, dated 2015; United States Geological Survey, dated 2005, and the Williamson County Geographic Information Systems (GIS) Department, dated 2014 and 2017.

SCALE

Map Projection:
Texas State Plane Central (FIPS ZONE 4203); North American Datum 1983;
Western Hemisphere; Vertical Datum: NAVD 88

N

1 inch = 1,000 feet 1:12,000

0 1,000 2,000 4,000 feet

0 250 500 1,000 meters

PANEL LOCATOR

*PANEL NOT PRINTED

FEMA

National Flood Insurance Program

NATIONAL FLOOD INSURANCE PROGRAM

FLOOD INSURANCE RATE MAP

WILLIAMSON COUNTY, TEXAS

and Incorporated Areas

PANEL 245 OF 750

Panels Contains:

COMMUNITY	NUMBER	PANEL	SUFFIX
LEANDER, CITY OF	481536	0245	F
LIBERTY HILL, CITY OF	480073	0245	F
WILLIAMSON COUNTY	481079	0245	F

VERSION NUMBER

2.3.3.3

MAP NUMBER

48491C0245F

MAP REVISED

DECEMBER 20, 2019

APPENDIX B

CONSTRUCTION ACTIVITY SCHEDULE

Construction Activity Schedule

Activities	Start Date	Finish Date
1.		
2.		
3.		
4.		
5.		
6.		
7.		
8.		
9.		
10.		
11.		

*Construction activity sequences for linear projects may be conducted on a rolling basis. As a result, construction activities may be at different stages at different locations in the project area. The Contractor is required to complete and update the schedule and adjust as necessary.

APPENDIX C

BEST MANAGEMENT PRACTICE MEASURES AND CONTROLS

Best Management Practice Measures and Controls

Best Management Practice (BMP)	In Use	Maintained Post Construction?
Interceptor Swale		
Diversion Dike		
Pipe Slope Drain		
Vegetation		
Mulching		
Erosion Control Blankets		
Channel Protection		
Dust Control		
Silt Fence		
Organic Filter Berm		
Triangular Sediment Filter Dike		
Inlet Protection		
Stone Outlet Sediment Trap		
Sediment Basin		
Check Dam		
Temporary Sediment Tank		
Stabilized Construction Entrance		
Wheel Wash		
Debris and Trash Management		
Chemical Management		
Concrete Waste Management		
Concrete Sawcutting Waste Management		
Sandblasting Waste Management		
Lime Stabilization Management		
Sanitary Facilities		
Other*		
Other*		

***If another BMP is being used, include the BMP information in Appendix D.**

APPENDIX D

BEST MANAGEMENT PRACTICE CHECKLIST AND FACT SHEETS

EROSION AND SEDIMENT CONTROL CHECKLIST

Instructions: Check each item and fill in the blanks below to evaluate compliance for each drainage area and location.

Stabilization Practices:

☐ Stabilization will be initiated on all disturbed areas where construction activity will not occur for a period of more than 21 calendar days by the 14th day after construction activity has permanently or temporarily ceased. Stabilization measures to be used include:

- ☐ Temporary Seeding
- ☐ Permanent Seeding
- ☐ Mulching
- ☐ Sod Stabilization
- ☐ Geotextiles
- ☐ Other _____

Structural Practices

☐ Flows from upstream areas will be diverted from exposed soils to the degree attainable. Measures to be used include:

- ☐ Earth Dike
- ☐ Drainage Swale
- ☐ Interceptor Dike and Swale
- ☐ Pipe Slope Drain
- ☐ Other _____

For Drainage locations serving less than 10 disturbed acres, Sediment *Basin will be installed and will include:*

- ☐ Sediment Trap
- ☐ Silt Fence or equivalent along all sideslopes & downstream boundaries

For Drainage locations serving 10 or more disturbed acres, a Sediment Basin will be installed (See Appendix N), if a Sediment Basin is not attainable on-site, Sediment Controls will be installed & will include:

- ☐ Sediment Trap
- ☐ Silt Fence or equivalent along all sideslopes & downstream boundaries
- ☐ Sediment Basin

FINAL STABILIZATION / TERMINATION CHECKLIST

1. All soil disturbing activities are complete.

2. Temporary erosion and sediment control measures have been, or will be, removed at an appropriate time.

3. All areas of the construction site not otherwise covered by a permanent pavement or structure have been stabilized with a uniform perennial vegetative cover with a density of 70% or equivalent measures have been employed.

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2.0 Erosion Controls
3.0 Sediment Controls
4.0 Material Waste Controls

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1.0 Overview of Construction Controls

1.1 Introduction

In order to address the requirements of pollution reduction at construction sites, a variety of controls should be employed to reduce soil erosion, reduce sediment loss from the site, and manage construction-generated waste and construction related toxic materials. Controls consist of both temporary and permanent methods to reduce pollution from a construction site.

The majority of controls address loss of soil from the site. Soil loss in the form of erosion and sediment due to storm events and wind constitute the majority of pollution generated from construction sites. Controls that address erosion and sediment are typically more site specific than waste and toxics management. Erosion and sediment controls are dependent on site slopes, drainage patterns and drainage quantities along with other site-specific conditions. Materials and waste management consists primarily of "good housekeeping" practices which are dependent on the type of construction and the quantity and type of building materials.

1.2 Control Selection Guide

The designer preparing the iSWM Construction Plan can first use the control selection guide on the following pages to determine the controls that are most appropriate for the site. Chapters 2.0, 3.0 and 4.0 contain the descriptions, design requirements, maintenance requirements, and limitations of the controls. These provide the tools for the designer to select the appropriate controls and properly locate them on the site, to effectively reduce erosion and sediment loss.

The Efficiency Ratings listed for the controls are the range of average efficiencies in reducing erosion or trapping sediment for the control, assuming the controls are properly designed, installed, and maintained for the flow and volumes from the design storm. The removal efficiency varies within in the range based on soil type.

The Efficiency Ratings are useful in comparing the effectiveness of the controls. The ratings are also used in calculating the Site Rating, which is used by some municipalities to ensure adequate design of erosion and sediment controls. Refer to *Section 1.3 Site Rating Calculations* for additional details concerning the Efficiency Ratings and the methodology for calculating the Site Rating.

The following legend applies to the Targeted Pollutants and Implementation Considerations presented for each of the controls:

Legend

- ● Significant Impact
- ◒ Medium Impact
- ○ Low Impact
- ? Unknown or Questionable Impact

1.2.1 Erosion Controls

These controls are the measures and techniques used to retain soil in place. They are installed on the perimeter of the site to limit flow across disturbed areas and within the site to provide protective covering of disturbed areas that are not actively being worked. Erosion controls reduce the amount of soil removed and transported by stormwater runoff and reduce the need for sediment controls.

Table 1.1 Erosion Controls

Control	Primary Purpose	Efficiency Rating (Fe)
Check Dam	Slow flow to prevent erosion of swales and drainage ditches while also providing minor detention and sediment removal	0.30 - 0.50 *(Depends on soil type)*
Diversion Dike	Route flows around slopes and disturbed areas	0.95
Erosion Control Blankets	Protect disturbed soil and slopes from erosion using a degradable, rolled erosion control product; also provides limited protection as a perimeter control	*0.90 (Ground cover)* 0.65 *(Perimeter w/o vegetation)*
Interceptor Swale	Route flows around slopes and disturbed areas	0.95
Mulching	Protect disturbed soil with a layer of straw, wood chips, compost or other organic material	0.75 - 0.90 *(Depends on coverage)*
Pipe Slope Drain	Route overland flow on a slope into a pipe to protect the slope	0.95
Soil Surface Treatments	Protect disturbed soil from wind erosion (dust control) while also providing some protection from water erosion, depending on the treatment method	0.10 - 0.90 *(Depends on type of treatment)*
Turf Reinforcement Mats	Protect disturbed soil on steep slopes and in channels from erosion using a non-degradable, rolled erosion control product	0.90
Vegetation	Prevent erosion by providing a natural cover through hydro-mulching, seeding or sod placement	0.90 *(When fully established; lower while vegetation is first growing)*
Velocity Dissipation Devices	Protect soil from erosion at points where concentrated flows are discharged	N/A

The Efficiency Ratings listed for the erosion controls are the assumed average efficiencies in reducing erosion, based on the controls being designed for the flow and volume from the temporary control design storm and installed in accordance with the criteria in this manual.

1.2.2 Sediment Controls

These controls are temporary structures or devices that capture soil transported by stormwater through sedimentation, filtration or chemical treatment of the runoff. They are used to trap sediment before it leaves the construction site. The effectiveness of controls that form a barrier or filter for trapping soil is highly dependent on the size of soil particles. The efficiencies presented are **ranges based on soil types**. The removal efficiency will be at the high end of the range for sand and coarse silt or loam and at the low end for fine silt or loam and clay. Controls with a single number for the efficiency rating do not vary in performance based on soil type.

Table 1.2 Sediment Controls

Control	*Primary Purpose*	*Efficiency Rating (Fe)*
Active Treatment System	Remove pollutants and suspended soil, including fine clay particles, through filtration and/or chemical-aided flocculation	0.99
Depressed Grade Sediment Trap	Detain and settle suspended soil from small areas within rights-of-way	0.50 - 0.75
Dewatering Controls	Remove suspended soil from water that is pumped out of low points onsite	0.50 - 0.75
Inlet Protection	Intercept sediment at curb and area inlets as a secondary defense in sequence with other controls	0.35 - 0.65
Organic Filter Berm	Slow and filter runoff to retain sediment	0.50 - 0.75
Organic Filter Tubes	Slow and filter runoff to retain sediment	0.50 - 0.75
Passive Treatment System	Improve performance of other controls by adding flocculation agents to stormwater	0.85
Pipe Inlet Protection	Detain stormwater for sedimentation and filtration before it enters a closed conveyance system	0.50 - 0.75
Sediment Basin	Detain stormwater in a pond with a controlled outflow to allow for sedimentation	0.50 - 0.90
Silt Fence	Slow and filter runoff to retain sediment	0.50 - 0.75
Stabilized Construction Exit	Reduce offsite sediment tracking from trucks and construction equipment	N/A
Stone Outlet Sediment Trap	Intercept and filter small, concentrated flows in swales and other defined waterways	0.50 - 0.85
Triangular Sediment Filter Dike	Slow and filter runoff to retain sediment	0.50 - 0.75
Turbidity Barrier	Detain and settle suspended soil where work is occurring in or adjacent to a water body	0.50 - 0.90
Vegetated Filter Strips and Buffers	Slow sheet flow from small areas to allow for sedimentation	0.35 – 0.85 (*Depends on many conditions in addition to soil type*)
Wheel Cleaning Systems	Reduce offsite sediment tracking from trucks and construction equipment	N/A

The Efficiency Ratings listed for the sediment controls are the assumed average efficiencies in capturing sediment for a range of soil types, based on the controls being designed for the flow and volume from the temporary control design storm and installed in accordance with the criteria in this manual.

1.2.3 Material and Waste Controls

Material and waste control techniques are applicable on the majority of construction projects due to their general purpose of reducing the discharge of pollutants from construction activities. They form the basis of good housekeeping procedures that should be followed during construction and in many cases are mandated by stormwater discharge permits. The techniques are essential to preventing the discharge of pollutants other than sediment from a construction site.

A numeric efficiency rating is not provided for material and waste controls, since the controls are not for erosion and sediment and are not a factor in the Site Rating calculation. All of these techniques are highly effective in minimizing discharges of the targeted pollutants when properly applied.

Table 1.3 Material and Waste Controls

Control	*Primary Purpose*
Chemical Management	Techniques to minimize the exposure of paints, solvents, fertilizer, pesticides, herbicides, and other chemicals to precipitation and stormwater; and techniques for managing the wastewater from washout of paint, form release oils, curing compounds, and other construction chemicals
Concrete Sawcutting Waste Management	Techniques for collection and disposal of the slurry of cutting water and concrete cuttings that results from concrete sawing
Concrete Waste Management	Techniques for disposal of concrete washout, demolished concrete, etc.
Debris and Trash Management	Techniques for storage and disposal of packaging, scrap building materials, personal trash, and other wastes generated by construction activities and personnel
Hyper-Chlorinated Water Management	Techniques to prevent water with high concentrations of chlorine from being discharged
Sandblasting Waste Management	Techniques for disposal of sandblasting waste and containment of wastes during operations
Sanitary Waste Management	Techniques to control and prevent the exposure of sanitary waste to precipitation and stormwater
Spill and Leak Response Procedures	Techniques to minimize the discharge of pollutants from spills and leaks
Subgrade Stabilization Management	Techniques to control runoff from soil being chemically stabilized in preparation for construction
Vehicle and Equipment Management	Techniques to prevent discharges of fluids used in vehicle and equipment operation and maintenance and the discharge of wash waters that contain soaps or solvents

1.3 Site Rating Calculation

1.3.1 Introduction

The site rating calculation is a useful tool for evaluating the potential effectiveness of proposed erosion and sediment controls on a construction site. It is used to compare the potential soil loss from a site without controls to the soil loss from the site with proposed controls. The site rating may also be used to compare the effectiveness of two different controls on a site.

The site rating calculation is an optional element for an iSWM Construction Plan but may be required by some municipalities in North Central Texas. When required, a numeric site rating is established as the criteria for the design of erosion and sediment controls for a construction site. Municipalities that use the site rating will typically require a minimum site rating of 0.70, which reflects a realistic, attainable reduction in sediment loss from a construction site of 70 percent using controls compared to the same site without the use of controls.

The user of this manual is advised to confirm local requirements with the municipality where the project is located. When required to provide the site rating by the local government, the iSWM Construction Plan should be prepared as described in Chapter 4 of the iSWM Criteria Manual, followed by calculation of the site rating. Controls shall then be modified and added as needed to achieve the minimum required site rating.

1.3.2 Background

The design and implementation of erosion and sediment controls is highly dependent on project site conditions and construction methods. The amount of potential soil loss from a site is based on the physical features and location of the site: soil type(s), slope, length of stormwater flow across the site, the rainfall intensity and overall runoff quantity of a particular storm, and the groundcover of the site. Of these factors, construction activity at a site can affect the groundcover, the slope of the site and the length of stormwater flow across the site. These effects are mitigated by minimizing onsite disturbance of the soil and groundcover and providing structural measures to retain sediment onsite after erosion occurs.

The most effective method to reduce sediment loss from a tract of land is to prevent the occurrence of erosion. While structural barriers, such as those shown in this manual, have a theoretical 70 to 90 percent effectiveness rating for removal of sediment from runoff, natural groundcover and mulching can provide up to 98 percent reduction in erosion and site soil loss. Therefore, the primary goals of the erosion control plan for a construction site is to prevent the soil from eroding and to minimize the area of disturbance through the phasing of construction activities, mulching of disturbed but inactive areas, and providing tarps, seeding or hydromulching of stockpiles. These techniques are not only the most effective at reducing soil loss; they are normally the most cost effective due to low initial cost and reduced maintenance requirements.

Sediment removal controls provide the second line of defense by treating sediment-laden stormwater before it is discharged from the site. All construction activities will require areas in which soil is disturbed. Stormwater runoff that crosses areas of exposed soil will require treatment by adequate Best Management Practices in accordance with the guidelines presented in this manual. Sediment removal controls include diversion of stormwater around areas of construction, and filtration and sedimentation (detention) of sediment-laden runoff that crosses disturbed areas.

1.3.3 Methodology

Site Rating Description

The runoff across both disturbed and non-disturbed areas of a drainage basin produces a quantity of soil loss due to erosion. This quantity is estimated through the use of the Universal Soil Loss Equation as a

mass per time period. Erosion and sediment controls are used to reduce the sediment transported offsite.

The site rating is defined as the theoretical amount of soil that remains uneroded and/or is captured on a site through the use of erosion and sediment controls (soil retained) divided by the theoretical amount of soil that would leave the site if no controls were used (uncontrolled). A minimum site rating of 0.70 is typically used as a guideline for the adequate design of erosion and sediment control systems.

This **site rating** is calculated as follows:

$$\mathbf{SR = ZA_{retained} / ZA_{uncontrolled}} \qquad \textbf{(1.1)}$$

where:

SR = Site Rating

$ZA_{retained}$ = Soil uneroded and/or retained onsite by erosion prevention and sediment trapping practices (pounds/year)

$ZA_{uncontrolled}$ = Soil loss from site if no controls used (pounds/year)

Note that the site rating calculation methodology assumes that the erosion and sediment control measures are correctly designed, installed, and maintained in accordance with the criteria in this manual to treat the volume of runoff from the 2-year, 24-hour storm event, which is the regionally defined design storm frequency for temporary control design.

Universal Soil Loss Equation

Several elements are involved in evaluating the potential for erosion of a site. Soil type, length of flow across the ground, slope of ground, rainfall intensity and groundcover play important roles in determining if a site will produce excessive siltation downstream. The Universal Soil Loss Equation is used to determine the potential erodibility of a site. The Universal Soil Loss Equation (USLE) is expressed as:

$$\mathbf{Z = R * K * LS * C_s * P} \qquad \textbf{(1.2)}$$

where:

Z = Rate of soil loss (tons per acre per year)

R = Rainfall erosion factor (300 for North Texas)

K = Soil erodibility factor

LS = Length/slope factor

C_s = Cropping/management factor

P = Erosion control practice

Calculate the anticipated yearly soil loss (ZA)

$$\mathbf{ZA = Z * A} \qquad \textbf{(1.3)}$$

where

ZA = Soil loss per year (tons per year)

Z = Rate of soil loss for a drainage basin (tons per acre per year)

A = Area of drainage basin (acres)

Some of the factors above (R and K) remain constant throughout the construction of the project. Both the LS and C_s factors are altered during construction through clearing, grading and drainage operations on the site. The P factor represents the implementation of erosion and sediment controls to reduce the potential for sediment to be transported offsite. These factors are discussed in the following sections.

Rainfall Erosion Factor

The average annual rainfall erosion factor, R, varies for different regions throughout the country and during the year. This value accounts for the volume and intensity of rainfall for a one year time period in a region. A value of 300 is used for R in the North Central Texas area.

Soil Erodibility Factor

The soil erodibility factor, K, indicates the potential for water erosion of the soil. It is strongly suggested that soil erodibility be determined as part of the geotechnical investigation of the site in order to determine the most effective means to reduce site erosion. If a site has not been previously disturbed, the native soil type(s) most likely to be present at the site can be identified on the NRCS Web Soil Survey at: http://websoilsurvey.nrcs.gov/app/. The website also contains the soil erodibility factors for native soils.

Consider the depth of grading activities when determining the soil erodibility factor. Soil type varies with depth. The surface soil may have a low erodibility factor, but the soil at a lower depth may have a high erodiblility factor when it is exposed by grading operations.

Table 1.4 provides approximate values of K for various soil types and can be used in calculations if detailed data are not available.

Table 1.4 Soil Erodibility Factors (K)*

Soil Type	*K*
Sand	0.03
Fine Sand	0.14
Loamy Sand	0.10
Sandy Loam	0.24
Loam	0.34
Silt Loam	0.42
Silt	0.52
Sandy Clay Loam	0.25
Clay Loam	0.25
Silty Clay Loam	0.32
Sandy Clay	0.13
Silty Clay	0.23
Clay	0.13 – 0.29

(Source: Standard Handbook of Environmental Engineering edited by Robert A. Corbitt)
*Assuming 2% organic matter content.

Length/Slope Factor

The length-slope factor, LS, of the drainage basin may be changed through construction operations. A reduction in slope or drainage length can significantly reduce the erosion potential of the drainage basin. The length-slope factor considers the topographic features of the drainage basin. The LS factor is defined by the length and slope that a drop of water will travel through the drainage basin from the farthest reach to the point of analysis. The slope value is the average slope of this path. Table 1.5 lists values of LS for a wide variety of slope and drainage length. LS can also be calculated as follows:

$$LS = [L/72.6]^{M} * [65.41 * \sin^2(S) + 4.56 * \sin(S) + 0.065] \quad (1.4)$$

where:

L = Length of flow path of contributing area (feet)

M = 0.6 * [1 - exp(-35.835*s)] where s=slope (feet/feet)

S = Average slope of contributing area (degrees)

Table 1.5 Length/Slope Factor (LS)

Length (ft.)	*Slope (ft/ft)*												
	0.005	**0.01**	**0.015**	**0.02**	**0.025**	**0.03**	**0.04**	**0.05**	**0.06**	**0.1**	**0.15**	**0.2**	**0.3**
10	0.07	0.08	0.09	0.10	0.11	0.12	0.14	0.17	0.20	0.37	0.67	1.06	2.06
20	0.08	0.09	0.11	0.12	0.14	0.16	0.20	0.24	0.29	0.55	1.01	1.60	3.13
30	0.08	0.10	0.12	0.14	0.16	0.18	0.23	0.29	0.36	0.70	1.29	2.05	3.99
40	0.08	0.11	0.13	0.15	0.18	0.21	0.27	0.34	0.42	0.82	1.53	2.43	4.74
50	0.09	0.11	0.13	0.16	0.19	0.22	0.30	0.38	0.47	0.94	1.75	2.78	5.42
60	0.09	0.11	0.14	0.17	0.21	0.24	0.32	0.41	0.52	1.04	1.95	3.10	6.04
70	0.09	0.12	0.15	0.18	0.22	0.26	0.35	0.45	0.56	1.14	2.13	3.40	6.63
80	0.09	0.12	0.15	0.19	0.23	0.27	0.37	0.48	0.60	1.23	2.31	3.68	7.18
90	0.09	0.12	0.16	0.19	0.24	0.28	0.39	0.51	0.64	1.32	2.48	3.95	7.71
100	0.09	0.12	0.16	0.20	0.25	0.30	0.41	0.53	0.68	1.41	2.64	4.21	8.21
125	0.09	0.13	0.17	0.22	0.27	0.32	0.45	0.60	0.76	1.60	3.02	4.81	9.39
150	0.10	0.13	0.18	0.23	0.28	0.35	0.49	0.66	0.84	1.78	3.36	5.37	10.47
175	0.10	0.14	0.18	0.24	0.30	0.37	0.53	0.71	0.91	1.95	3.69	5.89	11.49
200	0.10	0.14	0.19	0.25	0.32	0.39	0.56	0.76	0.98	2.11	3.99	6.38	12.45
250	0.10	0.15	0.20	0.27	0.34	0.42	0.62	0.85	1.10	2.40	4.56	7.29	14.23
300	0.10	0.15	0.21	0.28	0.36	0.46	0.67	0.93	1.22	2.67	5.09	8.14	15.87
350	0.10	0.16	0.22	0.30	0.38	0.49	0.72	1.00	1.32	2.92	5.58	8.92	17.41
400	0.11	0.16	0.23	0.31	0.40	0.51	0.77	1.07	1.42	3.16	6.04	9.67	18.86
450	0.11	0.16	0.23	0.32	0.42	0.54	0.81	1.13	1.51	3.38	6.48	10.37	20.25
500	0.11	0.17	0.24	0.33	0.44	0.56	0.85	1.20	1.59	3.59	6.90	11.05	21.57
600	0.11	0.17	0.25	0.35	0.47	0.60	0.92	1.31	1.75	4.00	7.70	12.33	24.06
700	0.11	0.18	0.26	0.37	0.49	0.64	0.99	1.42	1.90	4.37	8.44	13.52	26.39
800	0.11	0.18	0.27	0.38	0.52	0.67	1.05	1.51	2.04	4.73	9.14	14.65	28.59
900	0.11	0.18	0.28	0.39	0.54	0.70	1.11	1.60	2.18	5.07	9.81	15.72	30.69
1000	0.12	0.19	0.28	0.41	0.56	0.73	1.17	1.69	2.30	5.39	10.44	16.74	32.69
1500	0.12	0.20	0.32	0.46	0.64	0.86	1.40	2.07	2.85	6.82	13.31	21.35	41.69
2000	0.12	0.21	0.34	0.50	0.71	0.97	1.60	2.39	3.32	8.07	15.80	25.37	49.55
3000	0.13	0.23	0.37	0.57	0.82	1.13	1.93	2.93	4.12	10.22	20.13	32.35	63.19
4000	0.13	0.24	0.40	0.62	0.91	1.27	2.20	3.38	4.80	12.09	23.90	38.44	75.10
5000	0.14	0.25	0.43	0.67	0.99	1.39	2.43	3.78	5.40	13.77	27.31	43.95	85.86

Cropping/Management Factor

The cropping factor, C_s, considers the protection of natural ground cover in preventing erosion of the soil. This is dependent on the type of vegetation (grass or trees) and the density of the vegetation on the site. The higher the value for C, the less protection from erosion is available; for example, a bare construction site with no groundcover has a C value of 1.0, while hay mulch applied at 1 ton per acre produces a C value of 0.13.

The C_s factor is not intended to account for the reduced erosion provided by temporary or final vegetation established on areas that have been disturbed. The erosion control factor, P, described below reflects the erosion protection afforded by use of vegetation in accordance with the *Section 2.9 Vegetation*.

Table 1.6 provides approximate values for C_s for a variety of conditions. The sensitivity of the C_s value reflects the importance of minimizing the area of disturbance and providing protection to the disturbed soil before erosion occurs. **For existing bare areas or areas stripped of natural vegetation by construction, a C_s value of 1.0 shall be used.**

Table 1.6 Cropping Factors

Type and Height of Raised Vegetative Canopy	*Canopy Cover, %*	*Ground cover that contacts the surface, %*					
		0	**20**	**40**	**60**	**80**	**95-100**
No appreciable canopy / Canopy of tall weeds or short brush (<1' tall)	0	0.450	0.200	0.100	0.042	0.013	0.003
	25	0.360	0.170	0.090	0.038	0.012	0.003
	50	0.260	0.130	0.070	0.035	0.012	0.003
	75	0.170	0.100	0.060	0.031	0.011	0.003
Appreciable brush or bushes (5' fall height)	25	0.400	0.180	0.090	0.040	0.013	0.003
	50	0.340	0.160	0.085	0.038	0.012	0.003
	75	0.280	0.140	0.080	0.036	0.012	0.003
Trees w/o appreciable low brush (>10' fall height)	25	0.420	0.190	0.100	0.041	0.013	0.003
	50	0.390	0.180	0.090	0.040	0.013	0.003
	75	0.360	0.170	0.090	0.039	0.012	0.003

(Source: Standard Handbook of Environmental Engineering edited by Robert A. Corbitt)

For each drainage basin, this C_s value is weighted based on the percentage of disturbed area in the basin:

$$C_{stotal} = [(C_{sun} * A_{un}) + (C_{sdis} * A_{dis})] / A_{total} \quad (1.5)$$

where:

C_{stotal} = C_s for drainage basin
C_{sun} = C_s for undisturbed areas
A_{un} = Area of undisturbed areas of drainage basin (acres)
C_{sdis} = C_s for disturbed areas
A_{dis} = Area of disturbed areas of drainage basin (acres)
A_{total} = Total area of drainage basin (acres)

Erosion Control Practice Factor

The erosion control practice factor, P, accounts for the erosion control and sediment trapping effectiveness of land treatments such as mulching, erosion control blankets, temporary or final vegetation, sediment basins, filter berms, check dams, and other controls.

For the, A P value of 1 is used in the USLE calculation of the uncontrolled soil loss from the site ($ZA_{uncontrolled}$) because it is assumed that no controls are used.

The Efficiency Rating (F_e) for the calculation of the soil erosion prevented/sediment retained on the site ($ZA_{retained}$) for the various controls is used in place of the erosion control practice factor. The Efficiency Rating is the compliment of the P value (F_e = 1 - P) and is used instead of P, because the desired calculation is the soil retained on the site through the use of the practices rather than the soil lost from the site.

When multiple structural controls are used in series to treat runoff from disturbed areas, the design efficiency can be calculated as follows[1]:

$$F_{eTOTAL} = 1-((1-F_{e1})*(1-F_{e2})) \quad (1.6)$$

where:

F_{e1} = Removal efficiency of first control

F_{e2} = Removal efficiency of second control

Site Rating Factor Calculation

After erosion potential is calculated for both uncontrolled ($ZA_{uncontrolled}$) and controlled conditions ($ZA_{retained}$), a site rating (SR) is calculated using Equation 1.1.

A minimum design storm of 2-year intensity and 24-hour duration shall be used for design of structural sediment control techniques. Other design criteria are defined in sections of the manual for specific erosion controls. The 2-year intensity is the rainfall intensity that has a 50 percent probability of occurring in any given year. The 24-hour duration establishes the overall volume of rainfall and runoff of the storm with a peak flow of the referenced intensity. Municipalities can adjust this requirement for particularly sensitive areas or other areas of concern.

1.3.4 Summary

The following outlines the primary steps required to calculate the Site Rating.

I. Develop design storm flows.

Determine drainage sub-basin.
Determine C_s values and drainage patterns (LS) based on conditions for design period.

II. Calculate theoretical soil loss for each sub-basin if no controls are used.

Use value of 1 for the Erosion Control Practice factor, P, since no controls are used.

III. Calculate theoretical soil uneroded and/or retained for each sub-basin by use of controls.

Use F_e from *Section 2.0 Erosion Controls* and *Section 3.0 Sediment Controls* (or test/manufacturer's data) in place of P in USLE.

Calculate soil retained onsite due to use of controls.

IV. Determine site rating.

[1] *Hartigan, P. and K. Wilweding, The Clean Colorado Project and Urban Nonpoint Source Pollution Control: The LCRA Program, Seminar Publication - Nonpoint Source Watershed Workshop, Environmental Protection Agency, Sept. 1991, p. 170.*

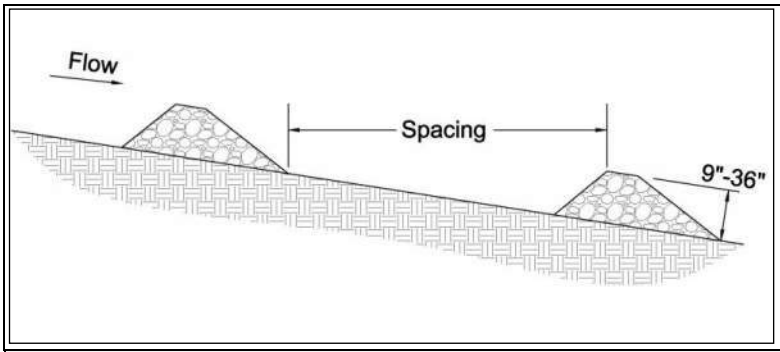
Total sediment loss from the site must be reduced by a minimum of 70 percent from uncontrolled conditions (Site Rating > 0.70).

For sites that include phasing of the construction, repeat the steps for each phase.

2.0 Erosion Controls

2.1 Check Dam

Erosion Control



Description: Check dams are small barriers consisting of loose rock, rock bags, or organic filter tubes placed across a drainage swale or ditch. They reduce the velocity of small concentrated flows, provide a limited barrier for sediment and reduce the potential for erosion of the swale or ditch.

KEY CONSIDERATIONS

DESIGN CRITERIA:

- Heights between 9 inches and 36 inches
- Top of the downstream dam should be at the same elevation as the toe of the upstream dam

ADVANTAGES / BENEFITS:

- Reduced velocities in long drainage swales or ditches
- May be used with other channel protection measures
- Provides some sediment removal

DISADVANTAGES / LIMITATIONS:

- Cannot be used in live stream channels
- Minor ponding upstream of the check dams
- Extensive maintenance or replacement of the dams required after heavy flows or high velocity flows
- Mowing hazard from loose rocks if all rock is not removed at end of construction

MAINTENANCE REQUIREMENTS:

- Inspect regularly
- Remove silt when it reaches approximately ⅓ the height of the dam or 12 inches, whichever is less

TARGETED POLLUTANTS

◒ Sediment
○ Nutrients & Toxic Materials
○ Oil & Grease
◒ Floatable Materials
○ Other Construction Wastes

APPLICATIONS

Perimeter Control
Slope Protection
Sediment Barrier
Channel Protection
Temporary Stabilization
Final Stabilization
Waste Management
Housekeeping Practices

Fe=0.30-0.50
(*Depends on soil type*)

IMPLEMENTATION CONSIDERATIONS

◒ Capital Costs
● Maintenance
○ Training
◒ Suitability for Slopes > 5%

Other Considerations:

- *None*

2.1.1 Primary Use

Check dams are used in long drainage swales or ditches to reduce erosive velocities. They are typically used in conjunction with other channel protection techniques such as vegetation lining and turf reinforcement mats. Check dams provide limited treatment to sediment-laden flows. They are more useful in reducing flow velocities to acceptable levels for stabilization methods. Check dams may be used in combination with stone outlet sediment traps, where the check dams prevent erosion of the swale while the sediment trap captures sediment at the downstream end of the swale.

2.1.2 Applications

Check dams are typically used in swales and drainage ditches along linear projects such as roadways. They can also be used in short swales down a steep slope, such as swales down a highway embankment, to reduce velocities. Check dams shall not be used in live stream channels.

Check dams should be installed before the contributing drainage area is disturbed, so as to mitigate the effects on the swale from the increase in runoff. If the swale itself is graded as part of the construction activities, check dams are installed immediately upon completion of grading to control velocities in the swale until stabilization is completed.

2.1.3 Design Criteria

General Criteria

- Typically, the dam height should be between 9 inches and 36 inches, depending on the material of which they are made. The height of the check dam shall always be less than one-third the depth of the channel.
- Dams should be spaced such that the top of the downstream dam is at the same elevation as the toe of the upstream dam. On channel grades flatter than 0.4 percent, check dams should be placed at a distance that allows small pools to form between each check dam.
- The top of the side of the check dam shall be a minimum of 12 inches higher than the middle of the dam. In addition, the side of the dams shall be embedded a minimum of 18 inches into the side of the drainage ditch, swale or channel to minimize the potential for flows to erode around the side of the dam.
- Larger flows (greater than 2-year, 24-hour design storm) must pass the check dam without causing excessive upstream flooding.
- Check dams should be used in conjunction with other sediment reduction techniques prior to releasing flow offsite.
- Use geotextile filter fabric under check dams of 12 inches in height or greater. The fabric shall meet the following minimum criteria:
    - Tensile Strength, ASTM D4632 Test Method for Grab Breaking Load and Elongation of Geotextiles, 250-lbs.
    - Puncture Rating, ASTM D4833 Test Method for Index Puncture Resistance of Geotextiles, Geomembranes, and Related Products, 135-lbs.
    - Mullen Burst Rating, ASTM D3786 Standard Test Method for Hydraulic Bursting Strength of Textile Fabrics-Diaphragm Bursting Strength Tester Method, 420-psi.
    - Apparent Opening Size, ASTM D4751 Test Method for Determining Apparent Opening Size of a Geotextile, U.S. Sieve No. 20 (max).
- Loose, unconfined soil, wood chips, compost, and other material that can float or be transported by runoff shall not be used to construct check dams.

Rock Check Dams

- Stone shall be well graded with stone size ranging from 3 to 6 inches in diameter for a check dam height of 24 inches or less. The stone size range for check dams greater than 24 inches is 4 to 8 inches in diameter.
- Rock check dams shall have a minimum top width of 2 feet with side slopes of 2:1 or flatter.

Rock Bag Check Dams

- Rock bag check dams should have a minimum top width of 16 inches.
- Bag length shall be 24 inches to 30 inches, width shall be 16 inches to 18 inches and thickness shall be 6 inches to 8 inches and having a minimum weight of 40 pounds.
- Minimum rock bag dam height of 12 inches would consist of one row of bags stacked on top of two rows of bag. The dam shall always be one more row wide than it is high, stacked pyramid fashion.
- Bags should be filled with pea gravel, filter stone, or aggregate that is clean and free of deleterious material.
- Sand bags shall not be used for check dams, due to their propensity to break and release sand that is transported by the concentrated flow in the drainage swale or ditch.
- Bag material shall be polypropylene, polyethylene, polyamide or cotton burlap woven fabric, minimum unit weight 4-ounces-per-square-yard, Mullen burst strength exceeding 300-psi as determined by ASTM D3786, Standard Test Method for Hydraulic Bursting Strength of Textile Fabrics-Diaphragm Bursting Strength Tester Method, and ultraviolet stability exceeding 70 percent.
- PVC pipes may be installed through the dam to allow for controlled flow through the dam. Pipe should be schedule 40 or heavier polyvinyl chloride (PVC) having a nominal internal diameter of 2 inches.

Sack Gabion Check Dams

- Sack gabion check dams may be used in channels with a contributing drainage area of 5 acres or less.
- Sack gabions shall be wrapped in galvanized steel, woven wire mesh. The wire shall be 20 gauge with 1 inch diameter, hexagonal openings.
- Wire mesh shall be one piece, wrapped around the rock, and secured to itself on the downstream side using wire ties or hog rings.
- Sack gabions shall be staked with ¾ inch rebar at a maximum spacing of three feet. Each wire sack shall have a minimum of two stakes.
- Stone shall be well graded with a minimum size range from 3 to 6 inches in diameter.

Organic Filter Tube Check Dams

- Organic filter tubes may be used as check dams in channels with a contributing drainage area of 5 acres or less.
- Organic filter tubes shall be a minimum of 12 inches in diameter.
- Filter material used within tubes to construct check dams shall be limited to coir, straw, aspen fiber and other organic material with high cellulose content. The material should be slow to decay or leach nutrients in standing water.
- Staking of filter tubes shall be at a maximum of 4 foot spacing and shall alternate through the tube and on the downstream face of the tube.
- Unless superseded by requirements in this section, filter tubes and filter material shall comply with the

criteria in *Section 3.6 Organic Filter Tubes*.

2.1.4 Design Guidance and Specifications

Specifications for construction of this item may be found in the Standard Specifications for Public Works Construction – North Central Texas Council of Governments, Section 201.9 Check Dam (Rock). Specifications are also available in the Standard Specifications for Construction and Maintenance of Highways, Streets, and Bridges (TxDOT 2004), Item 506.2.A and Item 506.4.C.1.

2.1.5 Inspection and Maintenance Requirements

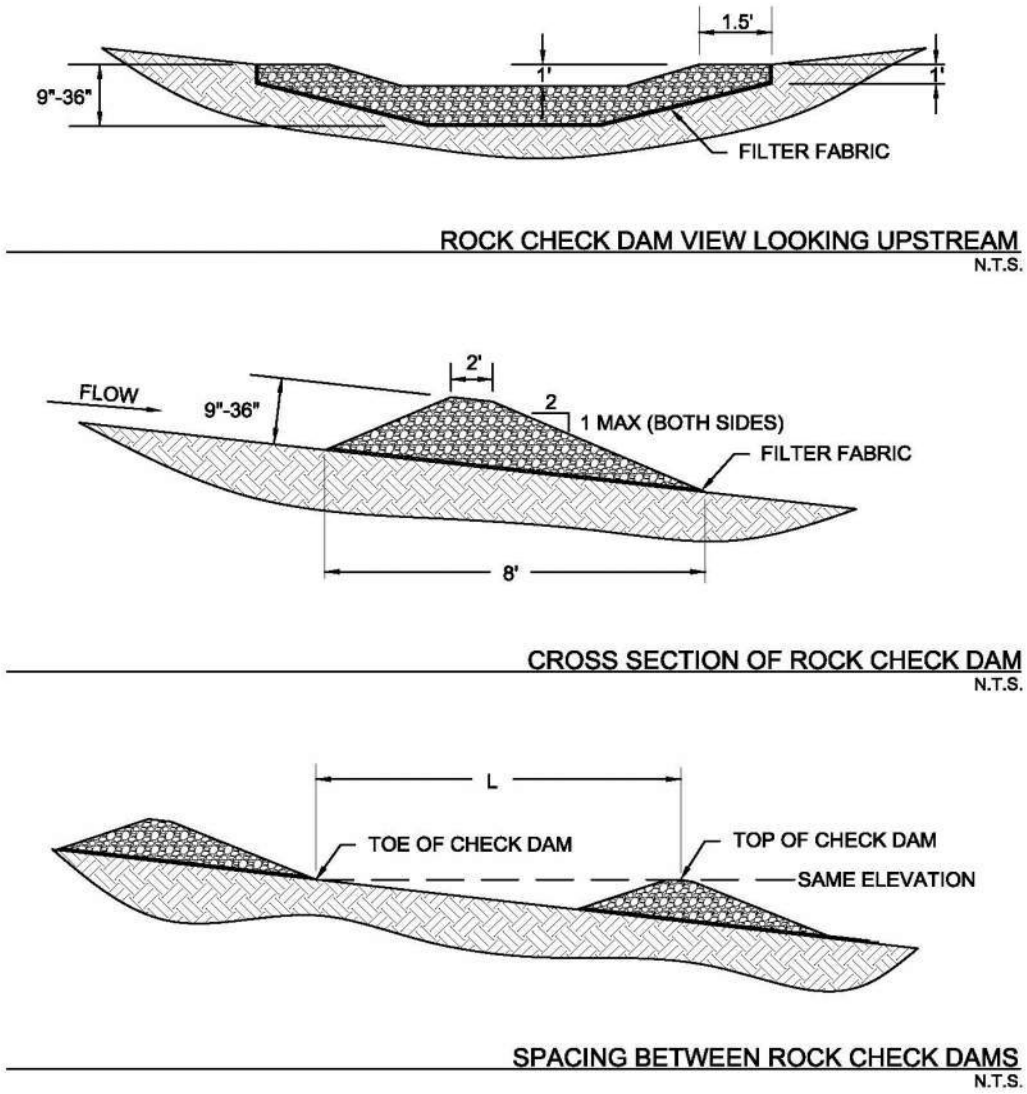
Check dams should be inspected regularly (at least as often as required by the TPDES Construction General Permit). Silt must be removed when it reaches approximately 1/3 the height of the dam or 12 inches, whichever is less. Inspectors should monitor the edges of the dam where it meets the sides of the drainage ditch, swale or channel for evidence of erosion due to bypass or high flows. Eroded areas shall be repaired. If erosion continues to be a problem, modifications to the check dam or additional controls are needed.

Care must be used when taking out rock check dams in order to remove as much rock as possible. Loose rock can create an extreme hazard during mowing operations once the area has been stabilized.

2.1.6 Example Schematics

The following schematics are example applications of the construction control. They are intended to assist in understanding the control's design and function.

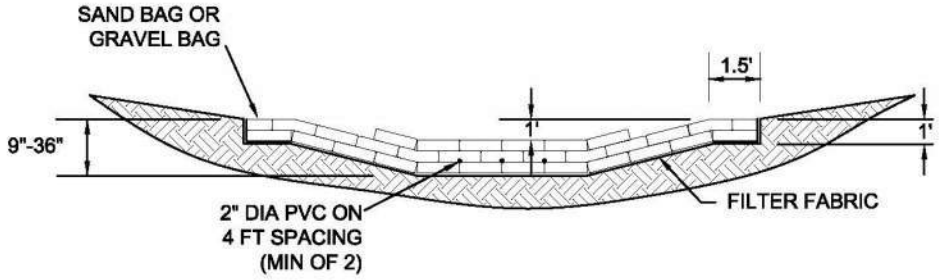
The schematics are **not for construction**. They may serve as a starting point for creating a construction detail, but they must be adapted for the site by the designer. Dimensions and notes appropriate for the application must also be added by the designer.



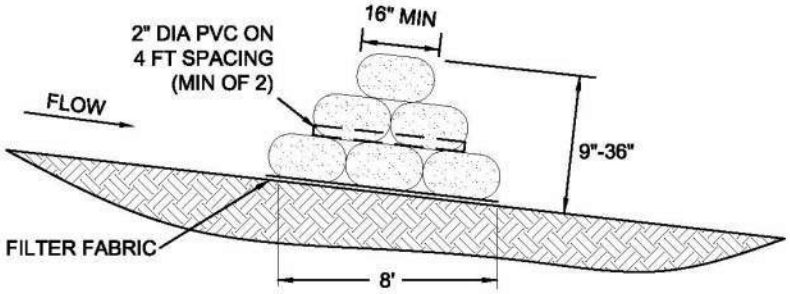
NOTES: ACTUAL DIMENSIONS OF THE CHECK DAMS SHALL BE DESIGNED BASED ON FLOW CONDITIONS IN THE DRAINAGE SWALE OR DITCH. PROVIDE CALCULATIONS THAT DOCUMENT THE FOLLOWING PARAMETERS USED TO DESIGN THE CHECK DAMS.

- HEIGHT OF CHECK DAMS BASED ON SWALE OR DITCH DIMENSIONS AND FLOW CONDITIONS.
- SPACING OF CHECK DAMS BASED ON GRADE OF THE SWALE OR DITCH. TOP OF DOWNSTREAM DAM SHALL BE AT SAME ELEVATION AS TOE OF UPSTREAM DAM

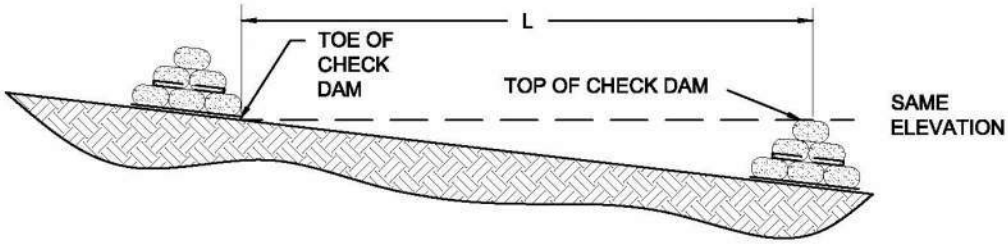
Figure 2.1 Schematics of Rock Check Dams
(Source: Modified from Stormwater Management Manual for Western Washington)



ROCK BAG CHECK DAM VIEW LOOKING UPSTREAM
N.T.S.



CROSS SECTION OF ROCK BAG CHECK DAM
N.T.S.

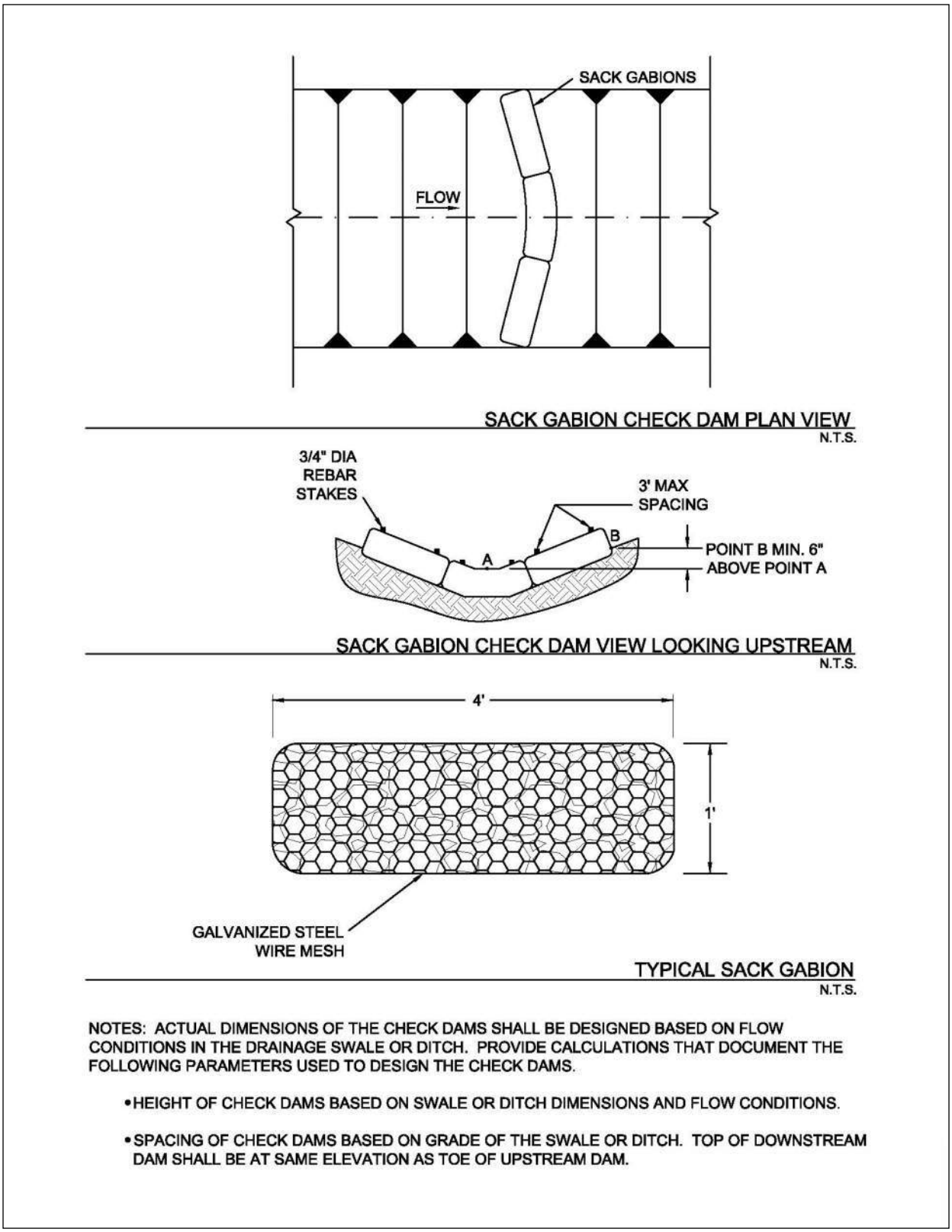


SPACING BETWEEN ROCK BAG CHECK DAMS
N.T.S.

NOTES: ACTUAL DIMENSIONS OF THE CHECK DAMS SHALL BE DESIGNED BASED ON FLOW CONDITIONS IN THE DRAINAGE SWALE OR DITCH. PROVIDE CALCULATIONS THAT DOCUMENT THE FOLLOWING PARAMETERS USED TO DESIGN THE CHECK DAMS.

- HEIGHT OF CHECK DAMS BASED ON SWALE OR DITCH DIMENSIONS AND FLOW CONDITIONS.
- SPACING OF CHECK DAMS BASED ON GRADE OF THE SWALE OR DITCH. TOP OF DOWNSTREAM DAM SHALL BE AT SAME ELEVATION AS TOE OF UPSTREAM DAM.

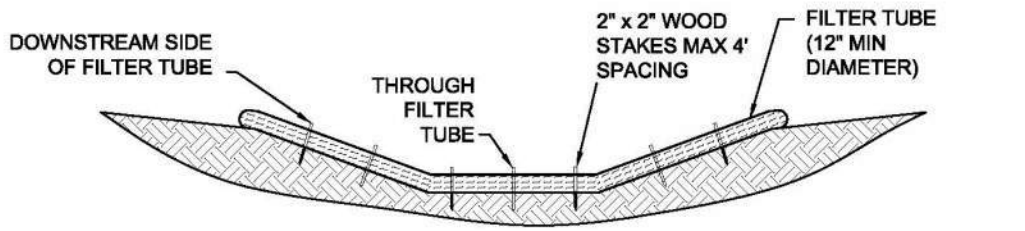
Figure 2.2 Schematics of Rock Bag Check Dams



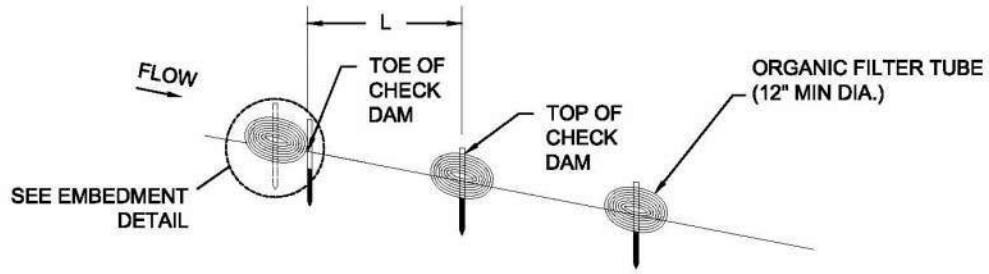
NOTES: ACTUAL DIMENSIONS OF THE CHECK DAMS SHALL BE DESIGNED BASED ON FLOW CONDITIONS IN THE DRAINAGE SWALE OR DITCH. PROVIDE CALCULATIONS THAT DOCUMENT THE FOLLOWING PARAMETERS USED TO DESIGN THE CHECK DAMS.

- HEIGHT OF CHECK DAMS BASED ON SWALE OR DITCH DIMENSIONS AND FLOW CONDITIONS.
- SPACING OF CHECK DAMS BASED ON GRADE OF THE SWALE OR DITCH. TOP OF DOWNSTREAM DAM SHALL BE AT SAME ELEVATION AS TOE OF UPSTREAM DAM.

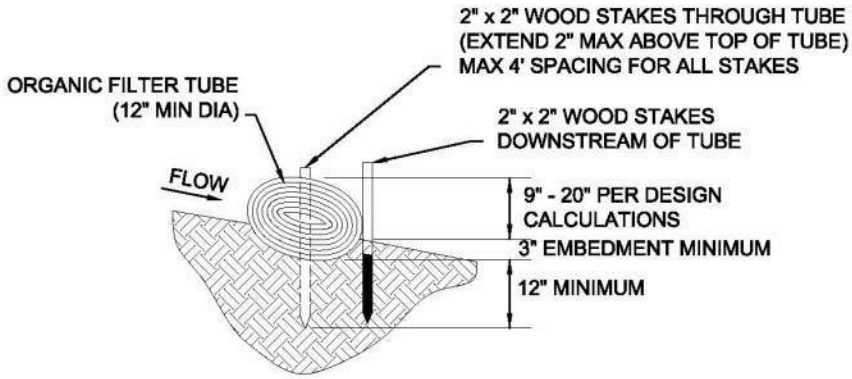
Figure 2.3 Schematics of Sack Gabion Check Dams
(Source: Modified from Texas Department of Transportation Detail Sheet EC (2)-93)



ORGANIC FILTER TUBE CHECK DAM VIEW LOOKING UPSTREAM
N.T.S.



ORGANIC FILTER TUBE CHECK DAM PROFILE
N.T.S.



EMBEDMENT DETAIL FOR ORGANIC FILTER TUBE CHECK DAM
N.T.S.

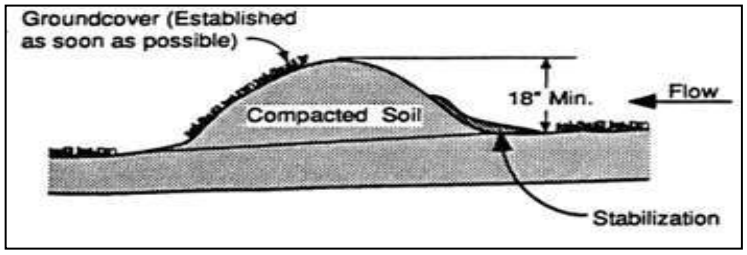
NOTES: ACTUAL DIMENSIONS OF THE CHECK DAMS SHALL BE DESIGNED BASED ON FLOW CONDITIONS IN THE DRAINAGE SWALE OR DITCH. PROVIDE CALCULATIONS THAT DOCUMENT THE FOLLOWING PARAMETERS USED TO DESIGN THE CHECK DAMS.

- HEIGHT OF CHECK DAMS BASED ON SWALE OR DITCH DIMENSIONS AND FLOW CONDITIONS.
- SPACING OF CHECK DAMS BASED ON GRADE OF THE SWALE OR DITCH. TOP OF DOWNSTREAM DAM SHALL BE AT SAME ELEVATION AS TOE OF UPSTREAM DAM.

Figure 2.4 Schematics of Organic Filter Tube Check Dams
(Source: Modified from City of Plano BMP S-7)

2.2 Diversion Dike

Erosion Control



Description: A diversion dike is a compacted soil mound, which redirects runoff to a desired location. The dike is typically stabilized with natural grass for low velocities or with stone or erosion control mats for higher velocities.

KEY CONSIDERATIONS

DESIGN CRITERIA:

- Maximum 1 foot flow depth at the dike for a 2-year return period design storm peak flow
- Side slopes 3:1 or flatter
- Minimum 2 feet top width
- Minimum embankment height of 18 inches measured from toe of slope on upgrade side
- Maximum contributing drainage area of 5 acres or less

ADVANTAGES / BENEFITS:

- Easy to install during early grading operations
- Very effective in reducing erosion at a reasonable cost
- Can be used in combination with an interceptor swale

DISADVANTAGES / LIMITATIONS:

- Must be stabilized immediately after placement or the dike will become a sediment source
- Can be a hindrance to construction equipment moving on the site

MAINTENANCE REQUIREMENTS:

- Inspect regularly
- Remove silt
- Repair erosion on the face of the dike
- Provide additional stabilization if erosion occurs

TARGETED POLLUTANTS

- ● Sediment
- ○ Nutrients & Toxic Materials
- ○ Oil & Grease
- ○ Floatable Materials
- ○ Other Construction Wastes

APPLICATIONS

Perimeter Control
Slope Protection

Sediment Barrier

Channel Protection

Temporary Stabilization

Final Stabilization

Waste Management

Housekeeping Practices

Fe=0.95

IMPLEMENTATION CONSIDERATIONS

- ◒ Capital Costs
- ◒ Maintenance
- ○ Training
- ● Suitability for Slopes > 5%

Other Considerations:

- *None*

2.2.1 Primary Use

The primary use of diversion dikes is to prevent erosion by diverting runoff away from steep slopes and disturbed areas. The diversion dike is normally used to intercept offsite flow upstream of the construction area and direct the flow around the disturbed soils. It can also be used downstream of the construction area to direct flow into a sediment control, such as a sediment basin or protected inlet. The diversion dike serves the same purpose as an interceptor swale and, based on the topography of the site, can be used in combination with an interceptor swale.

2.2.2 Applications

By intercepting runoff before it has the chance to cause erosion, diversion dikes are very effective in reducing erosion at a reasonable cost. They are applicable to a large variety of projects including site developments and linear projects, such as roadways and pipeline construction. Diversion dikes are normally used as upslope perimeter controls for construction sites with large amounts of offsite flow that needs to be re-directed around the construction site. They can also be used as a downslope perimeter control to direct runoff from the disturbed area to a sediment control.

Used in combination with swales, the diversion dike can be quickly installed with a minimum of equipment and cost, using the swale excavation material to construct the dike. No sediment removal technique is required if the dike is properly stabilized and the runoff is intercepted prior to crossing disturbed areas.

Significant savings in sediment controls can be realized by using diversion dikes to direct sheet flow from disturbed areas to a central sediment control, such as a sediment basin or other sediment trap, instead of installing a series of high-maintenance linear controls. Dikes can also be used to direct runoff from disturbed areas to a filtration device, passive treatment system, or active treatment system when these are necessary to attain required levels of sediment removal.

2.2.3 Design Criteria

- The maximum contributing drainage area should be 5 acres or less depending on site conditions.
- Maximum depth of flow at the dike shall be 1 foot based on a 2-year return period design storm peak flow.
- Side slopes of the diversion dike shall be 3:1 or flatter.
- Side slopes of the diversion dike may be 2:1 for dike installations to be used less than 3 months, if the dike is within an area protected by perimeter controls.
- Minimum width at the top of the dike shall be 2 feet.
- Minimum embankment height shall be 18 inches as measured from the toe of slope on the upgrade side of the berm.
- For grades less than 2 percent and velocities less than 6 feet per second, the minimum required channel stabilization shall be grass, erosion control blankets, or anchored mulch. For grades in excess of 2 percent or velocities exceeding 6 feet per second, stabilization is required in the form of turf reinforcement mats (or riprap with appropriate size, gradation, and thickness depending on flow conditions). Velocities greater than 8 feet per second will require approval by the local municipality and is discouraged.
- Refer to *Section 2.9 Vegetation* for design criteria and guidance on establishing vegetation in the swale.
- The dikes shall remain in place until all disturbed areas that are protected by the dike are permanently stabilized unless other controls are put into place to protect the disturbed area.
- The flow line at the dike shall have a positive grade to drain to a controlled outlet.

- Diverted runoff from a disturbed or exposed upland area shall be conveyed to a sediment-trapping device.
- The soil for the dike shall be placed in lifts of 8 inches or less and be compacted to 95 percent standard proctor density using ASTM D698 Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Standard Effort.
- Soil used in construction of the dike can be onsite material. It should be free of rocks larger than three inches in diameter and should be clay, silty clay or sandy clay with a plasticity index greater than 25. If only low PI material is available, it will be necessary to armor the slopes with stone or geotextile to prevent erosion of the dike.
- An interceptor swale may be installed on the upslope side of the diversion dike. Refer to *Section 2.4 Interceptor Swale* for swale design criteria.

2.2.4 Design Guidance and Specifications

Specifications for construction of this item may be found in the Standard Specifications for Public Works Construction – North Central Texas Council of Governments, Section 201.7 Diversion Dike.

2.2.5 Inspection and Maintenance Requirements

Dikes should be inspected regularly (at least as often as required by the TPDES Construction General Permit) to determine if silt is building up behind the dike or if erosion is occurring on the face of the dike. Silt shall be removed in a timely manner. If erosion is occurring on the face of the dike, the face of the slopes shall either be stabilized with mulch or seeding or the slopes shall be flattened.

2.2.6 Example Schematics

The following schematics are example applications of the construction control. They are intended to assist in understanding the control's design and function.

The schematics are **not for construction**. They may serve as a starting point for creating a construction detail, but they must be site adapted by the designer. In addition, dimensions and notes appropriate for the application must be added by the designer.

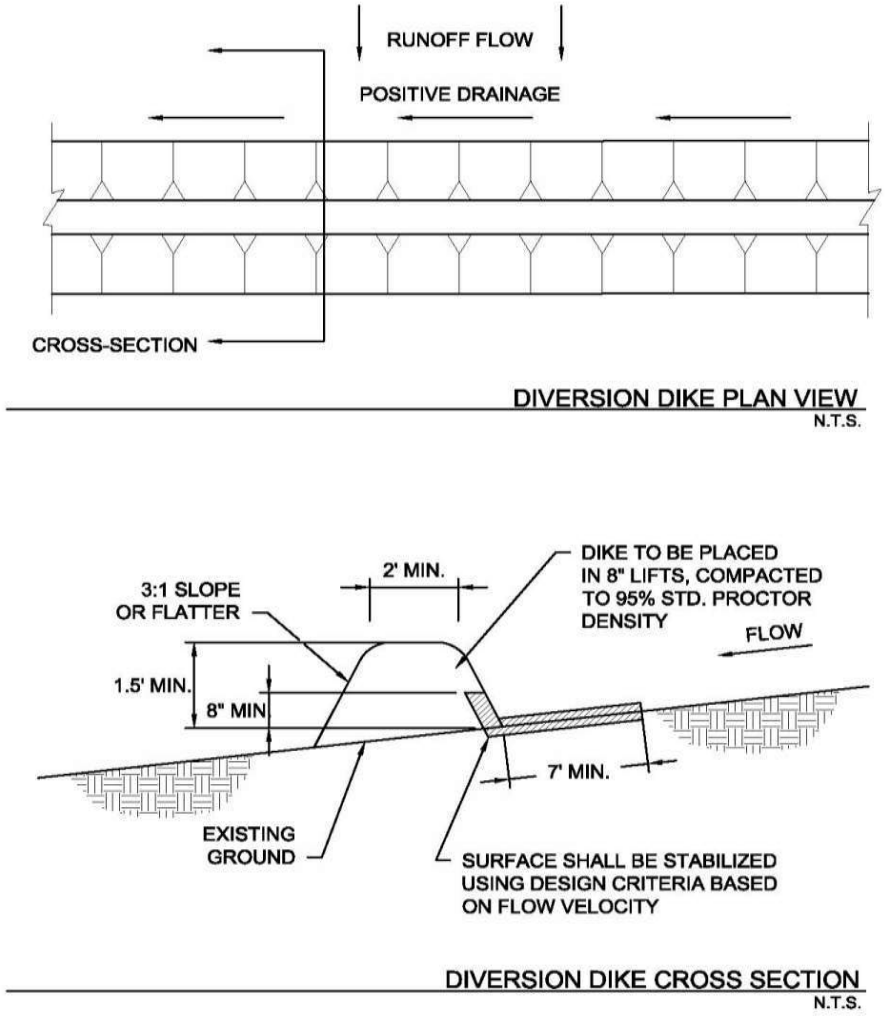
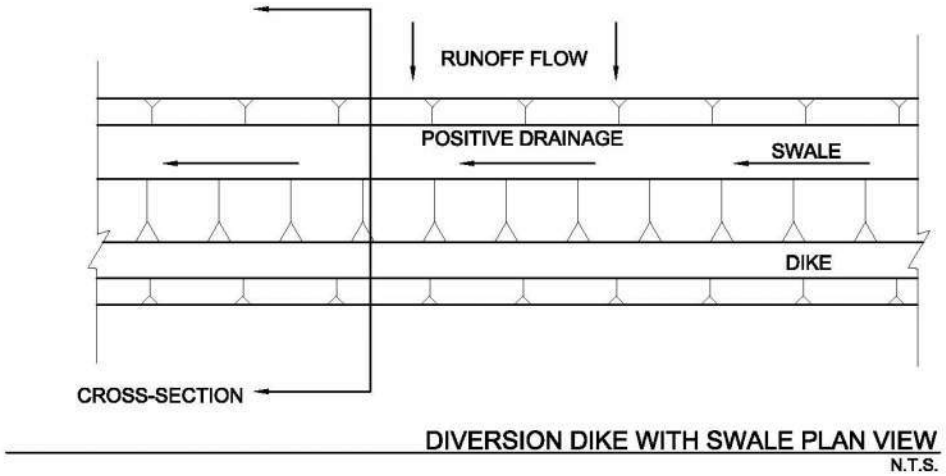
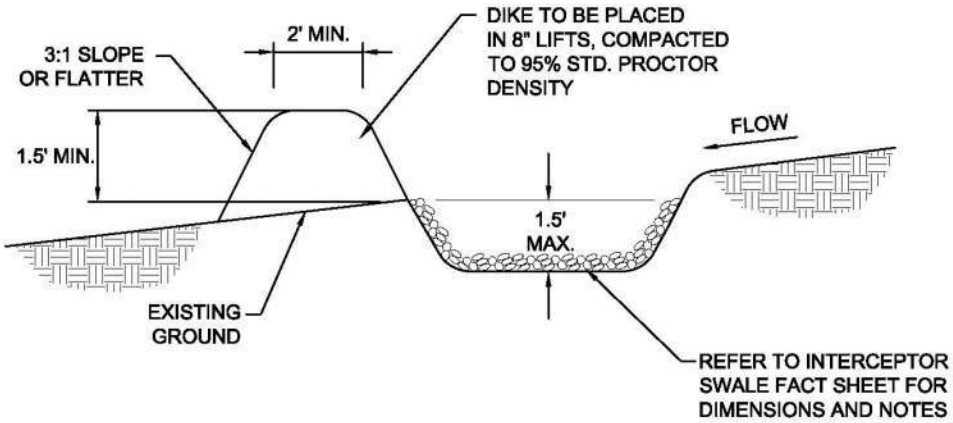


Figure 2.5 Schematics of Diversion Dike



DIVERSION DIKE WITH SWALE PLAN VIEW
N.T.S.

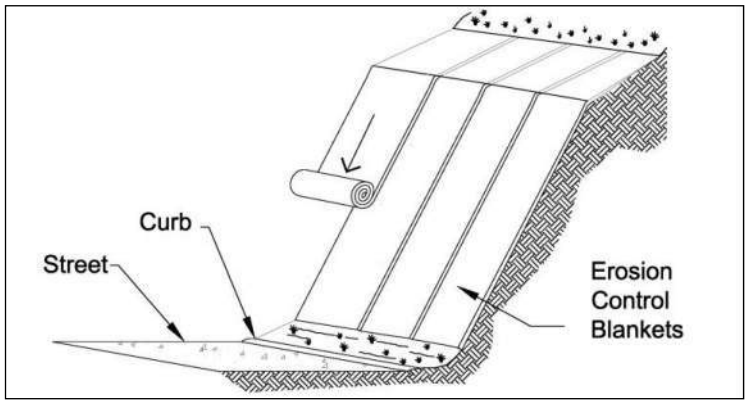


DIVERSION DIKE WITH SWALE CROSS SECTION
N.T.S.

Figure 2.6 Schematics of Diversion Dike with Swale

2.3 Erosion Control Blankets

Erosion Control



Description: An erosion control blanket (ECB) is a temporary, degradable, rolled erosion control product that reduces soil erosion and assists in the establishment and growth of vegetation. ECBs, also known as soil retention blankets, are manufactured by many companies and are composed primarily of processed, natural, organic materials that are woven, glued, or structurally bound together with natural fiber netting or mesh on one or both sides.

KEY CONSIDERATIONS

DESIGN CRITERIA:

- ECB selected based on slope, flow rate and length of service
- Specify preparation of soil surface to ensure uniform contact with blanket
- Installation and anchoring according to manufacturer's recommendations

ADVANTAGES / BENEFITS:

- Holds seed and soil in place until vegetation is established
- Effective for slopes, embankments and small channels

DISADVANTAGES / LIMITATIONS:

- Not for use on slopes greater than 2:1 or in channels with shear stresses greater than 2.0 pounds per square foot

MAINTENANCE REQUIREMENTS:

- Replace or re-anchor loosened blankets
- Remove sediment deposited on blankets

TARGETED POLLUTANTS

- ● Sediment
- ○ Nutrients & Toxic Materials
- ○ Oil & Grease
- ○ Floatable Materials
- ○ Other Construction Waste

APPLICATIONS

Perimeter Control
Slope Protection
Sediment Barrier
Channel Protection
Temporary Stabilization
Final Stabilization

Waste Management

Housekeeping Practices

Fe=0.90 (*Ground cover*)
Fe=0.65
(*Perimeter w/o vegetation*)

IMPLEMENTATION CONSIDERATIONS

- ● Capital Costs
- ◒ Maintenance
- ◒ Training
- ● Suitability for Slopes > 5%

Other Considerations:

- *Life expectancy, partial degradation, and mowing/ maintenance issues for ECBs left in place as part of final stabilization*

2.3.1 Primary Use

Erosion control blankets (ECBs) are used to hold seed and soil in place until vegetation is established on disturbed areas. They can be used on many types of disturbed areas, but are particularly effective for slopes and embankments and in small drainage swales.

ECBs seeded for vegetation may be used as a perimeter control. When used in combination with other sediment barriers, such as silt fence or organic filter tubes, blankets may be used as a perimeter control with or without vegetation.

2.3.2 Applications

ECBs may be used on many types of disturbed areas but are most applicable on gradual to steep (2:1) cut/fill slopes and in swales and channels with low to moderate flow velocities. In these applications they may provide temporary stabilization by themselves or may be used with seeding to provide final stabilization. ECBs are also used to establish vegetation in channels where velocities are less than 6.0 feet per second.

When seeded for establishment of vegetation, ECBs can be an effective perimeter along the down slope side of linear construction projects (roads and utilities). ECBs with vegetation are also used as perimeter controls for new development, particularly at the front on residential lots in new subdivisions. ECBs are an effective aid in establishing vegetated filter strips.

2.3.3 Design Criteria

- The designer shall specify the manufacturer, type of erosion control blanket to be used, and dimensioned limits of installation based on the site topography and drainage.
- The type and class of erosion control blanket must be specified in accordance with the manufacturer's guidance for the slope of the area to be protected, the flow rate (sheet flow on cut/fill slopes) or velocity (concentrated flow in swales) of stormwater runoff in contact in with the ECB, and the anticipated length of service.
- ECBs should meet the applicable "Minimum Performance Standards for TxDOT" as published by TxDOT in its "Erosion Control Report" and/or be listed on the most current annual "Approved Products List for TxDOT" applicable to TxDOT Item 169 Soil Retention Blanket and its Special Provisions.
- ECBs shall be installed vertically down slope (across contours) on cut/fill slopes and embankments and along the contours (parallel to flow) in swales and drainage ditches.
- ECBs designed to remain onsite as part of final stabilization shall have netting or mesh only on one side (the exposed side) of the ECB. The ECB shall be installed with the side that does not have netting or mesh in contact with the soil surface. All materials in the ECB, including anchors, should be 100 percent biodegradable within three years.
- On cut/fill slopes and drainage ditches or swales designed to receive erosion control blankets for temporary or final stabilization, installation of the ECBs shall be initiated immediately after completing grading of the slope or drainage way, and in no case later than 14 days after completion of grading these features. Do not delay installation of ECBs on these highly-erodible areas until completion of construction activities and stabilization of the remainder of the site.
- Unless the ECB is seeded to establish vegetation, perimeter control applications shall be limited to thirty foot wide drainage areas (i.e. linear construction projects) for an 8 foot width of ECB. When seeded for vegetation, use of ECBs for perimeter control shall follow the criteria in the *Section 3.15 Vegetated Filter Strips and Buffers*.
- Prior to the installation of the ECB, all rocks, dirt clods, stumps, roots, trash and any other obstructions that would prevent the ECB from lying in direct contact with the soil shall be removed.

- Anchor trenching shall be located along the top of slope of the installation area, except for small areas with less than 2 percent slope.
- Installation and anchoring shall conform to the recommendations shown within the manufacturer's published literature for the erosion control blanket. Anchors (staples) shall be a minimum of 6 inches in length and 1 inch wide. They shall be made of 11-gauge wire, or equivalent, unless the ECB is intended to remain in place with final stabilization and biodegrade.
- Particular attention must be paid to joints and overlapping material. Overlap along the sides and at the ends of ECBs should be per the manufacturer's recommendations for site conditions and the type of ECB being installed. At a minimum, the end of each roll of ECB shall overlap the next roll by 3 feet and the sides of rolls shall overlap 4 inches.
- After installation, the blankets should be checked for uniform contact with the soil, security of the lap joints, and flushness of the staples with the ground.
- When ECBs are installed to assist with establishing vegetation, seeding shall be completed before installation of the ECB. Criteria for seeding are provided in *Section 2.9 Vegetation*.
- Turf Reinforcement Mats should be used instead of ECBs for permanent erosion control and for stabilizing slopes greater than 2:1.
- ECBs are limited to use in swales and channels that have shear stresses of less than 2.0 pounds per square foot. Turf reinforcement mats shall be used in open channels with higher shear stresses.

2.3.4 Design Guidance and Specifications

Specifications for construction of this item may be found in the Standard Specifications for Public Works Construction – North Central Texas Council of Governments, Section 201.15 Erosion Control Blankets and in Item 169 of the Standard Specifications for Construction and Maintenance of Highways, Streets, and Bridges (TxDOT, 2004).

2.3.5 Inspection and Maintenance Requirements

Erosion control blankets should be inspected regularly (at least as often as required by the TPDES Construction General Permit) for bare spots caused by weather or other events. Missing or loosened blankets must be replaced or re-anchored.

Check for excess sediment deposited from runoff. Remove sediment and/or replace blanket as necessary. In addition, determine the source of excess sediment and implement appropriate measures to control the erosion. Also check for rill erosion developing under the blankets. If found, repair the eroded area. Determine the source of water causing the erosion and add controls to prevent its reoccurrence.

2.3.6 Example Schematics

The following schematics are example applications of the construction control. They are intended to assist in understanding the control's design and function.

The schematics are **not for construction**. The designer is responsible for working with ECB manufacturers to ensure the proper ECB is specified based on the site topography and drainage. Installation measures should be dictated by the ECB manufacturer and are dependent on the type of ECB installed. Manufacturer's recommendations for overlap, anchoring, and stapling shall always be followed. Criteria shown here are applicable only when they are more stringent than those provided by the manufacturer.

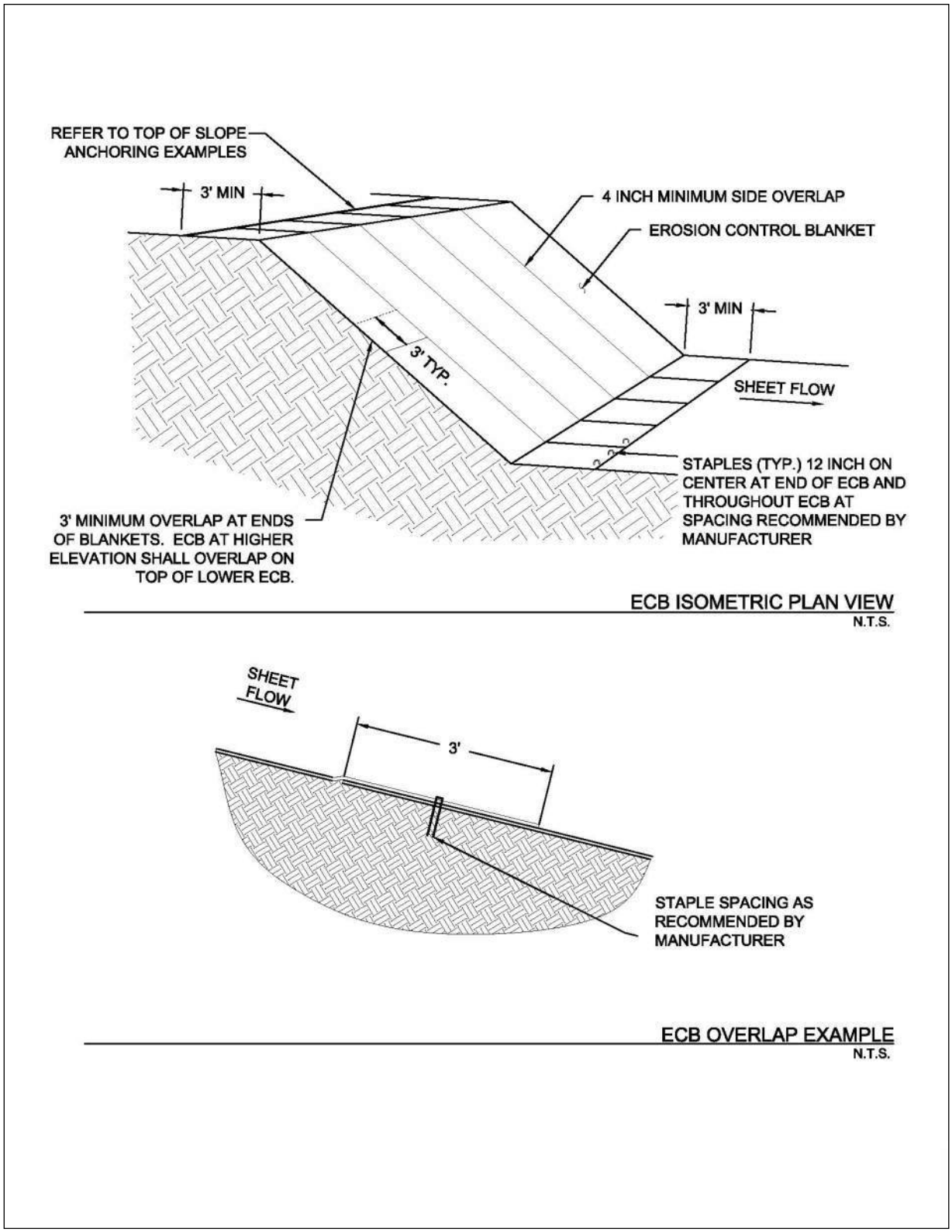
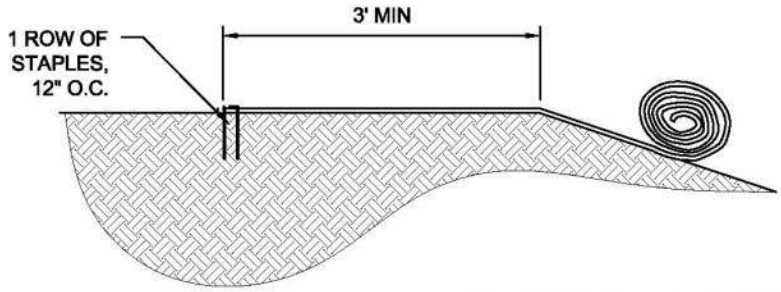
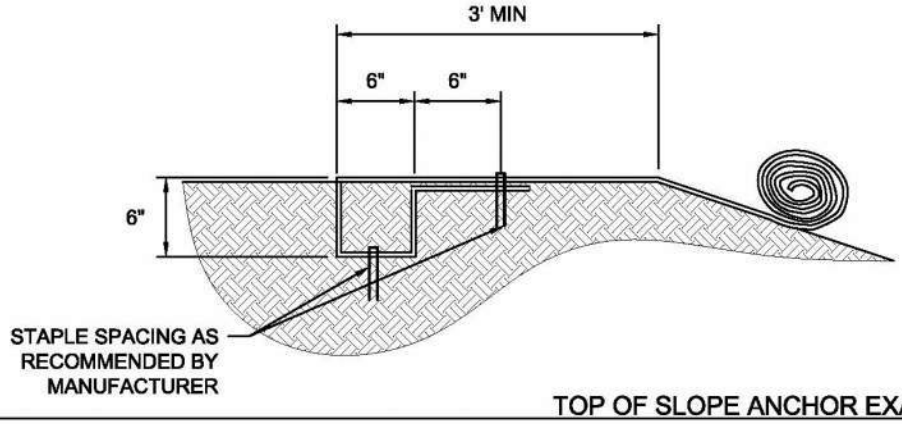


Figure 2.7 Schematics of Erosion Control Blankets



TOP OF SLOPE ANCHOR EXAMPLE 1
N.T.S.



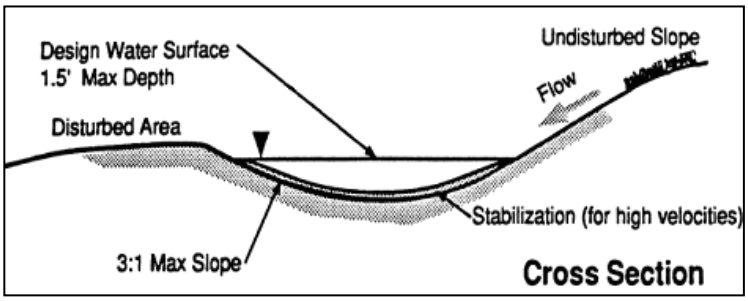
TOP OF SLOPE ANCHOR EXAMPLE 2
N.T.S.

NOTE: ANCHORING METHODS PROVIDED ARE EXAMPLES OF THE TYPE OF ANCHORING THE ECB MANUFACTURER MAY RECOMMEND. THERE ARE MORE THAN A DOZEN DIFFERENT TOP OF SLOPE ANCHORING METHODS BASED ON TYPE OF ECB, TYPE OF SOIL, SPECIFIED PERFORMANCE PERIOD, SLOPE STEEPNESS, ETC. ALWAYS FOLLOW THE MANUFACTURER'S RECOMMENDATIONS FOR ANCHORING BASED ON THE SITE-SPECIFIC APPLICATION.

Figure 2.8 Anchor Examples for Erosion Control Blankets
(Sources: American Excelsior Company and Western Excelsior Corporation)

2.4 Interceptor Swale

Erosion Control



Description: An interceptor swale is a small v-shaped, trapezoidal, or parabolic channel that collects runoff and directs it to a desired location. It can either have a natural grass lining or, depending on slope and design velocity, a protective lining of erosion control blankets, turf reinforcement mats, or rock riprap.

KEY CONSIDERATIONS

DESIGN CRITERIA:

- Maximum flow depth of 1.5 feet for a 2-year, 24-hour design storm
- Side slopes 3:1 or flatter
- Minimum freeboard of 6 inches
- Maximum velocity of 8 fps with stabilization
- Maximum contributing drainage area of 5 acres

ADVANTAGES / BENEFITS:

- Prevents erosion and reduces cost of sediment controls by directing "clean" runoff around disturbed areas
- Easy to install during early grading operations

DISADVANTAGES / LIMITATIONS:

- Must be stabilized immediately after excavation or the swale will become a sediment source
- May be unsuitable to the site conditions (too flat or steep)

MAINTENANCE REQUIREMENTS:

- Inspect regularly
- Remove debris or other obstructions so as not to diminish flow capacity
- Repair damage from storms or normal construction activities such as tire ruts

APPLICATIONS

Perimeter Control
Slope Protection
Sediment Barrier
Channel Protection
Temporary Stabilization
Final Stabilization
Waste Management
Housekeeping Practices

Fe=0.95

TARGETED POLLUTANTS

- ● Sediment
- ○ Nutrients & Toxic Materials
- ○ Oil & Grease
- ○ Floatable Materials
- ○ Other Construction Waste

IMPLEMENTATION CONSIDERATIONS

- ◒ Capital Costs
- ◒ Maintenance
- ○ Training
- ● Suitability for Slopes > 5%

Other Considerations:

- *None*

2.4.1 Primary Use

The primary use of interceptor swales is to prevent erosion by diverting runoff around disturbed areas and steep slopes. The interceptor swale can either be used to direct sediment-laden flow from disturbed areas into a sediment control or to direct 'clean' runoff from upslope areas around the disturbed areas. Since the swale is easy to install during early grading operations, it can serve as the first line of defense in reducing sediment by reducing runoff across disturbed areas. An interceptor swale reduces the requirements for structural measures to capture sediment from runoff, since the volume of runoff is reduced. By intercepting sediment laden flow downstream of the disturbed area, runoff can be directed into a sediment basin or other control for sedimentation as opposed to long runs of silt fence or other filtration method.

2.4.2 Applications

Common applications for interceptor swales include roadway projects, site development projects with substantial offsite flow onto the construction site, and sites with a large area(s) of disturbance. The swale can be used in conjunction with diversion dikes to intercept flows. Temporary swales can be used throughout the project to direct flows away from staging, storage, and fueling areas to minimize the potential for construction materials and wastes to come into contact with runoff.

Runoff from disturbed areas that flows into a swale and flows within unstabilized (bare soil) swales must be routed into a sediment control such as a sediment basin. Dikes can also be used to direct runoff from disturbed areas to a filtration device, passive treatment system, or active treatment system when these are necessary to attain required levels of sediment removal.

Vegetated swales are an effective final stabilization technique if used to permanently direct flows around steep, easily eroded, slopes. The vegetation in the swale also effectively filters both sediment and other pollutants while reducing erosion potential.

2.4.3 Design Criteria

- Design calculations are required for the use of this control. The designer shall provide drainage computations, channel shape, channel dimensions, and channel slopes for each application.
- The maximum contributing drainage area should be 5 acres or less depending on site conditions.
- Maximum depth of flow in the swale shall be 1.5 feet based on a 2-year, 24-hour design storm. Positive overflow must be provided to accommodate larger storms.
- For permanent swales, the 1.5 feet maximum depth can be increased as long as provisions for public safety are implemented.
- The maximum contributing drainage area should be 5 acres or less depending on site conditions.
- Channels may be trapezoidal, parabolic, or v-shaped; however v-shaped channels may be difficult to stabilize, so they are generally used only where the volume and rate of flow is low.
- Side slopes of the swale shall be 3:1 or flatter.
- Side slopes of the interceptor swale may be 2:1 for swales to be used less than 3 months if flows in the swale are directed to a sediment control.
- Minimum design channel freeboard shall be 6 inches.
- For grades less than 2 percent and velocities less than 6 feet per second, the minimum required channel stabilization shall be grass, erosion control blankets or anchored mulch. For grades in excess of 2 percent or velocities exceeding 6 feet per second, stabilization is required in the form of turf reinforcement mats (or riprap with appropriate size, gradation, and thickness depending on flow conditions). Velocities greater than 8 feet per second will require approval by the local municipality and is discouraged.

- Refer to *Section 2.9 Vegetation* for design criteria and guidance on establishing vegetation in the swale.
- Check dams can be used to reduce velocities in steep swales. See *Section 2.1 Check Dam* for design criteria.
- Interceptor swales must be designed for flow capacity based on Manning's Equation to ensure a proper channel section. Alternate channel sections may be used when properly designed and accepted.
- Consideration must be given to the possible impact that any swale may have on upstream or downstream conditions.
- The outlet (discharge point) of the swale shall be designed to have non-erosive velocities or designed with velocity dissipation devices.
- Diverted runoff from a disturbed area or other construction activity shall be conveyed to a sediment-trapping device.
- A diversion dike may be used with an interceptor swale. Refer to *Section 2.2 Diversion Dike* for dike design criteria.

2.4.4 Design Guidance and Specifications

Specifications for construction of this item may be found in the Standard Specifications for Public Works Construction – North Central Texas Council of Governments, Section 201.6 Interceptor Swale.

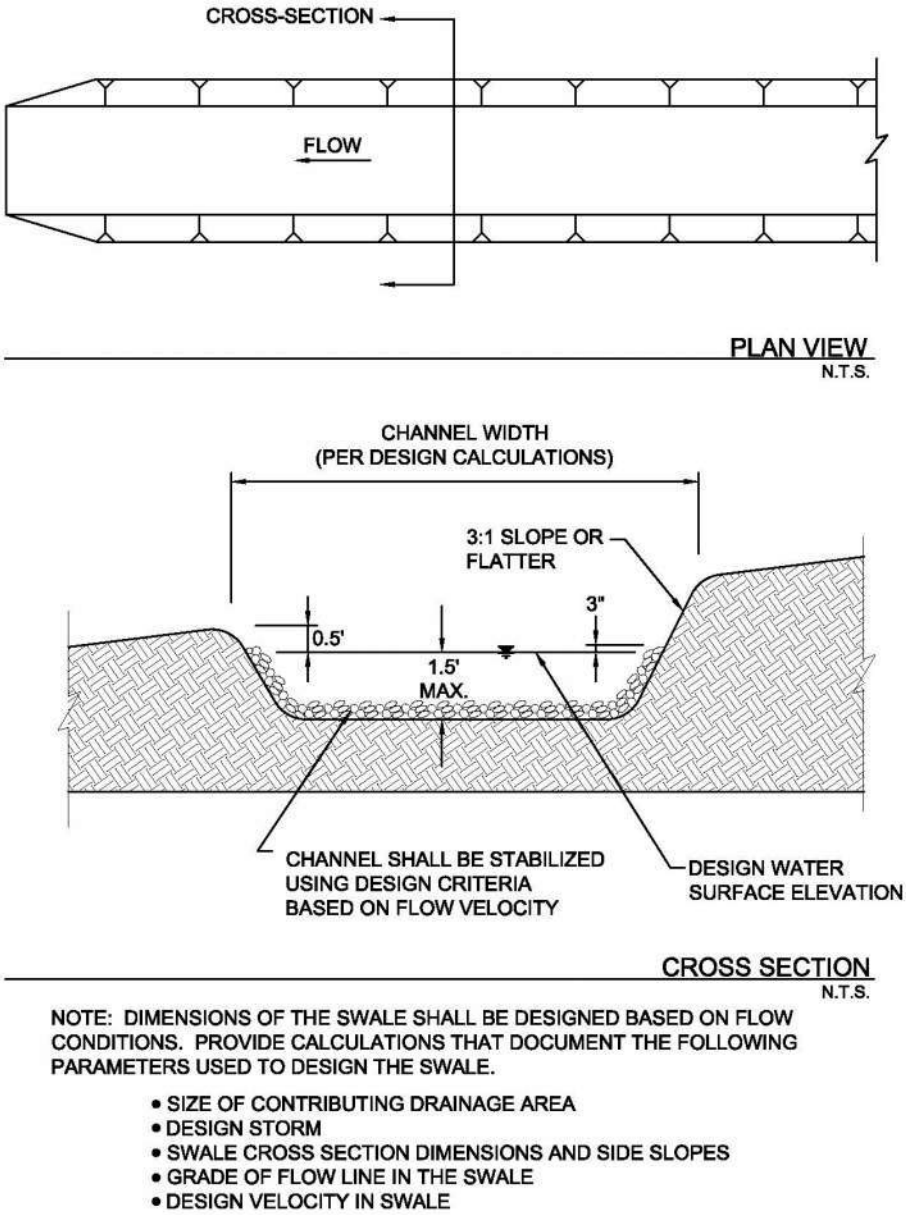
2.4.5 Inspection and Maintenance Requirements

Swales should be inspected regularly (at least as often as required by the TPDES Construction General Permit) to locate and repair any damage to the channel or to clear debris or other obstructions so as not to diminish flow capacity. Damage from storms or normal construction activities such as tire ruts or disturbance of swale stabilization shall be repaired as soon as practical. Accumulated sediment deposited from water in the swale should be removed regularly to maintain the hydraulic capacity of the swale.

2.4.6 Example Schematics

The following schematics are example applications of the construction control. They are intended to assist in understanding the control's design and function.

The schematics are **not for construction**. They may serve as a starting point for creating a construction detail, but they must be site adapted by the designer. In addition, dimensions and notes appropriate for the application must be added by the designer.



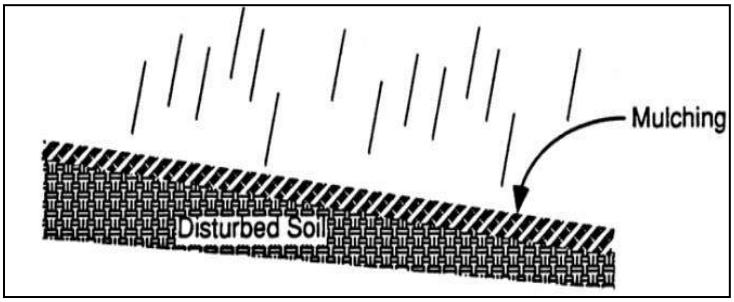
NOTE: DIMENSIONS OF THE SWALE SHALL BE DESIGNED BASED ON FLOW CONDITIONS. PROVIDE CALCULATIONS THAT DOCUMENT THE FOLLOWING PARAMETERS USED TO DESIGN THE SWALE.

- SIZE OF CONTRIBUTING DRAINAGE AREA
- DESIGN STORM
- SWALE CROSS SECTION DIMENSIONS AND SIDE SLOPES
- GRADE OF FLOW LINE IN THE SWALE
- DESIGN VELOCITY IN SWALE

Figure 2.9 Schematics of Interceptor Swale

2.5 Mulching

Erosion Control



Description: Mulching is the application of a uniform layer of organic material over barren areas to reduce the effects of erosion from rainfall. Types of mulch include compost mixtures, straw, wood chips, bark, or other fibers. Commercialized surface treatments that combine straw or other mulch material with organic or inorganic soil binding systems are also available and are particularly useful on steep slopes.

KEY CONSIDERATIONS

DESIGN CRITERIA:

- Specify even, uniform application
- Thickness of 1 to 2 inches, depending on application
- Application criteria specific to type of mulch
- Anchor mulch on slopes of 3:1 to 1.5:1
- Do not use mulch on slopes steeper than 1.5:1

ADVANTAGES / BENEFITS:

- Provides immediate stabilization of bare areas
- May be used with seeding for final stabilization
- Decreases soil moisture loss
- Decreases velocity of sheet flow
- Reduces volume of sediment-laden flow

DISADVANTAGES / LIMITATIONS:

- Subject to removal by wind or water
- Results in lower soil temperature, which may yield longer seed germination periods
- Should not be applied within the ordinary high-water mark of natural surface waters or within the design flow depth of constructed ditches and channels

MAINTENANCE REQUIREMENTS:

- Inspect regularly
- Replace regularly in high traffic areas to maintain uniform thickness
- Maintain a stockpile of excess mulch at the site to repair problem spots

TARGETED POLLUTANTS

- ◒ Sediment
- ○ Nutrients & Toxic Materials
- ○ Oil & Grease
- ○ Floatable Materials
- ○ Other Construction Wastes

APPLICATIONS

Perimeter Control

Slope Protection

Sediment Barrier

Channel Protection

Temporary Stabilization

Final Stabilization

Waste Management

Housekeeping Practices

Fe=0.75-0.90

(Depends on coverage)

IMPLEMENTATION CONSIDERATIONS

- ◒ Capital Costs
- ◒ Maintenance
- ○ Training
- ◒ Suitability for Slopes > 5%

Other Considerations:

- *Availability of materials for mulch*
- *Application depends on slope*

2.5.1 Primary Use

Mulch may be used by itself to temporarily stabilize bare areas or with seed to establish final stabilization of bare areas. Mulch protects the soil from erosion and moisture loss by lessening the effects of wind, water, and sunlight. It also decreases the velocity of sheet flow, thereby reducing the volume of sediment-laden water flow leaving the mulched area.

2.5.2 Applications

Mulch may be applied on most areas disturbed by construction that require surface protection including:

- Freshly seeded or planted areas;
- Disturbed areas at risk of erosion due to the time period being unsuitable for growing vegetation;
- Disturbed areas that are not conducive to vegetation for temporary stabilization; or
- Steep slopes of 3:1 to 1.5:1, provided the mulch is anchored to the soil by use of soil stabilizers, netting, or crimping.

Mulch is frequently applied with seeding for vegetation. In these cases, refer to *Section 2.9 Vegetation* for related criteria that may affect mulching.

Mulch may also be applied with commercially available polymers for soil surface treatment to bind the mulch with the soil. This method is particularly useful on steep slopes. Related criteria are available in *Section 2.7 Soil Surface Treatments*.

2.5.3 Design Criteria

General

- Specific design information is required for the use of this control. The designer shall specify the type of mulch to be used, the application rate and/or thickness, and the type of anchoring (if applicable) based on site conditions.
- Choice of mulch depends largely on slope and soil type, in addition to availability of materials.
- Netting, adhesive polymers, or other methods of anchoring the mulch are required on slopes of 3:1 to 1.5:1. Do not use mulch on slopes steeper than 1.5:1.
- Mulch should be applied in an even and uniform manner where concentrated water flow is negligible. Do not apply mulch within the ordinary high-water mark of natural surface waters or within the design flow depth of constructed ditches and channels.
- Hay should not be used as mulch.
- Organic mulches may be distributed by hand or by mechanical means, provided a uniform thickness is achieved.
- When mulch is used with vegetation for final stabilization, fertilization and soil treatment for vegetation establishment should be done prior to placement of mulch, with the exception of hydroseeding or when seed is distributed following straw mulch spread during winter months.
- Table 2.1 on the following page contains a summary of mulch types and general guidelines.

Table 2.1 Mulch Standards and Guidelines

Mulch Material	*Quality Standards*	*Application Rates*	*Remarks*
Straw	Air-dried, free of mold and not rotten. Certified Weed Free.	1.5 to 2 tons per acre	Cost-effective when applied with adequate thickness. Straw must be held in place by crimping, netting, or soil stabilizer.
Chipped Site Vegetation	Should include gradation from fine to coarse to promote interlocking properties. Must be free of waste materials such as plastic bags, metal debris, etc.	10 to 12 tons per acre	Cost-effective method to dispose of vegetative debris from site. Best application is for temporary stabilization where construction will resume. Use cautiously on areas where vegetation will be established, as wood chips will deplete soil nitrogen.
Erosion Control Compost (Wood Chip and Compost Mixture)	Shall meet the Physical Requirements in Table 1 of TxDOT Special Specification 1001.	Approx. 10 tons per acre	Special caution is advised regarding the source and composition of wood mulches. Ensure compost is free of herbicides. Ensure wood chips are from unpainted and untreated wood.
Hydraulic Mulch	Must not contain sawdust, cardboard, paper, paper byproducts, plastics, or synthetics. No petroleum-based tackifiers.	Follow the manufacturer's recommendations. Application rate increases with slope steepness.	May be particularly effective on slopes steeper than 3:1. Ensure wood fibers are from unpainted and untreated wood.

Straw Mulch

- Straw mulch shall be free of weed and grass seed.
- Straw mulch shall be air-dried, free of mold, and not rotten.
- Straw fibers shall be a minimum of 4 inches and a maximum of 8 inches in length.
- Straw mulch must be anchored by using a tractor-drawn crimper to punch into the soil, by placing degradable netting above the mulch, or by application of a soil stabilizer (*Section 2.7 Soil Surface Treatments*).

Chipped Site Vegetation

- Chipped site vegetation is suitable mulch for temporary stabilization before construction will resume in an area of the construction site.
- Ensure the cleared vegetation is free of trash, litter, and debris prior to chipping.

- Chipped pieces shall be a minimum of 2 inches and a maximum of 6 inches in length.
- Chipped woody vegetation that is greater than 50% wood chips by volume may result in mulch that depletes nitrogen in the soil. It is useful as mulch for temporary stabilization where construction activity will resume and result in removal of the mulch. However, it should be used with care on areas where vegetation will be established for final stabilization.
- Chipped vegetation that is greater than 50 percent wood chips by volume may require treatment with a nitrogen fertilizer when used for mulch with seeding.
- Chipped vegetation that includes green matter will include seeds. It should not be used on areas that have specific landscaping requirements.

Erosion Control Compost (Wood Chip and Compost Mixture)

- Wood chip and compost mixture used for mulch shall meet the criteria for Erosion Control Compost in TxDOT Special Specification 1001.
- Wood chips for the mixture shall be less than or equal to 5 inches in length with 95 percent passing a 2 inch screen and less than 30 percent passing a 1 inch screen. Mulch should not contain chipped manufactured boards or chemically treated wood such as particleboard, railroad ties, or similar treated wood.
- Compost for the mixture shall meet the Physical Requirements specified in Table 1 of 2004 TxDOT Special Specification 1001, Compost. It must be free of herbicides and other chemicals.
- Mixing of the Erosion Control Compost into the soil surface is allowed when vegetation is established for final stabilization, except for drill seeding, in which case it is best to leave the mulch as an undisturbed top layer.

Hydraulic Mulch (Including Bonded Fiber Matrix)

- Hydraulic mulch shall consist of a mixture of shredded wood fiber and a stabilizing binder. The mulch must not contain sawdust, cardboard, paper or paper byproducts.
- Shredded wood fiber shall be long strand, whole wood fibers that are:
  - Minimum of 25 percent of fibers 3/8 inch long;
  - Minimum of 50 percent held on a No. 25 sieve;
  - Free from paint, printing ink, varnish, petroleum products, seed germination inhibitors; and
  - Free from synthetic or plastic materials.
- Mulch binders may be organic or inorganic polymers. Asphaltic emulsions and other petroleum-based tackifiers shall not be used.
- The stabilizing emulsion must be nonflammable, non-toxic to aquatic organisms, and free from growth or germination inhibiting factors.
- Areas hydraulically mulched shall be protected from all traffic, including foot traffic, a minimum of 24 hours to allow the mulch to dry and cure. Depending on the mulch, up to 48 hours of protection may be required. Always follow manufacturer's recommendations.
- Hydraulic mulch provides limited to no protection until cured. Do not apply when rain is forecast within the next 24 hours.
- Hydraulic mulch may be particularly effective on slopes steeper than 3:1.

2.5.4 Design Guidance and Specifications

Specifications for construction of this item may be found in the Standard Specifications for Public Works Construction – North Central Texas Council of Governments, Section 201.16 Mulching. Specifications for

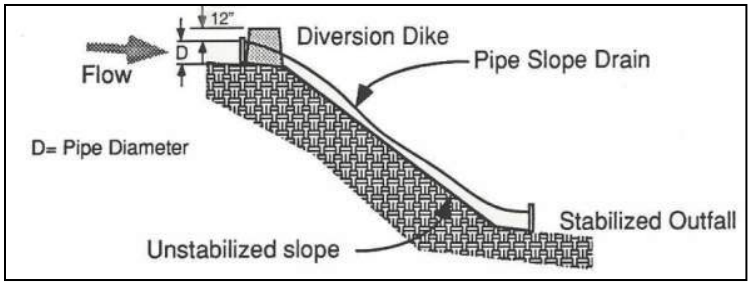
compost may be found in Standard Specifications for Construction and Maintenance of Highways, Streets and Bridges (TxDOT 2004) Item 161.

2.5.5 Inspection and Maintenance Requirements

Mulched areas should be inspected regularly (at least as often as required by the TPDES Construction General Permit) for thin or bare spots caused by natural decomposition or weather related events. Mulch in high traffic areas should be replaced on a regular basis to maintain uniform protection. Excess mulch should be brought to the site and stockpiled for use during the maintenance period to dress problem spots.

2.6 Pipe Slope Drain

Erosion Control



Description: A pipe slope drain is a temporary or permanent pipeline, typically utilizing flexible pipe that conveys runoff down steep or unstabilized slopes without causing erosion. The drain is anchored on the upstream end with some form of headwall to limit erosion and secure the pipe.

KEY CONSIDERATIONS

DESIGN CRITERIA:

- Maximum entrance grade of 3 percent
- Anchor upstream end with a headwall or similar device
- Secure pipe with hold down anchors spaced 10 feet on center
- Stabilize outlet and provide velocity dissipation so that released flow has a velocity less than 3 feet per second

ADVANTAGES / BENEFITS:

- Protects slopes from erosion caused by overland flow
- A series of pipes may be used to control drainage areas greater than 5 acres in size

DISADVANTAGES / LIMITATIONS:

- Drain can easily be damaged by construction traffic
- Difficult to secure pipe to the slope
- Can become clogged during large rain events causing water to overflow and create a serious erosion condition

MAINTENANCE REQUIREMENTS:

- Inspect regularly
- Repair damage to pipe joints
- Unclog pipe

TARGETED POLLUTANTS

- ● Sediment
- ○ Nutrients & Toxic Materials
- ○ Oil & Grease
- ○ Floatable Materials
- ○ Other Construction Wastes

APPLICATIONS

Perimeter Control

Slope Protection

Sediment Barrier

Channel Protection

Temporary Stabilization

Final Stabilization

Waste Management

Housekeeping Practices

Fe=0.95

IMPLEMENTATION CONSIDERATIONS

- ● Capital Costs
- ● Maintenance
- ○ Training
- ● Suitability for Slopes > 5%

Other Considerations:

- *Normally used in combination with interceptor swales or diversion dikes to direct flow*
- *Additional measures needed to remove sediment from runoff*

2.6.1 Primary Use

Pipe slope drains are used to protect graded slopes during establishment of temporary and final vegetation. They are used on sites with a long, unstabilized, steep slope area that is subject to erosion from overland flow. Drains are normally used in combination with interceptor swales or diversion dikes to direct the flow into the pipe. The pipe slope drain can provide service for a relatively large area. It does not treat the runoff; therefore if the runoff contains sediment from a disturbed area, treatment through a sediment control is required before the flow is released offsite.

2.6.2 Applications

Sites with large berms or grade changes, such as roadway embankments, are candidates for a pipe slope drain. Since provisions must be made to direct the flow into the pipe drain, some grading is normally required upstream of the pipe slope drain. Installed properly, slope erosion can be greatly reduced (but not entirely eliminated) through the use of the drain.

Pipe slope drains also require a stabilized outlet. This is critical since the velocities at the outfall are normally high. Velocity dissipators such as stone or concrete riprap are typically required to reduce the velocity and spread the flow, reducing erosion.

2.6.3 Design Criteria

- Design calculations and information are required for the use of this control. The designer shall provide drainage computations, pipe material, pipe size, and stone apron size for each application.
- The entrance to the pipe slope drain may be a standard corrugated, metal pre-fabricated, flared end section with an integral toe plate extending a minimum of 6 inches from the bottom of the end section.
- The grade of the entrance shall be 3 percent maximum.
- The diversion dike at the entrance shall have a minimum height of the pipe diameter plus 12 inches and a minimum width of 3 times the pipe diameter. Additional criteria are in *Section 2.2 Diversion Dike*.
- The drain pipe shall be made of any material, rigid or flexible, capable of conveying runoff. Regardless of material, the drain pipe shall be completely water-tight so that no water leaks onto the slope being protected.
- All sections of the pipe slope drain shall be connected using watertight collars or gasketed watertight fittings.
- If the upslope drainage area contributing flow to the pipe drain is disturbed or the collection swale/dike for the drain is not stabilized, flow from a pipe slope drain must be routed to a sediment control to remove suspended soil collected in these areas before being discharged from the site.
- The pipe shall be secured with hold down anchors spaced 10 feet on center.
- Temporary pipe slope drains are to be sized to accommodate runoff flows equivalent to a 10-year storm as calculated using the Rational Method and Manning's equation, but in no case shall pipes be sized smaller than shown on the following table.

