2848.00

TEXAS COMMISSION ON ENVIRONMENTAL QUALITY

Protecting Texas by Reducing and Preventing Pollution

March 10, 2009

Mr. John Davenport
Heiser Hollow Partners, LLC
12790 Merit Drive, Suite 100
Dallas, TX 75251

Re: Edwards Aquifer, Comal County
NAME OF PROJECT: Guadalupe River Club Unit 3; Located on the north side of FM 306, east of the FM 2673 and FM 306 intersection; Comal County, Texas
TYPE OF PLAN: Request for Approval of a Contributing Zone Plan (CZP); 30 Texas Administrative Code (TAC) Chapter 213 Subchapter B Edwards Aquifer
Edwards Aquifer Protection Program ID No. 2848.00; Investigation No. 722973; Regulated Entity No. RN105670590

Dear Mr. Davenport:

The Texas Commission on Environmental Quality (TCEQ) has completed its review of the CZP application for the above-referenced project submitted to the San Antonio Regional Office by Jacobs on behalf of Heiser Hollow Partners, LLC on December 22, 2008. Final review of the CZP was completed after additional material was received on February 11, 2009 and February 27, 2009. 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.*

BACKGROUND

The development for Guadalupe River Club has been divided into three phases or units. Guadalupe River Club Unit 1 (EAPP #2799.00), approved by letter on July 21, 2008, was approximately 11.79 acres with 1.66 acres of impervious cover for an entrance roadway and parking area. Engineered filter strips were approved for stormwater treatment.

Guadalupe River Club Unit 2 (EAPP #2839.00), approved on December 18, 2008, was 295.52 acres with 40.67 acres for single family residences. The low density residential project did not have more than 20 percent impervious cover so additional permanent BMPs were not required.

Guadalupe River Club Unit 3 was originally submitted with Unit 2, however, the layout of and the use of the residential cabins did not qualify for low density and thus, Unit 3 was removed from the project and submitted separately.

PROJECT DESCRIPTION

The proposed residential project will have an area of approximately 56.60 acres. It will include 76 clustered residential cabins, roadways, five wet vault units and vegetative filter strips. The impervious cover will be 6.11 acres (10.8 percent). Project wastewater will be disposed of by conveyance to the proposed Heiser Hollow Water Reclamation, LLC Center (Permit No. WQ0014806001) owned by the Heiser Hollow Partners, LLC.

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, five Stormceptor Units and engineered and natural filter strips, designed using the TCEQ technical guidance document, Complying with the Edwards Aquifer Rules: Technical Guidance on Best Management Practices (2005) will be constructed to treat stormwater runoff. The required total suspended solids (TSS) treatment for this project is 5,484 pounds of TSS generated from the 6.11 acres of impervious cover. The approved measures meet the required 80 percent removal of the increased load in TSS caused by the project. Refer to Table A for a summary of the BMP types and the TSS treatment amount.

Table A: BMP Summary

BMP Type	Impervious Cover Acreage (ac)	TSS Treatment (lb/yr)
Stormceptor	1.074	964.02
Engineered Filter Strip	4.877	4,377.24
Natural Filter Strip	0.159	143.08
Total	6.110	5,484.33

The Stormceptor units are produced by Rinker Materials and will follow the specifications provided in the plan sheets. Refer to Table B for a summary of the unit model, drainage area and TSS treatment for each drainage area.

Table B: Stormceptor BMP Summary

Drainage Area	STC Model	Total Acreage (ac)	Impervious Acreage (ac)	TSS Treatment Required (lb/yr)	TSS Treatment Provided (lb/yr)
A	2400	0.280	0.280	251.33	251.33
B	2400	0.290	0.290	260.30	260.30
C	2400	0.221	0.221	198.37	198.37
D	2400	0.203	0.203	182.21	182.21
E	4501	0.080	0.080	71.81	71.81
Total	---	1.074	1.074	964.02	964.02

The engineered and natural filter strips are in compliance with the requirements of the technical guidance manual. The engineered filter strip will have a minimum width of 15 feet and a maximum slope of 20 percent and at least 80 percent vegetation cover. The natural filter strip will have a minimum width of 50 feet and a maximum slope of 10 percent.

SPECIAL CONDITIONS

I. 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 format (Deed Recordation Affidavit, TCEQ-0625A) that you may use to deed record the approved CZP is enclosed.

II. Permanent pollution abatement measures shall be operational prior to occupancy of the facility or public use of the roadway.

III. As discussed with the project engineer, the limits of construction for this project and for the projects discussed in the Background Section of this letter will not extend outside the contributing zone boundary. If the limits of construction change or regulated activities are proposed on the recharge zone, a new plan or modification may be required.

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

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

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

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

During Construction:

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

9. If sediment escapes the construction site, the sediment must be removed at a frequency sufficient to minimize offsite impacts to water quality (e.g., fugitive sediment in street being washed into surface streams or sensitive features by the next rain). Sediment must be removed from sediment traps or sedimentation ponds not later than when design capacity has been significantly reduced. Litter, construction debris, and construction chemicals exposed to stormwater shall be prevented from becoming a pollutant source for stormwater discharges (e.g., screening outfalls, picked up daily).

10. Intentional discharges of sediment laden 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.

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

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

13. This approval does not authorize the installation of temporary aboveground storage tanks on this project. If the contractor desires to install a temporary aboveground storage tank for use during construction, an application to modify this approval must be submitted and approved prior to installation. The application must include information related to tank location and spill containment. Refer to Standard Condition No. 5, above.

After Completion of Construction:

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

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

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

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

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

If you have any questions or require additional information, please contact Charly Fritz of the Edwards Aquifer Protection Program of the San Antonio Regional Office at (210) 403-4065.

Sincerely,

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

MRV/CEF/eg

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

cc: Mr. Sandy Harwood, P.E., Jacobs
Mr. Tom Hornseth, P.E., Comal County Engineers Office
Ms. Velma Danielson, Edwards Aquifer Authority
TCEQ Central Records, Building F, MC212

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March 10, 2009

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If you have any questions or require additional information, please contact Charly Fritz of the Edwards Aquifer Protection Program of the San Antonio Regional Office at (210) 403-4065.

Sincerely,

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

MRV/CEF/eg

Enclosures: Deed Recordation Affidavit, Form TCEQ-0625A
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cc: Mr. Sandy Harwood, P.E., Jacobs
Mr. Tom Hornseth, P.E., Comal County Engineers Office
Ms. Velma Danielson, Edwards Aquifer Authority
TCEQ Central Records, Building F, MC212

Comal Co.

CONTRIBUTING ZONE PL
COMMENT RESPONSE TO T
COMMENTS JULY 10, 200

FOR

GUADALUPE RIVER CLUB
RANCH ROAD FM 306
COMAL COUNTY, TEXAS

PREPARED FOR:

HEISER HOLLOW PARTNERS, LLC
12790 MERIT DRIVE, SUITE 100
DALLAS, TEXAS 75251

PREPARED BY:

JACOBS
Carter Burgess

2705 BEE CAVE ROAD, SUITE 300
AUSTIN, TEXAS 78746

JULY 2008

C&B PROJECT NO. 050807

JACOBS
Carter Burgess

COMMENT RESPONSE TO TEXAS COMMISSION ON ENVIRONMENTAL QUALITY (TCEQ) COMMENTS JULY 10, 2008

July 16, 2008

Mr. Jason Jupe
TCEQ: Region 13
14250 Judson Road
San Antonio, Texas 78233

RECEIVED
JUL 2 1 2008
COUNTY ENGINEER

Guadalupe River Club-Unit 1 Comment and Responses to Contributing Zone Plan
Comal County, Texas

Mr. Jupe:

We have received your comments regarding our submittal on the Contributing Zone Plan for Guadalupe River Club located in Comal County, Texas, dated June 18, 2008. The comments have been addressed and our responses (bold italic) are below. Due to the additional letter following this, we have also submitted another full set of plans, one original and three copies.

1. Update the site plan to show finished contours of the roadway.

   We have complied; please see comment #3 for attached sheet reflecting contours

2. It appears that stormwater runoff will be allowed to exit the site/project limits prior to receiving treatment by sediment/erosion controls during the construction phase (see attached exhibit). Verify that the temporary measures will retain sediment onsite to the maximum extent practicable, and update the plan sheet to exhibit additional controls as necessary.

   The concrete road in this area will no longer be constructed at this time; however, we have installed temporary erosion control measures to retain sediment onsite. These measures are shown on the attached plan as well as in the construction documents.

3. Per email correspondence on 7/9/08, the investigator received a site plan detailing the treatment for a portion of roadway located outside the 2.18 acre Lot 1. Please incorporate this detail on a full-size plan sheet and submit one original and 3 copies.

   This sheet is attached and the area under concern has been circled for clarification.

4. All plan sheets submitted must be signed and sealed. If no changes are proposed from comments #1-3 above, please provide signed and sealed copies of the plan sheets provided in the NOD1 response.

   As stated earlier, due to the recent changes in construction scheduling, we are submitting one original and 3 copies of the entire set of plans.

   Due to these changes, we are also resubmitting our impervious cover calculations since the cover has now been reduced. Please see attached.

We have attached one original and three copies of the corrected material that will supplement the CZP application and we trust that this as well as the comments above will help in the continuation of your review. If you have any question, or need more information, regarding the information provided for Guadalupe River Club, please contact us at (512) 314-3100.

Sincerely,

Sandy Harwood, P.E.
Senior Project Manager

JACOBS
Carter Burgess

July 15, 2008

Mr. Jason Jupe
TCEQ: Region 13
14250 Judson Road
San Antonio, Texas 78233

Guadalupe River Club-Unit 1 Limits of Construction Change for Contributing Zone Plan
Comal County, Texas

Mr. Jupe:

This letter is to document proposed modifications the Guadalupe River Club-Unit 1 construction plans. Per our conversation July 14, 2008, approximately 270 linear feet of roadway will no longer be constructed during this phase of construction. Consequently, we will no longer propose vegetated filter strips as a permanent water quality BMP associated with this section of road. However, silt fence will be used along this alignment as a temporary erosion control BMP. In addition, the currently bare soil on the existing slope along this alignment will be seeded to reduce erosion and improve water quality.

We are making appropriate changes to our Contributing Zone Plan (CZP) to reflect the changes to impervious cover and limits of road construction. We have included a revised grading sheet and erosion control plan in this submittal along with the revisions to the CZP that we discussed today.

If you have any questions regarding this matter, please do not hesitate to contact me at 512-431-2660, or by e-mail at sandy.harwood@jacobs.com

Sincerely,

Sandy Harwood, P.E.
Senior Project Manager

1. Update the site plan to show finished contours of the roadway.

   We have complied; please see comment #3 for attached sheet reflecting contours

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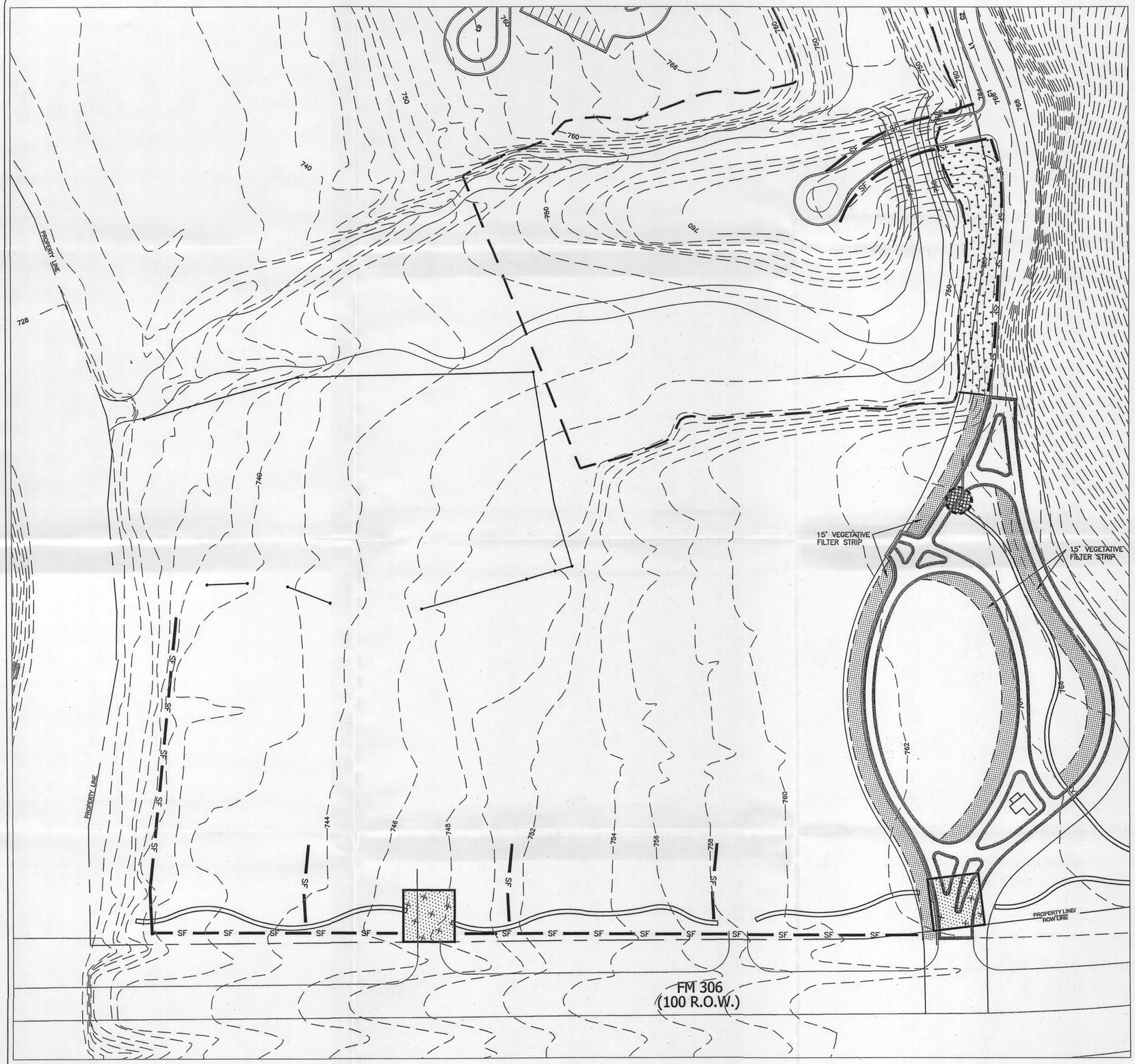

LEGEND

- BOUNDARY / RIGHT OF WAY LINE
- 726 EXISTING CONTOUR ELEVATIONS
- 726 PROPOSED CONTOUR ELEVATIONS
- PROPOSED STORM DRAIN
- SF TEMPORARY SILT FENCE
- STABILIZED CONSTRUCTION ENTRANCE
- INLET PROTECTION
- 15' VEGETATIVE FILTER STRIP
- SEEDING AREA

0 25 50 100

EROSION / SEDIMENTATION CONTROL NOTES:

1. CONTRACTOR IS TO SUBMIT A DEWATERING PLAN WHICH MAY BE A TEMPORARY DIVERSION CHANNEL, DIVERSION PIPE, PUMPS, COFFER DAM OR OTHER APPROVED METHOD. CONTRACTOR WILL OBTAIN DEWATERING PLAN APPROVAL PRIOR TO CONSTRUCTION. SANDBAGS, EARTHEN DIKES OR OTHER ERODIBLE MATERIALS ARE NOT ACCEPTABLE. CONTRACTOR SHALL MAINTAIN THE DEWATERING SYSTEM TO ENSURE PERFORMANCE. IF THE DEWATERING SYSTEM IS NOT PERFORMING, THE CONTRACTOR MUST FOLLOW THE ENVIRONMENTAL INSPECTOR'S DIRECTION TO ENSURE ADEQUATE PERFORMANCE.
2. FILL MATERIAL STORAGE – AT THE END OF THE WORK DAY THE CONTRACTOR SHOULD REMOVE ALL LOOSE EXCAVATED MATERIAL FROM THE CHANNEL AS DELINEATED ON THE APPROVED PLAN. NO CONSTRUCTION OR FILL MATERIALS CAN BE STORED WITHIN THE LIMITS OF THE CHANNEL.
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NOTE:
THESE PLANS ARE GENERAL IN NATURE; THE EROSION CONTROL BMPS SHOWN ON THESE PLANS CAN BE MODIFIED ON SITE TO ACCOUNT FOR ACTUAL FIELD CONDITIONS.

NO.	DATE	REVISION	BY

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Austin, Texas 78746
(512) 314-3100 Fax (512) 314-3535

STATE OF TEXAS
HENRY SANFORD HARWOOD
93504
LICENSED
PROFESSIONAL ENGINEER
7/15/08

(GUADALUPE RIVER CLUB) - CONSTRUCTION PLANS

EROSION & SEDIMENTATION CONTROL PLAN

GUADALUPE RIVER CLUB ENTRANCE PLAN
FM 306
COMAL COUNTY, TEXAS

PLOTTING SCALE: 1"= 40'
DRAWN BY: FF
DESIGNED BY: JCC
REVIEWED BY: SANDY HARWOOD
PROJECT #:050807.001

SHEET
C-101
3 OF 11

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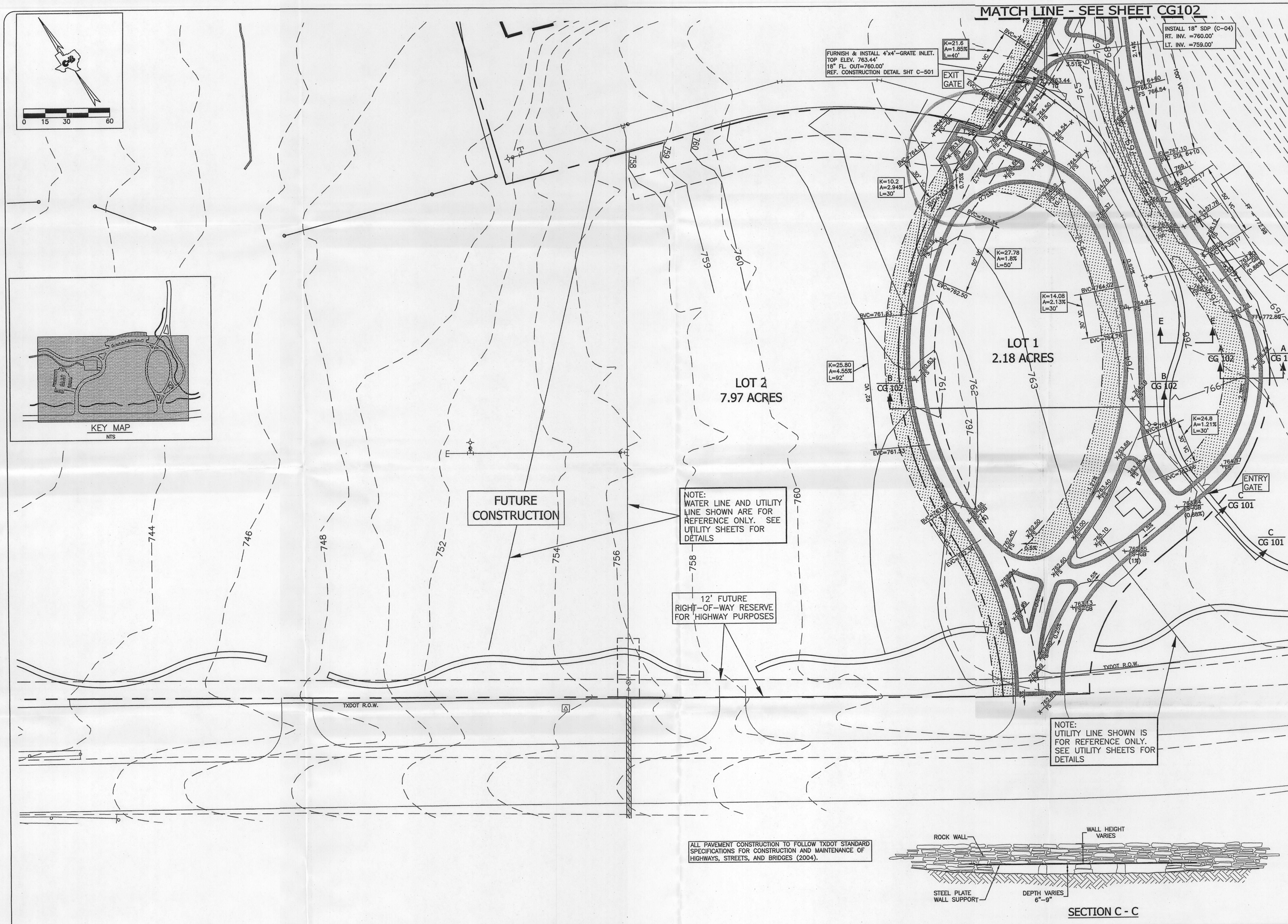

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(GUADALUPE RIVER CLUB) - CONSTRUCTION PLANS

STATE OF TEXAS
HENRY SANFORD HARWOOD
93504
LICENSED PROFESSIONAL ENGINEER
7/15/08

GRADING AND DRAINAGE DESIGN PLAN

GUADALUPE RIVER CLUB
ENTRANCE PLAN
FM 306
COMAL COUNTY, TEXAS

PLOTTING SCALE: 1"= 40'
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SHEET
CG101
4 OF 11

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3. Per email correspondence on 7/9/08, the investigator received a site plan detailing the treatment for a portion of roadway located outside the 2.18 acre Lot 1. Please incorporate this detail on a full-size plan sheet and submit one original and 3 copies.

   This sheet is attached and the area under concern has been circled for clarification.

4. All plan sheets submitted must be signed and sealed. If no changes are proposed from comments #1-3 above, please provide signed and sealed copies of the plan sheets provided in the NOD1 response.

   As stated earlier, due to the recent changes in construction scheduling, we are submitting one original and 3 copies of the entire set of plans.

   Due to these changes, we are also resubmitting our impervious cover calculations since the cover has now been reduced. Please see attached.

7. X **ATTACHMENT C - Project Narrative.** A detailed narrative description of the proposed project is found at the end of this form.

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)
   - __ Other:

PROJECT INFORMATION

9. The type of project is:
   - __ Residential: # of Lots:
   - __ Residential: # of Living Unit Equivalents:
   - __ Commercial
   - __ Industrial
   - X Other: **Residential entry way, serving approx 450 homes**

10. Total project area (size of site): **11.79** Acres
    Total disturbed area: **5.50** Acres

11. Projected population: **1100**

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

Impervious Cover of Proposed Project	Sq. Ft.	Sq. Ft./Acre	Acres
Structures/Rooftops (rock walls)	**67,648.7**	÷ 43,560 =	**1.55**
Parking	**1000**	÷ 43,560 =	**.023**
Other paved surfaces (Lot 1)	23000	÷ 43,560 =	0.53
Total Impervious Cover	**97398.7**	÷ 43,560 =	**2.10**
		Total Impervious Cover ÷ Total Acreage x 100 =	**17.8 %**

13. X **ATTACHMENT D - Factors Affecting Surface Water Quality.** A description of factors that could affect surface water quality is found as at the end of this form. If applicable, this should included the location and description of any discharge associated with industrial activity other than construction.

14. X Only inert materials as defined by 30 TAC 330.2 will be used as fill material.

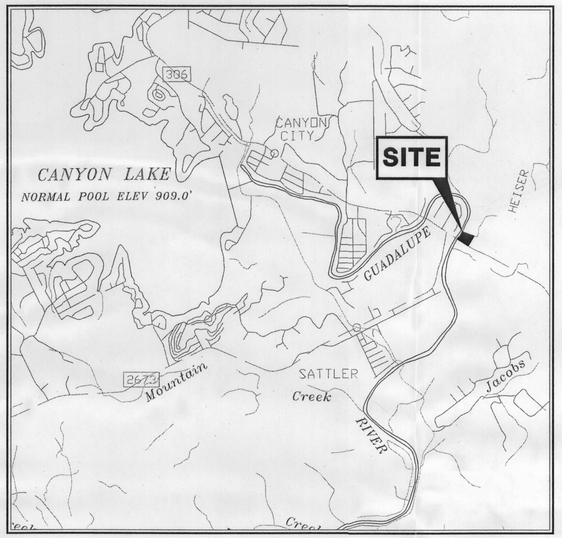
GUADALUPE RIVER CLUB ENTRANCE PLAN

IN COMAL COUNTY, TX

F.M. 306

RECEIVED
JUL 2 1 2008
COUNTY ENGINEER

DEVELOPER:	PRM REALTY GROUP 12790 MERIT DRIVE, SUITE 100 DALLAS, TX 75251 (469) 916-5840 (469) 916-5859 FAX
OWNER:	HEISER HOLLOW PARTNERS. LLC 12790 MERIT DRIVE, SUITE 100 DALLAS, TX 75251 (469) 916-5840 (469) 916-5859 FAX
ENGINEER:	JACOBS CARTER BURGESS INC. 2705 BEE CAVE ROAD, SUITE 300 AUSTIN, TEXAS 78746 (512)314-3100 (512)314-3135 FAX
LANDSCAPE ARCHITECT:	N/A
SURVEYOR:	JACOBS CARTER BURGESS INC. 2705 BEE CAVE ROAD, SUITE 300 AUSTIN, TEXAS 78746 (512)314-3100 (512)314-3135 FAX



MAPSCO GRID #
N/A

VICINITY MAP
N.T.S.

MAPSCO PAGE #
N/A

SUBMITTAL DATE
JULY 14, 2008

SHEET INDEX

SHEET NO.		TITLE / DESCRIPTION
CIVIL		
C-000	1 OF 11	COVER SHEET
CD101	2 OF 11	DEMOLITION PLAN
C-101	3 OF 11	EROSION SEDIMENTATION CONTROL PLAN
CG101	4 OF 11	GRADING & DRAINAGE DESIGN PLAN
CG102	5 OF 11	GRADING & DRAINAGE DESIGN PLAN
CG103	6 OF 11	EXISTING DRAINAGE MAP
CG104	7 OF 11	DESIGN DRAINAGE MAP
CU101	8 OF 11	UTILITY LAYOUT
CU102	9 OF 11	UTILITY LAYOUT AND DETAILS
CU103	10 OF 11	UTILITY DETAILS
C-501	11 OF 11	CONSTRUCTION DETAILS

GENERAL NOTES:

THIS PROJECT IS LOCATED IN THE EDWARDS AQUIFER CONTRIBUTING ZONE.

THIS PROJECT IS PARTIALLY AFFECTED BY A 100 YR. FLOOD PLAIN AS SHOWN ON THE FEMA FLOOD INSURANCE RATE MAP NO. 48091C0260F ZONE "AE" FOR COMAL COUNTY, TEXAS, EFFECTIVE DATE MARCH 10, 2006.

LEGAL DESCRIPTION

CALLED 458.01 ACRES. DOC NO. 200606004456 O.R.C.C.T.

SUBMITTED BY :

7/15/08

HENRY SANFORD HARWOOD, P.E.
LICENSED PROFESSIONAL ENGINEER NO. 93504
JACOBS CARTER BURGESS INC.
2705 BEE CAVE ROAD, SUITE 300
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STATE OF TEXAS
HENRY SANFORD HARWOOD
93504
LICENSED
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(GUADALUPE RIVER CLUB) - CONSTRUCTION PLANS

COVER SHEET

GUADALUPE RIVER CLUB
ENTRANCE PLAN
FM 306
COMAL COUNTY, TEXAS

PLOTTING SCALE: 1"= 40'
DRAWN BY: FF
DESIGNED BY: JCC
REVIEWED BY: SANDY HARWOOD
PROJECT #:050807.001

SHEET
C-000
1 OF 11

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REVIEWED BY:	SANDY HARWOOD
PROJECT #:	050807.001

SHEET CD101
2 OF 11

GUADALUPE RIVER CLUB
ENTRANCE PLAN
FM 306
COMAL COUNTY, TEXAS

DEMOLITION PLAN

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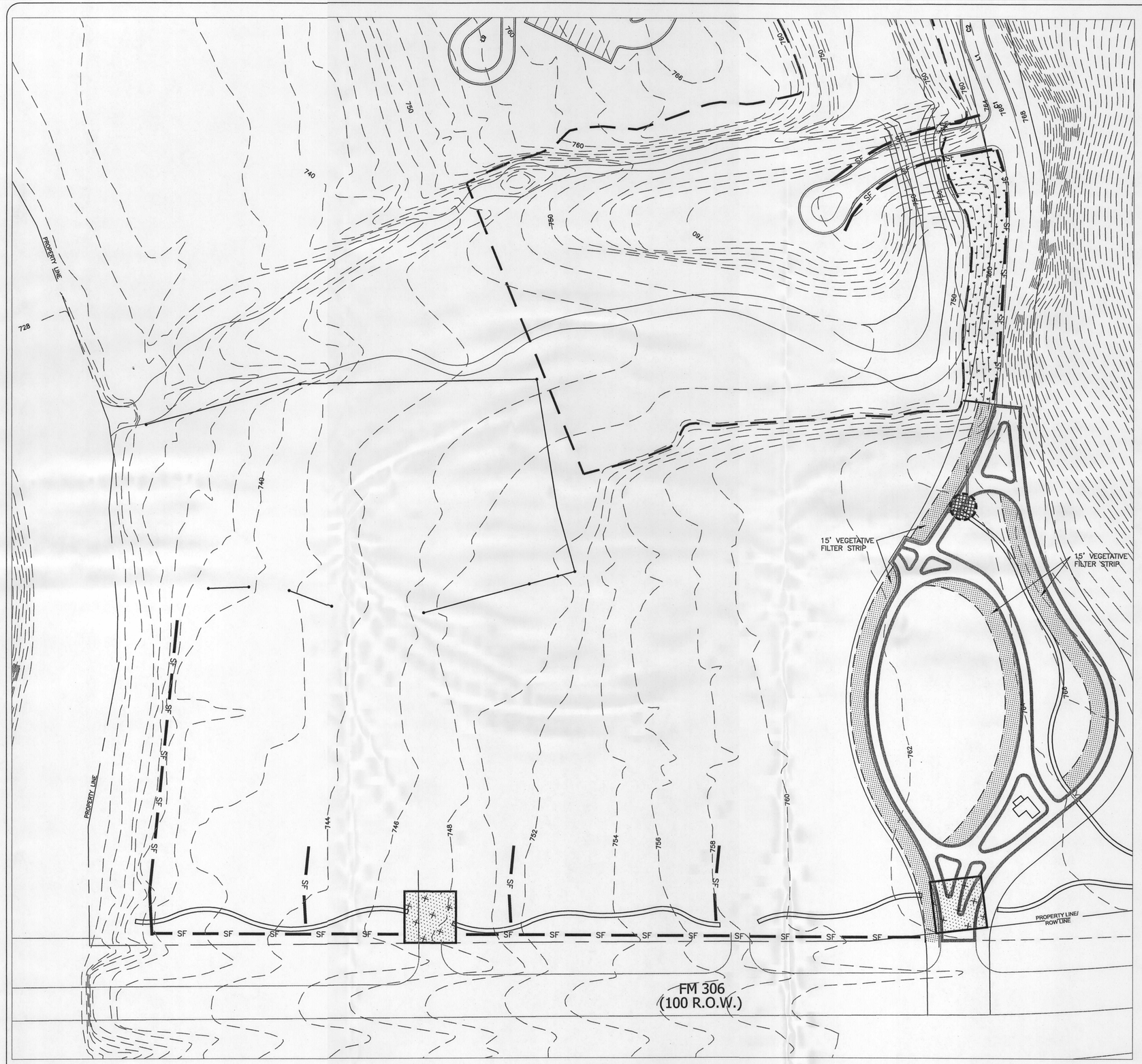

LEGEND

- BOUNDARY / RIGHT OF WAY LINE
- 726 EXISTING CONTOUR ELEVATIONS
- 726 PROPOSED CONTOUR ELEVATIONS
- PROPOSED STORM DRAIN
- SF TEMPORARY SILT FENCE
- STABILIZED CONSTRUCTION ENTRANCE
- INLET PROTECTION
- 15' VEGETATIVE FILTER STRIP
- SEEDING AREA

0 25 50 100

EROSION / SEDIMENTATION CONTROL NOTES:

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NO.	DATE	REVISION	BY

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LICENSED
PROFESSIONAL ENGINEER
7/15/08

(GUADALUPE RIVER CLUB) - CONSTRUCTION PLANS

EROSION & SEDIMENTATION CONTROL PLAN

GUADALUPE RIVER CLUB
ENTRANCE PLAN
FM 306
COMAL COUNTY, TEXAS

PLOTTING SCALE:	1"= 40'
DRAWN BY:	FF
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REVIEWED BY:	SANDY HARWOOD
PROJECT #:	050807.001

SHEET
C-101
3 OF 11

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MATCH LINE - SEE SHEET CG102

KEY MAP
NTS

LOT 1
2.18 ACRES

LOT 2
7.97 ACRES

FUTURE CONSTRUCTION

NOTE:
WATER LINE AND UTILITY LINE SHOWN ARE FOR REFERENCE ONLY. SEE UTILITY SHEETS FOR DETAILS

12' FUTURE RIGHT-OF-WAY RESERVE FOR HIGHWAY PURPOSES

NOTE:
UTILITY LINE SHOWN IS FOR REFERENCE ONLY. SEE UTILITY SHEETS FOR DETAILS

FURNISH & INSTALL 4'x4'-GRATE INLET.
TOP ELEV. 763.44'
18" FL OUT=760.00'
REF. CONSTRUCTION DETAIL SHT C-501

INSTALL 18" SDP (C-04)
RT. INV. =760.00'
LT. INV. =759.00'

EXIT GATE

ENTRY GATE

TXDOT R.O.W.

