TEXAS COMMISSION ON ENVIRONMENTAL QUALITY

Protecting Texas by Reducing and Preventing Pollution

October 22, 2008

Mr. Jim De La Garza
Ocean 2 Ocean, L.L.C.
PO Box 592479
San Antonio, Texas 78259

Re: Edwards Aquifer, Comal County
NAME OF PROJECT: The Village of Bulverde; Located on the south side of FM 1863, approximately one mile west of US 281 North; Bulverde, Texas
TYPE OF PLAN: Request for Approval of a Water Pollution Abatement Plan (WPAP); 30 Texas Administrative Code (TAC) Chapter 213 Edwards Aquifer
Edwards Aquifer Protection Program ID No.: 236.01; Investigation No. 700767; Regulated Entity No. RN105354211

Dear Mr. De La Garza:

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 Sherfey Engineering SA, L.L.C. on behalf of Ocean 2 Ocean, L.L.C. on August 18, 2008. Final review of the WPAP was completed after additional material was received on October 16, 2008. As presented to the TCEQ, the Temporary and Permanent Best Management Practices (BMPs) and construction plans were prepared by a Texas Licensed Professional Engineer to be in general compliance with the requirements of 30 TAC Chapter 213. These planning materials were sealed, signed and dated by a Texas Licensed Professional Engineer. Therefore, based on the engineer's concurrence of compliance, the planning materials for construction of the proposed project and pollution abatement measures are hereby approved subject to applicable state rules and the conditions in this letter. The applicant or a person affected may file with the chief clerk a motion for reconsideration of the executive director's final action on this Edwards Aquifer Protection Plan. A motion for reconsideration must be filed no later than 23 days after the date of this approval letter. *This approval expires two (2) years from the date of this letter unless, prior to the expiration date, more than 10 percent of the construction has commenced on the project or an extension of time has been requested.*

PROJECT DESCRIPTION

The proposed commercial project will have an area of approximately 22.25 acres. It will include the placement of fill material and other associated earthwork. No impervious cover is proposed for this project. No wastewater will be generated by this project. Fill material shall be clean, uncontaminated and free of organic materials.

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, disturbed areas will be re-vegetated.

GEOLOGY

According to the geologic assessment included with the application, the site is located on Alluvium (Qal) and consists of terrace deposits within the Cibolo Creek flood plain, and the entire site contains an approximate 2 – 3 foot silty clay soil cover which overlies and is transitional with the alluvium. No karstic or structural features were noted. Three geologic features (non-karst closed depressions) and three man made features (two wells and two on-site sewage facilities) were reported. The two wells were assessed as sensitive. Both wells are to be properly plugged. The San Antonio Regional Office site assessment conducted on October 6, 2008 revealed that the site was mostly covered with vegetation (one foot to two feet tall grasses and weeds), and scattered oak trees. No recent soil disturbance was observed. One empty 500-gallon aboveground tank (labeled diesel) and one full 55-gallon drum (labeled antifreeze/coolant ethylene glycol base) were observed. According to the project manager, the 55-gallon anti-freeze drum had been removed.

SPECIAL CONDITIONS

I. Site grading and fill is the only activity authorized by this letter. Future site development requires a modification to the approved WPAP.

II. The TCEQ shall be notified in writing at the completion of site grading.

III. Soil stabilization practices shall be implemented in accordance with Standard Conditions 17 below.

IV. All permanent pollution abatement measures shall be operational at the completion of the mass grading project.

V. This approval letter is being issued for regulated activities (as defined in Chapter 213) and for best management practices presented in the application. This approval does not constitute a water right permit or authorization from the TCEQ Dam Safety Program. Failure to obtain all necessary authorizations could result in enforcement actions. For more information on Water Rights Permits, please refer to:
http://www.tceq.state.tx.us/permitting/water_supply/water_rights/wr_amiregulated.html
For more information on the Dam Safety program, please refer to:
http://www.tceq.state.tx.us/compliance/field_ops/dam_safety/damsafetyprog.html

VI. A plugging report for each on-site well shall be provided to the TCEQ's San Antonio Regional Office upon completion of their closure, and 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.

VII. This approval letter does not exempt the applicant or development from compliance with all other state, county and local ordinances and regulations.

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 and/or authorizations from other TCEQ Programs (i.e., Stormwater, Water Rights, PST) can be required depending on the specifics of the plan.

3. In addition to the rules of the Commission, the applicant may also be required to comply with state and local ordinances and regulations providing for the protection of water quality.

Prior to Commencement of Construction:

4. 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.

5. 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.

6. 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.

7. 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.

8. 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.

9. 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:

10. 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.

11. 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.

12. 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.

13. Two water wells are located on the subject 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.

14. 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.

15. Intentional discharges of sediment laden storm 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.

16. 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.

17. 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.

<u>After Completion of Construction:</u>

18. 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.

19. 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.

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

21. 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.

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

If you have any questions or require additional information, please contact John Mauser of the Edwards Aquifer Protection Program of the San Antonio Regional Office at 210/403-4024.

Sincerely,

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

MRV/JKM/eg

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

cc: Mr. Javier Garcia, Sherfey Engineering SA, LLC
Mr. Jim Klein, P.E., City of New Braunfels
Mr. Tom Hornseth, P.E., Comal County
Mr. John Nowak., City of Bulverde
Mr. Velma Danielson, Edwards Aquifer Authority
TCEQ Central Records, Building F, MC 212

TCEQ 4

236.01

THE VILLAGE OF BULVERDE

Comal County, Texas

WATER POLLUTION ABATEMENT PLAN

August 11, 2008

Prepared by:

Sherfey Engineering SA, LLC
8400 Blanco Road, Suite 201
San Antonio, Texas 78216
Ph:(210) 493-9200 Fax:(210) 493-9205

City of Bulverde
2008 SEP 11 AM 11:42
30360 Cougar Bend
Bulverde, TX 78163
Office (830) 438-3612
Fax (830) 438-4339

September 16, 2008

TCEQ, Region 13
Lynn Bumgardner
14250 Judson Rd
San Antonio, TX 78233

RE: Village of Bulverde WPAP Application; EAPP File No. 236.01

Dear Ms. Bumgardner,

The City of Bulverde has reviewed the WPAP application material. In general terms, the City does not have objections to the proposed mitigation practices for sediment control during placement of the proposed fill material. However, the City does wish to raise the following concerns regarding this project:

- The majority of the parcel in question lies in the Edwards Aquifer Recharge zone. The existing soil conditions provide "moderate" infiltration. Placing up to 13 feet of fill material suitable for building on would likely dramatically reduce the infiltration rate of this parcel. Would this not have an adverse impact to the aquifer?
- To the best of our knowledge, the applicant has not submitted a CLOMR for this proposed work. Placement of the proposed fill material will have a very large impact to the floodplain boundary in this area. How can area residents be assured that their properties will not be adversely impacted by this fill placement when a detailed study and analysis has not been provided or a CLOMR approved?
- It also appears that there is some sort of a historic/natural drainage way running diagonally across a portion of the property. This drainage way generally runs from near the northwest corner of the property down to a point just east of Bulverde Lane, where it connects with the Indian Creek channel. Placing fill material over this feature will block this historic flow of runoff. This could also have a very significant impact to adjacent and upstream property owners. Detailed study and analysis of this feature have not been provided. It is likely that this feature would be included in the CLOMR request as this drainage way is included in the floodplain boundary.
- The property owner has repeatedly stated his intentions to fully develop this parcel. He has publicly represented that this will be a large scale commercial and mixed use development. The conceptual plans shown publically indicate the vast majority of the site will be covered by impervious cover. How will the increased runoff be handled? Will this have an even larger impact to infiltration into the recharge zone?

- How will sanitary sewer service be provided for this parcel? In the application, the applicant acknowledges that typical septic discharges are not allowed over the recharge zone, so where will this effluent go?

In summary, the City of Bulverde feels that there are too many unanswered questions/concerns regarding the ultimate development of this parcel. We strongly feel that these questions/concerns should be addressed before any permits associated with placing large amounts of fill material on this parcel are granted.

If you should have any further questions, please contact me at (830)438-3612 or at jnowak@ci.bulverde.tx.us

Sincerely,

John M. Nowak, P.E.
Public Works Director

cc: Frank Garza, City Attorney

JN/09.09.08

TEXAS COMMISSION ON ENVIRONMENTAL QUALITY

Protecting Texas by Reducing and Preventing Pollution

August 6, 2008

Mr. Thomas H. Hornseth, P.E.
Comal County Engineer
195 David Jonas Drive
New Braunfels TX 78132-3710

Re: Edwards Aquifer, Comal County
PROJECT NAME: The Village of Bulverde, located on the southwest corner of Bulverde Road and Bulverde Lane, Bulverde, Comal County Texas
PLAN TYPE: Application for Approval of a Water Pollution Abatement Plan (WPAP) 30 Texas Administration Code (TAC) Chapter 213; Edwards Aquifer Protection Program
EAPP File No.: 236.01

Dear Mr. Hornseth:

The enclosed WPAP application received on August 18, 2008, is being forwarded to you pursuant to the Edwards Aquifer Rules. The Texas Commission on Environmental Quality (TCEQ) is required by 30 TAC Chapter 213 to provide copies of all applications to affected incorporated cities and underground water conservation districts for their comments prior to TCEQ approval.

Please forward your comments to this office by September 17, 2008.

The Texas Commission on Environmental Quality appreciates your assistance in this matter and your compliance efforts to ensure protection of the State's environment. If you or members of your staff have any questions regarding these matters, please feel free to contact the San Antonio Region Office at (210) 490-3096.

Sincerely

Lynn M. Bumguardner
Water Section Work Leader
San Antonio Regional Office

LMB/eg

TABLE of CONTENTS

CORE DATA FORM

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)*

☒ New Permit, Registration or Authorization *(Core Data Form should be submitted with the program application)*

☐ Renewal *(Core Data Form should be submitted with the renewal form)* ☐ Other

2. Attachments **Describe Any Attachments:** *(ex. Title V Application, Waste Transporter Application, etc.)*

☒ Yes ☐ No — T.C.E.Q. Edwards Aquifer Water Pollution Abatement Plan

3. Customer Reference Number *(if issued)*	Follow this link to search for CN or RN numbers in Central Registry**	4. Regulated Entity Reference Number *(if issued)*
CN 603251149		RN 105354211

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:*

☒ Owner ☐ Operator ☐ Owner & Operator
☐ Occupational Licensee ☐ Responsible Party ☐ Voluntary Cleanup Applicant ☐ Other: _____

7. General Customer Information

☒ New Customer ☐ Update to Customer Information ☐ Change in Regulated Entity Ownership
☐ Change in Legal Name (Verifiable with the Texas Secretary of State) ☐ No Change**

If "No Change" and Section I is complete, skip to Section III – Regulated Entity Information.

8. Type of Customer:	☒ Corporation	☐ Individual	☐ Sole Proprietorship- D.B.A
☐ City Government	☐ County Government	☐ Federal Government	☐ State Government
☐ Other Government	☐ General Partnership	☐ Limited Partnership	☐ Other:

9. Customer Legal Name *(If an individual, print last name first: ex: Doe, John)*	*If new Customer, enter previous Customer below*	*End Date:*
Ocean 2 Ocean, L.L.C.		

10. Mailing Address: Jim De La Garza

P.O. Box 592479

City	San Antonio	State	TX	ZIP	78259	ZIP + 4	

11. Country Mailing Information *(if outside USA)*	12. E-Mail Address *(if applicable)*

13. Telephone Number	14. Extension or Code	15. Fax Number *(if applicable)*
(210) 651-4355		(210) 568-2499

16. Federal Tax ID *(9 digits)*	17. TX State Franchise Tax ID *(11 digits)*	18. DUNS Number *(if applicable)*	19. TX SOS Filing Number *(if applicable)*

20. Number of Employees

☐ 0-20 ☐ 21-100 ☐ 101-250 ☐ 251-500 ☐ 501 and higher

21. Independently Owned and Operated?

☒ Yes ☐ 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)*

☐ New Regulated Entity ☐ Update to Regulated Entity Name ☒ Update to Regulated Entity Information ☐ 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)*

The Village of Bulverde

24. Street Address of the Regulated Entity: *(No P.O. Boxes)*	unassigned						
	City		**State**		**ZIP**		**ZIP + 4**
25. Mailing Address:							
	City		**State**		**ZIP**		**ZIP + 4**

26. E-Mail Address:			
27. Telephone Number	**28. Extension or Code**	**29. Fax Number** *(if applicable)*	
( ) -		( ) -	
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)
1542		236220	

34. What is the Primary Business of this entity? *(Please do not repeat the SIC or NAICS description.)*

Commercial, Office, and Retail - undetermined

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

35. Description to Physical Location:	2280 Bulverde Road; Bulverde, TX; 78163-4582		
36. Nearest City	**County**	**State**	**Nearest ZIP Code**
Bulverde	Comal	TX	78163

37. Latitude (N) In Decimal:	29.742		**38. Longitude (W) In Decimal:**	98.454		
Degrees	Minutes	Seconds	Degrees	Minutes	Seconds	
29	44	31	98	27	14	

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.

☐ Dam Safety	☐ Districts	☒ Edwards Aquifer	☐ Industrial Hazardous Waste	☐ Municipal Solid Waste
		TCEQ File #236.00		
☐ New Source Review – Air	☐ OSSF	☐ Petroleum Storage Tank	☐ PWS	☐ Sludge
☐ Stormwater	☐ Title V – Air	☐ Tires	☐ Used Oil	☐ Utilities
☐ Voluntary Cleanup	☐ Waste Water	☐ Wastewater Agriculture	☐ Water Rights	☐ Other:

SECTION IV: Preparer Information

40. Name:	Javier Garcia, P.E.	**41. Title:**	President

42. Telephone Number	**43. Ext./Code**	**44. Fax Number**	**45. E-Mail Address**
(210) 493-9200		(210) 493-9205	

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:	Sherfey Enginineering SA, L.L.C.	**Job Title:**	President
Name *(In Print)*:	Javier Garcia, P.E.	**Phone:**	(210) 493-9200
Signature:		**Date:**	8/11/08

Central Registry Query - Customer Information

Customer Information

CN Number:	CN603251497
Name:	OCEAN 2 OCEAN
Legal Name:	Ocean2Ocean, LLC
Customer Type:	CORPORATION

Affiliated Regulated Entities - Current

Your Search Returned **1** Current Affiliation Records (View History)

1-1 of 1 Records

RN Number	Regulated Entity Name ▲	Location	County	Customer's Role	More Information
RN105354211	OCEAN 2 OCEAN	2280 BULVERDE RD BULVERDE TX 78163 4582	COMAL	OWNER OPERATOR	

GENERAL INFORMATION FORM

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: The Village of Bulverde

COUNTY: Comal. STREAM BASIN: Cibolo Creek (via Indian Creek).

EDWARDS AQUIFER: X RECHARGE ZONE
___ TRANSITION ZONE

PLAN TYPE: X WPAP ___ AST ___ EXCEPTION
SCS ___ UST ___ MODIFICATION

CUSTOMER INFORMATION:

1. Contact (Applicant):

Contact Person: Jim De La Garza
Entity: Ocean 2 Ocean, L.L.C.
Mailing Address: P. O. Box 592479
City, State: San Antonio, Texas Zip: 78259
Telephone: 210 / 651 - 4355 FAX: 210 / 568 - 2499

Agent/Representative (if any):

Contact Person: Javier Garcia, P.E.
Entity: Sherfey Engineering SA, L.L.C.
Mailing Address: 8400 Blanco Road; Suite 201
City, State: San Antonio, Texas Zip: 78216
Telephone: 210 / 493 - 9200 FAX: 210 / 493 - 9205

2. ✓ This project is inside the city limits of Bulverde.
✓ This is outside the city limits but inside the ETJ of Bulverde.
___ This project is not located within any city's limits of 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.

The Project Site is a 22 acre tract located north of San Antonio on Bulverde Road about 1 mile west of the FM 1863 exit (about 10 miles north of Loop 1604) from US 281 North. The tract is situated in the southwest corner of the intersection of Bulverde Road and Bulverde Lane in Bulverde.

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.

From the intersection of Judson Road and Loop 1604, take 1604 west about 5 miles to US 281. Take US 281 North about 10 miles to the FM 1863 exit. Turn left under 281 and follow Bulverde Road about 1 mile to the traffic signal at Bulverde Lane. Project site is located in the southwest corner of the intersection behind the existing commercial buildings.

5. ✓ **ATTACHMENT B - USGS / EDWARDS RECHARGE ZONE MAP.**
A copy of the official 7 ½ minute USGS Quadrangle Map (Scale: 1" = 2000') of the Edwards Recharge Zone is attached behind this sheet. The map(s) should clearly show:
X Project site.
X USGS Quadrangle Name(s).
X Boundaries of the Recharge Zone (and Transition Zone, if applicable).
X 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 is a detailed narrative description of the proposed project.

8. Existing project site conditions are noted below:
___ Existing commercial site
___ Existing industrial site
___ Existing residential site
___ Existing paved and/or unpaved roads
X Undeveloped (Cleared)
___ Undeveloped (Undisturbed/Uncleared)
X Other: Cultivated Farm Land

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);
(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.

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)

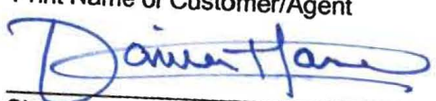
13. ✓ Submit one (1) original and three (3) copies of the completed application to the appropriate regional office for distribution by the TCEQ to the local municipality or county, groundwater conservation districts, and the TCEQ's Central Office.

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.
    n/a 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:

Javier Garcia, P.E.
Print Name of Customer/Agent

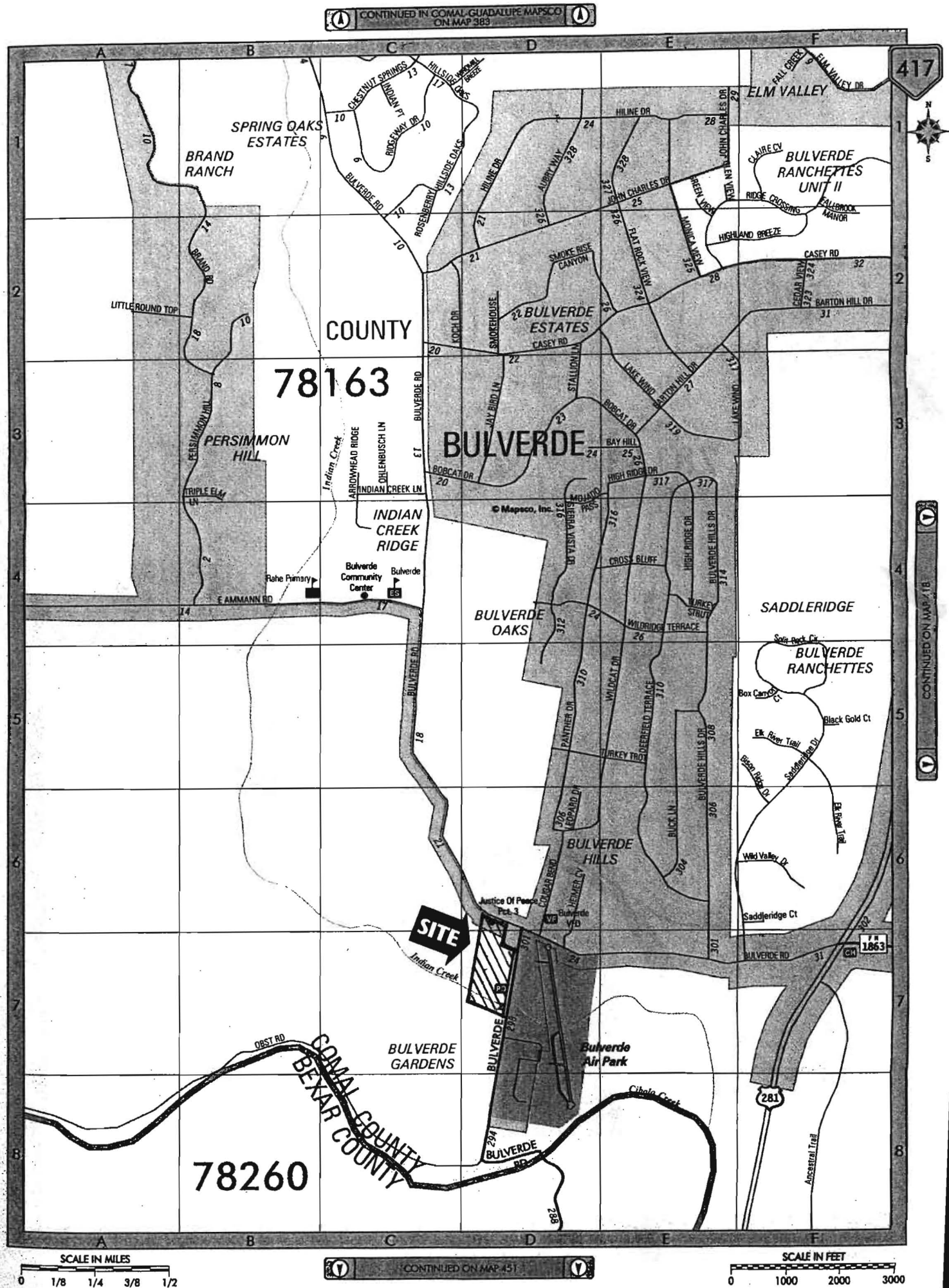


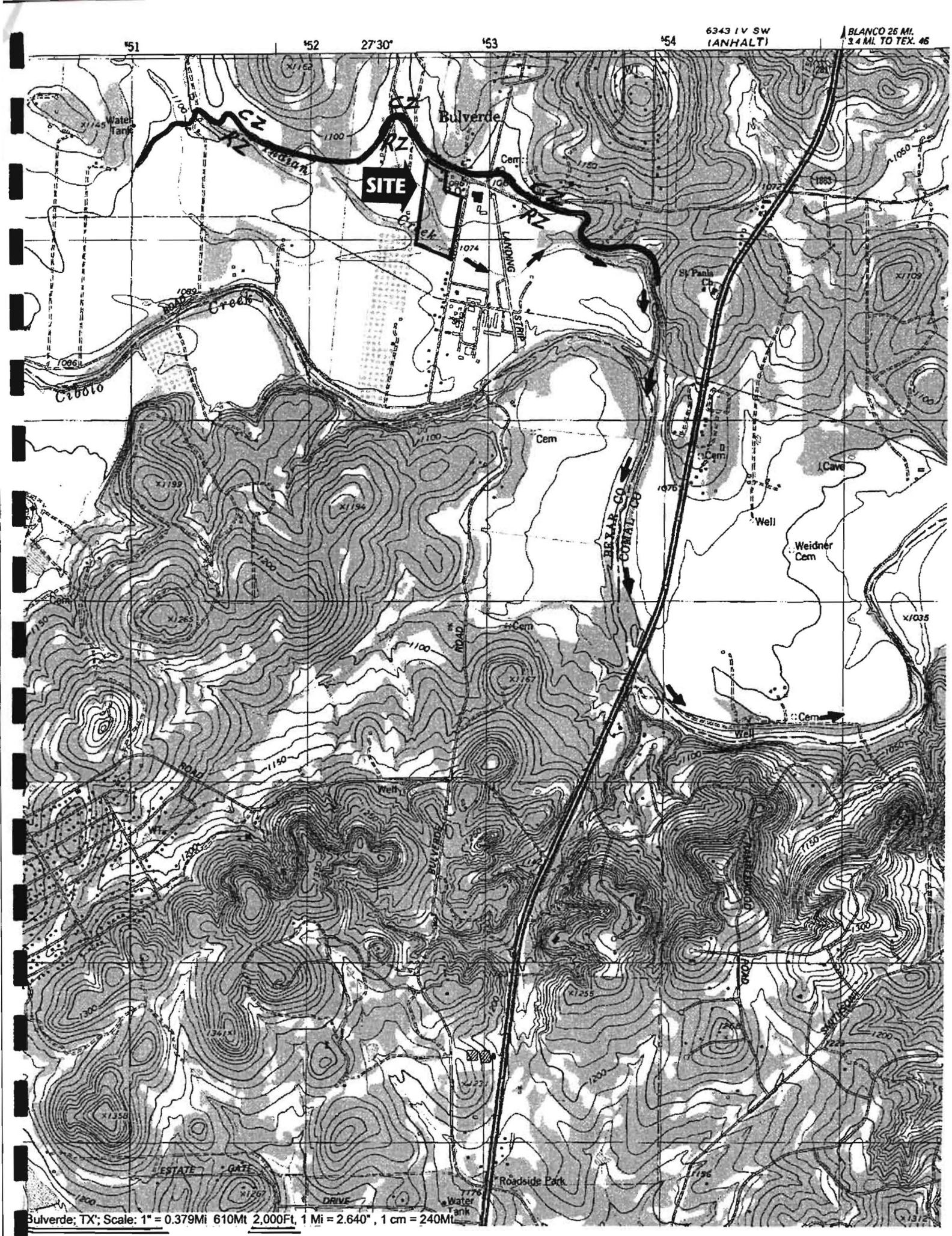
Signature of Customer/Agent

August 11, 2008
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.