Table 2.2 Pipe Slope Drain Minimum Diameters	
Minimum Pipe Size	***Maximum Contributing Drainage Area***
12 inches	0.5 Acres
18 inches	1.5 Acres
21 inches	2.5 Acres
24 inches	3.5 Acres
30 inches	5.0 Acres

- Maximum drainage areas for individual pipe slope drains shall be 5 acres. For areas larger than 5 acres, additional drains shall be added.
- Both the entrance and outfall of the pipe slope drain should be properly stabilized. Grass can normally be used at the entrance, but armor type stabilization such as stone or concrete riprap is normally required to address the high velocities of the outfall.
- A riprap lined apron shall be excavated to accept the discharge from the pipe and dissipate the energy of the flow. The width of the bottom of the apron shall be 3 times the pipe diameter, and the length shall be a minimum of 6 times the pipe diameter of the drain pipe.
- The riprap apron shall be a minimum of 12 inches in depth and shall be lined with well graded stone weighing between 50 and 150 pounds per stone at a minimum thickness of 12 inches. The top of the riprap apron shall be relatively flat (no slope) and flush with the surrounding ground.
- The apron shall be designed so that the released flow has a velocity less than 3 feet per second.

2.6.4 Design Guidance and Specifications

Specifications for construction of this item may be found in the Standard Specifications for Public Works Construction – North Central Texas Council of Governments, Section 201.14 Pipe Slope Drain and in the Standard Specifications for Construction and Maintenance of Highways, Streets and Bridges (TxDOT 2004) Item 506.2.B and 506.4.C.2.

2.6.5 Inspection and Maintenance Requirements

Pipe slope drains should be inspected regularly (at least as often as required by the TPDES Construction General Permit) to locate and repair any damage to joints or clogging of the pipe. In cases where the diversion dike has deteriorated around the entrance of the pipe, it may be necessary to reinforce the dike with sandbags or to install a concrete collar to prevent failure. Signs of erosion around the pipe drain should be addressed in a timely manner by stabilizing the area with erosion control blanket, turf reinforcement mats, riprap, concrete, or other acceptable methods.

2.6.6 Example Schematics

The following schematics are example applications of the construction control. They are intended to assist in understanding the control's design and function.

The schematics are **not for construction**. They may serve as a starting point for creating a construction detail, but they must be site adapted by the designer. In addition, dimensions and notes appropriate for the application must be added by the designer.

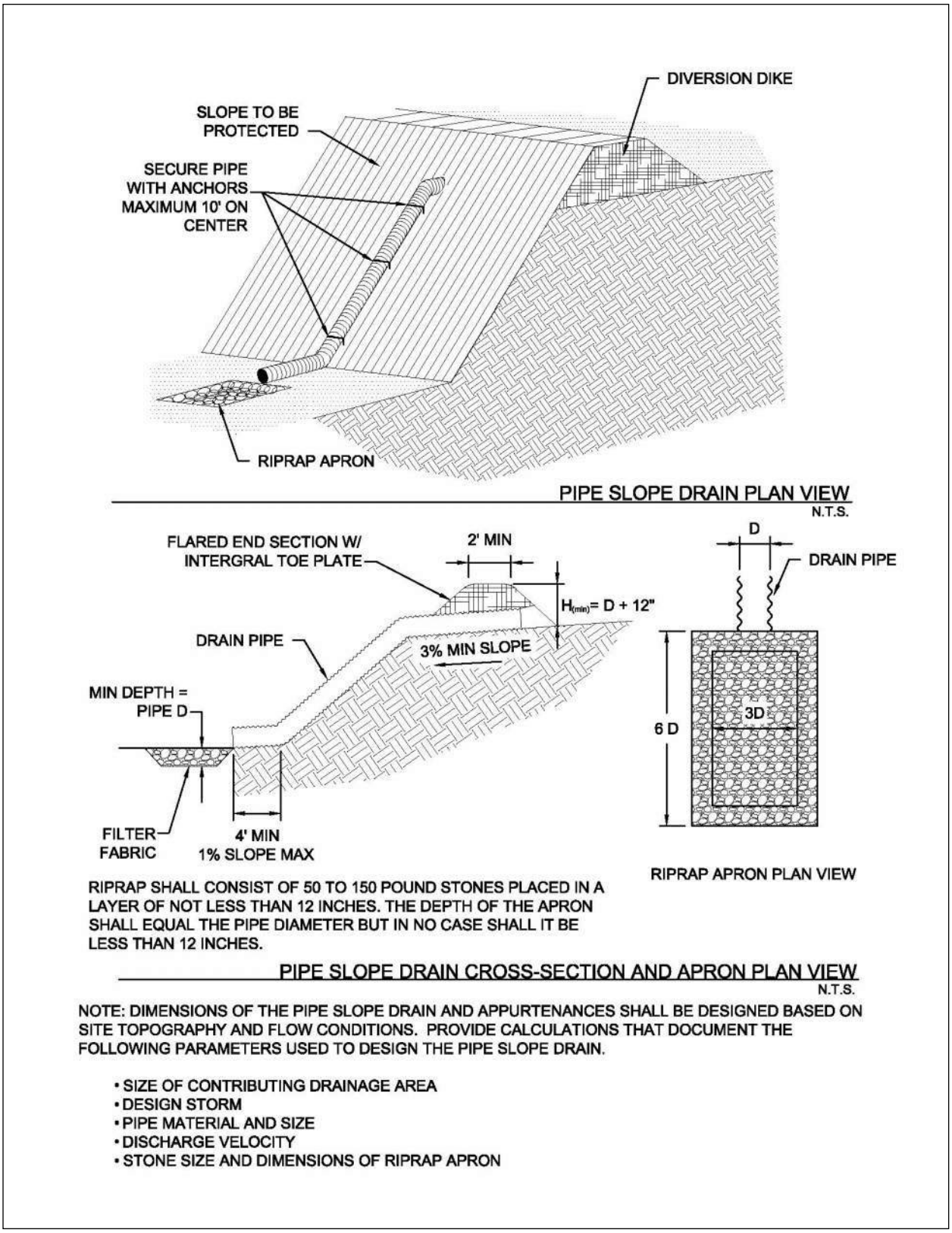
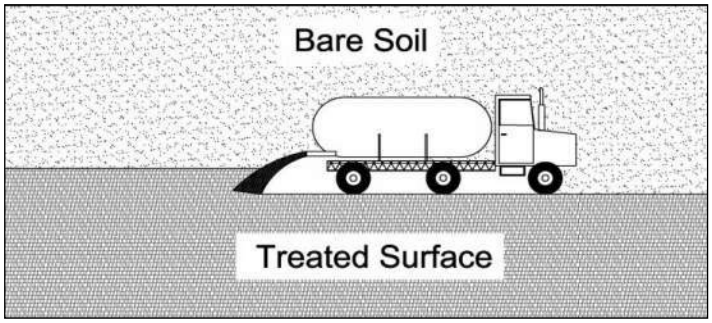


Figure 2.10 Schematics of Pipe Slope Drain

2.7 Soil Surface Treatments

Erosion Control



Description: Soil surface treatments are measures applied to a bare soil surface to temporarily decrease the amount of soil lost to wind and water erosion. Substances typically applied to the soil surface are water and organic and inorganic palliatives. Soil surface treatments are also effective for the surfaces of temporary berms and stockpiles.

KEY CONSIDERATIONS

DESIGN CRITERIA:

- Maintain the original ground cover as long as practical
- Select treatment method based on soil type, site conditions, and required duration of effectiveness
- Control traffic on areas being treated
- Apply water before start of work and repeat reguarly
- Select, dilute and apply palliatives according to manufacturer's recommendations

ADVANTAGES / BENEFITS:

- Prevents onsite and off-site impacts of dust deposition on roadways, drainage ways, or surface waters

DISADVANTAGES / LIMITATIONS:

- Sediment controls are still needed with soil surface treatments
- Effectiveness is temporary
- Control methods often require repeated applications
- Water has limited effectiveness on soils in wind erodibility groups 1 – 4 and 4L

MAINTENANCE REQUIREMENTS:

- Inspect regularly
- Reapply water and palliatives as needed

TARGETED POLLUTANTS

- ◒ Sediment
- ○ Nutrients & Toxic Materials
- ○ Oil & Grease
- ○ Floatable Materials
- ○ Other Construction Wastes

APPLICATIONS

Perimeter Control

Slope Protection

Sediment Barrier

Channel Protection

Temporary Stabilization

Final Stabilization

Waste Management

Housekeeping Practices

Fe=0.10-0.90

(Depends on type of treatment)

IMPLEMENTATION CONSIDERATIONS

- ◒ Capital Costs
- ◒ Maintenance
- ◒ Training
- ◒ Suitability for Slopes > 5%

Other Considerations:

- *Worker protection for mixing, dilution, and application of some palliatives*

2.7.1 Primary Use

Surface treatments are used to reduce wind and water erosion by providing temporary stabilization of bare soil. They are primarily used where stabilization is needed for less than 12 months.

2.7.2 Applications

Soil surface treatments are applicable to any construction site where dust is created and there is the potential for air and water pollution from dust being blown off the site. The treatments are applicable to bare areas of soil, temporary soil berms, stockpiles, earth-moving activities, and demolition activities, all of which can be sources of dust.

The National Resources Conservation Service (NRCS) assigns a wind erodibility group to soils as shown in Table 2.3.

Table 2.3 NRCS Wind Erodibility Groups

Group	Soil Type	Erosion Potential
1	Sands, coarse sands, fine sands and very fine sands	Extremely erodible
2	Loamy sands, loamy fine sands, and loamy very fine sands	Very highly erodible
3	Sandy loams, coarse sandy loams, fine sandy loams, and very fine sandy loams	Highly erodible
4L	Calcareous loamy soils that are less than 35 percent clay and more than 5 percent finely divided calcium carbonate	Erodible
4	Clay, silty clays, clay loams and silty clay loams that are more than 35 percent clay	Moderately erodible
5	Loam soils that are less than 18 percent clay and less than 5 percent finely divided calcium carbonate and sandy clay loams and sandy clays that are less than 5 percent finely divided calcium carbonate	Slightly erodible
6	Loamy soils that are 18 to 35 percent clay and less than 5 percent finely divided calcium carbonate, except silty clay loams	Very slightly erodible
7	Siltly clay loams that are less than 35 percent clay and less than 5 percent finely divided calcium carbonate	Slightly erodible
8	Stony or gravelly soils	Not subject to wind erosion

Soil surface treatments for dust control will be most applicable to soils in groups 1 through 4 and 4L. If the soil type is unknown, the native soil type(s) at a site can be identified on the NRCS Web Soil Survey at: http://websoilsurvey.nrcs.gov/app/. The website also provides the wind erodibility group for native soils.

Consider the depth of grading activities when determining the applicable surface treatments. Soil type varies with depth. The surface soil may have low potential for wind erosion, but the soil at a lower depth may be highly erodible when it is exposed by grading operations.

2.7.3 Design Criteria

General

- The first design criterion for soil surface treatments is to minimize the area of disturbed soil that requires treatment.

- Limit clearing and grading to the areas of the site required for the immediate phase of construction. For larger sites, plan the work to be phased such that the total disturbed area is less than 10 acres at all times. If possible, design the site layout and grading to allow for street and utility construction without having to grade the entire site to balance cut and fill.
- Selection of the surface treatment should consider the length of time for which stabilization is needed.
- Natural (e.g. trees) windbreaks or artificial wind screens can be designed into the site to decrease wind erosion potential. Wind screens should be 3 to 5 feet in height. Porosity of the wind screens should be a minimum of 20 percent. Optimum performance is in the 40 percent to 60 percent porosity range.
- Wind screens should never be impermeable. The purpose of the screen is to disrupt the wind, not block it.
- Wind screens placed around stockpiles shall enclose three sides of the stockpile.

Water Treatments

- Water treatment shall be used only for decreasing wind erosion. It provides no protection from erosion due to stormwater runoff.
- Water treatment is appropriate for areas that are worked daily or at least as frequently as every week or two. Areas where construction activities will not occur for more than 14 days shall receive another type of surface treatment, such as a palliative, vegetation, or other treatment that provides temporary stabilization and protection from water erosion.
- Water shall be applied 15 to 20 minutes before start of work and re-applied throughout the day as necessary to prevent visible emissions.
- At a minimum, sprinkle bare areas with an amount of water and at a rate that will moisten the top two inches of soil without creating runoff.
- When grading activities are occurring during prolonged dry and windy periods, sufficient water should be applied to moisten soil to the depth of cut or equipment penetration. This may require installing portable piping and sprinklers in advance of grading.
- If construction activities include installing an irrigation system, install it in early phases of construction, where feasible, to use for dust control.
- Water treatments provide limited stabilization against wind erosion and no stabilization against water erosion. Sediment controls are required with water treatments.

Palliative Treatments

- Palliatives consist of liquids that react with soil particles and bonds them into a cohesive crust that provides temporary resistance to wind and water erosion. Palliative treatments are also called soil binders.
- The major groups of palliatives used for erosion control are polyacrylamide (PAM), guar-based (organic) compounds, and polyvinyl acetates (inorganic polymers). Numerous variations and mixes of these palliatives are available, each with its unique properties.
- Palliative treatments are appropriate for areas that require temporary stabilization for 3 to 12 months. Palliative treatments are highly effective in controlling wind erosion and moderately effective in controlling water erosion. Perimeter controls for sediment should remain in place until final stabilization.
- In general, areas stabilized with palliatives must be protected from traffic to be effective. Palliative treatments that can withstand traffic (pedestrian or vehicle) are available; however, they are more expensive. The designer should determine whether the site can be controlled to prevent traffic on the stabilized areas. This analysis should consider non-construction related traffic. Often, the public driving ATV's and bicycles on the site when construction is not active is the cause of stabilization

failure. In many cases, temporary chain-link fencing is less expensive than a palliative that can withstand traffic or re-applying a palliative to areas that have been disturbed.

- Selection of the palliative mix, dilution rate, and application rate should be based on the soil type, site conditions, climate, anticipated traffic on the treated area, and required duration of the stabilization.
- The designer should work with the supplier to develop a mix specific for the soil, climate, and site conditions. A successful application is highly dependent on the right proportions in the mix. An "off the shelf" mix should not be used.
- Palliatives are dependent on soil penetration to be effective. Compaction of soil prior to stabilization should be minimized. If compaction has occurred or the soil has high clay content, loosening of the surface may be necessary before applying the palliative.
- Do not apply palliatives in rainy conditions or when the soil has high moisture content. Verify that there is not rain in the forecast for the length of time recommended by the manufacturer to cure the palliative. Typically, a minimum of 24 hours is required.
- If the soil is excessively dry, pre-wetting may be necessary to ensure the palliatives do not cure too quickly.
- Palliative mixes may be supplied as a powder or a concentrated liquid. The designer should work with the supplier to establish exact dilution and application rates for the site. An application without enough water for the site and climate conditions will dry too quickly, and the soil particles will not bond properly. A too wet mix will result in a weaker bond that may not be sustained for the required duration of the stabilization.
- Palliatives should not be diluted until it is time for the palliative to be applied.
- Palliatives may be applied with mulch to stabilize slopes of 3:1 to 1.5:1. Additional criteria are in *Section 2.5 Mulching*.
- Palliatives may be mixed and applied with seed to establish vegetation. The palliative mix used for this application must be specified as one that is air and water permeable. The palliative will provide temporary stabilization until vegetation is established for final stabilization.

Vegetation Treatments

- If an area will not be disturbed by construction activities for a year or longer, vegetation is frequently the most cost-effective treatment.
- *Section 2.9 Vegetation* contains criteria for temporary stabilization with vegetation.

Other Treatments

- Gravel, recycled concrete or asphalt, or similar rock should be applied to temporary roads, contractor staging areas, employee parking lots and other portions of the site that receive daily traffic. The treatment will prevent dust and decrease the need for sediment controls on these areas during the duration of the construction project.
- Soil roughening, by driving tracked vehicles up and down slopes and across bare areas in irregular patterns, can be used to disrupt wind and water flow across the soil surface and decrease erosion for short periods of time. The track marks should be perpendicular to the predominate direction of water flow or wind.
- Similar to soil roughening, deep tillage (6 to 12 inches) in large open areas can significantly disrupt wind and drainage patterns to reduce erosion.
- Do not use "soil tackifiers" that are petroleum-based.

2.7.4 Design Guidance and Specifications

No specification for soil surface treatments is currently available in the Standard Specifications for Public Works Construction – North Central Texas Council of Governments.

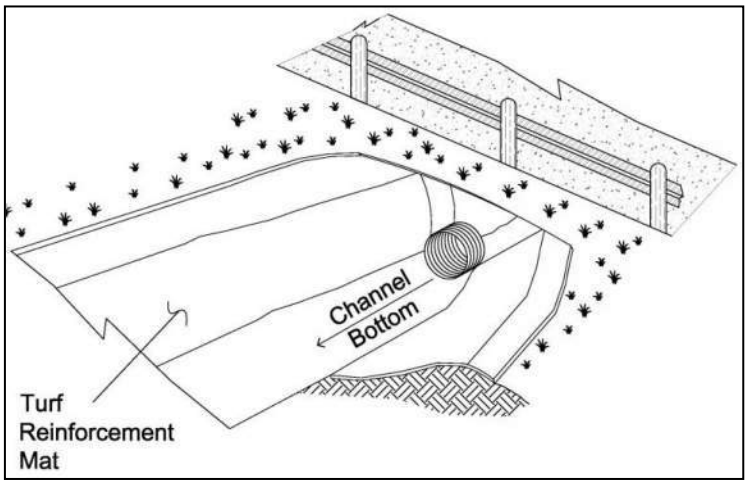
2.7.5 Inspection and Maintenance Requirements

Soil surface treatments should be inspected regularly (at least as often as required by the TPDES Construction General Permit). Adequacy of watering for dust control should be visually monitored. If dust is observed, additional applications or different controls are needed.

Areas that have received a palliative treatment should be checked for breaks or eroded spots in the surface crust. This spots and areas that have been driven on or otherwise disturbed should be re-treated. Palliative treatments are intended to control sheet erosion. If rill erosion is detected during inspections, additional controls are needed.

2.8 Turf Reinforcement Mats

Erosion Control



Description: A turf reinforcement mat (TRM) is a long-term, non-degradable, rolled erosion control product that reduces soil erosion and assists in the establishment and growth of vegetation. TRMs, also known as flexible channel liners, are manufactured by many companies They are composed primarily of UV stabilized, geosythetic or geocomposite materials, netting and/or wire mesh, processed into a three dimensional reinforcement matrix. TRMs are designed to be permanent and for use in critical hydraulic conditions.

KEY CONSIDERATIONS

DESIGN CRITERIA:

- Select TRM based on flow velocities and shear stresses in the channel
- Installation and anchoring according to manufacturer's recommendations

ADVANTAGES / BENEFITS:

- Provides long-term stabilization of channels with high velocities and shear stresses
- Retains soil in a 3-dimensional matrix that facilitates establishment of vegetation

DISADVANTAGES / LIMITATIONS:

- Expensive
- Effectiveness is highly dependent on proper installation

MAINTENANCE REQUIREMENTS:

- Inspect regularly
- Replace or re-anchor loosened mats

TARGETED POLLUTANTS

- ● Sediment
- ○ Nutrients & Toxic Materials
- ○ Oil & Grease
- ○ Floatable Materials
- ○ Other Construction Wastes

APPLICATIONS

Perimeter Control

Slope Protection

Sediment Barrier

Channel Protection

Temporary Stabilization

Final Stabilization

Waste Management

Housekeeping Practices

Fe=0.90

IMPLEMENTATION CONSIDERATIONS

- ● Capital Costs
- ◒ Maintenance
- ◒ Training
- ● Suitability for Slopes > 5%

Other Considerations:

- *Long term maintenance*

2.8.1 Primary Use

Turf reinforcement mats (TRMs) are primarily used to provide temporary and final stabilization of channels where design discharges exert velocities and shear stresses that exceed the limits of mature vegetation. They are also used to stabilize steep slopes where it's difficult to establish vegetation.

2.8.2 Applications

TRMs provide long-term erosion protection in channels where flow conditions exceed the ability of vegetation alone to withstand erosive forces (grades in excess of 2 percent or velocities exceeding 6 feet per second). Turf reinforcement mats may provide channel protection for conditions of up to approximately 8 lbs/ft^2 sheer stress.

TRMs may also be used for short lengths of steep cut/fill slopes on which establishment of vegetation is difficult. TRMs also contain void spaces that can retain soil that would erode without protection, and thus give vegetation a change to establish.

2.8.3 Design Criteria

- The designer shall specify the manufacturer, type of TRM to be used, and dimensioned limits of installation based on the site topography and drainage.
- The type and class of TRM must be specified in accordance with the manufacturer's guidance for the slope of the area to be protected, the flow rate (sheet flow on cut/fill slopes) or velocity (concentrated flow in swales) of stormwater runoff in contact in with the TRM, shear stress, and the design life (duration) of the TRM.
- TRMs specified on projects should meet the applicable "Minimum Performance Standards for TxDOT" as published by TxDOT in its "Erosion Control Report." Alternatively, the TRM may be listed on the most current annual "Approved Products List for TxDOT" applicable to TxDOT Item 169 Soil Retention Mat and its Special Provisions.
- TRMs shall meet the following criteria when applied on slopes of 0.5:1 or flatter.
    - Minimum thickness of 0.25 inches using ASTM D6525 Standard Test Method for Measuring Nominal Thickness of Permanent Rolled Erosion Control Products.
    - UV stability of 80 percent at 500 hours using ASTM D4355 Standard Test Method for Deterioration of Geotextiles by Exposure to Light, Moisture and Heat in a Xenon Arc Type Apparatus.
    - Minimum tensile strength of 175 lbs/ft using ASTM D6818 Standard Test Method for Ultimate Tensile Properties of Turf Reinforcement Mats.
- TRMs shall be installed vertically down slope (across contours) on steep cut/fill slopes and embankments. In channels, TRMs shall be installed along the contours (parallel to flow) below the water surface elevation of the flood mitigation storm (100-year, 24-hour) and vertically across any steep slopes for high banks above the water surface elevation.
- On cut/fill slopes and channels designed to receive turf reinforcement mats for temporary or final stabilization, the installation of the TRMs shall be initiated immediately after completing grading of the slope or channel, and in no case later than 14 days after completion of grading these features. Do not delay installation of TRMs on these highly-erodible areas until completion of construction activities and stabilization of the remainder of the site.
- Prior to the installation of the TRM, all rocks, dirt clods, stumps, roots, trash and any other obstructions that would prevent the TRM from lying in direct contact with the soil shall be removed.
- Installation and anchoring shall conform to the recommendations shown within the manufacturer's published literature for the turf reinforcement mat. Anchors (staples) shall be a minimum of 6 inches in length and 1 inch wide. They shall be made of 8-gauge wire, or equivalent.

- The end of each TRM roll shall overlap the next end of the next roll by a minimum of 3 feet. Sides of rolls typically overlap a minimum of 4 inches.
- The perimeter of the TRM installation shall be anchored into a trench that is a minimum of 6 inches deep.
- The upstream end of TRMs used for channel protection shall be anchored a minimum of 12 inches, while the downstream end should be anchored 6 inches.
- Trenches shall be excavated for anchoring, followed by placement and tamping of fill on top of the mat.

2.8.4 Design Guidance and Specifications

Specifications for this item may be found in Item 169 of the Standard Specifications for Construction and Maintenance of Highways, Streets and Bridges (TXDOT 2004).

2.8.5 Inspection and Maintenance Requirements

Turf reinforcement mats should be inspected regularly (at least as often as required by the TPDES Construction General Permit) for bare spots caused by weather or other events. The mats should be checked for uniform contact with the soil, security of the lap joints, and flushness of the staples with the ground. Missing or loosened mats must be replaced or re-anchored.

2.8.6 Example Schematics

The following schematics are example applications of the construction control. They are intended to assist in understanding the control's design and function.

The schematics are **not for construction**. The designer is responsible for working with TRM manufacturers to ensure the proper TRM is specified based on the site topography and drainage. Installation measures should be dictated by the TRM manufacturer and are dependent on the type of TRM installed. Manufacturer's recommendations for overlap, anchoring, and stapling shall always be followed. Criteria shown here are applicable only when they are more stringent than those provided by the manufacturer.

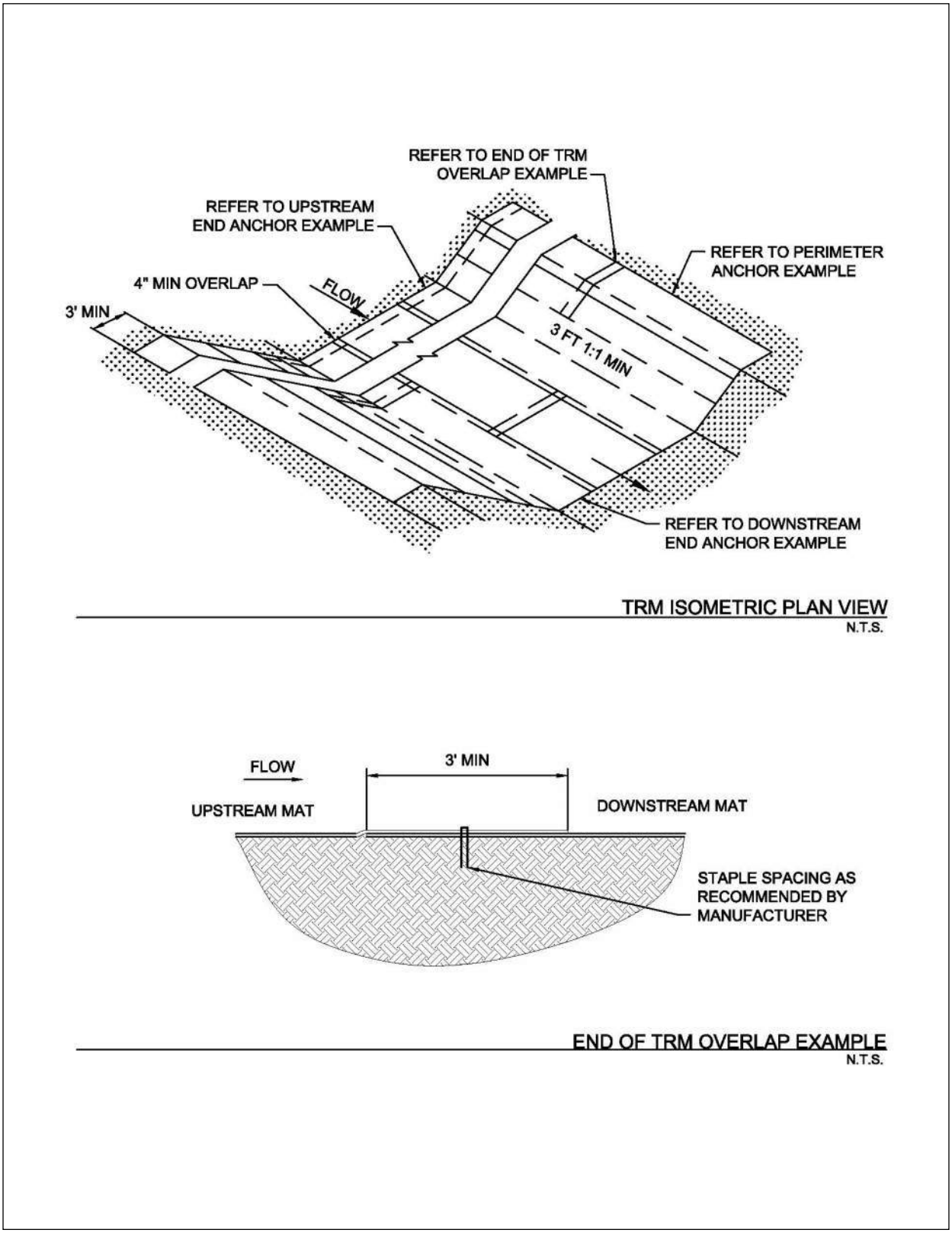
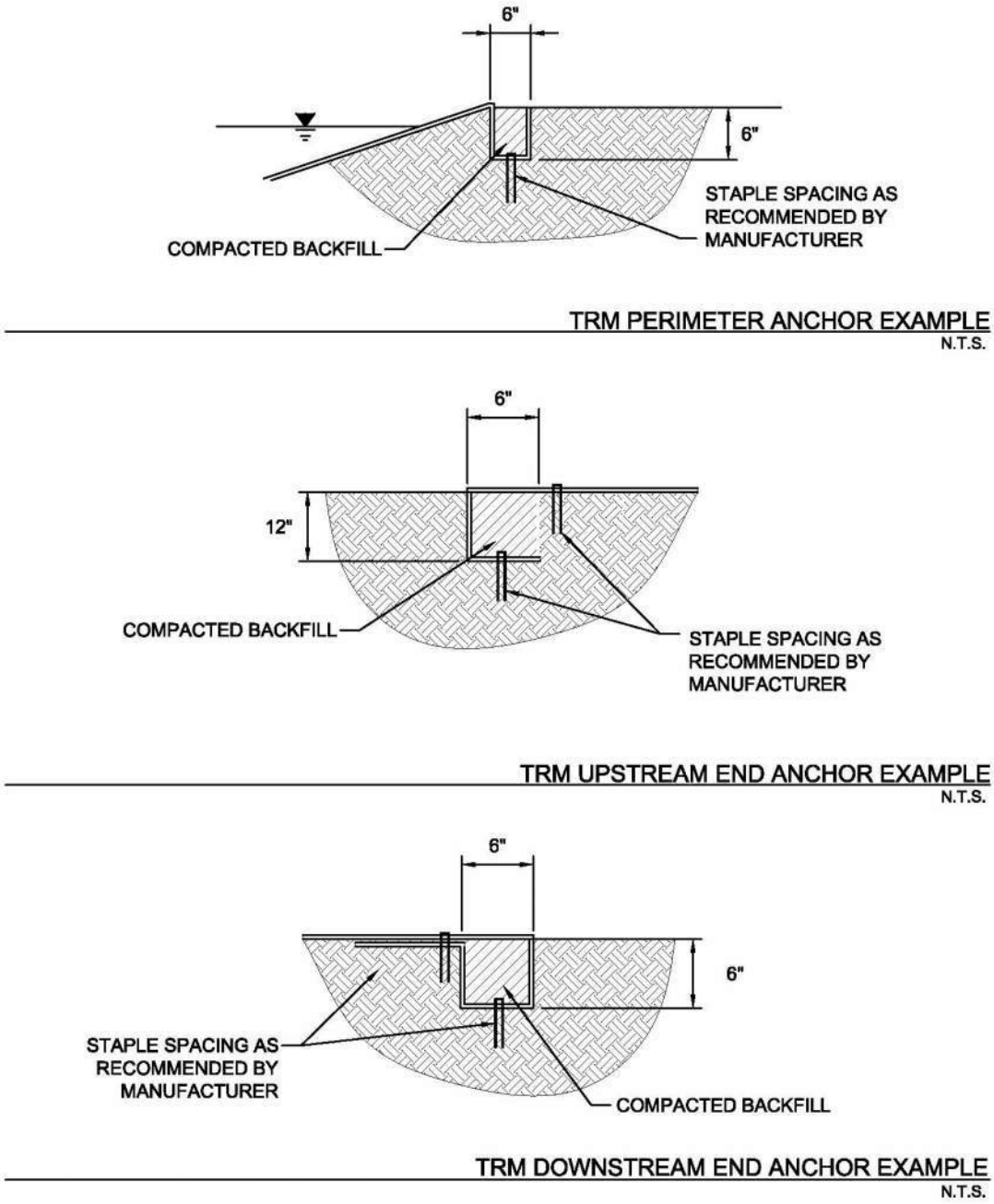


Figure 2.11 Schematics of Turf Reinforcement Mats
(Sources: Modified from American Excelsior Company and Texas Department of Transportation)



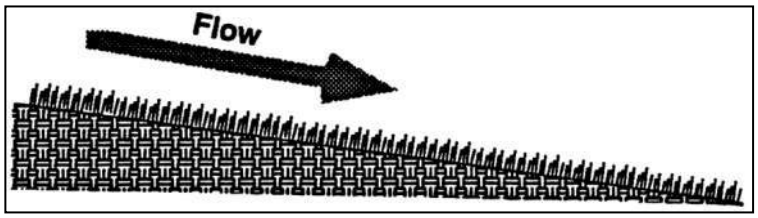
NOTE: ANCHORING METHODS PROVIDED ARE EXAMPLES OF THE TYPE OF ANCHORING THE TRM MANUFACTURER MAY RECOMMEND. THERE ARE DOZENS OF DIFFERENT ANCHORING METHODS DEPENDING ON THE TRM AND SITE-SPECIFIC CONDITIONS. ALWAYS FOLLOW THE MANUFACTURER'S RECOMMENDATIONS FOR ANCHORING.

Figure 2.12 Examples of Turf Reinforcement Mat Anchoring

(Source: Modified from Texas Department of Transportation Soil Retention Blanket Product Installation Sheet)

2.9 Vegetation

Erosion Control



Description: Vegetation, used as an erosion control, is the sowing or sodding of grasses, small grains, or legumes to provide temporary and final vegetative stabilization for disturbed areas.

KEY CONSIDERATIONS

DESIGN CRITERIA:

- Specify preparation of the soil surface before seeding or sodding
- Minimum of 4 to 6 inches of top soil required, depending on subsurface conditions
- Specify soil amendments depending on soil conditions
- Select seed or sod species appropriate for the climate, season, and soil

ADVANTAGES / BENEFITS:

- More effective and easier to maintain than sediment controls during a long construction period
- May be used for temporary or final stabilization

DISADVANTAGES / LIMITATIONS:

- Not appropriate for areas with heavy pedestrian, vehicular traffic, or concentrated, high velocity flow
- May require days to weeks for adequate establishment
- Alternate erosion control is needed until vegetation is established

MAINTENANCE REQUIREMENTS:

- Inspect regularly
- Protect newly seeded areas from excessive runoff, high velocity flow, and traffic until vegetation is established
- Water and fertilize until vegetation is established
- Reseed and/or provide mulch or another control for bare spots
- Rake accumulations of sediment from the vegetation

TARGETED POLLUTANTS

- ● Sediment
- ◒ Nutrients & Toxic Materials
- ○ Oil & Grease
- ○ Floatable Materials
- ○ Other Construction Wastes

APPLICATIONS

Perimeter Control

Slope Protection

Sediment Barrier

Channel Protection

Temporary Stabilization

Final Stabilization

Waste Management

Housekeeping Practices

Fe=0.90

(*When fully established; lower while vegetation is first growing*)

IMPLEMENTATION CONSIDERATIONS

- ◒ Capital Costs
- ◒ Maintenance
- ○ Training
- ◒ Suitability for Slopes > 5%

Other Considerations:

- *Design is unique to soil and other conditions at each site*
- *Watering and other maintenance required until vegetation is established*

2.9.1 Primary Use

Vegetation is used as a temporary or final stabilization measure for areas disturbed by construction. As a temporary control, vegetation is used to stabilize stockpiles, earthen dikes, and barren areas that are inactive for longer than two weeks. As a final control at the end of construction, grasses and other vegetation provide good protection from erosion along with some filtering for overland runoff. Subjected to acceptable runoff velocities, vegetation can provide a positive method of long-term stormwater management as well as a visual amenity to the site.

Other control measures may be required to assist during the establishment of vegetation. These other controls include erosion control blankets, mulching, swales, and dikes to direct flow around newly seeded areas and proper grading to limit runoff velocities during construction.

2.9.2 Applications

Vegetation effectively reduces erosion in channels and swales and on stockpiles, dikes, and mild to medium slopes. Vegetative strips can provide some protection and sediment trapping when used as a perimeter control for utility and site development construction. Refer to *Section 3.15 Vegetated Filter Strips and Buffers* for more information.

In many cases, the initial cost of temporary seeding may be high compared to tarps or covers for stockpiles or other barren areas subject to erosion. This initial cost should be weighed with the amount of time the area is to remain inactive, since vegetation is more effective and the maintenance cost for vegetated areas is much less than most structural controls.

2.9.3 Design Criteria

General

- Vegetation is a highly effective erosion control when the vegetation is fully established. Until then, additional controls are needed. Sediment controls should not be removed from vegetated areas until the vegetation is established.
- On grades steeper than 20:1 (5 percent), anchored mulch or erosion control blankets are required to protect seeded areas until vegetation is established. Refer to *Section 2.5 Mulching* and *Section 2.3 Erosion Control Blankets* for design criteria.
- Vegetation may be used by itself for channel protection when the channel grade is less than 2 percent and the temporary control design storm (2-year, 24-hour) and the conveyance storm (25-year, 24-hour) flow velocities are less than 6 feet per second.
- If the velocity of the temporary control design storm is greater than 2 feet per second, erosion control blankets shall be used in the channel while vegetation is being established. Turf reinforcement mats are required when the velocity exceeds 6 feet per second. Refer to *Section 2.3 Erosion Control Blankets* and *Section 2.8 Turf Reinforcement Mats* for design criteria.
- Stabilization of channels with vegetation is limited to channels that have side slopes of 3:1 or flatter.
- On cut/fill slopes and channels designed to receive temporary or final vegetation, establishment of vegetation shall be initiated immediately after completing grading of the cut/fill slope or channel, and in no case later than 14 days after completion of grading on these features. It is not acceptable to delay establishing vegetation on these highly-erodible areas until completion of construction activities and stabilization of the remainder of the site.

Surface Preparation

- Unless infeasible, remove and stockpile existing topsoil at the start of grading activities. Store topsoil in a series of small stockpiles instead of one large stockpile to decrease the loss of aerobic soil micro-organisms during stockpiling.

- Interim or final grading must be completed prior to seeding or sodding.
- To minimize soil compaction of areas to be vegetated, limit vehicle and equipment traffic in these areas to the minimum necessary to accomplish grading.
- Install all necessary erosion structures such as dikes, swales, diversions, etc. prior to seeding or sodding.
- Spread stockpiled topsoil evenly over the disturbed area to be vegetated.
- Depth of topsoil shall be a minimum of 4 inches, with 6 inches required where the topsoil is over rock, gravel or otherwise unsuitable material for root growth. After spreading stockpiled topsoil, provide additional top soil as needed to achieve these depths.
- Compost Manufactured Topsoil as specified in TxDOT Special Specification 1001 may be used to achieve the specified depths or when it's infeasible to stockpile topsoil. Topsoil may also be acquired from another construction site if there is no space to stockpile the topsoil at that site.
- Topsoil shall have an organic content of 10 to 20 percent using ASTM D2974 Standard Test Methods for Moisture, Ash, and Organic Matter of Peat and Other Organic Soils.
- Topsoil that does not meet the organic content requirement shall be amended with General Use Compost as specified in TxDOT Special Specification 1001. Amendment should be three parts of topsoil to one part compost by volume thoroughly blended.
- Seed bed should be well pulverized and loosened to a minimum depth of 3 inches and then raked to have a uniform surface.
- When establishing vegetation from seed, groove or furrow slopes steeper than 3:1 on the contour line before seeding.

Plant Selection, Fertilization and Seeding

- Use only high quality, USDA certified seed.
- Use an appropriate species or species mixture adapted to the local climate, onsite soil conditions and the season as shown below, or consult with the local office of the Natural Resource Conservation Service (NRCS) or Texas AgriLife Extension Service for selection of proper species and application technique in this area.
- Seeding rate should be in accordance with the Tables 2.4, 2.5 and 2.6 as follow in this section or as recommended by the Natural Resources Conservation Service (NRCS) or Texas AgriLife Extension Service.
- Chemical fertilization is not recommended at the time of seeding, because it typically stimulates and is consumed by fast growing weeds that out-compete the slower growing grasses and legumes. If the topsoil has not been amended by compost as discussed above, an 0.5 inch layer of General Use Compost (TxDOT Special Specification 1001) is recommended as a surface treatment to protect the seed and provide slow release nutrients
- Evenly apply seed using a seed drill, cultipacker, terraseeding, or hydroseeder.
- Hydro-seeding should not be used on slopes of 5:1 or steeper unless Bonded Fiber Matrix is used.
- Seeded areas shall be thoroughly watered immediately after planting. Water shall be applied at a rate that moistens the top 6 inches of soil without causing runoff. Provide water daily for the first 14 days after seeding and thereafter as needed to aid in establishment of vegetation.
- Use appropriate mulching techniques (*Section 2.5 Mulching*) where necessary, especially during cold periods of the year. Mulch consisting of chipped site vegetation is discouraged, since the wood content may result in depleting nitrogen from the soil.

Sodding

- Use of sod should be limited to planned landscapes due to the relatively high water use of most types of sod grass.
- When sod is necessary to achieve immediate stabilization, buffalograss (*Buchloe dactyloides*) is recommended. Other types of sod may be used in landscaping when specified by a landscape architect for a commercial property or a homebuyer for a residential lot.
- The sod should be mowed prior to sod cutting so that the height of the grass shall not exceed 3 inches and should not be harvested or planted when its moisture condition is so excessively wet or dry that its survival shall be affected.
- Sod shall have a healthy, virile, system of dense, thickly matted roots throughout a minimum soil thickness of 0.75 inch.
- Sod shall be planted within 3 days after it is excavated.
- In areas subject to direct sunlight, pre-moisten prepared sod bed by watering immediately prior to placing sod.
- Sodded areas shall be thoroughly watered immediately after they are planted.

Temporary Vegetation

The following table lists recommended plant species for the North Central Texas region depending on the season for planting.

Table 2.4 Recommended Grass Mixture for Temporary Erosion Control

Season	*Common Name*	*Pure Live Seed Rate (Lbs/Acre)*
Sep 1 - Nov 30	Tall Fescue Western Wheat Grass Wheat (Red, Winter)	4.5 5.6 34.0
May 1 - Aug 31	Foxtail Millet	34.0
Feb 15 – May 31 Sep 1 – Dec 31	Annual Rye	20.0

Areas receiving temporary seeding and vegetation shall be landscaped, re-seeded or sodded with perennial species to establish final vegetation at the end of construction.

Vegetation for Final Stabilization

Sodding or seeding may be used to establish vegetation for final stabilization of areas disturbed by construction activity. The vegetation must achieve a cover that is 70 percent of the native background vegetative cover to be considered final stabilization. Sod will achieve this coverage quicker than seeding; however, sod is usually more expensive than seeding. Sod is most cost-effective for small areas or areas of concentrated flow or heavy pedestrian traffic where it will be difficult to establish vegetation by seeding.

Grass seed for establishing final stabilization can be sown at the same time as seeding for temporary (annual) vegetation. Drought tolerant native vegetation is recommended rather than exotics as a long-term water conservation measure. Native grasses can be planted as seed or placed as sod. Buffalo 609, for example, is a hybrid grass that is placed as sod. Fertilizers are not normally used to establish native grasses, but mulching is effective in retaining soil moisture for the native plants.

Table 2.5 Recommended Grass Mixture for Final Stabilization of Upland in Rural Areas

County	Planting Date	Clay Soils Species and Pure Live Seed Rate (Lbs/Acre)		Sandy Soils Species and Pure Live Seed Rate (Lbs/Acre)	
Erath Hood Johnson Palo Pinto Parker Somervell Tarrant Wise	February 1 – May 15	Green Sprangletop Sideoats Grama (El Reno) Bermudagrass Little Bluestem (Native) Blue Grama (Hachita) Illinois Bundleflower	0.3 2.7 0.9 1.0 0.9 1.0	Green Sprangletop Sand Lovegrass Bermudagrass Weeping Lovegrass (Ermelo) Sand Dropseed Partridge Peal	0.3 0.5 1.8 0.8 0.4 1.0
Collin Dallas Denton Ellis Kaufman Navarro Rockwell	February 1 – May 15	Green Sprangletop Bermudagrass Sideoats Grama (El Reno) Little Bluestem (Native) Buffalograss (Texoka) Illinois Bundleflower	0.3 1.2 2.7 2.0 1.6 1.0	Green Sprangletop Bermudagrass Weeping Lovegrass (Ermelo) Sand Lovegrass Sand Dropseed Partridge Pea	0.3 1.8 0.6 0.6 0.4 1.0
Hunt	February 1 – May 15	Green Sprangletop Sideoats Grama (El Reno) Bermudagrass Little Bluestem (Native) Illinois Bundleflower	0.3 3.2 1.8 1.7 1.0	Green Sprangletop Bermudagrass Bahiagrass (Pensacola) Sand Lovegrass Weeping Lovegrass (Ermelo) Partridge Pea	0.3 1.5 6.0 0.6 0.8 1.0

(Source: TxDOT Standard Specifications for Construction and Maintenance of Highways, Streets and Bridges, Item 164)

Table 2.6 Recommended Grass Mixture for Final Stabilization of Upland in Urban Areas

County	Planting Date	Clay Soils Species and Pure Live Seed Rate (Lbs/Acre)		Sandy Soils Species and Pure Live Seed Rate (Lbs/Acre)	
Erath Hood Johnson Palo Pinto Parker Somervell Tarrant Wise	February 1 – May 15	Green Sprangletop Sideoats Grama (El Reno) Bermudagrass Buffalograss (Texoka)	0.3 3.6 2.4 1.6	Green Sprangletop Sideoats Grama (El Reno) Bermudagrass Sand Dropseed	0.3 3.6 2.1 0.3
Collin Dallas Denton Ellis Kaufman Navarro Rockwell	February 1 – May 15	Green Sprangletop Sideoats Grama (El Reno) Buffalograss (Texoka) Bermudagrass	0.3 3.6 1.6 2.4	Green Sprangletop Buffalograss (Texoka) Bermudagrass Sand Dropseed	0.3 1.6 3.6 0.4
Hunt	February 1 – May 15	Green Sprangletop Bermudagrass Sideoats Grama (Haskell)	0.3 2.4 4.5	Green Sprangletop Bermudagrass	0.3 5.4

(Source: TxDOT Standard Specifications for Construction and Maintenance of Highways, Streets and Bridges, Item 164)

Vegetation for final stabilization of channels requires grasses that are tolerant of periodic inundation, such as Bermuda grass, Kentucky bluegrass or a grass-legume mixture.

Additional Considerations

- Conditions for establishing vegetation vary significantly from site to site. Therefore, specifics of the vegetation design should be prepared based on the soil, slopes, drainage patterns, and the purpose of the vegetation at a each site.
- For construction activities that include landscaping in the development plans, the landscape architect should be consulted when specifying vegetation for temporary or final stabilization of disturbed areas.
- Vegetation is easier to establish if equipment and vehicle traffic is managed onsite to minimize soil compaction by traffic in the disturbed area that will be vegetated.
- Establishing a good vegetative cover is dependent on the season of the year. Projects that commence in the fall of the year may not be candidates for using vegetation as an erosion control.
- Where vegetation is used in swales and channels it may be necessary to use sod, rather than seeding, to establish an erosion resistant surface that accommodates rainfall runoff flows.
- Mulch should be used to enhance vegetative growth, in that mulch protects seeds from heat, prevents soil moisture loss, and provides erosion protection until the vegetation is established. Compost mulch has the additional benefit of providing some slow-release nutrients.
- Fertilizers have both beneficial and adverse effects. Fertilizers provide nutrients to the vegetation, but fertilizers are also a source of unwanted nutrients in streams and lakes. In this latter regard, they are a pollutant. The use of native vegetation rather than exotics reduces the need for fertilizers. Organic fertilizers, such as compost mulch, are generally preferred over chemical fertilizers. They provide a slow release of nutrients over a longer period of time and are less likely to cause environmental problems.
- Steep slopes represent a problem for establishing vegetation. Hydraulic mulches are useful for establishing vegetation on slopes. Refer to *Section 2.5 Mulching*.

2.9.4 Design Guidance and Specifications

Additional criteria for the application of vegetation in channels are in *Section 3.6.3 of the iSWM Criteria Manual* and design guidance is in *Section 3.2 of the Hydraulics Technical Manual*.

Specifications for construction of this item may be found in the Standard Specifications for Public Works Construction – North Central Texas Council of Governments, Item 202 Landscaping. Additional specifications for the following components of this item are in the Standard Specifications for Construction and Maintenance of Highways, Streets, and Bridges (TxDOT 2004):

- Topsoil, Item 160.
- Compost, Item 161.
- Sodding for Erosion Control, Item 162.
- Seeding for Erosion Control, Item 163.
- Fertilization, Item 164.
- Vegetative Watering 165.

2.9.5 Inspection and Maintenance Requirements

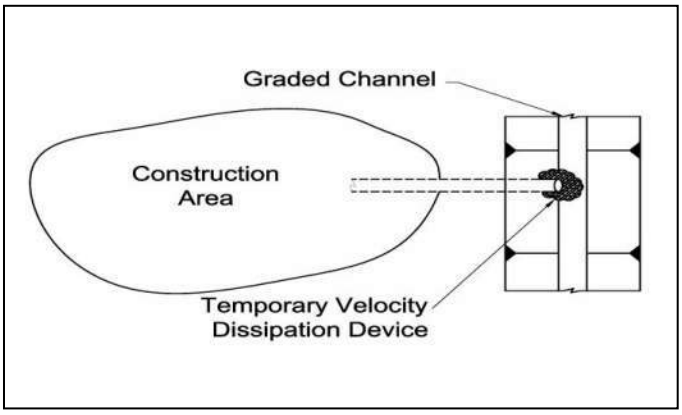
Protect newly seeded areas from excessive runoff and traffic until vegetation is established. Include a watering and fertilizing schedule in the iSWM Construction Plan facilitate the establishment of the vegetation. Vegetation for final stabilization must be maintained until the vegetative cover is 70 percent of the native background vegetative cover.

Vegetation should be inspected regularly (at least as often as required by the TPDES Construction General Permit) to ensure that the plant material is established properly and remains healthy. Bare spots shall be reseeded and/or protected from erosion by mulch or other measures. Accumulated sediment

deposited by runoff should be removed to prevent smothering of the vegetation. In addition, determine the source of excess sediment and implement appropriate measures to control the erosion.

2.10 Velocity Dissipation Devices

Erosion Control



Description: Velocity dissipation devices control erosion by dispersing concentrated flow and slowing flow velocities at drainage pipe outlets, the outlet end of an armored flume or swale, and other points where concentrated flow is discharged to an open channel. Velocity dissipation devices are also called energy dissipaters. They may consist of crushed rock, rock riprap, gabions, and other non-erosive materials.

KEY CONSIDERATIONS

DESIGN CRITERIA:

- Use at discharge points into unlined and natural channels where the flow velocity exceeds 4 fps during construction
- Install permanent energy dissipaters in the first phase of construction when possible to eliminate the need for temporary devices
- Design based on discharge rate and velocity for the temporary control design storm (2-year, 24-hour)

ADVANTAGES / BENEFITS:

- Protects habitat in natural channels
- Protects new conveyance systems from damage due to erosion until permanent controls are installed

DISADVANTAGES / LIMITATIONS:

- Additional cost for temporary structures
- May be damaged by larger storm events

MAINTENANCE REQUIREMENTS:

- Inspect regularly
- Repair damaged devices and eroded areas
- Replace dislodged rock

TARGETED POLLUTANTS

- ○ Sediment
- ○ Nutrients & Toxic Materials
- ○ Oil & Grease
- ○ Floatable Materials
- ○ Other Construction Wastes

APPLICATIONS

Perimeter Control

Slope Protection

Sediment Barrier

Channel Protection

Temporary Stabilization

Final Stabilization

Waste Management

Housekeeping Practices

Fe=N/A

IMPLEMENTATION CONSIDERATIONS

- ◒ Capital Costs
- ○ Maintenance
- ○ Training
- ◒ Suitability for Slopes > 5%

Other Considerations:

- *Coordination of temporary structures with the plans for permanent infrastructure*

2.10.1 Primary Use

Velocity dissipation devices are used to disperse concentrated flow and slow velocities to a point where they will not cause erosion in a vegetated or natural drainage way. In process of slowing the flow, suspended sediments in runoff from disturbed areas may be removed from the runoff and settle in the dissipation device.

2.10.2 Applications

Velocity dissipation devices are used where velocities in concentrated flow may cause erosion of un-lined or natural channels during construction. These locations are typically where a constructed conveyance system (such as a storm drain pipe, concrete flume, or roadside drainage ditch) discharges flow to a channel that is larger in size or lower in elevation.

2.10.3 Design Criteria

General

- Temporary velocity dissipation devices should be installed at pipe outlets and similar discharge points during construction to maintain the downstream physical and biological characteristics and functions until channel protection and stabilization measures are installed. Other points that may require velocity dissipaters are locations where concrete flumes, drainage swales, roadside ditches, and other drainage structures discharge to an unlined or natural channel.
- The design and use of velocity dissipation devices during construction should be coordinated with the stormwater infrastructure design in the development plans. It is recommended that permanent devices be constructed early in the first phase of construction to provide velocity dissipation both during and post-construction, thus eliminating the need for temporary devices.
- The criteria in this section are specific to **temporary** velocity dissipation devices that are designed using the temporary control design storm (2-year, 24-hour). The design of permanent dissipation devices shall be in accordance with the municipality's drainage design criteria and are more stringent.
- Temporary dissipation devices must not block flow or cause flooding during larger storm events.
- Temporary dissipation devices shall be installed on all outlets where the design storm velocity exceeds 4 feet per second and the discharge is to an unlined or natural channel.

Rock Riprap

- Rock riprap is the most common material used for temporary velocity dissipation. The rock may be removed and re-used for other applications when permanent drainage structures, channel lining, or final stabilization measures are installed.
- Design calculations are required for the use of this control. The designer shall provide drainage computations, discharge velocity, stone size, and apron dimensions for each application.
- Rock may be natural stone or recycled concrete.
- The stone shall be well graded from 2 inch diameter through the median diameter (d_{50}) and up to the maximum diameter (d_{MAX}). The stone should create a homogeneous stone surface with no voids larger than 1½ inches in diameter.
- Stone shall be sized using the criteria for riprap aprons in *Section 4.0 of the Hydraulics Technical Manual* or using an alternative method accepted by the municipality reviewing the plans. The median stone size (d_{50}) shall be a minimum of 6 inches for temporary velocity dissipation. The maximum stone size (d_{MAX}) shall be 1.5 times d_{50}.
- Minimum depth of the riprap apron shall be 1.5 times d_{MAX}.

- Minimum length of the apron shall be 4.5 times the outlet pipe diameter or equivalent for other types of outlets.
- Minimum width of the apron shall be 4.0 times the outlet pipe diameter or equivalent for other types of outlets.
- Riprap should be placed on a lining of filter fabric to prevent soil movement into or through the riprap. The perimeter of the filter fabric must be keyed into the ground a minimum of 6 inches.
- Riprap apron should be aligned with flow direction.
- Riprap shall not be used where there is a difference in elevation between the outlet and the receiving channel.

Other Devices

- Articulating concrete blocks, gabions, stilling basins or manufactured velocity dissipaters may be used for velocity dissipation if the designer provides calculations that document size and dimensions of the device for the design storm flow rate and velocities.
- Temporary baffled chutes, gabion drop structures, or other stabilized grade breaks shall be installed where an elevation difference exists at the outlet until permanent structures are installed.

2.10.4 Design Guidance and Specifications

Criteria for the design of permanent design velocity dissipation devices are in *Section 3.6.3 of the iSWM Criteria Manual*, and additional design guidance is in *Section 4.0 of the Hydraulics Technical Manual*. Guidance is also available in the Federal Highway Administration Engineering Circular No. 14, Hydraulic Design of Energy Dissipaters for Culverts and Channels.

Specifications for construction of this item may be found in the Standard Specifications for Public Works Construction – North Central Texas Council of Governments, Item 803, Slope and Channel Protection.

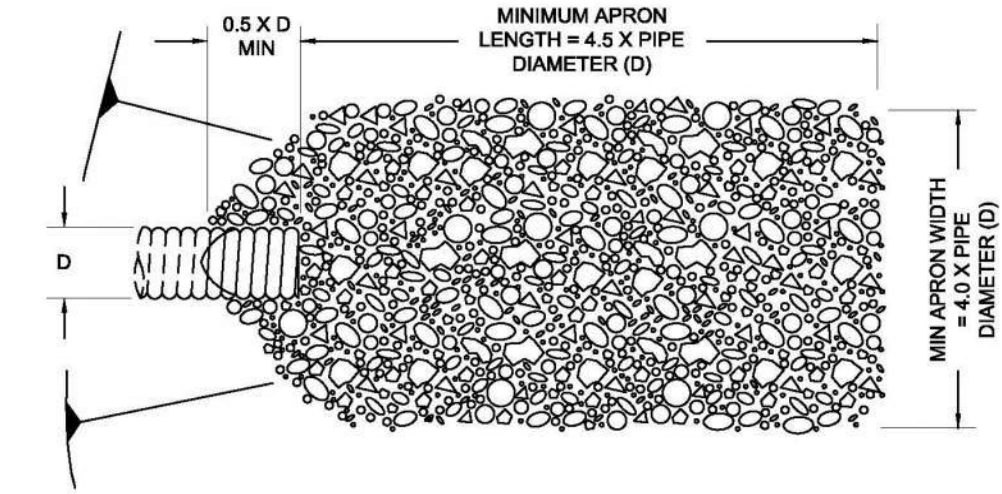
2.10.5 Inspection and Maintenance Requirements

Discharge points shall be inspected regularly (at least as often as required by the TPDES Construction General Permit) for evidence of downstream erosion. Repair dislodges or missing rock riprap. The development of head-cuts, the deepening or widening of the channel, or low flow channels developing within the main channel are all evidence that additional velocity dissipation measures are required until permanent structures are installed.

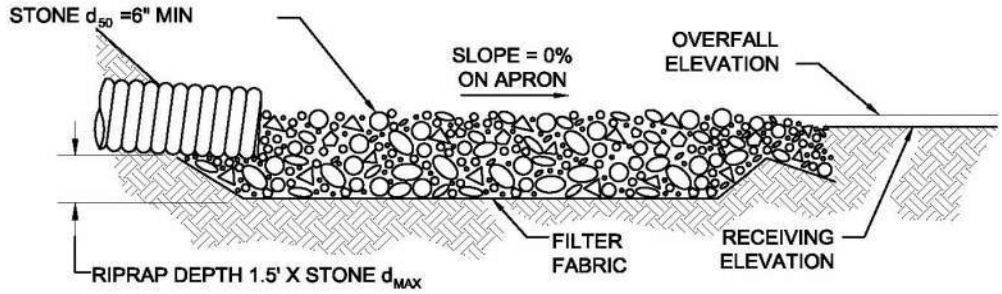
2.10.6 Example Schematics

The following schematics are only applicable to **temporary** installations of riprap for velocity dissipation. Permanent installations shall be in accordance with the municipality's design criteria.

The schematics are **not for construction**. They may serve as a starting point for creating a construction detail, but they must be site adapted by the designer. In addition, dimensions and notes appropriate for the application must be added by the designer.



TEMPORARY VELOCITY DISSIPATION DEVICE PLAN VIEW
N.T.S.



TEMPORARY VELOCITY DISSIPATION DEVICE PROFILE VIEW
N.T.S.

NOTE: DIMENSIONS OF THE RIPRAP APRON SHALL BE DESIGNED BASED ON FLOW CONDITIONS. TEMPORARY CONTROL DESIGN STORM (2-YEARS, 24-HOUR). PROVIDE CALCULATIONS THAT DOCUMENT THE FOLLOWING PARAMETERS USED TO DESIGN THE APRON.

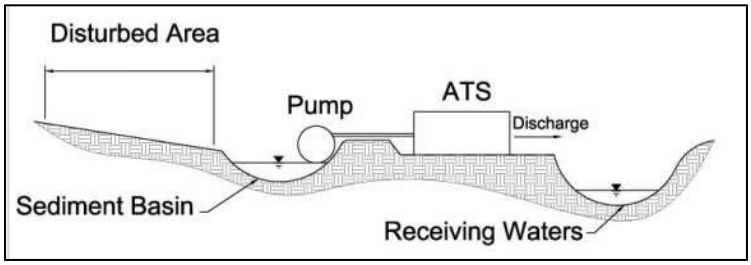
- PIPE DIAMETER (OR EQUIVALENT FOR FLUME, SWALE, ETC.)
- DISCHARGE VELOCITY FROM DRAINAGE STRUCTURE
- MEDIAN STONE DIAMETER (d_{50}) AND MAXIMUM STONE DIAMETER (d_{MAX})
- DEPTH OF APRON

Figure 2.13 Schematics of Velocity Dissipation Device
(Source: Modified from Oklahoma City Public Works Engineering Division Detail ERO-A17)

3.0 Sediment Controls

3.1 Active Treatment System (ATS)

Sediment Control



Description: An Active Treatment System (ATS) is a small, onsite, water treatment plant used to produce discharge water quality that is better than can be achieved by traditional sediment controls. Common ATS methods are filtration and chemical-aided coagulation/flocculation.

KEY CONSIDERATIONS

DESIGN CRITERIA:

- ATS designed based on site conditions, stormwater characteristics, and required discharge quality
- ATS shall be designed in coordination with the system provider and operator

ADVANTAGES / BENEFITS:

- Provides consistent, high quality, stormwater discharges

DISADVANTAGES / LIMITATIONS:

- Most expensive treatment method
- Retention structures required to capture the design storm for treatment
- Filtration requires pre-treatment with a sediment trap or basin
- Highly dependent on operator knowledge and skill level

MAINTENANCE REQUIREMENTS:

- Daily monitoring and maintenance while in operation, including influent characteristics and chemical dosage
- Backwash filters and dispose of waste from backwashing
- Monitor discharge for residual chemicals
- Repair erosion or other damage on stormwater retention structures that precede the ATS

TARGETED POLLUTANTS

- ● Sediment
- ○ Nutrients & Toxic Materials
- ◒ Oil & Grease
- ● Floatable Materials
- ● Other Construction Wastes

APPLICATIONS

Perimeter Control

Slope Protection

Sediment Barrier

Channel Protection

Temporary Stabilization

Final Stabilization

Waste Management

Housekeeping Practices

Fe=0.99

IMPLEMENTATION CONSIDERATIONS

- Capital Costs
- Maintenance
- Training
- Suitability for Slopes > 5%

Other Considerations:

- *Operator training*
- *Site access to operate the ATS during wet conditions*
- *Worker safety and spill response procedures*

3.1.1 Primary Use

Active treatment systems (ATS) are used when traditional sediment controls cannot achieve the necessary level of sediment removal for discharges from a construction site. They are primarily used to remove fine silt and clay soil particles, for which traditional sediment controls are the least effective. These fine particles are small enough to pass through the pores or void spaces of sediment barriers. They are also not removed by sediment basins, because their settling velocities require a detention time of days or weeks, not hours.

3.1.2 Applications

Active treatment systems are applicable on sites that have a large percentage of fine silt and clay soils. The systems are most useful where special aquatic sites or sensitive receiving waters result in specific limits on discharges or regulations require a higher level of treatment. An ATS may be used when a turbidity effluent limit is established for a construction activity or where the activity discharges to:

- Wetlands regulated under Section 404 of the Clean Water Act;
- Spring-fed receiving waters;
- Receiving water with a Total Maximum Daily Load;
- Receiving water bodies with a Water Quality Standard that could be exceeded by the discharge; or
- Receiving water utilized by a species protected under the Federal Endangered Species Act or the State of Texas Threatened and Endangered Species Regulations.

3.1.3 Design Criteria

Active treatment systems are a specialized application that requires skill in designing, operating, and maintaining the systems. When the designer has determined that an ATS is needed for a project, the designer should select a supplier of ATSs and work with their technical experts. The criteria contained in this section are general guidelines. It is essential that the designer of controls for a construction activity work with an ATS supplier and operator to develop an effective system based on site conditions and anticipated characteristics of the stormwater runoff.

General

- A source of electricity is required for an ATS. Diesel generators are required until the electrical distribution system is extended to the site. In some cases, it may be advisable to maintain the generators onsite for the duration of the project in case of power outages.
- An ATS requires a sediment basin, tank, or other structure to capture the temporary control design storm (2-year, 24-hour) and retain it to be pumped to the ATS. The retention structure should be designed to pass larger storm events without damage to the structure.
- An ATS can be either a batch flow or flow-through (continuous flow) design.
- ATS designs are specific to each site, the stormwater runoff characteristics, and the required discharge water quality. The designer should consult with suppliers and operators of ATSs and consider the following when designing the ATS:
    - Available stormwater detention space for the storm event being treated and for another event that could occur during treatment.
    - Turbidity, pH, and suspended solids concentrations of the stormwater to be treated.
    - Size of soil particles to be removed.
    - Required discharge concentrations.
    - Flow rate through the ATS.

- Available space.
- Cost.

- Electrocoagulation is available as an ATS for sediment removal; however, it is not recommended for construction sites.
- The design should include requirements for operator training and/or required skill and experience for the lead operator. Unlike other sediment control devices, improper operation can result in a discharge that is more damaging to the receiving water than the construction activity. The recommended minimum skill level is 5 years experience operating stormwater ATSs or a combination of training and experience equivalent to a Class C Surface Water Operators license in the State of Texas.
- The ATS operator selected for the project shall have written plans for the following:
  - Operation and maintenance manual for all equipment in the ATS.
  - Monitoring, sampling and reporting, including Quality Assurance/Quality Control (QA/QC).
  - Worker health and safety.
  - Spill prevention and response.
- The ATS shall be equipped with instrumentation that automatically measures and records the following:
  - Influent and effluent turbidity.
  - Influent and effluent pH.
  - Influent and effluent flow rate.
- The ATS should be designed with a recirculation mode or a safe shut down mode that will be automatically activated upon system upset, power failure, or other catastrophic event.
- A velocity dissipation device is required at the ATS discharge point.

Filtration

- Filtration is accomplished by pumping water through vessels filled with granular filter media. The media may be sand, gravel, anthracite or a combination. Single media, sand filters are most common in construction applications.
- Bag or cartridge filters may be used after the media filter to provide the highest level of sediment removal. They are typically only needed when extremely low turbidity values (<10 NTU) are required for discharges to clear, cool-water streams, such as spring-feed creeks flowing over a limestone channel bed.
- For temporary installations at construction sites, filtration units are frequently hauled to the site and operated on flat bed trailers.
- The designer shall specify the filter media to be used based on the particle size to be removed and desired reduction in turbidity and suspended solids concentrations.
- Filtration can be effective in removing other pollutants from construction sites, such as sheen on stormwater surfaces; however, the filter media must then be classified and handled as the appropriate type of waste.
- Filtration may be used as an ATS by itself on sites where the suspend soils are primarily coarser silts and sands and a higher quality discharge is required than can be achieved by traditional sediment controls.
- Filtration systems are most commonly used after chemical-aided flocculation to remove flocs that do not settle within the detention time available while maintaining the design flow rate.

- When used without chemical-aided flocculation, stormwater requires pre-treatment with a sediment trap or basin before being pumped to the filter. Pre-treatment extends the operating life of the filter and decreases maintenance requirements.
- Filters shall be equipped with gauges to measure differential pressure across the filter to monitor filter loading.
- Filtration designs shall contain a means for backwashing the filters and collection and disposal of the backwash water.

Chemical-Aided Flocculation

- Chemicals are added as coagulation agents in an ATS. The coagulants destabilize the charged soil particles. As a result, the particles form flocs that can be settled or filtered from the stormwater.
- The ATS typically consists of the following, each of which requires its own design parameters:
  - Retention basin or other structure to capture the design storm.
  - Water pump to convey stormwater from the retention structure to the settling tank.
  - Chemical injection and metering pump.
  - Settling tank or chamber.
  - Filters (optional).
- Commonly used chemicals for stormwater treatment are chitosan, polyacrylamide (PAM), aluminum sulfate (alum), and polyaluminum chloride.
- Chemicals must be applied in proper doses and for the proper contact times to avoid potential toxicity in the ATS effluent. The effluent should be monitored for both turbidity and residual concentration of the treatment chemical.
- Where feasible, chemical injection should occur on the intake side of the stormwater pump to provide for maximum mixing.
- Chemical dosing should be designed based on flow rate, pH, and suspended solids concentration. Adjustments to dosage are common as the stormwater characteristics vary for different storm events and changing conditions on the construction site.
- Jar tests should be used to determine the chemical dosage. Jar tests should be conducted in accordance with ASTM D2035 Standard Practice for Coagulation-Flocculation Jar Test of Water. Tests shall be performed 15 minutes after start-up and every 8 hours of operation.
- The settling tank or chamber should be designed to prevent the accidental discharge of settled floc during floc pumping and related cleaning operations. Include specifications for disposal of settled floc.
- When chitosan is used, the discharge from the ATS should be tested for residual concentration of the chemical using commercially available residual field tests. Tests should be performed 15 minutes after start-up, every 8 hours of operation, and 15 minutes after each change in dosage. Return period of the test results depends on the sensitivity of the receiving water, but in no case should be longer than 24 hours. Return period may be as short as one hour if the receiving water has a species that is threatened, endangered, or of concern.
- The residual concentration of chitosan should be limited to 10 percent or less of the following for the aquatic species most sensitive to the chemical being used:
  - Geometric mean of the No Observed Effect Concentration (NOEC).
  - Acute toxicity concentration.
  - Chronic toxicity concentration.

- For PAM and other coagulation agents without a residual field test, a daily bioassay shall be performed on an effluent sample. The methods used for acute toxicity testing shall be those outlined for a 96-hour acute test in Methods for Measuring the Acute Toxicity of Effluents and Receiving Water to Freshwater and Marine Organisms (USEPA-841-R-02-012) for Fathead minnow, *Pimephales promelas.*
- PAM has a documented record of low toxicity. For all other chemical coagulants without a residual field test, batch operation of the ATS is encouraged to delay discharge of the treated stormwater until results of the toxicity tests are available.
- Toxicity testing should be done by an independent, third-party laboratory that is accredited in Texas according to the standards of the National Environmental Laboratory Accreditation Conference (NELAC).

3.1.4 Design Guidance and Specifications

No specification for construction of this item is currently available in the Standard Specifications for Public Works Construction – North Central Texas Council of Governments.

3.1.5 Inspection and Maintenance Requirements

Active treatment systems must be maintained and monitored by trained, onsite personnel that observe the system at all times while it is in operation. Inspection and maintenance should be according to the system's operations and maintenance manual.

The overall system should be inspected regularly (at least as often as required by the TPDES Construction General Permit) to ensure stormwater is not bypassing the ATS. The basin or other structure used to collect and pre-treat stormwater should be inspected for damage and repaired as needed.

During operation of chemical-aided flocculation, the chemical dosage should be monitored and changed according to characteristic of the stormwater inflow. The discharge from the ATS should be sampled and analyzed regularly to verify that chemical residuals are acceptable levels.

3.1.6 Example Schematics

The following schematics are example applications of the construction control. They are intended to assist in understanding the control's design and function.

The schematics are **not for construction**. They may serve as a starting point for creating a construction detail, but they must be site adapted by the designer. In addition, dimensions and notes appropriate for the application must be added by the designer.

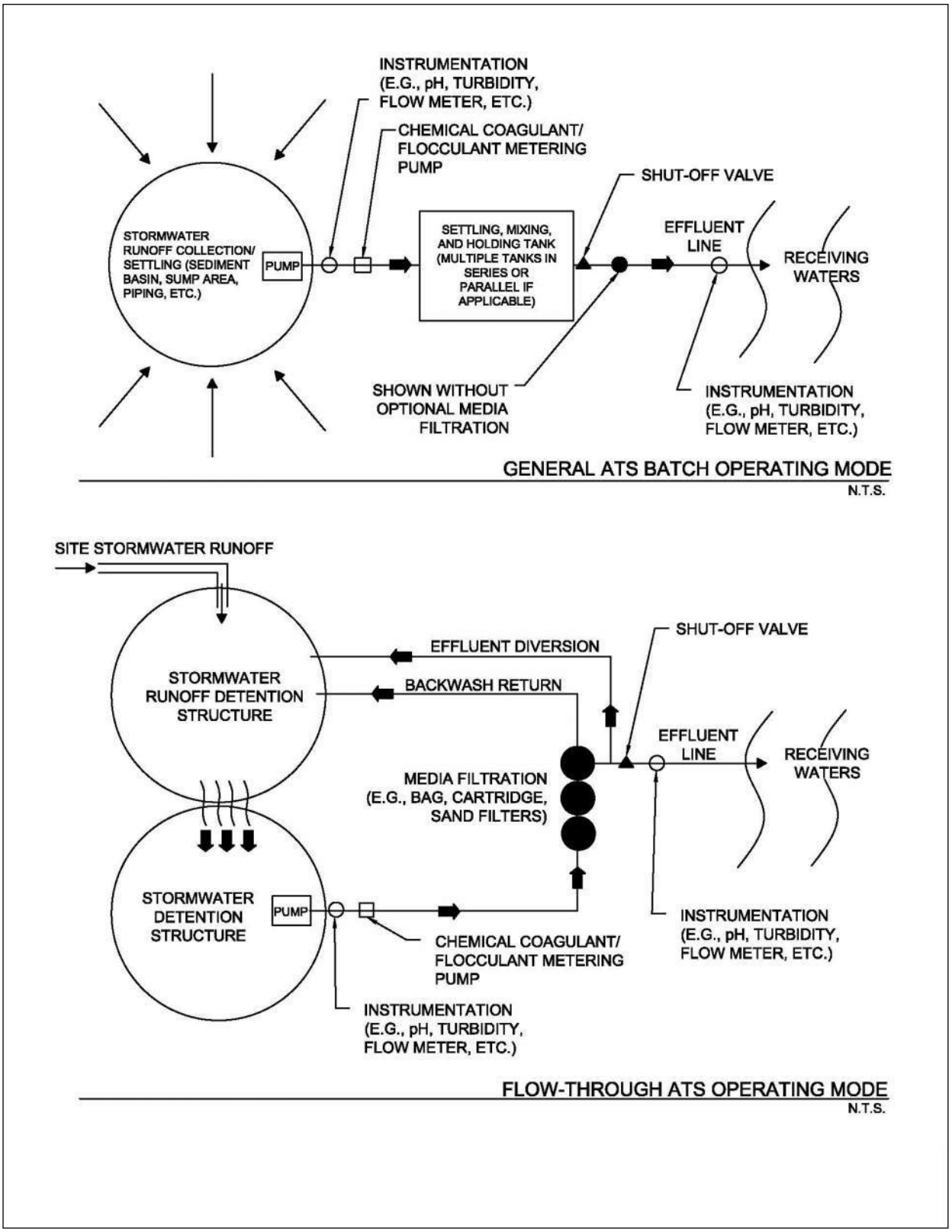
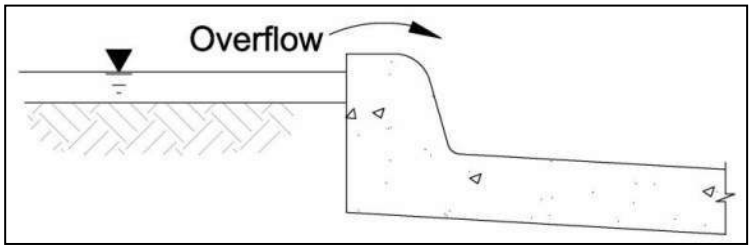


Figure 3.1 Schematics of Active Treatment System
(Source: EPA Development Document for Final Effluent Guidelines and Standards for the Construction & Development Category)

3.2 Depressed Grade (Curb Cut-Back) Sediment Trap

(Source: Modified from City of Plano BMP SP-12)

Sediment Control



Description: A depressed grade sediment trap is a sediment barrier created by grading or leaving the grade of an area at the back of curb or edge of pavement depressed to detain the surface flow until overflows onto the pavement.

KEY CONSIDERATIONS

DESIGN CRITERIA:

- Minimum 4 feet width and 1.5 inch depth
- Maximum 2 percent longitudinal slope and 3 percent transverse slope
- Erosion control blankets required at low point (sag) curb inlets

ADVANTAGES / BENEFITS:

- Inexpensive sediment trap for very small areas
- Alternative to inlet protection for projects within rights-of-way
- May be used on individual residential lots in certain situations

DISADVANTAGES / LIMITATIONS:

- May be disturbed and altered by construction equipment driving through it
- Limited application to very small areas along rights-of-way and residential lots

MAINTENANCE REQUIREMENTS:

- Inspect regularly
- Use a shovel or blade to remove sediment
- Re-grade as necessary
- Inspect erosion control blankets and repair as needed

TARGETED POLLUTANTS

- ● Sediment
- ○ Nutrients & Toxic Materials
- ○ Oil & Grease
- ○ Floatable Materials
- ○ Other Construction Wastes

APPLICATIONS

- **Perimeter Control**
- **Slope Protection**
- **Sediment Barrier**
- **Channel Protection**
- **Temporary Stabilization**
- **Final Stabilization**
- **Waste Management**
- **Housekeeping Practices**

Fe=0.50-0.75
(*Depends on soil type*)

IMPLEMENTATION CONSIDERATIONS

- ○ Capital Costs
- ◒ Maintenance
- ○ Training
- ○ Suitability for Slopes > 5%

Other Considerations:

- *None*

3.2.1 Primary Use

Depressed grade sediment traps are used to intercept and trap flows from very small drainage areas (i.e. parkways, medians, and pavements).

3.2.2 Applications

Depressed grade sediment traps are used at construction sites within rights-of-way to control small drainage areas. It can be used at the back of curb or edge of pavement where the drainage area is limited to the parkway or median. It can also be used where sections of pavement are removed and replaced for pavement repair or underground utility installation.

3.2.3 Design Criteria

- The width of the excavated area when installed back of curb shall be a minimum of 4 feet.
- The longitudinal slope along the back of curb depression cannot exceed 2 percent and the transverse slope toward the back of curb cannot exceed 3 percent. Steeper slopes require additional sediment controls.
- The maximum width of the right-of-way draining into the sediment trap shall be 11.5 feet. No other drainage area may contribute runoff to the sediment trap.
- The depressed grade sediment trap may be used back of curb for sediment control on single residential lots if no other drainage area contributes runoff to the depressed area. The designer shall calculate the minimum width of the depressed area, based on a 1.5 inch depth, the length of the curb at the front of the lot, and the volume of runoff from the lot for the temporary control design storm (2-year, 24-hour).
- Erosion control blankets (ECBs) are required at low or sag points along the curb where flow may become more concentrated. Criteria for ECBs are in *Section 2.3 Erosion Control Blankets*.
- The excavation of the cut may be offset a maximum distance of 5 feet from the curb to avoid utility boxes.
- When a curb cut for a driveway is encountered and no driveway has been constructed, securely install a plank of wood (2x4, 4x4) across the cur cut in order to continue the curb.

3.2.4 Design Guidance and Specifications

No specification for depressed grade sediment trap is currently available in the Standard Specifications for Public Works Construction – North Central Texas Council of Governments.

3.2.5 Inspection and Maintenance Requirements

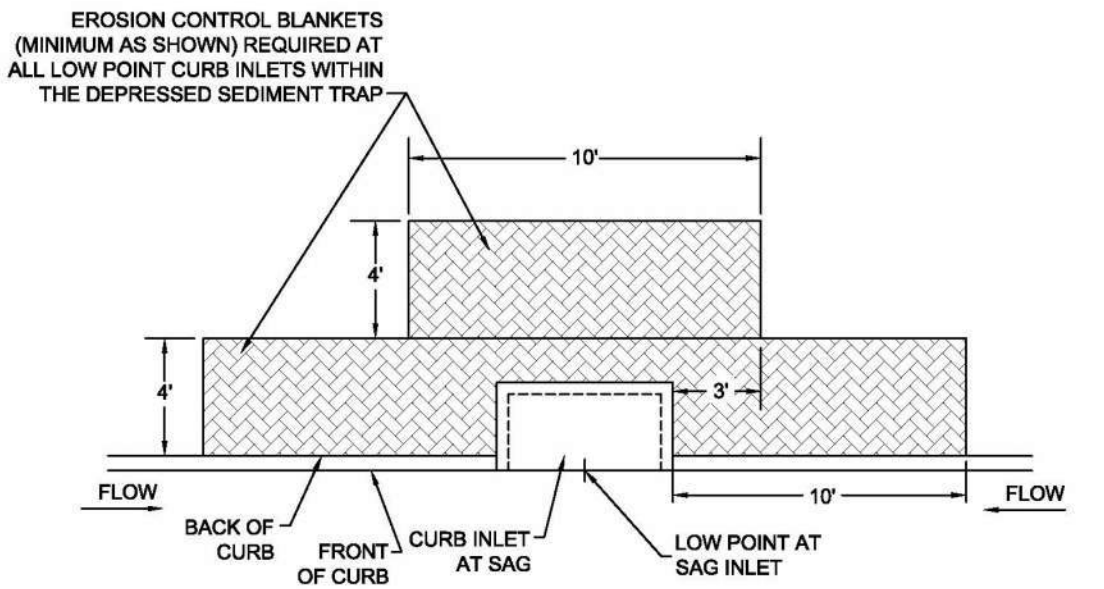
Depressed grade sediment traps should be inspected regularly (at least as often as required by TPDES Construction General Permit). Inspect the depression area periodically to ensure that the necessary storage volume is available. Use a shovel or blade to remove sediment from the area back of curb as needed. Re-grade the depression if it's disturbed by construction traffic.

The low points where this method is used should also be monitored during rain events to ensure the erosion control blankets are adequate to prevent sediment from flowing onto the pavement. Additional controls shall be added as needed.

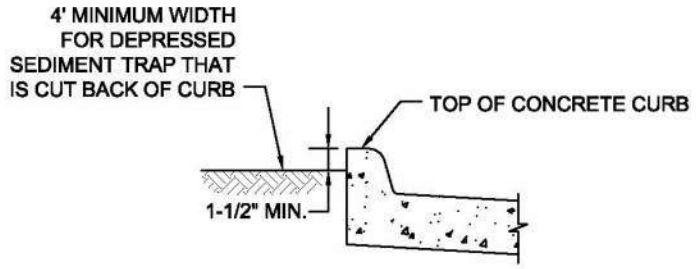
3.2.6 Example Schematics

The following schematics are example applications of the construction control. They are intended to assist in understanding the control's design and function.

The schematics are **not for construction**. They may serve as a starting point for creating a construction detail, but they must be site adapted by the designer. In addition, dimensions and notes appropriate for the application must be added by the designer.



DEPRESSED BACK OF CURB SEDIMENT TRAP PLAN VIEW
N.T.S.



DEPRESSED BACK OF CURB SEDIMENT TRAP CROSS SECTION
N.T.S.

NOTES:
1. THE DEPRESSED SEDIMENT TRAP MAY BE OFFSET A MAXIMUM DISTANCE OF 5 FEET FROM THE CURB IF NECESSARY TO AVOID UTILITY BOXES.
2. WHEN A CURB CUT FOR A FUTURE DRIVEWAY IS ENCOUNTERED, INSTALL 2" X 4" BOARDS ACROSS THE CURB TO FORM A TEMPORARY "CURB" FOR THE SEDIMENT TRAP.

Figure 3.2 Schematics of Depressed Grade (Curb Cut-Back) Sediment Trap
(Source: City of Plano BMP SP-12)

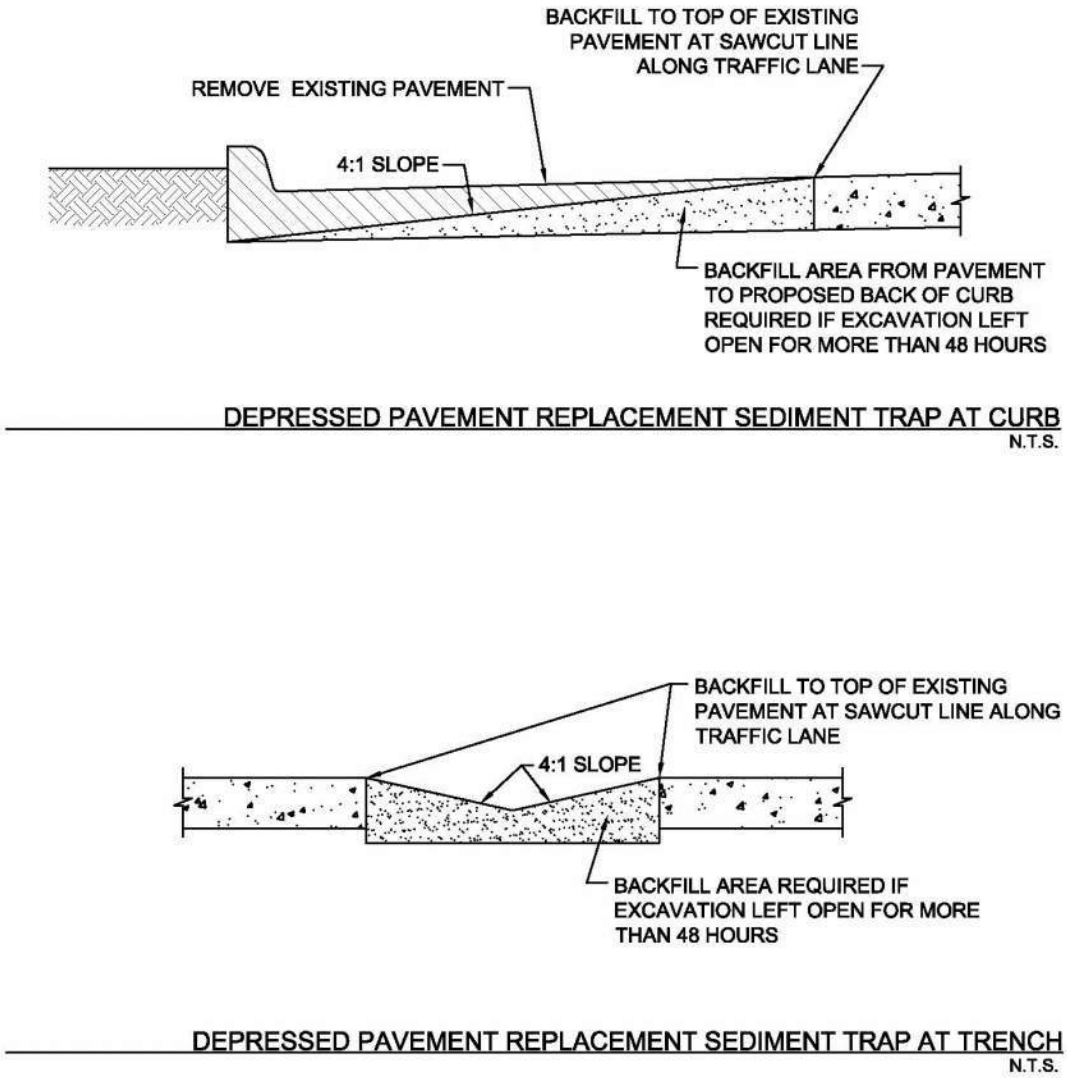
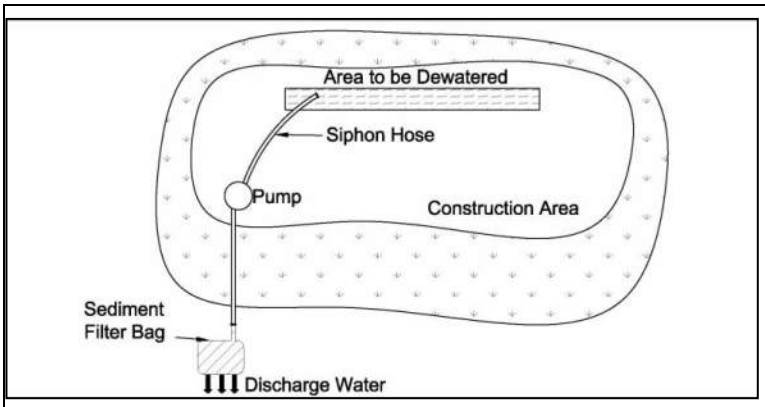


Figure 3.3 Schematics of Depressed Pavement Replacement Sediment Trap
(Source: City of Plano BMP SP-12)

3.3 Dewatering Controls

Sediment Control



Description: Dewatering controls consist of methods and devices to remove suspended soil in water that is pumped or otherwise discharged from foundations, trenches, excavations, and other low areas. The controls may be the sediment controls already onsite (e.g. silt fence, organic filters tubes) or dedicated dewatering devices such as sediment tanks and sediment filter bags.

KEY CONSIDERATIONS

DESIGN CRITERIA:

- Discharge of pumped water is prohibited unless controlled for the removal of suspended soil
- Select controls based on dewatering flow rate and duration and available space
- Dewatering discharge points must be protected for high velocities

ADVANTAGES / BENEFITS:

- Removes suspended soil and some pollutants from pumped water
- Works well with passive treatment systems for removal of clay soil particles
- Water may be applied to other onsite uses

DISADVANTAGES / LIMITATIONS:

- Requires frequent maintenance

MAINTENANCE REQUIREMENTS:

- Inspect regularly
- Monitor for erosion, control failure and unauthorized discharges frequently while pumping
- Clean and replace controls as they are filled with sediment

TARGETED POLLUTANTS

- ● Sediment
- ○ Nutrients & Toxic Materials
- ◒ Oil & Grease
- ○ Floatable Materials
- ○ Other Construction Wastes

APPLICATIONS

Perimeter Control
Slope Protection
Sediment Barrier
Channel Protection
Temporary Stabilization
Final Stabilization
Waste Management
Housekeeping Practices

Fe=0.50-0.75
(*Depends on soil type*)

IMPLEMENTATION CONSIDERATIONS

- ◒ Capital Costs
- ● Maintenance
- ◒ Training
- ○ Suitability for Slopes > 5%

Other Considerations:

- *None*

3.3.1 Primary Use

Dewatering controls are used to remove suspended soil in water that is pumped or otherwise discharged from foundations, trenches, excavations, and other low areas. Some dewatering controls, such as the temporary sediment tank, may also be useful in removing other pollutants.

3.3.2 Applications

Dewatering controls are applicable whenever water must be pumped from a low area on a construction site before construction can continue in that area. Pumping of foundations, excavated trenches, and utility vaults are common on development projects.

Dewatering controls may also apply when a temporary cofferdam has been constructed to dewater a normally wet area for construction, such as road crossings of creeks and bank stabilization projects. Water pumped from these areas must be flow through a control before it is discharged back to the water body.

3.3.3 Design Criteria

General

- Construction plan notes shall prohibit the discharge of water from dewatering activities into public streets, flumes, storm drains, creeks or other drainage ways unless controlled to remove suspended soil or other pollutants.
- The designer shall determine whether dewatering will be a batch operation after storm events or a continuous operation due to high groundwater and specify controls accordingly. Controls for continuous dewatering need to provide effective removal of sediment over long periods. Controls that clog easily are not appropriate for controlling long-term dewatering operations.
- Pumped water that has sheen or other evidence of pollutants shall be collected and sampled before it is discharged. State or local discharge permit requirements may exist for the pollutant(s) suspected of being in the water.
- Regulations or effluent criteria that apply to stormwater discharges from a construction activity typically also apply to water discharged from dewatering activities.
- The dewatering controls in this section are most effective with sands and coarse silts. Dewatering controls may be combined with a passive treatment system to provide higher sediment removal rates for fine silt and clay soil particles. Liquid polymers injected at the pump or solid and gel forms installed at the discharge generally work well to promote floc growth and settling of clay soil. Design criteria are contained in *Section 3.7 Passive Treatment System*.

Conventional Controls

- Discharges from dewatering are typically concentrated and have relatively high flow rates and velocities. If conventional controls are used, velocity dissipaters and/or flow spreaders or levelers are required before the control to prevent the discharge from causing erosion and damaging the control.
- The best control for pumped water is to discharge it to a vegetated area.
- Pumped water should be sprayed through a nozzle on the end of a discharge hose or directed to a device that dissipates velocity and disperses flow before the water enters the vegetated area.
- The vegetated area must be large enough to detain the volume being dewatered. The size of area needed is dependent on type of vegetation (interception storage and water uptake capacity) and soil type (infiltration rate) and condition (wet or dry). Vegetation may not be a feasible option if dewatering is due to a large or prolonged storm event and the vegetated area is saturated or if the soil has high clay content.

- If a vegetated area is not available or feasible, the discharge from dewatering may be directed to a conventional sediment barrier, such silt fence, organic filter tubes, sediment basin, or stone outlet sediment trap.
- Opportunities for using the water onsite should be considered, particularly where groundwater intrusion results in frequent or continuous dewatering. The water may be collected in a temporary, onsite storage container or holding pit and used to water vegetation for stabilization, applied for dust control, or used for pavement subgrade preparation. If any of these water needs are present at the time of dewatering, the water may be applied directly to this use without sediment controls, since no discharge occurs.

Sediment Filter Bag

- Sediment filter bags are specifically designed to control pumped water and connect directly to the pump discharge line.
- Show location of the filter bag on the drawings. The bag installed where its discharge will flow away from the disturbed area and onto vegetation or into a swale or drainage ditch with erosion and sediment controls.
- Bags should be placed on a level, stable surface that is prepared with mulch, straw, small aggregate, or other material as recommended by the manufacturer. In some cases, the bag may be placed directly on vegetation or well graded soil. The key is to have a surface without rocks or other protrusions that could puncture the bag.
- The bag should be made of a non-woven, needle-punched, geotextile that meets the following minimum criteria:
    - 205 lbs minimum tensile strength using ASTM D4632 Test Method for Grab Breaking Load and Elongation of Geotextiles.
    - 130 lbs minimum puncture strength using ASTM D4833 Test Method for Index Puncture Resistance of Geotextiles, Geomembranes, and Related Products.
    - 400 psi minimum Mullen burst strength using ASTM D3786 Standard Test Method for Hydraulic Bursting Strength of Textile Fabrics-Diaphragm Bursting Strength Tester Method.
    - Minimum 70 percent at 500 hours ultraviolet resistance using ASTM D4355 Standard Test Method for Deterioration of Geotextiles by Exposure to Light, Moisture, and Heat in a Xenon Arc Type Apparatus.
    - 85 to 110 gpm/ft^2 water flow rate using ASTM D4491 Standard Test Methods for Water Permeability of Geotextiles by Permittivity.
- Apparent opening size using ASTM D4751 Test Method for Determining Apparent Opening Size of a Geotextile should be specified based on the type of soil that will be in the discharge. A size that is too large will not trap the sediment; however, a size that is too small will create an unnecessary head for the dewatering pump to work against.
- The smallest apparent opening size currently available is 70 microns. This size will not capture fine silt and clay particles. A passive treatment system will be necessary with the bag to capture these soils.
- Bags are available in sizes ranging from 6 feet x 6 feet to 15 feet x 25 feet. The size of the bag should be specified based on availability of space, flow rates, and duration of use. If space is available, larger bags will last longer between replacements and may have a lower price per square foot. However, larger bags are heavier when sediment-laden. Equipment must be available to lift and remove the bag from the site for disposal.
- Bags are not reusable. Make sure they are installed at a location where equipment has access to the bags for lifting and removal without causing erosion or damaging other erosion and sediment controls.

Temporary Sediment Tank

- A temporary sediment tank is a compartmented container through which sediment-laden water is pumped to trap and retain sediment before discharging the water to drainage ways, adjoining properties, and rights-of-way below the sediment tank site.
- A temporary sediment tank is typically used at construction sites in urban areas where conventional methods of sediment removal are not practical. It is also used on sites where excavations are deep and space is limited, such as urban construction, where direct discharge of sediment-laden water to streams and storm drainage systems should be avoided.
- The location of temporary sediment tanks should facilitate easy cleanout and disposal of the trapped sediment to minimize interference with construction activities and pedestrian traffic. The tank size should be determined according to the storage volume of the sediment tank, with 1 cubic foot of storage for each gallon per minute of pump discharge capacity.
- A temporary sediment tank can be used as either a sedimentation or filtration device. If an oil sheen is present in the runoff, an underflow baffle may be used in the tank to remove it. However, local and state discharge regulations and permits may apply and should be checked before discharging.
- For use as a small scale sedimentation basin, de-watering discharge is directed into the temporary sediment tank to a level below the tank midpoint and held for a minimum of 2 hours to allow settlement of a majority of the suspended particles. This detention time is insufficient for removal of fine silt and clay soil particles. Passive treatment systems should be combined with the tank if these soil particles will be present.
- The tank should be designed for a controlled release when the contents of the tank reach a level higher than the midpoint.
- As a filtration device, a temporary sediment tank is used for collecting de-watering discharge and passing it through a filtered opening at the outlet of the tank to reduce suspended sediment volume. The filter opening in the temporary sediment tank should have an Apparent Opening Size (AOS) (see *Section 3.10 Silt Fence*) of 70 or smaller.
- The trapped sediment and stormwater must be disposed of properly.

3.3.4 Design Guidance and Specifications

No specification for dewatering controls is currently available in the Standard Specifications for Public Works Construction – North Central Texas Council of Governments.

3.3.5 Inspection and Maintenance Requirements

Dewatering controls should be inspected regularly (at least as often as required by the TPDES Construction Permit). Dewatering discharge points should be checked for erosion. Eroded areas should be repaired, and erosion controls should be installed to prevent future erosion.

Dewatering pumps and sediment controls should be monitored frequently, at least hourly, while pumps are in operation to prevent unauthorized discharges and to catch erosion problems or control failure.

Conventional sediment controls should be inspected at least weekly when used for continuous dewatering, because they will become overcome with sediment more quickly than when used to control runoff from storm events. The controls shall be maintained according to the criteria in their respective sections. They should be replaced when they no longer provide the necessary level of sediment removal.

Sediment filter bags should be checked to determine if they need replacing. The bags cannot be cleaned or reused. They should be used until they reach the manufacturer's recommended capacity. The entire bag with sediment can be disposed of as solid waste. If a controlled location onsite or a spoil site is available, the bag can be cut open and the sediment spread on the ground. Only the bag is waste in this case.

Sediment tanks should be cleaned when they become ⅓ full of sediment. To facilitate maintenance, the tanks need to be located with easy access for regular pump out. The rate at which a tank is pumped depends on site-specific considerations such as rainfall and sediment loads to the system. Regular inspections will help determine pump out frequency and prevent overloading and failure of the system.

3.3.6 Example Schematics

The following schematics are example applications of the construction control. They are intended to assist in understanding the control's design and function.

The schematics are **not for construction**. They may serve as a starting point for creating a construction detail, but they must be site adapted by the designer. In addition, dimensions and notes appropriate for the application must be added by the designer.

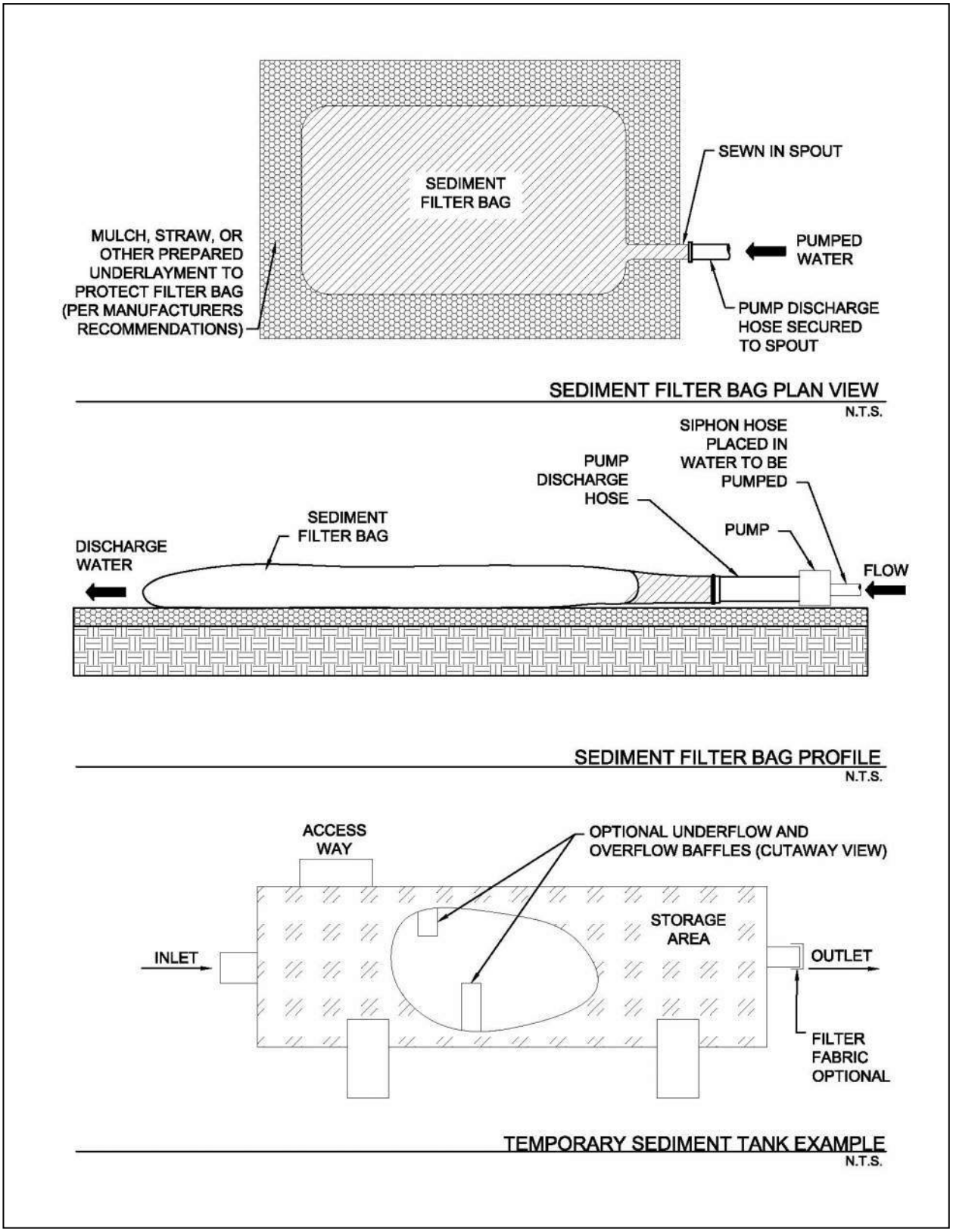
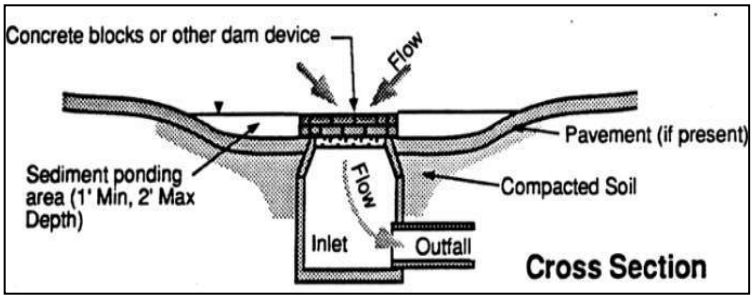


Figure 3.4 Schematics of Dewatering Controls

3.4 Inlet Protection

Sediment Control



Description: Inlet protection consists of a variety of methods to intercept sediment at low point inlets through the use of depressed grading, filter stone, filter fabric, inlet inserts, organic filter tubes and other materials. The protection devices are placed around or across the inlet openings to provide localized detention or filtration of sediment and floatable materials in stormwater. Protection devices may be assembled onsite or purchased as manufactured assemblies.

KEY CONSIDERATIONS

DESIGN CRITERIA:

- Evaluate drainage patterns to ensure inlet protection will not cause flooding of roadway, property or structures
- Never block entire inlet opening
- Size according to drainage area and flow rates
- Include flow bypass for clogged controls and large storm events

ADVANTAGES / BENEFITS:

- May be the only feasible sediment control when all construction is located within rights-of-way

DISADVANTAGES / LIMITATIONS:

- Limited effectiveness and reliability
- High maintenance requirements
- Has potential to flood roadways or adjacent properties

MAINTENANCE REQUIREMENTS:

- Inspect regularly
- Check for and remove blockage of inlet after every storm event
- Remove sediment before it reaches half the design height or volume of the inlet protection, more frequently for curb inlets
- Repair or replace damaged materials
- Clean or replace filter stone and organic filter tubes is when clogged with sediment

TARGETED POLLUTANTS

◒ Sediment

○ Nutrients & Toxic Materials

○ Oil & Grease

◒ Floatable Materials

○ Other Construction Wastes

APPLICATIONS

Perimeter Control

Slope Protection

Sediment Barrier

Channel Protection

Temporary Stabilization

Final Stabilization

Waste Management

Housekeeping Practices

Fe=0.35-0.65
(*Depends on soil type*)

IMPLEMENTATION CONSIDERATIONS

◒ Capital Costs

● Maintenance

○ Training

○ Suitability for Slopes > 5%

Other Considerations:

- *Traffic hazards*
- *Passage of larger storm events without causing flooding*
- *Flow diversion to other inlets or drainage points*

3.4.1 Primary Use

Inlet protection is typically used as a secondary sediment barrier, due to its limited effectiveness and numerous disadvantages. It is used to reduce sediment in storm sewer systems by serving as a back-up system for areas that have newly applied erosion controls or for other sediment controls that cannot achieve adequate sediment removal by themselves.

Inlet protection may be used as a primary sediment control only when all other primary controls are infeasible because of site configuration or the type of construction activity.

3.4.2 Applications

Inlet protection is best applied at low point (sump) inlets where stormwater runoff will pond behind the protection measure, and then either filter through the protection measure or flow over a weir created by it. Most inlet protection measures depend on ponding to be effective. These types of inlet protection are not applicable to on-grade curb inlets, where the inlet protection will cause stormwater runoff to bypass the inlet and overload downstream inlets. Only inlet protection measures that allow for use of the inlet opening (e.g. inlet inserts) are applicable as inlet protection for on-grade inlets.

Inlet protection is normally used in new developments with new inlets and roads that are not in public use. It has limited applications in developed areas due to the potential for flooding, traffic safety, pedestrian safety, and maintenance problems. Potential applications in developed areas are on parking lot inlets where water can pond without causing damage and during major repairs to existing roadways where no other controls are viable.

The application of inlet protection is highly variable due to the wide variety of inlet configurations (existing and new) and site conditions. The schematics in Section 6 show example applications; however, applications in most cases must be site adapted. Different methods and materials may be used. It is the responsibility of the designer to ensure that the methods and materials applied for inlet protection are appropriate to the site and flow conditions following the design criteria in Section 3.

3.4.3 Design Criteria

General

- Drainage patterns shall be evaluated to ensure inlet protection will not divert flow or flood the roadway or adjacent properties and structures.
- Inlet protection measures or devices that completed block the inlet are prohibited. They must also include a bypass capability in case the protection measures are clogged.
- Inlet protection must be designed to pass the conveyance storm (25-year, 24-hour) without creating a road hazard or damaging adjacent property. This may be accomplished by any of the following measures:
    - An overflow weir on the protection measure.
    - An existing positive overflow swale on the inlet.
    - Sufficient storage volume around the inlet to hold the ponded water until it can all filter into the inlet.
    - Other engineered method.
- Positive overflow drainage is critical in the design of inlet protection. If overflow is not provided for at the inlet, temporary means shall be provided to route excess flows through established swales, streets, or other watercourses to minimize damage due to flooding.
- Filter fabric and wire mesh used for inlet protection shall meet the material requirements specified in *Section 3.10 Silt Fence*.