ALL PAVEMENT CONSTRUCTION TO FOLLOW TXDOT STANDARD SPECIFICATIONS FOR CONSTRUCTION AND MAINTENANCE OF HIGHWAYS, STREETS, AND BRIDGES (2004).

SECTION C - C

ROCK WALL
WALL HEIGHT VARIES
STEEL PLATE WALL SUPPORT
DEPTH VARIES 6"-9"

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7/5/08

(GUADALUPE RIVER CLUB) - CONSTRUCTION PLANS

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CG101
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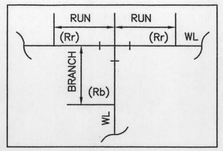
UTILITY PLAN LEGEND

- 100 YEAR FLOOD PLAIN
- SS — SANITARY SEWER LINE
- WASTEWATER MANHOLE
- CB — WASTEWATER CLEAN OUT
- FIRE HYDRANT
- WATER VALVE
- IRRIGATION METER
- WATER METER
- POST INDICATOR VALVE
- W — WATER LINE
- W — FIRE HYDRANT ASSEMBLY
- 690 — EXISTING CONTOUR
- 830 — PROPOSED CONTOUR
- PROPERTY BOUNDARY
- FM — FM — FORCE MAIN
- BFP — BACKFLOW PREVENTER
- E — ELECTRIC MANHOLE
- T — TRANSFORMER
- ELECTRIC METER

NOTE: ALL WATERLINE OUTSIDE ROADWAY TO BE ULTRA-BLUE AWWA C909 PIPE, ALL OTHER TO BE DUCTILE IRON.

NOTE: SANITARY SEWER COVER VARIES, MINIMUM COVER IS 3' ABOVE TOP OF PIPE.



TEE RESTRAINT DETAIL

NOTES:

1. RESTRAINT DISTANCES ARE CALCULATED USING 200 PSI TEST PRESSURE.
2. USE EBAA DUCTILE IRON RESTRAINT – SERIES 1100 MEGALUG'

0 20 40 80

SHARED WATER/PEC UTILITY EASEMENT
100 YR FLOOD PLAIN
EXISTING UTILITY LINE
3-TRANSFORMERS 2-JUNCTION BOXES
1-2" CAP
12"x2" WATER SERVICE TAP
1-6" FIRE HYDRANT 1-6" GATE VALVE 1-6" SWIVEL TEE RESTRAINT 54'
1-12"X12"X12" TEE 1-12" GATE VALVE Rr=20' Rb=30'
1-11.25° BEND RESTRAINT 5' EACH SIDE
1-11.25° BEND RESTRAINT 5' EACH SIDE
1-11.25° BEND RESTRAINT 5' EACH SIDE
PROPOSED 15' WATER EASEMENT
PROPOSED 20' UTILITY EASEMENT
UTILITY TRENCH
-END CLEANOUT -MANHOLE SEE DETAIL CU102
PROPOSED 12" WATER LINE
PROPOSED 15' WATER EASEMENT
PROPOSED 6" WATER LINE
PROPOSED 12" WATER LINE
PROPOSED 20' UTILITY EASEMENT
12' FUTURE RIGHT-OF-WAY RESERVE FOR HIGHWAY PURPOSES
TIE INTO EX 12" WATER LINE
F.M. HWY 306
100 YR FLOOD PLAIN
EXISTING SEPTIC FIELD
BUILDING
1-6" CAP RESTRAINT 54' BACK
EXISTING UTILITY LINE
1-6" FIRE HYDRANT 1-6" GATE VALVE 1-6" SWIVEL TEE Rr=16' Rb=1'
1-12"X12"6" TEE 1-6" GATE VALVE Rr=20' Rb=30'
PROPOSED 6" WATER LINE
PROPOSED 12" WATER LINE
UTILITY TRENCH
BUILDING

NOTE: UTILITY TRENCH INCLUDES ELECTRIC, PHONE, CABLE, & GAS SERVICE. SEE TYPICAL CROSS SECTIONS TO IDENTIFY UTILITIES IN TRENCH AT SPECIFIC LOCATIONS.

UTILITY TRENCH
PROPOSED 12" WATER LINE
3" LOW PRESSURE SANITARY SEWER
INLINE FLUSHING AND MANHOLE @ JUNCTION SEE DETAIL CU102
UTILITY CROSSING: SANITARY SEWER LINE CROSSING 12" WATER LINE 6" DUCTILE IRON PIPE CENTERED ON WATER LINE CROSSING
SANITARY SEWER SERVICE
3" LOW PRESSURE SANITARY SEWER
1-22.5° BEND RESTRAINT 6' EACH SIDE
1-11.25° BEND RESTRAINT 3' EACH SIDE
6"x6"x6" TEE 2-6" GATE VALVE Rr=16' Rb=1'
1-11.25° BEND RESTRAINT 3' EACH SIDE
PROPOSED 6" WATER LINE
1-6" FIRE HYDRANT 1-6" GATE VALVE 1-6" SWIVEL TEE
JUNCTION BOX
1" SERVICE
WATER METER
UTILITY TRENCH
-END CLEANOUT -MANHOLE SEE DETAIL CU102
SANITARY SEWER SERVICE
PROPOSED 20' UTILITY EASEMENT
UTILITY TRENCH
12' FUTURE RIGHT-OF-WAY RESERVE FOR HIGHWAY PURPOSES
MAINTAIN 10' SEPARATION FROM OUTSIDE-EDGE TO OUTSIDE-EDGE OF WATER LINE AND WASTEWATER LINE
UTILITY CROSSING: SANITARY SEWER LINE 18" STORM DRAIN SEE DRAINAGE SHEET FOR DETAILS
UTILITY CROSSING: SANITARY SEWER LINE CROSSING 12" WATER LINE 6" DUCTILE IRON PIPE CENTERED ON WATER LINE CROSSING
1-1/2" LOW PRESSURE SANITARY SEWER
SANITARY SEWER SERVICE
EXISTING SLAB; PROPOSED BUILDING
1" WATER METER
1-90° BEND RESTRAINT 26' EACH SIDE
1-6" FIRE HYDRANT 1-6" GATE VALVE 1-6" SWIVEL TEE
PROPOSED 6" WATER LINE
BUILDING
1-6" FIRE HYDRANT 1-6" GATE VALVE 1-6" SWIVEL TEE
EXISTING SEPTIC FIELD
1-1/2" LOW PRESSURE SANITARY SEWER
1-6" CAP RESTRAINT 54' BACK
-END CLEANOUT -MANHOLE SEE DETAIL CU102
APPROXIMATE LOCATION OF EXISTING UTILITY POLE TO BE REPLACED BY PEC
SANITARY SEWER SERVICE
PROPOSED 20' UTILITY EASEMENT
UTILITY TRENCH
12' FUTURE RIGHT-OF-WAY RESERVE FOR HIGHWAY PURPOSES

NO.	DATE	REVISION	BY
1	4/4/08	MOVED PEC LINE, SIZED LPSS	

JACOBS
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Austin, Texas 78746
(512) 314-3100 Fax (512) 314-3135

STATE OF TEXAS
HENRY SANFORD HARWOOD
93504
LICENSED
PROFESSIONAL ENGINEER

UTILITY LAYOUT

GUADALUPE RIVER CLUB ENTRANCE PLAN
FM 306
COMAL COUNTY, TEXAS

(QUADALUPE RIVER CLUB) - CONSTRUCTION PLANS

PLOTTING SCALE: 1"= 40'
DRAWN BY: FF
DESIGNED BY: JCC
REVIEWED BY: SANDY HARWOOD
PROJECT #:050807.001

SHEET
CU101
8 OF 11

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...\..\XREF\050807_CSSP01.dwg
...\..\XREF\050807_CSSP01.dwg

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GRADING & STORM DRAINAGE LEGEND

- PROPERTY BOUNDARY
- EXISTING CONTOUR (e.g. 830)
- 100 YEAR FLOOD PLAIN
- DRAINAGE AREA BOUNDARY
- DRAINAGE FLOW
- RETAINING WALL
- DRAINAGE INLET
- PR-A / 1.3 Ac. — PROPOSED DRAINAGE AREA LABEL

PR-C 1.66 Ac.

LOT 3

PR-B 2.41 Ac.

PR-A2 2.34 Ac.

APPROXIMATE LIMIT OF "ZONE AE" 100-YR FLOOD
BASED ON FIRM MAP NUMBER 48091C 0260 F
DATED: "PRELIMINARY MAR. 10, 2006"

EXISTING BUILDINGS TO REMAIN. (TYP.)

PROPOSED STREETS FOR ENTRANCE PHASE (TYPICAL)

LOT 2

LOT 1

PR-A1 10.77 Ac.

PROPOSED GRASS PARKING AREA (Ac. 3.6)

PR-A1 10.77 Ac.

GUADALUPE RIVER

FM 306

0 25 50 100

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HENRY SANFORD HARWOOD
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7/15/01

(GUADALUPE RIVER CLUB) - CONSTRUCTION PLANS

DESIGN DRAINAGE MAP

GUADALUPE RIVER CLUB
ENTRANCE PLAN
FM 306
COMAL COUNTY, TEXAS

PLOTTING SCALE: 1" = 40'
DRAWN BY: FF
DESIGNED BY: JCC
REVIEWED BY: SANDY HARWOOD
PROJECT #:050807.001

SHEET
CG104
7 OF 11

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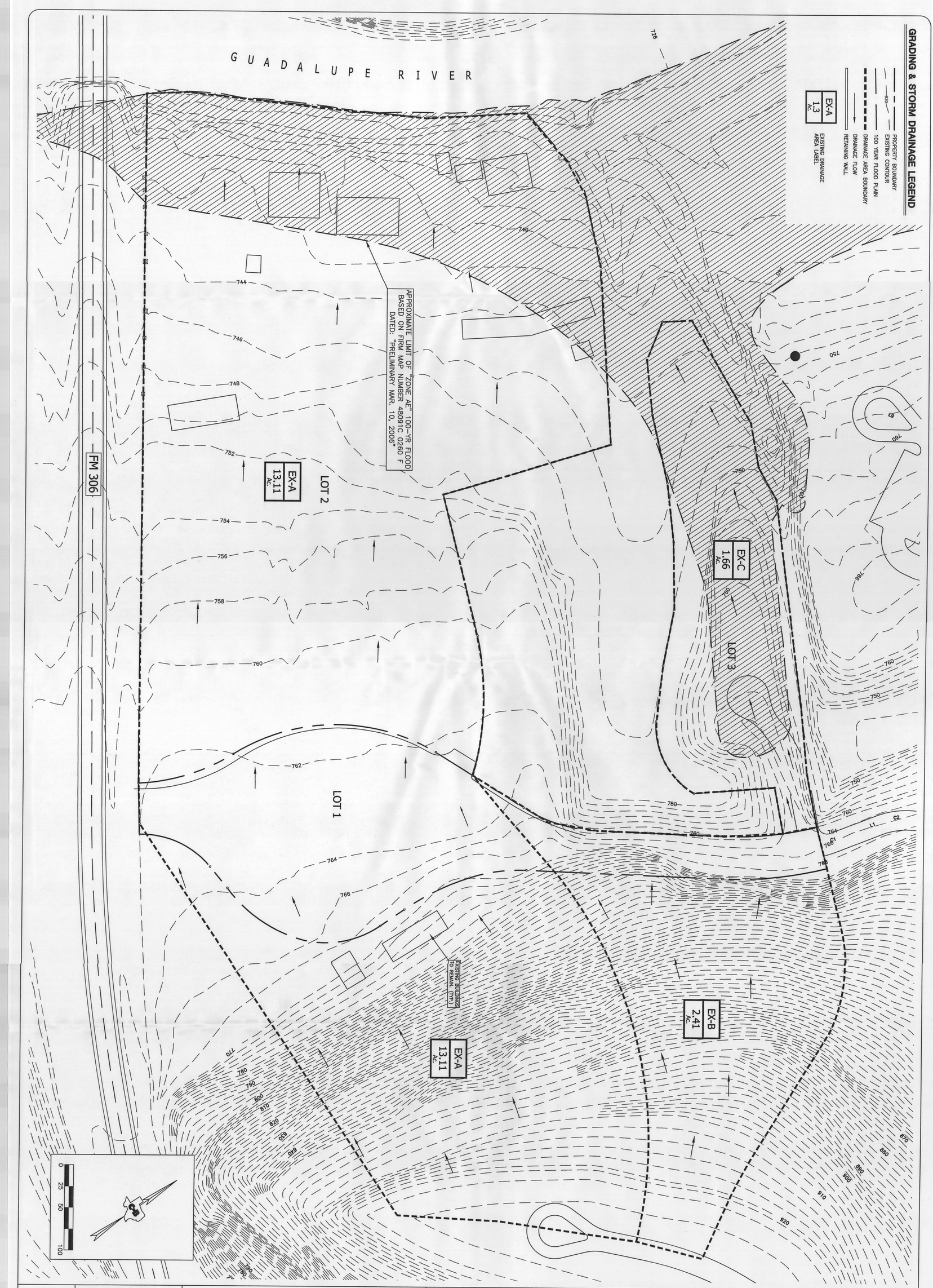

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DRAWN BY:	FF
DESIGNED BY:	JCC
REVIEWED BY:	SANDY HARWOOD
PROJECT #:	050807.001

SHEET CG103 6 OF 11

GUADALUPE RIVER CLUB
ENTRANCE PLAN
FM 306
COMAL COUNTY, TEXAS

EXISTING DRAINAGE MAP

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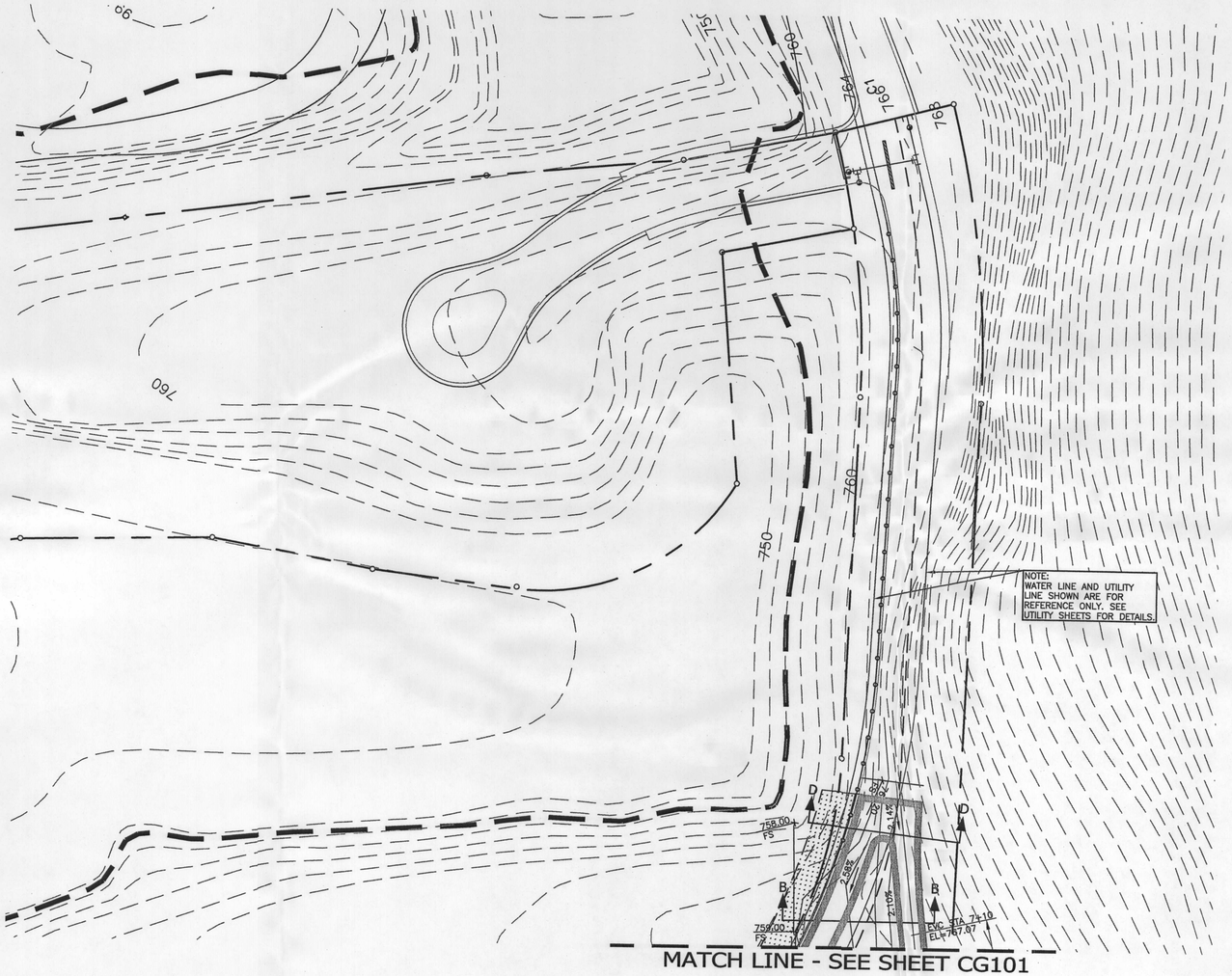
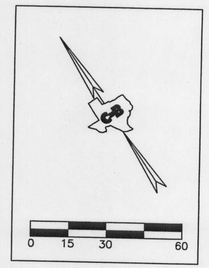
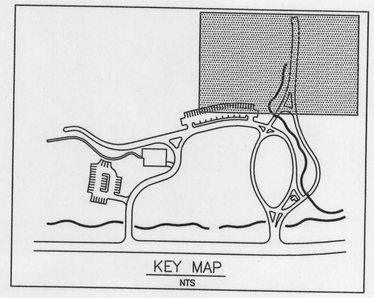
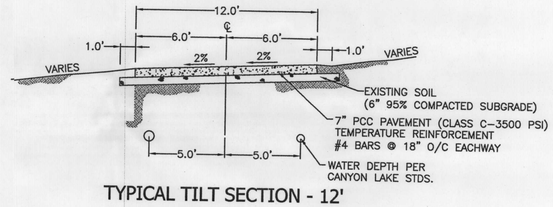


MATCH LINE - SEE SHEET CG101

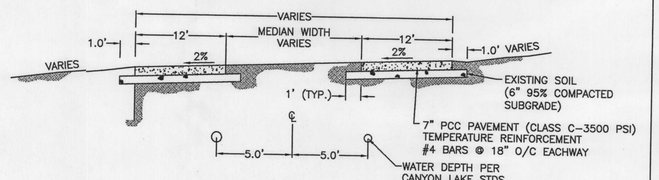




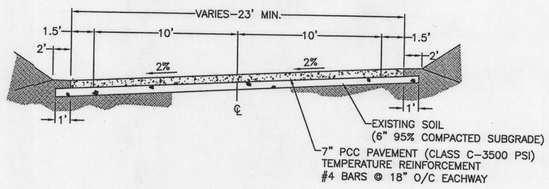
KEY MAP
NTS



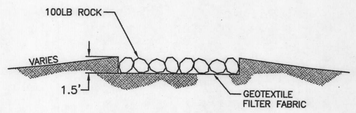
TYPICAL TILT SECTION - 12'
SECTION A - A



TYPICAL TILT SECTION - 12'
WITH GRASS MEDIAN
SECTION B - B



TYPICAL TILT SECTION - 23' MIN
SECTION D - D



ROCK SLOPE PROTECTION
(ROCK RIP-RAP)

CONCRETE HAS OPTION TO BE COLORED AND\OR TEXTURED PER LANDSCAPE ARCHITECT'S PLANS.

ALL PAVEMENT CONSTRUCTION TO FOLLOW TXDOT STANDARD SPECIFICATIONS FOR CONSTRUCTION AND MAINTENANCE OF HIGHWAYS, STREETS, AND BRIDGES (2004).

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STATE OF TEXAS
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88504
LICENSED
PROFESSIONAL ENGINEER
7/15/08

(GUADALUPE RIVER CLUB) - CONSTRUCTION PLANS

GRADING AND
DRAINAGE DESIGN PLAN

GUADALUPE RIVER CLUB
ENTRANCE PLAN
FM 306
COMAL COUNTY, TEXAS

PLOTTING SCALE: 1"= 40'
DRAWN BY: FF
DESIGNED BY: JCC
REVIEWED BY: SANDY HARWOOD
PROJECT #:050807.001

SHEET
CG102
5 OF 11

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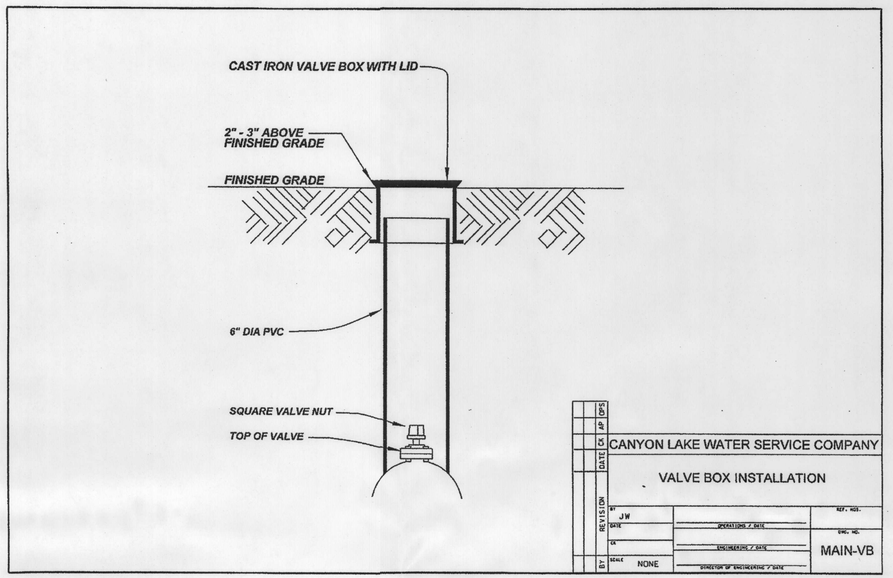
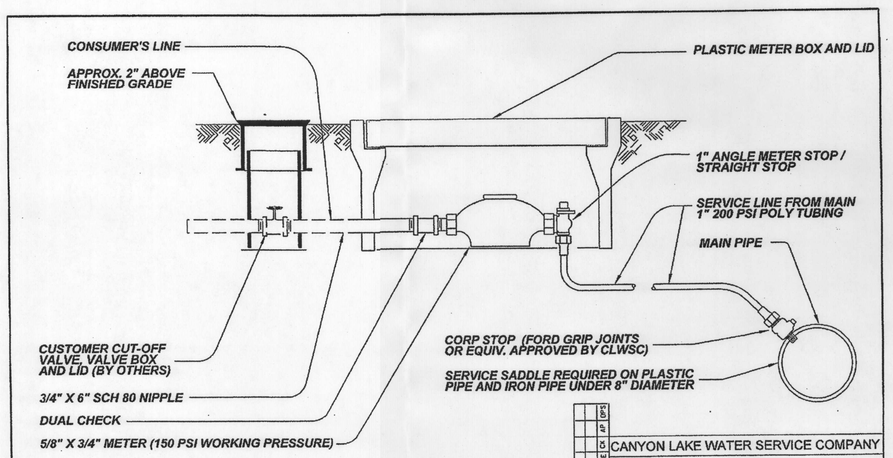


CANYON LAKE WATER SERVICE COMPANY			
VALVE BOX INSTALLATION			
REVISION	BY	JW	OPERATIONS / DATE
	DATE		ENGINEERING / DATE
	CK		DIRECTOR OF ENGINEERING / DATE
	APP		
	DES		
BY:	SCALE	NONE	MAIN-VB



NOTES:

1. SERVICE SADDLES SHALL BE WRAPPED COMPLETELY WITH 8 MIL. POLYETHYLENE FILM
2. PIPING AND TUBING SHALL BE BEDDED IN GRANULAR MATERIALS AS REQUIRED IN THE SPECIFICATIONS
3. METERS SUPPLIED BY CLWSC

CANYON LAKE WATER SERVICE COMPANY			
1" SERVICE			
REVISION	BY	JW	OPERATIONS / DATE
	DATE		ENGINEERING / DATE
	CK		DIRECTOR OF ENGINEERING / DATE
	APP		
	DES		
BY:	SCALE	NONE	SER-1

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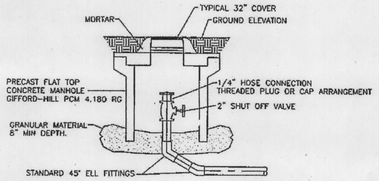
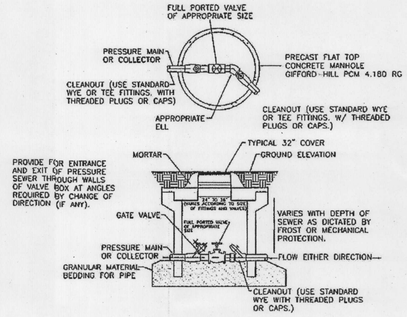
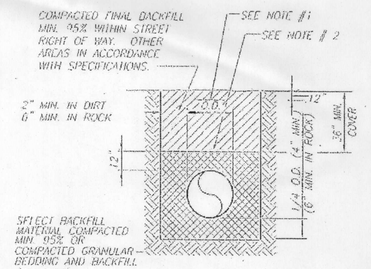


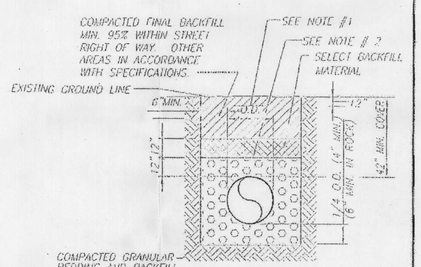
VALVE BOX AND CLEANOUT ARRANGEMENTS
AT END OF PRESSURE MAIN OR COLLECTOR BRANCH
LOCATE AT END OF ALL SYSTEM LINES
NTS



VALVE BOX AND CLEANOUT ARRANGEMENTS
ALONG STRAIGHT RUNS AND CHANGES IN DIRECTION
NTS



1-1/4" PUMP DISCHARGE LINES



LOW PRESSURE SEWER MAINS

NOTES:

1. UNDERGROUND MARKING TAPE MARKED "CAUTION SEWER LINE BURIED BELOW" BY TERRA TAPE OR APPROVED EQUAL. LOCATED 12" BELOW FINISHED GRADE.
2. TRACER WIRE FOR SEWER PIPELINE AND DISCHARGE PIPING, HIGH MOLECULAR WEIGHT - POLYETHYLENE TRACER WIRE, 1-#14 AWG, BY PAIGE ELECTRIC OR APPROVED EQUAL. SPLICING SHALL BE WITH 3M DBY/DBR DIRECT BURY SPLICE KITS. TRACER WIRE LEAD CONNECTIONS TO BE LOCATED IN "IN-LINE FLUSHING ASSEMBLIES".
3. TWO 45° BENDS SHALL BE USED TO ACCOMPLISH A 90° BEND.

