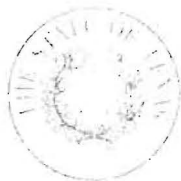


Bryan W. Shaw, Ph.D., P.E., *Chairman*
Toby Baker, *Commissioner*
Zak Covar, *Commissioner*
Richard A. Hyde, P.E., *Executive Director*



TEXAS COMMISSION ON ENVIRONMENTAL QUALITY

Protecting Texas by Reducing and Preventing Pollution

March 6, 2015

RECEIVED

MAR 13 2015

COUNTY ENGINEER

Mr. Ty Thaggard
M2G FM 1863, Ltd.
12330 West Avenue, Suite 204
San Antonio, Texas 78216

Re: Edwards Aquifer, Comal County

NAME OF PROJECT: **Wiley Road**; Located 0.3 miles east of intersection of US Hwy. 281 and FM 1863; Bulverde, Texas

TYPE OF PLAN: Request for Approval of a **Water Pollution Abatement Plan (WPAP)**; 30 Texas Administrative Code (TAC) Chapter 213 Edwards Aquifer

Investigation No. 1221272; Regulated Entity No. RN105558761; Additional ID No. 13-15011402

Dear Mr. Thaggard:

The Texas Commission on Environmental Quality (TCEQ) has completed its review of the WPAP Application for the above-referenced project submitted to the San Antonio Regional Office by Pape-Dawson Engineers, Inc. on behalf M2G FM 1863, Ltd. on January 14, 2015. Final review of the WPAP was completed after additional material was received on March 2, 2015. As presented to the TCEQ, the Temporary 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 project will have an area of approximately 7.10 acres. The project proposes the construction of approximately 2,073 feet of public street including pavement, curbs, sidewalks, storm drains, a drainage crossing, and associated grading. Impervious cover totals 2.65 acres (37.32 percent). Approximately 6.1 acres of the site limits lie within the Contributing

Zone and 1.0 acre is located within the Recharge Zone. No wastewater will be generated from this project.

PERMANENT POLLUTION ABATEMENT MEASURES

To prevent the pollution of stormwater runoff originating on-site or upgradient of the site and potentially flowing across and off the site after construction, one vertical walled single-chamber sedimentation/filtration 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 2,379 pounds of TSS generated from the 2.65 acres of impervious cover. The approved measures meet the required 80 percent removal of the increased load in TSS caused by the project.

The total capture volume of the vertical walled single-chamber sedimentation/filtration basin is 21,645 cubic feet (14,083 cubic feet required). The filtration system for the basin will consist of 3,160 square feet of sand (1,408 square feet required) meeting ASTM C-33, which is 18 inches thick and an underdrain piping system covered with a minimum two inch gravel layer. The required TSS removal is 2,379 pounds and the provided TSS removal is 2,379 pounds.

GEOLOGY

According to the geologic assessment included with the application, the site is located within the upper member of the Glen Rose Limestone. One non-sensitive geologic feature was noted in the assessment by the project geologist. The San Antonio Regional Office site assessment conducted on February 26, 2015 revealed that the site was generally as described in the application.

SPECIAL CONDITIONS

- I. The permanent pollution abatement measure shall be operational prior to occupancy of the facility.
- II. All sediment and/or media removed from the water quality 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:

COUNTY ENGINEER

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

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 WPAP and this notice of approval shall be maintained at the project location until all regulated activities are completed.
5. Modification to the activities described in the referenced WPAP application following the date of approval may require the submittal of a plan to modify this approval, including the payment of appropriate fees and all information necessary for its review and approval prior to initiating construction of the modifications.
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 San Antonio Regional Office no later than 48 hours prior to commencement of the regulated activity. Written notification must include the date on which the regulated activity will commence, the name of the approved plan and program ID number for the regulated activity, and the name of the prime contractor with the name and telephone number of the contact person. The executive director will use the notification to determine if the approved plan is eligible for an extension.
7. Temporary erosion and sedimentation (E&S) controls, i.e., silt fences, rock berms, stabilized construction entrances, or other controls described in the approved WPAP, must be installed prior to construction and maintained during construction. Temporary E&S controls may be removed when vegetation is established and the construction area is stabilized. If a water quality pond is proposed, it shall be used as a sedimentation basin during construction. The TCEQ may monitor stormwater discharges from the site to evaluate the adequacy of temporary E&S control measures. Additional controls may be necessary if excessive solids are being discharged from the site.
8. All borings with depths greater than or equal to 20 feet must be plugged with non-shrink grout from the bottom of the hole to within three (3) feet of the surface. The remainder of the hole must be backfilled with cuttings from the boring. All borings less than 20 feet must be backfilled with cuttings from the boring. All borings must be backfilled or plugged within four (4) days of completion of the drilling operation. Voids may be filled with gravel.

During Construction:

9. During the course of regulated activities related to this project, the applicant or agent shall comply with all applicable provisions of 30 TAC Chapter 213, Edwards Aquifer. The applicant shall remain responsible for the provisions and conditions of this approval until such responsibility is legally transferred to another person or entity.
10. 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. 6, above.

11. If any sensitive feature (caves, solution cavities, sink holes, etc.) is discovered during construction, all regulated activities near the feature must be suspended immediately. The applicant or his agent must immediately notify the San Antonio Regional Office of the discovery of the feature. Regulated activities near the feature may not proceed until the executive director has reviewed and approved the methods proposed to protect the feature and the aquifer from potentially adverse impacts to water quality. The plan must be sealed, signed, and dated by a Texas Licensed Professional Engineer.
12. No wells exist on the site. All water wells, including injection, dewatering, and monitoring wells must be in compliance with the requirements of the Texas Department of Licensing and Regulation under Title 16 TAC Chapter 76 (relating to Water Well Drillers and Pump Installers) and all other locally applicable rules, as appropriate.
13. If sediment escapes the construction site, the sediment must be removed at a frequency sufficient to minimize offsite impacts to water quality (e.g., fugitive sediment in street being washed into surface streams or sensitive features by the next rain). Sediment must be removed from sediment traps or sedimentation ponds not later than when design capacity has been reduced by 50 percent. Litter, construction debris, and construction chemicals shall be prevented from becoming stormwater discharge pollutants.
14. 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.
15. 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.
16. Stabilization measures shall be initiated as soon as practicable in portions of the site where construction activities have temporarily or permanently ceased, and construction activities will not resume within 21 days. When the initiation of stabilization measures by the 14th day is precluded by weather conditions, stabilization measures shall be initiated as soon as practicable.

After Completion of Construction:

17. 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 San Antonio Regional Office within 30 days of site completion.
18. The applicant shall be responsible for maintaining the permanent BMPs after construction until such time as the maintenance obligation is either assumed in writing by another entity having ownership or control of the property (such as without limitation, an owner's association, a new property owner or lessee, a district, or municipality) or the ownership of the property is transferred to the entity. The regulated entity shall then be responsible for maintenance until another entity assumes such obligations in writing or ownership is transferred. A copy of the transfer of responsibility must be filed with the executive director through San Antonio Regional Office within 30 days of the transfer. A copy of the transfer form (TCEQ-10263) is enclosed.
19. Upon legal transfer of this property, the new owner(s) is required to comply with all terms of the approved Edwards Aquifer protection plan. If the new owner intends to commence any new regulated activity on the site, a new Edwards Aquifer protection plan that specifically

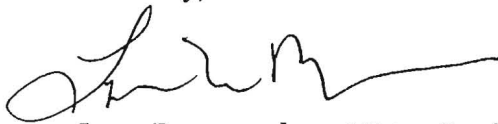
Mr. Ty Thaggard
Page 5
March 6, 2015

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.

20. An Edwards Aquifer protection plan approval or extension will expire and no extension will be granted if more than 50 percent of the total construction has not been completed within ten years from the initial approval of a plan. A new Edwards Aquifer protection plan must be submitted to the San Antonio Regional Office with the appropriate fees for review and approval by the executive director prior to commencing any additional regulated activities.
21. 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 Dianne Pavlicek-Mesa, P.G., of the Edwards Aquifer Protection Program of the San Antonio Regional Office at 210-403-4074.

Sincerely,



Lynn Bumgardner, Water Section Manager
San Antonio Region Office
Texas Commission on Environmental Quality

LB/DPM/eg

Enclosure: Deed Recordation Affidavit, Form TCEQ-0625
Change in Responsibility for Maintenance of Permanent BMPs, Form TCEQ-10263

cc: Mr. Matt Johnson, P.E., Pape-Dawson Engineers, Inc.
Mr. Thomas H. Hornseth, P.E., Comal County Engineer
Mr. Bill Krawietz, City of Bulverde
Mr. Roland Ruiz, Edwards Aquifer Authority
TCEQ Central Records, Building F, MC 212

RECEIVED

MAR 13 2015

COUNTY ENGINEER

COMAL



TCEQ-R13
JUL 20 2015
SAN ANTONIO

July 17, 2015

Ms. Todd Jones
Texas Commission on Environmental Quality
Region 13
14250 Judson Road
San Antonio, Texas 78233-4480

RECEIVED
JUL 24 2015

COUNTY ENGINEER

Re: Edwards Aquifer, Comal County
PROJECT: Wiley Road, located 0.3 miles east of intersection of US Hwy. 281 and FM 1863, Bulverde, Texas
TYPE: Cave/Solution Opening – Water Pollution Abatement Plan (WPAP); 30 Texas Administration Code (TAC) §213.5, Edwards Aquifer Protection Program ID No. 368.00

Dear Mr. Jones:

In accordance with the Texas Commission on Environmental Quality's (TCEQ) WPAP approval letter dated March 6, 2015, regarding the above referenced project, submitted with this letter are photographs, a description, and treatment methods for one (1) solution feature evaluated on July 1, 2015.

This project is currently under construction and your prompt attention would be very much appreciated. If you have questions or require additional information, please do not hesitate to call on us at your earliest convenience.

Sincerely,
Pape-Dawson Engineers, Inc.
Texas Board of Professional Engineers, Firm Registration #470
Texas Board of Professional Geoscientist, Firm Registration #503

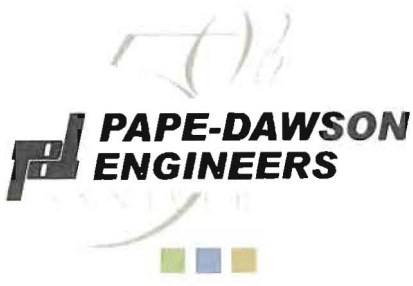
Cara C. Tackett, P.E.
Sr. Vice President



Amanda L. Miller, P.G.
Geologist

Attachments

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2015 JUL 13 AM 10:31

RECEIVED TCEQ
SAN ANTONIO
REGION

July 10, 2015

Ms. Todd Jones
Texas Commission on Environmental Quality
Region 13
14250 Judson Road
San Antonio, Texas 78233-4480

Re: Edwards Aquifer, Bexar County

PROJECT: Wiley Road, located 0.3 miles east of intersection of US Hwy. 281 and FM 1863, Bulverde, Texas
TYPE: Cave/Solution Opening – Water Pollution Abatement Plan (WPAP); 30 Texas Administration Code (TAC) §213.5. Edwards Aquifer Protection Program ID No. 368.00

Dear Mr. Jones:

In accordance with the Texas Commission on Environmental Quality's (TCEQ) WPAP approval letter dated March 6, 2015, regarding the above referenced project, submitted with this letter are photographs, a description, and treatment methods for one (1) solution feature evaluated on July 1, 2015.

This project is currently under construction and your prompt attention would be very much appreciated. If you have any questions or require additional information, please do not hesitate to call on us at your earliest convenience.

Sincerely,

Pape-Dawson Engineers, Inc.
Texas Board of Professional Engineers, Firm Registration #470
Texas Board of Professional Geoscientist, Firm Registration #50351

Cara C. Tackett, P.E.
Sr. Vice President



Amanda L. Miller, P.G.
Geologist

Attachments

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Solution Feature Discovery Notification Form
 Edwards Aquifer Protection Program
 For Regulated Activities on the Edwards Aquifer Recharge Zone and Transition Zone
 And Relating to 30 TAC 213.5(f)(2) Effective June 1, 1999

When reporting a solution feature encountered during construction activities please provide the following information:

Regulated Entity Name:	Wiley Road	EAPP ID #:	RN105558761 Investigation No. 1221272
Project Type:	WPAP SCS UST AST	Approval Date:	March 6, 2015
Regulated Entity Location:	0.3 miles east of intersection of US Hwy. 281 and FM 1863, Bulverde Texas	Approval Dates/ID#'s of any Modifications:	
Date Feature(s) Discovered:	June 30, 2015	Date TCEQ Notified:	July 1, 2015
Holder of Approved Plan:	M2G FM 1863 LTD	Solution Feature Plan Submitted By:	Cara C. Tackett, P.E.
Contact:	Mr. Ty Thaggard	Title:	Sr. Vice President
Title:	Managing Director	Company:	Pape-Dawson Engineers, Inc.
Mailing Address:	12330 West Avenue, Suite 204 San Antonio, Texas 78216	Mailing Address:	2000 NW Loop 410 San Antonio, Texas 78213
Phone:	(210) 822-7500	Phone:	210-375-9000
Fax:		Fax:	210-375-9010

Feature No.	Feature Dimensions	Location of Feature (Reference features related to a SCS by Line and Station)	Case*/Sensitivity**
1	2.4 'x 1.4' x ~12'	Located in cul-de-sac of Wiley Road; 29.737382, -98.430337 (see attached location map)	NA/NA

* per TCEQ Guidance Document 96.004
 ** per Geologic Assessment Table

- Plan, profile, cross section sketches, and photos for each feature are found as **ATTACHMENT 1**.
- Geologic Assessment Table (if applicable) is found as **ATTACHMENT 2**.
- Drawings and narrative descriptions of the proposed protection measures are found as **ATTACHMENT 3**.
- If the discovery is related to a sewage collection system, a Texas Registered Professional Engineer is required to submit the protection plan.

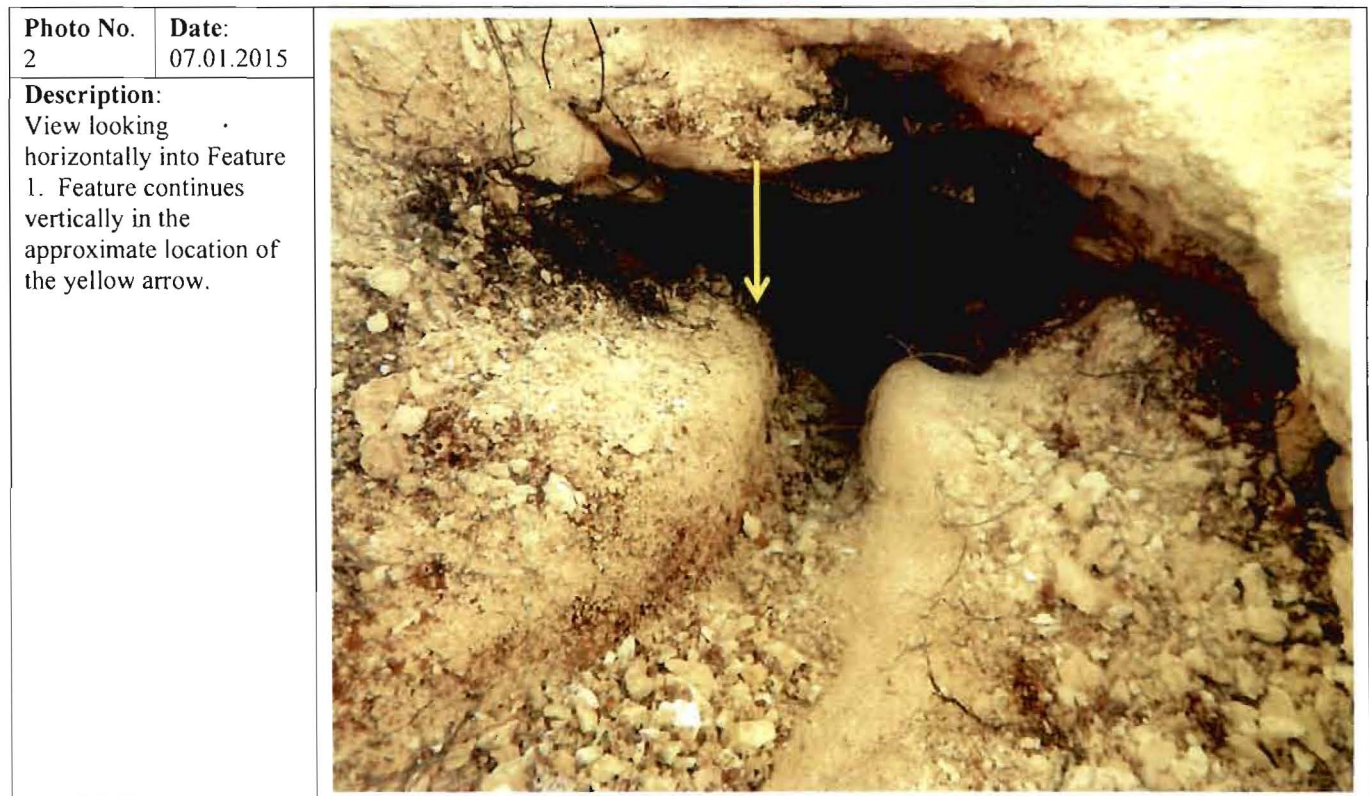
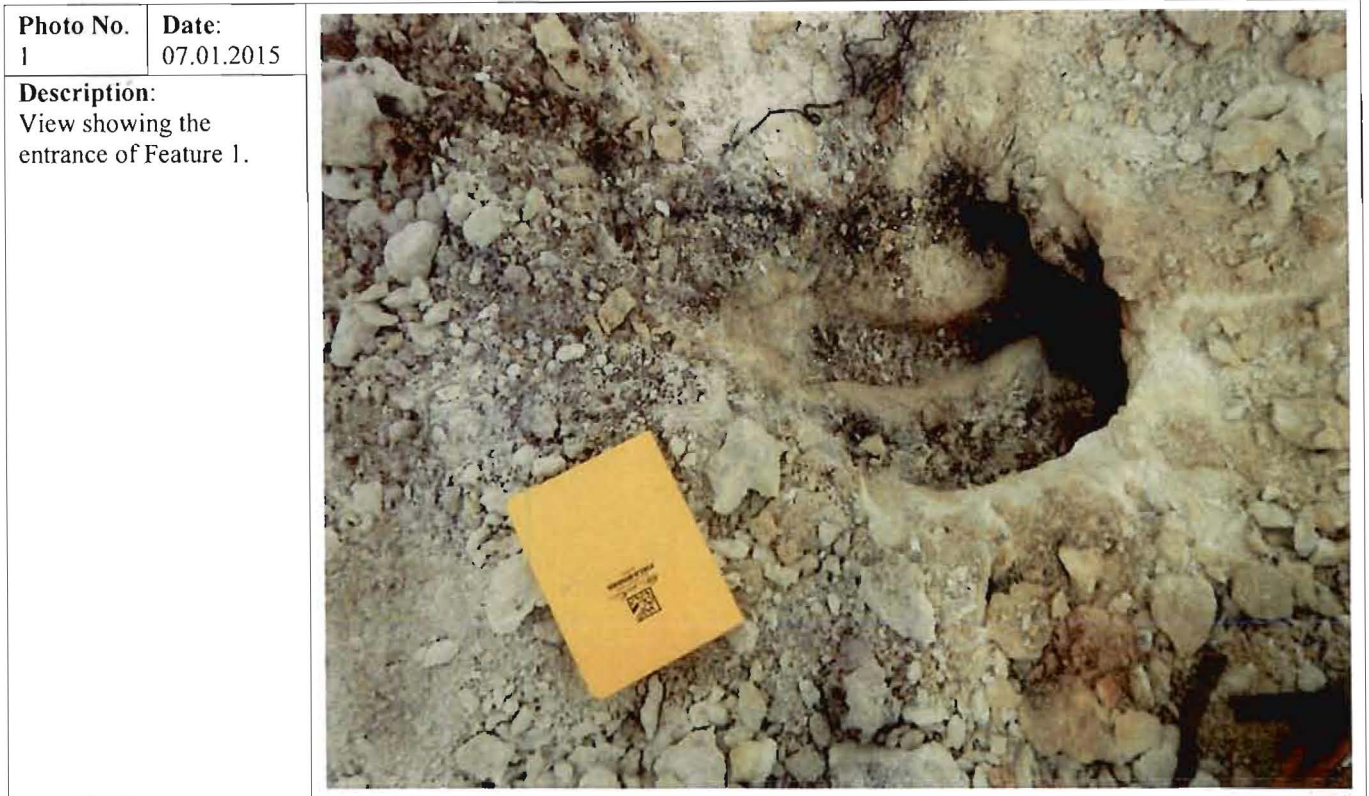
Submitted by:  Date: 7/10/15
 Printed name: Cara C. Tackett, P.E.

If you have questions on how to fill out this form or about the Edwards Aquifer protection program, please contact us at 210/490-3096 for projects located in the San Antonio Region or 512/339-2929 for projects located in the Austin Region.

Individuals are entitled to request and review their personal information that the agency gathers on its forms. They may also have any errors in their information corrected. To review such information, contact us at 512/239-3282

ATTACHMENT 1

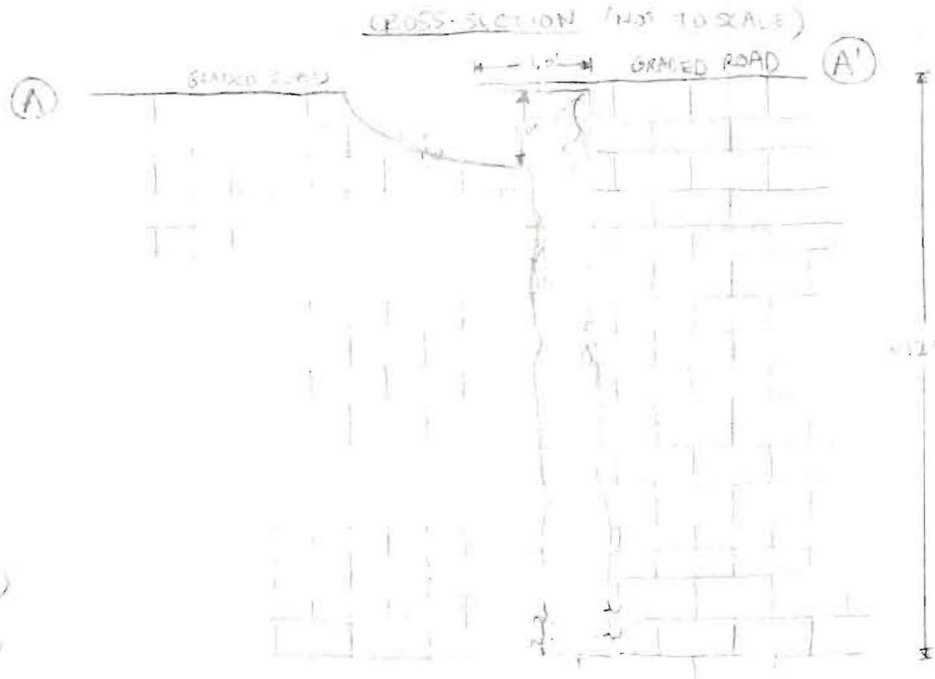
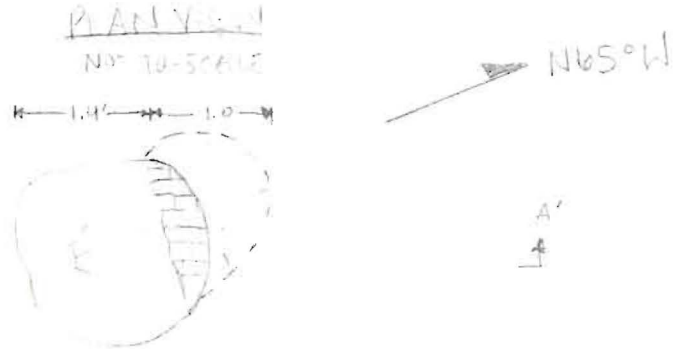
WILEY ROAD



PROJECT: WILEY ROAD
 PROJECT NO.: 6109-81 DATE: JULY 1, 2015
 DESCRIPTION: SOLUTION CAVITY, FEATURE # 1
 PAGE 1 OF 1



Amanda L. Miller
 JULY 10, 2015



LEGEND

- ROOTS
- VOID (VERTICAL CAVITY)
- BREAKDOWN FROM SURFACE
- INFERRED LIMITS
- WATER SEEPAGE
- EXTENT UNCERTAINTY
- SLOPE

NOTES: FEATURE HAS ABUNDANT ROOTS NEAR ENTRANCE BLOCKING VIEW WITH CAMERA. DEPT FROM ENTRANCE TAPE MEASUREMENT WAS USED TO COMPUTE TOTAL DEPTH. FEATURE WAS MARKED ON JULY 1, 2015 BY AMANDA L. MILLER.

ATTACHMENT 1

ATTACHMENT 2
(not applicable)

ATTACHMENT 3

WILEY ROAD

NARRATIVE DESCRIPTION

During grading for drainage improvements along Wiley Road, one solution feature was discovered. The solution feature is located within the Contributing Zone of the Edwards Aquifer (see location map in Attachment 1). A geologist evaluated the solution feature on July 1, 2015. Photographs of the feature and a description of observations are presented in Attachment 1.

Listed below is a table with the feature number, the TCEQ case number, and the proposed treatment type for the feature. The solution feature will receive a type C treatment, which is described in greater detail later in this submittal. The feature list is detailed as follows.

Feature Number	Photograph Number	Case	Treatment
1	1, 2	4	C

Although the feature is not within a sanitary or storm sewer trench, the proposed treatment type generally follows the treatments outlined in the attached Edwards Aquifer Protection Program "Minimum Protective Standards for Sewer Line and Storm Sewer Trenches", effective August 11, 1998.

Treatment "C"

1. Voids shall be filled with flowable fill to match final excavated elevation. Flowable fill should set 24-hours prior to next step.
2. Continue construction according to plans and specifications.

This treatment method is designed to address environmental concerns related to surface water infiltration and is not intended to address structural integrity issues.

Table 5-1 Minimum Protective Standards for Sewer and Storm Drain Trenches

(from Edwards Aquifer Guidance Document 96.004, Effective 8/11/98)

Case	Description	Concern	Treatment	Notification/Approval
1	Sensitive feature is less than or equal to six (6) inches in all directions and is located above the embedment of the pipe. All rock within and surrounding the feature is sound.	Not environmental nor pipe integrity	No abatement required.	None required.
2	Sensitive feature is either larger than six (6) inches in at least one direction or is located within the level of the pipe embedment. No portion of the sensitive feature may intersect the plane of trench floor. All rock within and surrounding the feature is sound.	Environmental	The sensitive feature shall be filled with concrete. Gravel to "fist sized" rock or sacks of gravel may be placed in feature prior to placement of the concrete as long as a minimum of eighteen (18) inches of concrete is used to close the feature).	Requires notification and prior written approval from TCEQ.
3	Sensitive feature intersects the plane of the trench floor is less than four (4) feet in any direction. All rock within and surrounding the feature is sound.	Environmental	Sensitive feature shall be filled with concrete. Gravel to "fist sized" rock or sacks of gravel may be placed in feature prior to placement of concrete at least eighteen (18) inches of concrete is used to close the feature. The sewer line or storm sewer lines shall be concrete encased for width of the sensitive feature plus a minimum of five (5) feet on either end. The encasement shall provide a minimum of six (6) inches of concrete on all sides of the pipe and shall have a compression strength of at least two thousand five hundred (2,500) psi (28-day strength). The concrete may be steel reinforced.	Requires notification and prior written approval from TCEQ.
4	Sensitive feature intersects the plane of the trench floor and any opening in trench floor is greater than four (4) feet in any direction or the trench floor is unstable.	Environmental & Structural	Requires an engineered resolution at least as protective as Case 3 above. Additional protective measures, including rerouting of line, may be required.	Requires notification and prior written approval from TCEQ.

All plans submitted to the TCEQ regional office shall have a signed and dated seal of a Texas licensed Professional Engineer. All plans will be reviewed on a case-by-case basis and additional protective measures or additional information may be required.



LAND DEVELOPMENT ENVIRONMENTAL TRANSPORTATION WATER RESOURCES SURVEYING

February 26, 2015

RECEIVED

MAR 13 2015

COUNTY ENGINEER

RECEIVED TCEQ
SAN ANTONIO
REGION
2015 MAR -2 AM 9:54

Ms. Dianne Pavlicek-Mesa, P.G.
TCEQ – Region 13
14250 Judson Road
San Antonio, Texas 78233

Re: Wiley Road WPAP
EAPP File No. 13-15011402
Response to Notice of Deficiency (NOD1)


Dear Ms. Pavlicek-Mesa:

The following is a response to the comment from your office dated February 17, 2015, regarding the Water Pollution Abatement Plan Application (WPAP) technical review for the above-referenced project. A copy of the comment email is attached for your reference.

1. Please provide a copy of the TSS Removal Calculations that are signed and sealed by the P.E.
Response: TSS Removal Calculations submitted on January 14, 2015 are provided. Please see the TSS Removal Calculations attached with this letter.
2. Please note that when an approval letter goes out for a project after comments have been satisfactorily addressed, a special condition is included indicating that prior to occupancy of the facility where there is a Permanent Best Management Practice (PBMP), that the PBMP must be operational. Please revise the Inspection, Maintenance, Repair, and Retrofit (IMRR) Plan to address that the PBMP (i.e., sedimentation/filtration basin) will become operation (converted from a temporary sedimentation basin) prior to first occupancy and that until all construction within the PBMP drainage area has been completed and exposed earth stabilized, that the PBMP will be inspected weekly and after all rain events.
Response: Inspection, Maintenance, Repair, and Retrofit (IMRR) Plan has been updated. Please see the revised IMRR Plan attached with this letter.

Your prompt attention to this submittal is greatly appreciated. Please do not hesitate to contact our office if you have further questions or require additional information.

Sincerely,
Pape-Dawson Engineers, Inc.
Texas Board of Professional Engineers, Firm Registration # 470


Matt Johnson, P.E.
Vice President

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Protecting Texas
by Reducing and
Preventing Pollution

Fax Cover Sheet

Number of Pages:
(Including this sheet)

2

Date: February 17, 2015
To: Matt Johnson, P.E. *CLAIRe MARTIN*
Organization: Pape-Dawson Engineers, Inc.
Fax: 210-375-9010

RECEIVED
MAR 13 2015
COUNTY ENGINEER

To: Ty Thaggard
Organization: M2G FM 1863, Ltd.
Fax: tdt@milamcapital.com

From: Dianne Pavlicek-Mesa, P.G.
Division : Edwards Aquifer Protection Program - San Antonio Region
 Texas Commission on Environmental Quality
Phone: 210-403-4074
Fax: 210-545-4329

Re: Edwards Aquifer, Comal County

Name of Project: Wiley Road; Located approximately 0.3 miles east of the intersection of Hwy 281 and FM 1863; Bulverde, Texas

Plan Type: Request for the Water Pollution Abatement Plan (WPAP); 30 Texas Administrative Code (TAC) Chapter 213;

EAPP File No. 13-15011402

Dear Mr. Johnson:

We are in the process of technically reviewing the WPAP you submitted on the above-referenced project. Before we can proceed with our review, the following comments relating to the application must be addressed.

1. Please provide a copy of the TSS Removal Calculations that are signed and sealed by the P.E.
2. Please note that when an approval letter goes out for a project after comments have been satisfactorily addressed, a special condition is included indicating that prior to occupancy of the facility where there is a Permanent Best Management Practice (PBMP), that the PBMP must be operational. Please revise the Inspection, Maintenance, Repair, and Retrofit (IMRR) Plan to address that the PBMP (i.e., sedimentation/filtration basin) will become operational (converted from a temporary sedimentation basin) prior to first occupancy and that until all construction within the PBMP drainage area has been completed and

exposed earth stabilized, that the PBMP will be inspected weekly and after all rain events.

We ask that you submit one original and four copies of the amended materials to supplement the WPAP to this office by no later than **14 days from the date of this fax** to avoid denial of the plan. If the response to this notice is not received, is incomplete or inadequate, or provides new information that is incomplete or inadequate, a second notice will be sent to you requiring a response within 14 days from the notice date. 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 will be denied unless you provide written notification that the application is being withdrawn. Please note that the application fee will be forfeited if the plan is not withdrawn. If you have any questions or require additional information, please contact Dianne Pavlicek, P.G., of the Edwards Aquifer Protection Program of the San Antonio Regional Office at (210) 403-4074.

RECEIVED
MAR 13 2015
COUNTY ENGINEER

RECEIVED

MAR 13 2015

COUNTY ENGINEER

**PERMANENT POLLUTION ABATEMENT MEASURES
MAINTENANCE SCHEDULE AND MAINTENANCE PROCEDURES**

This document has been prepared to provide a description and schedule for the performance of maintenance on permanent pollution abatement measures. Maintenance measures to be performed will be dependent on what permanent pollution abatement measures are incorporated into the project. The project specific water pollution abatement plan should be reviewed to determine what permanent pollution abatement measures are incorporated in to a project.

It should also be noted that the timing and procedures presented herein are general guidelines. Adjustment to the timing and procedures may have to be made depending on project specific characteristics as well as weather related conditions but may not be altered without TCEQ approval.

Where a project is occupied by the owner, the owner may provide for maintenance with his own skilled forces or contract for recommended maintenance of Permanent Best Management Practices. Where a project is occupied or leased by a tenant, the owner shall require tenants to contract for such maintenance services either through a lease agreement, property owners association covenants, or other binding document.

After completion of civil infrastructure, all permanent BMPs will be cleaned and established to proper operating conditions. Upon completion of the civil infrastructure and while construction is underway, inspections of the water quality basin will be the responsibility of the builder. The builder will include written acknowledgement of acceptance of regular inspections and maintenance as part of his TPDES plan in place during construction. During construction, monthly inspections of the permanent BMPs will be the responsibility of the builder. After 25% of the total construction within the project is complete, the builder may reduce the inspection frequency of the basin to the bi-annual frequency outlined on the Inspection and Maintenance Schedule for Permanent Pollution Abatement Measures (Attachment G) as well as in the maintenance plan and schedule outlined in TCEQ's Technical Guidance Manual (TGM) RG-348 Section 3.5, so long as there have been three (3) consecutive inspections of the basin that have resulted in satisfactory compliance. Satisfactory compliance for three (3) consecutive months would indicate that the upstream temporary BMPs installed on each lot for construction are functioning appropriately. At any point during the process of construction, the ownership and ultimate responsibility of the permanent BMP may be transferred (such as to a new property owner, -owner's association, or lessee). If such transfer occurs before 25% of the total construction is complete, then the builder will need to include written documentation accepting responsibility of inspections and maintenance of the water quality basin from the new owner/responsible party until such time as those more inspections are no longer needed and the

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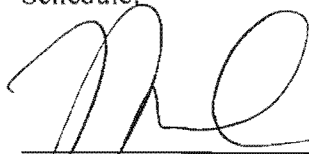
COUNTY ENGINEER

WILEY ROAD
Permanent Pollution Abatement Measures

bi-annual inspections proposed in the permanent inspection and maintenance schedule (Attachment G) may be used.

I understand that I am responsible for maintenance of the Permanent Pollution Abatement Measures included in this project until such time as the maintenance obligation is either assumed in writing by another entity having ownership or control of the property or ownership is transferred.

I, the owner, have read and understand the requirements of the attached Maintenance Plan and Schedule.



Ty Thaggard
M2G FM 1863, Ltd

2/23/15

Date

WILEY ROAD
Permanent Pollution Abatement Measures

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**INSPECTION AND MAINTENANCE SCHEDULE
 FOR
 PERMANENT POLLUTION ABATEMENT MEASURES**

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Recommended Frequency	Task to be Performed													
	1	2	3	4	5	6	7	8	9	10	11	12	13	14
After Rainfall	√							√	√					
Biannually*	√	√	√	√	√	√	√	√	√					√

**At least one biannual inspection must occur during or immediately after a rainfall event.
 √Indicates maintenance procedure that applies to this specific site.*

See description of maintenance task to be performed on the following pages. Frequency of maintenance tasks may vary depending on amount of rainfall and other weather related conditions.

A written record should be kept of inspection results and maintenance performed.

<i>Task No. & Description</i>	<i>Included in this project</i>	
1. Check Depth of Vegetation	Yes	No
2. Check Depth of Silt Deposit in Basin	Yes	No
3. Removal of Debris and Trash	Yes	No
4. Cut-off Valve	Yes	No
5. Inlet Splash Pad	Yes	No
6. Underdrain System	Yes	No
7. Structural Integrity	Yes	No
8. Discharge Pipe	Yes	No
9. Drawdown Time	Yes	No
10. Vegetated Filter Strips	Yes	No
11. For Pump Stations	Yes	No
12. For Pump Stations	Yes	No
13. For Pump Stations	Yes	No
14. Visually Inspect Security Fencing for Damage or Breach	Yes	No

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Permanent Pollution Abatement Measures

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MAINTENANCE PROCEDURES FOR PERMANENT POLLUTION ABATEMENT
MEASURES

Note: Additional guidance can be obtained from TCEQ's Technical Guidance Manual (TGM) RG-348 (2005) Section 3.5.

1. Check Depth of Vegetation. Vegetation in the basin shall not exceed 18-inches in depth. When vegetation needs to be cut, it shall be cut to an approximately 4-inch height. *A written record should be kept of inspection results and maintenance performed.*

2. Check Depth of Silt Deposit in Basin. Top of cleanouts shall be set 4-inches above sand layer. When silt has accumulated to top of cleanouts, the silt shall be removed. The top two (2) inches of the sand media shall also be removed and replaced with clean, silica-based washed sand meeting ASTM C33 specifications [0.0165 inch (#40 sieve) to 0.0469 inch (#16 sieve)]. Silt/sediment shall be cleared from the inlet structure at least every year and from the basin at least every five (5) years. Any sand discolored as a result of apparent impact by petroleum hydrocarbon or hazardous materials should also be removed and replaced. *Written record should be kept of inspection results and maintenance performed.*

3. Removal of Debris and Trash. The basin and inlet structure shall be checked for the accumulation of debris and trash such as brush, limbs, leaves, paper cups, aluminum cans, plastic bottles etc. Accumulated trash and debris shall be raked or collected from the basin and inlet structure and disposed of properly. *Written record should be kept of inspection results and maintenance performed.*

4. Cut-off Valve. The cut-off valve shall be turned to confirm full opening and full closure. Prior to operating the valve, the valve setting shall be checked to determine the position to which the valve is to be returned (which should limit drawdown time of the basin between 24-hours and 48-hours). Count should be kept of number of turns to open and close the valve

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Permanent Pollution Abatement Measures

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so that the valve can be reset to the starting position. Defects in the operation of the cut-off valve shall be corrected within 7 working days. *A written record should be kept of inspection results and maintenance performed.*

5. Inlet Splash Pad. The filter area around the inlet splash pad shall be checked for erosion and for the condition of the rock rubble. Erosion or disturbance of the rock rubble should be corrected by removing the rock rubble, restoring missing sand media to appropriate depth and replacement of the rock rubble. If the condition persists in subsequent inspections, the size of the rock rubble should be increased. Rubble should be placed to a density that minimizes the amount of exposed sand between the rock rubble. Deficiencies should be corrected within seven working days. *A written record should be kept of inspection results and maintenance performed.*

6. Underdrain System. The underdrain system shall be visually inspected for the accumulation of silt in the pipe system. The pipe clean-outs shall have the caps removed and visually inspected for accumulation of silt deposits. If silt deposits appear to have accumulated so as to significantly reduce the drain capacity of the pipes then maintenance shall be performed. When silt deposits have accumulated to the stage described above, the clean-outs and drainpipes can be flushed with a high-pressure water flushing process. Clean-out caps must be replaced onto the clean-outs after maintenance so as to avoid the possibility of short circuiting the filtering process. Sediment accumulation at outlet pipe or in wet well due to flushing shall be removed and disposed of properly. *A written record should be kept of inspection results and the maintenance performed.*

7. Structural Integrity. In addition to Items 1 through 6 the following are measures which should be reviewed during a check of structural integrity:
 - Observe the height of the confining berm for visible signs of erosion or potential breach. Signs of erosion should be identified and repaired immediately. Corrective measures

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Permanent Pollution Abatement Measures

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include but are not limited to addition of topsoil or appropriate soil material so as to restore the original berm height of the sand filter basin. Restored areas shall be protected through placement of solid block sod.

- Bypass of filter process. This condition can manifest itself in several ways. One way is by visually inspecting the clean-outs for accumulation of silt as described in Item 6. Significant accumulations of silt could be a sign of a torn filter fabric. Observations should be made over several inspection cycles to determine whether the condition persists. A second non-intrusive way of making observations for structural condition would be to visually look for collapsed or depressed areas along the edge of the filter media interface with basin side slope. If condition exists, corrective action should be performed within 15 working days. Removal of sand and replacement of filter fabric and/or pipe and gravel may be necessary. *A written record should be kept of inspection results and corrective measures taken.*

- 8. Discharge Pipe. The basin discharge pipe shall be checked for accumulation of silt, debris or other obstructions which could block flow. Soil accumulations, vegetative overgrowth and other blockages should be cleared from the pipe discharge point. Erosion at the point of discharge shall be monitored. If erosion occurs, the addition of rock rubble to disperse the flow should be accomplished. *A written record should be kept of inspection results and corrective measures taken*

- 9. Drawdown Time. This characteristic can be a sign of the need for maintenance. The minimum drawdown time is 24 hours. If drawdown time is less than 24 hours, the gate valve shall be checked and partially closed to limit the drawdown time. Extensive drawdown time greater than 48 hours may indicated blockage of the sand media, the underdrain system and/or the discharge pipe. Corrective actions should be performed and completed within 15 working days. *A written record of the inspection findings and corrective actions performed should be made.*

WILEY ROAD
Permanent Pollution Abatement Measures

10. Vegetated Filter Strips. Vegetation height for native grasses shall be limited to no more than 18-inches. When vegetation exceeds that height, the filter strip shall be cut to a height of approximately 4 inches. Turf grass shall be limited to a height of 4-inches with regular maintenance that utilizes a mulching mower. Trash and debris shall be removed from filter strip prior to cutting. Check filter strip for signs of concentrated flow and erosion. Areas of filter strip showing signs of erosion shall be repaired by scarifying the eroded area, reshaping, regrading and placement of solid block sod over the affected area. *A written record of the inspection findings and corrective actions performed should be made*

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11. For Pump Stations. Check wet well discharge pipe to confirm flow through the pump system. If flow is not present, allow sufficient time for pump to cycle on and off. If flow does not occur, the wet well should be checked for the level of water. The wet well should be opened and the on/off float switches should be moved up and down to activate the pump. If the pump does not start, a repair technician shall be called in to repair the malfunction within 5 working days. *A written record of the inspection findings and corrective actions performed should be made*

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12. For Pump Stations. Check the wet well for accumulation for trash, debris and silt. Trash and debris shall be removed and disposed of properly. Silt depth can be checked by probing the bottom of the wet well with a stick or PVC pipe. Silt accumulations should be removed when silt collects to a depth of three (3) inches over the entire wet well bottom. Silt can be removed by vacuum pump method. If silt buildup continues, underdrain system shall be inspected. *A written record should be kept of inspection results and maintenance performed.*

13. For Pump Stations. Visually check aboveground pump wiring and connections for damage. Damaged or loose connections should be repaired within 5 working days. *A written record should be kept of inspection results and the maintenance performed.*

WILEY ROAD
Permanent Pollution Abatement Measures

14. Visually Inspect Security Fencing for Damage or Breach. Check maintenance access gates for proper operation. Damage to fencing or gates shall be repaired within 5 working days. *A written record should be kept of inspection results and maintenance performed.*

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Matt Johnson
11/9/15

POLLUTANT LOAD AND REMOVAL CALCULATIONS

Texas Commission on Environmental Quality

TSS Removal Calculations

Project: **Wiley Road Water Quality Basin**
 Watershed: **A + B**

Input By User
 Automatically Calculated Variables

Job No.: **6109-60**
 Date: **1/8/2015**

1. Calculate Required Load Reduction

$$L_m = 27.2(A_n \times P)$$

where:
 L_m = Required TSS removal from proposed development
 A_n = Net increase in impervious area for project
 P = Average annual precipitation, inches

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Site Data:		
County =	Gomal	
Basin watershed area =	13.70	acres
Predevelopment impervious area =	0.00	acres
Post-development impervious area =	2.65	acres
Post-development impervious fraction =	0.19	
P =	33	inches

$L_m = 2,378.64$ lbs ← 0.00 lbs included for overtreatment of uncaptured area

2. Select BMP

Proposed BMP = **SF** abbreviation
 Removal efficiency = **89** percent

- AC= Aqualogic™ Cartridge Filter
- BR= Bioretention
- CW= Constructed Wetland
- RI= Retention / Irrigation
- SF= Sand Filter
- WB= Wet Basin

3. Calculate TSS Load Removed by BMP

$$L_r = (\text{BMP efficiency}) \times P \times (A_i \times 34.6 + A_p \times 0.54)$$

where:
 L_r = TSS Load removed by BMP
 A_i = Impervious area of BMP catchment
 A_p = Pervious area of BMP catchment

A_i =	2.65	acres
A_p =	11.05	acres
L_r =	2,868.19	lbs

4. Calculate Fraction of Annual Runoff to Treat

$F = 0.83$ OK

5. Calculate Capture Volume

Rainfall Depth = **1.20** inches
 Post-development Runoff Coefficient = **0.20**
 Runoff Volume = **11,736** cubic feet
 Storage for Sediment = **2,347** cubic feet

Total Capture Volume **14,083** cubic feet

6. Calculate Sand Area Required

$A_f = WQV/10$ (for systems combining filtration and sedimentation in a single basin; Partial Sedimentation)
 $A_f = WQV/18$ (for systems combining filtration and sedimentation in a separate basins; Full Sedimentation)

Required Sand Area **1,174** square feet

Check if Partial Sedimentation Is Used

Required Sand Area **652** square feet

Check if Full Sedimentation Is Used

Texas Commission on Environmental Quality

TSS Removal Calculations

Project: **Wiley Road Water Quality Basin**
 Watershed: **A + B**

Input By User
 Automatically Calculated Variables

Job No.: **6100-60**
 Date: **2/26/2015**

1. Calculate Required Load Reduction

$$L_m = 27.2(A_n \times P)$$

where:
 L_m = Required TSS removal from proposed development
 A_n = Net increase in impervious area for project
 P = Average annual precipitation, inches

Site Data:
 County = **Comal**
 Basin watershed area = **13.70** acres
 Predevelopment impervious area = **0.00** acres
 Post-development impervious area = **2.65** acres
 Post-development impervious fraction = **0.19**
 P = **33** inches

L_m = **2,378.64** lbs ← **0.00** lbs included for overtreatment of uncaptured area

2. Select BMP

Proposed BMP = **SF** abbreviation
 Removal efficiency = **89** percent

AC= Aqualogic™ Cartridge Filter
 BR= Bioretention
 CW= Constructed Wetland
 RI= Retention / Irrigation
 SF= Sand Filter
 WB= Wet Basin

3. Calculate TSS Load Removed by BMP

$$L_r = (\text{BMP efficiency}) \times P \times (A_i \times 34.6 + A_p \times 0.54)$$

where:
 L_r = TSS Load removed by BMP
 A_i = Impervious area of BMP catchment
 A_p = Pervious area of BMP catchment

A_i = **2.65** acres
 A_p = **11.05** acres
 L_r = **2,668.19** lbs

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4. Calculate Fraction of Annual Runoff to Treat

F = **0.83** OK

5. Calculate Capture Volume

Rainfall Depth = **1.20** inches
 Post-development Runoff Coefficient = **0.20**
 Runoff Volume = **11,736** cubic feet
 Storage for Sediment = **2,347** cubic feet

Total Capture Volume **14,083** cubic feet

6. Calculate Sand Area Required

A_f = WQV/10 (for systems combining filtration and sedimentation in a single basin; Partial Sedimentation)
 A_f = WQV/18 (for systems combining filtration and sedimentation in a separate basins; Full Sedimentation)

Required Sand Area **1,174** square feet

Check if Partial Sedimentation Is Used

Required Sand Area **652** square feet

Check if Full Sedimentation Is Used

Texas Commission on Environmental Quality

TSS Removal Calculations

Project: **Wiley Road Water Quality Basin**
 Watershed: **A + B**

Input By User
 Automatically Calculated Variables

Job No.: **6109-60**
 Date: **2/26/2015**

BASIN SIZING TABLES FOR INTERNAL USE ONLY

Required Sand Area **1,408** square feet For single-chamber basin design (includes 20% increase in sand area)

Rectangular Vertical Wall Basin (PARTIAL SEDIMENTATION)

Check if Vertical Wall Basin Is Used

	<input checked="" type="radio"/> Alternative 1	<input type="radio"/> Alternative 2	
Area =	13.70	13.70	Watershed drainage area
Width =	62.4	192.0	Basin width (Inner Wall Dimension)
Length =	62.4	63.0	Basin length (Inner Wall Dimension)
D _s =	6.0	7.0	Basin depth (Water Storage Depth)
FB =	2.000	1.500	Freeboard in basin plus head above weir (head (ft) + 0.5 ft FB)
Lg Rmp =	1,440	1,680	Large ramp: cf (12 ft. wide ramp @ 4:1 slope)
Sm Rmp =	960	1,120	Small ramp: cf (8 ft. wide ramp @ 4:1 slope) (6 ft is too small for machinery)
Vol + Rmp =	15,523	15,763	Capture volume required plus large ramp requirement
Vol + Rmp =	15,043	15,203	Capture volume required plus small ramp requirement
A _r =	3,893	12,096	Sand area of basin (you need to subtract area of ramp)
Vol. =	23,355	84,672	Total volume of basin (Water Storage + Ramp)
Vol. _{target} =	15,523	15,763	Total capture volume (plus ramp volume)
Af _{target} =	1,174	1,174	Minimum Filtration surface area (sf) = WQV/10

*Dimensions do not reflect weir height or free board height - dimensions are at water surface
 **For Actual Sand Area, must subtract area taken by maintenance ramp, splashpads, etc.
 ***Structural Engineer must provide structural design and wall thickness. Length and Width are at inner wall for storage only.