- Block and gravel (crushed stone or recycled concrete) protection is used when flows exceed 0.5 cubic feet per second and it is necessary to allow for overtopping to prevent flooding.
- The tube and filler for organic filter tubes shall be in accordance with the criteria in *Section 3.6 Organic Filter Tube*.
- Bags used to secure inlet protection devices on pavement shall be filled with aggregate, filter stone, or crushed rock that is less likely than sand to be washed into an inlet if the bag is broken. Filled bags shall be 24 to 30 inches long, 16 to 18 inches wide, and 6 to 8 inches thick. Bags shall be polypropylene, polyethylene, or polyamide woven fabric with a minimum unit weight of 4 ounces per square yard and meet the following criteria:
    - Greater than 300 psi Mullen Burst Strength using ASTM D3786 Standard Test Method for Hydraulic Bursting Strength of Textile Fabrics-Diaphragm Bursting Strength Tester Method.
    - Greater than 70 percent UV Stability using ASTM D4355 Standard Test Method for Deterioration of Geotextiles by Exposure to Light, Moisture, and Heat in a Xenon Arc Type Apparatus.

Curb Inlet Protection

- Municipality approval is required before installing inlet protection on public streets.
- Special caution must be exercised when installing curb inlet protection on publicly traveled streets or in developed areas. Ensure that inlet protection is properly designed, installed and maintained to avoid flooding of the roadway or adjacent properties and structures.
- A two inch overflow gap or weir is required on all curb inlet protection devices.
- Traffic cones, warning signs, or other measures shall be installed to warn motorists when the inlet protection measures extend beyond the gutter line.
- 2 inch X 4 inch Weir Protection:
    - Bend wire mesh around the 2 inch x 4 inch board and staple to the board. Bend wire mesh around the bottom of the board, the curb opening, and along the pavement to form a cage for the rock.
    - Rock bags shall be placed perpendicular to the curb, at both ends of the wooden frame, to disrupt the flow and direct water into the rock filter. Stack the bags two high if needed.
- Organic Filter Tube Protection:
    - The diameter of the tube shall be at least 2 inches less than the height of the inlet opening. The tube should not be allowed to block the entire opening, since it will clog.
    - The tube shall be placed on 4 inch x 4 inch or 2 inch x 4 inch wire mesh to prevent the tube from sagging into the inlet.
    - The tube should be long enough to extend a minimum of 12 inches past the curb opening on each side of the inlet.
- Hog Wire Weir Protection:
    - The filter fabric and wire mesh shall extend a minimum of 12 inches past the curb opening on each side of the inlet.
    - Filter fabric shall be placed on 2 inch x 4 inch wire mesh to prevent the tube from sagging into the inlet.
    - Rock bags are used to hold the wire mesh and filter fabric in contact with the pavement. At least one bag shall be placed on either side of the opening, parallel to and up against the concrete curb. The bags are in intended to disrupt and slow the flow and ensure it does not go under the fabric. Add bags if needed.

- If a board is used to anchor the wire mesh and fabric instead of rock bags, the board shall be secured with concrete nails at 3 inches on center. Upon removal clean any dirt or debris from the nailing locations, apply chemical sanding agent, and apply non-shrink grout flush with surface of concrete.

- Block and Gravel Protection:
  - Concrete blocks shall be standard 8 inch x 8 inch x 16 inch concrete masonry units and shall be in accordance with ASTM C139, Concrete Masonry Units for Construction. Filter gravel shall be ¾ inch washed stone containing no fines. Angular shaped stone is preferable to rounded shapes.
  - Concrete blocks are to be placed on their sides in a single row around the perimeter of the inlet, with ends abutting. Openings in the blocks should face outward, not upward. ½ inch x ½ inch wire mesh shall then be placed over the outside face of the blocks covering the holes. Filter gravel shall then be piled against the wire mesh to the top of the blocks with the base of the stone being a minimum of 18 inches from the blocks.
  - Alternatively, where loose stone is a concern (streets, etc.), the filter gravel may be placed in appropriately sized filter fabric bags.
  - Periodically, when the gravel filter becomes clogged, the gravel must be removed and cleaned in a proper manner or replaced with new gravel and piled back against the wire mesh.
- Organic Filter Tube On-Grade Protection:
  - Organic filter tubes may be used to provide sediment control at on-grade curb inlets where the tube will not be a traffic hazard, such as on residential streets where the pavement adjacent to the curb is allocated to parked cars. Tubes should not be used in this manner where they will extend into an active travel lane.
  - The filter tube shall be secured in a U-shape by rock bags. Runoff flowing in the gutter will pond within the U until it filters through the tube or overflows around the end.
- Inlet protection shall be phased on curb inlets being constructed. Controls shall be installed on the pipe inlet at the bottom of the catch basin as soon as it is installed and while the inlet box and top are being formed or placed.

Area Inlet Protection

- Installation methods for protection on area inlets vary depending on the type of inlet (drop, “Y,” or other) and the type and use of the surface surrounding the inlet (parking lot, playground, etc.). It is the responsibility of the designer to appropriately adapt inlet protection measures and their installation methods for each site condition. Several types may be needed on one project.
- Filter Fabric Protection:
  - Filter fabric protection is appropriate where the drainage area is less than one acre and the basin slope is less than five (5) percent. Filter fabric, posts, and wire mesh shall meet the material requirements specified in *Section 3.10 Silt Fence*.
  - A 6 inch wide trench is to be cut 6 inches deep at the toe of the fence to allow the fabric to be laid below the surface and backfilled with compacted earth or gravel. This entrenchment prevents any bypass of runoff under the fence.
  - Stone overflow structures, according to the criteria in *Section 3.10 Silt Fence* shall be installed where flow to the inlet is concentrated and more than 1 cubic feet per second.
- Excavated Impoundment Protection:
  - Excavated inlet protection is usually the most effective type of area inlet protection; however, it is only applicable to drop inlets. It should not be applied to Y inlets because it will undermine the concrete pad surrounding the inlet opening. Nor can it be used for inlets on pavement.

- With this protection method, it is necessary to install weep holes to allow the impoundment to drain completely.
- The impoundment shall be sized such that the volume of excavation is equal to or exceeds the runoff volume from the temporary control design storm (2-year, 24-hour) for the inlet's drainage area.
- The trap shall have a minimum depth of one foot and a maximum depth of 2 feet as measured from the top of the inlet and shall have side slopes of 2:1 or flatter.

- Block and Gravel Protection:
  - Block and gravel inlet protection is the most stable area inlet protection and can handle more concentrated flows. It may be installed on paved or vegetated surfaces. Loose stone shall be carefully removed from vegetated surfaces at the end of construction to prevent the stone from becoming a mowing hazard.
  - The inlet protection may be one or two blocks high. Single block heights are applicable for drainage areas up to 3 acres in size. The double block height shall be used for larger drainage areas.
  - Concrete blocks shall be standard 8 inch x 8 inch x 16 inch concrete masonry units and shall be in accordance with ASTM C139, Concrete Masonry Units for Construction. Filter gravel shall be ¾ inch washed stone containing no fines. Angular shaped stone is preferable to rounded shapes.
- Organic Filter Tube Protection:
  - Organic filter tubes may be used on paved or unpaved surfaces.
  - On paved surfaces, tubes shall be secured in place by rock bags. On unpaved surfaces, the tubes shall be embedded in the ground a minimum of 3 inches and staked at 4 foot spacing.
  - Designer shall provide calculations and specify the diameter of tube to be used based on the inlet's drainage area and the flow rate of runoff to the inlet. The minimum allowable diameter is 12 inches.

Proprietary Inlet Protection

- Numerous proprietary protection devices are available from commercial vendors. The devices often have the advantage of being reusable on several projects if they are maintained in good condition.
- It is the policy of this manual not to recommend any specific commercial vendors for proprietary controls. However, this subsection is included in order to provide municipalities with a rationale for approving the use of a proprietary inlet protection device within their jurisdiction.
- The designer shall work with the supplier to provide the municipality with flow calculations or independent third-party tests that document the device's performance for conditions similar to the ones in which it is proposed to be installed. The conditions that should be considered include: type and size of inlet, inlet configuration, size of contributing drainage area, design flow rate, soil particle sizes to be removed, and other pollutants to be removed.
- The designer or vendor of the proprietary device shall provide a minimum of three references for projects where the device has been installed and maintained in operation at a construction site for at least six months. Local references are preferred; but references from other regions can be accepted if a similarity between the reference project and the proposed application can be demonstrated.
- Proprietary devices must not completely block the inlet. The device shall have a minimum of a 2 inch wide opening for the length of the inlet when it will be used in areas that water can safely pond to depths deeper than the design depths for the inlet. If ponding is not an option, then the device must have overflow capacity equal to the inlet design flow rate.
- Some proprietary devices are available with replaceable pads or filters. These pads or filters have the added benefit or removing pollutants such as metals and oils in addition to removing sediment.

These types of inserts are recommended in applications where prior or current land use in or adjacent to the construction areas may result in the discharge of pollutants.

- Proprietary protection devices shall be in accordance with the General criteria at the beginning of this section and any criteria listed under Curb Inlet Protection and Area Inlet Protection that are not specific to an inlet protection method.

3.4.4 Design Guidance and Specifications

Specifications for construction of this item may be found in the Standard Specifications for Public Works Construction – North Central Texas Council of Governments, Section 201.15 Inlet Protection.

3.4.5 Inspection and Maintenance Requirements

Inlet protection should be inspected regularly (at least as often as required by the TPDES Construction General Permit). Inlet controls should also be inspected after every storm event to check for collapse into the inlet or other damages that may block flow in the inlet. In addition to routine inspection, inlet protection devices should be observed and monitored during larger storm events to verify that they are not ponding or diverting water in a manner that floods a roadway or damages property.

Floatable debris and other trash caught by the inlet protection should be removed after each storm event. Sediment should also be removed from curb inlet protection after each storm event because of the limited storage area associated with curb inlets.

Sediment collected at area inlet protection should be removed before it reaches half the height of the protection device. Sediment should be removed from inlets with excavated impoundment protection before the volume of the excavation is reduced by 50 percent. In addition, the weep holes should be checked and kept clear of blockage.

Concrete blocks, 2 inch x 4 inch boards, stakes, and other materials used to construct inlet protection should be checked for damaged and repaired or replaced if damaged.

When filter fabric or organic filter tubes are used, they should be cleaned or replaced when the material becomes clogged. For systems using filter stone, when the filter stone becomes clogged with sediment, the stones must be pulled away from the inlet and cleaned or replaced.

Because of the potential for inlet protection to divert runoff or cause localized flooding, remove inlet protection as soon as the drainage area contributing runoff to the inlet is stabilized. Ensure that all inlet protection devices are removed at the end of the construction.

3.4.6 Example Schematics

The following schematics are example applications of the construction control. They are intended to assist in understanding the control's design and function.

The schematics are **not for construction**. They may serve as a starting point for creating a construction detail, but they must be site adapted by the designer. In addition, dimensions and notes appropriate for the application must be added by the designer.

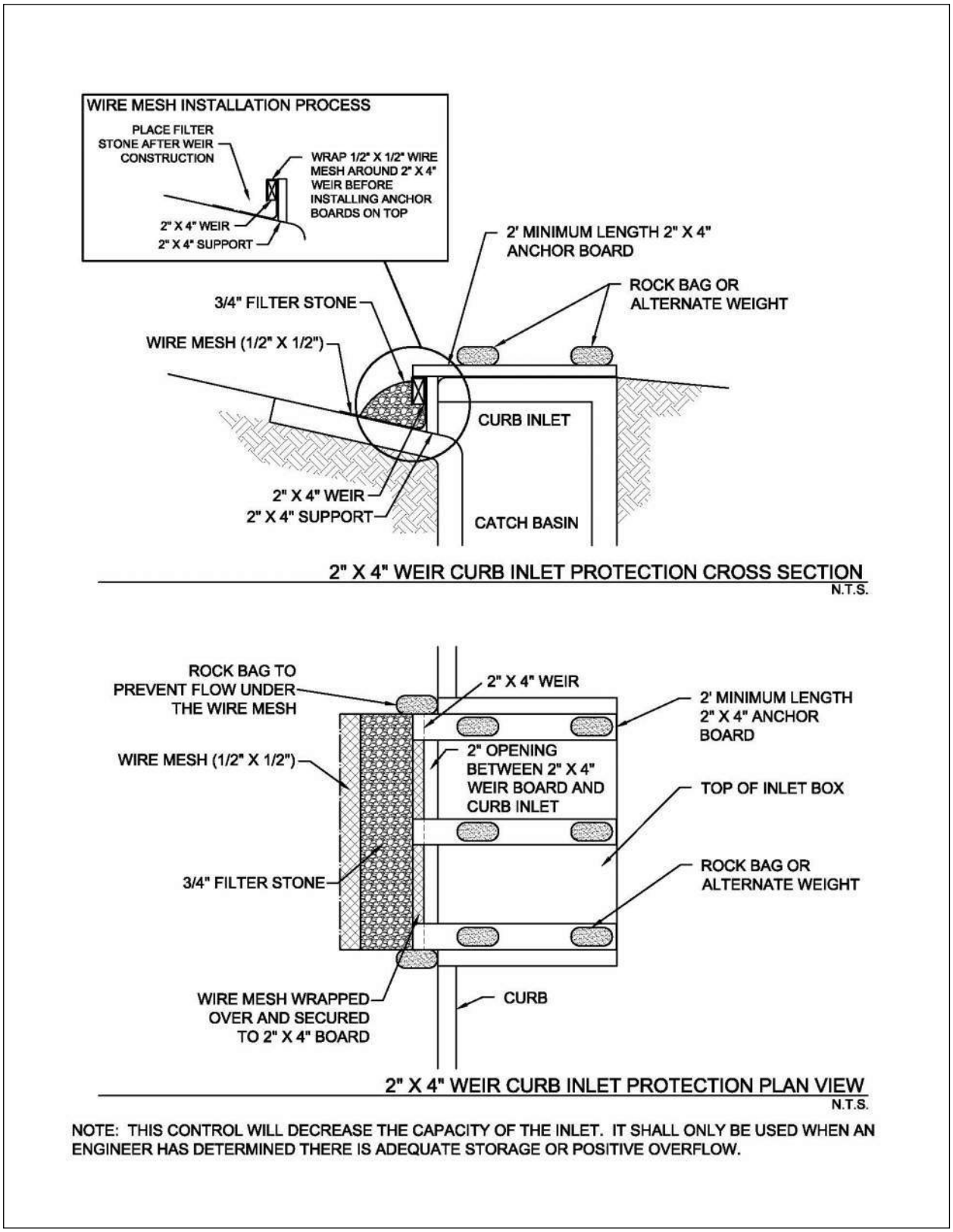
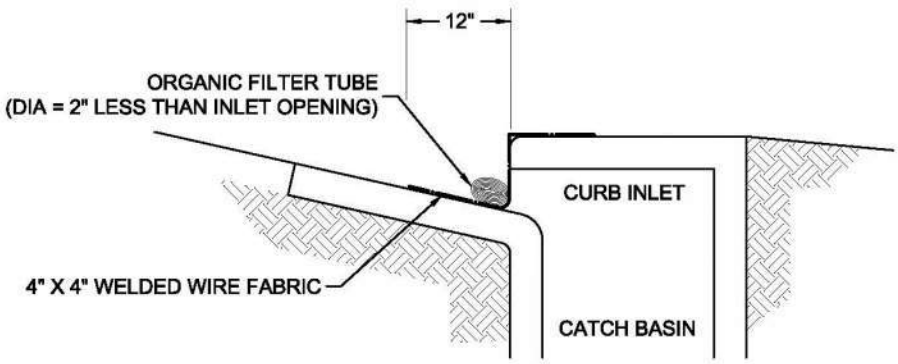
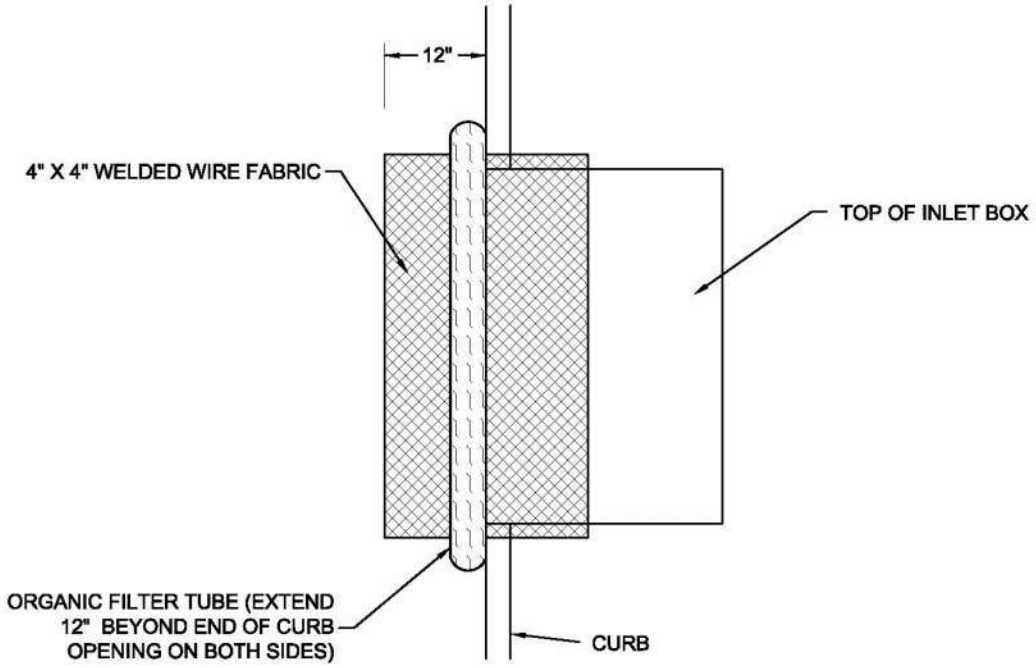


Figure 3.5 Schematics of 2"x4" Weir Curb Inlet Protection
(Source: Modified from Washington Suburban Sanitary Commission Detail SC-16.0)



ORGANIC FILTER TUBE CURB INLET PROTECTION CROSS SECTION
N.T.S.



ORGANIC FILTER TUBE CURB INLET PROTECTION PLAN VIEW
N.T.S.

NOTE: THIS CONTROL WILL DECREASE THE CAPACITY OF THE INLET. IT SHALL ONLY BE USED WHEN AN ENGINEER HAS DETERMINED THERE IS ADEQUATE STORAGE OR POSITIVE OVERFLOW.

Figure 3.6 Schematics of Organic Filter Tube Curb Inlet Protection
(Source: Modified from City of Plano BMP SP-4)

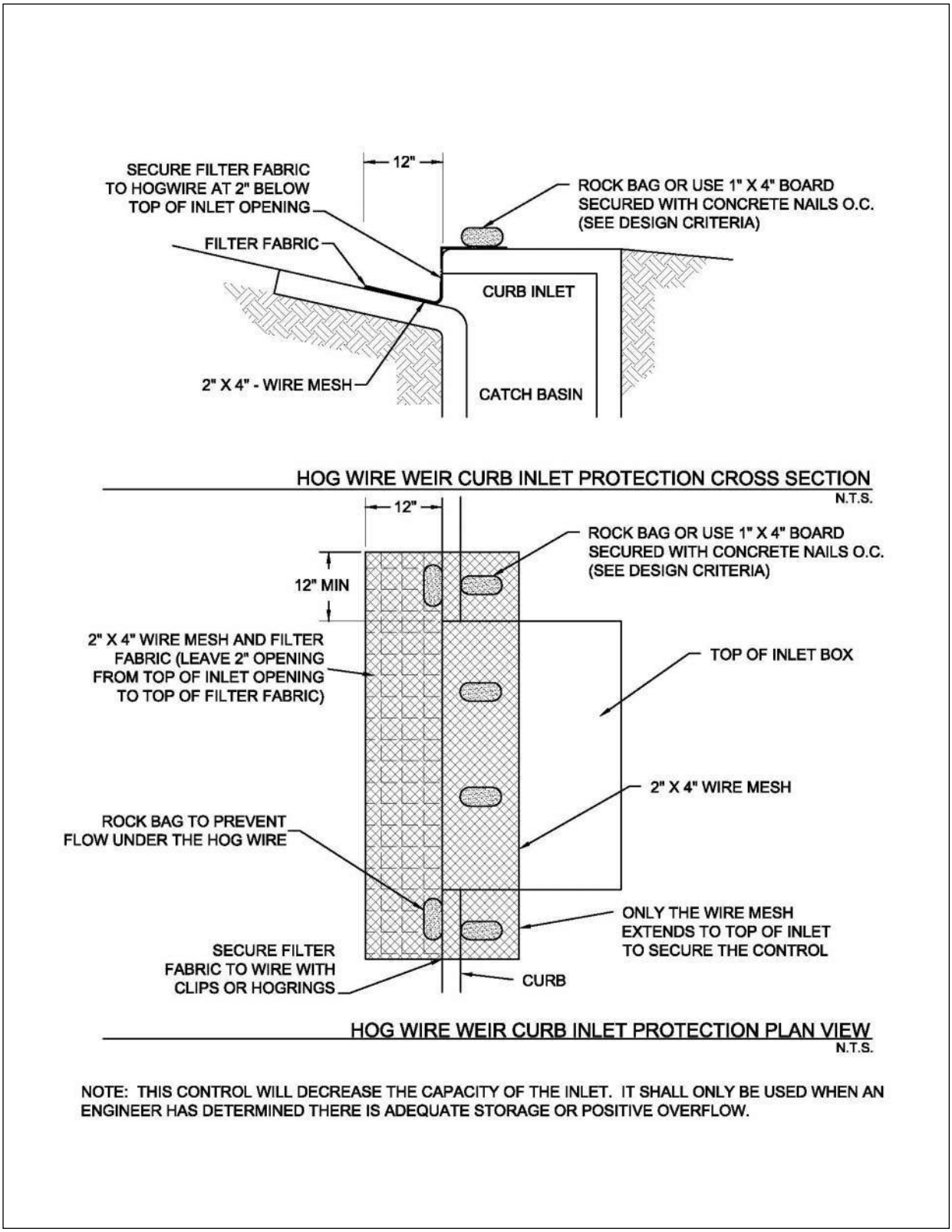
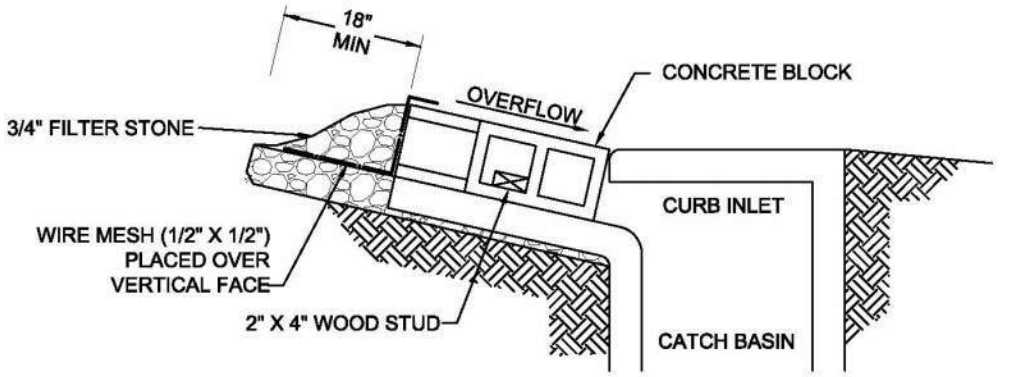
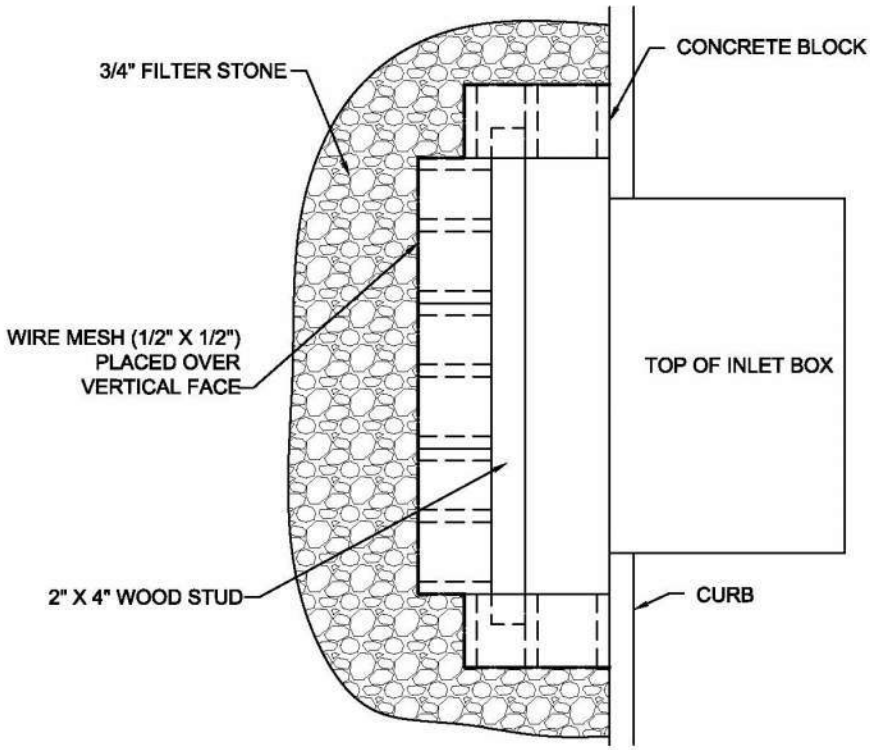


Figure 3.7 Schematics of Hog Wire Weir Curb Inlet Protection
(Source: Modified from City of Round Rock Detail E-03)



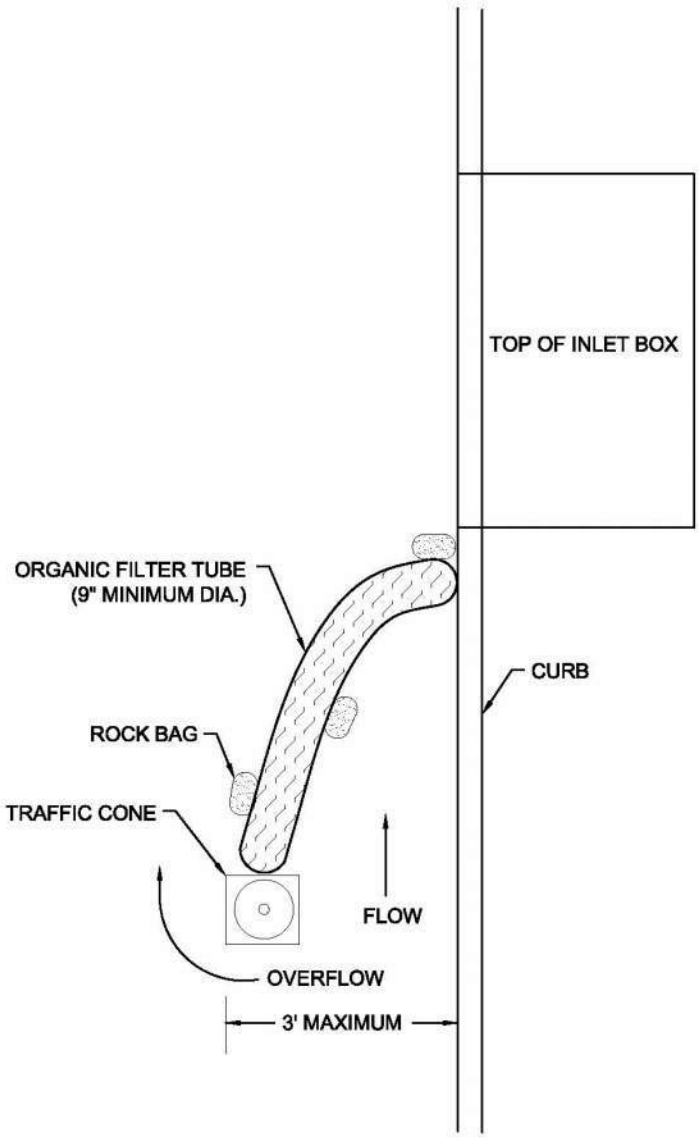
BLOCK AND GRAVEL FILTER CURB INLET PROTECTION CROSS SECTION
N.T.S.



BLOCK AND GRAVEL FILTER CURB INLET PROTECTION PLAN VIEW
N.T.S.

NOTES:
1. DO NOT INSTALL ON INLETS IN A PUBLIC STREET OR OTHER ACTIVE TRAVEL LANE. BLOCK AND GRAVEL FILTER IS INTENDED FOR USE ON LOW POINT (SUMP) INLETS IN PARKING LOTS AND OTHER PAVEMENT THAT IS NOT AN ACTIVE TRAVEL LANE. THIS INLET PROTECTION METHOD ALLOWS FOR FULL USE OF THE INLET DESIGN CAPACITY.
2. INSTALL TRAFFIC CONES AS NEEDED TO MINIMIZE THE POTENTIAL FOR CARS HITTING THE BLOCK AND GRAVEL.

Figure 3.8 Schematics of Block and Gravel Filter Curb Inlet Protection



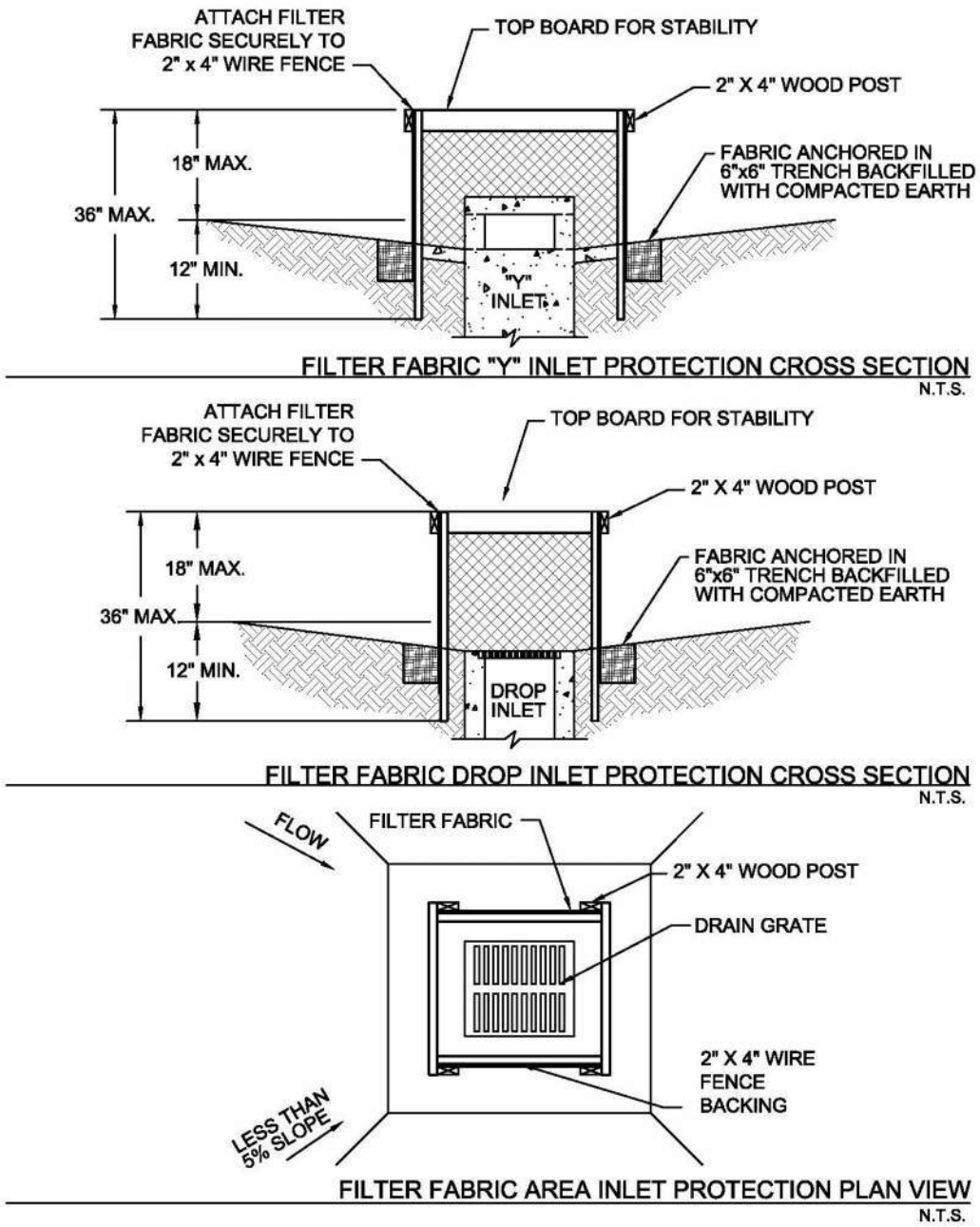
ORGANIC FILTER TUBE ON-GRADE CURB INLET PROTECTION DETAIL

N.T.S.

NOTES: 1. THIS DETAIL IS INTENDED FOR USE WITH ON-GRADE INLETS (NOT A LOW POINT) WHERE WATER WOULD BE DIVERTED INSTEAD OF PONDING BEHIND THE OTHER TYPES OF INLET PROTECTION.

2. DO NOT INSTALL ON INLETS WHERE THE ORGANIC FILTER TUBE WOULD EXTEND INTO AN ACTIVE TRAVEL LANE.

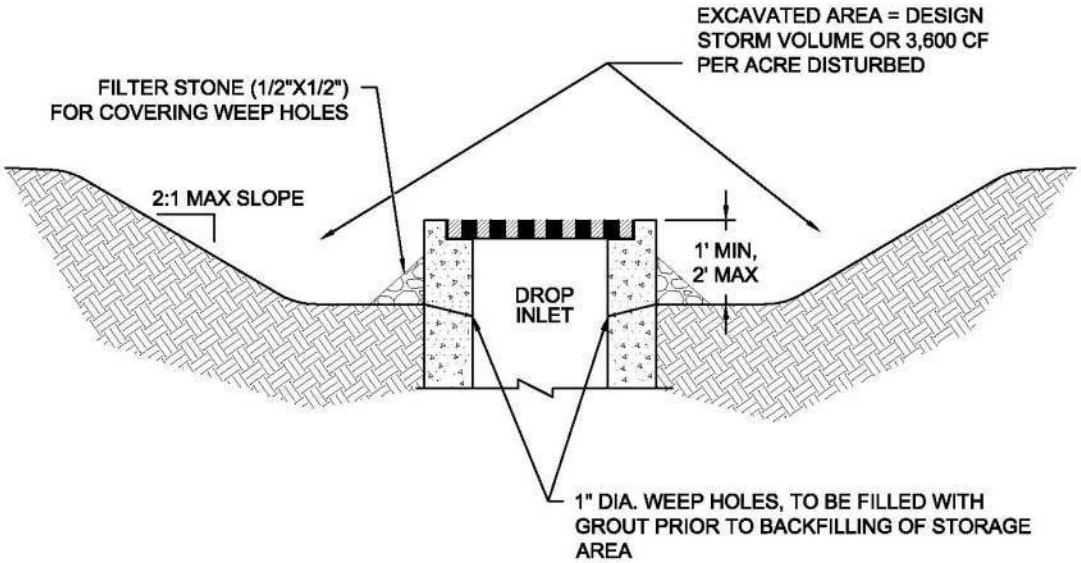
Figure 3.9 Schematic of Organic Filter Tube On-Grade Curb Inlet Protection



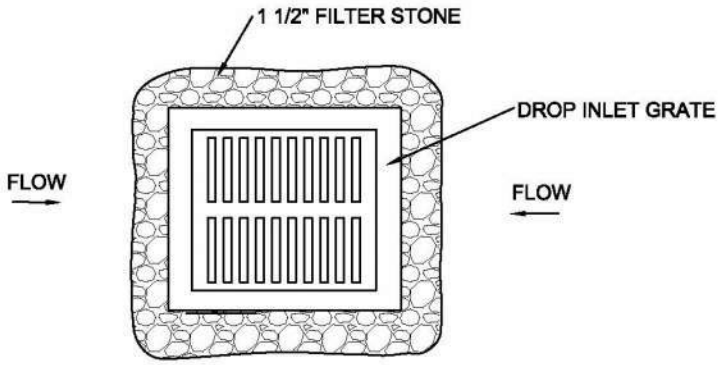
NOTES: 1. CONCENTRATED DITCH FLOW COMING FROM ONE OR MORE SIDES TOWARD THE INLET MAY REQUIRE A STONE OVERFLOW STRUCTURE TO BE CONSTRUCTED ON ONE SIDE OF THE INLET (SEE *SECTION 3.10 SILT FENCE*).

2. POSTS SHALL BE INSTALLED AT EACH CORNER AND BETWEEN CORNERS IF THE DISTANCE IS GREATER THAN 6' BETWEEN CORNER POSTS.

Figure 3.10 Schematics of Filter Fabric Area Inlet Protection
(Source: City of Plano BMP SP-4)



EXCAVATED IMPOUNDMENT DROP INLET PROTECTION CROSS SECTION
N.T.S.



EXCAVATED IMPOUNDMENT AREA INLET PROTECTION PLAN VIEW
N.T.S.

Figure 3.11 Schematics of Excavated Impoundment Area Inlet Protection

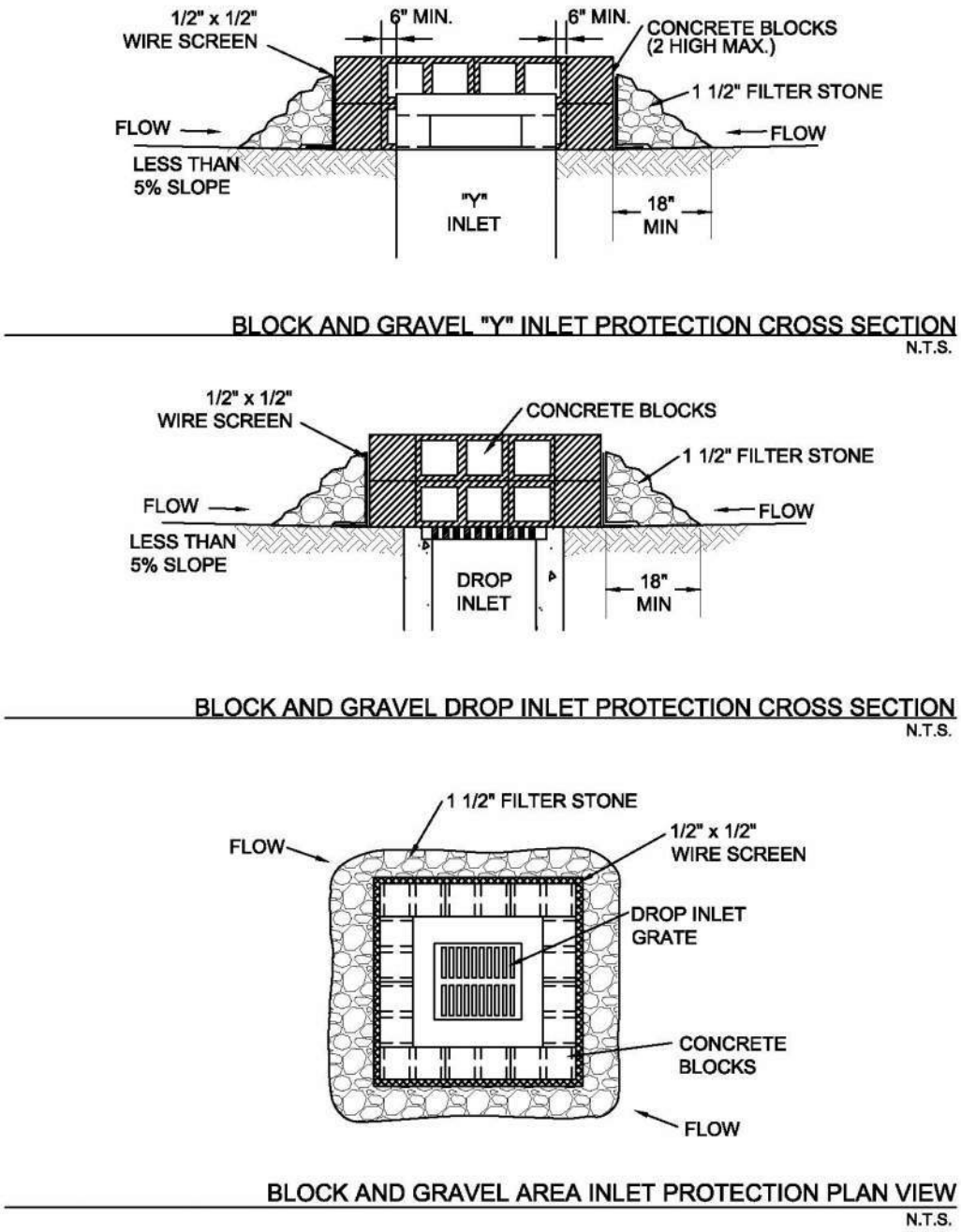


Figure 3.12 Schematics of Block and Gravel Area Inlet Protection
(Source: Modified from City of Plano BMP SP-4)

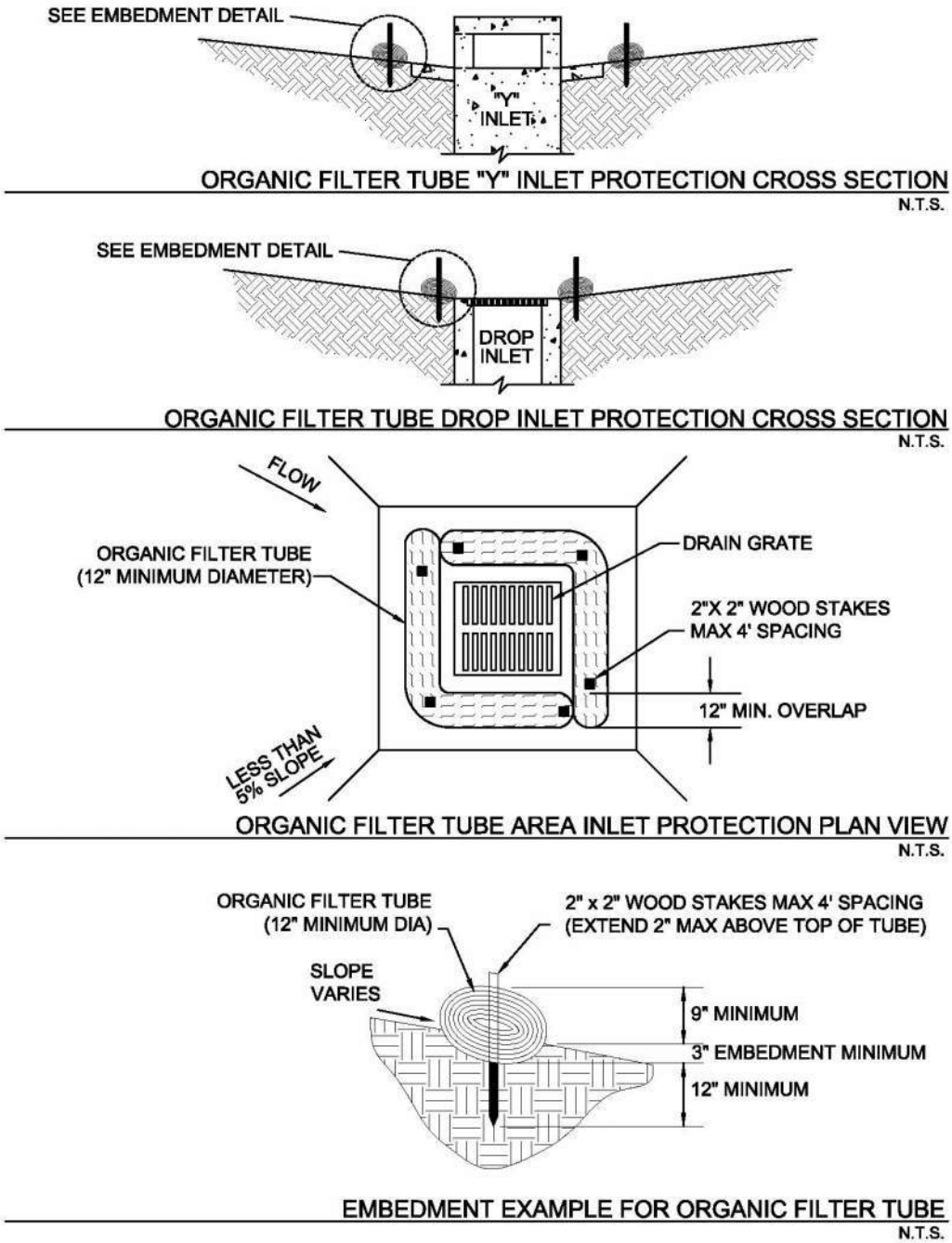
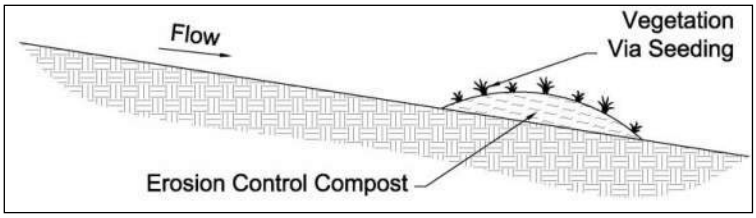


Figure 3.13 Schematics of Organic Filter Tube Area Inlet Protection

3.5 Organic Filter Berm

Sediment Control



Description: Organic filter berms, also called compost filter berms, are linear berms constructed of a mix of compost and wood chips. They are placed on a contour to control runoff. The organic filter berm provides both filtration and time for sediment settling by reducing the velocity of the runoff.

KEY CONSIDERATIONS

DESIGN CRITERIA:

- Maximum drainage area of 0.25 acre per 100 linear feet of berm
- Maximum 200 feet distance of flow to silt fence; 50 feet if slope exceeds 10 percent
- 1½ to 3 feet high, top width of 2 to 3 feet, and base of 3 to 5 feet for trapezoidal shaped berms
- 1 to 2 feet high and 2 to 4 feet wide for windrow (triangular) berms

ADVANTAGES / BENEFITS:

- Economical means to trap sediment
- Most effective with coarse to silty soil types
- May be tilled into the soil at end of project, thus adding organic content to the soil

DISADVANTAGES / LIMITATIONS:

- Localized flooding due to minor ponding upslope of the filter berm
- Not for use in swales or low areas where berms will be subject to concentrated flow
- Can interfere with construction operations
- Repeated clogging may require replacement of berm with another control

MAINTENANCE REQUIREMENTS:

- Inspect regularly
- Repair undercutting and other failures
- Remove sediment when before it reaches one-half the height of the berm
- Maintain dimensions of the berm by replacing organic filter material when necessary

TARGETED POLLUTANTS

- ● Sediment
- ○ Nutrients & Toxic Materials
- ○ Oil & Grease
- ◒ Floatable Materials
- ○ Other Construction Wastes

APPLICATIONS

Perimeter Control
Slope Protection
Sediment Barrier

Channel Protection

Temporary Stabilization

Final Stabilization

Waste Management

Housekeeping Practices

Fe=0.50-0.75
(*Depends on soil type*)

IMPLEMENTATION CONSIDERATIONS

- ◒ Capital Costs
- ● Maintenance
- ○ Training
- ◒ Suitability for Slopes > 5%

Other Considerations

- *Effects of ponding on adjacent areas and property*

3.5.1 Primary Use

Organic filter berms are used as perimeter controls down slope of disturbed areas and on side slopes where stormwater may runoff the area. They are very well suited to sites with small disturbed drainage areas that are not subjected to concentrated flows and that will ultimately be seeded, sodded, or landscaped.

3.5.2 Applications

Properly designed, the organic filter berm is economical due to the ease of installation and because it can be tilled into the soil at the end of project, limiting the cost of removal and adding to the organic content of the soil. The berms are used as perimeter control devices for both development sites and linear (roadway) type projects. They are most effective with coarse to silty soil types. Additional controls, such as a passive treatment system, may be needed to remove fine silts and clay soils suspended in stormwater.

3.5.3 Design Criteria

- Filter berms are to be constructed along a line of constant elevation (along a contour line) where possible.
- Berms can interfere with construction operations; therefore planning of access routes onto the site is critical.
- Maximum drainage area shall be 0.25 acre per 100 linear feet of filter berm.
- Maximum flow to any 20 foot section of filter berm shall be 1cubic feet per second.
- Maximum distance of flow to berm shall be 200 feet or less. If the slope exceeds 10 percent the flow distance shall be less than 50 feet.
- Maximum slope adjacent to the filter berm shall be 4:1.
- Trapezoidal shaped berms should be 1½ to 3 feet high with a top width of 2 to 3 feet and a base of 3 to 6 feet wide.
- Windrow (triangular) shaped berms should be 1 to 2 feet high and 2 to 4 feet wide.
- Berm side slopes shall be 2:1 or flatter.
- Roughen the soil surface before placing the berm to increase adherence of the compost.
- Compost shall conform to the requirements for Erosion Control Compost in Item 161 of the Standard Specifications for Construction and Maintenance of Highways, Streets, and Bridges (TxDOT 2004).
- Organic filter berms should be stabilized by seeding if there are no other sediment controls down slope of the filter berm. Seeding shall be as specified in *Section 2.9 Vegetation* at a seed loading of 1 lb. per 10 linear feet for small berms (1ft. by 2 ft.) or 2.25 lbs per 10 linear ft. for larger berms (1.5 ft. by 3 ft.)

3.5.4 Design Guidance and Specifications

Specifications for Erosion Control Compost to be used as filter material may be found in Item 161 of the Standard Specifications for Construction and Maintenance of Highways, Streets, and Bridges (TxDOT 2004).

3.5.5 Inspection and Maintenance Requirements

Filter berms should be inspected regularly (at least as often as required by the TPDES Construction General Permit) for buildup of excess sediment, undercutting, and other failures. Silt must be removed

when before it reaches half the height of the berm. Silt may be raked from the disturbed side of the device to clean side the berm for the first few times that it becomes clogged to prevent ponding. Repeated clogging of the berm at one location will require replacement of the organic filter material or may require installation of another control to prevent failure of the berm.

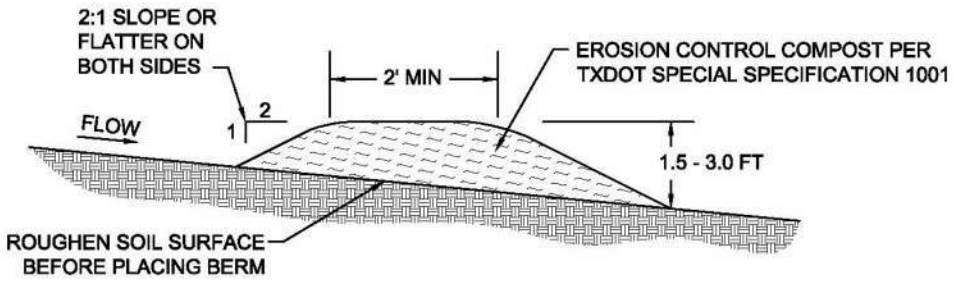
Dimensions of the berm must be maintained by replacing organic filter material when necessary. Typically excess material is stockpiled onsite for repairs to berms disturbed by construction activity.

There shall be no signs of erosion, breeching or runoff around or under the berm.

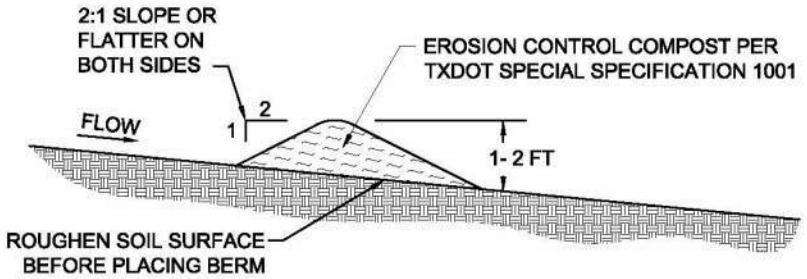
3.5.6 Example Schematics

The following schematics are example applications of the construction control. They are intended to assist in understanding the control's design and function.

The schematics are **not for construction**. They may serve as a starting point for creating a construction detail, but they must be site adapted by the designer. In addition, dimensions and notes appropriate for the application must be added by the designer.



TRAPEZOIDAL SHAPED ORGANIC FILTER BERM
N.T.S.



TRIANGULAR SHAPED ORGANIC FILTER BERM
N.T.S.

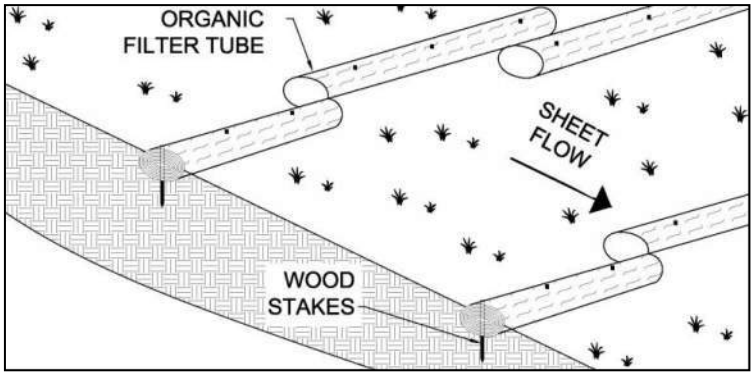
NOTE: DIMENSIONS OF THE BERM SHALL BE DESIGNED BASED ON FLOW CONDITIONS. PROVIDE CALCULATIONS THAT DOCUMENT THE FOLLOWING PARAMETERS TO DESIGN THE SWALE:

- SIZE OF CONTRIBUTING DRAINAGE AREA
- DESIGN STORM
- FLOW RATE
- BERM HEIGHT AND WIDTH

Figure 3.14 Schematics of Organic Filter Berm

3.6 Organic Filter Tubes

Sediment Control



Description: Organic filter tubes are comprised of an open weave, mesh tube that is filled with a filter material (compost, wood chips, straw, coir, aspen fiber, or a mixture of materials). The tube may be constructed of geosynthetic material, plastic, or natural materials. Organic filter tubes are also called fiber rolls, fiber logs, wattles, mulch socks, and/or coir rolls. Filter tubes detain flow and capture sediment as linear controls along the contours of a slope or as a perimeter control down-slope of a disturbed area.

KEY CONSIDERATIONS

DESIGN CRITERIA:

- Tube diameter when filled shall be specified on the plans
- 3 inch minimum embedment in soil
- 18 inch minimum overlap at ends of tubes
- Spacing based on drainage area and slope
- Must be staked on soil and secured with rockbags on pavement
- Turn ends of tube lines upslope a minimum of 10 feet

ADVANTAGES / BENEFITS:

- Effective means to treat sheet flow over a short distance
- Relatively easy to install
- May be used on steep slopes
- Can provide perimeter control on paved surfaces or where soil type prevents embedment of other controls
- Work well as perimeter controls around stockpiles

DISADVANTAGES / LIMITATIONS:

- Difficult to remove when wet and/or filled with sediment
- Relatively small effective areas for sediment capture

MAINTENANCE REQUIREMENTS:

- Inspect regularly
- Repair eroded areas underneath the organic filter tubes
- Re-align and stake tubes that are dislodged by flow
- Remove sediment before it reaches half the height of the exposed tube

TARGETED POLLUTANTS

- ● Sediment
- ○ Nutrients & Toxic Materials
- ◒ Oil & Grease
- ○ Floatable Materials
- ○ Other Construction Wastes

APPLICATIONS

Perimeter Control
Slope Protection
Sediment Barrier

Channel Protection

Temporary Stabilization

Final Stabilization

Waste Management

Housekeeping Practices

Fe=0.50-0.75
(*Depends on soil type*)

IMPLEMENTATION CONSIDERATIONS

- ◒ Capital Costs
- ◒ Maintenance
- ○ Training
- ◒ Suitability for Slopes > 5%

Other Considerations:

- *None*

3.6.1 Primary Use

Organic filter tubes are long, flexible controls that are used along a line of constant elevation (along a contour) on slopes. They are used as perimeter controls down slope of disturbed areas, around temporary stockpiles and on side slopes where stormwater may runoff the area. The tubes maintain sheet flow, slow velocities, and capture sediment. When used in series on slopes, they also shorten the slope length and protect the slope from erosion.

3.6.2 Applications

Organic filter tubes include a wide variety of tube and filter materials. Organic filter tubes are used as a perimeter sediment barrier, similar to silt fence, for development projects and linear projects, such as roadways and utilities. They work well on individual residential lots and on lots being re-developed, where space may be limited. Organic filter tubes are most effective with coarse to silty soil types. Additional controls may be needed to remove fine silts and clay soils suspended in stormwater.

Organic filter tubes can be used on paved surfaces where it's not possible to stake a silt fence. Applications on paved surfaces include perimeter controls for soil stockpiles, pavement repair areas, utility trenching, and building demolition. When compost filter material is used in tubes on pavement, the material has the added benefit of removing some oil and grease from stormwater runoff.

Applications on slopes include temporary sediment control during construction and erosion control of the disturbed soil on the slope. Organic filter tubes may be used to control sheet flow on slopes when final stabilization measures are being applied and established.

Organic filter tubes may also be used for inlet protection and, in limited cases, as check dams in small drainage swales. Refer to *Section 3.4 Inlet Protection* and *Section 2.1 Check Dam* for the design criteria to use organic filter tubes in these applications.

3.6.3 Design Criteria

General Criteria

- Filter tubes should be installed along the contour.
- Tubes shall be staked with 2 inch by 2 inch wooden stakes at a maximum spacing of 4 feet. Rebar or similar metal stakes may be used instead of wooden stakes.
- When placed on pavement, sand or rock bags shall be placed abutting the down-slope side of the tubes to prevent runoff from dislodging the tubes. At a minimum, bags shall be placed one foot from each end of the tube and at the middle of the tube.
- Filter tubes shall be embedded a minimum of three inches when placed on soil. Placement on rock shall be designed as placement on pavement.
- The end of tubes shall overlap a minimum of 18 inches when multiple tubes are connected to form a linear control along a contour or a perimeter.
- Loose mulch material shall be placed against the log on the upstream side to facilitate contact with the ground.
- The last 10 feet (or more) at the ends of a line of tubes shall be turned upslope to prevent bypass by stormwater. Additional upslope lengths of tubes may be needed every 200 to 400 linear feet, depending on the traverse slope along the line of tubes.
- The most common sizes of tubes are 6 to 24 inches in diameter; however, tubes are available in sizes as small as 4 inches and up to 36 inches in diameter. The designer shall specify a diameter based on the site application. Tubes less than 8 inches in diameter when filled will require more frequent maintenance if used.

- Manufactured organic filter tube products shall have documentation of a minimum 75 percent soil retention using ASTM D7351 Standard Test Method for Determination of Sediment Retention Device Effectiveness in Sheet Flow Applications.
- When using manufactured tubes, the manufacturer's recommendations for diameter and spacing based on slope, flow velocities, and other site conditions shall be followed when they are more stringent than the design criteria in this section.
- When used as a perimeter control on grades of 10:1 or less, criteria in the following table shall be used as a guide for the size and installation rate of the organic filter tube.

Table 3.1 Perimeter Control Applications*

Drainage Area (Max)	*Max Flow Length to the Tube*	*Tube Diameter (Min)*
1/3 Acre per 100 feet	145 feet	18 inches
1/4 Acre per 100 feet	110 feet	15 inches
1/5 Acre per 100 feet	85 feet	12 inches
1/8 Acre per 100 feet	55 feet	9 inches

(Source: Modified and expanded from City of Plano Fact Sheet SP-13)
*Applicable on grades of 10:1 or flatter.

- When installing organic filter tubes along contours on slopes, criteria in the following table shall be used as a general guide for size and spacing of the tubes. Actual tube diameter and spacing shall be specified by the designer. The designer shall consider the tube manufacturers recommendations, the soil type, flow volume on the slope, required performance life, and erosion control measures that may be used in conjunction with the tubes.

Table 3.2 Maximum Spacing for Slope Protection

	Tube Diameter (Min)			
Slope (H:V)	*9 Inches*	*12 Inches*	*18 Inches*	*24 Inches*
5:1 to 10:1	35 feet	40 feet	55 feet	60 feet
4:1	30 feet	40 feet	50 feet	50 feet
3:1	25 feet	35 feet	40 feet	40 feet
2:1	20 feet	25 feet	30 feet	30 feet
1:1	10 feet	15 feet	20 feet	20 feet

(Source: Modified and expanded from Iowa Statewide Urban Design and Specifications Standards for Filter Socks)

Tube Material

- The designer shall specify the type of mesh based on the required life of the tube. At a minimum, the mesh shall have a rated life of one year under field conditions.
- If the tubes will be left onsite as part of the final stabilization, they must be constructed of 100 percent biodegradable jute, coir, sisal or similar natural fiber or 100 percent UV photodegradable plastic, polyester or geosynthetic material.
- Mesh tubes may be oval or round in cross-section.
- Mesh for the tubes shall be open and evenly woven. Size of weave openings shall be specified based on filter material. Openings may range from ½ inch for Erosion Control Compost to 2 inches for straw and coir.
- Mesh openings should not exceed ½ inch in diameter.

Filter Material

- Different filter materials have different properties and will affect sheet flow differently. The designer shall specify the type of material to be used (or excluded) on a particular site.
- Straw filter material shall be Certified Weed Free Forage. The straw must be in good condition, air-dried, and not rotten or moldy.
- Compost shall conform to the requirements for Erosion Control Compost in Item 161 of the Standard Specifications for Construction and Maintenance of Highways, Streets, and Bridges (TxDOT 2004).
- Compost may provide some oil and grease removal; however, the large percentage of fines in compost will result in less filtering and more ponding of stormwater.
- Wood chips shall be 100 percent untreated chips and free of inorganic debris, such as plastic, glass, metal, etc. Wood chip size shall not be smaller than 1 inch and shall not exceed 3 inches in diameter. Shavings shall not be more than 5% of the total mass.

3.6.4 Design Guidance and Specifications

Specifications for Erosion Control Compost to be used as filter material may be found in Item 161 of the Standard Specifications for Construction and Maintenance of Highways, Streets, and Bridges (TxDOT 2004).

3.6.5 Inspection and Maintenance Requirements

Organic filter tubes should be inspected regularly (at least as often as required by the TPDES Construction General Permit). The filter tube should be checked to ensure that it is in continuous contact with the soil at the bottom of the embedment trench. Closely check for rill erosion that may develop under the filter tubes. Eroded spots must be repaired and monitored to prevent reoccurrence. If erosion under the tube continues, additional controls are needed.

Staking shall be checked to ensure that the filter tubes are not moving due to stormwater runoff. Repair and re-stake slumping filter tubes. Tubes that are split, torn or unraveling shall be repaired or replaced.

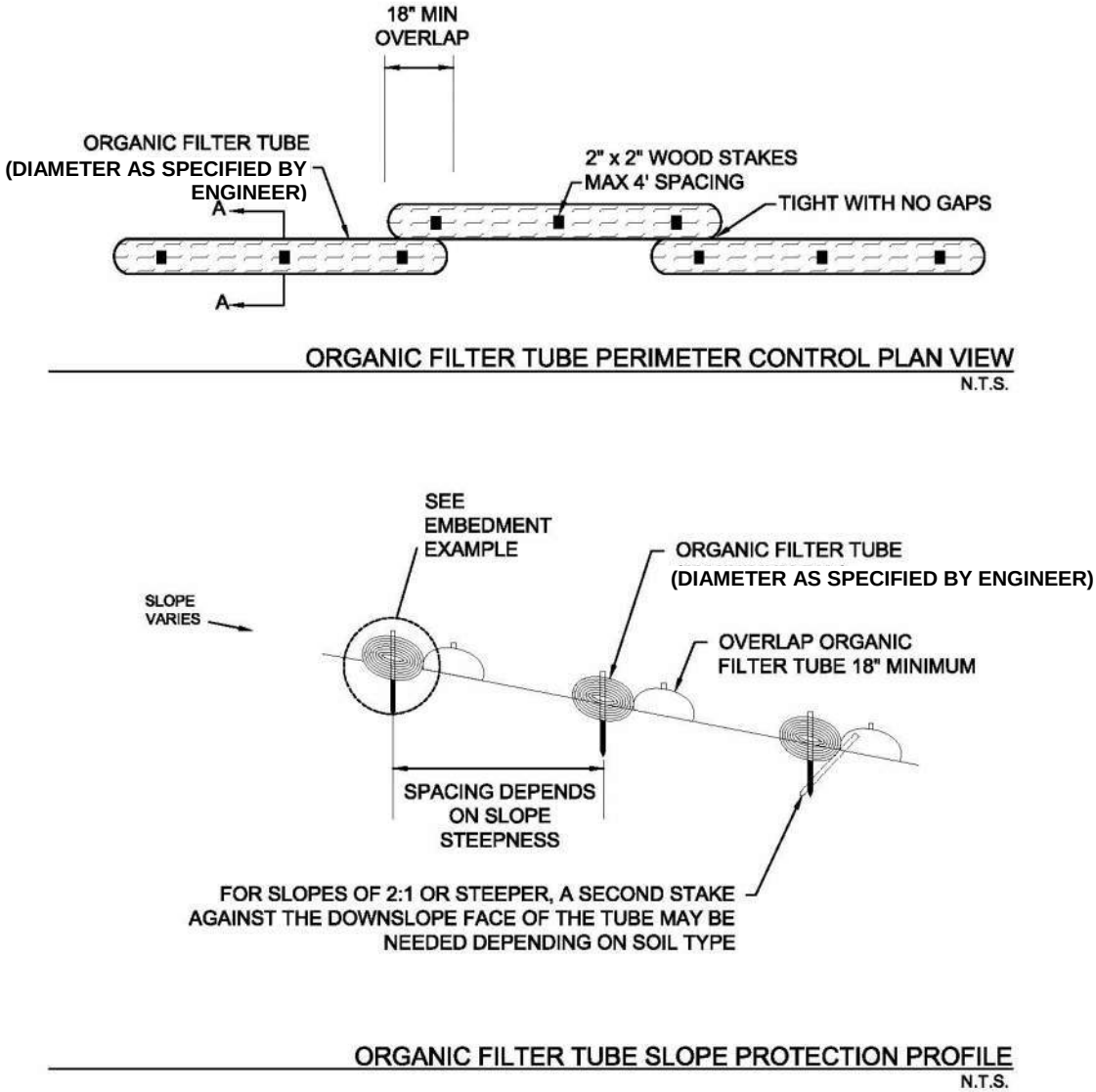
Check the filter tube material to make sure that it has not become clogged with sediment or debris. Clogged filter tubes usually lead to standing water behind the filter tube after the rain event. Sediment shall be removed from behind the filter tube before it reaches half the height of the exposed portion of the tube.

When sediment control is no longer needed on the site, the tubes may be split open and the filter material may be used for mulching during establishment of vegetation for final stabilization if it meets the criteria in *Section 2.5 Mulching*.

3.6.6 Example Schematics

The following schematics are example applications of the construction control. They are intended to assist in understanding the control's design and function.

The schematics are **not for construction**. They may serve as a starting point for creating a construction detail, but they must be site adapted by the designer. In addition, dimensions and notes appropriate for the application must be added by the designer.



NOTES:

1. TYPE OF NETTING, FILTER MATERIAL, DIAMETER OF TUBE, AND SPACING OF TUBES SHALL BE SPECIFIED BY THE DESIGNER BASED ON THE FOLLOWING SITE PARAMETERS.
   - SIZE OF CONTRIBUTING DRAINAGE AREA
   - STEEPNESS OF SLOPE
   - GROUND CONDITIONS (SOIL OR PAVEMENT)
2. DESIGNER SHALL SHOW ON THE DRAWINGS THE LOCATIONS WHERE TUBES ARE TO BE TURNED UPSLOPE. UPSLOPE LENGTHS SHALL BE MINIMUM OF 10 FEET.

Figure 3.15 Schematics of Organic Filter Tubes

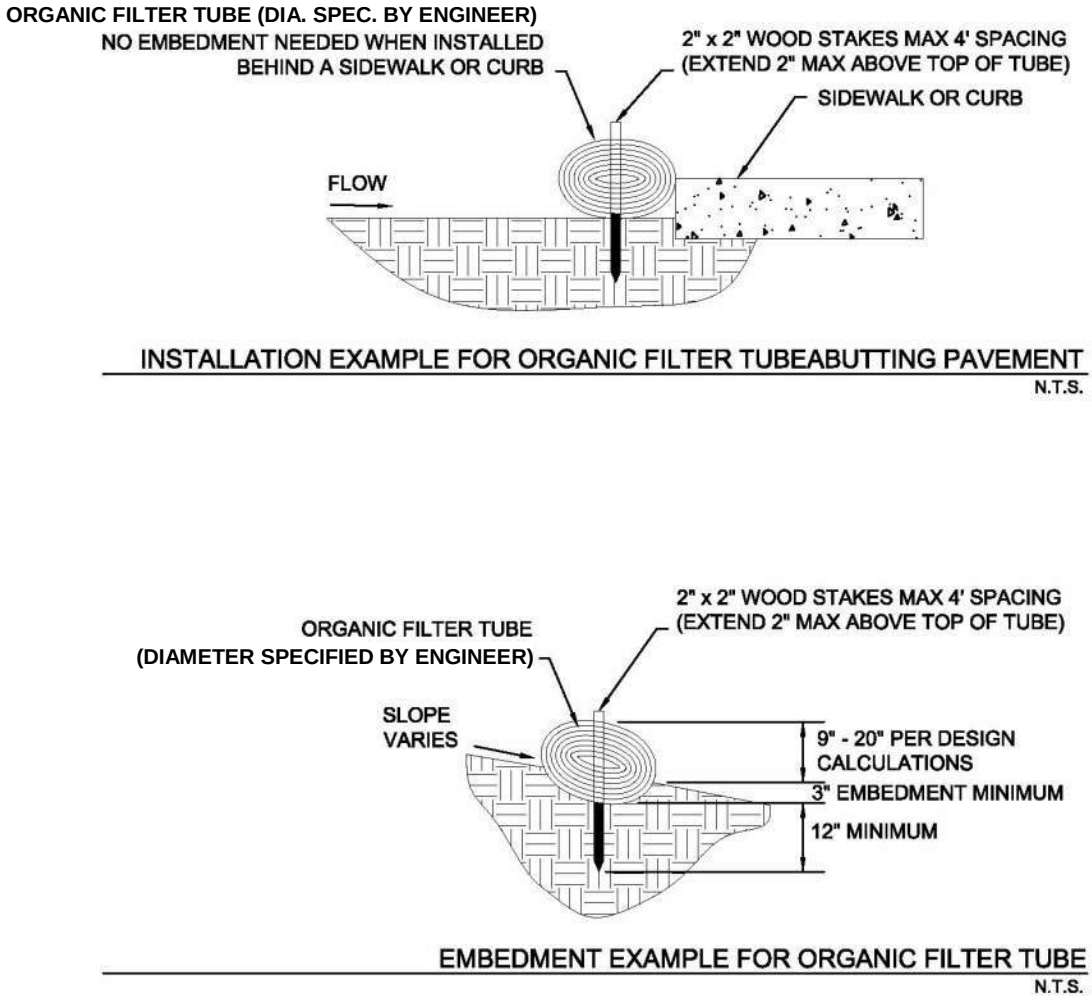
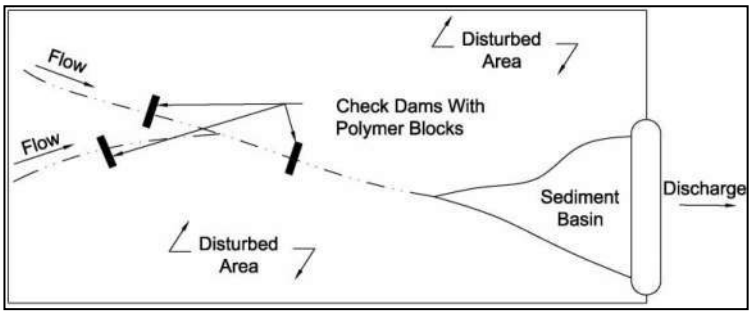


Figure 3.16 Examples of Organic Filter Tube Installation Methods

3.7 Passive Treatment System (PTS)

Sediment Control



Description: Passive Treatment Systems (PTS) consist of adding polymers to traditional sediment controls. The polymers act as a coagulant to cause flocculation of fine silts and clay soil particles that are not typically removed by the traditional controls. PTS devices include polymer gel socks, floc blocks, floc logs, and surface applications of powder or liquid polymers.

KEY CONSIDERATIONS

DESIGN CRITERIA:

- Install in flowing water upstream of sediment barriers
- Do not install at perimeter controls
- Select polymers based on soil type
- Closely monitor performance after storm events and adjust based on results

ADVANTAGES / BENEFITS:

- Less expensive and easier to operate than an ATS
- Capable of producing discharges with turbidity less than 280 NTU when applied and managed properly
- Improves removal of fine silt and clay particles from stormwater
- Reduces size requirements for a sediment basin
- May be used with dewatering devices

DISADVANTAGES / LIMITATIONS:

- Does not produce a predictable level of sediment removal
- Unknown levels of residual chemicals may be in discharges
- Trial and error often required to achieve high removal rates without off-site impacts

MAINTENANCE REQUIREMENTS:

- Inspect after every storm event
- Reapply and/or adjust locations after each storm event

TARGETED POLLUTANTS

- ● Sediment
- ○ Nutrients & Toxic Materials
- ○ Oil & Grease
- ○ Floatable Materials
- ○ Other Construction Wastes

APPLICATIONS

Perimeter Control

Slope Protection

Sediment Barrier

Channel Protection

Temporary Stabilization

Final Stabilization

Waste Management

Housekeeping Practices

Fe=0.85

IMPLEMENTATION CONSIDERATIONS

- ◒ Capital Costs
- ● Maintenance
- ◒ Training
- ◒ Suitability for Slopes > 5%

Other Considerations:

- *Potential off-site impacts of over dosing*

3.7.1 Primary Use

Passive treatment systems (PTS) are used to remove fine silt and clay soil particles, for which traditional sediment controls are the least effective. These fine particles are small enough to pass through the pores or void spaces of sediment barriers. They are also not removed by sediment basins, because their settling velocities require a detention time of days or weeks, not hours.

3.7.2 Applications

Passive treatment systems are applicable on construction sites that have a large percentage of fine silt and clay soils. The site must have an internal system of berms, swales and control devices where the PTS can be applied.

A PTS functions similarly to an active treatment system (ATS); however, it trades lower cost for less consistency in removal rates. PTSs are applicable on sites where variability in the effluent characteristics is acceptable, such as where the discharge from the PTS will flow through a vegetated area before leaving the site, instead of directly to receiving waters. A PTS may also be a viable alternative to an ATS when the concentration of suspended solids in runoff is relatively low due to soil type or good erosion control measures on the site.

The systems are also applicable where discharge criteria are established for a construction site or discharges from a disturbed area have the potential to impact special aquatic sites or sensitive receiving waters. Examples of sensitive receiving waters include wetlands regulated under Section 404 of the Clean Water Act, spring-fed water bodies, water bodies with species protected under the Federal Endangered Species Act or the State of Texas Threatened and Endangered Species Regulations, or water bodies closely monitored by citizen groups.

3.7.3 Design Criteria

The passive use of polymers to enhance sediment removal is a relatively new and rapidly evolving science. The pace of new product development is expected to accelerate due to the demand that is being driven by the Effluent Limitation Guidelines and Standards for the Construction and Development Point Source Category, issued by the EPA on December 1, 2009. The following criteria are general guidelines. It is essential that the designer of controls for a construction activity develop the PTS specifications based on consultation with technical experts at the company supplying the polymer.

General

- Polymers are used for PTS function by altering the charge of soil particles to allow them to floc, or “clump” together. The flocs are then trapped as a soil mass by a traditional sediment control, instead of passing through pores or voids of the control as a suspended particle. This effect will more quickly clog the sediment barrier and require more frequent cleaning.
- Polymers are available in anionic (negatively charged), non-ionic (no charge), and cationic (positively charged) forms. The charged state of the soil to be treated should be known to specify the proper polymer. Clay soils are typically anionic.
- Numerous types of polymers are commercially available; however, polyacrylamide (PAM) and chitosan are effective and non-toxic in a wide range of applications. They are the safest for use in systems that are not being continuously monitored.
- Polymers are available in numerous formulations that will have varying rates of effectiveness depending on the soil type being treated. Jar tests may be used to determine the effectiveness of a particular formulation or to evaluate different formulations if the one being used is not producing the desired results. Jar tests should be conducted in accordance with ASTM D2035 Standard Practice for Coagulation-Flocculation Jar Test of Water.

- PTSs may produce fluctuating and unpredictable levels of residual polymer in stormwater discharged from the site. Either residual testing or the use of an ATS is advisable when an endangered, threatened, or other sensitive species is present in the receiving water.
- Areas downstream of the PTS shall be monitored for floc accumulation. Design is partially trial and error. The goal is to provide sufficient polymer to produce onsite settling of soil flocs while not providing excess polymer that results in a chemical residual being discharged to receiving waters.

Floc Blocks, Floc Logs and Gel Socks

- Floc blocks and logs contain a solid form of polyacrylamide (PAM), a polymer that acts as a flocculating agent.
- Gel socks are a soft powder form of chitosan, a polymer that acts as a flocculating agent, contained within a fabric sock.
- The PTS should only be used in flowing water that is concentrated in swales or pipes. The turbulence of flowing water is necessary for mixing the polymer with the suspended soil.
- Swales and channels, upstream of a sediment basin, stone outlet sediment trap, check dam or other detention structure are effective locations for the PTS. This location gives the polymer time to mix before velocities are slowed by the sediment control, where the newly formed flocs can be settled or filtered.
- Removal rates increase proportionally with the distance the PTS is installed upstream of the sediment barrier. Longer distances correlate to higher removal rates.
- The PTS should be secured in a non-biodegradable mesh bag or galvanized wire cage, which in turn is securely anchored in a swale, channel, or pipe.
- The PTS should be installed in a manner that elevates above the ground at least six inches to minimize the potential for it to be in standing water a prolonged period of time.
- During long periods (weeks) of no precipitation, the floc blocks or logs that contain PAM may degrade from exposure to air and sunlight. In these situations, the blocks or logs should be replaced before the next predicted storm event. Alternatively, they may be removed during drought conditions to prevent their degradation, and then re-installed at the first forecast of precipitation.

Powder or Liquid Polymer

- Powder or liquid polymer can be sprayed onto check dams, silt fences, organic filter tubes, and other permeable barriers. Polymer can also be sprayed onto filter fabric or erosion control blankets lining a swale. The polymer will mix with stormwater as it filters through of flows over the control.
- Polymer shall not be applied to perimeter controls, as this will result in flocs forming after the stormwater has been discharged from the site. Liquid polymer shall only be applied to sediment controls that are located within the disturbed areas and have a perimeter control or other sediment trap down slope to catch the flocs.
- Polymer should be re-applied after each storm event. If a long period passes between storm events, the polymer will break-down and should be re-applied.
- Liquid polymer may be injected into concentrated stormwater (swales, channels, etc.) upstream of sediment basins to improve the removal efficiency of the basin. The polymer is typically injected using a small metering pump that is calibrated for a pre-established dose based on the design flow for the temporary control design storm (2-year, 24-hour).
- Liquid polymer may also be injected into the pump intake of dewatering systems to provide a higher sediment removal rate for fine silt and clay soil particles. Criteria for dewatering are in *Section 3.3 Dewatering*.

3.7.4 Design Guidance and Specifications

No specification for construction of this item is currently available in the Standard Specifications for Public Works Construction – North Central Texas Council of Governments.

3.7.5 Inspection and Maintenance Requirements

Passive treatment systems should be inspected regularly (at least as often as required by the TPDES Construction General Permit).

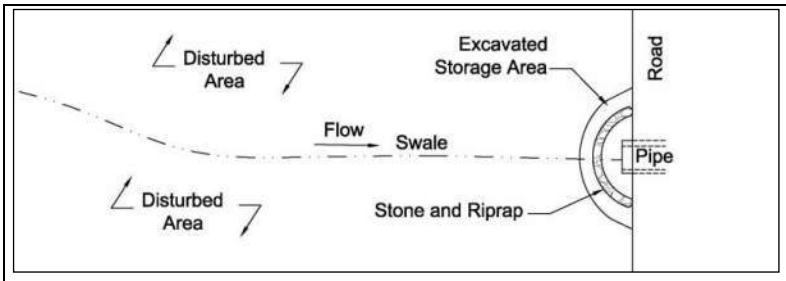
Floc blocks, floc logs, and gel socks should be checked after every storm event that produces stormwater runoff. Replace the PTS before it is completely dissolved. If the PTS is found to be submerged in standing water, it should be removed and re-installed at a new location where it will only be in contact with flowing stormwater.

The site's discharge points and downstream drainage infrastructure and water bodies should be inspected for accumulations of soil flocs. If flocs are found off the construction site, the PTS is not being implemented at a point where there is sufficient flow distance and time for polymer mixing and floc removal, or too much polymer is being used. The off-site floc accumulation must be removed if doing so will not negatively impact the receiving water. Then, the location or application of the PTS should be modified to provide additional mixing, more time for removal, or a lower dose, as applicable. If modifying the PTS is not possible, then an ATS may be needed to meet the discharge conditions for which a PTS was being used.

3.8 Pipe Inlet Sediment Trap

(Source: Modified from City of Plano BMP SP-11)

Sediment Control



Description: The pipe inlet sediment trap is a barrier surrounding a pipe inlet to capture sediment before it enters a closed drainage system. The barrier may be made of concrete block and filter stone or stone riprap and filter stone. The barrier provides both filtration and detention for sediment to settle in the excavated area.

KEY CONSIDERATIONS

DESIGN CRITERIA:

- Top of control shall be no higher than half the pipe diameter
- Excavate a storage volume for the 2-year, 24-hour design storm upslope of the barrier
- Side slopes of 2:1 or flatter on the excavated storage area
- Maximum drainage area of 5 acres
- Overflow capability required for large storm events

ADVANTAGES / BENEFITS:

- Removes sediment before it enters a closed conveyance system

DISADVANTAGES / LIMITATIONS:

- Ponding upstream of the pipe inlet with localized flooding possible
- Type A Pipe Inlet Sediment Trap limited to pipes of 36 inches in diameter or less

MAINTENANCE REQUIREMENTS:

- Inspect regularly
- Remove trash and debris after each storm event
- Remove sediment from the sediment storage area before it reaches half the design depth
- If de-watering of the storage volume is not occurring, clean or replace the filter stone

TARGETED POLLUTANTS

- ● Sediment
- ○ Nutrients & Toxic Materials
- ○ Oil & Grease
- ◒ Floatable Materials
- ○ Other Construction Wastes

APPLICATIONS

- **Perimeter Control**
- **Slope Protection**
- **Sediment Barrier**
- **Channel Protection**
- **Temporary Stabilization**
- **Final Stabilization**
- **Waste Management**
- **Housekeeping Practices**

Fe=0.50-0.75

(*Depends on soil type*)

IMPLEMENTATION CONSIDERATIONS

- ◒ Capital Costs
- ◒ Maintenance
- ○ Training
- ● Suitability for Slopes > 5%

Other Considerations:

- *Re-grading and stabilization of the control area after construction*

3.8.1 Primary Use

The pipe inlet sediment trap is used to intercept and filter sediment from concentrated flows at the inlet to a pipe. Capturing sediment before it enters a closed conveyance system decreases the cost of cleaning and removing sediment from the system.

3.8.2 Applications

The pipe inlet sediment trap should be used where existing or proposed storm drain pipes or culverts are used prior to final stabilization of the area draining to the pipe inlet.

3.8.3 Design Criteria

- The pipe inlet sediment trap must be designed with overflow capability, since this control is used where pipe culverts collect relatively heavy concentrations of stormwater flows.
- The drainage area contributing runoff to the sediment trap shall be not larger than 5 acres.
- Type A pipe inlet sediment trap is limited to pipes of 36 inches diameter and smaller. Type B pipe inlet sediment trap should be used on larger pipes.
- A stormwater and sediment storage area shall be excavated upslope of the stone barrier. Minimum storage area volume should be the volume of runoff from the temporary control design storm (2-year, 24-hour). Caution should be exercised during excavation so as to not undermine the control structure or the pipe that is being protected.
- Side slopes surrounding the storage area shall be 2:1 or flatter.
- Top of stone and sediment storage created by the stone shall not be any higher than half of the inlet pipe diameter. On Type A Pipe Inlet Sediment Trap, the concrete blocks shall not be stacked any higher than two blocks high.
- Concrete blocks shall be standard 8”x8”x16” concrete masonry units and shall be in accordance with ASTM C139, Concrete Masonry Units for Construction.
- Wire fabric shall be a standard galvanized hardware fabric with ½ inch by ½ inch openings.
- Filter stone shall be nominal 1½ inch washed stone with no fines. Angular shaped stone is preferable to rounded shapes.
- Stone riprap shall be 6 inch to 12 inch well-graded stone, Dry Riprap, Type A.
- Riprap shall be placed on filter fabric meeting the following minimum criteria:
    - Tensile Strength, ASTM D4632 Test Method for Grab Breaking Load and Elongation of Geotextiles, 250-lbs.
    - Puncture Rating, ASTM D4833 Test Method for Index Puncture Resistance of Geotextiles, Geomembranes, and Related Products, 135-lbs.
    - Mullen Burst Rating, ASTM D3786 Standard Test Method for Hydraulic Bursting Strength of Textile Fabrics-Diaphragm Bursting Strength Tester Method, 420-psi.
    - Apparent Opening Size, ASTM D4751 Test Method for Determining Apparent Opening Size of a Geotextile, U.S. Sieve No. 20 (max).
- The pipe inlet sediment trap is most effective with coarse silt and sand soil particles. A passive treatment system may be used with the sediment trap to remove fine silt and clay soil particles.

3.8.4 Design Guidance and Specifications

Specifications for the riprap used in this item may be found in the Standard Specifications for Public Works Construction – North Central Texas Council of Governments, Section 803.3 Riprap.

3.8.5 Inspection and Maintenance Requirements

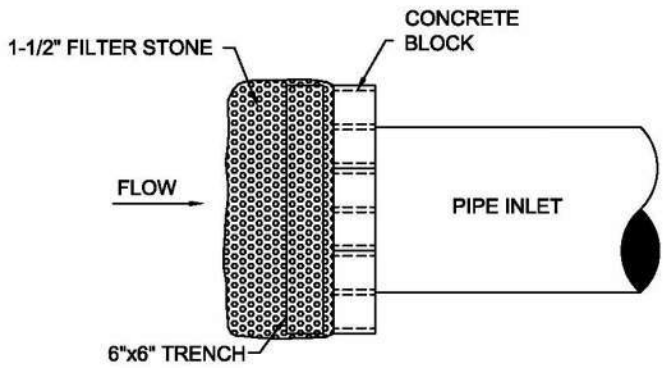
The pipe inlet sediment trap should be inspected regularly (at least as often as required by the TPDES Construction General Permit) to ensure that the device is functioning properly. The controls should also be checked after storm events to verify it's operating properly and to inspect for damages. Make repairs as needed.

Trash and debris should be removed from the trap after each storm event to prevent it from plugging the rock. Remove sediment from the storage area before the depth of sediment is half of the design depth. If the sediment storage area is not being de-watered, the filter stone surrounding the pipe inlet must be cleaned or replaced. Cleaning the filter stone surface the first few times by raking may be adequate. Repeated sediment build-up and clogging of the stone will require filter stone removal and replacement.

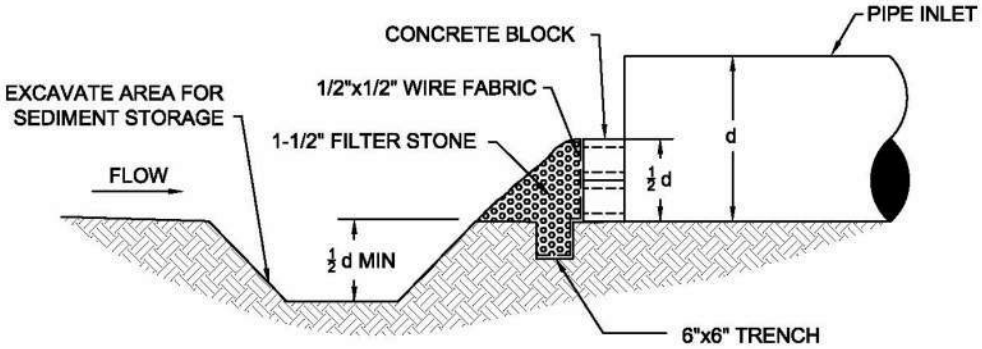
3.8.6 Example Schematics

The following schematics are example applications of the construction control. They are intended to assist in understanding the control's design and function.

The schematics are **not for construction**. They may serve as a starting point for creating a construction detail, but they must be site adapted by the designer. In addition, dimensions and notes appropriate for the application must be added by the designer.



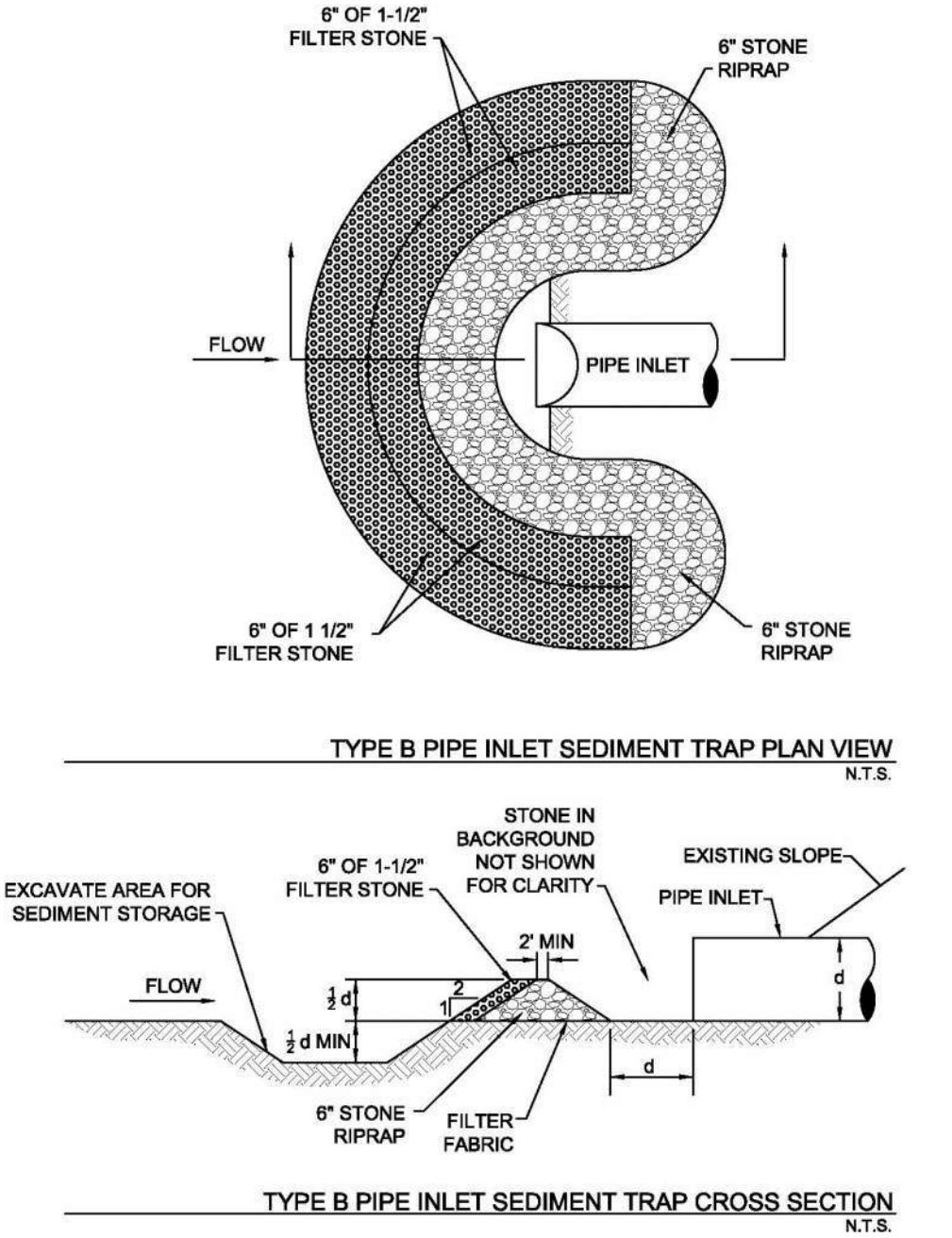
TYPE A PIPE INLET SEDIMENT TRAP PLAN VIEW
N.T.S.



TYPE A PIPE INLET SEDIMENT TRAP CROSS SECTION
N.T.S.

NOTE: THE TYPE A CONTROL IS FOR USE ON PIPES WITH A DIAMETER EQUAL TO OR LESS THAN 36 INCHES.

Figure 3.17 Schematics of Type A Pipe Inlet Sediment Trap
(Source: Modified from City of Plano BMP SP-11)

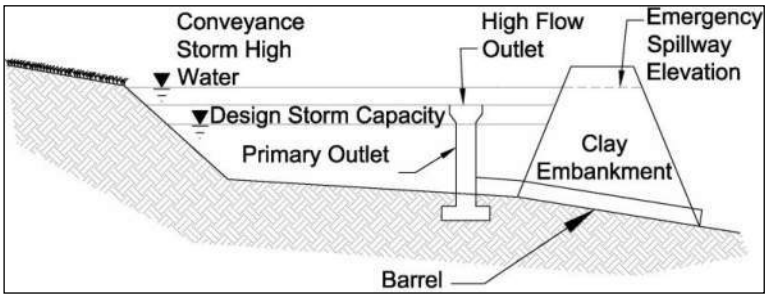


NOTE: THE TYPE B CONTROL IS FOR USE ON PIPES WITH A DIAMETER GREATER THAN 36 INCHES.

Figure 3.18 Schematics of Type B Pipe Inlet Sediment Trap
(Source: Modified from City of Plano BMP SP-11)

3.9 Sediment Basin

Sediment Control



Description: A sediment basin is an embankment with a controlled outlet that detains stormwater runoff, resulting in the settling of suspended sediment. The basin provides treatment for the runoff as well as detention and controlled release of runoff, decreasing erosion and flood impacts downstream.

KEY CONSIDERATIONS

DESIGN CRITERIA:

- Minimum 4:1 length to width ratio
- Maximum embankment height and storage capacity limited by TCEQ requirements
- Minimum dewatering time of 36 hours
- Safely pass 25-year, 24-hour storm event without structure damage

ADVANTAGES / BENEFITS:

- Effective at removing suspended sand and loam
- May be both a temporary and permanent control
- Can be used in combination with passive treatment

DISADVANTAGES / LIMITATIONS:

- Effectiveness depends on type of outlet
- Limited effectiveness in removing fine silt and clay
- May require a relatively large portion of the site
- Storm events that exceed the design storm event may damage the structure and cause downstream impacts

MAINTENANCE REQUIREMENTS:

- Inspect regularly
- Remove obstructions from discharge structures
- Remove sediment and re-grade basin when storage capacity reduced by 20 percent

TARGETED POLLUTANTS

- ● Sediment
- ◒ Nutrients & Toxic Materials
- ○ Oil & Grease
- ◒ Floatable Materials
- ○ Other Construction Wastes

APPLICATIONS

Perimeter Control

Slope Protection

Sediment Barrier

Channel Protection

Temporary Stabilization

Final Stabilization

Waste Management

Housekeeping Practices

Fe=0.50-0.90
(*Depends on soil type*)

IMPLEMENTATION CONSIDERATIONS

- ● Capital Costs
- ◒ Maintenance
- ○ Training
- ● Suitability for Slopes > 5%

Other Considerations:

- *Public safety*
- *Mosquito breeding habitat*
- *Requires comprehensive planning and design*

3.9.1 Primary Use

Sediment basins should be used for all sites with adequate open space for a basin and where the site topography directs a majority of the site drainage to one point. Sediment basins are necessary as either temporary or permanent controls for sites with disturbed areas of 10 acres and larger that are part of a common drainage area unless specific site conditions limit their use.

3.9.2 Applications

Sediment basins serve as treatment devices that can be used on a variety of project types. They are normally used in site development projects in which large areas of land are available for the basin, a minor stream or off-line drainage way crosses the site, or a specific water feature is planned for the site. Sediment basins are highly effective at reducing sediment and other pollutants for design storm conditions. Sediment basins are typically easier to maintain than other structural controls (e.g. silt fences, etc).

A sediment basin by itself does not typically remove a sufficient percentage of fine silts and clays to be an effective sediment barrier. Table 3.3 provides a summary of sediment basin effectiveness based on soil type.

Table 3.3 Sediment Basin Effectiveness for Different Soil Types

Soil Type	*Runoff Potential*	*Settling Rate*	*Sediment Basin Effectiveness*	*Efficiency Rating (Fe)*
Sand	Low	High	High	0.90
Sandy Loam	Low	High	High	0.90
Sandy Silt Loam	Moderate	Moderate	Moderate	0.75
Silt Loam	Moderate	Moderate	Moderate	0.75
Silty Clay Loam	Moderate	Low	Low	0.75
Clay Loam	Great	Low	Low	0.50
Clay	Great	Low	Low	0.50

(Source: Michigan Department of Environmental Quality Soil Erosion and Sedimentation Control Training Manual)

When the disturbed area contains a high percentage of fine silt or clay soil types, the sediment basin may be used with a passive or active treatment system to remove these finer suspended solids. Design criteria may be found in *Section 3.1 Active Treatment System* and *Section 3.7 Passive Treatment System*.

3.9.3 Design Criteria

Texas Administrative Code Title 30, Chapter 299 (30 TAC 299), Dams and Reservoirs, contains specific requirements for dams that:

- Have a height greater than or equal to 25 feet and a maximum storage capacity greater than or equal to 15 acre-feet; or
- Have a height greater than six feet and a maximum storage capacity greater than or equal to 50 acre feet.

If the size of the detention basin meets or exceeds the above applicability, the design must be in accordance with state criteria, and the final construction plans and specifications must be submitted to the TCEQ for review and approval.

The following design criteria are for temporary sediment basins that are smaller than the TCEQ thresholds. The sediment basin shall be designed by a licensed engineer in the State of Texas. The criteria and schematics are the minimum and, in some cases, only concept level. It is the responsibility of the engineer to design and size the embankment, outfall structures, overflow spillway, and downstream

energy dissipaters and stabilization measures. Alternative designs may be acceptable if submitted to the reviewing municipality with supporting design calculations.

Sediment Basin Location and Planning

- Design of the sediment basin should be coordinated with design of the permanent drainage infrastructure for the development.
- The basin shall not be located within a mapped 100-year floodplain unless its effects on the floodplain are modeled, and the model results are approved by the reviewing municipality.
- Basins shall not be located on a live stream that conveys stormwater from upslope property through the construction site.
- Basins may be located at the discharge point of a drainage swale that collects runoff from construction activities, or the basin may be located off-channel with a swale or dike constructed to divert runoff from disturbed areas to the basin. Design criteria for these controls are in *Section 2.2 Diversion Dike* and *Section 2.4 Interceptor Swale*.
- Sediment basins must be designed, constructed, and maintained to minimize mosquito breeding habitats by minimizing the creation of standing water.
- Temporary stabilization measures should be specified for all areas disturbed to create the basin.

Basin Size

- Minimum capacity of the basin shall be the calculated volume of runoff from a 2-year, 24-hour duration storm event plus sediment storage capacity of at least 1,000 cubic feet.
- The basin must be laid out such that the effective flow length to width ratio of the basin is a minimum of 4:1. Settling efficiencies are dependent on flow velocity, basin length, and soil type. Smaller particle sizes require slower velocities and longer basins. Basin dimensions should be designed based on flow velocities and anticipated particle sizes.
- Stoke's equation for settling velocities, as modified to Newton's equation for turbulent flow, may be used to estimate length required based on depth of the basin.

  Settling Velocity (ft/s) = 1.74 $[(\rho_p - \rho)gd/\rho]^{1/2}$ **(3.1)**

  Where:

  ρ_p = density of particles (lb/ ft^3)

  ρ = density of water (lb/ft^3)

  g = gravitational acceleration (ft/s^2)

  d = diameter of particles (ft)

- The effective length of sediment basins may be increased with baffles. Baffles shall be spaced at a minimum distance of 100 feet. Spacing should be proportional to the flow rate, with greater spacing for higher flow rates. Check the flow velocity in the cross section created by the baffles to ensure settling will occur.
- Baffles may be constructed by using excavated soil to create a series of berms within the basin; however, porous baffles are recommended. Porous baffles may consist of coir fiber, porous geotextiles, porous turbidity barriers, and similar materials. Porous materials disrupt the flow patterns, decrease velocities, and increase sedimentation.
- Basins have limited effectiveness on suspended clay soil particles. The basin's length to width ratio typically should be 10:1 to effectively remove suspended clay particles. The use of passive treatment systems can significantly reduce this ratio and improve removal rates. Criteria are in *Section 3.7 Passive Treatment System*.

Embankment

- Top width shall be determined by the engineer based on the total height of the embankment as measured from the toe of the slope on the downstream side.
- Embankment side slopes shall be 3:1 or flatter.
- The embankment shall be constructed with clay soil, minimum Plasticity Index of 30 using ASTM D4318 Standard Test for Liquid Limit, Plastic Limit, and Plasticity Index of Soils.
- Clay soil for the embankment shall be placed in 8 inch lifts and compacted to 95 percent Standard Proctor Density at optimum moisture content using ASTM D698 Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Standard Effort.
- The embankment should be stabilized with rock riprap or temporary vegetation.

Outlet and Spillway

- The primary outlet shall have a minimum design dewatering time of 36 hours for the temporary control design storm (2-year, 24-hour).
- Whenever possible, the outlet shall be designed to drain the basin in less than 72 hours to minimize the potential for breeding mosquitoes.
- The basin's primary outlet and spillway shall be sized to pass the difference between the conveyance storm (25-year, 24-hour) and the temporary control design storm without causing damage to the embankment and structures.
- Unless infeasible, the primary outlet structure should withdraw water from the surface of the impounded water. Outlet structures that do this include surface skimmers, solid risers (non-perforated), flashboard risers, and weirs.
- Surface skimmers use a floating orifice to discharge water from the basin. Skimmers have the advantage of being able to completely drain the detention basin. Skimmers typically result in the greatest sediment removal efficiency for a basin, because they allow for a slower discharge rate than other types of surface outlets. Due to this slower discharge rate, a high flow riser may still be needed to discharge the conveyance storm if a large enough spillway is not feasible due to site constraints.
- Discharge rates for surface skimmers are dependent on the orifice configuration in the skimmer. Use manufacturer's flow rate charts to select the skimmer based on the flow rate needed to discharge the design storm from the basin within a selected time period (i.e. Q=Volume/time).
- Risers shall be designed using the procedures in *Section 3.9.7 Design Procedures*.
- Weir outlets should be designed using the guidance in *Section 2.2.2 of the Hydraulics Technical Manual*.
- Use of overflow risers and weirs result in a pool of water that should be accounted for in the design capacity of the basin. These outlet structures are good options when the temporary sediment basin will be retained as a permanent site feature upon completion of construction. If the basin is temporary and standing water is not acceptable during construction, the construction plans shall include procedures for dewatering the basin following criteria in *Section 3.3 Dewatering Controls*.
- Flashboard risers function like an overflow riser pipe, but they contain a series of boards that allow for adjustment of the pool level. The boards may be removed for draining the basin to a lower level. However, this operation can be difficult and a safety hazard when done manually.
- A perforated riser may be used as an outlet when surface discharge is not feasible. A perforated rise has the advantage of dewatering the basin; however, it also results in the lowest sediment removal efficiency. Perforated risers provide a relatively rapid drawdown of the pool, and they discharge water from the entire water column, resulting in more suspended sediment being discharged than with a surface outlet.

- Size and spacing of the orifices on a perforated riser shall be designed to provide the minimum detention time while allowing for the drawdown of detained water.
- Gravel (1½ to 3 inches) may be placed around the perforated riser to aid sediment removal, particularly the removal of fine soil particles, and to keep trash from plugging the perforations. The gravel is most effective when the basin will be used for less than a year. When installed for longer periods of time, the gravel may become clogged with fine sediments and require cleaning while submerged.
- The outlet of the outfall pipe (barrel) shall be stabilized with riprap or other materials designed using the conveyance storm flow rate and velocity. Velocity dissipation measures shall be used to reduce outfall velocities in excess of 5 feet per second.
- The outfall pipe through the embankment shall be provided with anti-seep collars connected to the exterior of the pipe section or at a normal joint of the pipe material. The anti-seep collar material shall be compatible with the pipe material used and shall have a watertight bond to the exterior of the pipe section. The size and number of collars shall be selected by the designer in accordance with the following formula and table:

  Collar Outside Dimension = X + Diameter of pipe in feet

  Example: Pipe Length = 45 feet
  Barrel Pipe Diameter = 12 inches = 1 foot
  2 anti-seep collars

  Anti-seep Collar Dimensions:
  3.4 feet (from table) + 1.0 foot (Pipe dia.) = 4.4 feet
  Use 2 anti-seep collars each being 4.4 feet square or 4.4 feet diameter if round.

Table 3.4 Number and Spacing of Anti-Seep Collars

	X Values - Feet			
Pipe Length	*Number of Anti-Seep Collars*			
	1	**2**	**3**	**4**
40	6.0	3.0		
45	6.8	3.4		
50	7.5	3.8	2.5	
55		4.2	2.8	
60		4.5	3.0	
65		4.9	3.3	
70		5.3	3.5	2.6
75		5.6	3.8	2.8
80		6.0	4.0	3.0

- Risers used to discharge high flows shall be equipped with an anti-vortex device and trash rack.
- Spillways shall be constructed in undisturbed soil material (not fill) and shall not be placed on the embankment that forms the basin.

3.9.4 Design Guidance and Specifications

Design guidance for temporary sediment basins is in *Section 3.9.7 Design Procedures*. Criteria for sediment basins that will become permanent detention basins are in *Section 3.6.3 of the iSWM Criteria Manual*. Additional design guidance for different types of outlet structures is in *Section 2.2 of the Hydraulics Technical Manual*.

No specification for construction of this item is currently available in the Standard Specifications for Public Works Construction – North Central Texas Council of Governments.

3.9.5 Inspection and Maintenance Requirements

Sediment basins should be inspected regularly (at least as often as required by the TPDES Construction General Permit) to check for damage and to insure that obstructions are not diminishing the effectiveness of the structure. Sediment shall be removed and the basin shall be re-graded to its original dimensions when the sediment storage capacity of the impoundment has been reduced by 20 percent. The removed sediment may be stockpiled or redistributed onsite in areas that are protected by erosion and sediment controls.

Inspect temporary stabilization of the embankment and graded basin and the velocity dissipaters at the outlet and spillway for signs of erosion. Repair any eroded areas that are found. Install additional erosion controls if erosion is frequently evident.

3.9.6 Example Schematics

The following schematics are example applications of the construction control. They are intended to assist in understanding the control's design and function.

The schematics are **not for construction**. Dimensions of the sediment basin, embankment, and appurtenances shall be designed by an engineer licensed in the State of Texas. Construction drawings submitted to the municipality for review shall include, but are not limited to, the following information and supporting calculations.

- Embankment height, side slopes and top width.
- Dimensions of the skimmer, riser, weir or other primary outlet.
- Diameter of outfall pipe (barrel).
- Pool elevation for the temporary control design storm and conveyance storm.
- Outfall pipe flow rate and velocity for the temporary control design storm and conveyance storm.
- Spillway cross section, slope, flow rate, and velocity for the conveyance storm.
- Depth, width, length, and mean stone diameter for riprap apron or other velocity dissipation device at the outfall pipe and spillway discharge points.