Bulverde; TX'; Scale: 1" = 0.379Mi 610Mt 2,000Ft, 1 Mi = 2.640" , 1 cm = 240Mt

ATTACHMENT C

Project Description:

The 22.25 acre tract (composed of two parcels of 20.21 acres and 2.04 acres) has been used for farming for several generations and has two existing residences currently being used as well as associated buildings and rural structures. A significant portion of the tract lies in the flood plain (FEMA Zone A) of the Cibolo Creek and also has the Indian Creek, a tributary of the Cibolo, crossing the property. Currently the tract has large cleared areas with native grass cover, areas with stands of large oak trees that are mostly in the lows of the creek, and brushy woody growth along the fence lines.

Due to the location of the tract in Bulverde, it is anticipated that this property will be developed as some form of commercial development. As the first step toward preparing the site for future development, Ocean 2 Ocean, L.L.C. is proposing a mass grading project to place fill material* on the 22.25 acres to reduce the acreage that lies within the FEMA recognized floodplain. The majority of the fill will be placed over about 17 acres of the tract with three-to-one (3:1) earth side-slopes on three sides that will range in height up to about 13 feet.

* Fill material is to meet City of San Antonio Construction Specification for Item 107 – Embankment (copy in Appendix 'E'). Fill material shall be clean, uncontaminated, and free of organic materials. The specification shall be amended as follows:

- Compacted density shall as a minimum be 95% Modified Proctor.
- Placement shall be in maximum 8" loose depth lifts or layers.
- Maximum dimension of any rock used in the embankment layer is 8" in it's greatest dimension.

To a lesser extent, other earthwork (excavation and/or fill) operations will occur on the remaining acreage (about 5 acres) in conjunction with the above to meet floodplain development requirements of Comal County and FEMA, and to create slopes that are both less susceptible to soil erosion and more conducive to further development of the tract . In general, those changes to the area's contouring will be limited and will approximate that of the existing contours. Also, stockpiling of topsoil (with appropriate erosion control measures) for use in future development may occur.

This project is for placement fill material and other minor associated earthwork, consequently there is no impervious cover development being proposed with this application. Subsequent applications will be submitted for approval, at the appropriate time for any future development that would include any impervious cover.

The immediacy of further development (to be approved by separate application) is currently unclear, therefore the following activities may occur in conjunction with the mass grading operation, or as a separate future activity (but approved with this application):

- Structures (such as, but not limited to the farm house, farm buildings, the mobile home, fences, cisterns) will be demolished and the debris removed and properly disposed of in accordance with applicable regulations.

- The two septic systems serving the two residences will be removed and properly disposed of in accordance with applicable regulations. The excavated area will be filled in to generally match the adjacent existing ground.
- The two residential water wells will be plugged and abandoned in compliance with the current appropriate State Rules and Regulations. Note that the actual plugging and abandonment of these two wells may need to be delayed if their use is necessary during the mass grading operation, and possibly during other future construction activities (to be approved by separate application(s)), to provide a source of water necessary to construction operations.
- Other clearing of trees and brush with or without mechanical equipment.

GEOLOGIC ASSESSMENT

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: "THE VILLAGE OF BULVERDE"
22 Acre Tract - Comal County

TYPE OF PROJECT: XX WPAP __ AST __ SCS __ UST

LOCATION OF PROJECT: XXRecharge Zone __ Transition Zone __ Contributing Zone within the Transition Zone

PROJECT INFORMATION

1. XX 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 Name	Group*	Thickness (feet)
(LeA/B) Lewisville silty clay	"B"	2-3

* Soil Group Definitions (Abbreviated)

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

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

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

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

3. XX 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. XX 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. XX 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" = 120 '
Site Geologic Map Scale 1" = 120 '
Site Soils Map Scale (if more than 1 soil type) 1" = _____ '

6. __ Method of collecting positional data:
Global Positioning System (GPS) technology.

XX Other method(s).

7. XX The project site is shown and labeled on the Site Geologic Map.

8. XX Surface geologic units are shown and labeled on the Site Geologic Map.

9. XX 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. XX The Recharge Zone boundary is shown and labeled, if appropriate.

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

XX There are 2 (#) 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. XX One (1) original and three (3) copies of the completed assessment has been provided.

Date(s) Geologic Assessment was performed: August 6 & 7, 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.

David Seagraves
Print Name of Geologist

(210) 377-1603
(830) 438-3344
Telephone

- - - - -
Fax

David Seagraves, PG
Signature of Geologist

August 8, 2008
Date

Representing: Consultant
(Name of Company)

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.

* NOTE: THE WATER WELLS ARE BEING USED FOR RESIDENTIAL PURPOSES AND DO NOT APPEAR TO HAVE BEEN DRILLED RECENTLY. NO RECORDS OR OTHER INFORMATION COULD BE LOCATED REGARDING THESE TWO WELLS. THEIR COMPLIANCE WITH CURRENT STATE REGULATIONS COULD NOT BE ASCERTAINED.

GEOLOGIC ASSESSMENT TABLE			PROJECT NAME: "THE VILLAGE OF BULVERDE" (22 Acres)																	
LOCATION			FEATURE CHARACTERISTICS												EVALUATION			PHYSICAL SETTING		
1A	1B*	1C*	2A	2B	3	4			5	5A	6	7	8A	8B	9	10		11		12
FEATURE ID	LATITUDE	LONGITUDE	FEATURE TYPE	POINTS	FORMATION	DIMENSIONS (FEET)			TREND (DEGREES)	DOM	DENSITY (NO/FT)	APERTURE (FEET)	INFILL	RELATIVE INFILTRATION RATE	TOTAL	SENSITIVITY		CATCHMENT AREA (ACRES)		TOPOGRAPHY
						X	Y	Z		10						<40	≥40	<1.6	≥1.6	
S-1			MB	30	Kgr									10	40		✓	✓		HILLSIDE
S-2			MB	30	Qal									5	35	✓		✓		HILLSIDE
S-3			MB	30	Kgr									10	40		✓	✓		HILLSIDE
S-4			MB	30	Qal									5	35	✓		✓		HILLSIDE
S-5			CD	5	Qal	250	30	5					F,C	20	25	✓			✓	STREAMBED
S-6			CD	5	Qal	100	20	3					F	10	15	✓			✓	STREAMBED
S-7			CD	5	Qal	20	10	2					F,C	20	25	✓			✓	STREAMBED

* DATUM:

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.

[signature], PG

Date AUGUST 8, 2008

Sheet 1 of 1

STATE OF TEXAS
DAVID P. SEAGRAVES
GEOLOGY
3917
LICENSED
PROFESSIONAL GEOSCIENTIST

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

"THE VILLAGE OF BULVERDE"
22 ACRE TRACT
Bulverde, Comal County
Bulverde Road

SOIL UNIT

The on-site soil consists of the Lewisville silty clay (LeA/B). The soil unit was identified by field investigation and referenced by the S.C.S. Soil Survey of Comal County (1984). This soil type is in Soil Group "B" as referenced by the S.C.S. Hydrologic Soil Groups - Technical Release No. 55, Appendix A, and is defined as soils having a moderate infiltration rate when thoroughly wetted. The Lewisville soils consist of a grayish-brown silty clay to a silty clay loam with some gravel and limestone fragments. Thickness of this soil unit is approximately 2 to 3 feet. Several other soil types are located along the western portion of the site but are similar and transitional with the Lewisville soils. The Lewisville soil also appears to be transitional with the underlying alluvium. Surface analysis of the Lewisville at the site appears to be more in a Soil Group "C" range due to a more clayey texture.
The site contains a moderate to good grass cover and a localized moderate tree cover (primarily oaks).
Overall, the soil cover at the site appears to have the capacity to impede fluid movement into the subsurface.

"THE VILLAGE OF BULVERDE"
22 ACRE TRACT
Bulverde, Comal County
6 Bulverde Road

Site Specific Stratigraphic Column

QUATERNARY (HOLOCENE)

Alluvium (Qal): upwards to 10-15 feet thick, stream and river deposits, as well as, terrace deposits. Consists of clay, silt, sand and gravel. Sand and gravel increases with depth.

- - - - - - - - - - - - - - - - -

LOWER CRETACEOUS (TRINITY GROUP)

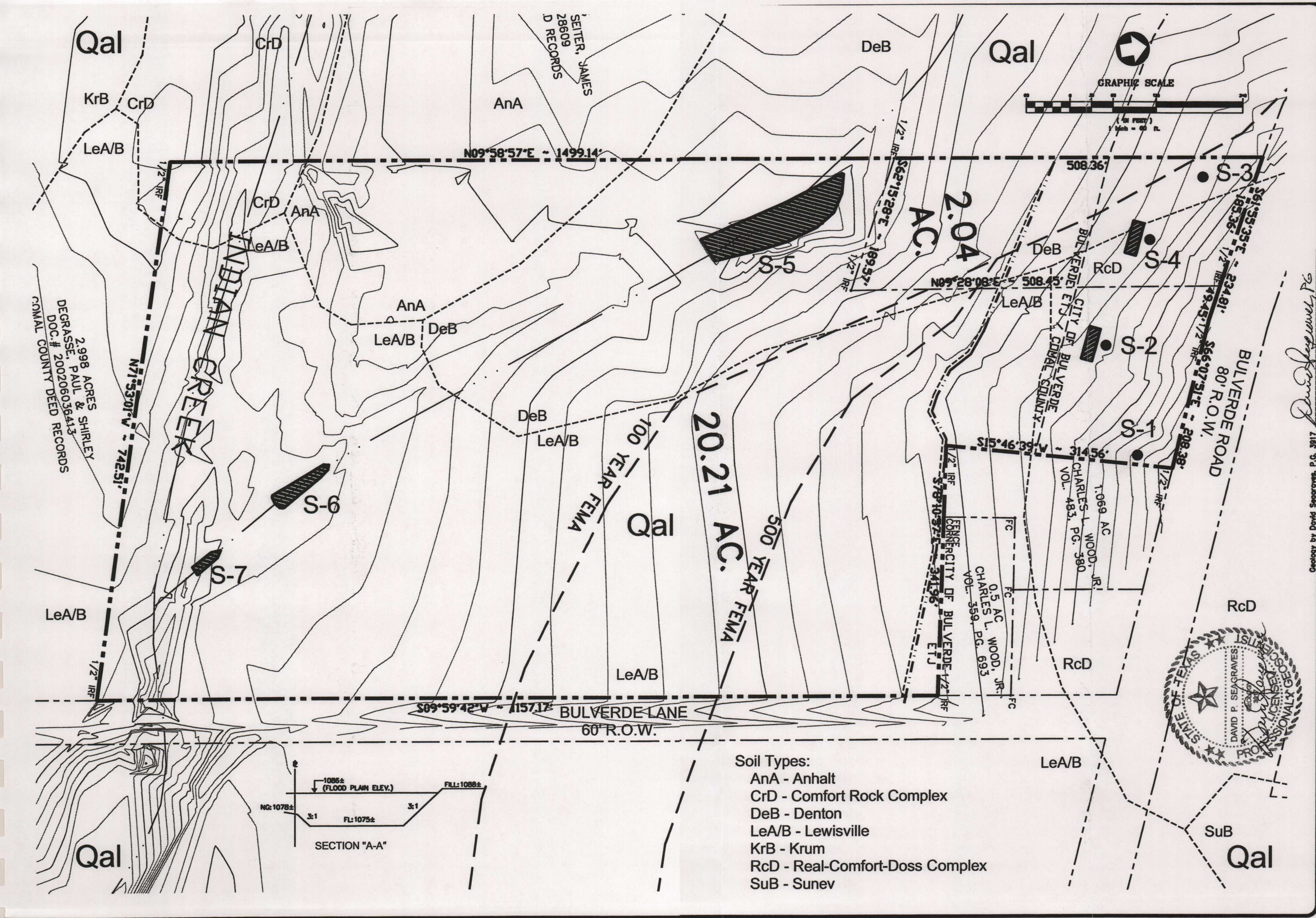
Glen Rose Formation (Kgr): the upper member of the Glen Rose Fm. unconformably underlies the Alluvium (Qal). The upper Glen Rose Fm. is approximately 250 feet thick and consists of interbedded limestone and marl beds.

"THE VILLAGE OF BULVERDE"
22 Acre Tract - Comal County
Bulverde Road

SITE SPECIFIC GEOLOGY

The on-site geological unit is Alluvium (Qal) and consists of terrace deposits within the Cibolo Creek flood plain. This geological unit was identified by field investigation and referenced by the Hydrogeologic Subdivision Map of the U.S.G.S. Water-Resources Investigation Report 94-4117, Comal County, Texas and the Geologic Map of the New Braunfels, Texas 30x60 Minute Quadrangle (Scale 1:100,000 - B.E.G., 2000).
The entire site contains an approximate 2-3 foot silty clay soil cover which overlies and is transitional with the alluvium. The site contains a gentle slope of approximately 1-2 percent and slopes towards the south. No karstic or structural features were noted at the site.
Seven geologic or manmade features were noted at the site and are as follows:
S-1 is an active residential water well. No record or data is available. A sealed metal casing was observed and is approximately one foot above grade. This feature has been evaluated as sensitive with at least 40 points assigned. This well will be properly plugged when development commences.
S-2 is an active residential on-site sewage facility. No record or data is available. Location is approximate and this will also be properly abandoned during development.
S-3 is an assumed active water well. A small utility shed possibly contains a well head and pressure tank was not accessible during field investigation. If there is a water well, it will be considered as sensitive with at least 40 points assigned. This will also be properly plugged during the development phase.
S-4 is an active residential on-site sewage facility. This is similar to feature S-2.
S-5 is a non-karst closed depression and appears to be the result of scouring. This feature is predominantly fines with some coarse material. This feature appears to have some capacity to retain water during wetter periods.
S-6 is a non-karst closed depression and is within fine material, as well as, grass covered. Appears to have a greater capacity to retain water during wetter periods.
S-7 is a non-karst closed depression and appears to be the result of scouring. This feature is predominantly fines with some coarse material. This feature appears to have some capacity to retain water during wetter periods.

Overall, due to the existing soil cover, surface conditions at the site appear to have the capacity to impede fluid movement into the subsurface.



Qal
CrD
KrB
LeA/B
AnA
DeB
SEITER, JAMES
GRAPHIC SCALE
(IN FEET)
1 inch = 60 ft.
N09°58'57"E ~ 1499.14'
1/2" IRF
508.36'
S-3
S62°15'38"E ~ 189.57'
2.04 AC.
S-5
S-4
RcD
N09°28'08"E ~ 508.45'
BULVERDE ETJ / CITY OF BULVERDE / COMAL COUNTY
S61°55'35"E ~ 185.36'
S66°07'31"E ~ 234.81'
S-2
BULVERDE ROAD 80' R.O.W.
S-1
S15°46'39"W ~ 314.56'
208.38'
2.998 ACRES
DEGRASSE, PAUL & SHIRLEY
DOC.# 200206036413
COMAL COUNTY DEED RECORDS
N71°53'01"W ~ 742.51'
INDIAN CREEK
S-6
S-7
100 YEAR FEMA
20.21 AC.
500 YEAR FEMA
1.069 AC
CHARLES L. WOOD, JR.
VOL. 483, PG. 380
0.5 AC
CHARLES L. WOOD, JR.
VOL. 359, PG. 693
FENCE CORNER
CITY OF BULVERDE ETJ
S78°10'37"E ~ 341.96'
FC
S09°59'42"W ~ 1157.17'
BULVERDE LANE
60' R.O.W.
1086± (FLOOD PLAIN ELEV.)
FILL:1088±
NG:1078±
3:1
FL:1075±
SECTION "A-A"
SuB
Soil Types:
AnA - Anhalt
CrD - Comfort Rock Complex
DeB - Denton
LeA/B - Lewisville
KrB - Krum
RcD - Real-Comfort-Doss Complex
SuB - Sunev
STATE OF TEXAS
DAVID P. SEAGRAVES
GEOLOGY
PROFESSIONAL
LICENSED
GEOSCIENTIST
Geology by David Seagraves, P.G. 3917

Designed By: HJ
Drawn By: HJ
Checked By: JG
Approved By: JG
File: S-SP5438

Sherfey Engineering SA, LLC
8400 Blanco Road, Ste. 201
San Antonio, Texas 78216
Ph: (210) 493-9200 Fax: (210) 493-9205

DATE: AUG. 2008

Revision	Date	Description

Ocean 2 Ocean, LLC
THE VILLAGE OF BULVERDE

W.P.A.P.
GEOLOGIC & SOILS MAP

PROJ. NO. 5417

C2

SHT C2 OF C6

WATER POLLUTION ABATEMENT PLAN

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: The Village of Bulverde

REGULATED ENTITY INFORMATION:

1. The type of project is:
   - ___ Residential (Single-family): # of Lots: _____
   - ___ Residential (Multi-family): # of Living Unit Equivalents: _____
   - ___ Commercial
   - ___ Industrial
   - ✓ Other: Mass Grading (earthwork only)

2. Total site acreage (size of property): 22.25 acres.

3. Projected population: not applicable for mass grading.

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 =	0.000
Parking	0	÷ 43,560 =	0.000
Other Paved Surfaces	0	÷ 43,560 =	0.000
		÷ 43,560 =	
Total Impervious Cover	0	÷ 43,560 =	0.000
Total Impervious Cover (0.509) ÷ Total Acreage (15.1) x 100 =			0.0 %

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

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.

*Questions 7 - 12 are **NOT APPLICABLE***

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

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

9. Length of Right of Way (R.O.W.): _____ feet.
Width of R.O.W.: _____ feet.
L x W = _____ Ft^2 ÷ 43,560 Ft^2/Acre = _____ acres.

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

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

12. ___ Maintenance and repair of existing roadways that do not require approval from the TCEQ Executive Director. Modifications to existing roadways such as widening roads/adding shoulders totaling more than one-half (½) 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. 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.

WASTEWATER TO BE GENERATED BY THE PROPOSED PROJECT:

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

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

15. Wastewater will be disposed of by:
n/a **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 §285.
n/a 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 n/a Treatment Plant. The treatment facility is :
___ existing.
___ proposed.

16. n/a 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.

17. The Site Plan must have a minimum scale of 1" = 400'.
    Site Plan Scale: 1" = 120' (11 x 17 half-size sheets; 1"=60' on full-size sheets)

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):
    F.E.M.A. F.I.R.M. Map Number 485463 0030D dated 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 is(are) 2 (#) well(s) present on the project site and the location(s) is(are) shown and labeled. (Check all of the following that apply)
    ___ The well(s) are not in use and have been properly abandoned.
    ___ The well(s) are not in use and will be properly abandoned.
    ✓ The well(s) are in use and comply with 30 TAC §238.

    Note: the water wells are being used for residential purposes and do not appear to have been drilled recently. No records or other information could be located regarding these two wells. Their compliance with current state regulations could not be ascertained.

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

21. Geologic or manmade features which are on the site:
    ✓ All **sensitive 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.
    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.
    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.

23. ✓ Areas of soil disturbance and areas which will not be disturbed.

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

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

26. ✓ Surface waters (including wetlands).

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:

Javier Garcia, P.E.
Print Name of Customer/Agent

Signature of Customer/Agent

August 11, 2008
Date

ATTACHMENT A

Factors Affecting Water Quality:

The following are factors that could affect surface water and groundwater quality during the construction of this project:

- Soil erosion due to clearing, grubbing and placement of fill material.
- Oil, grease, fuel and hydraulic fluid contamination from construction equipment and vehicle drippings.
- Miscellaneous trash and litter from construction workers.
- Construction debris.

The following are factors that could affect future surface water and groundwater quality after completion of this project:

- Soil erosion due to loss of vegetation on any portion of the placed fill material.
- Oil, grease, fuel, hydraulic fluid contamination, and vehicle drippings from equipment used to mow and otherwise maintain the vegetative growth on the fill material and elsewhere on the tract until further development takes place.
- Miscellaneous debris from general farming operations if agricultural operations take place on the tract to maintain the tract's ag-exemption for tax purposes.

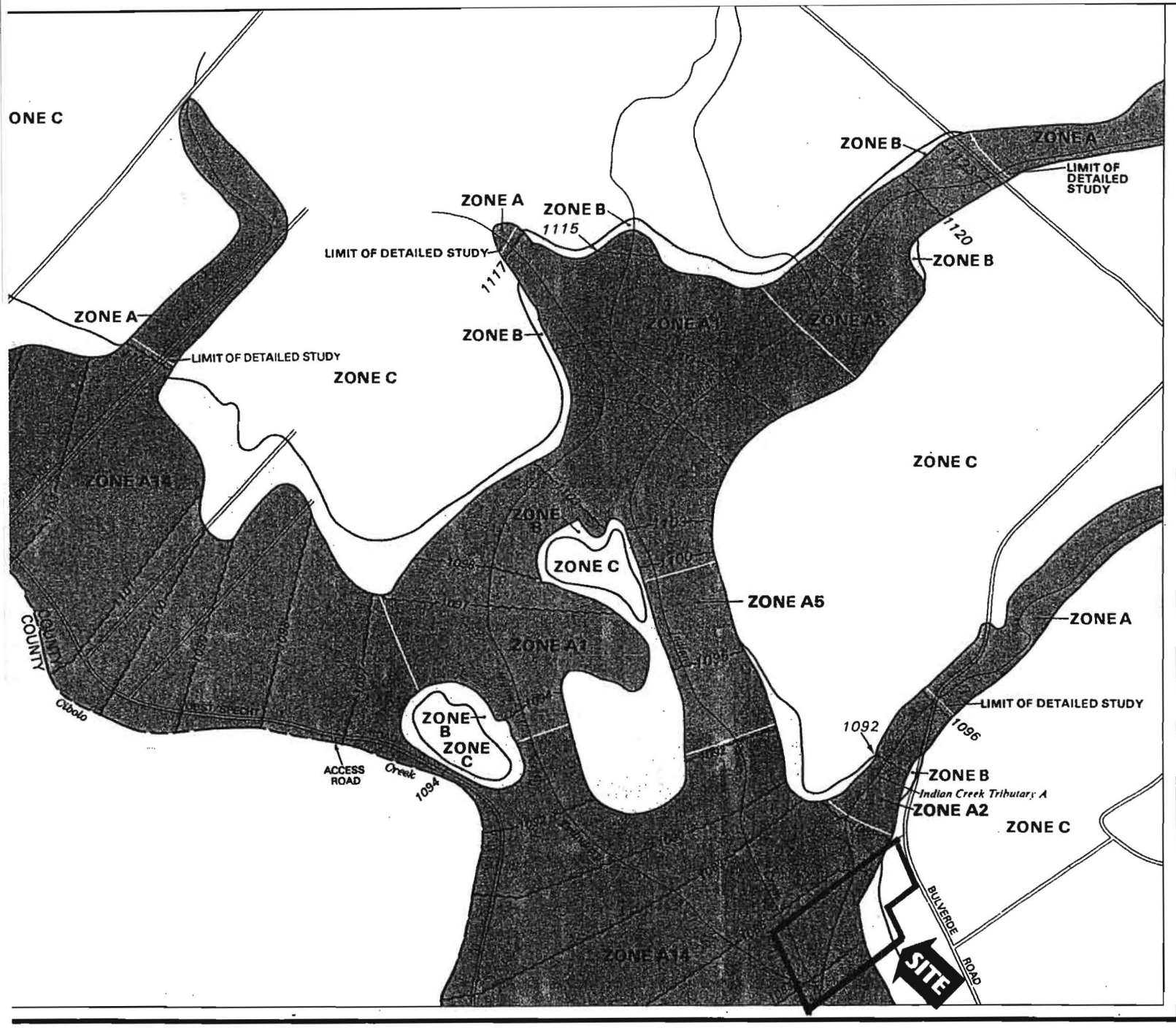
ATTACHMENT B

Volume and Character of Stormwater:

- The proposed project is for the placement of fill material only. No impervious cover is proposed as part of this project. The runoff will remain as sheet flow while flowing across gentle (0.5%) earth slopes from a center ridge to the 3:1 side-slopes along the three sides. Once vegetation is re-established on the newly placed fill there should be no change to the level of contaminates generated by this tract.