Rectangular Basin w/ 3:1 Side Slopes (PARTIAL SEDIMENTATION)

Check if Side Slope Basin Is Used

A_D = 13.70 Drainage area (acres)
 H = 1.20 Runoff depth (in)
 Vol. = 14,083 Total capture volume

	<input type="radio"/> Alternative 1	<input type="radio"/> Alternative 2	
Area =	13.70	13.70	Watershed drainage area
Width =	58.0	65.0	Basin width (at Water Surface)
Length =	175.0	90.0	Basin length (at Water Surface)
D _s =	3.0	4.0	Basin depth (Water Storage Depth)
FB + Weir	1.5	1.5	Freeboard in basin plus head above weir (head (ft) + 0.5 ft FB)
L =	1.5	1.5	Sand bed depth (ft)
Slope =	3	3	Side Slopes of Basin Walls
Liner Slope =	3	3	Side Slope of Liner/Underdrain (Typ 3:1)
Vol. =	24,483	16,728	Capture Volume - not including ramps (if applicable)
A _r =	4,588	1,824	Sand bed area at minimum width (ie bottom of sand)
Vol. _{target} =	14,083	14,083	Total capture volume
Af _{target} =	1,174	1,174	Minimum Filtration surface area (sf) = WQV/10

*Dimensions are at water surface only. Additional Area required for weir, FB, Top of Bank, and Grading.
 **Volume does not account for the need for a maintenance ramp. If side slopes exceed 3:1, a ramp is needed.
 ***For Actual Sand Area, must subtract area taken by maintenance ramp, splashpads, etc.

OVERFLOW DESIGN:

$$L = \frac{Q}{C \times h^{(3/2)}} \quad Q = 60.6$$

Where : L = Length of opening needed for Q₂₅ (in feet)
 Q = Flow in cfs based on intensity for 25yr. storm
 C = 3.087
 h = head of weir (in feet)

Use A if the length is unknown, and B when the length is known.

A) When **h = 1** L₁ = **19.63** feet
 B) When **L = 20** h₁ = **0.99** feet

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TSS Removal Calculations

Project: **Wiley Road Water Quality Basin**
Watershed: **A + B**

Input By User
Automatically Calculated Variables

Job No.: **6109-60**
Date: **2/26/2015**

Uncaptured Required Load Reduction

$$L_m = 27.2(A_n \times P)$$

where:

L_m = Required TSS removal from proposed development

A_n = Net increase in impervious area for project

P = Average annual precipitation, inches

Site Data:

County =	Comal	
Uncaptured watershed area =	0.00	acres
Predevelopment impervious area =	0.00	acres
Post-development impervious area =	0.00	acres
Post-development impervious fraction =	#DIV/0!	
P =	33	inches
L_m =	0.00	lbs

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TSS Removal Calculations

Project: **Wiley Road Water Quality Basin**
 Watershed: **A + B**

Input By User
 Automatically Calculated Variables

Job No.: **6109-60**
 Date: **2/26/2015**

1. Calculate Required Load Reduction

$$L_m = 27.2(A_n \times P)$$

where:
 L_m = Required TSS removal from development
 A_n = Net increase in impervious area for project
 P = Average annual precipitation, inches

Site Data:

County = **Comal**
 Basin watershed area = **3.43** acres
 Predevelopment impervious area = **0.00** acres
 Post-development impervious area = **2.65** acres
 Postdevelopment impervious fraction = **0.77**
 P = **33** inches

L_m = **2,378.64** lbs ← **0.00** lbs included for overtreatment of uncaptured area

2. Select BMP

Proposed BMP = **SF** abbreviation
 Removal efficiency = **89** percent

AC= Aqualogic™ Cartridge Filter
 BR= Bioretention
 CW= Constructed Wetland
 RI= Retention / Irrigation
 SF= Sand Filter
 WB= Wet Basin

3. Calculate TSS Load Removed by Partial Full

$$L_R = (\text{BMP efficiency}) \times P \times (A_i \times 34.6 + A_p \times 0.54)$$

where:
 L_R = TSS Load removed by BMP
 A_i = Impervious area of BMP catchment
 A_p = Pervious area of BMP catchment Check if Vertical

A_i = **2.65** acres
 A_p = **0.78** acres
 L_r = **2,705.31** lbs

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4. Calculate Fraction of Annual Runoff to Treat

F = **0.88** **OK**
 Check if Side Slope

5. Calculate Capture Volume

⊙ Rainfall Depth = **1.50** inches
 Post Development Runoff Coefficient = **0.59**
 Runoff Volume = **10,974** cubic feet
 Storage for Sediment = **2,195**

Total Capture Volume **13,169** cubic feet

6. Calculate Sand Area Required

A_f = $WQV/10$ (for systems combining filtration and sedimentation in a single basin)
 A_f = $WQV/18$ (for systems combining filtration and sedimentation in a separate basins)

Required Sand Area **1,097** square feet

Required Sand Area **610** square feet

Texas Commission on Environmental Quality

TSS Removal Calculations

Project: **Wiley Road Water Quality Basin**
 Watershed: **A + B**

Input By User
 Automatically Calculated Variables

Job No.: **6100-60**
 Date: **2/26/2015**

BASIN SIZING TABLES FOR INTERNAL USE ONLY

Required Sand Area **1,317** square feet For single-chamber basin design (includes 20% increase in sand area)

Rectangular Vertical Wall Basin (PARTIAL SEDIMENTATION)

	Alternative 1	Alternative 2	
Area =	3.43	3.43	Watershed drainage area
Width =	100.0	100.0	Basin width (Inner Wall Dimension)
Length =	100.0	100.0	Basin length (Inner Wall Dimension)
D _s =	4.0	5.0	Basin depth (Water Storage Depth)
FB + Weir	1.500	1.500	Freeboard in basin plus head above weir (head (ft) + 0.5 ft FB)
Lg Rmp	672	960	Large Ramp: cf (12 ft. wide ramp @ 4:1 slope)
Sm Rmp	448	640	Small Ramp: cf (8 ft. wide ramp @ 4:1 slope) (6 ft is too small for machinery)
Vol + Rmp	13,841	14,129	Capture volume required plus LG ramp requirement
Vol + Rmp	13,617	13,809	Capture volume required plus SM ramp requirement
A _r =	10,000	10,000	Sand area of basin (you need to subtract area of ramp)
Vol _r =	40,000	50,000	Total volume of basin (Water Storage + Ramp)
Vol _{target} =	13,841	14,129	Total capture volume (plus ramp volume)
A _{f target} =	1,097	1,097	Minimum filtration surface area (sf)=WQV/10; Increase by 20% for single-chamber basin

*Dimensions are at water surface only.

**For Actual Sand Area, must subtract area taken by maintenance ramp, splashpads, etc.

***Structural Engineer must provide structural design and wall thickness. Length and Width are at inner wall for storage only.

Rectangular Basin w/ 3:1 Side Slopes (PARTIAL SEDIMENTATION)

A_D = 3.43 Drainage area (acres)
 H = 1.50 Runoff depth (in)
 Vol. = 13,169 Capture Volume including the 20% for sediment accumulation

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	Alternative 1	Alternative 2	
Area =	3.43	3.43	Watershed drainage area
Width =	108.0	100.0	Basin length (at Water Surface)
Length =	192.0	100.0	Basin width (at Water Surface)
D _s =	5.0	5.0	Basin depth (Water Storage ONLY)
FB + Weir	1.5	1.5	Freeboard in basin plus head above weir (head (ft) + 0.5 ft FB)
L =	1.5	1.5	Sand bed depth (ft)
Slope =	3	3	Side Slopes of Basin Walls
Liner Slope =	3	3	Side Slope of Liner/Underdrain (Typ 3:1)
Vol _r =	82,680	36,500	Capture Volume - not including ramps (if applicable)
A _r =	10,557	3,721	Sand bed area at minimum width (i.e. bottom of sand)
Vol _{target} =	13,169	13,169	Total capture volume
A _{f target} =	1,097	1,097	Minimum Filtration surface area (sf) = WQV/10; Increase by 20% for single-chamber basin

*Dimensions are at water surface only. Additional Area required for weir, FB, Top of Bank, and Grading.

**Volume does not account for the need for a maintenance ramp. If side slopes exceed 3:1, a ramp is needed.

***For Actual Sand Area, must subtract area taken by maintenance ramp, splashpads, etc.

OVER FLOW DESIGN:

$$L = \frac{Q}{C \times h^{(3/2)}}$$

$$Q = 0$$

Where : L = Length of opening needed for Q₂₅ (in feet)
 Q = Flow in cfs based on intensity for 25yr. storm
 C = 3.087
 h = head of weir (in feet)

Use A if the length is unknown, and B when the length is known.

A) When **h = 1** L_r = **0.00** feet

B) When **L = 1** h_r = **0.00** feet

BASIN DRAWDOWN CALCULATIONS

 Input By User
 Automatically Calculated Variables

Project: Wiley Road Water Quality Basin
 Watershed: 1

Job No.: 610953
 Date: 2/26/2015

Basin Volume	21,645 Cubic Feet	161,916 Gallons
Basin Water Storage Depth	6.0 Feet	
Sand Surface Area	3,160 Square Feet	
Sand Depth	1.5 Feet	
Outlet Pipe Diameter	6 Inches	
Outlet Pipe Slope	0.5 Percent	

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Flow Rate for 24 Hour Drawdown

$$\frac{21,645 \text{ CF}}{1440 \text{ Min/Day}} = 15.03 \text{ CF/Min} = \text{0.25 CF/Sec} \text{ or } 1.87 \text{ Gal/Sec}$$

Check flow through rate (Q) of basin sand surface area using 2Ft/Day for k for sand. Book values range from 2 to 3.5 Feet/Day.

Af= Sand filter surface area in Square Feet
 L= Sand Bed Depth in Feet
 h= Average head of water above sand surface in Feet

h= 3 Feet

Calculate $i = (h+L)/L = 3.00$

Drawdown Rate Through Sand Flow

Drawdown Assuming Sand Flow Through Rate at 2ft/day

$$Q = kiAf \quad 2.0 \text{ Ft/Day} \times 3.00 \times 3,160 \text{ Sq.Ft} = 18,960 \text{ CF/Day} \text{ or}$$
$$141,831 \text{ Gal/Day} \text{ or}$$
$$98 \text{ Gal/Min} \text{ or}$$
$$1.6 \text{ Gal/Sec}$$
$$\frac{161,916 \text{ Gallons}}{141,831 \text{ Gal/Day}} = 1.14 \text{ Day} = 27.40 \text{ Hours}$$

Drawdown Assuming Sand Flow Through Rate at 3.5ft/day

$$Q = kiAf \quad 3.5 \text{ Ft/Day} \times 3.00 \times 3,160 \text{ Sq.Ft} = 33,180 \text{ CF/Day} \text{ or}$$
$$248,204 \text{ Gal/Day} \text{ or}$$
$$172 \text{ Gal/Min} \text{ or}$$
$$2.9 \text{ Gal/Sec}$$
$$\frac{161,916 \text{ Gallons}}{248,204 \text{ Gal/Day}} = 0.65 \text{ Day} = 15.66 \text{ Hours}$$

Conclusion:

- If drawdown is greater than 24 Hours and less than 48 Hours, sand surface may control drawdown. Check drawdown on pipe.
- If drawdown is less than 24 Hours then sand filter area does not control drawdown. Check drawdown through discharge pipe.

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Drawdown Rate Through Discharge Pipe

Size in Inches = 6
 Slope in Percent = 0.5
 n coefficient = 0.009
 Rate (From Table 1 Below) = 350.18 GPDx1000 = 350,180 GPD = 243.18 GPM

Drawdown
 Time = $\frac{161,916 \text{ Gallons}}{243.18 \text{ GPM}}$ = 0.46 Days = **11.10 Hours**

TABLE 1
 Flow Characteristics For Sewer PVC Pipe (Flow Velocity Ft/Sec x 1000 US GPD)

Slope (Ft/100 Ft)	Pipe Diameter (Inches)		
	4	6	8
	Rate		
0.10	54.29	156.61	341.15
0.20	76.78	221.47	482.46
0.30	94.04	271.25	590.89
0.40	108.59	313.21	682.3
0.50	121.41	350.18	762.83
0.60	132.99	383.61	835.64
0.70	143.65	414.34	902.6
0.80	153.57	442.95	964.92
0.90	162.88	469.82	1023.45
1.00	171.69	495.23	1078.81

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 MAR 13 2015
 COUNTY ENGINEER

Conclusion:
 --If drawdown is **greater than 24 hours and is less than 48 Hours**, then the carrying capacity of the PVC pipe will control drawdown for a full basin. Since the pipe is the limiting factor the valve calculations are not needed. A valve will still be installed and will be set to full open position.
 --If drawdown is **greater than 48 hours** a larger discharge pipe will be needed.
 --If drawdown is **less than 24 Hours** valve calculations will be needed.

Bryan W. Shaw, Ph.D., P.E., *Chairman*
Toby Baker, *Commissioner*
Zak Covar, *Commissioner*
Richard A. Hyde, P.E., *Executive Director*



TEXAS COMMISSION ON ENVIRONMENTAL QUALITY

Protecting Texas by Reducing and Preventing Pollution

August 13, 2014

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SEP 03 2014

COUNTY ENGINEER

Mr. Plack Carr
Milam Real Estate Capital, LLC.
9601 McAllister Fwy., Suite 1160
San Antonio, Texas 78216

Re: Edwards Aquifer Protection Program, Comal County

NAME OF PROJECT: Wiley Road Drainage Improvements; Located along FM 1863 approximately 1700 feet east of Highway 281; Bulverde, Texas

TYPE OF PLAN: Request for Extension of Time to Commence Regulated Activities Authorized by a Water Pollution Abatement Plan (WPAP); 30 Texas Administrative Code (TAC) Chapter 213 Edwards Aquifer

Investigation No.: 1186911; Regulated Entity Number: RN105558761; Additional ID No. 13-14080101

Dear Mr. Carr:

On August 1, 2014, the Texas Commission on Environmental Quality (TCEQ) received an application for an extension of time to commence regulated activities related to the above referenced Water Pollution Abatement Plan (WPAP) approval. The application has been reviewed for compliance with applicable requirements. The approval for this WPAP expired on March 5, 2014, and the extension request cannot be accepted.

According to §213.4(h)(4), any requests for extensions received by the executive director after the expiration date of an approved Edwards Aquifer protection plan or a previously approved extension will not be accepted. A new application for the purposes of this chapter must be submitted to the appropriate regional office with the appropriate fees for the review and approval by the executive director.


In order to conduct regulated activities at this site, a new application for the Wiley Road Drainage Improvements must be submitted to the San Antonio Region Office with the appropriate fees for the review. Regulated activities shall not commence until the new plan is approved.

A summary of the dates of approval and expiration are as follows:

Date of Original Approval:	September 5, 2008
Date of Expiration:	September 5, 2010
Date Extension Request Received:	Date of Extension Expiration:
August 6, 2010	March 5, 2011
January 20, 2011	September 5, 2011
July 5, 2011	March 5, 2012
January 19, 2012	September 5, 2012
August 1, 2012	March 5, 2013
January 15, 2013	September 5, 2013
August 22, 2013	March 5, 2014
August 1, 2014	Not Applicable - Expired

This action is taken under authority delegated by the Executive Director of the Texas Commission on Environmental Quality. If you have any questions or should clarification of this letter be desired, please contact Mr. Todd Jones of the Edwards Aquifer Protection Program, San Antonio Regional Office at (210) 403-4025.

Sincerely,



Lynn M. Bumguardner, Water Section Manager
San Antonio Region Office
Texas Commission on Environmental Quality

LMB/TJ/eg

cc: Ms. Cara C. Tackett, P.E., Pape-Dawson Engineers, Inc.
The Honorable Bill Krawietz, City of Bulverde
Mr. Tom Horseth, P.E., Comal County
Mr. Roland Ruiz, Edwards Aquifer Authority
TCEQ Central Records, Building F, MC 212

Bryan W. Shaw, Ph.D., *Chairman*
Carlos Rubinstein, *Commissioner*
Toby Baker, *Commissioner*
Zak Covar, *Executive Director*



TEXAS COMMISSION ON ENVIRONMENTAL QUALITY

Protecting Texas by Reducing and Preventing Pollution

January 29, 2013

RECEIVED

FEB 19 2013

COUNTY ENGINEER

Mr. Plack Carr
Milam Real Estate Capital, LLC
9601 McAllister Fwy., Suite 1160
San Antonio, Texas 78216

Re: Edwards Aquifer Protection Program, Comal County

Name of Project: **Wiley Road Drainage Improvements**; Located along FM 1863 approximately 1,700 feet east of Highway 281; Bulverde, Texas

Type of Plan: **Request for the Extension of Time** to Commence Regulated Activities Authorized by a **Water Pollution Abatement Plan (WPAP)**; 30 Texas Administrative Code (TAC) Chapter 213 Edwards Aquifer

Edwards Aquifer Protection Program San Antonio File No. 2814.06; Investigation No. 1054296; Regulated Entity No. RN105558761; Additional ID No. 13-13011502

Dear Mr. Carr:

On January 15, 2013, the Texas Commission on Environmental Quality (TCEQ) received your request for an extension of time to commence regulated activities related to the above referenced WPAP approval. The request has been reviewed for compliance with 30 TAC §213.4(h) and §213.13 which set forth the procedures for requesting an extension of time to commence regulated activities authorized by the approval and was found to be in general agreement with these procedures. Therefore, the request for an extension to the term of approval for the referenced project is granted. A summary of the dates of approval and expiration are as follows:

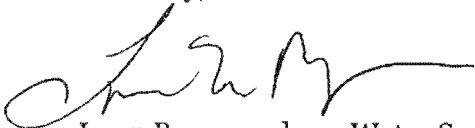
Date of Original Approval:	September 5, 2008
Date of Expiration:	September 5, 2010
Date Extension Request Received	Date of Extension Expiration
August 6, 2010	March 5, 2011
January 20, 2011	September 5, 2011
July 5, 2011	March 5, 2012

January 19, 2012	September 5, 2012
August 1, 2012	March 5, 2013
January 15, 2013	September 5, 2013

The request and fee were received in compliance with 30 TAC §213.4(h) and §213.13. As indicated in the rules, an extension may not be granted if the proposed regulated activities or approved plan for the regulated activities have changed. As understood, there will be no changes or modifications to the originally approved plan. This request for extension expires on September 5, 2013. Should construction not commence before the end of the six (6) month period, another request for extension would be required to keep the Edwards Aquifer Protection Plan validated.

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 Neal Denton of the Edwards Aquifer Protection Program of the San Antonio Regional Office at 210-403-4026.

Sincerely,



Lynn Bumguardner, Water Section Manager
San Antonio Region Office
Texas Commission on Environmental Quality

LMB/ND/eg

cc: Ms. Cara Tackett, P.E., Pape-Dawson Engineers, Inc.
The Honorable Bill Krawietz, City of Bulverde
Mr. Thomas Hornseth, P.E., Comal County
Mr. Roland Ruiz, Edwards Aquifer Authority
TCEQ Central Records, Building F, MC 212

Bryan W. Shaw, Ph.D., *Chairman*
Buddy Garcia, *Commissioner*
Carlos Rubinstein, *Commissioner*
Mark R. Vickery, P.G., *Executive Director*



TEXAS COMMISSION ON ENVIRONMENTAL QUALITY

Protecting Texas by Reducing and Preventing Pollution

March 12, 2012

Mr. Plack Carr
Milam Real Estate Capital, LLC
9601 McAllister Fwy., Suite 1160
San Antonio, Texas 78216

Re: Edwards Aquifer, Comal County

NAME OF PROJECT: **Wiley Road Drainage Improvements**; Located along FM 1863, approximately 1,700 feet east of Hwy 281; Bulverde, Texas

TYPE OF PLAN: Request for Extension of Time to Commence Regulated Activities Authorized by a Water Pollution Abatement Plan (WPAP); 30 Texas Administrative Code (TAC) Chapter 213 Edwards Aquifer

Edwards Aquifer Protection Program File No. 2814.04, Investigation No. 982000, Regulated Entity Number: RN105558761

Dear Mr. Carr:

On January 19, 2012, the Texas Commission on Environmental Quality (TCEQ) received your request for an extension of time to commence regulated activities related to the above referenced WPAP approval. The request has been reviewed for compliance with 30 TAC §213.4(h) and §213.13 which set forth the procedures for requesting an extension of time to commence regulated activities authorized by the approval and was found to be in general agreement with these procedures. Therefore, the request for an extension to the term of approval for the referenced project is granted. A summary of the dates of approval and expiration is as follows.

Date of Original Approval:	September 5, 2008
Date of Expiration:	September 5, 2010
Date Extension Request Received	Date of Extension Expiration
August 6, 2010	March 5, 2011
January 20, 2011	September 5, 2011
July 5, 2011	March 5, 2012

REPLY TO: REGION 13 • 14250 JUDSON RD. • SAN ANTONIO, TEXAS 78233-4480 • 210-490-3096 • FAX 210-545-4329

P.O. Box 13087 • Austin, Texas 78711-3087 • 512-239-1000 • Internet address: www.tceq.state.tx.us

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January 19, 2012	September 5, 2012
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The request and fee were received in compliance with 30 TAC §213.4(h) and §213.13. As indicated in the rules, an extension may not be granted if the proposed regulated activity or approved plan for the regulated activity has changed. As understood, there will be no changes or modifications to the originally approved plan. This request for extension expires on September 5, 2012. Should construction not commence before the end of the six (6) month period, another request for extension would be required to keep the Edwards Aquifer Protection Plan validated.

If you have any questions or require additional information, please contact Javier Anguiano of the Edwards Aquifer Protection Program with the San Antonio Regional Office at (210) 490-3096.

Sincerely,



Mark R. Vickery, P.G., Executive Director
Texas Commission on Environmental Quality

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APR 04 2012
COUNTY ENGINEER

MRV/JA/eg

cc: The Honorable Bill Krawietz, City of Bulverde
Mr. Thomas Hornseth, P.E., Comal County
Mr. Karl J. Dreher, Edwards Aquifer Authority
TCEQ Central Records, Building F, MC 212

Bryan W. Shaw, Ph.D., *Chairman*
Buddy Garcia, *Commissioner*
Carlos Rubinstein, *Commissioner*
Mark R. Vickery, P.G., *Executive Director*



TEXAS COMMISSION ON ENVIRONMENTAL QUALITY

Protecting Texas by Reducing and Preventing Pollution

March 15, 2011

Mr. Plack Carr
Milam Real Estate Capital, LLC
9601 McAllister Fwy., Suite 1160
San Antonio, Texas 78216

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APR 18 2011
COUNTY ENGINEER

Re: Edwards Aquifer, Comal County

NAME OF PROJECT: **Wiley Road Drainage Improvements**; Located along FM 1863, approximately 1,700 feet east of Hwy 281; Bulverde, Texas

TYPE OF PLAN: Request for Extension of Time to Commence Regulated Activities Authorized by a **Water Pollution Abatement Plan (WPAP)**; 30 Texas Administrative Code (TAC) Chapter 213 Edwards Aquifer

Edwards Aquifer Protection Program File No. 2814.02, Investigation No. 894066, Regulated Entity Number: RN105558761

Dear Mr. Carr:

On January 20, 2011, the Texas Commission on Environmental Quality (TCEQ) received your request for an extension of time to commence regulated activities related to the above referenced WPAP approval. The request has been reviewed for compliance with 30 TAC §213.4(h) and §213.13 which set forth the procedures for requesting an extension of time to commence regulated activities authorized by the approval and was found to be in general agreement with these procedures. Therefore, the request for an extension to the term of approval for the referenced project is granted. A summary of the dates of approval and expiration is as follows.

Date of Original Approval:	September 5, 2008
Date of Expiration:	September 5, 2010
Date Extension Request Received	Date of Extension Expiration
August 6, 2010	March 5, 2011
January 20, 2011	September 5, 2011

The request and fee were received in compliance with 30 TAC §213.4(h) and §213.13. As

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Mr. Plack Carr
March 15, 2011
Page 2

indicated in the rules, an extension may not be granted if the proposed regulated activity or approved plan for the regulated activity has changed. As understood, there will be no changes or modifications to the originally approved plan. This request for extension expires on September 5, 2011. Should construction not commence before the end of the six (6) month period, another request for extension would be required to keep the Edwards Aquifer Protection Plan validated.

If you have any questions or require additional information, please contact Javier Anguiano of the Edwards Aquifer Protection Program with the San Antonio Regional Office at (210) 490-3096.

Sincerely,



6 Mark R. Vickery, P.G., Executive Director
Texas Commission on Environmental Quality

MRV/JA/eg

cc: The Honorable Bill Krawietz, City of Bulverde
Mr. Thomas Hornseth, P.E., Comal County
Mr. Karl J. Dreher, Edwards Aquifer Authority
TCEQ Central Records, Building F, MC 212

2814.00



WILEY ROAD DRAINAGE IMPROVEMENTS

Water Pollution Abatement Plan

TCE 13
18
2008
SAN ANTONIO

June 2008

WILEY ROAD DRAINAGE IMPROVEMENTS

Water Pollution Abatement Plan

June 2008



LAND DEVELOPMENT ENVIRONMENTAL TRANSPORTATION WATER RESOURCES SURVEYING

May 27, 2008

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

Re: Wiley Road Drainage Improvements
Water Pollution Abatement Plan

Dear Mr. Garcia:

Please find attached one (1) original and three (3) copies of the Wiley Road Drainage Improvements Water Pollution Abatement Plan. This Water Pollution Abatement Plan has been prepared to be consistent with the Texas Commission on Environmental Quality (30 TAC 213) and current policies for development over the Edwards Aquifer Recharge Zone.

This Water Pollution Abatement Plan applies to an approximate 56.64-acre project area. Please review the plan information for the items it is intended to address, and, if acceptable, provide a written approval of the plan in order that construction may begin at the earliest opportunity.

Appropriate review fees (\$8,000) and fee application are included. If you have any questions regarding this information, please call our office.

Sincerely,
Pape-Dawson Engineers, Inc.

Matt Johnson, P.E.
Vice President, Land Development

Attachments

6109\53\WORD\REPORT\080324A1



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

REGULATED ENTITY NAME: Wiley Road Drainage Improvements

COUNTY: Bexar STREAM BASIN: Cibolo Creek

EDWARDS AQUIFER: RECHARGE ZONE
 TRANSITION ZONE

PLAN TYPE: WPAP AST EXCEPTION
 SCS UST MODIFICATION

CUSTOMER INFORMATION

1. Customer (Applicant):

Contact Person: Larry Baumgardner ^{FM}
Entity: B & M 1863, Ltd.
Mailing Address: 335 E. Sonterra Blvd., Suite 200
City, State: San Antonio, Texas Zip: 78258
Telephone: (210) 308-6288 FAX: (210) 979-6126

Agent/Representative (If any):

Contact Person: Matt Johnson, P.E.
Entity: Pape-Dawson Engineers, Inc.
Mailing Address: 555 E. Ramsey
City, State: San Antonio, Texas Zip: 78216
Telephone: (210) 375-9000 FAX: (210) 375-9010

2. This project is inside the city limits of Bulverde.
 This project is outside the city limits but inside the ETJ (extra-territorial jurisdiction) of _____
 This project is not located within any city's limits or ETJ.

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

From TCEQ's Regional office, travel approximately 2.6 miles north on Judson Road to Loop 1604. Turn left onto Loop 1604 and travel about 5.0 miles to US Hwy. 281. Exit Loop 1604 onto 281 and travel north approximately 9.3 miles to FM 1863. Travel east on FM 1863 approximately 0.3 miles to Wiley Road, the project location.

4. ATTACHMENT A - ROAD MAP. A road map showing directions to and the location of

the project site is attached ~~at the end of this form~~ **directly behind this sheet.**

5. **ATTACHMENT B - USGS / EDWARDS RECHARGE ZONE MAP.** A copy of the official 7½ minute USGS Quadrangle Map (Scale: 1" = 2000') of the Edwards Recharge Zone is attached behind this sheet. The map(s) should clearly show:

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

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

7. **ATTACHMENT C - PROJECT DESCRIPTION.** ~~Attached at the end of this form~~ **Provided below** is a detailed narrative description of the proposed project.

The site of the Wiley Road Drainage Improvements project is within the city limits of Bulverde in Comal County, Texas. As this is primarily a roadway and drainage project, there is no permanent population associated with this work and thus no wastewater or potable water service is needed.

This 56.64-acre project proposes the construction of an earthen drainage channel thru the site, an earthen bypass channel along Wiley Road and the paving of the existing Wiley Road, which is currently rock.

Approximately 2.65 acres (4.68%) of impervious cover is proposed to be constructed. Runoff from this impervious cover will be directed to the proposed water quality basin for treatment. A single-chamber sand filter basin has been designed in accordance with the Texas Commission on Environmental Quality's (TCEQ's) Technical Guidance Manual (TGM) RG-348 (2005) to remove 80% of the increased TSS from the proposed development.

8. Existing project site conditions are noted below:

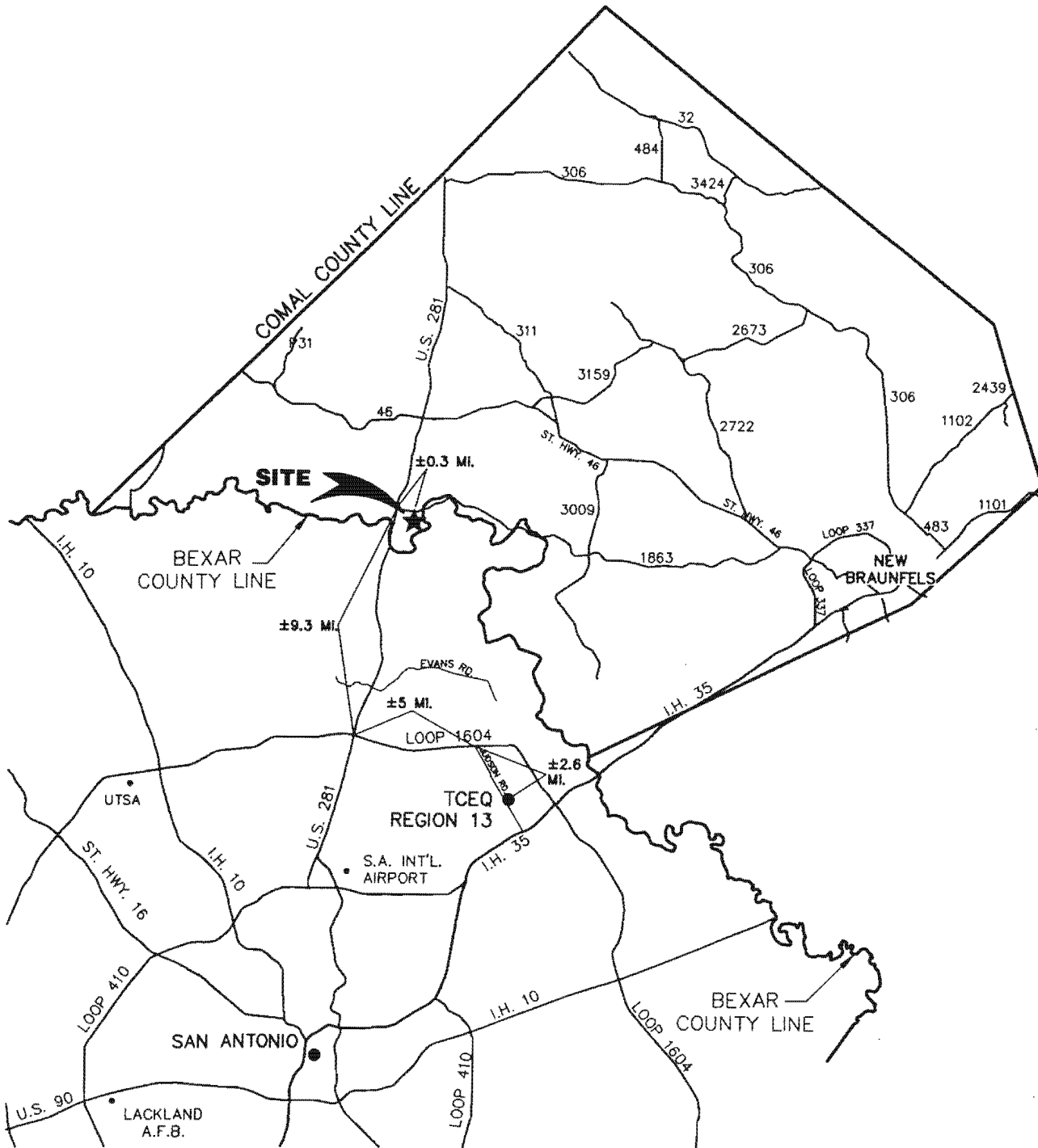
- Existing commercial site
- Existing industrial site
- Existing residential site
- Existing paved and/or unpaved roads
- Undeveloped (Cleared)
- Undeveloped (Undisturbed/Uncleared)
- Other: _____

PROHIBITED ACTIVITIES

9. I am aware that the following activities are prohibited on the **Recharge Zone** and are not proposed for this project:

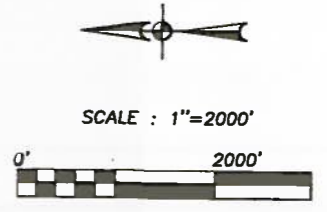
- (1) waste disposal wells regulated under 30 TAC Chapter 331 of this title (relating to Underground Injection Control);

WILEY ROAD DRAINAGE IMPROVEMENTS WATER POLLUTION ABATEMENT PLAN





LEGEND
 ← ← DRAINAGE FLOW



ATTACHMENT B

Date: May 27, 2008, 11:17am User ID: TEdeth
 File: P:\61\09\33\Design\Environmental\00810933.dwg

THIS DOCUMENT HAS BEEN PRODUCED FROM MATERIAL THAT WAS STORED AND/OR TRANSMITTED ELECTRONICALLY AND MAY HAVE BEEN INADVERTENTLY ALTERED. RELY ONLY ON FINAL HARD COPY MATERIALS BEARING THE CONSULTANT'S ORIGINAL SIGNATURE AND SEAL.

REVISIONS:

**PAPE-DAWSON
 ENGINEERS**

555 EAST RAMSEY | SAN ANTONIO, TEXAS 78216 | PHONE: 210.372.0000
 FAX: 210.372.0010

WILEY ROAD DRAINAGE
 IMPROVEMENTS WATER POLLUTION
 ABATEMENT PLAN USGS/EDWARDS'S
 AQUIFER RECHARGE ZONE MAP
 BULVERDE, TX QUADRANGLE

JOB NO. 6100-53
 DATE MAY 2008
 DESIGNER TFE
 CHECKED DKH DRAWN PFS
 SHEET 1 OF 2



LEGEND
 DRAINAGE FLOW



SCALE : 1"=2000'

MATCHLINE ATTACHMENT B SHEET 1 OF 2

**WILEY ROAD DRAINAGE
 IMPROVEMENTS WATER POLLUTION
 ABATEMENT PLAN USGS/EDWARD'S
 AQUIFER RECHARGE ZONE MAP
 BULVERDE, TX QUADRANGLE**

JOB NO. 6100-53
 DATE MAY 2008
 DESIGNER TFE
 CHECKED DKH DRAWN FBS
 SHEET 2 OF 2

REVISIONS:

**PAPE-DAWSON
 ENGINEERS**
 655 EAST RAMSEY | SAN ANTONIO TEXAS 78216 | PHONE: 210.378.0000
 FAX: 210.378.0010

Date: May 27, 2008, 11:15am User ID: TFE\eth
 File Path: \\P:\GIS\Design\Environmental\080510083.dwg

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- (2) new feedlot/concentrated animal feeding operations, as defined in 30 TAC §213.3;
- (3) land disposal of Class I wastes, as defined in 30 TAC §335.1;
- (4) the use of sewage holding tanks as parts of organized collection systems; and
- (5) new municipal solid waste landfill facilities required to meet and comply with Type I standards which are defined in §330.41(b), (c), and (d) of this title (relating to Types of Municipal Solid Waste Facilities).

10. N/A I am aware that the following activities are prohibited on the **Transition Zone** and are not proposed for this project:

- (1) waste disposal wells regulated under 30 TAC Chapter 331 (relating to Underground Injection Control);
- (2) land disposal of Class I wastes, as defined in 30 TAC §335.1; and
- (3) new municipal solid waste landfill facilities required to meet and comply with Type I standards which are defined in §330.41 (b), (c), and (d) of this title.

This project is not located on the Transition Zone.

ADMINISTRATIVE INFORMATION

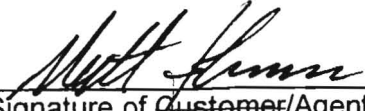
11. The fee for the plan(s) is based on:
- For a Water Pollution Abatement Plan and Modifications, the total acreage of the site where regulated activities will occur.
 - For an Organized Sewage Collection System Plans and Modifications, the total linear footage of all collection system lines.
 - For a UST Facility Plan or an AST Facility Plan, the total number of tanks or piping systems.
 - A Contributing Zone Plan.
 - A request for an exception to any substantive portion of the regulations related to the protection of water quality.
 - A request for an extension to a previously approved plan.
12. Application fees are due and payable at the time the application is filed. If the correct fee is not submitted, the TCEQ is not required to consider the application until the correct fee is submitted. Both the fee and the Edwards Aquifer Fee Form have been sent to the Commission's:
- TCEQ cashier
 - Austin Regional Office (for projects in Hays, Travis, and Williamson Counties)
 - San Antonio Regional Office (for projects in Bexar, Comal, Kinney, Medina, and Uvalde Counties)
13. Submit one (1) original and three (3) copies of the completed application to the appropriate regional office for distribution by the TCEQ to the local municipality or county, groundwater conservation districts, and the TCEQ's Central Office.
14. No person shall commence any regulated activity until the Edwards Aquifer Protection Plan(s) for the activity has been filed with and approved by the executive director.
- No person shall commence any regulated activity until the Contributing Zone Plan for the activity has been filed with the executive director.

To the best of my knowledge, the responses to this form accurately reflect all information requested concerning the proposed regulated activities and methods to protect the Edwards Aquifer. This

GENERAL INFORMATION FORM is hereby submitted for TCEQ review. The application was prepared by:

Pape-Dawson Engineers, Inc.
Matt Johnson, P.E.

Print Name of Customer/Agent


Signature of Customer/Agent


Date

If you have questions on how to fill out this form or about the Edwards Aquifer protection program, please contact us at 210/490-3096 for projects located in the San Antonio Region or 512/339-2929 for projects located in the Austin Region.

Individuals are entitled to request and review their personal information that the agency gathers on its forms. They may also have any errors in their information corrected. To review such information, contact us at 512/239-3282.

GEOLOGIC ASSESSMENT



LAND DEVELOPMENT ENVIRONMENTAL TRANSPORTATION WATER RESOURCES SURVEYING

March 10, 2008

Mr. Larry Baumgardner
c/o Lee Majors
Dominion Advisory Group
335 E. Sonterra Boulevard
San Antonio, Texas 78258

Re: Wiley Road Drainage Improvements
Geologic Assessment for the Water Pollution Abatement Plan (WPAP)

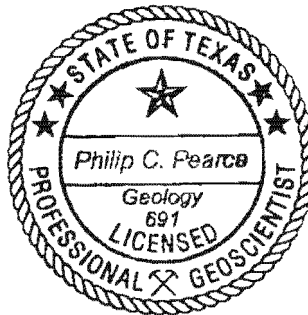
Dear Mr. Baumgardner:

Attached is a copy of the Geologic Assessment Report completed for the referenced site. The report is presented on the current Texas Commission on Environmental Quality (TCEQ) forms. This report has been prepared in general accordance with the requirements of the TCEQ that existed at the time of the fieldwork.

If you have questions regarding this report, please contact this office.

Sincerely,
Pape-Dawson Engineers, Inc.

Philip C. Pearce, P.G.
Geologist/Project Manager



Attachment

61091531WordReport1080215a1

PREFACE

This report is not intended to be a definitive investigation of all possible geologic or karst features at the site. Transect spacing utilized during surface reconnaissance was approximately 50-feet or less depending on vegetation thickness. While this accomplishes the discovery of many visible features, hindrances such as dense vegetation, lighting, topographic relief, soil cover, fill material, brush piles, intentional filling/covering, etc. may conceal features. No geophysical or remote sensing techniques were utilized to locate features. All conclusions, opinions and recommendations in this report are based upon site conditions at the time of Pape-Dawson's site visit and should not be relied upon to represent conditions at later dates. Erosion or deposition subsequent to this report can respectively, expose or cover features.

This report was prepared in accordance with an agreement dated February 12, 2008 and is subject to the limitations and restrictions in that agreement. No services beyond those explicitly stated in the agreement should be inferred or implied.

This report is prepared for the exclusive use of Dominion Advisory Group. The scope of services performed during this investigation may not be appropriate for other users and such use or reuse of this report is unauthorized, unless the prior written approval of Pape-Dawson Engineers, Inc. has been obtained.

In the preparation of this report, Pape-Dawson has relied upon commonly used sources of data, including literature searches and agency contacts. Pape-Dawson does not warrant the accuracy of the information obtained from those sources and has not independently verified such information.

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

REGULATED ENTITY NAME: Wiley Road Drainage Improvements

TYPE OF PROJECT: WPAP AST SCS UST

LOCATION OF PROJECT: Recharge Zone Transition Zone Contributing Zone within the Transition Zone

PROJECT INFORMATION

1. Geologic or manmade features are described and evaluated using the attached **GEOLOGIC ASSESSMENT TABLE**.
2. Soil cover on the project site is summarized in the table below and uses the SCS Hydrologic Soil Groups* (*Urban Hydrology for Small Watersheds, Technical Release No. 55, Appendix A, Soil Conservation Service, 1986*). If there is more than one soil type on the project site, show each soil type on the site Geologic Map or a separate soils map.