PIPE INSTALLATION DETAILS

NO.	DATE	REVISION	BY

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STATE OF TEXAS
HENRY SANFORD HARWOOD
93504
LICENSED
PROFESSIONAL ENGINEER
7/15/08

(QUADALUPE RIVER CLUB) - CONSTRUCTION PLANS

UTILITY DETAILS

GUADALUPE RIVER CLUB
ENTRANCE PLAN
FM 306
COMAL COUNTY, TEXAS

PLOTTING SCALE: 1"= 40'
DRAWN BY: FF
DESIGNED BY: JCC
REVIEWED BY: SANDY HARWOOD
PROJECT #:050807.001

SHEET
CU103
10 OF 11

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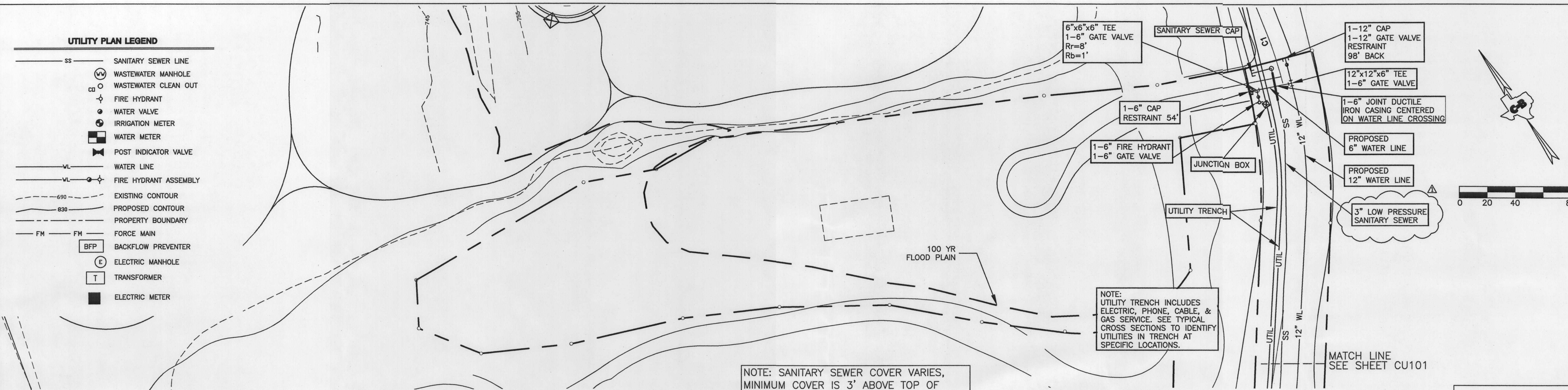

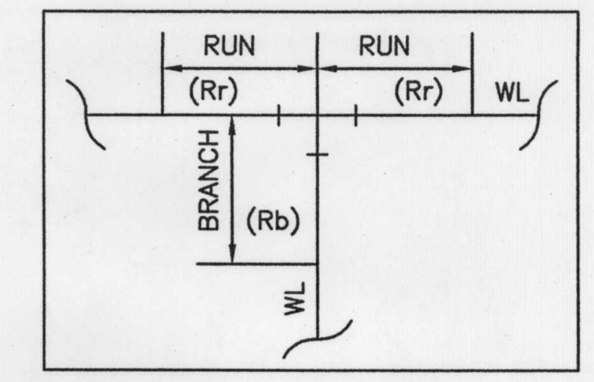

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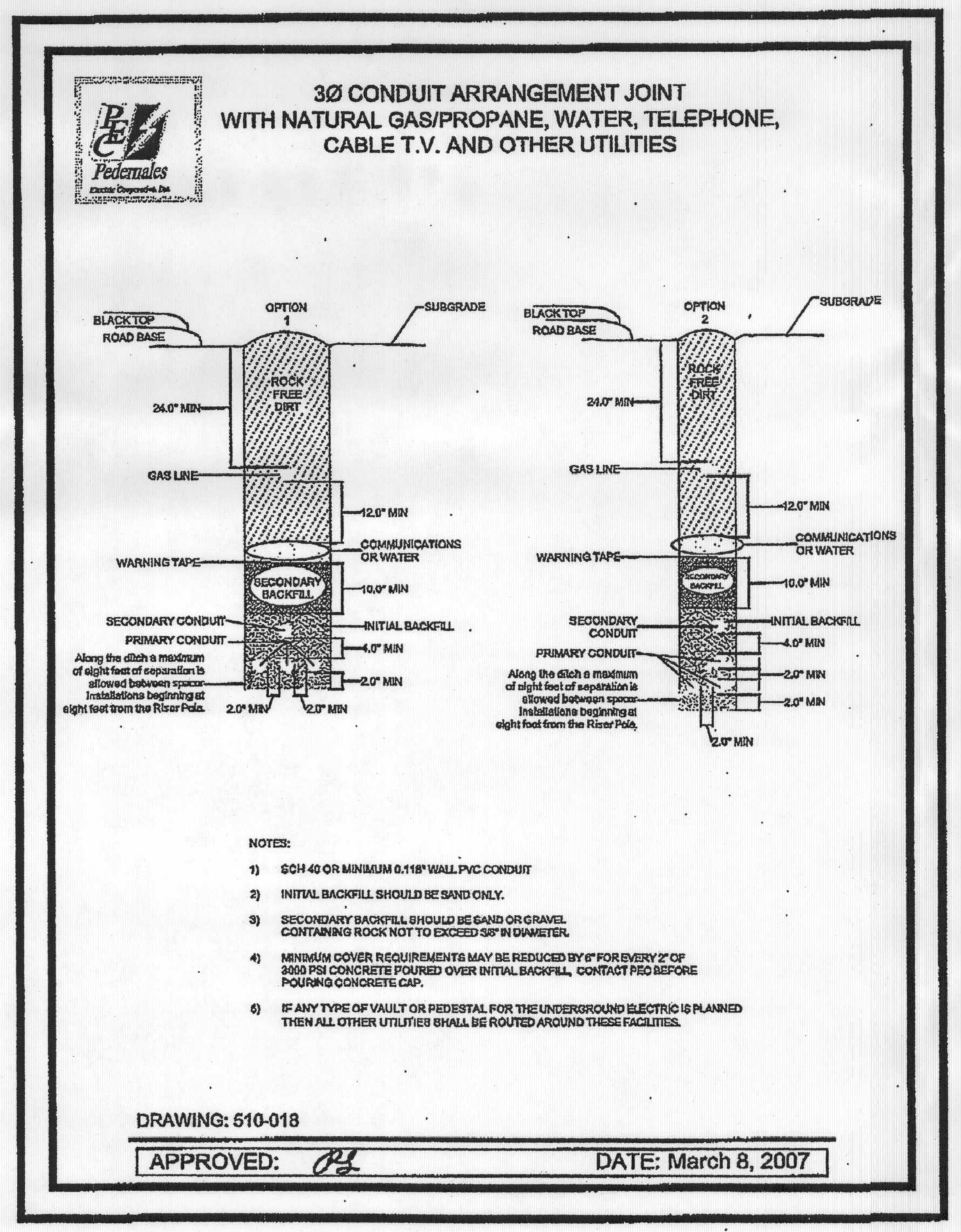
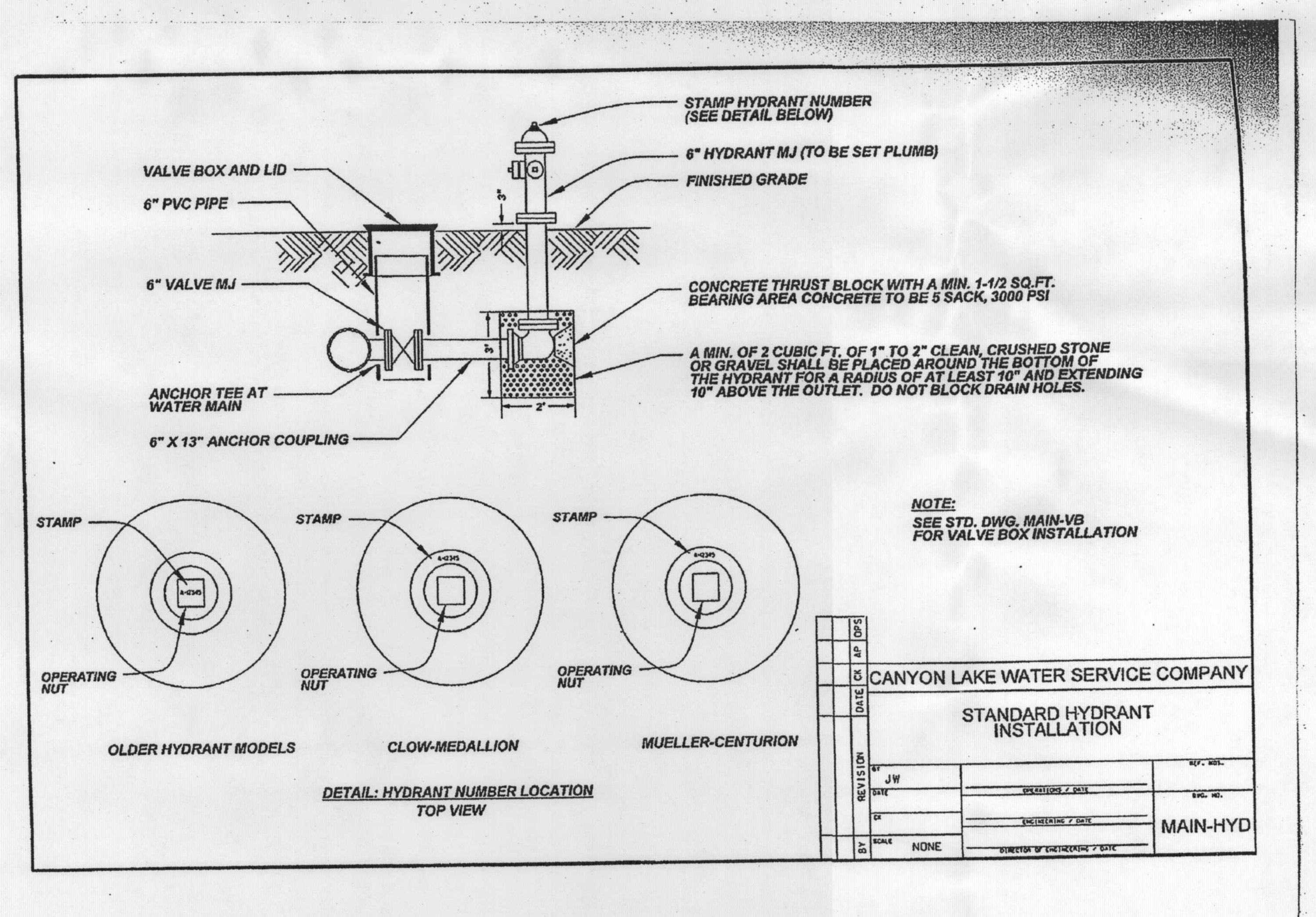
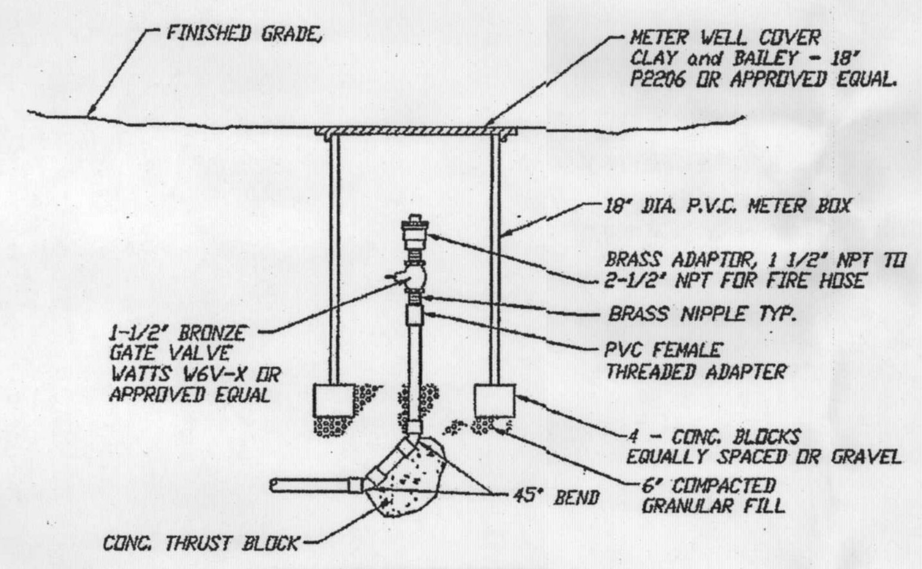
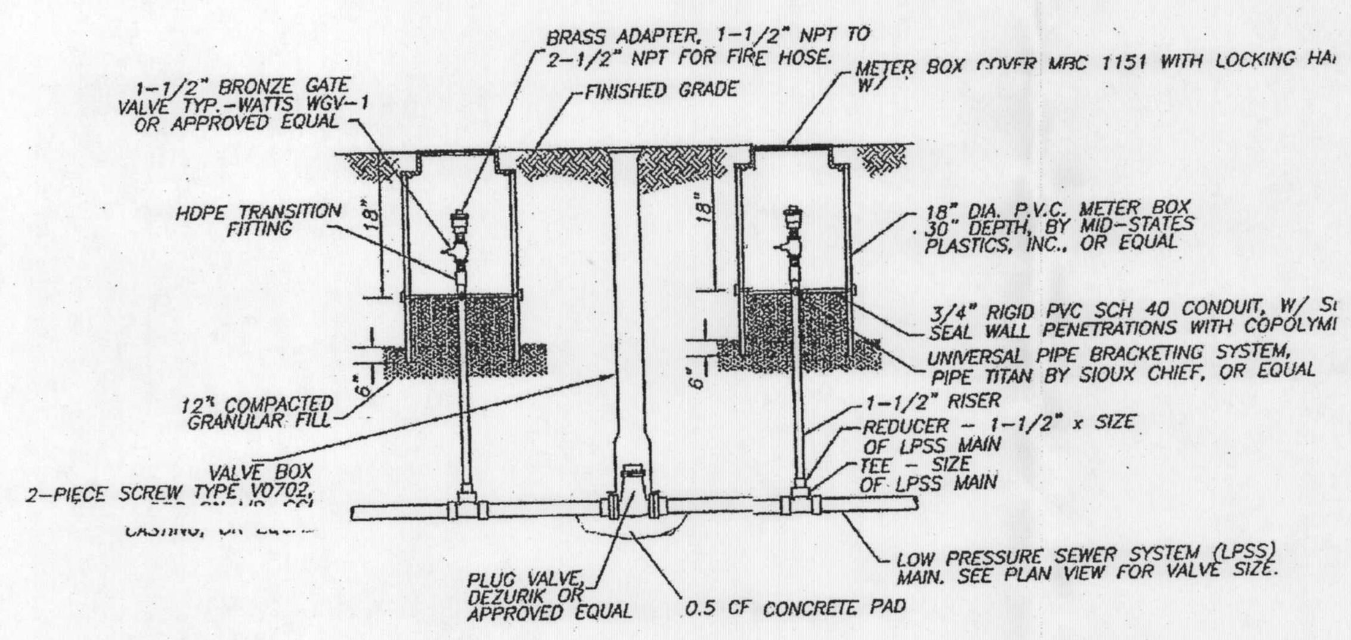






END CLEANOUT ASSEMBLY
N.T.S.



IN-LINE FLUSHING ASSEMBLY
N.T.S.

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NO.	DATE	REVISION	BY
1	4/4/08	SIZED LPSS	

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(GUADALUPE RIVER CLUB) - CONSTRUCTION PLANS

STATE OF TEXAS
HENRY SANFORD HARWOOD
93504
LICENSED PROFESSIONAL ENGINEER
7/15/08

UTILITY LAYOUT AND DETAILS

GUADALUPE RIVER CLUB
ENTRANCE PLAN
FM 306
COMAL COUNTY, TEXAS

PLOTTING SCALE: 1"= 40'
DRAWN BY: FF
DESIGNED BY: JCC
REVIEWED BY: SANDY HARWOOD
PROJECT #:050807.001

SHEET
CU102
9 OF 11

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AREA A

AREA B

NOTE: ALL CABINS WILL UTILIZE RAIN BARRELS.

NOTE: SEE SHEET 3 FOR TYPICAL SECTION.

STORMCEPTOR DETAILS SEE SHEET 4

STORMCEPTOR E-450 (AREA = 0.080 Ac)

STORMCEPTOR C-2400 (AREA = 0.221 Ac)

STORMCEPTOR B-2400 (AREA = 0.290 Ac)

STORMCEPTOR A-2400 (AREA = 0.280 Ac)

STORMCEPTOR D-2400 (AREA = 0.203 Ac)

DA-A 0.280ac

DA-B 0.290ac

DA-C 0.221ac

DA-D 0.203ac

DA-E 0.080ac

UNIT 3 BOUNDARY

AMENITY CENTER

NATURAL VEGETATIVE FILTER STRIP

BERMUDA GRASS

APPROXIMATE 100-YEAR FEMA FLOOD PLAIN

GUADALUPE RIVER

0 50 100 200

LEGEND

- EXISTING CONTOUR ELEVATIONS
- BERMUDA GRASS
- BOUNDARY LIMITS
- 15' ENGINEERED FILTER STRIPS (TYP)
- DRAINAGE ARROW
- NATURAL VEGETATIVE STRIP

KEY MAP
NTS

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(512) 314-3100 Fax (512) 314-3135

PROJECT NAME - PLAN TYPE

STATE OF TEXAS
HENRY SANFORD HARWOOD
93504
LICENSED
PROFESSIONAL ENGINEER

CZP UNIT 3 PERMANENT BMP
EXHIBIT / PROPOSED
DRIVEWAY GRADES

GUADALUPE RIVER CLUB

FM 306, COMAL COUNTY, TEXAS

DEVELOPER: NAME
DRAWN/DESIGNED BY:
EIT/PROJECT MANAGER:
Sr. PROJECT MANAGER:
JCB PROJECT #: NUMBER

SHEET
2
2 OF 4

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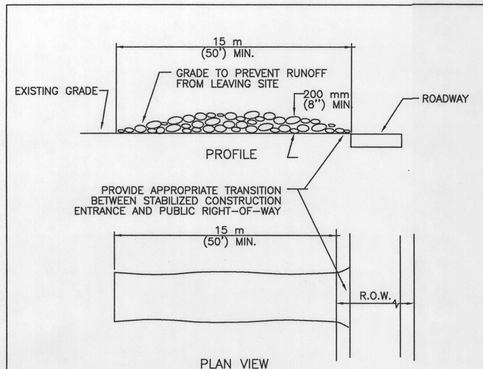
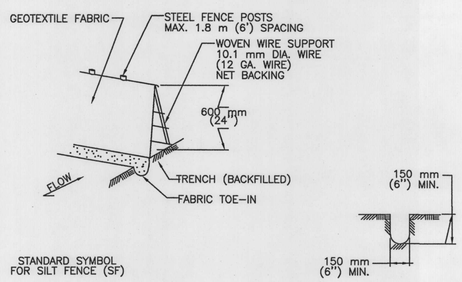


NOTES:

1. STONE SIZE: 75–125 mm (3–5") OPEN GRADED ROCK.
2. LENGTH: AS EFFECTIVE BUT NOT LESS THAN 15 m (50').
3. THICKNESS: NOT LESS THAN 200 mm (8").
4. WIDTH: NOT LESS THAN FULL WIDTH OF ALL POINTS OF INGRESS/EGRESS.
5. WASHING: WHEN NECESSARY, VEHICLE WHEELS SHALL BE CLEANED TO REMOVE SEDIMENT PRIOR TO ENTRANCE ONTO PUBLIC ROADWAY. WHEN WASHING IS REQUIRED, IT SHALL BE DONE ON AN AREA STABILIZED WITH CRUSHED STONE AND DRAINS INTO AN APPROVED TRAP OR SEDIMENT BASIN. ALL SEDIMENT SHALL BE PREVENTED FROM ENTERING ANY STORM DRAIN, DITCH OR WATERCOURSE USING APPROVED METHODS.
6. MAINTENANCE: THE ENTRANCE SHALL BE MAINTAINED IN A CONDITION THAT WILL PREVENT TRACKING OR FLOWING OF SEDIMENT ONTO PUBLIC ROADWAY. THIS MAY REQUIRE PERIODIC TOP DRESSING WITH ADDITIONAL STONE AS CONDITIONS DEMAND, AS WELL AS REPAIR AND CLEAN OUT OF ANY MEASURE DEVICES USED TO TRAP SEDIMENT. ALL SEDIMENTS THAT IS SPILLED, DROPPED, WASHED OR TRACKED ONTO PUBLIC ROADWAY MUST BE REMOVED IMMEDIATELY.
7. DRAINAGE: ENTRANCE MUST BE PROPERLY GRADED OR INCORPORATE A DRAINAGE SWALE TO PREVENT RUNOFF FROM LEAVING THE CONSTRUCTION SITE.

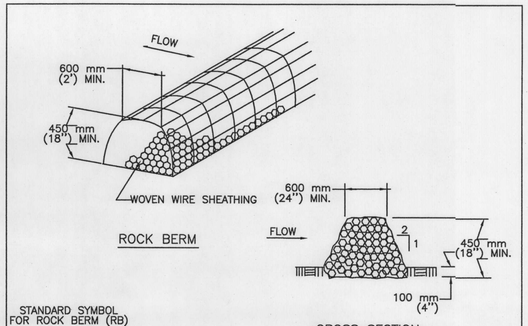
CITY OF AUSTIN WATERSHED PROTECTION DEPARTMENT	STABILIZED CONSTRUCTION ENTRANCE	
RECORD COPY SIGNED BY J. PATRICK MURPHY 5/23/00 ADOPTED	THE ARCHITECT/ENGINEER ASSUMES RESPONSIBILITY FOR APPROPRIATE USE OF THIS STANDARD.	STANDARD NO. 641S–1



NOTES:

1. STEEL POSTS WHICH SUPPORT THE SILT FENCE SHALL BE INSTALLED ON A SLIGHT ANGLE TOWARD THE ANTICIPATED RUNOFF SOURCE. POST MUST BE EMBEDDED A MINIMUM OF 300 mm (1").
2. THE TOE OF THE SILT FENCE SHALL BE TRENCHED IN WITH A SPADE OR MECHANICAL TRENCHER, SO THAT THE DOWNSLOPE FACE OF THE TRENCH IS FLAT AND PERPENDICULAR TO THE LINE OF FLOW. WHERE FENCE CAN NOT BE TRENCHED INTO THE SURFACE (E.G. PAVEMENT), THE FABRIC FLAP SHALL BE WEIGHTED DOWN WITH WASHED GRAVEL ON UPHILL SIDE TO PREVENT FLOW UNDER FENCE.
3. THE TRENCH MUST BE A MINIMUM OF 150 mm (6 inches) DEEP AND 150 mm (6 inches) WIDE TO ALLOW FOR THE SILT FENCE FABRIC TO BE LAID IN THE GROUND AND BACKFILLED WITH COMPACTED MATERIAL.
4. 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.
5. INSPECTION SHALL BE MADE WEEKLY OR AFTER EACH RAINFALL EVENT AND REPAIR OR REPLACEMENT SHALL BE MADE PROMPTLY AS NEEDED.
6. SILT FENCE SHALL BE REMOVED WHEN THE SITE IS COMPLETELY STABILIZED SO AS NOT TO BLOCK OR IMPEDE STORM FLOW OR DRAINAGE.
7. ACCUMULATED SILT SHALL BE REMOVED WHEN IT REACHES A DEPTH OF 150 mm (6 inches). THE SILT SHALL BE DISPOSED OF ON AN APPROVED SITE AND IN SUCH A MANNER THAT WILL NOT CONTRIBUTE TO ADDITIONAL SILTATION.

CITY OF AUSTIN WATERSHED PROTECTION DEPARTMENT	SILT FENCE	
RECORD COPY SIGNED BY J. PATRICK MURPHY 5/23/00 ADOPTED	THE ARCHITECT/ENGINEER ASSUMES RESPONSIBILITY FOR APPROPRIATE USE OF THIS STANDARD.	STANDARD NO. 642S–1



NOTES:

1. USE ONLY OPEN GRADED ROCK 100 to 200 mm (4 to 8") DIAMETER FOR STREAM FLOW CONDITIONS. USE OPEN GRADED ROCK 75 to 125 mm (3 to 5") DIAMETER FOR OTHER CONDITIONS.
2. THE ROCK BERM SHALL BE SECURED WITH A WOVEN WIRE SHEATHING HAVING MAXIMUM 25 mm (1") OPENING AND MINIMUM WIRE DIAMETER OF 12.9 mm (20 GAUGE). ROCK BERMS IN CHANNEL APPLICATIONS SHALL BE ANCHORED FIRMLY INTO THE SUBSTRATE A MINIMUM OF 150 mm (6 ") WITH T–POSTS OR WITH 15M OR 20M (#5 OR #6) REBAR, WITH MAXIMUM SPACING APART OF 1.2 m (48") ON CENTER.
3. THE ROCK BERM SHALL BE INSPECTED WEEKLY OR AFTER EACH RAIN, AND THE STONE AND/OR FABRIC CORE–WOVEN SHEATHING SHALL BE REPLACED WHEN THE STRUCTURE CEASES TO FUNCTION AS INTENDED, DUE TO SILT ACCUMULATION AMONG THE ROCKS, WASHOUT, CONSTRUCTION TRAFFIC DAMAGE, ETC.
4. WHEN SILT REACHES A DEPTH EQUAL TO ONE–THIRD THE HEIGHT OF THE BERM OR 150 mm (6"), WHICHEVER IS LESS, THE SILT SHALL BE REMOVED AND DISPOSED OF ON AN APPROVED SITE AND IN A MANNER THAT WILL NOT CREATE A SILTATION PROBLEM.
5. DAILY INSPECTION SHALL BE MADE ON SEVERE–SERVICE ROCK BERMS; SILT SHALL BE REMOVED WHEN ACCUMULATION REACHES 150 mm (6").
6. WHEN THE SITE IS COMPLETELY STABILIZED,THE BERM AND ACCUMULATED SILT SHALL BE REMOVED AND DISPOSED OF IN AN APPROVED MANNER.

CITY OF AUSTIN WATERSHED PROTECTION DEPARTMENT	ROCK BERM	
RECORD COPY SIGNED BY J. PATRICK MURPHY 5/23/00 ADOPTED	THE ARCHITECT/ENGINEER ASSUMES RESPONSIBILITY FOR APPROPRIATE USE OF THIS STANDARD.	STANDARD NO. 639S–1

NO.	DATE	REVISION	BY

JACOBS
Carter Burgess
2700 Blue Cove Road, Suite 300
Austin, Texas 78746
(512) 314-3100 Fax (512) 314-3350

STATE OF TEXAS
HENRY SANFORD HARWOOD
93504
LICENSED
PROFESSIONAL ENGINEER
4/15/08

(GUADALUPE RIVER CLUB) - CONSTRUCTION PLANS

CONSTRUCTION DETAILS

GUADALUPE RIVER CLUB
ENTRANCE PLAN
FM 306
COMAL COUNTY, TEXAS

PLOTTING SCALE: 1"= 40'
DRAWN BY: FF
DESIGNED BY: JCC
REVIEWED BY: SANDY HARWOOD
PROJECT #:050807.001

SHEET
C-501
11 OF 11

Drawing: L:\050807 Heiser Hollow\CAD FILES\SHEETS\Entrance Plan Sheets\050807_001_C-501.dwg Xrefs: -:\-\XREF\050807_TBLK_23234.dwg
User Initials: JCC
Last Modified: May. 07, 08 - 09:08
Plot Date/Time: Jul. 15, 08 - 15:00:23

LEGEND

LIMITS OF CONSTRUCTION

PROPERTY LINE

PROPERTY LINE

PROPERTY LINE

PROPERTY LINE

PROPERTY LINE

UNIT 2 LIMITS OF CONSTRUCTION

UNIT 2 LIMITS OF CONSTRUCTION

UNIT 2 LIMITS OF CONSTRUCTION

UNIT 2 LIMITS OF CONSTRUCTION

GUADALUPE RIVER

0 125 250 500

SHEET OF

DEVELOPER: NAME

DRAWN/DESIGNED BY:

EIT/PROJECT MANAGER:

SR. PROJECT MANAGER:

JCB PROJECT #: NUMBER

GUADALUPE RIVER CLUB

FM 306, COMAL COUNTY, TEXAS

LIMITS OF CONSTRUCTION WITHIN SITE BOUNDARY

STATE OF TEXAS
93504
REGISTERED PROFESSIONAL ENGINEER
GARY SANFORD HARRISON

JACOBS
2705 Bee Cave Road, Suite 300
Austin, Texas 78746
(512) 314-3100 Fax (512) 314-3101

PROJECT NAME - PLAN TYPE

FOR ROAD PROJECTS ONLY

Complete questions 15-20 if this application is exclusively for a road project.

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

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

17. Length of Right of Way (R.O.W.): **800** feet.
   Width of R.O.W.: **varies** feet.
   L x W = **94961** Ft² ÷ 43,560 Ft²/Acre = **2.18** acres.

18. Length of pavement area: **1560** feet.
   Width of pavement area: **varies (12-22')** feet.
   L x W = **23000** Ft² ÷ 43,560 Ft²/Acre = **0.53** acres.
   Pavement area **0.53** acres ÷ R.O.W. area **2.18** acres x 100 = **24.3**% impervious cover.

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

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

STORMWATER TO BE GENERATED BY THE PROPOSED PROJECT

21. X **ATTACHMENT E - 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 found at the end of this form. The estimates of stormwater runoff quality and quantity are based on area and type of impervious cover. The runoff coefficient of the site for both pre-construction and post-construction conditions is included.

WASTEWATER TO BE GENERATED BY THE PROPOSED PROJECT

22. Wastewater will be disposed of by:

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

   ATTACHMENT F - Suitability Letter from Authorized Agent. An on-site sewage facility will be used to treat and dispose of the wastewater from this site. The appropriate licensing authority's written approval is provided at the end of this form. It states that the land is suitable for the use of private sewage facilities and will meet or exceed the requirements for on-site sewage facilities as specified under 30 TAC Chapter 285 relating to On-site Sewage Facilities, or it identifies those areas that are not suitable for the use of private sewage facilities. The system will be designed by a licensed professional engineer or a registered sanitarian and installed by a licensed installer in compliance with 30 TAC §285.

CONTRIBUTING ZONE PLAN
ATTACHMENT C

PROJECT DESCRIPTION

Guadalupe River Club is a proposed development tract located in Comal County. The project area is located in the northeast region of Comal County, east of the Guadalupe River on FM 306 near Sattler, TX. The proposed development is an entry way plan for access to the water recreation area located on the east side of the property and the future residential phases. The combination of roadway and drainage for this site will be designed and built to serve the site without affecting any surrounding areas. The future residential area will consist of approximately 330 lots.

The total site area is 11.79 acres with the total existing impervious cover equal to 2.68 acres or 22.7%. The only history of previous development to this site is a water recreation area for canoeing and tubing, walking areas, some miscellaneous cover and some existing camp grounds that were constructed in 1978. The total impervious cover after construction will be 17.8% or 2.10 acres. The only added impervious cover is locate din Lot 1, 0.53 acres of pavement. We are reducing the amount of impervious cover in Lot 2 by adding a grassed parking area.

Number 12 in the attached application describes all the impervious cover on this site. The "other paved surfaces" section illustrates the impervious area in Lot 1, the only amount of pavement to be constructed. The other sections in this chart reflect the impervious cover located in Lots 2 and 3.

The project is located within the Edwards Aquifer Contributing Zone. Few portions of this project are within the FEMA recognized 100-year floodplain per Flood Insurance Rate Map (FIRM) Panel No. 48091C0260F, effective date March 10, 2006.

CONTRIBUTING ZONE PLAN
COMMENT RESPONSE TO TCEQ COMMENTS FEBRUARY 23, 2009

FOR

GUADALUPE RIVER CLUB UNIT 3

RANCH ROAD FM 306
COMAL COUNTY, TEXAS

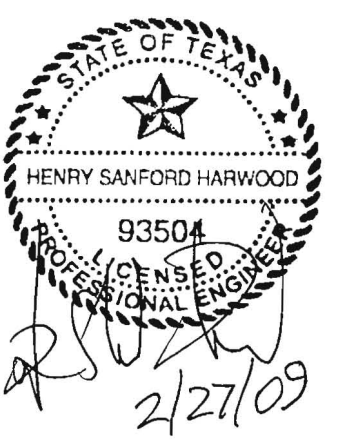
PREPARED FOR:

HEISER HOLLOW PARTNERS, LLC
12790 MERIT DRIVE, SUITE 100
DALLAS, TEXAS 75251

PREPARED BY:

JACOBS
2705 BEE CAVE ROAD, SUITE 300
AUSTIN, TEXAS 78746

FEBRUARY 2009



JACOBS

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Austin, Texas 78746 U.S.A.
(512) 314-3100 Fax: (512) 314-3135

COMMENT RESPONSE TO
TEXAS COMMISSION ON ENVIRONMENTAL QUALITY (TCEQ)
COMMENTS FEBRUARY 23, 2009

February 24, 2009

Ms Charly Fritz
TCEQ: Region 13
14250 Judson Road
San Antonio, Texas 78233

Guadalupe River Club-Unit 3 Comments and Responses to Contributing Zone Plan
Comal County, Texas

Ms. Fritz:

We have received your comments regarding our submittal on the Contributing Zone Plan for Guadalupe River Club Unit 3 located in Comal County, Texas, dated February 23, 2009. The comments have been addressed and our responses (bold italic) are below. Please refer to the 'Sheets' tab for all referenced sheets within this response.