- Since there is no impervious cover with this mass grading project, the post-construction conditions co-efficient will be the same as the pre-construction conditions co-efficient of 0.52. As a result, no change in the stormwater runoff rate and volume is anticipated due to the placement of the fill material.

  No local detention will not be required as part of this mass grading project. Any requirement regarding an onsite detention facility will need to be determined with the City of Bulverde and Comal County at a later date as part of a specific site plan for that future development.



APPROXIMATE SCALE

1000 0 1000 FEET

NATIONAL FLOOD INSURANCE PROGRAM

FIRM

FLOOD INSURANCE RATE MAP

COMAL COUNTY, TEXAS

UNINCORPORATED AREAS

PANEL 30 OF 130

(SEE MAP INDEX FOR PANELS NOT PRINTED)

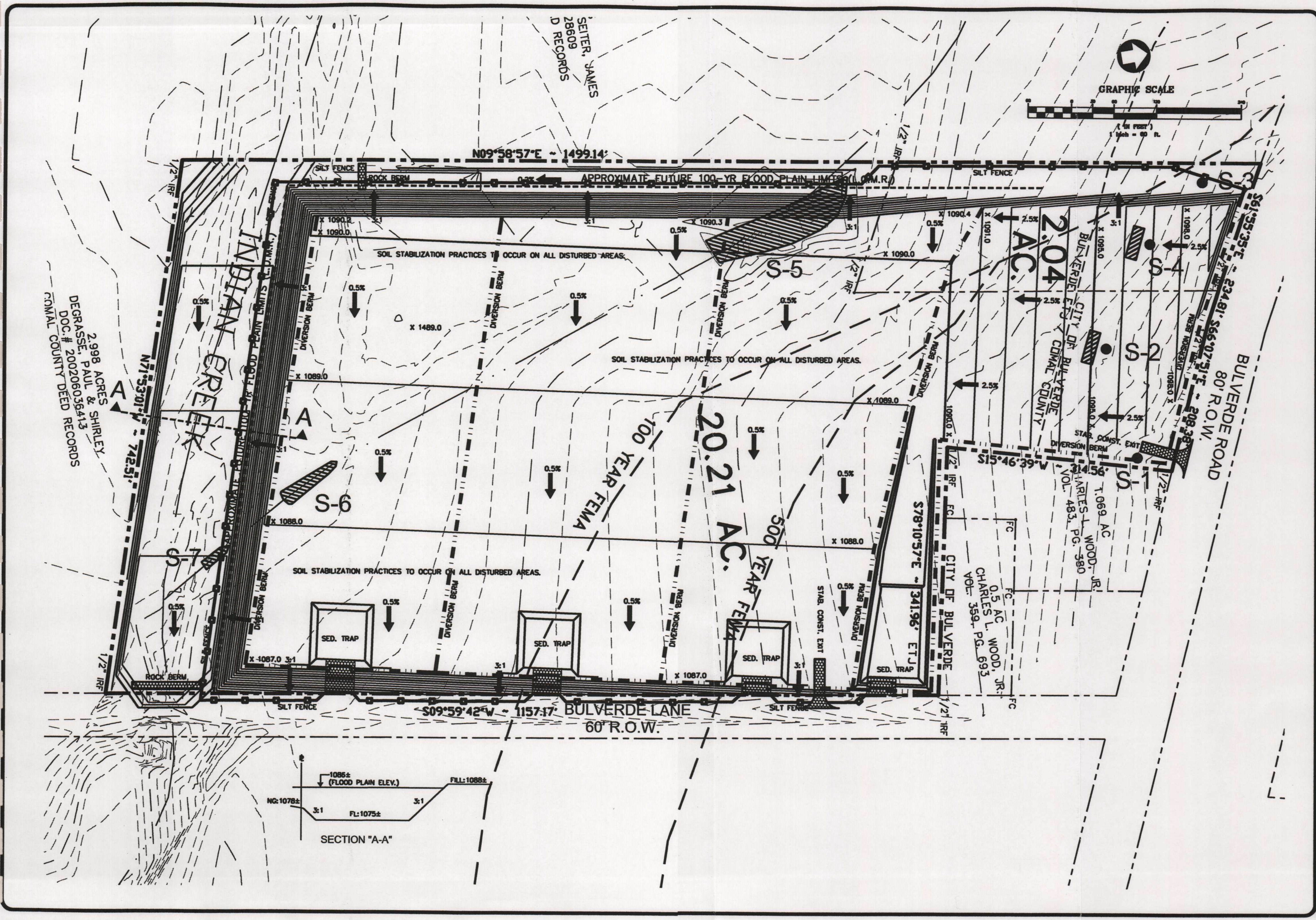
COMMUNITY-PANEL NUMBER

485463 0030 D

MAP REVISED:

JULY 17, 1995

Federal Emergency Management Agency



SEITER, JAMES
28609
D RECORDS
GRAPHIC SCALE
(IN FEET)
1 inch = 60 ft.
N09°58'57"E ~ 1499.14'
SILT FENCE
ROCK BERM
APPROXIMATE FUTURE 100-YR FLOOD PLAIN LIMITS (L.O.M.R.)
SOIL STABILIZATION PRACTICES TO OCCUR ON ALL DISTURBED AREAS.
INDIAN CREEK
DIVERSION BERM
2.04 AC.
BULVERDE CITY OF BULVERDE COMAL COUNTY
S-1
S-2
S-3
S-4
S-5
S-6
S-7
20.21 AC.
100 YEAR FEMA
500 YEAR FEMA
SED. TRAP
STAB. CONST. EXIT
S61°35'35"E
S66°07'51"E ~ 234.81'
BULVERDE ROAD
80' R.O.W.
S15°46'39"W ~ 314.56'
1.069 AC
CHARLES L. WOOD, JR.
VOL. 483, PG. 380
S78°10'57"E ~ 341.96'
CITY OF BULVERDE ETJ
0.5 AC
CHARLES L. WOOD, JR.
VOL. 359, PG. 693
2.998 ACRES
DEGRASSE, PAUL & SHIRLEY
DOC.# 200206036413
COMAL COUNTY DEED RECORDS
N71°53'01"W ~ 742.51'
S09°59'42"W ~ 1157.17'
BULVERDE LANE
60' R.O.W.
1/2" IRF
1086± (FLOOD PLAIN ELEV.)
FILL:1088±
NG:1078±
3:1
FL:1075±
SECTION "A-A"

Designed By: HJ
Drawn By: HJ
Checked By: JG
Approved By: JG
File: S-SP5436

Sherfey Engineering SA, LLC
8400 Blanco Road, Ste. 201
San Antonio, Texas 78216
Ph: (210) 493-9200 Fax: (210) 493-9205

DATE: AUG. 2008

Revision	Date	Description

Ocean 2 Ocean, L.L.C.
THE VILLAGE OF BULVERDE

W.P.A.P.
SITE PLAN

PROJ. NO. 5417

C1

SHT C1 OF C6

TEMPORARY STORMWATER SECTION

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: The Village of Bulverde.

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

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 in an attachment at the end of this form any other activities or processes which may be a potential source of contamination.
   - ___ The are no other potential sources of contamination.

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. For each activity described, an estimate of the total area of the site to be disturbed by each activity is given.

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

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

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

___ **ATTACHMENT E - Request to Temporarily Seal a Feature.** A request to temporarily seal a feature is 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.

10. ✓ **ATTACHMENT G - Drainage Area Map.** A drainage area map is provided at the end of this form to support the following requirements.

___ 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.

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.

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.

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:

Javier Garca, P.E.
Print Name of Customer/Agent

Signature of Customer/Agent

August 11, 2008
Date

ATTACHMENT A

Spill Response Actions:

It is quite typical to find all hydrocarbons and other hazardous materials to be present in relatively small quantities during construction. As a result, it is anticipated that any spill that may occur will not be of a reportable magnitude. In addition, any spill that may occur will likely be released directly into the ground and subsequently immediately absorbed. The contractor is instructed in the General Notes of the attached Storm Water Pollution Prevention Plan to properly remove and dispose of any soil that becomes contaminated.

Contractor shall adhere to the additional material presented in Appendix 'A' of this application.

ATTACHMENT B

POTENTIAL SOURCES OF CONTAMINATION

As previously mentioned in the Water Pollution Abatement Plan Application section of this submittal, the following are potential sources of contamination during the construction of this project:

- Soil erosion due to clearing, grubbing and placement of fill material.
- Oil, grease, fuel, hydraulic fluid contamination, and vehicle drippings from construction equipment.
- Miscellaneous trash and litter from construction workers.
- Construction debris.

ATTACHMENT C

SEQUENCE OF MAJOR ACTIVITIES

The sequence of major activities is as follows:

- Installation of BMP's (Stabilized Construction Exits, Silt Fence, "exterior" Diversion Dikes, Rock Berm at Bulverde Lane) - minimal site disturbance.
- Clearing – up to entire site for approximately 22 acres disturbed.
- Mass Grading and Excavation of Channel for Indian Creek Tributary re-route, Excavation to enhance existing Channel of Indian Creek, Installation of remaining BMP's (Sediment Traps &"interior" Diversion Dikes, Rock Berm in Re-Route Channel) – up to entire 22.25 acres directly disturbed.
- Final Site Stabilization – All disturbed areas for up to 22.25 acres.
- Site Cleanup & Removal of BMP's - minimal site disturbance.

ATTACHMENT D

TEMPORARY BEST MANAGEMENT PRACTICES AND MEASURES

On-site temporary best management practices and measures, which are continuous until the project site is permanently stabilized, may include the following:

1. Erection of silt fences along the three toe of side-slopes of the proposed fill material. Fencing will remain in place until the side-slopes are stabilized via hydromulching (Specification in Appendix 'E'), after which the fencing shall be removed.

2. Construction of two stabilized construction exits, one each on Bulverde Road and Bulverde Lane. Exits will require constant maintenance and occasional total replacement during the project to ensure effectiveness. These exits will need to remain in place until the final vegetative procedures are implemented after which they shall be removed.

3. Phasing of the fill operation to allow the placement of any construction staging areas as needed within the 19 acre area to be filled.

4. Construction of two low diversion dikes at the up-gradient end of the tract along Bulverde Road (drains west) and along the developed out-tracts at the intersection of Bulverde Road and Bulverde Lane (drains south and east to swale in Bulverde Lane right-of-way). These two diversion dikes will need to remain until the final vegetative procedures are implemented at which time they need to be bladed out so as to allow the stormwater runoff to return to historic paths and patterns.

5. Installation of two Rock Berms, one in the small channel to re-route the tributary to Indian Creek and the other at the Bulverde Lane culvert crossing of Indian Creek. The excavation for these two channels should be completed at the earliest opportunity and the areas so disturbed stabilized via hydromulching. Upon stabilization of those areas the rock berms should be promptly removed.

6. Creation of the four Stone Outlet Sediment Traps along Bulverde Lane and the "interior" Diversion Dikes that will maintain separate drainage areas at, or less than, 5 acres each during the mass grading filling operations. The traps may require occasional removal of sediment buildup. As the fill raises in elevations the traps should also be raised correspondingly and reshaped as needed to maintain the appropriate size. Each trap will remain until it's drainage area is stabilized via hydomulching, at which time it may be filled in and it's rock berm filter removed.

7. Establish vegetative cover on all disturbed areas at the end of the project, or in phases as significant areas may be brought to plan grades via hydomulching.

8. Removal of any remaining temporary BMP's and the filling-in of any remaining Sediment Traps. Establishment of vegetative cover on those disturbed areas via hydromulching.

9. Periodic inspections and maintenance as outlined elsewhere in this application.

The "exterior" diversion dikes will divert up-gradient stormwater runoff from Bulverde Road and the developed out-tracts away from the area being filled thereby eliminating that stormwater runoff which will in turn reduce the amount of sediment generated on-site.

Silt fencing along the three toe of slopes will capture much of the sediment from the 3:1 side-slopes that may accumulate in the runoff that falls onto and drains down the slopes of the area being filled.

Construction of stabilized construction exits will reduce the amount of soil transported off of the site onto adjacent roadways as vehicles leave the construction area.

The two Rock Berms in the drainageways will on lesser rainfall events slow the flow rates in the drainageways and encourage deposition of sediment thereby reducing the amount of sediment leaving the site. In significant events, these two drainageways will receive runoff rates that are too great for any measure to control.

The four Stone Outlet Sediment Traps will have their drainage areas separated by "interior" Diversion Dikes. These dikes can continuously be built up as the site is filled thereby maintaining the separation of runoff to each trap. The traps will capture the first ½" up to 1" of runoff and will retain much of the sediment by causing the stormwater to pond and stand while being filtered though a rock berm with filter fabric.

These types of storm water pollution controls help by diverting runoff away from the disturbed areas or by slowing the velocity of the stormwater runoff, thereby enhancing the sedimentation and increasing the capture of sediment that accumulates in the stormwaters exiting the disturbed areas of the site, thus reducing the potential for pollutants to enter surface streams, sensitive features, or the aquifer.

The two sensitive features identified in the Geologic Assessment are residential water wells located outside of and generally up-gradient of the area to be filled. Further, the well heads are such that contamination from surface runoff is not possible. As such, it is anticipated that temporary BMP's will not be necessary to protect those features from sediment.

- It should be understood that modifications to the Storm Water Pollution Prevention Plan might have to be made in the field in order to adjust for field conditions. These revisions to the plan are to insure that the revised plan provides the intended effect. All changes to the plan must be shown on the Storm Water Pollution Prevention Plan sheet, dated and signed by the responsible party as described in this report.

ATTACHMENT F

STRUCTURAL PRACTICES

On-site temporary best management practices and measures, which are continuous until the project site is permanently stabilized, may include the following:

1. Erection of silt fences along the three toe of side-slopes of the proposed fill material. Fencing will remain in place until the side-slopes are stabilized via hydromulching (Specification in Appendix 'E'), after which the fencing shall be removed.

2. Construction of two stabilized construction exits, one each on Bulverde Road and Bulverde Lane. Exits will require constant maintenance and occasional total replacement during the project to ensure effectiveness. These exits will need to remain in place until the final vegetative procedures are implemented after which they shall be removed.

3. Construction of two low diversion dikes at the up-gradient end of the tract along Bulverde Road (drains west) and along the developed out-tracts at the intersection of Bulverde Road and Bulverde Lane (drains south and east to swale in Bulverde Lane right-of-way). These two diversion dikes will need to remain until the final vegetative procedures are implemented at which time they need to be bladed out so as to allow the stormwater runoff to return to historic paths and patterns.

4. Installation of two Rock Berms, one in the small channel to re-route the tributary to Indian Creek and the other at the Bulverde Lane culvert crossing of Indian Creek. The excavation for these two channels should be completed at the earliest opportunity and the areas so disturbed stabilized via hydromulching. Upon stabilization of those areas the rock berms should be promptly removed.

5. Creation of the four Stone Outlet Sediment Traps along Bulverde Lane and the "interior" Diversion Dikes that will maintain separate drainage areas at, or less than, 5 acres each during the mass grading filling operations. The traps may require occasional removal of sediment buildup. As the fill raises in elevations the traps should also be raised correspondingly and reshaped as needed to maintain the appropriate size. Each trap will remain until it's drainage area is stabilized via hydomulching, at which time it may be filled in and it's rock berm filter removed.

The "exterior" diversion dikes will divert up-gradient stormwater runoff from Bulverde Road and the developed out-tracts away from the area being filled thereby eliminating that stormwater runoff which will in turn reduce the amount of sediment generated on-site.

Silt fencing along the three toe of slopes will capture much of the sediment from the 3:1 side-slopes that may accumulate in the runoff that falls onto and drains down the slopes of the area being filled.

Construction of stabilized construction exits will reduce the amount of soil transported off of the site onto adjacent roadways as vehicles leave the construction area.

The two Rock Berms in the drainageways will on lesser rainfall events slow the flow rates in the drainageways and encourage deposition of sediment thereby reducing the amount of sediment leaving the site. In significant events, these two drainageways will receive runoff rates that are too great for any measure to control.

The four Stone Outlet Sediment Traps will have their drainage areas separated by "interior" Diversion Dikes. These dikes can continuously be built up as the site is filled thereby maintaining the separation of runoff to each trap. The traps will capture the first ½" up to 1" of runoff and will retain much of the sediment by causing the stormwater to pond and stand while being filtered though a rock berm with filter fabric.

These types of storm water pollution controls help by diverting runoff away from the disturbed areas or by slowing the velocity of the stormwater runoff, thereby enhancing the sedimentation and increasing the capture of sediment that accumulates in the stormwaters exiting the disturbed areas of the site, thus reducing the potential for pollutants to enter surface streams, sensitive features, or the aquifer.

These types of storm water pollution controls help slow the velocity of the stormwater runoff, thereby enhancing the sedimentation and capture of sediment that may accumulate in the stormwaters exiting the project site, thus reducing the potential for pollutants to enter surface streams, sensitive features, or the aquifer.

- It should be understood that modifications to the Storm Water Pollution Prevention Plan might have to be made in the field in order to adjust for field conditions. These revisions to the plan are to insure that the revised plan provides the intended effect. All changes to the plan must be shown on the Storm Water Pollution Prevention Plan sheet, dated and signed by the responsible party as described in this report.

GRAPHIC SCALE

(IN FEET)
1 inch = 60 ft.

DA=0.63 Ac.

N09°58'57"E ~ 1499.14'

APPROXIMATE FUTURE 100-YR FLOOD PLAIN LIMITS (L.O.M.R.)

1/2" IRF

SEITER, JAMES
28609
D RECORDS

INDIAN CREEK

DA=4.98 Ac.

DA=4.58 Ac.

DA=4.56 Ac.

2.04 AC.

20.21 AC.

DA=4.88 Ac.

DA=2.62 Ac.

100 YEAR FEMA

500 YEAR FEMA

BULVERDE ROAD
80' R.O.W.

S61°55'35"E ~ 2349.91'

S66°07'51"E ~ 208.38'

CITY OF BULVERDE
COMAL COUNTY

S15°46'39"W
314.56'

T.069 AC
CHARLES L. WOOD, JR.
VOL. 483, PG. 380

0.5 AC
CHARLES L. WOOD, JR.
VOL. 359, PG. 693

S78°10'57"E ~ 341.96' ETJ

CITY OF BULVERDE

FC

N71°53'01"W ~ 742.51'

A

A

2.998 ACRES
DEGRASSE, PAUL & SHIRLEY
DOC.# 20020603413
COMAL COUNTY DEED RECORDS

S09°59'42"W ~ 1157.17'

BULVERDE LANE
60' R.O.W.

1086± (FLOOD PLAIN ELEV.)

FILL: 1088±

NG: 1078±

3:1

3:1

FL: 1075±

SECTION "A-A"

Designed By: H3
Drawn By: H3
Checked By: JC
Approved By: JC
File: S-SP2436

Sherfey Engineering SA, LLC
9400 Blanco Road, Ste. 201
San Antonio, Texas 78216
Ph: (210) 493-9200 Fax: (210) 493-9205

DATE: AUG. 2008

STATE OF TEXAS
JANICE GARCIA
83920
LICENSED
PROFESSIONAL
ENGINEER

Revision	Date	Description

Ocean 2 Ocean, LLC.
THE VILLAGE OF BULVERDE

WPAP ATTACHMENT 'G'
DRAINAGE AREA MAP

PROJ. NO. 5417

ATTACHMENT H

TEMPORARY SEDIMENT POND(S) PLANS AND CALCULATIONS

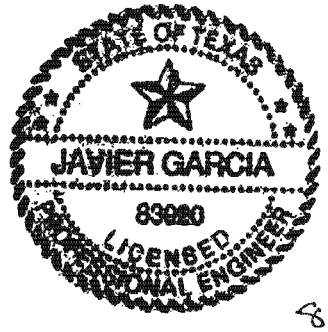
The area fronting Bulverde Road at the up-gradient northern end will receive fill sloping at about 2.5% toward the area that is to receive the majority of the fill material. The floodplain area being reclaimed will have a gentle slope of about 0.5% from west to east toward Bulverde Lane.

Stone outlet sediment traps will be located along the Bulverde Lane frontage on the eastern side of the tract where they can discharge into an existing bar ditch or swale located in the right-of-way. The rock berm discharge structure shall extend to the toe of fill slope to prevent the discharged runoff from potentially eroding the side-slope. Trap discharge flows will be conveyed by the swale to the Indian Creek at the southern end of the tract.

Diversion Dikes will be provided within the interior of the area being filled as shown on the plans. A Diversion Dike shall be constructed around the perimeter of the fill material as shown on TxDOT Standard Detail for "Embankment Section - Diversion Dike" shown on detail EC (4) – 93 in Appendix 'D'.

Since the initial areas for each trap range from 4.56 acres to 4.98 acres, all traps are sized based on the 5.00 acre recommended maximum drainage area. (Note that as the fill is placed and the 3:1 side-slopes are formed, the actual area draining to each trap will decrease slightly. This decrease is ignored in the following calculations.) Based on the requirement of providing 3,600 cubic feet (cf) per acre drained, the required volume of the traps is 18,000 cf. Details for sediment traps by the City of San Antonio and the Texas Department of Transportation are provided in Appendix 'D'. TCEQ Specifications and a Schematic Diagram for sediment traps is provided in Appendix 'C'.

All traps shall have maximum 3:1 side-slopes with depths from a minimum of 1'-6" up to a maximum of 5'-0". The weir length of each rock filter berm is 30 feet. A table is provided on the Temporary Abatement Plan for the dimensions and area of the bottom or floor of the traps. The dimensions are based on a square configuration. Other shapes are permissible and the bottom dimensions may be adjusted accordingly to best fit field conditions and construction needs so long as the bottom area for the respective depth is maintained. As the fill material rises around the traps, it is the contractor's option to raise the weir of the rock berm filter and partially filled in on the sides of the trap to take advantage of the increased depth.



8/14/08

ATTACHMENT I

INSPECTION AND MAINTENANCE FOR BMPs

1. MAINTENANCE

Structural controls shall be inspected as stipulated in the plans. Structural units shall be maintained to function as intended. When a structure deteriorates to a condition such that its performance is less then intended, the structure shall be repaired or replaced to full function as specified. Erosion and sediment controls that have been intentionally disturbed, removed, run over or otherwise rendered ineffective, must be replaced or otherwise corrected upon discovery.

When the sediment has accumulated to six inches or more behind a rock berm or silt fence, it shall be removed and the control devices restored to their original specifications. Sediment removed from these structures shall be disposed of in accordance with appropriate regulations.