Soil Units, Infiltration Characteristics & Thickness			* Soil Group Definitions (Abbreviated)
Soil Name	Group*	Thickness (feet)	
Bolar clay loam, 1-3% slopes	C	2-3	

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

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

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

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

3. A **STRATIGRAPHIC COLUMN** is attached at the end of this form that shows formations, members, and thicknesses. The outcropping unit should be at the top of the stratigraphic column.
4. A **NARRATIVE DESCRIPTION OF SITE SPECIFIC GEOLOGY** is attached at the end of this form. The description must include a discussion of the potential for fluid movement to the Edwards Aquifer, stratigraphy, structure, and karst characteristics of the site.
5. Appropriate **SITE GEOLOGIC MAP(S)** are attached:

The Site Geologic Map must be the same scale as the applicant's Site Plan. The minimum scale is 1" : 400'

Applicant's Site Plan Scale	1" = <u>100'</u>
Site Geologic Map Scale	1" = <u>100'</u>
Site Soils Map Scale (if more than 1 soil type)	1" = <u>N/A'</u>

6. Method of collecting positional data:
 Global Positioning System (GPS) technology.
 Other method(s).

7. The project site is shown and labeled on the Site Geologic Map.
8. Surface geologic units are shown and labeled on the Site Geologic Map.
9. Geologic or manmade features were discovered on the project site during the field investigation. They are shown and labeled on the Site Geologic Map and are described in the attached Geologic Assessment Table.
 Geologic or manmade features were not discovered on the project site during the field investigation.
10. The Recharge Zone boundary is shown and labeled, if appropriate.
11. All known wells (test holes, water, oil, unplugged, capped and/or abandoned, etc.):
 There are (#) wells present on the project site and the locations are shown and labeled. (Check all of the following that apply.)
 The wells are not in use and have been properly abandoned.
 The wells are not in use and will be properly abandoned.
 The wells are in use and comply with 16 TAC Chapter 76.
 There are no wells or test holes of any kind known to exist on the project site.

ADMINISTRATIVE INFORMATION

12. One (1) original and three (3) copies of the completed assessment has been provided.

Date(s) Geologic Assessment was performed: February 14, 2008
Date(s)

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

Philip C. Pearce, P.G.
Print Name of Geologist

(210) 375-9000
Telephone

Philip C. Pearce

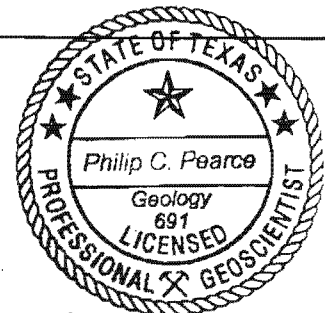
(210) 375-9010
Fax

Signature of Geologist

3-10-2008
Date

Representing: Pape-Dawson Engineers, Inc.
(Name of Company)

- The following attachments are included and complete this submittal.**
* Attachment A - Geologic Assessment Table
* Attachment B - Site Geologic Map
* Attachment C - Stratigraphic Column
* Attachment D - Narrative of Site Specific Geology
* Attachment E - References



If you have questions on how to fill out this form or about the Edwards Aquifer protection program, please contact us at 210/490-3096 for projects located in the San Antonio Region or 512/339-2929 for projects located in the Austin Region.

Individuals are entitled to request and review their personal information that the agency gathers on its forms. They may also have any errors in their information corrected. To review such information, contact us at 512/239-3282.

GEOLOGIC ASSESSMENT TABLE				PROJECT NAME: WILEY ROAD DRAIANGE IMPROVEMENTS																
LOCATION			FEATURE CHARACTERISTICS										EVALUATION		PHYSICAL SETTING					
1A	1B *	1C*	2A	2B	3	4			5	5A	6	7	8A	8B	9	10	11	12		
FEATURE ID	LATITUDE	LONGITUDE	FEATURE TYPE	POINTS	FORMATION	DIMENSIONS (FEET)			TREND (DEGREES)	DOM	DENSITY (NO/FT)	APERTURE (FEET)	INFILLING	RELATIVE INFILTRATION RATE	TOTAL	SENSITIVITY		CATCHMENT AREA (ACRES)		TOPOGRAPHY
						X	Y	Z												
S-6	29°44'29.8"	98°25'48.2"	CD	5	Kgru	9	10	5.5	N70°W	0			C	5	10	10		X	Drainage	

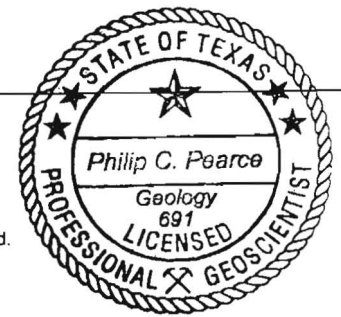
* DATUM: NAD 83

Note: Only those geologic and manmade features within that area of this assessment are included. Therefore, the features may not be numbered sequentially.

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

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

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



I have read, I understood, and I have followed the Texas Commission on Environmental Quality's Instructions to Geologists. The information presented here complies with that document and is a true representation of the conditions observed in the field. My signature certifies that I am qualified as a geologist as defined by 30 TAC Chapter 213.

Philip C. Pearce

Date 3-10-2008

WILEY ROAD DRAINAGE IMPROVEMENTS

Stratigraphic Column

[Ashworth, J.B. (Jan 1983) Ground-Water Availability of the Lower Cretaceous Formations in the Hill Country of South-Central Texas, Texas Department of Water Resources, rept., 273, 12 pp.]

System	Series	Group	Stratigraphic Unit		Hydrologic Unit	Approximate Maximum Thickness (feet)	Character of Rocks	Water Bearing Properties		
Cretaceous	Comanche	Trinity	Glen Rose Limestone	Upper member (Kgru)	Upper Trinity	500	Alternating resistant and nonresistant beds of blue shale, nodular marl, and impure, fossiliferous limestone. Also contains two distinct evaporite zones	Yields very small to small quantities of relatively highly mineralized water		
				Lower Member (Kgrl)	Middle Trinity	320	Massive, fossiliferous limestone grading upward into thin beds of limestone, dolomite, marl, and shale. Numerous caves and reefs occur in the lower portion of the member	Yields small to moderate quantities of fresh to slightly saline water		
			Travis Park Formation	Hensell Sand Member		300	Red to gray clay, silt, sand, conglomerate, and thin limestone beds grading downward into silty dolomite, marl, calcareous shale, and shaley limestone			
				Bexar Shale Member		90	Massive, fossiliferous, white to gray, argillaceous to dolomitic limestone with local thinly bedded layers of sand, shale, and lignite			
			Cow Creek Limestone Member	80				Dark blue to gray, fossiliferous, calcareous and dolomitic shale with thinly interbedded layers of limestone and sand	Not known to yield water	
			Hammett Shale Member			Lower Trinity	120			Sandy dolomitic limestone
			Sligo Limestone Member	350				Red and white conglomerate, sandstone, claystone, shale, dolomite, and limestone		
			Hosston Sand Member							
			Pre-Cretaceous rocks							Black, red, and green folded shale, hard massive dolomite limestone, sandstone, and slate

WILEY ROAD DRAINAGE IMPROVEMENTS

Narrative Description

The overall potential for fluid migration to the Edwards Aquifer for the site is low. The site is located in the upper member of the Glen Rose Limestone. The upper member (Kgru) of the Glen Rose Limestone is characterized as yellowish-tan thinly bedded limestone and marl. Karst development in the Kgru is generally characterized by few, small sinkholes and lateral cave development, as phreatic passages and springs. No caves or sinkholes were identified onsite.

No faults were identified onsite. The predominant trend of faults in the vicinity of the site is approximately N 55°E, based on faults presented on the Geologic Atlas of Texas, San Antonio Sheet (Barnes, 1983).

Feature S-6

Feature S-6 is a non-karst closed depression created by stream scour. The scour contained alluvium. Due to the non-karst origin, the probability of rapid infiltration is low.

WILEY ROAD DRAINAGE IMPROVEMENTS

References

- Arnow, Ted, 1959, Groundwater Geology of Bexar County, Texas: Texas Board of Water Engineers, Bulletin 5911, 62 pp., 18 figs.
- Barnes, V.L., 1983, Geologic Atlas of Texas, San Antonio Sheet, Bureau of Economic Geology, The University of Texas at Austin, Texas.
- Federal Emergency Management Agency (FEMA), February 16, 1996, Bexar County, Texas and Incorporated Areas, Flood Insurance Rate Map (FIRM), Panel 48029C0140 E, FEMA, Washington, D.C.
- Maclay, R.W., and Small, T.A., 1976, Progress Report on the Geology of the Edwards Aquifer, San Antonio Area, Texas and Preliminary Interpretation of Borehole Geophysical and Laboratory Data on Carbonate Rocks: U.S. Geol. Survey open file rept., 76627, 62 pp., 20 figs.
- Rose, P.R., 1972, Edwards Group, Surface and Subsurface, Central Texas: Bur. Econ. Geol., Rep of Invest. 74, 198 pp.
- Stein, W.G., and Ozuna, G.B., 1995, Geologic Framework and Hydrogeologic Characteristics of the Edwards Aquifer Recharge Zone, Bexar County, Texas: U.S. Geol. Survey, Water - Resources Investigations 95-4030, 8 pp., 2 figs.
- Texas Water Commission, 1999, Edwards Aquifer Recharge Zone Map, Bulverde Quadrangle, TWC, San Antonio, Texas.
- United States Department of Agriculture, 1991, Soil Survey – Bexar County, Texas, UDA.
- United States Geologic Survey, 1988, (USGS), Bulverde Quadrangle, USGS, Denver, Colorado.
- Veni, G., 1988, The Caves of Bexar County, Second Edition, The Texas Memorial Museum, University of Texas, Austin, Texas.
- Veni, George, and Associates, 1994, Geologic Controls in Cave Development and the Distribution of Cave Fauna in the San Antonio, Texas, Region: Report for the Texas Parks and Wildlife Department and U.S. Fish & Wildlife Service, 99 pp.

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

REGULATED ENTITY NAME: Wiley Road Drainage Improvements

REGULATED ENTITY INFORMATION

1. The type of project is:
 Residential: # of Lots: _____
 Residential: # of Living Unit Equivalents: _____
 Commercial _____
 Industrial _____
 Other: Road & Drainage

2. Total site acreage (size of property): 56.64

3. Projected population: -0-

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

Impervious Cover of Proposed Project	Sq. Ft.	Sq. Ft./Acre	Acres
Structures/Rooftops	0	÷ 43,560 =	0
Parking	0	÷ 43,560 =	0
Other paved surfaces (Road & Sidewalks)	115,434	÷ 43,560 =	2.65
Total Impervious Cover	115,434	÷ 43,560 =	2.65
Total Impervious Cover ÷ Total Acreage x 100 =			4.68 %*

* 2.65 acres/56.64 acres = 4.68%

5. **ATTACHMENT A - Factors Affecting Water Quality.** A description of any factors that could affect surface water and groundwater quality is provided **below** ~~at the end of this form.~~

Potential sources of pollution that may reasonably be expected to affect the quality of storm water discharges from the site during construction include:

- Soil erosion due to the clearing of the site;
- Oil, grease, fuel and hydraulic fluid contamination from construction equipment and vehicle drippings;
- Hydrocarbons from asphalt paving operations;
- Miscellaneous trash and litter from construction workers and material wrappings;
- Concrete truck washout.
- Potential overflow/spills from portable toilets

Potential sources of pollution that may reasonably be expected to affect the quality of storm water discharges from the site after development include:

- **Oil, grease, fuel and hydraulic fluid contamination from vehicle drippings;**
- **Dirt and dust which may fall off vehicles; and**
- **Miscellaneous trash and litter.**

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

FOR ROAD PROJECTS ONLY

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

7. Type of project:
 TXDOT road project.
 County road or roads built to county specifications.
 City thoroughfare or roads to be dedicated to a municipality.
 Street or road providing access to private driveways.

8. Type of pavement or road surface to be used:
 Concrete
 Asphaltic concrete pavement
 Other: _____

9. Length of Right of Way (R.O.W.): 1,950 feet. (approximately)
 Width of R.O.W.: 72 feet.
 L x W = 140,400 Ft² ÷ 43,560 Ft²/Acre = 3.22 acres. (approximately)

10. Length of pavement area: 1,950 feet.
 Width of pavement area: 44 feet.
 L x W = 85,800 Ft² ÷ 43,560 Ft²/Acre = 1.97 acres.
 Pavement area 1.97 acres ÷ R.O.W. area 3.22 acres x 100 = 61.18 % impervious cover. *

***Note: This figure does not represent the percent of impervious cover for the whole site, as the impervious cover for the sidewalks along Wiley Road are not included here.**

11. A rest stop will be included in this project.
 A rest stop will **not** be included in this project.

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

STORMWATER TO BE GENERATED BY THE PROPOSED PROJECT

13. **ATTACHMENT B - Volume and Character of Stormwater.** A description of the volume and character (quality) of the stormwater runoff which is expected to occur from the proposed project is provided ~~at the end of this form~~ **below**. The estimates of stormwater runoff quality and quantity should be based on area and type of impervious cover. Include the runoff coefficient of the site for both pre-construction and post-construction conditions.

Stormwater runoff will increase as a result of this development. The character of the stormwater runoff that is expected to occur from the proposed project can be described as stormwater runoff from an improved roadway. For a 25-year storm event, the overall project will generate approximately 35.96 cfs. The runoff coefficient for the site

changes from approximately 64 before development to approximately 75 after development. Values are based on the City of San Antonio's Unified Development Code (UDC).

WASTEWATER TO BE GENERATED BY THE PROPOSED PROJECT

No wastewater will be generated by this proposed project; therefore, Items 14-16 do not apply.

14. The character and volume of wastewater is shown below:
- | | |
|---------------------------------------|-------------------|
| <input type="checkbox"/> % Domestic | _____ gallons/day |
| <input type="checkbox"/> % Industrial | _____ gallons/day |
| <input type="checkbox"/> % Commingled | _____ gallons/day |
| TOTAL | _____ gallons/day |

15. Wastewater will be disposed of by:
- On-Site Sewage Facility (OSSF/Septic Tank):**
ATTACHMENT C - Suitability Letter from Authorized Agent. An on-site sewage facility will be used to treat and dispose of the wastewater. The appropriate licensing authority's (authorized agent) written approval is provided at the end of this form. It states that the land is suitable for the use of an on-site sewage facility or identifies areas that are not suitable.
 - Each lot in this project/development is at least one (1) acre (43,560 square feet) in size. The system will be designed by a licensed professional engineer or registered sanitarian and installed by a licensed installer in compliance with 30 TAC Chapter 285.

 - Sewage Collection System (Sewer Lines):**
 - Private service laterals from the wastewater generating facilities will be connected to an existing SCS.
 - Private service laterals from the wastewater generating facilities will be connected to a proposed SCS.
 - The SCS was previously submitted on _____.
 - The SCS was submitted with this application.
 - The SCS will be submitted at a later date. The owner is aware that the SCS may not be installed prior to executive director approval.
- The sewage collection system will convey the wastewater to the _____ (name) Treatment Plant. The treatment facility is:
- existing.
 - proposed.

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

SITE PLAN REQUIREMENTS

Items 17 through 27 must be included on the Site Plan.

See the Temporary and Permanent Pollution Abatement Plan for site plan requirements.

17. The Site Plan must have a minimum scale of 1" = 400'.
Site Plan Scale: 1" = 100'.
18. 100-year floodplain boundaries
 Some part(s) of the project site is located within the 100-year floodplain. The

floodplain is shown and labeled.

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

FEMA FIRM Community Panel Number 485463 0055D, Revised July 17, 1995

19. The layout of the development is shown with existing and finished contours at appropriate, but not greater than ten-foot contour intervals. Show lots, recreation centers, buildings, roads, etc.
 The layout of the development is shown with existing contours. Finished topographic contours will not differ from the existing topographic configuration and are not shown.
20. All known wells (oil, water, unplugged, capped and/or abandoned, test holes, etc.):
 There are ___ (#) wells present on the project site and the locations are shown and labeled. (Check all of the following that apply)
 The wells are not in use and have been properly abandoned.
 The wells are not in use and will be properly abandoned.
 The wells are in use and comply with 30 TAC §238.
 There are no wells or test holes of any kind known to exist on the project site.
21. Geologic or manmade features which are on the site:
 ^(M&B) All **sensitive and possibly sensitive** geologic or manmade features identified in the Geologic Assessment are shown and labeled.
 No **sensitive and possibly sensitive** geologic or manmade features were identified in the Geologic Assessment.
N/A **ATTACHMENT D - Exception to the Required Geologic Assessment.** An exception to the Geologic Assessment requirement is requested and explained in ATTACHMENT D provided at the end of this form. Geologic or manmade features were found and are shown and labeled.
N/A **ATTACHMENT D - Exception to the Required Geologic Assessment.** An exception to the Geologic Assessment requirement is requested and explained in ATTACHMENT D provided at the end of this form. No geologic or manmade features were found.
22. The drainage patterns and approximate slopes anticipated after major grading activities.

Drainage patterns are illustrated by arrows. Slopes vary throughout the site. Typical slopes in this project will range from 1.0% to 25.0%.
23. Areas of soil disturbance and areas which will not be disturbed.

The nature of construction is such that it is difficult to predict areas that will be disturbed and revegetated. The construction plans include a note, which will require the contractor to revegetate disturbed areas with seeding, hydromulch or sod and sprinkling. All impervious cover areas will be disturbed.
24. Locations of major structural and nonstructural controls. These are the temporary and permanent best management practices.

Temporary BMPs and Permanent BMPs are shown on Exhibits 1 and 2, respectively.

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

The nature of construction is such that it is difficult to predict areas that will be disturbed and revegetated. The construction plans include a note, which will require the contractor to revegetate disturbed areas with seeding, hydromulch or sod and sprinkling. All impervious cover areas will be disturbed.

26. Surface waters (including wetlands).

27. Locations where stormwater discharges to surface water or sensitive features.
There will be no discharges to surface water or sensitive features.

ADMINISTRATIVE INFORMATION

28. One (1) original and three (3) copies of the completed application have been provided.
29. Any modification of this WPAP will require TCEQ executive director approval, prior to construction, and may require submission of a revised application, with appropriate fees.

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

Pape-Dawson Engineers, Inc.
Matt Johnson, P.E.

Print Name of Customer/Agent


Signature of Customer/Agent


Date

Temporary Stormwater Section
for Regulated Activities
on the Edwards Aquifer Recharge Zone
and Relating to 30 TAC §213.5(b)(4)(A), (B), (D)(I) and (G); Effective June 1, 1999

REGULATED ENTITY NAME: **Wiley Road Drainage Improvements**

POTENTIAL SOURCES OF CONTAMINATION

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

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

- Aboveground storage tanks with a cumulative storage capacity of less than 250 gallons ~~will~~ **may** be stored on the site for less than one (1) year.
- Aboveground storage tanks with a cumulative storage capacity between 250 gallons and 499 gallons will be stored on the site for less than one (1) year.
- Aboveground storage tanks with a cumulative storage capacity of 500 gallons or more will be stored on the site. An **Aboveground Storage Tank Facility Plan** application must be submitted to the appropriate regional office of the TCEQ prior to moving the tanks onto the project.
- Fuels and hazardous substances will not be stored on-site.

Temporary aboveground storage tank(s) may be located within the construction staging area in compliance with 30 TAC §213.

2. **ATTACHMENT A - Spill Response Actions.** A description of the measures to be taken to contain any spill of hydrocarbons or hazardous substances is provided at the end of this form.
3. Temporary aboveground storage tank systems of 250 gallons or more cumulative storage capacity must be located a minimum horizontal distance of 150 feet from any domestic, industrial, irrigation, or public water supply well, or other sensitive feature.
4. **ATTACHMENT B - Potential Sources of Contamination.** Describe **below** ~~in an attachment at the end of this form~~ any other activities or processes which may be a potential source of contamination.
- There are no other potential sources of contamination.

Other potential sources of contamination during construction include:

Potential Source • Asphalt products used on this project.

Preventative Measure ■ After placement of asphalt, emulsion or coatings, the contractor will be responsible for immediate cleanup should an unexpected rain occur. For the duration of the asphalt product curing time, the contractor will maintain standby personnel and equipment to contain any asphalt wash-off should an unexpected rain occur. The contractor will be instructed not to place asphalt products on the ground within 48 hours of a forecasted rain.

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

Preventative Measure ■ **Vehicle maintenance when possible will be performed within the construction staging area.**
- Potential Source** • **Miscellaneous trash and litter from construction workers and material wrappings.**

Preventive Measure ■ **Trash containers will be placed throughout the site to encourage proper trash disposal.**
- Potential Source** • **Construction debris.**

Preventive Measure ■ **Construction debris will be monitored daily by contractor. Debris will be collected weekly and placed in disposal bins. Situations requiring immediate attention will be addressed on a case by case basis.**
- Potential Source** • **Spills/Overflow of waste from portable toilets**

Preventative Measure ■ **Portable toilets will be placed away from high traffic vehicular areas and storm drain inlets.**

■ **Portable toilets will be placed on a level ground surface.**

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

SEQUENCE OF CONSTRUCTION

5. √ **ATTACHMENT C - Sequence of Major Activities.** A description of the sequence of major activities which will disturb soils for major portions of the site (grubbing, excavation, grading, utilities, and infrastructure installation) is provided ~~at the end of this form~~ **below**. For each activity described, an estimate of the total area of the site to be disturbed by each activity is given.

The sequence of major activities which disturb soil during construction on this site will be divided into two stages. The first is site preparation that will include clearing and grubbing of vegetation, where applicable, and grading. This will disturb approximately 56.64 acres. The second is construction that will include construction of the sedimentation/filtration basin, earthen drainage channels and new pavement area, landscaping and site cleanup. This will disturb approximately 56.64 acres.

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

TEMPORARY BEST MANAGEMENT PRACTICES (TBMPs)

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

7. √ **ATTACHMENT D - Temporary Best Management Practices and Measures.** A description of the TBMPs and measures that will be used during and after construction are provided at the end of this form. For each activity listed in the sequence of

construction, include appropriate control measures and the general timing (or sequence) during the construction process that the measures will be implemented.

√

TBMPs and measures will prevent pollution of surface water, groundwater, and stormwater. The construction-phase BMPs for erosion and sediment controls have been designed to retain sediment on site to the extent practicable. The following information has been provided in the attachment at the end of this form **below**.

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

Upgradient water from undeveloped areas will cross the site; however, it will not flow across impervious areas. Upgradient water will flow to the proposed earthen channel to run thru the site and be discharged. It will not cross Wiley Road.

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

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

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

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

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

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

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

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

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

N/A **ATTACHMENT E - Request to Temporarily Seal a Feature.** A request to temporarily seal a feature is provided at the end of this form. The request includes justification as to why no reasonable and practicable alternative exists for each feature.

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

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

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

- **Erection of silt fences along the downgradient boundary of construction activities and rock berms for secondary protection.**
- **Installation of stabilized construction entrance/exit(s) and construction staging area(s).**
- **Installation of concrete truck washout pit(s), as required.**
- **Excavation of the sedimentation/filtration basin to provide a temporary sediment basin.**

10. √ **ATTACHMENT G - Drainage Area Map.** A drainage area map is provided ~~at the end of this form~~ **in the Exhibits section** to support the following requirements. See **Permanent Pollution Abatement Plan.**

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

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

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

— There are no areas greater than 10 acres within a common drainage area that will be disturbed at one time. A smaller sediment basin and/or sediment trap(s)

will be used in combination with other erosion and sediment controls within each disturbed drainage area.

A combination of measures will be used to protect down slope and side slope boundaries of the construction area. All are adequate for the drainage areas they serve.

11. **ATTACHMENT H - Temporary Sediment Pond(s) Plans and Calculations.** Temporary sediment pond or basin construction plans and design calculations for a proposed temporary BMP or measure has been prepared by or under the direct supervision of a Texas Licensed Professional Engineer. All construction plans and design information must be signed, sealed, and dated by the Texas Licensed Professional Engineer. Construction plans for the proposed temporary BMPs and measures are provided as at the end of this form **below**.
- The proposed sedimentation/filtration basin will be used as a temporary sediment basin during site construction. The basin will be converted to a permanent basin and filter media installed after 70% of the pavement areas in the watershed has been paved.***
- Prior to final acceptance by the owner, the contractor will remove trash, debris and accumulated silt from the sedimentation/filtration basin and re-establish it to proper operating condition.***
- Capacity of sediment basin:***
[(4,800 sf)(7.53 ft)] x (1 acre drainage area/3,500 ft³ volume) = 10.04 acres of drainage area
12. **ATTACHMENT I - Inspection and Maintenance for BMPs.** A plan for the inspection of temporary BMPs and measures and for their timely maintenance, repair, and, if necessary, retrofit is provided at the end of this form. A description of documentation procedures and recordkeeping practices is included in the plan.
13. All control measures must be properly selected, installed, and maintained in accordance with the manufacturers specifications and good engineering practices. If periodic inspections by the applicant or the executive director, or other information indicates a control has been used inappropriately, or incorrectly, the applicant must replace or modify the control for site situations.
14. If sediment escapes the construction site, off-site accumulations of sediment must be removed at a frequency sufficient to minimize offsite impacts to water quality (e.g., fugitive sediment in street being washed into surface streams or sensitive features by the next rain).
15. Sediment must be removed from sediment traps or sedimentation ponds not later than when design capacity has been reduced by 50%. A permanent stake will be provided that can indicate when the sediment occupies 50% of the basin volume.
16. Litter, construction debris, and construction chemicals exposed to stormwater shall be prevented from becoming a pollutant source for stormwater discharges (e.g., screening outfalls, picked up daily).

SOIL STABILIZATION PRACTICES

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

17. **ATTACHMENT J - Schedule of Interim and Permanent Soil Stabilization Practices.** A schedule of the interim and permanent soil stabilization practices for the site is attached at the end of this form *below*.

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

Stabilization measures will be initiated as soon as practicable in portions of the site where construction activities have temporarily or permanently ceased, and except as provided below, will be initiated no more than fourteen (14) days after the construction activity in that portion of the site has temporarily or permanently ceased. Where construction activity on a portion of the site is temporarily ceased, and earth disturbing activities will be resumed within twenty-one (21) days, temporary stabilization measures do not have to be initiated on that portion of site. In areas experiencing droughts where the initiation of stabilization measures by the 14th day after construction activity has temporarily or permanently ceased is precluded by seasonably arid conditions, stabilization measures must be initiated as soon as practicable.

18. Records must be kept at the site of the dates when major grading activities occur, the dates when construction activities temporarily or permanently cease on a portion of the site, and the dates when stabilization measures are initiated.
19. Stabilization practices must be initiated as soon as practicable where construction activities have temporarily or permanently ceased.


ADMINISTRATIVE INFORMATION

20. All structural controls will be inspected and maintained according to the submitted and approved operation and maintenance plan for the project.
21. If any geologic or manmade features, such as caves, faults, sinkholes, etc., are discovered, all regulated activities near the feature will be immediately suspended. The appropriate TCEQ Regional Office shall be immediately notified. Regulated activities must cease and not continue until the TCEQ has reviewed and approved the methods proposed to protect the aquifer from any adverse impacts.
22. Silt fences, diversion berms, and other temporary erosion and sediment controls will be constructed and maintained as appropriate to prevent pollutants from entering sensitive features discovered during construction.


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

Pape-Dawson Engineers, Inc.
Matt Johnson, P.E.

Print Name of Customer/Agent



Signature of Customer/Agent



Date

WILEY ROAD DRAINAGE IMPROVEMENTS

Water Pollution Abatement Plan Application

Spill Response Actions

In the event of an accidental spill:

- Contractor shall take action to contain spill. Contractor may use sand or other absorbent material stockpiled on site to absorb spill. Absorbent material should be spread over the spill area to absorb the spilled product.
- In the event of an uncontained discharge the contractor shall utilize onsite equipment to construct berms downgradient of the spill with sand or other absorbent material to contain and absorb the spilled product.
- Sand or material used to contain the spill should be collected and stored in such a way so as not to continue to affect additional ground. Once the spill has been contained, collected material should be placed on poly or plastic sheeting until removed from the site. In the event of potential rainfall the material should be covered with poly or plastic sheeting.
- The contractor will be required to notify the owner, who will in turn contact TCEQ to notify them in the event of a spill. Additional notifications as required by the type and amount of spill will be conducted by owner or owner's representative.
- The contractor will be required to report significant or hazardous spills in reportable quantities to:
 - the National Response Center at (800) 424-8802
 - the Edwards Aquifer Authority at (210) 222-2204
 - the TCEQ Regional Office (210) 490-3096 (if during business hours: 8 AM to 5 PM) or
 - the State Emergency Response Center (800) 832-8224 (if after hours)
- Contaminated soils will be sampled for waste characterization. When the analysis results are known the contaminated soils will be removed from the site and disposed in a permitted landfill in accordance with applicable regulations.

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

WILEY ROAD DRAINAGE IMPROVEMENTS

Water Pollution Abatement Plan Application

INSPECTIONS

Designated and qualified person(s) shall inspect Pollution Control Measures weekly and within 24 hours after a storm event. An inspection report that summarizes the scope of the inspection, names and qualifications of personnel conducting the inspection, date of the inspection, major observations, and actions taken as a result of the inspection shall be recorded and maintained as part of Storm Water TPDES data for a period of three years after the date of the inspection. A copy of the Inspection Report Form is provided in this Storm Water Pollution Prevention Plan.

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

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

WILEY ROAD DRAINAGE IMPROVEMENTS
Water Pollution Abatement Plan Application

Pollution Prevention Measure	Inspected	Corrective Action	
		Description	Date Completed
General			
Revegetation			
Erosion/sediment controls			
Vehicle exits			
Material areas			
Equipment areas			
Concrete rinse			
Construction debris			
Trash receptacles			
Infrastructure			
Roadway clearing			
Utility clearing			
Roadway grading			
Utility construction			
Drainage construction			
Roadway base			
Roadway surfaces			
Site cleanups			
Building			
Clearing for building			
Foundation grading			
Utility construction			
Foundation construction			
Building construction			
Site grading			
Site cleanup			

**Indicate N/A where measure does not apply.*

By my signature below, I certify that all items are acceptable and the project site is in compliance with SWPPP.

 Inspector's Name

 Inspector's Signature

 Name of Owner/Operator (Firm)

 Date

Note: Inspector is to attach a brief statement of his qualifications to this report.

**WILEY ROAD DRAINAGE IMPROVEMENTS
Water Pollution Abatement Plan Application**

PROJECT MILESTONE DATES

Date when major site grading activities begin:

<u>Construction Activity</u>	<u>Date</u>
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____

Dates when construction activities temporarily or permanently cease on all or a portion of the project:

<u>Construction Activity</u>	<u>Date</u>
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____

Dates when stabilization measures are initiated:

<u>Stabilization Activity</u>	<u>Date</u>
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____

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

REGULATED ENTITY NAME: Wiley Road Drainage Improvements

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

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

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

 The TCEQ Technical Guidance Manual (TGM) was used to design permanent BMPs and measures for this site.
 A technical guidance other than the TCEQ TGM was used to design permanent BMPs and measures for this site. The complete citation for the technical guidance that was used is provided below

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

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

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

5. The executive director may waive the requirement for other permanent BMPs for multi-family residential developments, schools, or small business sites where 20% or less impervious cover is used at the site. This exemption from permanent BMPs must be recorded in the county deed records, with a notice that if the percent impervious cover

increases above 20% or land use changes, the exemption for the whole site as described in the property boundaries required by 30 TAC §213.4(g) (relating to Application Processing and Approval), may no longer apply and the property owner must notify the appropriate regional office of these changes.

- N/A **ATTACHMENT A - 20% or Less Impervious Cover Waiver.** This 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 found at the end of this form.
- This site will be used for multi-family residential developments, schools, or small business sites but has more than 20% impervious cover.
- √ This site will not be used for multi-family residential developments, schools, or small business sites.

6. **ATTACHMENT B - BMPs for Upgradient Stormwater.**

- A description of the BMPs and measures that will be used to prevent pollution of surface water, groundwater, or stormwater that originates upgradient from the site and flows across the site is identified as **ATTACHMENT B** at the end of this form.
- If no surface water, groundwater or stormwater originates upgradient from the site and flows across the site, an explanation is provided as **ATTACHMENT B** at the end of this form.
- √ If 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, an explanation is provided as ~~ATTACHMENT B~~ at the end of this form **below**.

Upgradient water from undeveloped areas will cross the site; however, it will not flow across impervious areas. Upgradient water will flow to the proposed earthen channel to run thru the site and be discharged. It will not cross Wiley Road.

7. **ATTACHMENT C - BMPs for On-site Stormwater.**

- √ A description of the BMPs and measures that will be used to prevent pollution of surface water or groundwater that originates on-site or flows off the site, including pollution caused by contaminated stormwater runoff from the site is identified as ~~ATTACHMENT C~~ at the end of this form. **below**.

A single-chamber sedimentation/filtration basin will serve as the permanent BMP for this site. It has been designed in accordance with the TCEQ's Technical Guidance Manual (TGM) RG-348 (2005) to remove 80% of the increased TSS from the improved area.

- If 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, an explanation is provided as **ATTACHMENT C** at the end of this form.

8. √ **ATTACHMENT D - BMPs for Surface Streams.** A description of the BMPs and measures that prevent pollutants from entering surface streams, sensitive features, or the aquifer is provided at the end of this form. **below** Each feature identified in the Geologic Assessment as "sensitive" or "possibly sensitive" has been addressed.

A single-chamber sedimentation/filtration basin will serve as the permanent BMP for this site. It has been designed in accordance with the TCEQ's Technical Guidance Manual (TGM) RG-348 (2005) to remove 80% of the increased TSS from the improved area.

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

The permanent sealing of or diversion of flow from a naturally-occurring "sensitive" or "possibly sensitive" feature that accepts recharge to the Edwards Aquifer as a permanent pollution abatement measure has not been proposed for any naturally-occurring "sensitive" or "possibly sensitive" features on this site.

N/A ATTACHMENT E - Request to Seal Features. A request to seal a naturally-occurring "sensitive" or "possibly sensitive" feature, that includes a justification as to why no reasonable and practicable alternative exists, is found at the end of this form. A request and justification has been provided for each feature.

The following table identifies the proposed treatment for all on-site features identified in the Geologic Assessment.

# ¹	Feature Type	Relative Infiltration Rate (refer to Geologic Assessment)	Sensitivity Of Feature	Permanent Pollution Abatement Measure ²
S-6	Non-Karst Closed Depression	Low	Not Sensitive	Permanent Fill

10. **ATTACHMENT F - 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. All construction plans and design information have been signed, sealed, and dated by the Texas Licensed Professional Engineer. Construction plans for the proposed permanent BMPs and measures are provided at the end of this form **in the Exhibit section**. Design Calculations, TCEQ Construction Notes, all man-made or naturally occurring geologic features, all proposed structural measures, and appropriate details must be shown on the construction plans.

11. **ATTACHMENT G - Inspection, Maintenance, Repair and Retrofit Plan.** A plan for the inspection, maintenance, repair, and, if necessary, retrofit of the permanent BMPs and measures is provided at the end of this form. The plan has been prepared and certified by the engineer designing the permanent BMPs and measures. The plan has been signed by the owner or responsible party. The plan includes procedures for documenting inspections, maintenance, repairs, and, if necessary, retrofits as well as a discussion of record keeping procedures.

12. The TCEQ Technical Guidance Manual (TGM) was used to design permanent BMPs and measures for this site.
 Pilot-scale field testing (including water quality monitoring) may be required for BMPs that are not contained in technical guidance recognized by or prepared by the executive director.
N/A ATTACHMENT H - Pilot-Scale Field Testing Plan. A plan for pilot-scale field testing is provided at the end of this form.
13. **ATTACHMENT I -Measures for Minimizing Surface Stream Contamination.** A description of the measures that will be used to avoid or minimize surface stream contamination and changes in the way in which water enters a stream as a result of the construction and development is provided ~~at the end of this form~~ **below**. The measures address increased stream flashing, the creation of stronger flows and in-stream velocities, and other in-stream effects caused by the regulated activity which increase erosion that results in water quality degradation.


Any points where discharge from the site is concentrated and erosive velocities exist will include appropriately sized energy dissipaters to reduce velocities to non-erosive levels.


Responsibility for maintenance of permanent BMPs and measures after construction is complete.

14. The applicant is responsible for maintaining the permanent BMPs after construction until such time as the maintenance obligation is either assumed in writing by another entity having ownership or control of the property (such as without limitation, an owner's association, a new property owner or lessee, a district, or municipality) or the ownership of the property is transferred to the entity. Such entity shall then be responsible for maintenance until another entity assumes such obligations in writing or ownership is transferred.
15. A copy of the transfer of responsibility must be filed with the executive director at the appropriate regional office within 30 days of the transfer if the site is for use as a multiple single-family residential development, a multi-family residential development, or a non-residential development such as commercial, industrial, institutional, schools, and other sites where regulated activities occur.

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

Pape-Dawson Engineers, Inc.
Matt Johnson, P.E.
 Print Name of Customer/Agent


 Signature of Customer/Agent


 Date

**WILEY ROAD DRAINAGE IMPROVEMENTS
Permanent Pollution Abatement Measures**

**PERMANENT POLLUTION ABATEMENT MEASURES
MAINTENANCE SCHEDULE AND MAINTENANCE PROCEDURES**

This document has been prepared to provide a description and schedule for the performance of maintenance on permanent pollution abatement measures. Maintenance measures to be performed will be dependent on what permanent pollution abatement measures are incorporated into the project. The project specific water pollution abatement plan should be reviewed to determine what permanent pollution abatement measures are incorporated in to a project.

It should also be noted that the timing and procedures presented herein are general guidelines, adjustment to the timing and procedures may have to be made depending on project specific characteristics as well as weather related conditions.

Where a project is occupied by the owner, the owner may provide for maintenance with his own skilled forces or contract for recommended maintenance of Permanent Best Management Practices. Where a project is occupied or leased by a tenant, the owner shall require tenants to contract for such maintenance services either through a lease agreement, property owners association covenants, or other binding document.

I understand that I am responsible for maintenance of the Permanent Pollution Abatement Measures included in this project until such time as the maintenance obligation is either assumed in writing by another entity having ownership or control of the property or ownership is transferred.

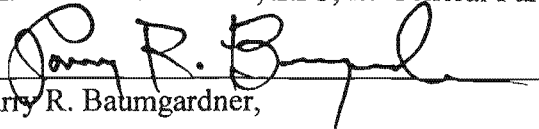
I, the owner, have read and understand the requirements of the attached Maintenance Plan and Schedule.

B & M FM 1863, LTD.,
a Texas limited partnership

By: KLMR-LRB FM 1863, LLC, its General Partner

5-28-08
Date

By:


Larry R. Baumgardner,
its Co-Manager

WILEY ROAD DRAINAGE IMPROVEMENTS
Permanent Pollution Abatement Measures

INSPECTION AND MAINTENANCE SCHEDULE
FOR
PERMANENT POLLUTION ABATEMENT MEASURES

Recommended Frequency	Task to be Performed													
	1	2	3	4	5	6	7	8	9	10	11	12	13	14
After Rainfall	√							√	√					
Biannually*	√	√	√	√	√	√	√	√	√					√

**At least one biannual inspection must occur during or immediately after a rainfall event.
 √Indicates maintenance procedure that applies to this specific site.*

See description of maintenance task to be performed on the following pages. Frequency of maintenance tasks may vary depending on amount of rainfall and other weather related conditions.

A written record should be kept of inspection results and maintenance performed.

<i>Task No. & Description</i>	<i>Included in this project</i>	
1. Check Depth of Vegetation	Yes	No
2. Check Depth of Silt Deposit in Basin	Yes	No
3. Removal of Debris and Trash	Yes	No
4. Cut-off Valve	Yes	No
5. Inlet Splash Pad	Yes	No
6. Underdrain System	Yes	No
7. Structural Integrity	Yes	No
8. Discharge Pipe	Yes	No
9. Drawdown Time	Yes	No
10. Vegetated Filter Strips	Yes	No
11. For Pump Stations	Yes	No
12. For Pump Stations	Yes	No
13. For Pump Stations	Yes	No
14. Visually Inspect Security Fencing for Damage or Breach	Yes	No

WILEY ROAD DRAINAGE IMPROVEMENTS

Permanent Pollution Abatement Measures

MAINTENANCE PROCEDURES FOR PERMANENT POLLUTION ABATEMENT MEASURES

Note: Additional guidance can be obtained from TCEQ's Technical Guidance Manual (TGM) RG-348 (2005) Section 3.5.

1. Check Depth of Vegetation. Vegetation in the basin shall not exceed 18-inches in depth. When vegetation needs to be cut, it shall be cut to an approximately 4-inch height. *A written record should be kept of inspection results and maintenance performed.*
2. Check Depth of Silt Deposit in Basin. Top of cleanouts shall be set 4-inches above sand layer. When silt has accumulated to top of cleanouts, the silt shall be removed the top 2 inches of the sand media shall also be removed and replaced with clean silica based sand. Written record should be kept of inspection results and maintenance performed.
3. Removal of Debris and Trash. The basin and inlet structure shall be checked for the accumulation of debris and trash such as brush, limbs, leaves, paper cups, aluminum cans, plastic bottles etc. Accumulated trash and debris shall be raked or collected from the basin and inlet structure and disposed of properly. *Written record should be kept of inspection results and maintenance performed.*
4. Cut-off Valve. The cut-off valve shall be turned to confirm full opening and full closure. Prior to operating the valve, the valve setting shall be checked to determine the position to which the valve is to be returned (which should limit drawdown time of the basin between 24-hours and 48-hours). Count should be kept of number of turns to open and close the valve so that the valve can be reset to the starting position. Defects in the operation of the cut-off valve shall be corrected within 7 working days. *A written record should be kept of inspection results and maintenance performed.*

WILEY ROAD DRAINAGE IMPROVEMENTS

Permanent Pollution Abatement Measures

5. Inlet Splash Pad. The filter area around the inlet splash pad shall be checked for erosion and for the condition of the rock rubble. Erosion or disturbance of the rock rubble should be corrected by removing the rock rubble, restoring missing sand media to appropriate depth and replacement of the rock rubble. If the condition persists in subsequent inspections, the size of the rock rubble should be increased. Rubble should be placed to a density that minimizes the amount of exposed sand between the rock rubble. Deficiencies should be corrected within seven working days. *A written record should be kept of inspection results and maintenance performed.*

6. Underdrain System. The underdrain system shall be visually inspected for the accumulation of silt in the pipe system. The pipe clean-outs shall have the caps removed and visually inspected for accumulation of silt deposits. If silt deposits appear to have accumulated so as to significantly reduce the drain capacity of the pipes then maintenance shall be performed. When silt deposits have accumulated to the stage described above, the clean-outs and drainpipes can be flushed with a high-pressure water flushing process. Clean-out caps must be replaced onto the clean-outs after maintenance so as to avoid the possibility of short circuiting the filtering process. Sediment accumulation at outlet pipe or in wet well due to flushing shall be removed and disposed of properly. *A written record should be kept of inspection results and the maintenance performed.*

7. Structural Integrity. In addition to Items 1 through 6 the following are measures which should be reviewed during a check of structural integrity:
 - Observe the height of the confining berm for visible signs of erosion or potential breach. Signs of erosion should be corrected within 2 weeks or immediately in case of emergency conditions. Corrective measures include but are not limited to addition of topsoil or appropriate soil material so as to restore the original berm height of the sand filter basin. Restored areas shall be protected through placement of solid block sod.

WILEY ROAD DRAINAGE IMPROVEMENTS

Permanent Pollution Abatement Measures

- Bypass of filter process. This condition can manifest itself in several ways. One way is by visually inspecting the clean-outs for accumulation of silt as described in Item 6. Significant accumulations of silt could be a sign of a torn filter fabric. Observations should be made over several inspection cycles to determine whether the condition persists. A second non-intrusive way of making observations for structural condition would be to visually look for collapsed or depressed areas along the edge of the filter media interface with basin side slope. If condition exists, corrective action should be performed within 15 working days. Removal of sand and replacement of filter fabric and/or pipe and gravel may be necessary. *A written record should be kept of inspection results and corrective measures taken.*
8. Discharge Pipe. The basin discharge pipe shall be checked for accumulation of silt, debris or other obstructions which could block flow. Soil accumulations, vegetative overgrowth and other blockages should be cleared from the pipe discharge point. Erosion at the point of discharge shall be monitored. If erosion occurs, the addition of rock rubble to disperse the flow should be accomplished. *A written record should be kept of inspection results and corrective measures taken*
 9. Drawdown Time. This characteristic can be a sign of the need for maintenance. The minimum drawdown time is 24 hours. If drawdown time is less than 24 hours, the gate valve shall be checked and partially closed to limit the drawdown time. Extensive drawdown time greater than 48 hours may indicated blockage of the sand media, the underdrain system and/or the discharge pipe. Corrective actions should be performed and completed within 15 working days. *A written record of the inspection findings and corrective actions performed should be made.*
 10. Vegetated Filter Strips. Vegetation height for native grasses shall be limited to no more than 18-inches. When vegetation exceeds that height, the filter strip shall be cut to a height of

WILEY ROAD DRAINAGE IMPROVEMENTS

Permanent Pollution Abatement Measures

approximately 4 inches. Turf grass shall be limited to a height of 4-inches with regular maintenance that utilizes a mulching mower. Trash and debris shall be removed from filter strip prior to cutting. Check filter strip for signs of concentrated flow and erosion. Areas of filter strip showing signs of erosion shall be repaired by scarifying the eroded area, reshaping, regrading and placement of solid block sod over the affected area. *A written record of the inspection findings and corrective actions performed should be made*

11. For Pump Stations. Check wet well discharge pipe to confirm flow through the pump system. If flow is not present, allow sufficient time for pump to cycle on and off. If flow does not occur, the wet well should be checked for the level of water. The wet well should be opened and the on/off float switches should be moved up and down to activate the pump. If the pump does not start, a repair technician shall be called in to repair the malfunction within 5 working days. *A written record of the inspection findings and corrective actions performed should be made*

12. For Pump Stations. Check the wet well for accumulation for trash, debris and silt. Trash and debris shall be removed and disposed of properly. Silt depth can be checked by probing the bottom of the wet well with a stick or PVC pipe. Silt accumulations should be removed when silt collects to a depth of three (3) inches over the entire wet well bottom. Silt can be removed by vacuum pump method. If silt buildup continues, underdrain system shall be inspected. *Written record should be kept of inspection results and maintenance performed.*

13. For Pump Stations. Visually check aboveground pump wiring and connections for damage. Damaged or loose connections should be repaired within 5 working days. *A written record should be kept of inspection results and the maintenance performed.*

WILEY ROAD DRAINAGE IMPROVEMENTS Permanent Pollution Abatement Measures

14. Visually Inspect Security Fencing for Damage or Breach. Check maintenance access gates for proper operation. Damage to fencing or gates shall be repaired within 5 working days. *A written record should be kept of inspection results and maintenance performed.*

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

I **Larry Baumgardner**,
Print Name

Co-Manager
Title - Owner/President/Other

of **B & M 1863, Ltd.**
Corporation/Partnership/Entity Name

have authorized **Pape-Dawson Engineers, Inc.**
Print Name of Agent/Engineer

of **Pape-Dawson Engineers, Inc.**
Print Name of Firm

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

I also understand that:

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

B & M FM 1863, LTD.,
a Texas limited partnership

By: KLMB-LRB FM 1863, LLC, its General Partner

By: *Larry R. Baumgardner*
Larry R. Baumgardner,
its Co-Manager

5-28-08
Date

THE STATE OF Texas §
County of Brewer §

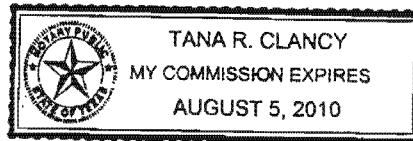
BEFORE ME, the undersigned authority, on this day personally appeared LARRY R. BAUMGARDNER
known to me to be the person whose name is subscribed to the foregoing instrument,
and acknowledged to me that (s)he executed same for the purpose and consideration therein
expressed.