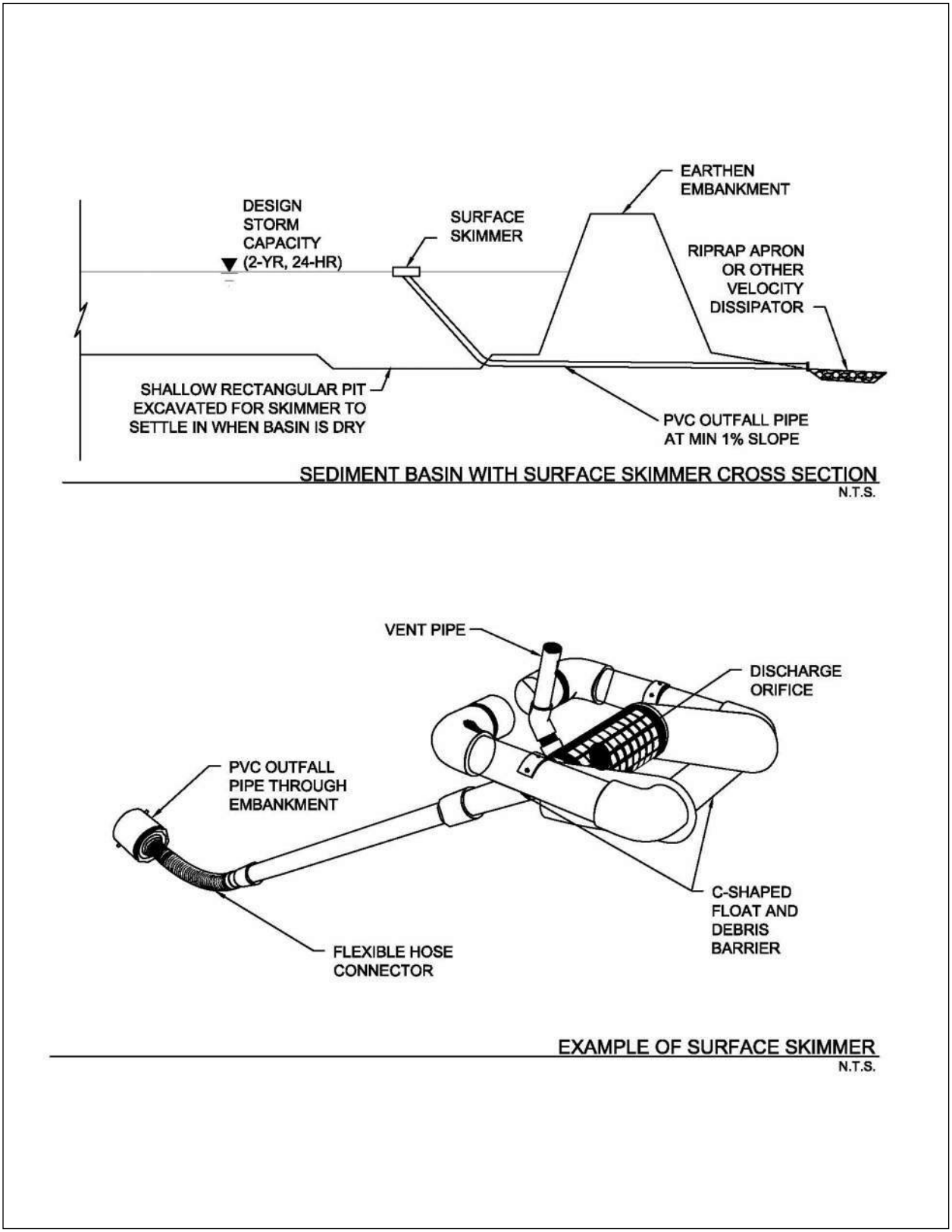


Figure 3.19 Schematics of Sediment Basin with Surface Skimmer
(Source: J.W. Faircloth & Son, Inc.)

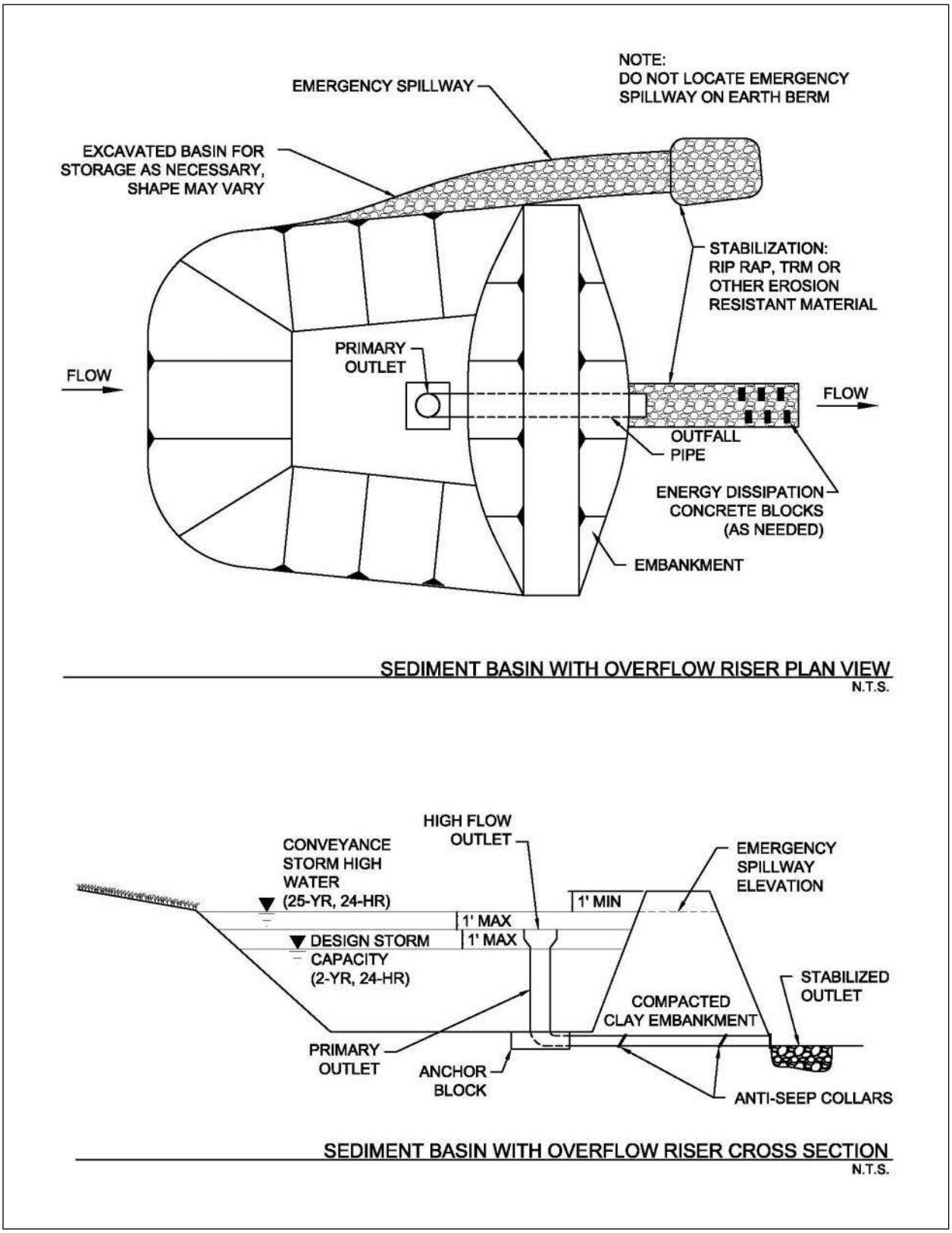


Figure 3.20 Schematics of Sediment Basin with Overflow Riser

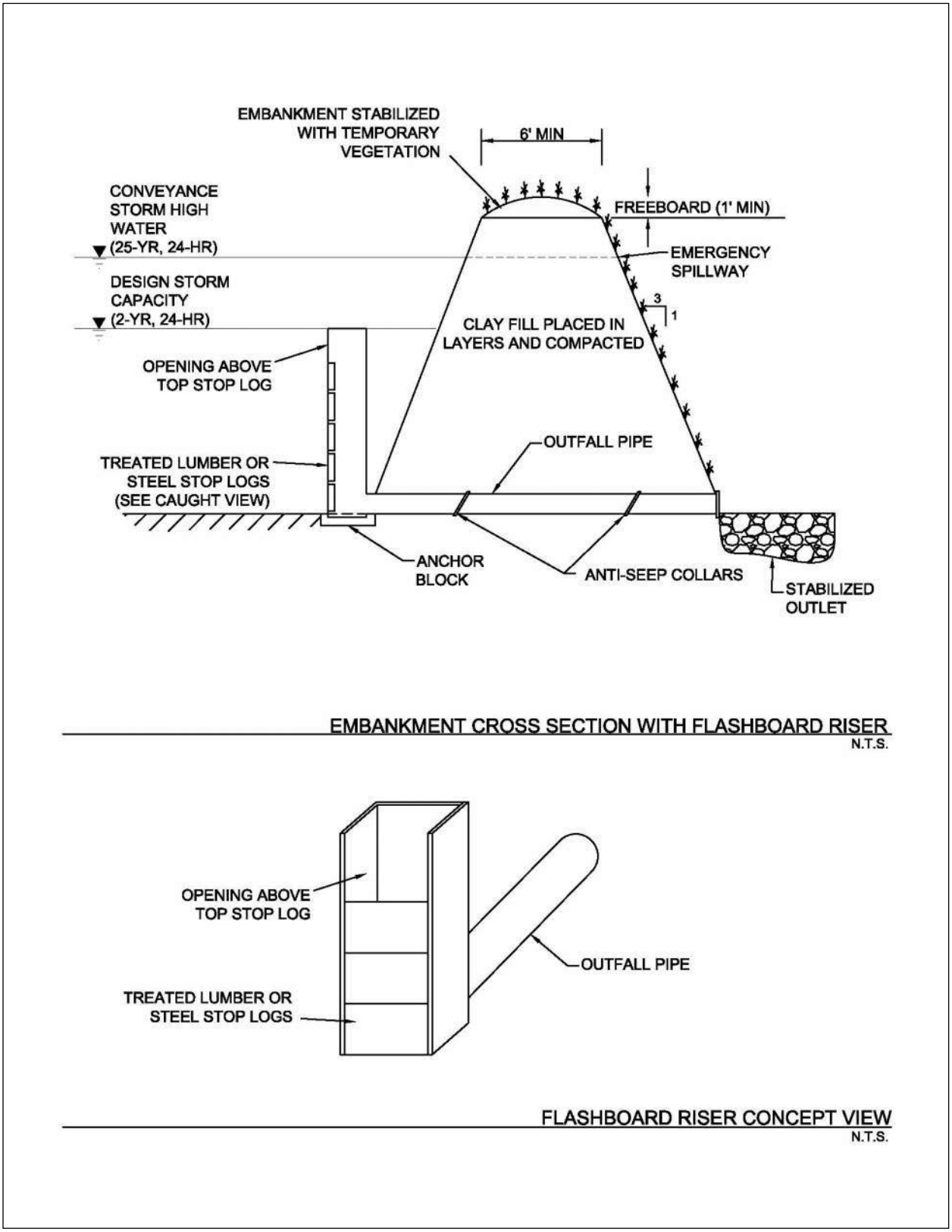


Figure 3.21 Schematics of Basin Embankment with Flashboard Riser

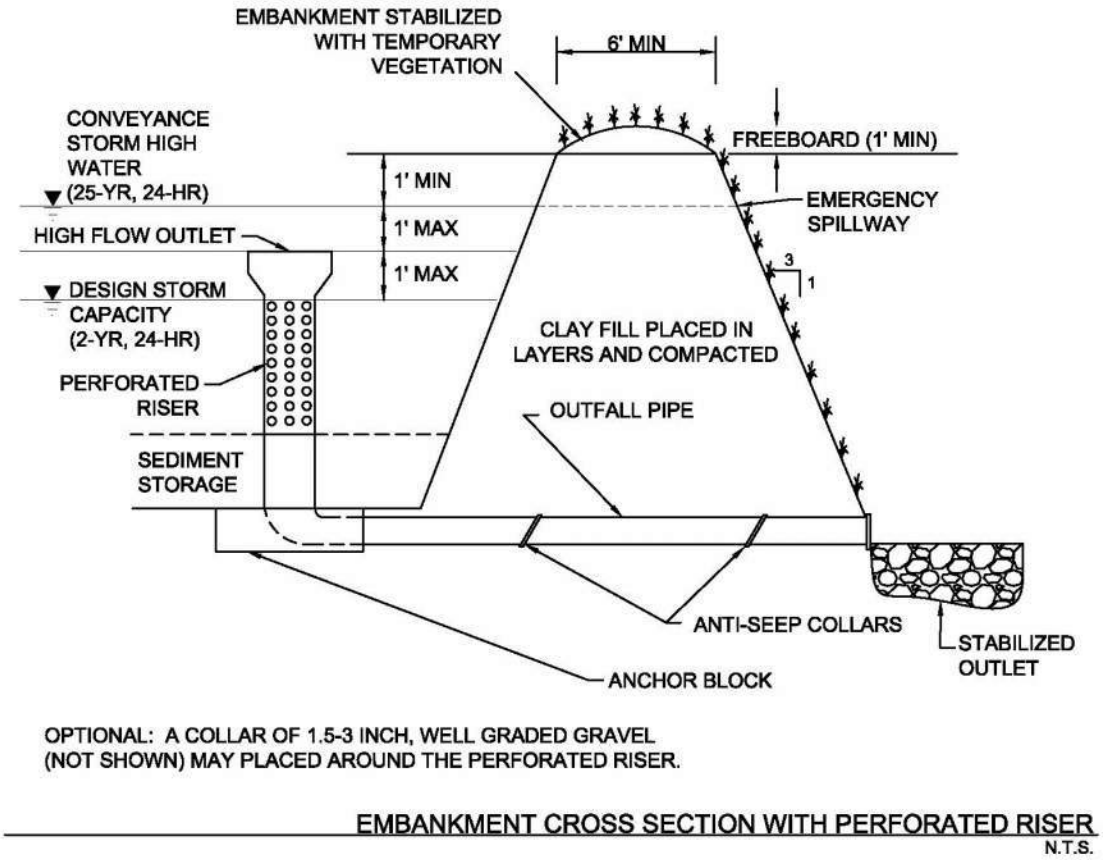


Figure 3.22 Schematic of Basin Embankment with Perforated Riser

3.9.7 Design Procedures

The following procedures provide a step-by-step method for the design of a temporary sediment basin that is smaller than the TCEQ thresholds for state requirements to apply. Criteria in *Section 3.8 of the iSWM Criteria Manual* should be used for the design of permanent basins (dry detention/extended dry detention) and stormwater ponds. *Section 3.9.8 Design Form* should be used to document the design values calculated for the temporary sediment basin.

These design procedures are provided as an example of the steps required to design a temporary sediment basin and are based on a specific type of primary outlet. When designing a sediment basin for a construction site, it's the engineer's responsibility to select the type of outlet that is appropriate based on criteria in the preceding sections and to modify the following procedures as needed to use appropriate calculations for the selected outlet, particularly in Steps 12, 13, and 14.

Step 1 Determine the required basin volume.

The basin volume shall be the calculated volume of runoff from the temporary control design storm (2-year, 24-hour) from each disturbed acre draining to the basin. When rainfall data is not available, a design volume of 3600 cubic feet of storage per acre drained may be used.

For a natural basin, the storage volume may be approximated as follows:

$$\mathbf{V_1 = 0.4 \times A_1 \times D_1} \qquad \textbf{(3.2)}$$

where:

V_1 = the storage volume in cubic feet

A_1 = the surface area of the flooded area at the crest of the basin outlet, in square feet

D_1 = the maximum depth in feet, measured from the low point in the basin to the crest of the basin riser

Note 1: The volumes may be computed from more precise contour information or other suitable methods.

Note 2: Conversion between cubic feet and cubic yards is as follows:

Number of cubic feet x 0.037 = number of cubic yards

If the volume of the basin is inadequate or embankment height becomes excessive, pursue the use of excavation to obtain the required volume.

Step 2 Determine the basin shape.

The shape of the basin must be such that the length-to-width ratio is at least 4 to 1 according to the following equation:

$$\textbf{Length-to-width Ratio} = \frac{L}{We} \qquad \textbf{(3.3)}$$

where:

We = A/L = the effective width

A = the surface area of the normal pool

L = the length of the flow path from the inflow to the outflow. If there is more than one inflow point, any inflow that carries more than 30 percent of the peak rate of inflow must meet these criteria.

The correct basin length can be obtained by proper site selection, excavation, or the use of baffles. Baffles increase the flow length by interrupting flow and directing it through the basin in a circuitous path to prevent short-circuiting. Porous baffles are recommended. Spacing of baffles should be wide enough to not cause a channeling effect within the basin. Analyze the

flow cross section and velocity between baffles to ensure that velocities are not too fast for settling to occur.

Step 3 Design the embankment.

The side slopes of the embankment should be 3:1 or flatter.

Top width shall be determined by the engineer based on the total height of the embankment.

The area under the embankment should be cleared, grubbed, and stripped of topsoil to remove trees, vegetation, roots, or other objectionable materials. The pool area should also be cleared of all brush and trees.

The embankment fill material should be clay soil from an approved borrow area. It should be clean soil, free from roots, woody vegetation, oversized stones, and rocks.

Step 4 Select the type(s) of outlet(s).

The outlets for the basin may consist of a combination of a primary outlet and emergency spillway or a primary outlet alone. In either case, the outlet(s) must pass the peak runoff expected from the drainage area for the conveyance storm (25-year, 24-hour) without damage to the embankment, structures, or basin.

Step 5 Determine whether the basin will have a separate emergency spillway.

A side channel emergency spillway is required for sediment basins receiving stormwater from more than 10 acres.

Step 6 Determine the elevation of the crest of the basin outlet riser for the required volume.

Step 7 Estimate the elevation of the conveyance storm and the required height of the dam.

(a) If an emergency spillway is included, the crest of the basin outlet riser must be at least 1.0 foot below the crest of the emergency spillway.

(b) If an emergency spillway is included, the elevation of the peak flow through the emergency spillway (which will be the design high water for the conveyance storm) must be at least 1.0 foot below the top of embankment.

(c) If an emergency spillway is not included, the crest of the basin outlet riser must be at least 3 feet below the top of the embankment.

(d) If an emergency spillway is not included, the elevation of the design high water for the conveyance storm must be 2.0 feet below the top of the embankment.

Step 8 Determine the peak rate of runoff for a 25-year storm.

Using SCS TR 55 Urban Hydrology for Small Watersheds or other methods, determine the peak rate of runoff expected from the drainage area of the basin for the conveyance storm. The "C" factor or "CN" value used in the runoff calculation should be derived from analysis of the contributing drainage area at the peak of land disturbance (condition which will create greatest peak runoff).

Step 9 Design the basin outlet.

(a) If an emergency spillway is included, the basin outfall must at least pass the peak rate of runoff from the basin drainage area for the temporary control design storm (2-year, 24-hour).

Q_p = the 2-year peak rate of runoff.

(b) If an emergency spillway is not included, the basin outfall must pass the peak rate of runoff from the basin drainage area for the conveyance storm (25-year, 24-hour).

Q_{25} = the 25-year peak rate of runoff.

(c) Refer to Figure 3.23, where h is the difference between the elevation of the crest of the basin outlet riser and the elevation of the crest of the emergency spillway.

(d) Enter Figure 3.24 with Q_p. Choose the smallest riser which will pass the required flow with the available head, h.

(e) Refer to Figure 3.23, where H is the difference in elevation of the centerline of the outlet of the outfall and the crest of the emergency spillway. L is the length of the barrel through the embankment.

(f) Enter Table 3.5 or Table 3.6 with H. Choose the smallest size outlet that will pass the flow provided by the riser. If L is other than 70 feet, make the necessary correction.

(g) The basin riser shall consist of a solid (non-perforated), vertical pipe or box of corrugated metal joined by a watertight connection to a horizontal pipe (outfall) extending through the embankment and discharging beyond the downstream toe of the fill. Another approach is to utilize a perforated vertical riser section surrounded by filter stone.

(h) The basin outfall, which extends through the embankment, shall be designed to carry the flow provided by the riser with the water level at the crest of the emergency spillway. The connection between the riser and the outfall must be watertight. The outlet of the outfall must be protected to prevent erosion or scour of downstream areas.

(i) Weirs, skimmers and other types of outlets may be used if accompanied with appropriate calculations.

Step 10 Design the emergency spillway.

(a) The emergency spillway must pass the remainder of the 25-year peak rate of runoff not carried by the basin outlet.

(b) Compute: $Q_e = Q_{25} - Q_p$

(c) Refer to Figure 3.25 and Table 3.7.

(d) Determine approximate permissible values for b, the bottom width; s, the slope of the exit channel; and X, minimum length of the exit channel.

(e) Enter Table 3.7 and choose the exit channel cross-section which passes the required flow and meets the other constraints of the site.

(f) Notes:

1. The maximum permissible velocity for vegetated waterways must be considered when designing an exit channel.
2. For a given Hp, a decrease in the exit slope from S as given in the table decreases spillway discharge, but increasing the exit slope from S does not increase discharge. If an exit slope (Se) steeper than S is used, then the exit should be considered an open channel and analyzed using the Manning's Equation.
3. Data to the right of heavy vertical lines should be used with caution, as the resulting sections will be either poorly proportioned or have excessive velocities.

(g) The emergency spillway should not be constructed over fill material.

(h) The emergency spillway should be stabilized with rock riprap or temporary vegetation upon completion of the basin.

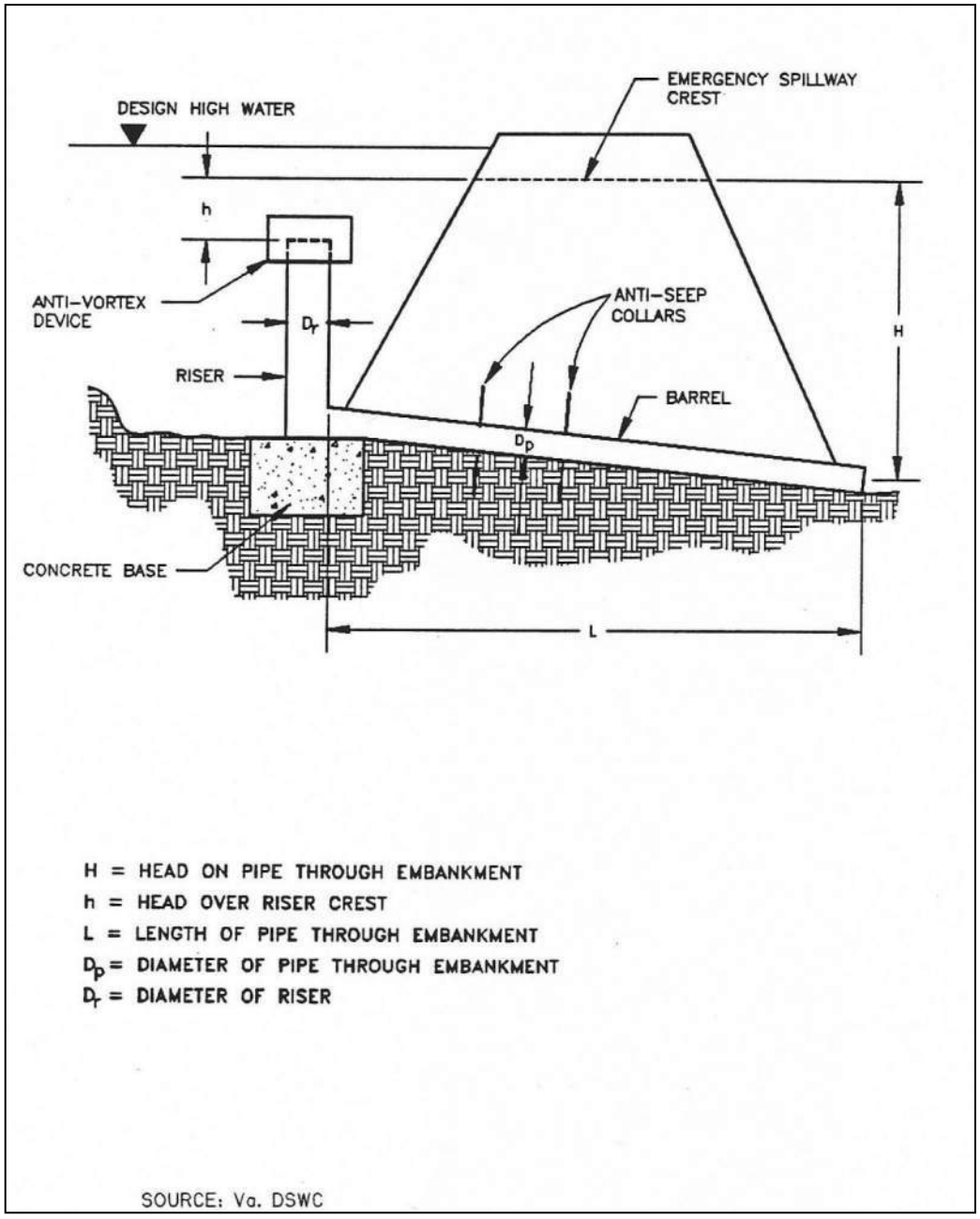


Figure 3.23 Example of Basin Outlet Design

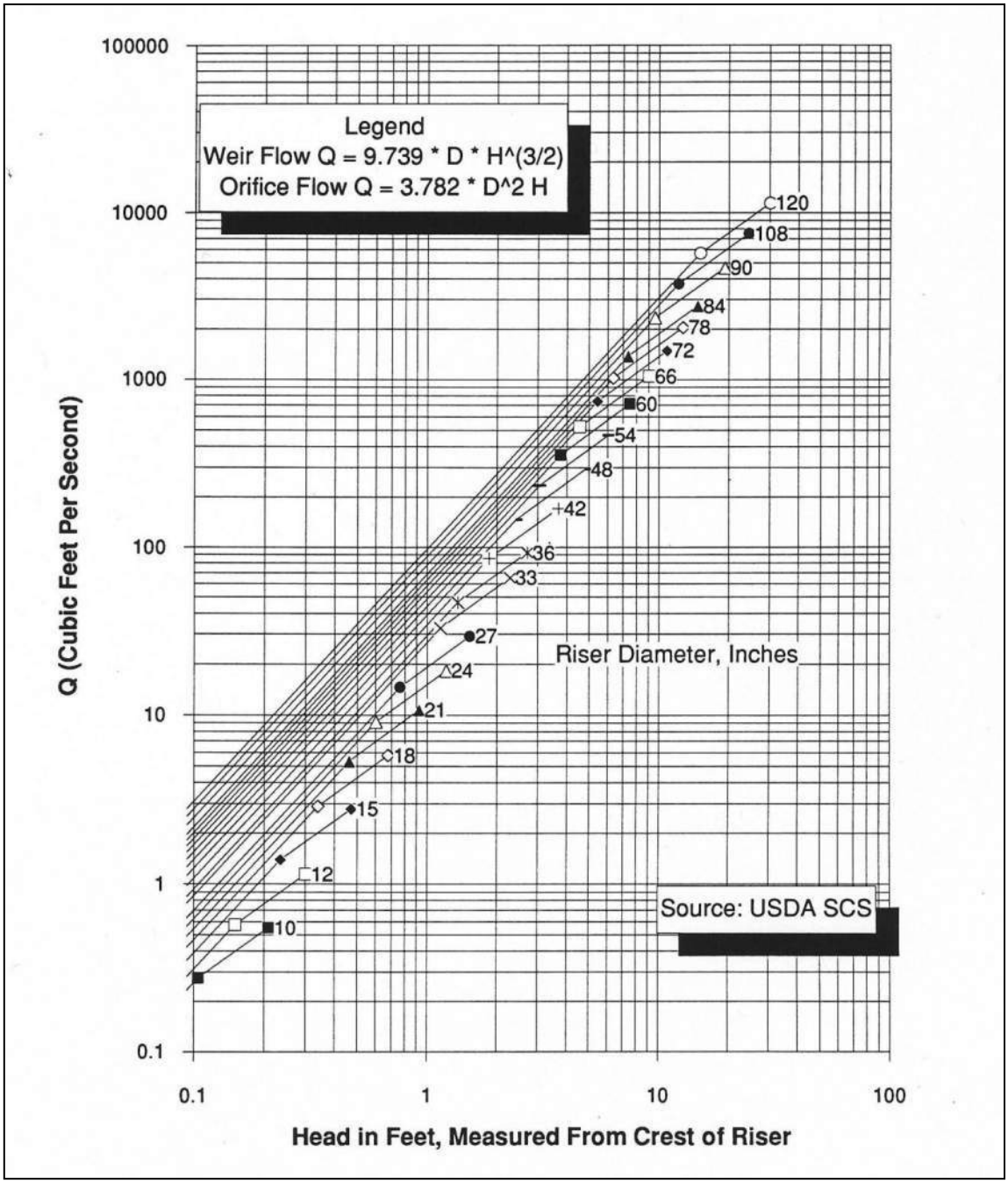


Figure 3.24 Riser Inflow Curves for Basin Outlet Design

Table 3.5 Pipe Flow Chart, n=0.013

For Reinforced Concrete Pipe Inlet Km = Ke + Kb =0.65 and 70 Feet of Reinforced Concrete Pipe Conduit (Full Flow Assumed)
Note: Correction Factors for pipe lengths other than 70 feet

Head (In feet)	Pipe Diameter in Inches																	
	12	15	18	21	24	30	36	42	48	54	60	66	72	78	84	90	96	102
1	3.22	5.44	8.29	11.8	15.9	26	38.6	53.8	71.4	91.5	114	139	167	197	229	264	302	342
2	4.55	7.69	11.7	16.7	22.5	36.8	54.6	76	101	129	161	197	236	278	324	374	427	483
3	5.57	9.42	14.4	20.4	27.5	45	66.9	93.1	124	159	198	241	289	341	397	458	523	592
4	6.43	10.9	16.6	23.5	31.8	52	77.3	108	143	183	228	278	334	394	459	529	604	683
5	7.19	12.2	18.5	26.3	35.5	58.1	86.4	120	160	205	255	311	373	440	513	591	675	764
6	7.88	13.3	20.3	28.8	38.9	63.7	94.6	132	175	224	280	341	409	482	562	647	739	837
7	8.51	14.4	21.9	31.1	42	68.8	102	142	189	242	302	368	441	521	607	699	798	904
8	9.1	15.4	23.5	33.3	44.9	73.5	109	152	202	259	323	394	472	557	685	748	854	966
9	9.65	16.3	24.9	35.3	47.7	78	116	161	214	275	342	418	500	590	688	793	905	1025
10	10.2	17.2	26.2	37.2	50.2	82.2	122	170	226	289	361	440	527	622	725	836	954	1080
11	10.7	18	27.5	39	52.7	86.2	128	178	237	304	379	462	553	653	761	877	1001	1133
12	11.1	18.9	28.7	40.8	55	90.1	134	186	247	317	395	482	578	682	794	916	1045	1184
13	11.6	19.6	29.9	42.4	57.3	93.7	139	194	257	330	411	502	601	710	827	953	1088	1232
14	12	20.4	31	44.1	59.4	97.3	145	201	267	342	427	521	624	736	858	989	1129	1278
15	12.5	21.1	32.1	45.6	61.5	101	150	208	277	354	442	539	646	762	888	1024	1169	1323
16	12.9	21.8	33.2	47.1	63.5	104	155	215	286	366	457	557	667	787	917	1057	1207	1367
17	13.3	22.4	34.2	48.5	65.5	107	159	222	294	377	471	574	688	812	946	1090	1244	1409
18	13.7	23.1	35.2	49.9	67.4	110	164	228	303	388	484	591	708	835	973	1121	1280	1450
19	14	23.7	36.1	51.3	69.2	113	168	234	311	399	497	607	727	858	1000	1152	1315	1489
20	14.4	24.3	37.1	52.6	71	116	173	240	319	409	510	623	746	880	1026	1182	1350	1528
21	14.7	24.9	38	53.9	72.8	119	177	246	327	419	523	638	764	902	1051	1211	1383	1566
22	15.1	25.5	38.9	55.2	74.5	122	181	252	335	429	535	653	782	923	1076	1240	1415	1603
23	15.4	26.1	39.8	56.5	76.2	125	186	258	342	439	547	668	800	944	1100	1268	1447	1639
24	15.8	26.7	40.6	57.7	77.8	127	189	263	350	448	559	682	817	964	1123	1295	1478	1674
25	16.1	27.2	41.5	58.9	79.4	130	193	269	357	458	571	696	834	984	1147	1322	1509	1708
26	16.4	27.7	42.3	60	81	133	197	274	364	467	582	710	850	1004	1169	1348	1539	1742
27	16.7	28.3	43.1	61.2	82.5	135	201	279	371	476	593	723	867	1023	1192	1373	1568	1775
28	17	28.8	43.9	62.3	84.1	138	204	285	378	484	604	737	883	1041	1214	1399	1597	1808
29	17.3	29.3	44.7	63.4	85.5	140	208	290	384	493	615	750	898	1060	1235	1423	1625	1840
30	17.6	29.8	45.4	64.5	87	142	212	294	391	501	625	763	913	1078	1256	1448	1653	1871
	Correction Factors for Other Pipe Lengths																	
20	1.3	1.24	1.21	1.18	1.15	1.12	1.1	1.08	1.07	1.06	1.05	1.05	1.04	1.04	1.03	1.03	1.03	1.03
30	1.22	1.18	1.15	1.13	1.12	1.09	1.08	1.06	1.05	1.05	1.04	1.04	1.03	1.03	1.03	1.02	1.02	1.02
40	1.15	1.13	1.11	1.1	1.08	1.07	1.05	1.05	1.04	1.03	1.03	1.03	1.02	1.02	1.02	1.02	1.02	1.02
50	1.09	1.08	1.07	1.06	1.05	1.04	1.04	1.03	1.03	1.02	1.02	1.02	1.02	1.01	1.01	1.01	1.01	1.01
60	1.04	1.04	1.03	1.03	1.03	1.02	1.02	1.02	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01
70	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
80	0.96	0.97	0.97	0.97	0.98	0.98	0.98	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
90	0.93	0.94	0.94	0.95	0.95	0.96	0.97	0.97	0.98	0.98	0.98	0.98	0.98	0.99	0.99	0.99	0.99	0.99
100	0.9	0.91	0.92	0.93	0.93	0.95	0.95	0.96	0.97	0.97	0.97	0.98	0.98	0.98	0.98	0.98	0.98	0.99
120	0.84	0.86	0.87	0.89	0.9	0.91	0.93	0.94	0.94	0.95	0.96	0.96	0.96	0.97	0.97	0.97	0.97	0.98
140	0.8	0.82	0.83	0.85	0.96	0.88	0.9	0.91	0.92	0.93	0.94	0.94	0.95	0.95	0.96	0.96	0.96	0.97
160	0.76	0.78	0.8	0.82	0.83	0.86	0.88	0.89	0.9	0.91	0.92	0.93	0.94	0.94	0.95	0.95	0.95	0.96

Source: USDA SCS

Table 3.6 Pipe Flow Chart, n=0.025

For Corrugated Metal Pipe Inlet Km = Ke + Kb =0.65 and 70 Feet of Corrugated Metal Pipe Conduit (Full Flow Assumed)
Note: Correction Factors for pipe lengths other than 70 feet

Head (in feet)	Pipe Diameter in Inches																				
	6	8	10	12	15	18	21	24	30	36	42	48	54	60	66	72	78	84	90	96	102
1	0.33	0.7	1.25	1.98	3.48	5.47	7.99	11	18.8	28.8	41.1	55.7	72.6	91.8	113	137	163	191	222	255	290
2	0.47	0.99	1.76	2.8	4.92	7.74	11.3	15.6	26.6	40.8	58.2	78.8	103	130	160	194	231	271	314	360	410
3	0.58	1.22	2.16	3.43	6.02	9.48	13.8	19.1	32.6	49.9	71.2	96.5	126	159	196	237	282	331	384	441	502
4	0.67	1.4	2.49	3.97	6.96	10.9	16	22.1	37.6	57.7	82.3	111	145	184	226	274	326	383	444	510	580
5	0.74	1.57	2.79	4.43	7.78	12.2	17.9	24.7	42.1	64.5	92	125	162	205	253	306	365	428	496	570	648
6	0.82	1.72	3.05	4.86	8.52	13.4	19.6	27	46.1	70.6	101	136	178	225	277	336	399	469	544	624	710
7	0.88	1.86	3.3	5.25	9.2	14.5	21.1	29.2	49.8	76.3	109	147	192	243	300	362	431	506	587	674	767
8	0.94	1.99	3.53	5.61	9.84	15.5	22.6	31.2	53.2	81.5	116	158	205	260	320	388	461	541	628	721	820
9	1	2.11	3.74	5.95	10.4	16.4	24	33.1	56.4	86.5	123	167	218	275	340	411	489	574	666	764	870
10	1.05	2.22	3.94	6.27	11	17.3	25.3	34.9	59.5	91.2	130	176	230	290	358	433	516	605	702	806	917
11	1.1	2.33	4.13	6.58	11.5	18.2	26.5	36.6	62.4	95.6	136	185	241	304	376	454	541	635	736	845	962
12	1.15	2.43	4.32	6.87	12.1	19	27.7	38.2	65.2	99.9	142	193	252	318	392	475	565	663	769	883	1004
13	1.2	2.53	4.49	7.15	12.6	19.7	28.8	39.8	67.8	104	148	201	262	331	408	494	588	690	800	919	1045
14	1.25	2.63	4.66	7.42	13	20.5	29.9	41.3	70.4	108	154	208	272	343	424	513	610	716	830	953	1085
15	1.29	2.72	4.83	7.68	13.5	21.2	30.9	42.8	72.8	112	159	216	281	355	439	531	631	741	860	987	1123
16	1.33	2.81	4.99	7.93	13.9	21.9	32	44.2	75.2	115	165	223	290	367	453	548	652	765	888	1019	1160
17	1.37	2.9	5.14	8.18	14.3	22.6	32.9	45.5	77.5	119	170	230	300	378	467	565	672	789	915	1051	1195
18	1.41	2.98	5.29	8.41	14.8	23.2	33.9	46.8	79.8	120	174	236	308	389	480	581	692	812	942	1081	1230
19	1.45	3.06	5.43	8.64	15.2	23.9	34.8	48.1	82	126	179	243	316	400	494	597	711	834	967	1111	1264
20	1.49	3.14	5.57	8.87	15.6	24.5	35.7	49.4	84.1	129	184	249	325	410	506	613	729	856	993	1139	1297
21	1.53	3.22	5.71	9.09	15.9	25.1	36.6	50.6	86.2	132	188	255	333	421	519	628	747	877	1017	1168	1329
22	1.56	3.29	5.85	9.3	16.3	25.7	37.5	51.8	88.2	135	193	261	341	430	531	643	765	898	1041	1195	1360
23	1.6	3.37	5.98	9.51	16.7	26.2	38.3	53	90.2	138	197	267	348	440	543	657	782	918	1064	1222	1390
24	1.63	3.44	6.11	9.72	17	26.8	39.1	54.1	92.1	141	201	273	356	450	555	671	799	937	1087	1248	1420
25	1.66	3.51	6.23	9.92	17.4	27.4	39.9	55.2	94	144	206	279	363	459	566	685	815	957	1110	1274	1450
26	1.7	3.58	6.36	10.1	17.7	27.9	40.7	56.3	95.9	147	210	284	370	468	577	699	831	976	1132	1299	1478
27	1.73	3.65	6.48	10.3	18.1	28.4	41.5	57.4	97.7	150	214	290	377	477	588	712	847	994	1153	1324	1507
28	1.76	3.72	6.6	10.5	18.4	29	42.3	58.4	99.5	153	218	295	384	486	599	725	863	1013	1174	1348	1534
29	1.79	3.78	6.71	10.7	18.7	29.5	43	59.5	101	155	221	300	391	494	610	738	878	1030	1195	1372	1561
30	1.82	3.85	6.83	10.9	19.1	30	43.7	60.5	103	158	225	305	398	503	620	750	893	1048	1216	1396	1588
	Correction Factors for Other Pipe Lengths																				
20	1.69	1.63	1.58	1.53	1.47	1.42	1.37	1.34	1.28	1.24	1.2	1.18	1.16	1.14	1.13	1.11	1.1	1.1	1.09	1.08	1.08
30	1.44	1.41	1.39	1.36	1.32	1.29	1.27	1.24	1.21	1.18	1.15	1.13	1.12	1.11	1.1	1.09	1.08	1.07	1.07	1.06	1.06
40	1.28	1.27	1.25	1.23	1.21	1.2	1.18	1.17	1.14	1.12	1.11	1.1	1.09	1.08	1.07	1.06	1.06	1.05	1.05	1.05	1.04
50	1.16	1.16	1.15	1.14	1.13	1.12	1.11	1.1	1.09	1.08	1.07	1.06	1.06	1.05	1.05	1.04	1.04	1.04	1.03	1.03	1.03
60	1.07	1.07	1.07	1.06	1.06	1.05	1.05	1.05	1.04	1.04	1.03	1.03	1.03	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.01
70	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
80	0.94	0.94	0.95	0.95	0.95	0.95	0.96	0.96	0.96	0.97	0.97	0.97	0.98	0.98	0.98	0.98	0.98	0.98	0.99	0.99	0.99
90	0.89	0.89	0.9	0.9	0.91	0.91	0.92	0.92	0.93	0.94	0.94	0.95	0.95	0.96	0.96	0.96	0.97	0.97	0.97	0.97	0.94
100	0.85	0.85	0.86	0.86	0.87	0.88	0.89	0.89	0.9	0.91	0.92	0.93	0.93	0.94	0.94	0.95	0.95	0.95	0.96	0.96	0.94
120	0.78	0.79	0.79	0.8	0.81	0.82	0.83	0.83	0.85	0.86	0.87	0.89	0.89	0.9	0.91	0.91	0.92	0.93	0.93	0.94	0.94
140	0.72	0.73	0.74	0.75	0.76	0.77	0.78	0.79	0.81	0.82	0.84	0.85	0.86	0.87	0.88	0.86	0.89	0.9	0.91	0.91	0.92
160	0.68	0.69	0.69	0.7	0.71	0.73	0.74	0.75	0.77	0.79	0.8	0.82	0.83	0.84	0.85	0.92	0.87	0.88	0.89	0.89	0.9

Source: USDA SCS

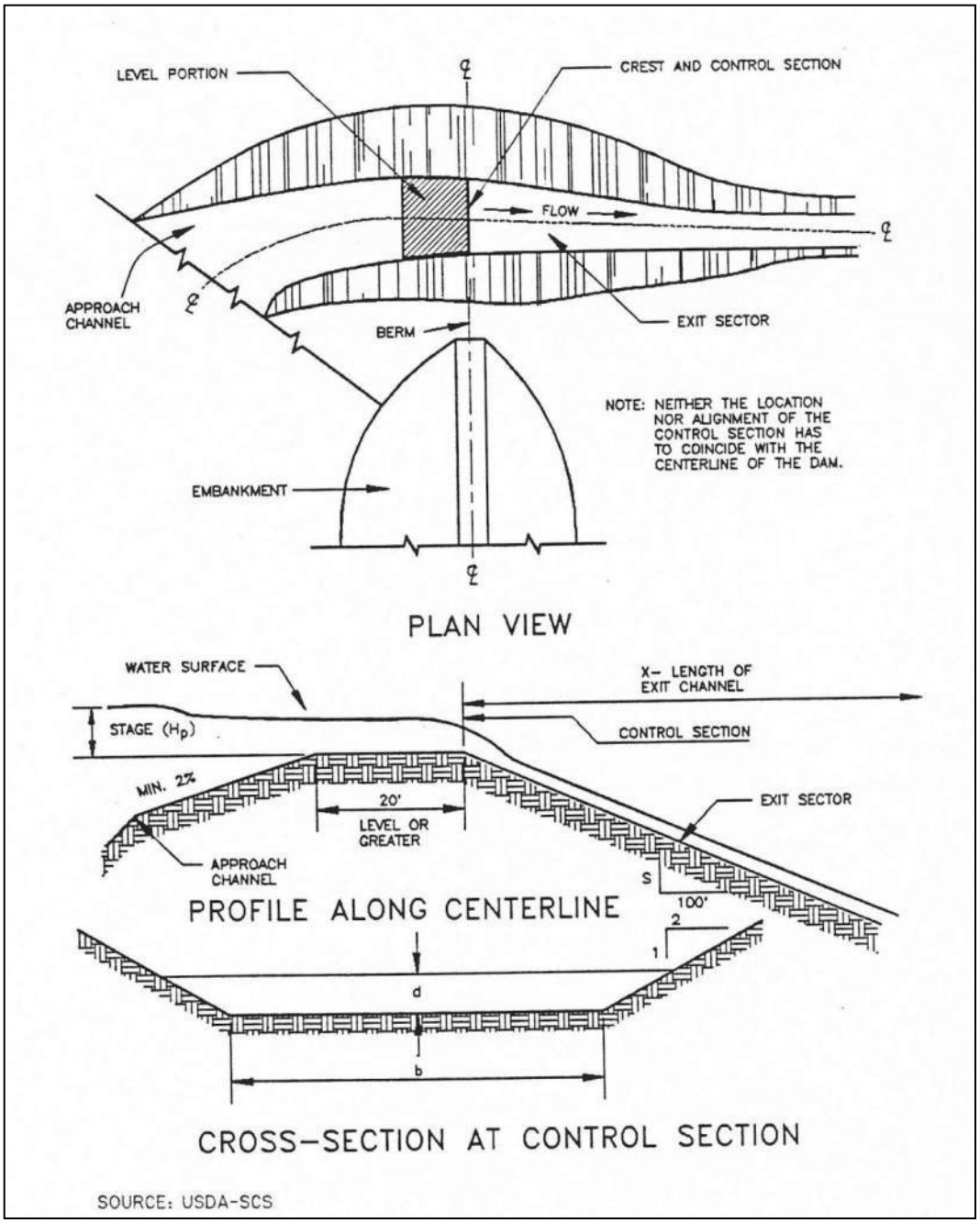


Figure 3.25 Example of Excavated Earth Spillway Design

Table 3.7 Design Data for Earth Spillways

Stage (Hp) In Feet	Spillway Variables	Bottom Width (b) In Feet																
		8	10	12	14	16	18	20	22	24	26	28	30	32	34	36	38	40
0.5	Q	6	7	8	10	11	13	14	15	17	18	20	21	22	24	25	27	28
	V	2.7	2.7	2.7	2.7	2.7	2.7	2.7	2.7	2.7	2.7	2.7	2.7	2.7	2.7	2.7	2.7	2.7
	S	3.9	3.9	3.9	3.9	3.8	3.8	3.8	3.8	3.8	3.8	3.8	3.8	3.8	3.8	3.8	3.8	3.8
	X	32	33	33	33	33	33	33	33	33	33	33	33	33	33	33	33	33
0.6	Q	8	10	12	14	16	18	20	22	24	26	28	30	32	34	35	37	39
	V	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
	S	3.7	3.7	3.7	3.7	3.6	3.7	3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.6
	X	36	36	36	36	36	36	37	37	37	37	37	37	37	37	37	37	37
0.7	Q	11	13	16	18	20	23	25	28	30	33	35	38	41	43	44	46	48
	V	3.2	3.2	3.3	3.3	3.3	3.3	3.3	3.3	3.3	3.3	3.3	3.3	3.3	3.3	3.3	3.3	3.3
	S	3.5	3.5	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4
	X	39	40	40	40	41	41	41	41	41	41	41	41	41	41	41	41	41
0.8	Q	13	16	19	22	26	29	32	35	38	42	45	46	48	51	54	57	60
	V	3.5	3.5	3.5	3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.6
	S	3.3	3.3	3.3	3.2	3.2	3.2	3.2	3.2	3.2	3.2	3.2	3.2	3.2	3.2	3.2	3.2	3.2
	X	44	44	44	44	44	45	45	45	45	45	45	45	45	45	45	45	45
0.9	Q	17	20	24	28	32	35	39	43	47	51	53	57	60	64	68	71	75
	V	3.7	3.8	3.8	3.8	3.8	3.8	3.8	3.8	3.8	3.8	3.8	3.8	3.8	3.8	3.8	3.8	3.8
	S	3.2	3.1	3.1	3.1	3.1	3.1	3.1	3.1	3.1	3.1	3.1	3.1	3.1	3.1	3.1	3.1	3.1
	X	47	47	48	48	48	48	48	48	48	48	49	49	49	49	49	49	49
1	Q	20	24	29	33	38	42	47	51	56	61	63	68	72	77	81	86	90
	V	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4
	S	3.1	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
	X	51	51	51	51	52	52	52	52	52	52	52	52	52	52	52	52	52
1.1	Q	23	28	34	39	44	49	54	60	65	70	74	79	84	89	95	100	105
	V	4.2	4.2	4.2	4.3	4.3	4.3	4.3	4.3	4.3	4.3	4.3	4.3	4.3	4.3	4.3	4.3	4.3
	S	2.9	2.9	2.9	2.9	2.9	2.9	2.9	2.9	2.9	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8
	X	55	55	55	55	55	55	55	56	56	56	56	56	56	56	56	56	56
1.2	Q	28	33	40	45	51	58	64	69	76	80	86	92	98	104	110	116	122
	V	4.4	4.4	4.4	4.4	4.4	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
	S	2.9	2.9	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8
	X	58	58	59	59	59	59	59	59	60	60	60	60	60	60	60	60	60
1.3	Q	32	38	46	53	58	65	73	80	86	91	99	106	112	119	125	133	140
	V	4.5	4.6	4.6	4.6	4.6	4.6	4.7	4.7	4.7	4.7	4.7	4.7	4.7	4.7	4.7	4.7	4.7
	S	2.8	2.8	2.8	2.7	2.7	2.7	2.7	2.7	2.7	2.7	2.7	2.7	2.7	2.7	2.7	2.7	2.7
	X	62	62	62	63	63	63	63	63	63	63	63	64	64	64	64	64	64
1.4	Q	37	44	51	59	66	74	82	90	96	103	111	119	127	134	143	150	158
	V	4.8	4.8	4.8	4.8	4.8	4.8	4.8	4.8	4.8	4.9	4.9	4.9	4.9	4.9	4.9	4.9	4.9
	S	2.8	2.7	2.7	2.7	2.7	2.7	2.7	2.6	2.6	2.6	2.6	2.6	2.6	2.6	2.6	2.6	2.6
	X	65	66	66	66	66	67	67	67	67	67	67	68	68	68	68	68	69

Table 3.7 Design Data for Earth Spillways (continued)

Stage (Hp) In Feet	Spillway Variables	Bottom Width (b) In Feet																
		8	10	12	14	16	18	20	22	24	26	28	30	32	34	36	38	40
1.5	Q	41	50	58	66	75	85	92	101	108	116	125	133	142	150	160	169	178
	V	4.8	4.9	5	5	5	5	5	5	5	5	5	5	5	5	5.1	5.1	5.1
	S	2.7	2.7	2.6	2.6	2.6	2.6	2.6	2.6	2.6	2.6	2.6	2.6	2.6	2.6	2.5	2.5	2.5
	X	69	69	70	70	71	71	71	71	71	71	71	72	72	72	72	72	72
1.6	Q	46	56	65	75	84	94	104	112	122	132	142	149	158	168	178	187	197
	V	5	5.1	5.1	5.1	5.1	5.2	5.2	5.2	5.2	5.2	5.2	5.2	5.2	5.2	5.2	5.2	5.2
	S	2.6	2.6	2.6	2.6	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5
	X	72	74	74	75	75	76	76	76	76	76	76	76	76	76	76	76	76
1.7	Q	52	62	72	83	94	105	115	126	135	145	156	167	175	187	196	206	217
	V	5.2	5.2	5.2	5.3	5.3	5.3	5.3	5.4	5.4	5.4	5.4	5.4	5.4	5.4	5.4	5.4	5.4
	S	2.6	2.6	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5
	X	76	78	79	80	80	80	80	80	80	80	80	80	80	80	80	80	80
1.8	Q	58	69	81	93	104	116	127	138	150	160	171	182	194	204	214	226	233
	V	5.3	5.4	5.4	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.6	5.6	5.6	5.6	5.6	5.6
	S	2.5	2.5	2.5	2.5	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4
	X	80	82	83	84	84	84	84	84	84	84	84	84	84	84	84	84	84
1.9	Q	64	76	88	102	114	127	140	152	164	175	188	201	213	225	235	248	260
	V	5.5	5.5	5.5	5.6	5.6	5.6	5.7	5.7	5.7	5.7	5.7	5.7	5.7	5.7	5.7	5.7	5.7
	S	2.5	2.5	2.5	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4
	X	84	85	86	87	88	88	88	88	88	88	88	88	88	88	88	88	88
2	Q	71	83	97	111	125	138	153	164	178	193	204	218	232	245	256	269	283
	V	5.6	5.7	5.7	5.7	5.8	5.8	5.8	5.8	5.8	5.8	5.8	5.9	5.9	5.9	5.9	5.9	5.9
	S	2.5	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3
	X	88	90	91	91	91	91	92	92	92	92	92	92	92	92	92	92	92
2.1	Q	77	91	107	122	135	149	162	177	192	207	220	234	250	267	276	291	305
	V	5.7	5.8	5.9	5.9	5.9	5.9	5.9	6	6	6	6	6	6	6	6	6	6
	S	2.4	2.4	2.4	2.4	2.4	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3
	X	92	93	95	95	95	95	95	95	95	96	96	96	96	96	96	96	96
2.2	Q	84	100	116	131	146	163	177	194	210	224	238	253	269	288	301	314	330
	V	5.9	5.9	6	6	6	6.1	6.1	6.1	6.1	6.1	6.1	6.1	6.1	6.2	6.2	6.2	6.2
	S	2.4	2.4	2.4	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3
	X	96	98	99	99	99	99	99	100	100	100	100	100	100	100	100	100	100
2.3	Q	90	108	124	140	158	175	193	208	226	243	258	275	292	306	323	341	354
	V	6	6.1	6.1	6.1	6.2	6.2	6.2	6.2	6.3	6.3	6.3	6.3	6.3	6.3	6.3	6.3	6.3
	S	2.4	2.4	2.3	2.3	2.3	2.3	2.3	2.3	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2
	X	100	102	102	103	103	103	104	104	104	105	105	105	105	105	105	105	105
2.4	Q	99	116	136	152	170	189	206	224	241	260	275	294	312	327	346	364	378
	V	6.1	6.2	6.2	6.3	6.3	6.3	6.4	6.4	6.4	6.4	6.4	6.4	6.4	6.4	6.4	6.4	6.4
	S	2.3	2.3	2.3	2.3	2.3	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2
	X	105	105	106	107	107	108	108	108	108	109	109	109	109	109	109	109	109

Source: USDA - SCS

Step 11 Re-estimate the elevation of the design high water and the top of the dam based upon the design of the basin outlet and the emergency spillway.

Step 12 Design the anti-vortex device and trash rack.

If an outfall riser is used, an anti-vortex device and trash rack shall be attached to the top of the basin riser to improve the flow of water into the outfall and prevent floating debris from being carried out of the basin.

This design procedure for the anti-vortex device and trash rack refers only to round riser pipes of corrugated metal. There are numerous ways to provide protection for concrete pipe; these include various hoods and grates and rebar configurations which should be a part of project-specific design and will frequently be a part of a permanent structure.

Refer to Figure 3.26 and Table 3.8. Choose cylinder size, support bars, and top requirements from Table 3.8 based on the diameter of the riser pipe.

Step 13 Design the anchoring for the basin outlet.

The basin outlet must be firmly anchored to prevent its floating.

If the riser is over 10 feet high, the forces acting on the spillway must be calculated. A method of anchoring the spillway which provides a safety factor of 1.25 must be used (downward forces = 1.25 x upward forces).

If the riser is 10 feet or less in height, choose one of the two methods in Figure 3.27 to anchor the basin outlet.

Determine the number and spacing of anti-seep collars for the outfall pipe through the embankment.

Step 14 Provide for dewatering.

(a) Use a modified version of the discharge equation for a vertical orifice and a basic equation for the area of a circular orifice.

Naming the variables:

A = flow area of orifice, in square feet

D = diameter of circular orifice, in inches

h = average driving head (maximum possible head measured from radius of orifice to crest of basin outlet divided by 2), in feet

Q = volumetric flow rate through orifice needed to achieve approximate 6-hour drawdown, cubic feet per second

S = total storage available in dry storage area, cubic feet

Q = S/21,600 seconds

(b) An alternative approach for dewatering is the use of a perforated riser (0.75" to 1" diameter holes spaced every 12 inch horizontally and 8 inch vertically) with 1½ inch to 2 inch filter stone stacked around the exterior.

Use S for basin and find Q. Then substitute in calculated Q and find A:

$$A = \frac{Q}{(0.6) \times (64.32 \times \frac{h}{2})} \qquad (3.4)$$

Then, substitute in calculated A and find d:

$$d^* = 2 \times \frac{(A)}{(3.14)} \qquad (3.5)$$

Diameter of the dewatering orifice should never be less than 3 inches in order to help prevent clogging by soil or debris.

Flexible tubing should be at least 2 inches larger in diameter than the calculated orifice to promote improved flow characteristics.

Additional design guidance for orifices and perforated risers are in *Section 2.2.2 of the Hydraulics Technical Manual*.

(c) If a surface skimmer is used as the basin's primary outlet, it may also be used to dewater the basin. Orifice flowrates for the skimmer will be provided by the manufacturer.

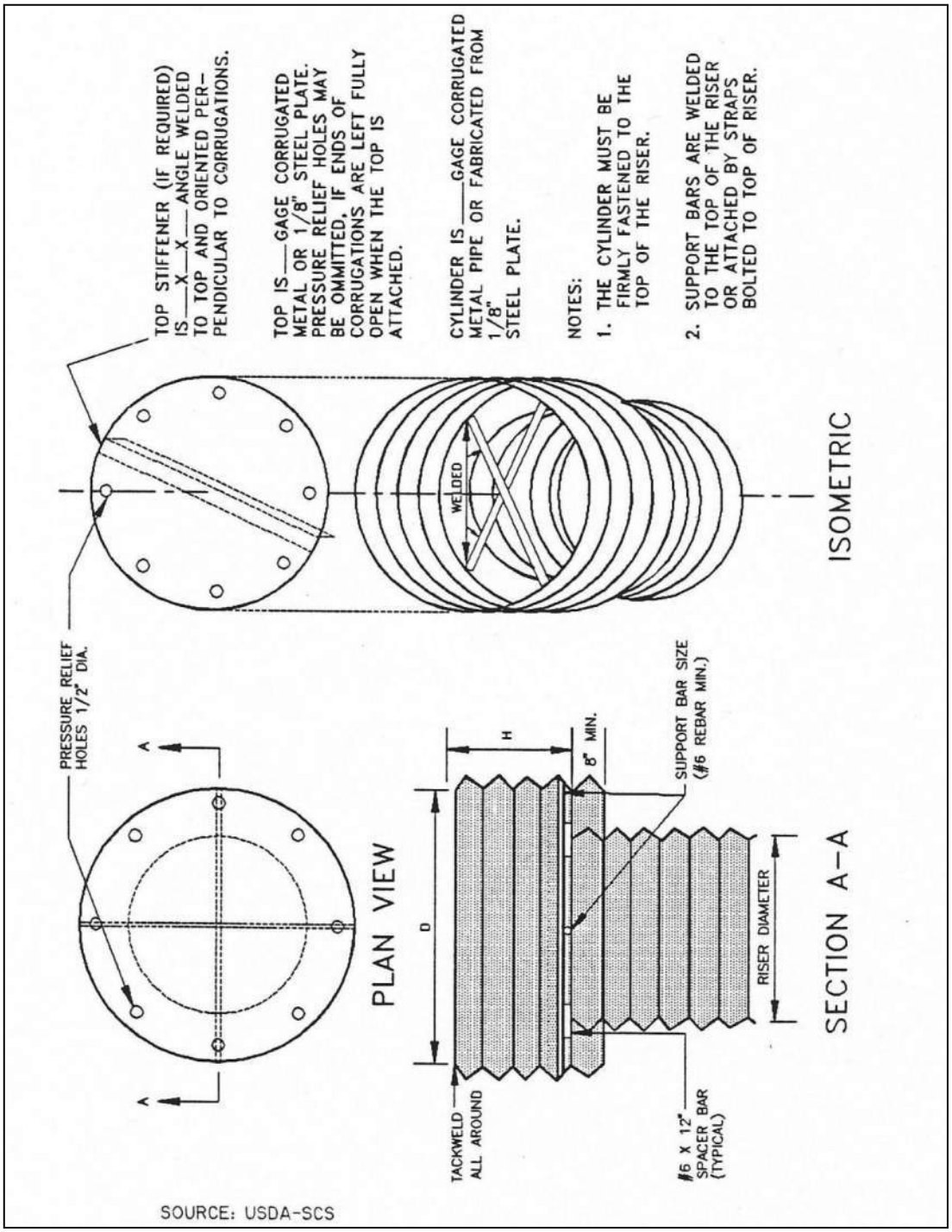


Figure 3.26 Example of Anti-Vortex Design for Corrugated Metal Pipe Riser

Table 3.8 Trash Rack and Anti-Vortex Device Design Table

Riser Diam., in.	Cylinder		Height inches	Minimum Size Support Bar	Minimum Top	
	Diameter inches	Thickness gage			Thickness	Stiffener
12	18	16	6	#6 Rebar or 1 ½ x 1 ½ x 3/16 angle	16 ga. (F&C)	-
15	21	16	7	" "	" "	-
18	27	16	8	" "	" "	-
21	30	16	11	" "	16 ga.(C), 14 ga.(F)	-
24	36	16	13	" "	" "	-
27	42	16	13	" "	" "	-
36	54	14	17	#8 Rebar	14 ga.(C), 12 ga.(F)	-
42	60	16	19	" "	" "	-
48	72	16	21	1 ¼" pipe or 1 ½ x 1 ½ x ¼ angle	14 ga.(C), 10 ga.(F)	-
54	78	16	25	" "	" "	-
60	90	14	29	1 ½" pipe or 1 ½ x 1 ½ x ¼ angle	12 ga.(C), 8 ga.(F)	-
66	96	14	33	2" pipe or 2 x 2 x 3/16 angle	12 ga.(C), 8	2 x 2 x ¼ angle
72	102	14	36	" "	" "	2 ½ x 2 ½ x ¼ angle
78	114	14	39	2 ½" pipe or 2 ½ x ¼ angle	" "	" "
84	120	12	42	2 ½" pipe or 2 ½ x 2 ½ x ¼ angle	" "	2 ½ x 2 ½ x 5/16 angle

Note$_1$: The criterion for sizing the cylinder is that the area between the inside of the cylinder and the outside of the riser is equal to or greater than the area inside the riser. Therefore, the above table is invalid for use with concrete pipe risers.
Note$_2$: Corrugation for 12"-36" pipe measures 2 ⅔ x ½"; for 42"-84" the corrugation measures 5" x 1" or 8" x 1".
Note$_3$: C = corrugated; F = flat.

Source: Adapted from USDA-SCS and Carl M. Henshaw Drainage Products Information.

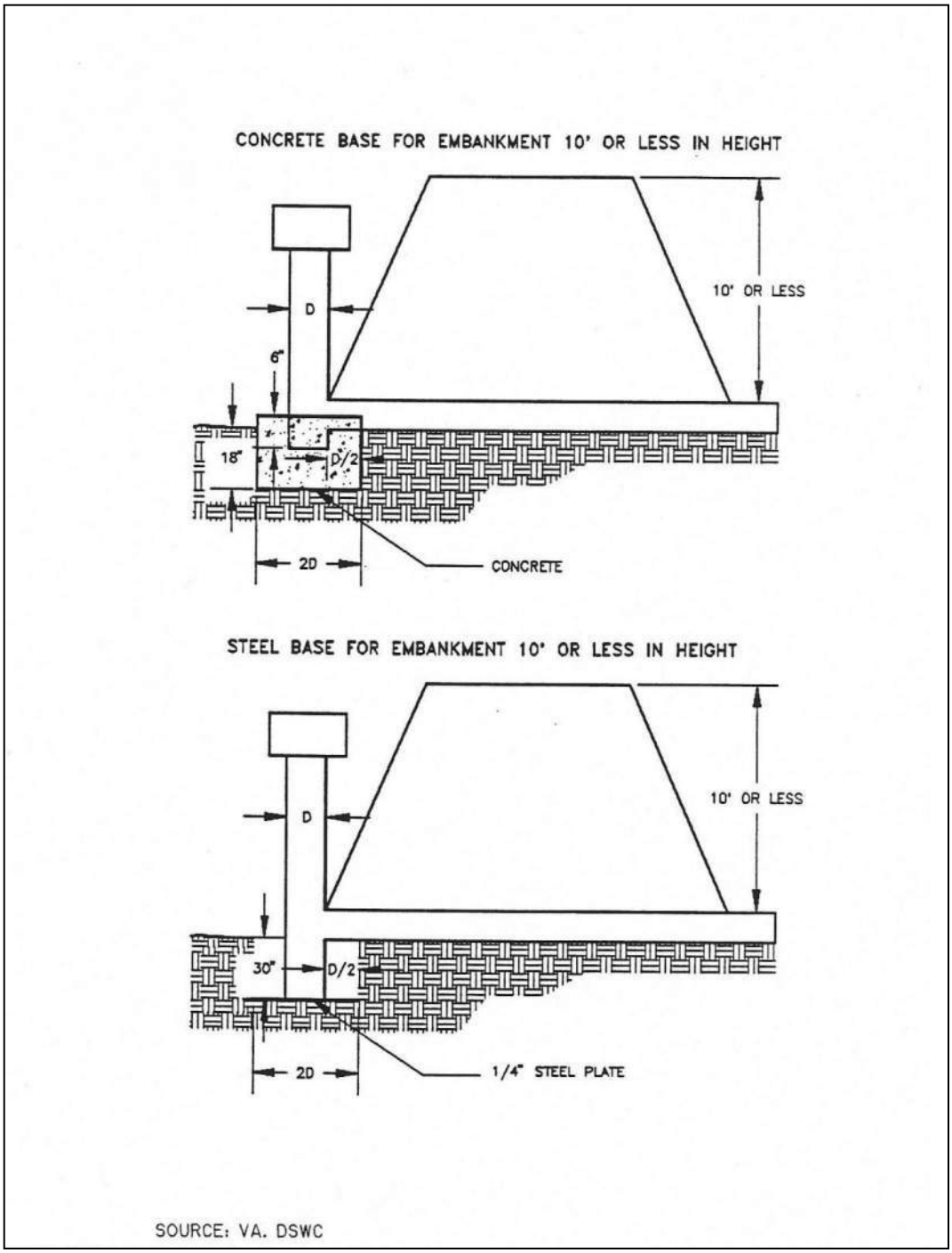


Figure 3.27 Riser Pipe Base Design for Embankment Less Than 10 Feet High

3.9.8 Design Form

Note: This design form is for basins designed with a riser as its primary outlet. It is provided as an example of the type of documentation required for a sediment basin. Different calculations will be needed for other types of outlets.

Project _____

Basin # _____ Location _____

Total area draining to basin: _____ acres.

Total disturbed area draining to basin: _____ acres.

Basin Volume Design

1. Minimum required volume is the lesser of

   a.) (3600 cu. ft. x _____ total drainage acres) / 27 = _____ cu. yds.

   b.) 2 yr, 24 hr storm volume in cubic yards = _____ cu. yds.

2. Total available basin volume at crest of riser* = _____ cu. yds. at elevation _____.
   (From Storage - Elevation Curve)

   * Minimum = Lesser of 3600 cubic feet/acre of Total Drainage Area or
   2yr. 24 hr. storm volume from Disturbed Area drained

3. Excavate _____ cu. yds. to obtain required volume*.

   *Elevation corresponding to required volume = invert of the dewatering orifice.

4. Diameter of dewatering orifice = _____ in.

5. Diameter of flexible tubing = _____ in. (diameter of dewatering orifice plus 2 inches).

Preliminary Design Elevations

6. Crest of Riser = _____

   Top of Dam = _____

   Design High Water = _____

   Upstream Toe of Dam = _____

Basin Shape

7. Length of Flow / Effective Width $\frac{L}{We}$ = _____

   If > 2, baffles are not required _____

   If < 2, baffles are required _____

Runoff

8. Q_2 = _____ cfs (From TR-55)

9. Q_{25} = _____ cfs (From TR-55)

Basin Outlet Design

10. With emergency spillway, required basin outlet capacity $Q_p = Q_2$ = _____ cfs. (riser and outfall)

    Without emergency spillway, required basin outlet capacity $Q_p = Q_{25}$ = _____ cfs. (riser and outfall)

11. With emergency spillway:

    Assumed available head (h) = _____ ft. (Using Q_2)

    h = Crest of Emergency Spillway Elevation - Crest of Riser Elevation

    Without emergency spillway:

    h = Design High Water Elevation - Crest of Riser Elevation

12. Riser diameter (D_r) = _____ in. Actual head (h) = _____ft.

    (Figure 3.23)

    Note: Avoid orifice flow conditions.

13. Barrel length (l) = _____ ft.

    Head (H) on outfall through embankment = _____ ft.

    (Figure 3.24)

14. Barrel Diameter = _____ in.

    (From Table 3.5 [concrete pipe] or Table 3.6 [corrugated pipe]).

15. Trash rack and anti-vortex device

    Diameter = _____ inches.

    Height = _____ inches.

    (From Table 3.8).

Emergency Spillway Design

16. Required spillway capacity $Q_e = Q_{25} - Q_p$ = _____ cfs.

17. Bottom width (b) = _____ ft.; the slope of the exit channel(s) = _____ ft./foot; and the minimum length of the exit channel (x) = _____ ft.
    (From Figure 3.25 and Table 3.7).

Final Design Elevations

18. Top of Dam = _____

    Design High Water = _____

    Emergency Spillway Crest = _____

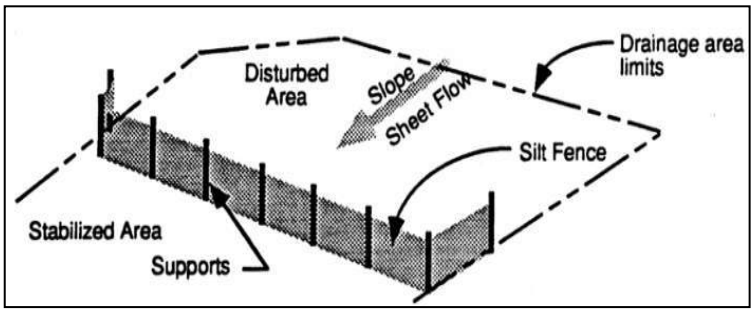
    Basin Riser Crest = _____

    Dewatering Orifice Invert = _____

    Elevation of Upstream Toe of Dam
    (if excavation was performed) = _____

3.10 Silt Fence

Sediment Control



Description: A silt fence consists of geotextile fabric supported by wire mesh netting or other backing stretched between metal posts with the lower edge of the fabric securely embedded six-inches in the soil. The fence is typically located downstream of disturbed areas to intercept runoff in the form of sheet flow. A silt fence provides both filtration and time for sediment settling by reducing the velocity of the runoff.

KEY CONSIDERATIONS

DESIGN CRITERIA:

- Maximum drainage area of 0.25 acre per 100 linear feet of silt fence
- Maximum 200 feet distance of flow to silt fence; 50 feet if slope exceeds 10 percent
- Minimum fabric overlap of 3 feet at abutting ends; join fabric to prevent leakage
- Turn end of silt fence line upslope a minimum of 10 feet
- Install stone overflow structure at low points or spaced at approximately 300 feet if no apparent low point

ADVANTAGES / BENEFITS:

- Economical means to treat sheet flow
- Most effective with coarse to silty soil types

DISADVANTAGES / LIMITATIONS:

- Limited effectiveness with clay soils due to clogging
- Localized flooding due to minor ponding at the upslope side of the silt fence
- Not for use as check dams in swales or low areas subject to concentrated flow
- Not for use where soil conditions prevent a minimum toe-in depth of 6 inches or installation of support posts to a depth of 12 inches
- Can fail structurally under heavy storm flows, creating maintenance problems and reducing effectiveness

MAINTENANCE REQUIREMENTS:

- Inspect regularly
- Repair undercutting, sags and other fence failures
- Remove sediment before it reaches half the height of the fence
- Repair or replace damaged or clogged filter fabric

TARGETED POLLUTANTS

- ● Sediment
- ○ Nutrients & Toxic Materials
- ○ Oil & Grease
- ◒ Floatable Materials
- ○ Other Construction Wastes

APPLICATIONS

- **Perimeter Control**
- **Slope Protection**
- **Sediment Barrier**
- **Channel Protection**
- **Temporary Stabilization**
- **Final Stabilization**
- **Waste Management**
- **Housekeeping Practices**

Fe=0.50-0.75
(*Depends on soil type*)

IMPLEMENTATION CONSIDERATIONS

- ◒ Capital Costs
- ● Maintenance
- ○ Training
- ◒ Suitability for Slopes > 5%

Other Considerations:

- *Effects of ponding or the redirection of flow onto adjacent areas and property*

3.10.1 Primary Use

Silt fence is normally used as a perimeter control on the down slope side of disturbed areas and on side slopes where stormwater may runoff the area. It is only feasible for non-concentrated, sheet flow conditions. If it becomes necessary to place a silt fence where concentrated flows may be occur (e.g. where two silt fences join at an angle, or across minor channels or gullies), it will be necessary to reinforce the silt fence at that area by a rock berm or sand bag berm, or other structural measures that will support the silt fence.

3.10.2 Applications

Silt fence is an economical means to treat overland, non-concentrated flows for all types of projects. Silt fences are used as perimeter control devices for both site developers and linear (roadway) type projects. They are most effective with coarse to silty soil types. Due to the potential of clogging and limited effectiveness, silt fences should be used with caution in areas that have predominantly clay soil types. In this latter instance, a soils engineer or soil scientist should confirm the suitability of silt fence for that application. Additional controls may be needed to remove fine silts and clay soils suspended in stormwater.

3.10.3 Design Criteria

- Fences are to be constructed along a line of constant elevation (along a contour line) where possible.
- Silt fence can interfere with construction operations; therefore, planning of access routes onto the site is critical.
- Maximum drainage area shall be 0.25 acre per 100 linear feet of silt fence.
- Maximum flow to any 20 foot section of silt fence shall be 1 CFS.
- Maximum distance of flow to silt fence shall be 200 feet or less. If the slope exceeds 10 percent the flow distance shall be less than 50 feet.
- Maximum slope adjacent to the fence shall be 2:1.
- Silt fences shall not be used where there is a concentration of water in a channel, drainage ditch or swale, nor should it be used as a control on a pipe outfall.
- If 50 percent or less soil, by weight, passes the U.S. Standard Sieve No. 200; select the apparent opening size (A.O.S.) to retain 85percent of the soil.
- If 85 percent or more of soil by weight, passes the U.S. Standard Sieve No. 200, silt fences shall not be used unless the soil mass is evaluated and deemed suitable by a soil scientist or geotechnical engineer concerning the erodiblity of the soil mass, dispersive characteristics, and the potential grain-size characteristics of the material that is likely to be eroded.
- Stone overflow structures or other outlet control devices shall be installed at all low points along the fence or spaced at approximately 300 feet if there is no apparent low point.
- Filter stone for overflow structure shall be 1 ½ inches washed stone containing no fines. Angular shaped stone is preferable to rounded shapes.
- Silt fence fabric must meet the following minimum criteria:
    - Tensile Strength, ASTM D4632 Test Method for Grab Breaking Load and Elongation of Geotextiles, 90-lbs.
    - Puncture Rating, ASTM D4833 Test Method for Index Puncture Resistance of Geotextiles, Geomembranes, and Related Products, 60-lbs.
    - Mullen Burst Rating, ASTM D3786 Standard Test Method for Hydraulic Bursting Strength of Textile Fabrics-Diaphragm Bursting Strength Tester Method, 280-psi.

  - Apparent Opening Size, ASTM D4751 Test Method for Determining Apparent Opening Size of a Geotextile, U.S. Sieve No. 30(max) to No. 100 (min).
  - Ultraviolet Resistance, ASTM D4355 Standard Test Method for Deterioration of Geotextiles by Exposure to Light, Moisture, and Heat in a Xenon Arc Type Apparatus, Minimum 70 percent.
- Fence posts shall be steel and may be T-section or L-section, 1.3 pounds per linear foot minimum, and 4 feet in length minimum. Wood posts may be used depending on anticipated length of service and provided they are 4 feet in length minimum and have a nominal cross section of 2 inches by 4 inches for pine or 2 inches by 2 inches for hardwoods.
- Silt fence shall be supported by steel wire fence fabric as follows:
  - 4 inch x 4 inch mesh size, W1.4 /1.4, minimum 14 gauge wire fence fabric;
  - Hog wire, 12 gauge wire, small openings installed at bottom of silt fence;
  - Standard 2 inch x 2 inch chain link fence fabric; or
  - Other welded or woven steel fabrics consisting of equal or smaller spacing as that listed herein and appropriate gauge wire to provide support.
- Silt Fence shall consist of synthetic fabric supported by wire mesh and steel posts set a minimum of 1-foot depth and spaced not more than 6-feet on center.
- A 6 inch wide trench is to be cut 6 inches deep at the toe of the fence to allow the fabric to be laid below the surface and backfilled with compacted earth or gravel to prevent bypass of runoff under the fence. Fabric shall overlap at abutting ends a minimum of 3 feet and shall be joined such that no leakage or bypass occurs. If soil conditions prevent a minimum toe-in depth of 6 inches or installation of support post to depth of 12 inches, silt fences shall not be used.
- Sufficient room for the operation of sediment removal equipment shall be provided between the silt fence and other obstructions in order to properly maintain the fence.
- The last 10 feet (or more) at the ends of a line of silt fence shall be turned upslope to prevent bypass of stormwater. Additional upslope runs of silt fence may be needed every 200 to 400 linear feet, depending on the traverse slope along the line of silt fence.

3.10.4 Design Guidance and Specifications

Specifications for construction of this item may be found in the Standard Specifications for Public Works Construction – North Central Texas Council of Governments, Section 201.5 Silt Fence and in the Standard Specifications for Construction and Maintenance of Highways, Streets and Bridges (TxDot 2004) Item 506.2.J and Item 506.4.C.9.

The American Society for Testing and Materials has established standard specifications for silt fence materials (ASTM D6461) and silt fence installation (ASTM D6462).

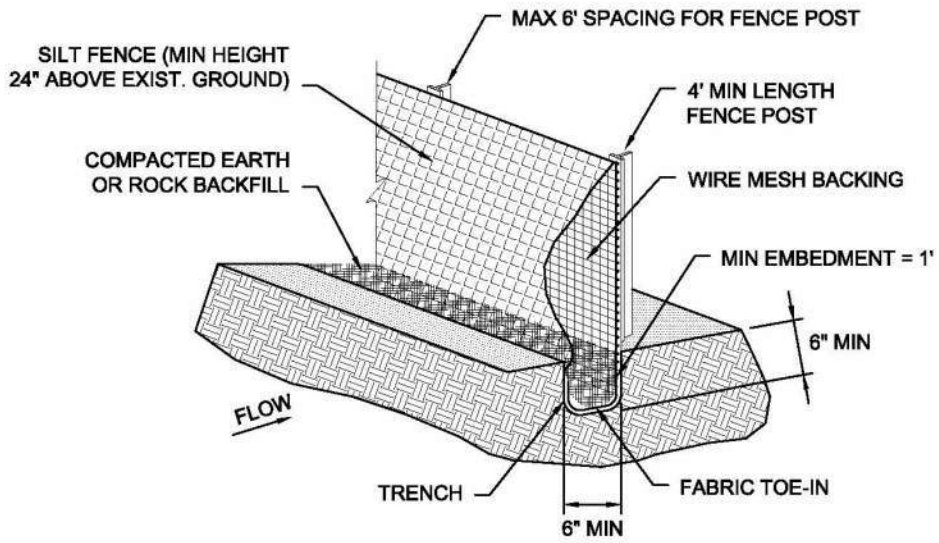
3.10.5 Inspection and Maintenance Requirements

Silt fence should be inspected regularly (at least as often as required by the TPDES Construction General Permit) for buildup of excess sediment, undercutting, sags, and other failures. Sediment should be removed before it reaches half the height of the fence. In addition, determine the source of excess sediment and implement appropriate measures to control the erosion. Damaged or clogged fabric must be repaired or replaced as necessary.

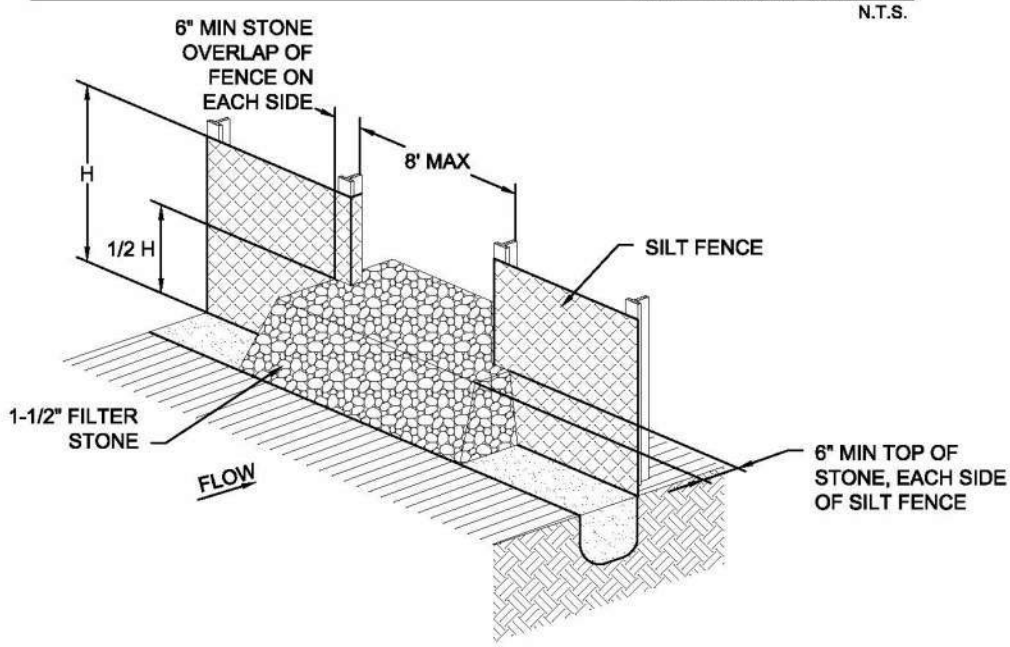
3.10.6 Example Schematics

The following schematics are example applications of the construction control. They are intended to assist in understanding the control's design and function.

The schematics are **not for construction**. They may serve as a starting point for creating a construction detail, but they must be site adapted by the designer. In addition, dimensions and notes appropriate for the application must be added by the designer.



SILT FENCE EXAMPLE
N.T.S.



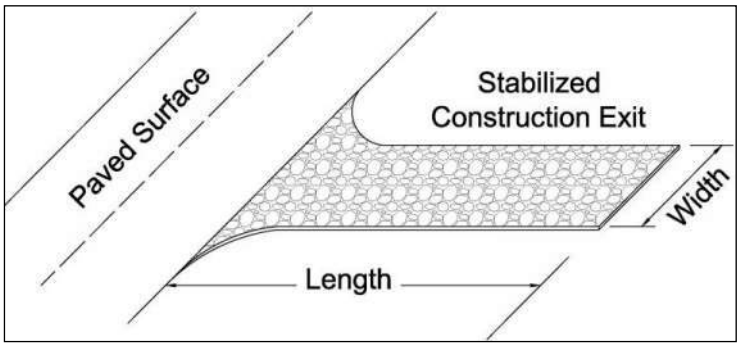
STONE OVERFLOW STRUCTURE EXAMPLE
N.T.S.

NOTES:
1. DESIGN SHALL SHOW ON THE DRAWINGS THE LOCATIONS WHERE OVERFLOW STRUCTURES SHALL BE INSTALLED. OVERFLOW STRUCTURES ARE REQUIRED AT ALL LOW POINTS AND AT A SPACING OF APPROXIMATELY 300 FT WHERE NO LOW POINT IS APPARENT.
2. DESIGNER SHALL ON THE DRAWINGS THE LOCATIONS WHERE SILT FENCE IS TO BE TURNED UPSLOPE. UPSLOPE LENGTHS SHALL BE A MINIMUM OF 10 FEET.

Figure 3.28 Schematics of Silt Fence

3.11 Stabilized Construction Exit

Sediment Control



Description: A stabilized construction exit is a pad of crushed stone, recycled concrete or other rock material placed on geotextile filter cloth to dislodge soil and other debris from construction equipment and vehicle tires prior to exiting the construction site. The object is to minimize the tracking of soil onto public roadways where it will be suspended by stormwater runoff.

KEY CONSIDERATIONS

DESIGN CRITERIA:

- Slope exit away from offsite paved surface
- Minimum width and length dependent on size of disturbed area, which correlates to traffic volume
- 6 inches minimum thickness of stone layer
- Stone of 3 to 5 inches in size
- Add a wheel cleaning system when inspections reveal the stabilized exit does not prevent tracking

ADVANTAGES / BENEFITS:

- Reduces tracking of soil onto public streets
- Directs traffic to a controlled access point
- Protects other sediment controls by limiting the area disturbed

DISADVANTAGES / LIMITATIONS:

- Effectiveness dependent on limiting ingress and egress to the stabilized exit
- A wheel washing system may also be required to remove clay soil from tires, particularly in wet conditions

MAINTENANCE REQUIREMENTS:

- Inspect regularly
- Replace rock when sediment in the void area between the rocks is visible on the surface
- Periodically re-grade and top dress with additional stone to maintain efficiency

TARGETED POLLUTANTS

◒ Sediment

○ Nutrients & Toxic Materials

○ Oil & Grease

○ Floatable Materials

○ Other Construction Wastes

APPLICATIONS

Perimeter Control

Slope Protection

Sediment Barrier

Channel Protection

Temporary Stabilization

Final Stabilization

Waste Management

Housekeeping Practices

Fe=N/A

IMPLEMENTATION CONSIDERATIONS

◒ Capital Costs

◒ Maintenance

○ Training

○ Suitability for Slopes > 5%

Other Considerations:

- *None*

3.11.1 Primary Use

Stabilized construction exits are used to remove soil, mud and other matter from vehicles that drive off of a construction site onto public streets. Stabilized exits reduce the need to remove sediment from streets. When used properly, they also control traffic by directing vehicles a single (or two for larger sites) location. Controlling traffic onto and off of the site reduces the number and quantity of disturbed areas and provides protection for other sediment controls by decreasing the potential for vehicles to drive over the control.

3.11.2 Applications

Stabilized construction exits are used on all construction sites with a disturbed area of one acre or larger and are a recommended practice for smaller construction sites. A stabilized exit is used on individual residential lots until the driveway is placed. Stabilized construction exits may be used in conjunction with wheel cleaning systems as described in *Section 3.16 Wheel Cleaning Systems*.

3.11.3 Design Criteria

- Limit site access to one route during construction, if possible; two routes for linear and larger projects.
- Prevent traffic from avoiding or shortcutting the full length of the construction exit by installing barriers. Barriers may consist of silt fence, construction safety fencing, or similar barriers.
- Design the access point(s) to be at the upslope side of the construction site. Do not place construction access at the lowest point on the construction site.
- Stabilized construction exits are to be constructed such that drainage across the exit is directed to a controlled, stabilized outlet onsite with provisions for storage, proper filtration, and removal of wash water.
- The exit must be sloped away from the paved surface so that stormwater from the site does not discharge through the exit onto roadways.
- Minimum width of exit shall be 15 feet.
- The construction exit material shall be a minimum thickness of 6 inches. The stone or recycled concrete used shall be 3 to 5 inches in size with little or no fines.
- The geotextile fabric must meet the following minimum criteria:
    - Tensile Strength, ASTM D4632 Test Method for Grab Breaking Load and Elongation of Geotextiles, 300 lbs.
    - Puncture Strength, ASTM D4833 Test Method for Index Puncture Resistance of Geotextiles, Geomembranes, and Related Products, 120 lbs.
    - Mullen Burst Rating, ASTM D3786 Standard Test Method for Hydraulic Bursting Strength of Textile Fabrics-Diaphragm Bursting Strength Tester Method, 600 psi.
    - Apparent Opening Size, ASTM D4751 Test Method for Determining Apparent Opening Size of a Geotextile, U.S. Sieve No. 40 (max).
- Rock by itself may not be sufficient to remove clay soils from wheels, particularly in wet conditions. When necessary, vehicles must be cleaned to remove sediment prior to entering paved roads, streets, or parking lots. Refer to *Section 3.16 Wheel Cleaning Systems* for additional controls.
- Using water to wash sediment from streets is prohibited
- Minimum dimensions for the stabilized exit shall be as follows:

Table 3.9 Minimum Exit Dimensions

Disturbed Area	*Min. Width of Exit*	*Min. Length of Exit*
< 1 Acre	15 feet	20 feet
≥ 1 Acre but < 5 Acres	25 feet	50 feet
≥ 5 Acres	30 feet	50 feet

- If a wheel cleaning system is used, the width of the stabilized exit may be reduced to funnel traffic into the system. Refer to *Section 3.16 Wheel Cleaning*.

3.11.4 Design Guidance and Specifications

Specifications for construction of this item may be found in the Standard Specifications for Public Works Construction – North Central Texas Council of Governments, Section 201.10 Stabilized Construction Entrance and in the Standard Specifications for Construction and Maintenance of Highways, Streets and Bridges (TxDOT 2004) Item 506.2.E and Item 506.4.C.5.

3.11.5 Inspection and Maintenance Requirements

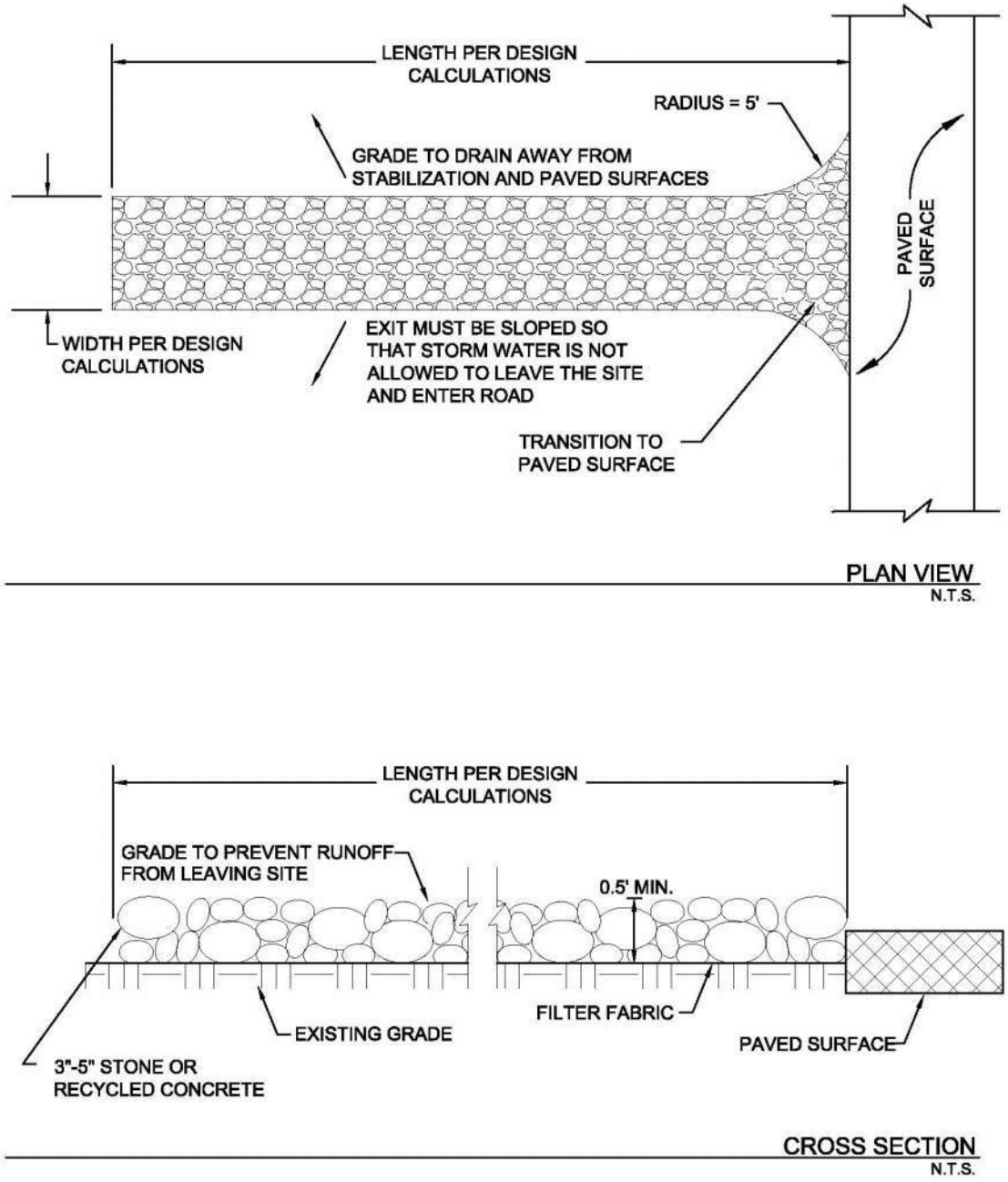
Construction exits should be inspected regularly (at least as often as required by the TPDES Construction General Permit). The stabilized construction exit shall be maintained in a condition that prevents tracking or flow of sediment onto paved surfaces. Periodic re-grading and top dressing with additional stone must be done to keep the efficiency of the exit from diminishing. The rock shall be re-graded when ruts appear. Additional rock shall be added when soil is showing through the rock surface.

Additional controls are needed if inspections reveal a properly installed and maintained exit, but tracking of soil outside the construction area is still evident. Additional controls may be daily sweeping of all soil spilled, dropped, or tracked onto public rights-of-way or the installation of a wheel cleaning system.

3.11.6 Example Schematics

The following schematics are example applications of the construction control. They are intended to assist in understanding the control's design and function.

The schematics are **not for construction**. They may serve as a starting point for creating a construction detail, but they must be site adapted by the designer. In addition, dimensions and notes appropriate for the application must be added by the designer.

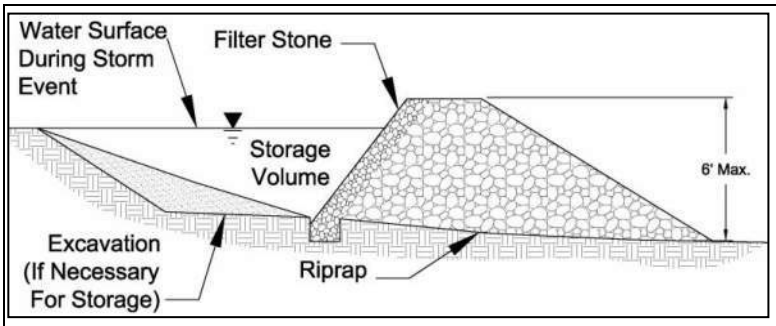


NOTE: INSTALL SILT FENCE, CONSTRUCTION SAFETY FENCING, OR SIMILAR BARRIER ALONG THE EXIT TO DIRECT TRAFFIC INTO THE EXIT.

Figure 3.29 Schematics of Stabilized Construction Exit

3.12 Stone Outlet Sediment Trap

Sediment Control



Description: A stone outlet sediment trap is a small detention area formed by placing a stone embankment with an integral stone filter outlet across a drainage swale for the purpose of detaining sediment-laden runoff from construction activities. The sediment trap detains runoff long enough to allow most of the suspended sediment to settle while still allowing for diffused flow of runoff.

KEY CONSIDERATIONS

DESIGN CRITERIA:

- Maximum contributing drainage area of 10 acres for excavated trap and 5 acres for bermed trap
- Provide storage volume for the 2-year, 24-hour design storm
- Maximum embankment height of 6 feet
- Embankment slope of 1.5:1 or flatter
- 2 foot minimum top width

ADVANTAGES / BENEFITS:

- Effectively traps sediment in a drainage swale
- Reduces flow velocities
- Relatively long effective life

DISADVANTAGES / LIMITATIONS:

- Amount of land required
- Can cause minor upstream flooding, possibly impacting construction operations
- Not for use in “live” (normally flowing) channels

MAINTENANCE REQUIREMENTS:

- Inspect regularly
- Replace filter stone when it appears to be silted in such that efficiency is diminished
- Remove trash and debris after each storm event
- Remove deposited sediment when before the storage capacity is reduced by one third or has reached a depth of one foot, whichever is less

TARGETED POLLUTANTS

- ● Sediment
- ○ Nutrients & Toxic Materials
- ○ Oil & Grease
- ◒ Floatable Materials
- ○ Other Construction Wastes

APPLICATIONS

Perimeter Control

Slope Protection

Sediment Barrier

Channel Protection

Temporary Stabilization

Final Stabilization

Waste Management

Housekeeping Practices

Fe=0.50-0.85
(*Depends on soil type*)

IMPLEMENTATION CONSIDERATIONS

- ◒ Capital Costs
- ◒ Maintenance
- ○ Training
- ● Suitability for Slopes > 5%

Other Considerations:

- *Re-grading and stabilization of the control area after construction*

3.12.1 Primary Use

A sediment trap is used where flows are concentrated in a drainage swale or channel. The sediment trap detains and temporarily impounds stormwater, which allows for settling of sediment as the water is slowly discharged from the trap. Sediment traps may be used in combination with check dams when erosive velocities exist in the swale upstream of the sediment trap.

3.12.2 Applications

Temporary stone outlet sediment traps are installed at locations where concentrated flows require a protected outlet to contain sediment or spread flow prior to discharge. They are an effective, long term (12 – 18 months) application for sediment control on large construction sites where a sediment basin is not feasible due to site or construction method restrictions. Several traps may be used to control sediment on drainage sub-basins within the construction site, instead of one large sediment basin at the discharge point from the entire construction site. Sediment traps may also be used with a passive treatment system to provide better removal of fine silt and clay soil particles.

3.12.3 Design Criteria

- Design calculations are required for the use of this control. The designer shall provide drainage computations and dimensions for the stone outlet, berms, and excavated areas associated with this control.
- The maximum drainage area contributing to the trap shall be less than 10 acres for the excavated stone outlet sediment trap and 5 acres or less for the bermed trap.
- The minimum storage volume shall be the volume of runoff from the temporary control design storm (2-year, 24 hour) for the sediment trap's drainage area.
- The surface area of the design storage area shall not be less than 1 percent of the area draining to the device.
- The maximum height of the rock shall be 6 feet, as measured from the toe of the slope on the downstream side to the low point in the rock dam.
- Minimum width of the rock dam at the top shall be 2 feet.
- Rock dam slope shall be 1.5:1 or flatter.
- The rock dam shall have a depressed area, over the center of swale, to serve as the outlet with a minimum width of 4 feet.
- A six inch minimum thickness layer of 1½ inch filter stone shall be placed on the upstream face of the stone embankment when the stormwater runoff contains fine silt and clay soil particles.
- The embankment shall be comprised of well graded stone with a size range of 6 to 12 inches in diameter. The stone may be enclosed in wire mesh or gabion basket and anchored to the channel bottom to prevent washing away.
- The dam shall consist of stone riprap or a combination of compacted fill with a stone riprap outlet.
- Fill placed to constrict the swale for construction of the excavated stone outlet sediment trap and fill placed for the berm in the bermed stone outlet sediment trap shall consist of clay material, minimum Plasticity Index of 30, using ASTM D4318 Standard Test for Liquid Limit, Plastic Limit, and Plasticity Index of Soils.
- Fill shall be placed in 8 inch loose lifts (maximum) and compacted to 95% Standard Proctor Density at optimum moisture content using ASTM D698 Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Standard Effort.
- The outlet shall be designed to have a minimum freeboard of 6" at design flow.

- Rock shall be placed on geotextilefilter fabric meeting the following minimum criteria:
  - Tensile Strength, ASTM D4632 Test Method for Grab Breaking Load and Elongation of Geotextiles, 250-lbs.
  - Puncture Rating, ASTM D4833 Test Method for Index Puncture Resistance of Geotextiles, Geomembranes, and Related Products, 135-lbs.
  - Mullen Burst Rating, ASTM D3786 Standard Test Method for Hydraulic Bursting Strength of Textile Fabrics-Diaphragm Bursting Strength Tester Method, 420-psi.
  - Apparent Opening Size, ASTM D4751 Test Method for Determining Apparent Opening Size of a Geotextile, U.S. Sieve No. 20 (max).
- The geotextile fabric, covered with a layer of stone, shall extend past the base of the embankment on the downstream side a minimum of 2 feet.

3.12.4 Design Guidance and Specifications

Specifications for construction of this item may be found in the Standard Specifications for Public Works Construction – North Central Texas Council of Governments, Section 201.12 Stone Outlet Sediment Trap.

3.12.5 Inspection and Maintenance Requirements

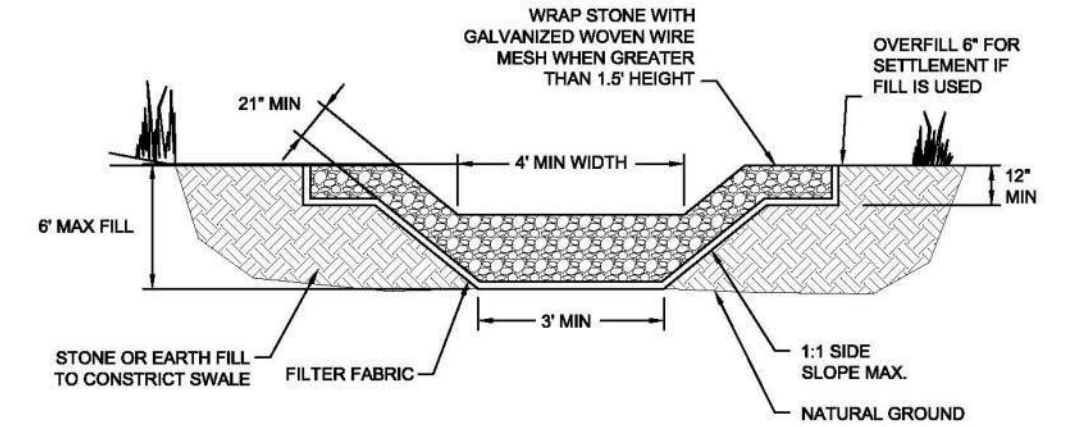
The stone outlet sediment trap should be inspected regularly (at least as often as required by the TPDES Construction General Permit) to check for clogging of the void spaces between stones. If the filter stone appears to be clogged, such that the basin will not completely drain, then the filter stone will require maintenance. If the filter stone is not completely clogged it may be raked with a garden rake to allow the water to release from the basin. If filter stone is completely clogged with mud and sediment, then the filter stone will have to be removed and replaced. Failure to keep the filter stone material properly maintained will lead to clogging of the stone riprap embankment. When this occurs, the entire stone rip-rap structure will need to be replaced. If the aggregate appears to be silted in such that efficiency is diminished, the stone should be replaced.

Trash and debris should be removed from the trap after each storm event to prevent it from plugging the rock. Deposited sediment shall be removed before the storage capacity is decreased by one-third, or sediment has reached a depth of one foot, whichever is less. The removed sediment shall be stockpiled or redistributed in areas that are protected with erosion and sediment controls.

3.12.6 Example Schematics

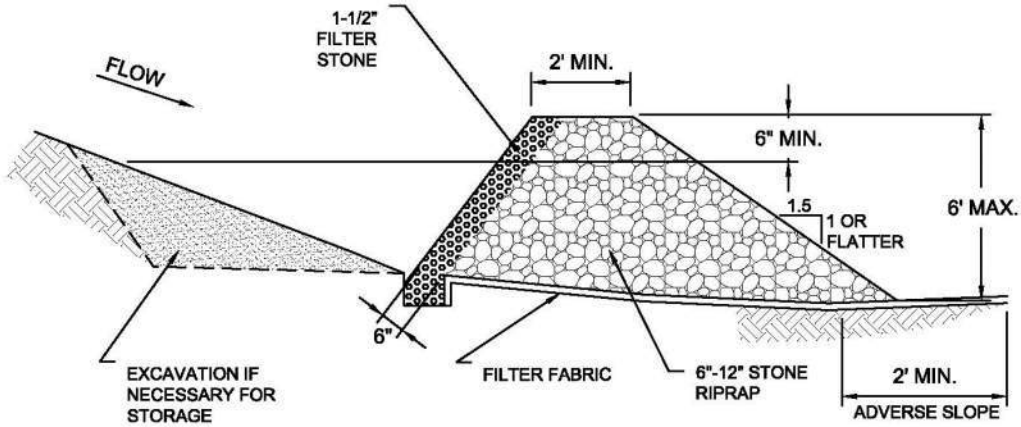
The following schematics are example applications of the construction control. They are intended to assist in understanding the control's design and function.

The schematics are **not for construction**. They may serve as a starting point for creating a construction detail, but they must be site adapted by the designer. In addition, dimensions and notes appropriate for the application must be added by the designer.



EXCAVATED STONE OUTLET SEDIMENT TRAP VIEW LOOKING UPSTREAM

N.T.S.



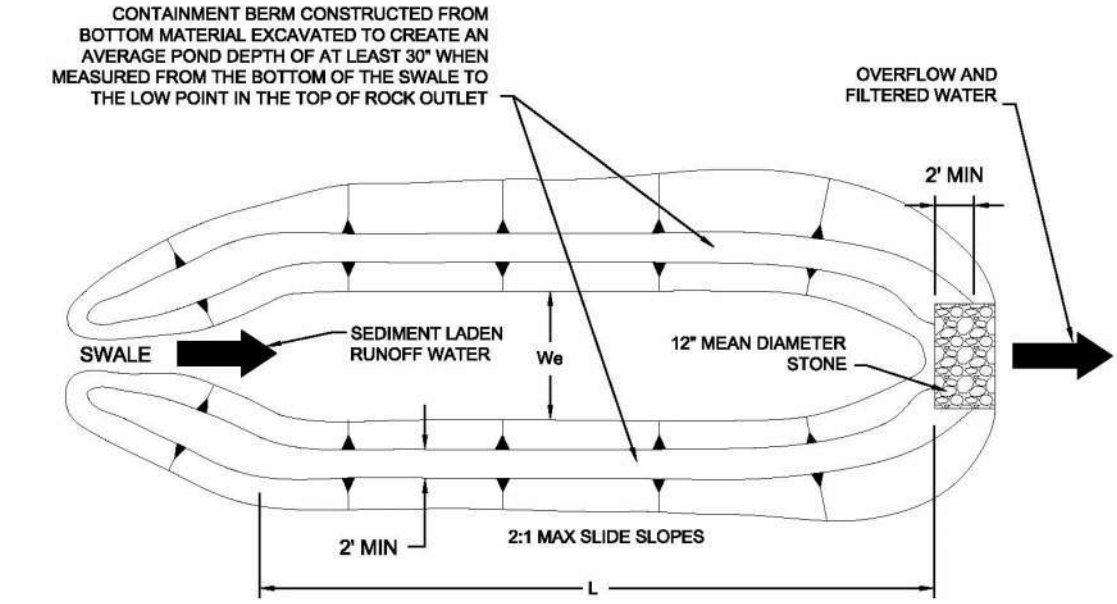
EXCAVATED STONE OUTLET SEDIMENT TRAP SECTION VIEW

N.T.S.