1. The maintenance plan provided in the response received on February 11, 2009 is sufficient but needs to be signed by the owner or responsible party. Please provide a revised attachment which includes the owner's signature and acknowledgement of the maintenance requirements for both the vegetative filter strips and the Stormceptor units.

   The maintenance plan is included with signature of owner.

2. The rainfall amount (p") should be 33 inches in the Stormceptor Sizing calculations. Please revise.

   The sheets have been updated to reflect the 33". Please see attached worksheets.

3. For Drives D ~ E and the cabins located near those roads, confirm the amount of impervious cover (combined from roadways and cabins) does not exceed 72 feet in the direction off low to the engineered filter strip. The amount of imperious cover which flows to the filter strip does not have to be considered, just the linear amount impervious cover.

   The greatest length of cabin IC is approx 40 feet flowing along the roof. This IC then flows on natural ground anywhere between 10 and 40 feet before reaching the driveways. Drive D has the greatest width of 21 feet. Therefore, at most, 60 linear feet of IC will flow across the filter strip assuming water flows from cabin directly

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onto the road. This flow will be broken up by natural ground in between. At no point will 72 continuous linear feet of IC flow across the filter strips.

4. Verify the total impervious cover for the site; 5.90 acres from Item 12 (Impervious Cover of Proposed Project Table of the original Unit 3 CZP 01' 6.11 acres from the Impervious Cover/Erosion & Sedimentation Control Exhibit (submitted Feb. 11, 2009).

   The impervious cover has been updated for Item 12 of the CZP application. The impervious cover calculations that were submitted on February 11, 2009 are the correct calculations. Item 12 in the application was not updated in that submittal. Item 12 and Attachment C have been updated and can be referenced in Tab 4 of this comment response packet.

5. For clarity in the approval letter, indicate the amount of impervious cover (IC) treated by the natural filter strip and the amount IC treated by engineered filter strip.

   There will be approximately 6944 sq feet treated by the natural filter strip and approximately 4914 treated by the engineered filter strip.

6. The Unit 1 boundary appears to be located just north of the circular loop driveway entrance/exit. The Unit 3 boundary is depicted approximately 130 feet north of the Unit 1 boundary, which results in a gap along the roadway between Units 1 and 3.

   a. Which unit covers this roadway area between Units 1 and 3?

      This will be covered under Unit 3. Please see the attached Sheet 2 for verification and adjusted drainage areas. This roadway will be treated by Stormceptor D. The calculation for this system can be seen in Tab 2 along with the other updated calculation sheets.

   b. Is TSS treatment and permanent BMPs required for this section of roadway?

      Yes and a Stormceptor (D) unit has been added. Please reference Tab 2 for calculations of the new Stormceptor.

   c. Is the east/west roadway located just south of the Unit 3 boundary part of Unit 1, Unit 3 or an existing roadway? Please explain.

      This is an existing, non-impervious drive that was included for planning purposes only. This roadway will remain as pervious cover and does not require treatment.

7. Confirm the boundary between Unit 2 and Unit 3 along the River Club Drive. The approved exhibits for Unit 2 depict boundaries different from the submitted exhibits for this unit. Please explain and revise the exhibits as necessary.

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The boundary for Unit 2 is correct. The total acreage provided for Unit 3 is correct, however, the boundary was not adjusted until now. We have revised the Unit 3 boundary line to extend to the Unit 2 boundary. This additional roadway being added caused us to add another Stormceptor at the edge of the boundary. All portions of River Club Dr are now accounted for in Unit 2. Please see Tab 2 for the calculations for the newest Stormceptor E and Sheet 2 for adjusted areas.

a. There appears to be approximately 40 feet of roadway, to the north of the drainage area for Stormceptor unit C, which is not included in the drainage area. If treatment is required for this portion of roadway, revise the plan so the entire roadway receives permanent BMP treatment (or over treatment).

   The Stormceptor has been relocated to the correct location of the roadway. The area has been adjusted and is updated in our calculation worksheets.

8. Confirm the submitted site plan layout is the current design. The site layout depicted at www.guadaluperiverclub.com varies slightly in road and cabin layout.

   The submitted site plan is the current design. The layout viewed on the website is an old marketing plan that should not be used as a reference.

We have attached one original and three copies of the corrected material that will supplement the CZP application and we trust that this as well as the comments above will help in the continuation of your review. If you have any questions or need more information regarding the information provided for Guadalupe River Club Unit 3, please contact us at (512) 314-3100.

Sincerely,

Sandy Harwood, P.E.
Senior Project Manager

1. The maintenance plan provided in the response received on February 11, 2009 is sufficient but needs to be signed by the owner or responsible party. Please provide a revised attachment which includes the owner's signature and acknowledgement of the maintenance requirements for both the vegetative filter strips and the Stormceptor units.

   The maintenance plan is included with signature of owner.

CONTRIBUTING ZONE PLAN
ATTACHMENT N

INSPECTION, MAINTENANCE, AND RETROFIT PLAN

The inspection, maintenance and retrofit plan will follow the basic guidelines provided by the Edwards Aquifer Technical Guidance Manual.

Once a vegetated area is well established, little additional maintenance is generally necessary. The key to establishing a viable 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. If the filter strip is made up of turf grass, it should be moved as needed to limit vegetation height to 18 inches, using a mulching mower (or removal of clippings). If native grasses are used, the filter may require less frequent mowing, but a minimum of twice annually. Grass clippings and brush debris should not be deposited on vegetated filter strip areas. Regular mowing should also include weed control practices, however herbicide use should be kept to a minimum (Urbonas et al., 1992). Healthy grass can be maintained without using fertilizers because runoff usually contains sufficient nutrients. Irrigation of the site can help assure a dense and healthy vegetative cover.

- Inspection. Inspect filter strips at least twice annually for erosion or damage to vegetation; however, additional inspection after periods of heavy runoff is most desirable. The strip should be checked for uniformity of grass cover, debris and litter, and areas of sediment accumulation. More frequent inspections of the grass cover during the first few years after establishment will help to determine if any problems area developing, and to plan for long-term restorative maintenance needs. Bare spots and areas of erosion identified during semi-annual inspections must be replanted and restored to meet specifications. Construction of a level spreader device may be necessary to reestablish shallow overland flow.

- Debris and Litter Removal. Trash tends to accumulate in vegetated areas, particularly along highways. Any filter strip structures (i.e. level spreaders) should be kept free of obstructions to reduce floatables being flushed downstream, and for aesthetic reasons.

The need for this practice is determined through periodic inspection, but should be performed no less than 4 times per year.

- Sediment Removal. Sediment removal is not normally required in filter strips, since the vegetation normally grows through it and binds it to the soil. However, sediment may accumulate along the upstream boundary of the strip preventing uniform overland flow. Excess sediment should be removed by hand or with flat-bottomed shovels.

- Grass Reseeding and Mulching. A healthy dense grass should be maintained on the filter strip. If areas are eroded, they should be filled, compacted, and reseeded so that the final grade is level. Grass damaged during the sediment removal process should be promptly replaced using the same seed mix used during filter strip establishment. 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, particularly as they vegetation is initially established.

The inspection, maintenance and retrofit plan for the Stormceptor Units will also follow the basic guidelines provided by the Edwards Aquifer Technical Guidance Manual. The following sheets are excerpts from the Manual are to be followed.

John H. Daigh
MANAGER

The StormFilter® requires regular routine maintenance. Typical designs are intended for an annual maintenance cycle.

Recommended maintenance guidelines include:

- Inspections. Inspection of the storage component (and sedimentation manhole, if appropriate) should occur at a minimum of twice a year. It is recommended to wait 7 – 14 days after the last storm event, prior to making an inspection. This should allow for improved water clarity for observations in the storage facility. Sediment depth can be measured with a rod or other means. If sediment depth is greater than 1 foot, sediment removal in the storage facility is warranted.

- Cartridge Replacement. Cartridges should initially be replaced annually. If inspection of the removed cartridges indicates that their life expectancy exceeds one year, a modified maintenance plan should be provided to TCEQ specifying the new replacement schedule. Cartridge replacement also may be required in the event of a chemical spill or due to excessive sediment loading from site erosion or extreme storms.

- Sediment Removal. Sediment removal should occur before the accumulated sediment occupies 20% of the settling chamber. Typically includes cartridge replacement and sediment removal from the vault.

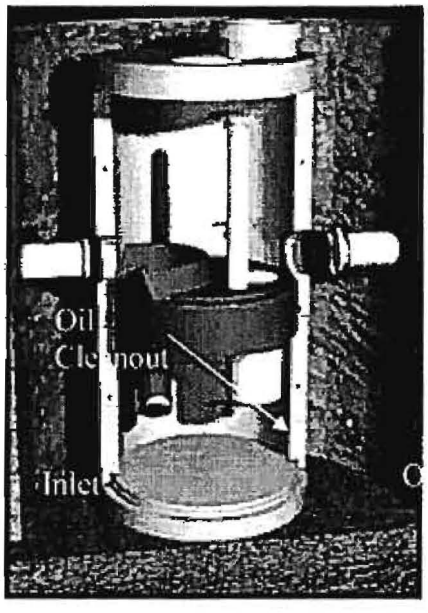
- Debris and Litter Removal. Debris and litter must be removed when its presence threatens the proper operation of the system.

3.2.14

3.2.14 Stormceptor®

TCEQ Approval of Innovative Technology

Stormceptor® is a patented water quality treatment structure for storm drain systems. Stormceptor® removes total suspended solids (TSS) and free oil (TPH) from storm water runoff through gravitational separation, and prevents small spills and non-point source pollution from entering downstream lakes and rivers. Stormceptor® takes the place of a conventional manhole or inlet structure within a storm drain system. Rinker Materials manufactures the Stormceptor® System with precast concrete components and a fiberglass disc insert. A diagram of a Stormceptor® is presented in Figure 3-33.



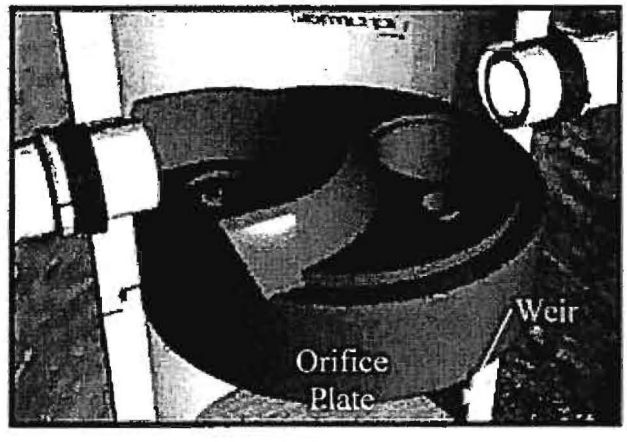


Figure 3-33 Stormceptor® Diagram

The Stormceptor® consists of a lower treatment/holding chamber, which is always full of water, and an upper conveyance chamber. Under standard operating conditions (frequent storm events), storm water flows in the upper conveyance chamber and is diverted down into the lower separation/holding chamber by the fiberglass weir. Flow entering the lower chamber is carefully controlled by an orifice plate, preventing excessive operational velocities, and maximizing capture and retention of suspended solids and hydrocarbons. This downward flow is directed tangentially around the circular walls of the lower chamber to maximize the flow path and detention time, reduce turbulent eddy currents, and prevent short-circuiting of flow path. Flow continues around the circumference of the unit, exits the lower chamber through the riser pipe, due to pressure head differential, and continues down the drainage system. Fine and coarse suspended solids settle to the floor of the chamber, under very low velocity (quiescent conditions), while the petroleum products rise and become trapped beneath the fiberglass insert. During infrequent high flow events, peak storm water flows will pass over the diverting weir and continue through the upper conveyance chamber into the downstream drainage system, while still providing positive treatment of storm water entering the lower chamber.

Selection Criteria

- Use when space constraints make installation of a surface treatment system infeasible
- Achieves greater than 80% TSS removal when properly sized, so can be used as a standalone BMP, as well as in a treatment train
- Use where there is little elevation head available
- Use in retrofit/redevelopment applications when constructability is limited

Limitations

- Below grade installation means that special equipment is required to remove accumulated sediment and other pollutants.
- Manhole cover must be removed to determine whether maintenance is required
- Use for relatively small catchment areas (less than 2 acres of 100% impervious land per single unit)
- Cannot be used as a drop structure
- Maximum treatable velocity within storm drain is 3.28 ft/s

Cost Considerations

The cost for a Stormceptor®, based on price/acre and the volume of runoff treated, may be significantly higher than many alternative technologies. Consequently, its primary use will be in space-constrained locations where surface systems such as sand filters may not be feasible.

Detailed Section

3.4.16 Stormceptor®

Stormceptor® is a patented, below grade water quality treatment structure for storm drain systems. Stormceptor® removes pollutants from storm water runoff through gravitational separation, and prevents small spills and non-point source pollution from entering downstream lakes and rivers. Stormceptor® takes the place of a conventional manhole or inlet structure within a storm drain system.

Stormceptors should be located as far upstream in the drainage system as possible. The frequency of the magnitude of a flow rate is dependent on the upstream drainage area and the level of imperviousness of that drainage area. If the drainage area is too large, the required capture rate may exceed the capacity of a single unit; therefore, **the use of multiple units located on lateral storm lines rather than the main trunk line may be more beneficial both physically and economically.**

The most commonly installed unit is the In-Line Stormceptor®. It is designed with single or multiple inlets

and a single outlet, and is available in eight different unit sizes, ranging from 900 to 7,200 gallon separation chamber (see Figure 2 and Table 1). Each unit is constructed from precast reinforced concrete components and a patented fiberglass insert that separates the upper and lower chambers. In areas where oil or hydrocarbon/petroleum spills accumulate in substantial volume between cleaning, the fiberglass insert provides secondary containment to ensure trapped hydrocarbons are safely stored inside the treatment chamber. On single inlet inserts, the invert elevation drop across the unit is equal to 1", while on the multiple inlet inserts the drop is 3". Taking place of traditional inlet structures is the Inlet Stormceptor® (STC 450i). The STC 450i can be used as an in-line unit, direct inlet device, or both simultaneously.

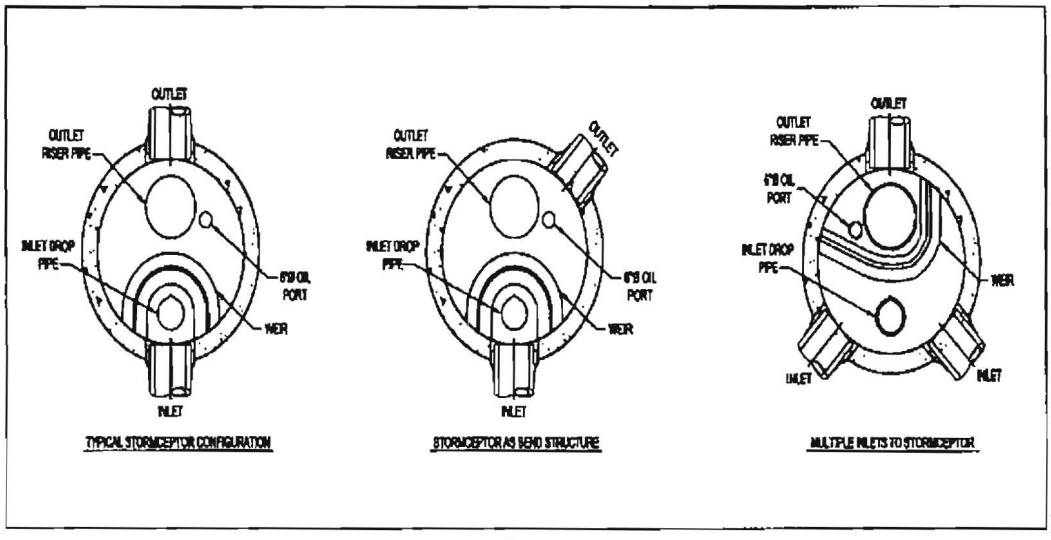


Figure 2

Stormceptor® In-Line Configurations

Table 1 Stormceptor® Dimensions*

Model	Treatment Chamber Diameter	Pipe Invert to Bottom of Base Slab	Water Surface Area
450i	4'	68"	12.57
900	6'	63"	28.27
1200	6'	79"	28.27
1800	6'	113"	28.27
2400	8'	108"	50.27
3600	8'	148"	50.27
4800	10'	140"	78.54
6000	10'	162"	78.54
7200	12'	148"	113.10
11000**	10'	140"	157.08
13000**	10'	162"	157.08
16000**	12'	148"	226.19

* Depths are approximate

** Two vertical structures

Sizing Guidelines

The Stormceptor® System is designed based on the total annual rainfall (using historical rainfall data), total drainage area and the percent of impervious area. Small frequent storms account for a majority of annual rainfall and for a majority of the sediment loading.

Stormceptor®sizing is based on computer simulation of suspended solids removal within the Stormceptor®.

This simulation is based on the USEPA SWMM Version 4.3. Solids build-up, wash-off and settling calculations were added to the hydrology code to estimate suspended solids capture by the Stormceptor®.

The Wimberley Rainfall Station, collected from the National Oceanic and Atmospheric Association (NOAA), was used along with default site parameters and a predetermined particle size distribution to determine the Stormceptor® model for multiple acreage sites. The results of the computer simulation were then used to develop the figure below. Table 2 is a plot of Effective Area vs. Stormceptor® Model Number. The Effective Area is defined as the sum of the impervious area times 0.9 and the pervious area times 0.03.

$$EA = (IMP \times 0.9) + (PER \times 0.03)$$

Where: IMP = impervious area draining to facility
PER = pervious area draining to facility

Table 2 Stormceptor® Sizing Chart

Effective Area (Ac.)	Stormceptor® Model
E.A. < .08	STC 450i
0.08 < E.A. < 0.16	STC 900 thru STC 1800
0.16 < E.A. < 0.29	STC 2400 thru STC 3600
0.29 < E.A. < 0.46	STC 4800 thru STC 6000
0.46 < E.A. < 0.66	STC 7200
0.66 < E.A. < 0.92	STC 11,000 thru STC 13,000
0.92 < E.A. ≤ 1.32	STC 16,000

Notes:
1) Effective Area = C * A

2) Effective Area is the number of acres draining to each ***Single Stormceptor Unit***

3) Intermediate Stormceptor Models do not increase the treatable flow, but reduce maintenance cost and increase clean-out intervals

Please note that if your sizing parameters are more complex, or Stormceptor® is used within a treatment train, use Figure 4 and follow the same design procedures outlined in Section 3.3 (TSS Removal and BMP Sizing Calculations).

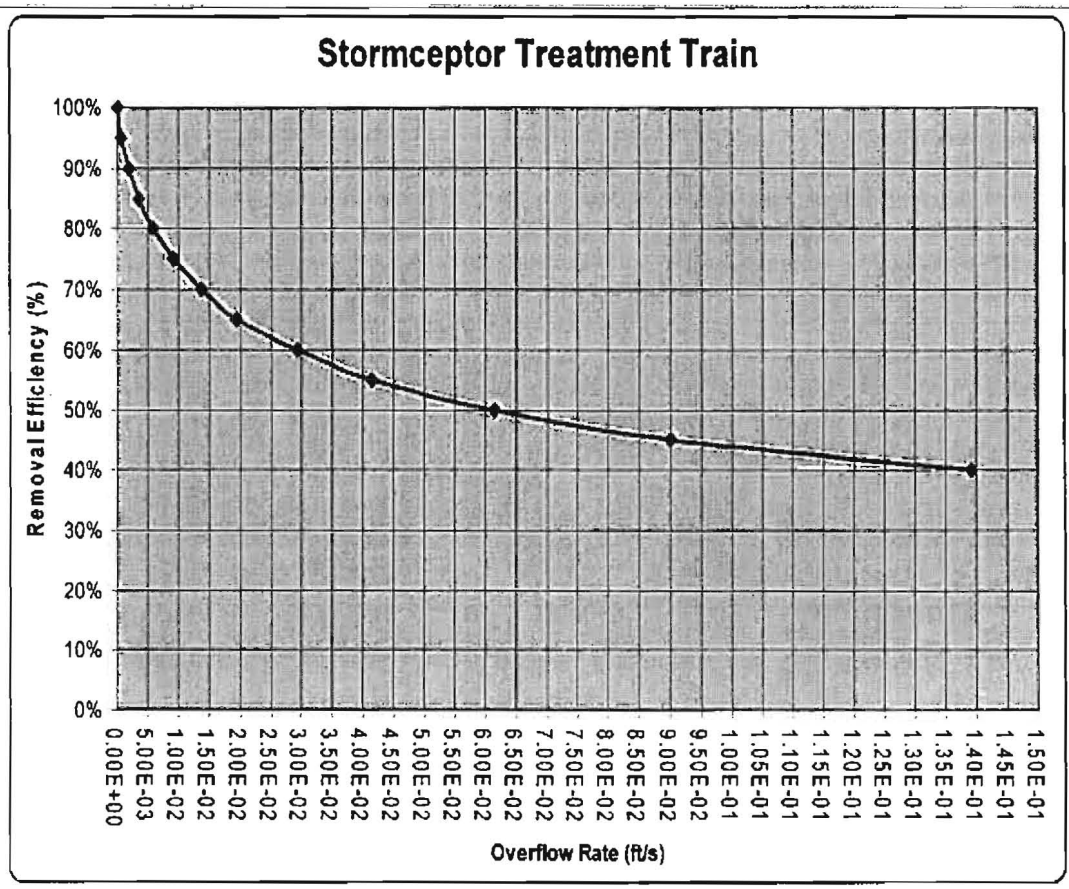


Figure 4

3.5.17

3.5.14 Stormceptor® Maintenance Guidelines

Stormceptor® recommends annual maintenance (1 time per year) of the Stormceptor® Unit(s) in conjunction with quarterly monitoring (4 times per year). A Professional Engineer licensed by the State of Texas and knowledgeable in storm water quality treatment devices should perform inspection services. **All units with the optional trash screen must be inspected on a monthly basis at minimum. Owner must observe site conditions and determine whether or not pollutant loads require a more frequent inspection schedule.** Pollutant levels will be recorded monthly. When the pollutant levels reach the guideline values indicated in this plan, maintenance is required. Vacuum maintenance will be done on an annual basis **and/or** when monitoring indicates high pollutant levels (see Table 2 in Stormceptor® Monitoring section). Monitoring should be noted on the attached "Stormceptor® Monitoring / Maintenance Plan Summary" sheet. All entries must be signed and dated by the property owner or designee. Stormceptor® maintenance must be documented to include a copy of the applicable vacuum service manifest. Upon completion of the monitoring and the annual maintenance, the "Stormceptor® Monitoring / Maintenance Plan Summary" sheet and all back-up documentation (to include manifest from vacuum service) should be maintained on-site.

TCEQ Approval of Innovative Technology

Monitoring

Monitoring the Stormceptor® unit requires a dipstick tube equipped with a ball valve (typically a Sludge Judge® or Core Pro®). A normal monitoring scenario requires removal of the manhole cover and lowering the dipstick tube through the oil port into the bottom treatment chamber (see Figure 5). Make sure the dipstick tube goes completely to the bottom. Lift the dipstick tube out of the unit and keep it in a vertical position and read the level of sediment and oils from the gauge on the dipstick. Record pollutant levels on your "Stormceptor® Monitoring / Maintenance Plan Summary". Remove all trash and debris engaged with the trash screen. If either pollutant(s) in the dipstick tube (sediments or oils) exceed the levels indicated on Table 2, maintenance of the Stormceptor® is required. Please skip to "Stormceptor® Maintenance". Upon completing the recording of pollutant levels, the dipstick tube is then drained back into the inlet side of the Stormceptor®. This ensures that the pollutants in the dipstick tube do not leave the unit.

Table 2 – Stormceptor® Maximum Pollutant Levels

Model	Down Pipe Orifice	Sediment Depth	*Sediment Capacity (ft^3)	Oil Depth	Oil Capacity (U.S. Gal.)
STC 450i	4"	8"	9	12"	86
STC 900	6"	8"	19	16"	251
STC 1200	6"	10"	25	16"	251
STC 1800	6"	15"	37	16"	251
STC 2400	8"	12"	49	44"	840
STC 3600	8"	17"	75	44"	840
STC 4800	10"	15"	101	44"	909
STC 6000	10"	18"	123	44"	909
STC 7200	12"	15"	149	44"	1059
STC 11000	10"	17"	224**	44"	2797
STC 13000	10"	20"	268**	44"	2797
STC 16000	12"	17"	319**	44"	3055

* Capacity prior to recommended maintenance

** Total both structures combined

Maintenance

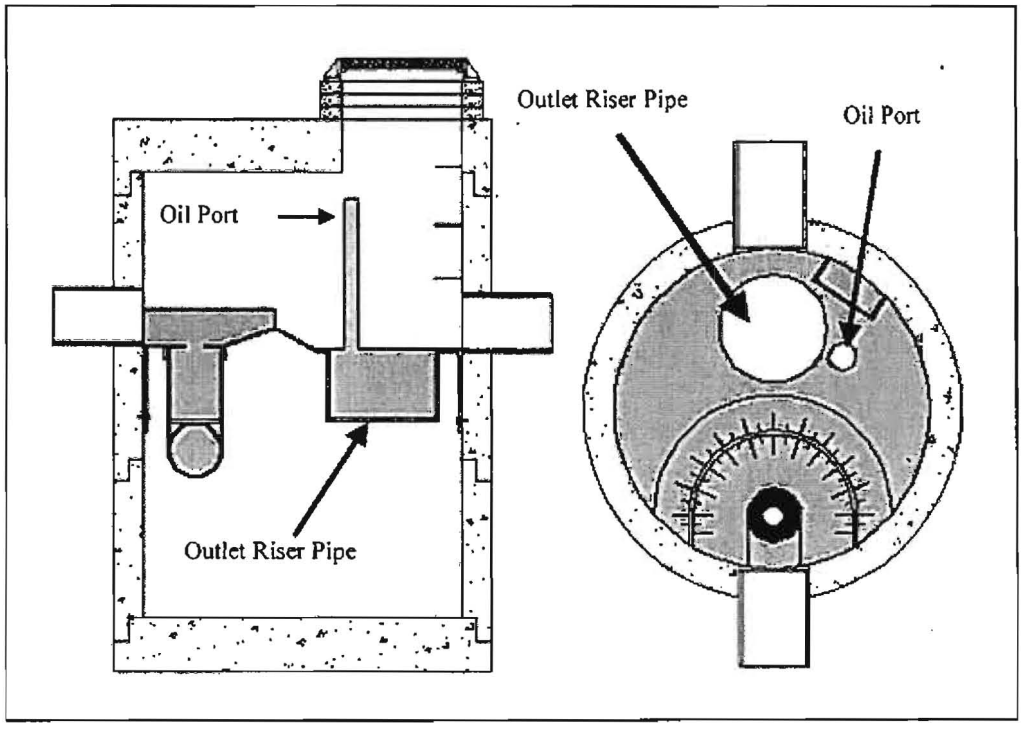
Maintenance of the Stormceptor® system is recommended at least once a year or when dictated by the pollutant levels referenced in Table 2. It is imperative that the Stormceptor® be maintained regularly to ensure proper operation of the unit. If the unit reaches the pollutant levels listed in Table 2, the designed effectiveness of the unit will decrease.

Maintenance is accomplished when the owner contacts a representative of the vacuum service industry, a well-established sector of the service industry that cleans underground tanks, sewers, and catch basins. Cost to clean the Stormceptor® will vary based on the size of the unit and transportation distances. If you need assistance for cleaning a Stormceptor® unit, please contact your local Rinker Materials representative, or the Stormceptor® Information Line at (800) 909-7763.

Typically, the Vacuum Service representative will maintain the Stormceptor® by first removing the manhole. The vacuum service will first remove the oil through the oil port (refer to Figure 5). If the vacuum cannot remove the oils through the oil port (i.e. the vacuum service hose diameter is larger than the 6" oil port opening) water can be removed through the outlet pipe (refer to Figure 5) until such time that the oils can be removed. Typically, your vacuum service representative will recycle the oils at their facility. Sediments in the Stormceptor® can be removed by inserting the vacuum service hose into the bottom treatment chamber via the outlet pipe (refer to Figure 1). In most areas the sediment, once

dewatered at the vacuum service facility, can be disposed of in a sanitary landfill. Once the floatables and sediments have been removed from the Stormceptor®, the unit is required to be filled with clean water to the top of the riser / drop pipe. This completes the maintenance process. All waste should be disposed of in manner that complies with local, state, and federal laws and regulations pertaining to their specific situation and/or facility.

Once maintenance has been completed, document the information on the "Stormceptor® Monitoring / Maintenance Plan Summary" sheet. Attach a copy of the manifest from the applicable vacuum service.



Monitoring / Maintenance Completion - Summary

Company Name: _____

Company Address: _____

City/State/Zip: _____

Phone: _____

Engineer: _____

Engineers Address: _____

City/State/Zip: _____

Phone: _____

Property Owner: _____

*Stormceptor Model _____

Monitoring / Maintenance Table

	Jan	Feb	Mar	Apr	May	Jun	July	Aug	Sep	Oct	Nov	Dec
Oil Depth (inches)												
Sediment Depth (inches)												
Completed By:												
Date												
Floatables (Optional)												

I hereby certify that the monitoring and maintenance of the Stormceptor® unit was completed in accordance with the directions of the Stormceptor® monitoring / maintenance plan.

Manager

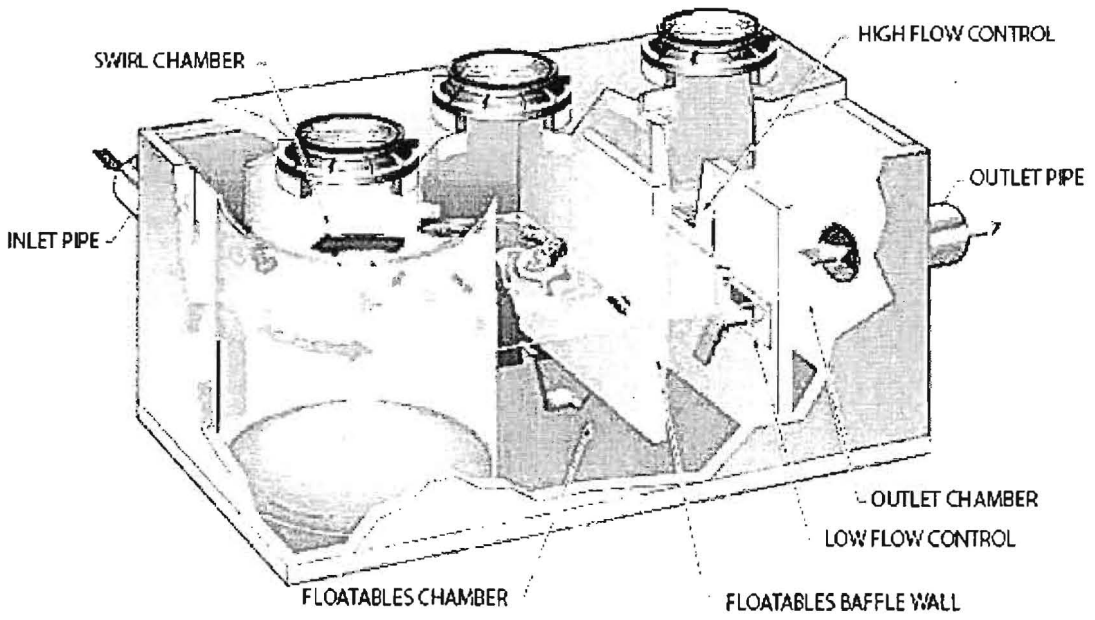
(Signed by property owner or designee)

** Note – This form must be completed for both chambers of the STC 11000, STC 13000, and STC 16000.

Section 3.2.15

The Vortechs System

The Vortechs system (Figure 1) is a patented hydrodynamic separator that effectively removes sediment, oil and grease, and floating and sinking debris. Its swirl concentrator and flow controls work together to minimize turbulence and provide stable storage of captured pollutants.