GIVEN under my hand and seal of office on this 28th day of May, 2008

Tana R. Clancy
NOTARY PUBLIC

TANA R. CLANCY
Typed or Printed Name of Notary

MY COMMISSION EXPIRES: August 5, 2010



Texas Commission on Environmental Quality
Edwards Aquifer Protection Program
Application Fee Form

NAME OF PROPOSED REGULATED ENTITY: Wiley Road Drainage Improvements
 REGULATED ENTITY LOCATION: Southeast of the intersection of 281 and FM 1863
 NAME OF CUSTOMER: B & M 1863, Ltd.
 CONTACT PERSON: Larry Baumgardner PHONE: (210) 308-6288
 (Please Print)

Customer Reference Number (if issued): CN _____ (nine digits)
 Regulated Entity Reference Number (if issued): RN _____ (nine digits)

Austin Regional Office (3373) Hays Travis Williamson
San Antonio Regional Office (3362) Bexar Comal Medina Kinney Uvalde

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 (Check One):

- | | |
|---|--|
| <input type="checkbox"/> Austin Regional Office | <input checked="" type="checkbox"/> San Antonio Regional Office |
| <input type="checkbox"/> Mailed to TCEQ:
TCEQ – Cashier
Revenues Section
Mail Code 214
P.O. Box 13088
Austin, TX 78711-3088 | <input type="checkbox"/> Overnight Delivery to TCEQ:
TCEQ - Cashier
12100 Park 35 Circle
Building A, 3rd Floor
Austin, TX 78753
512/239-0347 |

Site Location (Check All That Apply): Recharge Zone Contributing Zone Transition Zone

Type of Plan	Size	Fee Due
Water Pollution Abatement Plan, Contributing Zone Plan: One Single Family Residential Dwelling	Acres	\$
Water Pollution Abatement Plan, Contributing Zone Plan: Multiple Single Family Residential and Parks	Acres	\$
Water Pollution Abatement Plan, Contributing Zone Plan: Non-residential	56.64 Acres	\$8,000
Sewage Collection System	L.F.	\$
Lift Stations without sewer lines	Acres	\$
Underground or Aboveground Storage Tank Facility	Tanks	\$
Piping System(s)(only)	Each	\$
Exception	Each	\$
Extension of Time	Each	\$


Signature

4/2/08
Date

If you have questions on how to fill out this form or about the Edwards Aquifer protection program, please contact us at 210/490-3096 for projects located in the San Antonio Region or 512/339-2929 for projects located in the Austin Region.

Individuals are entitled to request and review their personal information that the agency gathers on its forms. They may also have any errors in their information corrected. To review such information, contact us at 512/239-3282.

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

**Water Pollution Abatement Plans and Modifications
 Contributing Zone Plans and Modifications**

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

Organized Sewage Collection Systems and Modifications

PROJECT	COST PER LINEAR FOOT	MINIMUM FEE MAXIMUM FEE
Sewage Collection Systems	\$0.50	\$650 - \$6,500

Underground and Aboveground Storage Tank System Facility Plans and Modifications

PROJECT	COST PER TANK OR PIPING SYSTEM	MINIMUM FEE MAXIMUM FEE
Underground and Aboveground Storage Tank Facility	\$650	\$650 - \$6,500

Exception Requests

PROJECT	FEE
Exception Request	\$500

Extension of Time Requests

PROJECT	FEE
Extension of Time Request	\$150

EXHIBITS



TCEQ Use Only

TCEQ Core Data Form

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

SECTION I: General Information

1. Reason for Submission (If other is checked please describe in space provided)			
<input checked="" type="checkbox"/> New Permit, Registration or Authorization (Core Data Form should be submitted with the program application)			
<input type="checkbox"/> Renewal (Core Data Form should be submitted with the renewal form)		<input type="checkbox"/> Other	
2. Attachments Describe Any Attachments: (ex. Title V Application, Waste Transporter Application, etc.)			
<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No Water Pollution Abatement Plan Application and Exhibits			
3. Customer Reference Number (if issued)		4. Regulated Entity Reference Number (if issued)	
CN		RN	

SECTION II: Customer Information

5. Effective Date for Customer Information Updates (mm/dd/yyyy)			
6. Customer Role (Proposed or Actual) – as it relates to the Regulated Entity listed on this form. Please check only one of the following:			
<input checked="" type="checkbox"/> Owner	<input type="checkbox"/> Operator	<input type="checkbox"/> Owner & Operator	
<input type="checkbox"/> Occupational Licensee	<input type="checkbox"/> Responsible Party	<input type="checkbox"/> Voluntary Cleanup Applicant	<input type="checkbox"/> Other: _____
7. General Customer Information			
<input checked="" type="checkbox"/> New Customer		<input type="checkbox"/> Update to Customer Information	
<input type="checkbox"/> Change in Legal Name (Verifiable with the Texas Secretary of State)		<input type="checkbox"/> Change in Regulated Entity Ownership	
		<input type="checkbox"/> No Change**	
**If "No Change" and Section I is complete, skip to Section III – Regulated Entity Information.			
8. Type of Customer:			
<input type="checkbox"/> Corporation	<input type="checkbox"/> Individual	<input type="checkbox"/> Sole Proprietorship- D.B.A	
<input type="checkbox"/> City Government	<input type="checkbox"/> County Government	<input type="checkbox"/> Federal Government	<input type="checkbox"/> State Government
<input type="checkbox"/> Other Government	<input checked="" type="checkbox"/> General Partnership	<input type="checkbox"/> Limited Partnership	<input type="checkbox"/> Other: _____
9. Customer Legal Name (If an individual, print last name first: ex: Doe, John)			End Date:
B & M ^{FM} 1863, Ltd.			
10. Mailing Address:			
335 E. Sonterra Blvd, Ste. 200			
City	San Antonio	State	TX
ZIP	78258	ZIP + 4	4385
11. Country Mailing Information (if outside USA)		12. E-Mail Address (if applicable)	
13. Telephone Number		14. Extension or Code	
(210) 308-6288			
		15. Fax Number (if applicable)	
		(210) 979-6126	
16. Federal Tax ID (9 digits)		17. TX State Franchise Tax ID (11 digits)	
205653290			
		18. DUNS Number (if applicable)	
		800630842	
		19. TX SOS Filing Number (if applicable)	
		800631368	
20. Number of Employees			21. Independently Owned and Operated?
<input checked="" type="checkbox"/> 0-20 <input type="checkbox"/> 21-100 <input type="checkbox"/> 101-250 <input type="checkbox"/> 251-500 <input type="checkbox"/> 501 and higher			<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No

SECTION III: Regulated Entity Information

22. General Regulated Entity Information (If 'New Regulated Entity' is selected below this form should be accompanied by a permit application)			
<input checked="" type="checkbox"/> New Regulated Entity <input type="checkbox"/> Update to Regulated Entity Name <input type="checkbox"/> Update to Regulated Entity Information <input type="checkbox"/> No Change** (See below)			
**If "NO CHANGE" is checked and Section I is complete, skip to Section IV, Preparer Information.			
23. Regulated Entity Name (name of the site where the regulated action is taking place)			
Wiley Road Drainage Improvements			

24. Street Address of the Regulated Entity: (No P.O. Boxes)	Not yet assigned							
	City		State		ZIP		ZIP + 4	
25. Mailing Address:	335 E. Sonterra Blvd, Ste. 200							
	City	San Antonio	State	TX	ZIP	78258	ZIP + 4	4385
26. E-Mail Address:								
27. Telephone Number	28. Extension or Code			29. Fax Number (if applicable)				
(210) 308-6288				(210) 979-6126				
30. Primary SIC Code (4 digits)	31. Secondary SIC Code (4 digits)		32. Primary NAICS Code (5 or 6 digits)		33. Secondary NAICS Code (5 or 6 digits)			
1611	6552		23411		23311			
34. What is the Primary Business of this entity? (Please do not repeat the SIC or NAICS description.)								
Road								

Questions 34 – 37 address geographic location. Please refer to the instructions for applicability.

35. Description to Physical Location:	Along FM 1863, approximately 1700 ft east of 281				
36. Nearest City	County		State		Nearest ZIP Code
Bulverde	Comal		TX		78261
37. Latitude (N) In Decimal:	29.73784		38. Longitude (W) In Decimal:	98.42675	
Degrees	Minutes	Seconds	Degrees	Minutes	Seconds
29	44	16.2	98	25	36.3

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 or the updates may not be made. If your Program is not listed, check other and write it in. See the Core Data Form instructions for additional guidance.

<input type="checkbox"/> Dam Safety	<input type="checkbox"/> Districts	<input checked="" type="checkbox"/> Edwards Aquifer	<input type="checkbox"/> Industrial Hazardous Waste	<input type="checkbox"/> Municipal Solid Waste
<input type="checkbox"/> New Source Review – Air	<input type="checkbox"/> OSSF	<input type="checkbox"/> Petroleum Storage Tank	<input type="checkbox"/> PWS	<input type="checkbox"/> Sludge
<input type="checkbox"/> Stormwater	<input type="checkbox"/> Title V – Air	<input type="checkbox"/> Tires	<input type="checkbox"/> Used Oil	<input type="checkbox"/> Utilities
<input type="checkbox"/> Voluntary Cleanup	<input type="checkbox"/> Waste Water	<input type="checkbox"/> Wastewater Agriculture	<input type="checkbox"/> Water Rights	<input type="checkbox"/> Other:

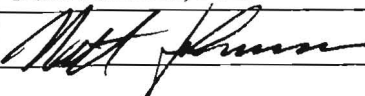
SECTION IV: Preparer Information

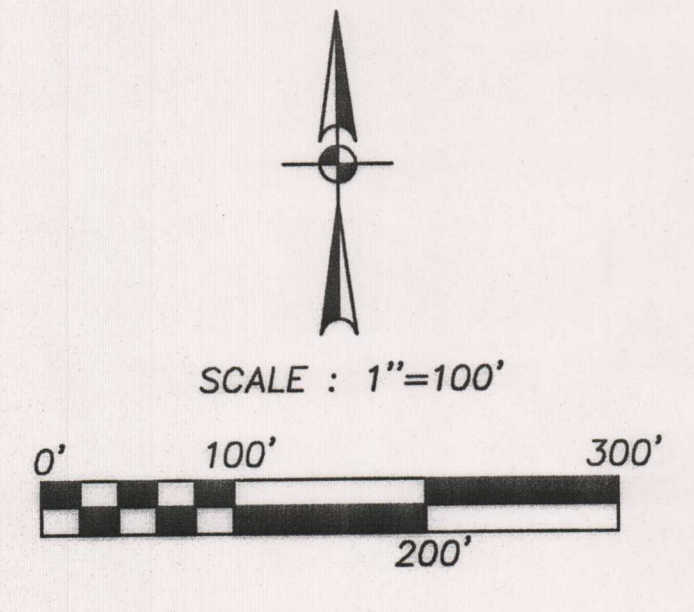
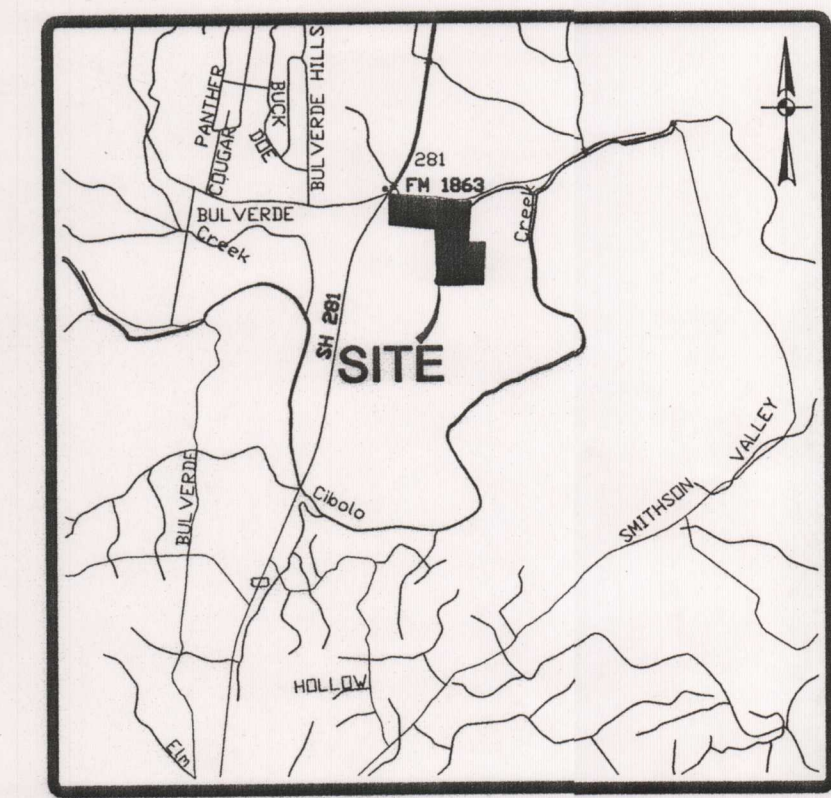
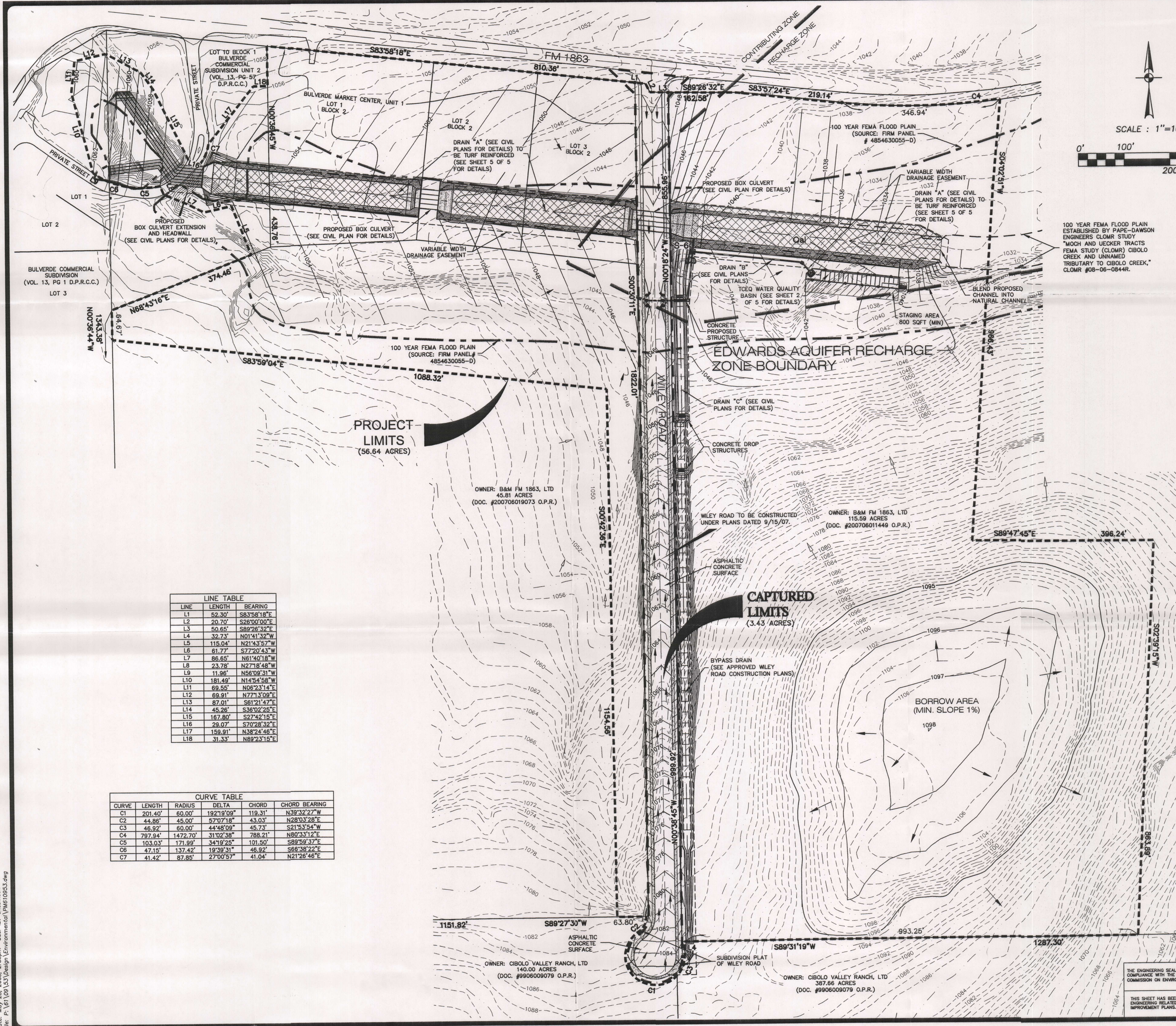
40. Name:	Miranda G. Briones, E.I.T.	41. Title:	Engineer II
42. Telephone Number	43. Ext./Code	44. Fax Number	45. E-Mail Address
(210) 375-9000		(210) 375-9010	mbriones@pape-dawson.com

SECTION V: Authorized Signature

46. By my signature below, I certify, to the best of my knowledge, that the information provided in this form is true and complete, and that I have signature authority to submit this form on behalf of the entity specified in Section II, Field 9 and/or as required for the updates to the ID numbers identified in field 39.

(See the Core Data Form instructions for more information on who should sign this form.)

Company:	B & M 1863, Ltd.	Job Title:	Vice-President, Land Development
Name (In Print):	Matt Johnson, P.E.	Phone:	(210) 375-9000
Signature:		Date:	4/2/08



LEGEND

- STAGING AREA FOR BASIN MAINTENANCE
- AREA TO USE TURF REINFORCEMENT (SEE SHEET 4 OF 5 FOR DETAILS)
- PROJECT LIMITS
- CAPTURE LIMITS
- DRAINAGE FLOW (PROPOSED)
- DRAINAGE FLOW (EXISTING)
- EXISTING CONTOURS
- PROPOSED CONTOURS
- POTENTIAL RECHARGE FEATURE
- ALLUVIUM
- NON-KARST CLOSED DEPRESSION
- SINKHOLE

NOTE: DRAINAGE PATTERNS ARE ILLUSTRATED BY TOPOGRAPHIC CONTOURS AND ARROWS. SLOPES VARY THROUGHOUT THE SITE. TYPICAL SLOPES IN THIS PROJECT WILL RANGE FROM 1.0% TO 33.33%. THE CAPTURED AREA IS DENOTED ON MAP AND THE REST OF THE OVERALL PROJECT SITE IS UNCAPTURED.

NOTE: CONTRACTOR SHALL REVIEW CONSTRUCTION PHASING PLANS PRIOR TO INSTALLING BMPs. CONTRACTOR'S PHASE I AND PHASE II EROSION AND SEDIMENTATION CONTROL PLANS SHALL REFLECT WHEN BMPs FOR EACH CONSTRUCTION PHASE ARE TO BE INSTALLED. AS CONSTRUCTION PHASES PROGRESS CONTRACTOR SHALL MODIFY BMPs AS NECESSARY TO ALLOW FOR PROPER VEHICULAR AND PEDESTRIAN TRAFFIC CIRCULATION, AND MAINTAIN THE EFFECTIVENESS OF THE BMPs. CONTRACTOR SHALL COORDINATE WITH CONSTRUCTION MANAGER FOR ALL WORK ONSITE.

SOIL STABILIZATION SHALL OCCUR IN ALL DISTURBED AREAS WHERE IMPERVIOUS COVER WILL NOT BE PLACED ON THE GROUND. REFERENCE NOTE 10 UNDER TCEQ W.P.A. GENERAL CONSTRUCTION NOTES.

DISTURBED EARTHEN AREAS SHALL BE VEGETATED BY HYDROMULCH. TEMPORARY BMP'S ARE NOT TO BE REMOVED UNTIL AREAS ARE 85% REVEGETATED.

SUMMARY OF PERMANENT POLLUTION ABATEMENT MEASURES:

1. SILT FENCE WILL BE MAINTAINED UNTIL THE SITE IMPROVEMENTS ARE COMPLETED AND SUFFICIENT VEGETATION HAS BEEN ESTABLISHED IN ACCORDANCE WITH APPLICABLE PROJECT SPECIFICATIONS.
2. STORMWATER RUNOFF FROM WITHIN THIS DEVELOPMENT WILL BE DISCHARGED TO A SEDIMENTATION/FILTRATION BASIN FOR TREATMENT. THIS BASIN HAS BEEN DESIGNED TO REMOVE AT LEAST 80% OF THE INCREASED TOTAL SUSPENDED SOLIDS (TSS) FOR THE 6.27 ACRE WATERSHED IN ACCORDANCE WITH THE TCEQ'S TECHNICAL GUIDANCE MANUAL (TGM) RG-348 (2005).
3. DURING CONSTRUCTION, TO THE EXTENT PRACTICAL, CONTRACTOR SHALL MINIMIZE THE AREA OF SOIL DISTURBANCE. AREAS OF DISTURBED SOIL SHALL BE VEGETATED TO STABILIZE SOIL USING SOLID SOD IN A STAGGERED PATTERN. SEE DETAIL ON EXHIBIT 5 AND REFER TO SECTION 1.3.11 IN TCEQ'S TECHNICAL GUIDANCE MANUAL RG-348 (2005). SOD SHOULD BE USED IN CHANNELS AND ON SLOPES GREATER THAN 15%. THE CONTRACTOR MAY SUBSTITUTE THE USE OF SOD WITH THE PLACEMENT OF TOP SOIL AND A FRIABLE SEED BED WITH A PROTECTIVE MATTING OR HYDRAULIC MULCH ALONG WITH WATERING UNTIL VEGETATION IS ESTABLISHED. APPLICATIONS AND PRODUCTS SHALL BE THOSE APPROVED BY TXDOT AS OF FEBRUARY 2001 AND IN COMPLIANCE WITH THE TGM RG-348 (2005). SEED MIXTURE AND/OR GRASS TYPE TO BE DETERMINED BY OWNER AND SHOULD BE IN COMPLIANCE WITH TGM RG-348 (2005) GUIDELINES. IRRIGATION MAY BE REQUIRED IN ORDER TO ESTABLISH SUFFICIENT VEGETATION.
4. FOR DISTURBED AREAS WHERE INSUFFICIENT SOIL EXISTS TO ESTABLISH VEGETATION, CONTRACTOR SHALL PLACE A MINIMUM OF 6" TOPSOIL PRIOR TO REVEGETATION, OR AS OTHERWISE SPECIFIED IN LANDSCAPE PLANS.
5. SLOPES ON SITE VARY FROM APPROXIMATELY 1.0% TO 33.33%.

LINE TABLE

LINE	LENGTH	BEARING
L1	52.30'	S83°58'18"E
L2	20.70'	S28°00'00"E
L3	50.65'	S89°26'32"E
L4	32.73'	N01°41'32"W
L5	115.04'	N21°43'57"W
L6	61.77'	S77°20'43"W
L7	86.65'	N61°40'18"W
L8	23.78'	N27°18'48"W
L9	11.96'	N56°09'31"W
L10	181.49'	N14°54'58"W
L11	69.55'	N06°23'14"E
L12	89.91'	N77°13'09"E
L13	87.01'	S61°21'47"E
L14	45.26'	S36°02'25"E
L15	167.80'	S27°42'15"E
L16	29.07'	S70°28'32"E
L17	159.91'	N38°24'46"E
L18	31.33'	N89°23'19"E

CURVE TABLE

CURVE	LENGTH	RADIUS	DELTA	CHORD	CHORD BEARING
C1	201.40'	60.00'	192°19'09"	119.31'	N39°32'27"W
C2	44.86'	45.00'	57°07'18"	43.03'	N28°03'28"E
C3	46.92'	60.00'	44°48'09"	45.73'	S21°53'54"W
C4	787.94'	1472.70'	31°02'38"	788.21'	N80°33'12"E
C5	103.03'	171.99'	34°19'25"	101.50'	S89°59'37"E
C6	47.15'	137.42'	19°39'31"	46.39'	S66°38'22"E
C7	41.42'	87.85'	27°00'57"	41.04'	N21°26'46"E

THE ENGINEERING SEAL HAS BEEN AFFIXED TO THIS SHEET ONLY FOR THE PURPOSE OF DEMONSTRATING COMPLIANCE WITH THE POLLUTION ABATEMENT SIZING AND TREATMENT REQUIREMENTS OF THE TEXAS COMMISSION ON ENVIRONMENTAL QUALITY'S EDWARDS AQUIFER TECHNICAL GUIDANCE MANUAL.

THIS SHEET HAS BEEN PREPARED FOR PURPOSES OF POLLUTION ABATEMENT ONLY. ALL OTHER CIVIL ENGINEERING RELATED INFORMATION SHOULD BE ACQUIRED FROM THE APPROPRIATE SHEET IN THE CIVIL IMPROVEMENT PLANS.

REVISIONS:



PAPE-DAWSON ENGINEERS

555 EAST RAMSEY | SAN ANTONIO, TEXAS 78216 | PHONE: 210.375.6000 FAX: 210.375.6010

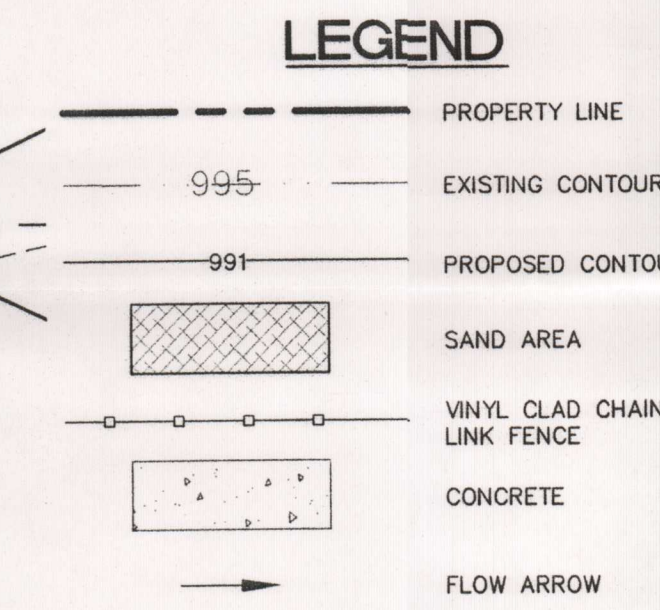
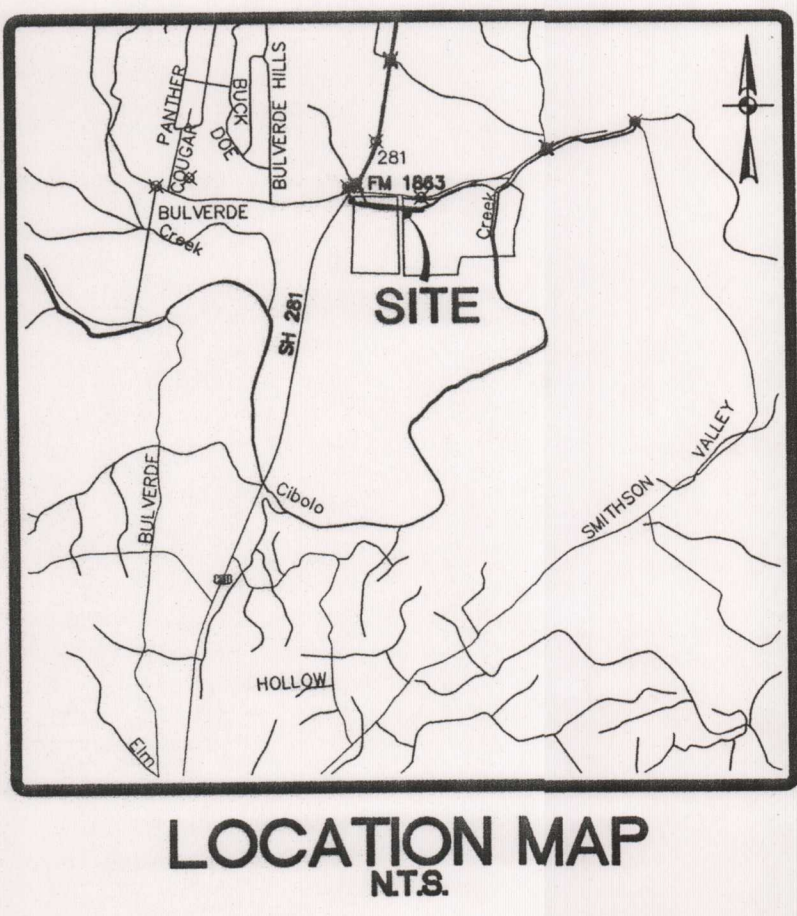
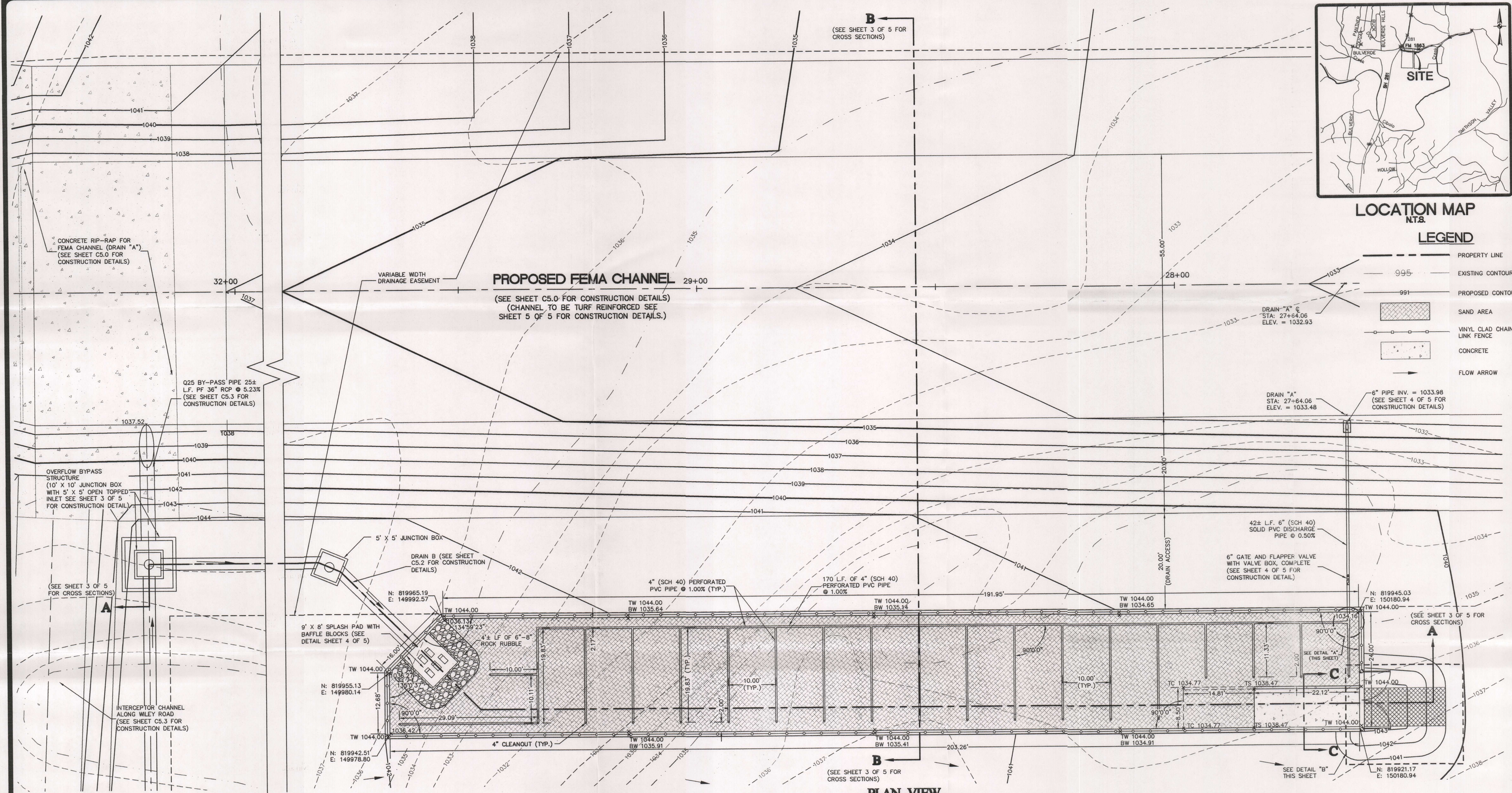
**WILEY ROAD DRAINAGE IMPROVEMENTS
PERMANENT POLLUTION ABATEMENT PLAN
BULVERDE, TEXAS**

JOB NO. 6109-53
DATE MAY 2008
DESIGNER TFE
CHECKED DKH DRAWN ESL
SHEET 1 OF 5

EXHIBIT 3

Date: May 23, 2008, 2:35pm User ID: jrobinson
File: P:\01\09\13\Design\Environmental\Plan\0953.dwg

THIS DOCUMENT HAS BEEN PRODUCED FROM MATERIAL THAT WAS STORED AND/OR TRANSMITTED ELECTRONICALLY AND MAY HAVE BEEN INADVERTENTLY ALTERED. RELY ONLY ON FINAL HARDCOPY MATERIALS BEARING THE CONSULTANT'S ORIGINAL SIGNATURE AND SEAL.



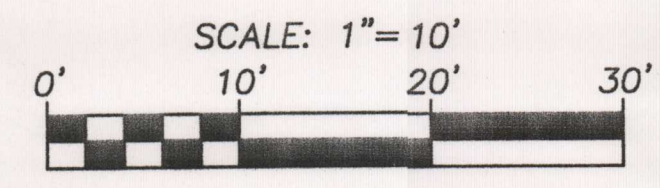
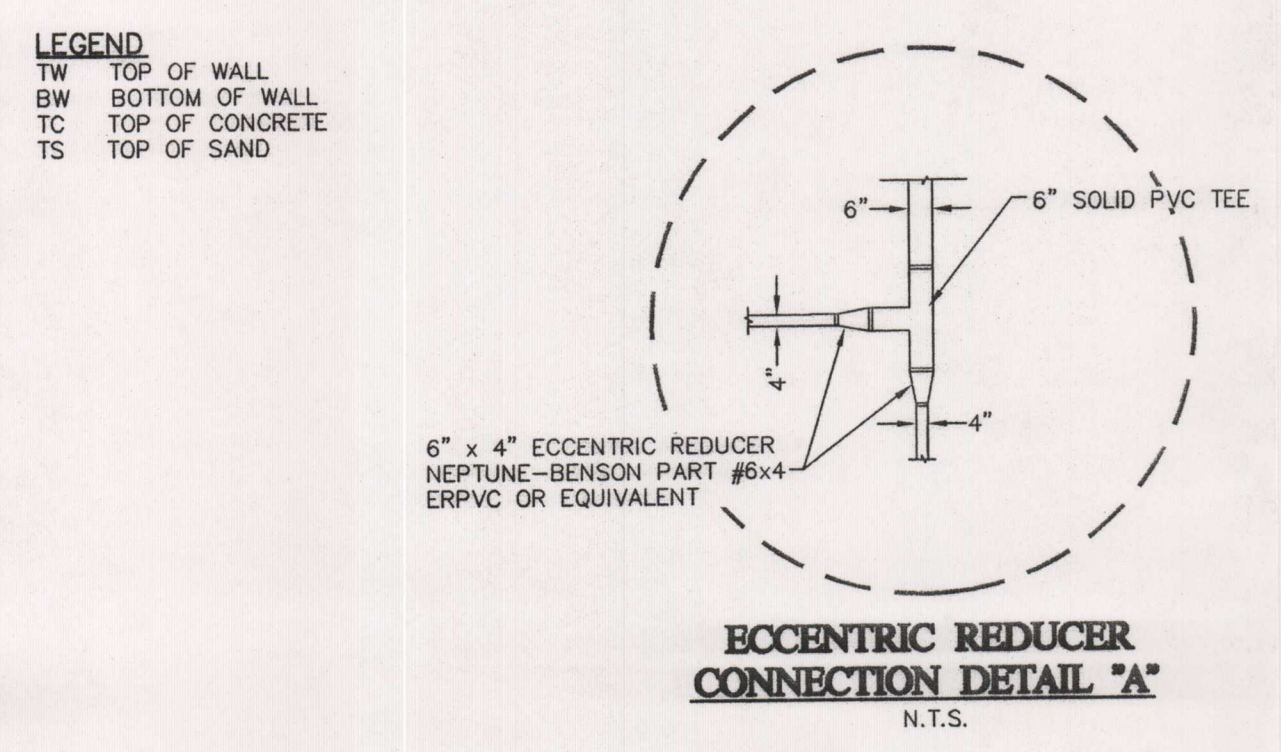
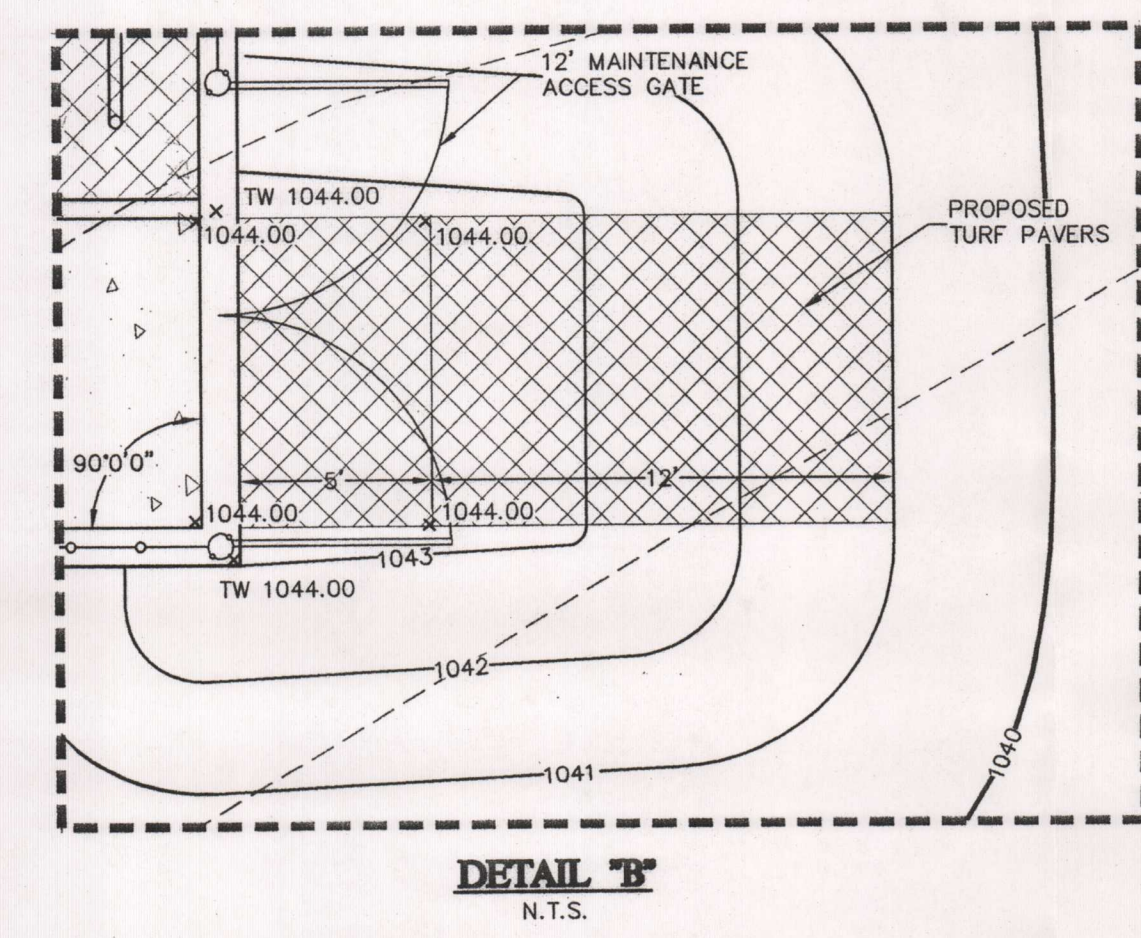
NOTES TO CONTRACTOR

- CONTRACTOR IS ADVISED THAT TCEQ DOES NOT ALLOW CHANGES TO PERMANENT POLLUTION ABATEMENT MEASURES WITHOUT THEIR PRIOR APPROVAL.
- CONTRACTOR SHALL NOTIFY CERTIFYING ENGINEER WHEN BASIN CONSTRUCTION HAS PROCEEDED TO THE FOLLOWING MILESTONES:
 - REINFORCING STEEL FOR BASIN WALL OR RIP-RAP LINER HAS BEEN SET, CONCRETE HAS NOT BEEN PLACED AND DRAIN PIPE IS IN PLACE, WHERE EPDM LINER IS USED, CONTRACTOR SHALL PROVIDE ENGINEER WITH SURVEY DATA WHICH DEMONSTRATES THE LINER HAS BEEN SET AT PROPER ELEVATION AND GRADE.
 - CONCRETE RIP-RAP OR EPDM LINER IS IN PLACE AND UNDER-DRAIN SYSTEM IS IN PLACE WITHOUT GRAVEL.
 - GRAVEL AROUND UNDER DRAIN SYSTEM IS IN PLACE AND FILTER FABRIC IS INSTALLED AND ATTACHED TO WALLS OR RIP-RAP.
 - SAND FILTER MEDIA HAS BEEN PLACED & BASIN HAS BEEN COMPLETELY FINISHED INCLUDING SOD OR SEED PLACEMENT ON SIDE SLOPES (WHERE APPLICABLE).
- WORK SHALL NOT CONTINUE ON THE BASIN UNTIL THE ENGINEER HAS HAD AN OPPORTUNITY TO OBSERVE THE STATUS OF CONSTRUCTION AT EACH STAGE. CONTRACTOR SHALL PROVIDE ENGINEER A MINIMUM OF 24 HOURS ADVANCE NOTICE PRIOR TO TIME THE BASIN WILL BE AT THE REQUIRED STAGE.
- UPON SUBSTANTIAL COMPLETION, OR AS REQUESTED BY ENGINEER, CONTRACTOR TO PROVIDE CERTIFYING ENGINEER WITH FIELD SHOTS VERIFYING ELEVATIONS OF THE FOLLOWING:
 - TOP OF BANK/WALL AT EACH CORNER OF BASIN
 - TOE OF SLOPE AT EACH CORNER OF BASIN (INSIDE BASIN TOE)
 - SPLASH PAD/INLET PIPES
 - OVERFLOW WEIRS
- BEFORE FINAL ACCEPTANCE OF CONSTRUCTION BY THE OWNER, THE CONTRACTOR WILL REMOVE ALL TRASH, DEBRIS, AND ACCUMULATED SILT FROM THE BASINS AND REESTABLISH THEM TO THE PROPER OPERATING CONDITION.
- THIS SHEET HAS BEEN PREPARED FOR PURPOSES OF POLLUTION ABATEMENT ONLY. ALL OTHER CIVIL ENGINEERING RELATED INFORMATION SHOULD BE ACQUIRED FROM THE APPROPRIATE SHEET IN THE CIVIL IMPROVEMENT PLANS.
- UNLESS OTHERWISE PROVIDED, CONTRACTOR SHALL ENGAGE A TEXAS LICENSED STRUCTURAL ENGINEER TO PROVIDE A SIGNED AND SEALED SET OF STRUCTURAL PLANS, DETAILS AND SPECIFICATIONS FOR THE STRUCTURAL COMPONENTS OF THE POLLUTION ABATEMENT BASIN INCLUDING INLET DISCHARGE AND BYPASS COMPONENTS. CONTRACTOR SHALL ALSO PROVIDE FOR STRUCTURAL ENGINEER'S INSPECTION DURING BASIN CONSTRUCTION AND STRUCTURAL ENGINEER'S CONSTRUCTION CERTIFICATION UPON COMPLETION OF THE BASIN.
- ELEVATIONS SHOWN INSIDE THE DETENTION BASIN ARE AT THE BASIN FLOOR UNLESS OTHERWISE NOTED.
- DETENTION BASIN DIMENSIONS ARE TO THE INSIDE FACE OF WALL.
- UPON COMPLETION OF CONSTRUCTION, AND IN ACCORDANCE WITH TCEQ REGULATIONS, ALL PERMANENT BMP'S (BASINS) MUST BE CERTIFIED BY A REGISTERED PROFESSIONAL ENGINEER.
- ALL AREAS DISTURBED AS PART OF CONSTRUCTION OF BASIN SHALL BE REVEGETATED PRIOR TO COMPLETION.