NOTE: ACTUAL DIMENSIONS OF THE SEDIMENT TRAP SHALL BE DESIGNED BASED ON FLOW CONDITIONS AND SITE TOPOGRAPHY. PROVIDE CALCULATIONS THAT DOCUMENT THE FOLLOWING PARAMETER USED TO DESIGN THE TRAP.

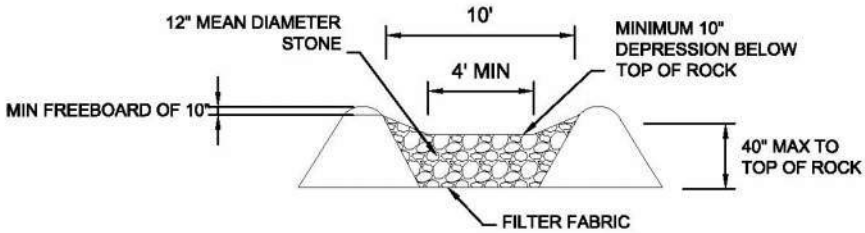
- SIZE OF CONTRIBUTING DRAINAGE AREA
- DESIGN STORM VOLUME AND FLOW RATE AT THE TRAP
- HEIGHT, SLOPE, AND LENGTH OF STONE OUTLET
- STORAGE VOLUME
- EXTENT OF GRADING TO PROVIDE THE CONTROLLED OUTLET

Figure 3.30 Schematics of Excavated Stone Outlet Sediment Trap



BERMED STONE OUTLET SEDIMENT TRAP PLAN VIEW

N.T.S.



BERMED STONE OUTLET SEDIMENT TRAP SECTION VIEW

N.T.S.

NOTE: ACTUAL DIMENSIONS OF THE SEDIMENT TRAP SHALL BE DESIGNED BASED ON FLOW CONDITIONS AND SITE TOPOGRAPHY. PROVIDE CALCULATIONS THAT DOCUMENT THE FOLLOWING PARAMETER USED TO DESIGN THE TRAP.

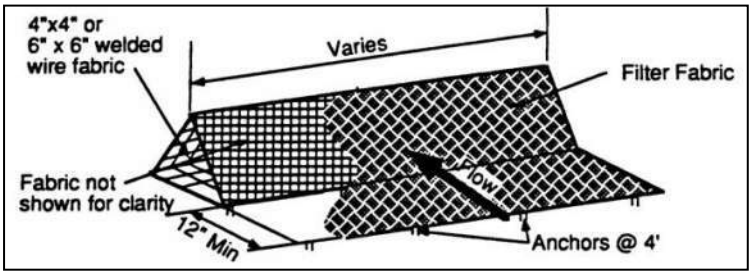
- SIZE OF CONTRIBUTING DRAINAGE AREA
- DESIGN STORM VOLUME AND FLOW RATE AT THE TRAP
- HEIGHT, SLOPE, AND LENGTH OF STONE OUTLET
- STORAGE VOLUME
- EXTENT OF GRADING TO PROVIDE THE CONTROLLED OUTLET

TRIBUTARY AREA (ACRES)	L (FT)	We (FT)
< 0.5	59	13
0.51-1.0	82	16
1.01-1.5	102	20
1.51-2.0	118	23
2.01-2.5	131	26
2.51-3.0	144	30
3.01-3.5	154	30
3.51-4.0	167	33
4.01-4.5	177	36
4.51-5.0	187	36

Figure 3.31 Schematics of Bermed Stone Outlet Sediment Trap
(Source: City of Chesterfield Department of Public Works Detail SC 7.2)

3.13 Triangular Sediment Filter Dike

Sediment Control



Description: A triangular sediment filter dike is a self-contained silt fence consisting of filter fabric wrapped around welded wire fabric and shaped into a triangular cross section. While similar in use to a silt fence, the dike is reusable, sturdier, transportable, and can be used on paved areas or in situations where it is impractical to install embedded posts for support.

KEY CONSIDERATIONS

DESIGN CRITERIA:

- Maximum drainage area of 0.25 acre per 100 linear feet of dike
- Maximum 200 feet distance of flow to filter dike; 50 feet if slope exceeds 10 percent
- Overlap ends of filter material 6 inches to cover dike-to-dike junction; secure with shoat rings

ADVANTAGES / BENEFITS:

- Can be installed on paved surfaces or where the soil type prevents embedment of other controls
- Withstands more concentrated flow and higher flow rates than silt fence

DISADVANTAGES / LIMITATIONS:

- Localized flooding due to minor ponding at the upslope side of the filter dike
- Not effective where there are substantial concentrated flows
- Not effective along contours due to the potential for flow concentration and overtopping

MAINTENANCE REQUIREMENTS:

- Inspect regularly
- Remove sediment before it reaches 6 inches in depth
- Clean or replace fabric if clogged
- Repair or replace dike when structural deficiencies are found

TARGETED POLLUTANTS

- ● Sediment
- ○ Nutrients & Toxic Materials
- ○ Oil & Grease
- ◒ Floatable Materials
- ○ Other Construction Wastes

APPLICATIONS

- **Perimeter Control**
- **Slope Protection**
- **Sediment Barrier**
- **Channel Protection**
- **Temporary Stabilization**
- **Final Stabilization**
- **Waste Management**
- **Housekeeping Practices**

Fe=0.50-0.75
(*Depends on soil type*)

IMPLEMENTATION CONSIDERATIONS

- ◒ Capital Costs
- ◒ Maintenance
- ○ Training
- ◒ Suitability for Slopes > 5%

Other Considerations:

- *Effects of ponding on adjacent areas and property*

3.13.1 Primary Use

Triangular filter dikes are used in place of silt fence, treating sediment flow at the perimeter of construction areas and at the perimeter of the site. Also, the dikes can serve as stream protection devices by preventing sediment from entering the streams or as check dams in small swales.

Triangular sediment filter dikes are especially useful for construction areas surrounded by pavement, where silt fence, filter berm, or other sediment control installations are impractical.

3.13.2 Applications

Triangular dikes are used to provide perimeter control by detaining sediment on a disturbed site with drainage that would otherwise flow onto adjacent properties. Triangular dikes function as sediment trapping devices when used in areas of sheet flow across disturbed areas or are placed along stream banks to prevent sediment-laden sheet flow from entering the stream. The dikes can be subjected to more concentrated flows and a higher flow rate than silt fence.

Dikes can be used on a variety of surfaces where other controls are not effective. They may be installed on paved surfaces and where the soil type prevents embedment of other sediment controls.

3.13.3 Design Criteria

- Dikes are to be installed along a line of constant elevation (along a contour line).
- Maximum drainage area shall be 0.25 acre per 100 linear feet of dike.
- Maximum flow to any 20 foot section of dike shall be 1 CFS.
- Maximum distance of flow to dike shall be 200 feet or less. If the slope exceeds 10 percent, the flow distance shall be less than 50 feet.
- Maximum slope adjacent to the dike shall be 2:1.
- If 50 percent or less of soil, by weight, passes the U.S. Standard Sieve No. 200, select the apparent opening size (A.O.S.) to retain 85 percent of the soil.
- If 85 percent or more of soil, by weight, passes the U.S. Standard Sieve No. 200, triangular sediment dike shall not be used due to clogging.
- The filter fabric shall meet the following minimum criteria:
    - Tensile Strength, ASTM D4632 Test Method for Grab Breaking Load and Elongation of Geotextiles 90-lbs.
    - Puncture Rating, ASTM D4833 Test Method for Index Puncture Resistance of Geotextiles, Geomembranes, and Related Products, 60-lbs.
    - Mullen Burst Rating, ASTM D3786 Standard Test Method for Hydraulic Bursting Strength of Textile Fabrics-Diaphragm Bursting Strength Tester Method, 280-psi.
    - Apparent Opening Size, ASTM D4751 Test Method for Determining Apparent Opening Size of a Geotextile, U.S. Siev No. 30 (max) to 100 (min).
    - Ultraviolet Resistance, ASTM D4355 Standard Test Method for Deterioration of Geotextiles by Exposure to Light, Moisture, and Heat in a Xenon Arc Type Apparatus, Minimum 70 percent.
- The internal support for the dike structure shall be 6-gauge 6 inch x 6 inch wire mesh or 6-guage 4 inch x 4 inch welded wire fabric folded into triangular form eighteen (18) inches on each side.
- Tie-in to the existing grade should be accomplished by:

  (i) embedding the fabric six-inches below the top of ground on the upslope side;

(ii) extending the fabric to form a 12 inch skirt on the upstream slope and covering it with 3 to 5 inches of 1½ inch washed filter stone; or

(iii) entrenching the base of the triangular dike four inches below ground.

For (ii) above, the skirt and the upslope portion of the triangular dike skeleton should be anchored by metal staples on two-foot centers, driven a minimum of six inches into the ground (except where crossing pavement or exposed limestone). When installed on pavement, the washed rock in option (ii) may be replaced by bags filled with 1½ inch washed filter stone placed at 4 foot spacing to anchor the end of the filter fabric to the pavement.

- Filter material shall lap over ends six (6) inches to cover dike-to-dike junction; each junction shall be secured by shoat rings. Where the dike is placed on pavement, two rock bags shall be used to anchor the overlap to the pavement. Additional bags shall be used as needed to ensure continuous contact with the pavement (no gaps).
- Sand bags or large rock should be used as ballast inside the triangular dike section to stabilize the dike against the effects of high flows.
- Sufficient room for the operation of sediment removal equipment shall be provided between the dike and other obstructions in order to properly remove sediment.
- The ends of the dike shall be turned upgrade to prevent bypass of stormwater.
- When used as a perimeter control on drainage areas larger than 0.5 acres, a stone overflow structure, similar to the one shown in *Section 3.10 Silt Fence*, may be necessary at low points to act as a controlled overflow point in order to prevent localized flooding and failure of the dike.
- If used as check dams in small swales (drainage areas less than 3 acres), the dikes shall be installed according to the spacing and other criteria in *Section 2.1 Check Dam*.

3.13.4 Design Guidance and Specifications

Specifications for construction of this item may be found in the Standard Specifications for Public Works Construction – North Central Texas Council of Governments, Section 201.8 Triangular Sediment Filter Dike.

3.13.5 Inspection and Maintenance Requirements

Triangular sediment filter dikes should be inspected regularly (at least as often as required by the TPDES Construction General Permit). Sediment should be removed before it reaches 6 inches in depth. If the fabric becomes clogged, it should be cleaned or, if necessary, replaced. If structural deficiencies are found, the dike should be immediately repaired or replaced.

The integrity of the filter fabric is important to the effectiveness of the dike. Overlap between dike sections must be checked on a regular basis and repaired if deficient.

3.13.6 Example Schematics

The following schematics are example applications of the construction control. They are intended to assist in understanding the control's design and function.

The schematics are **not for construction**. They may serve as a starting point for creating a construction detail, but they must be site adapted by the designer. In addition, dimensions and notes appropriate for the application must be added by the designer.

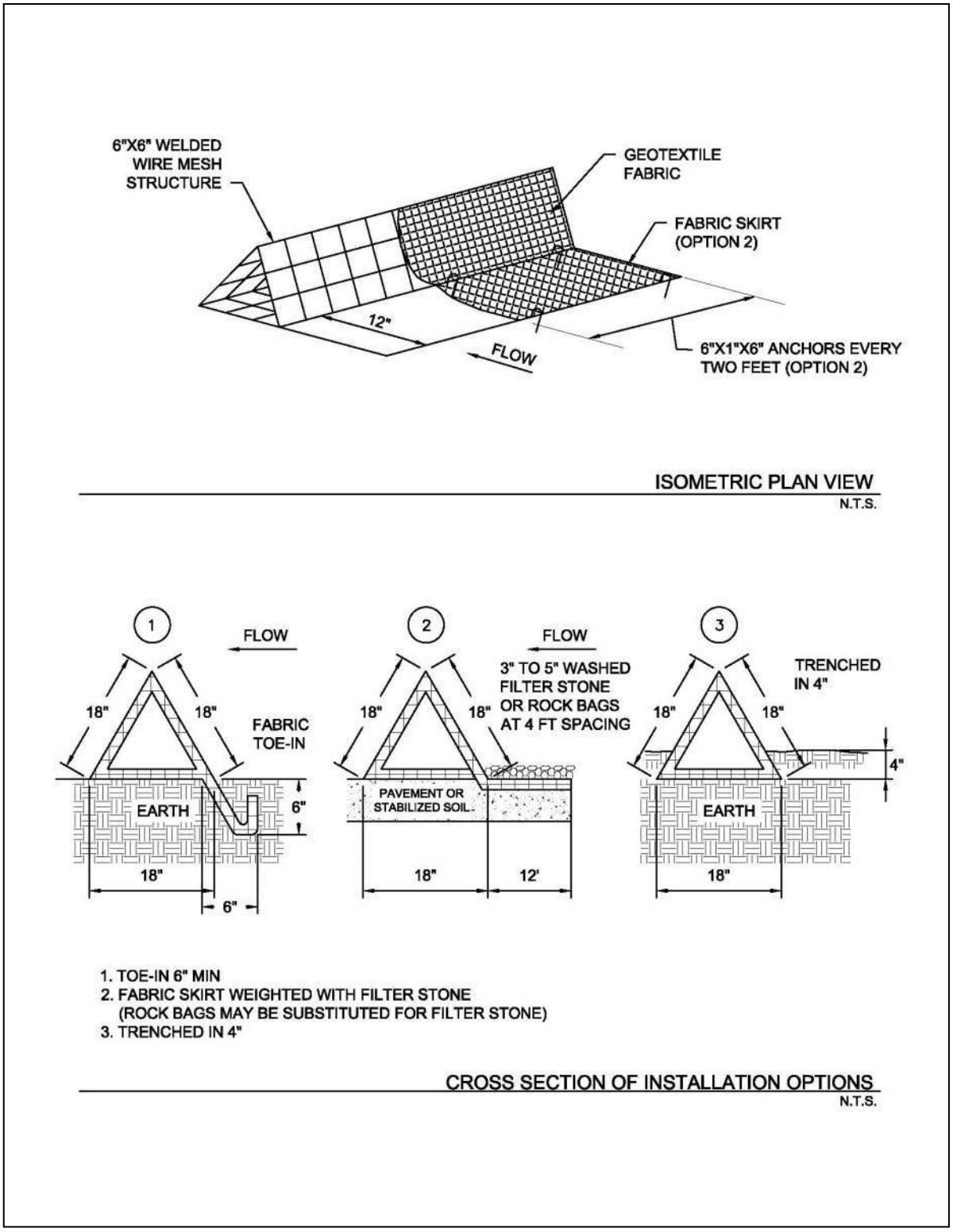
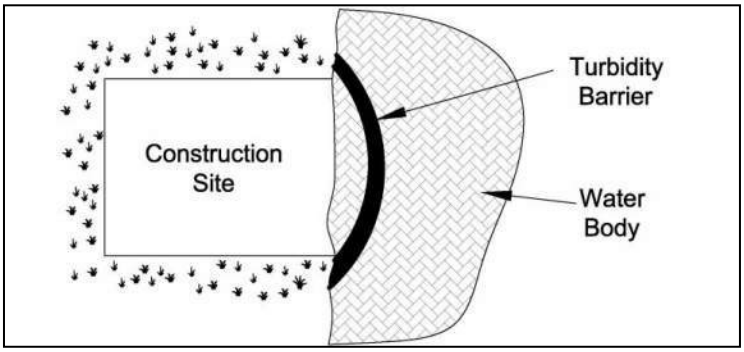


Figure 3.32 Schematics of Triangular Sediment Filter Dike

3.14 Turbidity Barrier

Sediment Control



Description: A turbidity barrier is a floating geotextile or PVC curtain that is designed to control sediment within a body of water. It is also known as a floating silt barrier or turbidity/silt curtain. The barrier typically consists of floats, curtain, ballast, and anchor lines. The barrier may be permeable or impermeable. Barriers of 100 feet or longer are constructed of a series of connected panels.

KEY CONSIDERATIONS

DESIGN CRITERIA:

- Barrier specified based on depths and velocities in the water body in which the barrier is installed
- Installation and anchoring according to manufacturer's recommendations
- Height of barrier 10 percent greater than design water depth
- Specified length of barrier 10 to 20 percent greater than design length

ADVANTAGES / BENEFITS:

- Controls sediment from construction activities where other types of down slope barriers are infeasible
- Protects sensitive wetlands and water bodies
- May be re-used on different projects

DISADVANTAGES / LIMITATIONS:

- Limited usefulness in water bodies with high velocities
- May be damaged by a large storm event
- Barrier can be difficult to remove when under heavy sediment accumulations

MAINTENANCE REQUIREMENTS:

- Inspect regularly
- Repair or replace fabric as needed
- Re-anchor if dislodged

TARGETED POLLUTANTS

- ● Sediment
- ○ Nutrients & Toxic Materials
- ● Oil & Grease
- ● Floatable Materials
- ○ Other Construction Wastes

APPLICATIONS

- **Perimeter Control**
- **Slope Protection**
- **Sediment Barrier**
- **Channel Protection**
- **Temporary Stabilization**
- **Final Stabilization**
- **Waste Management**
- **Housekeeping Practices**

Fe=0.50-0.90
(*Depends on soil type*)

IMPLEMENTATION CONSIDERATIONS

- ● Capital Costs
- ◒ Maintenance
- ○ Training
- ● Suitability for Slopes > 5%

Other Considerations:

- *Conflicts with boat traffic*

3.14.1 Primary Use

Turbidity barriers are used when construction activities will disturb the bank of a perennial stream, river, pond, or lake. They are also used when construction activities require construction of a coffer dam, low water crossing, or other activity that will disturb soil within a water body.

3.14.2 Applications

Turbidity barriers are used on development projects that have a perennial water body within or adjacent to the development. The barrier floats in the water and is anchored at the bottom and/or sides depending on the site conditions. Where construction activities extend down a bank of the water body into the water surface, it is installed along the length of disturbed area and functions as a down slope perimeter control.

The barriers are also used where linear projects cross a water body, development extends into a water body, or temporary coffer dams are installed to facilitate construction. In these applications, the turbidity barrier functions as a sediment trap for soil suspended in the water body by construction activities.

Turbidity barriers are most applicable where special aquatic sites or sensitive receiving waters need to be protected. Examples of these types of waters included wetlands regulated under Section 404 of the Clean Water Act, spring-fed water bodies, water bodies with a Total Maximum Daily Load, construction sites with an effluent limit, and water bodies with species protected under the Federal Endangered Species Act or the State of Texas Threatened and Endangered Species Regulations.

3.14.3 Design Criteria

- Specific design information is required for the use of this control. The designer shall specify the manufacturer, type of turbidity barrier, length, and anchoring mechanism based on the site conditions, range of depths and velocities in the water body, and project duration.
- The type of turbidity barrier must be specified in accordance with the manufacturer's guidance for the depth of water, salinity, velocities, wave height, and project duration.
- If the barrier will be used to contain contaminants in addition to sediment, ensure the barrier's material is compatible with the contaminant of concern.
- Fabrics used to construct the curtain shall be woven and coated for UV protection.
- Fabric minimum grab tensile strength shall be 202 pounds using ASTM D4632 Test Method for Grab Breaking Load and Elongation of Geotextiles for velocities of 0.5 feet per second or less. Higher velocities require an engineer's design, typically provided by the manufacturer.
- The height of the barrier shall be 10 percent greater than the design water depth to ensure the bottom of the barrier rests on the ground.
- The physical length of the barrier as purchased from the manufacturer shall be 10 to 20 percent longer than the design length to reduce stress on the barrier and make installation easier.
- Panel lengths shall be a maximum of 100 feet in water less than 13 feet and 50 feet in water of 13 feet or deeper.
- Minimize the area to be enclosed by the barrier.
- Provide a means to remove captured trash and sediment from behind the turbidity barrier before the barrier is removed, unless the potential for re-suspending the sediment is greater than the benefit of removing it. Removed sediment will be saturated with water. If possible, reserve a space onsite for the sediment to be spread for drying. Otherwise, provide water-tight containers and disposal procedures for the wet sediment.
- Sediment-laden water may be removed from behind the barrier using dewatering procedures discussed in *Section 3.3 Dewatering Controls*.

- Barriers shall be designed at a slant to the direction of flow to decrease pressure on the curtain. Barriers should not be installed perpendicular to flow.
- On large lakes where reversing currents may exist, design the barrier to be anchored on both sides of the curtain.
- On lakes or other bodies of water that may have boat traffic, install a buoy marker on any anchors or anchor lines that extend into the water beyond the visible surface of the turbidity barrier.

3.14.4 Design Guidance and Specifications

No specification for construction of turbidity barriers is currently available in the Standard Specifications for Public Works Construction – North Central Texas Council of Governments.

3.14.5 Inspection and Maintenance Requirements

The turbidity barrier should be inspected regularly (at least as often as required by the TPDES Construction General Permit) for movement or dislodgement of the barrier. Verify that all floats are intact and that anchors are secure. The entire top edge should be visible above the water surface. Re-anchor or re-enforce the anchors if the barrier has moved.

Check for debris that may have floated into the barrier and damaged it. Also look for and remove debris caught in the fabric or sediment collected in pockets of the fabric. The fabric should be free of tears and gaps. Repair and replace fabric where damage has occurred.

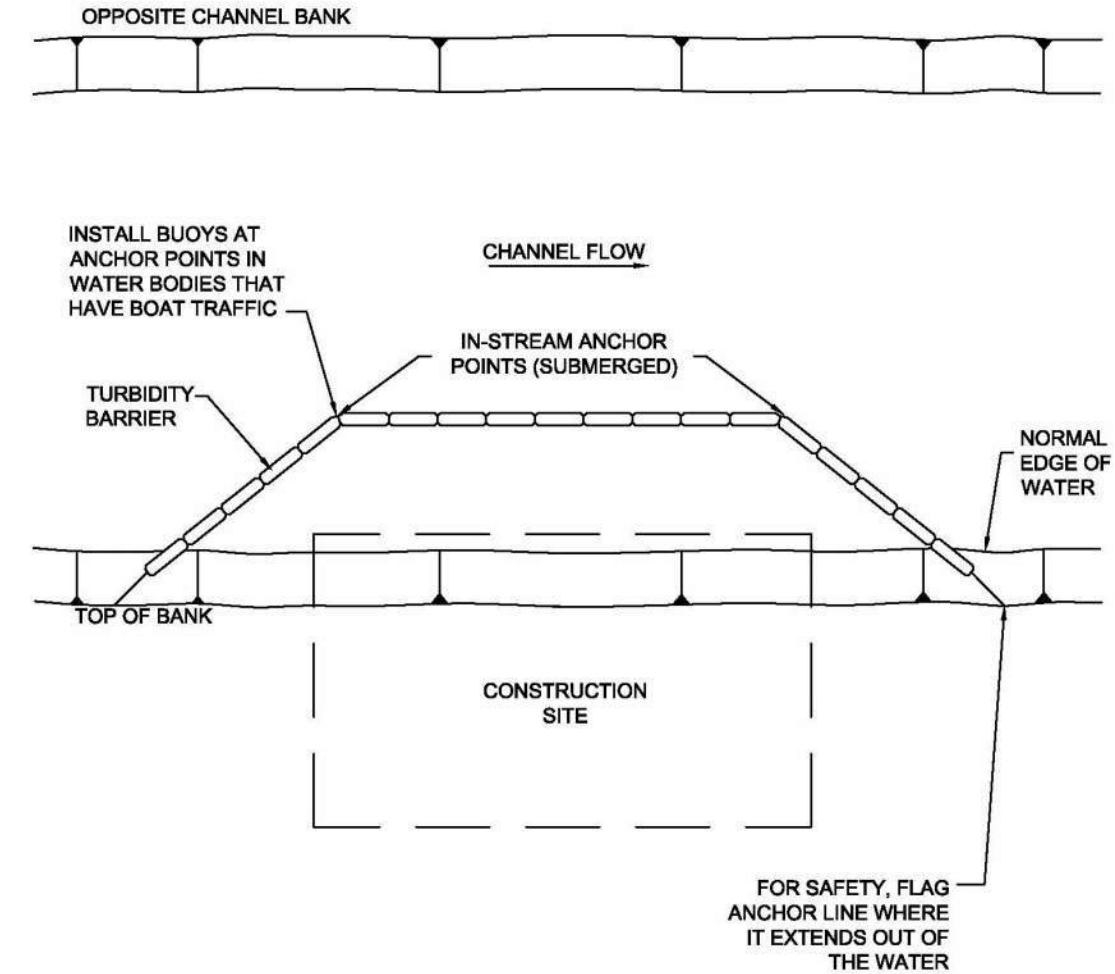
Ensure panel connections are secure and in good condition. Repair any tears in the fabric at the connection points.

Remove sediment from folds and pleats in the barrier when there is evidence of the barrier being pulled down by the weight of the sediment. All sediment accumulated behind the barrier shall be removed from the water before the barrier is removed.

3.14.6 Example Schematics

The following schematics are example applications of the construction control. They are intended to assist in understanding the control's design and function.

The schematics are **not for construction**. They may serve as a starting point for creating a construction detail, but they must be site adapted by the designer. In addition, dimensions and notes appropriate for the application must be added by the designer.



TURBIDITY BARRIER PLAN VIEW
N.T.S.

NOTE: TURBIDITY BARRIER APPLICATIONS WILL VARY WIDELY DEPENDING ON TYPE OF CURTAIN USED AND SITE-SPECIFIC CONDITIONS. ALWAYS FOLLOW THE MANUFACTURER'S RECOMMENDATIONS FOR ANCHORING.

Figure 3.33 Example Application of Turbidity Barrier

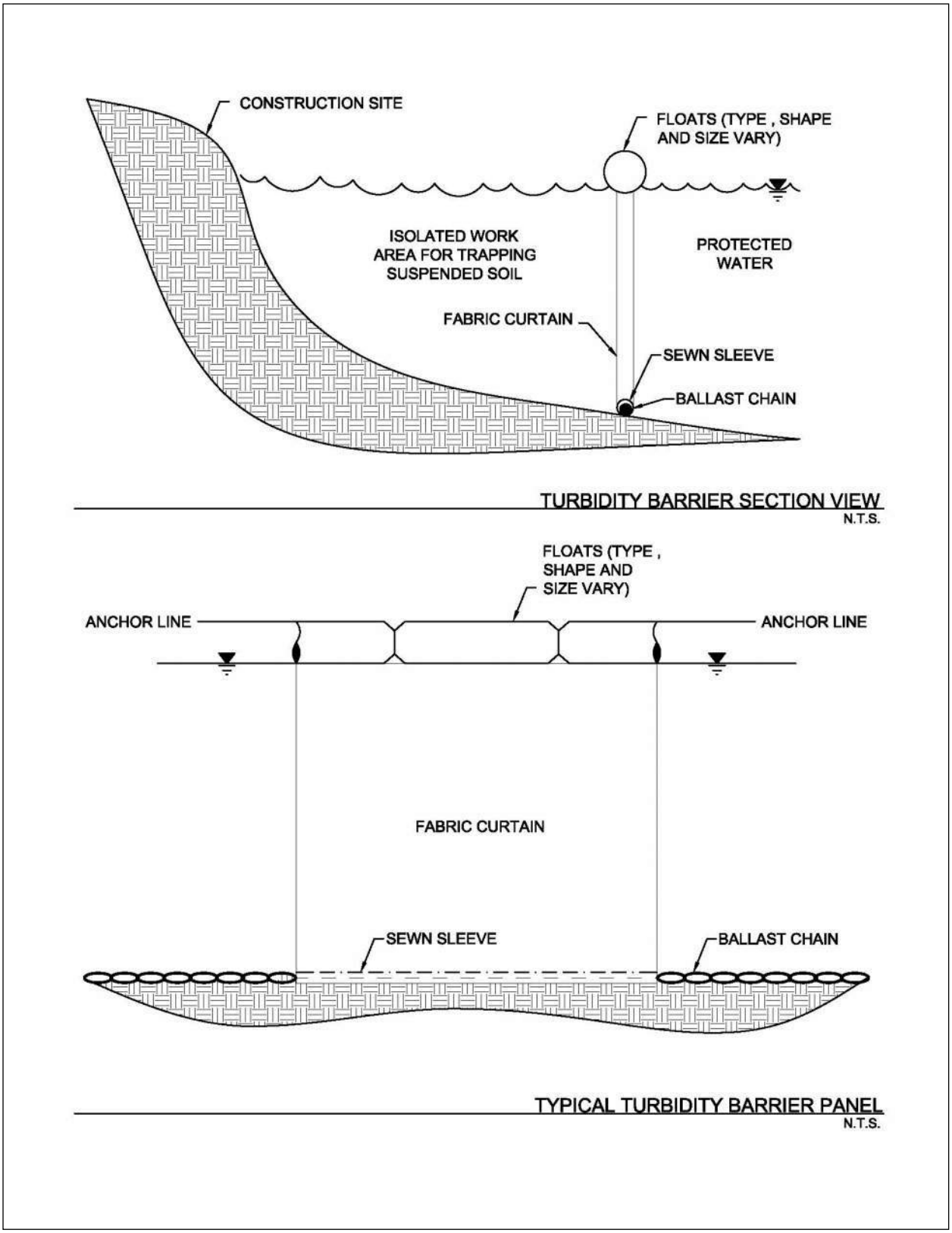
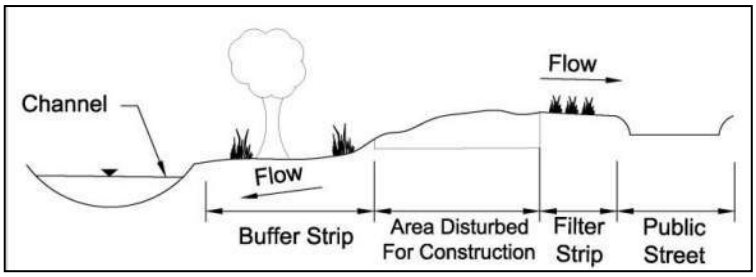


Figure 3.34 Schematics of Turbidity Barrier

3.15 Vegetated Filter Strips and Buffers

Sediment Control



Description: Buffer strips (existing vegetation) and filter strips (planted vegetation) are sections of vegetated land adjacent to disturbed areas. They are designed with low slopes to convey sheet flow runoff from disturbed areas, resulting in the removal of sediment and other pollutants as the runoff passes through vegetation and infiltration occurs.

KEY CONSIDERATIONS

DESIGN CRITERIA:

- Minimum width (direction of flow across the vegetation) dependent on slope of disturbed area
- Maximum ratio of disturbed area to vegetated area dependent on slope
- Existing vegetation must meet criteria for type and coverage
- Dense grass required for planted vegetation
- Demarcate limits of vegetation and protect from traffic

ADVANTAGES / BENEFITS:

- Effective secondary control for removing clay particles
- Disperses flow and slows velocities to decrease erosion potential in receiving water
- Preserves the character of existing riparian corridor
- May become part of the permanent stormwater controls

DISADVANTAGES / LIMITATIONS:

- Appropriate as a primary control only for drainage areas of 2 acres or less and under certain site conditions
- Maximum 150 feet of flow to vegetated strip or buffer is used as a primary control
- Cannot treat large volumes or concentrated flows
- Not effective as a perimeter control when the perimeter cuts across contours instead of following contours
- Must limit access to vegetated portion of the site

MAINTENANCE REQUIREMENTS:

- Inspect regularly
- Rake accumulations of sediment from the vegetation
- Repair bare areas

TARGETED POLLUTANTS

- ● Sediment
- ◒ Nutrients & Toxic Materials
- ○ Oil & Grease
- ○ Floatable Materials
- ○ Other Construction Wastes

APPLICATIONS

Perimeter Control
Slope Protection
Sediment Barrier

Channel Protection

Temporary Stabilization

Final Stabilization

Waste Management

Housekeeping Practices

Fe=0.35-0.85
(*Depends on many conditions in addition to soil type*)

IMPLEMENTATION CONSIDERATIONS

- ◒ Capital Costs
- ○ Maintenance
- ○ Training
- ◒ Suitability for Slopes > 5%

Other Considerations:

- *Coordination with final landscaping*

3.15.1 Primary Use

Vegetated filter strips and buffers are used to reduce the velocity of sheet flow and reduce the volume of runoff through infiltration. In the process, sediment is removed as the runoff is filtered through the vegetation and infiltration occurs.

Vegetated filter strips and buffers are frequently used a secondary sediment control, since their performance is highly variable. They may be used as a primary sediment control only for small areas and under select site conditions.

3.15.2 Applications

Vegetated buffers are most applicable on development projects that are adjacent or near to floodplains, wetlands, streams and other natural waterways. Vegetated strips may be established along roads and property lines as a perimeter control for development. They are also applicable along the down slope side of utility line projects.

Vegetated buffers may be a primary sediment control for small areas where the conditions meet design criteria. They are also commonly used as a secondary control with other perimeter controls to provide higher levels of sediment removal. Vegetated areas have more capability to remove fine particle sizes than many conventional sediment controls. Combinations such as an organic filter tube or silt fence at the upslope edge of a vegetated strip are very effective.

In addition to perimeter control, vegetated strips are applicable for slope protection. Strips may be established at regular intervals to interrupt long or steep slopes. The strips maintain sheet flow, decrease velocities, and decrease erosion on the slopes.

3.15.3 Design Criteria

Vegetated buffers should be preserved along existing floodplains, wetlands, channels, and other natural waters whenever possible, even when the buffer is not a primary sediment control. Check for local requirements, as many municipalities mandate a vegetated buffer to maintain the character of the riparian corridor along a natural waterway. Vegetated buffers are encouraged to protect existing waterways by decreasing velocities, dispersing flow, and attenuating volume before the runoff reaches the waterway. If the development plans necessitate disturbing the riparian corridor, phase the development (when possible) to retain a vegetated buffer until final grading and landscaping at the end construction.

The evaluation and use of vegetated strips and buffers for use as a sediment control are unique to each site. The designer should carefully consider slope, vegetation, soils, depth to impermeable layer, depth to ground water, and runoff sediment characteristics before specifying a vegetated strip or buffer as a primary sediment control. This consideration is especially true for buffer strips of existing vegetation. If the buffer is not correctly planned, the first storm event can damage the natural vegetation beyond repair.

Design criteria in this section are only applicable when a vegetated strip or buffer is intended to be a primary or secondary sediment control for the construction site. As discussed above, a vegetated buffer may be preserved for other reasons that do not necessitate the use of these criteria if other sediment controls are provided for the construction site.

General

- Maximum slope of the vegetated strip or buffer shall be 5% across the width of the vegetation in the direction of flow.
- To maintain sheet flow, maximum distance of flow to the vegetated filter shall be 150 feet.
- Vegetated buffers and strips may only serve as a primary sediment control when the contributing drainage area has a slope of 15% or less. On steeper slopes, another perimeter control (e.g. organic filter tube, silt fence) may be installed at the upslope edge of the vegetated buffer or strip as a primary control, with the vegetation serving as a secondary control.

- Maximum disturbed area contributing runoff to the vegetated strip or buffer shall be 2 acres.
- Vegetated filter strips and buffers shall be a minimum of 15 feet wide. Width shall be increased based on the slope of the disturbed area as shown in the following table. Although the slope of the disturbed area may be up 15%, the slope of the vegetated strip or buffer is still limited to 5% maximum if used as a primary control for sediment.

Table 3.10 Sizing of Vegetated Buffers and Strips

Maximum Slope of Contributing Drainage Area	*Maximum Ratio of Disturbed Area to Vegetated Area*	*Minimum Width of Vegetated Area (Direction of Flow)*
5%	8:1	15 feet
10%	5:1	30 feet
15%	3:1	50 feet

- Access to vegetated buffers and strips shall be prohibited. These areas shall be protected from all traffic. No activities should occur in these areas, including no parking of the workers' vehicles, no eating of lunch, etc.
- Install controlled and stabilized ingress/egress points to manage traffic and direct it away from vegetation. Fence the vegetation or provide other means of protection to prevent vehicles and equipment from driving on the vegetated areas.
- Vegetated buffers and filter strips should not be used when high ground water, shallow depth to bedrock, or low soil permeability will inhibit infiltration of runoff.

Buffers of Existing Vegetation

- Fencing, flagged stakes spaced at a maximum of 6 feet, or other measures shall be used to clearly mark existing vegetation that is being preserved as a buffer before the start of any clearing, grubbing, or grading.
- Existing vegetation must be well established to be used as a vegetated buffer. It may be a mix of trees, sapling/shrubs, vines and herbaceous plants. However, the herbaceous plants shall cover at least 80 percent of the ground area.
- Bare soil shall not be visible within the buffer. Area between herbaceous plants shall be covered with a natural litter of organic matter (e.g. leaves, dead grass).
- Lots with a thick stand of existing grasses may preserve strips of the grasses as perimeter control in addition to using vegetation as a buffer along a natural waterway.

Strips of Planted Vegetation

- Vegetated strips should only be used when the site perimeter is along (parallel to) contours. Erosion of the vegetated strip will be a problem when the strip is placed along roads or site perimeters that cut across contours, resulting in runoff flowing along, instead of across, the filter strip.
- Minimize vehicle and equipment traffic and other activities that could compact soils on areas that will be planted for vegetated strips.
- Sod is required when the strip is intended to immediately function as a sediment control.
- Erosion control blankets (ECBs) should be used to prevent erosion and provide sediment control while establishing vegetation for a filter strip. If ECBs are not used, than another perimeter control is required until the vegetation is mature. Refer to *Section 2.3 Erosion Control Blankets*.
- Refer to the *Section 2.9 Vegetation* for criteria on establishing vegetation.
- When using vegetated strips for slope protection, spacing of the strips should be designed based on

slope steepness and type of soil. The strips may be planted directly on the slope grade when the slope is flatter than 2:1. For slopes of 2:1 and steeper, vegetation should be established on terraces. Terraces shall have a transverse slope of 1 percent in the opposite direction of the slope (i.e. back into the ground).

3.15.4 Design Guidance and Specifications

Guidance for analysis of the hydraulic loading on filter strips is in *Section 13.3 of the Stormwater Controls Technical Manual*.

No specification for vegetated filter strips and buffers is currently available in the Standard Specifications for Public Works Construction – North Central Texas Council of Governments.

3.15.5 Inspection and Maintenance Requirements

Vegetated filter strips and buffers should be inspected regularly (at least as often as required by the TPDES Construction General Permit). If rill erosion is developing, additional controls are needed to spread the flow before it enters the vegetated area. Rake light accumulations of sediment from the vegetation. Remove trash that accumulates in the vegetation. Additional sediment controls (e.g. a line of organic filter tubes or silt fence), are needed if sediment accumulations are large enough to bury the vegetation.

Inspect established planted vegetation for bare areas and place sod or install seeded erosion control blankets, as appropriate. Mow as needed after planted vegetation is mature.

3.15.6 Example Schematics

The following schematics are example applications of the construction control. They are intended to assist in understanding the control's design and function.

The schematics are **not for construction**. They may serve as a starting point for creating a construction detail, but they must be site adapted by the designer. In addition, dimensions and notes appropriate for the application must be added by the designer.

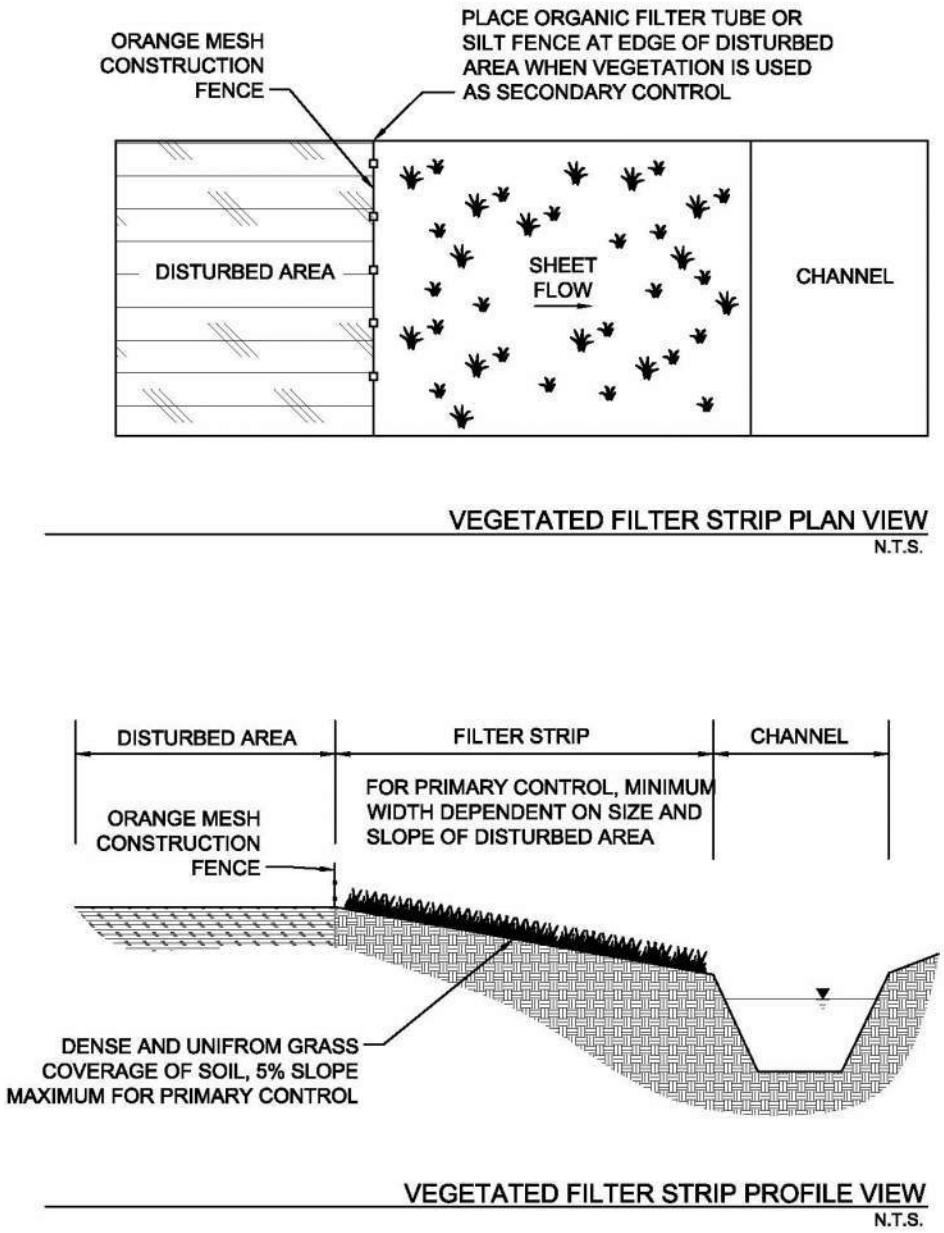
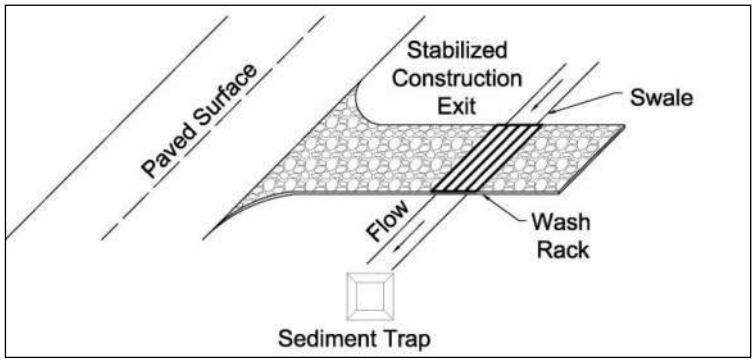


Figure 3.35 Schematics of Vegetated Filter Strip

3.16 Wheel Cleaning Systems

Sediment Control



Description: Wheel cleaning systems are used with a stabilized construction exit to remove soil from vehicle wheels and undercarriages prior to leaving the construction site. The cleaning system may be as simple as uneven, steel racks that "rumble" the vehicle or as complex as a pre-manufactured wash bay. Systems that include wash water must provide for collecting the water and removing sediments and other pollutants prior to discharge.

KEY CONSIDERATIONS

DESIGN CRITERIA:

- Locate within the stabilized construction exit
- Design according to type of soil and the number and size of vehicles using the cleaning system
- Provide a means of collecting wash water and removing sediment before discharge

ADVANTAGES / BENEFITS:

- Effectively reduces off-site sediment tracking
- Components of the system may be re-used on different projects

DISADVANTAGES / LIMITATIONS:

- Requires separate construction entrances and exits
- Requires frequent cleaning to remain functional
- Effectiveness dependent on operator training
- Sediment trapping controls won't remove oils or other pollutants in the wash water
- Potential overflows and discharges of wash water if sediment controls not carefully designed for the maximum amount of wash water to be generated

MAINTENANCE REQUIREMENTS:

- Inspect regularly
- Remove sediment from wheel cleaning device before sediment accumulates to half the depth of the device
- Remove sediment from sediment traps before it reaches a depth of half the design depth or 12 inches, whichever is less
- Dewater and clean wash basins using dewatering controls

TARGETED POLLUTANTS

- ● Sediment
- ○ Nutrients & Toxic Materials
- ○ Oil & Grease
- ○ Floatable Materials
- ○ Other Construction Wastes

APPLICATIONS

Perimeter Control
Slope Protection
Sediment Barrier
Channel Protection
Temporary Stabilization
Final Stabilization
Waste Management
Housekeeping Practices

Fe=N/A

IMPLEMENTATION CONSIDERATIONS

- ● Capital Costs
- ● Maintenance
- ◒ Training
- ○ Suitability for Slopes > 5%

Other Considerations:

- *Management of wash water*
- *Prohibitions on the discharge of soaps and petroleum products*

3.16.1 Primary Use

Wheel cleaning systems are used to remove soil from construction vehicles and equipment before they leave the site and enter paved streets. Wheel cleaning systems are used with a stabilized construction exit to minimize the tracking of soil from disturbed areas. They provide added protection and reduce the need to remove sediment from streets.

3.16.2 Applications

Wheel cleaning systems can be used on any construction site where a stabilized construction exit is not adequate to prevent off-site tracking of soil. However, because of their cost, they are most applicable for:

- Sites with large areas (> 10 acres) that are disturbed for long periods of time;
- Sites with a large number of vehicles and/or heavy equipment entering and exiting the site, which that will quickly and repeatedly degrade rock exits;
- Sites with clay soils or wet site conditions that result in tires accumulating large amounts of soil; or
- Sites where contaminated soils might be present.

3.16.3 Design Criteria

General

- Provide separate entrances and exits to the construction site so that incoming vehicles do not drive through the wheel cleaning system. Signage and employee training is critical to making the system work.
- Wheel cleaning systems should be located within the stabilized construction exit so that the vehicle does not pick up additional sediment load by traversing disturbed areas. A minimum of 25 feet of stabilized exit shall be maintained between the cleaning system and the paved road.
- The stabilized exit shall be sloped at 1 percent toward the cleaning system.
- The width of the stabilized exit may be reduced to 10 to 20 feet, depending on the size and number of vehicles using the exit, as long as all exiting traffic is funneled through the cleaning system.
- Post a sign requiring all vehicles to use the cleaning system before leaving the site. Posted speed limit through the wheel cleaning system should be 5 mph.
- Wheel cleaning systems should be designed with ease of access to areas where sediment will accumulate, so the system can be frequently cleaned.

Rumble Racks

- The minimum cleaning system shall consist of 10 foot wide, 8 foot long, steel grates with individual bars of the grates at varying heights to shake the vehicle and knock off soil. These grates are also known as rumble racks.
- Minimum length of the rumble rack shall be the length of the circumference of the largest tire on vehicles that will be using the construction exit. Two to three lengths of grates are typically necessary to provide adequate soil removal, depending on soil type and size of vehicles.
- Grates shall be placed over an excavated pit that is a minimum of one foot deep.
- Grates may be purchased pre-made from vendors or constructed by welding 10 foot lengths of structural steel tubing (rectangular section) or angle. The lengths of steel (“bars” of the rumble rack) should be welded to steel beams or other cross supports in a manner that provides for alternating heights. This is accomplished with rectangular steel tube by alternating the long and short sides of

the tube upward. Angle iron, welded to the support structure with the angle pointed upward, may also be used. Round tubing shall not be used, as it does not adequately shake the tires.

- Size and spacing of bars and support beams shall be designed based on the size and weight of vehicles expected to be using the rumble rack.
- Welded or manufactured grates may be cleaned and re-used on multiple projects.

Wheel Washes

- Two common types of wheel wash systems constructed onsite are the corrugated metal wheel wash and the flooded basin wheel wash. In addition, several companies manufacture packaged wash systems that can be assembled onsite and re-used. All of these require a source of water, and several of the packaged systems require electricity to run pumps for water pressure.
- All wheel washes must provide a means to collect the wash water in a sediment basin or other sediment control that provides equivalent or better treatment prior to discharge from the site.
- For the flooded basin wheel wash, sedimentation occurs in the wash basin, meaning the basin cannot be used for a period of time while settling is allowed to occur. Cleaning of the basin should be done first thing in the morning after particles have settled overnight, and ideally the basin would be cleaned on Monday after settling all weekend. If the basin is pumped for cleaning, it should be accomplished using the controls in *Section 3.3 Dewatering Controls*.
- Corrugated metal wheel washes shall be constructed over a drainage swale that conveys the wash water to a sediment barrier, typically a sediment basin. However, a passive or active treatment system may be needed to adequately remove suspended solids depending on the permit requirements for the site.
- Swales, sediment basins, stone outlet sediment traps, and other controls for the wash water must be sized for the anticipated flows from the wheel wash using criteria in their respective sections of this manual. Depending on the volume of water, two sediment controls may be needed in parallel, to allow for settling and cleaning of one sediment control while the other is in operation for the wheel wash.
- Manufactured wash systems frequently collect, filter, and recycle the wash water, resulting in the use of less water and producing less wash water to treat for sediment removal. For this reason, they may be more cost-effective over the life of the project, even if their initial cost is higher.
- If a packaged wheel wash system does not include a sediment collection area, then a swale and sediment trap is required, similar to the corrugated metal wheel wash.
- Prohibit the use of soap for wheel washing. The purpose of a wheel wash is to remove soil that would otherwise fall off on the roadway, not to clean the vehicle. Refer to *Section 4.10 Vehicle and Equipment Management* for proper vehicle washing procedures. The discharge of wash water with soap in it is prohibited, and soap is not removed by a sediment control.
- Train employees to only use water in the wheel wash for removing accumulations of soil from the wheels and undercarriage. Minimize water contact with other portions of the vehicle or equipment. Wash water contaminated with oil, grease or fuel requires special handling and disposal. Refer to *Section 4.10 Vehicle and Equipment Management*.

3.16.4 Design Guidance and Specifications

No specification for construction of this item is currently available in the Standard Specifications for Public Works Construction – North Central Texas Council of Governments.

3.16.5 Inspection and Maintenance Requirements

Wheel cleaning systems should be inspected regularly (at least as often as required by the TPDES Construction General Permit). Systems should be cleaned frequently, at least weekly and sometimes daily, to ensure proper operation. Grated systems should be cleaned before sediment accumulates to half the depth of the pit below the grates. Depending on volume of traffic, flooded basin systems often needed daily pumping, cleaning and refilling to be effective.

The sediment basin or other sediment trapping device shall be inspected for damaged areas and repaired as necessary. Sediment that has accumulated in the wash water sediment control (must be removed before it reaches half the design depth of the device or 12 inches, whichever is less. The removed sediment shall be stockpiled or redistributed to areas of the site that are protected by erosion and sediment controls.

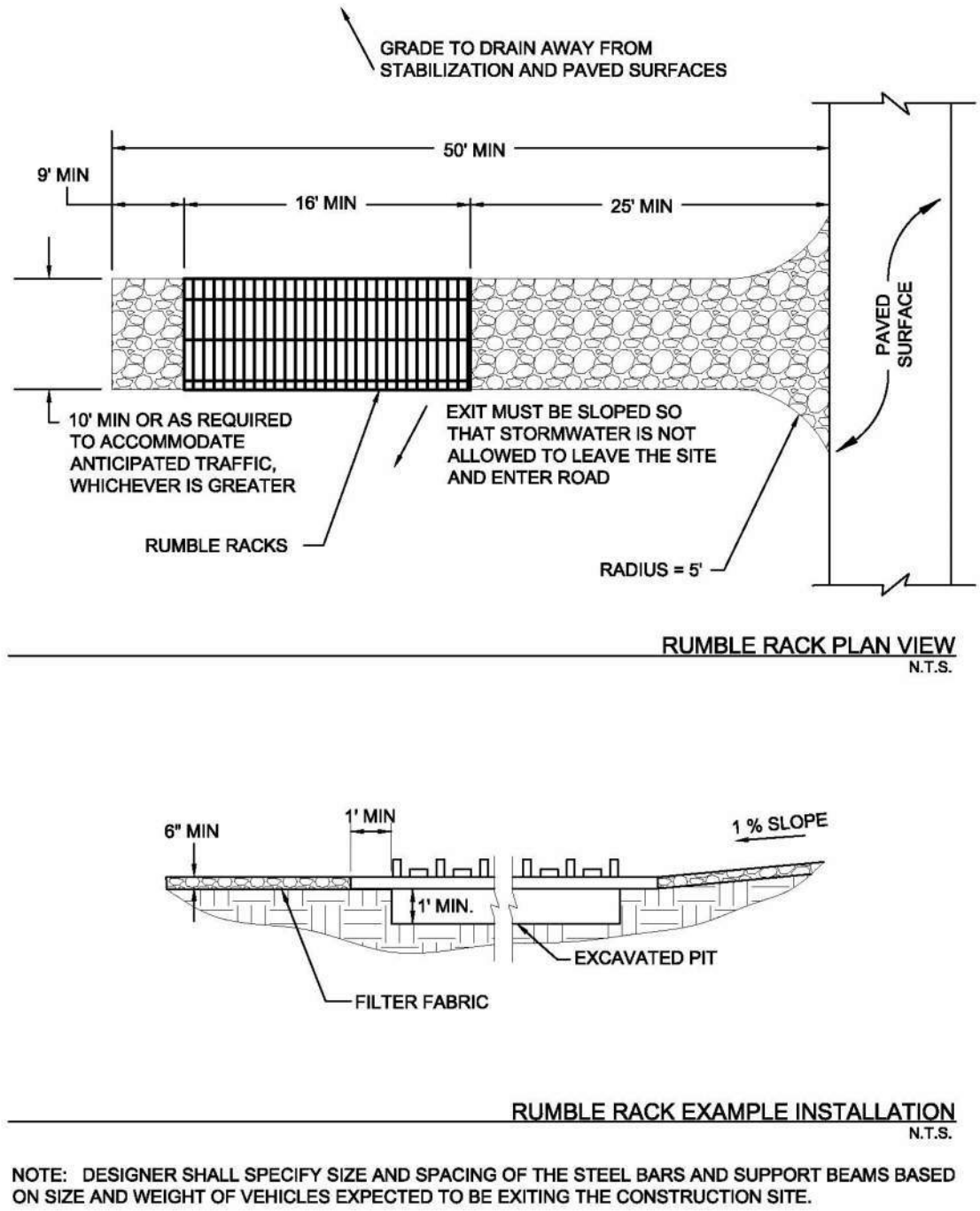
Water that ponds in the sediment basin should be inspected for sheen. If sheen is present, the water is considered contaminated by a petroleum product. Regulations of the TCEQ require this water to be pumped into containers and disposed of appropriately. It is not an authorized discharge from the construction site. Proper vehicle and equipment maintenance is essential to preventing this problem from occurring.

Manufacturer's recommendations should be followed for cleaning and maintaining packaged wheel wash systems.

3.16.6 Example Schematics

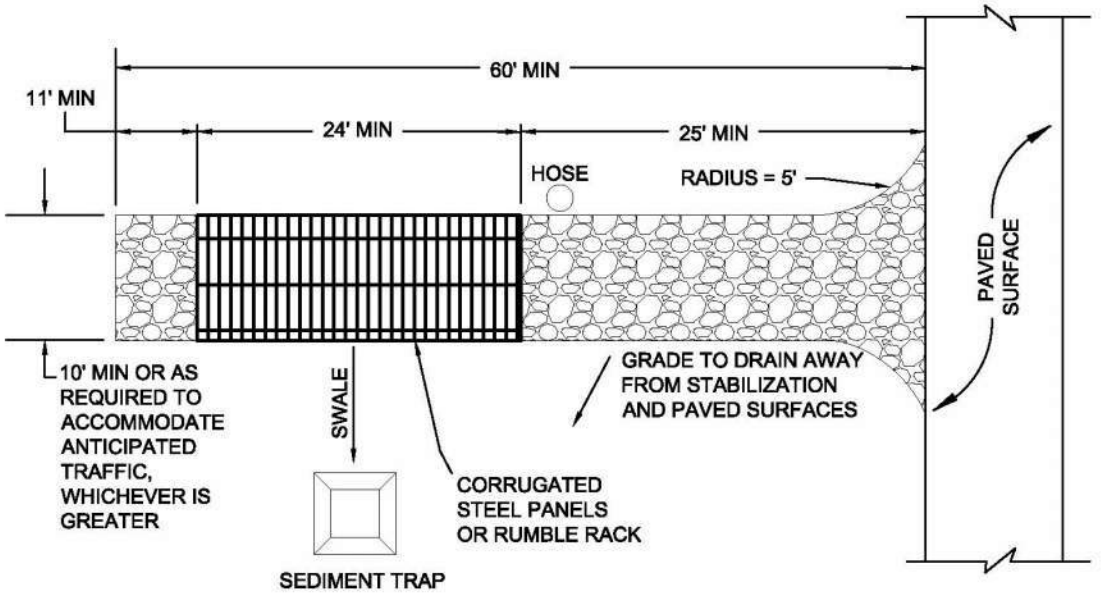
The following schematics are example applications of the construction control. They are intended to assist in understanding the control's design and function.

The schematics are **not for construction**. They may serve as a starting point for creating a construction detail, but they must be site adapted by the designer. In addition, dimensions and notes appropriate for the application must be added by the designer.

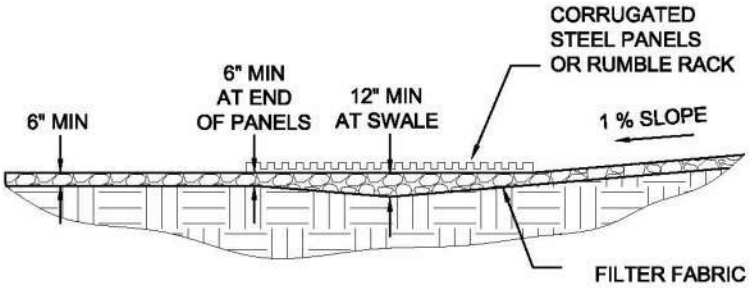


NOTE: DESIGNER SHALL SPECIFY SIZE AND SPACING OF THE STEEL BARS AND SUPPORT BEAMS BASED ON SIZE AND WEIGHT OF VEHICLES EXPECTED TO BE EXITING THE CONSTRUCTION SITE.

Figure 3.36 Schematics of Rumble Rack Wheel Cleaning



CORRUGATED METAL WHEEL WASH PLAN VIEW
N.T.S.

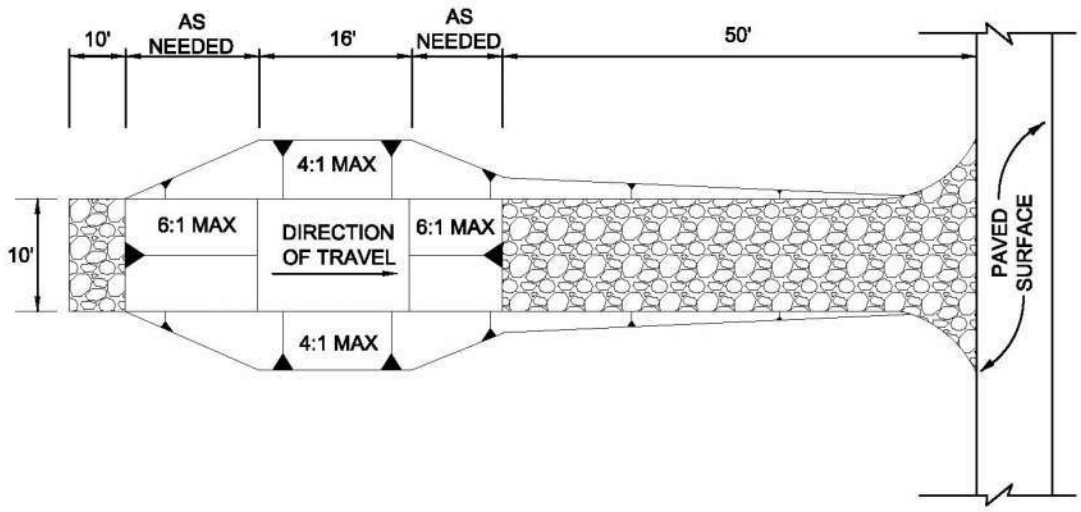


TYPICAL CORRUGATED METAL WHEEL WASH SECTION
N.T.S.

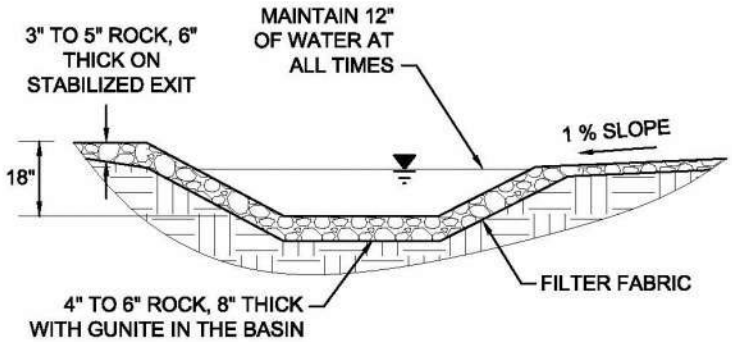
NOTE: PROVIDE CALCULATIONS THAT DOCUMENT THE FOLLOWING PARAMETERS USED FOR THE DESIGN.

- NUMBER AND TYPE OF VEHICLES USING THE SYSTEM DAILY
- SOURCE OF WASH WATER
- VOLUME OF WASTE WASH WATER GENERATED DAILY
- SIZE AND TYPE OF SEDIMENT TRAP
- DESIGN PARAMETERS FOR THE SWALE
- PARAMETERS REQUIRED FOR DESIGN OF THE SEDIMENT TRAP
- ESTIMATE OF WHEEL WASH DOWN-TIME FOR CLEANING THE SEDIMENT TRAP

Figure 3.37 Schematics of Corrugated Metal Wheel Wash
(Source: Modified from California Stormwater Quality Association BMP Handbook BMP Detail TC-1)



FLOODED BASIN WHEEL WASH PLAN VIEW
N.T.S.



TYPICAL FLOODED BASIN WHEEL WASH SECTION
N.T.S.

NOTE: CONSTRUCTION DRAWINGS SHALL INCLUDE NOTES ON THE SOURCE OF WATER AND PROPER DEWATERING METHODS.

Figure 3.38 Schematics of Flooded Basin Wheel Wash
(Source: Modified from Oregon Department of Environmental Quality Erosion and Control Sediment Manual Detail SC-11)

4.0 Material and Waste Controls

4.1 Chemical Management

Material and Waste Control

Description: Chemical management addresses the potential for stormwater to be polluted with chemical materials and wastes that are used or stored on a construction site. The objective of chemical management is to minimize the potential of stormwater contamination by construction chemicals through appropriate recognition, handling, storage, and disposal practices.

KEY CONSIDERATIONS

DESIGN CRITERIA:

- Designate a person responsible for chemical management
- Minimize the amount of chemicals and waste stored onsite
- Provide secondary containment that's 110 percent of the largest container in the containment
- Label all containers
- Prohibit the discharge of washout water
- Train workers in proper procedures
- Provide timely removal of waste materials

LIMITATIONS:

- Not intended to address site-assessment and pre-existing contamination
- Does not address demolition activities and potential pre-existing materials, such as lead and asbestos
- Does not address contaminated soils
- Does not address spill and leak response procedures
- Does not address chemicals associated with vehicle and equipment management

MAINTENANCE REQUIREMENTS:

- Inspect regularly
- Check for proper storage and evidence of leaks and spills
- Make sure all containers are labeled
- Check waste containers and dispose of the waste when 90 percent full
- Verify procedures are being followed
- Train new employees and regularly re-train all employees

TARGETED POLLUTANTS

○ Sediment

● Nutrients & Toxic Materials

● Oil & Grease

○ Floatable Materials

● Other Construction Wastes

APPLICATIONS

Perimeter Control

Slope Protection

Sediment Barrier

Channel Protection

Temporary Stabilization

Final Stabilization

Waste Management

Housekeeping Practices

IMPLEMENTATION CONSIDERATIONS

◒ Capital Costs

◒ Maintenance

● Training

○ Suitability for Slopes > 5%

Other Considerations:

- *TCEQ regulations for hazardous waste*

4.1.1 Primary Use

These management practices, along with applicable OSHA, EPA, and TCEQ requirements, are implemented at construction sites to prevent chemicals, hazardous materials, and their wastes from becoming stormwater pollutants.

4.1.2 Applications

Chemical management is applicable on all construction sites where chemicals and hazardous materials are stored or used and could result in pollutants being discharged with stormwater. Many chemicals, such as paints, grease, concrete curing compounds, and pesticide are present at most construction sites. Chemical management is most effective when used in conjunction with controls in *Section 4.8 Spill and Leak Response Procedures*.

Management of vehicle and equipment maintenance chemicals is applicable to all construction activities. These chemicals are the most common ones on construction sites; plus, there are specific stormwater permit requirements for vehicle and equipment maintenance. For these reasons, the management of chemicals associated with vehicles and equipment are found in *Section 4.10 Vehicle and Equipment Maintenance*.

Chemical management techniques are based on proper recognition, handling, and disposal practices by construction workers and supervisors. Key elements are education and modification of workers' behavior and provisions for safe storage and disposal. Cooperation and vigilance is required on the part of supervisors and workers to ensure that the procedures are followed.

The following list (not all inclusive) gives examples of targeted chemicals:

- Paints
- Solvents
- Stains
- Wood preservatives
- Cutting oils
- Greases
- Roofing tar
- Pesticides, herbicides, & fertilizers
- Concrete curing compound

It is not the intent of chemical management to supersede or replace normal site assessment and remediation procedures. Significant spills and/or contamination warrant immediate response by trained professionals. Chemical management shall be applied in combination with criteria in *Section 4.8 Spill and Leak Response Procedures*.

4.1.3 Design Criteria

- Construction plan notes shall require controls for all chemicals, hazardous materials, and their wastes that are potentially exposed to precipitation or stormwater runoff.
- Show the location of chemical and hazardous waste storage and secondary containment on the drawings, or require the contractor to add this information.
- The contractor should be required to designate a site superintendent, foreman, safety officer, or other senior person who is onsite daily to be responsible for implementing chemical management.
- Specify use of the least hazardous chemical to perform a task when alternatives are available. To the extent possible, do not use chemicals that are classified as hazardous materials or that will generate

a hazardous waste. A hazardous material is any compound, mixture, solution, or substance containing a chemical listed on the EPA's *Consolidated List of Chemicals Subject to the Emergency Planning and Community Right-to-Know Act (EPCRA) and Section 112(r) of the Clean Air Act* (EPA 550-B-01-003, October 2001), available at:

http://www.epa.gov/ceppo/pubs/title3.pdf

Chemical and Hazardous Material Storage

- As much as possible, minimize the exposure of building materials, building products, landscape materials, fertilizers, pesticides, herbicides, detergents, and other materials to precipitation and stormwater runoff.
- Chemicals and hazardous materials shall be stored in their original, manufacturers' containers, inside a shelter that prevents contact with rainfall and runoff.
- The amount of chemicals and hazardous materials stored onsite shall be minimized and limited to the materials necessary for the current phase of construction.
- Material Safety and Data Sheets (MSDSs) shall be available for all chemicals used or stored onsite.
- Chemical and hazardous materials shall be stored a minimum of 50 feet away from inlets, swales, drainage ways, channels, and other waters, if the site configuration provides sufficient space to do so. In no case shall material and waste sources be closer than 20 feet from inlets, swales, drainage ways, channels, and other waters.
- Use secondary containment controls for all hazardous materials. Containment shall be a minimum size of 110 percent of the largest chemical container stored within the containment.
- If an earthen pit or berm is used for secondary containment, it shall be lined with plastic or other material that is compatible with the chemical being stored.
- Chemical and hazardous material storage shall be in accordance with Federal and State of Texas regulations and with the municipality's fire codes.
- Storage locations shall have appropriate placards for emergency responders.
- Containers shall be kept closed except when materials are added or removed.
- Chemicals shall be dispensed using drip pans or within a lined, bermed area or using other spill/overflow protection measures.

Washout Procedures

- Many chemicals (e.g. stucco, paint, form release oils, curing compounds) used during construction may require washing of applicators or containers after use. The discharge of this wash water is prohibited.
- Wash water shall be collected in containers, labeled, and classified for correct waste disposal.
- A licensed waste hauler shall be used for wash water.

Chemical and Hazardous Waste Handling

- Ensure that adequate waste storage volume is available.
- Ensure that waste collection containers are conveniently located and compatible with the waste chemicals.
- Waste containers shall have lids and be emptied or hauled for disposal when they are 90 percent full or more frequently.
- Segregate potentially hazardous waste from non-hazardous construction waste and debris.

- Do not mix different chemical wastes. First, dangerous reactions may result. Second, all of the waste will be classified as the most hazardous waste in the container and will increase disposal costs.
- Clearly label all chemical and hazardous waste containers to identify which wastes are to be placed in each container.
- Based on information in the Material Safety Data Sheet, ensure that proper spill containment material is available onsite and maintained near the storage area.
- Do not allow potentially hazardous waste to be stored on the site for more than 90 days.
- Enforce hazardous waste handling and disposal procedures.

Disposal Procedures

- Regularly schedule waste removal to minimize onsite storage.
- Use only licensed waste haulers.
- For special and hazardous wastes, use licensed hazardous waste transporter that can classify, manifest and transport the special or hazardous wastes for disposal.
- Where possible, send wastes such as used oil to a recycler instead of a disposal facility.
- No chemical waste shall be buried, burned or otherwise disposed of onsite.

Education

- Instruct workers on safe chemical storage and disposal procedures.
- Instruct workers in identification of chemical pollutants and proper methods to contain them during storage and use.
- Educate workers of potential dangers to humans and the environment from chemical pollutants.
- Educate all workers on chemical storage and disposal procedures.
- Have regular meetings to discuss and reinforce identification, handling and disposal procedures (incorporate in regular safety seminars).
- Establish a program to train new employees.

Quality Control

- Designated personnel shall monitor onsite chemical storage, use, and disposal procedures.
- Educate and if necessary, discipline workers who violate procedures.
- Retain trip reports and manifests that document the recycling or disposal location for all chemical, special, and hazardous wastes that all hauled from the site.

4.1.4 Design Guidance and Specifications

National guidance for response procedures are established by the Environmental Protection Agency (EPA) in the Code of Federal Regulations (CFR). Specific sections addressing spills are governed by:

- 40 CFR Part 261 Identification and Listing of Hazardous Waste.
- 40 CFR Part 262 Standards Applicable to Generators of Hazardous Waste.
- 40 CFR Part 263 Standards Applicable to Transporters of Hazardous Waste.
- 49 CFR Parts 171-178 of the Transportation Hazardous Materials Regulations.

Guidance for storing, labeling, and managing hazardous waste in the State of Texas are established by the Texas Commission on Environmental Quality (TCEQ) in the Texas Administrative Code Title 30, Chapter 335, Industrial Solid Waste and Municipal Hazardous Waste.

No specification for chemical management measures is currently available in the Standard Specifications for Public Works Construction – North Central Texas Council of Governments.

4.1.5 Inspection and Maintenance Requirements

Chemical management measures should be inspected regularly (at least as often as required by the TPDES Construction General Permit) for proper storage and evidence of leaks or spills. Check that all chemicals, hazardous materials, and wastes are properly stored and labeled. If not stored properly, take corrective action, and reinforce procedures through re-education of employees.

If leaks or spills have occurred, check that proper clean up and reporting procedures have been followed. If procedures have not been followed, take corrective action. Check that all employees have been trained in spill and leak procedures as detailed in *Section 4.8 Spill and Leak Response Procedure*.

4.2 Concrete Sawcutting Waste Management

Waste Control

Description: Sawcutting of concrete pavement is a routine practice used to control shrinkage cracking immediately following placement of plastic concrete. It is also used to remove curb sections and pavement sections for pavement repairs, utility trenches, and driveways. Sawcutting for joints involves sawing a narrow, shallow grove in the concrete, while sawcutting for removals is usually done full depth through the slab. Water is used to control saw blade temperature and to flush the detritus from the sawed groove. The objective of concrete sawcutting waste management is to prevent the resulting slurry of process water and fine particles with its high pH from becoming a water pollutant.

KEY CONSIDERATIONS

DESIGN CRITERIA:

- Prohibit discharge of untreated slurry
- Educate employees on proper procedures
- Continuously vacuum slurry and cuttings during sawcutting operation
- Block inlets to prevent discharges
- Establish an onsite containment area (minimum 1 ft freeboard) if immediate disposal of the vacuumed slurry is not feasible
- Water evaporation and concrete recycling are the recommended disposal methods when slurry is not vacuumed

LIMITATIONS:

- Only one part of concrete waste management
- Does not address concrete demolition waste

MAINTENANCE REQUIREMENTS:

- Check for uncollected slurry after all sawcutting operations
- Inspect collection areas and repair containment as needed
- Dispose of sediment and cuttings when collection area volume is reduced by 50 percent
- Train new employees and regularly re-train all employees

TARGETED POLLUTANTS

○ Sediment

● Nutrients & Toxic Materials

○ Oil & Grease

○ Floatable Materials

● Other Construction Wastes

APPLICATIONS

Perimeter Control

Slope Protection

Sediment Barrier

Channel Protection

Temporary Stabilization

Final Stabilization

Waste Management

Housekeeping Practices

IMPLEMENTATION CONSIDERATIONS

○ Capital Costs

◒ Maintenance

● Training

○ Suitability for Slopes > 5%

Other Considerations:

- *Coordinate with concrete waste management*

4.2.1 Primary Use

Pavement sawcutting is performed on almost all construction projects that include removal or installation of pavement. Properly managing the slurry and cuttings from sawcutting prevents them from affecting surface and ground water resources.

4.2.2 Applications

Concrete sawcutting waste management is applicable on construction activities where sawcutting is part of the work, regardless of the size of the total area disturbed. It is also applicable on repair and maintenance projects that may not be required to implement erosion and sediment controls.

Concrete sawcutting waste management is based on the proper collection and disposal of the slurry and cuttings. Employee education is critical to ensuring correct procedures are followed.

4.2.3 Design Criteria

- Construction plan notes shall include proper concrete sawcutting waste management procedures.
- The contractor should be required to designate the site superintendent, foreman, or other person who is responsible for concrete sawcutting to also be responsible for concrete sawcutting waste management.

Slurry Collection

- During sawcutting operations, the slurry and cuttings shall be continuously vacuumed or otherwise recovered and not be allowed to discharge from the site.
- If the pavement to be cut is near a storm drain inlet, the inlet shall be blocked by sandbags or equivalent temporary measures to prevent the slurry from entering the inlet. Remove the sandbags immediately after completing sawcutting operations, so they do not cause drainage problems during storm events.
- The slurry and cuttings shall not be allowed to remain on the pavement to dry out.

Slurry Disposal

- Develop pre-determined, safe slurry disposal areas.
- Collected slurry and cuttings should be immediately hauled from the site for disposal at a waste facility. If this is not possible, the slurry and cuttings shall be discharged into onsite containment.
- The onsite containment may be an excavated or bermed pit lined with plastic that is a minimum of 10 millimeters thick. Refer to *Section 4.3 Concrete Waste Management* for additional design criteria and an example schematic. If the project includes placement of new concrete, slurry from sawcutting may be disposed of in facilities designated for the washout of concrete trucks instead constructing a separate containment.
- The containment shall be located a minimum of 50 feet away from inlets, swales, drainage ways, channels, and other waters, if the site configuration provides sufficient space to do so. In no case shall the collection area be closer than 20 feet from inlets, swales, drainage ways, channels and other waters.
- Several, portable, pre-fabricated, concrete washout, collection basins are commercially available and are an acceptable alternative to an onsite containment pit.
- Remove waste concrete when the containment is half full. Always maintain a minimum of one foot freeboard.

- Onsite evaporation of slurry water and recycling of the concrete waste is the preferred disposal method. When this is not feasible, discharge from the collection area shall only be allowed if a passive treatment system is used to remove the fines. Criteria are in *Section 3.7 Passive Treatment System*. Mechanical mixing is required in the collection area. The pH must be tested, and discharge is allowed only if the pH does not exceed 8.0. The pH may be lowered by adding sulfuric acid to the slurry water. Dewatering of the collection area after treatment shall follow the criteria in *Section 3.3 Dewatering Controls*.
- Care shall be exercised when treating the slurry water for discharge. Monitoring must be implemented to verify that discharges from the collection area do not violate groundwater or surface water quality standards.
- Geotextile fabrics such as those used for silt fence should not be used to control sawcutting waste, since the grain size is significantly smaller than the apparent opening size of the fabric.
- Use waste and recycling haulers and facilities approved by the local municipality.

Education

- Supervisors must be made aware of the potential environmental consequences of improperly handling sawcutting slurry and waste.
- Train all workers performing sawcutting operations on the proper slurry and cuttings collection and disposal procedures.

4.2.4 Design Guidance and Specifications

No specification for concrete sawcutting waste management is currently available in the Standard Specifications for Public Works Construction – North Central Texas Council of Governments.

4.2.5 Inspection and Maintenance Requirements

Concrete sawcutting waste management measures should be inspected regularly (at least as often as required by the TPDES Construction General Permit). Project personnel should inspect the operations to assure that operators are diligent in controlling the water produced by the sawcutting activities. Pavement should be inspected each day after operations to ensure that waste removal has been adequately performed. Residual waste should be cleaned. Reinforce proper procedures with workers.

Inspect the collection area for signs of unauthorized discharges. Repair containment area as needed. Remove sediment and fines when the collection area volume is reduced by 50 percent.

4.3 Concrete Waste Management

Waste Control

Description: Concrete waste at construction sites comes in two forms: 1) excess fresh concrete mix, including residual mix washed from trucks and equipment, and 2) concrete dust and concrete debris resulting from demolition. Both forms have the potential to impact water quality through stormwater runoff contact with the waste. The objective of concrete waste management is to dispose of these wastes in a manner that protects surface and ground water.

KEY CONSIDERATIONS

DESIGN CRITERIA:

- Prohibit the discharge of untreated concrete washout water
- Prohibit dumping waste concrete anywhere except at pre-determined, regulated, recycling or disposal sites
- Provide a washout containment with a minimum of 6 cubic feet of containment volume for every 10 cubic yards of concrete placed
- Minimum 1 foot freeboard on containment
- Minimum 10 mil plastic lining of containment
- Washout water evaporation and concrete recycling are the recommended disposal methods
- Educate drivers and operators on proper disposal and equipment cleaning procedures

LIMITATIONS:

- Does not address concrete sawcutting waste

MAINTENANCE REQUIREMENTS:

- Inspect regularly
- Check for and repair any damage to washout containment areas
- Clean up any overflow of washout pits
- Regularly remove and properly dispose of concrete waste

TARGETED POLLUTANTS

○ Sediment

● Nutrients & Toxic Materials

○ Oil & Grease

○ Floatable Materials

● Other Construction Wastes

APPLICATIONS

Perimeter Control

Slope Protection

Sediment Barrier

Channel Protection

Temporary Stabilization

Final Stabilization

Waste Management

Housekeeping Practices

IMPLEMENTATION CONSIDERATIONS

◒ Capital Costs

◒ Maintenance

● Training

○ Suitability for Slopes > 5%

Other Considerations:

- *None*

4.3.1 Primary Use

Concrete waste management is used to prevent the discharge of concrete wash water and waste into stormwater runoff. A number of water quality parameters can be affected by the introduction of concrete, especially fresh concrete. Concrete affects the pH of runoff, causing significant chemical changes in water bodies and harming aquatic life. Suspended solids in the form of both cement and aggregated dust are also generated from both fresh and demolished concrete waste.

4.3.2 Applications

Concrete waste management is applicable to all construction sites where existing concrete is being demolished or new concrete is being placed, regardless of the size of the total area disturbed. It is also applicable on repair and maintenance projects that may not be required to implement erosion and sediment controls.

4.3.3 Design Criteria

- The discharge of washout water to an inlet, swale, or any portion of the storm drainage system or a natural drainage system (e.g. channel) shall be prohibited.
- Construction plan notes shall state that the discharge of concrete washout to anything except a designated containment area is prohibited.
- Show the location of the concrete washout containment on the drawings, or require the contractor to provide this information.
- The contractor should be required to designate the site superintendent, foreman, or other person who is responsible for concrete placement to also be responsible for concrete waste management.

Unacceptable Waste Concrete Disposal Practices

- Dumping in vacant areas on the job-site.
- Illicit dumping onto off-site lots or any other placed not permitted to receive construction demoliotion debris.
- Dumping into ditches, drainage facilities, or natural water ways.
- Using concrete waste as fill material or bank stabilization.

Recommended Disposal Procedures

- Identify pre-determined, regulated, facilities for disposal of solid concrete waste. Whenever possible, haul the concrete waste to a recycling facility. Disposal facilities must have a Class IV (or more stringent) municipal solid waste permit from the TCEQ.
- A concrete washout pit or other containment shall be installed a minimum of 50 feet away from inlets, swales, drainage ways, channels, and other waters, if the site configuration provides sufficient space to do so. In no case shall concrete washout occur closer than 20 feet from inlets, swales, drainage ways, channels and other waters.
- Provide a washout area with a minimum of 6 cubic feet of containment volume for every 10 cubic yards of concrete poured. Alternatively, the designer may provide calculations sizing the containment based on the number of concrete trucks and pumps to be washed out.
- The containment shall be lined with plastic (minimum 10 millimeters thick) or an equivalent measure to prevent seepage to groundwater.
- Mosquitoes do not typically breed in the high pH of concrete washout water. However, the concrete washout containment should be managed in a manner that prevents the collection of other water that could be a potential breeding habitat.

  - Do not excavate the washout area until the day before the start of concrete placement to minimize the potential for collecting stormwater.
  - Do not discharge any water or wastewater into the containment except for concrete washout to prevent dilution of the high pH environment that is hostile to mosquitoes.
  - Remove the waste concrete and grade the containment closed within a week of completing concrete placement. Do not leave it open to collect stormwater.
  - If water must be pumped from the containment, it shall be collected in a tank, neutralized to lower the pH, and then hauled to a treatment facility for disposal. Alternatively, it may be hauled to a batch plant that has an onsite collection facility for concrete washout water.
  - Do **not** pump water directly from the containment to the Municipal Separate Storm Sewer System or a natural drainage way without treating for removal of fine particles and neutralization of the pH.
- Multiple concrete washout areas may be needed for larger projects to allow for drying time and proper disposal of the washout water and waste concrete.
- Portable, pre-fabricated, concrete washout containers are commercially available and are an acceptable alternative to excavating a washout area.
- Evaporation of the washout water and recycling of the concrete waste is the preferred disposal method. After the water has evaporated from the washout containment, the remaining cuttings and fine sediment shall be hauled from the site to a concrete recycling facility or a solid waste disposal facility.
- Remove waste concrete when the washout containment is half full. Always maintain a minimum of one foot freeboard.
- Use waste and recycling haulers and facilities approved by the local municipality.
- When evaporation of the washout water is not feasible, discharge from the collection area shall only be allowed if a passive treatment system is used to remove the fines. Criteria are in *Section 3.7 Passive Treatment System*. Mechanical mixing is required within the containment for passive treatment to be effective. The pH must be tested, and discharge is allowed only if the pH does not exceed 8.0. The pH may be lowered by adding sulfuric acid to the water. Dewatering of the collection area after treatment shall follow the criteria in *Section 3.3 Dewatering Controls*.
- Care shall be exercised when treating the concrete washout water for discharge. Monitoring must be implemented to verify that discharges do not violate groundwater or surface water quality standards.
- On large projects that are using a nearby batch plant, a washout facility associated with the plant and under the plant's TPDES Multi-Sector General Permit may be used instead of installing an onsite containment area for truck washout.

Education

- Drivers and equipment operators should be instructed on proper disposal and equipment washing practices (see above).
- Supervisors must be made aware of the potential environmental consequences of improperly handled concrete waste.

Enforcement

- The construction site manager or foreman must ensure that employees and pre-mix companies follow proper procedures for concrete disposal and equipment washing.
- Employees violating disposal or equipment cleaning directives must be re-educated or disciplined if necessary.

Demolition Practices

- Monitor weather and wind direction to ensure concrete dust is not entering drainage structures and surface waters.
- Spray water on structures being demolished to wet them before start of demolition operations. Reapply water whenever dust is observed.
- Construct sediment traps or other types of sediment detention devices downstream of demolition activities to capture and treat runoff from demolition wetting operations.

4.3.4 Design Guidance and Specifications

No specification for concrete waste management is currently available in the Standard Specifications for Public Works – North Central Texas Council of Governemtns.

4.3.5 Inspection and Maintenance Requirements

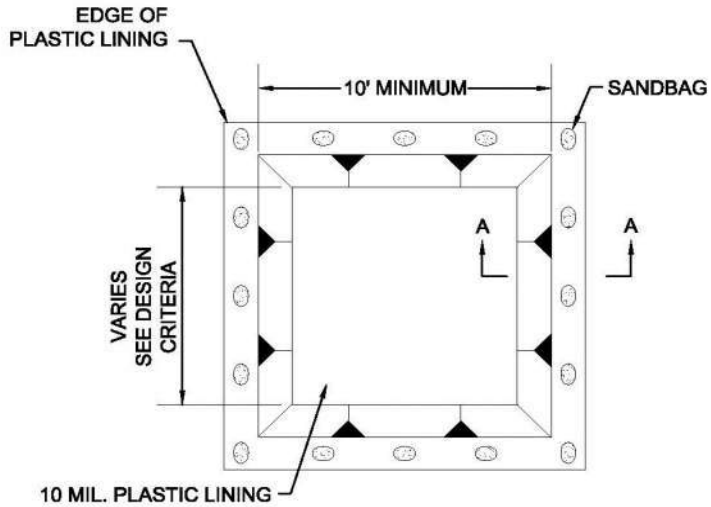
Concrete waste management controls should be inspected regularly (at least as often as required by the TPDES Construction General Permit) for proper handling of concrete waste. Check concrete washout pits and make repairs as needed. Washout pits should not be allowed to overflow. Maintain a schedule to regularly remove concrete waste and prevent over-filling.

If illicit dumping of concrete is found, remove the waste and reinforce proper disposal methods through education of employees.

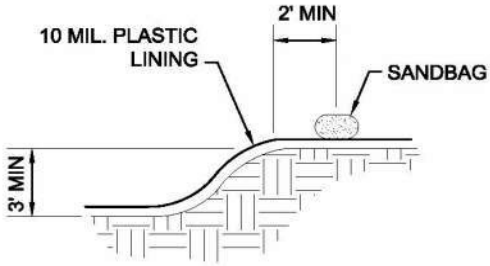
4.3.6 Example Schematics

The following schematics are example applications of the construction control. They are intended to assist in understanding the control's design and function.

The schematics are **not for construction**. They may serve as a starting point for creating a construction detail, but they must be site adapted by the designer. In addition, dimensions and notes appropriate for the application must be added by the designer.



CONCRETE WASHOUT PLAN VIEW
N.T.S.



CONCRETE WASHOUT SECTION A-A
N.T.S.

NOTE: SANDBAGS MAY BE REPLACED BY A SOIL
BERM TO ANCHOR THE PLASTIC LINING.

Figure 4.1 Schematics of Concrete Washout Containment

4.4 Debris and Trash Management

Waste Control

Description: Large volumes of debris and trash are often generated at construction sites, including packaging, pallets, wood waste, personal trash, scrap material, and a variety of other wastes. The objective of debris and trash management is to minimize the potential of stormwater contamination from solid waste through appropriate storage and disposal practices. Recycling of construction debris is encouraged to reduce the volume of material to be disposed of and associated costs of disposal.

KEY CONSIDERATIONS

DESIGN CRITERIA:

- Implement a job-site waste handling and disposal education and awareness program
- Provide sufficient and appropriate waste storage containers
- Provide timely removal of stored solid waste materials
- Train workers and monitor compliance

LIMITATIONS:

- Only addresses non-hazardous solid waste
- One part of a comprehensive construction site waste management program

MAINTENANCE REQUIREMENTS:

- Inspect regularly
- Empty waste containers regularly
- Clean up loose trash and debris daily
- Verify procedures are being followed
- Train new employees and regularly re-train all employees

TARGETED POLLUTANTS

○ Sediment
● Nutrients & Toxic Materials
○ Oil & Grease
● Floatable Materials
● Other Construction Wastes

APPLICATIONS

Perimeter Control
Slope Protection
Sediment Barrier
Channel Protection
Temporary Stabilization
Final Stabilization
Waste Management
Housekeeping Practices

IMPLEMENTATION CONSIDERATIONS

◒ Capital Costs
◒ Maintenance
● Training
○ Suitability for Slopes > 5%

Other Considerations:

- *None*

4.4.1 Primary Use

Debris and trash management is used to minimize floatables and other wastes in stormwater. By controlling the trash and debris onsite, stormwater quality is improved and the need for extensive clean up upon completion of the project is reduced.

4.4.2 Applications

Debris and trash management is applicable on all construction sites where workers are present. Even if the only construction activity is earthwork, workers will still have drink bottles, lunch bags, and other wastes that must be managed.

Solid waste management for construction sites is based on proper storage and disposal practices by construction workers and supervisors. Key elements of the program are education and modification of improper disposal habits. Cooperation and vigilance is required on the part of supervisors and workers to ensure that the procedures are followed.

The following are lists describing the type of targeted materials.

- Construction (and Demolition) Debris:

  Dimensional lumber

  Miscellaneous wood (pallets, plywood, etc)

  Copper (pipe and electrical wiring)

  Miscellaneous metal (studs, pipe, conduit, sheathing, nails, etc)

  Insulation

  Brick and mortar

  Shingles

  Roofing materials

  Gypsum board

- Trash:

  Paper and cardboard (packaging, containers, wrappers)

  Plastic (packaging, bottles, containers)

  Styrofoam (cups, packing, and forms)

  Food and beverage containers

  Food waste

4.4.3 Design Criteria

- Construction plan notes shall include proper debris and trash management procedures.
- Show the location of waste storage containers on the drawings, or require the contractor to add this information.
- The contractor should be required to designate a site superintendent, foreman, safety officer, or other senior person who is onsite daily to be responsible for implementing debris and trash management.

Storage Procedures

- All waste sources and storage areas shall be located a minimum of 50 feet away from inlets, swales, drainage ways, channels and other waters, if the site configuration provides sufficient space to do so.

In no case shall material and waste sources be closer than 20 feet from inlets, swales, drainage ways, channels, and other waters.

- Construction waste and trash shall be stored in a manner that minimizes its exposure to precipitation and stormwater runoff.
- Whenever possible, minimize production of debris and trash.
- Instruct construction workers in proper debris and trash storage and handling procedures.
- Segregate potentially hazardous waste from non-hazardous construction site debris. Hazardous waste shall be managed according to the criteria in *Section 4.1 Chemical Management*.
- Segregate recyclable or re-usable construction debris from other waste materials. A goal of re-using or recycling 50 percent of the construction debris and waste is recommended.
- Keep debris and trash under cover in either a closed dumpster or other enclosed trash container that limits contact with rain and runoff and prevents light materials from blowing out.
- Check the municipality's storage requirements. Some municipalities have specific requirements for the size and type of waste containers for construction sites.
- Do not allow trash containers to overflow. Do not allow waste materials to accumulate on the ground.
- Prohibit littering by workers and visitors.
- Police site daily for litter and debris.
- Enforce solid waste handling and storage procedures.

Disposal Procedures

- If feasible, recycle construction and demolition debris such as wood, metal, and concrete.
- Trash and debris shall be removed from the site at regular intervals that are scheduled to empty containers when they are 90 percent full or more frequently.
- General construction debris may be hauled to a licensed construction debris landfill (typically less expensive than a sanitary landfill).
- Use waste and recycling haulers/facilities approved by the local municipality.
- No waste, trash, or debris shall be buried, burned or otherwise disposed of onsite.
- Cleared trees and brush may be burned if authorized by the municipality and proper permits are obtained from the county and/or TCEQ. Chipping of trees and brush for use as mulch is the preferred alternative to burning or offsite disposal.

Education

- Educate all workers on solid waste storage and disposal procedures.
- Instruct workers in identification of solid waste and hazardous waste.
- Have regular meetings to discuss and reinforce disposal procedures (incorporate in regular safety seminars).
- Clearly mark on all debris and trash containers which materials are acceptable.

Quality Control

- Foreman and/or construction supervisor shall monitor onsite solid waste storage and disposal procedures.
- Check the site, particularly areas frequented by workers during lunch and breaks, for loose trash and debris and the end of each work day.

- Discipline workers who repeatedly violate procedures.

4.4.4 Design Guidance and Specifications

No specification for debris and trash management measures is found currently available in the Standard Specifications for Public Works Construction – North Central Texas Council of Governments.

4.4.5 Inspection and Maintenance Requirements

Debris and trash management measures should be inspected regularly (at least as often as required by the TPDES Construction General Permit). If waste containers are overflowing, call the waste hauler immediately for a pick-up. If loose trash and debris are found around the site, reinforce proper waste management procedures through education of workers.

Construction sites must maintain separate waste containers clearly marked for non-hazardous, hazardous and recyclable waste. Check solid waste containers for chemical, special, or hazardous wastes that are improperly placed in them. These wastes shall be removed and handled according to criteria in *Section 4.1 Chemical Management*.

The site should be checked for loose litter and debris at the end of each working day.

4.5 Hyper-Chlorinated Water Management

Waste Control

Description: Hyper-chlorinated water is routinely used to disinfect new waterlines and appurtenances. Chlorine protects humans from pathogens in water, but it is toxic to aquatic ecosystems. The objective of hyper-chlorinated water management is to discharge the water in a manner that protects surface water and related aquatic ecosystems.

KEY CONSIDERATIONS

DESIGN CRITERIA:

- Educate employees on proper procedures
- Discharge to sanitary sewer if the system operator approves
- Discharge water onsite for natural chlorine attenuation
- Use appropriate dosage for chemical de-chlorination based on chemical used and chlorine concentration
- Chlorine concentration must be less than 4 ppm before leaving the site
- Use velocity dissipation devices for discharges
- Always monitor receiving waters for negative effects

LIMITATIONS:

- Discharge to sanitary sewer limited by sewer capacity
- Discharges limited to areas without vegetation that is to be preserved
- Wet, cool, and overcast days limits chlorine attenuation and removal

MAINTENANCE REQUIREMENTS:

- Monitor continuously during discharge
- Check for and repair any erosion caused by discharge
- Sample and test receiving water hourly for chlorine

TARGETED POLLUTANTS

○ Sediment
● Nutrients & Toxic Materials
○ Oil & Grease
○ Floatable Materials
○ Other Construction Wastes

APPLICATIONS

Perimeter Control
Slope Protection
Sediment Barrier
Channel Protection
Temporary Stabilization
Final Stabilization
Waste Management
Housekeeping Practices

IMPLEMENTATION CONSIDERATIONS

◒ Capital Costs
○ Maintenance
● Training
○ Suitability for Slopes > 5%

Other Considerations:

- *None*

4.5.1 Primary Use

Hyper-chlorinated water is used to disinfect new water lines.

4.5.2 Applications

Construction sites that install new water lines or repair or replace existing water lines should use hyper-chlorinated water management measures.

4.5.3 Design Criteria

- Drawing notes shall include procedures for the proper discharge of hyper-chlorinated water from waterline disinfection.
- The contractor should be required to designate the site superintendent, foreman, or other person who is responsible for water line disinfection to also be responsible for hyper-chlorinated water management.
- Educate employees about the environmental hazards of high chlorine concentrations and the proper procedures for handling hyper-chlorinated water.
- Hyper-chlorinated water shall not be discharged to the environment unless the chlorine concentration is reduced to 4 ppm or less by chemically treating to dechlorinate or by onsite retention until natural attenuation occurs.
- Water with a measurable chlorine concentration of less than 4 ppm is considered potable and an authorized discharge; however, large volumes of water with chlorine at this concentration can still be toxic to aquatic ecosystems. Do not discharge water that has been de-chlorinated to 4 ppm directly to surface water. It shall be discharged onto vegetation or through a conveyance system for further attenuation of the chlorine before it reaches surface water.
- Discharges of high flow rate and velocities shall be directed to velocity dissipation devices.

Discharge to Sanitary Sewers

- The preferred method of disposal for hyper-chlorinated water is discharge into a sanitary sewer system.
- Permission from the sanitary sewer operator **must** be obtained to discharge to the sanitary sewer.
- Limitations on discharges to the sanitary sewer are the capacity of the sanitary sewer and the availability of a sewer manhole near the construction site.
- The designer shall verify that the sanitary sewer is capable of receiving the flow rate that will result from dewatering the disinfected line within the required time.
- Consideration should be given to timing the discharge with the daily low flow period for the sanitary sewer system.

Onsite Discharge

- Hyper-chlorinated water may be applied to the construction site if it can be done without causing a discharge. The feasibility of this option is dependent on the volume of water, the size of the construction site, and the conditions of the site. Site application should not be done when the soil moisture content is high due to recent storm events.
- Chlorine can burn vegetation, so it should not be used to water vegetation that is being used for stabilization, vegetated filters or buffers, or other vegetation to be preserved.
- Hyper-chlorinated water may be discharged to an onsite retention area until natural attenuation occurs. The area may be a dry stormwater retention basin, or a portion of the site may be graded to form a temporary pit or bermed area.

- Natural attenuation of the chlorine may be aided by aeration. Air can be added to the water by directing the discharge over a rough surface (e.g. riprap) before it enters the temporary retention area or an aeration device (e.g. circulation pump) can be placed in the retention area.
- Onsite discharge may require several hours to a few days before the water is safe to discharge. The rate at which chlorine will attenuate is affected by soil conditions and weather conditions. Attenuation will occur quickest during warm, sunny, dry periods.
- If the hyper-chlorinated water is retained in a pit or basin, and then pumped to discharge, pumping shall follow the criteria in *Section 3.3 Dewatering Controls*.

Chemical Dechlorination

- If non-chemical means of dechlorination are not feasible, chemical methods may be used to neutralize the chlorine before discharging the hyper-chlorinated water.
- Vitamin C in the form of ascorbic acid or sodium ascorbate is the preferred dechlorination agent.
- Consider the National Fire Protection Association (NFPA) rating when selecting a dechlorination chemical. The NFPA rating is given by a series of three numbers ranging from 0 to 4, with 0 being no risk and 4 the highest risk. The sequence of numbers rank the health hazard, flammability risk and reactivity risk of the chemical. A NFPA rating of 0,0,0 indicates no risk for all three categories.
- Ensure appropriate personal protective equipment (PPE) is specified for workers depending on the chemical being used to neutralize the chlorine.
- The chemicals listed in Table 4.1 may be used to neutralize chlorine.

Table 4.1 Chemical Dechlorination Agents and Approximate Dosages

Dechlorinating Agent	*Dosing Rate (parts Agent : parts Chlorine)*	*Advantages*	*Disadvantages*
Ascorbic Acid (form of Vitamin C)	2.5:1	• Not toxic to aquatic species • Quick reaction time • NFPA rating of 0,0,0	• May lower pH in receiving water
Sodium Ascorbate (form of Vitamin C)	2.8:1	• Does not affect pH • Not toxic to aquatic species • Quick reaction time • NFPA rating of 0,0,0	• Greater amount needed than Ascorbic Acid • More expensive
Sodium Thiosulfate	2:1 to 7:1 depending on pH	• Less expensive • Readily available • Long history of use (familiarity)	• Must calculate dosage based on pH • Skin, eye, nose and throat irritant • Consumes oxygen in water • May encourage bacterial growth in receiving streams
Calcium Thiosulfate	1:1 to 0.5:1 depending on pH	• Less expensive • Not toxic to aquatic species • NFPA rating of 0,0,0	• Must calculate dosage based on pH • Over-dosing produces suspended solids • Over-dosing may increase turbidity in receiving water • May encourage bacterial growth in receiving streams

- The designer shall confirm dosages with the chemical supplier before using the dechlorination agent.

- Chlorine and residual agent concentrations and the pH of the discharged water shall be monitored at least hourly using field tests.
- The treated water should be discharged onto pavement or into a dry conveyance system to allow aeration and reaction time before the dechlorinated water reaches the receiving water. The receiving water should be closely monitored for any signs of negative effects from the discharge.

4.5.4 Design Guidance and Specifications

No specification for hyper-chlorinated water management is currently available in the Standard Specifications for Public Works Construction – North Central Texas Council of Governments.

4.5.5 Inspection and Maintenance Requirements

Hyper-chlorinated water management measures should be monitored continuously while the hyper-chlorinated water is being discharged. Discharges to a sanitary sewer should be monitored for back-ups or overflows that indicate the discharge is exceeding the sewer's capacity. If these occur, the rate of discharge must be decreased or another discharge method is needed.

Onsite or chemically treated discharge should be monitored for chlorine and residual chemical concentrations. Verify that discharges are not causing erosion, and modify the discharge to use velocity dissipation devices if erosion is occurring. Repair any eroded areas. If water is being pumped from a temporary retention area, verify that appropriate dewatering controls are in place.

For all discharges, frequently inspect the receiving water for any evidence of negative effects. Sample and test the receiving water hourly for chlorine. Stop the discharge immediately if chlorine is detected and modify the discharge procedures before resuming.

4.6 Sandblasting Waste Management

Waste Control

Description: The objective of sandblasting waste management is to minimize the potential of stormwater quality degradation from sandblasting activities at construction sites. The key issues in this program are prudent handling and storage of sandblast media, dust suppression, and proper collection and disposal of spent media. It is not the intent of this control to outline all of the worker safety issues pertinent to this practice. Safety issues should be addressed by construction safety programs as well as local, state, and federal regulations.

KEY CONSIDERATIONS

DESIGN CRITERIA:

- Prohibit discharge of sandblasting waste
- Provide site specific fugitive dust control and containment equipment
- Educate employees on proper procedures
- Provide proper sandblast equipment for the job
- Ensure compliance by supervisors and workers

LIMITATIONS:

- Does not address hazardous materials that may be present in the waste
- Does not address spill and leak response procedures

MAINTENANCE REQUIREMENTS:

- Inspect regularly
- Contain and dispose of sandblast grit
- Train new employees and regularly re-train all employees

TARGETED POLLUTANTS

- ○ Sediment
- ● Nutrients & Toxic Materials
- ○ Oil & Grease
- ○ Floatable Materials
- ● Other Construction Wastes

APPLICATIONS

Perimeter Control

Slope Protection

Sediment Barrier

Channel Protection

Temporary Stabilization

Final Stabilization

Waste Management

Housekeeping Practices

IMPLEMENTATION CONSIDERATIONS

- ● Capital Costs
- ● Maintenance
- ● Training
- ○ Suitability for Slopes > 5%

Other Considerations:

- *OSHA requirements*
- *Special procedures for sandblasting operations on structures know to contain hazardous materials*
- *Possible site assessment or remediation required if hazardous materials present*

4.6.1 Primary Use

Sandblasting is typically used to clean a surface or prepare a surface for coatings. Since the sandblasting media consists of fine abrasive granules, it can be easily transported by running water. Sandblasting activities typically create a significant dust problem that must be contained and collected to prevent off-site migration of fines. Particular attention must be paid to sandblasting work on bridges, box culverts, and head walls that span or are immediately adjacent to streams and waterways.

4.6.2 Applications

This control should be implemented when sandblasting operations will occur on a construction site.

If a discharge of sandblasting waste occurs, it shall be considered a spill and handled according to the criteria in *Section 4.8 Spill and Leak Response Procedures*.

4.6.3 Design Criteria

- Construction plan notes shall include proper sandblasting waste management procedures.
- The contractor should be required to designate the site superintendent, foreman, or other person who is responsible for sandblasting to also be responsible for sandblasting waste management.
- Prohibit the discharge of sandblasting waste.

Operational Procedures

- Use only inert, non-degradable sandblast media.
- Use appropriate equipment for the job; do not over-blast.
- Wherever possible, blast in a downward direction.
- Install a windsock or other wind direction instrument.
- Cease blasting activities in high winds or if wind direction could transport grit to drainage facilities.
- Install dust shielding around sandblasting areas.
- Collect and dispose of all spent sandblast grit, use dust containment fabrics and dust collection hoppers and barrels.
- Non-hazardous sandblast grit may be disposed in permitted construction debris landfills or permitted sanitary landfills.
- If sandblast media cannot be fully contained, construct sediment traps downstream from blasting area where appropriate.
- Use sand fencing where appropriate in areas where blast media cannot be fully contained.
- If necessary, install misting equipment to remove sandblast grit from the air prevent runoff from misting operations from entering drainage systems.
- Use vacuum grit collection systems where possible.
- Keep records of sandblasting materials, procedures, and weather conditions on a daily basis.
- Take all reasonable precautions to ensure that sandblasting grit is contained and kept away from drainage structures.

Educational Issues

- Educate all onsite employees of potential dangers to humans and the environment from sandblast grit.

- Instruct all onsite employees of the potential hazardous nature of sandblast grit and the possible symptoms of over-exposure to sandblast grit.
- Instruct operators of sandblasting equipment on safety procedures and personal protection equipment.
- Instruct operators on proper procedures regarding storage, handling and containment of sandblast grit.
- Instruct operators and supervisors on current local, state and federal regulations regarding fugitive dust and hazardous waste from sandblast grit.
- Have weekly meetings with operators to discuss and reinforce proper operational procedures.
- Establish a continuing education program to indoctrinate new employees.

Materials Handling Recommendations

- Sandblast media should always be stored under cover away from drainage structures.
- Ensure that stored media or grit is not subject to transport by wind.
- Ensure that all sandblasting equipment and storage containers comply with current local, state and federal regulations.
- Refer to *Section 4.1 Chemical Management* if sandblast grit is known or suspected to contain hazardous components.
- Capture and treat runoff, which comes into contact with sandblasting material or waste.

Quality Assurance

- Foreman and/or construction supervisor should monitor all sandblasting activities and safety procedures.
- Educate and if necessary, discipline workers who violate procedures.
- Take all reasonable precautions to ensure that sandblast grit is not transported off-site or into drainage facilities.

4.6.4 Design Guidance and Specifications

No specification for sandblasting waste management is currently available in the Standard Specifications for Public Works Construction – North Central Texas Council of Governments.

4.6.5 Inspection and Maintenance Requirements

Sandblasting waste management measures should be inspected regularly (at least as often as required by the TPDES Construction General Permit). Verify that sandblasting grit is contained and disposed of properly. Check for downstream locations and the off-site perimeter for evidence of discharges or off-site transport by wind.

Check that daily records of sandblasting activities are current. Hold weekly meetings with operators to reinforce proper procedures. Regularly re-educate employees on potential dangers and hazards, safety procedures and proper handling.

4.7 Sanitary Waste Management

Waste Control

Description: The objective of sanitary waste management is to provide for collection and disposal of sanitary waste in a manner that minimizes the exposure to precipitation and stormwater. This is most often accomplished by providing portable facilities for construction site workers.