2. The rainfall amount (p") should be 33 inches in the Stormceptor Sizing calculations. Please revise.

   The sheets have been updated to reflect the 33". Please see attached worksheets.

PROJECT: **Guadalupe River Club Unit 3**

EAPP STORMCEPTOR Compensation Worksheet (Rev. 7/21/08): Use additional sheets for additional catchment areas.

Table 1

Effective Area (ac)	Stormceptor Model	Surface Area (ft^2)
EA < 0.08	450i	12.57
0.08 < EA < 0.16	900, 1200, 1800	28.27
0.16 < EA < 0.29	2400, 3600	50.27
0.29 < EA < 0.46	4800, 6000	78.54
0.46 < EA < 0.66	7200	113.10
0.66 < EA < 0.92	11,000, 13,000	157.08
0.92 < EA ≤ 1.32	16,000	226.19

Use additional sheets for additional BMPs.
A_I = Impervious Cover
A_P = Pervious Cover
A = Total Area
P = Avg. Annual Rainfall
A_N = Increase in impervious cover (new IC – existing IC)
TSS = $L_M = 27.2 \times A_N \times P$

List only the uncaptured area being compensated for in the BMP. TSS compensation for uncaptured areas can be divided up between multiple BMPs.

*

BMP Catchment Area A		Uncaptured / Untreated Areas (for compensation in BMP)	
A_{I1} =	0.28	A_{I2} =	0
A_{P1} =	0	A_{P2} =	0
A_1 =	0.28	A_2 =	0
A_{N1} =	0.28	A_{N2} =	0
L_{M1} =	251.33	L_{M2} =	0

1 Stormceptor (STC) Model (Actual Catchment Area to the BMP); Use additional sheets as necessary.
Effective Area (EA) = (0.9 x A_{I1}) + (0.03 x A_{P1})
EA = (0.9 x 0.28) + (0.03 x 0) = 0.252 EA

STC Model (from Table 1 to start) 2400 ; Surface area (SA) of model (Table 1) 50.27 ft^2
Required TSS Removal for Catchment Area:
L_{M1} = 27.2 x 0.28 A_{N1} x 33 P" = 251.33 #TSS

2 Overflow Rate (Round to the sixth decimal place)
V_{or} = (EA x 1.1 in/hr) / Model surface area (SA)
V_{or} = (0.252 x 1.1) / 50.27 = 0.0055 f/s

3 BMP Efficiency (Table 2); If the overflow rate is between two percent efficiencies, use the smaller percent efficiency (round the overflow rate to the larger overflow value). Enter rounded overflow value:
V_{or} = 0.005810 f/s

BMP % = 80 % / 100 = 0. 80 BMP Eff.

4 Maximum TSS Removal of BMP: L_{R1}
L_{R1} = (BMP Eff x P) x [(A_{I1} x 34.6) + (A_{P1} x 0.54)]
L_{R1} = (0. 80 x 34.6 ") x [(0.28 x 34.6) + (0 x 0.54)] = 268.16 #TSS

TSS Load Credit (L_C) to be counted towards untreated areas = $L_{R1} - L_{M1}$
L_C = (268.16 #TSS – 251.33 #TSS) = 16.82 #TSS

5 Required TSS Removal for Uncaptured Area L_{M2} = 27.2 x 0 A_{N2} x 0 " = 0 #TSS

6 Is Sufficient Treatment Available?
If $L_C \geq L_{M2}$; Model size is adequate.
If $L_C < L_{M2}$; Model size is inadequate. Choose a larger model size or redefine the catchment areas. Repeat steps 1 - 6.
L_C (< , > , ≥ , pick) L_{M2}

Final Model Size: 2400 .

7 TSS Treatment by BMP
L_{M1} (step 1) + L_{M2} (step 5) = TSS Treatment by BMP
251.33 #TSS + 0 #TSS = 251.33 #TSS

8 TSS Treatment Summary

Catchment Area	STC Model	Total Drainage Area (ac)	Impervious Cover (ac)	Calculated TSS Removal (lb/yr) (L_M)	TSS Treatment by BMP (lb/yr) (Step 7)
BMP Catchment	2400	0.28	0.28	251.33	251.33
Uncaptured/Untreated	---				0
Total	---				251.33

PROJECT: **Guadalupe River Club Unit 3**

EAPP STORMCEPTOR Compensation Worksheet (Rev. 7/21/08): Use additional sheets for additional catchment areas.

Table 1

Effective Area (ac)	Stormceptor Model	Surface Area (ft^2)
EA < 0.08	450i	12.57
0.08 < EA < 0.16	900, 1200, 1800	28.27
0.16 < EA < 0.29	2400, 3600	50.27
0.29 < EA < 0.46	4800, 6000	78.54
0.46 < EA < 0.66	7200	113.10
0.66 < EA < 0.92	11,000, 13,000	157.08
0.92 < EA ≤ 1.32	16,000	226.19

Use additional sheets for additional BMPs.
A_I = Impervious Cover
A_P = Pervious Cover
A = Total Area
P = Avg. Annual Rainfall
A_N = Increase in impervious cover (new IC – existing IC)
TSS = L_M = 27.2 x A_N x P

List only the uncaptured area being compensated for in the BMP. TSS compensation for uncaptured areas can be divided up between multiple BMPs.

*

BMP Catchment Area B		Uncaptured / Untreated Areas (for compensation in BMP)	
A_{I1} =	0.29	A_{I2} =	0
A_{P1} =	0	A_{P2} =	0
A_I =	0.29	A_2 =	0
A_{N1} =	0.29	A_{N2} =	0
L_{M1} =	260.30	L_{M2} =	0

1 Stormceptor (STC) Model (Actual Catchment Area to the BMP); Use additional sheets as necessary.
Effective Area (EA) = (0.9 x A_{I1}) + (0.03 x A_{P1})
EA = (0.9 x 0.29) + (0.03 x 0) = 0.261 EA

STC Model (from Table 1 to start) 2400 ; Surface area (SA) of model (Table 1) 50.27 ft^2
Required TSS Removal for Catchment Area:
L_{M1} = 27.2 x 0.29 A_{N1} x 33 P" = 260.30 #TSS

2 Overflow Rate (Round to the sixth decimal place)
V_{or} = (EA x 1.1 in/hr) / Model surface area (SA)
V_{or} = (0.261 x 1.1) / 50.27 = 0.005711 f/s

3 BMP Efficiency (Table 2); If the overflow rate is between two percent efficiencies, use the smaller percent efficiency (round the overflow rate to the larger overflow value). Enter rounded overflow value:
V_{or} = 0.005810 f/s

BMP % = 80 % / 100 = 0. 80 BMP Eff.

4 Maximum TSS Removal of BMP: L_{R1}
L_{R1} = (BMP Eff x P) x [(A_{I1} x 34.6) + (A_{P1} x 0.54)]
L_{R1} = (0. 80 x 34.6 ") x [(0.29 x 34.6) + (0 x 0.54)] = 277.74 #TSS

TSS Load Credit (L_C) to be counted towards untreated areas = L_{R1} – L_{M1}
L_C = (277.74 #TSS – 260.30 #TSS) = 17.44 #TSS

5 Required TSS Removal for Uncaptured Area L_{M2} = 27.2 x 0 A_{N2} x 0 " = 0 #TSS

6 Is Sufficient Treatment Available?
If $L_C \geq L_{M2}$; Model size is adequate.
If $L_C < L_{M2}$; Model size is inadequate. Choose a larger model size or redefine the catchment areas. Repeat steps 1 - 6.
_____ L_C (<, >, ≥, pick) _____ L_{M2}

Final Model Size: 2400 .

7 TSS Treatment by BMP
L_{M1} (step 1) + L_{M2} (step 5) = TSS Treatment by BMP
260.30 #TSS + 0 #TSS = 260.30 #TSS

8 TSS Treatment Summary

Catchment Area	STC Model	Total Drainage Area (ac)	Impervious Cover (ac)	Calculated TSS Removal (lb/yr) (L_M)	TSS Treatment by BMP (lb/yr) (Step 7)
BMP Catchment	2400	0.29	0.29	260.30	260.30
Uncaptured/Untreated	---				0
Total	---				260.30

PROJECT: **Guadalupe River Club Unit 3**

EAPP STORMCEPTOR Compensation Worksheet (Rev. 7/21/08): Use additional sheets for additional catchment areas.

Table 1

Effective Area (ac)	Stormceptor Model	Surface Area (ft^2)
EA < 0.08	450i	12.57
0.08 < EA < 0.16	900, 1200, 1800	28.27
0.16 < EA < 0.29	2400, 3600	50.27
0.29 < EA < 0.46	4800, 6000	78.54
0.46 < EA < 0.66	7200	113.10
0.66 < EA < 0.92	11,000, 13,000	157.08
0.92 < EA ≤ 1.32	16,000	226.19

Use additional sheets for additional BMPs.
A_I = Impervious Cover
A_P = Pervious Cover
A = Total Area
P = Avg. Annual Rainfall
A_N = Increase in impervious cover (new IC – existing IC)
TSS = L_M = 27.2 x A_N x P

List only the uncaptured area being compensated for in the BMP. TSS compensation for uncaptured areas can be divided up between multiple BMPs.

*

BMP Catchment Area C		Uncaptured / Untreated Areas (for compensation in BMP)	
A_{I1} =	0.221	A_{I2} =	0
A_{P1} =	0	A_{P2} =	0
A_1 =	0.221	A_2 =	0
A_{N1} =	0.221	A_{N2} =	0
L_{M1} =	198.37	L_{M2} =	0

1 Stormceptor (STC) Model (Actual Catchment Area to the BMP); Use additional sheets as necessary.
Effective Area (EA) = (0.9 x A_{I1}) + (0.03 x A_{P1})
EA = (0.9 x 0.221) + (0.03 x 0) = 0.199 EA

STC Model (from Table 1 to start) 2400 ; Surface area (SA) of model (Table 1) 50.27 ft^2
Required TSS Removal for Catchment Area:
L_{M1} = 27.2 x 0.221 A_{N1} x 33 P" = 198.37 #TSS

2 Overflow Rate (Round to the sixth decimal place)
V_{or} = (EA x 1.1 in/hr) / Model surface area (SA)
V_{or} = (0.199 x 1.1) / 50.27 = 0.0043 f/s

3 BMP Efficiency (Table 2); If the overflow rate is between two percent efficiencies, use the smaller percent efficiency (round the overflow rate to the larger overflow value). Enter rounded overflow value:
V_{or} = 0.004460 f/s

BMP % = 83 % / 100 = 0. 83 BMP Eff.

4 Maximum TSS Removal of BMP: L_{R1}
L_{R1} = (BMP Eff x P) x [(A_{I1} x 34.6) + (A_{P1} x 0.54)]
L_{R1} = (0. 83 x 33 ") x [(0.221 x 34.6) + (0 x 0.54)] = 209.44 #TSS

TSS Load Credit (L_C) to be counted towards untreated areas = L_{R1} – L_{M1}
L_C = (209.44 #TSS – 198.37 #TSS) = 11.07 #TSS

5 Required TSS Removal for Uncaptured Area L_{M2} = 27.2 x 0 A_{N2} x 0 " = 0 #TSS

6 Is Sufficient Treatment Available?
If $L_C \geq L_{M2}$; Model size is adequate.
If $L_C < L_{M2}$; Model size is inadequate. Choose a larger model size or redefine the catchment areas. Repeat steps 1 - 6.
_____ L_C (<, >, ≥, pick) _____ L_{M2}

Final Model Size: 2400 ,

7 TSS Treatment by BMP
L_{M1} (step 1) + L_{M2} (step 5) = TSS Treatment by BMP
198.37 #TSS + 0 #TSS = 198.37 #TSS

8 TSS Treatment Summary

Catchment Area	STC Model	Total Drainage Area (ac)	Impervious Cover (ac)	Calculated TSS Removal (lb/yr) (L_M)	TSS Treatment by BMP (lb/yr) (Step 7)
BMP Catchment	2400	0.221	0.221	198.37	198.37
Uncaptured/Untreated	---				0
Total	---				198.37

PROJECT: **Guadalupe River Club Unit 3**

EAPP STORMCEPTOR Compensation Worksheet (Rev. 7/21/08): Use additional sheets for additional catchment areas.

Table 1

Effective Area (ac)	Stormceptor Model	Surface Area (ft^2)
EA < 0.08	450i	12.57
0.08 < EA < 0.16	900, 1200, 1800	28.27
0.16 < EA < 0.29	2400, 3600	50.27
0.29 < EA < 0.46	4800, 6000	78.54
0.46 < EA < 0.66	7200	113.10
0.66 < EA < 0.92	11,000, 13,000	157.08
0.92 < EA ≤ 1.32	16,000	226.19

Use additional sheets for additional BMPs.
A_I = Impervious Cover
A_P = Pervious Cover
A = Total Area
P = Avg. Annual Rainfall
A_N = Increase in impervious cover (new IC – existing IC)
TSS = L_M = 27.2 x A_N x P

List only the uncaptured area being compensated for in the BMP. TSS compensation for uncaptured areas can be divided up between multiple BMPs.

*

BMP Catchment Area D		Uncaptured / Untreated Areas (for compensation in BMP)	
A_{I1} =	0.203	A_{I2} =	0
A_{P1} =	0	A_{P2} =	0
A_1 =	0.203	A_2 =	0
A_{N1} =	0.203	A_{N2} =	0
L_{M1} =	182.21	L_{M2} =	0

1 Stormceptor (STC) Model (Actual Catchment Area to the BMP); Use additional sheets as necessary.
Effective Area (EA) = (0.9 x A_{I1}) + (0.03 x A_{P1})
EA = (0.9 x 0.203) + (0.03 x 0) = 0.183 EA

STC Model (from Table 1 to start) 2400 ; Surface area (SA) of model (Table 1) 50.27 ft^2
Required TSS Removal for Catchment Area:
L_{M1} = 27.2 x 0.203 A_{N1} x 33 P" = 182.21 #TSS

2 Overflow Rate (Round to the sixth decimal place)
V_{or} = (EA x 1.1 in/hr) / Model surface area (SA)
V_{or} = (.183 x 1.1) / 50.27 = 0.004004 f/s

3 BMP Efficiency (Table 2); If the overflow rate is between two percent efficiencies, use the smaller percent efficiency (round the overflow rate to the larger overflow value). Enter rounded overflow value:
V_{or} = 0.004010 f/s

BMP % = 84 % / 100 = 0. 84 BMP Eff.

4 Maximum TSS Removal of BMP: L_{R1}
L_{R1} = (BMP Eff x P) x [(A_{I1} x 34.6) + (A_{P1} x 0.54)]
L_{R1} = (0. 84 x 33 ") x [(0.203 x 34.6) + (0 x 0.54)] = 194.70 #TSS

TSS Load Credit (L_C) to be counted towards untreated areas = L_{R1} – L_{M1}
L_C = (194.70 #TSS – 182.21 #TSS) = 12.49 #TSS

5 Required TSS Removal for Uncaptured Area L_{M2} = 27.2 x 0 A_{N2} x 0 " = 0 #TSS

6 Is Sufficient Treatment Available?
If $L_C \geq L_{M2}$; Model size is adequate.
If $L_C < L_{M2}$; Model size is inadequate. Choose a larger model size or redefine the catchment areas. Repeat steps 1 - 6.
_____ L_C (< , > , ≥, pick) _____ L_{M2}

Final Model Size: 2400 ,

7 TSS Treatment by BMP
L_{M1} (step 1) + L_{M2} (step 5) = TSS Treatment by BMP
182.21 #TSS + 0 #TSS = 182.21 #TSS

8 TSS Treatment Summary

Catchment Area	STC Model	Total Drainage Area (ac)	Impervious Cover (ac)	Calculated TSS Removal (lb/yr) (L_M)	TSS Treatment by BMP (lb/yr) (Step 7)
BMP Catchment	2400	0.203	0.203	182.21	182.21
Uncaptured/Untreated	---				0
Total	---				182.21

PROJECT: **Guadalupe River Club Unit 3**

EAPP STORMCEPTOR Compensation Worksheet (Rev. 7/21/08): Use additional sheets for additional catchment areas.

Table 1

Effective Area (ac)	Stormceptor Model	Surface Area (ft^2)
EA < 0.08	450i	12.57
0.08 < EA < 0.16	900, 1200, 1800	28.27
0.16 < EA < 0.29	2400, 3600	50.27
0.29 < EA < 0.46	4800, 6000	78.54
0.46 < EA < 0.66	7200	113.10
0.66 < EA < 0.92	11,000, 13,000	157.08
0.92 < EA ≤ 1.32	16,000	226.19

Use additional sheets for additional BMPs.
A_I = Impervious Cover
A_P = Pervious Cover
A = Total Area
P = Avg. Annual Rainfall
A_N = Increase in impervious cover (new IC – existing IC)
TSS = L_M = 27.2 x A_N x P

List only the uncaptured area being compensated for in the BMP. TSS compensation for uncaptured areas can be divided up between multiple BMPs.

*

BMP Catchment Area E		Uncaptured / Untreated Areas (for compensation in BMP)	
A_{I1} =	0.08	A_{I2} =	0
A_{P1} =	0	A_{P2} =	0
A_1 =	0.08	A_2 =	0
A_{N1} =	0.08	A_{N2} =	0
L_{M1} =	71.81	L_{M2} =	0

1. Stormceptor (STC) Model (Actual Catchment Area to the BMP); Use additional sheets as necessary.
Effective Area (EA) = (0.9 x A_{I1}) + (0.03 x A_{P1})
EA = (0.9 x 0.08) + (0.03 x 0) = 0.072 EA

STC Model (from Table 1 to start) 450i ; Surface area (SA) of model (Table 1) 12.57 ft^2
Required TSS Removal for Catchment Area:
L_{M1} = 27.2 x 0.08 A_{N1} x 33 P" = 71.81 #TSS

2. Overflow Rate (Round to the sixth decimal place)
V_{or} = (EA x 1.1 in/hr) / Model surface area (SA)
V_{or} = (.072 x 1.1) / 50.27 = 0.0063 f/s

3. BMP Efficiency (Table 2); If the overflow rate is between two percent efficiencies, use the smaller percent efficiency (round the overflow rate to the larger overflow value). Enter rounded overflow value:
V_{or} = 0.006480 f/s

BMP % = 79 % / 100 = 0. 79 BMP Eff.

4. Maximum TSS Removal of BMP: L_{R1}
L_{R1} = (BMP Eff x P) x [(A_{I1} x 34.6) + (A_{P1} x 0.54)]
L_{R1} = (0. 79 x 33 ") x [(0.08 x 34.6) + (0 x 0.54)] = 72.16 #TSS

TSS Load Credit (L_C) to be counted towards untreated areas = L_{R1} – L_{M1}
L_C = (72.16 #TSS – 71.81 #TSS) = 0.34 #TSS

5. Required TSS Removal for Uncaptured Area L_{M2} = 27.2 x 0 A_{N2} x 0 " = 0 #TSS

6. Is Sufficient Treatment Available?
If $L_C \geq L_{M2}$; Model size is adequate.
If $L_C < L_{M2}$; Model size is inadequate. Choose a larger model size or redefine the catchment areas. Repeat steps 1 - 6.
_____ L_C (< , > , ≥, pick) _____ L_{M2}

Final Model Size: 450i ,

7. TSS Treatment by BMP
L_{M1} (step 1) + L_{M2} (step 5) = TSS Treatment by BMP
71.81 #TSS + 0 #TSS = 71.81 #TSS

8. TSS Treatment Summary

Catchment Area	STC Model	Total Drainage Area (ac)	Impervious Cover (ac)	Calculated TSS Removal (lb/yr) (L_M)	TSS Treatment by BMP (lb/yr) (Step 7)
BMP Catchment	450i	0.08	0.08	71.81	71.81
Uncaptured/Untreated	---				0
Total	---				71.81

PROJECT: **Guadalupe River Club Unit 3**

Table 2: Stormceptor BMP Efficiency and Overflow Rate (V_{OR})							
Eff (%)	Overflow (f/s)	Eff (%)	Overflow (f/s)	Eff (%)	Overflow (f/s)	Eff (%)	Overflow (f/s)
40%	0.139000	56%	0.039000	72%	0.012000	88%	0.002602
41%	0.129000	57%	0.036500	73%	0.011000	89%	0.002280
42%	0.119000	58%	0.034100	74%	0.010100	90%	0.001960
43%	0.110000	59%	0.031700	75%	0.009180	91%	0.001710
44%	0.099800	60%	0.029200	76%	0.008510	92%	0.001460
45%	0.090000	61%	0.027300	77%	0.007830	93%	0.001210
46%	0.084300	62%	0.025300	78%	0.007160	94%	0.000963
47%	0.078600	63%	0.023300	79%	0.006480	95%	0.000713
48%	0.072800	64%	0.021400	80%	0.005810	96%	0.000595
49%	0.067100	65%	0.019400	81%	0.005360	97%	0.000477
50%	0.061400	66%	0.018300	82%	0.004910	98%	0.000358
51%	0.057400	67%	0.017200	83%	0.004460	99%	0.000240
52%	0.053400	68%	0.016000	84%	0.004010	100%	0.000121
53%	0.049400	69%	0.014900	85%	0.003560		
54%	0.045400	70%	0.013800	86%	0.003240		
55%	0.041400	71%	0.012900	87%	0.002920		

Table 3: BMP Summary Table for the Site Complete this table to show the types of BMPs and TSS treatment amounts for the site. Provide additional, as needed.					
BMP Catchment Area	BMP Type or Model	Total Drainage Area (ac)	Impervious Cover (ac)	Calculated TSS Removal (lb/yr) (L_m)	TSS Treatment by BMP (lb/yr)
A	2400	0.28	0.28	251.33	251.33
B	2400	0.29	0.29	260.30	260.30
C	2400	0.221	0.221	198.37	198.37
D	2400	0.203	0.203	182.21	182.21
E Uncaptured	450	0.08	0.08	71.81	71.81
Total	---				964.02

3. For Drives D ~ E and the cabins located near those roads, confirm the amount of impervious cover (combined from roadways and cabins) does not exceed 72 feet in the direction off low to the engineered filter strip. The amount of imperious cover which flows to the filter strip does not have to be considered, just the linear amount impervious cover.

   The greatest length of cabin IC is approx 40 feet flowing along the roof. This IC then flows on natural ground anywhere between 10 and 40 feet before reaching the driveways. Drive D has the greatest width of 21 feet. Therefore, at most, 60 linear feet of IC will flow across the filter strip assuming water flows from cabin directly onto the road. This flow will be broken up by natural ground in between. At no point will 72 continuous linear feet of IC flow across the filter strips.

4. Verify the total impervious cover for the site; 5.90 acres from Item 12 (Impervious Cover of Proposed Project Table of the original Unit 3 CZP 01' 6.11 acres from the Impervious Cover/Erosion & Sedimentation Control Exhibit (submitted Feb. 11, 2009).

   The impervious cover has been updated for Item 12 of the CZP application. The impervious cover calculations that were submitted on February 11, 2009 are the correct calculations. Item 12 in the application was not updated in that submittal. Item 12 and Attachment C have been updated and can be referenced in Tab 4 of this comment response packet.

7. X **ATTACHMENT C - Project Narrative.** A detailed narrative description of the proposed project is found at the end of this form.

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)
   - ___ Other:

PROJECT INFORMATION

9. The type of project is:
   - ___ Residential: # of Lots:
   - ___ Residential: # of Living Unit Equivalents:
   - ___ Commercial
   - ___ Industrial
   - X Other: 76 Cabins

10. Total project area (size of site): **56.6** Acres
    Total disturbed area: **9** Acres

11. Projected population: **100**

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

Impervious Cover of Proposed Project	Sq. Ft.	Sq. Ft./Acre	Acres
Structures/Rooftops (rock walls)	**134215**	÷ 43,560 =	**3.08**
Parking	**0**	÷ 43,560 =	**0**
Other paved surfaces	**132067**	÷ 43,560 =	**3.03**
Total Impervious Cover	**266282**	÷ 43,560 =	**6.11**
Total Impervious Cover ÷ Total Acreage x 100 =			**10.8 %**

13. X **ATTACHMENT D - Factors Affecting Surface Water Quality.** A description of factors that could affect surface water quality is found as at the end of this form. If applicable, this should included the location and description of any discharge associated with industrial activity other than construction.

14. X Only inert materials as defined by 30 TAC 330.2 will be used as fill material.

CONTRIBUTING ZONE PLAN
ATTACHMENT C

PROJECT DESCRIPTION

Guadalupe River Club (GRC) Unit 3 is a proposed development tract located in Comal County. The project area is located in the northeast region of Comal County, east of the Guadalupe River on FM 306 near Sattler, TX. The proposed development is connected to two other Contributing Zone Plans, Unit 1 having been approved as the entry way for the development and Unit 2 is under the last review as December 15, 2008. GRC Unit 3 is a combination of roadway and drainage that will be designed and built to serve the site without affecting any surrounding areas. This site contains single family cabins that provide a natural setting of the surrounding areas. The intent of this site is to remain this way, natural and undisturbed. There will be a total of 76 cabins located within this 56.60 acre site, all of which will have restrictions on the owners so they cannot disturb the surrounding features that make the property unique.

The total site area is 56.60 acres with 6.11 acres being impervious, making this site 10.8% impervious. The existing impervious area on this site is 1.58 acres which consists of 4 existing cabins and some gravel roads. All existing impervious cover will be removed.

The project is located within the Edwards Aquifer Contributing Zone. Few portions of this project are within the FEMA recognized 100-year floodplain per Flood Insurance Rate Map (FIRM) Panel No. 48091C0260F, effective date March 10, 2006.

5. For clarity in the approval letter, indicate the amount of impervious cover (IC) treated by the natural filter strip and the amount IC treated by engineered filter strip.

   There will be approximately 6944 sq feet treated by the natural filter strip and approximately 4914 treated by the engineered filter strip.

6. The Unit 1 boundary appears to be located just north of the circular loop driveway entrance/exit. The Unit 3 boundary is depicted approximately 130 feet north of the Unit 1 boundary, which results in a gap along the roadway between Units 1 and 3.

    a. Which unit covers this roadway area between Units 1 and 3?

    This will be covered under Unit 3. Please see the attached Sheet 2 for verification and adjusted drainage areas. This roadway will be treated by Stormceptor D. The calculation for this system can be seen in Tab 2 along with the other updated calculation sheets.

    b. Is TSS treatment and permanent BMPs required for this section of roadway?

    Yes and a Stormceptor (D) unit has been added. Please reference Tab 2 for calculations of the new Stormceptor.

    c. Is the east/west roadway located just south of the Unit 3 boundary part of Unit 1, Unit 3 or an existing roadway? Please explain.

    This is an existing, non-impervious drive that was included for planning purposes only. This roadway will remain as pervious cover and does not require treatment.

7. Confirm the boundary between Unit 2 and Unit 3 along the River Club Drive. The approved exhibits for Unit 2 depict boundaries different from the submitted exhibits for this unit. Please explain and revise the exhibits as necessary.

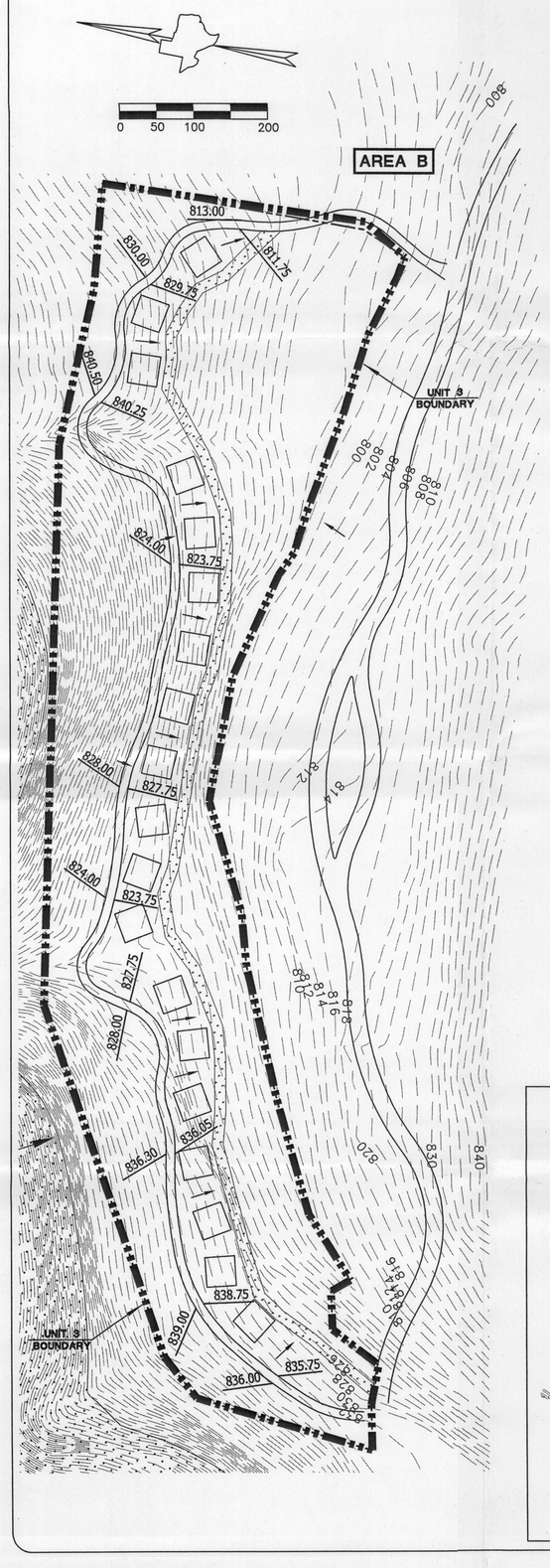
   The boundary for Unit 2 is correct. The total acreage provided for Unit 3 is correct, however, the boundary was not adjusted until now. We have revised the Unit 3 boundary line to extend to the Unit 2 boundary. This additional roadway being added caused us to add another Stormceptor at the edge of the boundary. All portions of River Club Dr are now accounted for in Unit 2. Please see Tab 2 for the calculations for the newest Stormceptor E and Sheet 2 for adjusted areas.