WPAP BASIN DESIGN DATA

BASIN WATERSHED AREA	= 149,411 sf (3.43 AC)
RUN OFF DEPTH	= 1.50 in (SEE SHEET 1 OF 4 FOR WATERSHED AREA)
REQUIRED CAPTURE VOLUME	= 17,390 cf
REQUIRED SAND AREA	= 1,449 sf
BASIN DEPTH (WATER STORAGE)	= 4.0'
BASIN CAPTURE VOLUME	= 19,200 cf
BASIN SAND AREA	= 4,800 sf
Q25	= 35.96 cfs
OVERFLOW WEIR LENGTH	= 20'
HEIGHT OF HEAD ABOVE WEIR	= 0.70'

BASIN DRAWDOWN IS CONTROLLED BY THE VALVE SETTING ON THE 6" DISCHARGE PIPE WHICH THE VALVE OPENING IS APPROXIMATELY 64.21" FOR DRAWDOWN TO HAVE A RATE OF 24 TO 48 HOURS.

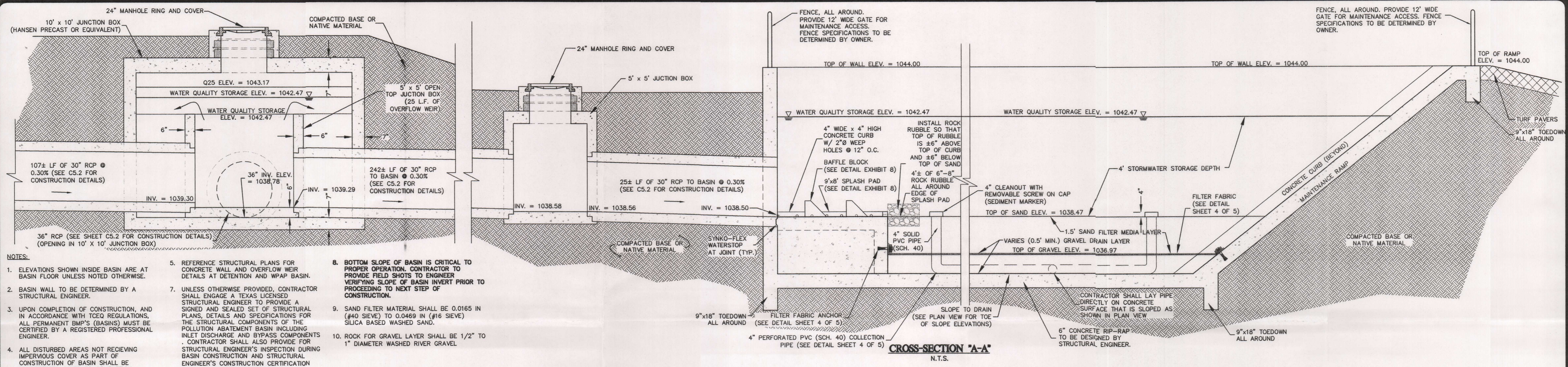


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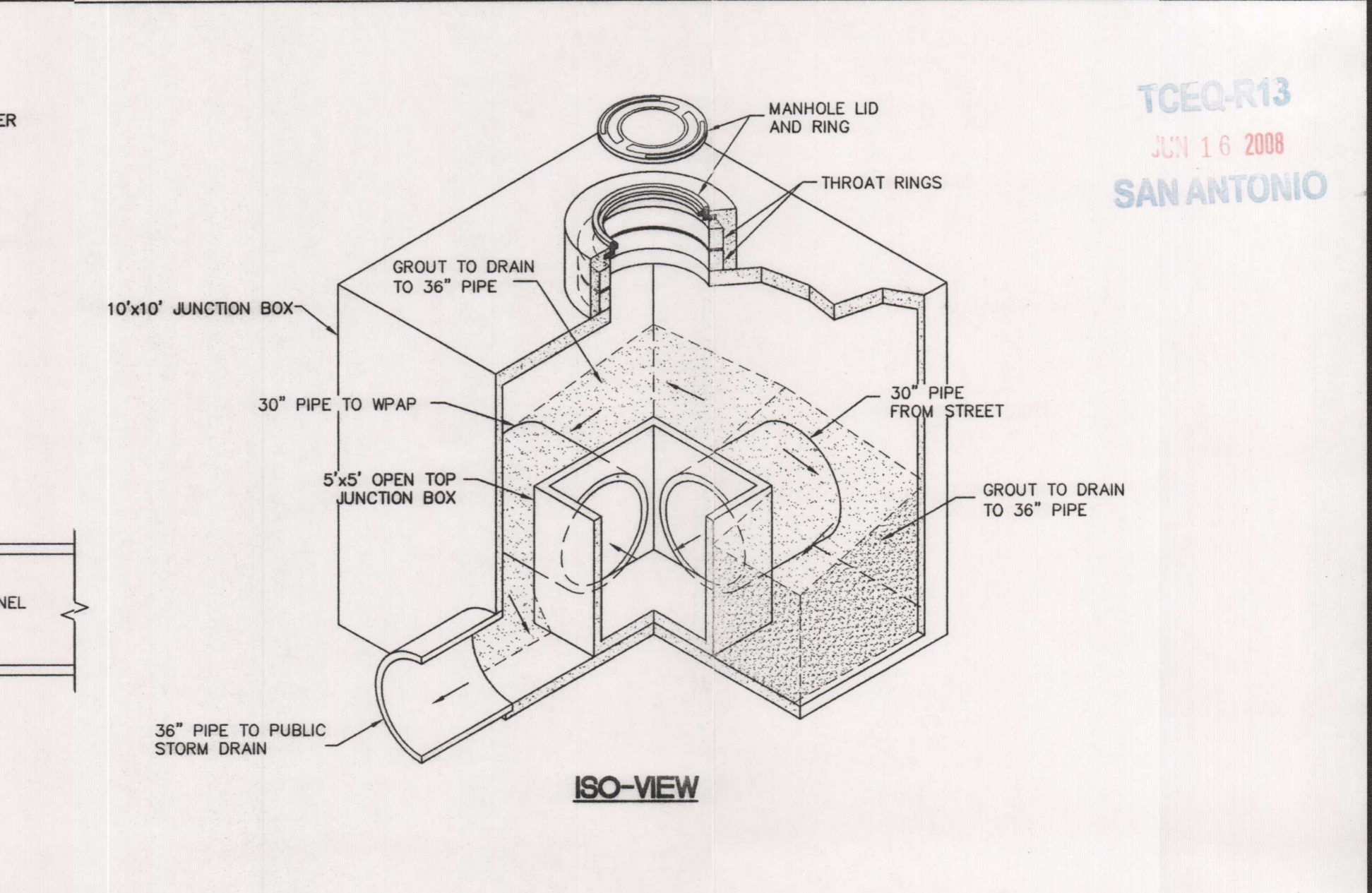
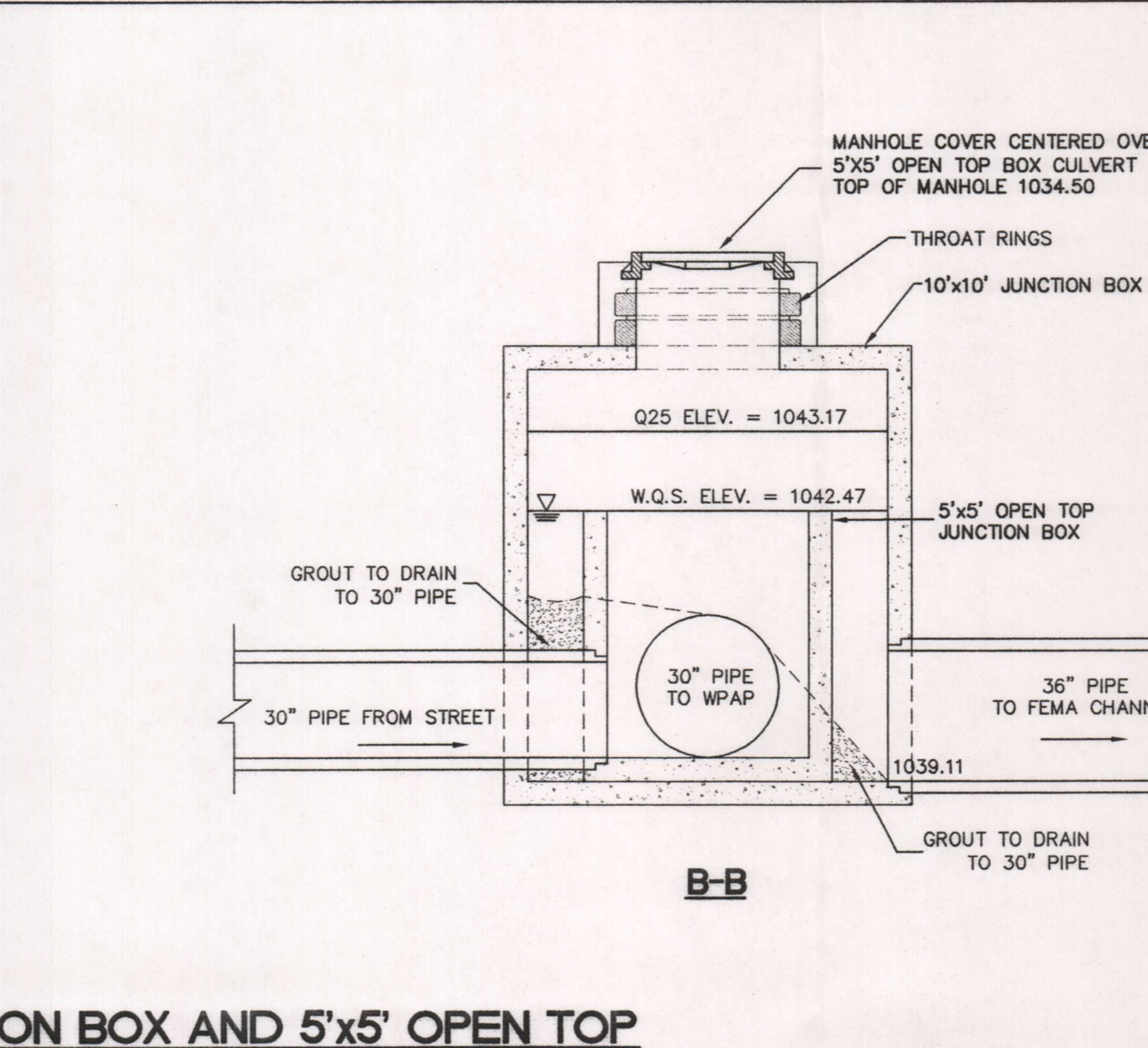
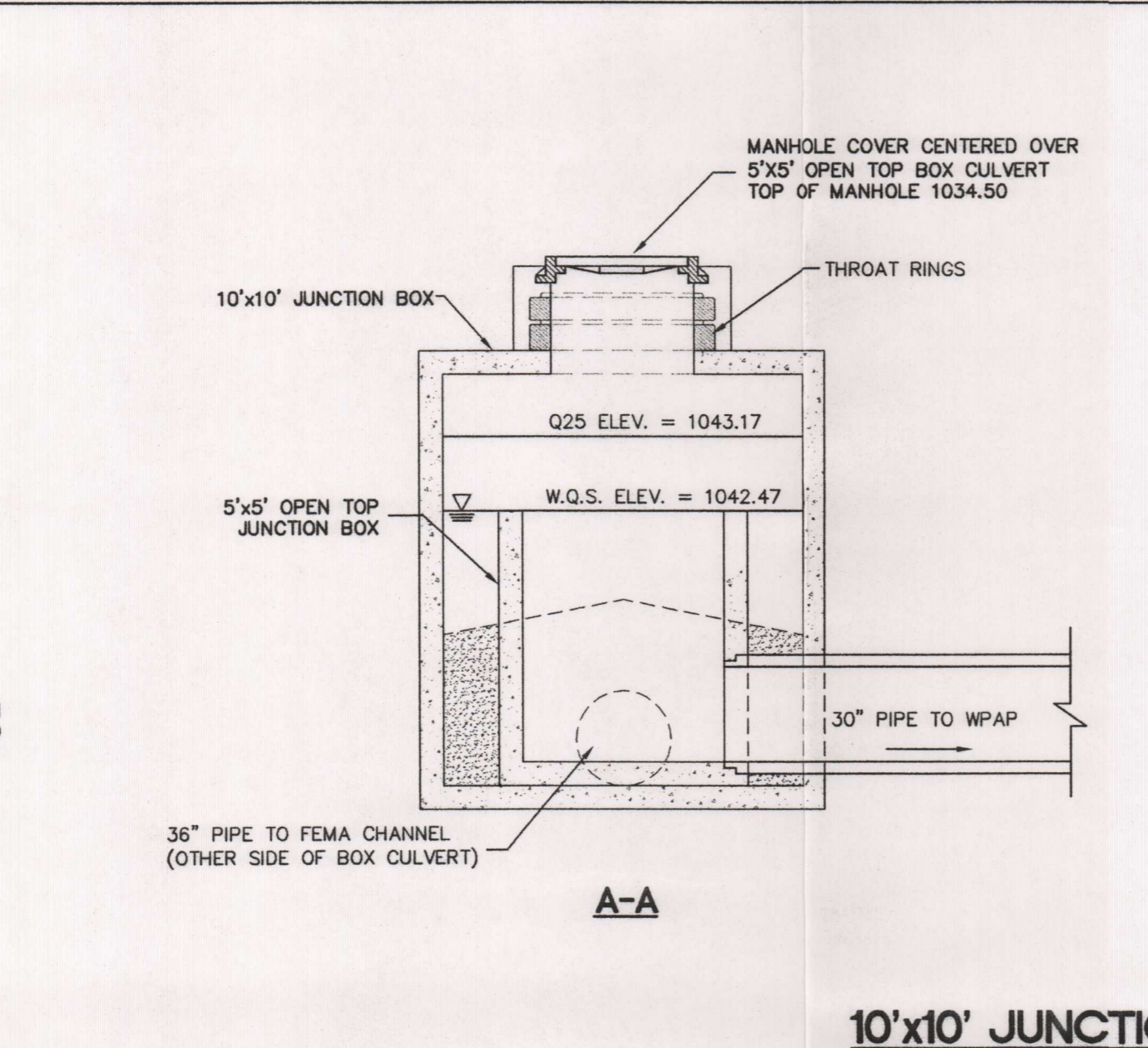
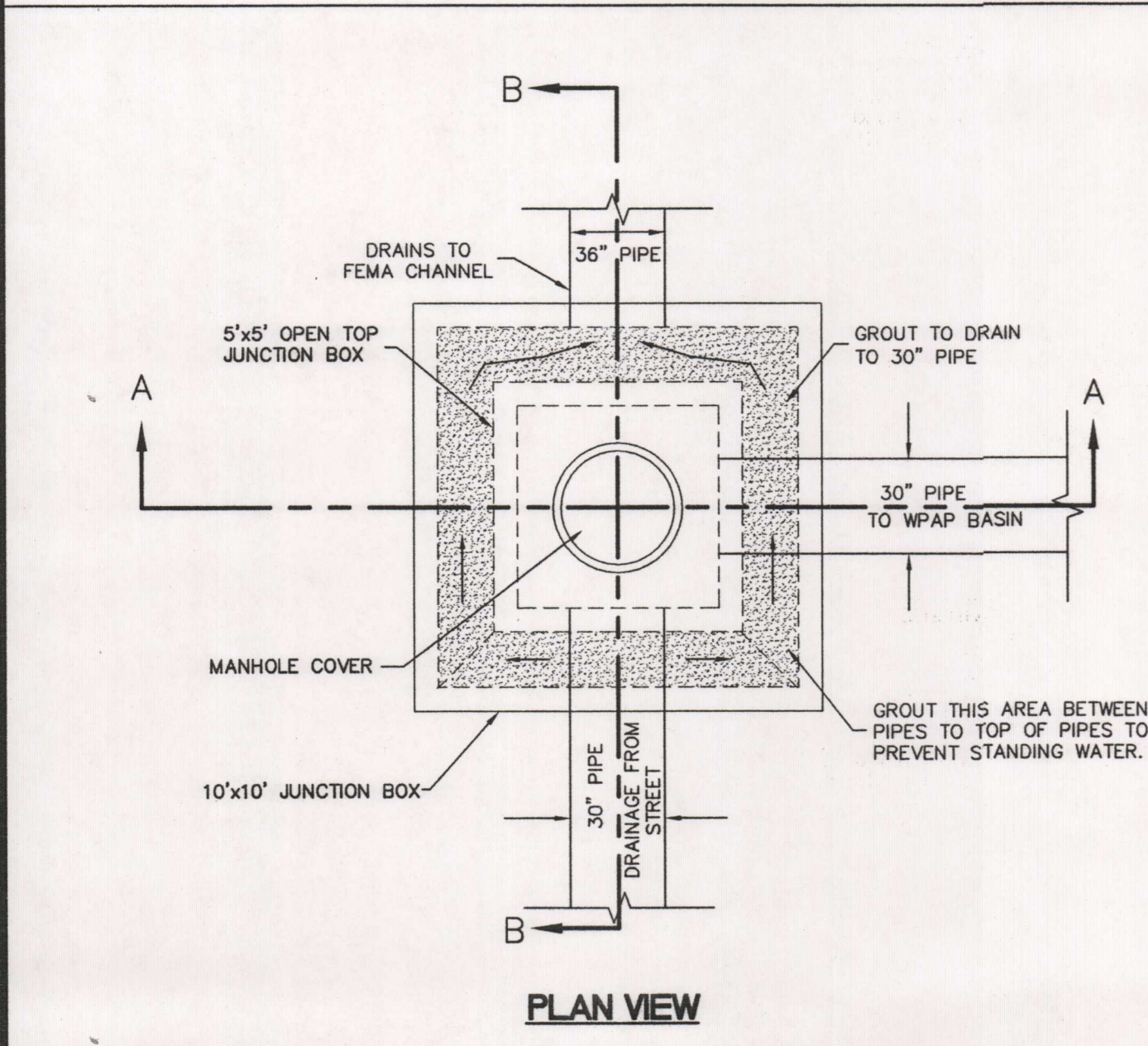
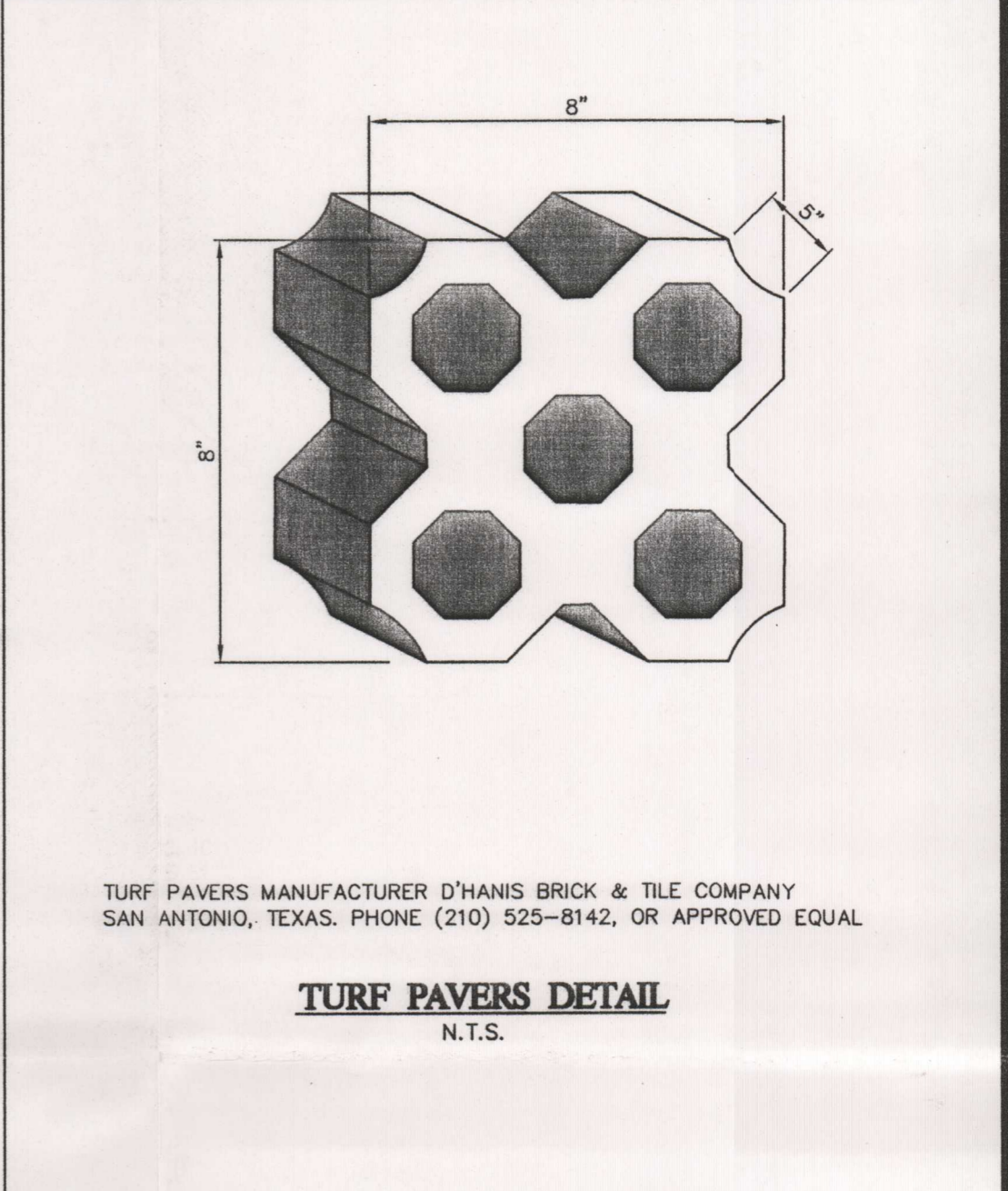
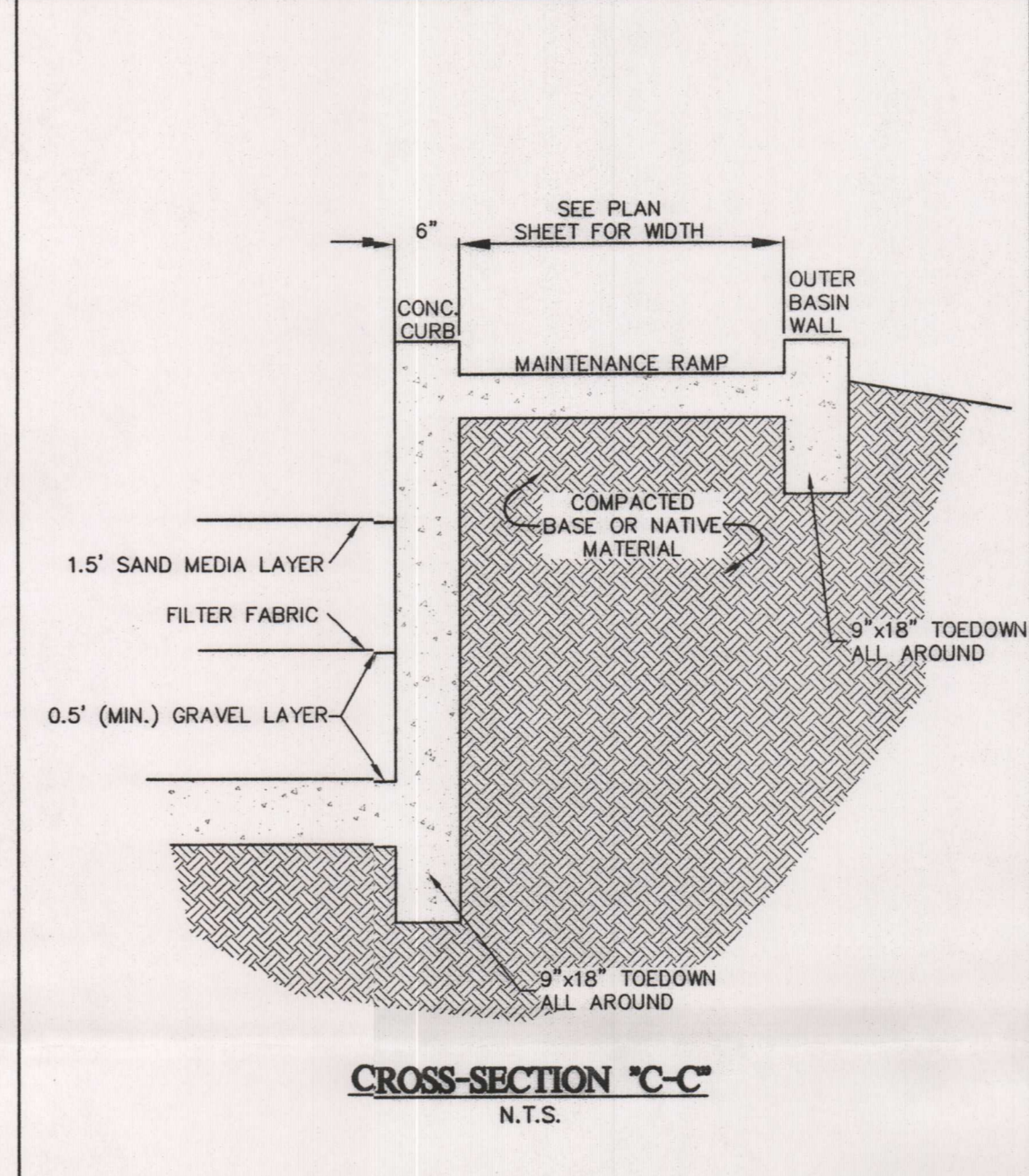
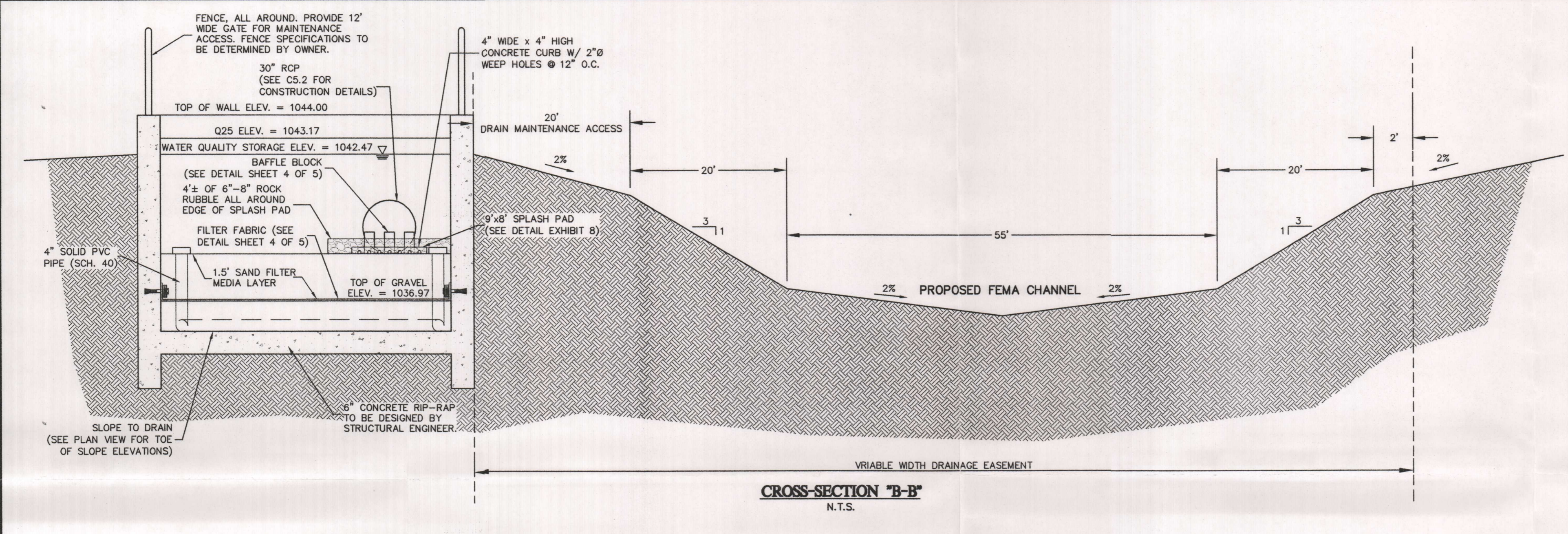
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REVISIONS:
 STATE OF TEXAS
MATT JOHNSON
 64827
 5/23/08
PAPE-DAWSON ENGINEERS
 555 EAST RAMSEY | SAN ANTONIO TEXAS 78216 | PHONE: 210.375.6000 FAX: 210.375.6010
WILEY ROAD DRAINAGE IMPROVEMENTS
WPAP BASIN PLAN
BULVERDE, TEXAS
 JOB NO. 6109-53
 DATE MAY 2008
 DESIGNER TRE
 CHECKED DKH DRAWN ESL
 SHEET 2 OF 5
EXHIBIT 3

Date: May 23, 2008, 2:38pm User: ID: jfshelton
 File: P:\01\03\Design\Environmental\BAC\05053.dwg
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- NOTES:**
- ELEVATIONS SHOWN INSIDE BASIN ARE AT BASIN FLOOR UNLESS NOTED OTHERWISE.
 - BASIN WALL TO BE DETERMINED BY A STRUCTURAL ENGINEER.
 - UPON COMPLETION OF CONSTRUCTION, AND IN ACCORDANCE WITH TCEQ REGULATIONS, ALL PERMANENT BMP'S (BASINS) MUST BE CERTIFIED BY A REGISTERED PROFESSIONAL ENGINEER.
 - ALL DISTURBED AREAS NOT RECEIVING IMPEROVISED COVER AS PART OF CONSTRUCTION OF BASIN SHALL BE REVEGETATED PRIOR TO COMPLETION.
 - REFERENCE STRUCTURAL PLANS FOR CONCRETE WALL AND OVERFLOW WEIR DETAILS AT DETENTION AND WPAP BASIN.
 - UNLESS OTHERWISE PROVIDED, CONTRACTOR SHALL ENGAGE A TEXAS LICENSED STRUCTURAL ENGINEER TO PROVIDE A SIGNED AND SEALED SET OF STRUCTURAL PLANS, DETAILS AND SPECIFICATIONS FOR THE STRUCTURAL COMPONENTS OF THE POLLUTION ABATEMENT BASIN INCLUDING INLET DISCHARGE AND BYPASS COMPONENTS. CONTRACTOR SHALL ALSO PROVIDE FOR STRUCTURAL ENGINEER'S INSPECTION DURING BASIN CONSTRUCTION AND STRUCTURAL ENGINEER'S CONSTRUCTION CERTIFICATION UPON COMPLETION OF THE BASIN.
 - BOTTOM SLOPE OF BASIN IS CRITICAL TO PROPER OPERATION. CONTRACTOR TO PROVIDE FIELD SHOTS TO ENGINEER VERIFYING SLOPE OF BASIN INVERT PRIOR TO PROCEEDING TO NEXT STEP OF CONSTRUCTION.
 - SAND FILTER MATERIAL SHALL BE 0.0165 IN (#40 SIEVE) TO 0.0469 IN (#16 SIEVE) SILICA BASED WASHED SAND.
 - ROCK FOR GRAVEL LAYER SHALL BE 1/2" TO 1" DIAMETER WASHED RIVER GRAVEL.



10'x10' JUNCTION BOX AND 5'x5' OPEN TOP JUNCTION BOX PLAN AND SECTIONS

NOT-TO-SCALE

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EXHIBIT 3

REVISIONS:

PAPE-DAWSON ENGINEERS

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WILEY ROAD DRAINAGE IMPROVEMENTS

WPAP BASIN PLAN

BULVERDE, COMAL COUNTY, TEXAS

JOB NO. 6109-53

DATE FEBRUARY 2008

DESIGNER TRE

CHECKED DKH DRAWN ESL

SHEET 3 OF 5

TCEQ-R13
JUL 16 2008
SAN ANTONIO

Date: May 23, 2008, 2:40pm User ID: jrRobinson
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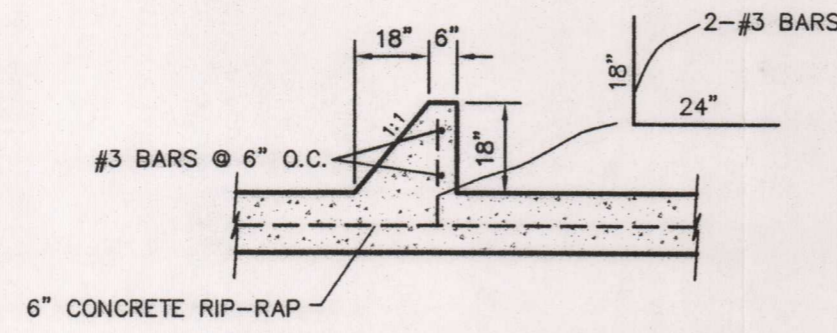
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THE SEPARATION LAYER BETWEEN THE FILTER, SAND, AND GRAVEL LAYERS SHALL BE A DRAINAGE MATTING CONSISTING OF NON-WOVEN FILTER FABRIC MEETING THE FOLLOWING SPECIFICATIONS:

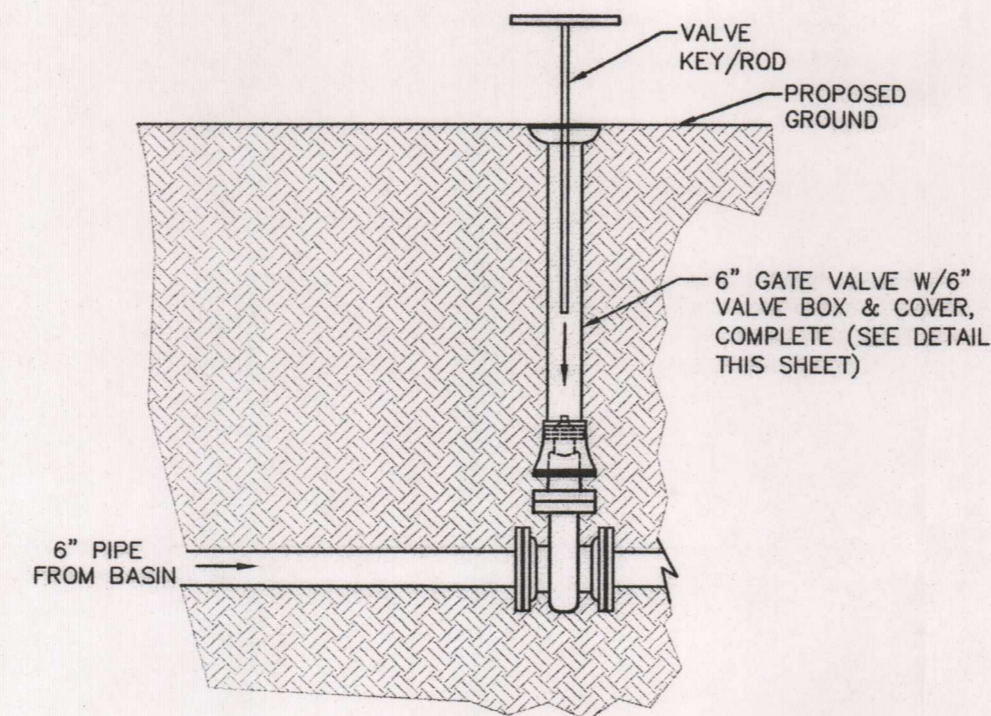
PROPERTY	TEST METHOD	SPECIFICATION
WEIGHT (OZ/SY)	ASTM D 3776	4.0
GRAB STRENGTH (LBS.)	ASTM D 4632	90
ELONGATIONS (%)	ASTM D 4632	55
PUNCTURE (LBS)	ASTM D 3787	60
AOS (SIEVE #)	ASTM D 4751	70-80
FLOW RATE (GPM/SF)	ASTM D 4491	120

NOTE:
SAND FILTER MATERIAL SHALL BE 0.0165 IN (#40 SIEVE) TO 0.0469 IN (#16 SIEVE) SILICA BASED WASHED SAND MEETING ASTM C33 AS A MINIMUM.
FABRIC OVERLAP SHALL BE A MINIMUM OF 24". ALL OVERLAPS SHALL BE WIRE TIED AT A MAXIMUM OF 36" INTERVALS.

FILTER FABRIC SPECIFICATIONS

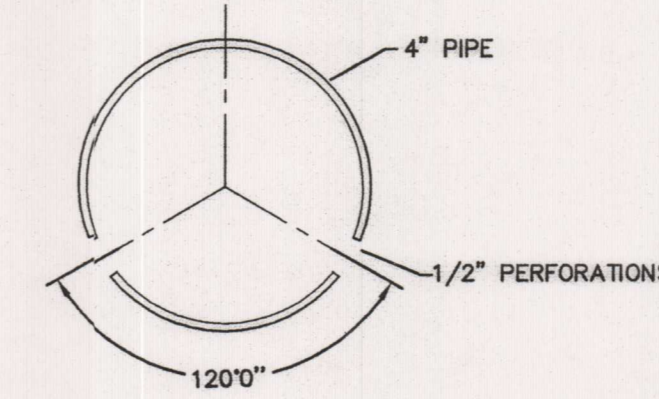


BAFFLE BLOCK DETAIL
N.T.S.



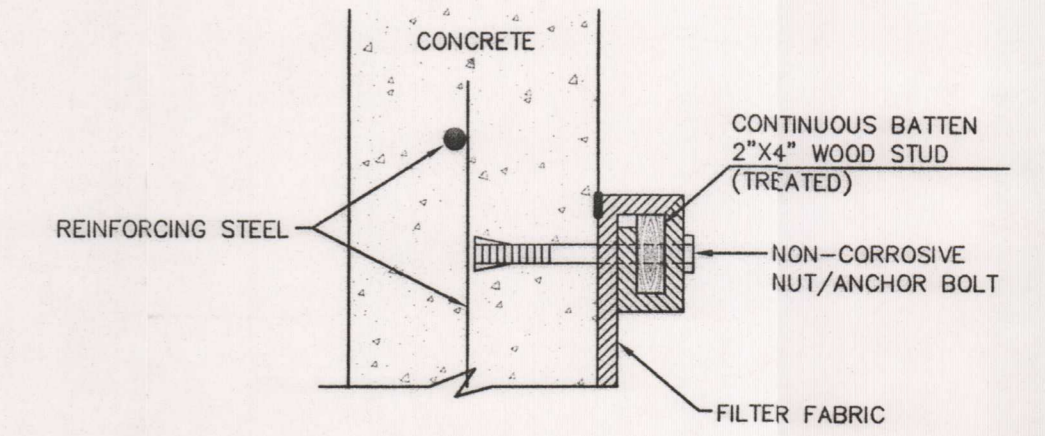
6" GATE VALVE DETAIL
N.T.S.

NOTE:
1. DUE TO THE LARGE CAPTURE VOLUME OF THE BASIN, THE 6" OUTLET PIPE WILL CONTROL THE DRAWDOWN OF THE BASIN. CONTRACTOR TO SET VALVE TO 65-83 DEGREES OPEN IN ORDER TO ALLOW FOR CALCULATED DRAWDOWN TIME OF 28.20 HOURS (SEE DRAWDOWN CALCULATIONS IN REPORT FOR ADDITIONAL INFORMATION).
2. CONTRACTOR SHALL PROVIDE OWNER WITH VALVE OPERATING KEY/ROD PRIOR TO PROJECT COMPLETION.



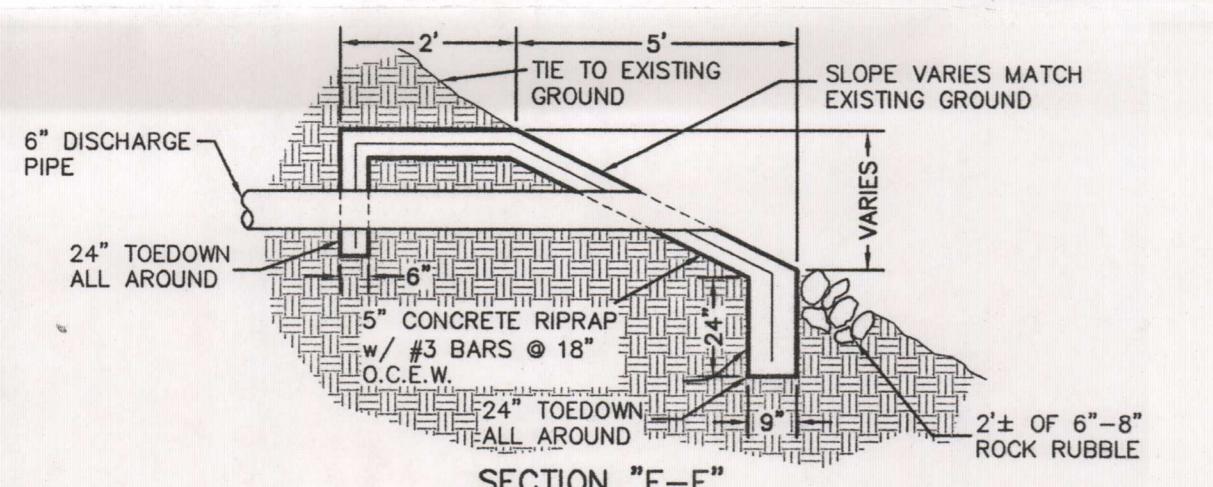
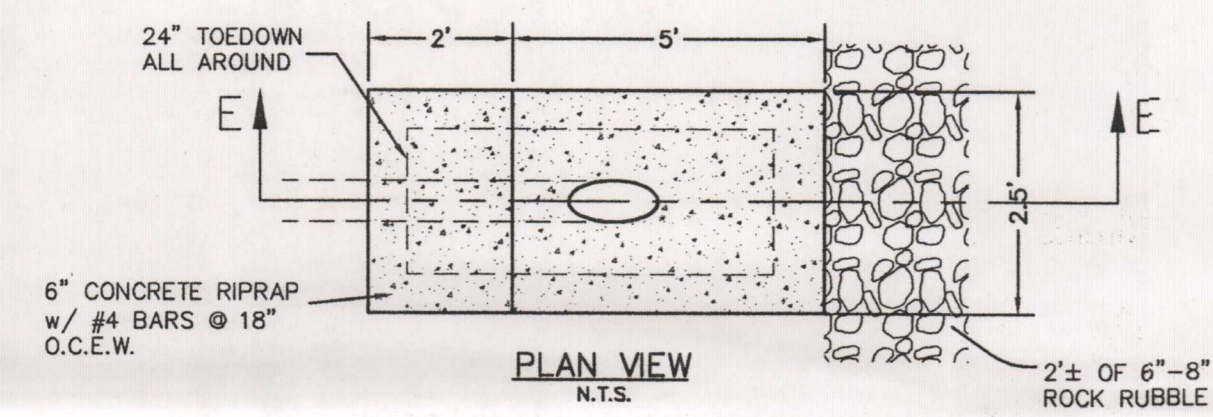
NOTE:
1. MINIMUM DIAMETER = 4"; SCHEDULE 40 PVC. (SEE PLAN VIEW)
2. THE MAXIMUM SPACING BETWEEN ROWS OF PERFORATIONS SHOULD NOT EXCEED 6".
3. SET PERFORATIONS DOWN.
4. PERFORATIONS SHOULD BE LESS THAN A 1/2".
5. PIPES SHOULD LIE FLAT ON CONCRETE BOTTOM WHICH HAS BEEN GRADED TO DRAIN AS SHOWN ON PLAN VIEW.
6. ALL CLEANOUTS SHALL BE SOLID PIPE WITH A CLEANOUT AT THE END OF EACH LINE.

4" PERFORATED PIPE
N.T.S.

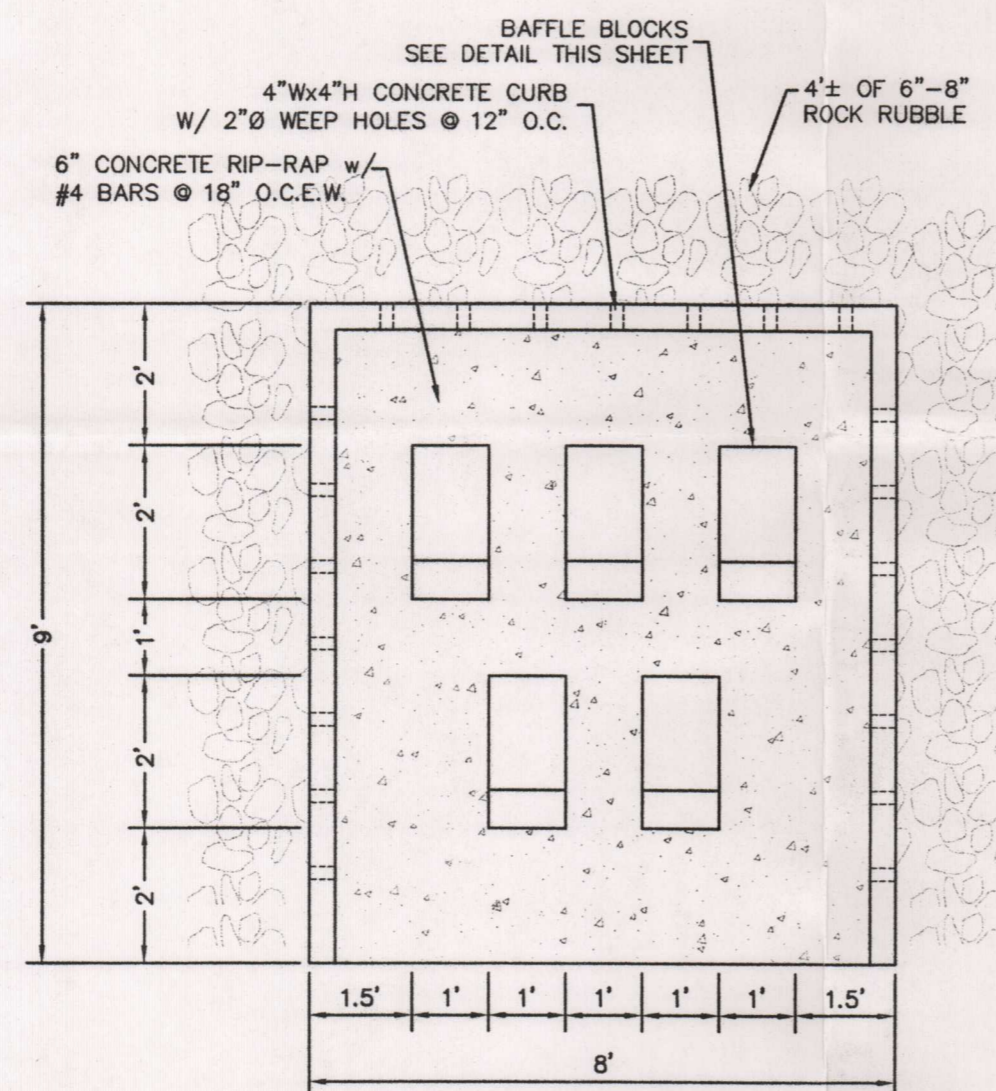


FILTER FABRIC ANCHORING DETAIL
N.T.S.