KEY CONSIDERATIONS

DESIGN CRITERIA:

- Provide sanitary facilities at the rate of one toilet per 10 workers for a 40-50 hour work week
- Locate portable toilets a minimum of 50 feet away from storm drain inlets, conveyance channels or surface waters
- If unable to meet the 50 foot requirement, locate portable toilets at least 20 feet away and provide secondary containment
- Show location of portable toilets on the drawings
- Have a plan to clean up spills

LIMITATIONS:

- Multiple facilities and/or facilities in several locations may be needed to adequately serve a construction site
- Facilities are subject to vandalism if not within a secured construction site

MAINTENANCE REQUIREMENTS:

- Inspect regularly
- Check for proper servicing, leaks and spills
- Service toilets at the frequency recommended by the supplier

TARGETED POLLUTANTS

- ○ Sediment
- ● Nutrients & Toxic Materials
- ○ Oil & Grease
- ○ Floatable Materials
- ● Other Construction Wastes

APPLICATIONS

Perimeter Control

Slope Protection

Sediment Barrier

Channel Protection

Temporary Stabilization

Final Stabilization

Waste Management

Housekeeping Practices

IMPLEMENTATION CONSIDERATIONS

- ○ Capital Costs
- ◒ Maintenance
- ◒ Training
- ○ Suitability for Slopes > 5%

Other Considerations:

- *None*

4.7.1 Primary Use

Sanitary facilities are used to properly store and dispose of sanitary wastes that are generated onsite.

4.7.2 Applications

Sanitary facilities should be available to workers at all construction sites. If permanent facilities are not available, portable toilets are placed at the construction site.

4.7.3 Design Criteria

- Construction plan notes shall include requirements for the contractor to provide an appropriate number of portable toilets based on the number of employees using the toilets and the hours they will work. The typical standard is one portable toilet per 10 workers for a 40-50 hour work week.
- The location of portable toilets shall be shown on the drawings.
- Sanitary facilities shall be placed a minimum of 50 feet away from storm drain inlets, conveyance channels or surface waters. If unable to meet the 50 foot requirement due to site configuration, portable toilets shall be a minimum of 20 feet away from storm drain inlets, conveyance channels or surface waters and secondary containment shall be provided in case of spills.
- The location of the portable toilets shall be accessible to maintenance trucks without damaging erosion and sediment controls or causing erosion or tracking problems.
- Sanitary facilities shall be fully enclosed and designed in a manner that minimizes the exposure of sanitary waste to precipitation and stormwater runoff.
- When high winds are expected, portable toilets shall be anchored or otherwise secured to prevent them from being blown over.
- The company that supplies and maintains the portable toilets shall be notified immediately if a toilet is tipped over or damaged in a way that results in a discharge. Discharged solid matter shall be vacuumed into the septic truck by the company that maintains the toilets. A solution of 10 parts water to 1 parts bleach shall be applied to all ground surfaces contaminated by liquids from the toilet.
- The operator of the municipal separate storm sewer system (MS4) shall be notified if a discharge from the portable toilets enters the MS4 or a natural channel.

4.7.4 Design Guidance and Specifications

No specification for sanitary facilities is currently available in the Standard Specifications for Public Works Construction – North Central Texas Council of Governments.

4.7.5 Inspection and Maintenance Requirements

Sanitary facilities should be inspected regularly (at least as often as required by the TPDES Construction General Permit) for proper servicing, leaks and spills. Portable toilets shall be regularly serviced at the frequency recommended by the supplier for the number of people using the facility.

4.8 Spill and Leak Response Procedures

Waste Control

Description: Spill and leak response procedures address the management of spills and leaks that may occur at the construction site. The objective of the spill and leak response procedures is to minimize the discharge of pollutants from unplanned releases of chemicals, fuel, motor vehicle fluids, hazardous materials or wastes through appropriate recognition and response procedures.

KEY CONSIDERATIONS

DESIGN CRITERIA:

- Develop procedures based on the Material Safety and Data Sheets for substances onsite
- Maintain spill kits for petroleum products and other chemicals frequently onsite
- Post emergency contact numbers
- Designate a spill response coordinator
- Train employees
- Review reporting requirements for onsite chemicals

LIMITATIONS:

- Procedures susceptible to being forgotten because they are seldom or never used
- Larger spills and spills of extremely hazardous materials require special equipment and should be handled by professionals
- Not applicable to long-term contamination remediation

MAINTENANCE REQUIREMENTS:

- Review procedures regularly
- Verify spill kits, MSDSs, and emergency contacts are readily available
- Train new employees and regularly re-train all employees

TARGETED POLLUTANTS

○ Sediment

● Nutrients & Toxic Materials

● Oil & Grease

○ Floatable Materials

● Other Construction Wastes

APPLICATIONS

Perimeter Control

Slope Protection

Sediment Barrier

Channel Protection

Temporary Stabilization

Final Stabilization

Waste Management

Housekeeping Practices

IMPLEMENTATION CONSIDERATIONS

◒ Capital Costs

◒ Maintenance

● Training

○ Suitability for Slopes > 5%

Other Considerations:

- *OSHA, EPA and TCEQ regulations*

4.8.1 Primary Use

Spill and leak procedures are used to minimize the impact of accidental releases on surface water. Pollutants that are of concern for spill and leaks include chemicals, hazardous materials, fuel, motor vehicle fluids, washout waters, and wastes. Spill and leak response is a secondary control. Proper procedures for managing these pollutants should be the primary control and are the best way to prevent the need for spill and leak response.

4.8.2 Applications

Spill and leak response procedures are applicable on all construction sites where chemicals, hazardous materials, fuels, etc. are stored or used. They are most important when the construction site is adjacent or near to a floodplain, wetland, stream, or other waters.

4.8.3 Design Criteria

General

- An effective spill and leak response depends on proper recognition and response practices by construction workers and supervisors. Key elements are education and training.
- Records of releases that exceed the Reportable Quantity (RQ) for oil and hazardous substances should be maintained in accordance with the Federal and State regulations.
- Emergency contact information and spill response procedures shall be posted in a readily available area for access by all employees and subcontractors.
- Spill containment kits should be maintained for petroleum products and other chemicals that are regularly onsite. Materials in kits should be based on containment guidelines in the Material Safety and Data Sheets (MSDSs) for the substance most frequently onsite.
- Spill kits are intended for response to small spills, typically less than 5 gallons, of substances that are not extremely hazardous.
- Significant spills or other releases warrant immediate response by trained professionals.
- Suspected job-site contamination should be immediately reported to regulatory authorities and protective actions taken.

Coordinator

- The contractor should be required to designate a site superintendent, foreman, safety officer, or other senior person who is onsite daily to be the Spill and Leak Response Coordinator.
- The coordinator must have knowledge of and be trained in correct spill and leak response procedures.
- The coordinator shall be responsible for implementing the spill and leak procedures and training all employees and sub-contractors on the site-specific spill and leak procedures. The training should include their responsibility to immediately notify the coordinator if a spill or leak occurs.

Spill Response

- Upon discovery of a spill, employees and subcontractors shall implement the following procedures:
    - Immediately stop work and clear the area by moving upwind of the spill.
    - Remove all ignition sources.
    - Notify the Spill and Leak Response Coordinator.
    - If there is an immediate danger to health or life, contact 911.

- The Spill and Leak Response Coordinator shall perform the following when the spill is not immediately dangerous to health and safety:
  - Consult the MSDS for safety and response procedures.
  - If it can be done safely, use onsite spill kits and soil to contain the spill.
  - Notify a hazardous response company to remove and properly dispose of the spilled material and the contaminated containment materials.

Spill Reporting

- The Spill and Leak Response Coordinator is responsible for notifying authorities of spills and leaks. Notification requirements are based on Reportable Quantities as established by the type or material, quantity and location (onto land or into water in the state) of the release.
- Reportable Quantities (RQ) in the State of Texas are established by the TCEQ in Texas Administrative Code Title 30, Chapter 327 (30 TAC 327) Spill Prevention and Control.
- The Texas RQ for petroleum products and used oil is 25 gallons released onto land or any amount that causes sheen on water.
- Reportable Quantities for all other substances are listed in 30 TAC 327.4, which references the EPA List of Lists (EPA 550-B-01-003) available at: http://www.epa.gov/ceppo/pubs/title3.pdf
- The Spill and Leak Response Coordinator shall notify the following:
  - The municipality that operates the local Municipal Separate Storm Sewer System (MS4) if a spill or leak enters public rights-of-way or any type of drainage way or drainage infrastructure within the jurisdiction of the municipality.
  - State of Texas Spill Report Hotline at 1-800-832-8224 if the spill or leak exceeds the RQ; and during regular business hours, the TCEQ Dallas/Fort Worth Regional Office at 817-588-5800.
  - National Spill Response Center at 1-800-424-8802 if the spill or leak exceeds the RQ.

4.8.4 Design Guidance and Specifications

National guidance for response procedures are established by the Environmental Protection Agency (EPA) in the Code of Federal Regulations (CFR). Specific sections addressing spills are governed by:

- 40 CFR Part 68 Chemical Accident Prevention Provisions.
- 40 CFR Part 302 Designation, Reportable Quantities (RQ) and Notification.
- 40 CFR Part 355 Emergency Planning and Notification.

Guidance for emergency response procedures in the State of Texas are established by the Texas Commission on Environmental Quality (TCEQ) in the Texas Administrative Code Title 30, Chapter 327, Spill Prevention and Control.

No specification for construction of this item is currently available in the Standard Specifications for Public Works Construction – North Central Texas Council of Governments.

4.8.5 Inspection and Maintenance Requirements

Spill and leak response measures should be inspected regularly (at least as often as required by the TPDES Construction General Permit). Verify that spill containment materials are available for small spills. Also verify that emergency contact information is posted. These phone numbers and Material Safety and Data Sheets should be in a location that is readily accessible to workers.

If procedures are lacking, reinforce requirements by re-training employees.

4.9 Subgrade Stabilization Management

Material Control

Description: Lime and other chemicals are used extensively in the North Central Texas region to stabilize pavement subgrades for roadways, parking lots, and other paved surfaces, and as a subgrade amendment for building pad sites. These chemicals are applied to the soil and mixed through disking and other techniques, and then allowed to cure. The objective of subgrade stabilization management is to reduce the potential for runoff to carry the chemicals offsite, where they may impact aquatic life in streams, ponds, and other water bodies.

KEY CONSIDERATIONS

DESIGN CRITERIA:

- Educate employees on proper procedures
- Include procedural controls in stabilization specifications
- Limit stabilization operations to that which can be thoroughly mixed and compacted by the end of each workday
- Prohibit vehicle traffic, other than water trucks and mixing equipment, from passing over the area being stabilized until mixing is completed
- Avoid applications when there is a significant probability of rain that will produce runoff
- Roughen areas adjacent and downstream of stabilized areas to intercept lime from runoff
- Provide secondary containment according to *Section 4.1 Chemical Management* for stabilizers stored onsite

LIMITATIONS:

- Prevention of contamination is only effective method
- Does not address spill response when discharge occurs

MAINTENANCE REQUIREMENTS:

- Inspect down slope perimeters and outfalls regularly during stabilization operations
- Immediately halt operations if a discharge is found and modify procedures to prevent future discharges

TARGETED POLLUTANTS

- ○ Sediment
- ◒ Nutrients & Toxic Materials
- ○ Oil & Grease
- ○ Floatable Materials
- ○ Other Construction Wastes

APPLICATIONS

Perimeter Control

Slope Protection

Sediment Barrier

Channel Protection

Temporary Stabilization

Final Stabilization

Waste Management

Housekeeping Practices

IMPLEMENTATION CONSIDERATIONS

- ○ Capital Costs
- ◒ Maintenance
- ◒ Training
- ○ Suitability for Slopes > 5%

Other Considerations:

- *Chemical management controls for onsite storage of stabilization chemicals*

4.9.1 Primary Use

This measure should be implemented when chemicals are required for soil stabilization. Lime is the most commonly used for stabilization and is considered a chemical. Other agents may also be used for subgrade stabilization depending on the soil and site conditions.

4.9.2 Applications

Chemical stabilization can be used under a variety of conditions. The engineer should determine the applicability of chemical stabilization based on site conditions such as available open space, quantity of area to be stabilized, proximity of nearby water courses and other measures employed at the site. The use of diversion dikes and interceptor swales (see appropriate sections) to divert runoff away from areas to be stabilized can be used in conjunction with these techniques to reduce the potential impact of discharges from chemical stabilization.

Management of stabilization chemicals is based on implementing procedures to prevent a discharge. If a discharge occurs, it shall be considered a spill and handled according to the criteria in *Section 4.8 Spill and Leak Response Procedures*.

4.9.3 Design Criteria

- Construction plan notes or stabilization shall include procedural controls to minimize the discharge of chemical stabilizers.
- The contractor shall limit the amount of stabilizing agent onsite to that which can be thoroughly mixed and compacted by the end of each workday.
- Stabilizers shall be applied at rates that result in no runoff.
- Stabilization shall not occur immediately before and during rainfall events.
- No traffic other than water trucks and mixing equipment shall be allowed to pass over the area being stabilized until after completion of mixing the chemical.
- Areas adjacent and downstream of stabilized areas shall be roughened to intercept chemical runoff and reduce runoff velocity.
- Geotextile fabrics such as those used for silt fence should not be used to treat chemical runoff, because the chemicals are dissolved in the water and won't be affected by a barrier and the suspended solids are significantly smaller than the apparent opening size of the fabric.
- For areas in which phasing of chemical staibilization is impractical, a curing seal (such as Liquid Asphalt, Grace MC-250, or MC-800) applied at a rate of 0.15 gallons per square yard of surface can be used to protect the base.
- Use of sediment basins with a significant (>36 hour) drawdown time is encouraged to capture any accidental lime or chemical overflows when large areas are being stabilized (*Section 3.9 Sediment Basin*).
- Provide containment around chemical storage, loading and dispensing areas.
- If soil stabilizers are stored onsite, they shall be considered hazardous material and shall be managed according to the criteria in *Section 4.1 Chemical Management* to capture any accidental lime or chemical overflow.

4.9.4 Design Guidance and Specifications

No specification for subgrade stabilization management is currently available in the Standard Specifications for Public Works Construction – North Central Texas Council of Governments.

4.9.5 Inspection and Maintenance Requirements

Subgrade stabilization operation should be observed frequently as the operations proceed for evidence of discharges. Inspect the down slope perimeter and all outfalls for evidence of discharges. Pay particularly attention to the outfall of drainage pipes connected to inlets within the area being stabilized. If a discharge is found, immediately halt stabilization operations until additional controls can be implemented.

4.9.6 Example Schematic

The following schematic is an example application of the construction control. It is intended to assist in understanding the control's design and function.

The schematic is **not for construction**. It may serve as a starting point for creating a construction detail, but it must be site adapted by the designer. In addition, dimensions and notes appropriate for the application must be added by the designer.

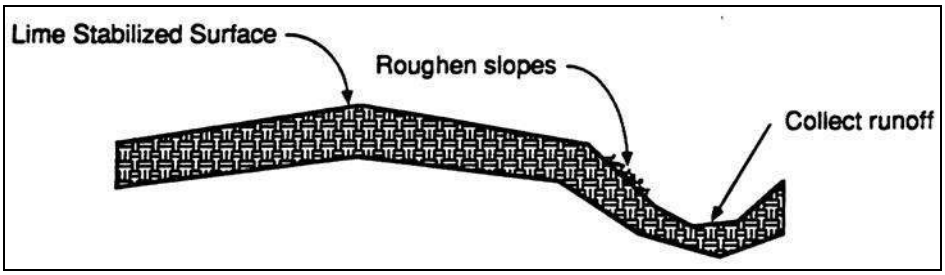


Figure 4.2 Schematic of Controls for Subgrade Stabilization

4.10 Vehicle and Equipment Management

Material and Waste Control

Description: Vehicle and equipment management addresses the practices associated with proper use and maintenance of vehicles and equipment at construction sites. The objective is to minimize the discharge of pollutants from vehicle and equipment operation, fueling, maintenance, and washing.

KEY CONSIDERATIONS

DESIGN CRITERIA:

- Prohibit the discharge of maintenance fluids and wash water with soap
- If feasible, prohibit onsite vehicle washing
- If feasible, prohibit onsite maintenance except fueling
- Provide secondary containment that's 110 percent of the largest container in the containment
- Use spill/overflow devices for fueling
- Never leave a fueling operation unattended
- Label all waste containers
- Train workers in proper procedures

LIMITATIONS:

- Cost of maintenance, repairs, and spill prevention equipment
- One part of a comprehensive construction site waste management program
- Does not address spill and leak response procedures

MAINTENANCE REQUIREMENTS:

- Inspect regularly
- Check for signs of leaks and spills and take corrective actions
- Place drip pans under leaking vehicles and equipment when parked
- Verify procedures are being followed
- Train new employees and regularly re-train all employees

APPLICATIONS

Perimeter Control

Slope Protection

Sediment Barrier

Channel Protection

Temporary Stabilization

Final Stabilization

Waste Management

Housekeeping Practices

IMPLEMENTATION CONSIDERATIONS

◒ Capital Costs

◒ Maintenance

● Training

○ Suitability for Slopes > 5%

Other Considerations:

- *None*

TARGETED POLLUTANTS

○ Sediment

● Nutrients & Toxic Materials

● Oil & Grease

○ Floatable Materials

● Other Construction Wastes

4.10.1 Primary Use

Vehicle and equipment management is used to minimize the pollutants that enter stormwater from fueling and maintenance activities.

4.10.2 Applications

Vehicle and equipment management is applicable on every construction site. The management controls are most effective when used in conjunction with controls in *Section 4.8 Spill and Leak Response Procedures*.

The management techniques are based on proper recognition and handling of pollutant sources related to vehicles and equipment. Key elements are education, established procedures, and provisions for safe storage and disposal of wastes. The following list (not all inclusive) gives examples of the targeted materials:

- Fuels
- Lube Oils
- Antifreeze
- Solvents
- Wash water

4.10.3 Design Criteria

- Construction plan notes shall state that the discharge of fuels, oils, or other pollutants used in vehicle and equipment operation and maintenance is prohibited.
- Construction plan notes shall state that the discharge of soaps or solvents used in vehicle and equipment washing is prohibited.
- On the construction plans, show the location of fuel tanks, motor vehicle fluids storage, and waste storage, including secondary containment, or require the contractor to provide this information.
- Provide secondary containment for fuel, new and waste oil, and other maintenance fluids that are stored onsite. Secondary containment shall have a minimum volume of 110 percent of the largest container within the containment.
- Criteria for the response to spills of motor vehicle fluids are in *Section 4.8 Spill and Leak Response Procedures*.
- The contractor should be required to designate a site superintendent, foreman, safety officer, or other senior person, who is on the site daily, to be responsible for implementing vehicle and equipment management.

Vehicle Washing

- Minimize the potential for the discharge of pollutants from equipment and vehicle washing by prohibiting these activities onsite, if practical. Vehicles and equipment should be transported to a commercial vehicle wash facility with appropriate discharge controls.
- Designate a wash area if vehicle and equipment washing must be done onsite. Require all washing to be done at this location. The area shall be graded so that all wash water flows to a sediment basin or other sediment control that provides equivalent or better treatment.
- Do not use soap for vehicle and equipment washing. Sediment controls will not remove soap from the wash water.

- Vehicle and equipment wash water may contain oils, greases, and heavy metals. Treatment to remove these pollutants is needed in addition to sediment trapping. Any wash water that has sheen on it must be considered polluted and cannot be discharged from the site without appropriate treatment. State or local discharge permits may be required.

Maintenance

- If possible, prohibit onsite maintenance except for fueling. Otherwise, limit onsite maintenance to routine preventive maintenance.
- Maintenance fluids should be stored in appropriate containers (closed drums or similar) and under cover.
- The ground under vehicles and equipment parked onsite should be inspected for drips and leaks before each use. Drip pans should be placed under parked vehicles and equipment that leak or drip.
- Vehicles and equipment that leak or drip should be removed from the site for repair as soon as possible.
- Vehicles and equipment that become inoperative should be removed from the site for repairs.

Fueling

- Check the municipality's requirements for fuel tanks. Some municipalities have specific requirements for the type of tank and secondary containment. At a minimum, local fire codes apply.
- Fuel should be dispensed using a drip pan or other spill/overflow device or within containment berms or other secondary containment.
- If the containment control is an earthen pit or berm, the containment shall be lined with plastic.
- If an automatic pump is used for fueling, it should be equipped with an overfill protection device.
- Workers performing fueling operations shall be trained in the correct procedures for fueling and spill response.
- Workers performing fueling operations shall be present and observe the fueling at all times. Fueling shall not be left unattended.
- A spill containment kit shall be maintained within 25 feet of the fueling area.

Waste Handling and Disposal

- Ensure that adequate waste storage volume is available.
- All waste containers shall be clearly labeled.
- Handling and disposal of waste from vehicle and equipment maintenance should be according to the criteria in *Section 4.1 Chemical Management*.

Education

- Instruct workers on procedures for washing, maintaining, and fueling vehicles and equipment.
- Instruct workers in identification of pollutants associated with vehicles and equipment.
- Have regular meetings to discuss and reinforce procedures (incorporate into regular safety briefings).
- Establish a continuing education program to train new employees.

4.10.4 Design Guidance and Specifications

No specification for vehicle and equipment management is currently available in the Standard Specifications for Public Works Construction – North Central Texas Council of Governments.

4.10.5 Inspection and Maintenance Requirements

Vehicle and equipment management controls should be inspected regularly (at least as often as required by the TPDES Construction General Permit). Verify that washing, fueling, storage, and disposal procedures are being followed. Correct workers where needed.

Fueling and maintenance fluid storage areas should be checked for signs of leakage or spills. If evidence is found, corrective actions should be implemented. Reinforce proper procedures through re-education of employees. Inspect areas where vehicles and equipment are parked for signs of leaks. Use drip pans where needed.

APPENDIX E

INSPECTION AND MAINTENANCE REPORTS

Inspector Qualifications*

Inspector Name: _____

Qualifications (Check as appropriate and provide description):

- ☐ Training Course _____
- ☐ Supervised Experience _____
- ☐ Other _____

Inspector Name: _____

Qualifications (Check as appropriate and provide description):

- ☐ Training Course _____
- ☐ Supervised Experience _____
- ☐ Other _____

Inspector Name: _____

Qualifications (Check as appropriate and provide description):

- ☐ Training Course _____
- ☐ Supervised Experience _____
- ☐ Other _____

**Personnel conducting inspections must be knowledgeable of the general permit, familiar with the construction site, and knowledgeable of the SWP3 for the site.*

INSPECTION SCHEDULE

Inspections must be conducted:

- **Option 1** – at least once every 14 calendar days and within 24 hours of the end of a storm event of 0.5 inch or greater
- **Option 2** – at least once every 7 calendar days, regardless of whether or not there has been a rainfall event since the previous inspection.

Any changes to the schedule are conducted in accordance with the following:

- the schedule is changed a maximum of one time each month,
- the schedule change must be implemented at the beginning of a calendar month, and
- the reason for the schedule change must be documented below.

Date	Schedule Option	Reason for Schedule Change

Construction Site SWP3 Inspection Report

Status		
	☐ Complies	
	☐ Warning	No.
	☐ Project Shutdown	

SWP3	On-Site		Up-to-date	
	Yes	No[1]	Yes	No[2]

General Information		
	Project:	Date:
	Address:	Inspector:
		Qualifications: see Appendix E of SWP3
		Weather Conditions:
	Owner:	Contractor:

BMP	BMP In Use		Maint. Req'd		Comments
	Yes	No	Yes[2]	No	

[1]The SWP3 must be retained on-site at the construction site or, if the site is inactive or does not have an on-site location to store the plan, a notice must be posted describing the location of the SWP3.

[2]Items marked in this column need to be addressed in the Actions to be Taken table.

ACTIONS TO BE TAKEN	RESPONSIBLE PERSON(S)	DUE DATE	DATE COMPLETED	INITIALS

NOTE: These reports will be kept on file as part of the Storm Water Pollution Prevention Plan for at least three years. A copy of the SWP3 will be kept at the site at all times during construction.

CERTIFICATION STATEMENT: *"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."*

Name:	
Address:	
Telephone:	
Site Location:	
Inspector Signature:	Date:

MAINTENANCE GUIDELINES

1. Below are some maintenance practices to be used to maintain erosion and sediment controls:
   - All control measures will be inspected according to the schedule identified in Appendix E.
   - All measures will be maintained in good working order. The operator should correct any damage or deficiencies as soon as practicable after the inspection, but in no case later than seven (7) calendar days after the inspection.
   - BMP Maintenance (as applicable)
     - Sediment must be removed from sediment traps and sedimentation ponds no later than the time that design capacity has been reduced by 50%. For perimeter controls such as silt fences, berms, etc., the trapped sediment must be removed before it reaches 50% of the above-ground height.
     - Silt fence will be inspected for depth of sediment, tears, to see of the fabric is securely attached to the fence posts, and to see that the fence posts are firmly in the ground.
     - Drainage swale will be inspected and repaired as necessary.
     - Inlet control will be inspected and repaired as necessary.
     - Check dam will be inspected and repaired as necessary.
     - Straw bale dike will be inspected and repaired as necessary.
     - Diversion dike will be inspected and any breaches promptly repaired.
     - Temporary and permanent seeding and planting will be inspected for bare spots, washouts, and healthy growth.
     - If sediment escapes the site, accumulations must be removed at a frequency that minimizes off-site impacts, and prior to the next rain event, if feasible. If the permittee does not own or operate the off-site conveyance, then the permittee must to work with the owner or operator of the property to remove the sediment.
     - Locations where vehicles enter or exit the site must be inspected for evidence of off-site sediment tracking.

2. To maintain the above practices, the following will be performed:
   - Maintenance and repairs will be conducted before the next anticipated storm event or as necessary to maintain the continued effectiveness of storm water controls. Following an inspection, deficiencies should be corrected no later than seven (7) calendar days after the inspection.
   - Any necessary revisions to the SWP3 as a result of the inspection must be completed within seven (7) calendar days following the inspection. If existing BMPs are modified or if additional BMPs are necessary, an implementation schedule must be described in the SWP3 and wherever possible those changes implemented before the next storm event.
   - Personnel selected for inspection and maintenance responsibilities must be knowledgeable of the general permit, familiar with the construction site, and knowledgeable of the SWP3 for the site.

APPENDIX F

ROLES AND RESPONSIBILITIES CHECKLIST AND CERTIFICATION STATEMENT

PRIMARY AND SECONDARY OPERATOR GENERAL RESPONSIBILITIES

DEFINITIONS:

Operator - The person or persons associated with a large or small construction activity that is either a primary or secondary operator as defined below:

Primary Operator – the person or persons associated with a large or small construction activity that meets either of the following two criteria:

(a.) the person or persons have operational control over construction plans and specifications, including the ability to make modifications to those plans and specifications, or

(b.) the person or persons have day-to-day operational control of those activities at a construction site that are necessary to ensure compliance with a storm water pollution prevention plan (SWP3) for the site or other permit conditions (e.g., they are authorized to direct workers at a site to carry out activities required by the SWP3 or comply with other permit conditions).

Secondary Operator – The person whose operational control is limited to the employment of other operators or to the ability to approve or disapprove changes to plans and specifications. A secondary operator is also defined as a primary operator and must comply with the permit requirements for primary operators if there are no other operators at the construction site.

Please note that both Owners and Contractors can meet the definition of being an Operator and will need to fulfill the associated requirements. The Roles and Responsibilities Checklist and Certification Statement located in Appendix F are to be completed and signed by the Owner and Contractor(s).

Secondary Operators and Primary Operators with Control Over Construction Plans and Specifications

All secondary operators and primary operators with control over construction plans and specifications must:

(a.) ensure the project specifications allow or provide that adequate BMPs are developed to meet the requirements of the general permit,

(b.) ensure that the SWP3 indicates the areas of the project where they have control over project specifications, including the ability to make modifications in specifications,

(c.) ensure all other operators affected by modifications in project specifications are notified in a timely manner so that those operators may modify their best management practices as necessary to remain compliant with the conditions of this general permit, and

(d.) ensure that the SWP3 for portions of the project where they are operators indicates the name and site-specific TPDES authorization numbers for permittees with the day-to-day operational control over those activities necessary to ensure compliance with the SWP3 and other permit conditions. If the party with day-to-day operational control has not been authorized or has abandoned the site, the

person with control over project specifications is considered to be the responsible party until the authority is transferred to another party and the SWP3 is updated.

Primary Operators with Day-to-Day Operational Control

Primary Operators with day-to-day operational control of those activities at a project that are necessary to ensure compliance with the SWP3 and other permit conditions must ensure that the SWP3 accomplishes the following requirements:

(a.) meets the requirements of the general permit for those portions of the project where they are operators,
(b.) the parties responsible for implementation of BMPs described in the SWP3,
(c.) indicates areas of the project where they have operational control over day-to-day activities, and
(d.) includes, for areas where they have operational control over day-to-day activities, the name and site-specific TPDES authorization number of the parties with control over project specifications, including the ability to make modifications in specifications.

Roles and Responsibilities Checklist

Role/Responsibility	Project Owner*	Primary Operator	Secondary Operator
Development of initial design specifications			
Payment for proposed construction activity			
Maintain SWP3 records for three years from the date that a NOT is submitted			
Complete, sign, and postmark NOI at least seven days prior to beginning of construction activity, or Complete, sign, and electronically submit NOI prior to the beginning of construction activity			
Post a copy of the signed NOI at project site and maintain through duration of project			
Post copy of completed construction site notice(s) at project site through duration of project			
Provide a copy of the signed NOI to any secondary operator and to the operator of any MS4 receiving construction site discharge, at least seven days prior to commencing construction activities			
Maintain schedule of major construction activities, keep a copy with SWP3, and retain a copy of the SWP3 at the construction site at all times			
Update SWP3 to reflect daily operations (e.g., revisions, installation dates, grading operation dates, BMP maintenance, and inspection information)			
Update SWP3 to reflect changes in the Contractor's contact information			
Identify, maintain and modify BMPs (as necessary) to control erosion and sedimentation due to construction activities throughout life of project			
Provide stabilized construction entrances and sediment barriers, and clean existing rock and/or add rock to prevent mud and dirt from entering streets or alleys			
Maintain and/or replace sediment barriers and silt traps (if installed), etc. throughout life of project			
Maintain erosion control on stockpiles without blocking drainage paths			
Perform SWP3 inspections in accordance with TPDES General Permit, and keep inspection reports with SWP3			
Based on inspection results, modify SWP3 and pollution prevention controls to maintain that storm water (or identified non-storm water discharges) are the only discharges leaving the site			

Role/Responsibility	Project Owner*	Primary Operator	Secondary Operator
Provide proper management of project-generated trash and debris, including debris collected from storm water protection devices			
Stabilize all disturbed areas related to construction for temporary or permanent ceasing of activities			
Comply with all State and local sanitary sewer or septic system regulations			
Provide copies of all SWP3 records to the Project Owner			
Complete, sign, and submit NOT form to the TCEQ and MS4 Operators when the project has been completed and stabilized			
Complete applicable portion of the site notice related to removal of the notice and submit to the operator of any MS4 receiving site discharge			

**Please note that the Project Owner can meet the definition of an operator. Please refer to the definitions of "primary operator" and "secondary operator" for more information.*

Each operator engaged in activities that disturb surface soils must be identified and must sign the following certification statement. Signatory requirement guidance and an additional certification statement form are attached (Appendix F).

Certification Statement:

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

I further certify that I am authorized under 30 Texas Administrative Code §305.44 to sign this document and can provide documentation in proof of such authorization upon request."

Project Owner

Name:_____

Title:_____

Company:_____

Signature:_____

Date:_____

Operator Type:_____

General Contractor

Name:_____

Title:_____

Company:_____

Signature:_____

Date:_____

Operator Type:_____

Subcontractor (as appropriate)

Name:_____

Title:_____

Company:_____

Signature:_____

Date:_____

Operator Type:_____

Subcontractor (as appropriate)

Name:_____

Title:_____

Company:_____

Signature:_____

Date:_____

Operator Type:_____

NOTICE OF INTENT (NOI) LOG			
Name	**Company**	**Date Submitted NOI**	**TPDES Permit No.**

Signature Requirements in 30 TAC §305.44

The purpose of this document is to clarify the signature requirements for water quality permit applications subject to 30 Texas Administrative Code (TAC) section (§)305.44. This includes most applications relating to authorizations issued under 30 TAC Chapter 305 (relating to Consolidated Permits), Chapter 205 (relating to General Permits for Waste Discharges), 30 TAC Chapter 312 (relating to Sludge Use, Disposal and Transportation), and 30 TAC Chapter 321 (relating to Control of Certain Activities By Rule).

TCEQ is currently updating the signatory instructions in its application forms. You may have recently received a notice of deficiency (NOD) letter indicating failure to meet the signatory requirements. Please review the information provided below concerning signatory requirements and have a person authorized to sign under §305.44 and submit the enclosed certification. The certification must clearly indicate the applicant and the original application form subject to the NOD. Upon satisfactory review of your signed certification, your submission will no longer be deficient for failing to meet the signatory requirements.

You are encouraged to use the attached certification page for water quality permit and registration applications, and other authorization forms subject to §305.44, until the forms have been updated.

IF YOU ARE A CORPORATION:

The regulation governing who may sign an application form is 30 TAC §305.44(a)(1) (see attached). According to this provision, any corporate representative may sign an application form so long as the authority to sign such a document has been delegated to that person in accordance with corporate procedures. By signing the application form, you are certifying that such authority has been delegated to you. The TCEQ may request documentation evidencing such authority.

IF YOU ARE A MUNICIPALITY OR OTHER GOVERNMENT ENTITY:

The regulation governing who may sign an application form is 30 Texas Administrative Code §305.44(a)(3) (see attached). According to this provision, only a ranking elected official or principal executive officer may sign an application form. Persons such as the City Mayor or County Commissioner are ranking elected officials. The principal executive officer may be identified in your city charter, county or city ordinances, or the Texas statute(s) under which your governmental entity was formed. An application form that is signed by a governmental official who is not a ranking elected official or principal executive officer does not conform to §305.44(a)(3). The signatory requirement may not be delegated to a government representative other than those identified in the regulation. By signing the application , you are certifying that you are either a ranking elected official or principal executive officer. Documentation demonstrating your position as a ranking elected official or principal executive officer may be requested by the TCEQ.

If you have questions or need additional information concerning the signatory requirements discussed above, please contact either Matt Beeter at (512) 239-1406 or Carol Lear at (512) 239-1025, of the Texas Commission on Environmental Quality's Environmental Law Division.

30 Texas Administrative Code
§305.44. Signatories to Applications.

(a) All applications shall be signed as follows.

(1) For a corporation, the application shall be signed by a responsible corporate officer. For purposes of this paragraph, a responsible corporate officer means a president, secretary, treasurer, or vice-president of the corporation in charge of a principal business function, or any other person who performs similar policy or decision-making functions for the corporation; or the manager of one or more manufacturing, production, or operating facilities employing more than 250 persons or having gross annual sales or expenditures exceeding $25 million (in second-quarter 1980 dollars), if authority to sign documents has been assigned or delegated to the manager in accordance with corporate procedures. Corporate procedures governing authority to sign permit or post-closure order applications may provide for assignment or delegation to applicable corporate positions rather than to specific individuals.

(2) For a partnership or sole proprietorship, the application shall be signed by a general partner or the proprietor, respectively.

(3) For a municipality, state, federal, or other public agency, the application shall be signed by either a principal executive officer or a ranking elected official. For purposes of this paragraph, a principal executive officer of a federal agency includes the chief executive officer of the agency, or a senior executive officer having responsibility for the overall operations of a principal geographic unit of the agency (e.g., regional administrator of the EPA).

CERTIFICATION

Permit/Registration No._____

Applicant:_____

I, _____ _____
Typed or printed name *Title*

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

I further certify that I am authorized under 30 Texas Administrative Code §305.44 to sign this document and can provide documentation in proof of such authorization upon request.

Signature:_____ Date:_____

APPENDIX G

TPDES GENERAL PERMIT (TXR150000) FOR STORM WATER DISCHARGES FROM CONSTRUCTION ACTIVITIES

Texas Commission on Environmental Quality

P.O. Box 13087, Austin, Texas 78711-3087

GENERAL PERMIT TO DISCHARGE UNDER THE

TEXAS POLLUTANT DISCHARGE ELIMINATION SYSTEM

under provisions of
402 of the Clean Water Act
and Chapter 26 of the Texas Water Code

This permit supersedes and replaces
TPDES General Permit No. TXR040000, issued December 13, 2013

Small Municipal Separate Storm Sewer Systems

located in the state of Texas

may discharge directly to surface water in the state

only according to requirements and conditions set forth in this general permit, as well as the rules of the Texas Commission on Environmental Quality (TCEQ or Commission), the laws of the State of Texas, and other orders of the the TCEQ. The issuance of this general permit does not grant to the permittee the right to use private or public property for conveyance of stormwater and certain non-stormwater discharges along the discharge route. This includes property belonging to but not limited to any individual, partnership, corporation or other entity. Neither does this general permit authorize any invasion of personal rights nor any violation of federal, state, or local laws or regulations. It is the responsibility of the permittee to acquire property rights as may be necessary to use the discharge route.

This general permit and the authorization contained herein shall expire at midnight, five years after the permit effective date.

EFFECTIVE DATE: 1-24-19

ISSUED DATE: 1-24-19

For the Commission

TCEQ GENERAL PERMIT NUMBER TXR040000 RELATING TO DISCHARGES FROM SMALL MUNICIPAL SEPARATE STORM SEWER SYSTEMS

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Part I. Definitions

Arid Areas - Areas with an average annual rainfall of less than ten (10) inches.

Benchmarks – A benchmark pollutant value is a guidance level indicator that helps determine the effectiveness of chosen best management practices (BMPs). This type of monitoring differs from "compliance monitoring" in that exceedances of the indicator or benchmark level are not permit violations, but rather indicators that can help identify problems at the MS4 with exposed or unidentified pollutant sources; or control measures that are either not working correctly, whose effectiveness need to be re-considered, or that need to be supplemented with additional BMP(s).

Best Management Practices (BMPs) - Schedules of activities, prohibitions of practices, maintenance procedures, structural controls, local ordinances, and other management practices to prevent or reduce the discharge of pollutants. BMPs also include treatment requirements, operating procedures, and practices to control runoff, spills or leaks, waste disposal, or drainage from raw material storage areas.

Catch basins - Storm drain inlets and curb inlets to the storm drain system. Catch basins typically include a grate or curb inlet that may accumulate sediment, debris, and other pollutants.

Classified Segment - A water body that is listed and described in Appendix A or Appendix C of the Texas Surface Water Quality Standards, at 30 Texas Administrative Code (TAC) § 307.10.

Clean Water Act (CWA) - The Federal Water Pollution Control Act or Federal Water Pollution Control Act Amendments of 1972, Pub.L. 92-500, as amended Pub. L. 95-217, Pub. L. 95-576, Pub. L. 96-483 and Pub. L. 97-117, 33 U.S.C. 1251 et. seq.

Common Plan of Development or Sale - A construction activity that is completed in separate stages, separate phases, or in combination with other construction activities. A common plan of development or sale is identified by the documentation for the construction project that identifies the scope of the project, and may include plats, blueprints, marketing plans, contracts, building permits, a public notice or hearing, zoning requests, or other similar documentation and activities.

Construction Activity - Soil disturbance, including clearing, grading, excavating, and other construction related activities (e.g., stockpiling of fill material and demolition); and not including routine maintenance that is performed to maintain the original line and grade, hydraulic capacity, or original purpose of the site (e.g., the routine grading of existing dirt roads, asphalt overlays of existing roads, the routine clearing of existing right-of-ways, and similar maintenance activities). Regulated construction activity is defined in terms of small and large construction activity.

> **Small Construction Activity** is construction activity that results in land disturbance of equal to or greater than one (1) acre and less than five (5) acres of land. Small construction activity also includes the disturbance of less than one (1) acre of total land area that is part of a larger common plan of development or sale if the larger common plan will ultimately disturb equal to or greater than one (1) and less than five (5) acres of land.
>
> **Large Construction Activity** is construction activity that results in land disturbance of equal to or greater than five (5) acres of land. Large construction activity also includes the disturbance of less than five (5) acres of total land area that is part of a larger common plan of development or sale if the larger common plan will ultimately disturb equal to or greater than five (5) acres of land.

Construction Site Operator - The entity or entities associated with a small or large construction project that meet(s) either of the following two criteria:

(a) The entity or entities that have operational control over construction plans and specifications (including approval of revisions) to the extent necessary to meet the requirements and conditions of this general permit; or

(b) The entity or entities that have day-to-day operational control of those activities at a construction site that are necessary to ensure compliance with a stormwater pollution prevention plan (SWP3) for the site or other permit conditions (for example they are authorized to direct workers at a site to carry out activities required by the SWP3 or comply with other permit conditions).

Control Measure - Any BMP or other method used to prevent or reduce the discharge of pollutants to water in the state.

Conveyance - Curbs, gutters, man-made channels and ditches, drains, pipes, and other constructed features designed or used for flood control or to otherwise transport stormwater runoff.

Discharge – When used without a qualifier, refers to the discharge of stormwater runoff or certain non-stormwater discharges as allowed under the authorization of this general permit.

Edwards Aquifer - As defined in 30 TAC §213.3 (relating to the Edwards Aquifer), that portion of an arcuate belt of porous, water-bearing, predominantly carbonate rocks known as the Edwards and Associated Limestones in the Balcones Fault Zone trending from west to east to northeast in Kinney, Uvalde, Medina, Bexar, Comal, Hays, Travis, and Williamson Counties; and composed of the Salmon Peak Limestone, McKnight Formation, West Nueces Formation, Devil's River Limestone, Person Formation, Kainer Formation, Edwards Formation, and Georgetown Formation. The permeable aquifer units generally overlie the less-permeable Glen Rose Formation to the south, overlie the less-permeable Comanche Peak and Walnut Formations north of the Colorado River, and underlie the less-permeable Del Rio Clay regionally.

Edwards Aquifer Recharge Zone - Generally, that area where the stratigraphic units constituting the Edwards Aquifer crop out, including the outcrops of other geologic formations in proximity to the Edwards Aquifer, where caves, sinkholes, faults, fractures, or other permeable features would create a potential for recharge of surface waters into the Edwards Aquifer. The recharge zone is identified as that area designated as such on official maps located in the offices of the TCEQ or the TCEQ website.

Final Stabilization - A construction site where any of the following conditions are met:

(a) All soil disturbing activities at the site have been completed and a uniform (for example, evenly distributed, without large bare areas) perennial vegetative cover with a density of 70 percent of the native background vegetative cover for the area has been established on all unpaved areas and areas not covered by permanent structures, or equivalent permanent stabilization measures (such as the use of riprap, gabions, or geotextiles) have been employed.

(b) For individual lots in a residential construction site by either:

(1) The homebuilder completing final stabilization as specified in condition (a) above; or

(2) The homebuilder establishing temporary stabilization for an individual lot prior to the time of transfer of the ownership of the home to the buyer and after informing the homeowner of the need for, and benefits of, final stabilization.

(c) For construction activities on land used for agricultural purposes (for example pipelines across crop or range land), final stabilization may be accomplished by returning the disturbed land to its preconstruction agricultural use. Areas disturbed that were not previously used for agricultural activities, such as buffer strips immediately adjacent to a surface water and areas which are not being returned to their preconstruction agricultural use must meet the final stabilization conditions of condition (a) above.

(d) In arid, semi-arid, and drought-stricken areas only, all soil disturbing activities at the site have been completed and both of the following criteria have been met:

(1) Temporary erosion control measures (e.g., degradable rolled erosion control product) are selected, designed, and installed along with an appropriate seed base to provide erosion control for at least three years without active maintenance by the operator, and

(2) The temporary erosion control measures are selected, designed, and installed to achieve 70 percent vegetative coverage within three years.

General Permit - A permit issued to authorize the discharge of waste into or adjacent to water in the state for one or more categories of waste discharge within a geographical area of the state or the entire state as provided by Texas Water Code (TWC) §26.040.

Groundwater Infiltration - For the purposes of this permit, groundwater that enters a municipal separate storm sewer system (including sewer service connections and foundation drains) through such means as defective pipes, pipe joints, connections, or manholes.

High Priority Facilities - High priority facilities are facilities with a high potential to generate stormwater pollutants. These facilities must include, at a minimum, the MS4 operator's maintenance yards, hazardous waste facilities, fuel storage locations, and other facilities where chemicals or other materials have a high potential to be discharged in stormwater. Among the factors that must be considered when giving a facility a high priority ranking are: the amount of urban pollutants stored at the site, the identification of improperly stored materials, activities that must not be performed outside (for example, changing automotive fluids, vehicle washing), proximity to waterbodies, proximity to sensitive aquifer recharge features, poor housekeeping practices, and discharge of pollutant(s) of concern to impaired water(s).

Hyperchlorinated Water – Water resulting from hyperchlorination of waterlines or vessels, with a chlorine concentration greater than 10 milligrams per liter (mg/L).

Illicit Connection - Any man-made conveyance connecting an illicit discharge directly to a municipal separate storm sewer.

Illicit Discharge - Any discharge to a municipal separate storm sewer that is not entirely composed of stormwater, except discharges pursuant to this general permit or a separate authorization and discharges resulting from emergency fire fighting activities.

Impaired Water - A surface water body that is identified as impaired on the latest approved CWA §303(d) List or waters with an EPA approved or established TMDL that are found on the latest EPA approved *Texas Integrated Report of Surface Water Quality for CWA Sections 305(b) and 303(d)* which lists the category 4 and 5 water bodies.

Implementation Plan (I-Plan) – A detailed plan of action that describes the measures or activities necessary to achieve the pollutant reductions identified in the total maximum daily load (TMDL).

Indian Country - Defined in 18 USC § 1151 as: (a) All land within the limits of any Indian reservation under the jurisdiction of the United States (U.S.) Government, notwithstanding the

issuance of any patent, and including rights-of-way running through the reservation; (b) All dependent Indian communities within the borders of the U.S. whether within the original or subsequently acquired territory thereof, and whether within or without the limits of a state; and (c) All Indian allotments, the Indian titles to which have not been extinguished, including rights-of-way running through the same. This definition includes all land held in trust for an Indian tribe.

Indicator Pollutant - An easily measured pollutant, that may or may not impact water quality that indicates the presence of other stormwater pollutants.

Industrial Activity - Any of the ten (10) categories of industrial activities included in the definition of "stormwater discharges associated with industrial activity" as defined in 40 Code of Federal Regulations (CFR) §122.26(b)(14)(i)-(ix) and (xi).

Infeasible - For the purpose of this permit, infeasible means not technologically possible, or not economically practicable and achievable in light of best industry practices. The TCEQ notes that it does not intend for any small MS4 permit requirement to conflict with state water right laws.

Maximum Extent Practicable (MEP) - The technology-based discharge standard for municipal separate storm sewer systems (MS4s) to reduce pollutants in stormwater discharges that was established by the CWA § 402(p). A discussion of MEP as it applies to small MS4s is found in 40 CFR § 122.34.

MS4 Operator - For the purpose of this permit, the public entity or the entity contracted by the public entity, responsible for management and operation of the small municipal separate storm sewer system that is subject to the terms of this general permit.

Municipal Separate Storm Sewer System (MS4) - A conveyance or system of conveyances (including roads with drainage systems, municipal streets, catch basins, curbs, gutters, ditches, man-made channels, or storm drains):

(a) Owned or operated by the U.S., a state, city, town, borough, county, parish, district, association, or other public body (created by or pursuant to state law) having jurisdiction over the disposal of sewage, industrial wastes, stormwater, or other wastes, including special districts under state law such as a sewer district, flood control district or drainage district, or similar entity, or an Indian tribe or an authorized Indian tribal organization, or a designated and approved management agency under the CWA §208 that discharges to surface water in the state;

(b) That is designed or used for collecting or conveying stormwater;

(c) That is not a combined sewer; and

(d) That is not part of a publicly owned treatment works (POTW) as defined in 40 CFR §122.2.

Non-traditional Small MS4 - A small MS4 that often cannot pass ordinances and may not have the enforcement authority like a traditional small MS4 would have to enforce the stormwater management program. Examples of non-traditional small MS4s include counties, transportation authorities (including the Texas Department of Transportation), municipal utility districts, drainage districts, military bases, prisons and universities.

Notice of Change (NOC) - A written notification from the permittee to the executive director providing changes to information that was previously provided to the agency in a notice of intent.

Notice of Intent (NOI) - A written submission to the executive director from an applicant requesting coverage under this general permit.

Notice of Termination (NOT) - A written submission to the executive director from a permittee authorized under a general permit requesting termination of coverage under this general permit.

Outfall - A point source at the point where a small MS4 discharges to waters of the U.S. and does not include open conveyances connecting two municipal separate storm sewers, or pipes, tunnels, or other conveyances that connect segments of the same stream or other waters of the U.S. and are used to convey waters of the U.S. For the purpose of this permit, sheet flow leaving a linear transportation system without channelization is not considered an outfall. Point sources such as curb cuts; traffic or right-or-way barriers with drainage slots that drain into open culverts, open swales or an adjacent property, or otherwise not actually discharging into waters of the U.S. are not considered an outfall.

Permittee - The MS4 operator authorized under this general permit.

Point Source - (from 40 CFR § 122.22) any discernible, confined, and discrete conveyance, including but not limited to, any pipe, ditch, channel, tunnel, conduit, well, discrete fissure, container, rolling stock, concentrated animal feeding operation, landfill leachate collection system, vessel or other floating craft from which pollutants are or may be discharged. This term does not include return flows from irrigated agriculture or agricultural stormwater runoff.

Pollutant(s) of Concern – For the purpose of this permit, includes biochemical oxygen demand (BOD), sediment or a parameter that addresses sediment (such as total suspended solids (TSS), turbidity or siltation), pathogens, oil and grease, and any pollutant that has been identified as a cause of impairment of any water body that will receive a discharge from an MS4. (Definition from 40 CFR § 122.32(e)(3)).

Redevelopment - Alterations of a property that changed the ”footprint” of a site or building in such a way that there is a disturbance of equal to or greater than one (1) acre of land. This term does not include such activities as exterior remodeling, routine maintenance activities, and linear utility installation.

Semiarid Areas - Areas with an average annual rainfall of at least ten (10) inches, but less than 20 inches.

Small Municipal Separate Storm Sewer System (MS4) – A conveyance or system of conveyances (including roads with drainage systems, municipal streets, catch basins, curbs, gutters, ditches, manmade channels, or storm drains):

(a) Owned or operated by the U.S., a state, city, town, borough, county, district, association, or other public body (created by or pursuant to State law) having jurisdiction over disposal of sewage, industrial wastes, stormwater, or other wastes, including special districts under state law such as a sewer district, flood control district or drainage district, or similar entity, or an Indian tribe or an authorized Indian tribal organization, or a designated and approved management agency under CWA § 208;

(b) Designed or used for collecting or conveying stormwater;

(c) Which is not a combined sewer;

(d) Which is not part of a POTW as defined in 40 CFR § 122.2; and

(e) Which was not previously regulated under a National Pollutant Discharge Elimination System (NPDES) or a Texas Pollutant Discharge Elimination System (TPDES)

individual permit as a medium or large municipal separate storm sewer system, as defined in 40 CFR §§122.26(b)(4) and (b)(7).

This term includes systems similar to separate storm sewer systems at military bases, large hospitals or prison complexes, and highways and other thoroughfares. This term does not include separate storm sewers in very discrete areas, such as individual buildings. For the purpose of this permit, a very discrete system also includes storm drains associated with certain municipal offices and education facilities serving a nonresidential population, where those storm drains do not function as a system, and where the buildings are not physically interconnected to a small MS4 that is also operated by that public entity.

Stormwater and Stormwater Runoff - Rainfall runoff, snow melt runoff, and surface runoff and drainage.

Stormwater Associated with Construction Activity - Stormwater runoff from an area where there is either a large construction or a small construction activity.

Stormwater Management Program (SWMP) - A comprehensive program to manage the quality of discharges from the municipal separate storm sewer system.

Structural Control (or Practice) - A pollution prevention practice that requires the construction of a device, or the use of a device, to capture or prevent pollution in stormwater runoff. Structural controls and practices may include but are not limited to: wet ponds, bioretention, infiltration basins, stormwater wetlands, silt fences, earthen dikes, drainage swales, vegetative lined ditches, vegetative filter strips, sediment traps, check dams, subsurface drains, storm drain inlet protection, rock outlet protection, reinforced soil retaining systems, gabions, and temporary or permanent sediment basins.

Surface Water in the State - Lakes, bays, ponds, impounding reservoirs, springs, rivers, streams, creeks, estuaries, wetlands, marshes, inlets, canals, the Gulf of Mexico inside the territorial limits of the state (from the mean high water mark (MHWM) out 10.36 miles into the Gulf), and all other bodies of surface water, natural or artificial, inland or coastal, fresh or salt, navigable or nonnavigable, and including the beds and banks of all water courses and bodies of surface water, that are wholly or partially inside or bordering the state or subject to the jurisdiction of the state; except that waters in treatment systems which are authorized by state or federal law, regulation, or permit, and which are created for the purpose of waste treatment are not considered to be water in the state.

Total Maximum Daily Load (TMDL) - The total amount of a substance that a water body can assimilate and still meet the Texas Surface Water Quality Standards.

Traditional Small MS4 - A small MS4 that can pass ordinances and have the enforcement authority to enforce the stormwater management program. An example of traditional MS4s includes cities.

Urbanized Area (UA) - An area of high population density that may include multiple small MS4s as defined and used by the U.S. Census Bureau in the 2000 and the 2010 Decennial Census.

Waters of the United States - (According to 40 CFR § 122.2) Waters of the United States or waters of the U.S. means:

(a) All waters which are currently used, were used in the past, or may be susceptible to use in interstate or foreign commerce, including all waters which are subject to the ebb and flow of the tide;

(b) All interstate waters, including interstate wetlands;

(c) All other waters such as intrastate lakes, rivers, streams (including intermittent streams), mudflats, sandflats, wetlands, sloughs, prairie potholes, wet meadows, playa lakes, or natural ponds that the use, degradation, or destruction of which would affect or could affect interstate or foreign commerce including any such waters:

(1) Which are or could be used by interstate or foreign travelers for recreational or other purposes;

(2) From which fish or shellfish are or could be taken and sold in interstate or foreign commerce; or

(3) Which are used or could be used for industrial purposes by industries in interstate commerce;

(d) All impoundments of waters otherwise defined as waters of the United States under this definition;

(e) Tributaries of waters identified in paragraphs (a) through (d) of this definition;

(f) The territorial sea; and

(g) Wetlands adjacent to waters (other than waters that are themselves wetlands) identified in paragraphs (a) through (f) of this definition.

Waste treatment systems, including treatment ponds or lagoons designed to meet the requirements of the CWA are not waters of the U.S. This exclusion applies only to manmade bodies of water which neither were originally created in waters of the U.S. (such as disposal area in wetlands) nor resulted from the impoundment of waters of the U.S. Waters of the U.S. do not include prior converted cropland. Notwithstanding the determination of an area's status as prior converted cropland by any other federal agency, for the purposes of the CWA, the final authority regarding the CWA jurisdiction remains with the EPA.

Part II. Permit Applicability and Coverage

This general permit provides authorization for stormwater and certain non-stormwater discharges from small municipal separate storm sewer systems (MS4) to surface water in the state. The general permit contains requirements applicable to all small MS4s that are eligible for coverage under this general permit.

Section A. Small MS4s Eligible for Authorization under this General Permit

Discharges from a small MS4 must be authorized if any of the following criteria are met and may be authorized under this general permit if coverage is not otherwise prohibited.

1. Small MS4s Located in an Urbanized Area

Operators of small MS4s that are fully or partially located within an urbanized area (UA), as determined by the 2000 or 2010 Decennial Censuses by the U.S. Census Bureau, must obtain authorization for the discharge of stormwater runoff and are eligible for coverage under this general permit unless otherwise prohibited.

2. Designated Small MS4s

A small MS4 that is outside an urbanized area that is *designated* by TCEQ based on evaluation criteria as required by 40 CFR § 122.32(a)(2) or 40 CFR § 122.26(a)(1)(v) and adopted by reference in Title 30, TAC § 281.25, is eligible for coverage under this general permit. Following designation, operators of small MS4s must obtain authorization under this general permit or apply for coverage under an individual TPDES stormwater permit within 180 days of notification of their designation.

3. Operators of Previously Permitted Small MS4s

Operators of small MS4s that were covered under the previous TPDES general permit for small MS4s (TXR040000, issued and effective on December 13, 2013) must reapply for permit coverage, or must obtain a waiver if applicable (see Part II.B, related to Obtaining a Waiver.)

4. Regulated Portion of Small MS4

The portion of the small MS4 that is required to meet the conditions of this general permit are those portions that are located within the UA as defined and used by the U.S. Census Bureau in the 2000 or 2010 Censuses, as well as any portion of the small MS4 that is designated by TCEQ.

For the purpose of this permit, the regulated portion of a small MS4 for a transportation entity is the land owned by the permittee within the UA which functions as, or is integral to a transportation system with drainage conveyance. Non-contiguous property that does not drain into the transportation drainage system is not subject to this general permit.

5. Categories of Regulated Small MS4s

This permit defines MS4 operators by the following categories, or levels, based on the population served within the 2010 UA. The level of a small MS4 may change during the permit term based on the MS4 operator acquiring or giving up regulated area, such as by annexing land or if land is annexed away. However, the level of a small MS4 will not change during the permit term based on population fluctuation.

The level of an MS4 is based on most the recent Decennial Census at the time of permit issuance. A national Census held during a permit term will not affect the level of an MS4 until the next permit renewal.

(a) Level 1: Operators of traditional small MS4s that serve a population of less than 10,000 within a UA;

(b) Level 2: Operators of traditional small MS4s that serve a population of at least 10,000 but less than 40,000 within a UA. This category also includes all non-traditional small MS4s such as counties, drainage districts, transportation entities, military bases, universities, colleges, correctional institutions, municipal utility districts and other special districts regardless of population served within the UA, unless the non-traditional MS4 can demonstrate that it meets the criteria for a waiver from permit coverage based on the population served;

(c) Level 3: Operators of traditional small MS4s that serve a population of at least 40,000 but less than 100,000 within a UA;

(d) Level 4: Operators of traditional small MS4s that serve a population of 100,000 or more within a UA.

For the purpose of this section "serve a population" means the residential population within the regulated portion of the small MS4 based on the 2010 Census, except for non-traditional small MS4s listed in (b) above.

Section B. Available Waivers from Coverage

The TCEQ may waive permitting requirements for small regulated MS4 operators if the criteria are met for Waiver Option 1 or 2 below. To obtain Waiver Option 1, the MS4 operator must submit the request on a waiver form provided by the executive director, or, starting from December 21, 2020, complete the form electronically via the online e-permitting system available through the TCEQ website.

To obtain Waiver Option 2, the MS4 operator must contact the executive director and coordinate the activities required to meet the waiver conditions. A provisional waiver from permitting requirements begins 30 days after an administratively complete waiver form is postmarked for delivery to the TCEQ, or starting from December 21, 2020, complete the form electronically via the online e-permitting system available through the TCEQ website.

Following review of the waiver form, the executive director may:(1) Determine that the waiver form is technically complete and approve the waiver by providing a notification and a waiver number; (2) Determine that the waiver form is incomplete and deny the waiver until a completed waiver form is submitted; or (3) Deny the waiver and require that permit coverage be obtained.

If the conditions of a waiver are not met by the MS4 operator, then the MS4 operator must submit an application for coverage under this general permit or a separate TPDES permit application.

At any time the TCEQ may require a previously waived MS4 operator to comply with this general permit or another TPDES permit if circumstances change so that the conditions of the waiver are no longer met. Changed circumstances can also allow a regulated MS4 operator to request a waiver at any time.

At any time the TCEQ can request to review any waivers granted to MS4 operators to determine whether any of the information required for granting the waiver has changed. At

a minimum TCEQ will review all waivers when MS4 operators submit their renewal waiver applications.

For the purpose of obtaining a waiver, the population served refers to the residential population for traditional small MS4s and for certain non-traditional small MS4s with a residential population (such as counties and municipal utility districts). For other non-traditional small MS4s, the population served refers to the number of people using the small MS4 on an average operational day.

Effective December 21, 2020, applicants must submit a waiver using the online e-permitting system available through the TCEQ website, or request and obtain a waiver from electronic reporting from the TCEQ. Waivers from electronic reporting are not transferrable and expire on the same date as the authorization.

1. Waiver Option 1:

The small MS4 serves a population of less than 1,000 within a UA and meets the following criteria:

(a) The small MS4 is not contributing substantially to the pollutant loadings of a physically interconnected MS4 that is regulated by the NPDES / TPDES stormwater program (40 CFR § 122.32(d)); and

(b) If the small MS4 discharges any pollutant(s) that have been identified as a cause of impairment of any water body to which the small MS4 discharges, stormwater controls are not needed based on wasteload allocations that are part of an EPA approved or established TMDL that addresses the pollutant(s) of concern.

2. Waiver Option 2:

The small MS4 serves a population under 10,000 within a UA and meets the following criteria:

(a) The TCEQ has evaluated all waters of the U.S., including small streams, tributaries, lakes, and ponds, that receive a discharge from the small MS4;

(b) For all such waters, the TCEQ has determined that stormwater controls are not needed based on wasteload allocations that are part of an approved or established TMDL that addresses the pollutant(s) of concern or, if a TMDL has not been developed or approved, an equivalent analysis that determines sources and allocations for the pollutant(s) of concern; and

(c) The TCEQ has determined that future discharges from the small MS4 do not have the potential to exceed Texas surface water quality standards, including impairment of designated uses, or other significant water quality impacts, including habitat and biological impacts.

(d) For the purpose of this paragraph (2.), the pollutant(s) of concern include biochemical oxygen demand (BOD), sediment or a parameter that addresses sediment (such as total suspended solids, turbidity or siltation), pathogens, oil and grease, and any pollutant that has been identified as a cause of impairment of any water body that will receive a discharge from the small MS4.

Section C. Allowable Non-Stormwater Discharges

The following non-stormwater sources may be discharged from the small MS4 and are not required to be addressed in the small MS4's Illicit Discharge and Detection or other minimum control measures, unless they are determined by the permittee or the TCEQ to be significant contributors of pollutants to the small MS4, or they are otherwise prohibited by the MS4 operator:

1. Water line flushing (excluding discharges of hyperchlorinated water, unless the water is first dechlorinated and discharges are not expected to adversely affect aquatic life);
2. Runoff or return flow from landscape irrigation, lawn irrigation, and other irrigation utilizing potable water, groundwater, or surface water sources;
3. Discharges from potable water sources that do not violate Texas Surface Water Quality Standards;
4. Diverted stream flows;
5. Rising ground waters and springs;
6. Uncontaminated ground water infiltration;
7. Uncontaminated pumped ground water;
8. Foundation and footing drains;
9. Air conditioning condensation;
10. Water from crawl space pumps;
11. Individual residential vehicle washing;
12. Flows from wetlands and riparian habitats;
13. Dechlorinated swimming pool discharges that do not violate Texas Surface Water Quality Standards;
14. Street wash water excluding street sweeper waste water;
15. Discharges or flows from emergency fire fighting activities (fire fighting activities do not include washing of trucks, run-off water from training activities, test water from fire suppression systems, and similar activities);
16. Other allowable non-stormwater discharges listed in 40 CFR § 122.26(d)(2)(iv)(B)(1);
17. Non-stormwater discharges that are specifically listed in the TPDES Multi Sector General Permit (MSGP) TXR050000 or the TPDES Construction General Permit (CGP) TXR150000;
18. Discharges that are authorized by a TPDES or NPDES permit or that are not required to be permitted; and
19. Other similar occasional incidental non-stormwater discharges such as spray park water, unless the TCEQ develops permits or regulations addressing these discharges.

Section D. Limitations on Permit Coverage

1. Discharges Authorized by Another TPDES Permit

Discharges authorized by an individual or other general TPDES permit may be authorized under this TPDES general permit only if the following conditions are met:

(a) The discharges meet the applicability and eligibility requirements for coverage under this general permit;

(b) A previous application or permit for the discharges has not been denied, terminated, or revoked by the executive director as a result of enforcement or water quality related concerns. The executive director may provide a waiver to this provision based on new circumstances at the regulated small MS4; and

(c) The executive director has not determined that continued coverage under an individual permit is required based on consideration of an approved total maximum daily loading (TMDL) model and implementation plan, anti-backsliding policy, history of substantive non-compliance or other 30 TAC Chapter 205 considerations and requirements, or other site-specific considerations.

2. Discharges of Stormwater Mixed with Non-Stormwater

Stormwater discharges that combine with sources of non-stormwater are not eligible for coverage by this general permit, unless either the non-stormwater source is described in Part II.C of this general permit or the non-stormwater source is authorized under a separate TPDES permit.

3. Compliance with Water Quality Standards

Discharges to surface water in the state that would cause, has the reasonable potential to cause, or contribute to a violation of water quality standards or that would fail to protect and maintain existing designated uses are not eligible for coverage under this general permit except as described in Part II.D.4 below. The executive director may require an application for an individual permit or alternative general permit to authorize discharges to surface water in the state if the executive director determines that an activity will cause has the reasonable potential to cause, or contribute to, a violation of water quality standards or is found to cause, have the reasonable potential to cause, or contribute to the impairment of a designated use of surface water in the state. The executive director may also require an application for an individual permit based on factors described in Part II.F.2.

4. Impaired Water Bodies and Total Maximum Daily Load (TMDL) Requirements

Discharges of the pollutant(s) of concern to impaired water bodies for which there is a TCEQ and EPA approved TMDL are not eligible for this general permit unless they are consistent with the approved TMDL. A water body is impaired for purposes of the permit if it has been identified, pursuant to the latest TCEQ and EPA approved CWA §303(d) list or the *Texas Integrated Report of Surface Water Quality for CWA Sections 305(b) and 303(d)* which lists the category 4 and 5 water bodies, as not meeting Texas Surface Water Quality Standards.

The permittee shall check annually, in conjunction with preparation of the annual report, whether an impaired water within its permitted area has been added to the latest EPA approved 303(d) list or the *Texas Integrated Report of Surface Water Quality for CWA Sections 305(b) and 303(d)* which lists the category 4 and 5 water bodies. Within two years following the approval date of the new list(s) of impaired waters, the permittee shall comply with the requirements of Part II.D.4.(b) (with the exception of (b)(1)c), and shall identify any newly listed waters in the annual report (consistent with Part IV.B.2.f) and SWMP (consistent with Part III.A.2.f).

The permittee shall control the discharges of pollutant(s) of concern to impaired waters and waters with approved TMDLs as provided in sections (a) and (b) below, and shall assess the progress in controlling those pollutants.

(a) Discharges to Water Quality Impaired Water Bodies with an Approved TMDL

If the small MS4 discharges to an impaired water body with an approved TMDL, where stormwater has the potential to cause or contribute to the impairment, the permittee shall include in the SWMP controls targeting the pollutant(s) of concern along with any additional or modified controls required in the TMDL and this section.

The SWMP and required annual reports must include information on implementing any targeted controls required to reduce the pollutant(s) of concern as described below:

(1) Targeted Controls

The SWMP must include a detailed description of all targeted controls to be implemented, such as identifying areas of focused effort or implementing additional Best Management Practices (BMPs) to reduce the pollutant(s) of concern in the impaired waters.

(2) Measurable Goals

For each targeted control, the SWMP must include a measurable goal and an implementation schedule describing BMPs to be implemented during each year of the permit term.

(3) Identification of Benchmarks

The SWMP must identify a benchmark for the pollutant(s) of concern. Benchmarks are designed to assist in determining if the BMPs established are effective in addressing the pollutant(s) of concern in stormwater discharge(s) from the MS4 to the maximum extent practicable (MEP). The BMPs addressing the pollutant of concern must be re-evaluated on an annual basis for progress towards the benchmarks and modified as necessary within an adaptive management framework. These benchmarks are not numeric effluent limitations or permit conditions but intended to be guidelines for evaluating progress towards reducing pollutant discharges consistent with the benchmarks. The exceedance of a benchmark is not a permit violation and does not in itself indicate a violation of instream water quality standards.

The benchmark must be determined based on one of the following options:

a. If the MS4 is subject to a TMDL that identifies a Waste Load Allocation(s) (WLA) for permitted MS4 stormwater sources, then the SWMP may identify it as the benchmark. Where an aggregate allocation is used as a benchmark, all affected MS4 operators are jointly responsible for progress in meeting the benchmark and shall (jointly or individually) develop a monitoring/assessment plan as required in Part II.D.4(a)(6).

b. Alternatively, if multiple small MS4s are discharging into the same impaired water body with an approved TMDL, with an aggregate WLA for all permitted stormwater MS4s, then the MS4s may combine or share efforts to determine an alternative sub-benchmark value for the pollutant(s) of concern (e.g., bacteria) for their respective MS4. The SWMP must clearly define this alternative approach and must describe how the sub-benchmark value would cumulatively support the aggregate WLA. Where an aggregate benchmark has

been broken into sub-benchmark values for individual MS4s, each permittee is only responsible for progress in meeting its sub-benchmark value.

(4) Annual Report

The annual report must include an analysis of how the selected BMPs will be effective in contributing to achieving the benchmark value.

(5) Impairment for Bacteria

If the pollutant of concern is bacteria, the permittee shall implement BMPs addressing the below areas, as applicable, in the SWMP and implement as appropriate. If a TMDL Implementation Plan (I-Plan) is available, the permittee may refer to the I-Plan for appropriate BMPs. The SWMP and annual report must include the selected BMPs. Permitees may not exclude BMPs associated with the minimum control measures required under 40 CFR §122.34 from their list of proposed BMPs. Proposed BMPs will be reviewed by the executive director during the NOI and SWMP review and approval process.

The BMPs shall, as appropriate, address the following:

a. Sanitary Sewer Systems

(i) Make improvements to sanitary sewers to reduce overflows;

(ii) Address lift station inadequacies;

(iii) Improve reporting of overflows; and

(iv) Strengthen sanitary sewer use requirements to reduce blockage from fats, oils, and grease.

b. On-site Sewage Facilities (for entities with appropriate jurisdiction)

(i) Identify and address failing systems; and

(ii) Address inadequate maintenance of On-Site Sewage Facilities (OSSFs).

c. Illicit Discharges and Dumping

Place additional effort to reduce waste sources of bacteria; for example, from septic systems, grease traps, and grit traps.

d. Animal Sources

Expand existing management programs to identify and target animal sources such as zoos, pet waste, and horse stables.

e. Residential Education

Increase focus to educate residents on:

(i) Bacteria discharging from a residential site either during runoff events or directly;

(ii) Fats, oils, and grease clogging sanitary sewer lines and resulting overflows;

(iii) Maintenance and operation of decorative ponds; and

(iv) Proper disposal of pet waste.

(6) Monitoring or Assessment of Progress

The permittee shall develop a Monitoring/Assessment Plan to monitor or assess progress in achieving benchmarks and determine the effectiveness of BMPs, and shall include documentation of this monitoring or assessment in the SWMP and annual reports. In addition, the SWMP must include methods to be used.

a. The permittee may use either of the following methods to evaluate progress towards the benchmark and improvements in water quality in achieving the water quality standards as follows:

(i) Evaluating Program Implementation Measures

The permittee may evaluate and report progress towards the benchmark by describing the activities and BMPs implemented, by identifying the appropriateness of the identified BMPs, and by evaluating the success of implementing the measurable goals.

The permittee may assess progress by using program implementation indicators such as: (1) number of sources identified or eliminated; (2) decrease in number of illegal dumping; (3) increase in illegal dumping reporting; (4) number of educational opportunities conducted; (5) reductions in sanitary sewer flows (SSOs); or, (6) increase in illegal discharge detection through dry screening, etc.; or

(ii) Assessing Improvements in Water Quality

The permittee may assess improvements in water quality by using available data for segment and assessment units of water bodies from other reliable sources, or by proposing and justifying a different approach such as collecting additional instream or outfall monitoring data, etc. Data may be acquired from TCEQ, local river authorities, partnerships, and/or other local efforts as appropriate.

b. Progress towards achieving the benchmark shall be reported in the annual report. Annual reports shall report the benchmark and the year(s) during the permit term that the MS4 conducted additional sampling or other assessment activities.

(7) Observing no Progress Towards the Benchmark

If, by the end of the third year from the effective date of the permit, the permittee observes no progress toward the benchmark either from program implementation or water quality assessments as described in Part II.D.4(a)(6), the permittee shall identify alternative focused BMPs that address new or increased efforts towards the benchmark or, as appropriate, shall develop a new approach to identify the most significant sources of the pollutant(s) of concern and shall develop alternative focused BMPs for those (this may also include information that identifies issues beyond the MS4's control). These revised BMPs must be included in the SWMP and subsequent annual reports.

Where the permittee originally used a benchmark value based on an aggregated WLA, the permittee may combine or share efforts with other MS4s discharging to the same watershed to determine an alternative sub-benchmark value for the pollutant(s) of concern for their respective MS4s, as described in Part II.D.4(a)(3)(b) above. Permittees must document, in their SWMP for the next permit term, the proposed schedule for the development and subsequent adoption

of alternative sub-benchmark value(s) for the pollutant(s) of concern for their respective MS4s and associated assessment of progress in meeting those individual benchmarks.

(b) Discharges Directly to Water Quality Impaired Water Bodies without an Approved TMDL

The permittee shall also determine whether the permitted discharge is directly to one or more water quality impaired water bodies where a TMDL has not yet been approved by TCEQ and EPA. If the permittee discharges directly into an impaired water body without an approved TMDL, the permittee shall perform the following activities:

(1) Discharging a Pollutant of Concern

a. The permittee shall determine whether the small MS4 may be a source of the pollutant(s) of concern by referring to the CWA §303(d) list and then determining if discharges from the MS4 would be likely to contain the pollutant(s) of concern at levels of concern.

b. If the permittee determines that the small MS4 may discharge the pollutant(s) of concern to an impaired water body without an approved TMDL, the permittee shall ensure that the SWMP includes focused BMPs, along with corresponding measurable goals, that the permittee will implement, to reduce, the discharge of pollutant(s) of concern that contribute to the impairment of the water body.

c. In addition, the permittee shall submit an NOC to amend the SWMP in accordance with Part II.E.6 to include any additional BMPs to address the pollutant(s) of concern. This requirement does not apply to BMPs implemented to address impaired waters that are listed after permit authorization pursuant to Part II.D.4.

(2) Impairment of Bacteria

Where the impairment is for bacteria, the permittee shall identify potential significant sources and develop and implement focused BMPs for those sources. The permittee may implement the BMPs listed in Part II.D.4(a)(5) or proposed alternative BMPs as appropriate.

(3) The annual report must include information on compliance with this section, including results of any sampling conducted by the permittee.

5. Discharges to the Edwards Aquifer Recharge Zone

Discharges of stormwater from regulated small MS4s, and other non-stormwater discharges, are not authorized by this general permit where those discharges are prohibited by 30 TAC Chapter 213 (Edwards Aquifer Rule). New discharges located within the Edwards Aquifer Recharge Zone, or within that area upstream from the recharge zone and defined as the Contributing Zone, must meet all applicable requirements of, and operate according to, 30 TAC Chapter 213 (Edwards Aquifer Rule) in addition to the provisions and requirements of this general permit.

For existing discharges, the requirements of the agency-approved Water Pollution Abatement Plan (WPAP) under the Edwards Aquifer Rule are in addition to the requirements of this general permit. BMPs and maintenance schedules for structural stormwater controls, for example, may be required as a provision of the rule. All applicable requirements of the Edwards Aquifer Rule for reductions of suspended solids in stormwater

runoff are in addition to the effluent limitation requirements found in Part VI.D. of this general permit.

The permittee's agency-approved WPAPs that are required by the Edwards Aquifer Rule must be referenced in the SWMP. Additional agency-approved WPAPs received after the SWMP submittal must be recorded in the annual report for each respective permit year. For discharges originating from the small MS4 permitted area, and located on or within ten stream miles upstream of the Edwards Aquifer recharge zone, applicants must also submit a copy of the MS4 NOI to the appropriate TCEQ Regional Office with each WPAP application.

Counties: Comal, Bexar, Medina, Uvalde, and Kinney

Contact:

TCEQ, Water Program Manager
San Antonio Regional Office
14250 Judson Road
San Antonio, Texas 78233-4480
(210) 490-3096

Counties: Williamson, Travis, and Hays

Contact:

TCEQ, Water Program Manager
Austin Regional Office
12100 Park 35 Circle, Bldg. A, Rm 179
Austin, Texas 78753
(512) 339-2929

6. Discharges to Specific Watersheds and Water Quality Areas

Discharges of stormwater from regulated small MS4s and other non-stormwater discharges are not authorized by this general permit where prohibited by 30 TAC Chapter 311 (relating to Watershed Protection) for water quality areas and watersheds.

7. Protection of Streams and Watersheds by Home Rule Municipalities

This general permit does not limit the authority of a home-rule municipality provided by Texas Local Government Code § 401.002.

8. Indian Country Lands

Stormwater runoff from small MS4s that occur on Indian Country lands are not under the authority of the TCEQ and are not eligible for coverage under this general permit. If discharges of stormwater require authorization under federal NPDES regulations, authority for these discharges must be obtained from the U.S. EPA.

9. Endangered Species Act

Discharges that would adversely affect a listed endangered or threatened species or its critical habitat are not authorized by this permit. Federal requirements related to endangered species apply to all TPDES permitted discharges, and site-specific controls may

be required to ensure that protection of endangered or threatened species is achieved. If a permittee has concerns over potential impacts to listed species, the permittee shall contact TCEQ for additional information prior to submittal of the NOI and SWMP. If adverse impact is determined after submittal of the NOI and SWMP or after permit issuance, the permittee shall contact TCEQ immediately to determine corrective action and potential modification to the MS4's permit.

10. Other

Nothing in Part II of the general permit is intended to negate any person's ability to assert the force majeure (act of God, war, strike, riot, or other catastrophe) defenses found in 30 TAC § 70.7.

This permit does not transfer liability for the act of discharging without, or in violation of, a NPDES or a TPDES permit from the operator of the discharge to the permittee(s).

Section E. Obtaining Authorization

1. Application for Coverage

When submitting a notice of intent (NOI) and SWMP, for coverage under this general permit, as described in Parts II.E.3., II.E.8, and Part III, the applicant must follow the public notice and availability requirements found in Part II.E.16 of this general permit.

Applicants seeking authorization to discharge under this general permit must submit a completed NOI on a form approved by the executive director, and a SWMP as described in Part III. The NOI and SWMP must be submitted to the TCEQ Water Quality Division, at the address specified on the form or starting from December 21, 2020, must be submitted electronically via the online e-permitting system available through the TCEQ website.

Following review of the NOI and SWMP, the executive director may determine that: 1) The submission is complete and the NOI and SWMP are approved, 2) The NOI or SWMP are incomplete and deny coverage and require that a new complete NOI and SWMP be submitted, 3) Approve the NOI and SWMP with revisions and provide a written description of the required revisions along with any compliance schedule(s), or 4) Deny coverage and provide a deadline by which the MS4 operator must submit an application for an individual permit. Where the executive director approves the submittal, either with or without changes, the applicant must then carry out the public participation provisions in Part II.E.12. Following the completion of the public participation process, the applicant is authorized to discharge upon notification by TCEQ, at which point the permittee is subject to the terms of this permit and the approved terms of the SWMP. Denial of coverage under this general permit is subject to the requirements of 30 TAC § 205.4(c). Application deadlines are as follows:

(a) Small MS4s Located in a 2000 or 2010 UA (Previously regulated Small MS4s)

Operators of small MS4s described in Part II.A.1 that were required to obtain authorization under the 2013 TPDES General Permit TXR040000 based on the 2000 and 2010 UA maps shall submit an NOI and SWMP within 180 days following the effective date of this general permit.

(b) Designated Small MS4s

Following designation, operators of small MS4s described in Part II.A.2 shall submit an NOI and SWMP, or apply for coverage under an individual TPDES stormwater permit, within 180 days of being notified in writing by the TCEQ of the need to obtain permit coverage.

(c) Individual Permit Alternative

If an operator of a small MS4 described in Part II.A.1. of this general permit elects to apply for an individual permit, the application must be submitted within 90 days following the effective date of this general permit.

Effective December 21, 2020, the NOI and the SWMP must be submitted using the online e-permitting system available through the TCEQ website, unless the permittee requests and obtains an electronic reporting waiver. Waivers from electronic reporting are not transferrable and expire on the same date as the authorization to discharge.

2. Late Submission of the NOI and SWMP

Operators are not prohibited from submitting an NOI and SWMP after the deadlines provided. If a late NOI and SWMP are submitted, then this general permit provides authorization only for discharges that occur after permit coverage is obtained. The TCEQ reserves the right to take appropriate enforcement actions for any unpermitted discharges.

3. SWMP General Requirements

A SWMP must be developed and submitted with the NOI for eligible discharges that will reach waters of the U.S., including discharges from the regulated small MS4 to other MS4s or to privately-owned separate storm sewer systems that subsequently drain to waters of the U.S., according to the requirements of Part III of this general permit. The SWMP must include, as appropriate, the months and years in which the permittee will undertake required actions, including interim milestones and the frequency of the action throughout the permit term.

New elements in the program must be completely implemented within five years of the effective date of this general permit, or within five years of being designated for those small MS4s which are designated following permit issuance. Previously regulated MS4s shall assess existing program elements set forth in the previous permit, modify as necessary, and develop and implement new elements, as necessary, to continue reducing the discharge of pollutants from the MS4 to the MEP.

4. SWMP Review

The permittee shall participate in an annual review of its SWMP in conjunction with preparation of the annual report required in Part IV.B.2. Results of the review shall be documented in the annual report.

5. SWMP Updates Required by TCEQ

Changes may be made to the SWMP during the permit term. The TCEQ may notify the permittee of the need to modify the SWMP to be consistent with the general permit, in which case the permittee will have 90 days to finalize such changes to the SWMP.

6. SWMP Updates

Changes that are made to the SWMP before the NOI is approved by the TCEQ must be submitted in a letter providing supplemental information to the NOI.

Changes to the SWMP that are made after TCEQ approval of the NOI and SWMP may be made by submittal and approval of a notice of change (NOC) unless the changes are non-substantial and do not change terms and conditions in the SWMP. Changes may be made as follows:

(a) Changes that do not require an NOC

The following changes may be implemented without submitting an NOC form. The changes may be made immediately following revision of the SWMP:

(1) Adding (but not subtracting or replacing) components, controls, or requirements to the SWMP;

(2) Adding areas such as by annexing land, or otherwise acquire additional land that expands the boundary of the MS4, or subtracting areas, such as by de-annexing lands;

(3) Adding impaired water bodies that are identified pursuant to Part II.D.4; and

(4) Minor modifications to the SWMP that include administrative or non-substantial changes as follows:

a. A change in personnel, or a reorganization of departments responsible for implementing the SWMP;

b. Minor clarifications to the existing BMPs;

c. Correction of typographical errors;

d. Other similar administrative or non-substantive comments.

(b) Changes that require an NOC

Modifications to the SWMP that include the following changes require submittal of an NOC along with those portions of the SWMP that are applicable to the change(s). The changes may be implemented once the permittee receives approval of the NOC.

(1) Replacing a less effective or infeasible BMP specifically identified in the SWMP with an alternative BMP, (for example, replacing a structural BMP with a non-structural BMP would be considered a replacement). The SWMP update must include documentation of the following:

a. An analysis of why the BMP is ineffective or infeasible (including cost prohibitive);

b. Expectations of the effectiveness of the replacement BMP; and

c. An analysis of why the replacement BMP is expected to achieve the goals of the BMP to be replaced;

(2) Requirement for more frequent monitoring or reporting by the permittee; and

(3) Interim compliance date change in a schedule of compliance, provided the new date is not more than 120 days after the date specified in the existing permit and does not interfere with attainment of the final compliance date requirement.

(c) Changes that require an NOC and Public Notice

All other modifications that changes permit terms and conditions must be submitted on an NOC form along with those portions of the SWMP that are applicable to the changes. The changes may only be implemented following public notice and written approval by TCEQ.

(1) After receiving an NOC, the TCEQ evaluates if the requested change(s) can be approved and might request additional information from the permittee during the review process. If the request can be approved, the MS4 is required to post the notice of the Executive Director's preliminary determination of the NOC and the revised terms of the SWMP on the MS4's website. If the MS4 does not have a website, the MS4 must notify TCEQ and TCEQ will post the notice on the TCEQ website at https://www.tceq.texas.gov/.

(2) The public comment period begins on the first day the notice is posted on the MS4 or the TCEQ website and ends 30 days later. If the 30th calendar day falls on a date that TCEQ is not open for business, then the public comment period is extended until 5 pm on the next TCEQ business day. If there is a decision to hold a public meeting, then the public comment period will continue until the public meeting has been held. The public may submit comments regarding the proposed changes to the TCEQ Water Quality Division.

(3) The Executive Director will hold a public meeting (equivalent to a "public hearing" as required by 40 CFR §122.28(d)(2)(ii)) if it is determined there is significant public interest. The Executive Director will post a notice of the public meeting on the TCEQ website at https://www.tceq.texas.gov/. The notice of a public meeting will be posted at least 30 days before the meeting and will be held in the county where the MS4 is located or primarily located. TCEQ staff will facilitate the meeting and provide a sign in sheet for attendees to register their names and addresses. The public meeting held under this general permit is not an evidentiary proceeding. If a public meeting is held, the comment period will end at the conclusion of the public meeting.

(4) The Executive Director, after considering public comment, shall incorporate the NOC changes into the SWMP. Once the revised terms are incorporated into the SWMP, the Executive Director will notify the permittee and the public on the revised terms and conditions of the SWMP.

7. Transfer of Ownership, Operational Authority, or Responsibility for SWMP Implementation

The permitte shall implement the SWMP:

(a) On all new areas added to its portion of the MS4 (or where the permittee becomes responsible for implementation of stormwater quality controls) as expeditiously as possible, but no later than three (3) years from addition of the new area.

Implementation may be accomplished in a phased manner to allow additional time for controls that cannot be implemented immediately.

(b) Within ninety (90) days of a transfer of ownership, operational authority, or responsibility for SWMP implementation, the permittee shall have a plan for implementing the SWMP in all affected areas. The plan must include schedules for implementation, and information on all new annexed areas. Any resulting updates required to the SWMP shall be submitted in the annual report.

8. Contents of the NOI

The NOI must contain the following minimum information:

(a) MS4 Operator Information

(1) The name, mailing address, electronic mail (email) address, telephone number, and facsimile (fax) number of the MS4 operator; and

(2) The legal status of the MS4 operator (for example, federal government, state government, county government, city government, or other government).

(b) Site Information

(1) The name, physical location description, and latitude and longitude of the approximate center of the regulated portion of the small MS4;

(2) County or counties where the small MS4 is located;

(3) An indication if all or a portion of the small MS4 is located on Indian Country Lands;

(4) The name, mailing address, telephone number, email (if available) and fax number of the designated person(s) responsible for implementing or coordinating implementation of the SWMP;

(5) A signature and certification on the NOI, according to 30 TAC § 305.44, that a SWMP has been developed according to the provisions of this permit;

(6) A statement that the applicant will comply with the Public Participation requirements described in Part II.E.12.;

(7) The name of each classified segment that receives discharges, directly or indirectly, from the small MS4. If one or more of the discharge(s) is not directly to a classified segment, then the name of the first classified segment that those discharges reach must be identified;

(8) The name of any MS4 receiving the discharge prior to discharge into waters of the U.S.;

(9) The name of all surface water(s) receiving discharges from the small MS4 that are on the latest EPA-approved CWA § 303(d) list of impaired waters;

(10) An indication of whether the small MS4 discharges within the Recharge Zone, the Contributing Zone or the Contributing Zone within the Transition Zone of the Edwards Aquifer; and

(11) Any other information deemed necessary by the executive director.

9. Notice of Change (NOC)

If the MS4 operator becomes aware that it failed to submit any relevant facts, or submitted incorrect information in the NOI, the correct information must be provided to the executive director in an NOC within 30 days after discovery. If any information provided in the NOI changes, an NOC must be submitted within 30 days from the time the permittee becomes aware of the change.

Any revisions that are made to the SWMP must be made in accordance with Parts II.E.4 through 6. Changes that are made to the SWMP following NOI approval must be made using an NOC form, in accordance with Part II.E.6.

Effective December 21, 2020, applicants must submit an NOC using the online e-permitting system available through the TCEQ website, or request and obtain a waiver from electronic reporting from the TCEQ. Waivers from electronic reporting reporting are not transferrable and expire on the same date as the authorization to discharge.

10. Change in Operational Control of a Small MS4

If the operational control of the regulated small MS4 changes, the previous operator must submit a Notice of Termination (NOT) and the new operator must submit an NOI and SWMP. The NOT and NOI must be submitted concurrently not more than ten (10) calendar days after the change occurs. Existing permittees who are expanding coverage of their MS4 area (e.g., city annexes part of unincorporated county MS4) are not required to submit a new NOI, but must comply with Part II.E.7.

11. Notice of Termination (NOT)

A permittee may terminate coverage under this general permit by providing a Notice of Termination (NOT) on a form approved by the executive director. Authorization to discharge terminates at midnight on the day that an NOT is postmarked for delivery to the TCEQ, or immediately following confirmation of receipt of the electronic NOT form by the TCEQ. A NOT must be submitted within 30 days after the MS4 operator obtains coverage under an individual permit.

Effective December 21, 2020, applicants must submit an NOT using the online e-permitting system available through the TCEQ website, or request and obtain a waiver from electronic reporting from the TCEQ. Waivers from electronic reporting are not transferrable and expire on the same date as the authorization to discharge.

12. Signatory Requirement for NOI, NOT, NOC, and Waiver Forms

NOI, NOT, NOC, and Waiver forms must be signed and certified consistent with 30 TAC § 305.44(a) and (b) (relating to Signatories to Applications).

13. Fees

An application fee of $ 400.00 must be submitted with each NOI. A fee is not required for submission of a waiver form, an NOT, or an NOC.

A permittee authorized under this general permit must pay an annual Water Quality fee of $100.00 under TWC § 26.0291 and 30 TAC Chapter 205 (relating to General Permits for Waste Discharges).

Effective December 21, 2020, applicants seeking coverage under an NOI or a waiver must submit their application electronically using the online e-permitting system available through the TCEQ website, or request and obtain a waiver from electronic reporting from

the TCEQ. Waivers from electronic reporting are not transferrable and expire on the same date as the authorization to discharge.

14. Permit Expiration

(a) This general permit is effective for five (5) years from the permit effective date. Authorizations for discharge under the provisions of this general permit will continue until the expiration date of the general permit. This general permit may be amended, revoked, or canceled by the commission or renewed by the TCEQ for an additional term not to exceed five (5) years.

(b) If the executive director proposes to reissue this general permit before the expiration date, the general permit will remain in effect until the date on which the commission takes final action on the proposal to reissue this general permit. For existing permittees, general permit coverage will remain in effect after the expiration date of the existing general permit, in accordance with 30 TAC, Chapter 205. No new NOIs will be accepted and no new authorizations will be processed under the general permit after the expiration date.

(c) Following issuance of a renewed or amended general permit, all permittees, including those covered under the expired general permit, may be required to submit an NOI according to the requirements of the new general permit or to obtain a TPDES individual permit for those discharges. The renewed permit will include a deadline to apply for coverage, and authorization for existing permittees will be automatically extended until the deadline to apply for coverage, or until an application is submitted for renewal, whichever occurs first.

(d) If the TCEQ does not propose to reissue this general permit within 90 days before the expiration date, permittees must apply for authorization under a TPDES individual permit or an alternative general permit. If the application for an individual permit is submitted before the expiration date of this general permit, authorization under this expiring general permit remains in effect until the issuance or denial of an individual permit.

15. Suspension of Permit Coverage

The executive director may suspend an authorization under this general permit for the reasons specified in 30 TAC § 205.4(d) by providing the discharger with written notice of the decision to suspend that authority, and the written notice will include a brief statement of the basis for the decision. If the decision requires an application for an individual permit or an alternative general permit, the written notice will also include a statement establishing the deadline for submitting an application. The written notice will state that the authorization under this general permit is either suspended on the effective date of the commission's action on the permit application, unless the commission expressly provides otherwise, or immediately, if required by the executive director.

16. Public Notice Process for NOI submittal

An applicant under this general permit shall adhere to the following procedures:

(a) The applicant shall submit an NOI and SWMP to the executive director. The SWMP must include information about:

(1) BMPs the applicant will implement for each of the six MCMs and program elements pursuant to Part II.D (relating to Impaired Water Bodies and Total Maximum Daily Load (TMDL) Requirements), as appropriate;

(2) The measurable goals for each of the BMPs and program elements pursuant to Part II.D.4 (relating to Impaired Water Bodies and Total Maximum Daily Load (TMDL) Requirements), including, as appropriate the months and years in which the applicant will take the required actions, including interim milestones and the frequency of the action; and

(3) The person or persons responsible for implementing or coordinating the applicants SWMP.

(b) After the applicant receives written instructions from the TCEQ's Office of Chief Clerk, the applicant must publish notice of the executive director's preliminary decision on the NOI and SWMP.

(c) The notice will include the following information, at a minimum:

(1) The legal name of the MS4 operator;

(2) Indication of whether the NOI is for a new authorization or is a renewal of an existing authorization;

(3) The address of the applicant;

(4) A brief summary of the information included in the NOI, such as the general location of the small MS4 and a description of the classified receiving waters that receive the discharges from the small MS4;

(5) The location and mailing address where the public may provide comments to the TCEQ;

(6) The public location where copies of the NOI and SWMP, as well as the executive director's general permit and fact sheet, may be reviewed; and

(7) If required by the executive director, the date, time, and location of the public meeting.

(d) This notice must be published at least once in a newspaper of general circulation in the municipality or county where the small MS4 is located. If the small MS4 is located in multiple municipalities or counties, the notice must be published at least once in a newspaper of general circulation in the municipality or county containing the largest resident population for the regulated portion of the small MS4. This notice must provide opportunity for the public to submit comments on the NOI and SWMP. In addition, the notice must allow the public to request a public meeting. A public meeting (equivalent to a "public hearing" as required by 40 CFR §122.28(d)(2)(ii)) will be held if the TCEQ determines that there is significant public interest.

(e) The public comment period begins on the first date the notice is published and lasts for at least 30 days. If a public meeting is held, the comment period will end at the closing of the public meeting (see paragraph (f) below). The public may submit written comments to the TCEQ Office of Chief Clerk during the comment period detailing how the NOI or SWMP for the small MS4 fails to meet the technical requirements or conditions of this general permit.

(f) If significant public interest exists, the executive director will direct the applicant to publish a notice of the public meeting and to hold the public meeting. The applicant shall publish notice of a public meeting at least 30 days before the meeting and hold the public meeting in a county where the small MS4 is located. TCEQ staff will facilitate the meeting.

(g) If a public meeting is held, the applicant shall describe the contents of the NOI and SWMP. The applicant shall also provide maps and other data on the small MS4. The applicant shall provide a sign in sheet for attendees to register their names and addresses and furnish the sheet to the executive director. A public meeting held under this general permit is not an evidentiary proceeding.

(h) The applicant shall file with the Chief Clerk a copy and an affidavit of the publication of notice(s) within 60 days of receiving the written instructions from the Chief Clerk.

(i) The executive director, after considering public comment, will either approve, approve with conditions, or deny the NOI based on whether the NOI and SWMP meet the requirements of this general permit.

(j) Persons whose names and addresses appear legibly on the sign-in sheet from the public meeting and persons who submitted written comments to the TCEQ will be notified by the TCEQ's Office of Chief Clerk of the executive director's decision regarding the authorization.

Section F. Permitting Options

1. Authorization Under the General Permit

An operator of a small MS4 is required to obtain authorization either under this general permit, or under an individual TPDES permit if it is located in a UA or designated by the TCEQ. Multiple small MS4s with separate operators must individually submit an NOI to obtain coverage under this general permit, regardless of whether the systems are physically interconnected, located in the same UA, or are located in the same watershed. Each regulated small MS4 will be issued a distinct permit number. These MS4 operators may combine or share efforts in meeting any or all of the SWMP requirements stated in Part III of this general permit. MS4 operators that share SWMP development and implementation responsibilities must meet the following conditions:

(a) Participants

The SWMP must clearly list the name and permit number for each MS4 operator that chooses to contribute to development or implementation of the SWMP, and provide written confirmation that the contributing MS4 operator has agreed to contribute. If a contributing small MS4 has submitted a NOI and SWMP to TCEQ, but has not yet received written notification of approval, along with the accompanying permit authorization number, a copy of the submitted NOI form must be made readily available or be included in the SWMP.

(b) Responsibilities

Each permittee is entirely responsible for meeting SWMP requirements within the boundaries of its small MS4. Where a separate MS4 operator is contributing to implementation of the SWMP, the SWMP must clearly define each minimum control measure and the component(s) each entity agrees to implement, within which MS4 area(s) each entity agrees to implement and clearly identify the contributing MS4 operator.

2. Alternative Coverage under an Individual TPDES Permit

An MS4 operator eligible for coverage under this general permit may alternatively be authorized under an individual TPDES permit according to 30 TAC Chapter 305 (relating to Consolidated Permits). The executive director may require a MS4 operator, authorized by

this general permit, to apply for an individual TPDES permit because of: the conditions of an approved TMDL or TMDL implementation plan; a history of substantive non-compliance; or other 30 TAC Chapter 205 considerations and requirements; or other site-specific considerations. The executive director shall deny or suspend a facility's authorization for disposal under this general permit based on a rating of "unsatisfactory performer" according to commission rules in 30 TAC §60.3, Use of Compliance History. An applicant who owns or operates a facility classified as an "unsatisfactory performer" is entitled to a hearing before the commission prior to having its coverage denied or suspended, in accordance with TWC § 26.040(h).

Part III. Stormwater Management Program (SWMP)

To the extent allowable under state and local law, a SWMP must be developed, implemented, and enforced according to the requirements of Part III of this general permit for stormwater discharges that reach waters of the U.S., regardless of whether the discharge is conveyed through a separately operated storm sewer system. The SWMP must be developed, implemented, and enforced to reduce the discharge of pollutants from the small MS4 to the maximum extent practicable (MEP), to protect water quality, and to satisfy the appropriate water quality requirements of the CWA and the TWC.

The SWMP must also be implemented and enforced in new MS4 areas added during the permit term. Implementation of appropriate BMPs for the new areas must occur in accordance with Part II.E.7.

A permittee that implements BMPs consistent with the provisions of their permit and SWMP constitutes compliance with the standard of reducing pollutants to the MEP and will be deemed in compliance with Part III of this permit. This permit does not extend any compliance deadlines set forth in the previous permit effective December 13, 2013.

Section A. Developing a Stormwater Management Program (SWMP)

1. SWMP Development and Schedule

(a) Existing regulated small MS4s

Permittees who were regulated under the previous TPDES general permit TXR040000, shall update and submit to the TCEQ an updated SWMP under this general permit along with the NOI for coverage. The NOI and SWMP are due within 180 days of the general permit effective date. The permittee shall continue to operate under the conditions of the previous permit and existing SWMP until the revised SWMP is approved.

(b) Implementation of the SWMP

Existing small MS4 operators shall ensure full implementation of any new elements in the revised SWMP as soon as practicable, but no later than five years from the permit effective date. Previously regulated MS4 operators shall continue to implement existing elements in the approved SWMPs until the revised SWMPs has been approved.

Designated small MS4s must achieve full implementation of the SWMP as soon as practicable, but no later than five years from designation.

2. Content of the SWMP

At a minimum, the permittee shall include the following information in its SWMP:

(a) A description of Minimum Control Measures (MCM) with measureable goals, including, as appropriate, the months and years when the permittee will undertake required actions, including interim milestones and the frequency of the action for each MCM described in Part III, Section B.

(b) A measurable goal that includes the development of ordinances or other regulatory mechanisms allowed by state, federal and local law, providing the legal authority necessary to implement and enforce the requirements of this permit, including information on any limitations to the legal authority;

(c) The measurable goals selected by the permittee must be clear, specific, and measurable.

(d) A summary of written procedures describing how the permittee will implement the provisions in Parts III and IV of this general permit.

(e) A description of a program or a plan of compliance with the requirements in Part II.D.4. (relating to Impaired Water Bodies and Total Maximum Daily Load (TMDL) Requirements)

(f) Identification of any impaired waters that have been added in accordance with Part II.D.4.

3. Legal Authority

(a) Traditional small MS4s, such as cities

(1) Within two years from the permit effective date, the permittee shall review and revise, if needed, its relevant ordinance(s) or other regulatory mechanism(s), or shall adopt a new ordinance(s) or other regulatory mechanism(s) that provide the permittee with adequate legal authority to control pollutant discharges into and from its small MS4 in order to meet the requirements of this general permit.

(2) To be considered adequate, this legal authority must, at a minimum, address the following:

a. Authority to prohibit illicit discharges and illicit connections;

b. Authority to respond to and contain other releases – Control the discharge of spills, and prohibit dumping or disposal of materials other than stormwater into the small MS4;

c. Authority to require compliance with conditions in the permittee's ordinances, permits, contracts, or orders;

d. Authority to require installation, implementation, and maintenance of control measures;

e. Authority to receive and collect information, such as stormwater plans, inspection reports, and other information deemed necessary to assess compliance with this permit, from operators of construction sites, new or redeveloped land, and industrial and commercial facilities;

f. Authority, as needed, to enter and inspect private property including facilities, equipment, practices, or operations related to stormwater discharges to the small MS4;

g. Authority to respond to non-compliance with BMPs required by the small MS4 consistent with their ordinances or other regulatory mechanism(s);

h. Authority to assess penalties, including monetary, civil, or criminal penalties; and

i. Ability to enter into interagency or interlocal agreements or other maintenance agreements, as necessary.

(b) Non-traditional small MS4s, such as counties, drainage districts, transportation entities, municipal utility districts, military bases, prisons, and universities

(1) Where the permittee lacks the authority to develop ordinances or to implement enforcement actions, the permittee shall exert enforcement authority as required by this general permit for its facilities, employees, contractors, and any other entity over which it has operational control within the portion of the UA under the jurisdiction of the permittee. For discharges from third party actions, the permittee shall perform inspections and exert enforcement authority to the MEP.

(2) If the permittee does not have inspection or enforcement authority and is unable to meet the goals of this general permit through its own powers, then, unless otherwise stated in this general permit, the permittee shall perform the following actions in order to meet the goals of the permit:

a. Enter into interlocal agreements with municipalities where the small MS4 is located. These interlocal agreements must state the extent to which the municipality will be responsible for inspections and enforcement authority in order to meet the conditions of this general permit; or,

b. If it is not feasible for the permittee to enter into interlocal agreements, the permittee shall notify an adjacent MS4 operator with enforcement authority or the appropriate TCEQ Regional Office to report discharges or incidents that it cannot itself enforce against. In determining feasibility for entering into interlocal agreements, the permittee shall consider all factors, including, without limitations, financial considerations and the willingness of the municipalities in which the small MS4 is located.

4. Resources

It is the permittee's responsibility to ensure that it has adequate resources and funding to implement the requirements of this permit.

5. Effluent Limitations

The controls and BMPs included in the SWMP constitute effluent limitations for the purposes of compliance with state rules. This includes the requirements of 30 TAC Chapter 319, Subchapter B, which lists the maximum allowable concentrations of hazardous metals for discharge to water in the state.

6. Enforcement Measures

Permittees with enforcement authority (i.e. traditional small MS4s) shall develop a standard operating procedure (SOP) to respond to violations to the extent allowable under state and local law. When the permittee does not have enforcement authority over the violator, and the violations continue after violator has been notified by the permittee, or the source of the illicit discharge is outside the MS4's boundary, the permittee shall notify either the adjacent MS4 operator with enforcement authority or the appropriate TCEQ Regional Office.

Section B. Minimum Control Measures

Operators of small MS4s seeking coverage under this general permit shall develop and implement a SWMP that includes the following six minimum control measures (MCMs), as applicable.

All program elements must be implemented according to the schedule mentioned in Part III.A. All six MCMs apply to all MS4s regardless of their level as described in Part II.A.5. Specific program elements under each MCM shall be implemented by all MS4 operators, unless it is specifically stated that particular program elements only are applicable for certain levels of small MS4s.

Permittees shall provide justification within the SWMP for any requirements that were not implemented because they were not feasible as described in each MCM.

1. Public Education, Outreach, and Involvement

(a) Public Education and Outreach

(1) All permittees shall develop, implement, and maintain a comprehensive stormwater education and outreach program to educate public employees, businesses, and the general public of hazards associated with the illegal discharges and improper disposal of waste and about the impact that stormwater discharges can have on local waterways, as well as the steps that the public can take to reduce pollutants in stormwater.

Existing permittees shall assess program elements that were described in the previous permit, modify as necessary, and develop and implement new elements, as necessary, to continue reducing the discharge of pollutants from the MS4 to the MEP. New elements must be fully implemented by the end of this permit term and newly regulated permittees shall have the program fully implemented by the end of this permit term. The program must, at a minimum:

a. Define the goals and objectives of the program based on high priority community-wide issues (for example, reduction of nitrogen in discharges from the small MS4, promoting previous techniques used in the small MS4, or improving the quality of discharges to the Edwards Aquifer);

b. Identify the target audience(s);

c. Develop or utilize appropriate educational materials, such as printed materials, billboard and mass transit advertisements, signage at select locations, radio advertisements, television advertisements, and websites;

d. Determine cost effective and practical methods and procedures for distribution of materials.

(2) Throughout the permit term, all permittees shall make the educational materials available to convey the program's message to the target audience(s) at least annually.

(3) If the permittee has a public website, the permittee shall post its SWMP and the annual reports required under Part IV.B.2. or a summary of the annual report on the permittee's website. The SWMP must be posted no later than 30 days after the approval date, and the annual report no later than 30 days after the due date.

(4) All permittees shall annually review and update the SWMP and MCM implementation procedures required by Part III.A.2., as necessary. Any changes

must be reflected in the annual report. Such written procedures must be maintained, either on site or in the SWMP and made available for inspection by the TCEQ.

(5) MS4 operators may partner with other MS4 operators to maximize the program and cost effectiveness of the required outreach.

(b) Public Involvement

All permittees shall involve the public, and, at minimum, comply with any state and local public notice requirements in the planning and implementation activities related to developing and implementing the SWMP, except that correctional facilities are not required to implement this portion of the MCM.

Existing permittees shall assess program elements that were described in the previous permit, modify as necessary, and develop and implement new elements, as necessary, to continue reducing the discharge of pollutants from the MS4 to the MEP. New elements must be fully implemented by the end of this permit term and newly regulated permittees shall have the program fully implemented by the end of this permit term. At a minimum, all permittees shall:

(1) Consider using public input (for example, the opportunity for public comment, or public meetings) in the implementation of the program;

(2) Create opportunities for citizens to participate in the implementation of control measures, such as stream clean-ups, storm drain stenciling, volunteer monitoring, volunteer “Adopt-A-Highway” programs, and educational activities;

(3) Ensure the public can easily find information about the SWMP.

2. Illicit Discharge Detection and Elimination (IDDE)

(a) Program Development

(1) All permittees shall develop, implement, and enforce a program to detect, investigate, and eliminate illicit discharges into the small MS4. The program must include a plan to detect and address non-stormwater discharges, including illegal dumping to the MS4 system.