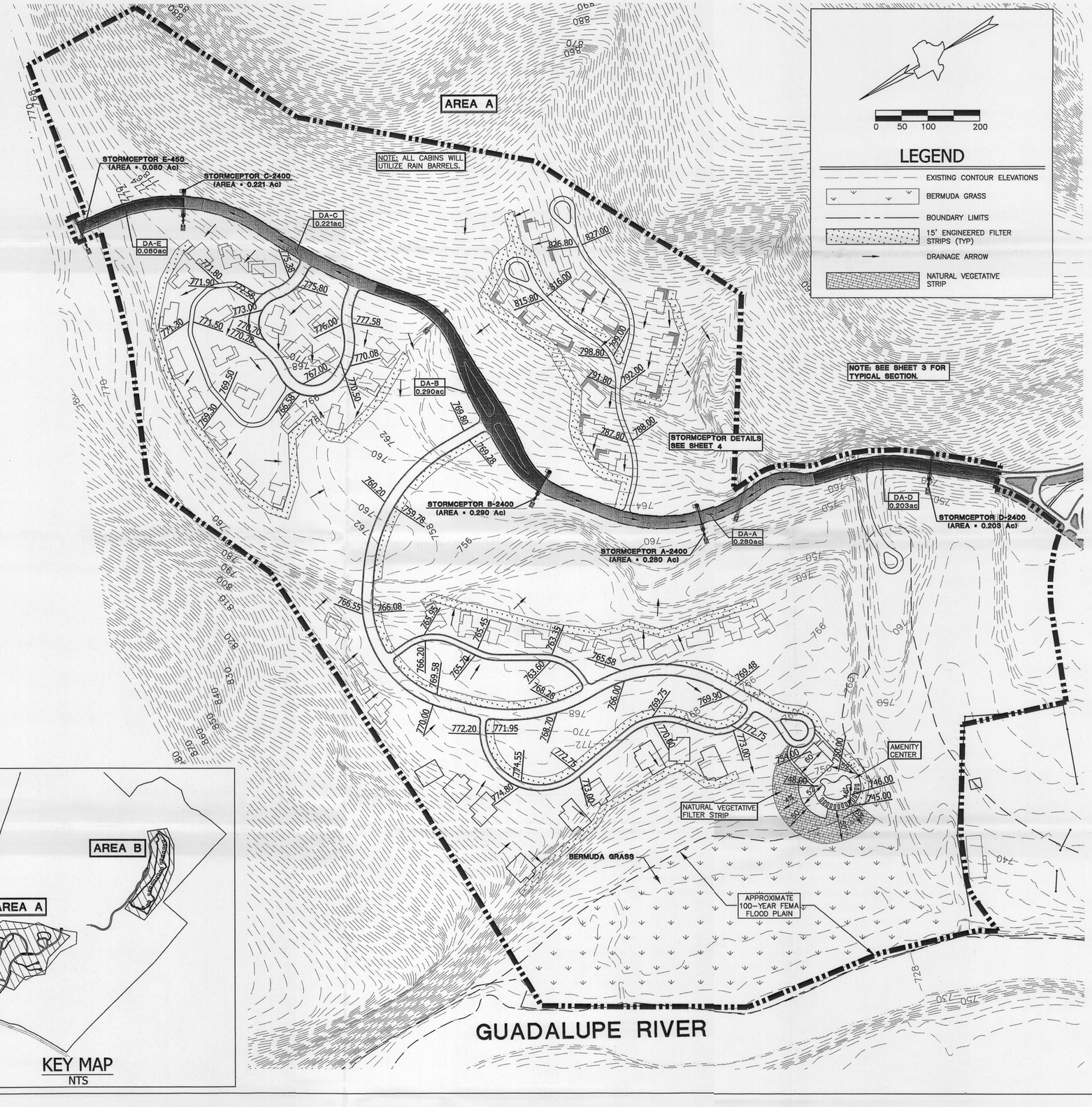
   a. There appears to be approximately 40 feet of roadway, to the north of the drainage area for Stormceptor unit C, which is not included in the drainage area. If treatment is required for this portion of roadway, revise the plan so the entire roadway receives permanent BMP treatment (or over treatment).

      The Stormceptor has been relocated to the correct location of the roadway. The area has been adjusted and is updated in our calculation worksheets.

8. Confirm the submitted site plan layout is the current design. The site layout depicted at www.guadaluperiverclub.com varies slightly in road and cabin layout.

   The submitted site plan is the current design. The layout viewed on the website is an old marketing plan that should not be used as a reference.





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STATE OF TEXAS
HENRY SANFORD HARWOOD
93504
LICENSED PROFESSIONAL ENGINEER

PROJECT NAME - PLAN TYPE

CZP UNIT 3 PERMANENT BMP EXHIBIT / PROPOSED DRIVEWAY GRADES

GUADALUPE RIVER CLUB

FM 306, COMAL COUNTY, TEXAS

DEVELOPER: NAME	
DRAWN/DESIGNED BY:	
EIT/PROJECT MANAGER:	
SR. PROJECT MANAGER:	
JCB PROJECT #: NUMBER	

SHEET 2

2 OF 4

Drawing: L:\050807 Heiner Hollow\ENGINEERING\REPORTS\CZP Unit 3\050807_CZP_UNIT3_BMP_Exhibit.dwg
User: fcrosby
Last Modified: Feb. 25, 09 - 19:09
Plot Style/Time: Feb. 26, 09 - 16:53:11

Xrefs: L:\050807 Heiner Hollow\CAD FILES\XREFS\050807_CSSP01.dwg
L:\050807 Heiner Hollow\ENGINEERING\REPORTS\CZP Unit 2\CAD FILES\XREFS\050807_CSSP01.dwg
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L:\050807 Heiner Hollow\ENGINEERING\REPORTS\CZP Unit 3\050807_CZP_UNIT3_BMP_Exhibit.dwg

CONTRIBUTING ZONE PLAN COMMENT RESPONSE TO TCEQ COMMENTS JANUARY 28, 2009

FOR

GUADALUPE RIVER CLUB UNIT 3

RANCH ROAD FM 306
COMAL COUNTY, TEXAS

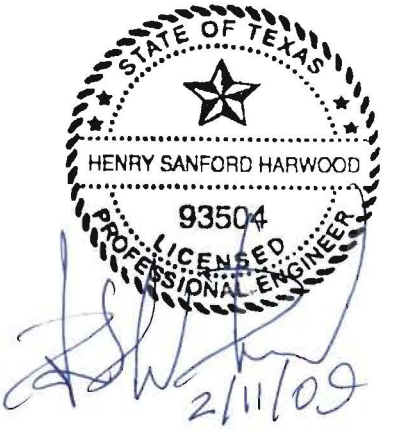
PREPARED FOR:

HEISER HOLLOW PARTNERS, LLC
12790 MERIT DRIVE, SUITE 100
DALLAS, TEXAS 75251

PREPARED BY:

JACOBS™
2705 BEE CAVE ROAD, SUITE 300
AUSTIN, TEXAS 78746

FEBRUARY 2009



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COMMENT RESPONSE TO
TEXAS COMMISSION ON ENVIRONMENTAL QUALITY (TCEQ)
COMMENTS JANUARY 28, 2009

February 11, 2009

Ms Charly Fritz
TCEQ: Region 13
14250 Judson Road
San Antonio, Texas 78233

Guadalupe River Club-Unit 3 Comments and Responses to Contributing Zone Plan
Comal County, Texas

Ms. Fritz:

We have received your comments regarding our submittal on the Contributing Zone Plan for Guadalupe River Club Unit 3 located in Comal County, Texas, dated January 28, 2009. The comments have been addressed and our responses (bold italic) are below. Please refer to the 'Sheets' tab for all referenced sheets within this response.

1. Please verify that the proposed site layout, including road and building locations, number of buildings and length of roads, match throughout the submitted exhibits. Revise any sheets as necessary.

   This has been verified. The exhibits match each other's site layouts.

2. Impervious Cover: Provide the following acreage amounts.
   a. The amount of impervious cover for the amenity center.

      The amount of impervious cover has been included in our calculations located on Sheet 1. The final impervious cover is 0.35 acres. We modified the amenity center to better illustrate what will be built.

   b. The amount of impervious cover for the amenity center parking lot.

      There is not a parking lot for the amenity center. The surrounding area will remain natural vegetation.

   c. The length and width of the roadways requiring treatment.

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The length and width of all the roadways requiring treatment are shown on Sheet 3. We designated each drive with its corresponding lengths and widths and assigned a typical section to each.

d. The typical amount of impervious cover for a cabin footprint. Include the rooftop and driveway in this amount. If there are multiple sized of cabins with various amounts of impervious cover, detail each typical design and estimate the number of cabins that will be constructed for each design.

The estimates for the cabins are located on Sheet 3. They are designated by letters (A, B, C) based on the estimated square footage of each. The table located on this sheet contains corresponding impervious cover calculations related to each type.

3. Stormceptor BMP: Depending on the response to Item a below, respond to Items b-g as necessary.
   a. As stated in the Edwards Aquifer Technical Guidance Manual (currently found on the Addendum Sheet to the TGM), the selection criteria for a Stormceptor BMP is for sites where, "space constraints make installation of a surface treatment system infeasible." In general, Stormceptor BMPs can be used at small sites and/or retrofit/redevelopment sites where space for surface treatment BMPs is limited. Revise the application to include surface treatment BMPs (basins, vegetative filter strips, swales, ect.) for the main roadway and remove or limit the use of the Stormceptor BMPs. If the application will still propose the use of Stormceptor BMPs, please demonstrate how surface treatment BMPs are infeasible for the proposed watershed.

We will continue to propose the use of Stormceptors as BMPs for this site. They are being proposed to treat only the roadway stormwater for River Club Dr. The remainder of the site will utilize surface treatment by vegetated filter strips. The roadway contains very steep slopes on either side, with an adjacent hill on the south side and a peninsula on the northern side. I have attached the cross sections to help illustrate. Please see sheet CP-104.

Also, in order to carry the stormwater from the roadway to a possible surface treatment location would require directing the water underneath a large creek. This is not a feasible situation. The stormceptor treats the required amount of TSS in the limited construction area we are required to build within while at the same time conserving the natural make of the land.

b. Confirm curbs and gutters are proposed for the main roadway to direct stormwater to the Stormceptor BMPs. Detail the gutter system with notes and illustrations on a plan sheet.
Please see sheet 3 for River Club Drive typical section. A detail of the mountable curb to be utilized is also shown. For details of the inlet see sheet 4.

c. Distinguish the individual drainage areas for each Stormceptor unit on a plan sheet.

Sheet 2 illustrates the individual drainage areas for the Stormceptors.

d. The submitted maintenance plan for the Stormceptor BMPs conflicts with the guidelines and requirements from RG-348. Please refer to the addendum section of RG-348 for a complete list of requirements for inspecting and maintaining Stormceptor BMPs and revise Attachment N to conform to these guidelines.

The original submitted maintenance plan was provided by the manufacturer. We have replaced that plan with that of TCEQ, Section 3.5.17 from RG-348.

e. Provide details of the Stormceptor models 450i and 900. Generally, these details can be obtained.

After speaking with a manufacturer, we have changed Stormceptor models. To eliminate much maintenance and construction costs, it has been decided to utilize 3-2400 instead of the smaller units. Details for the 2400 are provided in Tab 2. Also in this section are the new Compensation Worksheets.

f. Inlet protection for the Stormceptor drainage inlets is only detailed for one section of roadway. Indicate the other areas where inlet protection is necessary for the remaining Stormceptor units.

Since we have decided to utilize the 2400 series, inlet protection is no longer needed for these systems. Inlet protection is only required for the storm drain inlets and it is now shown on our exhibits.

g. On the Permanent BMP Exhibit, there appears to be two Stormceptor units proposed in the middle of the drainage area for Units B and I. Please explain. If theses structures are the Stormceptor Units, why are only two shown?

This sheet was in error. The corrected Sheet is attached with the correct amount of Stormceptors.

4. Vegetative Filter Strips
   a. Provide a detail of the pavement/filter strip transition to confirm stormwater will travel through the filter strip instead of along the top.

      Sheet 3 details the road to filter strip detail. See "Sections" in top right corner of the detail sheet. The water will flow along the pavement at 2% and then to the filter strip.

   b. RG-348 states the maximum amount of impervious cover draining to a filter strip is 72 feet. Confirm that no section of engineered filter strip receive greater than 72 feet of impervious cover or revise the plan sheets as necessary. The areas depicted in Attachment A and B, copied from the Unit 3 Permanent BMP Exhibit, appear to exceed 72 feet of impervious cover draining to the filter strip.

      We have provided a detail on Sheet 3 that illustrates the impervious cover flow to the filter strips. For a 9 foot wide roadway with a 2% cross slope and 10% max roadway slope (County max.), no stormwater will travel more than 45 feet before reaching a filter strip and 60 feet for a 12 foot wide roadway. The 21 foot driveway sections will have no more than a 5% slope, combined with a 2% cross slope, water travels 53 feet before reaching the strip.

      These are worse case scenarios; the driveways will not exceed these slopes.

   c. Refer to Attachment A and C, copied from the Unit 3 Permanent BMP Exhibit, to clarify how the areas depicted receives treatment. These areas appear to bypass proposed engineered filter strips and other permanent BMPs.

      We have extended the filter strips to make sure no areas are bypassed. Please see sheet 2.

5. Temporary BMPs:
   a. As stated in RG-348, the placement of temporary BMPs in the 100 year floodplain should be avoided. Revise the silt fence location on the SWPPP Control Plan as it appears the silt fence can be placed in closer proximity to the disturbed area.

      The plans have been revised to show this change. The silt fence will be placed outside the 100 year floodplain. Please see Sheet 1 and Sheet SC.

   b. On a plan sheet, provide construction details, figures and notes for all temporary BMPs proposed for the site.

Details have been provided and are attached. See last section, named EX

6. Provide contour lines and elevations for all roadways as necessary.

   We have provided spot elevations along the driveways to help illustrate how the tilt sections will be constructed and which way the water will flow on the filter strips.

   River Club Drive is a 2 lane, crown section. Please see Sheet 3 for typical section. There will be ditches on the right side to capture storm water from the natural terrain and utilize a curb section to capture the roadway drainage which will be conveyed to the Stormceptors. Please see Sheet 4 for this detail.

7. What is the site boundary for the total site (Unit 1, 2, 3)? The site boundary, presented in the USGS Map, appears different from the layout of the parcels owned by Heiser Hollow Partners as presented by the Comal County GIS Map and Comal County Appraisal District information (Attachment D). Please provide an exhibit or page which details the actual extent of the property and explain the discrepancy between the overall site layouts.

   I have included an exhibit showing the boundaries. I am not aware of any discrepancy. Our Unit 2 limits are provided to show what has been approved by TCEQ. Nothing will be constructed outside of those limits. Unit 3 CZP is also shown in relation to Unit 2 and Unit 1.

8. In the exhibits for Unit 3, the wastewater treatment plant (WWTP) is detailed with a roadway, buildings and other structures. The exhibits for the approved Unit 2 only detailed the roadway. It appears that only soil disturbance (clearing) for the WWTP was approved with the Unit 2. Please clarify if the impervious cover associated with the WWTP was included in the Unit 2 approval. If not, propose permanent BMPs for the impervious cover from the WWTP.

   The impervious cover for the WWTP was included in the Unit 2 calculations. It was a mistake on our part that the actual building was not shown on the exhibit for Unit 2; however it was included in our impervious cover calculations spreadsheet located on the same exhibit. The roadway leading up to and the roadway within the WWTP boundaries are within the Unit 2 calculations as well. Please reference the CZP Unit 2 exhibit named CZP Unit 2 Impervious Cover/Erosion and Sedimentation Control Plan

9. Address the following discrepancies found between the CZP Unit 3 Impervious Cover Exhibit, the CZP Mod 1 Impervious Cover Exhibit, both submitted with this proposed application and the CZP Unit 2 Impervious Cover Exhibit approved with the Unit 2 Plan.

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Austin, Texas 78746 U.S.A.
(512) 314-3100 Fax: (512) 314-3135

a. The CZP Mod. 1 exhibit details a roadway in the northern corner of the site which is not detailed in the other exhibits. Please explain or revise.

This was an AutoCAD error. That road no longer exists in the site plan and will not be constructed. Both exhibits now illustrate this.

b. The CZP Mod 1 exhibit details eight residential lots in the northeastern corner of the site that the other two exhibits do not detail. Please explain or revise.

This has also been revised, AutoCAD error. Those lots also will not be constructed and the site plan has been changed. All exhibits no longer show these lots.

We have attached one original and three copies of the corrected material that will supplement the CZP application and we trust that this as well as the comments above will help in the continuation of your review. If you have any questions or need more information regarding the information provided for Guadalupe River Club Unit 3, please contact us at (512) 314-3100.

Sincerely,

Sandy Harwood, P.E.
Senior Project Manager

1. Please verify that the proposed site layout, including road and building locations, number of buildings and length of roads, match throughout the submitted exhibits. Revise any sheets as necessary.

This has been verified. The exhibits match each other's site layouts.

2. Impervious Cover: Provide the following acreage amounts.
   a. The amount of impervious cover for the amenity center.

      The amount of impervious cover has been included in our calculations located on Sheet 1. The final impervious cover is 0.35 acres. We modified the amenity center to better illustrate what will be built.

   b. The amount of impervious cover for the amenity center parking lot.

      There is not a parking lot for the amenity center. The surrounding area will remain natural vegetation.

   c. The length and width of the roadways requiring treatment.

      The length and width of all the roadways requiring treatment are shown on Sheet 3. We designated each drive with its corresponding lengths and widths and assigned a typical section to each.

   d. The typical amount of impervious cover for a cabin footprint. Include the rooftop and driveway in this amount. If there are multiple sized of cabins with various amounts of impervious cover, detail each typical design and estimate the number of cabins that will be constructed for each design.

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   a. As stated in the Edwards Aquifer Technical Guidance Manual (currently found on the Addendum Sheet to the TGM), the selection criteria for a Stormceptor BMP is for sites where, "space constraints make installation of a surface treatment system infeasible." In general, Stormceptor BMPs can be used at small sites and/or retrofit/redevelopment sites where space for surface treatment BMPs is limited. Revise the application to include surface treatment BMPs (basins, vegetative filter strips, swales, ect.) for the main roadway and remove or limit the use of the Stormceptor BMPs. If the application will still propose the use of Stormceptor BMPs, please demonstrate how surface treatment BMPs are infeasible for the proposed watershed.

      We will continue to propose the use of Stormceptors as BMPs for this site. They are being proposed to treat only the roadway stormwater for River Club Dr. The remainder of the site will utilize surface treatment by vegetated filter strips. The roadway contains very steep slopes on either side, with an adjacent hill on the south side and a peninsula on the northern side. I have attached the cross sections to help illustrate. Please see sheet CP-104.

      Also, in order to carry the stormwater from the roadway to a possible surface treatment location would require directing the water underneath a large creek. This is not a feasible situation. The stormceptor treats the required amount of TSS in the limited construction area we are required to build within while at the same time conserving the natural make of the land.

   b. Confirm curbs and gutters are proposed for the main roadway to direct stormwater to the Stormceptor BMPs. Detail the gutter system with notes and illustrations on a plan sheet.

      Please see sheet 3 for River Club Drive typical section. A detail of the mountable curb to be utilized is also shown. For details of the inlet see sheet 4.

   c. Distinguish the individual drainage areas for each Stormceptor unit on a plan sheet.

      Sheet 2 illustrates the individual drainage areas for the Stormceptors.

   d. The submitted maintenance plan for the Stormceptor BMPs conflicts with the guidelines and requirements from RG-348. Please refer to the addendum section of RG-348 for a complete list of requirements for inspecting and

maintaining Stormceptor BMPs and revise Attachment N to conform to these guidelines.

The original submitted maintenance plan was provided by the manufacturer. We have replaced that plan with that of TCEQ, Section 3.5.17 from RG-348.

e. Provide details of the Stormceptor models 450i and 900. Generally, these details can be obtained.

After speaking with a manufacturer, we have changed Stormceptor models. To eliminate much maintenance and construction costs, it has been decided to utilize 3-2400 instead of the smaller units. Details for the 2400 are provided in Tab 2. Also in this section are the new Compensation Worksheets.

f. Inlet protection for the Stormceptor drainage inlets is only detailed for one section of roadway. Indicate the other areas where inlet protection is necessary for the remaining Stormceptor units.

Since we have decided to utilize the 2400 series, inlet protection is no longer needed for these systems. Inlet protection is only required for the storm drain inlets and it is now shown on our exhibits.

g. On the Permanent BMP Exhibit, there appears to be two Stormceptor units proposed in the middle of the drainage area for Units B and I. Please explain. If theses structures are the Stormceptor Units, why are only two shown?

This sheet was in error. The corrected Sheet is attached with the correct amount of Stormceptors.

CONTRIBUTING ZONE PLAN
ATTACHMENT N

INSPECTION, MAINTENANCE, AND RETROFIT PLAN

The inspection, maintenance and retrofit plan will follow the basic guidelines provided by the Edwards Aquifer Technical Guidance Manual.

Once a vegetated area is well established, little additional maintenance is generally necessary. The key to establishing a viable 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. If the filter strip is made up of turf grass, it should be moved as needed to limit vegetation height to 18 inches, using a mulching mower (or removal of clippings). If native grasses are used, the filter may require less frequent mowing, but a minimum of twice annually. Grass clippings and brush debris should not be deposited on vegetated filter strip areas. Regular mowing should also include weed control practices, however herbicide use should be kept to a minimum (Urbonas et al., 1992). Healthy grass can be maintained without using fertilizers because runoff usually contains sufficient nutrients. Irrigation of the site can help assure a dense and healthy vegetative cover.

- Inspection. Inspect filter strips at least twice annually for erosion or damage to vegetation; however, additional inspection after periods of heavy runoff is most desirable. The strip should be checked for uniformity of grass cover, debris and litter, and areas of sediment accumulation. More frequent inspections of the grass cover during the first few years after establishment will help to determine if any problems area developing, and to plan for long-term restorative maintenance needs. Bare spots and areas of erosion identified during semi-annual inspections must be replanted and restored to meet specifications. Construction of a level spreader device may be necessary to reestablish shallow overland flow.

- Debris and Litter Removal. Trash tends to accumulate in vegetated areas, particularly along highways. Any filter strip structures (i.e. level spreaders) should be kept free of obstructions to reduce floatables being flushed downstream, and for aesthetic reasons.

The need for this practice is determined through periodic inspection, but should be performed no less than 4 times per year.

- Sediment Removal. Sediment removal is not normally required in filter strips, since the vegetation normally grows through it and binds it to the soil. However, sediment may accumulate along the upstream boundary of the strip preventing uniform overland flow. Excess sediment should be removed by hand or with flat-bottomed shovels.

- Grass Reseeding and Mulching. A healthy dense grass should be maintained on the filter strip. If areas are eroded, they should be filled, compacted, and reseeded so that the final grade is level. Grass damaged during the sediment removal process should be promptly replaced using the same seed mix used during filter strip establishment. 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, particularly as they vegetation is initially established.

The inspection, maintenance and retrofit plan for the Stormceptor Units will also follow the basic guidelines provided by the Edwards Aquifer Technical Guidance Manual. The following sheets are excerpts from the Manual are to be followed.

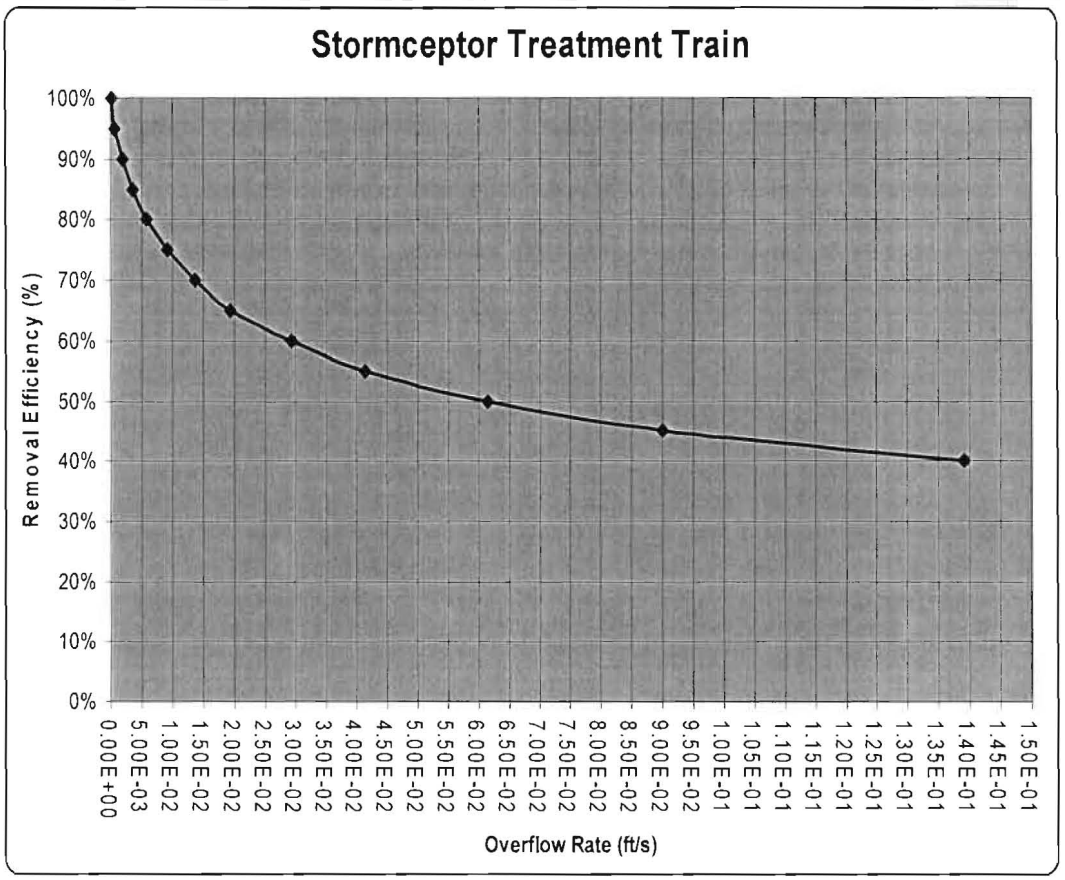


Figure 4

3.5.17

3.5.14 Stormceptor® Maintenance Guidelines

Stormceptor® recommends annual maintenance (1 time per year) of the Stormceptor® Unit(s) in conjunction with quarterly monitoring (4 times per year). A Professional Engineer licensed by the State of Texas and knowledgeable in storm water quality treatment devices should perform inspection services. **All units with the optional trash screen must be inspected on a monthly basis at minimum. Owner must observe site conditions and determine whether or not pollutant loads require a more frequent inspection schedule.** Pollutant levels will be recorded monthly. When the pollutant levels reach the guideline values indicated in this plan, maintenance is required. Vacuum maintenance will be done on an annual basis **and/or** when monitoring indicates high pollutant levels (see Table 2 in Stormceptor® Monitoring section). Monitoring should be noted on the attached "Stormceptor® Monitoring / Maintenance Plan Summary" sheet. All entries must be signed and dated by the property owner or designee. Stormceptor® maintenance must be documented to include a copy of the applicable vacuum service manifest. Upon completion of the monitoring and the annual maintenance, the "Stormceptor® Monitoring / Maintenance Plan Summary" sheet and all back-up documentation (to include manifest from vacuum service) should be maintained on-site.

TCEQ Approval of Innovative Technology

Monitoring

Monitoring the Stormceptor® unit requires a dipstick tube equipped with a ball valve (typically a Sludge Judge® or Core Pro®). A normal monitoring scenario requires removal of the manhole cover and lowering the dipstick tube through the oil port into the bottom treatment chamber (see Figure 5). Make sure the dipstick tube goes completely to the bottom. Lift the dipstick tube out of the unit and keep it in a vertical position and read the level of sediment and oils from the gauge on the dipstick. Record pollutant levels on your "Stormceptor® Monitoring / Maintenance Plan Summary". Remove all trash and debris engaged with the trash screen. If either pollutant(s) in the dipstick tube (sediments or oils) exceed the levels indicated on Table 2, maintenance of the Stormceptor® is required. Please skip to "Stormceptor® Maintenance". Upon completing the recording of pollutant levels, the dipstick tube is then drained back into the inlet side of the Stormceptor®. This ensures that the pollutants in the dipstick tube do not leave the unit.

Table 2 – Stormceptor® Maximum Pollutant Levels

Model	Down Pipe Orifice	Sediment Depth	*Sediment Capacity (ft^3)	Oil Depth	Oil Capacity (U.S. Gal.)
STC 450i	4"	8"	9	12"	86
STC 900	6"	8"	19	16"	251
STC 1200	6"	10"	25	16"	251
STC 1800	6"	15"	37	16"	251
STC 2400	8"	12"	49	44"	840
STC 3600	8"	17"	75	44"	840
STC 4800	10"	15"	101	44"	909
STC 6000	10"	18"	123	44"	909
STC 7200	12"	15"	149	44"	1059
STC 11000	10"	17"	224**	44"	2797
STC 13000	10"	20"	268**	44"	2797
STC 16000	12"	17"	319**	44"	3055

* Capacity prior to recommended maintenance

** Total both structures combined

Maintenance

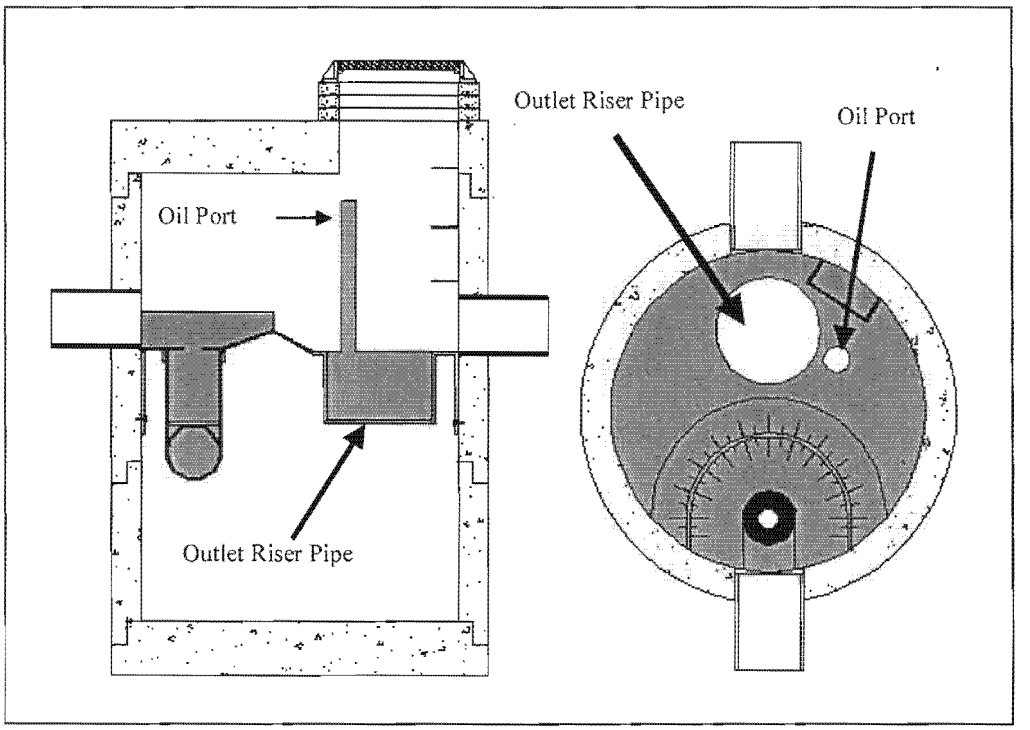
Maintenance of the Stormceptor® system is recommended at least once a year or when dictated by the pollutant levels referenced in Table 2. It is imperative that the Stormceptor® be maintained regularly to ensure proper operation of the unit. If the unit reaches the pollutant levels listed in Table 2, the designed effectiveness of the unit will decrease.