2. INSPECTIONS

Designated and qualified person(s) shall inspect the Pollution Control Measures at least every fourteen (14) days and within twenty-four (24) hours after a storm event greater that one-half (1/2) inch of rainfall at the project site. An alternative to this type of inspection may be inspections scheduled at least every (7) seven days. These inspections must occur on a specific defined day regardless of whether or not there has been a rainfall event since the previous inspection. In the event of flooding or other uncontrollable situations that prohibit access to the inspection sites, inspections must be conducted as soon as access is practicable. Where areas of the site have been finally or temporarily stabilized, inspections must be conducted at least every month.

An inspection report summarizing the scope of the inspections, inspector's name, qualifications of personnel conducting the inspection, date of inspection, major observations, and the actions taken as a result of the inspection must be recorded and maintained as part of the Stormwater plan. Major observations should include:

1. Location of discharges of sediment.
2. Location of discharges of other types of pollutants from the site.
3. Location of BMPs that need to be maintained.
4. Location of BMPs that failed to operate as designed.
5. Location of BMPs that prove inadequate.
6. Location of where additional BMPs are needed.

As a minimum, the inspector shall observe the following:

1. The significant disturbed areas for any evidence of erosion.
2. The storage areas for evidence of any leakage from exposed storage materials.
3. The various structural controls such as rock berm outlets, silt fences, drainage swales, etc., for evidence of failure or excess siltation.
4. Vehicle exit points for evidence of off-site sediment tracking.
5. Vehicle storage areas for signs of leaking equipment or spills.
6. Concrete truck rinse-out pits for signs of leakage or failure.
7. General site cleanliness.

Any deficiencies noted during the inspection shall be corrected and documented within seven (7) calendar days following the inspection or before the next anticipated storm event.

ATTACHMENT J

SCHEDULE OF INTERIM AND PERMANENT SOIL STABILIZATION PRACTICES

1. Stabilization practices may include but are not limited to the establishment of temporary vegetation, establishment of permanent vegetation, mulching, geotextiles, sodding, vegetative buffer strips, protection of existing trees and vegetation and other similar measures. Continuous interim on-site stabilization measures will include the following:

    a. Minimizing soil disturbances by exposing only the smallest practical area of land required for clearing and grading activities as well as for construction activities for the shortest time possible.
    b. Maximizing the use of natural vegetation including grass, weeds, trees, shrubs etc. by leaving these materials in place until construction necessitates the clearing for continuance of construction.
    c. All disturbed areas where construction has been completed, temporarily halted, or where no further activity is planned within the next three (3) weeks, shall be temporarily stabilized by an appropriate measure within two (2) weeks of the last activity.

2. Permanent on-site stabilization measures which will be scheduled will include the following:

    a. As soon as practical, all disturbed soil will be stabilized with permanent vegetation by applicable project specifications.

3. All stabilization measures will be initiated as soon as possible in those portions of the site where construction activities have either temporarily or permanently stopped. The stabilization measures shall be initiated within fourteen (14) days after the construction activity has ceased. Where construction activity on a portion of the site is temporarily stopped and earthwork activities will resume within twenty-one (21) days, the temporary stabilization methods do not have to be initiated on that area of the site.

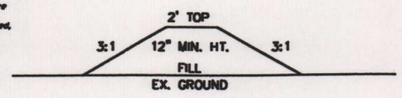
TEXAS COMMISSION ON ENVIRONMENTAL QUALITY
WATER POLLUTION ABATEMENT PLAN
GENERAL CONSTRUCTION NOTES

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 not 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. 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 offsite impacts to water quality (eg. 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 trap volume.
8. Litter, construction debris, and construction chemicals exposed to stormwater shall be prevented from becoming a pollutant source for stormwater discharges (eg., 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 temporary or permanently cease is precluded by weather conditions, stabilization measures shall be initiated as soon as practicable. Where construction activity on a portion of the site is temporarily ceased, and earth disturbing activities will be resumed within 21 days, temporary stabilization measures do not have to be initiated on that portion of site. In arid, semi-arid areas or 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 Edward Aquifer protection plan must notify the appropriate regional office in writing and obtain approval from the executive director prior to initiating any of the following:
   A. any physical or operational modification of any water pollution abatement structure(s), including but not limited to ponds, dams, berms, sewage treatment plants, and diversionary structures;
   B. any change in the nature or character of the regulated activity from that which was originally approved or a change which could 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.

TCEQ San Antonio Regional Office
14250 Judson Road
San Antonio, Texas 78233-4480

Phone:(210) 490-3096
Fax:(210) 545-4329

NOTE:
There are 'sensitive and possibly sensitive' geologic or recharge features identified on the project site.
There are 2 wells present on the project site.
Site is within the 100-year (FEMA Zone 'A') floodplain of the Cibolo Creek as shown on FEMA FIRM Panel 485463 0030 B
dated July 17, 1995.

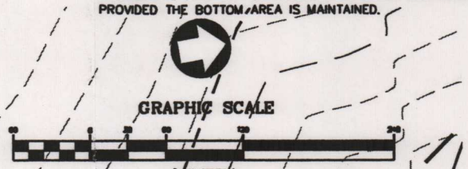


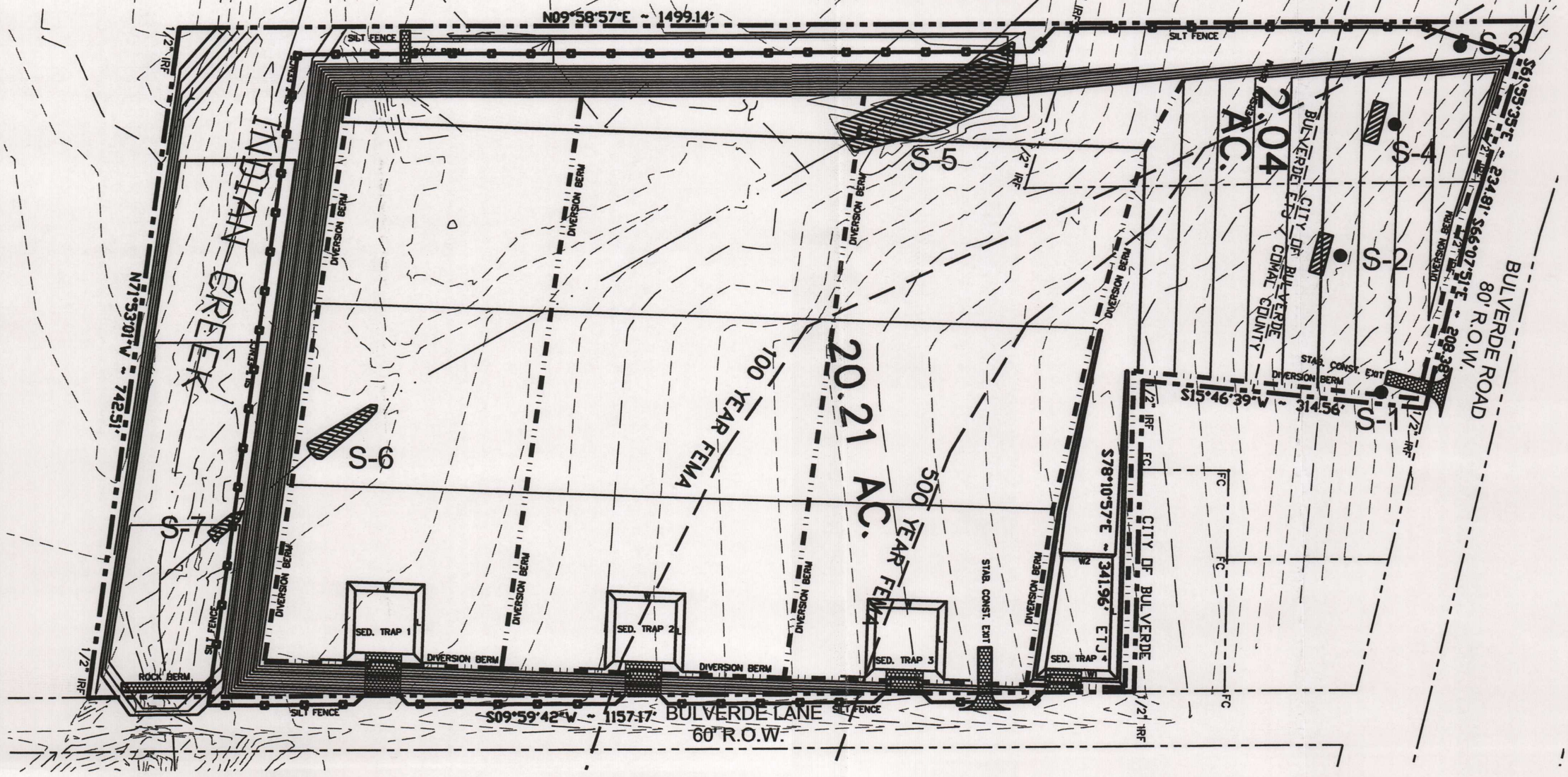
DIVERSION BERM DETAIL

TYPICAL SEDIMENT TRAP DIMENSIONS

DEPTH	L*	W*	AREA*	VOLUME
1'-6"	105'	105'	11,025 sf	18,010 cf
2'-0"	89'	89'	7,921 sf	18,120 cf
2'-6"	78'	78'	6,084 sf	18,410 cf
3'-0"	68'	68'	4,624 sf	18,030 cf
3'-6"	61'	61'	3,721 sf	18,270 cf
4'-0"	54'	54'	2,916 sf	18,000 cf
4'-6"	49'	49'	2,401 sf	18,390 cf
5'-0"	44'	44'	1,936 sf	18,530 cf

* MEASUREMENTS ARE AT THE BOTTOM OR FLOOR OF THE TRAP; SIZE AND DIMENSIONS BASED ON DA=5 ACRES AND 3:1 SLOPES; DIMENSION L & W MAY BE ADJUSTED TO MEET FIELD CONDITIONS PROVIDED THE BOTTOM AREA IS MAINTAINED.





Designed By: H3
Drawn By: H3
Checked By: JC
Approved By: JC
File: S-SP5436

Sherfey Engineering SA, LLC
8400 Blanco Road, Ste. 201
San Antonio, Texas 78216
Ph: (210) 493-9200 Fax: (210) 493-9205

DATE: AUG. 2008

STATE OF TEXAS · JAMES CARON · 83920 · LICENSED PROFESSIONAL ENGINEER
8/14/08

Revision	Date	Description

Ocean 2 Ocean, LLC.
THE VILLAGE OF BULVERDE

W.P.A.P.
TEMP. ABATEMENT PLAN

PROJ. NO. 5417
C3
SHT C3 OF C6

PERMANENT STORMWATER SECTION

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: The Village of Bulverde.

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.

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

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

   ___ **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 .

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.

✓ 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. Each feature identified in the Geologic Assessment as "sensitive" or "possibly sensitive" has been addressed.

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.

___ **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.

10. n/a **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. 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. n/a **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.

___ **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. 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.

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:

Javier Garcia, P.E.
Print Name of Customer/Agent

Signature of Customer/Agent

August 11, 2008
Date

ATTACHMENT B

BMPs FOR UPGRADIENT STORMWATER

- Stormwater originating up-gradient from the project site is that generated off of Bulverde Road, and during higher intensity storm events, potentially areas on the opposite side of the roadway. Since this project is for mass grading only (no impervious cover proposed), and the disturbed portions of the tract will be permanently re-vegetated at completion, there are no provisions in this application to divert those flows away from the tract. Those flows will continue onto the tract as they historically have.

- It is our opinion that to divert those up-gradient flows at this time would mean to concentrate them, thus increasing the potential for erosion, were as leaving the status quo (generally a sheet flow condition) keeps the potential for erosion at a minimum and may provide some filtration of that runoff by the native and/or proposed vegetation.

ATTACHMENT C

BMPs FOR ON-SITE STORMWATER

- This project is for the mass grading of a portion of the tract and there is no impervious cover proposed. Since there is no impervious cover proposed there is no change to the pollutant loading and thus no need to provide a BMP to reduce the loading.

- It may be noted that once the filling operation is completed, and the disturbed areas are re-vegetated, that the new vegetation will act much like a large vegetative filter strip which is an accepted BMP practice.

ATTACHMENT D

BMPs FOR SURFACE STREAMS

- This project is for the mass grading of a portion of the tract and there is no impervious cover proposed. Since there is no impervious cover proposed there is no change to the pollutant loading and thus no need to provide a BMP to reduce the loading.

- It may be noted that once the filling operation is completed, and the disturbed areas are re-vegetated, that the new vegetation will act much like a large vegetative filter strip which is an accepted BMP practice.

- The two sensitive features identified in the Geologic Assessment are residential water wells. Both of these wells are located up-gradient and away from the immediate area to be disturbed by the placement of fill.

ATTACHMENT E

REQUEST TO FILL FEATURES

Features S-1 and S-3 are man-made residential water wells rated in the Geologic Assessment as being sensitive. These two wells are to be plugged and abandoned in compliance with the current appropriate State Rules and Regulations. However, depending upon general economic conditions and other factors, further development of this tract may be delayed in which case the developer may elect to leave one or both of these water wells in service for an indefinite time until circumstances allow that further development to take place. Also, actual plugging and abandonment of these two wells may need to be delayed if their use is necessary during the mass grading operation, and possibly during other future construction activities (to be approved by separate application(s)), to provide a source of water necessary to construction operations.

Features S-2 and S-4 are man-made residential conventional septic systems (tanks and drain fields) rated in the Geologic Assessment as being not sensitive. These two septic systems will be removed and properly disposed of in accordance with applicable regulations. The excavated area will be filled in to generally match the adjacent existing ground.

Features S-5 and S-6 are natural closed depressions in the tributary of Indian Creek and are rated in the Geologic Assessment as being not sensitive. These two closed depressions are within the area of proposed fill and will consequently be filled over. Both appear to already be soil filled and thus do not need to be sealed prior to the mass grading.

Feature S-7 is a closed depression within Indian Creek at the confluence with the tributary and is rated in the Geologic Assessment as being not sensitive. This closed depression will be graded out or filled in during earthwork operations to enhance the conveyance of the current existing channel section as may be required by the Comal County floodplain development permit.

ATTACHMENT G

INSPECTION, MAINTENANCE, REPAIR AND RETROFIT PLAN

Re-vegetative Areas:

Once a vegetated area is well established, little additional maintenance is generally necessary. The key to establishing a viable and healthy vegetated feature is the care and maintenance it receives in the first few months after it is planted. Once established, all vegetated BMPs require some basic maintenance to insure the health of the plants including:

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

- **Seasonal Mowing and Lawn Care:** Re-vegetated portions of the tract employing turf grasses should be mowed, using a mulching mower, as needed to limit vegetation average height to 6 inches. If native grasses are employed in lieu of turf grasses, the re-vegetated areas will require less frequent mowing, but a minimum of twice annually in late spring and late fall. Grass clippings and brush debris should not be collected and deposited on the tract. Regular mowing should also include weed control practices, however herbicide use should be kept to a minimum (Urbonas et al., 1992). Healthy grass can be maintained without using fertilizers because runoff usually contains sufficient nutrients. Irrigation of the site can help assure a dense and healthy vegetative cover.

- **Inspection:** Inspect the re-vegetated areas of the tract at least twice annually for soil erosion or damage to vegetation. Additional inspection after periods of prolonged rainfall or after any heavy rainfall event should be made soon after those events. The tract should be checked for uniformity of grass cover, debris and litter, and areas of sediment accumulation. More frequent inspections of the grass cover during the first two years after establishment will help to determine if any problems are developing, and to plan for long-term restorative maintenance if warranted. Bare spots and areas of soil erosion identified during semi-annual inspections must be replanted and restored to meet specifications.

- **Debris and Litter Removal:** Trash tends to accumulate in vegetated areas, particularly along roadways. The tract should be kept free of debris and litter to reduce floatables being flushed downstream, and for aesthetic reasons. The need for removal of debris and litter is determined through periodic inspection, but should be performed no less than 2 times per year.

- **Sediment Removal:** Sediment removal is not normally needed on properly maintained and healthy re-vegetated areas since the vegetation normally binds the soil. However, sediment may accumulate and should be removed. Where the amount of sediment is small and isolated, removal by hand methods is preferred so that disturbance to other areas is minimized. Where the amount of sediment can not be feasibly removed by hand, mechanical equipment may be necessary to accomplish removal. Areas disturbed by such operations shall be re-vegetated. Provided the sediment is not contaminated with other types of pollutants, the removed sediment may be placed elsewhere on the tract. Any sediment that contains pollutants may be considered hazardous waste or toxic material, and are therefore subject to restrictions for disposal.

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

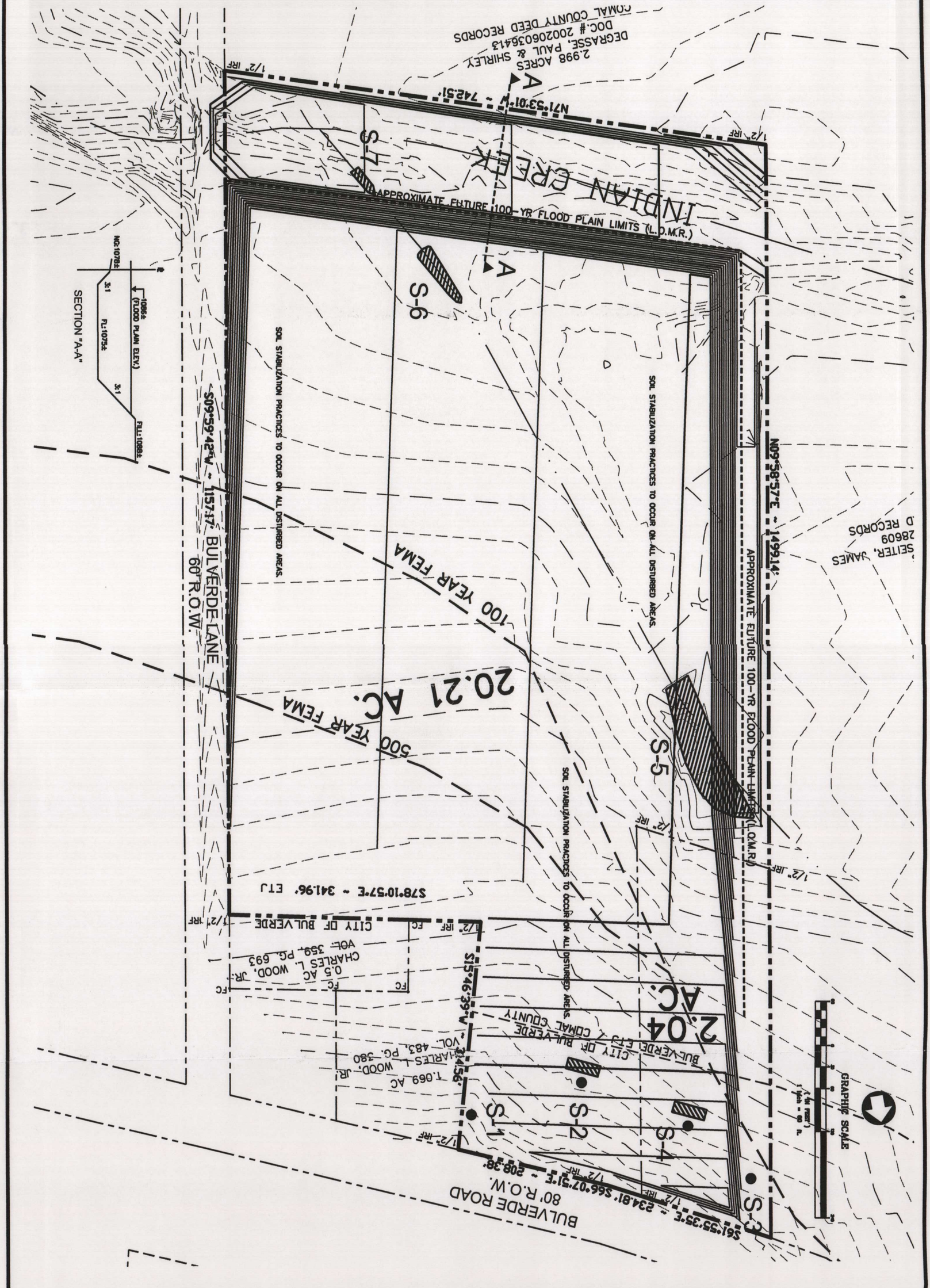
Jim De La Garza
Ocean 2 Ocean, L.L.C.

8-15-06
Date

ATTACHMENT I

MEASURES FOR MINIMIZING SURFACE STREAM CONTAMINATION

There is no proposed impervious cover associated with the mass grading of this tract. Since the finished grades over the majority of the site will be less than the existing grades, there is a potential for the rate and volume of stormwater runoff due to this project to be slightly reduced. Therefore, when combined with appropriate vegetation of the disturbed areas, the filling of this tract is considered to have minimal negative impact, if any at all, upon the "in stream" erosion and "water quality" down-gradient.



Ocean 2 Ocean, L.L.C.
THE VILLAGE OF BULVERDE

W.P.A.P.
PERM. ABATEMENT PLAN

Revision	Date	Description

STATE OF TEXAS
JAMES GARCIA
83920
LICENSED
PROFESSIONAL ENGINEER
8/18/08

Sherfey Engineering SA, LLC
8400 Blanco Road, Ste. 201
San Antonio, Texas 78216
Ph: (210) 493-9200 Fax: (210) 493-9205

DATE: AUG. 2008

Designed By: HJ
Drawn By: HJ
Checked By: JG
Approved By: JG
File: S-SP5436

PROJ. NO. 5417
C6
SHT C6 OF C6

APPLICATION FEE FORM
&
AGENT AUTHORIZATION FORM

APPLICATION FEE FORM

TEXAS COMMISSION ON ENVIRONMENTAL QUALITY
EDWARDS AQUIFER PROTECTION PLAN

NAME OF PROPOSED REGULATED ENTITY: The Village of Bulverde.
REGULATED ENTITY LOCATION 2280 Bulverde Road at Bulverde Lane; Bulverde, Texas.
NAME OF APPLICANT: Ocean 2 Ocean, L.L.C.
APPLICANT'S ADDRESS: P. O. Box 592479; San Antonio, TX 78259.
CONTACT PERSON: Jim De La Garza. PHONE: 210 / 651 - 4355.
Please Print

Customer Reference Number (if issued): CN 603251497 (nine digits)
Regulated Entity Reference Number (if issued): RN 105354211 (nine digits)

AUSTIN REGIONAL OFFICE (3373)
- ☐ Hays
- ☐ Travis
- ☐ Williamson

SAN ANTONIO REGIONAL OFFICE (3362)
- ☐ Bexar
- ■ Comal
- ☐ Kinney
- ☐ Medina
- ☐ Uvalde

APPLICATION FEES MUST BE PAID BY CHECK, CERTIFIED CHECK, OR MONEY ORDER, PAYABLE TO THE TEXAS NATURAL RESOURCE CONSERVATION COMMISSION. 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):

■ **SAN ANTONIO REGIONAL OFFICE**
☐ **Mailed to TCEQ:**
TCEQ - Cashier
Revenues Section
Mail Code 214
P.O. Box 13088
Austin, TX 78711-3088

☐ **AUSTIN REGIONAL OFFICE**
☐ **Overnight Delivery to TCEQ:**
TCEQ - Cashier
12100 Park 35 Circle
Building A, 3rd Floor
Austin, TX 78753
512/239-0347

Type of Plan	Size	Fee Due
Water Pollution Abatement, One Lot Single-Family Residential Dwelling	Acres	$
Water Pollution Abatement, Multiple Lot Single-Family Residential and Parks	Acres	$
Water Pollution Abatement, Non-residential	22.25 Acres	$6,500.00
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: _____ 11/04
Javier Garcia, P.E. Date

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.
TCEQ 0574 (Rev. 10/01/2004)

AGENT AUTHORIZATION FORM

FOR REQUIRED SIGNATURE
EDWARDS AQUIFER PROTECTION PROGRAM
RELATING TO 30 TAC CHAPTER 213
EFFECTIVE JUNE 1, 1999

I Jim De La Garza ,
Print Name

C.E.O.
Title - Owner/President/Other

of Ocean 2 Ocean, L.L.C.
Corporation/Partnership/Entity Name

have authorized Javier Garcia, P.E.
Print Name of Agent/Engineer

of Sherfey Engineering SA, L.L.C.
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. A notarized copy of the Agent Authorization Form must be provided for the person preparing the application, and the forms must accompany the completed application.
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. For applicants who are not the property owner, but who have the right to control and possess and control the property, additional authorization is required from the owner.