Existing permittees must assess program elements that were described in the previous permit, modify as necessary, and develop and implement new elements, as necessary, to continue reducing the discharge of pollutants from the MS4 to the MEP. New elements must be fully implemented by the end of this permit term and newly regulated permittees shall have the program fully implemented by the end of this permit term. (See also Part III.A.1(c).

The Illicit Discharge Detection and Elimination (IDDE) program must include the following:

a. An up-to-date MS4 map (see Part III.B.2.(c)(1));

b. Methods for informing and training MS4 field staff (see Part III.B.2.(c)(2));

c. Procedures for tracing the source of an illicit discharge (see Part III. B.2.(c)(5));

d. Procedures for removing the source of the illicit discharge (see Part III.B.2.(c)(5));

e. For Level 2, 3 and 4 small MS4s, if applicable, procedures to prevent and correct any leaking on-site sewage disposal systems that discharge into the small MS4;

f. For Level 4 small MS4s, procedures for identifying priority areas within the small MS4 likely to have illicit discharges, and a list of all such areas identified in the small MS4 (see Part III.B.2.(e)(1));

g. For Level 4 small MS4s, field screening to detect illicit discharges (see Part III.B.2.(e)(2)); and

h. For Level 4 small MS4s, procedures to reduce the discharge of floatables in the MS4. (see Part III.B.2.(e)(3).)

(2) For non-traditional small MS4s, if illicit connections or illicit discharges are observed related to another operator's MS4, the permittee shall notify the other MS4 operator within 48 hours of discovery. If notification to the other MS4 operator is not practicable, then the permittee shall notify the appropriate TCEQ Regional Office of the possible illicit connection or illicit discharge.

(3) If another MS4 operator notifies the permittee of an illegal connection or illicit discharge to the small MS4, then the permittee shall follow the requirements specified in Part III.B.2.(c)(3).

(4) All permittees shall annually review and update as necessary, the SWMP and MCM implementation procedures required by Part III.A.2. Any changes must be reflected in the annual report. Such written procedures must be maintained, either on site or in the SWMP and made available for inspection by the TCEQ.

(b) Allowable Non-Stormwater Discharges

Non-stormwater flows listed in Part II.C do not need to be considered by the permittee as an illicit discharge requiring elimination unless the permittee or the TCEQ identifies the flow as a significant source of pollutants to the small MS4.

(c) Requirements for all Permittees

All permittees shall include the requirements described below in Parts III.B.2(c)(1)-(6)

(1) MS4 mapping

All permittees shall maintain an up-to-date MS4 map, which must be located on site and available for review by the TCEQ. The MS4 map must show at a minimum the following information:

a. The location of all small MS4 outfalls that are operated by the permittee and that discharge into waters of the U.S;

b. The location and name of all surface waters receiving discharges from the small MS4 outfalls; and

c. Priority areas identified under Part III.B.2.(e)(1), if applicable.

(2) Education and Training

All permittees shall implement a method for informing or training all the permittee's field staff that may come into contact with or otherwise observe an illicit discharge or illicit connection to the small MS4 as part of their normal job responsibilities. Training program materials and attendance lists must be maintained on site and made available for review by the TCEQ.

(3) Public Reporting of Illicit Discharges and Spills

All permittees shall publicize and facilitate public reporting of illicit discharges or water quality impacts associated with discharges into or from the small MS4. The permittee shall provide a central contact point to receive reports; for example by including a phone number for complaints and spill reporting.

(4) All permittees shall develop and maintain on-site procedures for responding to illicit discharges and spills.

(5) Source Investigation and Elimination

a. Minimum Investigation Requirements – Upon becoming aware of an illicit discharge, all permittees shall conduct an investigation to identify and locate the source of such illicit discharge as soon as practicable.

(i) All permittees shall prioritize the investigation of discharges based on their relative risk of pollution. For example, sanitary sewage may be considered a high priority discharge.

(ii) All permittees shall report to the TCEQ immediately upon becoming aware of the occurrence of any illicit flows believed to be an immediate threat to human health or the environment.

(iii) All permittees shall track all investigations and document, at a minimum, the date(s) the illicit discharge was observed; the results of the investigation; any follow-up of the investigation; and the date the investigation was closed.

b. Identification and Investigation of the Source of the Illicit Discharge –All permittees shall investigate and document the source of illicit discharges where the permittees have jurisdiction to complete such an investigation. If the source of illicit discharge extends outside the permittee's boundary, all permittees shall notify the adjacent permitted MS4 operator or the appropriate TCEQ Regional Office according to Part III.A.3.b.

c. Corrective Action to Eliminate Illicit Discharge

If and when the source of the illicit discharge has been determined, all permittees shall immediately notify the responsible party of the problem, and shall require the responsible party to perform all necessary corrective actions to eliminate the illicit discharge.

(6) Inspections –The permittee shall conduct inspections, in response to complaints, and shall conduct follow-up inspections to ensure that corrective measures have been implemented by the responsible party.

The permittee shall develop written procedures describing the basis for conducting inspections in response to complaints and conducting follow-up inspections.

(d) Additional Requirements for Level 3 and 4 small MS4s

In addition to the requirements described in Parts III.B.2(c)(1)-(6) above, permittees who operate Level 3 and 4 small MS4s shall meet the following requirements:

Source Investigation and Elimination

Permittees who operate Level 3 and 4 small MS4 shall upon being notified that the discharge has been eliminated, conduct a follow-up investigation or field screening, consistent with Part III.B.2.(e)(2), to verify that the discharge has been eliminated. The

permittee shall document its follow-up investigation. The permittee may seek recovery and remediation costs from responsible parties consistent with Part III.A.3., and require compensation related costs. Resulting enforcement actions must follow the procedures for enforcement action in Part III.A.3. If the suspected source of the illicit discharge is authorized under an NPDES/TPDES permit or the discharge is listed as an authorized non-stormwater discharge, as described in Part III.C, no further action is required.

(e) Additional Requirements for Level 4 small MS4s

In addition to the requirements described in Parts III.B.2(c)-(d) above, permittees who operate Level 4 small MS4s shall meet the following requirements:

(1) Identification of Priority Areas

Permittees who operate Level 4 small MS4s shall identify priority areas likely to have illicit discharges and shall document the basis for the selection of each priority area and shall create a list of all priority areas identified. This priority area list must be available for review by the TCEQ.

(2) Dry Weather Field Screening

By the end of the permit term, permittees who operate Level 4 small MS4s shall develop and implement a written dry weather field screening program to assist in detecting and eliminating illicit discharges to the small MS4. Dry weather field screening must consist of (1) field observations; and (2) field screening according to item (2)c. below.

If dry weather field screening is necessary, at a minimum, the permittee shall:

a. Conduct dry weather field screening in priority areas as identified by the permittee in Part III.B.2(e)(1). By the end of the permit term, all of those priority areas, although not necessarily all individual outfalls must be screened.

b. Field observation requirements – The permittee shall develop written procedures for observing flows from outfalls when there has been at least 72 hours of dry weather. The written procedures must include the basis used to determine which outfalls will be observed. The permittee shall record visual observations such as odor, color, clarity, floatables, deposits, or stains.

c. Field screening requirements – The permittee shall develop written procedures to determine which dry weather flows will be screened, based on results of field observations or complaint from the public or the permittee's trained field staff. At a minimum, when visual observations indicate a potential problem such as discolored flows, foam, surface sheen, and other similar indicators of contamination, the permittee shall conduct a field screening analysis for selected indicator pollutants. The basis for selecting the indicator pollutants must be described in the written procedures. Screening methodology may be modified based on experience gained during the actual field screening activities. The permittee shall document the method used.

(3) Reduction of Floatables

The permittee shall implement a program to reduce the discharge of floatables (for example, litter and other human-generated solid refuse) in the MS4. The MS4 shall include source controls at a minimum and structural controls and other appropriate controls where necessary.

The permittee shall maintain two locations where floatable material can be removed before the stormwater is discharged to or from the MS4. Floatable material shall be collected at the frequency necessary for maintenance of the removal devices, but not less than twice per year. The amount of material collected shall be estimated by weight, volume, or by other practical means. Results shall be included in the annual report.

3. Construction Site Stormwater Runoff Control

(a) Requirements and Control Measures

(1) All permittees shall develop, implement, and enforce a program requiring operators of small and large construction activities, as defined in Part I of this general permit, to select, install, implement, and maintain stormwater control measures that prevent illicit discharges to the MEP. The program must include the development and implementation of an ordinance or other regulatory mechanism, as well as sanctions to ensure compliance to the extent allowable under state, federal, and local law, to require erosion and sediment control.

Existing permittees shall assess program elements that were described in the previous permit, modify as necessary, and develop and implement new elements, as necessary, to continue reducing the discharge of pollutants from the MS4 to the MEP. New elements must be fully implemented by the end of this permit term and newly regulated permittees shall have the the progam fully implemented by the end of this permit term.

If TCEQ waives requirements for stormwater discharges associated with small construction from a specific site(s), the permittee is not required to enforce the program to reduce pollutant discharges from such site(s).

(b) Requirements for all Permittees

All permittees shall include the requirements described below in Parts III.B.3(b)(1)-(7)

(1) All permittees shall annually review and update as necessary, the SWMP and MCM implementation procedures required by Part III.A.2. Any changes must be included in the annual report. Such written procedures must be maintained on site or in the SWMP and made available for inspection by the TCEQ.

(2) All permittees shall require that construction site operators implement appropriate erosion and sediment control BMPs. The permittee's construction program must ensure the following minimum requirements are effectively implemented for all small and large construction activities discharging to its small MS4.

a. Erosion and Sediment Controls - Design, install and maintain effective erosion controls and sediment controls to minimize the discharge of pollutants.

b. Soil Stabilization - Stabilization of disturbed areas must, at a minimum, be initiated immediately whenever any clearing, grading, excavating or other earth disturbing activities have permanently ceased on any portion of the site, or temporarily ceased on any portion of the site and will not resume for a period exceeding 14 calendar days. Stabilization must be completed as soon as practicable, but no more than 14 calendar days after the initiation of soil stabilization measures. In arid, semiarid, and drought-stricken areas, where initiating vegetative stabilization measures immediately is infeasible, alternative stabilization measures must be employed.

The permittee shall develop written procedures that describes initiating and completing stabilization measures for construction sites.

c. BMPs – Design, install, implement, and maintain effective BMPs to minimize the discharge of pollutants to the small MS4. At a minimum, such BMPs must be designed, installed, implemented and maintained to:

(i) Minimize the discharge of pollutants from equipment and vehicle washing, wheel wash water, and other wash waters;

(ii) Minimize the exposure of building materials, building products, construction wastes, trash, landscape materials, fertilizers, pesticides, herbicides, detergents, sanitary waste and other materials present on the site to precipitation and to stormwater; and

(iii) Minimize the discharge of pollutants from spills and leaks.

d. As an alternative to (a) through (c) above, all permittees shall ensure that all small and large construction activities discharging to the small MS4 have developed and implemented a stormwater pollution prevention plan (SWP3) in accordance with the TPDES CGP TXR150000. In arid, semiarid, and drought-stricken areas where initiating vegetative stabilization measures immediately is infeasible, alternative stabilization measures must be employed and described in the written procedure required in item (2)b. above. As an alternative, vegetative stabilization measures may be implemented as soon as practicable.

(3) Prohibited Discharges - The following discharges are prohibited:

a. Wastewater from washout of concrete and wastewater from water well drilling operations, unless managed by an appropriate control;

b. Wastewater from washout and cleanout of stucco, paint, from release oils, and other construction materials;

c. Fuels, oils, or other pollutants used in vehicle and equipment operation and maintenance;

d. Soaps or solvents used in vehicle and equipment washing; and

e. Discharges from dewatering activities, including discharges from dewatering of trenches and excavations, unless managed by appropriate BMPs.

(4) Construction Plan Review Procedures

To the extent allowable by state, federal, and local law, all permittees shall maintain and implement site plan review procedures that describe which plans will be reviewed as well as when an operator may begin construction. For those permittees without legal authority to enforce site plan reviews, this requirement is limited to those sites operated by the permittee and its contractors and located within the permittee's regulated area. The site plan procedures must meet the following minimum requirements:

a. The site plan review procedures must incorporate consideration of potential water quality impacts.

b. The permittee may not approve any plans unless the plans contain appropriate site specific construction site control measures that, at a minimum, meet the requirements described in Part III.B.3.(a) or in the TPDES CGP, TXR150000.

The permittee may require and accept a plan, such as a SWP3, that has been developed pursuant to the TPDES CGP, TXR150000.

(5) Construction Site Inspections and Enforcement

To the extent allowable by state, federal, and local law, all permittees shall implement procedures for inspecting large and small construction projects. Permittees without legal authority to inspect construction sites shall at a minimum conduct inspection of sites operated by the permittee or its contractors and that are located in the permittee's regulated area.

a. The permittee shall conduct inspections based on the evaluation of factors that are a threat to water quality, such as: soil erosion potential; site slope; project size and type; sensitivity of receiving waterbodies; proximity to receiving waterbodies; non-stormwater discharges; and past record of non-compliance by the operators of the construction site.

b. Inspections must occur during the active construction phase.

(i) All permittees shall develop and implement updated written procedures outlining the inspection and enforcement requirements. These procedures must be maintained on-site or in the SWMP and be made available to TCEQ.

(ii) Inspections of construction sites must, at a minimum:

1. Determine whether the site has appropriate coverage under the TPDES CGP, TXR150000. If no coverage exists, notify the permittee of the need for permit coverage;

2. Conduct a site inspection to determine if control measures have been selected, installed, implemented, and maintained according to the small MS4's requirements;

3. Assess compliance with the permittee's ordinances and other regulations; and

4. Provide a written or electronic inspection report.

c. Based on site inspection findings, all permittees shall take all necessary follow-up actions (for example, follow-up-inspections or enforcement) to ensure compliance with permit requirements and the SWMP. These follow-up and enforcement actions must be tracked and maintained for review by the TCEQ.

For non-traditional small MS4s with no enforcement powers, the permittee shall notify the adjacent MS4 operator with enforcement authority or the appropriate TCEQ Regional Office according to Part III.A.3(b).

(6) Information submitted by the Public

All permittees shall develop, implement, and maintain procedures for receipt and consideration of information submitted by the public.

(7) MS4 Staff Training

All permittees shall ensure that all staff whose primary job duties are related to implementing the construction stormwater program (including permitting, plan review, construction site inspections, and enforcement) are informed or trained to

conduct these activities. The training may be conducted by the permittee or by outside trainers.

(c) Additional Requirements for Level 3 and 4 small MS4s

In addition to the requirements described in Parts III.B.3(b)(1)-(7) above, permittees who operate Level 3 and 4 small MS4s shall meet the following requirements:

Construction Site Inventory

Permittees who operate Level 3 and 4 small MS4s shall maintain an inventory of all permitted active public and private construction sites, that result in a total land disturbance of one or more acres or that result in a total land disturbance of less than one acre if part of a larger common plan or development or sale. Notification to the small MS4 must be made by submittal of a copy of an NOI or a small construction site notice, as applicable. The permittee shall make this inventory available to the TCEQ upon request.

4. Post Construction Stormwater Management in New Development and Redevelopment

(a) Post-Construction Stormwater Management Program

(1) All permittees shall develop, implement, and enforce a program, to the extent allowable under state, federal, and local law, to control stormwater discharges from new development and redeveloped sites that discharge into the small MS4 that disturb one acre or more, including projects that disturb less than one acre that are part of a larger common plan of development or sale. The program must be established for private and public development sites. The program may utilize an offsite mitigation and payment in lieu of components to address this requirement.

Existing permittees shall assess program elements that were described in the previous permit and modify as necessary to continue reducing the discharge of pollutants from the MS4 to the MEP. New elements must be fully implemented by the end of this permit term and newly regulated permittees shall have the program fully implemented by the end of the permit term.

(2) All permittees shall use, to the extent allowable under state, federal, and local law and local development standards, an ordinance or other regulatory mechanism to address post-construction runoff from new development and redevelopment projects. The permittees shall establish, implement, and enforce a requirement that owners or operators of new development and redeveloped sites design, install, implement, and maintain a combination of structural and non-structural BMPs appropriate for the community and that protects water quality. If the construction of permanent structures is not feasible due to space limitations, health and safety concerns, cost effectiveness, or highway construction codes, the permittee may propose an alternative approach to TCEQ. Newly regulated permittees shall have the program element fully implemented by the end of the permit term.

(b) Requirements for all Permittees

All permittees shall include the requirements described below in Parts III.B.4.(b)(1)-(3)

(1) All permittees shall annually review and update as necessary, the SWMP and MCM implementation procedures required by Part III.A.2. Any changes must be

included in the annual report. Such written procedures must be maintained either on site or in the SWMP and made available for inspection by TCEQ.

(2) All permittees shall document and maintain records of enforcement actions and make them available for review by the TCEQ.

(3) Long-Term Maintenance of Post-Construction Stormwater Control Measures

All permittees shall, to the extent allowable under state, federal, and local law, ensure the long-term operation and maintenance of structural stormwater control measures installed through one or both of the following approaches:

a. Maintenance performed by the permittee. (See Part III.B.5)

b. Maintenance performed by the owner or operator of a new development or redeveloped site under a maintenance plan. The maintenance plan must be filed in the real property records of the county in which the property is located. The permittee shall require the owner or operator of any new development or redeveloped site to develop and implement a maintenance plan addressing maintenance requirements for any structural control measures installed on site. The permittee shall require operation and maintenance performed is documented and retained on site, such as at the offices of the owner or operator, and made available for review by the small MS4.

(c) Additional Requirements for Level 4 small MS4s

In addition to the requirements described in Parts III.B.5(b)(1)-(3), permittees who operate Level 4 small MS4s shall meet the following requirements:

Inspections - Permittees who operate Level 4 small MS4s shall develop and implement an inspection program to ensure that all post construction stormwater control measures are operating correctly and are being maintained as required consistent with its applicable maintenance plan. For small MS4s with limited enforcement authority, this requirement applies to the structural controls owned and operated by the small MS4 or its contractors that perform these activities within the small MS4's regulated area.

Inspection Reports - The permittee shall document its inspection findings in an inspection report and make them available for review by the TCEQ.

5. Pollution Prevention and Good Housekeeping for Municipal Operations

(a) Program development

All permittees shall develop and implement an operation and maintenance program, including an employee training component that has the ultimate goal of preventing or reducing pollutant runoff from municipal activities and municipally owned areas including but not limited to park and open space maintenance; street, road, or highway maintenance; fleet and building maintenance; stormwater system maintenance; new construction and land disturbances; municipal parking lots; vehicle and equipment maintenance and storage yards; waste transfer stations; and salt/sand storage locations.

Existing permittees shall assess program elements that were described in the previous permit, modify as necessary, and develop and implement new elements, as necessary, to continue reducing the discharges of pollutants from the MS4 to the MEP. New elements must be fully implemented by the end of this permit term and newly

regulated permittees shall have the program fully implemented by the end of this permit term. (See also Part III.A.1.(c))

(b) Requirements for all Permittees

All permitees shall include the requirements described below in Parts III.B.5.(1)-(6) in the program:

(1) Permittee-owned Facilities and Control Inventory

All permittees shall develop and maintain an inventory of facilities and stormwater controls that it owns and operates within the regulated area of the small MS4. The inventory must include all applicable permit numbers, registration numbers, and authorizations for each facility or controls. The inventory must be available for review by TCEQ and must include, but is not limited, to the following, as applicable:

a. Composting facilities;

b. Equipment storage and maintenance facilities;

c. Fuel storage facilities;

d. Hazardous waste disposal facilities;

e. Hazardous waste handling and transfer facilities;

f. Incinerators;

g. Landfills;

h. Materials storage yards;

i. Pesticide storage facilities;

j. Buildings, including schools, libraries, police stations, fire stations, and office buildings;

k. Parking lots;

l. Golf courses;

m. Swimming pools;

n. Public works yards;

o. Recycling facilities;

p. Salt storage facilities;

q. Solid waste handling and transfer facilities;

r. Street repair and maintenance sites;

s. Vehicle storage and maintenance yards; and

t. Structural stormwater controls.

(2) Training and Education

All permittees shall inform or train appropriate employees involved in implementing pollution prevention and good housekeeping practices. All permittees shall maintain a training attendance list for inspection by TCEQ when requested.

(3) Disposal of Waste Material - Waste materials removed from the small MS4 must be disposed of in accordance with 30 TAC Chapters 330 or 335, as applicable.

(4) Contractor Requirements and Oversight

a. Any contractors hired by the permittee to perform maintenance activities on permittee-owned facilities must be contractually required to comply with all of the stormwater control measures, good housekeeping practices, and facility-specific stormwater management operating procedures described in Parts III B.5.(b)(2)-(6).

b. All permittees shall provide oversight of contractor activities to ensure that contractors are using appropriate control measures and SOPs. Oversight procedures must be maintained on-site and made available for inspection by TCEQ.

(5) Municipal Operation and Maintenance Activities

a. Assessment of permittee-owned operations

All permittees shall evaluate operation and maintenance (O&M) activities for their potential to discharge pollutants in stormwater, including but not limited to:

(i) Road and parking lot maintenance, including such areas as pothole repair, pavement marking, sealing, and re-paving;

(ii) Bridge maintenance, including such areas as re-chipping, grinding, and saw cutting;

(iii) Cold weather operations, including plowing, sanding, and application of deicing and anti-icing compounds and maintenance of snow disposal areas; and

(iv) Right-of-way maintenance, including mowing, herbicide and pesticide application, and planting vegetation.

b. All permittees shall identify pollutants of concern that could be discharged from the above O&M activities (for example, metals; chlorides; hydrocarbons such as benzene, toluene, ethyl benzene, and xylenes; sediment; and trash).

c. All permittees shall develop and implement a set of pollution prevention measures that will reduce the discharge of pollutants in stormwater from the above activities. These pollution prevention measures may include the following examples:

(i) Replacing materials and chemicals with more environmentally benign materials or methods;

(ii) Changing operations to minimize the exposure or mobilization of pollutants to prevent them from entering surface waters; and

(iii) Placing barriers around or conducting runoff away from deicing chemical storage areas to prevent discharge into surface waters.

d. Inspection of pollution prevention measures - All pollution prevention measures implemented at permittee-owned facilities must be visually inspected to ensure they are working properly. The permittee shall develop written procedures that describes frequency of inspections and how they will

be conducted. A log of inspections must be maintained and made available for review by the TCEQ upon request.

(6) Structural Control Maintenance

If BMPs include structural controls, maintenance of the controls must be performed by the permittee and consistent with maintaining the effectiveness of the BMP. The permittee shall develop written procedures that define the frequency of inspections and how they will be conducted.

(c) Additional Requirements for Level 3 and 4 small MS4s:

In addition to the requirements described in Parts.B.5.(b)(1)-(6) above, permittees who operate Level 3 or 4 small MS4s shall meet the following requirements:

(1) Storm Sewer System Operation and Maintenance

a. Permittees who operate Level 3 or 4 small MS4s shall develop and implement an O&M program to reduce to the maximum extent practicable the collection of pollutants in catch basins and other surface drainage structures.

b. Permittees who operate Level 3 or 4 small MS4s shall develop a list of potential problem areas. The permittees shall identify and prioritize problem areas for increased inspection (for example, areas with recurrent illegal dumping).

(2) Operation and Maintenance Program to Reduce Discharges of Pollutants from Roads

Permittees who operate Level 3 or 4 small MS4s shall implement an O&M program that includes at least one of the following: a street sweeping and cleaning program, or an equivalent BMP such as an inlet protection program, which must include an implementation schedule and a waste disposal procedure. The basis for the decision must be included in the SWMP. If a street sweeping and cleaning program is implemented, the permittee shall evaluate the following permittee-owned and operated areas for the program: streets, road segments, and public parking lots including, but not limited to, high traffic zones, commercial and industrial districts, sport and event venues, and plazas, as well as areas that consistently accumulate high volumes of trash, debris, and other stormwater pollutants.

a. Implementation schedules – If a sweeping program is implemented, the permittee shall sweep the areas in the program (for example, the streets, roads, and public parking lots) in accordance with a frequency and schedule determined in the permittee's O&M program.

b. For areas where street sweeping is technically infeasible (for example, streets without curbs), the permittee shall focus implementation of other trash and litter control procedures, or provide inlet protection measures to minimize pollutant discharges to storm drains and creeks.

c. Sweeper Waste Material Disposal – If utilizing street sweepers, the permittee shall develop a procedure to dewater and dispose of street sweeper waste material and shall ensure that water and material will not reenter the small MS4.

(3) Mapping of Facilities

Permittees who operate Level 3 or 4 small MS4s shall, on a map of the area regulated under this general permit, identify where the permittee-owned and operated facilities and stormwater controls are located.

(4) Facility Assessment

Permittees who operate Level 3 or 4 small MS4s shall perform the following facility assessment in the regulated portion of the small MS4 operated by the permittee:

a. Assessment of Facilities' Pollutant Discharge Potential - The permittee shall review the facilities identified in Part III.B.5.(b) once per permit term for their potential to discharge pollutants into stormwater.

b. Identification of *high priority* facilities - Based on the Part III.B.5.(c)(4)a. assessment, the permittee shall identify as *high priority* those facilities that have a high potential to generate stormwater pollutants and shall document this in a list of these facilities. Among the factors that must be considered in giving a facility a high priority ranking are the amount of urban pollutants stored at the site, the identification of improperly stored materials, activities that must not be performed outside (for example, changing automotive fluids, vehicle washing), proximity to waterbodies, proximity to sensitive aquifer recharge features, poor housekeeping practices, and discharge of pollutant(s) of concern to impaired water(s). High priority facilities must include, at a minimum, the permittee's maintenance yards, hazardous waste facilities, fuel storage locations, and any other facilities at which chemicals or other materials have a high potential to be discharged in stormwater.

c. Documentation of Assessment Results - The permittee shall document the results of the assessments and maintain copies of all site evaluation checklists used to conduct the assessments. The documentation must include the results of the permittee's initial assessment, and any identified deficiencies and corrective actions taken.

(5) Development of Facility Specific SOPs

Permittees who operate Level 3 or 4 small MS4s shall develop facility specific stormwater management SOPs. The permittee may utilize existing plans or documents that may contain the following required information:

a. For each high priority facility identified in Part III.B.5.(c)(4)b., the permittee shall develop a SOP that identifies BMPs to be installed, implemented, and maintained to minimize the discharge of pollutants in stormwater from each facility.

b. A hard or electronic copy of the facility-specific stormwater management SOP (or equivalent existing plan or document) must be maintained and be available for review by the TCEQ. The SOP must be kept on site when possible and must be kept up to date.

(6) Stormwater Controls for High Priority Facilities

Permittees who operate Level 3 or 4 small MS4s shall implement the following stormwater controls at all high priority facilities identified in Part III.B.5.(c)(4)b. A description of BMPs developed to comply with this requirement must be included in each facility specific SOP:

a. General good housekeeping – Material with a potential to contribute to stormwater pollution must be sheltered from exposure to stormwater.

b. De-icing and anti-icing material storage - The permittee shall ensure, to the MEP, that stormwater runoff from storage piles of salt and other de-icing and anti-icing materials is not discharged; or shall ensure that any discharges from the piles are authorized under a separate discharge permit.

c. Fueling operations and vehicle maintenance - The permittee shall develop SOPs (or equivalent existing plans or documents) that address spill prevention and spill control at permittee-owned and operated vehicle fueling, vehicle maintenance, and bulk fuel delivery facilities.

d. Equipment and vehicle washing - The permittee shall develop SOPs that address equipment and vehicle washing activities at permittee-owned and operated facilities. The discharge of equipment and vehicle wash water to the small MS4 or directly to receiving waters from permittee-owned facilities is not authorized under this general permit. To ensure that wastewater is not discharged under this general permit, the permittee's SOP may include installing a vehicle wash reclaim system, capturing and hauling the wastewater for proper disposal, connecting to sanitary sewer (where applicable and approved by local authorities), ceasing the washing activity, or applying for and obtaining a separate TPDES permit.

(7) Inspections

Permittees who operate Level 3 or 4 small Ms4s shall develop and implement an inspection program, which at a minimum must include periodic inspections of high priority permittee-owned facilities. The results of the inspections and observations must be documented and available for review by the TCEQ.

(d) Additional Requirements for Level 4 small MS4s:

In addition to all the requirements described in Parts III.B.5(b) and III.B.5.(c) above, permittees who operate Level 4 small MS4s shall meet the following requirements:

(1) Pesticide, Herbicide, and Fertilizer Application and Management

a. Landscape maintenance - The permittee shall evaluate the materials used and activities performed on public spaces owned and operated by the permittee such as parks, schools, golf courses, easements, public rights of way, and other open spaces for pollution prevention opportunities. Maintenance activities for the turf landscaped portions of these areas may include mowing, fertilization, pesticide application, and irrigation. Typical pollutants include sediment, nutrients, hydrocarbons, pesticides, herbicides, and organic debris.

b. The permittee shall implement the following practices to minimize landscaping-related pollutant generation with regard to public spaces owned and operated by the permittee:

(i) Educational activities, permits, certifications, and other measures for the permittee's applicators and distributors.

(ii) Pest management measures that encourage non-chemical solutions where feasible. Examples may include:

(a) Use of native plants or xeriscaping;

(b) Keeping clippings and leaves out the small MS4 and the street by encouraging mulching, composting, or landfilling;

(c) Limiting application of pesticides and fertilizers if precipitation is forecasted within 24 hours, or as specified in label instructions;

(d) Reducing mowing of grass to allow for greater pollutant removal, but not jeopardizing motorist safety.

c. The permittee shall develop schedules for chemical application in public spaces owned and operated by the permittee that minimize the discharge of pollutants from the application due to irrigation and expected precipitation.

d. The permittee shall ensure collection and proper disposal of the permittee's unused pesticides, herbicides, and fertilizers.

(2) Evaluation of Flood Control Projects

The permittee shall assess the impacts of the receiving water(s) for all flood control projects. New flood control structures must be designed, constructed, and maintained to provide erosion prevention and pollutant removal from stormwater. The retrofitting of existing structural flood control devices to provide additional pollutant removal from stormwater shall be implemented to the maximum extent practicable.

6. Industrial Stormwater Sources

Permittees operating a Level 4 small MS4 shall include the requirements described below in Part III. B.6(a) and (b) – this requirement is only applicable to Level 4 MS4s

(a) Permittees who operate Level 4 small MS4s shall identify and control pollutants in stormwater discharges to the small MS4 from permittee's landfills; other treatment, storage, or disposal facilities for municipal waste (for example, transfer stations and incinerators); hazardous waste treatment, storage, disposal and recovery facilities and facilities that are subject to Emergency Planning and Community Right-to-Know Act (EPCRA) Title III, Section 313; and any other industrial or commercial discharge the permittee determines are contributing a substantial pollutant loading to the small MS4.

(b) The program must include priorities and procedures for inspections and for implementing control measures for such industrial discharges.

7. Authorization for Construction Activities where the Small MS4 is the Site Operator

The development of this MCM for construction activities, where the small MS4 is the site operator, is optional and provides an alternative to the MS4 operator seeking coverage under TPDES CGP, TXR150000 for each construction activity. Permittees that choose to develop this measure will be authorized to discharge stormwater and certain non-stormwater from construction activities where the MS4 operator meets the definition of a construction site operator in Part I of this general permit.

When developing this measure, permittees are required to meet all requirements of, and be consistent with, applicable effluent limitation guidelines for the Construction and Development industry (40 CFR Part 450), TPDES CGP TXR150000, and Part III.B.3 of this permit.

The authorization to discharge under this MCM is limited to the regulated area, such as the portion of the small MS4 located within a UA or the area designated by TCEQ as requiring

coverage. However, an MS4 operator may also utilize this MCM over additional portions of their small MS4 that are also in compliance with all of the MCMs listed in this general permit.

This MCM must be developed as a part of the SWMP that is submitted with the NOI for permit coverage. If this MCM is developed after submitting the initial NOI, an NOC must be submitted notifying the executive director of this change, and identifying the geographical area or boundary where the activities will be conducted under the provisions of this general permit.

Utilization of this MCM does not preclude a small MS4 from obtaining coverage under the TPDES CGP, TXR150000, or under an individual TPDES permit.

This MCM is only available for projects where the small MS4 is a construction site operator or owner, and the MCM does not provide any authorization for other construction site operators at a municipal project.

Controls required under this MCM must be implemented prior to discharge from a municipal construction site into surface water in the state.

The MCM must include:

(a) A description of how construction activities will generally be conducted by the permittee so as to take into consideration local conditions of weather, soils, and other site-specific considerations;

(b) A description of the area that this MCM will address and where the permittee's construction activities are covered (for example within the boundary of the urbanized area, the corporate boundary, a special district boundary, an extra territorial jurisdiction, or other similar jurisdictional boundary);

(c) Either a description of how the permittee will supervise or maintain oversight over contractor activities to ensure that the SWP3 requirements are properly implemented at the construction site; or how the permittee will make certain that contractors have a separate authorization for stormwater discharges;

(d) A general description of how a SWP3 will be developed for each construction site, according to Part VI of this general permit, "Authorization for Municipal Construction Activities"; and

(e) Records of municipal construction activities authorized under this optional MCM, in accordance with Part VI of this general permit.

Section C. General Requirements

Permittees shall provide information in the SWMP documenting the development and implementation of the program. At a minimum, the documentation must include:

1. A list of any public or private entities assisting with the development or implementation of the SWMP;
2. If applicable, a list of all MS4 operators contributing to the development and implementation of the SWMP, including a clear description of the contribution;
3. A list of all BMPs and measurable goals for each of the MCMs;
4. A schedule for the implementation of all SWMP requirements. The schedule must include, as appropriate, the months and years in which the permittee will undertake

required actions, including interim milestones and the frequency of the action throughout the permit term.

5. A description of how each measurable goal will be evaluated; and
6. A rationale statement that addresses the overall program, including how the BMPs and measurable goals were selected.

Part IV. Recordkeeping and Reporting

Section A. Recordkeeping

1. The permittee shall retain all records, a copy of this TPDES general permit, and records of all data used to complete the application (NOI) for this general permit and satisfy the public participation requirements, for a period of at least three (3) years, or for the remainder of the term of this general permit, whichever is longer. This period may be extended by request of the executive director at any time.
2. The permittee shall submit the records to the executive director only when specifically asked to do so. The SWMP required by this general permit (including a copy of the general permit) must be retained at a location accessible to the TCEQ.
3. The permittee shall make the NOI and the SWMP available to the public at reasonable times during regular business hours, if requested to do so in writing. Copies of the SWMP must be made available within ten (10) working days of receipt of a written request. Other records must be provided in accordance with the Texas Public Information Act. However, all requests for records from federal facilities must be made in accordance with the Freedom of Information Act.
4. The period during which records are required to be kept shall be automatically extended to the date of the final disposition of any administrative or judicial enforcement action that may be instituted against the permittee.

Section B. Reporting

1. General Reporting Requirements

(a) Noncompliance Notification

According to 30 TAC § 305.125(9), any noncompliance which may endanger human health or safety, or the environment, must be reported by the permittee to the TCEQ. Report of such information must be provided orally or by fax to the TCEQ Regional Office within 24 hours of becoming aware of the noncompliance. A written report must be provided by the permittee to the appropriate TCEQ Regional Office and to the TCEQ Enforcement Division (MC-224) within five working days of becoming aware of the noncompliance. The written report must contain:

(1) A description of the noncompliance and its cause;

(2) The potential danger to human health or safety, or the environment;

(3) The period of noncompliance, including exact dates and times;

(4) If the noncompliance has not been corrected, the anticipated time it is expected to continue; and

(5) Steps taken or planned to reduce, eliminate, and prevent recurrence of the noncompliance, and to mitigate its adverse effects.

(b) Other Information

When the permittee becomes aware that it either submitted incorrect information or failed to submit complete and accurate information requested in an NOI, NOT, or NOC, or any other report, the permittee shall promptly submit the facts or information to the executive director.

2. Annual Report

The MS4 operator shall submit a concise annual report to the executive director within 90 days of the end of each reporting year. For the purpose of this section, the reporting year may include either the permit year, the permittee's fiscal year or the calendar year, as elected by the small MS4 and notified to the TCEQ in the application submittal. The annual report must address the previous reporting year.

The first reporting year for annual reporting purposes shall begin on the permit effective date and shall last for a period of one (1) year (the end of the "permit year"). Alternatively, if the permittee elects to report based on its fiscal year, the first reporting year will last until the end of the fiscal year immediately following the issuance date of this permit. If the permittee elects to report based on the calendar year, then the first reporting year will last until December 31, 2019.

Subsequent calendar years will begin at the beginning of the first reporting year (which will vary based on the previous paragraph) and last for one (1) year. The MS4 operator shall also make a copy of the annual report readily available for review by TCEQ personnel upon request. The report must include:

(a) The status of the compliance with permit conditions, an assessment of the appropriateness of the identified BMPs, progress towards achieving the statutory goal of reducing the discharge of pollutants to the MEP, the measurable goals for each of the MCMs, and an evaluation of the success of the implementation of the measurable goals;

(b) A summary of the results of information collected and analyzed, during the reporting period, including monitoring data used to assess the success of the program at reducing the discharge of pollutants to the MEP;

(c) If applicable, a summary of any activities taken to address the discharge to impaired waterbodies, including any sampling results and a summary of the small MS4s BMPs used to address the pollutant of concern;

(d) A summary of the stormwater activities the MS4 operator plans to undertake during the next reporting year;

(e) Proposed changes to the SWMP, including changes to any BMPs or any identified measurable goals that apply to the program elements;

(f) Description and schedule for implementation of additional BMP's that may be necessary, based on monitoring results, to ensure compliance with applicable TMDLs and implementation plans. For waters that are listed as impaired after discharge authorization pursuant to Part II.D.4, include a list of such waters and the pollutant(s) causing the impairment, and a summary of any actions taken to comply with the requirements of Part II.D.4.b.;

(g) Notice that the MS4 operator is relying on another government entity to satisfy some of its permit obligations (if applicable);

(h) The number of construction activities where the small MS4 is the operator and authorized under the 7th optional MCM, including the total number of acres disturbed; and

(i) The number of construction activities that occurred within the jurisdictional area of the small MS4 (as noticed to the permittee by the construction operator), and that were not authorized under the 7th MCM.

MS4s authorized under the previous version of the permit must prepare an annual report whether or not the NOI and SWMP have been approved by the TCEQ. If the permittee has either not implemented the SWMP or not begun to implement the SWMP because it has not received approval of the NOI and SWMP, then the annual report may include that information.

If permittees share a common SWMP, they shall contribute to and submit a single system-wide report. Each permittee shall sign and certify the annual report in accordance with 30 TAC § 305.128 (relating to Signatories to Reports).

The annual report must be submitted with the appropriate TCEQ reporting forms if available, or as otherwise approved by TCEQ.

The annual report must be submitted to the following address:

Texas Commission on Environmental Quality
Stormwater Team; MC - 148
P.O. Box 13087
Austin, Texas 78711-3087

A copy of the annual report must also be submitted to the TCEQ Regional Office that serves the area of the regulated small MS4, except if the report is submitted electronically.

Effective December 21, 2020, annual reports must be submitted using the online electronic reporting system available through the TCEQ website unless the permittee requests and obtains an electronic reporting waiver.

Part V. Standard Permit Conditions

A. The permittee has a duty to comply with all permit conditions. Failure to comply with any permit condition is a violation of the general permit and statutes under which it was issued, and is grounds for enforcement action, for terminating coverage under this general permit, or for requiring a discharger to apply for and obtain an individual TPDES permit.

B. It shall not be a defense for the permittee in an enforcement action that it would have been necessary to halt or reduce the permitted activity in order to maintain compliance with the conditions of this permit.

C. The permittee shall take all reasonable steps to minimize or prevent any discharge in violation of this permit which has a reasonable likelihood of adversely affecting human health or the environment.

D. Authorization under this general permit may be suspended or revoked for cause. Filing a notice of planned changes or anticipated non-compliance by the permittee does not stay any permit condition. The permittee shall furnish to the executive director, upon

request and within a reasonable timeframe, any information necessary for the executive director to determine whether cause exists for modifying, revoking, suspending, reissuing or terminating authorization under this general permit. Additionally, the permittee shall provide to the executive director, upon request, copies of all records that the permittee shall maintain as a condition of this general permit.

E. The permittee shall at all times properly operate and maintain all facilities and systems of treatment and control (and related appurtenances) which are installed or used to achieve compliance with the conditions of this permit and with the condition of the permittee's SWMP. Proper operation and maintenance also includes adequate laboratory controls and appropriate quality assurance procedures. Proper operation and maintenance requires the operation of backup or auxiliary facilities or similar systems, installed only when the operation is necessary to achieve compliance with the conditions of this permit.

F. Inspection and entry shall be allowed under the TWC Chapters 26-28, Health and Safety Code §§ 361.032-361.033 and 361.037, and 40 CFR §122.41(i). The statement in TWC § 26.014 that commission entry of a facility shall occur according to an establishment's rules and regulations concerning safety, internal security, and fire protection is not grounds for denial or restriction of entry to any part of the facility or site, but merely describes the commission's duty to observe appropriate rules and regulations during an inspection.

G. The discharger is subject to administrative, civil, and criminal penalties, as applicable, under the TWC, Chapters 26, 27, and 28, and the Texas Health and Safety Code, Chapter 361 for violations including but not limited to the following:

1. Negligently or knowingly violating CWA, §§ 301, 302, 303, 306, 307, 308, 318, or 405, or any condition or limitation implementing any sections in a permit issued under CWA, § 402; and

2. Knowingly making any false statement, representation, or certification in any record or other document submitted or required to be maintained under a permit, including monitoring reports or reports of compliance or noncompliance.

H. All reports and other information requested by or submitted to the executive director must be signed by the person and in the manner required by 30 TAC § 305.128 (relating to Signatories to Reports).

I. Authorization under this general permit does not convey property or water rights of any sort and does not grant any exclusive privilege.

J. The permittee shall implement its SWMP on any new areas under its jurisdiction that are located in a UA or that are designated by the TCEQ. Implementation of the SWMP in these areas is required three (3) years from acquiring the new area, or five (5) years from the date of initial permit coverage.

Part VI. Authorization for Municipal Construction Activities – Applicable only if the 7th Optional MCM is selected

The MS4 operator may obtain authorization under TPDES CGP, TXR150000 to discharge stormwater runoff from each construction activity performed by the MS4 operator that results in a land disturbance of one (1) acre or more of land or less than one (1) acre of land, if the construction activity is part of a larger common plan of development or sale that would disturb one acre or more. Alternatively, the MS4 operator may develop the SWMP to include the optional seventh (7th) stormwater MCM listed in Part III.B.7 of this general permit if the eligibility requirements in Part VI.A. below are met.

If an MS4 operator decides to utilize this MCM, then the MS4 operator must include this MCM in its SWMP submitted with the NOI or submit an NOC notifying the executive director of the addition of this MCM to its SWMP. The MS4 operator must identify the geographic area or boundary where the construction activities will be conducted under the provisions of this general permit. If the permittee meets the terms and requirements of this general permit, then discharges from these construction activities may be authorized under this general permit as long as they occur within the regulated geographic area of the small MS4.

An MS4 operator may utilize this MCM over additional portions of their small MS4 if those areas are also in compliance with all MCMs listed in this general permit. Even if an MS4 operator has developed this optional seventh stormwater MCM, the MS4 operator may apply under TPDES CGP TXR150000 for authorization for particular municipal construction activities including those activities that occur during periods of low potential for erosion (for which no SWP3 must be developed).

Section A. Eligible Construction Sites

Discharges from construction activities within the regulated area where the MS4 operator meets the definition of construction site operator are eligible for authorization under this general permit. Discharges from construction activities outside of the regulated area, where the MS4 operator meets the definition of construction site operator, are only eligible for authorization under this general permit in those areas where the MS4 operator meets the requirements of Parts III.B.1. through III.B.6 of this general permit, related to MCMs.

Section B. Discharges Eligible for Authorization

1. Stormwater Associated with Construction Activity

Discharges of stormwater runoff from small and large construction activities may be authorized under this general permit.

2. Discharges of Stormwater Associated with Construction Support Activities

Discharges of stormwater runoff from construction support activities, including concrete batch plants, asphalt batch plants, equipment staging areas, material storage yards, material borrow areas, and excavated material disposal areas may be authorized under this general permit provided:

(a) The activity is located within a one-mile distance from the boundary of the permitted construction site and directly supports the construction activity;

(b) A SWP3 is developed according to the provisions of this general permit and includes appropriate controls and measures to control sediment and erosion and discharge of pollutants in stormwater runoff from the supporting construction activity site;

(c) The construction support activity either does not operate beyond the completion date of the construction activity or obtains separate TPDES authorization for discharges as required; and

(d) Discharge of stormwater from concrete production facilities must meet the requirements in Section E below

3. Non-Stormwater Discharges

The following non-stormwater discharges from construction sites authorized under this general permit are also eligible for authorization under this MCM:

(a) Discharges from emergency fire fighting activities (fire fighting activities do not include washing of trucks, run-off water from training activities, test water from fire suppression systems, and similar activities);

(b) Uncontaminated fire hydrant flushings (excluding discharges of hyperchlorinated water, unless the water is first dechlorinated and discharges are not expected to adversely affect aquatic life), which include flushings from systems that utilize potable water, surface water, or groundwater that does not contain additional pollutants (uncontaminated fire hydrant flushings do not include systems utilizing reclaimed wastewater as a source water);

(c) Water from the routine external washing of vehicles, the external portion of buildings or structures, and pavement, where detergents and soaps are not used and where spills or leaks of toxic or hazardous materials have not occurred (unless spilled materials have been removed; and if local state, or federal regulations are applicable, the materials are removed according to those regulations), and where the purpose is to remove mud, dirt, or dust;

(d) Uncontaminated water used to control dust;

(e) Potable water sources including waterline flushings (excluding discharges of hyperchlorinated water, unless the water is first dechlorinated and discharges are not expected to adversely affect aquatic life);

(f) Uncontaminated air conditioning condensate; and

(g) Uncontaminated ground water or spring water, including foundation or footing drains where flows are not contaminated with industrial materials such as solvents.

4. Other Permitted Discharges

Any discharge authorized under a separate TPDES or TCEQ permit may be combined with discharges from construction sites operated by the small MS4, provided the discharge complies with the associated permit.

Section C. Limitations on Permit Coverage

Discharges that occur after construction activities have been completed, and after the construction site and any supporting activity site have undergone final stabilization, are not eligible for coverage under Part VI of the general permit.

Section D. Stormwater Pollution Prevention Plan (SWP3) Requirements

Operators of municipal construction activities that qualify for coverage under this general permit and that discharge stormwater associated with construction activities into surface water in the state must:

1. Develop a SWP3 according to the provisions of this general permit that covers the entire site and begin implementation of that plan prior to commencing construction activities;
2. Post a signed copy of a TCEQ approved site notice in a location at the construction site where it is readily available for viewing prior to commencing construction activities and maintain the notice in that location until completion of the construction activity and final stabilization of the site;
3. Ensure the project specifications allow or provide that adequate BMPs may be developed and modified as necessary to meet the requirements of this general permit and the SWP3;
4. Ensure all contractors are aware of the SWP3 requirements, are aware that municipal personnel are responsible for the day-to-day operations of the SWP3, and who to contact concerning SWP3 requirements; and
5. Ensure that the SWP3 identifies the municipal personnel responsible for implementation of control measures described in the plan.

Section E. Stormwater Runoff from Concrete Batch Plants

Discharges of stormwater runoff from concrete batch plants at regulated construction sites may be authorized under the provisions of this general permit provided that the following requirements are met for concrete batch plant(s) authorized under this permit. If discharges of stormwater runoff from concrete batch plants are not covered under this general permit, then discharges must be authorized under an alternative general permit or an individual permit. This permit does not authorize the discharge or land disposal of any wastewater from concrete batch plants at regulated construction sites. Authorization for these wastes must be obtained under an individual permit or an alternative general permit.

1. Benchmark Sampling Requirements

(a) Operators of concrete batch plants authorized under this section must sample the stormwater runoff from the concrete batch plants according to the requirements of this section of the general permit, and must conduct evaluations of the effectiveness of the SWP3 based on the following benchmark monitoring values:

Table 1. Benchmark Monitoring

Benchmark Parameters	Benchmark Value	Sampling Frequency	Sample Type
Oil and Grease (*1)	15 mg/L	1/quarter (*2)(*3)	Grab (*4)
Total Suspended Solids (*1)	50 mg/L	1/quarter (*2)(*3)	Grab (*4)
pH (*1)	6.0-9.0 S.U.	1/quarter (*2)(*3)	Grab (*4)
Total Iron (*1)	1.3 mg/L	1/quarter (*2)(*3)	Grab (*4)

(*1) Analytical data intended for compliance with benchmark monitoring requirements must be analyzed by a National Environmental Laboratory Accreditation Program (NELAP) accredited laboratory based on state rules located in 30 TAC Chapter 25. Analysis must be performed using sufficiently sensitive methods for analysis that comply with the rules located in 40 CFR §136.1(c) and 40 CFR §122.44(i)(1)(iv).

(*2) When discharge occurs. Sampling is required within the first 30 minutes of discharge. If it is not practicable to take the sample, or to complete the sampling, within the first 30 minutes, sampling must be completed within the first hour of discharge. If sampling is not completed within the first 30 minutes of discharge, the reason must be documented and attached to all required reports and records of the sampling activity.

(*3) Sampling must be conducted at least once during each of the following periods. The first sample must be collected during the first full quarter that a stormwater discharge occurs from a concrete batch plant authorized under this general permit.

- January through March
- April through June
- July through September
- October through December

For projects lasting less than one full quarter, a minimum of one sample shall be collected, provided that a stormwater discharge occurred at least once following submission of the NOI.

(*4) A grab sample shall be collected from the stormwater discharge resulting from a storm event that is at least 0.1 inches of measured precipitation that occurs at least 72 hours from the previously measurable storm event. The sample shall be collected downstream of the concrete batch plant, and where the discharge exits any BMPs utilized to handle the runoff from the batch plant, prior to commingling with any other water authorized under this general permit.

(b) The permittee shall compare the results of sample analyses to the benchmark values above, and must include this comparison in the overall assessment of the SWP3's effectiveness. Analytical results that exceed a benchmark value are not a violation of this permit, as these values are not numeric effluent limitations. Results of analyses are indicators that modifications of the SWP3 should be assessed and may be necessary to protect water quality. The operator must investigate the cause for each exceedance and must document the results of this investigation in the SWP3 by the end of the quarter following the sampling event.

The operator's investigation must identify the following:

(1) Any additional potential sources of pollution, such as spills that might have occurred;

(2) Necessary revisions to good housekeeping measures that are part of the SWP3;

(3) Additional BMPs, including a schedule to install or implement the BMPs; and

(4) Other parts of the SWP3 that may require revisions in order to meet the goal of the benchmark values.

Background concentrations of specific pollutants may also be considered during the investigation. If the operator is able to relate the cause of the exceedance to background concentrations, then subsequent exceedances of benchmark values for that pollutant may be resolved by referencing earlier findings in the SWP3. Background concentrations may be identified by laboratory analyses of samples of stormwater run-on to the permitted facility, by laboratory analyses of samples of stormwater run-off from adjacent non-industrial areas, or by identifying the pollutant is a naturally occurring material in soils at the site.

2. BMPs and SWP3 Requirements

Minimum Stormwater Pollution Prevention Plan (SWP3) Requirements - The following are required in addition to other SWP3 requirements listed in this section:

(a) Description of Potential Pollutant Sources - The SWP3 must provide a description of potential sources (activities and materials) that may reasonably be expected to affect the quality of stormwater discharges associated with concrete batch plants authorized under this permit. The SWP3 must describe practices that that will be used to reduce the pollutants in these discharges to assure compliance with this general permit, including the protection of water quality, and must ensure the implementation of these practices. The following must be developed, at a minimum, in support of developing this description:

(1) Drainage – The site map must include the following information:

a. The location of all outfalls for stormwater discharges associated with concrete batch plants that are authorized under this permit;

b. A depiction of the drainage area and the direction of flow to the outfall(s);

c. Structural controls used within the drainage area(s);

d. The locations of the following areas associated with concrete batch plants that are exposed to precipitation: vehicle and equipment maintenance activities (including fueling, repair, and storage areas for vehicles and equipment scheduled for maintenance); areas used for the treatment, storage, or disposal of wastes listed in the TPDES CGP TXR150000; liquid storage tanks; material processing and storage areas; and loading and unloading areas; and

e. The locations of the following: any bag house or other dust control device(s); recycle or sedimentation pond, clarifier or other device used for the treatment of facility wastewater (including the areas that drain to the treatment device); areas with significant materials; and areas where major spills or leaks have occurred.

(2) Inventory of Exposed Materials – A list of materials handled at the concrete batch plant that may be exposed to stormwater and that have a potential to affect the quality of stormwater discharges associated with concrete batch plants that are authorized under this general permit.

(3) Spills and Leaks - A list of significant spills and leaks of toxic or hazardous pollutants that occurred in areas exposed to stormwater and that drain to stormwater outfalls associated with concrete batch plants authorized under this general permit must be developed, maintained, and updated.

(4) Sampling Data - A summary of existing stormwater discharge sampling data must be maintained, if available.

(b) Measures and Controls - The SWP3 must include a description of management controls to regulate pollutants identified in the SWP3's "Description of Potential Pollutant Sources" from Part VI.E.2.(a) of this permit, and a schedule for implementation of the measures and controls. This must include, at a minimum:

(1) Good Housekeeping - Good housekeeping measures must be developed and implemented in the area(s) associated with concrete batch plants.

a. Operators must prevent or minimize the discharge of spilled cement, aggregate (including sand or gravel), settled dust, or other significant materials from paved portions of the site that are exposed to stormwater.

Measures used to minimize the presence of these materials may include regular sweeping or other equivalent practices. These practices must be conducted at a frequency that is determined based on consideration of the amount of industrial activity occurring in the area and frequency of precipitation, and shall occur at least once per week when cement or aggregate is being handled or otherwise processed in the area.

b. Operators must prevent the exposure of fine granular solids, such as cement, to stormwater. Where practicable, these materials must be stored in enclosed silos, hoppers or buildings, in covered areas, or under covering.

(2) Spill Prevention and Response Procedures - Areas where potential spills that can contribute pollutants to stormwater runoff, and the drainage areas from these locations, must be identified in the SWP3. Where appropriate, the SWP3 must specify material handling procedures, storage requirements, and use of equipment. Procedures for cleaning up spills must be identified in the SWP3 and made available to the appropriate personnel.

(3) Inspections - Qualified facility personnel (for example, a person or persons with knowledge of this general permit, the concrete batch plant, and the SWP3 related to the concrete batch plant(s) for the site) must be identified to inspect designated equipment and areas of the facility specified in the SWP3. The inspection frequency must be specified in the SWP3 based upon a consideration of the level of concrete production at the facility, but must be a minimum of once per month while the facility is in operation. The inspection must take place while the facility is in operation and must, at a minimum, include all areas that are exposed to stormwater at the site, including material handling areas, above ground storage tanks, hoppers or silos, dust collection or containment systems, truck wash down and equipment cleaning areas. Follow-up procedures must be used to ensure that appropriate actions are taken in response to the inspections. Records of inspections must be maintained and be made readily available for inspection upon request.

(4) Employee Training - An employee training program must be developed to educate personnel responsible for implementing any component of the SWP3, or personnel otherwise responsible for stormwater pollution prevention, with the provisions of the SWP3. The frequency of training must be documented in the SWP3, and at a minimum, must consist of one training prior to the initiation of operation of the concrete batch plant.

(5) Record Keeping and Internal Reporting Procedures - A description of spills and similar incidents, plus additional information that is obtained regarding the quality and quantity of stormwater discharges, must be included in the SWP3. Inspection and maintenance activities must be documented and records of those inspection and maintenance activities must be incorporated in the SWP3.

(6) Management of Runoff - The SWP3 shall contain a narrative consideration for reducing the volume of runoff from concrete batch plants by diverting runoff or otherwise managing runoff, including use of infiltration, detention ponds, retention ponds, or reusing of runoff.

(c) Comprehensive Compliance Evaluation – At least once per year, one (1) or more qualified personnel (for example, a person or persons with knowledge of this general permit, the concrete batch plant, and the SWP3 related to the concrete batch plant(s) for the site) shall conduct a compliance evaluation of the plant. The evaluation must include the following:

(1) Visual examination of all areas draining stormwater associated with regulated concrete batch plants for evidence of, or the potential for, pollutants entering the drainage system. These include but are not limited to: cleaning areas, material handling areas, above ground storage tanks, hoppers or silos, dust collection or containment systems, and truck wash down and equipment cleaning areas. Measures implemented to reduce pollutants in runoff (including structural controls and implementation of management practices) must be evaluated to determine if they are effective and if they are implemented in accordance with the terms of this permit and with the permittee's SWP3. The operator shall conduct a visual inspection of equipment needed to implement the SWP3, such as spill response equipment.

(2) Based on the results of the evaluation, the following must be revised as appropriate within two (2) weeks of the evaluation: the description of potential pollutant sources identified in the SWP3 (as required in Part VI.E.2(a), "Description of Potential Pollutant Sources"); and pollution prevention measures and controls identified in the SWP3 (as required in Part VI.E.2.(b) "Measures and Controls"). The revisions may include a schedule for implementing the necessary changes.

(3) The permittee shall prepare and include in the SWP3 a report summarizing the scope of the evaluation, the personnel making the evaluation, the date(s) of the evaluation, major observations relating to the implementation of the SWP3, and actions taken in response to the findings of the evaluation. The report must identify any incidents of noncompliance. Where the report does not identify incidences of noncompliance, the report must contain a statement that the evaluation did not identify any incidence(s), and the report must be signed according to 30 TAC §305.128, relating to Signatories to Reports.

(4) The Comprehensive Compliance Evaluation may substitute for one of the required inspections delineated in Part VI.E.2.(b)(3) of this general permit.

3. Prohibition of Wastewater Discharges

Wastewater discharges associated with concrete production including wastewater disposal by land application are not authorized under this general permit. These wastewater discharges must be authorized under an alternative TCEQ water quality permit or otherwise disposed of in an authorized manner. Discharges of concrete truck washout at construction sites may be authorized if conducted in accordance with the requirements of Part VI of this general permit.

4. Concrete Truck Wash Out Requirements

This general permit authorizes the wash out of concrete trucks at construction sites regulated under this section of the general permit, provided the following requirements are

met. Authorization is limited to the land disposal of wash out water from concrete trucks. Any other direct discharge of concrete production waste water must be authorized under a separate TCEQ general permit or individual permit.

(a) Direct discharge of concrete truck wash out water to surface water in the state, including discharge to storm sewers, is prohibited by this general permit.

(b) Concrete truck wash out water shall be discharged to areas at the construction site where structural controls have been established to prevent direct discharge to surface waters or to areas that have a minimal slope that allow infiltration and filtering of wash out water to prevent direct discharge to surface waters. Structural controls may consist of temporary berms, temporary shallow pits, temporary storage tanks with slow rate release, or other reasonable measures to prevent runoff from the construction site.

(c) Wash out of concrete trucks during rainfall events shall be minimized. The direct discharge of concrete truck wash out water is prohibited at all times, and the operator shall insure that its BMPs are sufficient to prevent the discharge of concrete truck washout as the result of rain.

(d) The discharge of wash out water shall not cause or contribute to groundwater contamination.

(e) If a SWP3 is required to be implemented, the SWP3 shall include concrete wash out areas on the associated map.

Section F. Effective Date of Coverage

Construction activities may not commence under this section until the MS4 NOI and SWMP are approved in writing by the TCEQ. Following approval of the NOI and SWMP, operators of construction activities eligible for coverage under this general permit are authorized to discharge stormwater associated with construction activity immediately upon posting the signed construction site notice required under this section.

Section G. Deadlines for SWP3 Preparation and Compliance

The SWP3 must:

1. Be completed and initially implemented prior to commencing construction activities that result in soil disturbance;

2. Be updated as necessary to reflect the changing conditions of new contractors, new areas of responsibility, and changes in best management practices; and

3. Provide for compliance with the terms and conditions of this general permit.

Section H. Plan Review and Making Plans Available

The SWP3 must be retained on-site at the construction site or made readily available at the time of an on-site inspection to: the executive director; a federal, state, or local agency approving sediment and erosion plans, grading plans, or stormwater management plans; and to local government officials.

Section I. Keeping Plans Current

The permittee shall amend the SWP3 whenever either of the following occurs:

1. There is a change in design, construction, operation, or maintenance that has a significant effect on the discharge of pollutants and that has not been previously addressed in the SWP3; or
2. Results of inspections or investigations by site operators, authorized TCEQ personnel, or a federal, state or local agency approving sediment and erosion plans indicate the SWP3 is proving ineffective in eliminating or significantly minimizing pollutants in discharges authorized under this general permit.

Section J. Contents of SWP3

The SWP3 must include, at a minimum, the information described in this section.

1. Site Description

A site description, or project description, which must include:

(a) A description of the nature of the construction activity, potential pollutants and sources;

(b) A description of the intended schedule or sequence of major activities that will disturb soils for major portions of the site;

(c) The number of acres of the entire construction site property and the total number of acres of the site where construction activities will occur, including off-site material storage areas, overburden and stockpiles of dirt, and borrow areas;

(d) Data describing the soil type or the quality of any discharge from the site;

(e) A map showing the general location of the site (e.g. a portion of a city or county map);

(f) A detailed site map indicating the following:

(1) Drainage patterns and approximate slopes anticipated after major grading activities;

(2) Areas where soil disturbance will occur;

(3) Locations of all major structural controls either planned or in place;

(4) Locations where temporary or permanent stabilization practices are expected to be used;

(5) Locations of construction support activities, including off-site activities that are authorized under the permittee's NOI, including material, waste, borrow, fill, or equipment storage areas;

(6) Surface waters (including wetlands) either at, adjacent, or in close proximity to the site;

(7) Locations where stormwater discharges from the site directly to a surface water body or a MS4; and

(8) Vehicle wash areas.

(g) The location and description of asphalt plants and concrete plants (if any) providing support to the construction site and that are also authorized under this general permit;

(h) The name of receiving waters at or near the site that will be disturbed or that will receive discharges from disturbed areas of the project; and

(i) A copy of Part VI of this TPDES general permit.

2. Structural and non-structural controls

The SWP3 must describe the structural and the non-structural controls (BMPs) that will be used to minimize pollution in runoff. The description must identify the general timing or sequence for implementation and the party responsible for implementation. At a minimum, the description must include the following components:

Erosion and Sediment Controls

(a) Erosion and sediment controls must be designed to retain sediment on-site to the maximum extent practicable with consideration for local topography and rainfall.

(b) Control measures must be properly selected, installed, and maintained according to the manufacturer's or designer's specifications. If periodic inspections or other information indicates a control has been used incorrectly, or that the control is performing inadequately, the operator must replace or modify the control.

(c) Sediment must be removed from sediment traps and sedimentation ponds no later than the time that design capacity has been reduced by 50 percent.

(d) If sediment escapes the site, accumulations must be removed at a frequency to minimize further negative effects. and, whenever feasible, prior to the next rain event.

(e) Controls must be developed to limit offsite transport of litter, construction debris, and construction materials by stormwater runoff.

3. Stabilization Practices

The SWP3 must include a description of interim and permanent stabilization practices for the site, including a schedule of when the practices will be implemented. Site plans must ensure that existing vegetation is preserved where possible.

(a) Stabilization practices may include but are not limited to: establishment of temporary vegetation, establishment of permanent vegetation, mulching, geotextiles, sod stabilization, vegetative buffer strips, protection of existing trees and vegetation, and other similar measures.

(b) The following records must be maintained and either attached to or referenced in the SWP3 and made readily available upon request to the parties in Part VI.H. of this general permit:

   (1) The dates when major grading activities occur;

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

   (3) The dates when stabilization measures are initiated.

(c) Stabilization measures must be initiated immediately in portions of the site where construction activities have temporarily or permanently ceased, and will not resume for a period exceeding 14 calendar days, except as provided in (1) and (2) below.

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

   (2) Where the initiation of stabilization measures by the 14th day after construction activity has temporarily or permanently ceased is precluded by seasonably arid conditions, stabilization measures must be initiated as soon as practicable. These

conditions exist in arid areas, semiarid areas, and areas experiencing drought conditions.

4. Structural Control Practices

The SWP3 must include a description of any structural control practices used to divert flows away from exposed soils, to limit the contact of runoff with disturbed areas, or to lessen the off-site transport of eroded soils.

(a) Sites with a drainage area of ten (10) or more acres:

(1) A sediment basin is required, where feasible, for a common drainage location that serves an area with ten (10) or more acres disturbed at one time. A sedimentation basin may be temporary or permanent, but must provide sufficient storage to contain a calculated volume of runoff from a 2-year, 24-hour storm from each disturbed acre drained. When calculating the volume of runoff from a 2-year, 24-hour storm event, it is not required to include the flows from off-site areas and flow from on-site areas that are either undisturbed or have already undergone final stabilization, if these flows are diverted around both the disturbed areas of the site and the sediment basin. Capacity calculations must be included in the SWP3.

(2) Where rainfall data is not available or a calculation cannot be performed the sedimentation basin must provide at least 3,600 cubic feet of storage per acre drained until the site reaches final stabilization.

(3) If a sedimentation basin is not feasible, then the permittee shall provide equivalent control measures until the site reaches final stabilization. In determining whether installing a sediment basin is feasible, the permittee may consider factors such as site soils, slope, available area, public safety, precipitation pattern, site geometry, site vegetation, infiltration capacity, geotechnical factors, depth to groundwater, and other similar considerations. The permittee shall document the reason that the sediment basins are not feasible, and shall utilize equivalent control measures, which may include a series of smaller sediment basins.

(4) Perimeter Controls – At a minimum, silt fences, vegetative buffer strips, or equivalent sediment controls are required for all down slope boundaries of the construction area, and for those side slope boundaries deemed appropriate as dictated by individual site conditions.

(b) Controls for sites with drainage areas less than ten acres:

(1) Sediment traps and sediment basins may be used to control solids in stormwater runoff for drainage locations serving less than ten (10) acres. At a minimum, silt fences, vegetative buffer strips, or equivalent sediment controls are required for all down slope boundaries of the construction area, and for those side slope boundaries deemed appropriate as dictated by individual site conditions.

(2) Alternatively, a sediment basin that provides storage for a calculated volume of runoff from a 2-year, 24-hour storm from each disturbed acre drained may be utilized. Where rainfall data is not available or a calculation cannot be performed, a temporary or permanent sediment basin providing 3,600 cubic feet of storage per acre drained may be provided. If a calculation is performed, then the calculation shall be included in the SWP3.

5. Permanent Stormwater Controls

A description of any measures that will be installed during the construction process to control pollutants in stormwater discharges that will occur after construction operations have been completed must be included in the SWP3. Permittees are only responsible for the installation and maintenance of stormwater management measures prior to final stabilization of the site.

6. Other Controls

(a) Off-site vehicle tracking of sediments and the generation of dust must be minimized.

(b) The SWP3 must include a description of construction and waste materials expected to be stored on-site and a description of controls to reduce pollutants from these materials.

(c) The SWP3 must include a description of pollutant sources from areas other than construction (including stormwater discharges from dedicated asphalt plants and dedicated concrete plants), and a description of controls and measures that will be implemented at those sites to minimize pollutant discharges.

7. Effluent Limits

The federal Effluent Limitations Guidelines at 40 CFR § 450.21 apply to all regulated construction activities under this 7th optional MCM, where the small MS4 is the operator.

8. Approved State and Local Plans

(a) The permittee shall ensure the SWP3 is consistent with requirements specified in applicable sediment and erosion site plans or site permits, or stormwater management site plans or site permits approved by federal, state, or local officials.

(b) SWP3s must be updated as necessary to remain consistent with any changes applicable to protecting surface water resources in sediment erosion site plans or site permits, or stormwater management site plans or site permits approved by state or local official for whom the permittee receives written notice.

9. Maintenance

All erosion and sediment control measures and other protective measures identified in the SWP3 must be maintained in effective operating condition. If through inspections the permittee determines that BMPs are not operating effectively, maintenance must be performed before the next anticipated storm event or as necessary to maintain the continued effectiveness of stormwater controls. If maintenance prior to the next anticipated storm event is impracticable, maintenance must be scheduled and accomplished as soon as practicable.

10. Inspections of Controls

(a) Personnel provided by the permittee must inspect disturbed areas of the construction site that have not been finally stabilized, areas used for storage of materials that are exposed to precipitation, discharge locations, and structural controls for evidence of, or the potential for, pollutants entering the drainage system. Personnel conducting these inspections must be knowledgeable of this general permit, familiar with the construction site, and knowledgeable of the SWP3 for the site. Sediment and erosion

control measures identified in the SWP3 must be inspected to ensure that they are operating correctly. Locations where vehicles enter or exit the site must be inspected for evidence of off-site sediment tracking. Inspections must be conducted at least once every 14 calendar days and within 24 hours of the end of a storm event of 0.5 inches or greater.

Where sites have been finally or temporarily stabilized or where runoff is unlikely due to winter conditions (e.g. site is covered with snow, ice, or frozen ground exists), inspections must be conducted at least once every month. In arid or semi-arid, or drought-stricken areas, inspections must be conducted at least once every month and within 24 hours after the end of a storm event of 0.5 inches or greater

As an alternative to the above-described inspection schedule of once every 14 calendar days and within 24 hours of a storm event of 0.5 inches or greater, the SWP3 may be developed to require that these inspections will occur at least once every seven (7) calendar days. If this alternative schedule is developed, then the inspection must occur on a specifically defined day, regardless of whether or not there has been a rainfall event since the previous inspection.

The inspections may occur on either schedule provided that the SWP3 reflects the current schedule and that any changes to the schedule are conducted in accordance with the following provisions: the schedule may be changed a maximum of one time each month, the schedule change must be implemented at the beginning of a calendar month, and the reason for the schedule change must be documented in the SWP3 (e.g., end of “dry” season and beginning of “wet” season).

(b) Utility line installation, pipeline construction, and other examples of long, narrow, linear construction activities may provide inspection personnel with limited access to the areas described in Part VI.J.10(a) above. Inspection of these areas could require that vehicles compromise temporarily or even permanently stabilized areas, cause additional disturbance of soils, and increase the potential for erosion. In these circumstances, controls must be inspected at least once every 14 calendar days and within 24 hours of the end of a storm event of 0.5 inches, but representative inspections may be performed. For representative inspections, personnel must inspect controls along the construction site for 0.25 mile above and below each access point where a roadway, undisturbed right-of-way, or other similar feature intersects the construction site and allows access to the areas described in Part VI.J.10.(a) above. The conditions of the controls along each inspected 0.25 mile portion may be considered as representative of the condition of controls along that reach extending from the end of the 0.25 mile portion to either the end of the next 0.25 mile inspected portion, or to the end of the project, whichever occurs first.

As an alternative to the above-described inspection schedule of once every 14 calendar days and within 24 hours of a storm event of 0.5 inches or greater, the SWP3 may be developed to require that these inspections will occur at least once every seven (7) calendar days. If this alternative schedule is developed, the inspection must occur on a specifically defined day, regardless of whether or not there has been a rainfall event since the previous inspection. The inspections may occur on either schedule provided that the SWP3 reflects the current schedule and that any changes to the schedule are conducted in accordance with the following provisions: the schedule may be changed a maximum of one time each month, the schedule change must be implemented at the beginning of a calendar month, and the reason for the schedule change must be documented in the SWP3 (e.g., end of “dry” season and beginning of “wet” season).

(c) In the event of flooding or other uncontrollable situations that prohibit access to the inspection sites, inspections must be conducted as soon as access is practicable.

(d) The SWP3 must be modified based on the results of inspections, as necessary, to better control pollutants in runoff. Revisions to the SWP3 must be completed within seven (7) calendar days following the inspection. If existing BMPs are modified or if additional BMPs are necessary, an implementation schedule must be described in the SWP3 and wherever possible those changes implemented before the next storm event. If implementation before the next anticipated storm event is impracticable, these changes must be implemented as soon as practicable.

(e) A report summarizing the scope of the inspection, the date(s) of the inspection, and major observations relating to the implementation of the SWP3 must be made and retained as part of the SWP3. Major observations should include: The locations of discharges of sediment or other pollutants from the site; locations of BMPs that need to be maintained; locations of BMPs that failed to operate as designed or proved inadequate for a particular location; and locations where additional BMPs are needed.

Actions taken as a result of inspections must be described within, and retained as a part of, the SWP3. Reports must identify any incidents of non-compliance. Where a report does not identify any incidents of non-compliance, the report must contain a certification that the facility or site is in compliance with the SWP3 and this permit. The report must be signed by the person and in the manner required by 30 TAC §305.128 (relating to Signatories to Reports).

(f) The names and qualifications of personnel making the inspections for the permittee may be documented once in the SWP3 rather than being included in each report.

11. Pollution Prevention Measures

The SWP3 must identify and ensure the implementation of appropriate pollution prevention measures for all eligible non-stormwater components of the discharge.

Section K. Additional Retention of Records

The permittee shall retain the following records for a minimum period of three (3) years from the date that final stabilization has been achieved on all portions of the site. Records include:

1. A copy of the SWP3; and
2. All reports and actions required by this section, including copies of the construction site notices.

APPENDIX H

SITE NOTICE, NOTICE OF INTENT, NOTICE OF CHANGE AND NOTICE OF TERMINATION FORMS

Operator Notes

Construction Site Notice

The construction site notice located in Appendix H should be posted along with a signed copy of the Notice of Intent. The site notice must be located where it is safely and readily available for viewing by the general public, local, state, and federal authorities prior to commencing construction.

Notice of Intent (NOI)

The TPDES General Permit TXR 150000 requires that a NOI be submitted before construction activities begin. The NOI is essentially an application and contains items such as important information about your site, including site location, owner information, operator (general contractor) information, receiving water(s), and a brief description of the project.

TCEQ has developed a form to be used by industrial facilities and construction activities when they submit NOIs. This form indicates all the information that you are required to provide and must be used in order for the NOI to be processed correctly.

Primary Operators

Please note that both Owners and Contractors can meet the definition of being a "primary operator."

Primary operators must submit a NOI at least seven days prior to commencing construction activities, or if utilizing electronic submittal, prior to commencing construction activities.

If an additional primary operator is added after the initial NOI is submitted, the new primary operator must:

- submit a paper NOI at least seven days before assuming operational control, or
- submit an electronic NOI prior to assuming operational control.

If the primary operator changes after the initial NOI is submitted, the new primary operator must:

- submit a paper NOI at least ten days before assuming operational control, or
- submit an electronic NOI at least ten days before assuming operational control

All primary operators must post a copy of the signed NOI at the construction site in allocation where it is readily available for viewing by the general public, local, state, and federal authorities prior to commencing construction activities. A copy of the signed NOI must be submitted to the operator of any MS4 receiving the discharge and to any secondary operator, at least seven days prior to commencing construction activities. A list of the MS4 operators receiving a copy of the NOI is located in Appendix H.

Secondary Operators

Secondary operators are not required to submit a NOI, provided that another operator(s) at the site has submitted a NOI, or is required to submit a NOI and the secondary operator has provided notification to the operator(s) of the need to obtain coverage under the permit. Please refer to the general permit for more information.

NOI Fees

Please note the fees associated with NOI submission:

- $325 if submitting a paper NOI, or
- $225 if submitting an electronic NOI.

No separate annual fees will be assessed. The Water Quality Annual fee has been incorporated into the NOI fees.

It is anticipated that there will be projects where more than one entity (e.g., the owner, developer, or general contractor) will need to submit an NOI so that the requirements for an operator are met. In this case, those persons will share the Storm Water Pollution Plan, and the submittal of the NOI and the TPDES Permit Number will need to be recorded in the NOI log located in Appendix F.

Please refer to the general permit and NOI form instructions for more information.

Notice of Change (NOC)

The operators are responsible for updating the SWP3 to implement and maintain sediment controls and submit a Notice of Change (NOC) if off-site material, waste, borrow, fill or equipment storage areas are being utilized and are not under a separate permit. An operator must submit a NOC letter in conformance with TPDES General Permit TXR150000 if they become aware of any incorrect information in an NOI or failed to submit any relevant facts.

Information that may be included on an NOC includes, but is not limited to, the following: the description of the construction project, an increase in the number of acres disturbed (for increases of one or more acres), or the operator name. A transfer of operational control from one operator to another, including a transfer of the ownership of a company, may not be included in an NOC. A transfer of ownership of a company includes changes to the structure of a company, such as changing from a partnership to a corporation or changing corporation types, so that the filing number (or charter number) that is on record with the Texas Secretary of State must be changed.

An NOC is not required for notifying TCEQ of a decrease in the number of acres disturbed. This information must be included in the storm water pollution prevention plan (SWP3) and retained on site.

A list of the MS4 operators receiving a copy of the NOC is located in Appendix H.

Notice of Termination (NOT)

Any operator that has submitted a NOI must apply to terminate authorization of the general permit. The NOT is a form which should be completed and submitted to the TCEQ within 30 days of the following:

- final stabilization has been achieved on all portions of the site that are the responsibility of the permittee,
- a transfer of operational control has occurred, or

- the operator has obtained alternative authorization under an individual TPDES permit or alternative TPDES general permit.

Information to be included on the NOT includes the location of the construction site; the name, address, and telephone number of the operator terminating coverage; the TPDES General Permit Number; an indication of why coverage under the permit should be terminated for the operator; and a signed certification statement.

Authorization under the general permit terminates at midnight on the day the NOT is postmarked for delivery to the TCEQ. If the NOT is submitted electronically, the permit terminates immediately following confirmation of receipt of the NOT by TCEQ.

Note that when there is a change in operators of a construction activity, then the new operator must submit an NOI.

NOT's should be submitted to MS4 Operator(s). A list of the MS4 operator(s) receiving a copy of the NOT is located in Appendix H.

Record of Submittals to MS4s

Form Type	MS4 Name	Address	Date Submitted

Texas Commission on Environmental Quality
General Permit Payment Submittal Form

Use this form to submit your Application Fee only if you are mailing your payment.

- Complete items 1 through 5 below:
- Staple your check in the space provided at the bottom of this document.
- Do not mail this form with your NOI form.
- Do not mail this form to the same address as your NOI.

Mail this form and your check to:

BY REGULAR U.S. MAIL

Texas Commission on Environmental Quality
Financial Administration Division
Cashier's Office, MC-214
P.O. Box 13088
Austin, TX 78711-3088

BY OVERNIGHT/EXPRESS MAIL

Texas Commission on Environmental Quality
Financial Administration Division
Cashier's Office, MC-214
12100 Park 35 Circle
Austin, TX 78753

Fee Code: GPA	General Permit: TXR150000

1. Check / Money Order No: _____
2. Amount of Check/Money Order: _____
3. Date of Check or Money Order: _____
4. Name on Check or Money Order: _____
5. NOI INFORMATION

   If the check is for more than one NOI, list each Project/Site (RE) Name and Physical Address exactly as provided on the NOI. DO NOT SUBMIT A COPY OF THE NOI WITH THIS FORM AS IT COULD CAUSE DUPLICATE PERMIT ENTRIES.

   See Attached List of Sites (If more space is needed, you may attach a list.)

   Project/Site (RE) Name: _____

   Project/Site (RE) Physical Address:

   _____

Staple Check in This Space

LARGE CONSTRUCTION SITE NOTICE

FOR THE
Texas Commission on Environmental Quality (TCEQ)
Stormwater Program

TPDES GENERAL PERMIT TXR150000

"PRIMARY OPERATOR" NOTICE

This notice applies to construction sites operating under Part II.E.3. of the TPDES General Permit Number TXR150000 for discharges of stormwater runoff from construction sites equal to or greater than five acres, including the larger common plan of development. The information on this notice is required in Part III.D.2. of the general permit. Additional information regarding the TCEQ stormwater permit program may be found on the internet at:

https://www.tceq.texas.gov/permitting/stormwater/construction

Site-Specific TPDES Authorization Number:	
Operator Name:	
Contact Name and Phone Number:	
Project Description: *Physical address or description of the site's location, and estimated start date and projected end date, or date that disturbed soils will be stabilized.*	
Location of Stormwater Pollution Prevention Plan:	

LARGE CONSTRUCTION SITE NOTICE

FOR THE
Texas Commission on Environmental Quality (TCEQ)
Stormwater Program

TPDES GENERAL PERMIT TXR150000

"SECONDARY OPERATOR" NOTICE

This notice applies to secondary operators of construction sites operating under Part II.E.3. of the TPDES General Permit Number TXR150000 for discharges of stormwater runoff from construction sites equal to or greater than five acres, including the larger common plan of development. The information on this notice is required in Part III.D.2. of the general permit. Additional information regarding the TCEQ stormwater permit program may be found on the internet at:

https://www.tceq.texas.gov/permitting/stormwater/construction

Site-Specific TPDES Authorization Number:	
Operator Name:	
Contact Name and Phone Number:	
Project Description: *Physical address or description of the site's location, and estimated start date and projected end date, or date that disturbed soils will be stabilized.*	
Location of Stormwater Pollution Prevention Plan (SWP3):	

For Large Construction Activities Authorized Under Part II.E.3. (Obtaining Authorization to Discharge) the following certification must be completed:

I _____ (Typed or Printed Name Person Completing This Certification) certify under penalty of law that I have read and understand the eligibility requirements for claiming an authorization under Part II.E.3. of TPDES General Permit TXR150000 and agree to comply with the terms of this permit. A stormwater pollution prevention plan has been developed and will be implemented prior to construction, according to permit requirements. A copy of this signed notice is supplied to the operator of the MS4 if discharges enter an MS4. I am aware there are significant penalties for providing false information or for conducting unauthorized discharges, including the possibility of fine and imprisonment for knowing violations.

Signature and Title_____ Date _____

_____ *Date Notice Removed*

_____ *MS4 operator notified per Part II.F.3.*

TCEQ Office Use Only
Permit No.:
RN:
CN:
Region:

RESET FORM

Notice of Intent (NOI) for Stormwater Discharges Associated with Construction Activity under TPDES General Permit (TXR150000)

IMPORTANT:

- Use the **INSTRUCTIONS** to fill out each question in this form.
- Use the **CHECKLIST** to make certain all you filled out all required information. Incomplete applications **WILL** delay approval or result in automatic denial.
- Once processed your permit can be viewed at: http://www2.tceq.texas.gov/wq_dpa/index.cfm

ePERMITS: Sign up now for online NOI: https://www3.tceq.texas.gov/steers/index.cfm
Pay a $225 reduced application fee by using ePermits.

APPLICATION FEE:

- You must pay the **$325** Application Fee to TCEQ for the paper application to be complete.
- Payment and NOI must be mailed to separate addresses.
- Did you know you can pay on line?
  - Go to https://www3.tceq.texas.gov/epay/index.cfm
  - Select Fee Type: GENERAL PERMIT CONSTRUCTION STORM WATER DISCHARGE NOI APPLICATION
- **Provide your payment information below, for verification of payment:**

☐ Mailed Check/Money Order No.: _____
Name Printed on Check: _____
☐ EPAY Voucher No.: _____
Is the Payment Voucher copy attached? ☐ Yes

RENEWAL: Is this NOI a Renewal of an existing General Permit Authorization? (Note: A permit cannot be renewed after June 3, 2013.)

☐ Yes The Permit number is: TXR15_____
(If a permit number is not provided, a new number will be assigned.)
☐ No

1) OPERATOR (Applicant)

a) If the applicant is currently a customer with TCEQ, what is the Customer Number (CN) issued to this entity? You may search for your CN at: http://www12.tceq.texas.gov/crpub/index.cfm?fuseaction=cust.CustSearch

CN_____

b) What is the Legal Name of the entity (applicant) applying for this permit?

_____

(The legal name must be spelled exactly as filed with the Texas Secretary of State, County, or in the legal document forming the entity.)

c) What is the name and title of the person signing the application? The person must be an executive official meeting signatory requirements in TAC 305.44(a).
Prefix (Mr. Ms. Miss): _____
First/Last Name: _____Suffix: _____
Title: _____Credential: _____

d) What is the Operator Contact's (Responsible Authority) contact information and mailing address as recognized by the US Postal Service (USPS)? You may verify the address at: http://zip4.usps.com/zip4/welcome.jsp
Phone #:_____ext:_____Fax #:_____
E-mail: _____
Mailing Address:_____
Internal Routing (Mail Code, Etc.):_____
City:_____State:_____ZIP Code:_____
If outside USA: Territory:_____Country Code:_____Postal Code:_____

e) Indicate the type of Customer (The instructions will help determine your customer type):

☐ Individual	☐ Limited Partnership	☐ Sole Proprietorship-DBA
☐ Joint Venture	☐ General Partnership	☐ Corporation
☐ Trust	☐ Estate	☐ Federal Government
☐ State Government	☐ County Government	☐ City Government
☐ Other Government		

f) Independent Operator? ☐ Yes ☐ No
(If governmental entity, subsidiary, or part of a larger corporation, check "No".)

g) Number of Employees:
☐ 0-20; ☐ 21-100; ☐ 101-250; ☐ 251-500; or ☐ 501 or higher

h) Customer Business Tax and Filing Numbers:
(REQUIRED for Corporations and Limited Partnerships. Not Required for Individuals, Government, or Sole Proprietors)
State Franchise Tax ID Number: _____
Federal Tax ID: _____
Texas Secretary of State Charter (filing) Number: _____
DUNS Number (if known): _____

2) APPLICATION CONTACT

If TCEQ needs additional information regarding this application, who should be contacted?

Is the application contact the same as the applicant identified above?

☐ Yes, go to Section 3). ☐ No, complete section below.

Prefix (Mr. Ms. Miss):_____
First/Last Name: _____Suffix: _____
Title: _____Credential: _____

Organization Name:_____
Phone No.:_____ ext:_____ Fax Number:_____
E-mail:_____
Mailing Address:_____
Internal Routing (Mail Code, Etc.):_____
City:_____State:_____ZIP Code:_____
Mailing Information if outside USA:
Territory:_____Country Code:_____Postal Code:_____

3) REGULATED ENTITY (RE) INFORMATION ON PROJECT OR SITE

If the site of your business is part of a larger business site or if other businesses were located at this site before yours, a Regulated Entity Number (RN) may already be assigned for the larger site. Use the RN assigned for the larger site. Search TCEQ's Central Registry to see if the larger site may already be registered as a regulated site at: http://www12.tceq.texas.gov/crpub/index.cfm?fuseaction=regent.RNSearch.

If the site is found, provide the assigned Regulated Entity Reference Number and provide the information for the site to be authorized through this application below. The site information for this authorization may vary from the larger site information.

a) TCEQ issued RE Reference Number (RN): RN_____

b) Name of project or site (the name known by the community where located):
_____

c) In your own words, briefly describe the primary business of the Regulated Entity: (Do not repeat the SIC and NAICS code):
_____

d) County (or counties if > 1) _____

e) Latitude:_____ Longitude: _____

f) Does the site have a physical address?
☐ Yes, complete Section A for a physical address.
☐ No, complete Section B for site location information.

Section A: Enter the physical address for the site.
Verify the address with USPS. If the address is not recognized as a delivery address, provide the address as identified for overnight mail delivery, 911 emergency or other online map tools to confirm an address.

Physical Address of Project or Site:
Street Number: _____ Street Name: _____
City: _____State: Texas ZIP Code: _____

Section B: Enter the site location information.

If no physical address (Street Number & Street Name), provide a written location access description to the site. (Ex.: located 2 miles west from intersection of Hwy 290 & IH35 accessible on Hwy 290 South)

City where the site is located or, if not in a city, what is the nearest city:

State: Texas ZIP Code where the site is located: _____

4) GENERAL CHARACTERISTICS

a) Is the project/site located on Indian Country Lands?

☐ Yes - If the answer is Yes, you must obtain authorization through EPA, Region 6.

☐ No

b) Is your construction activity associated with a facility that, when completed, would be associated with the exploration, development, or production of oil or gas or geothermal resources?

☐ Yes - If the answer is Yes, you may be under jurisdiction of the Railroad Commission of Texas and may need to obtain authorization through EPA, Region 6.

☐ No

c) What is the Primary Standard Industrial Classification (SIC) Code that best describes the construction activity being conducted at the site?

Primary SIC Code: _____

d) If applicable, what is the Secondary SIC Code(s): _____

e) What is the total number of acres disturbed? _____

f) Is the project site part of a larger common plan of development or sale?

☐ Yes - If the answer is Yes, the total number of acres disturbed can be less than 5 acres.

☐ No - If the answer is No, the total number of acres disturbed must be 5 or more. If the total number of acres disturbed is less than 5 then the project site does not qualify for coverage through this Notice of Intent. Coverage will be denied. See the requirements in the general permit for small construction sites.

g) What is the name of the first water body(s) to receive the stormwater runoff or potential runoff from the site?

_____

h) What is the segment number(s) of the classified water body(s) that the discharge will eventually reach?

_____

i) Is the discharge into an MS4?

☐ Yes - If the answer is Yes, provide the name of the MS4 operator below.

☐ No

If Yes, provide the name of the MS4 operator:

_____

Note: The general permit requires you to send a copy of the NOI to the MS4 operator.

j) Are any of the surface water bodies receiving discharges from the construction site on the latest EPA-approved CWA 303(d) List of impaired waters?

☐ Yes - If the answer is Yes, provide the name(s) of the impaired water body(s) below.

☐ No

If Yes, provide the name(s) of the impaired water body(s):

_____

k) Is the discharge or potential discharge within the Recharge Zone, Contributing Zone, or Contributing Zone within the Transition Zone of the Edwards Aquifer as defined in 30 TAC Chapter 213?

☐ Yes - If the answer is Yes, complete certification below by checking "Yes."

☐ No

I certify that a copy of the TCEQ approved Plan required by the Edwards Aquifer Rule (30 TAC Chapter 213) is either included or referenced in the Stormwater Pollution Prevention Plan.

☐ Yes

5) CERTIFICATION

Check Yes to the certifications below. Failure to indicate Yes to ***ALL*** items may result in denial of coverage under the general permit.

a) I certify that I have obtained a copy and understand the terms and conditions of the Construction General Permit (TXR150000). ☐ Yes

b) I certify that the full legal name of the entity applying for this permit has been provided and is legally authorized to do business in Texas. ☐ Yes

c) I understand that a Notice of Termination (NOT) must be submitted when this authorization is no longer needed. ☐ Yes

d) I certify that a Stormwater Pollution Prevention Plan has been developed, will be implemented prior to construction and to the best of my knowledge and belief is compliant with any applicable local sediment and erosion control plans, as required in the general permit TXR150000. Note: For multiple operators who prepare a shared SWP3, the confirmation of an operator may be limited to its obligations under the SWP3 provided all obligations are confirmed by at least one operator. ☐ Yes

Operator Certification:

I,_____ _____

Typed or printed name Title

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

I further certify that I am authorized under 30 Texas Administrative Code 305.44 to sign and submit this document, and can provide documentation in proof of such authorization upon request.

Signature: _____ Date:_____

(Use blue ink)

NOTICE OF INTENT CHECKLIST (TXR150000)

- Did you complete everything? Use this checklist to be sure!
- Are you ready to mail your form to TCEQ? Go to the General Information Section of the Instructions for mailing addresses.

This checklist is for use by the operator to ensure a complete application. Missing information may result in denial of coverage under the general permit. (See NOI process description in the Instructions)

Application Fee:

If paying by Check:

- ☐ Check was mailed **separately** to the TCEQs Cashier's Office. (See Instructions for Cashier's address and Application address.)
- ☐ Check number and name on check is provided in this application.

If using ePay:

- ☐ The voucher number is provided in this application or a copy of the voucher is attached.

PERMIT NUMBER:

- ☐ Permit number provided – if this application is for renewal of an existing authorization.

OPERATOR INFORMATION - Confirm each item is complete:

- ☐ Customer Number (CN) issued by TCEQ Central Registry
- ☐ Legal name as filed to do business in Texas (Call TX SOS 512/463-5555)
- ☐ Name and title of responsible authority signing the application
- ☐ Mailing address is complete & verifiable with USPS. www.usps.com
- ☐ Phone numbers/e-mail address
- ☐ Type of operator (entity type)
- ☐ Independent operator
- ☐ Number of employees
- ☐ For corporations or limited partnerships – Tax ID and SOS filing numbers
- ☐ Application contact and address is complete & verifiable with USPS. http://www.usps.com

REGULATED ENTITY (RE) INFORMATION ON PROJECT OR SITE - Confirm each item is complete:

- ☐ Regulated Entity Reference Number (RN) (if site is already regulated by TCEQ)
- ☐ Site/project name/regulated entity
- ☐ Latitude and longitude http://www.tceq.texas.gov/gis/sqmaview.html
- ☐ County
- ☐ Site/project physical address. Do not use a rural route or post office box.
- ☐ Business description

GENERAL CHARACTERISTICS - Confirm each item is complete:

- ☐ Indian Country Lands –the facility is not on Indian Country Lands
- ☐ Construction activity related to facility associated to oil, gas, or geothermal resources
- ☐ Standard Industrial Classification (SIC) Code www.osha.gov/oshstats/sicser.html
- ☐ Acres disturbed is provided and qualifies for coverage through a NOI
- ☐ Common plan of development or sale
- ☐ Receiving water body(s)
- ☐ Segment number(s)
- ☐ Impaired water body(s)
- ☐ MS4 operator
- ☐ Edwards Aquifer rule

CERTIFICATION

- ☐ Certification statements have been checked indicating "Yes"
- ☐ Signature meets 30 Texas Administrative Code (TAC) 305.44 and is original.

Notice of Intent (NOI) for Stormwater Discharges Associated with Construction Activity under TPDES General Permit (TXR150000)

General Information and Instructions

GENERAL INFORMATION

Where to Send the Notice of Intent (NOI):

BY REGULAR U.S. MAIL
Texas Commission on
Environmental Quality
Stormwater Processing Center
(MC228)
P.O. Box 13087
Austin, Texas 78711-3087

BY OVERNIGHT/EXPRESS MAIL
Texas Commission on
Environmental Quality
Stormwater Processing Center
(MC228)
12100 Park 35 Circle
Austin, TX 78753

TCEQ Contact List:

Application – status and form questions:	*512/245-0130, swpermit@tceq.texas.gov*
Technical questions:	*512/239-4671, swgp@tceq.texas.gov*
Environmental Law Division:	*512/239-0600*
Records Management - obtain copies of forms:	*512/239-0900*
Reports from databases (as available):	*512/239-DATA (3282)*
Cashier's office:	*512/239-0357 or 512/239-0187*

Notice of Intent Process:

When your NOI is received by the program, the form will be processed as follows:

1) **Administrative Review:** Each item on the form will be reviewed for a complete response. In addition, the operator's legal name must be verified with Texas Secretary of State as valid and active (if applicable). The address(s) on the form must be verified with the US Postal service as receiving regular mail delivery. Never give an overnight/express mailing address.

2) **Notice of Deficiency:** If an item is incomplete or not verifiable as indicated above, a notice of deficiency (NOD) will be mailed to the operator. The operator will have 30 days to respond to the NOD. The response will be reviewed for completeness.

3) **Acknowledgment of Coverage:** An Acknowledgment Certificate will be mailed to the operator. This certificate acknowledges coverage under the general permit.
   -or-
   Denial of Coverage: If the operator fails to respond to the NOD or the response is inadequate, coverage under the general permit may be denied. If coverage is denied, the operator will be notified.

General Permit (Your Permit)

For NOIs submitted **electronically** through ePermits, provisional coverage under the general permit begins immediately following confirmation of receipt of the NOI form by the TCEQ.

For **paper** NOIs, provisional coverage under the general permit begins **7 days after a completed NOI is postmarked for delivery** to the TCEQ.

You should have a copy of your general permit when submitting your application. You may view and print your permit for which you are seeking coverage, on the TCEQ web site http://www.tceq.texas.gov. Search using key word TXR150000.

General Permit Forms

The Notice of Intent (NOI), Notice of Termination (NOT), and Notice of Change (NOC) (including instructions) are available in Adobe Acrobat PDF format on the TCEQ web site http://www.tceq.texas.gov.

Change in Operator

An authorization under the general permit is not transferable. If the operator of the regulated entity changes, the present permittee must submit a Notice of Termination and the new operator must submit a Notice of Intent. The NOT and NOI must be submitted no later than 10 days prior to the change in Operator status.

TCEQ Central Registry Core Data Form

The Core Data Form has been incorporated into this form. Do not send a Core Data Form to TCEQ. After final acknowledgment of coverage under the general permit, the program will assign a Customer Number and Regulated Entity Number.

You can find the information on the Central Registry web site at http://www12.tceq.texas.gov/crpub/index.cfm. You can search by the Regulated Entity (RN), Customer Number (CN) or Name (Permittee), or by your permit number under the search field labeled AAdditional ID@. Capitalize all letters in the permit number.

The Customer (Permittee) is responsible for providing consistent information to the TCEQ, and for updating all CN and RN data for all authorizations as changes occur. For General Permits, a Notice of Change form must be submitted to the program area.

Fees associated with a General Permit

Payment of the fee may be made by check or money order, payable to TCEQ, or through EPAY (electronic payment through the web).

Application Fee: This fee is required to be paid at the time the NOI is submitted. Failure to submit payment at the time the application is filed will cause delays in acknowledgment or denial of coverage under the general permit.

Mailed Payments:

Payment must be mailed under separate cover at one of the addresses below using the attached Application Fee submittal form. (DO NOT SEND A COPY OF THE NOI WITH THE APPLICATION FEE SUBMITTAL FORM)

BY REGULAR U.S. MAIL
Texas Commission on Environmental Quality
Financial Administration Division
Cashier's Office, MC-214
P.O. Box 13088
Austin, TX 78711-3088

BY OVERNIGHT/EXPRESS MAIL
Texas Commission on Environmental Quality
Financial Administration Division
Cashier's Office, MC-214
12100 Park 35 Circle
Austin, TX 78753

ePAY Electronic Payment: http://www.tceq.texas.gov/epay

When making the payment you must select Water Quality, and then select the fee category "General Permit Construction Storm Water Discharge NOI Application". You must include a copy of the payment voucher with your NOI. Your NOI will not be considered complete without the payment voucher.

INSTRUCTIONS FOR FILLING OUT THE NOI FORM

Renewal of General Permit. Dischargers holding active authorizations under the expired General Permit are required to submit a NOI to continue coverage. The existing permit number is required. If the permit number is not provided or has been terminated, expired, or denied a new permit number will be issued.

1. Operator (Applicant)

a) Enter assigned Customer Number (CN)
TCEQ's Central Registry will assign each customer a number that begins with CN, followed by nine digits. **This is not a permit number, registration number, or license number**.
If this customer has not been assigned a CN, leave the space for the CN blank.
If this customer has already been assigned this number, enter the permittee's CN.

b) Legal Name
Provide the current legal name of the permittee, as authorized to do business in Texas. The name must be provided exactly as filed with the Texas Secretary of State (SOS), or on other legal documents forming the entity, that is filed in the county where doing business. You may contact the SOS at 512/463-5555, for more information related to filing in Texas. If filed in the county where doing business, provide a copy of the legal documents showing the legal name.

c) Person Signing Application
Provide information about person signing section 5) Certification.

d) Operator Contact's (Responsible Authority) Contact Information and Mailing Address
Provide a complete mailing address for receiving mail from the TCEQ. The address must be verifiable with the US Postal Service at http://www.usps.com for regular mail delivery (not overnight express mail). If you find that the address is not verifiable using the USPS web search, please indicate the address is used by the USPS for regular mail delivery.

The area code and phone number should provide contact to the operator. Leave Extension blank if not applicable.

The fax number and e-mail address are optional and should correspond to the operator.

e) Type of Customer (Entity Type)
Check only one box that identifies the type of entity. Use the descriptions below to identify the appropriate entity type. Note that the selected entity type also indicates the name that must be provided as an applicant for a permit, registration or authorization.

Sole Proprietorship – DBA

A sole proprietorship is a customer that is owned by only one person and has not been incorporated. This business may:

- be under the person's name
- have its own name (doing business as or d.b.a.)
- have any number of employees

If the customer is a Sole Proprietorship or DBA, the 'legal name' of the individual business 'owner' must be provided. The DBA name is not recognized as the 'legal name' of the entity. The DBA name may be used for the site name (regulated entity).

Individual

An individual is a customer who has not established a business, but conducts an activity that needs to be regulated by the TCEQ.

Partnership

- A customer that is established as a partnership as defined by the Texas Secretary of State Office (TX SOS). A Limited Partnership or Limited Liability Partnership (Partnership) is required to file with the Texas Secretary of State. A General Partnership or Joint Venture is not required to register with the state.
- **Partnership (Limited Partnership or Limited Liability Partnership):** A limited partnership is defined in the Act as a partnership formed by two or more persons under the provisions of Section 3 of the Uniform Limited Partnership Act (Art. 6132a, Revised Civil Statutes of Texas) and having as members one or more general partners and one or more limited partners. The limited partners as such are not bound by the obligations of the partnership. Limited partners may not take part in the day-to-day operations of the business. A Limited Partnership must file with the Texas Secretary of State. A registered limited liability partnership is a general or limited partnership that is registered with the Texas Secretary of State. The partnership's name must contain the words "Registered Limited Liability Partnership" or the abbreviation "L.L.P." as the last words or letters of its name.
- **General Partnership:** A general partner may or may not invest, participates in running the partnership and is liable for all acts and debts of the partnership and any member of it. A General Partnership does not have limited partners. For a General Partnership, there is no registration with the state or even written agreement necessary for a general partnership to be formed. The legal definition of a partnership is generally stated as "an association of two or more persons to carry on as co-owners a business for profit" (Revised Uniform Partnership Act § 101 [1994]).
- **Joint Venture:** A joint venture is but another name for a special partnership. It might be distinguished from a general partnership in that the latter is formed for the transaction of a general business, while a joint venture is usually limited to a single transaction. That is, a joint venture is a special combination of persons in the nature of a partnership engaged in the joint prosecution of a particular transaction for mutual benefit or profit.

Corporation

A customer meets all of these conditions:

- is a legally incorporated entity under the laws of any state or country
- is recognized as a corporation by the Texas Secretary of State

- has proper operating authority to operate in Texas.
- The corporation's 'legal name' as filed with the Texas Secretary of State must be provided as applicant. An 'assumed' name of a corporation is not recognized as the 'legal name' of the entity.

Government

Federal, state, county, or city government (as appropriate)
The customer is either an agency of one of these levels of government or the governmental body itself. The government agency's 'legal name' must be provided as the applicant. A department name or other description of the organization should not be included as a part of the 'legal name' as applicant.

Trust or Estate

A trust and an estate are fiduciary relationships governing the trustee/executor with respect to the trust/estate property.

Other Government

A utility district, water district, tribal government, college district, council of governments, or river authority. Write in the specific type of government.

Other

The customer does not fit any of the above descriptions. Enter a short description of the type of customer in the blank provided.

f) Independent Entity

Check No if this customer is a subsidiary, part of a larger company, or is a governmental entity. Otherwise, check Yes.

g) Number of Employees

Check one box to show the number of employees for this customer's entire company, at all locations. This is not necessarily the number of employees at the site named in the application.

h) Customer Business Tax and Filing Numbers

These are required for Corporations and Limited Partnerships. These are not required for Individuals, Government, and Sole Proprietors.

State Franchise Tax ID Number

Corporations and limited liability companies that operate in Texas are issued a franchise tax identification number. If this customer is a corporation or limited liability company, enter this number here.

Federal Tax ID

All businesses, except for some small sole proprietors, individuals, or general partnerships should have a federal taxpayer identification number (TIN). Enter this number here. Use no prefixes, dashes, or hyphens. Sole proprietors, individuals, or general partnerships do not need to provide a federal tax ID.

TX SOS Charter (filing) Number

Corporations and Limited Partnerships required to register with the Texas Secretary of State are issued a charter or filing number. You may obtain further information by calling SOS at 512/463-5555.

DUNS Number
Most businesses have a DUNS (Data Universal Numbering System) number issued by Dun and Bradstreet Corp. If this customer has one, enter it here.

2. APPLICATION CONTACT

Provide the name, title and communication information of the person that TCEQ can contact for additional information regarding this application.

3. REGULATED ENTITY (RE) INFORMATION ON PROJECT OR SITE

a) Regulated Entity Reference Number (RN)
A number issued by TCEQ's Central Registry to sites (a location where a regulated activity occurs) regulated by TCEQ. This is not a permit number, registration number, or license number. If this regulated entity has not been assigned an RN, leave this space blank.

If the site of your business is part of a larger business site, a Regulated Entity Number (RN) may already be assigned for the larger site. Use the RN assigned for the larger site. Search TCEQ's Central Registry to see if the larger site may already be registered as a regulated site at: http://www12.tceq.texas.gov/crpub/index.cfm?fuseaction=regent.RNSearch

If the site is found, provide the assigned Regulated Entity Reference Number (RN) and provide the information for the site to be authorized through this application. The site information for this authorization may vary from the larger site information.

An example is a chemical plant where a unit is owned or operated by a separate corporation that is accessible by the same physical address of your unit or facility. Other examples include industrial parks identified by one common address but different corporations have control of defined areas within the site. In both cases, an RN would be assigned for the physical address location and the permitted sites would be identified separately under the same RN.

b) Site/Project Name/Regulated Entity
Provide the name of the site as known by the public in the area where the site is located. The name you provide on this application will be used in the TCEQ Central Registry as the Regulated Entity name.

c) Description of Activity Regulated
In your own words, briefly describe the primary business that you are doing that requires this authorization. Do not repeat the SIC Code description.

d) County
Identify the county or counties in which the regulated entity is located.

e) Latitude and Longitude
Enter the latitude and longitude of the site in degrees, minutes, and seconds or decimal form. For help obtaining the latitude and longitude, go to:
http://www.tceq.texas.gov/gis/sqmaview.html or http://nationalmap.gov/ustopo

f) Site/Project (RE) Physical Address/Location Information
Enter the complete address for the site in Section A if the address can be validated through the US Postal Service. If the physical address is not recognized as a USPS delivery address, you may need to validate the address with your local police (911 service) or through an online map site

used to locate a site. Please confirm this to be a complete and valid address. Do not use a rural route or post office box for a site location.

If a site does not have an address that includes a street (or house) number and street name, enter NO ADDRESS for the street name in Section A. In Section B provide a complete written location description. For example: "The site is located 2 miles west from intersection of Hwy 290 & IH35, located on the southwest corner of the Hwy 290 South bound lane."
Provide the city (or nearest city) and zip code of the facility location.

4. GENERAL CHARACTERISTICS

a) Indian Country Lands

If your site is located on Indian Country Lands, the TCEQ does not have authority to process your application. You must obtain authorization through EPA, Region 6, Dallas. Do not submit this form to TCEQ.

b) Construction activity associated with facility associated with exploration, development, or production of oil, gas, or geothermal resources

If your activity is associated with oil and gas exploration, development, or production, you may be under jurisdiction of the Railroad Commission of Texas and may need to obtain authorization from EPA Region 6. For more information, see:
http://info.sos.state.tx.us/pls/pub/readtac$ext.TacPage?sl=R&app=9&p_dir=&p_rloc=&p_tloc=&p_ploc=&pg=1&p_tac=&ti=16&pt=1&ch=3&rl=30

Construction activities associated with a facility related to oil, gas or geothermal resources may include the construction of a well site; treatment or storage facility; underground hydrocarbon or natural gas storage facility; reclamation plant; gas processing facility; compressor station; terminal facility where crude oil is stored prior to refining and at which refined products are stored solely for use at the facility; a carbon dioxide geologic storage facility; and a gathering, transmission, or distribution pipeline that will transport crude oil or natural gas, including natural gas liquids, prior to refining of such oil or the use of the natural gas in any manufacturing process or as a residential or industrial fuel.