NOTE:
CONTRACTOR TO PLACE ANCHOR BOLTS AT 5'-0" O.C.



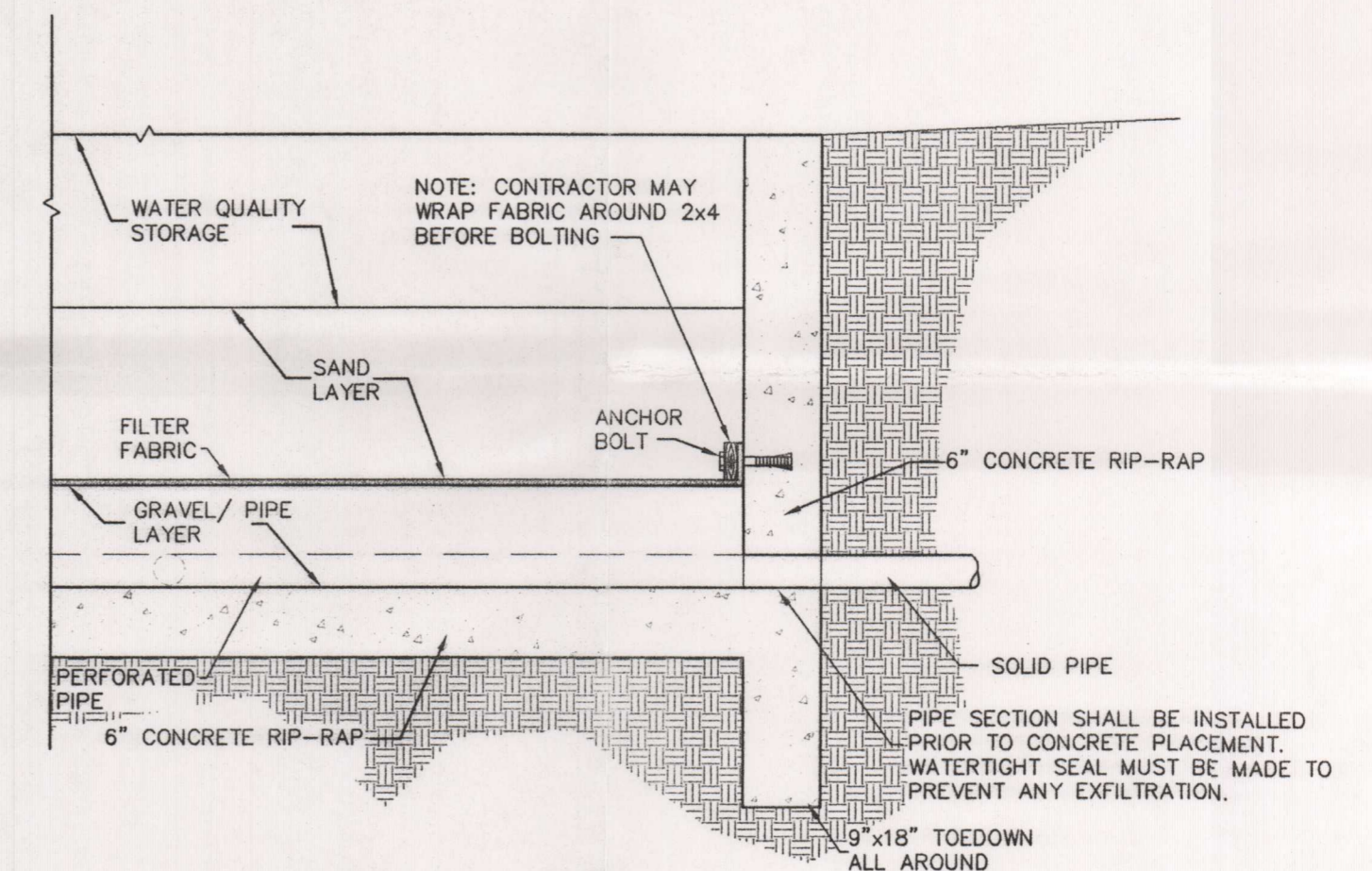
DISCHARGE HEADWALL DETAIL
N.T.S.



SPLASH PAD DETAIL
N.T.S.

NOTES TO CONTRACTOR FOR EACH PHASE OF BASIN CONSTRUCTION

NOTE:
1. CONTRACTOR IS ADVISED THAT TCEQ DOES NOT ALLOW CHANGES TO PERMANENT POLLUTION ABATEMENT MEASURES WITHOUT THEIR PRIOR APPROVAL.
2. CONTRACTOR SHALL NOTIFY CERTIFYING ENGINEER WHEN BASIN CONSTRUCTION HAS PROCEEDED TO THE FOLLOWING MILESTONES:
a.) CONCRETE WALLS OR LINER IN PLACE AND UNDER DRAIN SYSTEM IS IN PLACE WITHOUT GRAVEL.
b.) GRAVEL AROUND UNDER DRAIN SYSTEM IS IN PLACE AND FILTER FABRIC IS INSTALLED AND ATTACHED TO WALLS OR RIP-RAP.
c.) SAND FILTER MEDIA HAS BEEN PLACED & BASIN HAS BEEN COMPLETELY FINISHED INCLUDING SOIL PLACEMENT ON SIDE SLOPES (WHERE APPLICABLE).
3. WORK SHALL NOT CONTINUE ON THE BASIN UNTIL THE ENGINEER HAS HAD AN OPPORTUNITY TO OBSERVE THE STATUS OF CONSTRUCTION AT EACH STAGE. CONTRACTOR SHALL PROVIDE ENGINEER A MINIMUM OF 24 HOURS ADVANCE NOTICE PRIOR TO TIME THE BASIN WILL BE AT THE REQUIRED STAGE.
4. UPON SUBSTANTIAL COMPLETION, OR AS REQUESTED BY ENGINEER, CONTRACTOR TO PROVIDE CERTIFYING ENGINEER WITH FIELD SHOTS VERIFYING ELEVATIONS OF THE FOLLOWING:
- TOP OF BANK AT EACH CORNER OF BASIN
- TOE OF SLOPE AT EACH CORNER OF BASIN (INSIDE BASIN TOE)
- SPLASH PAD/INLET PIPES
- OVERFLOW WEIRS
5. BEFORE FINAL ACCEPTANCE OF CONSTRUCTION BY THE OWNER, THE CONTRACTOR WILL REMOVE ALL TRASH, DEBRIS, AND ACCUMULATED SILT FROM THE BASIN AND REESTABLISH IT TO THE PROPER OPERATING CONDITION.
6. THE MINIMUM DRAIN TIME FOR A FULL BASIN IS 24 HOURS. THE CONTRACTOR SHALL RESTRICT THE FLOW THROUGH THE BASIN BY ADJUSTING THE GATE VALVE ON THE DISCHARGE PIPE SO AS TO PROVIDE THE MINIMUM 24 HOUR DRAW DOWN TIME.



PIPE DISCHARGE AT LINER DETAIL
N.T.S.

TCEQ-R13
JUL 16 2008
SAN ANTONIO

REVISIONS:



PAPE-DAWSON ENGINEERS

555 EAST RAIMEY | SAN ANTONIO TEXAS 78216 | PHONE: 210.375.6000 FAX: 210.375.6001

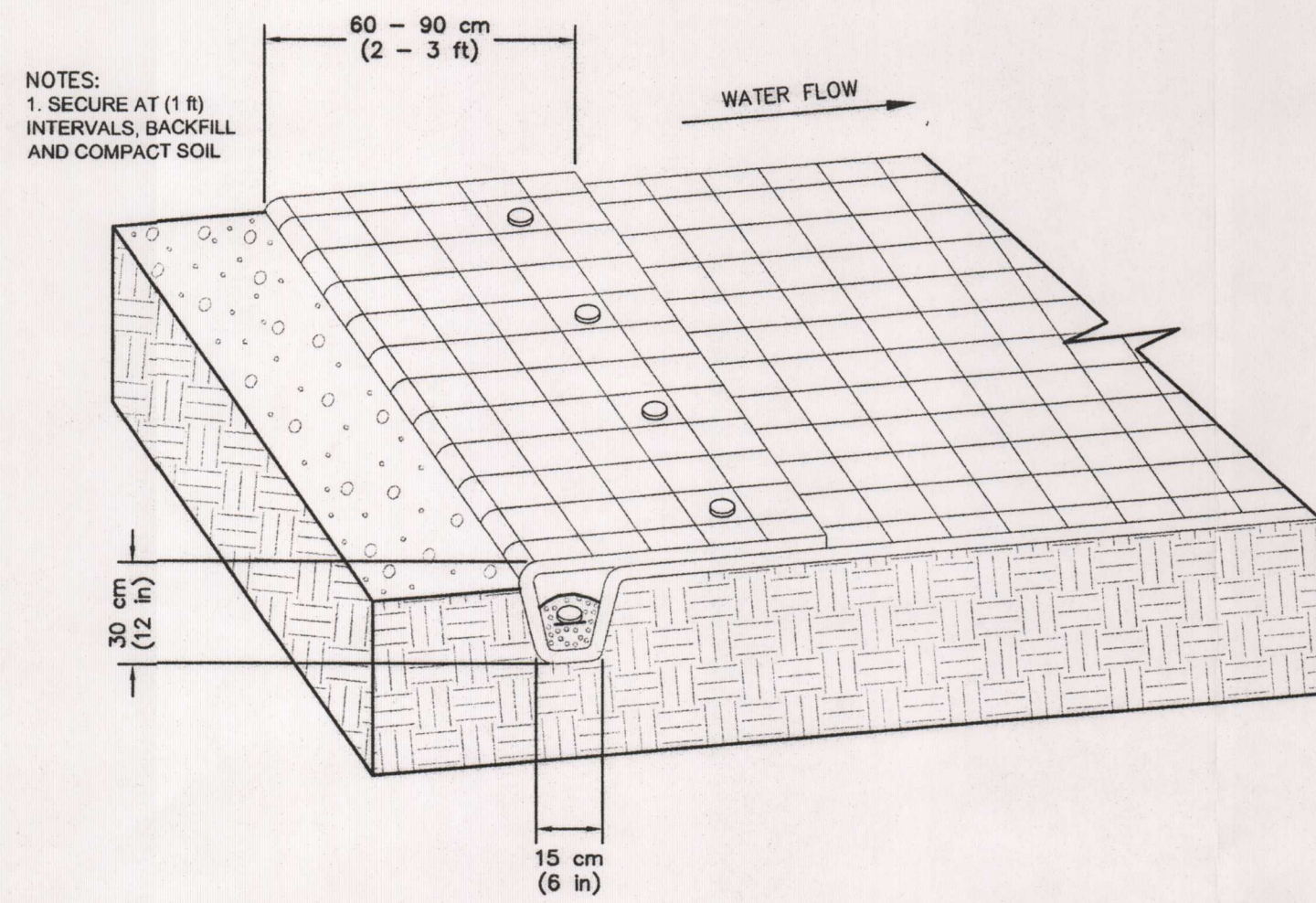
WILEY ROAD DRAINAGE IMPROVEMENTS
WPAP BASIN DETAIL SHEET
BULVERDE, COMAL COUNTY, TEXAS

JOB NO. 6109-53
DATE FEBRUARY 2008
DESIGNER TRE
CHECKED DKH DRAWN ESL
SHEET 4 OF 5

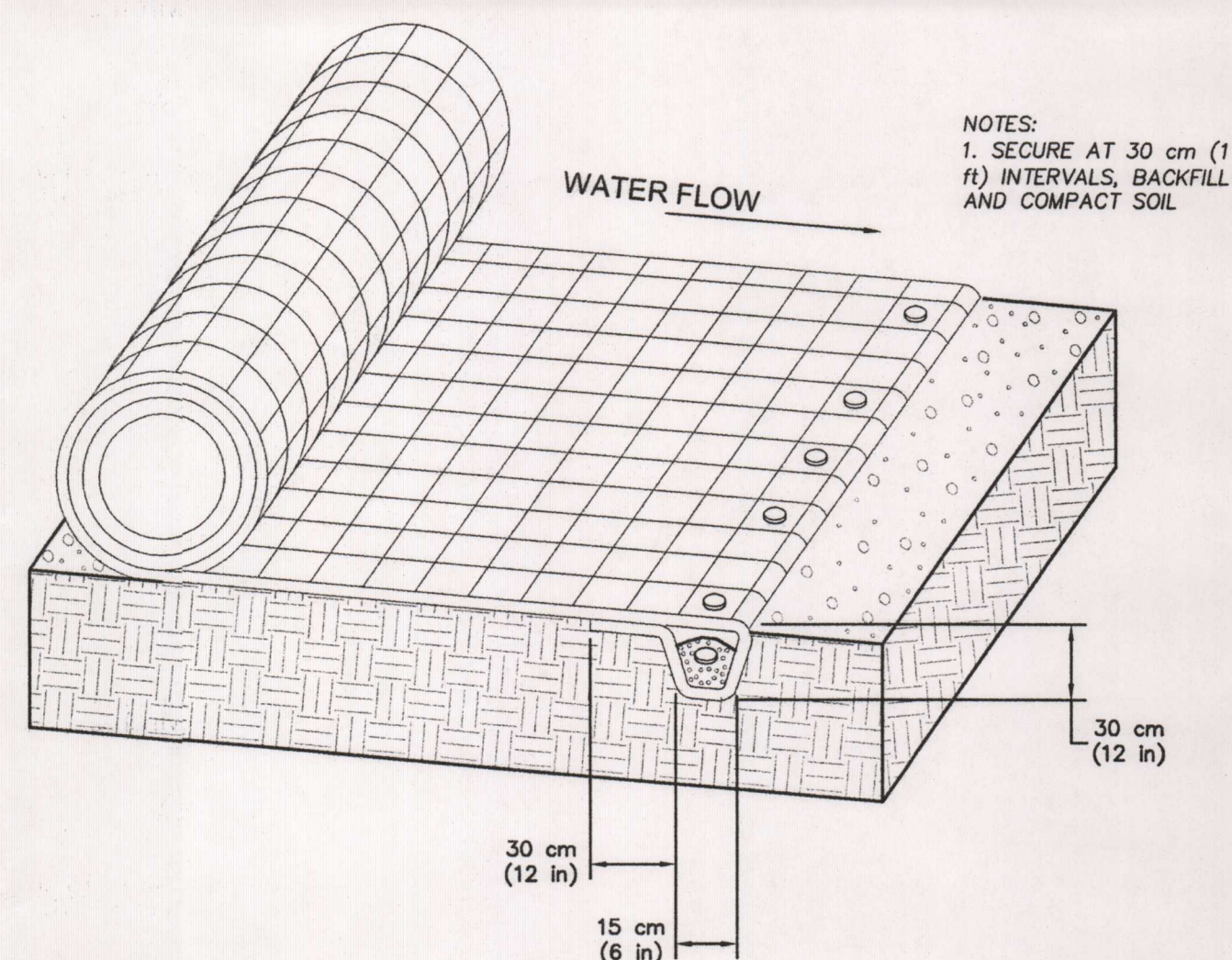
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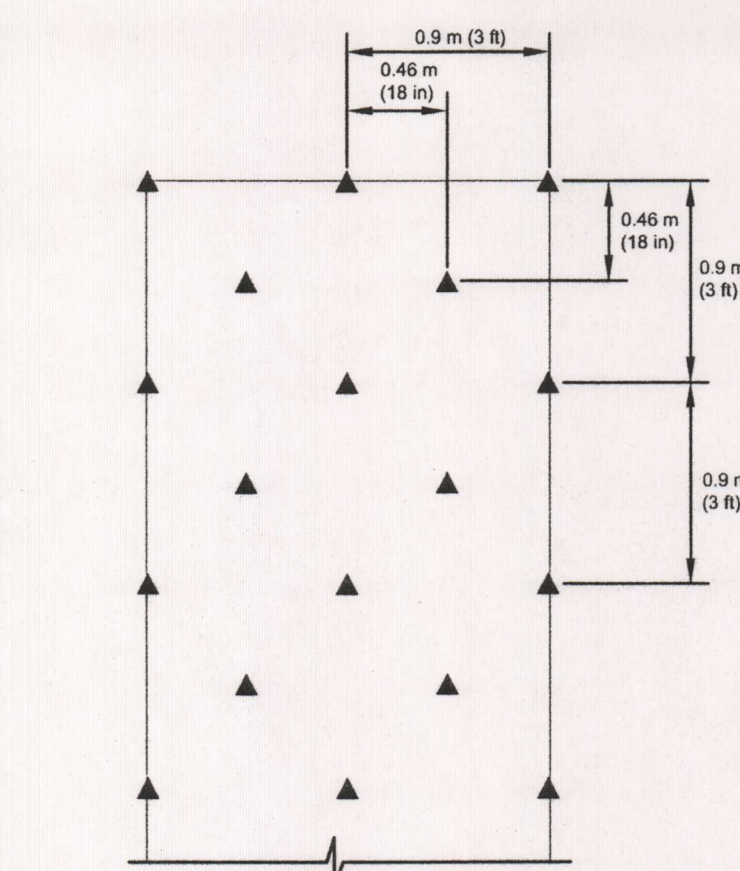
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TERMINAL ANCHOR TRENCH (UPSTREAM)
NOT TO SCALE

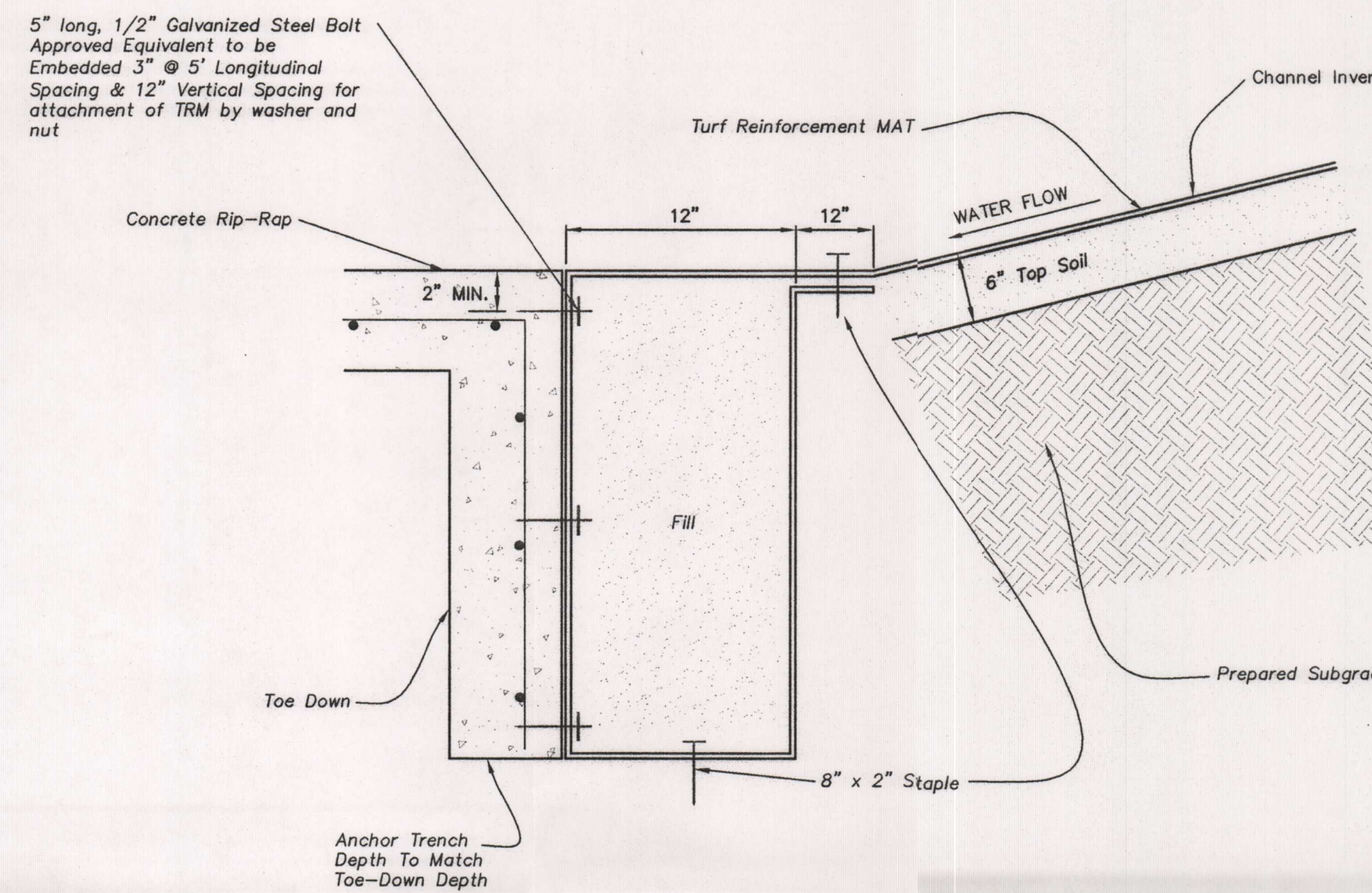


INITIAL ANCHOR TRENCH (DOWNSTREAM)
NOT TO SCALE

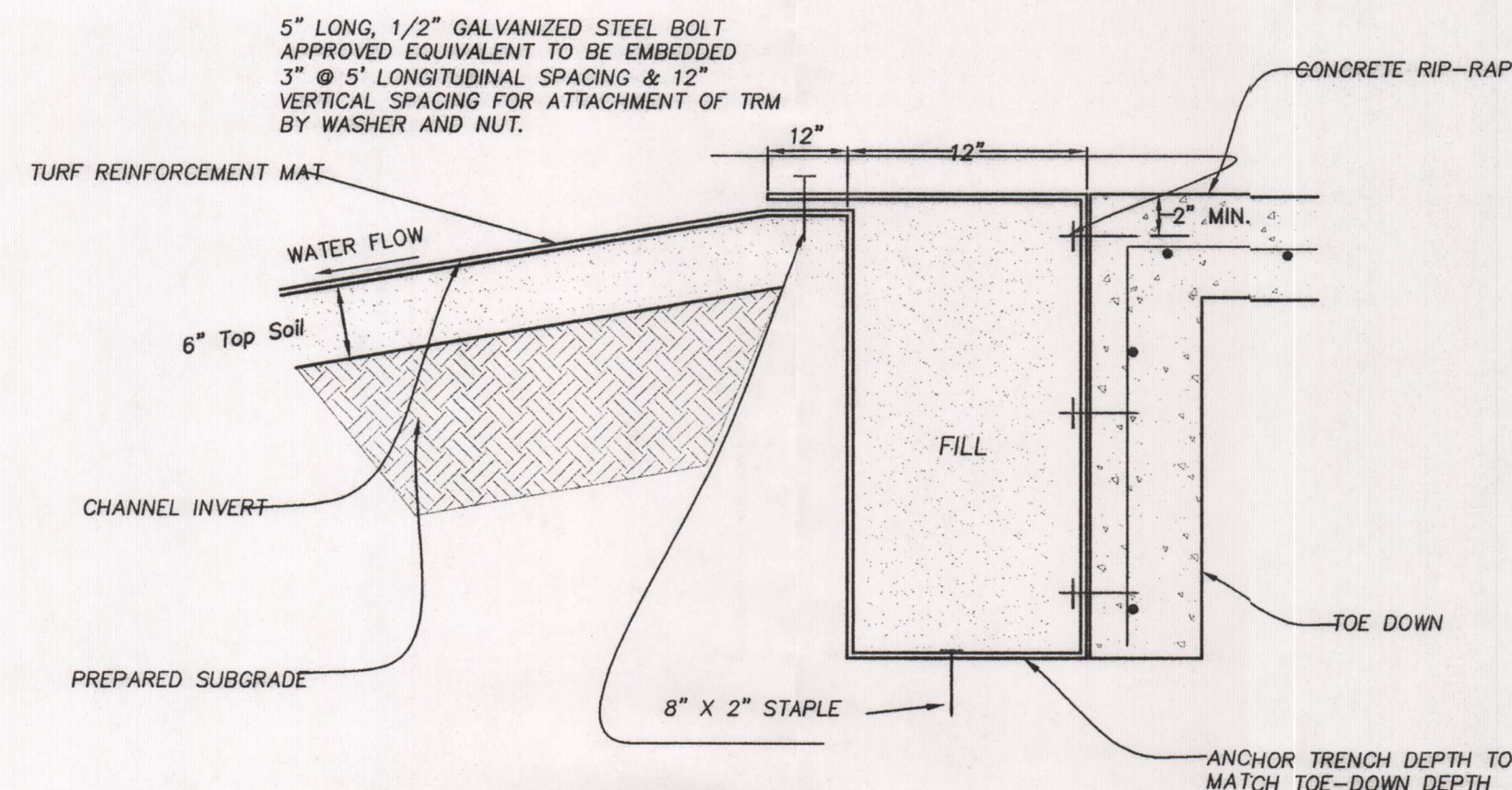


- NOTES:
1. ANCHOR PATTERN (2 1/2 ANCHORS / Yd²)
2. U - SHAPED WIRE STAPLES, METAL GEOTEXTILE PINS, TRIANGULAR WOODEN OR PLASTIC STAKES CAN BE USED TO ANCHOR TRMs TO THE GROUND SURFACE

ANCHOR PATTERN FOR SLOPES AND CHANNELS
NOT TO SCALE

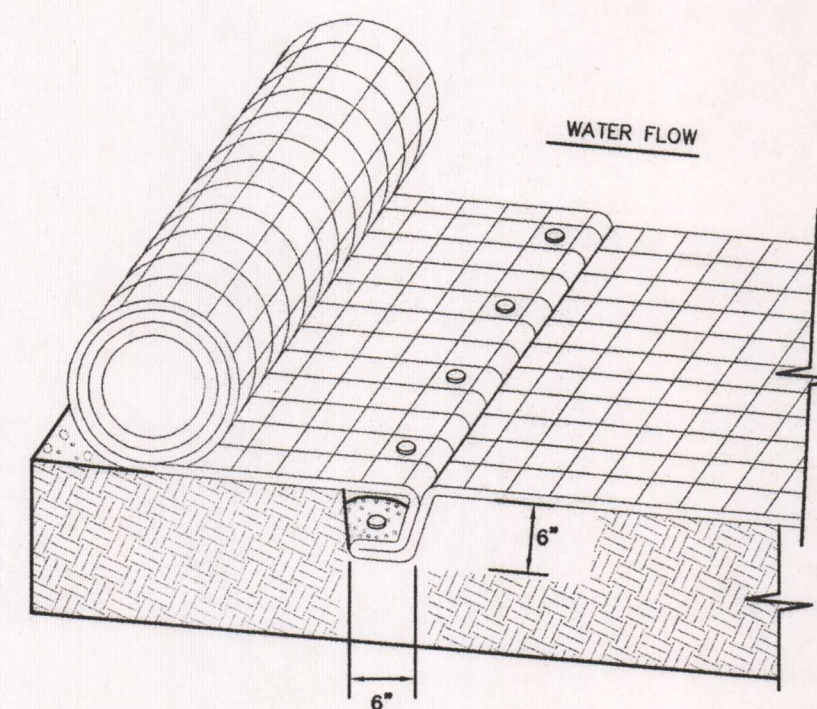


CONCRETE ANCHOR TRENCH (DOWNSTREAM)
NOT TO SCALE



CONCRETE ANCHOR TRENCH (UPSTREAM)
NOT TO SCALE

- NOTES:
1. SECURE AT 1 ft INTERVALS, BACKFILL AND COMPACT SOIL
2. CHECK SLOTS SHOULD BE INSTALLED AT 25-30' INTERVALS



INTERMITTENT CHECK SLOT
NOT TO SCALE

TURF REINFORCEMENT DETAILS
NOT TO SCALE

TURF REINFORCEMENT MAT (TRM) NOTES

1. **SITE PREPARATION - High Performance Turf Reinforcement Mat (TRM)**
- Grade and compact areas to be treated with TRM and compact. The top 8" of subgrade must be free of rock, debris and consist of a cohesive live soil. If the existing subgrade does not meet these standards the contractor is responsible for the import of acceptable material.
 - Remove large rocks, soil clods, vegetation, and other sharp objects (larger than 2" in diameter) that could keep the TRM from intimate contact with subgrade.
 - Prepare the 8" compacted seedbed by loosening the top 1/2" of soil above final subgrade.
 - Construct, as a minimum, 24 in x 12 in anchor trenches at upstream and downstream ends of the installation to inhibit undermining from stray surface water. (Anchor trenches shall be excavated to a depth that matches design scour depth.) Excavate 6 in x 6 in check slots at 25 to 30 feet intervals along length of channel. Cut longitudinal anchor slots 6 in x 6 in at top of each side slope. The aforementioned dimensions are minimums and the dimensions detailed on the drawings will control.
2. **INSTALLATION - TRM**
- A mandatory pre-construction conference with an Engineer representing the TRM manufacturer, contractor, and inspector must be completed. The conference is to be scheduled by the contractor with at least one week's notice to all parties involved. Representatives may be required to be on site for installation assistance.
- The Contractor is to schedule the Engineer representing the TRM to inspect the site preparation prior to installation and the completed installation and provide a certified letter stating the site meets the manufacturer's recommendations.
- Install the TRM at elevation and alignment indicated.
 - The TRM is to be soil filled with 1/2" of top soil, and vegetated by applying the right mixture of seed and soil amendments with Flexterra, a Flexible Growth Medium, protected by a light weight erosion control blanket, or by applying the right mixture of seed and soil amendments with a wood fiber mulch, protected by a light weight erosion control blanket, or by placing sod directly on top and secure sod with 8" staples.
 - Beginning at downstream end in center of channel, place initial end of first roll of TRM in anchor trench and secure with ground anchor devices at 12 in intervals.
 - Position adjacent rolls in anchor trench in some manner, overlapping preceding roll minimum 3 in.
 - Secure the TRM at 12 in intervals along the trench, backfill and compact with specified soil or as directed by City of Bulverde.
 - Unroll center strip of TRM upstream over compacted trench. Stop at next check slot or terminal anchor trench. Unroll adjacent rolls of TRM upstream in similar fashion, maintaining 3 in overlap.
 - Fold and secure the TRM snugly into transverse check slots. Lay material in bottom of slot, and then fold it back against itself as indicated. Anchor through both layers of TRM at 12 in intervals. Backfill with soil and compact. Continue unrolling the TRM widths upstream over compacted slot to next check slot or terminal anchor trench.
 - Secure TRM to channel bottom with ground anchoring devices at a frequency of 2 1/2 anchors per square yard. Anchors should be a minimum of 8 gauge and 8" in length or so that they have sufficient ground penetration to resist pullout in a saturated condition. Increased anchoring frequency may be required if site conditions are such that the Engineer determines it necessary.
 - At the Engineer's discretion a manufacturer's designated representative shall be on site for installation assistance.
 - Any installation of angular placement, overlapping ground curves, or modified placement methods must be detailed on the construction drawings.
 - City of Bulverde and/or Engineer must approve alternate installation methods prior to execution.
- 3.3. **Irrigation, Mowing and Project Acceptance**
- Prior to project acceptance by the City of Bulverde, it shall be the responsibility of the contractor to establish a minimum of 70% of the area seeded shall be covered with the specified vegetation with no bare or dead spots greater than 10 square feet. The contractor shall be responsible to set up and maintain temporary irrigation, as required, to assist in establishment of vegetation.
- All areas that erode prior to project acceptance shall be repaired at the expense of the contractor including necessary reseeded, watering, and repair of the TRM.
- Vegetated areas shall not be mowed prior to establishment of 70% vegetative density and a minimum grass growth of 3 inches. Mower height shall not be set lower than 3 inches. Throughout the duration of the project, the contractor shall be responsible for mowing to facilitate growth and shall not let the vegetation in the seeded areas exceed 18". In addition, the Contractor shall water all grassed areas as often as necessary to establish satisfactory growth and to maintain its growth throughout the duration of the project.

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EXHIBIT 3

REVISIONS:



PAPE-DAWSON ENGINEERS

555 EAST RAMSEY | SAN ANTONIO, TEXAS 78216 | PHONE: 210.375.0000 FAX: 210.375.6610

WILEY ROAD DRAINAGE IMPROVEMENTS
WPAP BASIN DETAIL SHEET
BULVERDE, COMAL COUNTY, TEXAS

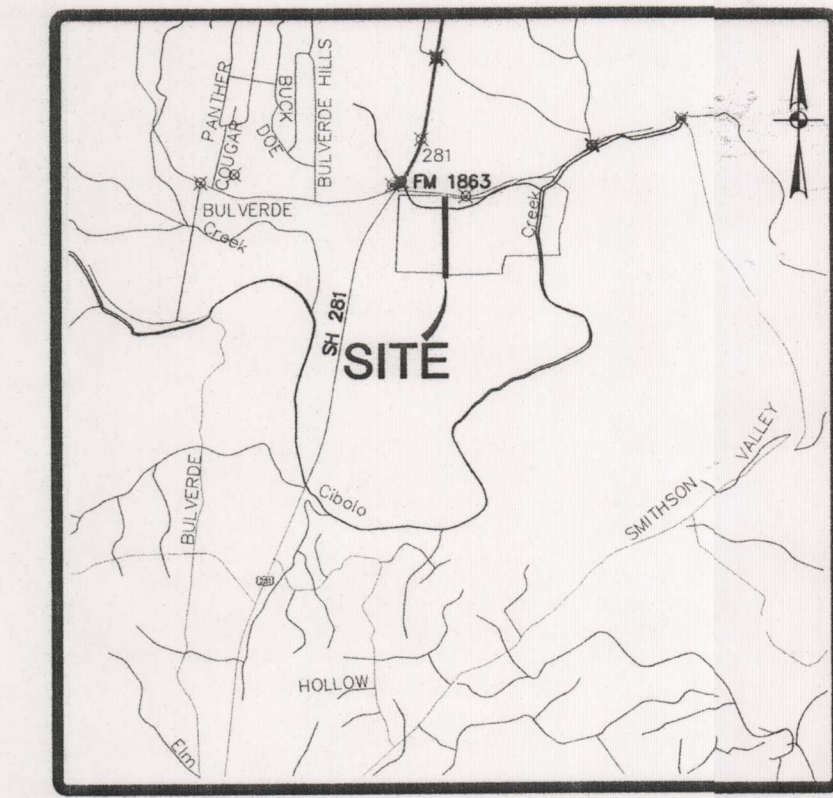
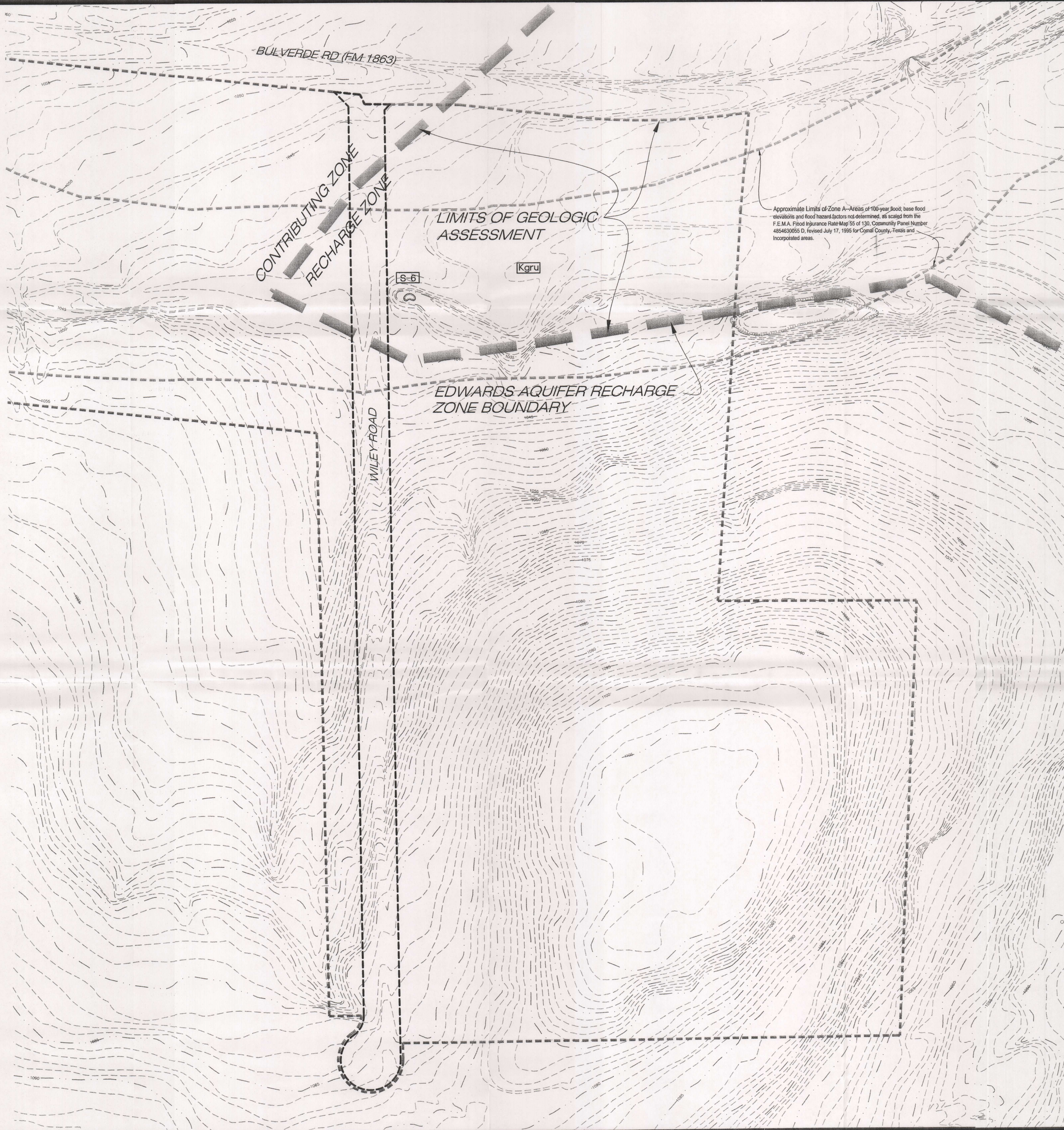
JOB NO. 6109-53

DATE FEBRUARY 2008

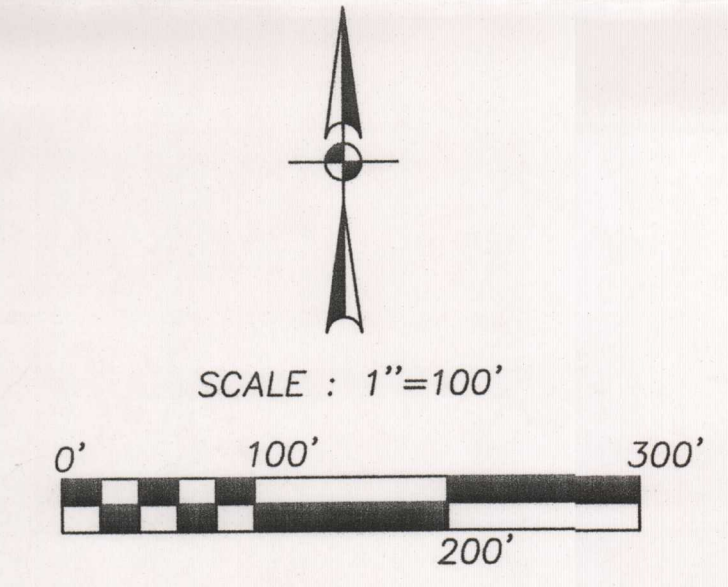
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CHECKED DKH DRAWN ESL

SHEET 5 OF 5



LOCATION MAP
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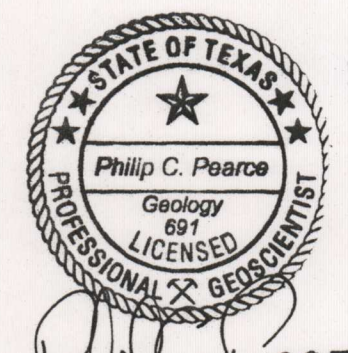


LEGEND

Qal	ALLUVIUM
Kbu	BUDA LIMESTONE
Kdr	DEL RIO CLAY
Kgt	GEORGETOWN FORMATION
Kep	PERSON FORMATION
Kek	KAINER FORMATION
Kgru	GLEN ROSE FORMATION (UPPER)
S-1	POTENTIAL RECHARGE FEATURE
(---)	DRAINAGE PATHWAY
(---)	CONTACT, LOCATED APPROXIMATELY
(---)	FAULT, LOCATED APPROXIMATELY (D, downthrown side; U, upthrown side)
(---)	FAULT, EXISTENCE UNCERTAIN
(---)	POSSIBLE FAULT (as located by aerial photographs)
(---)	STRIKE AND DIP OF BEDDING
(---)	STRIKE AND DIP OF JOINTS
(---)	STRIKE OF VERTICAL JOINTS
(○)	CAVE
(○)	NON-KARST CLOSED DEPRESSION
(○)	SINKHOLE
(○)	SOLUTION CAVITY
(○)	OTHER NATURAL BEDROCK FEATURES: VUGGY ROCK, REEF DEPOSITS
(○)	ZONE
(---)	MAN-MADE FEATURE IN BEDROCK
(○)	WATER WELL
(---)	SANITARY SEWER LINE

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5-27-08

REVISIONS:
5-27-08 Plot Area Redefined

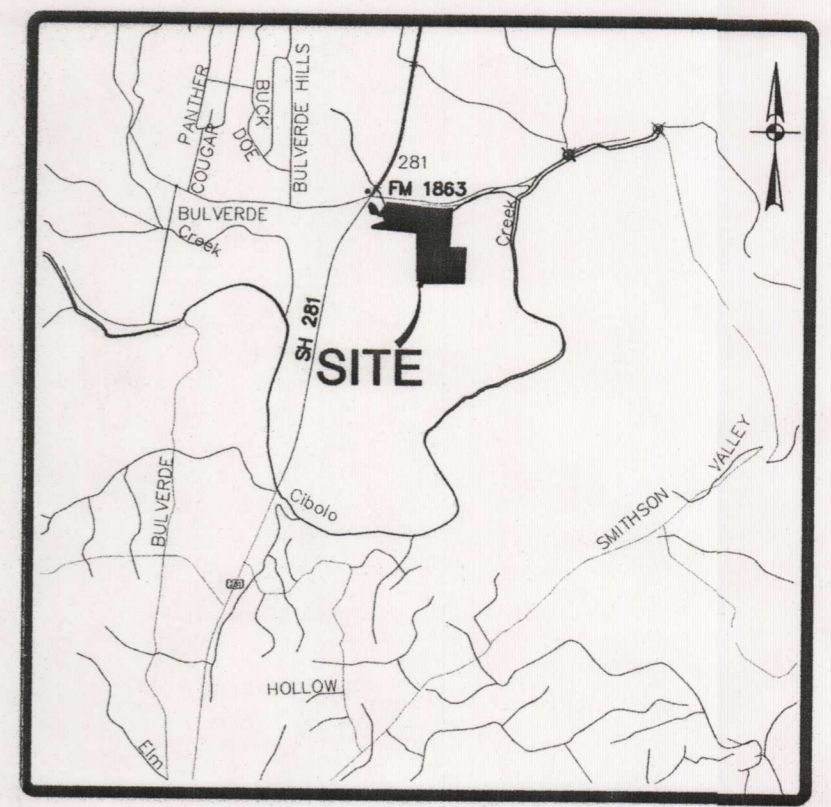
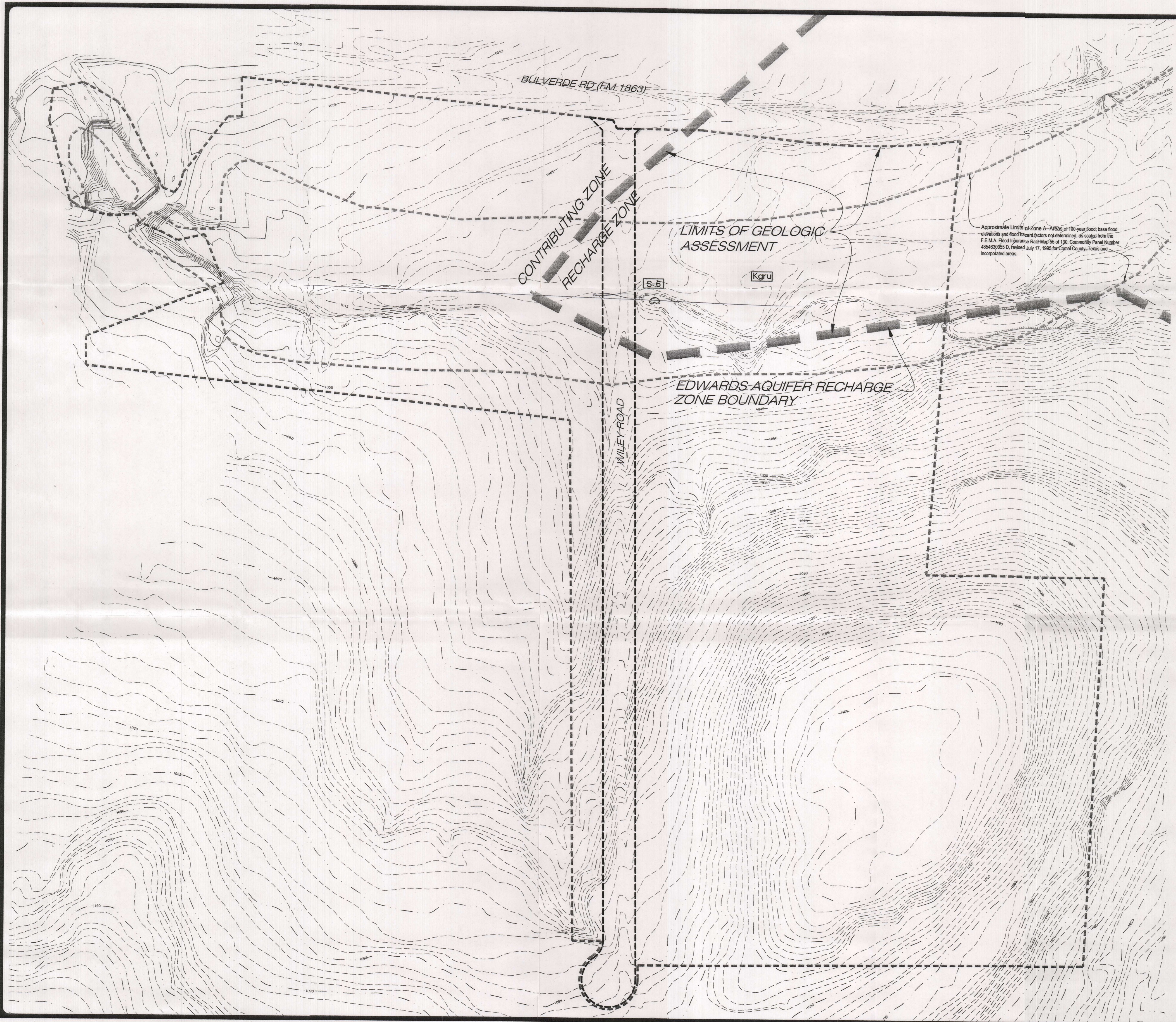
PAPE-DAWSON ENGINEERS

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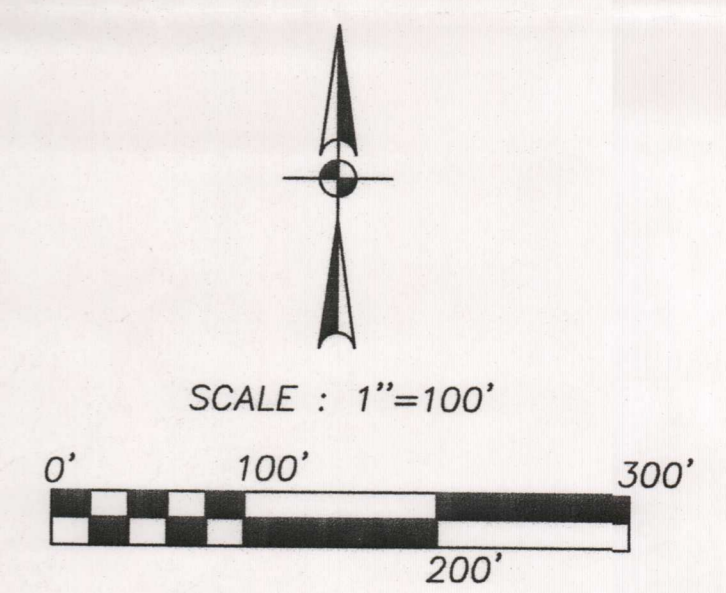
**WILEY ROAD DRAINAGE IMPROVEMENTS
SITE GEOLOGIC MAP
BULVERDE, COMAL COUNTY, TEXAS**

JOB NO. 6109-53
 DATE MAY 2008
 GEOLOGIST JRL
 CHECKED PCP DRAW JRL
ATTACHMENT B
 SHEET 1 OF 1

Date: Jun 16, 2008 1:21pm User: P:\09\033\Design\Geological\0461095301.dwg



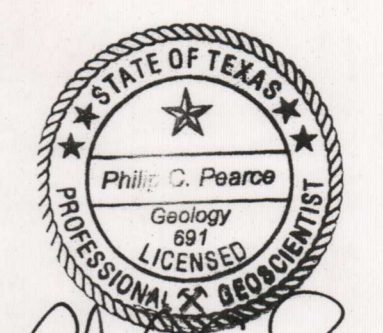
LOCATION MAP
N.T.S.