CEO
Applicant's Signature

August 11, 2008
Date

THE STATE OF Texas §

County of Bexar §

BEFORE ME, the undersigned authority, on this day personally appeared Jim De La Garza 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 11th day of August, 2008 .

NOTARY PUBLIC

HECTOR H. HERRERA
Typed or Printed Name of Notary

MY COMMISSION EXPIRES: 12/28/08

TCEQ 0599 (Rev. 10/01/2004)

APPENDIX 'A'

SPILL RESPONSE ACTIONS, PREVENTION, and CONTROL

1.4.16 Spill Prevention and Control

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

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

Education

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

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

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

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

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

General Measures

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

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

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

(4) Train employees in spill prevention and cleanup.

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

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

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

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

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

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

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

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

Cleanup

(1) Clean up leaks and spills immediately.

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

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

Minor Spills

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

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

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

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

(5) Contain the spread of the spill.

(6) Recover spilled materials.

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

Semi-Significant Spills

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

Spills should be cleaned up immediately:

(1) Contain spread of the spill.

(2) Notify the project foreman immediately.

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

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

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

Significant/Hazardous Spills

For significant or hazardous spills that are in reportable quantities:

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

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

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

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

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

More information on spill rules and appropriate responses is available on the TCEQ website at: http://www.tnrcc.state.tx.us/enforcement/emergency_response.html

Vehicle and Equipment Maintenance

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

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

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

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

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

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

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

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

(9) Store cracked batteries in a non-leaking secondary container. Do this with all cracked batteries even if you think all the acid has drained out. If you drop a battery, treat it as if it is cracked. Put it into the containment area until you are sure it is not leaking.

Vehicle and Equipment Fueling

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

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

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

APPENDIX 'B'

T.C.E.Q. W.P.A.P.
GENERAL CONSTRUCTION NOTES

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 offsite 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 temporary or permanently cease is precluded by weather conditions, stabilization measures shall be initiated as soon as practicable. Where construction activity on a portion of the site is temporarily ceased, and earth disturbing activities will be resumed within 21 days, temporary stabilization measures do not have to be initiated on that portion of 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 Edward Aquifer protection plan must notify the appropriate regional office in writing and obtain approval from the executive director prior to initiating any of the following:

    A. any physical or operational modification of any water pollution abatement structure(s), including but not limited to ponds, dams, berms, sewage treatment plants, and diversionary structures;

    B. any change in the nature or character of the regulated activity from that which was originally approved or a change which would significantly impact the ability of the plan to prevent pollution of the Edwards Aquifer;

    C. any development of land previously identified as undeveloped in the original water pollution abatement plan.

Austin Regional Office 2800 S. IH 35, Suite 100 Austin, Texas 78704-5712 Phone (512) 339-2929 Fax (512) 339-3795	San Antonio Regional Office 14250 Judson Road San Antonio, Texas 78233-4480 Phone (210) 490-3096 Fax (210) 545-4329

THESE GENERAL CONSTRUCTION NOTES MUST BE INCLUDED ON THE CONSTRUCTION PLANS PROVIDED TO THE CONTRACTOR AND ALL SUBCONTRACTORS.

APPENDIX 'C'

EDWARDS AQUIFER TECHNICAL GUIDENCE MANUAL TEMPORARY SEDIMENT CONTROL BMPs

1.4.2 Temporary Construction Entrance/Exit

The purpose of a temporary gravel construction entrance is to provide a stable entrance/exit condition from the construction site and keep mud and sediment off public roads. A stabilized construction entrance is a stabilized pad of crushed stone located at any point traffic will be entering or leaving the construction site from a public right-of-way, street, alley, sidewalk or parking area. The purpose of a stabilized construction entrance is to reduce or eliminate the tracking or flowing of sediment onto public rights-of-way. This practice should be used at all points of construction ingress and egress. Schematic diagrams of a construction entrance/exit are shown in Figure 1-24 and Figure 1-25.

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

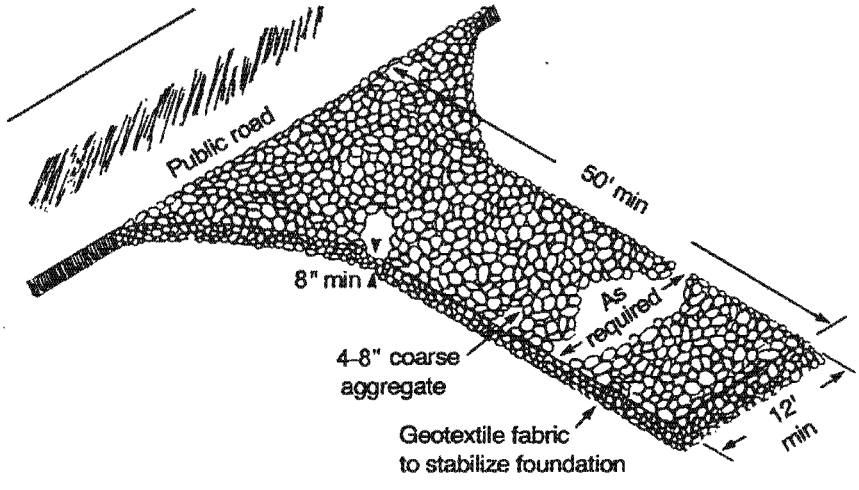


Figure 1-24 Schematic of Temporary Construction Entrance/Exit (after NC, 1993)

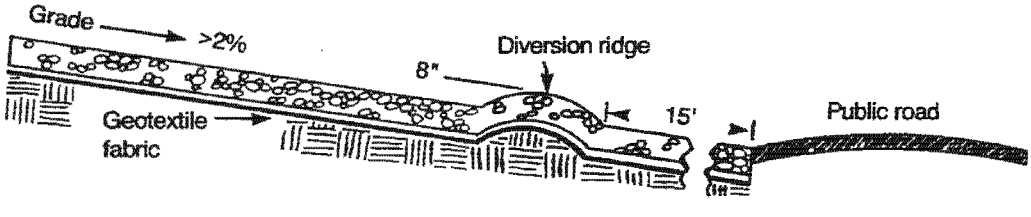


Figure 1-25 Cross-section of a Construction Entrance/Exit (NC, 1993)

Materials:

(1) The aggregate should consist of 4 to 8 inch washed stone over a stable foundation as specified in the plan.

(2) The aggregate should be placed with a minimum thickness of 8 inches.

(3) The geotextile fabric should be designed specifically for use as a soil filtration media with an approximate weight of 6 oz/yd^2, a mullen burst rating of 140 lb/in^2, and an equivalent opening size greater than a number 50 sieve.

(4) If a washing facility is required, a level area with a minimum of 4 inch diameter washed stone or commercial rack should be included in the plans. Divert wastewater to a sediment trap or basin.

Installation: (North Carolina, 1993)

(1) Avoid curves on public roads and steep slopes. Remove vegetation and other objectionable material from the foundation area. Grade crown foundation for positive drainage.

(2) The minimum width of the entrance/exit should be 12 feet or the full width of exit roadway, whichever is greater.

(3) The construction entrance should be at least 50 feet long.

(4) If the slope toward the road exceeds 2%, construct a ridge, 6 to 8 inches high with 3:1 (H:V) side slopes, across the foundation approximately 15 feet from the entrance to divert runoff away from the public road.

(5) Place geotextile fabric and grade foundation to improve stability, especially where wet conditions are anticipated.

(6) Place stone to dimensions and grade shown on plans. Leave surface smooth and slope for drainage.

(7) Divert all surface runoff and drainage from the stone pad to a sediment trap or basin.

(8) Install pipe under pad as needed to maintain proper public road drainage.

Common trouble points

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

(2) Stone too small or geotextile fabric absent, results in muddy condition as stone is pressed into soil.

(3) Pad too short for heavy construction traffic – extend pad beyond the minimum 50 foot length as necessary.

(4) Pad not flared sufficiently at road surface, results in mud being tracked on to road and possible damage to road edge.

(5) Unstable foundation – use geotextile fabric under pad and/or improve foundation drainage.

Inspection and Maintenance Guidelines:

(1) The entrance should be maintained in a condition, which will prevent tracking or flowing of sediment onto public rights-of-way. This may require periodic top dressing with additional stone as conditions demand and repair and/or cleanout of any measures used to trap sediment.

(2) All sediment spilled, dropped, washed or tracked onto public rights-of-way should be removed immediately by contractor.

(3) When necessary, wheels should be cleaned to remove sediment prior to entrance onto public right-of-way.

(4) When washing is required, it should be done on an area stabilized with crushed stone that drains into an approved sediment trap or sediment basin.

(5) All sediment should be prevented from entering any storm drain, ditch or water course by using approved methods.

1.4.3 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. A schematic illustration of a silt fence is shown in Figure 1-26.

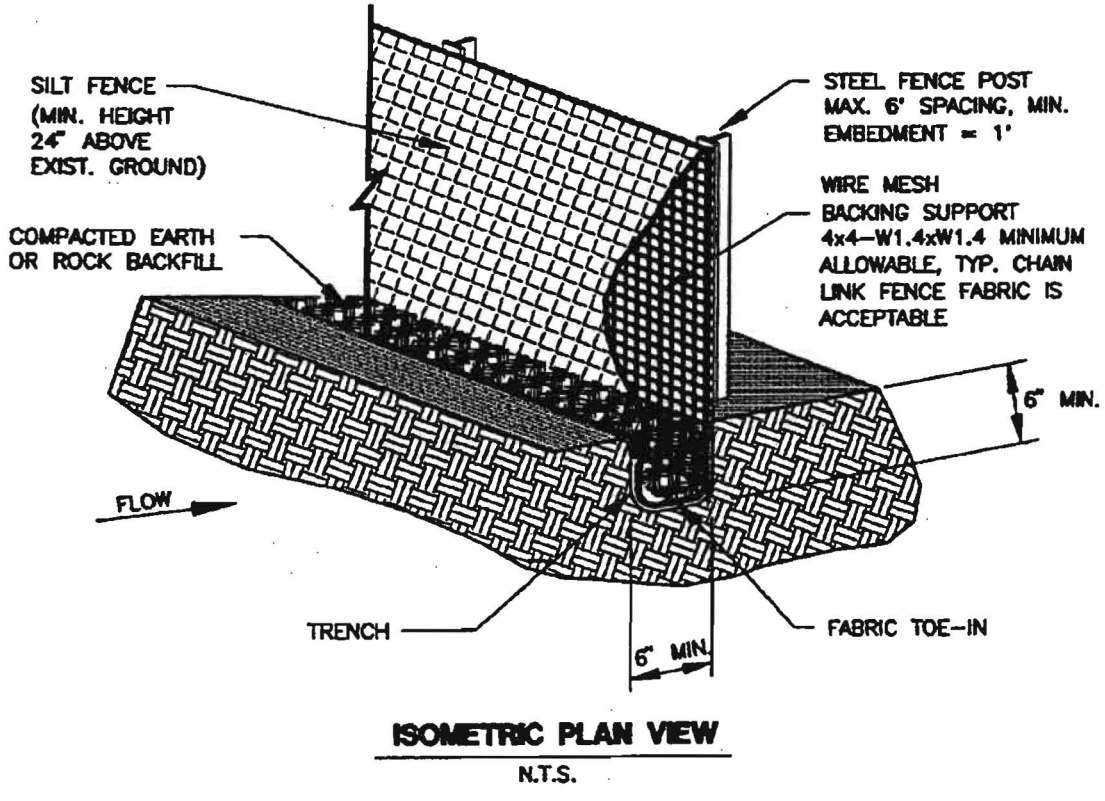


Figure 1-26 Schematic of a Silt Fence Installation (NCTCOG, 1993b)

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

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

Materials:

(1) Silt fence material should be polypropylene, polyethylene or polyamide woven or nonwoven fabric. The fabric width should be 36 inches, with a minimum unit weight of 4.5 oz/yd, mullen burst strength exceeding 190 lb/in^2, 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/ft^2, and Brindell hardness exceeding 140.

(3) Woven wire backing to support the fabric should be galvanized 2" x 4" welded wire, 12 gauge minimum.

Installation:

(1) Steel posts, which support the silt fence, should be installed on a slight angle toward the anticipated runoff source. Post must be embedded a minimum of 1-foot deep and spaced not more than 8 feet on center. Where water concentrates, the maximum spacing should be 6 feet.

(2) Lay out fencing down-slope of disturbed area, following the contour as closely as possible. The fence should be sited so that the maximum drainage area is ¼ acre/100 feet of fence.

(3) The toe of the silt fence should be trenched in with a spade or mechanical trencher, so that the down-slope face of the trench is flat and perpendic ular 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 any rainfall.

(2) Remove sediment when buildup reaches 6 inches.

(3) Replace any torn fabric or install a second line of fencing parallel to the torn section.

(4) Replace or repair any 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.

1.4.5 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 shoat 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.

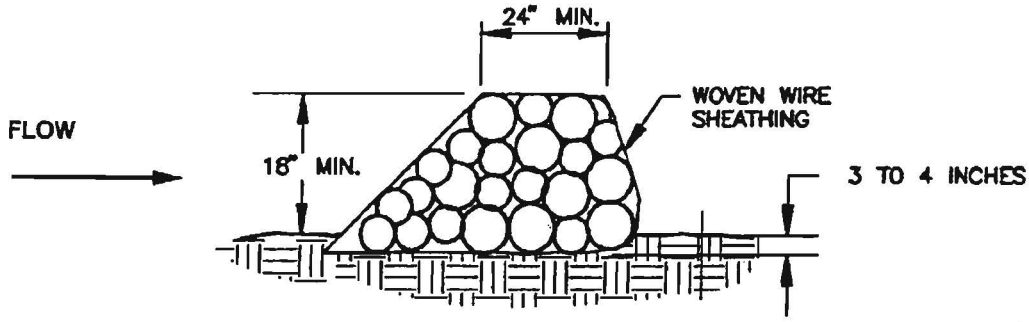
(2) Berm should have a top width of 2 feet minimum with side slopes being 2:1 (H:V) or flatter.

(3) Place the rock along the sheathing as shown in the diagram (Figure 1-28), 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.

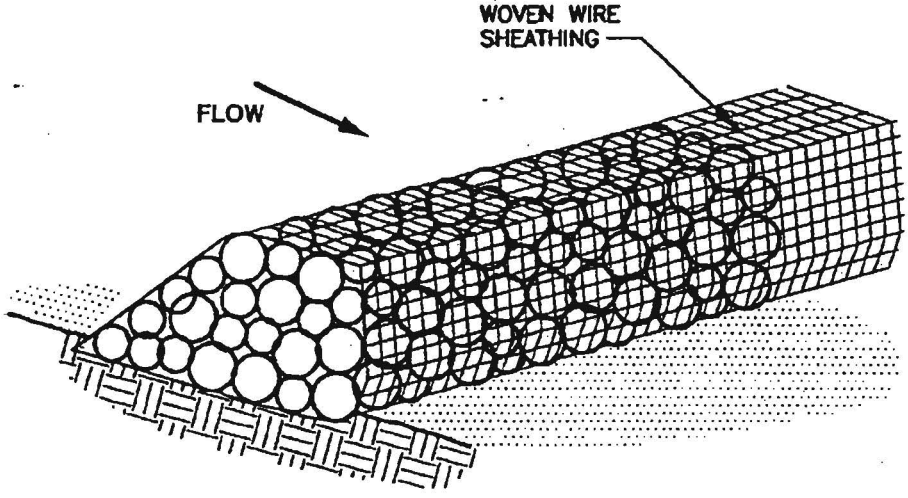
(5) Berm should be built along the contour at zero percent grade or as near as possible.

(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.



CROSS SECTION

N.T.S.



ISOMETRIC PLAN VIEW

N.T.S.

Figure 1-28 Schematic Diagram of a Rock Berm (NCTCOG, 1993)

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.

1.4.12 Stone Outlet Sediment Trap

A stone outlet sediment trap is an impoundment created by the placement of an earthen and stone embankment to prevent soil and sediment loss from a site. The purpose of a sediment trap is to intercept sediment-laden runoff and trap the sediment in order to protect drainage ways, properties and rights of way below the sediment trap from sedimentation. A sediment trap is usually installed at points of discharge from disturbed areas. The drainage area for a sediment trap is recommended to be less than 5 acres. Larger areas should be treated using a sediment basin. A sediment trap differs from a sediment basin mainly in the type of discharge structure. A schematic of a sediment trap is shown in Figure 1-40.

The trap should be located to obtain the maximum storage benefit from the terrain, for ease of cleanout and disposal of the trapped sediment and to minimize interference with construction activities. The volume of the trap should be at least 3600 cubic feet per acre of drainage area.

Materials:

(1) All aggregate should be at least 3 inches in diameter and should not exceed a volume of 0.5 cubic foot.

(2) The geotextile fabric specification should be woven polypropylene, polyethylene or polyamide geotextile, minimum unit weight of 4.5 oz/yd^2, mullen burst strength at least 250 lb/in^2, ultraviolet stability exceeding 70%, and equivalent opening size exceeding 40.

Installation:

(1) Earth Embankment: Place fill material in layers not more than 8 inches in loose depth. Before compaction, moisten or aerate each layer as necessary to provide the optimum moisture content of the material. Compact each layer to 95 percent standard proctor density. Do not place material on surfaces that are muddy or frozen. Side slopes for the embankment are to be 3:1. The minimum width of the embankment should be 3 feet.

(2) A gap is to be left in the embankment in the location where the natural confluence of runoff crosses the embankment line. The gap is to have a width in feet equal to 6 times the drainage area in acres.

(3) Geotextile Covered Rock Core: A core of filter stone having a minimum height of 1.5 feet and a minimum width at the base of 3 feet should be placed across the opening of the earth embankment and should be covered by geotextile fabric

which should extend a minimum distance of 2 feet in either direction from the base of the filter stone core.

(4) Filter Stone Embankment: Filter stone should be placed over the geotextile and is to have a side slope which matches that of the earth embankment of 3:1 and should cover the geotextile/rock core a minimum of 6 inches when installation is complete. The crest of the outlet should be at least 1 foot below the top of the embankment.

Common Trouble Points:

(1) Can cause minor flooding upstream of dam, impacting construction operations.

(2) The cost of construction, availability of materials, and the amount of land required limit the application of this measure.

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) Sediment should be removed and the trap restored to its original dimensions when the sediment has accumulated to half of the design depth of the trap.

(4) Sediment removed from the trap should be deposited in an approved spoils area and in such a manner that it will not cause additional siltation.

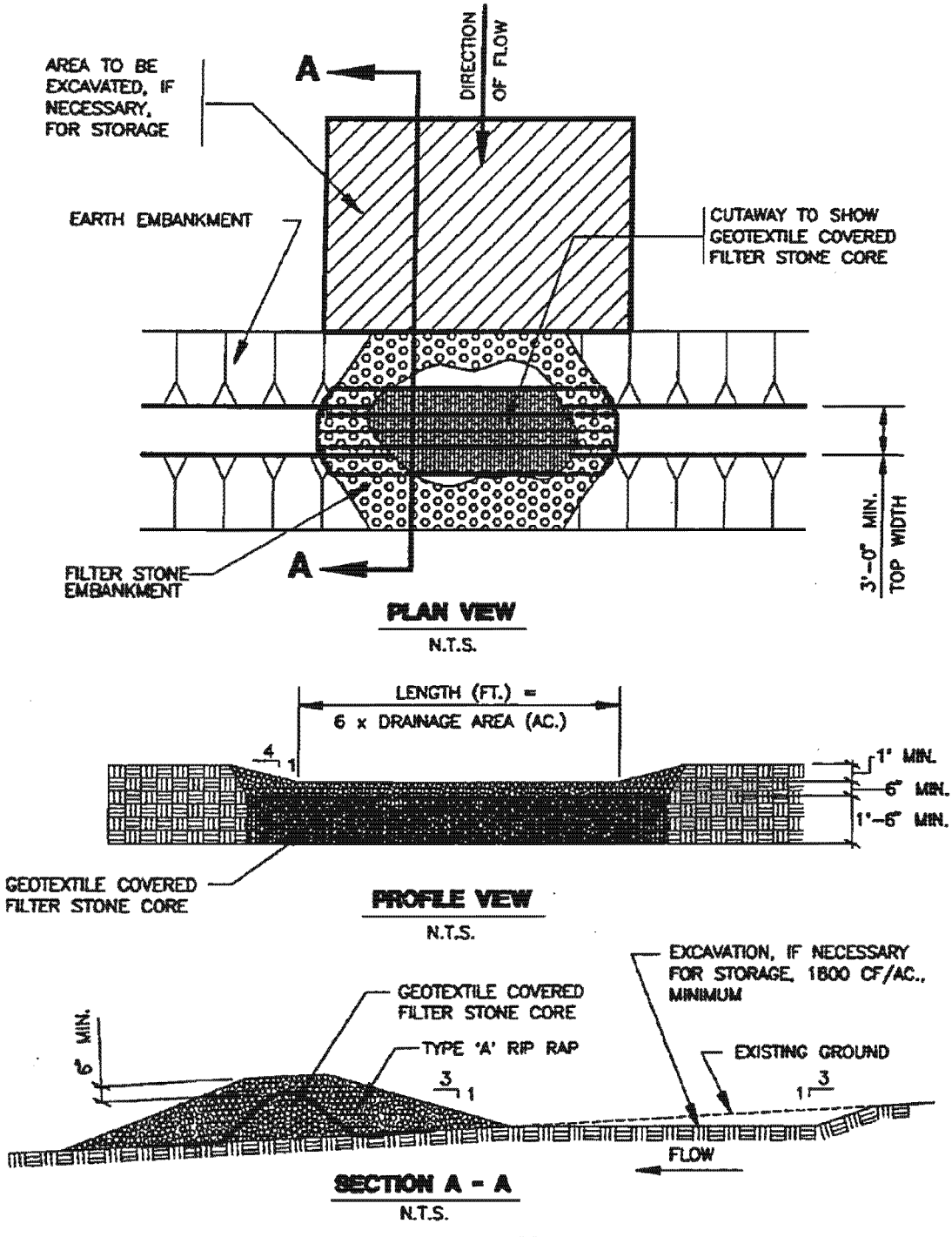
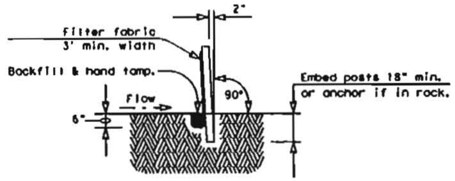


Figure 1-40 Schematic Diagram of a Sediment Trap (NCTCOG, 1993)

APPENDIX 'D'

TxDOT and CITY OF SAN ANTONIO EROSION and SEDIMENT CONTROL STANDARD DETAILS



SECTION A-A

SEDIMENT CONTROL FENCE USAGE GUIDELINES

A sediment control fence may be constructed near the downstream perimeter of a disturbed area along a contour to intercept sediment from overland runoff. A 2 year storm frequency may be used to calculate the flow rate to be filtered.

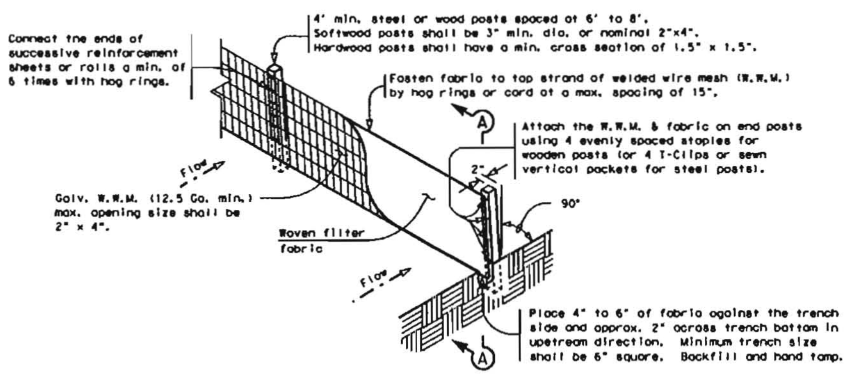
Sediment control fence should be sized to filter a max. flow through rate of 100 GPM/FT^2. Sediment control fence is not recommended to control erosion from a drainage area larger than 2 acres.