Maintenance is accomplished when the owner contacts a representative of the vacuum service industry, a well-established sector of the service industry that cleans underground tanks, sewers, and catch basins. Cost to clean the Stormceptor® will vary based on the size of the unit and transportation distances. If you need assistance for cleaning a Stormceptor® unit, please contact your local Rinker Materials representative, or the Stormceptor® Information Line at (800) 909-7763.

Typically, the Vacuum Service representative will maintain the Stormceptor® by first removing the manhole. The vacuum service will first remove the oil through the oil port (refer to Figure 5). If the vacuum cannot remove the oils through the oil port (i.e. the vacuum service hose diameter is larger than the 6" oil port opening) water can be removed through the outlet pipe (refer to Figure 5) until such time that the oils can be removed. Typically, your vacuum service representative will recycle the oils at their facility. Sediments in the Stormceptor® can be removed by inserting the vacuum service hose into the bottom treatment chamber via the outlet pipe (refer to Figure 1). In most areas the sediment, once

dewatered at the vacuum service facility, can be disposed of in a sanitary landfill. Once the floatables and sediments have been removed from the Stormceptor®, the unit is required to be filled with clean water to the top of the riser / drop pipe. This completes the maintenance process. All waste should be disposed of in manner that complies with local, state, and federal laws and regulations pertaining to their specific situation and/or facility.

Once maintenance has been completed, document the information on the "Stormceptor® Monitoring / Maintenance Plan Summary" sheet. Attach a copy of the manifest from the applicable vacuum service.



Monitoring / Maintenance Completion - Summary

Company Name: _____

Company Address: _____

City/State/Zip: _____

Phone: _____

Engineer: _____

Engineers Address: _____

City/State/Zip: _____

Phone: _____

Property Owner: _____

*Stormceptor Model _____

Monitoring / Maintenance Table

	Jan	Feb	Mar	Apr	May	Jun	July	Aug	Sep	Oct	Nov	Dec
Oil Depth (inches)												
Sediment Depth (inches)												
Completed By:												
Date												
Floatables (Optional)												

I hereby certify that the monitoring and maintenance of the Stormceptor® unit was completed in accordance with the directions of the Stormceptor® monitoring / maintenance plan.

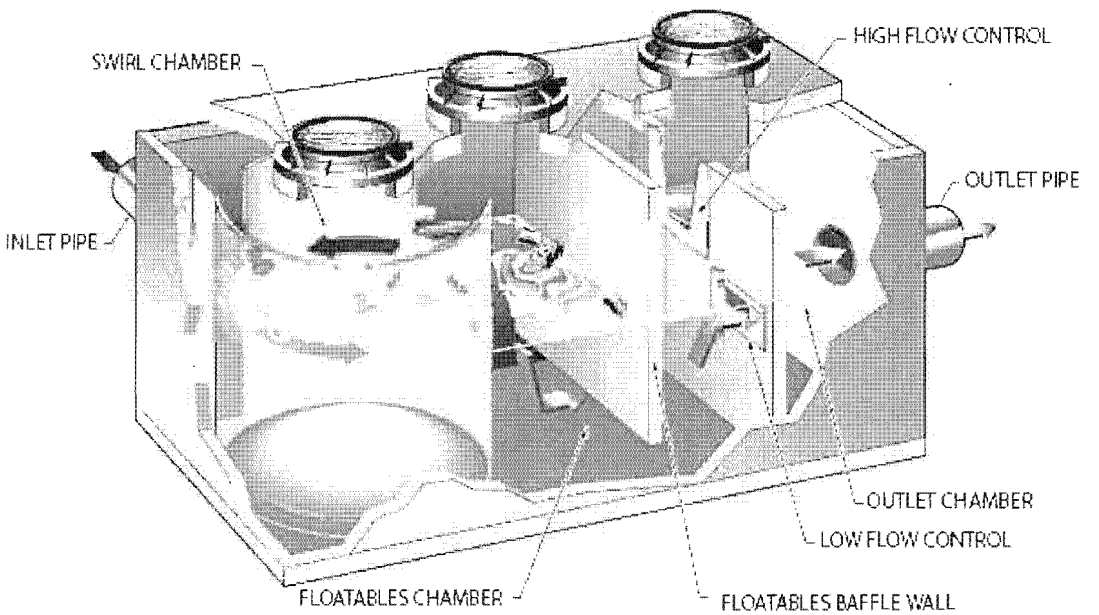
_____
(Signed by property owner or designee)

** Note – This form must be completed for both chambers of the STC 11000, STC 13000, and STC 16000.

Section 3.2.15

The Vortechs System

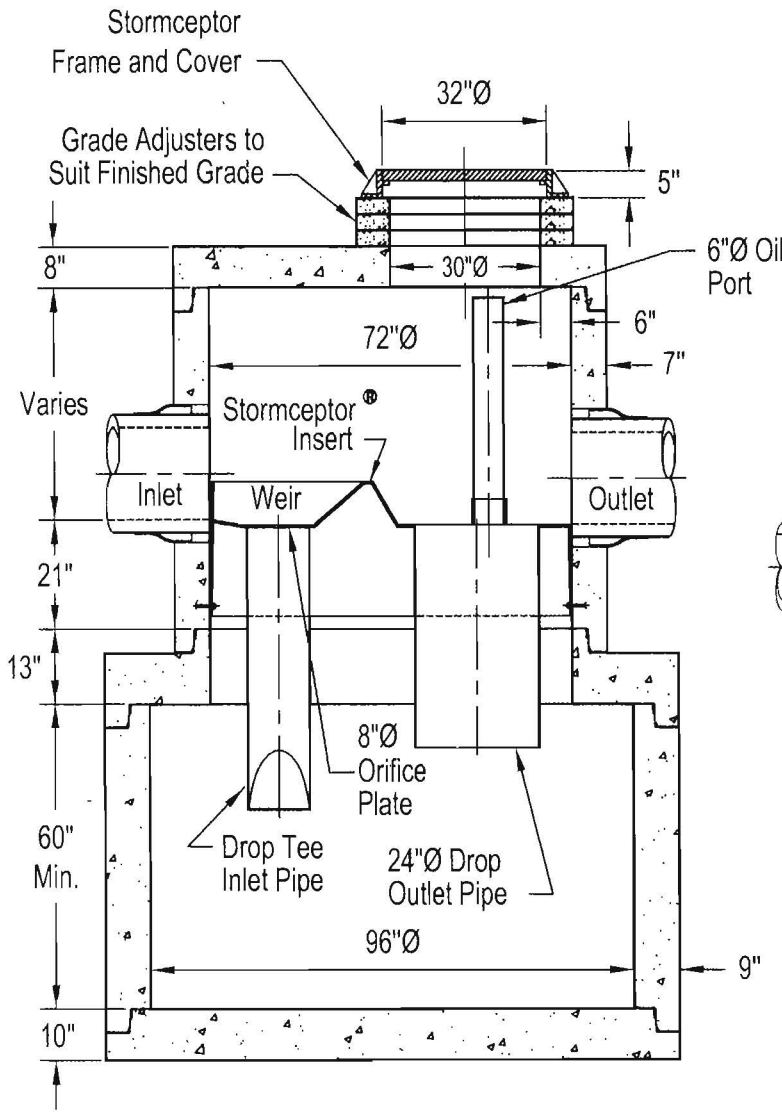
The Vortechs system (Figure 1) is a patented hydrodynamic separator that effectively removes sediment, oil and grease, and floating and sinking debris. Its swirl concentrator and flow controls work together to minimize turbulence and provide stable storage of captured pollutants.



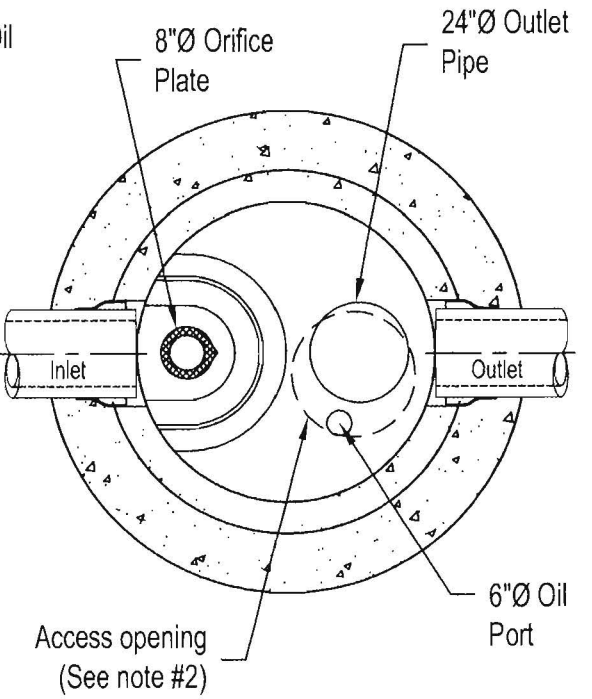
Rinker MATERIALS™

Concrete Pipe Division

STC 2400 Precast Concrete Stormceptor®
(2400 U.S. Gallon Capacity)



Section Thru Chamber



Plan View

Notes:

1. The Use Of Flexible Connection is Recommended at The Inlet and Outlet Where Applicable.
2. The Cover Should be Positioned Over The Outlet Drop Pipe and The Oil Port.
3. The Stormceptor System is protected by one or more of the following U.S. Patents: #4985148, #5498331, #5725760, #5753115, #5849181, #6068765, #6371690.
4. Contact a Concrete Pipe Division representative for further details not listed on this drawing.

PROJECT: **Guadalupe River Club Unit 3**

EAPP STORMCEPTOR Compensation Worksheet (Rev. 7/21/08): Use additional sheets for additional catchment areas.

Table 1

Effective Area (ac)	Stormceptor Model	Surface Area (ft^2)
EA < 0.08	450i	12.57
0.08 < EA < 0.16	900, 1200, 1800	28.27
0.16 < EA < 0.29	2400, 3600	50.27
0.29 < EA < 0.46	4800, 6000	78.54
0.46 < EA < 0.66	7200	113.10
0.66 < EA < 0.92	11,000, 13,000	157.08
0.92 < EA ≤ 1.32	16,000	226.19

Use additional sheets for additional BMPs.
A_I = Impervious Cover
A_P = Pervious Cover
A = Total Area
P = Avg. Annual Rainfall
A_N = Increase in impervious cover (new IC – existing IC)
TSS = $L_M = 27.2 \times A_N \times P$

List only the uncaptured area being compensated for in the BMP. TSS compensation for uncaptured areas can be divided up between multiple BMPs.

*

BMP Catchment Area A		Uncaptured / Untreated Areas (for compensation in BMP)	
A_{I1} =	0.28	A_{I2} =	0
A_{P1} =	0	A_{P2} =	0
A_1 =	0.28	A_2 =	0
A_{N1} =	0.28	A_{N2} =	0
L_{M1} =	263.51	L_{M2} =	0

1 Stormceptor (STC) Model (Actual Catchment Area to the BMP); Use additional sheets as necessary.
Effective Area (EA) = (0.9 x A_{I1}) + (0.03 x A_{P1})
EA = (0.9 x 0.28) + (0.03 x 0) = 0.252 EA

STC Model (from Table 1 to start) 2400 ; Surface area (SA) of model (Table 1) 50.27 ft^2
Required TSS Removal for Catchment Area:
L_{M1} = 27.2 x 0.28 A_{N1} x 34.6 P" = 263.51 #TSS

2 Overflow Rate (Round to the sixth decimal place)
V_{or} = (EA x 1.1 in/hr) / Model surface area (SA)
V_{or} = (0.252 x 1.1) / 50.27 = 0.0055 f/s

3 BMP Efficiency (Table 2); If the overflow rate is between two percent efficiencies, use the smaller percent efficiency (round the overflow rate to the larger overflow value). Enter rounded overflow value:
V_{or} = 0.005810 f/s

BMP % = 80 % / 100 = 0. 80 BMP Eff.

4 Maximum TSS Removal of BMP: L_{R1}
L_{R1} = (BMP Eff x P) x [(A_{I1} x 34.6) + (A_{P1} x 0.54)]
L_{R1} = (0. 80 x 34.6 ") x [(0.28 x 34.6) + (0 x 0.54)] = 268.16 #TSS

TSS Load Credit (L_C) to be counted towards untreated areas = $L_{R1} - L_{M1}$
L_C = (268.16 #TSS – 263.51 #TSS) = 4.65 #TSS

5 Required TSS Removal for Uncaptured Area L_{M2} = 27.2 x 0 A_{N2} x 0 " = 0 #TSS

6 Is Sufficient Treatment Available?
If $L_C \geq L_{M2}$; Model size is adequate.
If $L_C < L_{M2}$; Model size is inadequate. Choose a larger model size or redefine the catchment areas. Repeat steps 1 - 6.
_____ L_C (< , > , ≥, pick) _____ L_{M2}

Final Model Size: 2400

7 TSS Treatment by BMP
L_{M1} (step 1) + L_{M2} (step 5) = TSS Treatment by BMP
263.51 #TSS + 0 #TSS = 263.51 #TSS

8 TSS Treatment Summary

Catchment Area	STC Model	Total Drainage Area (ac)	Impervious Cover (ac)	Calculated TSS Removal (lb/yr) (L_M)	TSS Treatment by BMP (lb/yr) (Step 7)
BMP Catchment	2400	0.28	0.28	263.51	263.51
Uncaptured/Untreated	---				0
Total	---				263.51

PROJECT: **Guadalupe River Club Unit 3**

EAPP STORMCEPTOR Compensation Worksheet (Rev. 7/21/08): Use additional sheets for additional catchment areas.

Table 1

Effective Area (ac)	Stormceptor Model	Surface Area (ft^2)
EA < 0.08	450i	12.57
0.08 < EA < 0.16	900, 1200, 1800	28.27
0.16 < EA < 0.29	2400, 3600	50.27
0.29 < EA < 0.46	4800, 6000	78.54
0.46 < EA < 0.66	7200	113.10
0.66 < EA < 0.92	11,000, 13,000	157.08
0.92 < EA ≤ 1.32	16,000	226.19

Use additional sheets for additional BMPs.
A_I = Impervious Cover
A_P = Pervious Cover
A = Total Area
P = Avg. Annual Rainfall
A_N = Increase in impervious cover (new IC – existing IC)
TSS = $L_M = 27.2 \times A_N \times P$

List only the uncaptured area being compensated for in the BMP. TSS compensation for uncaptured areas can be divided up between multiple BMPs.

*

BMP Catchment Area A		Uncaptured / Untreated Areas (for compensation in BMP)	
A_{I1} =	0.29	A_{I2} =	0
A_{P1} =	0	A_{P2} =	0
A_1 =	0.29	A_2 =	0
A_{N1} =	0.29	A_{N2} =	0
L_{M1} =	272.93	L_{M2} =	0

1 Stormceptor (STC) Model (Actual Catchment Area to the BMP); Use additional sheets as necessary.
Effective Area (EA) = (0.9 x A_{I1}) + (0.03 x A_{P1})
EA = (0.9 x 0.29) + (0.03 x 0) = 0.261 EA

STC Model (from Table 1 to start) 2400 ; Surface area (SA) of model (Table 1) 50.27 ft^2
Required TSS Removal for Catchment Area:
L_{M1} = 27.2 x 0.29 A_{N1} x 34.6 P" = 272.93 #TSS

2 Overflow Rate (Round to the sixth decimal place)
V_{or} = (EA x 1.1 in/hr) / Model surface area (SA)
V_{or} = (0.261 x 1.1) / 50.27 = 0.005711 f/s

3 BMP Efficiency (Table 2); If the overflow rate is between two percent efficiencies, use the smaller percent efficiency (round the overflow rate to the larger overflow value). Enter rounded overflow value:
V_{or} = 0.005810 f/s

BMP % = 80 % / 100 = 0. 80 BMP Eff.

4 Maximum TSS Removal of BMP: L_{R1}
L_{R1} = (BMP Eff x P) x [(A_{I1} x 34.6) + (A_{P1} x 0.54)]
L_{R1} = (0. 80 x 34.6 ") x [(0.29 x 34.6) + (0 x 0.54)] = 277.74 #TSS

TSS Load Credit (L_C) to be counted towards untreated areas = $L_{R1} - L_{M1}$
L_C = (277.74 #TSS – 272.93 #TSS) = 4.81 #TSS

5 Required TSS Removal for Uncaptured Area L_{M2} = 27.2 x 0 A_{N2} x 0 " = 0 #TSS

6 Is Sufficient Treatment Available?
If $L_C \geq L_{M2}$; Model size is adequate.
If $L_C < L_{M2}$; Model size is inadequate. Choose a larger model size or redefine the catchment areas. Repeat steps 1 - 6.
_____ L_C (< , > , ≥ , pick) _____ L_{M2}

Final Model Size: 2400 ,

7 TSS Treatment by BMP
L_{M1} (step 1) + L_{M2} (step 5) = TSS Treatment by BMP
272.93 #TSS + 0 #TSS = 272.93 #TSS

8 TSS Treatment Summary

Catchment Area	STC Model	Total Drainage Area (ac)	Impervious Cover (ac)	Calculated TSS Removal (lb/yr) (L_M)	TSS Treatment by BMP (lb/yr) (Step 7)
BMP Catchment	2400	0.29	0.29	272.93	272.93
Uncaptured/Untreated	---				0
Total	---				272.93

PROJECT: **Guadalupe River Club Unit 3**

EAPP STORMCEPTOR Compensation Worksheet (Rev. 7/21/08): Use additional sheets for additional catchment areas.

Table 1

Effective Area (ac)	Stormceptor Model	Surface Area (ft^2)
EA < 0.08	450i	12.57
0.08 < EA < 0.16	900, 1200, 1800	28.27
0.16 < EA < 0.29	2400, 3600	50.27
0.29 < EA < 0.46	4800, 6000	78.54
0.46 < EA < 0.66	7200	113.10
0.66 < EA < 0.92	11,000, 13,000	157.08
0.92 < EA ≤ 1.32	16,000	226.19

Use additional sheets for additional BMPs.
A_I = Impervious Cover
A_P = Pervious Cover
A = Total Area
P = Avg. Annual Rainfall
A_N = Increase in impervious cover (new IC – existing IC)
TSS = L_M = 27.2 x A_N x P

List only the uncaptured area being compensated for in the BMP. TSS compensation for uncaptured areas can be divided up between multiple BMPs.

*

BMP Catchment Area A		Uncaptured / Untreated Areas (for compensation in BMP)	
A_{I1} =	0.20	A_{I2} =	0
A_{P1} =	0	A_{P2} =	0
A_1 =	0.20	A_2 =	0
A_{N1} =	0.20	A_{N2} =	0
L_{M1} =	188.24	L_{M2} =	0

1 Stormceptor (STC) Model (Actual Catchment Area to the BMP); Use additional sheets as necessary.
Effective Area (EA) = (0.9 x A_{I1}) + (0.03 x A_{P1})
EA = (0.9 x 0.20) + (0.03 x 0) = 0.18 EA

STC Model (from Table 1 to start) 2400 ; Surface area (SA) of model (Table 1) 50.27 ft^2
Required TSS Removal for Catchment Area:
L_{M1} = 27.2 x 0.20 A_{N1} x 34.6 P" = 188.24 #TSS

2 Overflow Rate (Round to the sixth decimal place)
V_{or} = (EA x 1.1 in/hr) / Model surface area (SA)
V_{or} = (0.18 x 1.1) / 50.27 = 0.0039 f/s

3 BMP Efficiency (Table 2); If the overflow rate is between two percent efficiencies, use the smaller percent efficiency (round the overflow rate to the larger overflow value). Enter rounded overflow value:
V_{or} = 0.004010 f/s

BMP % = 84 % / 100 = 0.84 BMP Eff.

4 Maximum TSS Removal of BMP: L_{R1}
L_{R1} = (BMP Eff x P) x [(A_{I1} x 34.6) + (A_{P1} x 0.54)]
L_{R1} = (0.84 x 34.6 ") x [(0.20 x 34.6) + (0 x 0.54)] = 201.12 #TSS

TSS Load Credit (L_C) to be counted towards untreated areas = L_{R1} – L_{M1}
L_C = (201.12 #TSS – 188.24 #TSS) = 12.88 #TSS

5 Required TSS Removal for Uncaptured Area L_{M2} = 27.2 x 0 A_{N2} x 0 " = 0 #TSS

6 Is Sufficient Treatment Available?
If $L_C \geq L_{M2}$; Model size is adequate.
If $L_C < L_{M2}$; Model size is inadequate. Choose a larger model size or redefine the catchment areas. Repeat steps 1 - 6.
_____ L_C (< , > , ≥, pick) _____ L_{M2}

Final Model Size: 2400 ,

7 TSS Treatment by BMP
L_{M1} (step 1) + L_{M2} (step 5) = TSS Treatment by BMP
188.24 #TSS + 0 #TSS = 188.24 #TSS

8 TSS Treatment Summary

Catchment Area	STC Model	Total Drainage Area (ac)	Impervious Cover (ac)	Calculated TSS Removal (lb/yr) (L_M)	TSS Treatment by BMP (lb/yr) (Step 7)
BMP Catchment	2400	0.20	0.20	188.24	188.24
Uncaptured/Untreated	---				0
Total	---				188.24

PROJECT: **Guadalupe River Club Unit 3**

Table 2: Stormceptor BMP Efficiency and Overflow Rate (V_{OR})							
Eff (%)	Overflow (f/s)	Eff (%)	Overflow (f/s)	Eff (%)	Overflow (f/s)	Eff (%)	Overflow (f/s)
40%	0.139000	56%	0.039000	72%	0.012000	88%	0.002602
41%	0.129000	57%	0.036500	73%	0.011000	89%	0.002280
42%	0.119000	58%	0.034100	74%	0.010100	90%	0.001960
43%	0.110000	59%	0.031700	75%	0.009180	91%	0.001710
44%	0.099800	60%	0.029200	76%	0.008510	92%	0.001460
45%	0.090000	61%	0.027300	77%	0.007830	93%	0.001210
46%	0.084300	62%	0.025300	78%	0.007160	94%	0.000963
47%	0.078600	63%	0.023300	79%	0.006480	95%	0.000713
48%	0.072800	64%	0.021400	80%	0.005810	96%	0.000595
49%	0.067100	65%	0.019400	81%	0.005360	97%	0.000477
50%	0.061400	66%	0.018300	82%	0.004910	98%	0.000358
51%	0.057400	67%	0.017200	83%	0.004460	99%	0.000240
52%	0.053400	68%	0.016000	84%	0.004010	100%	0.000121
53%	0.049400	69%	0.014900	85%	0.003560		
54%	0.045400	70%	0.013800	86%	0.003240		
55%	0.041400	71%	0.012900	87%	0.002920		

Table 3: BMP Summary Table for the Site Complete this table to show the types of BMPs and TSS treatment amounts for the site. Provide additional, as needed.					
BMP Catchment Area	BMP Type or Model	Total Drainage Area (ac)	Impervious Cover (ac)	Calculated TSS Removal (lb/yr) (L_m)	TSS Treatment by BMP (lb/yr)
A	2400	0.28	0.28	263.51	263.51
B	2400	0.29	0.29	272.93	272.93
C	2400	0.20	0.20	188.24	188.24
Uncaptured	---				0
Total	---				724.68

4. Vegetative Filter Strips
   a. Provide a detail of the pavement/filter strip transition to confirm stormwater will travel through the filter strip instead of along the top.

      Sheet 3 details the road to filter strip detail. See "Sections" in top right corner of the detail sheet. The water will flow along the pavement at 2% and then to the filter strip.

   b. RG-348 states the maximum amount of impervious cover draining to a filter strip is 72 feet. Confirm that no section of engineered filter strip receive greater than 72 feet of impervious cover or revise the plan sheets as necessary. The areas depicted in Attachment A and B, copied from the Unit 3 Permanent BMP Exhibit, appear to exceed 72 feet of impervious cover draining to the filter strip.

      We have provided a detail on Sheet 3 that illustrates the impervious cover flow to the filter strips. For a 9 foot wide roadway with a 2% cross slope and 10% max roadway slope (County max.), no stormwater will travel more than 45 feet before reaching a filter strip and 60 feet for a 12 foot wide roadway. The 21 foot driveway sections will have no more than a 5% slope, combined with a 2% cross slope, water travels 53 feet before reaching the strip.

      These are worse case scenarios; the driveways will not exceed these slopes.

   c. Refer to Attachment A and C, copied from the Unit 3 Permanent BMP Exhibit, to clarify how the areas depicted receives treatment. These areas appear to bypass proposed engineered filter strips and other permanent BMPs.

      We have extended the filter strips to make sure no areas are bypassed. Please see sheet 2.

5. Temporary BMPs:
   a. As stated in RG-348, the placement of temporary BMPs in the 100 year floodplain should be avoided. Revise the silt fence location on the SWPPP Control Plan as it appears the silt fence can be placed in closer proximity to the disturbed area.

      The plans have been revised to show this change. The silt fence will be placed outside the 100 year floodplain. Please see Sheet 1 and Sheet SC.

   b. On a plan sheet, provide construction details, figures and notes for all temporary BMPs proposed for the site.

      Details have been provided and are attached. See Sheet EX.

6. Provide contour lines and elevations for all roadways as necessary.

We have provided spot elevations along the driveways to help illustrate how the tilt sections will be constructed and which way the water will flow on the filter strips.

River Club Drive is a 2 lane, crown section. Please see Sheet 3 for typical section. There will be ditches on the right side to capture storm water from the natural terrain and utilize a curb section to capture the roadway drainage which will be conveyed to the Stormceptors. Please see Sheet 4 for this detail.

7. What is the site boundary for the total site (Unit 1, 2, 3)? The site boundary, presented in the USGS Map, appears different from the layout of the parcels owned by Heiser Hollow Partners as presented by the Comal County GIS Map and Comal County Appraisal District information (Attachment D). Please provide an exhibit or page which details the actual extent of the property and explain the discrepancy between the overall site layouts.

I have included an exhibit showing the boundaries. I am not aware of any discrepancy. Our Unit 2 limits are provided to show what has been approved by TCEQ. Nothing will be constructed outside of those limits. Unit 3 CZP is also shown in relation to Unit 2 and Unit 1.

8. In the exhibits for Unit 3, the wastewater treatment plant (WWTP) is detailed with a roadway, buildings and other structures. The exhibits for the approved Unit 2 only detailed the roadway. It appears that only soil disturbance (clearing) for the WWTP was approved with the Unit 2. Please clarify if the impervious cover associated with the WWTP was included in the Unit 2 approval. If not, propose permanent BMPs for the impervious cover from the WWTP.

The impervious cover for the WWTP was included in the Unit 2 calculations. It was a mistake on our part that the actual building was not shown on the exhibit for Unit 2; however it was included in our impervious cover calculations spreadsheet located on the same exhibit. The roadway leading up to and the roadway within the WWTP boundaries are within the Unit 2 calculations as well. Please reference the CZP Unit 2 exhibit named CZP Unit 2 Impervious Cover/Erosion and Sedimentation Control Plan

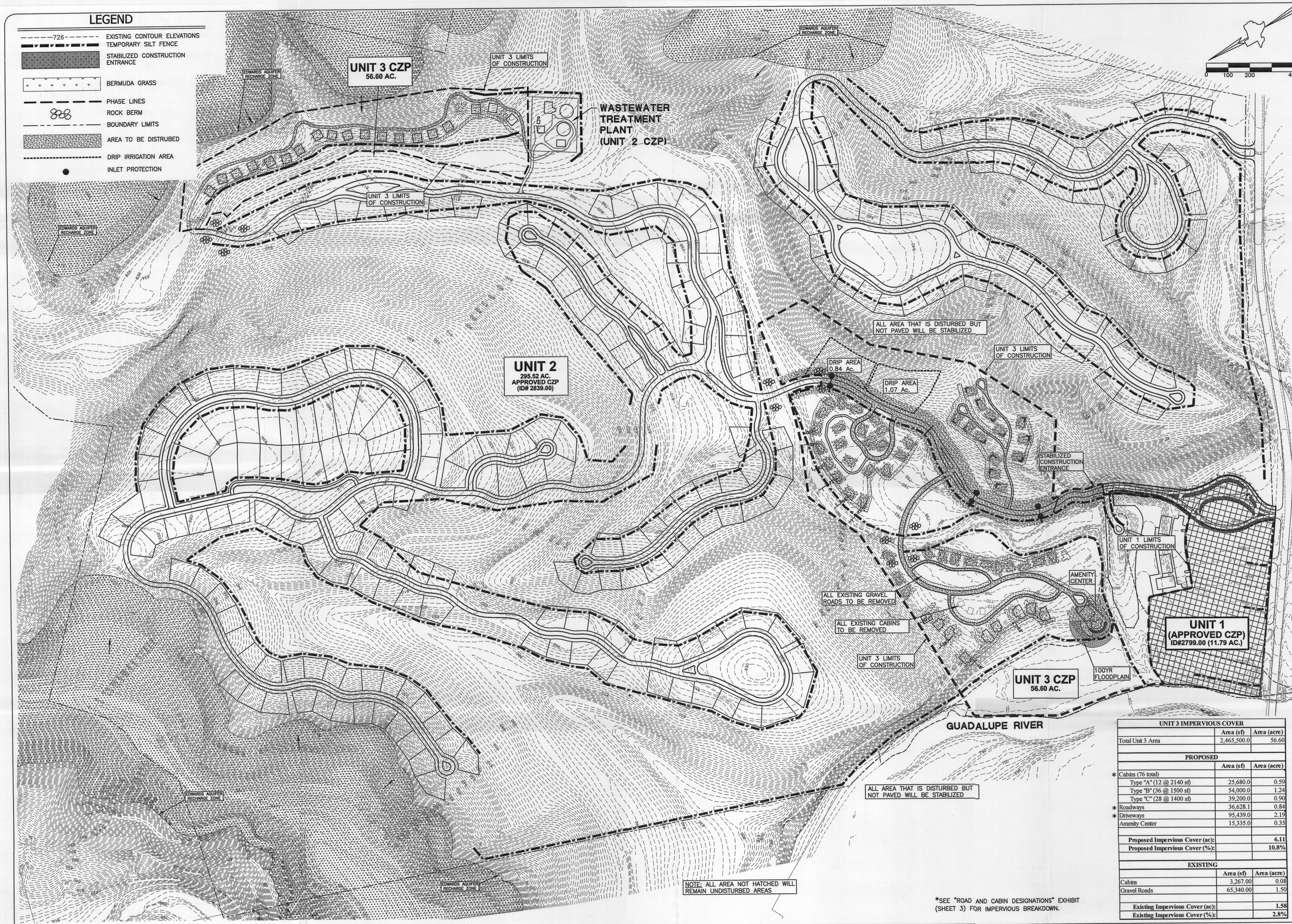
9. Address the following discrepancies found between the CZP Unit 3 Impervious Cover Exhibit, the CZP Mod 1 Impervious Cover Exhibit, both submitted with this proposed application and the CZP Unit 2 Impervious Cover Exhibit approved with the Unit 2 Plan.

    a. The CZP Mod. 1 exhibit details a roadway in the northern corner of the site which is not detailed in the other exhibits. Please explain or revise.