Where required by federal law, discharges of stormwater associated with construction activities under the Railroad Commission's jurisdiction must be authorized by the EPA and the Railroad Commission of Texas, as applicable. Activities under Railroad Commission of Texas jurisdiction include construction of a facility that, when completed, would be associated with the exploration, development, or production of oil or gas or geothermal resources, such as a well site; treatment or storage facility; underground hydrocarbon or natural gas storage facility; reclamation plant; gas processing facility; compressor station; terminal facility where crude oil is stored prior to refining and at which refined products are stored solely for use at the facility; a carbon dioxide geologic storage facility under the jurisdiction of the Railroad Commission of Texas; and a gathering, transmission, or distribution pipeline that will transport crude oil or natural gas, including natural gas liquids, prior to refining of such oil or the use of the natural gas in any manufacturing process or as a residential or industrial fuel. The Railroad Commission of Texas also has jurisdiction over stormwater from land disturbance associated with a site survey that is conducted prior to construction of a facility that would be regulated by the Railroad Commission of Texas. Under 33 U.S.C. §1342(l)(2) and §1362(24), EPA cannot require a permit for discharges of stormwater from "field activities or operations associated with {oil and gas} exploration, production, processing, or treatment operations, or transmission facilities, including activities necessary to prepare a site for drilling and for the movement and placement

of drilling equipment, whether or not such field activities or operations may be considered to be construction activities" unless the discharge is contaminated by contact with any overburden, raw material, intermediate product, finished product, byproduct, or waste product located on the site of the facility. Under §3.8 of this title (relating to Water Protection), the Railroad Commission of Texas prohibits operators from causing or allowing pollution of surface or subsurface water. Operators are encouraged to implement and maintain best management practices (BMPs) to minimize discharges of pollutants, including sediment, in stormwater during construction activities to help ensure protection of surface water quality during storm events.

c) Primary Standard Industrial Classification (SIC) Code
Provide the SIC Code that best describes the construction activity being conducted at this site.

Common SIC Codes related to construction activities include:

- 1521 - Construction of Single Family Homes
- 1522 - Construction of Residential Bldgs. Other than Single Family Homes
- 1541 - Construction of Industrial Bldgs. and Warehouses
- 1542 - Construction of Non-residential Bldgs, other than Industrial Bldgs. and Warehouses
- 1611 - Highway and Street Construction, except Highway Construction
- 1622 - Bridge, Tunnel, and Elevated Highway Construction
- 1623 - Water, Sewer, Pipeline and Communications, and Power Line Construction

For help with SIC Codes, go to:
http://www.osha.gov/pls/imis/sicsearch.html

d) Secondary SIC Code
Secondary SIC Code(s) may be provided. Leave blank if not applicable. For help with SIC Codes, go to:
http://www.osha.gov/pls/imis/sicsearch.html

e) Total Number of Acres Disturbed
Provide the approximate number of acres that the construction site will disturb. Construction activities that disturb less than one acre, unless they are part of a larger common plan that disturbs more than one acre, do not require permit coverage. Construction activities that disturb between one and five acres, unless they are part of a common plan that disturbs more than five acres, do not require submission of an NOI. Therefore, the estimated area of land disturbed should not be less than five, unless the project is part of a larger common plan that disturbs five or more acres. Disturbed means any clearing, grading, excavating, or other similar activities.

If you have any questions about this item, please contact the stormwater technical staff by phone at (512)239-4671 or by email at swgp@tceq.texas.gov.

f) Common Plan of Development
Construction activities that disturb less than five acres do not require submission of an NOI unless they are part of a common plan of development or for sale where the area disturbed is five or more acres. Therefore, the estimated area of land disturbed should not be less than five, unless the project is part of a larger common plan that disturbs five or more acres. Disturbed means any clearing, grading, excavating, or other similar activities.

For more information on "What is a common plan of development?" go to: www.tceq.texas.gov/permitting/stormwater/common_plan_of_development_steps.html

For further information, go to the TCEQ stormwater construction webpage at: www.tceq.texas.gov/goto/construction and search for "Additional Guidance and Quick Links". If you have any further questions about this item, please call the stormwater technical staff at (512)239-4671.

g) Identify the water body(s) receiving stormwater runoff
The stormwater may be discharged directly to a receiving stream or through a MS4 from your site. It eventually reaches a receiving water body such as a local stream or lake, possibly via a drainage ditch. You must provide the name of the water body that receives the discharge from the site (a local stream or lake).

If your site has more than one outfall you need to include the name of the first water body for each outfall, if they are different.

h) Identify the segment number(s) of the classified water body(s)
Identify the classified segment number(s) receiving a discharge directly or indirectly. Go to the following link to find the segment number of the classified water body where stormwater will flow from the site: www.tceq.texas.gov/waterquality/monitoring/viewer.html

You may also find the segment number in TCEQ publication GI-316: www.tceq.texas.gov/publications/gi/gi-316

If the discharge is into an unclassified receiving water and then crosses state lines prior to entering a classified segment, select the appropriate watershed:

- 0100 (Canadian River Basin)
- 0200 (Red River Basin)
- 0300 (Sulfur River Basin)
- 0400 (Cypress Creek Basin)
- 0500 (Sabine River Basin)

Call the Water Quality Assessments section at (512)239-4671 for further assistance.

i) Discharge into MS4
The discharge may initially be into a municipal separate storm sewer system (MS4). The Construction General Permit requires the Operator to provide a copy of the NOI to the MS4 Operator.

j) Identify the MS4 Operator
If the stormwater discharge is into an MS4, provide the name of the entity that operates the MS4 where the stormwater discharges. An MS4 operator is often a city, town, county, or utility district, but possibly can be another form of government. Please note that the Construction General Permit requires the Operator to supply the MS4 with a copy of the NOI submitted to TCEQ. For assistance, you may call the technical staff at (512)239-4671.

k) Surface Water bodies on list of impaired waters
Indicate Yes or No if any surface water bodies receiving discharges from the construction site are on the latest EPA-approved CWA 303(d) List of impaired waters. The EPA-approved CWA

303(d) List of impaired waters in Texas can be found at:
www.tceq.texas.gov/waterquality/assessment/305_303.html

NOTE: Do not use any "draft" documents.

l) Identify the impaired water body(s)
Provide the name(s) of surface water bodies receiving discharges or potential discharges from the construction site that are on the latest EPA-approved CWA 303(d) List of impaired waters. The EPA-approved CWA 303(d) List of impaired waters in Texas can be found at:
www.tceq.texas.gov/waterquality/assessment/305_303.html

NOTE: Do not use any "draft" documents.

m) Discharges to the Edwards Aquifer Recharge Zone
See maps on the TCEQ website to determine if the site is located within the Recharge Zone, Contributing Zone, or Contributing Zone within the Transition Zone of the Edwards Aquifer at:
www.tceq.texas.gov/field/eapp/viewer.html

If the discharge or potential discharge is within the Recharge Zone, Contributing Zone, or Contributing Zone within the Transition Zone of the Edwards Aquifer, a site specific authorization approved by the Executive Director under the Edwards Aquifer Protection Program (30 TAC Chapter 213) is required before construction can begin.

The general permit requires the approved Contributing Zone Plan or Water Pollution Abatement Plan to be included or referenced as a part of the Stormwater Pollution Prevention Plan.

n) Certification regarding Edwards Aquifer Rule (30 TAC Chapter 213)
If the discharge or potential discharge is within the Recharge Zone, Contributing Zone, or Contributing Zone within the Transition Zone of the Edwards Aquifer as defined in 30 TAC Chapter 213, the certification must be answered "Yes" for coverage under the Construction General Permit. The TCEQ approved plan must be readily available for TCEQ staff to review at the time that the NOI is submitted.

For questions regarding the Edwards Aquifer Protection Program, contact the appropriate TCEQ Regional Office. For projects in Hays, Travis and Williamson Counties: Austin Regional Office, 12100 Park 35 Circle, Austin, TX 78753, 512-339-2929. For Projects in Bexar, Comal, Kinney, Medina and Uvalde Counties: TCEQ San Antonio Regional Office, 14250 Judson Rd., San Antonio, TX 78233-4480, 210-490-3096.

5. CERTIFICATIONS

Failure to indicate **Yes** to ALL of the certification items may result in denial of coverage under the general permit.

a) Certification of Understanding the Terms and Conditions of Construction General Permit (TXR150000)
Provisional coverage under the Construction General Permit (TXR150000) begins 7 days after the completed paper NOI is postmarked for delivery to the TCEQ. (Electronic applications submitted through ePermits have immediate provisional coverage). You must obtain a copy and read the Construction General Permit before submitting your application. You may view and print the Construction General Permit for which you are seeking coverage at the TCEQ web site: www.tceq.texas.gov/goto/construction

b) Certification of Legal Name
The full legal name of the applicant as authorized to do business in Texas is required. The name must be provided exactly as filed with the Texas Secretary of State (SOS), or on other legal documents forming the entity, that is filed in the county where doing business. You may contact the SOS at (512)463 5555, for more information related to filing in Texas.

c) Understanding of Notice of Termination
A permittee shall terminate coverage under this Construction General Permit through the submittal of a NOT when the operator of the facility changes, final stabilization has been reached, the discharge becomes authorized under an individual permit, or the construction activity never began at this site.

d) Certification of Stormwater Pollution Prevention Plan
The SWP3 identifies the areas and activities that could produce contaminated runoff at your site and then tells how you will ensure that this contamination is mitigated. For example, in describing your mitigation measures, your site's plan might identify the devices that collect and filter stormwater, tell how those devices are to be maintained, and tell how frequently that maintenance is to be carried out. You must develop this plan in accordance with the TCEQ general permit requirements. This plan must be developed and implemented before you complete this NOI. The SWP3 must be available for a TCEQ investigator to review on request.

Operator Certification:
The certification must bear an original signature of a person meeting the signatory requirements specified under 30 Texas Administrative Code (TAC) §305.44.

IF YOU ARE A CORPORATION:
The regulation that controls who may sign an NOI or similar form is 30 Texas Administrative Code §305.44(a)(1) (see below). According to this code provision, any corporate representative may sign an NOI or similar form so long as the authority to sign such a document has been delegated to that person in accordance with corporate procedures. By signing the NOI or similar form, you are certifying that such authority has been delegated to you. The TCEQ may request documentation evidencing such authority.

IF YOU ARE A MUNICIPALITY OR OTHER GOVERNMENT ENTITY:
The regulation that controls who may sign an NOI or similar form is 30 Texas Administrative Code §305.44(a)(3) (see below). According to this code provision, only a ranking elected official or principal executive officer may sign an NOI or similar form. Persons such as the City Mayor or County Commissioner will be considered ranking elected officials. In order to identify the principal executive officer of your government entity, it may be beneficial to consult your city charter, county or city ordinances, or the Texas statute(s) under which your government entity was formed. An NOI or similar document that is signed by a government official who is not a ranking elected official or principal executive officer does not conform to §305.44(a)(3). The signatory requirement may not be delegated to a government representative other than those identified in the regulation. By signing the NOI or similar form, you are certifying that you are either a ranking elected official or principal executive officer as required by the administrative code. Documentation demonstrating your position as a ranking elected official or principal executive officer may be requested by the TCEQ.

If you have any questions or need additional information concerning the signatory requirements discussed above, please contact the Texas Commission on Environmental Quality's Environmental Law Division at (512)239-0600.

30 Texas Administrative Code

§305.44. Signatories to Applications

(a) All applications shall be signed as follows.

(1) For a corporation, the application shall be signed by a responsible corporate officer. For purposes of this paragraph, a responsible corporate officer means a president, secretary, treasurer, or vice-president of the corporation in charge of a principal business function, or any other person who performs similar policy or decision-making functions for the corporation; or the manager of one or more manufacturing, production, or operating facilities employing more than 250 persons or having gross annual sales or expenditures exceeding $25 million (in second-quarter 1980 dollars), if authority to sign documents has been assigned or delegated to the manager in accordance with corporate procedures. Corporate procedures governing authority to sign permit or post-closure order applications may provide for assignment or delegation to applicable corporate positions rather than to specific individuals.

(2) For a partnership or sole proprietorship, the application shall be signed by a general partner or the proprietor, respectively.

(3) For a municipality, state, federal, or other public agency, the application shall be signed by either a principal executive officer or a ranking elected official. For purposes of this paragraph, a principal executive officer of a federal agency includes the chief executive officer of the agency, or a senior executive officer having responsibility for the overall operations of a principal geographic unit of the agency (e.g., regional administrator of the EPA).

TCEQ Office Use Only
Permit No.:
RN:
CN:
Region:

RESET FORM

Notice of Change to an Authorization for Stormwater Discharges Associated With Construction Activity under TPDES General Permit TXR150000

IMPORTANT – Please read the following information and INSTRUCTIONS before filling out this form.

ePERMITS: Sign up now for online NOC: https://www3.tceq.texas.gov/steers/index.cfm

This form will be returned for any of the following reasons:

1) The permit number is not provided, is invalid, or is no longer active,
2) Wet ink signature of person meeting signatory requirements is not provided,
3) The current permittee is not the applicant, and;
4) A requested change in operator name is not a legal name change.

This form cannot be used for a change in operator. Refer to your general permit for information.

What is the permit number of the authorization to be changed?

TXR15_____ or TXRCW_____

1) APPLICANT INFORMATION

a) What is the full Legal Name of the current operator as on the authorization?

_____

b) What is the Customer Number (CN) assigned to this operator? You may search for your CN at: http://www12.tceq.texas.gov/crpub/index.cfm?fuseaction=cust.CustSearch

CN_____

c) What is the name and title of the person signing the application? (The person must be an executive official meeting signatory requirements in TAC 305.44(a).)

Prefix (Mr. Ms. Miss):_____
First/Last Name: _____ Suffix: _____
Title: _____Credential: _____

d) What is the Regulated Entity Reference Number (RN) assigned to this site?

RN_____

2) APPLICATION CONTACT

If TCEQ needs additional information regarding this application, who should be contacted?

Prefix (Mr. Ms. Miss):_____
First/Last Name: _____Suffix:_____
Title:_____ Credential:_____
Organization Name:_____
Phone Number:_____ Extension:_____ Fax Number:_____
E-mail Address:_____
Mailing Address:_____
Internal Routing (Mail Code, Etc.):_____
City:_____ State:_____ZIP Code:_____
Mailing Information if outside USA:
Territory: _____Country Code:_____ Postal Code: _____

3) REQUESTED CHANGE TO PERMITTED INFORMATION

What information has changed or needs to be corrected? Check one or more of the following options and enter the new information below.

☐ Operator legal name change with Texas Secretary of State (TX SOS).
Fill out sections a) and b) as applicable.
Note: Permits are not transferable. If a change in entity has occurred, this NOC will not be processed.

☐ Address and contact information for the operator. Fill out section b).

☐ Site Information (Regulated Entity). Fill out section c).
Note: Permits under a general permit are site specific. If a change in site location has occurred, this NOC will not be processed.

☐ General characteristics relating to the regulated activity. Fill out section d).

a) Operator Legal Name Change

i. What is the NEW active Legal Name with TX SOS or on other legal document?
New Legal Name: _____

ii. What is the TX SOS Filing Number for us to confirm this official name change?
This is only applicable to Limited Partnerships or Corporations.
TX SOS Filing number: _____

b) Address and Contact Information for Operator
Verify mailing addresses with USPS: http://zip4.usps.com/zip4/welcome.jsp.

Prefix (Mr. Ms. Miss):_____
First/Last Name: _____Suffix:_____
Title:_____Credential:_____
Organization Name:_____

Phone Number:_____ Extension:_____ Fax Number:_____
E-mail Address:_____
Mailing Address:_____
Internal Routing (Mail Code, Etc.):_____
City:_____ State:_____ZIP Code:_____
Mailing Information if outside USA:
Territory: _____Country Code:_____ Postal Code: _____

c) Regulated Entity (Site) Information Correction

i. Is this a change to the location of the permitted activity?
☐ Yes This NOC will not be processed since the authorizations are site specific.
☐ No Continue with NOC form.

ii. Corrected Name of Project or Site:

_____

iii. Updated Physical Address (new 911 address):
Street Number:_____Street Name:_____
City:_____ State: Texas ZIP Code:_____

iv. Corrected location access description, if no physical address (street number/street name):

v. Corrected Latitude:_____ N

vi. Corrected Longitude:_____W

vii. Corrected County (Counties if >1):_____

d) Change in General Characteristics Provided on Original Form
Identify the specific change and provide the updates information. If an attachment is needed, please reference it below.

4) OPERATOR CERTIFICATION

I, _____ _____
Typed or printed name *Title*

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

I further certify that I am authorized under 30 Texas Administrative Code 305.44 to sign and submit this document, and can provide documentation in proof of such authorization upon request.

Signature:_____Date:_____
(Use blue ink)

Notice of Change (NOC) for Authorizations for Stormwater Discharges Associated with Construction Activity under TPDES General Permit (TXR150000)

General Information and Instructions

GENERAL INFORMATION

Where to Send the NOC:

BY REGULAR U.S. MAIL
Texas Commission on Environmental Quality
Stormwater Processing Center (MC228)
P.O. Box 13087
Austin, Texas 78711-3087

BY OVERNIGHT/EXPRESS MAIL
Texas Commission on Environmental Quality
Stormwater Processing Center (MC228)
12100 Park 35 Circle
Austin, TX 78753

TCEQ Contact list:

Application – status and form questions:	*512/239-3700, swpermit@tceq.texas.gov*
Technical questions:	*512/239-4671, swgp@tceq.texas.gov*
Environmental Law Division:	*512/239-0600*
Records Management - obtain copies of forms:	*512/239-0900*
Reports from databases (as available):	*512/239-DATA (3282)*
Cashier's office:	*512/239-0357 or 512/239-0187*

NOC Process:

1. Administrative Review: The form will be reviewed to ensure the request is from the permittee (operator) on the authorization, the permit is active and initial coverage was acknowledged. Each item on the form will be reviewed for a complete response. In addition, the operator's legal name change must be verified with Texas Secretary of State (if applicable). The address(s) on the form must be verified with the US Postal Service (USPS) as an address receiving regular mail delivery. Never give an overnight/express mailing address.
If an item is incomplete or not verifiable, the operator may be notified by letter, phone call or email. In some instances as noted at the beginning of the form, the request may simply be returned.

2. NOC Confirmation: An updated Acknowledgment Certificate will be mailed to the operator only if the NOC is to change information provided on the acknowledgment certificate. The original coverage effective date will not change.

General Permit (Your Permit) and Forms

You may view and print your general permit on the TCEQ web site http://www.tceq.texas.gov. Search using key word TXR150000. General Permit Forms (NOI, Waiver, NOT, and NOC) and instructions are available on the TCEQ web site http://www.tceq.texas.gov.

Change in Operator

An authorization under the general permit is not transferable. If the operator of the regulated entity changes, the present permittee must submit a NOT and the new operator must submit a NOI. The NOI must be submitted not later than 10 days prior to the change in Operator status. Note that the NOT is effective on the postmarked date. It may be necessary to not terminate the existing permit until coverage by the new entity is confirmed.

TCEQ Central Registry Core Data Form

The Core Data Form has been incorporated into this form. Do not send a Core Data Form to TCEQ. You can find the information on the Central Registry web site at http://www12.tceq.texas.gov/crpub/index.cfm.

You can search by the Regulated Entity (RN), Customer Number (CN) or Name (Permittee), or by your permit number under the search field labeled "Additional ID".

The Customer (Permittee) is responsible for providing consistent information to the TCEQ, and for updating all CN and RN data for all associated authorizations as changes occur. For General Permits, a Notice of Change form must be submitted to the program area for approval to update the CN and RN data in central registry.

INSTRUCTIONS FOR FILLING OUT THE NOC FORM

1) APPLICANT INFORMATION

a) Legal Name

Provide the current legal name of the permittee, as on the permit.

b) Customer Number (CN)

TCEQ's Central Registry will assign each customer a number that begins with CN, followed by nine digits. You may search for your CN at: http://www12.tceq.texas.gov/crpub/index.cfm?fuseaction=cust.CustSearch.

If the name(s) provided do not match the current permittee name(s), this form will be returned. It is the responsibility of the permittee(s) to comply with the general permit.

Note: If a change is being made to the CN and the CN has other TCEQ authorization types, it is the entity's responsibility to update those authorizations at the same time. If an authorization has been cancelled or terminated, the name cannot be changed on the permit. Because of this, a new CN may be issued for the new name.

c) Person Signing this Application

Provide the name and title of the person signing the application. The person must be an executive official meeting signatory requirements in TAC §305.44.

d) Regulated Entity Reference Number (RN)

This is a number issued by TCEQ's Central Registry to sites (a location where a regulated activity occurs) regulated by TCEQ. This is not a permit number, registration number, or license number. Search for your RN: http://www12.tceq.texas.gov/crpub/index.cfm?fuseaction=regent.RNSearch.

If the site has changed or the information provided indicates a new location, this form will be returned. It is the responsibility of the permittee to comply with the general permit.

2) APPLICATION CONTACT

Provide the name, title and contact information of the person that TCEQ can contact for additional information regarding this application.

3) REQUESTED CHANGE TO PERMITTED INFORMATION

Check one or more of the available options indicating the information in the form that is to be updated. Provide the updated information in 3 a) for Legal Name Change, 3 b) for Address and Contact Information Change, 3 c) for Regulated Entity Site Information Change, or 3 d) for General Characteristics Change, as applicable.

a) Legal Name Change

Provide the new legal name. If the entity is a Limited Partnership or Corporation, the name change must be verifiable with Texas Secretary of State. The TX SOS filing number must be provided to verify only a name change occurred. You may contact the SOS at (512)463 5555, for more information related to filing in Texas. If filed in the county where doing business, provide a copy of the legal documents showing the legal name change.

Legal name changes of a Corporation and Limited Partnership will be verified with Texas Secretary of State. If the entity is filed as a new entity with a new filing number, then the change cannot be made through a NOC. The permits are not transferable. If the operator changes, the old entity must terminate their permit and the new entity must submit a form for a new permit.

b) Address and Contact Information Change

Indicate the type of address and contact information for the operator that has changed from the original NOI or last NOC submitted to TCEQ.

Verify mailing addresses with USPS http://zip4.usps.com/zip4/welcome.jsp for regular mail delivery (not overnight express mail). If you find that the address is not verifiable please indicate the address is used by the USPS for regular mail delivery. Failure to provide a valid mailing address will delay or prohibit us from updating the permit.

Please note that address updates relating to a general permit authorization can ONLY be made through a Notice of Change. Address changes submitted through any other form cannot be processed.

c) Regulated Entity Site Information Change

The NOC form is only for use to update or correct information submitted on the original application or last NOC for the authorization. The authorization under a general permit is site specific. If this change is related to a new location, a Notice of Change will not be processed.

Provide the updated site name, updated site addresses, corrected latitude and longitude, and/or corrected county, as applicable to your NOC request. A new physical address for an existing location is usually the result of a newly assigned 911 address for emergencies.

If providing a corrected latitude and longitude, enter the latitude and longitude of the site in degrees, minutes, and seconds or decimal form. For help obtaining the latitude and longitude, go to http://www.tceq.texas.gov/gis/sqmaview.html
or http://nationalmap.gov/ustopo/.

d) Change in General Characteristics Provided on Original Form

Describe any other change that is not addressed through any question in this section of the application.

4) OPERATOR CERTIFICATION

The certification must bear an original signature of a person meeting the signatory requirements specified under 30 Texas Administrative Code (TAC) §305.44.

IF YOU ARE A CORPORATION:
The regulation that controls who may sign an NOI or similar form is 30 Texas Administrative Code §305.44(a) (see below). According to this code provision, any corporate representative may sign an NOI or similar form so long as the authority to sign such a document has been delegated to that person in accordance with corporate procedures. By signing the NOI or similar form, you are certifying that such authority has been delegated to you. The TCEQ may request documentation evidencing such authority.

IF YOU ARE A MUNICIPALITY OR OTHER GOVERNMENT ENTITY:
The regulation that controls who may sign an NOI or similar form is 30 Texas Administrative Code §305.44(a)(see below). According to this code provision, only a ranking elected official or principal executive officer may sign an NOI or similar form. Persons such as the City Mayor or County Commissioner will be considered ranking elected officials. In order to identify the principal executive officer of your government entity, it may be beneficial to consult your city charter, county or city ordinances, or the Texas statute(s) under which your government entity was formed. An NOI or similar document that is signed by a government official who is not a ranking elected official or principal executive officer does not conform to §305.44(a)(3). The signatory requirement may not be delegated to a government representative other than those identified in the regulation. By signing the NOI or similar form, you are certifying that you are either a ranking elected official or principal executive officer as required by the administrative code. Documentation demonstrating your position as a ranking elected official or principal executive officer may be requested by the TCEQ.

If you have any questions or need additional information concerning the signatory requirements discussed above, please contact the Texas Commission on Environmental Quality's Environmental Law Division at 512/239-0600.

30 Texas Administrative Code
§305.44. Signatories to Applications

(a) All applications shall be signed as follows.

(1) For a corporation, the application shall be signed by a responsible corporate officer. For purposes of this paragraph, a responsible corporate officer means a president, secretary, treasurer, or vice-president of the corporation in charge of a principal business function, or any other person who performs similar policy or decision-making functions for the corporation; or the manager of one or more manufacturing, production, or operating facilities employing more than 250 persons or having gross annual sales or expenditures exceeding $25 million (in second-quarter 1980 dollars), if authority to sign documents has been assigned or delegated to the manager in accordance with corporate procedures. Corporate procedures governing authority to sign permit or post-closure order applications may provide for assignment or delegation to applicable corporate positions rather than to specific individuals.

(2) For a partnership or sole proprietorship, the application shall be signed by a general partner or the proprietor, respectively.

(3) For a municipality, state, federal, or other public agency, the application shall be signed by either a principal executive officer or a ranking elected official. For purposes of this paragraph, a principal executive officer of a federal agency includes the chief executive officer of the agency, or a senior executive officer having responsibility for the overall operations of a principal geographic unit of the agency (e.g., regional administrator of the EPA).

TCEQ Office Use Only
Permit No:
CN:
RN:
Region:

Notice of Termination (NOT) for Authorizations under TPDES General Permit TXR150000

IMPORTANT INFORMATION:

Please read and use the General Information and Instructions prior to filling out each question in the form.

Effective September 1, 2018, this paper form must be submitted to TCEQ with a completed electronic reporting waiver form (TCEQ-20754).

ePermits: This form is available on our online permitting system.
Sign up for online permitting at: https://www3.tceq.texas.gov/steers/

What is the permit number to be terminated?

TXR15 TXRCW

Section 1. OPERATOR (Permittee)

a) What is the Customer Number (CN) issued to this entity?

CN

b) What is the Legal Name of the current permittee?

c) Provide the contact information for the Operator (Responsible Authority).

Prefix (Mr. Ms. or Miss):

First and Last Name: Suffix:

Title: Credentials:

Phone Number: Fax Number:

Email:

Mailing Address:

City, State, and Zip Code:

Country Mailing Information, if outside USA:

Section 2. APPLICATION CONTACT

This is the person TCEQ will contact if additional information is needed regarding this application.

Is the application contact the same as the permittee identified above?

☐ Yes, go to Section 3.

☐ No, complete section below

Prefix (Mr. Ms. or Miss):

First and Last Name: Suffix:

Title: Credentials:

Phone Number: Fax Number:

Email:

Mailing Address:

City, State, and Zip Code:

Country Mailing Information, if outside USA:

Section 3. REGULATED ENTITY (RE) INFORMATION ON PROJECT OR SITE

a) TCEQ issued RE Reference Number (RN): RN

b) Name of project or site as known by the local community:

c) County, or counties if more than 1:

d) Latitude: Longitude:

e) Site Address/Location:

If the site has a physical address such as 12100 Park 35 Circle, Austin, TX 78753, complete Section 3A.

If the site does not have a physical address, provide a location description in Section 3B. Example: located on the north side of FM 123, 2 miles west of the intersection of FM 123 and Highway 1.

Section 3A: Physical Address of Project or Site:

Street Number and Name:

City, State, and Zip Code:

Section 3B: Site Location Description:

Location description:

City where the site is located or, if not in a city, what is the nearest city:

Zip Code where the site is located:

Section 4. REASON FOR TERMINATION

Check the reason for termination:

☐ Final stabilization has been achieved on all portions of the site that are the responsibility of the Operator and all silt fences and other temporary erosion controls have been removed, or scheduled for removal as defined in the SWP3.

☐ Another permitted Operator has assumed control over all areas of the site that have not been finally stabilized, and temporary erosion controls that have been identified in the SWP3 have been transferred to the new Operator.

☐ The discharge is now authorized under an alternate TPDES permit.

☐ The activity never began at this site that is regulated under the general permit.

Section 5. CERTIFICATION

Signatory Name:

Signatory Title:

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

I further certify that I am authorized under 30 Texas Administrative Code §305.44 to sign and submit this document, and can provide documentation in proof of such authorization upon request.

Signature (use blue ink): _____Date: _____

Instructions for Notice of Termination (NOT) for Authorizations under TPDES General Permit TXR150000

GENERAL INFORMATION

Where to Send the Notice of Termination (NOT):

BY REGULAR U.S. MAIL:
Texas Commission on Environmental Quality
Stormwater Processing Center (MC-228)
P.O. Box 13087
Austin, Texas 78711-3087

BY OVERNIGHT/EXPRESS MAIL:
Texas Commission on Environmental Quality
Stormwater Processing Center (MC-228)
12100 Park 35 Circle
Austin, TX 78753

TCEQ Contact List:

Application status and form questions:	512-239-3700, swpermit@tceq.texas.gov
Technical questions:	512-239-4671, swgp@tceq.texas.gov
Environmental Law Division:	512-239-0600
Records Management - obtain copies of forms:	512-239-0900
Reports from databases (as available):	512-239-DATA (3282)
Cashier's office:	512-239-0357 or 512-239-0187

Notice of Termination Process:

A Notice of Termination is **effective on the date postmarked for delivery to TCEQ.**

When your NOT is received by the program, the form will be processed as follows:

1) Administrative Review: The form will be reviewed to confirm the following:
   - the permit number is provided;
   - the permit is active and has been approved;
   - the entity terminating the permit is the current permittee;
   - the site information matches the original permit record; and
   - the form has the required original signature with title and date.

2) Notice of Deficiency: If an item is incomplete or not verifiable as indicated above, a phone call will be made to the applicant to clear the deficiency. A letter will not be sent to the permittee if unable to process the form.

3) Confirmation of Termination: A Notice of Termination Confirmation letter will be mailed to the operator.

Change in Operator:

An authorization under the general permit is not transferable. If the operator of the regulated entity changes, the present permittee must submit a Notice of Termination and the new operator must submit a Notice of Intent. The NOT and NOI must be submitted not later than 10 days prior to the change in Operator status.

INSTRUCTIONS FOR FILLING OUT THE FORM

The majority of permit information related to the current operator and regulated entity are available at the following website: http://www2.tceq.texas.gov/wq_dpa/index.cfm.

Section 1. Operator (Current Permittee):

a) Customer Number (CN)
TCEQ's Central Registry assigns each customer a number that begins with CN, followed by nine digits. This is not a permit number, registration number, or license number. The Customer Number, for the current permittee, is available at the following website: http://www2.tceq.texas.gov/wq_dpa/index.cfm.

b) Legal Name of Operator
The operator must be the same entity as previously submitted on the original Notice of Intent for the permit number provided. The current operator name, as provided on the current authorization, is available at the following website: http://www2.tceq.texas.gov/wq_dpa/index.cfm.

c) Contact Information for the Operator (Responsible Authority)
Provide information for person signing the NOT application in the Certification section. This person is also referred to as the Responsible Authority.

Provide a complete mailing address for receiving mail from the TCEQ. Update the address if different than previously submitted for the Notice of Intent or Notice of Change. The mailing address must be recognized by the US Postal Service. You may verify the address on the following website: https://tools.usps.com/go/ZipLookupAction!input.action.

The phone number should provide contact to the operator.

The fax number and e-mail address are optional and should correspond to the operator.

Section 2. Application Contact:

Provide the name, title and contact information of the person that TCEQ can contact for additional information regarding this application.

Section 3. Regulated Entity (RE) Information on Project or Site:

a) Regulated Entity Reference Number (RN)
A number issued by TCEQ's Central Registry to sites where an activity regulated by TCEQ. This is not a permit number, registration number, or license number. The Regulated Entity Reference Number is available at the following website: http://www2.tceq.texas.gov/wq_dpa/index.cfm.

b) Name of the Project or Site
Provide the name of the site as known by the public in the area where the site is located.

c) County
Identify the county or counties in which the regulated entity is located.

d) Latitude and Longitude
Enter the latitude and longitude of the site in degrees, minutes, and seconds or decimal form. The latitude and longitude as provided on the current authorization is available at the following website: http://www2.tceq.texas.gov/wq_dpa/index.cfm.

e) Site/Project (RE) Physical Address/Location Information
The physical address/location information, as provided on the current authorization, is available at the following website: http://www2.tceq.texas.gov/wq_dpa/index.cfm.

Section 3A. If a site has an address that includes a street number and street name, enter the complete address for the site. If the physical address is not recognized as a USPS delivery address, you may need to validate the address with your local police (911 service) or through an online map site used to locate the site. Please confirm this to be a complete and valid address. Do not use a rural route or post office box for a site location.

Section 3B. If a site does not have an address that includes a street number and street name, provide a complete written location description. For example: "The site is located on the north side of FM 123, 2 miles west of the intersection of FM 123 and Highway 1."

Provide the city (or nearest city) and Zip Code of the facility location.

Section 4. Reason for Termination:

The Notice of Termination form is only for use to terminate the authorization (permit). The Permittee must indicate the specific reason for terminating by checking one of the options. If the reason is not listed then provide an attachment that explains the reason for termination.

Please read your general permit carefully to determine when to terminate your permit. Permits will not be reactivated after submitting a termination form. The termination is effective on the date postmarked for delivery to TCEQ.

Section 5. Certification:

The certification must bear an original signature of a person meeting the signatory requirements specified under 30 Texas Administrative Code §305.44.

IF YOU ARE A CORPORATION:
The regulation that controls who may sign an application form is 30 Texas Administrative Code §305.44(a), which is provided below. According to this code provision, any corporate representative may sign an NOI or similar form so long as the authority to sign such a document has been delegated to that person in accordance with corporate procedures. By signing the NOI or similar form, you are certifying that such authority has been delegated to you. The TCEQ may request documentation evidencing such authority.

IF YOU ARE A MUNICIPALITY OR OTHER GOVERNMENT ENTITY:
The regulation that controls who may sign an NOI or similar form is 30 Texas Administrative Code §305.44(a), which is provided below. According to this code provision, only a ranking elected official or principal executive officer may sign an NOI or similar form. Persons such as the City Mayor or County Commissioner will be considered ranking elected officials. In order to identify the principal executive officer of your government entity, it may be beneficial to consult your city charter, county or city ordinances, or the Texas statutes under which your government entity was formed. An NOI or similar document that is signed by a government official who is not a ranking elected official or principal executive officer does not conform to §305.44(a) (3). The signatory requirement may not be delegated to a government representative other than those identified in the regulation. By signing the NOI or similar form, you are certifying that you are either a ranking elected official or principal executive officer as required by the administrative code. Documentation demonstrating your position as a ranking elected official or principal executive officer may be requested by the TCEQ.

If you have any questions or need additional information concerning the signatory requirements discussed above, please contact the Texas Commission on Environmental Quality's Environmental Law Division at 512-239-0600.

30 Texas Administrative Code §305.44. Signatories to Applications

(a) All applications shall be signed as follows.

(1) For a corporation, the application shall be signed by a responsible corporate officer. For purposes of this paragraph, a responsible corporate officer means a president, secretary, treasurer, or vice-president of the corporation in charge of a principal business function, or any other person who performs similar policy or decision-making functions for the corporation; or the manager of one or more manufacturing, production, or operating facilities employing more than 250 persons or having gross annual sales or expenditures exceeding $25 million (in second-quarter 1980 dollars), if authority to sign documents has been assigned or delegated to the manager in accordance with corporate procedures. Corporate procedures governing authority to sign permit or post-closure order applications may provide for assignment or delegation to applicable corporate positions rather than to specific individuals.

(2) For a partnership or sole proprietorship, the application shall be signed by a general partner or the proprietor, respectively.

(3) For a municipality, state, federal, or other public agency, the application shall be signed by either a principal executive officer or a ranking elected official. For purposes of this paragraph, a principal executive officer of a federal agency includes the chief executive officer of the agency, or a senior executive officer having responsibility for the overall operations of a principal geographic unit of the agency (e.g., regional administrator of the EPA).

SMALL CONSTRUCTION SITE NOTICE

FOR THE
Texas Commission on Environmental Quality (TCEQ)
Storm Water Program

TPDES GENERAL PERMIT TXR150000

The following information is posted in compliance with **Part II.E.2.** of the TCEQ General Permit Number TXR150000 for discharges of storm water runoff from small construction sites. Additional information regarding the TCEQ storm water permit program may be found on the internet at:

http://www.tceq.state.tx.us/nav/permits/wq_construction.html

Operator Name:	
Contact Name and Phone Number:	
Project Description: *Physical address or description of the site's location, estimated start date and projected end date, or date that disturbed soils will be stabilized*	
Location of Storm Water Pollution Prevention Plan:	

For Small Construction Activities Authorized Under Part II.E.2. (Obtaining Authorization to Discharge) the following certification must be completed:

I _____ (Typed or Printed Name Person Completing This Certification) certify under penalty of law that I have read and understand the eligibility requirements for claiming an authorization under Part II.E.2. of TPDES General Permit TXR150000 and agree to comply with the terms of this permit. A storm water pollution prevention plan has been developed and will be implemented prior to construction, according to permit requirements. A copy of this signed notice is supplied to the operator of the MS4 if discharges enter an MS4. I am aware there are significant penalties for providing false information or for conducting unauthorized discharges, including the possibility of fine and imprisonment for knowing violations.

Signature and Title_____ Date _____

_____*Date Notice Removed*
____*MS4 operator notified per Part II.F.3.*

Low Rainfall Erosivity Waiver for Stormwater Discharges Associated with Construction Activity under TPDES General Permit (TXR150000)

TCEQ Office Use Only
Permit No.:_____
RN:_____
CN:_____

IMPORTANT:
•Use the attached **INSTRUCTIONS** when completing this form.
•After completing this form, use the attached **CUSTOMER CHECKLIST** to make certain all items are complete and accurate.
•Missing, illegible, or inaccurate items may delay final acknowledgment or coverage under the general permit.

A. OPERATOR (applicant)

1. If the applicant is currently a customer with TCEQ, what is the Customer Number (CN) issued to this entity? **CN**
2. What is the full Legal Name of the applicant?

(The legal name must be spelled exactly as filed with the Texas Secretary of State, County, or in the legal document forming the entity.)

3. What is the applicant's mailing address as recognized by the **US Postal Service**?

Address:	Suite No./Bldg. No./Mail Code:	
City:	State:	ZIP Code:
Country Mailing Information (if outside USA).	Country Code:	Postal Code:

4. Phone No.: ( )	Extension:
5. Fax No.: ( )	E-mail Address:

6. Indicate the type of Customer:
   Individual Sole Proprietorship-D.B.A. Limited Partnership
   Corporation Federal Government General Partnership
   State Government County Government City Government
   Other:
7. Independent Operator: Yes No (If governmental entity, subsidiary, or part of a larger corporation, check "No".)
8. Number of Employees: 0-20; 21-100; 101-250; 251-500; or 501 or higher
9. Customer Business Tax and Filing Numbers *(This item is not applicable to Individuals, Government, GP or Sole Proprietor.)*
   REQUIRED for Corporations and Limited Partnerships

State Franchise Tax ID Number:	Federal Tax ID:
TX SOS Charter (filing) Number:	DUNS Number (if known):

B. APPLICATION CONTACT

If TCEQ needs additional information regarding this application, who should be contacted?

1. Name:	Title:	Company:
2. Phone No.: ( )	Extension:	
3. Fax No.: ( )	E-mail Address:	

C. REGULATED ENTITY (RE) INFORMATION ON PROJECT OR SITE

1. TCEQ Issued RE Reference Number (RN) (if available): **RN**
2. Name of Project or Site (the name as known by the community where this facility/project is located):

(example: phase and name of subdivision or name of project that's unique to the site)

3. Physical Address of Project or Site: (enter in spaces below)

Street Number:	Street Name:	
City:	ZIP Code:	County (Counties if >1):

4. If no physical address (Street Number & Street Name), provide a written location access description to the site:
   (Ex.: phase 1 of Woodland subdivision located 2 miles west from intersection of Hwy 290 & IH35 accessible on Hwy 290 South)

5. Latitude: N	Longitude: W

6. What is the primary business of this entity? In your own words, briefly describe the primary business of the Regulated Entity:
   (Do not repeat the SIC and NAICS code)
7. What is the mailing address and contact information for the regulated entity?

Is the RE mailing address the same as the Operator? Yes, same as Operator address No, provide the address

Street Number:	Street Name:	
City:	State:	ZIP Code:

D. GENERAL CHARACTERISTICS

1. I certify that the project/site is **not** located on Indian Country Lands? ☐ Yes ☐ No
If **No**, you must obtain authorization through EPA, Region VI.

2. The Standard Industrial Classification (SIC) code is (see instructions for common codes):

3. What is the Estimated Start Date: What is the Estimated End Date:

4. Does the construction site, based on its location and time frame for completion, have an R Factor < 5? ☐ Yes ☐ No
If **No**, this waiver cannot be obtained.

5. Will the construction site disturb an area of five or more acres, or is the construction site part of a larger common plan of development or sale that would disturb an area of five or more acres? ☐ Yes ☐ No
If **Yes**, this waiver cannot be obtained.

6. Discharge Information

a. What is the name of the first water body to receive the stormwater runoff or potential runoff from the site?

b. What is the segment number(s) of the classified water body(s) that the discharge or potential discharge will eventually reach?

c. Is the discharge into an MS4? ☐ Yes ☐ No
If **Yes**, what is the name of the MS4 Operator?
Note: The general permit requires you to send a copy of the NOI to the MS4 Operator.

7. Is the discharge or potential discharge within the Recharge Zone, Contributing Zone, or Contributing Zone within the Transition Zone of the Edwards Aquifer? ☐ Yes ☐ No
If the answer is **Yes**, please note that a copy of the agency approved Plan required by the Edwards Aquifer Rule (30 TAC Chapter 213) must be included in the Stormwater Pollution Prevention Plan.

E. CERTIFICATION

Check "Yes" to the certifications below. Failure to indicate "Yes" to ALL items may result in denial of coverage under the general permit.

I certify that I have obtained a copy and understand the terms and conditions of the general permit TX150000. ☐ Yes
I certify that the activities at this site qualify for coverage under the general permit TX150000. ☐ Yes

I understand that construction activities at this site shall occur within a time period in which the erosivity factor (R Factor) is less than 5, and if construction activities continue past the end date provided in this form, a new R factor must be calculated based on the initial start date and a new end date. If the R Factor is greater than or equal to 5, all applicable sections of the general permit must be followed. ☐ Yes

I understand that a Notice of Termination (NOT) must be submitted when this authorization is no longer needed. ☐ Yes
I understand that permits active on September 1st of each year will be assessed an Annual Water Quality Fee. ☐ Yes

Operator Certification:

I, _____ _____
Typed or printed name Title

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

I further certify that I am authorized under **30 Texas Administrative Code §305.44** to sign and submit this document, and can provide documentation in proof of such authorization upon request.

Signature:_____ Date:_____
(Use blue ink)

Did you complete everything? Use this checklist to be sure!

Are you ready to mail your form to TCEQ? Go to the General Information Section of the Instructions for mailing addresses.

	Customer GP Waiver Checklist **TXR150000**
√	This checklist is for use by the operator to ensure a complete application. Missing information may result in denial of coverage under the g permit. (See Waiver Process description in the Instructions)
☐	Application Fee was sent to TCEQ's Cashiers's Office and the check information is listed, or the EPAY payment voucher is attached.
	OPERATOR INFORMATION - Confirm each item is complete:
	√
☐	Customer Number (CN) issued by TCEQ Central Registry
☐	Legal Name as filed to do business in Texas (Call TX SOS 512/463-5555)
☐	Operator Mailing Address is complete & verifiable with USPS. www.usps.com
☐	Phone Numbers/E-mail Address
☐	Type of Operator (Entity Type)
☐	Independent Operator
☐	Number of Employees
☐	For Corporations or Limited Partnerships – Tax ID and SOS Filing numbers
☐	Billing Address is complete & verifiable with USPS. www.usps.com
	REGULATED ENTITY (RE) INFORMATION ON PROJECT OR SITE - Confirm each item is complete:
	√
☐	Regulated Entity Reference Number (RN) (if site is already regulated by TCEQ)
☐	Site/Project Name/Regulated Entity
☐	Site/Project (RE) Physical Address Please do not use a rural route or post office box for a site location
☐	Latitude and Longitude www.tceq.texas.gov/gis/drgview.html or http://www.terraserver.com/.
☐	Business description
☐	Site Mailing Address (checked same as operator or complete & verifiable with USPS. www.usps.com)
	GENERAL CHARACTERISTICS - Confirm each item is complete:
	√
☐	Indian Country Lands –the facility is not on Indian Country Lands
☐	Standard Industrial Classification (SIC) code www.osha.gov/oshstats/sicser.html
☐	Estimated Start and End dates
☐	R Factor is <5
☐	Acres disturbed is <5 and is not a part of common plan of development or sale where total acres disturbed in 5 or more acres
☐	Discharge Information (receiving water body, segment no. and MS4 Operator)
	CERTIFICATION
☐	Certification statements have been checked indicating "Yes"
☐	Signature meets 30 Texas Administrative Code (TAC) §305.44 and is original and has been provided for the Operator.

Low Rainfall Erosivity Waiver for Stormwater Discharges Associated with Construction Activity under TPDES General Permit (TXR150000)

General Information and Instructions

GENERAL INFORMATION

Where to Send the WAIVER and other related forms:

BY REGULAR U.S. MAIL
Texas Commission on Environmental Quality
Stormwater Processing Center (MC228)
P.O. Box 13087
Austin, TX 78711-3087

BY OVERNIGHT/EXPRESS MAIL
Texas Commission on Environmental Quality
Stormwater Processing Center (MC228)
12100 Park 35 Circle
Austin, TX 78753

TCEQ Contact list:

Application Processing Questions relating to the status and form requirements:	512/239-3700 or swpermit@tceq.texas.gov
Technical Questions relating to the general permit:	512/239-4671 or swgp@tceq.texas.gov
Environmental Law Division:	512/239-0600
Records Management for obtaining copies of forms submitted to TCEQ:	512/239-0900
Information Services for obtaining reports from program data bases (as available):	512/239-DATA (3282)
Financial Administration's Cashier's office:	512/239-0357 or 512/239-0187

Waiver Process:

When your Waiver is received by the program, the form will be processed as follows:

1. **Administrative Review:** Each item on the form will be reviewed for a complete response. In addition, the operator's legal name must be verified with Texas Secretary of State as valid and active (if applicable). The address(s) on the form must be verified with the US Postal service as an address receiving regular mail delivery. Never give an overnight/express mailing address.

2. **Notice of Deficiency:** If an item is incomplete or not verifiable as indicated above, a notice of deficiency (NOD) will be mailed to the operator. The operator will have 30 days to respond to the NOD. The response will be reviewed for completeness.

3. **Acknowledgment of Coverage:** An Acknowledgment Certificate will be mailed to the operator. This certificate acknowledges coverage under the general permit.
-or-
Denial of Coverage: If the operator fails to respond to the NOD or the response is inadequate, coverage under the general permit may be denied. If coverage is denied, the operator will be notified.

General Permit (Your Permit)
Coverage under the general permit begins on the **Estimated Start Date** and ends on the **Estimated End Date** as entered in the Waiver. You should have a copy of your general permit when submitting your application. You may view and print your permit for which you are seeking coverage, on the TCEQ web site www.tceq.texas.gov

General Permit Forms
The Waiver, Notice of Intent (NOI), Notice of Termination (NOT), and Notice of Change (NOC) with instructions are available in Adobe Acrobat PDF format on the TCEQ web site www.tceq.texas.gov.

Change in Operator
An authorization under the general permit is not transferable. If the operator of the regulated entity changes, the present permittee must submit a Notice of Termination and the new operator must submit a new Waiver form. The forms must be submitted not later than 10 days prior to the change in Operator status.

TCEQ Central Registry Core Data Form
The Core Data Form has been incorporated into this form. **Do not send a core data form to TCEQ.**

After final acknowledgment of coverage under the general permit, the program will assign a Customer Number (CN) and Regulated Entity Number (RN). For Construction Permits, a new RN will be assigned for each Notice of Intent filed with TCEQ, since construction project sites can overlap with other Customers. The RN assigned to your construction project will not be assigned to any other TCEQ authorization.

You can find the information on the Central Registry web site at www12.tceq.texas.gov/crpub/. You can search by the Regulated Entity (RN), Customer Number (CN) or Name (Permittee), or by your permit number under the search field labeled "Additional ID". Capitalize all letters in the permit number.

The Customer (Permittee) is responsible for providing consistent information to the TCEQ, and for updating all CN and RN data for all authorizations as changes occur. For General Permits, a Notice of Change form must be submitted to the program area.

INSTRUCTIONS FOR FILLING OUT THE WAIVER FORM

A. OPERATOR (As defined in the general permit.)

1. TCEQ Issued Customer Number (CN)
TCEQ's Central Registry will assign each customer a number that begins with "CN," followed by nine digits. **This is not a permit number**, registration number, or license number.

- If this customer has not been assigned a Customer Reference Number, leave the space for the Customer Reference Number blank.
- If this customer has already been assigned this number, enter the operator's Customer Reference Number in the space provided.

2. Legal Name
Provide the legal name of the facility operator, as authorized to do business in Texas. The name must be provided exactly as filed with the Texas Secretary of State (SOS), or on other legal documents forming the entity, that is filed in the county where doing business. You may contact the SOS at 512/463-5555, for more information related to filing in Texas. If filed in the county where doing business, provide a copy of the legal documents showing the legal name.

3. Operator Mailing Address
Provide a complete mailing address for receiving mail from the TCEQ. The address must be verifiable with the US Postal Service at www.usps.com., for regular mail delivery (not overnight express mail). If you find that the address is not verifiable using the USPS web search, please indicate the address is used by the USPS for regular mail delivery.

4. Phone Number
This number should correspond to this customer's mailing address given earlier. Enter the area code and phone number here. Leave "Extension" blank if this customer's phone system lacks this feature.

5. Fax Number and E-mail Address
This number and E-mail address should correspond to operator's mailing address provided earlier. (Optional Information)

6. Type of Entity
Check only one box that identifies the type of entity. Use the descriptions below to identify the appropriate entity type:

Individual is a customer who has not established a business, but conducts an activity that needs to be regulated by the TCEQ.

Sole Proprietorship— D.B.A. is a customer that is owned by only one person and has not been incorporated. This business may:

- be under the person's name
- have its own name ("doing business as," or d.b.a.)
- have any number of employees

Partnership is a customer that is established as a partnership as defined by the Texas Secretary of State's Office.

Corporation is the customer meets all of these conditions:

- is a legally incorporated entity under the laws of any state or country
- is recognized as a corporation by the Texas Secretary of State
- has proper operating authority to operate in Texas.

Government- Federal, state, county, or city government (as appropriate)
the customer is either an agency of one of these levels of government or the governmental body itself.

Other is Estate, Trust, etc.
the customer does not fit one of the above descriptions. Enter a short description of the type of customer in the blank provided.

7. Independent Operator
Check "No" if this customer is a subsidiary, part of a larger company, or is a governmental entity. Otherwise, check "Yes."

8. Number of Employees
Check one box to show the number of employees for this customer's entire company, at all locations. This is not necessarily the number of employees at the site named in the NOI.

9. State Franchise Tax ID Number
Corporations and limited liability companies that operate in Texas are issued a franchise tax identification number. If this customer is a corporation or limited liability company, enter this number here.

Federal Tax ID
All businesses, except for some small sole proprietors, individuals, or general partnerships should have a federal taxpayer identification number (TIN). Enter this number here. Use no prefixes, dashes, or hyphens. Sole proprietors, individuals, or general partnerships do not need to provide a federal tax ID.

TX SOS Charter (filing) Number
Corporations and Limited Partnerships required to register with the Texas Secretary of State are issued a charter or filing number. You may obtain further information by calling SOS at 512/463-5555.

DUNS Number
Most businesses have a DUNS (Data Universal Numbering System) number issued by Dun and Bradstreet Corp. If this customer has one, enter it here.

B. Application Contact

Provide the name, title and communication information of the person that TCEQ can contact for additional information regarding this application.

C. REGULATED ENTITY (RE) INFORMATION ON PROJECT OR SITE

1. Regulated Entity Reference Number (RN)

This is a number issued by TCEQ's Central Registry to sites (a location where a regulated activity occurs) regulated by TCEQ. This is not a permit number, registration number, or license number.

- If this Regulated Entity has not been assigned a Regulated Entity Number, leave this space blank.
- If this customer has been assigned this number, enter the operator's Regulated Entity Number.

2. Site/Project Name/Regulated Entity

Provide the name of the site as known by the public in the area where the site is located. The name you provide on this application will be used in the TCEQ Central Registry as the Regulated Entity. A new regulated entity number is assigned by Central Registry for each new construction Notice of Intent since the area under control of the operator may not be contiguous within a project site.

3. Site/Project (RE) Physical Address

Enter the complete address of where the site is located. This address must be validated through US Postal Service or your local police (911 service) as a valid address. Please confirm this to be a complete and valid address. In some rural areas, new addresses are being assigned to replace rural route addresses. Please do not use a rural route or post office box for a site location.

If a site does not have an actual physical address that includes a street number and street name, enter NO ADDRESS for the street name. Then provide a complete written location access description. For example: "The site is located 2 miles west from intersection of Hwy 290 & IH35, located on the southwest corner of the Hwy 290 South bound lane." This includes authorizations for construction projects such as highways and subdivision.

Provide the city and ZIP code of the area where the facility is located. This is information is required to complete the processing of your form.

4. Latitude and Longitude

Enter the latitude and longitude of the site in either degrees, minutes, and seconds or decimal form. For help obtaining the latitude and longitude, go to: www.tceq.texas.gov/gis/drgview.html or http://www.terraserver.com/.

5. Description of Activity Regulated

In your own words, briefly describe the primary business being conducted at the site. (A description specific to what you are doing that requires this authorization - Do not repeat the SIC Code(s).)

SITE MAILING ADDRESS

Provide a complete mailing address to be used by TCEQ for receiving mail at the site. In most cases, the address is the same as the operator. If so, simply place a check mark in the box. If you provide a different address, please verify the address with USPS as instructed above for the operator address.

D. GENERAL CHARACTERISTICS

1. **Indian Country Lands**

If your site is located on Indian Country Lands, the TCEQ does not have authority to process your application. You must obtain authorization through EPA, Region VI, Dallas. Do not submit this form to TCEQ.

2. **Standard Industrial Classification (SIC) code**

Provide the SIC code that best describes the construction activity being conducted at the site.
Common SIC Codes related to construction activities include: 1521 Construction of Single Family Homes; 1522 Construction of Residential Bldgs. Other than Single Family Homes; 1541 Construction of Industrial Bldgs. and Warehouses; 1542 Construction of Non-residential Bldgs. other than Industrial Bldgs. and Warehouses; 1611 Highway & Street Construction, except Highway Construction; 1622 Bridge, Tunnel, & Elevated Highway Construction; 1623 Water, Sewer, Pipeline & Communications, and Power Line Construction. For help with SIC codes, go to: www.osha.gov/oshstats/sicser.html

3. **Estimated Start and End Date**

Provide the date in which the construction activity will commence and the projected date in which the construction activity will be completed. The dates provided in this waiver must be used to calculate the R Factor for the site.

4. **R Factor <5**

Check Yes if the calculated R Factor for the construction site is less than 5. If the construction site has an R Factor greater than or equal to 5, this waiver is not attainable and authorization to discharge stormwater must be obtained by following the provisions in the Construction General Permit (TXR150000).

5. **Estimated Area of Land Disturbed**

Check Yes if the construction activity disturbs 5 acres or more, or the construction activity is part of a larger common plan of development or sale that would disturb 5 acres or more. Otherwise, check No. Only construction activities that disturb less than 5 acres are eligible for this waiver. If Yes is selected, this waiver is not attainable and authorization to discharge stormwater must be obtained by following the provisions in the Construction General Permit (TXR150000).

"Disturb" means any clearing, grading, excavating, or other similar activities. If you have any questions about this item, please call the stormwater technical staff at (512)239-4671.

6. **Discharge Information**

a. Identify the water body where the stormwater discharge or potential discharge will reach.
b. Identify the classified segment number. Go to the link to find the segment number of the classified water body where wastewater will flow http://www.tceq.texas.gov/waterquality/monitoring/viewer.html.
c. Identify the MS4 Operator name if the stormwater discharge is into an MS4.
For assistance, you may call the technical staff at 512/239-4671.

7. **Edwards Aquifer Rule**
See maps on the TCEQ website to determine if the site is located within the Recharge Zone, Contributing Zone, or Contributing Zone within the Transition Zone of the Edwards Aquifer at http://www.tceq.state.tx.us/compliance/field_ops/eapp/viewer.html.

If the discharge or potential discharge is within the Recharge Zone, Contributing Zone, or Contributing Zone within the Transition Zone of the Edwards Aquifer, a site specific authorization approved by the Executive Director under the Edwards Aquifer Protection Program (30 TAC Chapter 213) is required before construction can begin.

The general permit requires the approved Contributing Zone Plan or Water Pollution Abatement Plan to be included as a part of the Stormwater Pollution Prevention Plan. The certification must be answered "Yes" for coverage under the general permit.

E. CERTIFICATIONS

Failure to indicate "Yes" to ALL of the certification items may result in denial of coverage under the general permit.

The certification must bear an original signature of a person meeting the signatory requirements specified under 30 Texas Administrative Code (TAC) §305.44.

IF YOU ARE A CORPORATION:

The regulation that controls who may sign an NOI or similar form is 30 Texas Administrative Code §305.44(a)(1) (see below). According to this code provision, any corporate representative may sign an NOI or similar form so long as the authority to sign such a document has been delegated to that person in accordance with corporate procedures. By signing the NOI or similar form, you are certifying that such authority has been delegated to you. The TCEQ may request documentation evidencing such authority.

IF YOU ARE A MUNICIPALITY OR OTHER GOVERNMENT ENTITY:

The regulation that controls who may sign an NOI or similar form is 30 Texas Administrative Code §305.44(a)(3) (see below). According to this code provision, only a ranking elected official or principal executive officer may sign an NOI or similar form. Persons such as the City Mayor or County Commissioner will be considered ranking elected officials. In order to identify the principal executive officer of your government entity, it may be beneficial to consult your city charter, county or city ordinances, or the Texas statute(s) under which your government entity was formed. An NOI or similar document that is signed by a government official who is not a ranking elected official or principal executive officer does not conform to §305.44(a)(3). The signatory requirement may not be delegated to a government representative other than those identified in the regulation. By signing the NOI or similar form, you are certifying that you are either a ranking elected official or principal executive officer as required by the administrative code. Documentation demonstrating your position as a ranking elected official or principal executive officer may be requested by the TCEQ.

If you have any questions or need additional information concerning the signatory requirements discussed above, please contact the Texas Commission on Environmental Quality's Environmental Law Division at 512/239-0600.

30 Texas Administrative Code
§305.44. Signatories to Applications.

(a) All applications shall be signed as follows.

(1) For a corporation, the application shall be signed by a responsible corporate officer. For purposes of this paragraph, a responsible corporate officer means a president, secretary, treasurer, or vice-president of the corporation in charge of a principal business function, or any other person who performs similar policy or decision-making functions for the corporation; or the manager of one or more manufacturing, production, or operating facilities employing more than 250 persons or having gross annual sales or expenditures exceeding $25 million (in second-quarter 1980 dollars), if authority to sign documents has been assigned or delegated to the manager in accordance with corporate procedures. Corporate procedures governing authority to sign permit or post-closure order applications may provide for assignment or delegation to applicable corporate positions rather than to specific individuals.

(2) For a partnership or sole proprietorship, the application shall be signed by a general partner or the proprietor, respectively.

(3) For a municipality, state, federal, or other public agency, the application shall be signed by either a principal executive officer or a ranking elected official. For purposes of this paragraph, a principal executive officer of a federal agency includes the chief executive officer of the agency, or a senior executive officer having responsibility for the overall operations of a principal geographic unit of the agency (e.g., regional administrator of the EPA).

APPENDIX I

RECORD OF TEMPORARY/PERMANENT CEASING OF CONSTRUCTION ACTIVITIES

Record of Temporary/Permanent Ceasing of Construction Activities

Project Activity Area	Date Activities Ceased	Temporary* or Permanent	Date Soil Stabilization Implemented	Date Activities Resumed	Initials

*** "Temporarily Ceased" means inactive for less than 21 consecutive days.**

APPENDIX J

DELEGATION OF SIGNATORIES

Executive Director
Texas Commission on Environmental Quality
Storm Water and Pretreatment Team
P.O. Box 13087, MC-148
Austin, TX 78711-3087

Subject: Delegation of Signatories to Reports

Facility/Company/Site Name: _____
TPDES Permit Number: _____

Dear Executive Director:

This letter serves to designate the following people or positions as authorized personnel for signing reports, storm water pollution prevention plans, certifications or other information requested by the Executive Director or required by the general permit, as set forth by 30 TAC §305.128 (see page 2).

Name or Position	
Name or Position	
Name or Position	
Name or Position	

I understand that this authorization does not extend to the signing of a Notice of Intent for obtaining coverage under a storm water general permit.

By signing this authorization, I confirm that I meet the requirements to make such a designation as set forth in 30 TAC §305.44 (see page 2).

Sincerely,

_____ _____ _____
Name Title Date

RELEVANT PROVISIONS

305.128(a) All reports requested by permits and other information requested by the executive director shall be signed by a person described in §305.44(a) of this title (relating to Signatories to Applications) or by a duly authorized representative of that person. A person is a duly authorized representative only if:

(1) the authorization is made in writing by a person described in §305.44(a) of this title (relating to Signatories to Applications);

(2) the authorization specifies either an individual or a position having responsibility for the overall operation of the regulated facility or activity or for environmental matters for the applicant, such as the position of plant manager, operator of a well or well field, environmental manager, or a position of equivalent responsibility. (A duly authorized representative may thus be either a named individual or any individual occupying a named position); and

(3) the written authorization is submitted to the executive director.

(b) If an authorization under this section is no longer accurate because of a change in individuals or position, a new authorization satisfying the requirements of this section must be submitted to the executive director prior to or together with any reports, information, or applications to be signed by an authorized representative.

(c) Any person signing a report required by a permit shall make the certification set forth in §305.44(b) of this title (relating to Signatories to Applications).

305.44(a) All applications shall be signed as follows.

(1) For a corporation, the application shall be signed by a responsible corporate officer. For purposes of this paragraph, a responsible corporate officer means a president, secretary, treasurer, or vice-president of the corporation in charge of a principal business function, or any other person who performs similar policy or decision-making functions for the corporation; or the manager of one or more manufacturing, production, or operating facilities employing more than 250 persons or having gross annual sales or expenditures exceeding $25 million (in second-quarter 1980 dollars), if authority to sign documents has been assigned or delegated to the manager in accordance with corporate procedures. Corporate procedures governing authority to sign permit or post-closure order applications may provide for assignment or delegation to applicable corporate positions rather than to specific individuals.

(2) For a partnership or sole proprietorship, the application shall be signed by a general partner or the proprietor, respectively.

(3) For a municipality, state, federal, or other public agency, the application shall be signed by either a principal executive officer or a ranking elected official. For purposes of this paragraph, a principal executive officer of a federal agency includes the chief executive officer of the agency, or a senior executive officer having responsibility for the overall operations of a principal geographic unit of the agency (e.g., regional administrator of the EPA).

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

APPENDIX K

MATERIAL MANAGEMENT PRACTICES

MATERIAL MANAGEMENT PRACTICES

The following are the material management practices that will be used to reduce risk of spills or other accidental exposure of materials and substances to storm water runoff:

1. Good Housekeeping: The following good housekeeping practices will be followed onsite during the construction project:
   - An effort will be made to store only enough product required to do the job.
   - All materials stored on-site will be stored in a neat, orderly manner in their appropriate containers and, if possible, under a roof or other enclosure.
   - Products will be kept in their original containers with the original manufacturer's label.
   - Substances will not be mixed with one another unless recommended by the manufacturer.
   - Whenever possible, all of a product will be used up before disposing of the container.
   - Manufacturers' recommendations for proper use and disposal will be followed.
   - Designated areas for equipment maintenance and repair (control of oil, grease and fuel spills).
   - Waste receptacles with regular collection for litter and construction debris.
   - Equipment washdown area on-site with appropriate control of wash waters (including concrete truck wash down).
   - Protected storage areas for chemicals, paints, solvents, fertilizers and other potentially toxic materials.
   - Adequately maintained sanitary facilities.
   - Proper control of raw materials stored on-site (for example, sand, aggregate and cement used in the manufacture of concrete or stockpiles of topsoil).
   - Street sweeping or cleaning.
   - Removal of inlet protection barriers during major rainfall events if flooding occurs and verification that reinforced filter fabric fences are in proper condition prior to all rainfall events.
   - The site superintendent will ensure proper use and disposal of materials onsite.
2. Hazardous Products: The following practices are used to reduce the risks associated with hazardous materials.
   - Products will be kept in original containers unless they are not re-sealable.
   - Paints, solvents, fertilizer, fuel (small containers), and other stored chemical substances will be kept within an enclosure to protect the containers and the floor of the enclosure, from wind, precipitation, and storm water runoff.
   - Fuel storage and filling areas will be bermed off to provide collection of any spills and prevent exposure to storm water runoff.
   - Original labels and Material Safety Data Sheets (MSDS) will be retained on-site and available for review by workers.
   - If surplus product must be disposed of, manufacturers' or local and State recommended methods for proper disposal will be followed.

PRODUCT SPECIFIC PRACTICES

The following product specific practices will be followed onsite:

1. Petroleum Products: All onsite vehicles will be monitored for leaks and receive regular preventive maintenance to reduce the chance of leakage. Petroleum products will be stored in tightly sealed containers, which are clearly labeled. Any asphalt substances used onsite will be applied according to the manufacturer's recommendations.
2. Fertilizers: Fertilizers used will be applied only in the minimum amounts recommended by the manufacturer. Storage will be in a covered shed.
3. Paints: All containers will be tightly sealed and stored when not required for use. Excess paint will not be discharged to the storm sewer system but will be properly disposed of according to manufacturers' instructions or State and local regulations.
4. Concrete Trucks: Discharges of concrete truck wash out at construction sites may be authorized if conducted in accordance with the requirements of Part V of the general permit.

SPILL CONTROL PRACTICES

In addition to the good housekeeping and material management practices discussed in the previous sections of this plan, the following practices will be followed for spill prevention and cleanup:

- Manufacturers' recommended methods for spill cleanup will be maintained on-site in the material data sheets (MSDS) and site personnel will be made aware of the procedures and the location of the information and cleanup supplies.
- Materials and equipment necessary for spill cleanup will be kept in the material storage area onsite. Equipment and materials will include but not be limited to brooms, dust pans, mops, rags, gloves, goggles, kitty litter, sand, sawdust and plastic and metal trash containers specifically for this purpose.
- All spills will be cleaned up immediately after discovery.
- The spill area will be kept well ventilated and personnel will wear appropriate protective clothing to prevent injury from contact with a hazardous substance.
- Contact the MS4 Operator, TCEQ (800-832-8224), and the National Response Center (800-424-8802) to inform of any spill of toxic or hazardous material regardless of the size.

The spill prevention plan will be adjusted to include measures to prevent this type of spill from recurring and how to clean up the spill if there is another one. A description of the spill, what caused it, and the cleanup measures will also be included.

APPENDIX L

NON-STORM WATER DISCHARGE INVENTORY

NON-STORM WATER DISCHARGE INVENTORY

Mark the materials or substances listed below expected to be present onsite during construction:

☐	Concrete	☐	Detergents	☐	Paints (enamel/latex)
☐	Metal Studs	☐	Fuels	☐	Lubricants
☐	Fertilizers	☐	Petroleum Based Products	☐	Cleaning Solvents
☐	Masonry Block	☐	Electrical Equipment and Materials	☐	Asphalt and Asphalt Related Products
☐	Tar	☐	Roof Shingles	☐	Wood
☐	Steel Products	☐	_____	☐	_____
☐	_____	☐	_____	☐	_____

AUTHORIZED NON STORMWATER DISCHARGES ANTICIPATED DURING THE PROJECT

Mark the following non-storm water discharges expected to occur from the site during the construction period (refer to general permit in Appendix G for additional information):

- ☐ discharges from firefighting activities,
- ☐ uncontaminated fire hydrant flushings, which include flushings from systems that utilize potable water, surface water, or groundwater that does not contain additional pollutants,
- ☐ water from the routine external washing of vehicles, the external portion of buildings or structures, and pavement, where detergents and soaps are not used and where spills or leaks of toxic or hazardous materials have not occurred and where the purpose is to remove mud, dirt, or dust,
- ☐ uncontaminated water used to control dust,
- ☐ potable water sources including waterline flushings,
- ☐ uncontaminated air conditioning condensate,
- ☐ uncontaminated ground water or spring water, including foundation or footing drains where flows are not contaminated with industrial materials such as solvents,
- ☐ lawn watering and similar irrigation drainage,
- ☐ runoff from concrete batch plants (refer to Part IV of general permit),
- ☐ concrete truck wash out (refer to Part V of general permit).

APPENDIX M

REPORTABLE QUANTITIES OF HAZARDOUS SUBSTANCES

Each substance in Table 117.3 that is listed in Table 302.4, 40 CFR part 302, is assigned the reportable quantity listed in Table 302.4 for that substance.

TABLE 117.3 -- REPORTABLE QUANTITIES OF HAZARDOUS SUBSTANCES DESIGNATED PURSUANT TO SECTION 311 OF THE CLEAN WATER ACT

Note: The first number under the column headed "RQ" is the reportable quantity in pounds. The number in parentheses is the metric equivalent in kilograms. For convenience, the table contains a column headed "Category" which lists the code letters "X", "A", "B", "C", and "D" associated with reportable quantities of 1, 10, 100, 1000, and 5000 pounds, respectively.

Table 117.3_Reportable Quantities of Hazardous Substances Designated Pursuant to Section 311 of the Clean Water Act

Material	Category	RQ in pounds (kilograms)
Acetaldehyde	C	1,000 (454)
Acetic acid	D	5,000 (2,270)
Acetic anhydride	D	5,000 (2,270)
Acetone cyanohydrin	A	10 (4.54)
Acetyl bromide	D	5,000 (2,270)
Acetyl chloride	D	5,000 (2,270)
Acrolein	X	1 (0.454)
Acrylonitrile	B	100 (45.4)
Adipic acid	D	5,000 (2,270)
Aldrin	X	1 (0.454)
Allyl alcohol	B	100 (45.4)
Allyl chloride	C	1,000 (454)
Aluminum sulfate	D	5,000 (2,270)
Ammonia	B	100 (45.4)
Ammonium acetate	D	5,000 (2,270)
Ammonium benzoate	D	5,000 (2,270)
Ammonium bicarbonate	D	5,000 (2,270)
Ammonium bichromate	A	10 (4.54)
Ammonium bifluoride	B	100 (45.4)
Ammonium bisulfite	D	5,000 (2,270)
Ammonium carbamate	D	5,000 (2,270)
Ammonium carbonate	D	5,000 (2,270)
Ammonium chloride	D	5,000 (2,270)
Ammonium chromate	A	10 (4.54)
Ammonium citrate dibasic	D	5,000 (2,270)
Ammonium fluoborate	D	5,000 (2,270)
Ammonium fluoride	B	100 (45.4)
Ammonium hydroxide	C	1,000 (454)
Ammonium oxalate	D	5,000 (2,270)
Ammonium silicofluoride	C	1,000 (454)
Ammonium sulfamate	D	5,000 (2,270)
Ammonium sulfide	B	100 (45.4)
Ammonium sulfite	D	5,000 (2,270)
Ammonium tartrate	D	5,000 (2,270)
Ammonium thiocyanate	D	5,000 (2,270)
Amyl acetate	D	5,000 (2,270)
Aniline	D	5,000 (2,270)

Antimony pentachloride.....	C.....	1,000 (454)
Antimony potassium tartrate.....	B.....	100 (45.4)
Antimony tribromide.....	C.....	1,000 (454)
Antimony trichloride.....	C.....	1,000 (454)
Antimony trifluoride.....	C.....	1,000 (454)
Antimony trioxide.....	C.....	1,000 (454)
Arsenic disulfide.....	X.....	1 (0.454)
Arsenic pentoxide.....	X.....	1 (0.454)
Arsenic trichloride.....	X.....	1 (0.454)
Arsenic trioxide.....	X.....	1 (0.454)
Arsenic trisulfide.....	X.....	1 (0.454)
Barium cyanide.....	A.....	10 (4.54)
Benzene.....	A.....	10 (4.54)
Benzoic acid.....	D.....	5,000 (2,270)
Benzonitrile.....	D.....	5,000 (2,270)
Benzoyl chloride.....	C.....	1,000 (454)
Benzyl chloride.....	B.....	100 (45.4)
Beryllium chloride.....	X.....	1 (0.454)
Beryllium fluoride.....	X.....	1 (0.454)
Beryllium nitrate.....	X.....	1 (0.454)
Butyl acetate.....	D.....	5,000 (2,270)
Butylamine.....	C.....	1,000 (454)
n-Butyl phthalate.....	A.....	10 (4.54)
Butyric acid.....	D.....	5,000 (2,270)
Cadmium acetate.....	A.....	10 (4.54)
Cadmium bromide.....	A.....	10 (4.54)
Cadmium chloride.....	A.....	10 (4.54)
Calcium arsenate.....	X.....	1 (0.454)
Calcium arsenite.....	X.....	1 (0.454)
Calcium carbide.....	A.....	10 (4.54)
Calcium chromate.....	A.....	10 (4.54)
Calcium cyanide.....	A.....	10 (4.54)
Calcium dodecylbenzenesulfonate.	C.....	1,000 (454)
Calcium hypochlorite.....	A.....	10 (4.54)
Captan.....	A.....	10 (4.54)
Carbaryl.....	B.....	100 (45.4)
Carbofuran.....	A.....	10 (4.54)
Carbon disulfide.....	B.....	100 (45.4)
Carbon tetrachloride.....	A.....	10 (4.54)
Chlordane.....	X.....	1 (0.454)
Chlorine.....	A.....	10 (4.54)
Chlorobenzene.....	B.....	100 (45.4)
Chloroform.....	A.....	10 (4.54)
Chlorosulfonic acid.....	C.....	1,000 (454)
Chlorpyrifos.....	X.....	1 (0.454)
Chromic acetate.....	C.....	1,000 (454)
Chromic acid.....	A.....	10 (4.54)
Chromic sulfate.....	C.....	1,000 (454)
Chromous chloride.....	C.....	1,000 (454)
Cobaltous bromide.....	C.....	1,000 (454)
Cobaltous formate.....	C.....	1,000 (454)
Cobaltous sulfamate.....	C.....	1,000 (454)
Coumaphos.....	A.....	10 (4.54)
Cresol.....	B.....	100 (45.4)
Crotonaldehyde.....	B.....	100 (45.4)

Cupric acetate	B	100 (45.4)
Cupric acetoarsenite	X	1 (0.454)
Cupric chloride	A	10 (4.54)
Cupric nitrate	B	100 (45.4)
Cupric oxalate	B	100 (45.4)
Cupric sulfate	A	10 (4.54)
Cupric sulfate, ammoniated	B	100 (45.4)
Cupric tartrate	B	100 (45.4)
Cyanogen chloride	A	10 (4.54)
Cyclohexane	C	1,000 (454)
2,4-D Acid	B	100 (45.4)
2,4-D Esters	B	100 (45.4)
DDT	X	1 (0.454)
Diazinon	X	1 (0.454)
Dicamba	C	1,000 (454)
Dichlobenil	B	100 (45.4)
Dichlone	X	1 (0.454)
Dichlorobenzene	B	100 (45.4)
Dichloropropane	C	1,000 (454)
Dichloropropene	B	100 (45.4)
Dichloropropene-Dichloropropane (mixture).	B	100 (45.4)
2,2-Dichloropropionic acid	D	5,000 (2,270)
Dichlorvos	A	10 (4.54)
Dicofol	A	10 (4.54)
Dieldrin	X	1 (0.454)
Diethylamine	B	100 (45.4)
Dimethylamine	C	1,000 (454)
Dinitrobenzene (mixed)	B	100 (45.4)
Dinitrophenol	A	10 (45.4)
Dinitrotoluene	A	10 (4.54)
Diquat	C	1,000 (454)
Disulfoton	X	1 (0.454)
Diuron	B	100 (45.4)
Dodecylbenzenesulfonic acid	C	1,000 (454)
Endosulfan	X	1 (0.454)
Endrin	X	1 (0.454)
Epichlorohydrin	B	100 (45.4)
Ethion	A	10 (4.54)
Ethylbenzene	C	1,000 (454)
Ethylenediamine	D	5,000 (2,270)
Ethylenediamine-tetraacetic acid (EDTA).	D	5,000 (2,270)
Ethylene dibromide	X	1 (0.454)
Ethylene dichloride	B	100 (45.4)
Ferric ammonium citrate	C	1,000 (454)
Ferric ammonium oxalate	C	1,000 (454)
Ferric chloride	C	1,000 (454)
Ferric fluoride	B	100 (45.4)
Ferric nitrate	C	1,000 (454)
Ferric sulfate	C	1,000 (454)
Ferrous ammonium sulfate	C	1,000 (454)
Ferrous chloride	B	100 (45.4)
Ferrous sulfate	C	1,000 (454)
Formaldehyde	B	100 (45.4)
Formic acid	D	5,000 (2,270)

Fumaric acid	D	5,000 (2,270)
Furfural	D	5,000 (2,270)
Guthion	X	1 (0.454)
Heptachlor	X	1 (0.454)
Hexachlorocyclopentadiene	A	10 (4.54)
Hydrochloric acid	D	5,000 (2,270)
Hydrofluoric acid	B	100 (45.4)
Hydrogen cyanide	A	10 (4.54)
Hydrogen sulfide	B	100 (45.4)
Isoprene	B	100 (45.4)
Isopropanolamine dodecylbenzenesulfonate.	C	1,000 (454)
Kepone	X	1 (0.454)
Lead acetate	A	10 (4.54)
Lead arsenate	X	1 (0.454)
Lead chloride	A	10 (4.54)
Lead fluoborate	A	10 (4.54)
Lead fluoride	A	10 (4.54)
Lead iodide	A	10 (4.54)
Lead nitrate	A	10 (4.54)
Lead stearate	A	10 (4.54)
Lead sulfate	A	10 (4.54)
Lead sulfide	A	10 (4.54)
Lead thiocyanate	A	10 (4.54)
Lindane	X	1 (0.454)
Lithium chromate	A	10 (4.54)
Malathion	B	100 (45.4)
Maleic acid	D	5,000 (2,270)
Maleic anhydride	D	5,000 (2,270)
Mercaptodimethur	A	10 (4.54)
Mercuric cyanide	X	1 (0.454)
Mercuric nitrate	A	10 (4.54)
Mercuric sulfate	A	10 (4.54)
Mercuric thiocyanate	A	10 (4.54)
Mercurous nitrate	A	10 (4.54)
Methoxychlor	X	1 (0.454)
Methyl mercaptan	B	100 (45.4)
Methyl methacrylate	C	1,000 (454)
Methyl parathion	B	100 (45.4)
Mevinphos	A	10 (4.54)
Mexacarbate	C	1,000 (454)
Monoethylamine	B	100 (45.4)
Monomethylamine	B	100 (45.4)
Naled	A	10 (4.54)
Naphthalene	B	100 (45.4)
Naphthenic acid	B	100 (45.4)
Nickel ammonium sulfate	B	100 (45.4)
Nickel chloride	B	100 (45.4)
Nickel hydroxide	A	10 (4.54)
Nickel nitrate	B	100 (45.4)
Nickel sulfate	B	100 (45.4)
Nitric acid	C	1,000 (454)
Nitrobenzene	C	1,000 (454)
Nitrogen dioxide	A	10 (4.54)
Nitrophenol (mixed)	B	100 (45.4)

Nitrotoluene	C	1,000 (454)
Paraformaldehyde	C	1,000 (454)
Parathion	A	10 (4.54)
Pentachlorophenol	A	10 (4.54)
Phenol	C	1,000 (454)
Phosgene	A	10 (4.54)
Phosphoric acid	D	5,000 (2,270)
Phosphorus	X	1 (0.454)
Phosphorus oxychloride	C	1,000 (454)
Phosphorus pentasulfide	B	100 (45.4)
Phosphorus trichloride	C	1,000 (454)
Polychlorinated biphenyls	X	1 (0.454)
Potassium arsenate	X	1 (0.454)
Potassium arsenite	X	1 (0.454)
Potassium bichromate	A	10 (4.54)
Potassium chromate	A	10 (4.54)
Potassium cyanide	A	10 (4.54)
Potassium hydroxide	C	1,000 (454)
Potassium permanganate	B	100 (45.4)
Propargite	A	10 (4.54)
Propionic acid	D	5,000 (2,270)
Propionic anhydride	D	5,000 (2,270)
Propylene oxide	B	100 (45.4)
Pyrethrins	X	1 (0.454)
Quinoline	D	5,000 (2,270)
Resorcinol	D	5,000 (2,270)
Selenium oxide	A	10 (4.54)
Silver nitrate	X	1 (0.454)
Sodium	A	10 (4.54)
Sodium arsenate	X	1 (0.454)
Sodium arsenite	X	1 (0.454)
Sodium bichromate	A	10 (4.54)
Sodium bifluoride	B	100 (45.4)
Sodium bisulfite	D	5,000 (2,270)
Sodium chromate	A	10 (4.54)
Sodium cyanide	A	10 (4.54)
Sodium dodecylbenzenesulfonate	C	1,000 (454)
Sodium fluoride	C	1,000 (454)
Sodium hydrosulfide	D	5,000 (2,270)
Sodium hydroxide	C	1,000 (454)
Sodium hypochlorite	B	100 (45.4)
Sodium methylate	C	1,000 (454)
Sodium nitrite	B	100 (45.4)
Sodium phosphate, dibasic	D	5,000 (2,270)
Sodium phosphate, tribasic	D	5,000 (2,270)
Sodium selenite	B	100 (45.4)
Strontium chromate	A	10 (4.54)
Strychnine	A	10 (4.54)
Styrene	C	1,000 (454)
Sulfuric acid	C	1,000 (454)
Sulfur monochloride	C	1,000 (454)
2,4,5-T acid	C	1,000 (454)
2,4,5-T amines	D	5,000 (2,270)
2,4,5-T esters	C	1,000 (454)
2,4,5-T salts	C	1,000 (454)
TDE	X	1 (0.454)

2,4,5-TP acid	B	100 (45.4)
2,4,5-TP acid esters	B	100 (45.4)
Tetraethyl lead	A	10 (4.54)
Tetraethyl pyrophosphate	A	10 (4.54)
Thallium sulfate	B	100 (45.4)
Toluene	C	1,000 (454)
Toxaphene	X	1 (0.454)
Trichlorfon	B	100 (45.4)
Trichloroethylene	B	100 (45.4)
Trichlorophenol	A	10 (4.54)
Triethanolamine dodecylbenzenesulfonate.	C	1,000 (454)
Triethylamine	D	5,000 (2,270)
Trimethylamine	B	100 (45.4)
Uranyl acetate	B	100 (45.4)
Uranyl nitrate	B	100 (45.4)
Vanadium pentoxide	C	1,000 (454)
Vanadyl sulfate	C	1,000 (454)
Vinyl acetate	D	5,000 (2,270)
Vinylidene chloride	B	100 (45.4)
Xylene (mixed)	B	100 (45.4)
Xylenol	C	1,000 (454)
Zinc acetate	C	1,000 (454)
Zinc ammonium chloride	C	1,000 (454)
Zinc borate	C	1,000 (454)
Zinc bromide	C	1,000 (454)
Zinc carbonate	C	1,000 (454)
Zinc chloride	C	1,000 (454)
Zinc cyanide	A	10 (4.54)
Zinc fluoride	C	1,000 (454)
Zinc formate	C	1,000 (454)
Zinc hydrosulfite	C	1,000 (454)
Zinc nitrate	C	1,000 (454)
Zinc phenolsulfonate	D	5,000 (2,270)
Zinc phosphide	B	100 (45.4)
Zinc silicofluoride	D	5,000 (2,270)
Zinc sulfate	C	1,000 (454)
Zirconium nitrate	D	5,000 (2,270)
Zirconium potassium fluoride	C	1,000 (454)
Zirconium sulfate	D	5,000 (2,270)
Zirconium tetrachloride	D	5,000 (2,270)

– [50 FR 13513, Apr. 4, 1985, as amended at 51 FR 34547, Sept. 29, 1986; 54 FR 33482, Aug. 14, 1989; 58 FR 35327, June 30, 1993; 60 FR 30937, June 12, 1995]

APPENDIX N

SEDIMENTATION BASIN INFORMATION AND CALCULATIONS

Sites With Drainage Areas of Ten or More Acres

A sedimentation basin is required, where feasible, for a common drainage location that serves an area with ten (10) or more acres disturbed at one time.

A sedimentation basin may be temporary or permanent, and must provide sufficient storage to contain a calculated volume of runoff from a 2-year, 24-hour storm from each disturbed acre drained. When calculating the volume of runoff from a 2-year, 24-hour storm event, it is not required to include the flows from offsite areas and flow from onsite areas that are either undisturbed or have already undergone permanent stabilization, if these flows are diverted around both the disturbed areas of the site and the sediment basin. Capacity calculations shall be included in Appendix N of this SWP3.

Where rainfall data is not available or a calculation cannot be performed, the sedimentation basin must provide at least 3,600 cubic feet of storage per acre drained until final stabilization of the site.

If a sedimentation basin is not feasible, then the permittee shall provide equivalent control measures until final stabilization of the site. In determining whether installing a sediment basin is feasible, the permittee may consider factors such as site soils, slope, available area, public safety, precipitation patterns, site geometry, site vegetation, infiltration capacity, geotechnical factors, depth to groundwater, and other similar considerations. The permittee shall document the reason that the sediment basins are not feasible, and shall utilize equivalent control measures, which may include a series of smaller sediment basins.

Sites With Drainage Areas Less than Ten Acres

Sediment traps and sediment basins may be used to control solids in storm water runoff for drainage locations serving less than ten (10) acres.

Alternatively, a sediment basin that provides storage for a calculated volume of runoff from a 2-year, 24-hour storm from each disturbed acre drained may be utilized. Where rainfall data is not available or a calculation cannot be performed, a temporary or permanent sediment basin providing 3,600 cubic feet of storage per acre drained may be provided. If a calculation is performed, then the calculation shall be included in Appendix N of this SWP3.

APPENDIX O

LOCAL REQUIREMENTS

ARTICLE 6.07 STORMWATER POLLUTION PREVENTION CONTROL

Division 3. Construction Site Stormwater Management

Division 3. Construction Site Stormwater Management

Sec. 6.07.071 Construction requirements and control measures

Operators of public or private "construction activities" shall be required to select, install, implement, and maintain stormwater control measures that comply with city engineering design guidelines and construction standards (EDGCS), TPDES construction general permit, TPDES MS4 general permit, or other ordinances that may apply to construction activities. Construction activities include, at a minimum, all public and private construction sites. The operator shall ensure the following minimum requirements are effectively implemented and complied with:

(1) Requirements for construction activities.

(A) Development of sites one (1) acre or more.

(i) An SWPPP is currently required by EPA and TCEQ for all construction activities where one (1) or more acres will be disturbed during development. Developments of sites that disturb one (1) acre or more within the city's jurisdiction shall prepare a SWPPP that satisfies EPA, TCEQ regulations, the NPDES or TPDES construction general permit, and this article. No construction activities may begin until the SWPPP is approved by the city engineer or designee.

a. A copy of the SWPPP shall be provided to the city's engineer. The SWPPP shall be submitted at the time that subdivision construction plans are submitted, or if the construction activities do not require subdivision approval, at the time of submission of the site development application, or if the construction activities do not require site development application approval, at the time of submission of a building permit application. The city engineer or to his/her designee(s) of other city personnel may require correction of any deficiencies in the SWPPP, and may require additional measures in order to meet the minimum requirements of the pollution control measures section below.

b. A copy of any notice of intent (NOI) or small or large construction site notice provided to EPA or TCEQ shall be provided to the city engineer.

c. A copy of any notice of termination (NOT) submitted to EPA or TCEQ shall be provided to the city engineer.

(ii) If the site is one (1) acre or more, but less than one (1) acre and more than one-quarter (1/4) acre will be disturbed, an NPDES or TPDES stormwater

pollution prevention plan is not required, but an erosion and sedimentation control plan is required, unless the site is a single-lot, single-family residential construction that is not part of a larger development that requires an NPDES or TPDES permit. The erosion sedimentation control plan shall be submitted at the time that subdivision construction plans are submitted, or if the construction activities do not require subdivision approval, at the time of submission of the site development application, or if the construction activities do not require site development application approval, at the time of submission of a building permit application. No construction activities may begin until the erosion sedimentation control plan is approved by the city engineer or designee.

(B) Development of sites less than one (1) acre and more than one quarter.

(i) An erosion and sedimentation control plan, as defined in the engineering design guidelines is required for commercial construction, industrial construction, multifamily residential construction, and development of a residential subdivision within the city's jurisdictional area where less than one (1) but more than one-quarter (1/4) acre will be developed. The area of the development will be based upon the platted lot area or, if not platted, upon the area of the tract owned by the developer, including all contiguous property by the same person. Disturbance of a partial area of a tract is not a condition that will cause a change of the category in development size.

(ii) Submission of a site-specific erosion and sedimentation control plan is required for a single-lot, single-family residential construction, in accordance with section 3.01.004 of this Code of Ordinances, as amended, and/or an NPDES or TPDES permit.

(iii) The erosion and sedimentation control plan shall include any measures as required to comply with the pollution control measures section below. An erosion and sedimentation control plan shall be submitted to the city engineer for review before issuance of a building permit or approval to begin development. An erosion and sedimentation control plan that complies with this article must be submitted and approved by the city engineer before a building permit may be issued.

(iv) Implementation of the pollution control measures detailed in the plan is required. (Inspection of the status of the pollution control measures will be performed by city personnel during normal construction inspection and at other times when construction activities may be conducted).

(v) An erosion and sedimentation control plan is not required when a portion of a previously developed tract of land is redeveloped, unless the redevelopment will result in the conversion of more than one-quarter (1/4) acre from a porous surface to an impervious surface.

(C) Development of sites one-quarter (1/4) acre or less and single-lot, single-family residential construction.

(i) A site-specific erosion and sedimentation control plan is required for the development of sites which are one-quarter (1/4) acre in size or less, including single-lot, single-family residential construction.

(ii) In order to obtain a building permit, a responsible party shall provide written acknowledgement that the responsible party is aware of the pollution control measures of the city and that the responsible party will comply with these measures during the development of the property.

(D) For purposes of this section, the entire plat or site shown in a site plan application or building permit application shall be considered to be the area being disturbed unless otherwise specified within the plat, site plan, or building permit application, as appropriate. The responsible party shall take appropriate measures to ensure no construction activities disturb or occur on any area that is not designated as disturbed on the plat or site plan.

(E) If a TCEQ contributing zone plan is applicable to a specific permanent stormwater facility, then the responsible party shall adhere to Attachment N of the contributing zone plan as specified by the TCEQ during all stages of construction activity and after completion of construction activities. The responsible party shall further comply with any requirements of Attachment N apply prior to commencement of construction activity, and compliance with such requirements shall be required prior to commencement of construction activity and prior to issuance of plat approval, a site development permit, or a building permit, as applicable.

(F) A certificate of completion will not be issued until the planning director is satisfied that all temporary and permanent measures specified by the plan are complete and any access easements or maintenance agreements required by this article have been submitted to the city.

(G) A certificate of occupancy will not be issued until the director is satisfied that all temporary and permanent measures specified by the plan are complete and any access easements or maintenance agreements required by this article have been submitted to the city.

(H) The city shall not accept any public improvements until all temporary and permanent measures specified by the plan are complete, unless the responsible party has provided a maintenance bond to the city, and any access easements or maintenance agreements required by this article have been submitted to the city.

(2) Special land use requirements.

(A) Any plans submitted with an application for a site development and/or building permit for the development of property that will be used for one of the following uses shall identify the appropriate best management practices, published in the city engineering design guidelines and construction standards that the responsible party will adopt to prevent pollutants associated with the use from being discharged into the city's MS4.

(i) Fueling stations;

(ii) Vehicle/equipment washing and steam cleaning facilities;

(iii) Facilities engaged in harmful liquid materials loading and unloading;

(iv) Facilities engaged in storage in aboveground tanks;

(v) Facilities engaged in container storage of harmful liquids (such as oil, chemicals, and hazardous wastes);

(vi) Facilities engaged in outdoor storage of raw materials that are subject to leaching and transport by erosion and sedimentation, such as gravel, sand, topsoil, compost, sawdust, wood chips, building materials, including lumber, which are subject to leaching; and concrete and metal products, which are subject to chemical erosion, corrosion, and leaching.

(3) Pollution prevention measures. Any person engaging in construction activity and any operator shall design, install, implement, and maintain effective pollution prevention measures to minimize the discharge of pollutants. At a minimum, such measures shall be designed, installed, implemented and maintained to:

(A) Minimize the discharge of pollutants from equipment and vehicle washing, wheel wash water, and other wash waters. Wash waters shall be treated in a sediment basin or alternative control that provides equivalent or better treatment prior to discharge;

(B) Minimize the exposure of building materials, building products, construction wastes, trash, landscape materials, fertilizers, pesticides, herbicides, detergents, sanitary waste and other materials present on the site to precipitation and to stormwater; and

(C) Minimize the discharge of pollutants from spills and leaks and implement chemical spill and leak prevention and response procedures.

(4) Prohibited discharges. The following discharges are prohibited during construction:

(A) Wastewater from washout of concrete vehicles, unless managed by an appropriate control;

(B) Wastewater from washout and cleanout of stucco, paint, form release oils, curing compounds and other construction materials;

(C) Fuels, oils, or other pollutants used in vehicle and equipment operation and maintenance; and

(D) Soaps or solvents used in vehicle and equipment washing.

Division 3. Construction Site Stormwater Management

Sec. 6.07.072 Construction site inspections and enforcement

All sites requiring a site development, building, or construction permit that discharge to a tributary listed by the state as an impaired water for sediment or turbidity under the CWA section 303(d), and other sites as determined by the city, the TCEQ, or permitting authority to be a significant threat to water quality, shall be subject to inspection by the director or his/her designees prior to land disturbance, during active construction activity, and following completion of active construction activity, within the requirements as referenced in the engineering design guidelines.

Division 3. Construction Site Stormwater Management

Sec. 6.07.073 Maintenance and repair of stormwater facilities

(a) Responsibility for maintenance of permanent BMPs and measures after construction is complete. 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 city, as provided in subsections (b) and (c) below. The city shall then be responsible for maintenance until another entity assumes such obligations in writing or ownership is transferred. If a TCEQ contributing zone plan is applicable to a specific permanent stormwater facility, then the responsible party shall adhere to Attachment N of the contributing zone plan as specified by the TCEQ after completion of construction activities.

(b) Commercial and multifamily properties.

(1) The maintenance and repair of stormwater facilities for commercial and multifamily properties shall be the responsibility of the property owner and the person in control of the property, if different from the property owner. The stormwater facilities shall be maintained in good repair and working order in accordance with this article, applicable state and federal law, and good engineering practices.

(2) At least once each year, the property owner or person in control of the property shall cause the stormwater facility to be inspected and an inspection report provided by a person qualified to inspect stormwater facilities. The inspection report shall be maintained on file at the property at all times and shall be made available to the city upon request. The property owner and/or person in control of the stormwater detention facility shall promptly repair any deficiencies identified in the inspection report.

(3) Prior to the issuance of a certificate of occupancy or certificate of completion for a property upon which a stormwater management facility will be located, the property owner must execute an access easement agreement with the city in a form acceptable to the city that binds all subsequent owners of land served by the stormwater management facility, which allows the city or its contractor/agent access to the facility to periodically inspect if the facility is maintained in proper working condition and meets design standards and other provisions established by this article. The easement agreement shall be recorded by the [sic] in the county land records.

(4) In the event that a stormwater facility will be shared by two properties, in addition to the other requirements of this subsection (b), the property owners sharing the stormwater facility shall execute such agreements, covenants, and easements reasonably required by the city to address joint use of and access to the stormwater facilities.

(c) Single-family and two-family residential. All stormwater management facilities in areas designated as single- or two-family residential that are accepted by the city for maintenance and operation will be maintained by the city as provided in this subsection, except as provided in this section, the plat notes and/or restrictive covenants for the subdivision, or an agreement between the city and the developer of the subdivision or the HOA as appropriate. The city's maintenance and repair obligations shall include: removal of silt, litter, and other debris from all catch basins, inlets, and drainage pipes. The city will also maintain the functionality of water quality improvements contained in open channels, detention, and water quality areas. The property owner or person in control of the property upon which the stormwater facilities are located will be responsible for cutting grass, removal of litter and debris, vegetation removal, and maintenance or replacement of landscape vegetation within open channels, detention and water quality areas. Maintenance needs that are the obligation of the property owner or person in control of the property must be addressed in a timely manner as determined by the city. Stormwater management facilities shall be located in drainage easements in a form acceptable to the city, and shall be subject to such other agreements and requirements to ensure compliance with this section. The property owner or person in control of the property shall promptly notify the city of any conditions that require maintenance or repair that are the obligation of the city.

(d) Failure to maintain practices. If the stormwater management facility becomes a danger to public safety or public health, the city shall notify the party responsible for maintenance of the stormwater management facility in writing. Upon receipt of that notice, the responsible person shall have 7-14 days to meet maintenance and repair requirements. If the owner of the facility fails to comply with the requirements of the maintenance covenant, the city, after reasonable notice, may perform all necessary work to bring the facility into compliance and charge the owner for the cost of the work in accordance with section 6.07.005.

Division 3. Construction Site Stormwater Management

Secs. 6.07.074–6.07.090 Reserved

ARTICLE 6.07 STORMWATER POLLUTION PREVENTION CONTROL

Division 4. Construction Site Stormwater Management

(Reserved)

(Ordinance 15-051-00 adopted 10/15/15)

APPENDIX P

CONCRETE BATCH PLANT RECORDS

APPENDIX Q

EDWARDS AQUIFER RULE
TAC TITLE 30 CHAPTER 213

(Applies to Edwards Aquifer Only)

Kimley»Horn

SECTION 5: ADDITIONAL FORMS

Copy of Notice of Intent

Owner Authorization Form

Texas Commission on Environmental Quality
for Required Signature
Edwards Aquifer Protection Program
Relating to 30 TAC Chapter 213
Effective June 1, 1999

Land Owner Authorization

I, Bradley Andrews of Liberty Hill 29 LLC
Land Owner Signatory Name — Land Owner Name (Legal Entity or Individual)

am the owner of the property located at
13003 W State Highway 29, Liberty Hill, TX 78642
Legal description of the property referenced in the application

and am duly authorized in accordance with §213.4(c)(2) and §213.4(d)(1) or §213.23(c)(2) and §213.23(d) relating to the right to submit an application, signatory authority, and proof of authorized signatory.

I do hereby authorize BoATX, LLC
Applicant Name (Legal Entity or Individual)

to conduct modification of a previously approved contributing zone plan
Description of the proposed regulated activities

at 13003 W State Highway 29, Liberty Hill, TX 78642.
Precise location of the authorized regulated activities

Land Owner Acknowledgement

I understand that Liberty Hill 29 LLC
Land Owner Name (Legal Entity or Individual)

Is ultimately responsible for compliance with the approved or conditionally approved Edwards Aquifer protection plan and any special conditions of the approved plan through all phases of plan implementation even if the responsibility for compliance and the right to possess and control the property referenced in the application has been contractually assumed by another legal entity. I further understand that any failure to comply with any condition of the executive director's approval is a violation is subject to administrative rule or orders and penalties as provided under §213.10 (relating to Enforcement). Such violation may also be subject to civil penalties and injunction.

Land Owner Signature

Land Owner Signature

2-26-24
Date

THE STATE OF § Texas

County of § Lubbock

BEFORE ME, the undersigned authority, on this day personally appeared BRADLEY ANDREWS 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 26 day of February

NOTARY PUBLIC

YOLANDA ROE
Notary ID #129147902
My Commission Expires
October 2, 2024

Yolanda Roe
Typed or Printed Name of Notary

MY COMMISSION EXPIRES: 10-2-2024

Attached: (Mark all that apply)

- ☐ Lease Agreement
- ☐ Signed Contract
- ☐ Deed Recorded Easement
- ☐ Other legally binding document

Applicant Acknowledgement

I, David Higgins of BoATX, LLC
Applicant Signatory Name — Applicant Name (Legal Entity or Individual)

acknowledge that Liberty Hill 29 LLC
Land Owner Name (Legal Entity or Individual)

has provided BoATX, LLC
Applicant Name (Legal Entity or Individual)

with the right to possess and control the property referenced in the Edwards Aquifer protection plan.

I understand that BoATX, LLC
Applicant Name (Legal Entity or Individual)

is contractually responsible for compliance with the approved or conditionally approved Edwards Aquifer protection plan and any special conditions of the approved plan through all phases of plan implementation. I further understand that failure to comply with any condition of the executive director's approval is a violation is subject to administrative rule or orders and penalties as provided under §213.10 (relating to Enforcement). Such violation may also be subject to civil penalties and injunction.

Applicant Signature

Applicant Signature — Date: 02/28/2024

THE STATE OF § Texas

County of § Harris

BEFORE ME, the undersigned authority, on this day personally appeared David Higgins 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 28 day of 2024

BITZI M. KNEIB
Notary Public, State of Texas
Comm. Expires 08-11-2026
Notary ID 133803472

NOTARY PUBLIC

Bitzi M. Kneib
Typed or Printed Name of Notary

MY COMMISSION EXPIRES: 08-11-2026

Agent Authorization Form

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

I David Higgins,
Print Name

Member,
Title - Owner/President/Other

of BoATX, LLC,
Corporation/Partnership/Entity Name

have authorized Matthew Gatto, P.E.
Print Name of Agent/Engineer

of Kimley-Horn and Associates, Inc.
Print Name of Firm

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

I also understand that:

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

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

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

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

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

SIGNATURE PAGE:

DocuSigned by:
David Higgins
98759067372485...
Applicant's Signature

2/1/2024
Date

THE STATE OF Texas §
County of Harris §

BEFORE ME, the undersigned authority, on this day personally appeared David Higgins 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 1 day of February, 2024.

NOTARY PUBLIC

Bitzi M Kneib
Typed or Printed Name of Notary

BITZI M. KNEIB
Notary Public, State of Texas
Comm. Expires 08-11-2026
Notary ID 133903472

MY COMMISSION EXPIRES: 08-11-2026

Application Fee Form

Texas Commission on Environmental Quality

Name of Proposed Regulated Entity: Heritage Ridge (Lot 3A)

Regulated Entity Location: Approximately 600 LF east of the intersection of State Highway 29 and Championship Drive in Liberty Hill, TX

Name of Customer: BoATX, LLC.

Contact Person: Matthew Gatto, P.E.

Phone: 737-242-7310 Customer Reference Number (if issued):CN _____

Regulated Entity Reference Number (if issued):RN _____

Austin Regional Office (3373)

☐ Hays ☐ Travis ☒ Williamson

San Antonio Regional Office (3362)

☐ Bexar ☐ Medina ☐ Uvalde

☐ Comal ☐ Kinney

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

☒ Austin Regional Office

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

☐ San Antonio Regional Office

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

Site Location (Check All That Apply):

☐ Recharge Zone ☒ Contributing Zone ☐ Transition Zone

Type of Plan	***Size***	***Fee Due***
Water Pollution Abatement Plan, Contributing Zone Plan: One Single Family Residential Dwelling	N/A Acres	$ 0
Water Pollution Abatement Plan, Contributing Zone Plan: Multiple Single Family Residential and Parks	N/A Acres	$ 0
Water Pollution Abatement Plan, Contributing Zone Plan: Non-residential	1.58 Acres	$ 4,000
Sewage Collection System	N/A L.F.	$ 0
Lift Stations without sewer lines	N/A Acres	$ 0
Underground or Aboveground Storage Tank Facility	N/A Tanks	$ 0
Piping System(s)(only)	N/A Each	$ 0
Exception	N/A Each	$ 0
Extension of Time	N/A Each	$ 0

Signature: Date: 10/04/2023

Application Fee Schedule

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

Water Pollution Abatement Plants 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

Check Payable to the "Texas Commission on Environmental Quality"

Core Data Form

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 **CZP Modification**

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		**RN**

SECTION II: Customer Information

4. General Customer Information	**5. Effective Date for Customer Information Updates** (mm/dd/yyyy)	2/1/2024
☒ 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:*	
BoATX, LLC	Heritage Ridge Investments, LLC	

7. TX SOS/CPA Filing Number	**8. TX State Tax ID** (11 digits)	**9. Federal Tax ID** (9 digits)	**10. DUNS Number** *(if applicable)*
87-3139375	32081473434		

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 ☐ Other:
☐ Occupational Licensee ☒ Responsible Party ☐ VCP/BSA Applicant

15. Mailing Address:	12012 Wickchester, Suite 680						
	City	Houston	**State**	TX	**ZIP**	77079	**ZIP + 4**

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

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

(713) 530-2203		( ) -

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.)*

Heritage Ridge

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

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

25. Description to Physical Location:	Approximately 600 LF east of the intersection of State Highway 29 and Championship Drive in Liberty Hil, Williamson County, Texas.

26. Nearest City	**State**	**Nearest ZIP Code**
Liberty Hill	TX	78642

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:	30.662194		**28. Longitude (W) In Decimal:**	-97.9000645	
Degrees	Minutes	Seconds	Degrees	Minutes	Seconds
30	39	43.90	97	54	2.32

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)
5812		722511	

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

Quick Service Restaurant

34. Mailing Address:	**12012 Wickchester, Suite 680**						
	City	**Houston**	**State**	**TX**	**ZIP**	**77079**	**ZIP + 4**
35. E-Mail Address:	**david.higgins@bojangles.com**						

36. Telephone Number	**37. Extension or Code**	**38. Fax Number** *(if applicable)*
(713) 530-2203		**( ) -**

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:	Matthew Gatto, P.E.	**41. Title:**	Project Manager

42. Telephone Number	43. Ext./Code	44. Fax Number	45. E-Mail Address
(737) 242-7310		( ) -	matthew.gatto@kimley-horn.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:	BoATX, LLC	**Job Title:**	Member
Name *(In Print):*	David Higgins	**Phone:**	(7135302203
Signature:	DocuSigned by: David Higgins 9B735800757548 7...	**Date:**	1/31/2024