PLAN SHEET LEGEND

Sediment Control Fence —(SCF)—

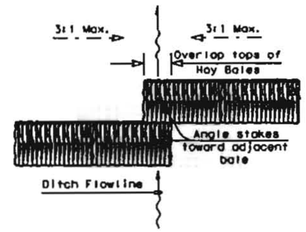
GENERAL NOTES

1. The guidelines shown hereon are suggestions only and may be modified by the Engineer.

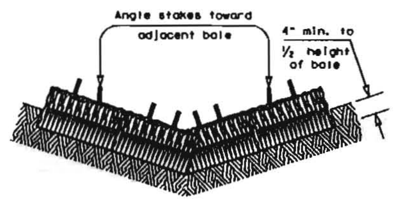


TEMPORARY SEDIMENT CONTROL FENCE

—(SCF)—



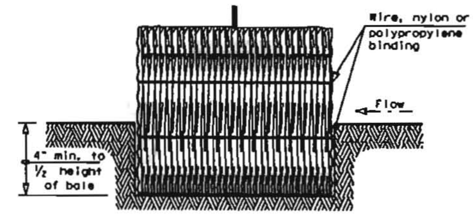
PLAN VIEW



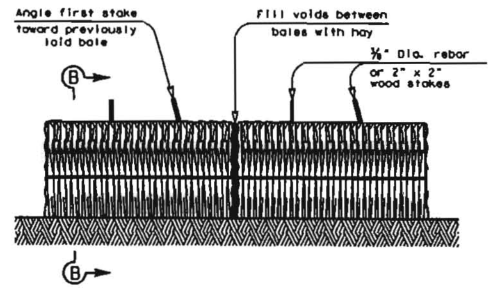
PROFILE VIEW

PLANS SHEET LEGEND

Baled Hay —(BH)—



SECTION B-B



BALED HAY FOR EROSION CONTROL

—(BH)—

GENERAL NOTES

1. Hay bales shall be a minimum of 30" in length and weigh a minimum of 50 Lbs.
2. Hay bales shall be bound by either wire or nylon or polypropylene string. The bales shall be composed entirely of vegetative matter.
3. Hay bales shall be embedded in the soil a minimum of 4" and where possible ½ the height of the bale.
4. Hay bales shall be placed in a row with ends tightly abutting the adjacent bales. The bales shall be placed with bindings parallel to the ground.
5. Hay bales shall be securely anchored in place with ⅝" Dia. rebar or 2" x 2" wood stakes, driven through the bales. The first stake shall be angled towards the previously laid bale to force the bales together.
6. The guidelines shown hereon are suggestions only and may be modified by the Engineer.

BALED HAY USAGE GUIDELINES

A Baled Hay Installation may be constructed near the downstream perimeter of a disturbed area along a contour to intercept sediment from overland runoff. A two year storm frequency may be used to calculate the flow rate to be filtered. The installation should be sized to filter a maximum flow thru rate of 5 GPM/FT^2 of cross sectional area. Baled hay may be used at the following locations:

1. Where the runoff approaching the baled hay flows over disturbed soil for less than 100'. If the slope of the disturbed soil exceeds 10%, the length of slope upstream the baled hay should be less than 50'.
2. Where the installation will be required for less than 3 months.
3. Where the contributing drainage area is less than ½ acre.

For Baled Hay Installations in small ditches, the additional following considerations apply:

1. The ditch sideslopes should be graded as flat as possible to maximize the drainage flowrate thru the hay.
2. The ditch should be graded large enough to contain the overtopping drainage when sediment has filled to the top of the baled hay.

Bales should be replaced usually every 2 months or more often during wet weather when loss of structural integrity is accelerated.

LEVELS DISPLAYED

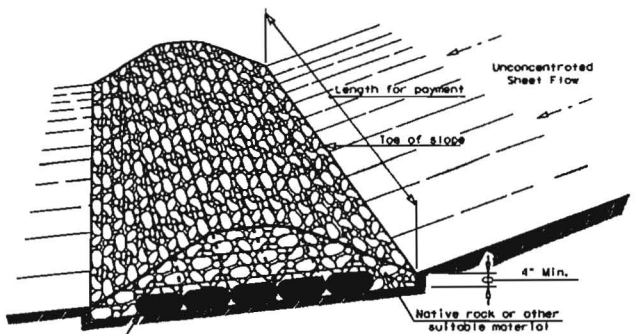
Texas Department of Transportation
Design Division (Roadway)

TEMPORARY EROSION, SEDIMENT AND WATER POLLUTION CONTROL MEASURES

FENCE & BALED HAY

EC(1)-93

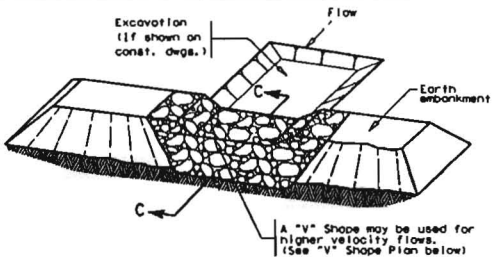
FILE: EC193.DGN	DN: HEJ	CK: HEJ	DW: BGD	CK:
© TxDOT JUNE 1993	DISTRICT	FEDERAL AID PROJECT		SHEET
REVISIONS		COUNTY	CONTROL SECT JOB	HIGHWAY



FILTER DAM AT TOE OF SLOPE

RFD1

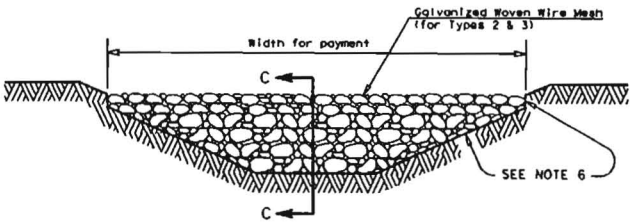
TYPE 1



FILTER DAM AT SEDIMENT TRAP

RFD1 — OR — RFD2

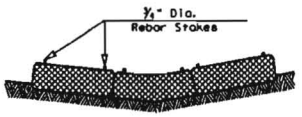
TYPE 1 OR TYPE 2



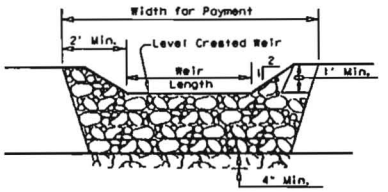
FILTER DAM AT CHANNEL SECTIONS

RFD1 — OR — RFD2 — OR — RFD3

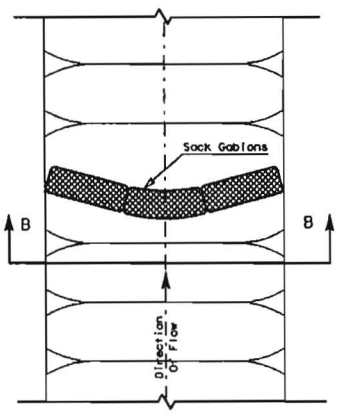
TYPE 1 OR TYPE 2



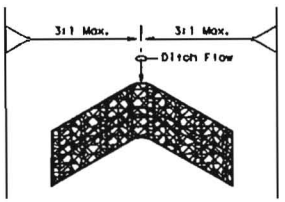
SECTION B-B



PROFILE

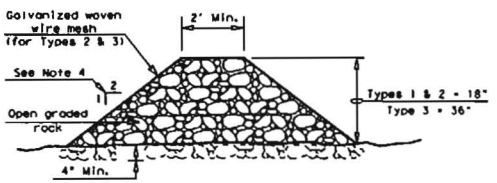


PLAN VIEW



"V" SHAPE

(Plan View)



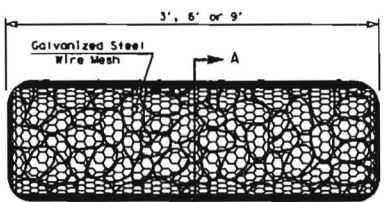
SECTION C-C

PLANS SHEET LEGEND

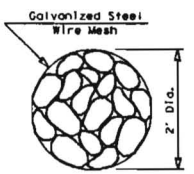
Type 1 Rock Filter Dam — RFD1

Type 2 Rock Filter Dam — RFD2

Type 3 Rock Filter Dam — RFD3



TYPE 4 (SACK GABIONS)



SECTION A-A

ROCK FILTER DAM USAGE GUIDELINES

Rock Filter Dams should be constructed downstream from disturbed areas to intercept sediment from overland runoff and/or concentrated flow. The dams should be sized to filter a maximum flow through rate of 60 GPM/FT² of cross sectional area. A 2 year storm frequency may be used to calculate the flow rate.

Type 1 (18" high with no wire mesh): Type 1 may be used at the toe of slopes, around inlets, in small ditches, and at dike or swale outlets. This type of dam is recommended to control erosion from a drainage area of 5 acres or less. Type 1 may not be used in concentrated high velocity flows (approx. 8 Ft/Sec or more) in which aggregate wash out may occur. Sandbags may be used at the embedded foundation (4" deep min.) for better filtering efficiency of low flows if called for on the plans or directed by the Engineer.

Type 2 (18" high with wire mesh): Type 2 may be used in ditches and at dike or swale outlets.

Type 3 (36" high with wire mesh): Type 3 may be used in stream flow and should be secured to the stream bed.

Type 4 (Sack gabions): Type 4 May be used in ditches and smaller channels to form an erosion control dam.

GENERAL NOTES

1. If shown on the plans or directed by the Engineer, filter dams should be placed near the toe of slopes where erosion is anticipated, upstream and/or downstream of drainage structures, and in roadway ditches and channels to collect sediment.
2. Materials (aggregate, wire mesh, sandbags, etc.) shall be as indicated by the specification for "Rock Filter Dams for Erosion and Sedimentation Control".
3. The rock filter dam dimensions shall be as indicated on the SW3P plans.
4. Side slopes should be 2:1 or flatter. Dams within the safety zone shall have sideslopes of 6:1 or flatter.
5. Maintain a minimum of 1' between top of rock filter dam weir and top of embankment for filter dams at sediment traps.
6. Filter dams should be embedded a minimum of 4" into existing ground.
7. The sediment trap for ponding of sediment laden runoff shall be of the dimensions shown on the plans.
8. Rock filter dam types 2 & 3 shall be secured with 20 gauge galvanized woven wire mesh with 1" diameter hexagonal openings. The aggregate shall be placed on the mesh to the height & slopes specified. The mesh shall be folded at the upstream side over the aggregate and tightly secured to itself on the downstream side using wire ties or hog rings. In stream use the mesh should be secured or staked to the stream bed prior to aggregate placement.
9. Sack Gabions should be staked down with ¾" dia. rebar stakes.
10. Flow outlet should be onto a stabilized area (vegetation, rock, etc.).
11. The guidelines shown hereon are suggestions only and may be modified by the Engineer.

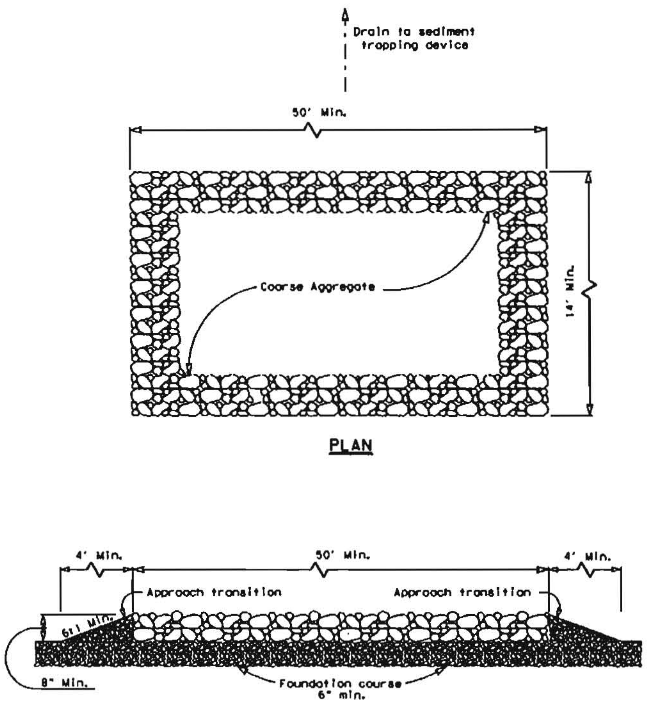
Texas Department of Transportation
Design Division (Roadway)

TEMPORARY EROSION, SEDIMENT AND WATER POLLUTION CONTROL MEASURES

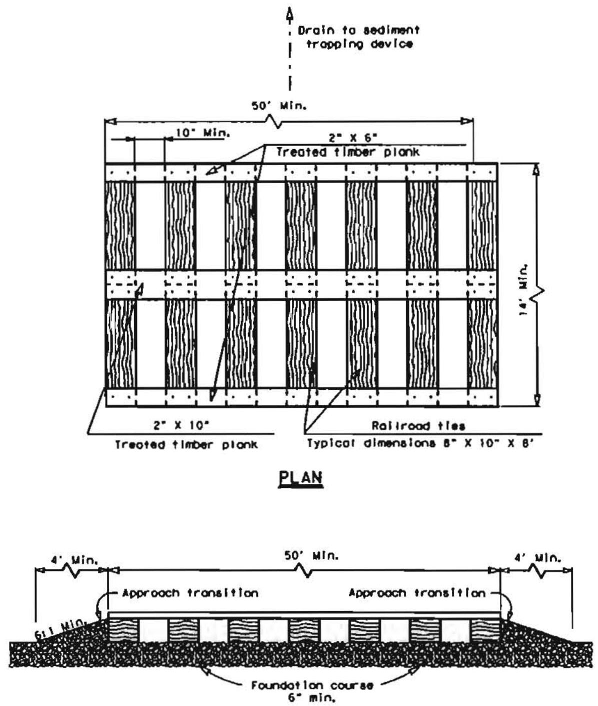
ROCK FILTER DAMS

EC(2)-93

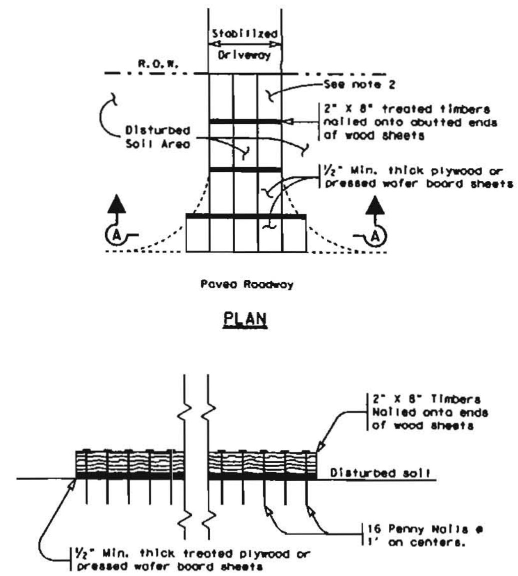
FILE: EC293.DGN	DN: MEJ	CK: MEJ	DW: SCD	CK:
©TxDOT JUNE 1993	DISTRICT	FEDERAL AID PROJECT		SHEET
REVISIONS				
	COUNTY	CONTROL	SECT	JOB	HIGHWAY



CONSTRUCTION EXIT (TYPE 1)



CONSTRUCTION EXIT (TYPE 2)



CONSTRUCTION EXIT (TYPE 3)

GENERAL NOTES

1. The length of the type 1 construction exit shall be as indicated on the plans, but not less than 50'.
2. The coarse aggregate should be open graded with a size of 4" to 8".
3. The approach transitions should be no steeper than 6:1 and constructed as directed by the Engineer.
4. The construction exit foundation course shall be flexible base, bituminous concrete, portland cement concrete or other material as approved by the Engineer.
5. The construction exit shall be graded to allow drainage to a sediment trapping device.
6. The guidelines shown hereon are suggestions only and may be modified by the Engineer.

GENERAL NOTES

1. The length of the type 2 construction exit shall be as indicated on the plans, but not less than 50'.
2. The treated timber planks shall be attached to the railroad ties with ½"x 6" min. lag bolts. Other fasteners may be used as approved by the Engineer.
3. The treated timber planks shall be #2 grade min., and should be free from large and loose knots.
4. The approach transitions shall be no steeper than 6:1 and constructed as directed by the Engineer.
5. The construction exit foundation course shall be flexible base, bituminous concrete, portland cement concrete or other material as approved by the Engineer.
6. The construction exit should be graded to allow drainage to a sediment trapping device.
7. The guidelines shown hereon are suggestions only and may be modified by the Engineer.

GENERAL NOTES

1. The length of the type 3 construction exit shall be as shown on the plans, or as directed by the Engineer.
2. The type 3 construction exit may be constructed from open graded crushed stone with a size of two to four inches spread a min. of 4" thick to the limits shown on the plans.
3. The treated timber planks shall be #2 grade min., and should be free from large and loose knots.
4. The guidelines shown hereon are suggestions only and may be modified by the Engineer.

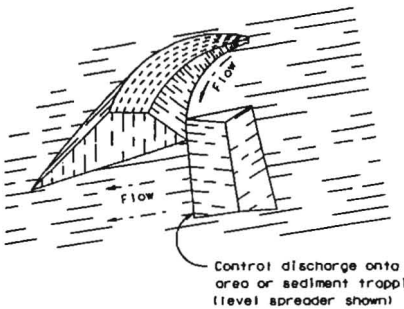
Texas Department of Transportation
Design Division (Roadway)

TEMPORARY EROSION, SEDIMENT AND WATER POLLUTION CONTROL MEASURES

CONSTRUCTION EXITS

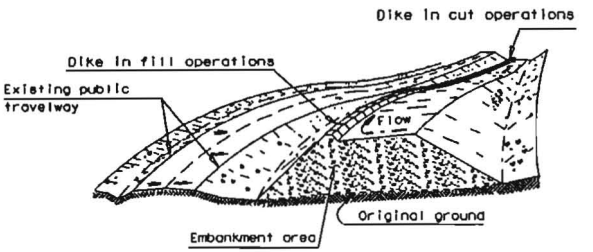
EC(3)-93

FILE: EC393.DGN	DN: HEJ	CK: HEJ	DW: BGD	CK:
© TxDOT JUNE 1993	DISTRICT	FEDERAL AID PROJECT		SHEET
REVISIONS				
	COUNTY	CONTROL	SECT JOB	HIGHWAY



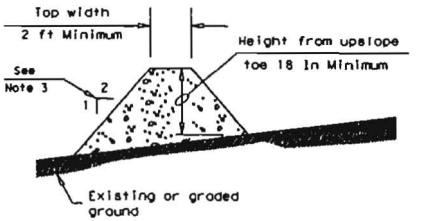
PERIMETER DIKE

Dike —(D)—

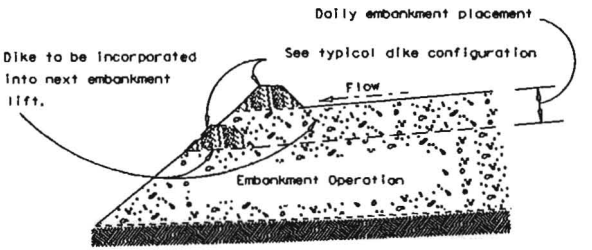


DIVERSION DIKE

Dike —(D)—

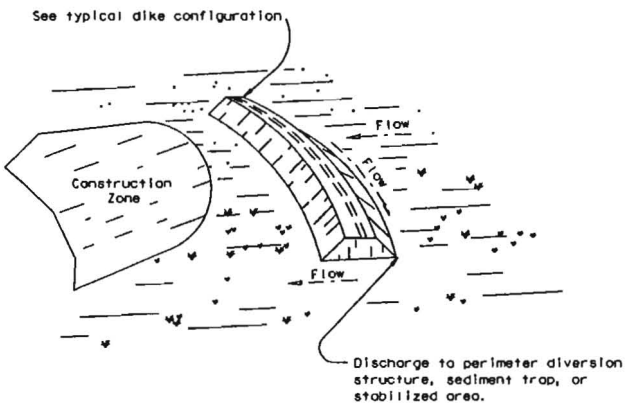


TYPICAL DIKE CONFIGURATION



EMBANKMENT SECTION - DIVERSION DIKE

Dike —(D)—



INTERCEPTOR DIKE

PLANS SHEET LEGEND

Dike —(D)—

DIKE USAGE GUIDELINES

A dike may be used to intercept runoff and divert it around unstabilized areas or to divert sediment laden runoff to an erosion control device (sediment basin or trap, rock filter dam, etc.).

The drainage area contributing runoff to a dike should not exceed 5 acres. The spacing of dikes should be as follows:

Slope of disturbed areas above dike	greater than 10%	5 - 10%	less than 5%
Maximum distance between dikes	100'	200'	300'

Intercepted runoff flowing along a dike should outlet to a stabilized area (vegetation, rock, etc.).

GENERAL NOTES:

1. Soil used in dike construction shall be machine compacted.
2. Top width and height of dike may be modified with prior approval of the Engineer.
3. Side slopes within the safety clear zone of a roadway shall be 6:1 or flatter.
4. Grading shall be shown elsewhere in the plans or as directed by the Engineer.
5. The Engineer reserves the right to modify the dimensions shown for the dike dependent on runoff volume characteristics.
6. Dikes that are in place for more than 14 calendar days should be stabilized to prevent sediment runoff.
7. The guidelines shown hereon are suggestions only and may be modified by the Engineer.

LOYLS SUBMITTED

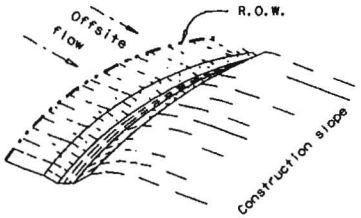
Texas Department of Transportation
Design Division (Roadway)

TEMPORARY EROSION, SEDIMENT AND WATER POLLUTION CONTROL MEASURES

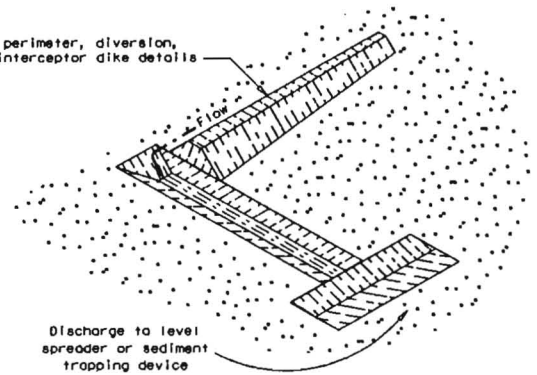
DIKES (EARTHWORK FOR EROSION CONTROL)

EC(4)-93

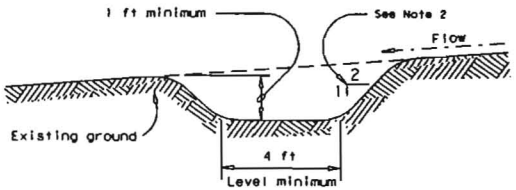
FILE: EC493.DGN	DN: HEJ	CK: HEJ	DW: BGD	CK:
©TxDOT JUNE 1993	DISTRICT	FEDERAL AID PROJECT		SHEET
REVISIONS				
	COUNTY	CONTROL	SECT	JOB	HIGHWAY



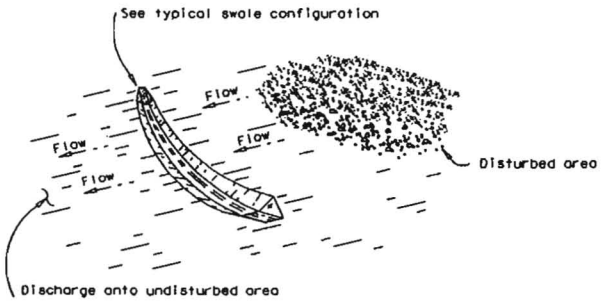
PERIMETER SWALE



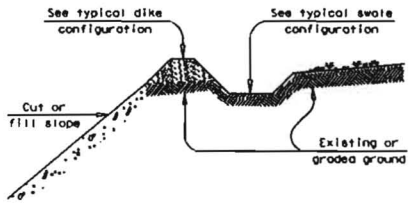
DIVERSION SWALE



TYPICAL SWALE CONFIGURATION



INTERCEPTOR SWALE



DIVERSION DIKE WITH SWALE

PLANS SHEET LEGEND

Swale —(S)—

Dike —(D)—

SWALE AND DIKE/SWALE USAGE GUIDELINES

A swale or dike/swale may be used to intercept runoff and divert it around unstabilized areas or to divert sediment laden runoff to an erosion control device (sediment basin or trap, rock filter dam, etc.).