LEGEND

Oal	ALLUVIUM
Kbu	BUDA LIMESTONE
Kdr	DEL RIO CLAY
Kgt	GEORGETOWN FORMATION
Kep	PERSON FORMATION
Kek	KAINER FORMATION
Kgru	GLEN ROSE FORMATION (UPPER)
S-1	POTENTIAL RECHARGE FEATURE
(dashed line)	DRAINAGE PATHWAY
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(dashed line with U/D)	FAULT, EXISTENCE UNCERTAIN
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(circle with dot)	CAVE
(circle with X)	NON-KARST CLOSED DEPRESSION
(circle with dot)	SINKHOLE
(circle with X)	SOLUTION CAVITY
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(square with X)	ZONE
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Phil C. Pearce
6-16-2008

TCEQ-R13
JUN 16 2008

REVISIONS:
5/27/08 PLOT AREA REDEFINED
6/16/08 PLOT AREA REDEFINED

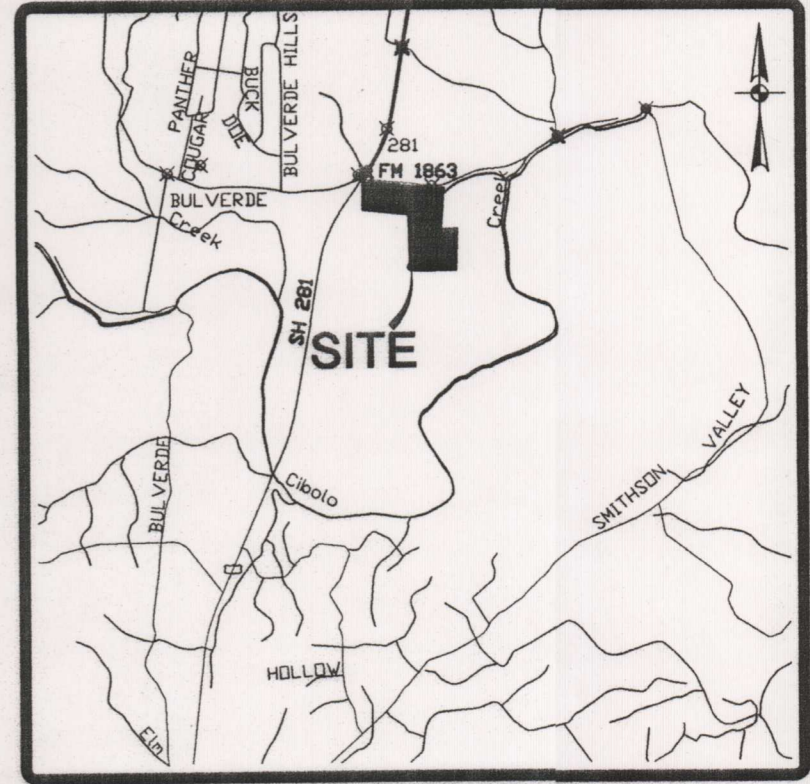
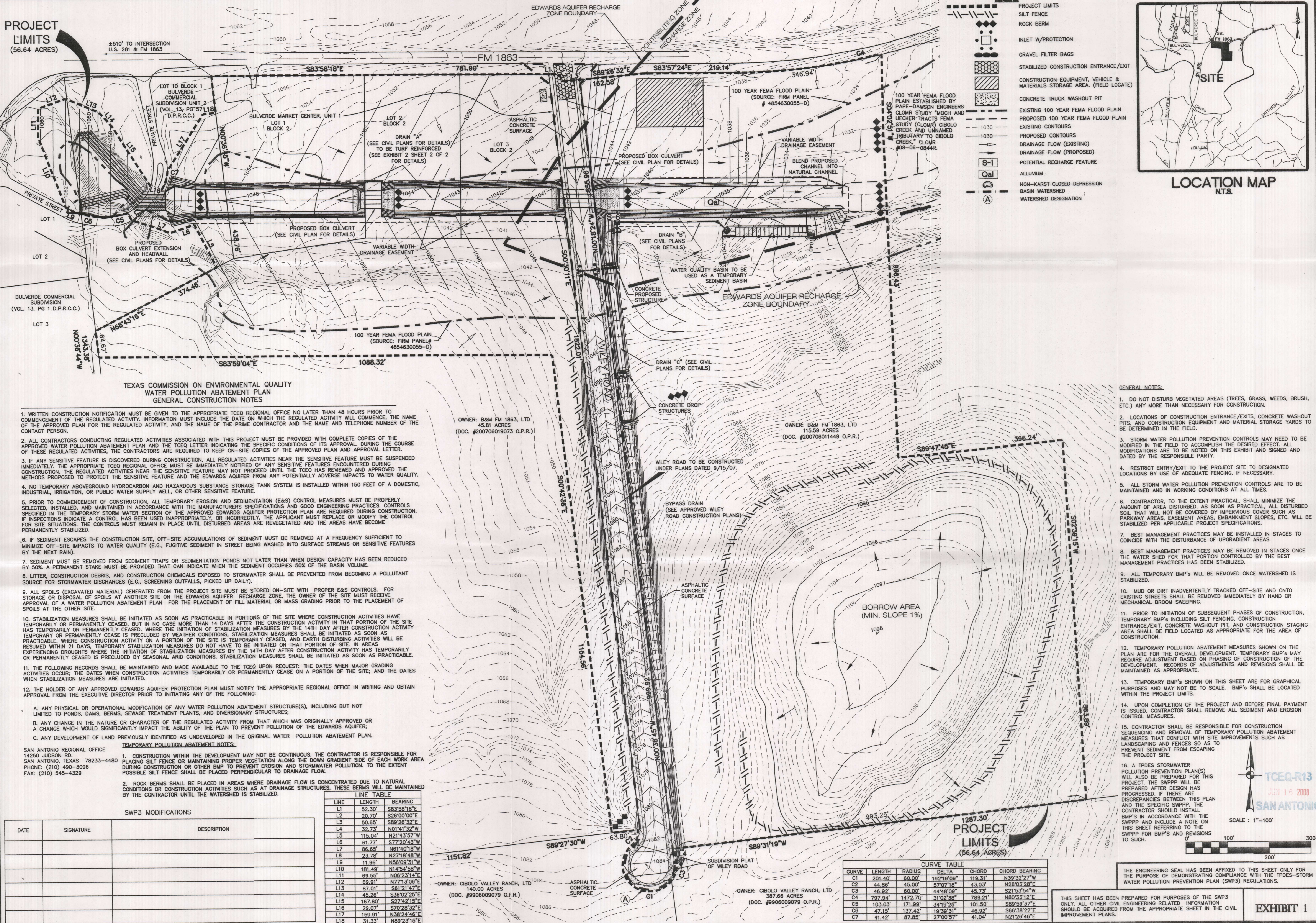
PAPE-DAWSON ENGINEERS
555 EAST RAMSEY | SAN ANTONIO TEXAS 78216 | PHONE: 210.375.9000 | FAX: 210.375.9070

WILEY ROAD DRAINAGE IMPROVEMENTS
SITE GEOLOGIC MAP
BULVERDE, COMAL COUNTY, TEXAS

JOB NO. 6109-53
DATE MAY 2008
GEOLOGIST JRL
CHECKED PCP DRAWN JRL
ATTACHMENT B
SHEET 1 OF 1

PROJECT LIMITS
(56.64 ACRES)

±510' TO INTERSECTION
U.S. 281 & FM 1863



- LEGEND**
- PROJECT LIMITS
 - SILT FENCE
 - ROCK BERM
 - INLET W/PROTECTION
 - GRAVEL FILTER BAGS
 - STABILIZED CONSTRUCTION ENTRANCE/EXIT
 - CONSTRUCTION EQUIPMENT, VEHICLE & MATERIALS STORAGE AREA (FIELD LOCATE)
 - CONCRETE TRUCK WASHOUT PIT
 - EXISTING 100 YEAR FEMA FLOOD PLAN
 - PROPOSED 100 YEAR FEMA FLOOD PLAN
 - EXISTING CONTOURS
 - PROPOSED CONTOURS
 - DRAINAGE FLOW (EXISTING)
 - DRAINAGE FLOW (PROPOSED)
 - POTENTIAL RECHARGE FEATURE
 - ALLUVIUM
 - NON-KARST CLOSED DEPRESSION BASIN WATERSHED
 - WATERSHED DESIGNATION

**TEXAS COMMISSION ON ENVIRONMENTAL QUALITY
WATER POLLUTION ABATEMENT PLAN
GENERAL CONSTRUCTION NOTES**

1. WRITTEN CONSTRUCTION NOTIFICATION MUST BE GIVEN TO THE APPROPRIATE TCEQ REGIONAL OFFICE NO LATER THAN 48 HOURS PRIOR TO COMMENCEMENT OF THE REGULATED ACTIVITY. INFORMATION MUST INCLUDE THE DATE ON WHICH THE REGULATED ACTIVITY WILL COMMENCE, THE NAME OF THE APPROVED PLAN FOR THE REGULATED ACTIVITY, AND THE NAME OF THE PRIME CONTRACTOR AND THE NAME AND TELEPHONE NUMBER OF THE CONTACT PERSON.
2. ALL CONTRACTORS CONDUCTING REGULATED ACTIVITIES ASSOCIATED WITH THIS PROJECT MUST BE PROVIDED WITH COMPLETE COPIES OF THE APPROVED WATER POLLUTION ABATEMENT PLAN AND THE TCEQ LETTER INDICATING THE SPECIFIC CONDITIONS OF ITS APPROVAL. DURING THE COURSE OF THESE REGULATED ACTIVITIES, THE CONTRACTORS ARE REQUIRED TO KEEP ON-SITE COPIES OF THE APPROVED PLAN AND APPROVAL LETTER.
3. IF ANY SENSITIVE FEATURE IS DISCOVERED DURING CONSTRUCTION, ALL REGULATED ACTIVITIES NEAR THE SENSITIVE FEATURE MUST BE SUSPENDED IMMEDIATELY. THE APPROPRIATE TCEQ REGIONAL OFFICE MUST BE IMMEDIATELY NOTIFIED OF ANY SENSITIVE FEATURES ENCOUNTERED DURING CONSTRUCTION. THE REGULATED ACTIVITIES NEAR THE SENSITIVE FEATURE MAY NOT PROCEED UNTIL THE TCEQ HAS REVIEWED AND APPROVED THE METHODS PROPOSED TO PROTECT THE SENSITIVE FEATURE AND THE EDWARDS AQUIFER FROM ANY POTENTIALLY ADVERSE IMPACTS TO WATER QUALITY.
4. NO TEMPORARY ABOVEGROUND HYDROCARBON AND HAZARDOUS SUBSTANCE STORAGE TANK SYSTEM IS INSTALLED WITHIN 150 FEET OF A DOMESTIC, INDUSTRIAL, IRRIGATION, OR PUBLIC WATER SUPPLY WELL, OR OTHER SENSITIVE FEATURE.
5. PRIOR TO COMMENCEMENT OF CONSTRUCTION, ALL TEMPORARY EROSION AND SEDIMENTATION (E&S) CONTROL MEASURES MUST BE PROPERLY SELECTED, INSTALLED, AND MAINTAINED IN ACCORDANCE WITH THE MANUFACTURERS SPECIFICATIONS AND GOOD ENGINEERING PRACTICES. CONTROLS SPECIFIED IN THE TEMPORARY STORM WATER SECTION OF THE APPROVED EDWARDS AQUIFER PROTECTION PLAN ARE REQUIRED DURING CONSTRUCTION. IF INSPECTIONS INDICATE A CONTROL HAS BEEN USED INAPPROPRIATELY, OR INCORRECTLY, THE APPLICANT MUST REPLACE OR MODIFY THE CONTROL FOR SITE SITUATIONS. THE CONTROLS MUST REMAIN IN PLACE UNTIL DISTURBED AREAS ARE REVEGETATED AND THE AREAS HAVE BECOME PERMANENTLY STABILIZED.
6. IF SEDIMENT ESCAPES THE CONSTRUCTION SITE, OFF-SITE ACCUMULATIONS OF SEDIMENT MUST BE REMOVED AT A FREQUENCY SUFFICIENT TO MINIMIZE OFF-SITE IMPACTS TO WATER QUALITY (E.G., FUGITIVE SEDIMENT IN STREET BEING WASHED INTO SURFACE STREAMS OR SENSITIVE FEATURES BY THE NEXT RAIN).
7. SEDIMENT MUST BE REMOVED FROM SEDIMENT TRAPS OR SEDIMENTATION PONDS NOT LATER THAN WHEN DESIGN CAPACITY HAS BEEN REDUCED BY 50%. A PERMANENT STAKE MUST BE PROVIDED THAT CAN INDICATE WHEN THE SEDIMENT OCCUPIES 50% OF THE BASIN VOLUME.
8. 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).
9. ALL SPOILS (EXCAVATED MATERIAL) GENERATED FROM THE PROJECT SITE MUST BE STORED ON-SITE WITH PROPER E&S CONTROLS. FOR STORAGE OR DISPOSAL OF SPOILS AT ANOTHER SITE ON THE EDWARDS AQUIFER RECHARGE ZONE, THE OWNER OF THE SITE MUST RECEIVE APPROVAL OF A WATER POLLUTION ABATEMENT PLAN FOR THE PLACEMENT OF FILL MATERIAL OR MASS GRADING PRIOR TO THE PLACEMENT OF SPOILS AT THE OTHER SITE.
10. STABILIZATION MEASURES SHALL BE INITIATED AS SOON AS PRACTICABLE IN PORTIONS OF THE SITE WHERE CONSTRUCTION ACTIVITIES HAVE TEMPORARILY OR PERMANENTLY CEASED, BUT IN NO CASE MORE THAN 14 DAYS AFTER THE CONSTRUCTION ACTIVITY IN THAT PORTION OF THE SITE HAS TEMPORARILY OR PERMANENTLY CEASED. WHERE THE INITIATION OF STABILIZATION MEASURES BY THE 14TH DAY AFTER CONSTRUCTION ACTIVITY TEMPORARILY OR PERMANENTLY CEASES IS PRECLUDED BY WEATHER CONDITIONS, STABILIZATION MEASURES SHALL BE INITIATED AS SOON AS PRACTICABLE. WHERE CONSTRUCTION ACTIVITY ON A PORTION OF THE SITE IS TEMPORARILY CEASED, AND EARTH DISTURBING ACTIVITIES WILL BE RESUMED WITHIN 21 DAYS, TEMPORARY STABILIZATION MEASURES DO NOT HAVE TO BE INITIATED ON THAT PORTION OF THE SITE. IN AREAS EXPERIENCING DROUGHTS WHERE THE INITIATION OF STABILIZATION MEASURES BY THE 14TH DAY AFTER CONSTRUCTION ACTIVITY HAS TEMPORARILY OR PERMANENTLY CEASED IS PRECLUDED BY SEASONAL ARID CONDITIONS, STABILIZATION MEASURES SHALL BE INITIATED AS SOON AS PRACTICABLE.
11. THE FOLLOWING RECORDS SHALL BE MAINTAINED AND MADE AVAILABLE TO THE TCEQ UPON REQUEST: THE DATES WHEN MAJOR GRADING ACTIVITIES OCCUR; THE DATES WHEN CONSTRUCTION ACTIVITIES TEMPORARILY OR PERMANENTLY CEASE ON A PORTION OF THE SITE; AND THE DATES WHEN STABILIZATION MEASURES ARE INITIATED.
12. THE HOLDER OF ANY APPROVED EDWARDS AQUIFER PROTECTION PLAN MUST NOTIFY THE APPROPRIATE REGIONAL OFFICE IN WRITING AND OBTAIN APPROVAL FROM THE EXECUTIVE DIRECTOR PRIOR TO INITIATING ANY OF THE FOLLOWING:
 - A. ANY PHYSICAL OR OPERATIONAL MODIFICATION OF ANY WATER POLLUTION ABATEMENT STRUCTURE(S), INCLUDING BUT NOT LIMITED TO PONDS, DAMS, BERMS, SEWAGE TREATMENT PLANTS, AND DIVERSIONARY STRUCTURES;
 - B. ANY CHANGE IN THE NATURE OR CHARACTER OF THE REGULATED ACTIVITY FROM THAT WHICH WAS ORIGINALLY APPROVED OR A CHANGE WHICH WOULD SIGNIFICANTLY IMPACT THE ABILITY OF THE PLAN TO PREVENT POLLUTION OF THE EDWARDS AQUIFER;
 - C. ANY DEVELOPMENT OF LAND PREVIOUSLY IDENTIFIED AS UNDEVELOPED IN THE ORIGINAL WATER POLLUTION ABATEMENT PLAN.

OWNER: B&M FM 1863, LTD
45.81 ACRES
(DOC. #200706019073 O.P.R.)

OWNER: B&M FM 1863, LTD
115.99 ACRES
(DOC. #200706011449 O.P.R.)

OWNER: CIBOLO VALLEY RANCH, LTD
140.00 ACRES
(DOC. #990600979 O.F.R.)

OWNER: CIBOLO VALLEY RANCH, LTD
387.86 ACRES
(DOC. #990600979 O.P.R.)

GENERAL NOTES:

1. DO NOT DISTURB VEGETATED AREAS (TREES, GRASS, WEEDS, BUSH, ETC.) ANY MORE THAN NECESSARY FOR CONSTRUCTION.
2. LOCATIONS OF CONSTRUCTION ENTRANCE/EXITS, CONCRETE WASHOUT PITS, AND CONSTRUCTION EQUIPMENT AND MATERIAL STORAGE YARDS TO BE DETERMINED IN THE FIELD.
3. STORM WATER POLLUTION PREVENTION CONTROLS MAY NEED TO BE MODIFIED IN THE FIELD TO ACCOMPLISH THE DESIRED EFFECT. ALL MODIFICATIONS ARE TO BE NOTED ON THIS EXHIBIT AND SIGNED AND DATED BY THE RESPONSIBLE PARTY.
4. RESTRICT ENTRY/EXIT TO THE PROJECT SITE TO DESIGNATED LOCATIONS BY USE OF ADEQUATE FENCING, IF NECESSARY.
5. ALL STORM WATER POLLUTION PREVENTION CONTROLS ARE TO BE MAINTAINED AND IN WORKING CONDITIONS AT ALL TIMES.
6. CONTRACTOR, TO THE EXTENT PRACTICAL, SHALL MINIMIZE THE AMOUNT OF AREA DISTURBED. AS SOON AS PRACTICAL, ALL DISTURBED SOIL THAT WILL NOT BE COVERED BY IMPERVIOUS COVER SUCH AS PARKWAY AREAS, EASEMENT AREAS, EMBANKMENT SLOPES, ETC. WILL BE STABILIZED PER APPLICABLE PROJECT SPECIFICATIONS.
7. BEST MANAGEMENT PRACTICES MAY BE INSTALLED IN STAGES TO COINCIDE WITH THE DISTURBANCE OF UPGRADE AREAS.
8. BEST MANAGEMENT PRACTICES MAY BE REMOVED IN STAGES ONCE THE WATER SHED FOR THAT PORTION CONTROLLED BY THE BEST MANAGEMENT PRACTICES HAS BEEN STABILIZED.
9. ALL TEMPORARY BMP'S WILL BE REMOVED ONCE WATERSHED IS STABILIZED.
10. MUD OR DIRT INADVERTENTLY TRACKED OFF-SITE AND ONTO EXISTING STREETS SHALL BE REMOVED IMMEDIATELY BY HAND OR MECHANICAL BROOM SWEEPING.
11. PRIOR TO INITIATION OF SUBSEQUENT PHASES OF CONSTRUCTION, TEMPORARY BMP'S INCLUDING SILT FENCING, CONSTRUCTION ENTRANCE/EXIT, CONCRETE WASHOUT PIT, AND CONSTRUCTION STAGING AREA SHALL BE FIELD LOCATED AS APPROPRIATE FOR THE AREA OF CONSTRUCTION.
12. TEMPORARY POLLUTION ABATEMENT MEASURES SHOWN ON THE PLAN ARE FOR THE OVERALL DEVELOPMENT. TEMPORARY BMP'S MAY REQUIRE ADJUSTMENT BASED ON PHASING OF CONSTRUCTION OF THE DEVELOPMENT. RECORDS OF ADJUSTMENTS AND REVISIONS SHALL BE MAINTAINED AS APPROPRIATE.
13. TEMPORARY BMP'S SHOWN ON THIS SHEET ARE FOR GRAPHICAL PURPOSES AND MAY NOT BE TO SCALE. BMP'S SHALL BE LOCATED WITHIN THE PROJECT LIMITS.
14. UPON COMPLETION OF THE PROJECT AND BEFORE FINAL PAYMENT IS ISSUED, CONTRACTOR SHALL REMOVE ALL SEDIMENT AND EROSION CONTROL MEASURES.
15. CONTRACTOR SHALL BE RESPONSIBLE FOR CONSTRUCTION SEQUENCING AND REMOVAL OF TEMPORARY POLLUTION ABATEMENT MEASURES THAT CONFLICT WITH SITE IMPROVEMENTS SUCH AS LANDSCAPING AND FENCES SO AS TO PREVENT SEDIMENT FROM ESCAPING THE PROJECT SITE.
16. A TPDES STORMWATER POLLUTION PREVENTION PLAN(S) WILL ALSO BE PREPARED FOR THIS PROJECT. THE SWPPP WILL BE PREPARED AFTER DESIGN HAS PROCEEDED. IF THERE ARE DISCREPANCIES BETWEEN THIS PLAN AND THE SPECIFIC SWPPP, THE CONTRACTOR SHOULD INSTALL BMP'S IN ACCORDANCE WITH THE SWPPP AND INCLUDE A NOTE ON THIS SHEET REFERRING TO THE SWPPP FOR BMP'S AND REVISIONS TO SUCH.

TEMPORARY POLLUTION ABATEMENT NOTES:

1. CONSTRUCTION WITHIN THE DEVELOPMENT MAY NOT BE CONTINUOUS. THE CONTRACTOR IS RESPONSIBLE FOR PLACING SILT FENCE OR MAINTAINING PROPER VEGETATION ALONG THE DOWN GRADIENT SIDE OF EACH WORK AREA DURING CONSTRUCTION OR OTHER BMP TO PREVENT EROSION AND STORMWATER POLLUTION. TO THE EXTENT POSSIBLE SILT FENCE SHALL BE PLACED PERPENDICULAR TO DRAINAGE FLOW.
2. ROCK BERMS SHALL BE PLACED IN AREAS WHERE DRAINAGE FLOW IS CONCENTRATED DUE TO NATURAL CONDITIONS OR CONSTRUCTION ACTIVITIES SUCH AS AT DRAINAGE STRUCTURES. THESE BERMS WILL BE MAINTAINED BY THE CONTRACTOR UNTIL THE WATERSHED IS STABILIZED.

SWP3 MODIFICATIONS

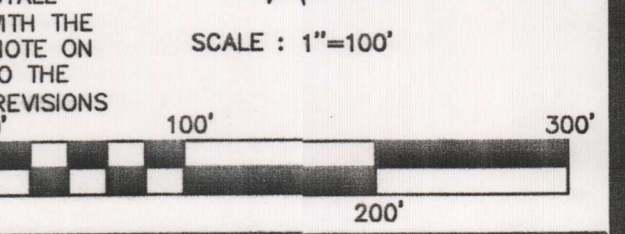
DATE	SIGNATURE	DESCRIPTION

LINE TABLE

LINE	LENGTH	BEARING
L1	52.30'	S83°58'18"E
L2	20.70'	S26°00'00"E
L3	50.65'	S89°26'32"E
L4	32.73'	N01°43'37"W
L5	115.04'	N21°43'37"W
L6	61.77'	S77°20'43"W
L7	86.85'	N81°40'18"W
L8	23.78'	N27°18'48"W
L9	11.96'	N56°09'31"W
L10	181.49'	N14°54'58"W
L11	69.65'	N02°31'47"E
L12	69.91'	N77°31'09"E
L13	87.01'	S61°21'47"E
L14	45.26'	S38°02'25"E
L15	167.80'	S27°42'15"E
L16	29.07'	S70°28'32"E
L17	159.91'	N38°24'46"E
L18	31.33'	N89°23'15"E

CURVE TABLE

CURVE	LENGTH	RADIUS	DELTA	CHORD	CHORD BEARING
C1	201.40'	60.00'	192°19'09"	119.31'	N39°32'27"W
C2	44.88'	45.00'	57°07'18"	43.03'	N28°32'28"E
C3	45.92'	60.00'	44°48'09"	45.72'	S21°53'54"W
C4	797.94'	1472.70'	31°02'38"	788.21'	N80°33'12"E
C5	103.03'	171.89'	34°19'25"	101.50'	S89°59'37"E
C6	47.15'	137.42'	19°39'31"	46.92'	S68°38'22"E
C7	41.42'	87.85'	27°00'57"	41.04'	N21°28'46"E



THIS SHEET HAS BEEN PREPARED FOR PURPOSES OF THE SWP3 ONLY. ALL OTHER CIVIL ENGINEERING RELATED INFORMATION SHOULD BE ACQUIRED FROM THE APPROPRIATE SHEET IN THE CIVIL IMPROVEMENT PLANS.

REVISIONS:

Matt Johnson
5/13/08

PAPE-DAWSON ENGINEERS

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SAN ANTONIO TEXAS 78216
PHONE: 210.375.8000
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**WILEY ROAD DRAINAGE IMPROVEMENTS
TEMPORARY POLLUTION ABATEMENT PLAN**

BULVERDE, TEXAS

JOB NO. 6109-53
DATE MAY 2008
DESIGNER TRE
CHECKED DKH DRAWN ESL
SHEET 1 OF 1

EXHIBIT 1

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File: P:\101\103\103\Design\Civil\WP3\103031.dwg

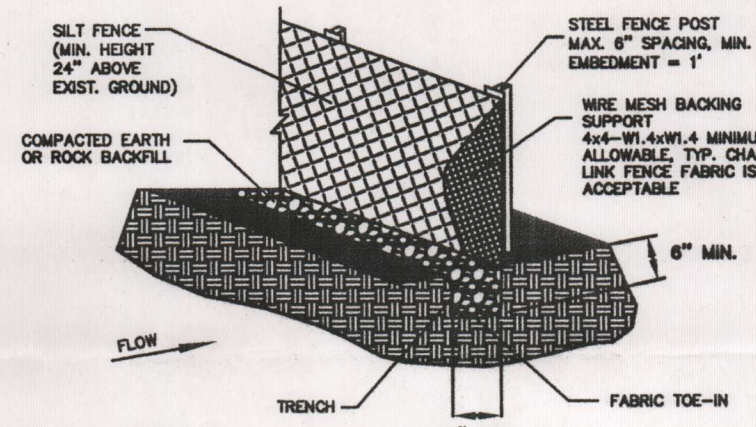
THIS DOCUMENT HAS BEEN PRODUCED FROM MATERIAL THAT WAS STORED AND/OR TRANSMITTED ELECTRONICALLY AND MAY HAVE BEEN INADVERTENTLY ALTERED. RELY ONLY ON FINAL HARD COPY MATERIALS BEARING THE CONSULTANT'S ORIGINAL SIGNATURE AND SEAL.

SILT FENCE

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

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

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



ISOMETRIC PLAN VIEW

Schematic of a Silt Fence Installation (NCTCOG, 1993b)

MATERIALS:

- (1) Silt fence material should be polypropylene, polyethylene or polyamide woven or nonwoven fabric. The fabric width should be 36 inches, with a minimum unit weight of 4.5 oz/yd, mullen burst strength exceeding 190 lb/ft², ultraviolet stability exceeding 70%, and minimum apparent opening size of U.S. sieve no. 30.
- (2) Fence posts should be made of hot rolled steel, at least 4 feet long with tee or y-bar cross section, surface painted or galvanized, minimum nominal weight 1.25 lb/ft², and brinell hardness exceeding 140.
- (3) Woven wire backing to support the fabric should be galvanized 2" x 4" welded wire, 12 gauge minimum.

INSTALLATION:

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

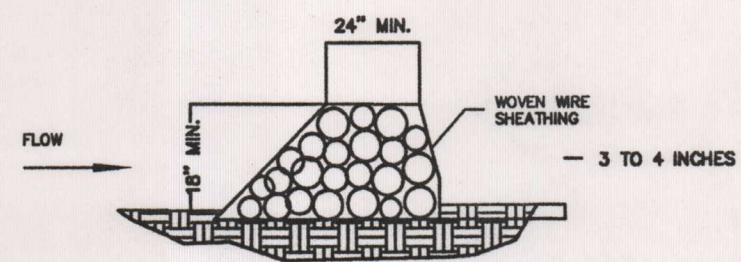
COMMON TROUBLE POINTS:

- (1) Fence not installed along the contour causing water to concentrate and flow over the fence.
- (2) Fabric not seated securely to ground (runoff passing under fence).
- (3) Fence not installed perpendicular to flow line (runoff escaping around sides).
- (4) Fence treating too large an area, or excessive channel flow (runoff overtops or collapses fence).

INSPECTION AND MAINTENANCE GUIDELINES:

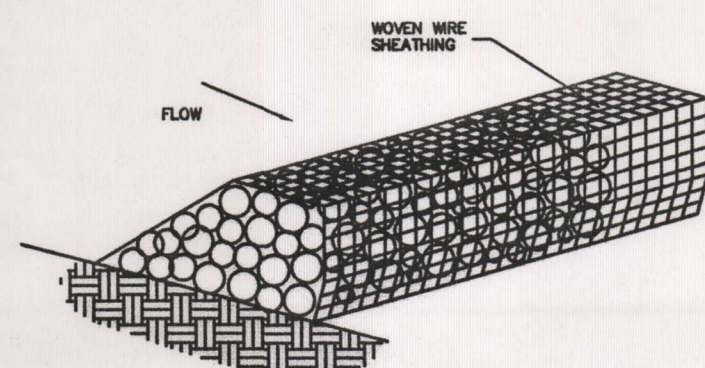
- (1) Inspect all fencing weekly, and after rainfall.
- (2) Remove sediment when buildup reaches 6 inches.
- (3) Replace torn fabric or install a second line of fencing parallel to the torn section.
- (4) Replace or repair sections crushed or collapsed in the course of construction activity. If a section of fence is obstructing vehicular access, consider relocating it to a spot where it will provide equal protection, but will not obstruct vehicles. A triangular filter dike may be preferable to a silt fence at common vehicle access points.
- (5) When construction is complete, the sediment should be disposed of in a manner that will not cause additional siltation and the prior location of the silt fence should be revegetated. The fence itself should be disposed of in an approved landfill.

SILT FENCE



CROSS SECTION

N.T.S.



ISOMETRIC PLAN VIEW

N.T.S.

Schematic Diagram of a Rock Berm (NCTCOG, 1993)

ROCK BERMS

The purpose of a rock berm is to serve as a check dam in areas of concentrated flow, to intercept sediment-laden runoff, detain the sediment and release the water in sheet flow. The rock berm should be used when the contributing drainage area is less than 5 acres. Rock berms are used in areas where the volume of runoff is too great for a silt fence to contain. They are less effective for sediment removal than silt fences, particularly for fine particles, but are able to withstand higher flows than a silt fence. As such, rock berms are often used in areas of channel flows (ditches, gullies, etc.). Rock berms are most effective at reducing bed load in channels and should not be substituted for other erosion and sediment control measures farther up the watershed.

MATERIALS:

- (1) The berm structure should be secured with a woven wire sheathing having maximum opening of 1 inch and a minimum wire diameter of 20 gauge galvanized and should be secured with short rings.
- (2) Clean, open graded 3- to 5-inch diameter rock should be used, except in areas where high velocities or large volumes of flow are expected, where 5- to 8-inch diameter rocks may be used.

INSTALLATION:

- (1) Lay out the woven wire sheathing perpendicular to the flow line. The sheathing should be 20 gauge woven wire mesh with 1 inch openings.
- (2) Berm should have a top width of 2 feet minimum with side slopes being 2:1 (H:V) or flatter.
- (3) Place the rock along the sheathing as shown in the diagram to a height not less than 18".
- (4) Wrap the wire sheathing around the rock and secure with tie wire so that the ends of the sheathing overlap at least 2 inches, and the berm retains its shape when walked upon.
- (5) Berm should be built along the contour at zero percent grade or as near as possible.
- (6) The ends of the berm should be tied into existing upslope grade and the berm should be buried in a trench approximately 3 to 4 inches deep to prevent failure of the control.

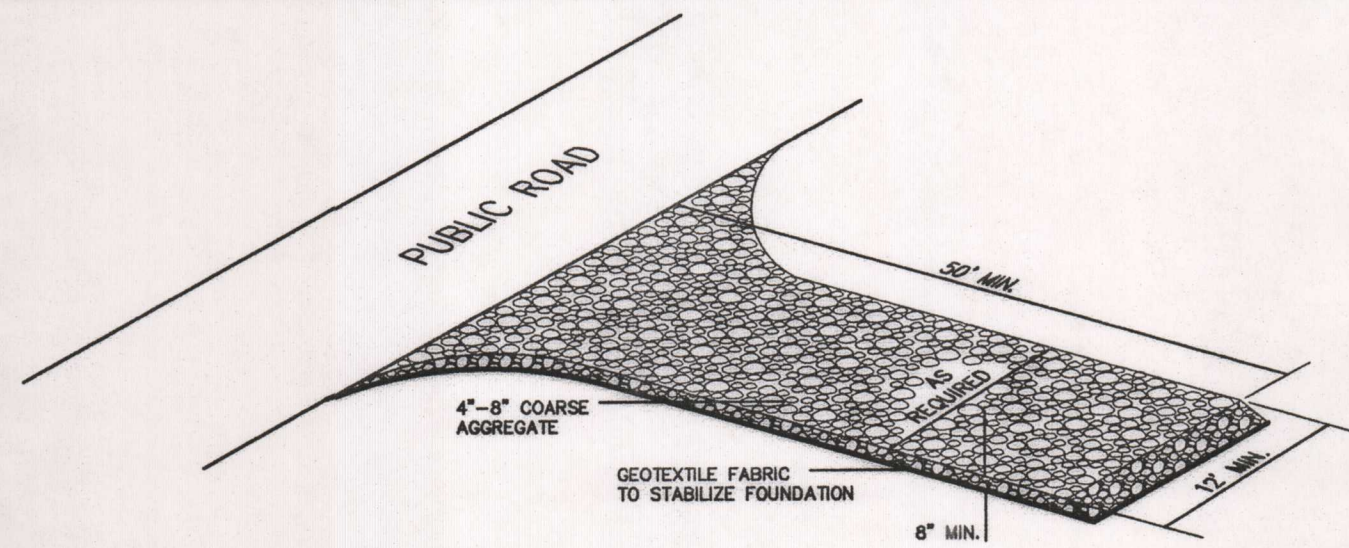
COMMON TROUBLE POINTS:

- (1) Insufficient berm height or length (runoff quickly escapes over the top or around the sides of berm).
- (2) Berm not installed perpendicular to flow line (runoff escaping around one side).

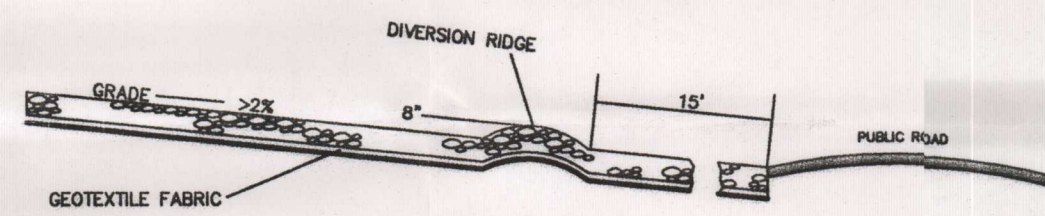
INSPECTION AND MAINTENANCE GUIDELINES:

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

ROCK BERM



SCHEMATIC OF TEMPORARY CONSTRUCTION ENTRANCE/EXIT



CROSS-SECTION OF A CONSTRUCTION ENTRANCE/EXIT

- (1) The aggregate should consist of 4 to 8 inch washed stone over a stable foundation as specified in the plan.
- (2) The aggregate should be placed with a minimum thickness of 8 inches.
- (3) The geotextile fabric should be designed specifically for use as a soil filtration media with an approximate weight of 6 oz/yd², a mullen burst rating of 140 lb/ft², and an equivalent opening size greater than a number 50 sieve.
- (4) If a washing facility is required, a level area with a minimum of 4 inch diameter washed stone or commercial rock should be included in the plans. Divert wastewater to a sediment trap or basin.

INSTALLATION:

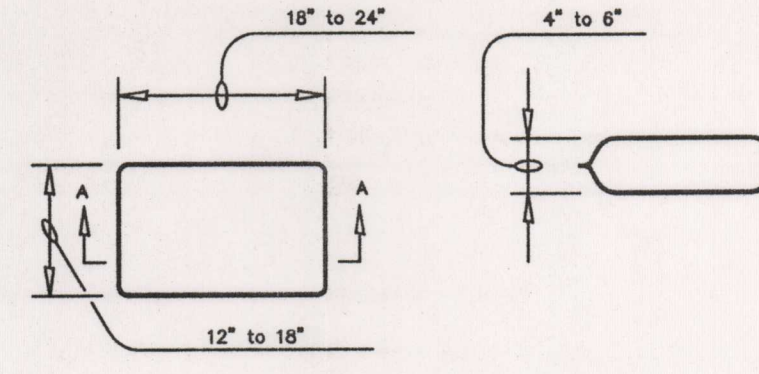
- (1) Avoid curves on public roads and steep slopes. Remove vegetation and other objectionable material from the foundation area. Grade crown foundation for positive drainage.
- (2) The minimum width of the entrance/exit should be 12 feet or the full width of exit roadway, whichever is greater.
- (3)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

STABILIZED CONSTRUCTION ENTRANCE/EXIT

THE ENGINEERING SEAL HAS BEEN AFFIXED TO THIS SHEET FOR THE CONSTRUCTION STAGING AREA ONLY. ALL OTHER INFORMATION IS FROM TCEQ'S TECHNICAL GUIDANCE MANUAL.

THE ENGINEERING SEAL HAS BEEN AFFIXED TO THIS SHEET ONLY FOR THE PURPOSE OF DEMONSTRATING COMPLIANCE WITH THE POLLUTION ABATEMENT SCHEDULING AND TREATMENT REQUIREMENTS OF THE TEXAS COMMISSION ON ENVIRONMENTAL QUALITY'S EDWARDS AQUIFER TECHNICAL GUIDANCE MANUAL.

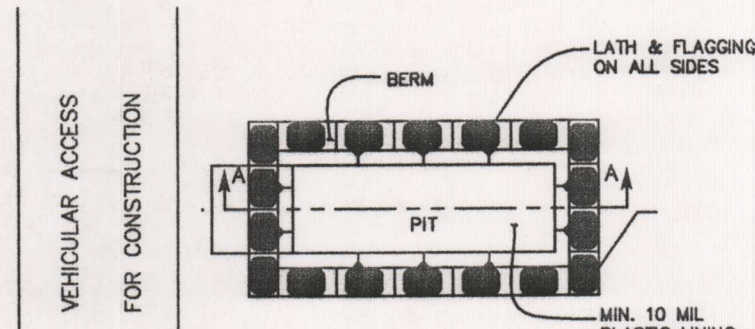
THIS SHEET HAS BEEN PREPARED FOR PURPOSES OF POLLUTION ABATEMENT ONLY. ALL OTHER CIVIL ENGINEERING RELATED INFORMATION SHOULD BE ACQUIRED FROM THE APPROPRIATE SHEET IN THE CIVIL IMPROVEMENT PLANS.



PLAN VIEW SECTION A-A

- The filter bag material shall be made of polypropylene, polyethylene or polyamide woven fabric, min unit weight of 4 ounces/sy, Mullen burst strength exceeding 300 psi and ultraviolet stability exceeding 70%.
- The filter bag shall be filled with clean, medium (washed pea gravel) to coarse gravel (0.31 to 0.75 inch diameter).

GRAVEL FILTER BAG DETAIL



PLAN VIEW

GENERAL NOTES:

- Detail above illustrates minimum dimensions. PIT can be increased in size depending on expected frequency of use.
- Washout pit shall be located in an area easily accessible to construction traffic.
- Washout pit shall not be located in areas subject to inundation from storm water runoff.
- Locate washout area at least 50 feet from sensitive features, storm drains, open ditches, or water bodies.
- Temporary concrete washout facility should be constructed with sufficient quantity and volume to contain all liquid and concrete waste generated by washout operations.

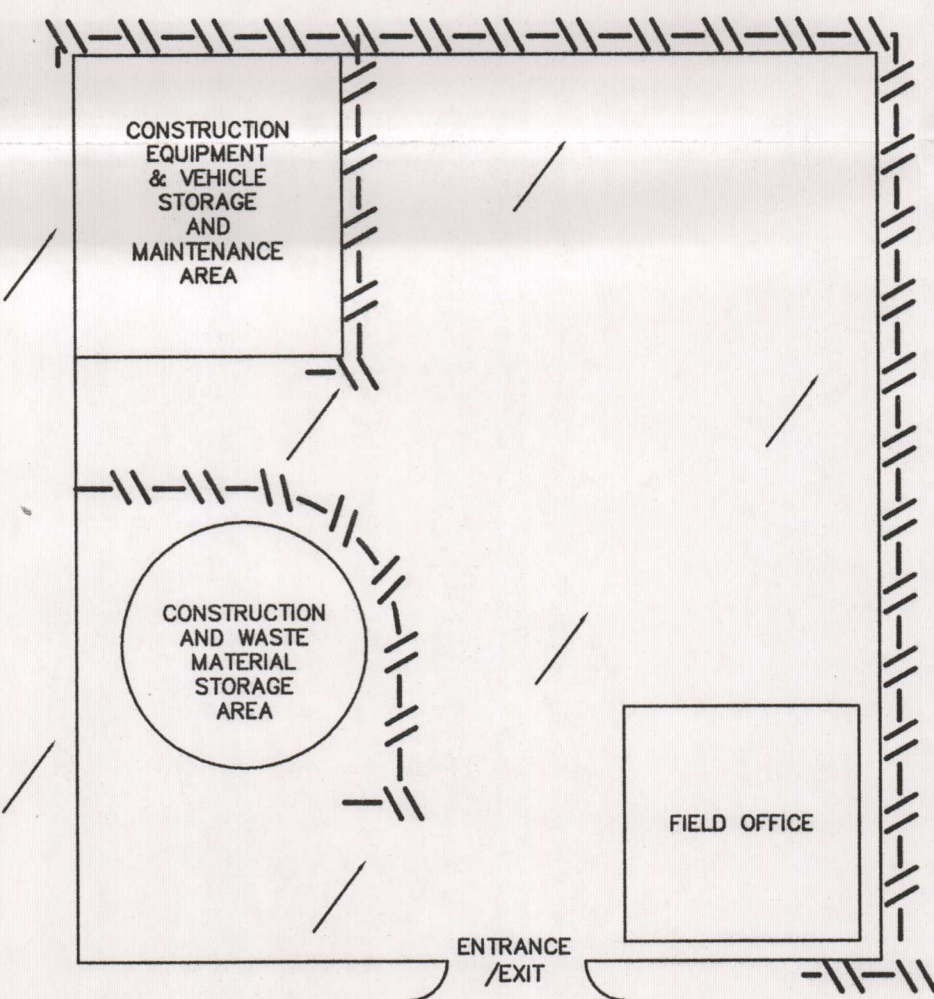
MATERIALS:

- 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.