The drainage area contributing runoff to a swale or dike/swale should not exceed 5 acres. The spacing of swales and dike/swales should be as follows:

Slope of disturbed areas above dike	greater than 10%	5 - 10%	less than 5%
Maximum distance between dikes	100'	200'	300'

Intercepted runoff flowing in a swale or dike/swale should outlet to a stabilized area (vegetation, rock, etc.).

GENERAL NOTES:

1. Dimensions of swale may be modified with prior approval of the Engineer.
2. Side slopes within the safety clear zone of a roadway shall be 6:1 or flatter.
3. Grading shall be shown elsewhere on the plans or as directed by the Engineer.
4. The Engineer reserves the right to modify the dimensions shown for the swale dependent on runoff volume characteristics.
5. Swales that are in place for more than 14 calender days should be stabilized through seeding or other measures to control sediment runoff.
6. The guidelines shown hereon are suggestions only and may be modified by the Engineer.

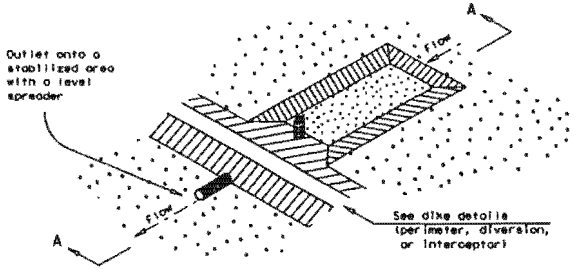
Texas Department of Transportation
Design Division (Roadway)

TEMPORARY EROSION, SEDIMENT AND WATER POLLUTION CONTROL MEASURES

SWALES (EARTHWORK FOR EROSION CONTROL)

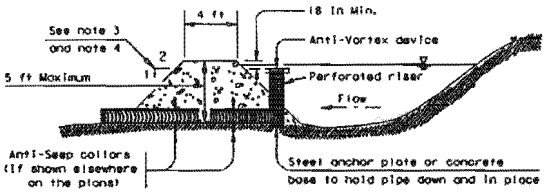
EC(5)-93

FILE: EC593.DGN	DN: HEJ	CK: HEJ	DW: BCD	CK:
©TxDOT MAY 1993	DISTRICT	FEDERAL AID PROJECT		SHEET
REVISIONS				
	COUNTY	CONTROL	SECT	JOB	HIGHWAY

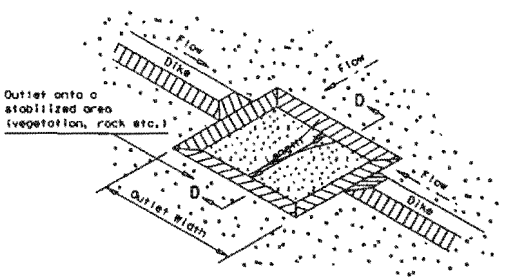


SEDIMENT BASIN AND/OR TRAP WITH PIPE OUTLET

(ST/PO)

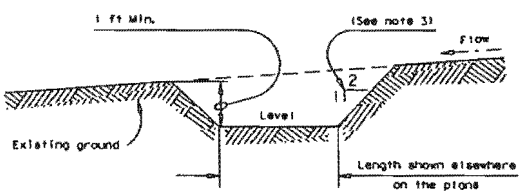


SECTION A-A

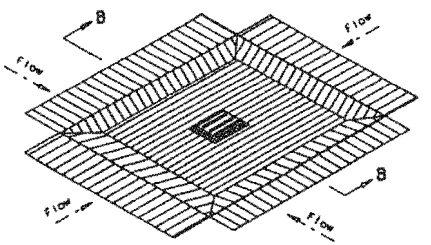


SEDIMENT TRAP WITH LEVEL STABILIZED OUTLET

(ST)

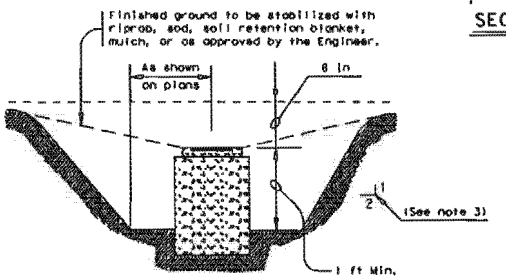


SECTION D-D

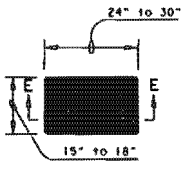


DROP INLET SEDIMENT TRAP

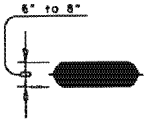
(ST-DI)



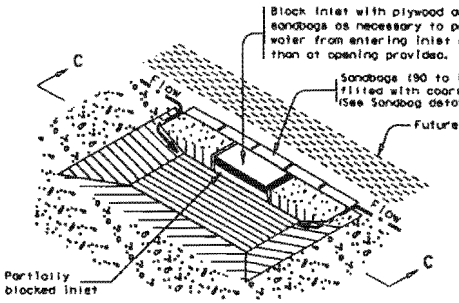
SECTION B-B



SANDBAG DETAIL

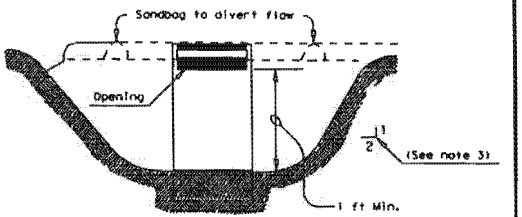


SECTION E-E



CURB INLET SEDIMENT TRAP

(ST-CI)



SECTION C-C

PLANS SHEET LEGEND

(ST/PO) Sediment Basin and/or Trap with Pipe Outlet

(ST-DI) Drop Inlet Sediment Trap

(ST-CI) Curb Inlet Sediment Trap

(ST) Sediment Trap with LevelStabilized Outlet

SEDIMENT BASIN & TRAP USAGE GUIDELINES

A sediment basin and/or trap may be used to precipitate sediment out of runoff draining from an unstabilized area.

Basins: The drainage area for a sediment basin should not exceed 100 acres. The basin capacity shall be at least 1800 CF/Acre of drainage area (0.5" over the drainage area). If the disturbed area draining to the basin is larger than 10 acres, the basin capacity should be 3600 CF/Acre (1.0" over the drainage area).

The basin should have a 40 hour draw-down time with an emergency spillway. The spillway may be designed to pass the peak rate of runoff from a 25 year frequency storm. The 100 year storm should be investigated to consider possible flooding impacts.

The entrance into the basin should be protected from erosion. The basin should be cleaned when the capacity has been reduced by 1/3.

Traps: The drainage area for a sediment trap should not exceed 5 acres. The trap capacity should be 1800 CF/Acre (0.5" over the drainage area).

Sediment traps should be placed in the following locations:
1. Within drainage ditches spaced @ 500'± on center
2. Immediately preceding ditch inlets
3. Just before the drainage enters a water course
4. Just before the drainage leaves the right of way

The trap outlet may either be through a perforated riser and pipe assembly designed to achieve a 40 hour draw-down time or over a level stabilized area (vegetation, rock, etc.).

The trap should be cleaned when the capacity has been reduced by $\frac{1}{2}$ or the sediment has accumulated to a depth of 1', whichever is less.

GENERAL NOTES

1. Pipe outlet material shall conform to the Item "Pipe Underdrains" or as accepted by the Engineer.
2. All pipe connections shall be watertight.
3. Side slopes within the safety clear zone of a roadway shall be 6:1 or flatter. Protect the traveling public from inlet stacks within the clear zone.
4. Sediment basins shall have side slopes of 3:1 or flatter.
5. The dimensions and limits of excavation for sediment basins and traps will be as shown elsewhere on the plans.
6. The sandbag materialshallbe made of polypropylene, polyethylene or polyamide woven fabric, min. unit weight 4 ounces/SY, Mullen burst strength exceeding 300 psi and ultraviolet stability exceeding 70%.
7. The guidelines shown hereon are suggestions only and may be modified by the Engineer.

LEVEL DISPLAYED

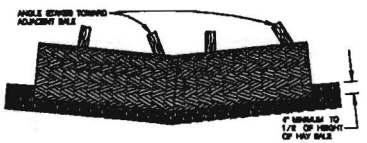
Texas Department of Transportation
Design Division (Roadway)

TEMPORARY EROSION, SEDIMENT AND WATER POLLUTION CONTROL MEASURES

SEDIMENT BASINS AND TRAPS (EARTHWORK FOR EROSION CONTROL)

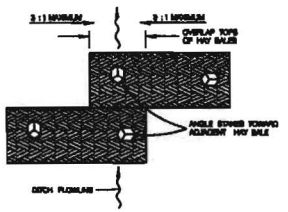
EC(6)-93

FILE: EC693.DGN	DN: HEJ	CK: HEJ	DW: BDD	CK:
©TxDOT MAY 1993	DISTRICT	FEDERAL AID PROJECT		SHEET
REVISIONS	COUNTY	CONTROL	SECT	JOB	HIGHWAY



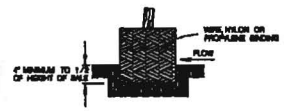
PROFILE VIEW

SCALE : 1" = 1'



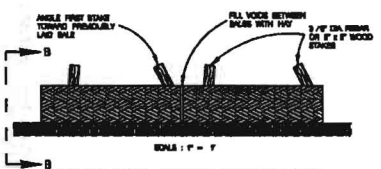
PLAN VIEW

SCALE : 1" = 1'



SECTION B-B

SCALE : 1" = 1'



BALED HAY USAGE GUIDELINES

A BALED HAY INSTALLATION MAY BE CONSTRUCTED NEAR THE DOWNSTREAM PERIMETER OF A DISTURBED AREA ALONG A CONTOUR TO INTERCEPT SEDIMENT FROM OVERLAND RUNOFF. A TWO YEAR STORM FREQUENCY MAY BE USED TO CALCULATE THE FLOW RATE TO BE FILTERED. THE INSTALLATION SHOULD BE SIZED TO FILTER A MAXIMUM FLOW THRU RATE OF 0.5 GPM / FT SQUARED OF CROSS SECTIONAL AREA. BALED HAY MAY BE USED AT THE FOLLOWING LOCATIONS:

1. WHERE THE RUNOFF APPROACHING THE BALED HAY FLOWS OVER DISTURBED SOIL FOR LESS THAN 100', IF THE SLOPE OF THE DISTURBED SOIL ENCOUNTER IS 5:1, THE LENGTH OF SLOPE UPSTREAM OF THE BALED HAY SHOULD BE LESS THAN 50'.
2. WHERE THE INSTALLATION WILL BE REQUIRED FOR LESS THAN 3 MONTHS.
3. WHERE THE CONTRIBUTING DRAINAGE AREA IS LESS THAN 1/10 ACRE.

FOR BALED HAY INSTALLATIONS IN SMALL DITCHES, THE FOLLOWING ADDITIONAL CONDITIONS, CONSIDERATIONS APPLY:

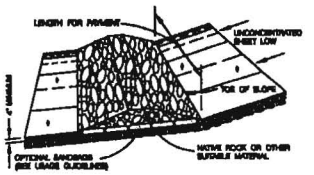
1. THE DITCH SIDESLOPES SHOULD BE GRADED AS FLAT AS POSSIBLE TO MAXIMIZE THE DRAINAGE FLOW AREA THRU THE HAY.
2. THE DITCH SHOULD BE GRADED LARGE ENOUGH TO CONTAIN THE OVERFLOWING DRAINAGE WHEN SEDIMENT HAS FILLED TO THE TOP OF THE BALED HAY.

BALES SHOULD BE REPLACED USUALLY EVERY 2 MONTHS OR MORE OFTEN DURING WET WEATHER WHEN LOSS OF STRUCTURAL INTEGRITY IS ACCELERATED.

GENERAL NOTES

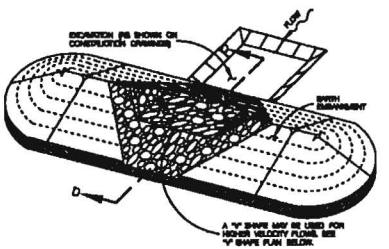
1. HAY BALES SHALL BE A MINIMUM OF 60" IN LENGTH AND WEIGH A MINIMUM OF 60 LBS.
2. HAY BALES SHALL BE BOUND BY BINDER WIRE OR NYLON OR POLYPROPYLENE BINDING. THE BALES SHALL BE COMPOSED ENTIRELY OF VEGETABLE MATTER.
3. HAY BALES SHALL BE EMBEDDED IN THE SOIL A MINIMUM OF 4" AND, WHERE POSSIBLE, ONE-HALF THE HEIGHT OF THE BALE.
4. HAY BALES SHALL BE PLACED IN A ROW WITH ENDS TIGHTLY ABUTTING THE ADJACENT BALES. THE BALES SHALL BE PLACED WITH BINDINGS PARALLEL TO THE GROUND.
5. HAY BALES SHALL BE SECURELY ANCHORED IN PLACE WITH 3/8" DIA. REBAR OR 2" x 2" WOOD STAKES DRIVEN THROUGH THE BALES. THE FIRST STAKE SHALL BE ANGLED TOWARDS THE PREVIOUSLY LAID BALE TO FORCE THE BALES TOGETHER.
6. THE GUIDELINES SHOWN HEREON ARE SUGGESTIONS ONLY AND MAY BE MODIFIED BY THE ENGINEER.

BALED HAY FOR EROSION CONTROL



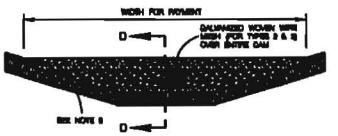
TYPE 1 FILTER DAM AT TOE OF SLOPE

SCALE : 1" = 5'



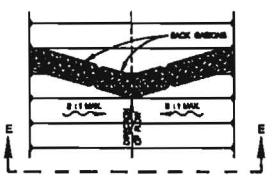
TYPE 1 & 2 FILTER DAM AT SEDIMENT TRAP

SCALE : 1" = 5'



TYPE 1, 2 & 3 FILTER DAM AT CHANNEL SECTIONS

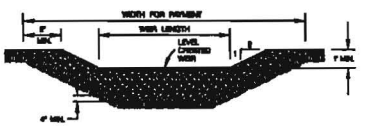
SCALE : 1" = 5'



PLAN VIEW

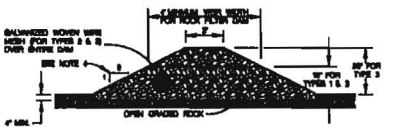
SCALE : 1" = 5'

TYPE 4 FILTER DAM AT DITCHES & SMALLER CHANNELS PLAN VIEW



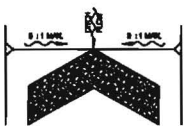
PROFILE OF TYPE 1 & 2 FILTER DAM AT SEDIMENT TRAP

SCALE : 1" = 5'



SECTION D-D

SCALE : 1" = 5'



"V" SHAPE PLAN VIEW

NOT TO SCALE

SECTION E-E

SCALE : 1" = 5'

ROCK FILTER DAM USAGE GUIDELINES

ROCK FILTER DAMS SHOULD BE CONSTRUCTED DOWNSTREAM FROM DISTURBED AREAS TO INTERCEPT SEDIMENT FROM OVERLAND RUNOFF AND /OR CONCENTRATED FLOW. THE DAMS SHOULD BE SIZED TO FILTER A MINIMUM FLOW THRU RATE OF 0.5 GPM / FT SQUARED OF CROSS SECTIONAL AREA. A 2 YEAR STORM FREQUENCY MAY BE USED TO CALCULATE THE FLOW RATE.

TYPE 1 (18" HIGH WITH NO WIRE MESH):

TYPE 1 MAY BE USED AT THE TOE OF SLOPES AROUND INLETS, IN SMALL DITCHES AND AT DIKE OR BERM OUTLETS. THIS TYPE OF DAM IS RECOMMENDED TO CONTROL EROSION FROM A DRAINAGE AREA OF 1 ACRES OR LESS. TYPE 1 MAY NOT BE USED IN CONCENTRATED HIGH VELOCITY FLOWS (APPROXIMATELY 5 FT./SEC) OR MORE IN WHICH AGGREGATE WASH OUT MAY OCCUR. SANDBAGS MAY BE USED AT THE EMBEDDED FOUNDATION 3" DEEP MIN.) FOR BETTER FILTERING EFFICIENCY OF LOW FLOWS IF CALLED FOR ON THE PLANS OR AS DIRECTED BY THE ENGINEER.

TYPE 2 (24" HIGH WITH WIRE MESH):

TYPE 2 MAY BE USED IN DITCHES AND AT DIKE OR BERM OUTLETS.

TYPE 3 (30" HIGH WITH WIRE MESH):

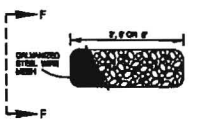
TYPE 3 MAY BE USED IN STREAM FLOW AND SHOULD BE SECURED TO THE STREAM BED.

TYPE 4 (SACK GABIONS):

TYPE 4 MAY BE USED IN DITCHES AND SMALLER CHANNELS TO FORM AN EROSION CONTROL DAM.

GENERAL NOTES

1. IF SHOWN ON THE PLANS OR DIRECTED BY THE ENGINEER, FILTER DAMS SHOULD BE PLACED NEAR THE TOE OF SLOPES WHERE EROSION IS ANTICIPATED, UPSTREAM AND / OR DOWNSTREAM AT DRAINAGE STRUCTURES, AND IN ROADWAY DITCHES AND CHANNELS TO COLLECT SEDIMENT.
2. MATERIALS (AGGREGATE, WIRE MESH, SANDBAGS, ETC.) SHALL BE AS INDICATED BY THE SPECIFICATION FOR ROCK FILTER DAMS FOR EROSION AND SEDIMENTATION CONTROL.
3. THE ROCK FILTER DAM DIMENSIONS SHALL BE AS INDICATED ON THE STORM WATER POLLUTION PREVENTION PLANS.
4. SIDE SLOPES SHOULD BE 3:1 OR FLATTER. DAMS WITHIN THE SAFETY ZONE SHALL HAVE SIDE SLOPES OF 5:1 OR FLATTER.
5. MAINTAIN A MINIMUM OF 9" BETWEEN TOP OF ROCK FILTER DAM WEIR AND TOP OF EMBANKMENT FOR FILTER DAMS AT SEDIMENT TRAPS.
6. FILTER DAMS SHOULD BE EMBEDDED A MINIMUM OF 4" INTO THE EXISTING GROUND.
7. THE SEDIMENT TRAP FOR PONDING OF SEDIMENT LADEN RUNOFF SHALL BE OF THE DIMENSIONS SHOWN ON THE PLANS.
8. ROCK FILTER DAM TYPES 2 & 3 SHALL BE SECURED WITH 20 GAUGE GALVANIZED WOVEN WIRE MESH WITH 1" DIAMETER HEXAGONAL OPENINGS. THE APPROPRIATE SHALL BE PLACED ON THE MESH TO THE HEIGHT AND SLOPES SPECIFIED. THE MESH SHALL BE FOLDED AT THE UPSTREAM SIDE OVER THE AGGREGATE AND TIGHTLY SECURED TO ITSELF ON THE DOWNSTREAM SIDE USING WIRE TIES OR HOG RINGS. IN STREAM USE, THE MESH SHOULD BE SECURED OR STAKED TO THE STREAM BED PRIOR TO AGGREGATE PLACEMENT.
9. SACK GABIONS SHOULD BE STAKED DOWN WITH 3/4" DIA REBAR STAKES.
10. FLOW OUTLET SHOULD BE DATO A STABILIZED AREA (VEGETATION, ROCK, ETC).
11. THE GUIDELINES SHOWN HEREON ARE SUGGESTIONS ONLY AND MAY BE MODIFIED BY THE ENGINEER.



TYPE 4 SACK GABION DETAIL

SCALE : 1" = 5'

SECTION F-F

SCALE : 1" = 5'

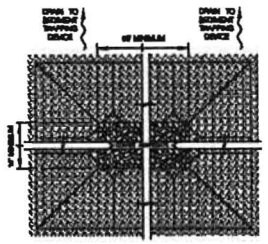
ROCK FILTER DAMS

JANUARY 2005

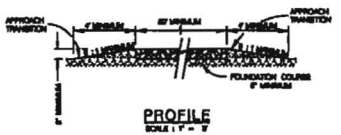
STANDARD PLANS
CITY OF SAN ANTONIO, TEXAS
DEPARTMENT OF PUBLIC WORKS

TEMPORARY EROSION, SEDIMENT & WATER POLLUTION CONTROL MEASURES STANDARDS 2

DRAWN BY: V. VASQUEZ	DATE	REVISIONS	SCALE: SEE ABOVE
CHECKED BY: RAY HARDY, P.E.			DATE:
			SHEET: OF



PLAN

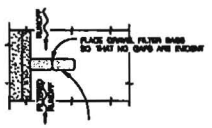


PROFILE

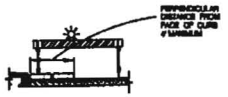
GENERAL NOTES

1. THE LENGTH OF THE TYPE 1 CONSTRUCTION EXIT SHALL BE AS INDICATED ON THE PLANS, BUT NOT LESS THAN 50'.
2. THE COARSE AGGREGATE SHOULD BE OPEN GRADED WITH A SIZE OF 4" TO 8".
3. THE APPROACH TRANSITIONS SHOULD BE NO STEEPER THAN 6:1 AND CONSTRUCTED AS DIRECTED BY THE ENGINEER.
4. THE CONSTRUCTION EXIT FOUNDATION COURSE SHALL BE FLEXIBLE BASE, BITUMINOUS CONCRETE, PORTLAND CEMENT CONCRETE OR OTHER MATERIAL AS APPROVED BY THE ENGINEER.
5. THE CONSTRUCTION EXIT SHALL BE GRADED TO ALLOW DRAINAGE TO A SEDIMENT TRAPPING DEVICE.
6. THE GUIDELINES SHOWN HEREON ARE SUGGESTIONS ONLY AND MAY BE MODIFIED BY THE ENGINEER.

CONSTRUCTION EXIT – TYPE 1



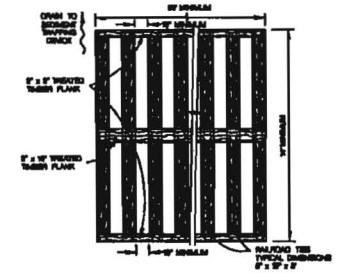
PLAN



ELEVATION

NOTE:
STAKE/DRIVE GRAVEL FILTER BAGS WITH TYPE 1 BARRICADES MOUNTED WITH TYPE "A" FLASHING WARNING LIGHT. SEE BARRICADE CONSTRUCTION SIGN DETAILS. PLACE FLASHING LIGHTS AWAY FROM GUTTER, FLUSH WITH OUTSIDE EDGE OF BAR CONFIGURATION.

GRAVEL FILTER BAGS



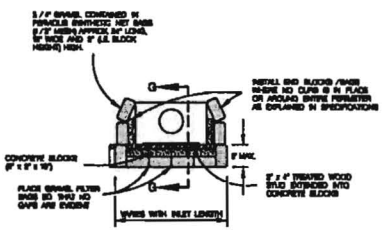
PLAN

PROFILE

GENERAL NOTES

1. THE LENGTH OF THE TYPE 2 CONSTRUCTION EXIT SHALL BE AS INDICATED ON THE PLANS, BUT NOT LESS THAN 50'.
2. THE TREATED TIMBER PLANKS SHALL BE ATTACHED TO THE RAILROAD TIES WITH 1/2"x 5" MIN. LAG BOLTS. OTHER FASTENERS MAY BE USED AS APPROVED BY THE ENGINEER.
3. THE TREATED TIMBER PLANKS SHALL BE #3 GRADE MIN., AND SHOULD BE FREE FROM LARGE AND LOOSE KNOTS.
4. THE APPROACH TRANSITIONS SHOULD BE NO STEEPER THAN 6:1 AND CONSTRUCTED AS DIRECTED BY THE ENGINEER.
5. THE CONSTRUCTION EXIT FOUNDATION COURSE SHALL BE FLEXIBLE BASE, BITUMINOUS CONCRETE, PORTLAND CEMENT CONCRETE OR OTHER MATERIAL AS APPROVED BY THE ENGINEER.
6. THE CONSTRUCTION EXIT SHOULD BE GRADED TO ALLOW DRAINAGE TO A SEDIMENT TRAPPING DEVICE.
7. THE GUIDELINES SHOWN HEREON ARE SUGGESTIONS ONLY AND MAY BE MODIFIED BY THE ENGINEER.

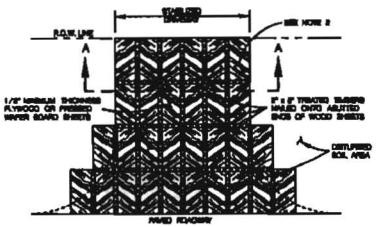
CONSTRUCTION EXIT – TYPE 2



PLAN

NOTE:
GRAVEL FILTERS CAN BE USED ON PAVEMENT OR BARE GROUND.

CURB INLET GRAVEL FILTER



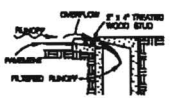
PLAN

SECTION A–A

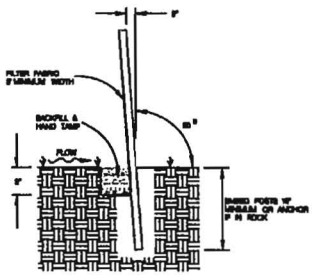
GENERAL NOTES

1. THE LENGTH OF THE TYPE 3 CONSTRUCTION EXIT SHALL BE AS INDICATED ON THE PLANS, OR AS DIRECTED BY THE ENGINEER.
2. THE TYPE 3 CONSTRUCTION EXIT MAY BE CONSTRUCTED FROM OPEN GRADED CRUSHED STONE WITH A SIZE OF 3 TO 4 INCHES SPREAD A MINIMUM OF 4 INCHES THICK TO THE LIMITS SHOWN ON THE PLANS.
3. THE TREATED TIMBER PLANKS SHALL BE #3 GRADE MIN.,AND SHOULD BE FREE FROM LARGE AND LOOSE KNOTS.
4. THE GUIDELINES SHOWN HEREON ARE SUGGESTIONS ONLY AND MAY BE MODIFIED BY THE ENGINEER.

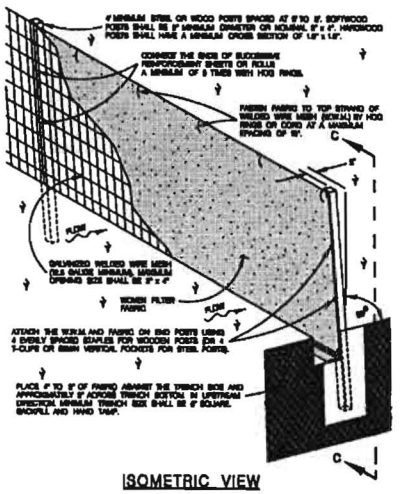
CONSTRUCTION EXIT – TYPE 3



SECTION G–G



SECTION C–C



ISOMETRIC VIEW

SEDIMENT CONTROL FENCE LAYOUT GUIDELINES

A SEDIMENT CONTROL FENCE MAY BE CONSTRUCTED NEAR THE DOWNSTREAM PERIMETER OF A DISTURBED AREA ALONG A CONTOUR TO INTERCEPT SEDIMENT FROM OVERLAND RUN-OFF. A 5 YEAR STORM FREQUENCY MAY BE USED TO CALCULATE THE FLOW RATE TO BE FILTERED.

SEDIMENT CONTROL FENCE SHOULD BE SIZED TO FILTER A MINIMUM FLOW RATE OF 100 GPM /FT EQUATED. SEDIMENT CONTROL FENCE IS NOT RECOMMENDED TO CONTROL EROSION FROM A DRAINAGE AREA LARGER THAN 2 ACRES.

GENERAL NOTES

1. THE GUIDELINES SHOWN HEREON ARE SUGGESTIONS ONLY AND MAY BE MODIFIED BY THE ENGINEER.

TEMPORARY SEDIMENT CONTROL FENCE

JANUARY 2005

STANDARD PLANS
CITY OF SAN ANTONIO, TEXAS
DEPARTMENT OF PUBLIC WORKS

TEMPORARY EROSION, SEDIMENT & WATER POLLUTION CONTROL MEASURES STANDARDS 1

DRAWN BY: V. WISOLEZ	DATE	REVISIONS	SCALE: SEE ABOVE
CHECKED BY: MAT HAVEN, P.E.			DATE:
			SHEET: OF

APPENDIX 'E'

REFERENCED CONSTUCTION SPECIFICATION

ITEM 107
EMBANKMENT

This item shall govern the placing and compacting of suitable materials obtained from approved sources for utilization in the construction of street embankments, berms, levees, dykes, channels, and obliterating streets.

MATERIAL: Material may be furnished from required excavation in the areas shown in the plans or from other sources obtained by the contractor and having a plasticity index not exceeding 20.

CONSTRUCTION METHODS:

1. General: Prior to placing any embankment, all "Preparing Right-of- Way" operations shall have been completed on the areas over which the embankment is to be placed. Stump holes or other small excavations in the limits of the embankments shall be backfilled with suitable material and thoroughly tamped by approved methods before commencing embankment construction. The surface of the ground, including plowed loosened ground, or surface roughened by small washes, etc., shall be restored to approximately its original slope where indicated on plans or required by the Engineer. The ground surface thus prepared shall be compacted by sprinkling and rolling.

Unless otherwise indicated on plans, the surface of the ground of all unpaved areas other than rock which are to receive embankment shall be loosened by scarifying or plowing to a depth of not less than 4 inches [102 mm]. The loosened material shall be recompacted with the new embankment as hereinafter specified.

Where indicated on plans or directed by the Engineer, the surface of hillsides to receive embankment shall be loosened by scarifying or plowing to a depth of not less than 4 inches [102 mm], or cut into steps before embankment materials are placed. The embankment shall then be placed in layers, as hereinafter specified, beginning at the low side in partial width layers and increasing the widths as the embankment is raised. The material which has been loosened shall be recompacted simultaneously with the embankment material placed at the same location.

Where embankments are to be placed adjacent to or over existing roadbeds, the roadbed slopes shall be plowed or scarified to a depth of not less than six inches [152 mm] and the embankment built up in successive layers, as hereinafter specified, to the level of the old roadbed before its height is increased. Then if directed, the top of the old roadbed shall be scarified, and recompacted with the next layer of the new embankment. The total depth of the scarified and added material shall not exceed the permissible depth layer.

Trees, stumps, roots, vegetation, or other unsuitable materials shall not be placed in embankment.

Except as otherwise required by the plans, all embankment shall be constructed in layers approximately parallel to the finished grade of the roadbed and unless otherwise specified, each layer shall be so constructed so to provide a uniform slope of 1/4 inch per foot [25 milimeters per meter] from the center line of the roadbed to the outside, except that on super elevated curvers, each layer shall be constructed to conform to the super elevation required by the plans.

Embankments shall be constructed to the grade established by the Engineer and completed embankments shall correspond to the general shape of the typical sections shown on the plans. Each section of the embankment shall correspond to the detailed section or slopes established by the Engineer. After completion of the roadway, it shall be continuously maintained to its finished section and grade until the project is accepted.

2. Earth Embankment: Earth embankments shall be defined as those composed principally of material other than rock, and shall be constructed of accepted material from approved sources.

Except as otherwise specified, earth embankments shall be constructed in successive layers 12 inches [305 mm] compacted for the full width of the individual roadway cross section and in such lengths as are best suited to the sprinkling and compaction methods utilized.

Minor quantities of rock encountered in constructing earth embankment shall be incorporated in the specified embankment layers, or may be placed in accordance with the requirements for the construction of rock embankments in the deeper fills, provided such placement of rock is not immediately adjacent to structures.

Each layer of embankment shall be uniform as to material, density and moisture content before beginning compaction. Where layers of unlike materials abut each other, each layer shall be feather edged for at least 100 feet [30 m] or the material shall

be so mixed as to prevent abrupt changes in the soil. No material placed in the embankment by dumping in a pile or windrow shall be incorporated in a layer in that position, but all such piles or windrows shall be moved by blading or similar methods. Clods or lumps of material shall be broken and the embankment material mixed by blading, harrowing, disking or similar methods to the end that a uniform material of uniform density is secured in each layer. Water required for sprinkling to bring the material to the moisture content necessary for maximum compaction shall be evenly applied and it shall be the responsibility of the Contractor to secure a uniform moisture content throughout the layer by such methods as may be necessary.

All earth cuts, full width or part width hill side cuts, which are not required to be excavated below subgrade elevation for base and backfill, shall be scarified to a uniform depth of at least 6 inches [152 mm] below grade, and the material shall be mixed and reshaped by blading and then sprinkled and rolled in accordance with the requirements outlined above for each embankment and to the same density as that required for the adjacent embankment.

Compaction of embankments shall be obtained by the "Density Control" method.

3. Density Control:

Each layer shall be compacted to the required density by any method, type, and size of equipment which will give the required compaction. Prior to and in conjunction with the rolling operation, each layer shall be brought to the moisture content necessary to obtain the required density and shall be kept leveled with suitable equipment to insure uniform compaction over the entire layer.

For each layer of earth embankment and select material, it is the intent of this specification to provide the density as required herein, unless otherwise shown on the plans. Soils shall be sprinkled as required and compacted to the extent necessary to provide not less than 90 percent of the maximum dry density as determined in accordance with TXDOT Test method Tex-113-E.

After each layer of earth embankment or select material is complete, tests as necessary will be made by the Inspector. If the material fails to meet the density specified, the course shall be reworked as necessary to obtain the specified compaction.

Just prior to placing any base materials, density and moisture content of the top 3 inches [76 mm] of compacted subgrade shall be checked and if tests show the density to be more than 2 percent below the specified minimum or the moisture content to be more than 3 percent above or below the optimum, the course shall be reworked as necessary to obtain the specified compaction and moisture content.

4. Rock Embankments: Rock embankments shall be defined as those composed principally of rock, and shall be constructed of accepted material from approved sources.

Except as otherwise specified, rock embankments, normally shall be constructed in successive layers for the full width of the individual roadway cross section and of 18 inches [457 mm] or less in depth. When, in the opinion of the Inspector, the rock sizes necessitate a greater depth of layer and the height of fill will permit, the layer depth may be increased as necessary, but in no case shall the depth of layer exceed 2 1/2 feet [762 mm]. Each layer shall be constructed by starting at one end and dumping the rock on top of the layer being constructed then pushing the material ahead with an approved "Bulldozer" in such manner that the larger rock will be placed on the ground or preceding embankment layer and the interstices between the larger stones will be filled with small stones and spalls by this operation and from the placing of succeeding loads of material.

The maximum dimension of any rock used in embankment shall be less than the depth of the embankment layer, and in no case shall any rock over 2-feet [610 mm] in it greatest dimension be placed in the embankment. All oversized rock which is otherwise suitable for construction shall be broken to the required dimension and utilized in embankment construction where proposed by plans, except that when preferred by the Contractor and acceptable to the Engineer, such rock may be placed at other points where the embankment layer is of greater depth, thus requiring less breakage.

Unless otherwise provided, the upper or final layer of the embankment shall contain no stones larger than 4 inches [102 mm] in their greatest dimension, and shall be composed of material so graded that the density and uniformity of the surface layer may be secured by the methods and requirements as set forth for "Density Control" method.

Each layer shall be compacted to the required density as outlined for "Earth Embankment", except in those layers where rock will make density testing difficult, the Inspector may accept the layer by visual inspection.

At Culverts and Bridges: Embankments adjacent to culverts and bridges which cannot be compacted by use of the blading and rolling equipment used in compacting the adjoining sections of embankment shall be compacted in the manner prescribed under Item 400, "Excavation, Trenching and Backfilling".

As a general rule embankment material placed adjacent to any portion of any structure and in the first two layers above the top of any culvert or similar structure shall be earth, free of any appreciable amount of gravel or stone particles more than 4-inches [102 mm] in the greatest dimension and of such gradation as to permit

thorough compaction. When, in the opinion of the Inspector, such material is not readily available, the use of rock or gravel mixed with earth will be permitted in which case no particles larger than 12-inches [305 mm] in greatest dimension and 6-inches [152 mm] in the least dimension may be used and the percentage of fines shall be sufficient to fill all voids and insure a uniform and thoroughly compacted mass of proper density.

MEASUREMENT: All accepted embankment will be measured in place and the volume computed in cubic yards [cubic meters] by the method of average end areas. No allowance will be made for shrinkage.

PAYMENT: This item will be paid for at the contract unit price bid for "Embankment", which price shall be full compensation for all work herein specified, including the furnishing of all materials, equipment, tools, labor, and incidentals necessary to complete the work.

BID ITEM:

Item 107 - Embankment - per cubic yard [cubic meter].

ITEM 515
TOPSOIL

This item shall govern for the furnishing, placing and spreading of approved selected topsoil, to the lines and grades, at locations shown on the plans or as directed by the Inspector and in conformity with these specifications.

MATERIALS:

The topsoil shall be obtained from approved sources, suitable to support plant growth (seeding or sodding). It shall be fertile loam, easily cultivated, and free from roots, weeds, stones or other objectionable material detrimental to plants.

CONSTRUCTION METHODS:

Topsoil shall be placed and spread on the places designated on the plans, or on areas as directed by the Inspector. The minimum thickness of topsoil shall be 4 inches [102 mm] on excavated areas. Where no excavation was accomplished, the topsoil shall be placed and spread and brought to the proper line and grades as shown on the plans. After the topsoil has been placed and shaped, it shall be sprinkled with water. If the topsoil settles below the kestablished grade after the application of water, additional topsoil shall be added and sprinkled with water as directed by the Inspector.

MEASUREMENT:

Measurement of "Topsoil" shall be made by the cubic yard [cubic meter] in place and only for those areas designated on the plans, or to areas as directed by the Inspector.

PAYMENT:

Topsoil measured as specified above will be paid for at the contract unit price bid per cubic yard [cubic meter], which price shall be full compensation for all hauling, placing material, sprinkling the material with water, and for all labor, equipment, tools and incidentals necessary to complete the work.

BID ITEM

Item 515: Topsoil - per cubic yard [cubic meter].

ITEM 520
HYDROMULCHING

This item shall govern for preparing ground, providing for sowing of seeds, mulching with cellulose fiber and other management practices along and across such areas as are designated on the plans and in accordance with these specifications. All areas shall be covered with live grass before acceptance.

MATERIALS:

1. Seeds: All seed must meet the requirements of the Texas Seed Law including the labeling requirements for showing purity, germination, name and type of seed. Seed furnished shall be of the previous season's crop for the date of the project. Each variety of seed shall be furnished and delivered in separate bags or containers. A sample of each variety shall be furnished for analysis and testing when directed by the Engineer. The amount of seed planted per acre shall be of the type specified below and shall equal or exceed the following percentages for purity and germination or an equivalent amount of pure live seed.

Common Name: Bermuda and Giant
Bermuda grass (hulled)

Scientific Name: Cynodon Dactylon

Purity: 95%

Germination: 90%

Annual Rye grass will be free of Johnson grass, field bind weed, dodder seed, and free of other seed to the limits allowable under the Federal Seed Act and applicable State Seed Laws.

Annual Rye grass will be added into slurry between October 1 through March 15. No additional cost will be charged to the City.

2. Wood Cellulose Fiber Mulch: Wood cellulose fiber mulch shall be natural cellulose fiber mulch produced from grinding clean, whole wood chips, or fiber produced from ground newsprint with a labeled ash content not to exceed 7%. The mulch shall be designed for use in conventional mechanical planting, hydraulic planting of seed or hydraulic mulching of grass seed, either alone or with fertilizer and other additives. The mulch shall be such that when applied, the material shall form a strong, moisture-retaining mat without the need of an asphalt binder.

The mulch material will also be dyed with a green color to assist in determining coverage and to provide an immediate pleasing appearance. The wood cellulose fiber is also required to be dispersed rapidly in water to form a homogeneous slurry and remain in such state when agitated in the hydraulic mulching unit with the specified materials.

3. Fertilizers: Fertilizer shall have a chemical analysis of 15-15-15 with micronutrients and shall be water soluble. (The figures in the analysis represent the percent of nitrogen, phosphoric acid and potash nutrients respectively.) Fifty percent or greater of the Nitrogen required shall be in the form of Nitrate Nitrogen ($N0_3$). The remaining Nitrogen required may be in the form urea Nitrogen ($C0(NH_2)_2$).

In the event it is necessary to substitute a fertilizer of a different analysis, it shall be a pelleted or granulated fertilizer with a lower concentration, but the total amount of nutrients furnished and applied per acre shall equal or exceed that specified for each nutrient.

The fertilizer shall be dry and in good physical condition. Fertilizer that is powdered or caked will be rejected.

4. Tactifier and binder: Natural vegetable gum containing gelling and hardening agents that when mixed with water and properly cured, shall form an insoluble network.

5. Water. Shall be furnished by the contractor and shall be clean and free of substances harmful to the growth of vegetation.

6. Herbicide: Herbicide used shall be an easy to apply, effective in a short term, chemical agent to inhibit or destroy weed growth, while being harmless to seed and grass being implanted.

7. Topsoil: Topsoil shall conform to the provisions of Item 515 "Topsoil".

CONSTRUCTION METHOD:

1. Security of stored hydromulch materials will be the sole responsibility of the Contractor at no additional expense to the City.

It is the contractor's responsibility to verify the location of all utility lines, electric cables, sprinkling systems and conduits so that the proper precautions must be taken not to disturb or damage any subsurface

improvements. Should obstructions be found, the Contractor will promptly notify the City Inspector. Any damage caused by the contractor shall be repaired by himself at no cost to the City. Any such repairs shall be subject to approval by the Inspector.

2. Preparation of Subsoil: Inspect subsoil for the presence of objectionable materials, such as rocks (2 inches [50 mm] in diameter and larger), concrete waste, building debris, weeds, grass or other material that would be detrimental to the growth of grasses. Protect existing underground improvements from damage.

Cultivate to a depth of 3 inches [76 mm] in areas to receive hydromulch. If compaction is due to equipment, traffic or storage, cultivate to a depth of 6 inches, and apply herbicide as directed by manufacturer.

Remove any foreign or objectionable materials collected during cultivation.

Grade to eliminate rough spots and low areas where ponding may occur. Assure positive drainage away from all buildings. Maintain smooth, uniform grades.

Hydromuch area and weed control shall consist of killing all weeds and maintaining a weed-free condition until completion of the project by applying herbicide as directed by the manufacturer.

3. Seeded Lawns: The following construction sequences and procedures shall be observed:

A) The contractor shall notify the Inspector not less than 48 hours in advance of any seeding operation and shall not begin the work until areas prepared or designated for seeding have been approved.

B) Before placement of hydromulch, all areas shall be cultivated to a depth of 3 inches [76 mm] unless otherwise specified or ordered by the City Inspector. Cultivation of the soil may be done by disc, spring tooth harrow, rototiler, or similar equipment. This operation shall be done at right angles to the natural flow of water on the slopes.

C) The area shall then be rolled in two directions; the second shall be done at right angles to the first rolling.

D) Rake the area to make it smooth and level. Add soil where necessary or as directed by the Inspector.

E) The finished grade shall be 1 inch (25 mm) below all curbs, sidewalks, and/or other appurtenances.

F) Apply the fertilizer at the rate and mixture specified. The fertilizer shall be applied by an approved hand or mechanical method.

G) Roll the area in one direction.

H) Slurry to be sprayed evenly in two intersecting directions with a hydraulic seeder.

I) Erect a barrier of stakes and strings, and post warning signs where necessary, or as directed by the Inspector.

J) Apply water as required to keep the mulch damp at all times throughout germination and initial growth period as determined by the Inspector.

K) Upon completion, all excess material shall be removed and disposed of off the project site at contractor's expense.

4. Slurry: The slurry will be mixed and spread uniformly over the area at the following rate:

Residential area or commercial area:
Wood Cellulose Fiber Mulch –2000 lb./acre.
Fertilizer – 400 lb./acre.
Bermuda – 1.5 lb./1000 sq. ft.
Annual Ryegrass (Oct. through March 15) –
20 lbs. per 1000 sq. ft.

Water and binder to be added according to manufacturer's recommendations.

5. Guarantee and Lawn Established Period: The guarantee and lawn established period shall begin immediately after the completion of the planting and shall start with the Provisional Acceptance and end with the Final Acceptance.

A) Provisional Acceptance:
Upon completion of hydromulching and written request of Contractor, the Inspector will inspect all the work for Provisional acceptance.

B) Guarantee Period:
The guarantee period shall begin upon completion of the provisional acceptance. All plant materials shall be guaranteed by the Contractor for a period of thirty days (30) from the date of provisional acceptance, to be in good, healthy, and nourished condition. The exceptions are damages resulting from neglect by the property owner, abuse or damage by others, or unusual phenomena or incidents which are beyond the Contractor's control.

During the lawn establishment period, it shall be the contractor's responsibility to ensure the continuing healthy growth. This care shall include labor, water and material necessary to keep the project in a presentable condition, including but not limit to removal of litter, mowing, trimming, removal of grass clippings, edging, fertilization, insecticide and fungicide applications, weed control, and repair and reseeding any and all damaged areas.

Water application shall be accomplished each week from March through October. An even application of one inch minimum of water shall be required over all lawn areas weekly. The rate and frequency of water application may be changed, as directed by the Inspector, depending on weather, and soil conditions.

C) Replacement:
The Contractor shall replace, without cost to the City, and as soon as weather conditions permit, all dead grassed areas not in a vigorous, thriving condition, as determined by the Inspector during and at the end of the guarantee period. Replacements shall be subject to all requirements stated in this specification. The Contractor shall make all necessary repairs to grades, grassed areas, and terrace paving required because of grass replacement at no cost to the City.

D) Final Inspection and Acceptance:
At the end of the guarantee period and upon written request of the contractor, the Inspector will inspect all guaranteed work for final acceptance. The written request shall be submitted to the City ten(10) days prior to the anticipated date of inspection.

Acceptance of hydromulching lawn as herein specified shall be based on a uniform stand of grass and a uniform grade at the time of final inspection. Area of two square feet or more that are bare or have a poor stand of grass and area not having a uniform grade for any cause before final inspection shall be regraded, rehydromulched and reseeded as specified at the Contractor's expense.

Upon completion by the Contractor of all repairs or renewals which may appear at that time to be necessary in the judgment of the City or its authorized representative, the final acceptance of the hydromulching will be issued.

MEASUREMENT:

Measurement of acceptable "Hydromulching", complete in place, shall be made by the square yard [square meter] and only for those areas designated on the plans, or for other areas directed by the Inspector. Fertilizers, wood cellulose fibers, seeds, herbicide and water will not be measured for payment.

BID ITEM:

Item 520: Hydromulching - per square yard [square meter]. (Residential or Commercial)