MAINTENANCE:

- 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.

CONCRETE TRUCK WASHOUT PIT



TYP. CONSTRUCTION STAGING AREA

LEGEND
 --- SILT FENCE
 --- FLOW ARROWS

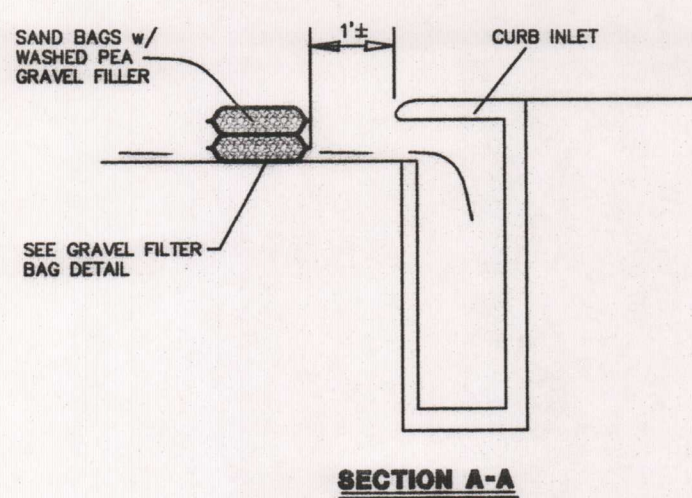
GENERAL NOTES:

- (1) The sandbags should be filled with washed pea gravel and stacked to form a continuous barrier about 1 foot high around inlets.
- (2) The bags should be tightly abutted against each other to prevent runoff from flowing between the bags.

INSPECTION AND MAINTENANCE GUIDELINES:

- (1) Inspection should be made weekly and after each rainfall. Repair or replacement should be made promptly as needed by the contractor.
- (2) Remove sediment when buildup reaches a depth of 3 inches. Removed sediment should be deposited in a suitable area and in such a manner that it will not erode.
- (3) Check placement of device to prevent gaps between device and curb.
- (4) Inspect filter fabric and patch or replace if torn or missing.
- (5) Structures should be removed and the area stabilized only after the remaining drainage area has been properly stabilized.

BAGGED GRAVEL CURB INLET PROTECTION



SECTION A-A

Date: May 23, 2008, 1:16pm User ID: jrobinson File: P:\109\031\Design\Civil\MPD161953.dwg

THIS DOCUMENT HAS BEEN PRODUCED FROM MATERIAL THAT WAS STORED AND/OR TRANSMITTED ELECTRONICALLY AND MAY HAVE BEEN INADVERTENTLY ALTERED. RELY ONLY ON FINAL HARD COPY MATERIALS BEARING THE CONSULTANT'S ORIGINAL SIGNATURE AND SEAL.

REVISIONS:



5/23/08

PAPE-DAWSON ENGINEERS

555 EAST RAMSEY | SAN ANTONIO, TEXAS 78216 | PHONE: 210.375.6000 | FAX: 210.375.5070

**WILEY ROAD DRAINAGE IMPROVEMENTS
 TEMPORARY POLLUTION ABATEMENT
 PLAN DETAIL SHEET
 BULVERDE, TEXAS**

TCEQ-R13
 JUN 16 2008
 SAN ANTONIO

JOB NO. 6109-S3

DATE MAY 2008

DESIGNER TRE

CHECKED DKH DRAWN ESL

SHEET 1 OF 2

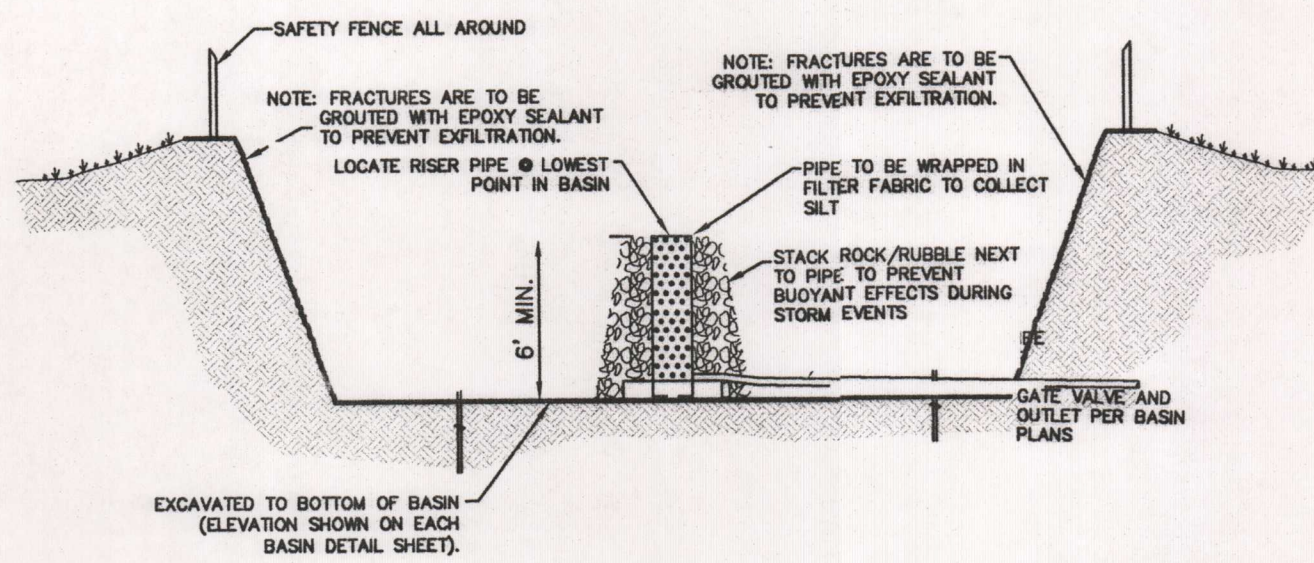
EXHIBIT 2

MATERIALS:

1. RISER SHOULD BE CORRUGATED METAL OR REINFORCED CONCRETE PIPE OR BOX AND SHOULD HAVE WATER-TIGHT FITTINGS OR END TO END CONNECTIONS OF SECTIONS
2. AN OUTLET PIPE OF CORRUGATED METAL OR REINFORCED CONCRETE SHOULD BE ATTACHED TO THE RISER AND SHOULD HAVE POSITIVE FLOW TO A STABILIZED OUTLET ON THE DOWNSTREAM SIDE OF THE EMBANKMENT.
3. AN ANTI-VORTEX DEVICE AND RUBBISH SCREEN SHOULD BE ATTACHED TO THE TOP OF THE RISER AND SHOULD BE MADE OF POLYVINYL CHLORIDE OR CORRUGATED METAL.

TEMPORARY SEDIMENTATION BASIN NOTES:

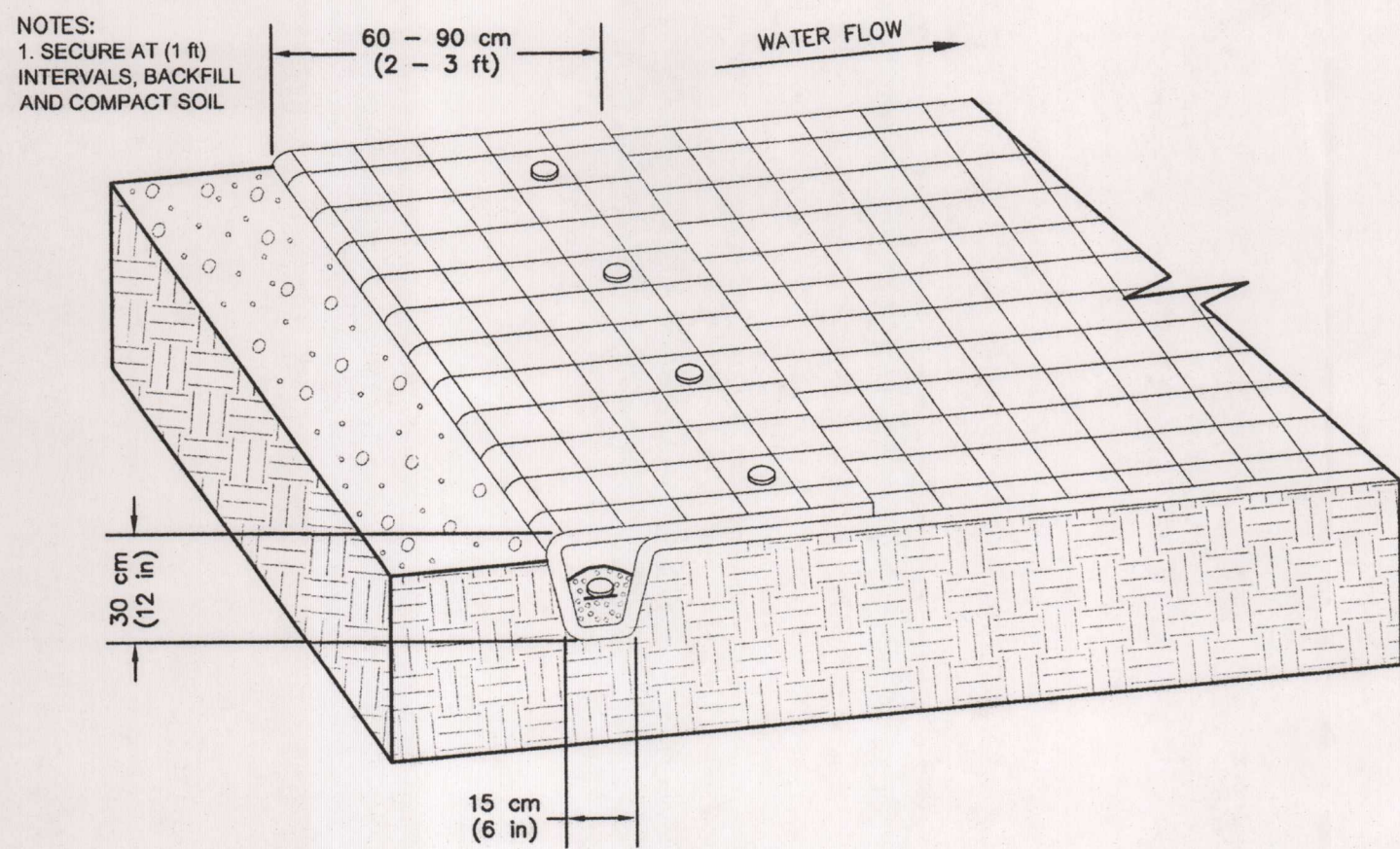
1. CONTRACTOR TO CONSTRUCT BASINS IN ACCORDANCE WITH CONSTRUCTION PLANS FOR PERMANENT SEDIMENTATION/FILTRATION WITH THE EXCEPTION OF THE GRAVEL DRAIN LAYER AND SAND FILTER LAYERS.
2. INSTALL PERMANENT STAKE TO INDICATE SEDIMENT LEVEL IN THE BASIN. STAKE SHOULD BE MARKED TO INDICATE WHEN SEDIMENT OCCUPIES 50% OF THE VOLUME OF THE BASIN.
3. SEDIMENT WILL BE REMOVED WHEN MORE THAN 50% OF THE BASIN CAPACITY IS EXCEEDED.
4. CONTRACTOR TO SECURE PIPE TO BOTTOM OF BASIN TO PREVENT BUOYANCY DURING A RAIN EVENT. A CONCRETE ANCHOR MAY BE USED.
5. DISCHARGE PIPE TO BE INSTALLED SO AS TO BE IN PLACE FOR PERMANENT STRUCTURE.



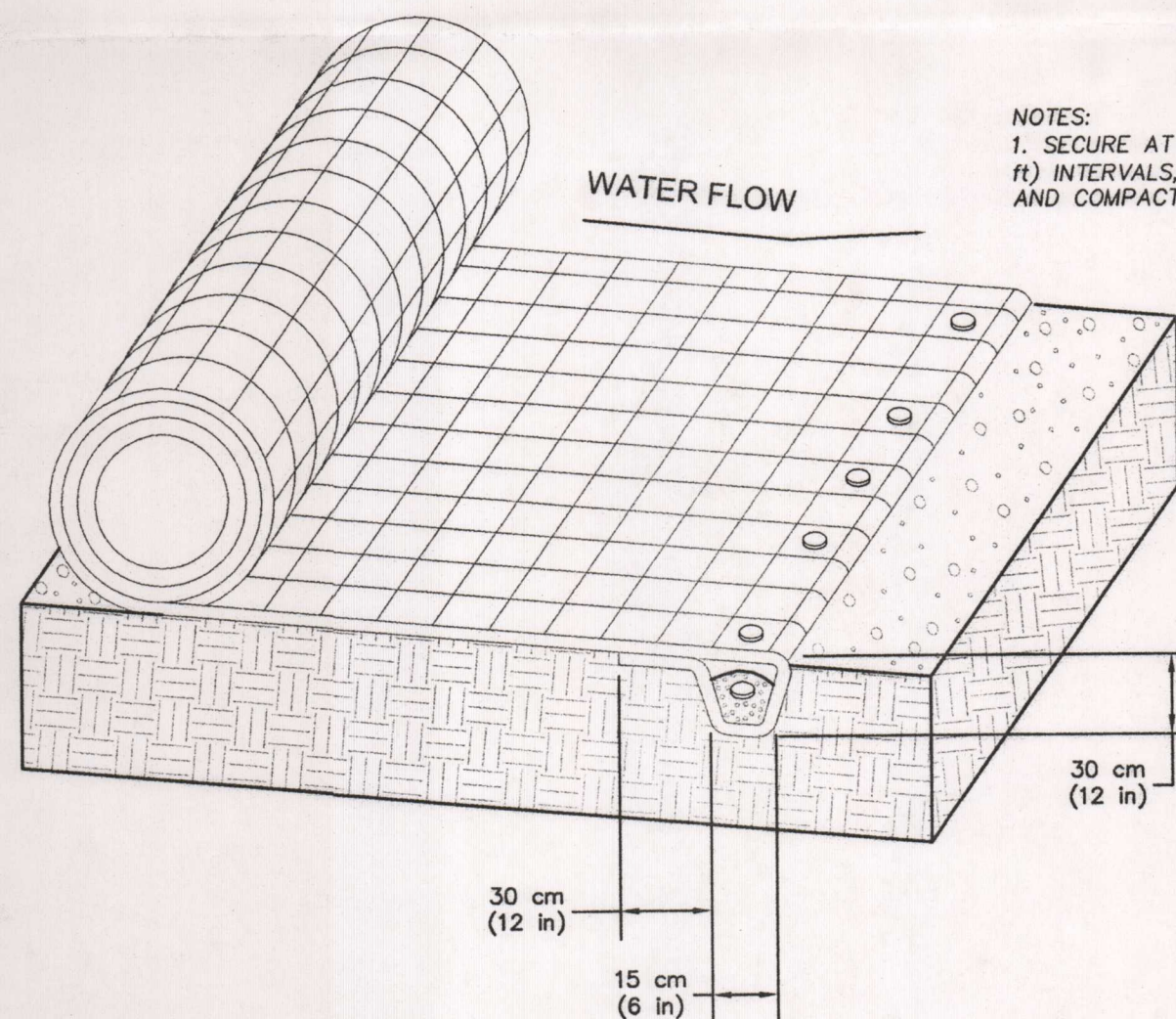
**TEMPORARY SEDIMENT POND
TYPICAL DETAIL
NOT-TO-SCALE**

INSPECTION AND MAINTENANCE GUIDELINES:

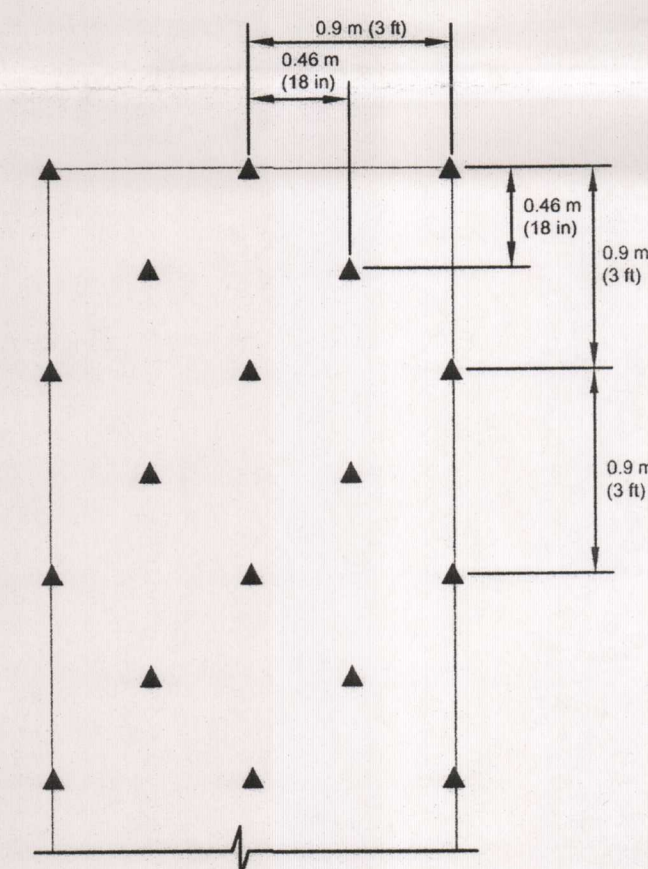
1. INSPECTION SHOULD BE MADE WEEKLY AND AFTER EACH RAINFALL. CHECK THE EMBANKMENT, SPILLWAYS, AND OUTLET FOR EROSION DAMAGE, AND INSPECT THE EMBANKMENT FOR PIPING AND SETTLEMENT. REPAIR SHOULD BE MADE PROMPTLY AS NEEDED BY THE CONTRACTOR.
2. TRASH AND OTHER DEBRIS SHOULD BE REMOVED AFTER EACH RAINFALL TO PREVENT CLOGGING OF THE OUTLET STRUCTURE.
3. ACCUMULATED SILT SHOULD BE REMOVED AND THE BASIN SHOULD BE RE-GRADED TO ITS ORIGINAL DIMENSIONS AT SUCH POINT THAT THE CAPACITY OF THE IMPOUNDMENT HAS BEEN REDUCED TO 50% OF ITS ORIGINAL STORAGE CAPACITY.
4. THE REMOVED SEDIMENT SHOULD BE STOCKPILED OR REDISTRIBUTED IN AREAS THAT ARE PROTECTED FROM EROSION.



**TERMINAL ANCHOR TRENCH (UPSTREAM)
NOT TO SCALE**

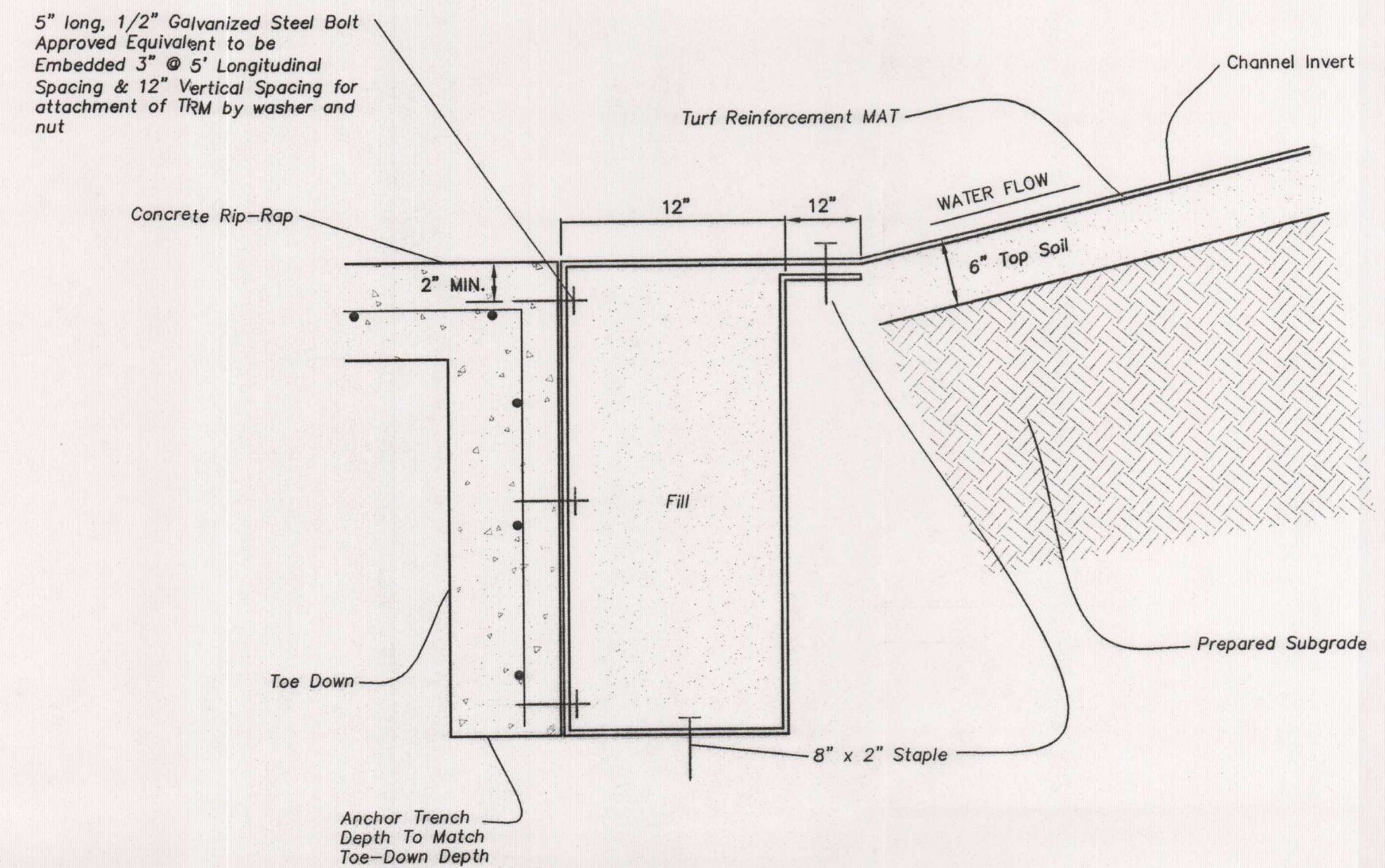


**INITIAL ANCHOR TRENCH (DOWNSTREAM)
NOT TO SCALE**

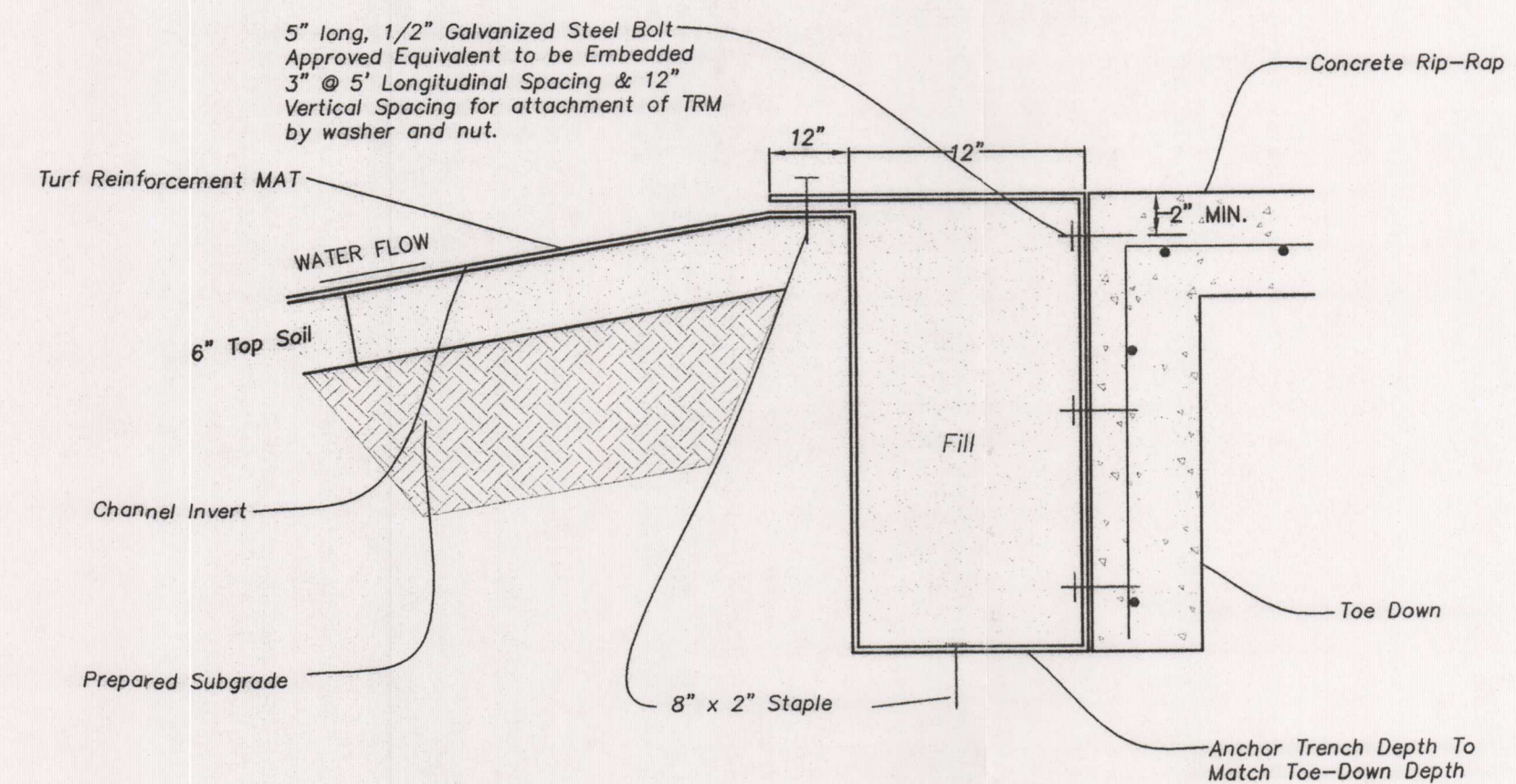


- NOTES:**
1. ANCHOR PATTERN (2 1/2 ANCHORS / Yd²)
 2. U - SHAPED WIRE STAPLES, METAL GEOTEXTILE PINS, TRIANGULAR WOODEN OR PLASTIC STAKES CAN BE USED TO ANCHOR TRM TO THE GROUND SURFACE

**ANCHOR PATTERN
FOR SLOPES AND CHANNELS
NOT TO SCALE**

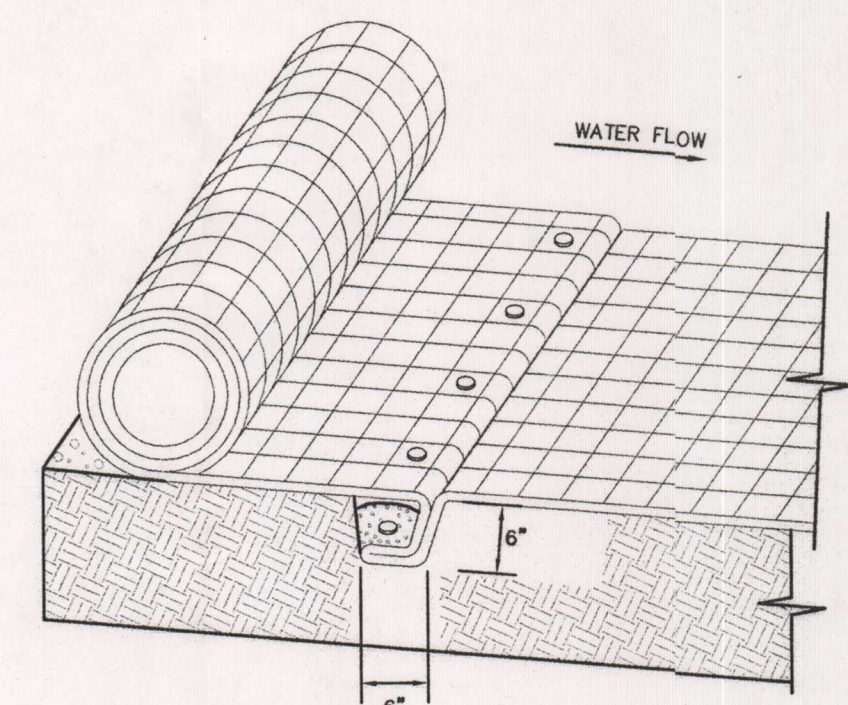


**CONCRETE ANCHOR TRENCH (DOWNSTREAM)
NOT TO SCALE**



**CONCRETE ANCHOR TRENCH (UPSTREAM)
NOT TO SCALE**

- NOTES:**
1. SECURE AT 1 ft INTERVALS, BACKFILL AND COMPACT SOIL
 2. CHECK SLOTS SHOULD BE INSTALLED AT 25-30' INTERVALS



**INTERMITTENT CHECK SLOT
NOT TO SCALE**



**TURF REINFORCEMENT DETAILS
NOT TO SCALE**

1. SITE PREPARATION - High Performance Turf Reinforcement Mat (TRM)

- A. Grade and compact areas to be treated with TRM and compact. The top 8" of subgrade must be free of rock, debris and consist of a cohesive live soil. If the existing subgrade does not meet these standards the contractor is responsible for the import of acceptable material.
 - B. Remove large rocks, soil clods, vegetation, and other sharp objects (larger than 2" in diameter) that could keep the TRM from intimate contact with subgrade.
 - C. Prepare the 8" compacted seedbed by loosening the top 1/2" of soil above final subgrade.
 - D. Construct, as a minimum, 24 in x 12 in anchor trenches at upstream and downstream ends of the installation to inhibit undermining from stray surface water. (Anchor trenches should be excavated to a depth that matches design scour depth). Excavate 6 in x 6 in check slots at 25 to 30 feet intervals along length of channel. Cut longitudinal anchor slots 6 in x 6 in at top of each side slope. The aforementioned dimensions are minimums and the dimensions detailed on the drawings will control.
- 2. INSTALLATION - TRM**
- A mandatory pre-construction conference with an Engineer representing the TRM manufacturer, contractor, and inspector must be completed. The conference is to be scheduled by the contractor with at least one week's notice to all parties involved. Representatives may be required to be on site for installation assistance.
- The Contractor is to schedule the Engineer representing the TRM to inspect the site preparation prior to installation and the completed installation and provide a certified letter stating the site meets the manufacturer's recommendations.
- A. Install the TRM at elevation and alignment indicated.
 - B. The TRM is to be soil filled with 1/2" of top soil, and vegetated by applying the right mixture of seed and soil amendments with Flexterra, a Flexible Growth Medium, protected by a light weight erosion control blanket, or by applying the right mixture of seed and soil amendments with a wood fiber mulch, protected by a light weight erosion control blanket, or by placing sod directly on top and secure sod with 8" staples.
 - C. Beginning at downstream end in center of channel, place initial end of first roll of TRM in anchor trench and secure with ground anchor devices at 12 in intervals.
 - D. Position adjacent rolls in same manner, overlapping preceding roll minimum 3 in.
 - E. Secure the TRM at 12 in intervals along the trench, backfill and compact with specified soil or as directed by City of Bulverde.
 - F. Unroll center strip of TRM upstream over compacted trench. Stop at next check slot or terminal anchor trench. Unroll adjacent rolls of TRM upstream in similar fashion, maintaining 3 in overlap.
 - G. Fold and secure the TRM snugly into transverse check slots. Lay material in bottom of slot, and then fold it back against itself as indicated. Anchor through both layers of TRM at 12 in intervals. Backfill with soil and compact. Continue unrolling the TRM widths upstream over compacted slot to next check slot or terminal anchor trench.
 - H. Secure TRM to channel bottom with ground anchoring devices at a frequency of 2 1/2 anchors per square yard. Anchors should be a minimum of 8 gauge and 8" in length or so that they have sufficient ground penetration to resist pullout in a saturated condition. Increased anchoring frequency may be required if site conditions are such that the Engineer determines it necessary.
 - I. At the Engineer's discretion a manufacturer's designated representative shall be on site for installation assistance.
 - J. Any installation of angular placement, overlapping ground curves, or modified placement methods must be detailed on the construction drawings.
 - K. City of Bulverde and or Engineer must approve alternate installation methods prior to execution.

3.3. Irrigation, Mowing and Project Acceptance

- A. Prior to project acceptance by the City of Bulverde, it shall be the responsibility of the contractor to establish a minimum of 70% of the area seeded shall be covered with the specified vegetation with no bare or dead spots greater than 10 square feet. The contractor shall be responsible to set up and maintain temporary irrigation, as required, to assist in establishment of vegetation.
- All areas that erode prior to project acceptance shall be repaired at the expense of the contractor including necessary reseed, watering, and repair of the TRM.
- Vegetated areas shall not be mowed prior to establishment of 70% vegetative density and a minimum grass growth of 3 inches. Mower height shall not be set lower than 3 inches. Throughout the duration of the project, the contractor shall be responsible for mowing to facilitate growth and shall not let the vegetation in the seeded areas exceed 18". In addition, the Contractor shall water all grassed areas as often as necessary to establish satisfactory growth and to maintain its growth throughout the duration of the project.

THE ENGINEERING SEAL HAS BEEN AFFIXED TO THIS SHEET FOR THE CONSTRUCTION STAGING AREA ONLY. ALL OTHER INFORMATION IS FROM TCEQ'S TECHNICAL GUIDANCE MANUAL.

THE ENGINEERING SEAL HAS BEEN AFFIXED TO THIS SHEET ONLY FOR THE PURPOSE OF DEMONSTRATING COMPLIANCE WITH THE POLLUTION ABATEMENT SIZING AND TREATMENT REQUIREMENTS OF THE TEXAS COMMISSION ON ENVIRONMENTAL QUALITY'S EDWARDS AQUIFER TECHNICAL GUIDANCE MANUAL.

THIS SHEET HAS BEEN PREPARED FOR PURPOSES OF POLLUTION ABATEMENT ONLY. ALL OTHER CIVIL ENGINEERING RELATED INFORMATION SHOULD BE ACQUIRED FROM THE APPROPRIATE SHEET IN THE CIVIL IMPROVEMENT PLANS.

EXHIBIT 2

REVISIONS:



**PAPE-DAWSON
ENGINEERS**

555 EAST RAMSEY | SAN ANTONIO, TEXAS 78216 | PHONE: 210.375.9000 FAX: 210.375.9010

**WILEY ROAD DRAINAGE IMPROVEMENTS
TEMPORARY POLLUTION ABATEMENT
PLAN DETAIL SHEET
BULVERDE, TEXAS**

JOB NO. 6109-53

DATE MAY 2008

DESIGNER TRE

CHECKED DKH DRAWN ESL

SHEET 2 OF 2



Matt Johnson
6/12/08

POLLUTANT LOAD AND REMOVAL CALCULATIONS

Texas Commission on Environmental Quality

TSS Removal Calculations

Project: **Wiley Road Water Quality Basin**
 Watershed: **1**

Input By User
 Automatically Calculated Variables

Job No.: 610953
 Date: 5/27/2008

1. Calculate Required Load Reduction

$$L_m = 27.2(A_n \times P)$$

where:
 L_m = Required TSS removal from proposed development
 A_n = Net increase in impervious area for project
 P = Average annual precipitation, inches

Site Data:

County = **Comal**
 Basin watershed area = **3.43** acres
 Predevelopment impervious area = **0.00** acres
 Post-development impervious area = **2.65** acres
 Post-development impervious fraction = **0.77**
 P = **33** inches

L_m = **2,378.64** lbs ← **0.00** lbs included for overtreatment of uncaptured area

2. Select BMP

Proposed BMP = **SF** abbreviation
 Removal efficiency = **89** percent

AC= Aqualogic™ Cartridge Filter
 BR= Bioretention
 CW= Constructed Wetland
 RI= Retention / Irrigation
 SF= Sand Filter
 WB= Wet Basin

3. Calculate TSS Load Removed by BMP

$$L_r = (\text{BMP efficiency}) \times P \times (A_i \times 34.6 + A_p \times 0.54)$$

where:
 L_r = TSS Load removed by BMP
 A_i = Impervious area of BMP catchment
 A_p = Pervious area of BMP catchment

A_i = **2.65** acres
 A_p = **0.78** acres
 L_r = **2,705.31** lbs

4. Calculate Fraction of Annual Runoff to Treat

F = **0.88** OK

5. Calculate Capture Volume

Rainfall Depth = **1.50** inches
 Post-development Runoff Coefficient = **0.59**
 Runoff Volume = **10,974** cubic feet
 Storage for Sediment = **2,195** cubic feet

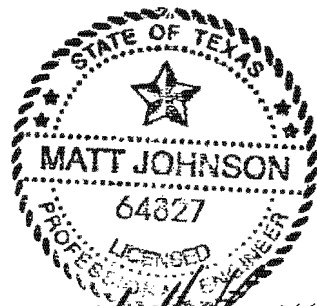
Total Capture Volume **13,169** cubic feet

6. Calculate Sand Area Required

A_f = $WQV/10$ (for systems combining filtration and sedimentation in a single basin; Partial Sedimentation)
 A_f = $WQV/18$ (for systems combining filtration and sedimentation in a separate basins; Full Sedimentation)

Required Sand Area **1,097** square feet Check If Partial Sedimentation Is Used

Required Sand Area **610** square feet Check If Full Sedimentation Is Used



Matt Johnson
6/2/08

BASIN DRAWDOWN

BASIN DRAWDOWN CALCULATIONS

	Input By User
	Automatically Calculated Variables

Project: **Wiley Road Water Quality Basin**
 Watershed: **1**
 Job No.: 610953
 Date: 6/2/2008

Basin Volume	19,200 Cubic Feet	143,626 Gallons
Basin Water Storage Depth	4.0 Feet	
Sand Surface Area	4,800 Square Feet	
Sand Depth	1.5 Feet	
Outlet Pipe Diameter	6 Inches	
Outlet Pipe Slope	0.5 Percent	

Flow Rate for 24 Hour Drawdown

$$\frac{19,200 \text{ CF}}{1440 \text{ Min/Day}} = 13.33 \text{ CF/Min} = 0.22 \text{ CF/Sec} \text{ or } 1.66 \text{ Gal/Sec}$$

Check flow through rate (Q) of basin sand surface area using 2Ft/Day for k for sand. Book values range from 2 to 3.5 Feet/Day.

Af= Sand filter surface area in Square Feet
 L= Sand Bed Depth in Feet
 h= Average head of water above sand surface in Feet

h= 2 Feet

Calculate $i = (h+L)/L = 2.33$

Drawdown Rate Through Sand Flow

Drawdown Assuming Sand Flow Through Rate at 2ft/day

$$Q = kiAf \quad 2.0 \text{ Ft/Day} \times 2.33 \times 4,800 \text{ Sq.Ft} = 22,400 \text{ CF/Day} \quad \text{or}$$
$$167,564 \text{ Gal/Day} \quad \text{or}$$
$$116 \text{ Gal/Min} \quad \text{or}$$
$$1.9 \text{ Gal/Sec}$$

$$\frac{143,626 \text{ Gallons}}{167,564 \text{ Gal/Day}} = 0.86 \text{ Day} = 20.57 \text{ Hours}$$

Drawdown Assuming Sand Flow Through Rate at 3.5ft/day

$$Q = kiAf \quad 3.5 \text{ Ft/Day} \times 2.33 \times 4,800 \text{ Sq.Ft} = 39,200 \text{ CF/Day} \quad \text{or}$$
$$293,236 \text{ Gal/Day} \quad \text{or}$$
$$204 \text{ Gal/Min} \quad \text{or}$$
$$3.4 \text{ Gal/Sec}$$

$$\frac{143,626 \text{ Gallons}}{293,236 \text{ Gal/Day}} = 0.49 \text{ Day} = 11.76 \text{ Hours}$$

Conclusion:

- If drawdown is greater than 24 Hours and less than 48 Hours, sand surface may control drawdown. Check drawdown on pipe.
- If drawdown is less than 24 Hours then sand filter area does not control drawdown. Check drawdown through discharge pipe.

Drawdown Rate Through Discharge Pipe

Size in Inches = 6
 Slope in Percent = 0.5
 n coefficient = 0.009
 Rate (From Table 1 Below) = 350.18 GPDx1000 = 350,180 GPD = 243.18 GPM

Drawdown
 Time = $\frac{143,626 \text{ Gallons}}{243.18 \text{ GPM}}$ = 0.41 Days = **9.84 Hours**

TABLE 1
 Flow Characteristics For Sewer PVC Pipe (Flow Velocity Ft/Sec x 1000 US GPD)

Slope (Ft/100 Ft)	Pipe Diameter (Inches)		
	4	6	8
	Rate		
0.10	54.29	156.61	341.15
0.20	76.78	221.47	482.46
0.30	94.04	271.25	590.89
0.40	108.59	313.21	682.3
0.50	121.41	350.18	762.83
0.60	132.99	383.61	835.64
0.70	143.65	414.34	902.6
0.80	153.57	442.95	964.92
0.90	162.88	469.82	1023.45
1.00	171.69	495.23	1078.81

Conclusion:
 --If drawdown is greater than 24 hours and is less than 48 Hours, then the carrying capacity of the PVC pipe will control drawdown for a full basin. Since the pipe is the limiting factor the valve calculations are not needed. A valve will still be installed and will be set to full open position.
 --If drawdown is greater than 48 hours a larger discharge pipe will be needed.
 --If drawdown is less than 24 Hours valve calculations will be needed.

Valve Position Required for 24 to 48 Hr. Drawdown Rate

Flow Rate Equation For Pratt Rubber Seated Butterfly Valves:

$$Q = 19.62 (C_v) D^2 \text{ SQRT } \Delta H$$

Q= Average Filter Flow Rate:	$\frac{116 + 204}{2} = 160.00$	Gal/Min
$\Delta H =$ Head Loss in Feet of Water (Based on Mannings Equation):		0.1

$$160.00 \text{ Gal/Min} = 19.62 (C_v) (6)^2 \text{ SQRT } 0.1$$

$$C_v = 0.7163$$

Estimation of the required valve opening based on the above C_v value:
(Based on Pratt Rubber Seat Butterfly Valves (3" - 8"))

64.21 Degrees

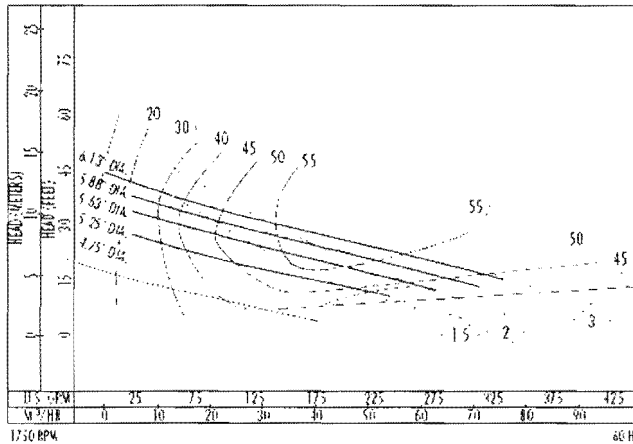
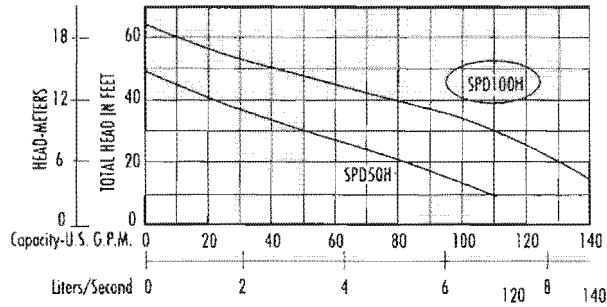
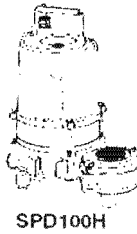
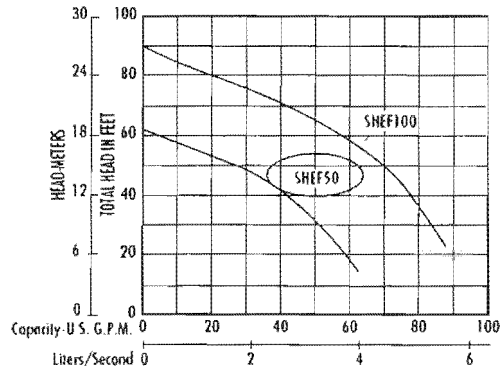
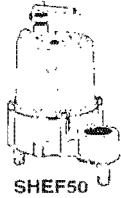
Degrees Open	C_v 3" - 8" Valves	Degrees Open	C_v 3" 8" Valves
5	0.0080	50	0.3890
10	0.0161	55	0.5000
15	0.0327	60	0.6180
20	0.0545	65	0.7470
25	0.0830	70	0.8950
30	0.1180	75	1.0270
35	0.1590	80	1.1180
40	0.2150	85	1.1800
45	0.2810	90	1.2050

Pump Calculations

Pump Type: HYDROMATIC S3S OR EQUIVALENT

Flow Rate (GPM): 375

Drawdown Time: 6.38 Hours



HP HYDROMATIC
Pentair Pump Group