    This was an AutoCAD error. That road no longer exists in the site plan and will not be constructed. Both exhibits now illustrate this.

    b. The CZP Mod 1 exhibit details eight residential lots in the northeastern corner of the site that the other two exhibits do not detail. Please explain or revise.

    This has also been revised, AutoCAD error. Those lots also will not be constructed and the site plan has been changed. All exhibits no longer show these lots.



*SEE "ROAD AND CABIN DESIGNATIONS" EXHIBIT (SHEET 3) FOR IMPERVIOUS BREAKDOWN.

UNIT 3 IMPERVIOUS COVER		
	Area (sf)	Area (acre)
Total Unit 3 Area	2,465,500.0	56.60
PROPOSED		
	Area (sf)	Area (acre)
* Cabins (76 total)		
Type "A" (12 @ 2140 sf)	25,680.0	0.59
Type "B" (36 @ 1500 sf)	54,000.0	1.24
Type "C" (28 @ 1400 sf)	39,200.0	0.90
* Roadways	36,628.1	0.84
* Driveways	95,439.0	2.19
Amenity Center	15,335.0	0.35
Proposed Impervious Cover (ac):		**6.11**
Proposed Impervious Cover (%):		**10.8%**
EXISTING		
	Area (sf)	Area (acre)
Cabins	3,267.00	0.08
Gravel Roads	65,340.00	1.50
Existing Impervious Cover (ac):		**1.58**
Existing Impervious Cover (%):		**2.8%**

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PROJECT NAME - PLAN TYPE

STATE OF TEXAS
HENRY SANFORD HARWOOD
93504
LICENSED
PROFESSIONAL ENGINEER
2/11/09

CZP UNIT 3
IMPERVIOUS COVER /
EROSION & SEDIMENTATION
CONTROL EXHIBIT

GUADALUPE RIVER CLUB

FM 306, COMAL COUNTY, TEXAS

DEVELOPER: NAME
DRAWN/DESIGNED BY:
EIT/PROJECT MANAGER:
SR. PROJECT MANAGER:
JCB PROJECT #: NUMBER

SHEET
1
1 OF 4

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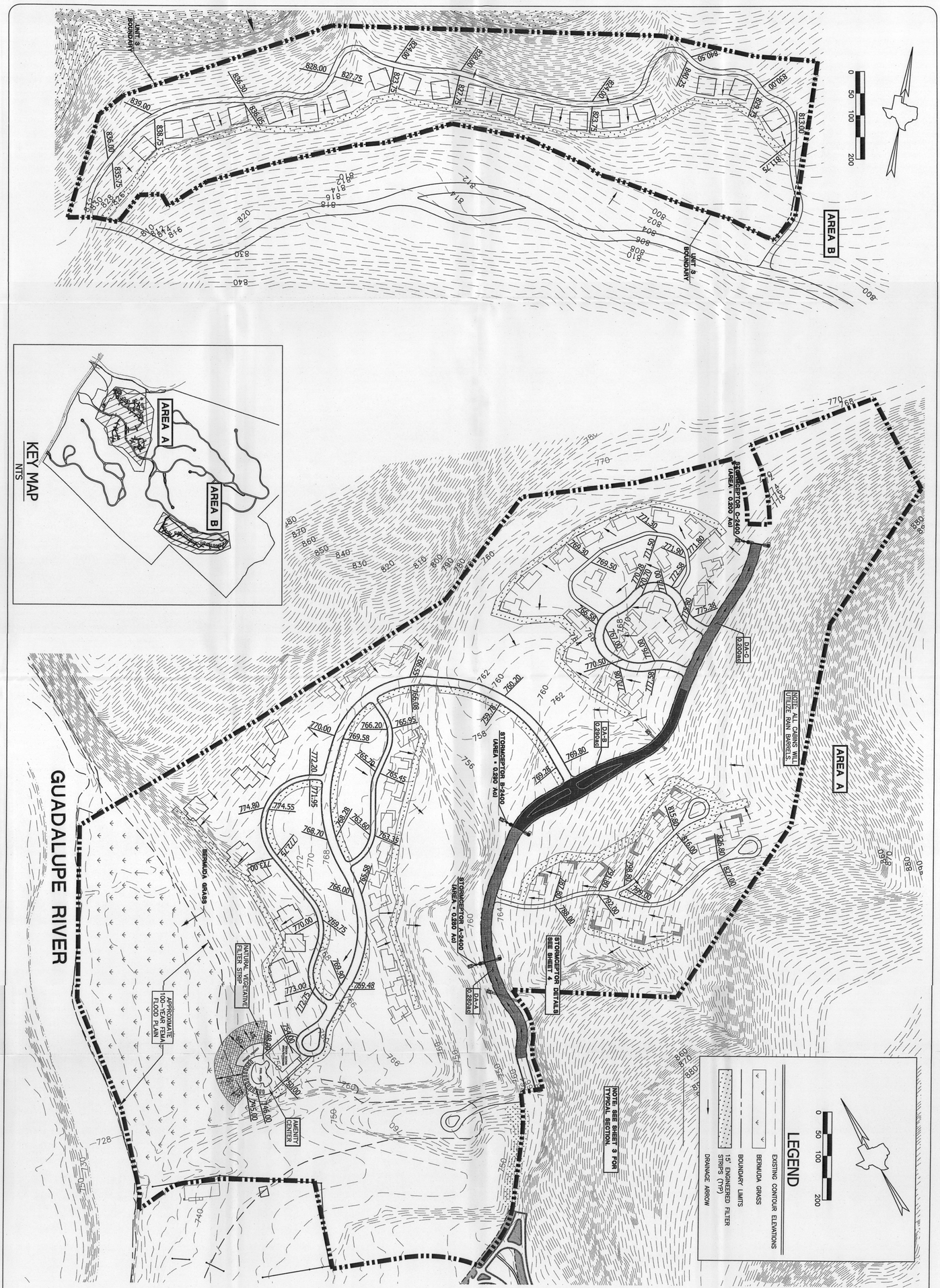

SHEET 2 OF 4	DEVELOPER: NAME DRAWN/DESIGNED BY: DT/PROJECT MANAGER: SR. PROJECT MANAGER: JCB PROJECT #: NUMBER	GUADALUPE RIVER CLUB FM 306, COMAL COUNTY, TEXAS	CZP UNIT 3 PERMANENT BMP EXHIBIT / PROPOSED DRIVEWAY GRADES	STATE OF TEXAS BRENT SANFORD HARWOOD 93504 LICENSED PROFESSIONAL ENGINEER 02/11/09

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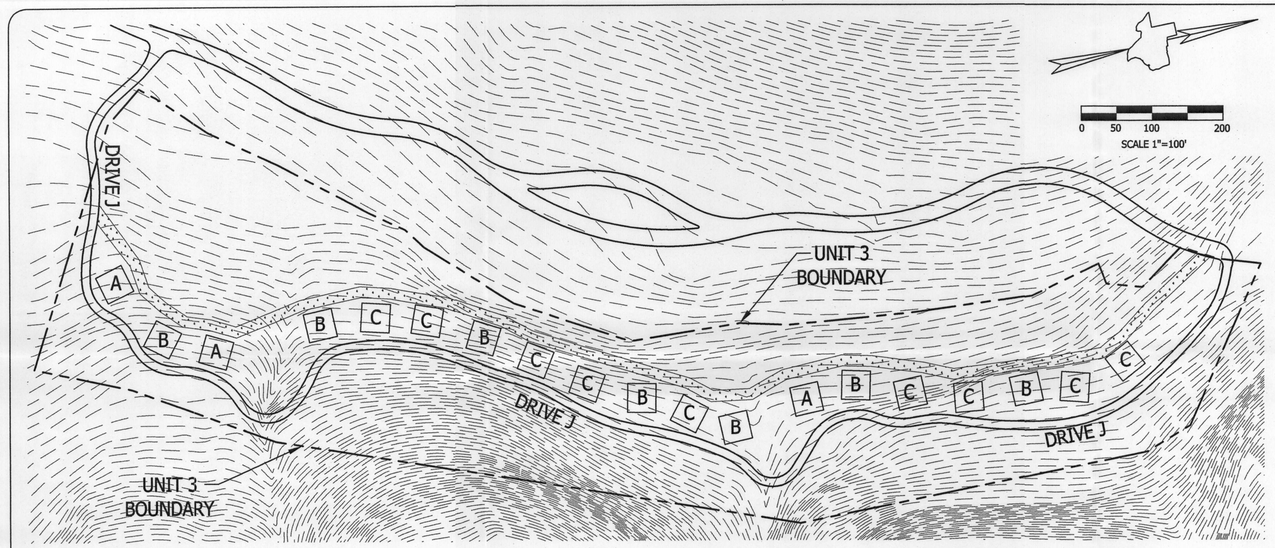
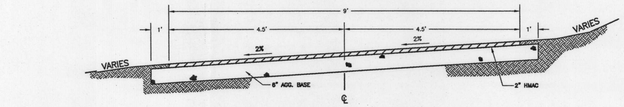
PROJECT NAME - PLAN TYPE

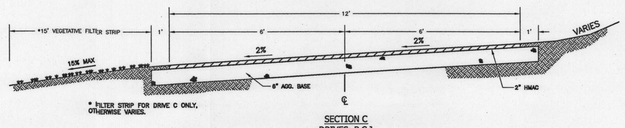


LEGEND

- FILTER STRIPS
- RIP RAP
- 2.5% ROADWAY GRADE
- PROPOSED CONTOUR



SECTION D
DRIVES: E,F,G



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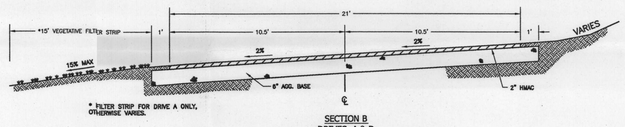
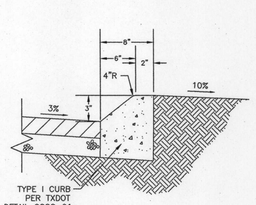
SECTION C
DRIVES: B,C,J



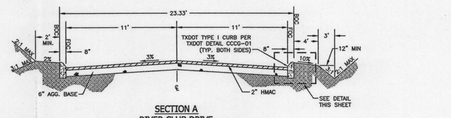
* FILTER STRIP FOR DRIVE A ONLY, OTHERWISE VARIES.

SECTION B
DRIVES: A & D



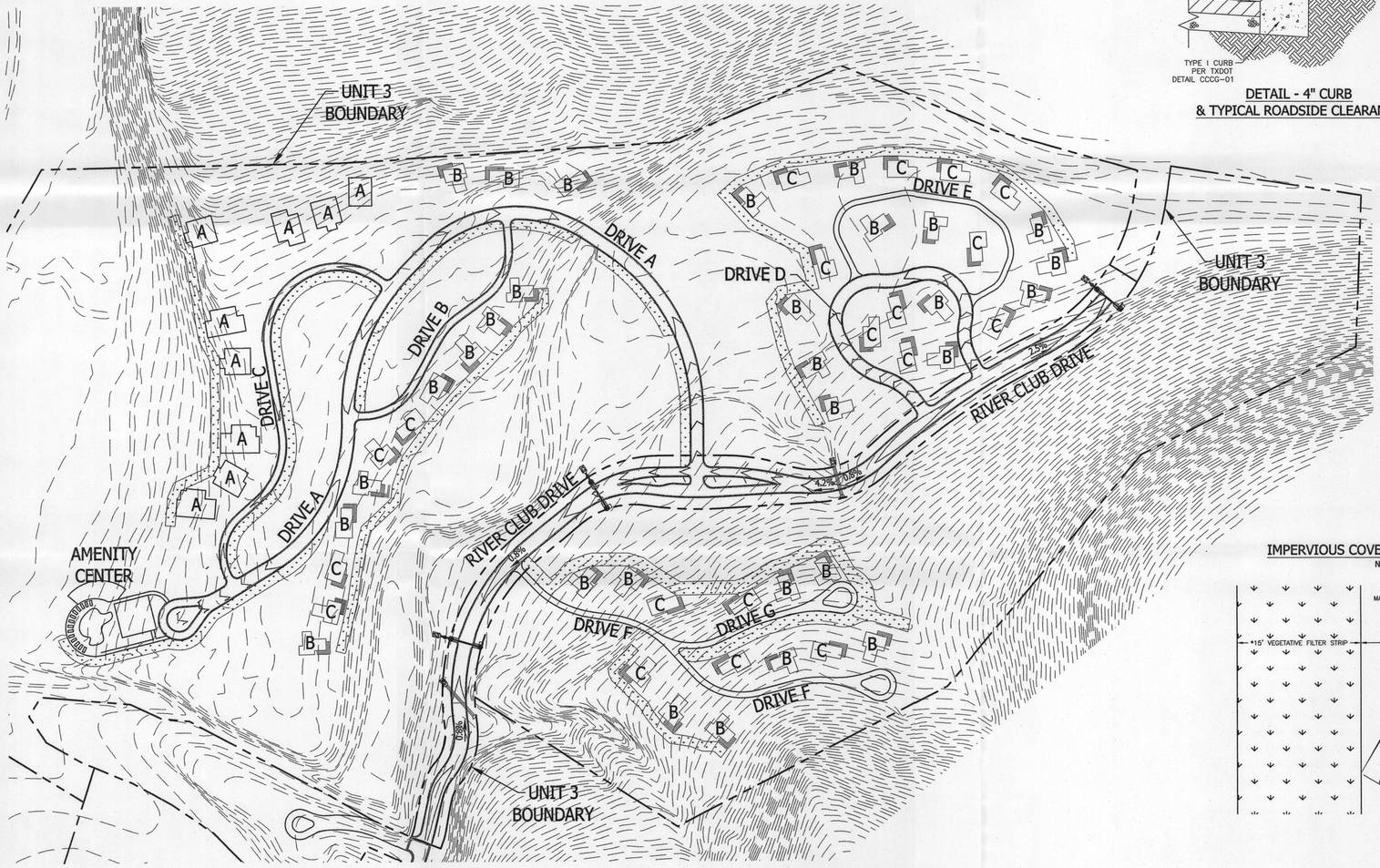
TYPE I CURB PER TXDOT DETAIL CCCG-01

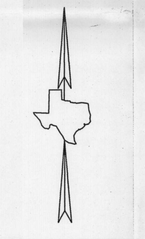
DETAIL - 4" CURB
& TYPICAL ROADSIDE CLEARANCE



SECTION A
RIVER CLUB DRIVE

Unit 3 Cabins - Impervious Cover Calculations			
Type	# of Cabins	Area (sf)	Total Area (sf)
A	12	2140	25680
B	36	1500	54000
C	28	1400	39200
TOTAL:	76		118880

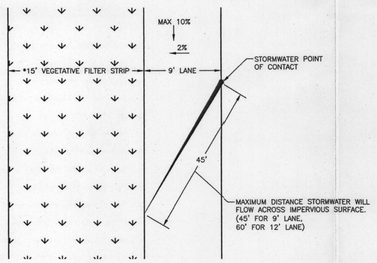


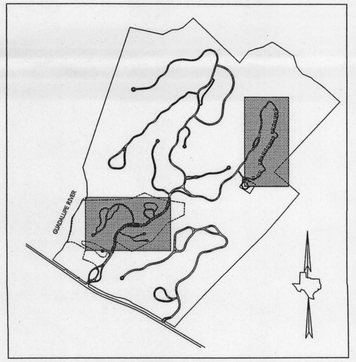


Unit 3 Roadways				
Roads	Roadway Section	Length (ft)	Width (ft)	Area (sf)
River Club Drive	A	1,570	23.33	36,628
		Total Roadway Area:		36,628

Unit 3 Driveways				
Driveways	Driveway Section	Length (ft)	Width (ft)	Area (sf)
DRIVE A	B	1,455	21	30,555
DRIVE B	C	418	12	5,016
DRIVE C	C	658	12	7,896
DRIVE D	B	601	21	12,621
DRIVE E	D	530	9	4,770
DRIVE F	D	662	9	5,958
DRIVE G	D	311	9	2,799
DRIVE J	C	2,152	12	25,824
		Total Driveway Area:		95,439

IMPERVIOUS COVER TO FILTER STRIP
NTS





KEY MAP
NOT TO SCALE

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GUADALUPE RIVER CLUB – UNIT 2

STATE OF TEXAS
HENRY SANFORD HARWOOD
93504
LICENSED
PROFESSIONAL ENGINEER
2/11/09

ROAD AND CABIN DETAILS

GUADALUPE RIVER CLUB
COMAL COUNTY, TEXAS

DEVELOPER: STONEHILL P.R.I.M.
DRWN./DESIGNED BY:
EIT/PROJECT MANAGER:
SR. PROJECT MANAGER:
JOB PROJECT #: 050807.002

SHEET
3
3 OF 4

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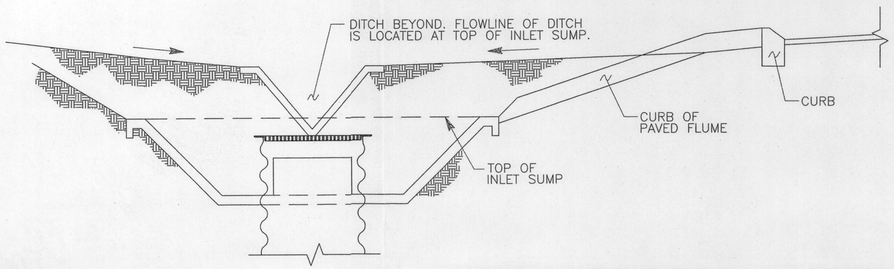
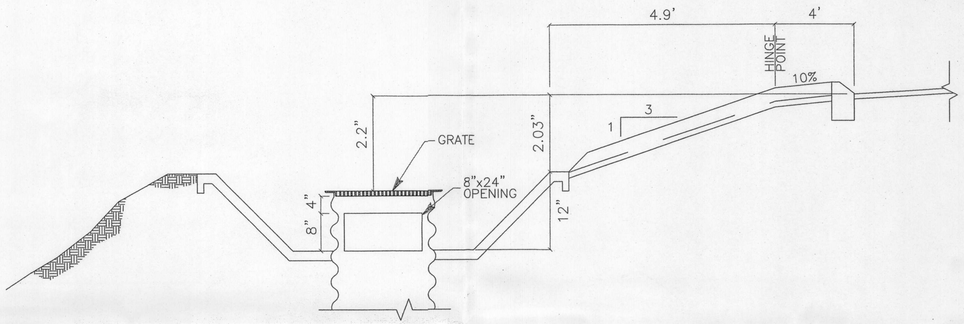
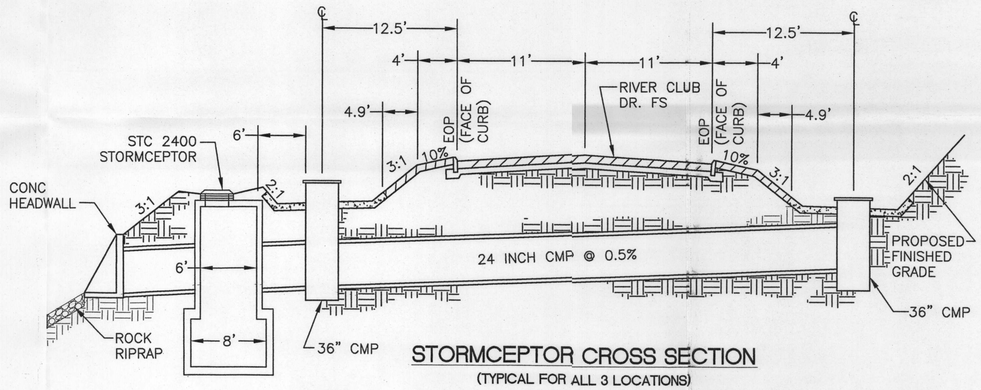


ELEVATION OF SUMP PERPENDICULAR TO ROAD ON SOUTHERLY SIDE OF ROAD



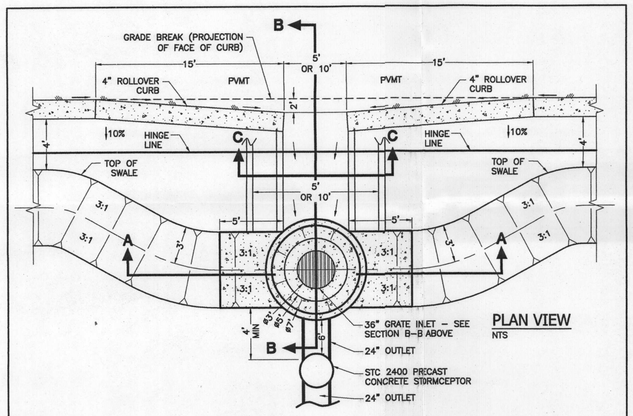
ELEVATION OF SUMP PERPENDICULAR TO ROAD ON NORTHERLY SIDE OF ROAD



STORMCEPTOR CROSS SECTION

(TYPICAL FOR ALL 3 LOCATIONS)

NOT TO SCALE



PLAN VIEW

NTS

SS 1 **STORM INLET / STORMCEPTOR**

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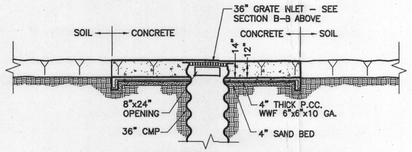

SECTION A-A

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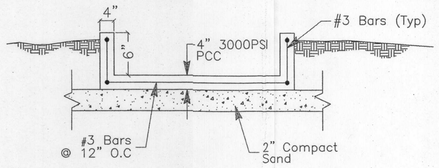
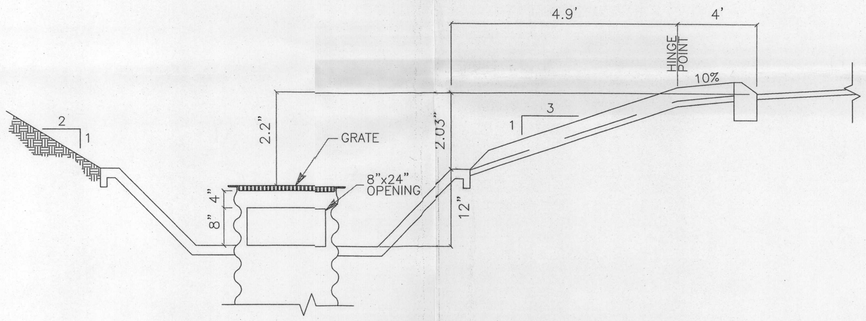


SECTION C-C

PAVED FLUME

NOT TO SCALE



SECTION B-B

CMP INLET

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STATE OF TEXAS
HENRY SANFORD HARWOOD
93504
LICENSED PROFESSIONAL ENGINEER
2/11/09

STORMCEPTOR OUTLET DETAIL

GUADALUPE RIVER CLUB

COMAL COUNTY, TEXAS

DEVELOPER: STONEHILL P.R.M.
DRAWN/DESIGNED BY:
ET/PROJECT MANAGER:
SR. PROJECT MANAGER:
JOB PROJECT #: 050807.002

SHEET 4

4 OF 4

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Xrefs:

LEGEND

- BOUNDARY / RIGHT OF WAY LINE
- 726 EXISTING CONTOUR ELEVATIONS
- 726 PROPOSED CONTOUR ELEVATIONS
- PROPOSED STORM DRAIN
- SF TEMPORARY SILT FENCE
- INLET PROTECTION
- 15' VEGETATIVE FILTER STRIP
- SEEDING AREA
- PHASE LINES

NOTE:
THESE PLANS ARE GENERAL IN NATURE; THE EROSION CONTROL BMPS SHOWN ON THESE PLANS CAN BE MODIFIED ON SITE TO ACCOUNT FOR ACTUAL FIELD CONDITIONS.

EROSION / SEDIMENTATION CONTROL NOTES:

1. CONTRACTOR IS TO SUBMIT A DEWATERING PLAN WHICH MAY BE A TEMPORARY DIVERSION CHANNEL, DIVERSION PIPE, PUMPS, COFFER DAM OR OTHER APPROVED METHOD. CONTRACTOR WILL OBTAIN DEWATERING PLAN APPROVAL PRIOR TO CONSTRUCTION. SANDBAGS, EARTHEN DIKES OR OTHER ERODIBLE MATERIALS ARE NOT ACCEPTABLE. CONTRACTOR SHALL MAINTAIN THE DEWATERING SYSTEM TO ENSURE PERFORMANCE. IF THE DEWATERING SYSTEM IS NOT PERFORMING, THE CONTRACTOR MUST FOLLOW THE ENVIRONMENTAL INSPECTOR'S DIRECTION TO ENSURE ADEQUATE PERFORMANCE.
2. FILL MATERIAL STORAGE – AT THE END OF THE WORK DAY THE CONTRACTOR SHOULD REMOVE ALL LOOSE EXCAVATED MATERIAL FROM THE CHANNEL AS DELINEATED ON THE APPROVED PLAN. NO CONSTRUCTION OR FILL MATERIALS CAN BE STORED WITHIN THE LIMITS OF THE CHANNEL.
3. TEMPORARY CREEK CROSSINGS – TEMPORARY CROSSINGS COMPOSED OF SOIL MAY BE USED ONLY IF NO PRACTICAL ALTERNATIVE EXISTS. IF USED, THEY MUST BE HIGHLY COMPACTED AND HAVE ANY STREAM FLOW DIRECTED THROUGH DRAINAGE PIPING INCORPORATED INTO THE STRUCTURE. THEY MUST BE REMOVED ENTIRELY FROM THE STREAM BED AS SOON AS POSSIBLE. CROSSINGS CONSTRUCTED OF EXISTING LOOSE MATERIAL FROM THE STREAM BED ARE NOT AS CRITICAL.
4. DEWATERING OR DIVERSION OF STREAM FLOW – THE TEMPORARY DAMMING AND DIVERSION (BY PUMPING OR GRAVITY) OF SMALL AMOUNTS OF EXISTING FLOW AROUND CONSTRUCTION ACTIVITIES UNDER WAY IN A CHANNEL IS AN EFFECTIVE TECHNIQUE. THIS FLOW IS THEN SAFELY DISCHARGED FURTHER DOWNSTREAM AND PREVENTED FROM COMING IN CONTACT WITH AREAS DISTURBED BY THE CONSTRUCTION ACTIVITY.
5. STREAM FLOW THAT DOES BECOME SILTED FROM CONSTRUCTION ACTIVITY MUST NOT BE DISCHARGED DIRECTLY BACK INTO THE STREAM, BUT MUST BE TEMPORARILY DETAINED UNTIL THE SEDIMENT HAS SETTLED OUT. ALL WATER DISCHARGES SHOULD COMPLY WITH THE RECOMMENDATIONS FOR WATER DISCHARGES FROM CONSTRUCTION SITES.
6. SILT FENCE TYPE AND INSTALLATION SHALL COMPLY WITH ECM 1.4.2(G).
7. FIBER ROLLS ARE TO BE INSTALLED ONLY AFTER MASS GRADING IS COMPLETE, AT THE TOE OF SLOPES. REMOVAL OF FIBER ROLLS SHALL COINCIDE WITH REMOVAL OF ALL TEMPORARY EROSION CONTROL DEVICES.
8. MULCH TO BE INSTALLED AFTER ROUGH-CUT GRADING

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93504
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2/11/09

SWPPP CONTROL PLAN

GUADALUPE RIVER CLUB UNIT 3

ROAD AND UTILITY CONSTRUCTION PLANS
COMAL COUNTY, TEXAS

DEVELOPER: STONEHILL P.R.M.
DRAWN/DESIGNED BY:
EIT/PROJECT MANAGER:
SR. PROJECT MANAGER:
JOB PROJECT #: 050807.002

SHEET
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Texas Commission on Environmental Quality
Contributing Zone Plan
General Construction Notes

1. Written construction notification should be provided to the appropriate TCEQ regional office no later than 48 hours prior to commencement of the regulated activity. Information should 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 with the name and telephone number of the contact person.

2. All contractors conducting regulated activities associated with this project should be provided with complete copies of the approved Contributing Zone Plan and the TCEQ letter indicating the specific conditions of its approval. During the course of these regulated activities, the contractor(s) should keep copies of the approved plan and approval letter on-site.

3. No temporary aboveground hydrocarbon and hazardous substance storage tank system may be installed within 150 feet if a domestic, industrial, irrigation, or public water supply well.

4. Prior to commencing construction, all temporary erosion and sedimentation (E&S) control measures must be properly selected, installed, and maintained in accordance with the manufacturer's specifications and good engineering practices. Controls specified in the SWPPP section of the approved Edwards Aquifer Contributing Zone 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.

5. 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).

6. 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.

7. 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).

8. All spoils (excavated material) generated from the project site and stored on-site must have proper E&S controls installed.

9. 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.

10. The following records should 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.

11. The holder of any approved Contributing Zone 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 best management practices or structure(s), including but not limited to temporary or permanent ponds, dams, berms, silt fences, and diversionary structures;

    B. any change in the nature or character of the regulated activity from that which was originally approved;

    C. any change that would significantly impact the ability to prevent pollution of the Edwards Aquifer and hydrologically connected surface water; or

    D. any development of land previously identified in a contributing zone plan as undeveloped.

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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

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.

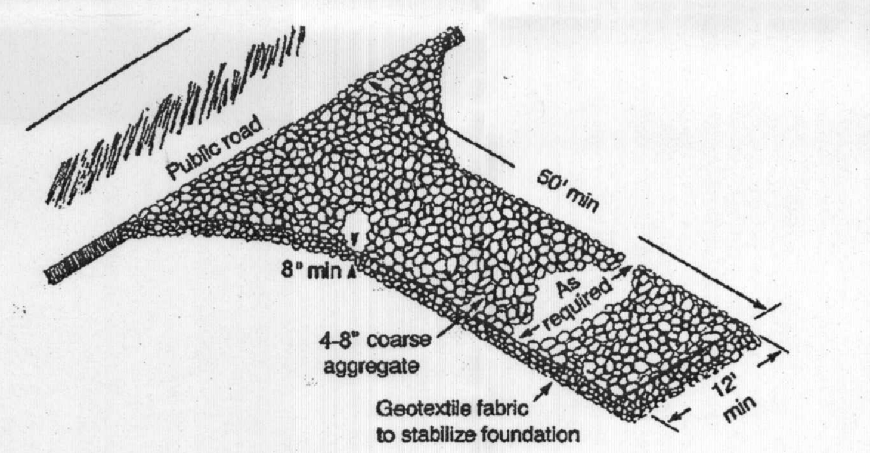

Figure 1-24 Schematic of Temporary Construction Entrance/Exit (after NC, 1993)

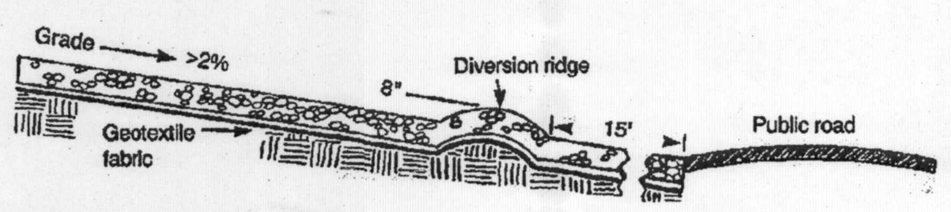

Figure 1-25 Cross-section of a Construction Entrance/Exit (NC, 1993)

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.

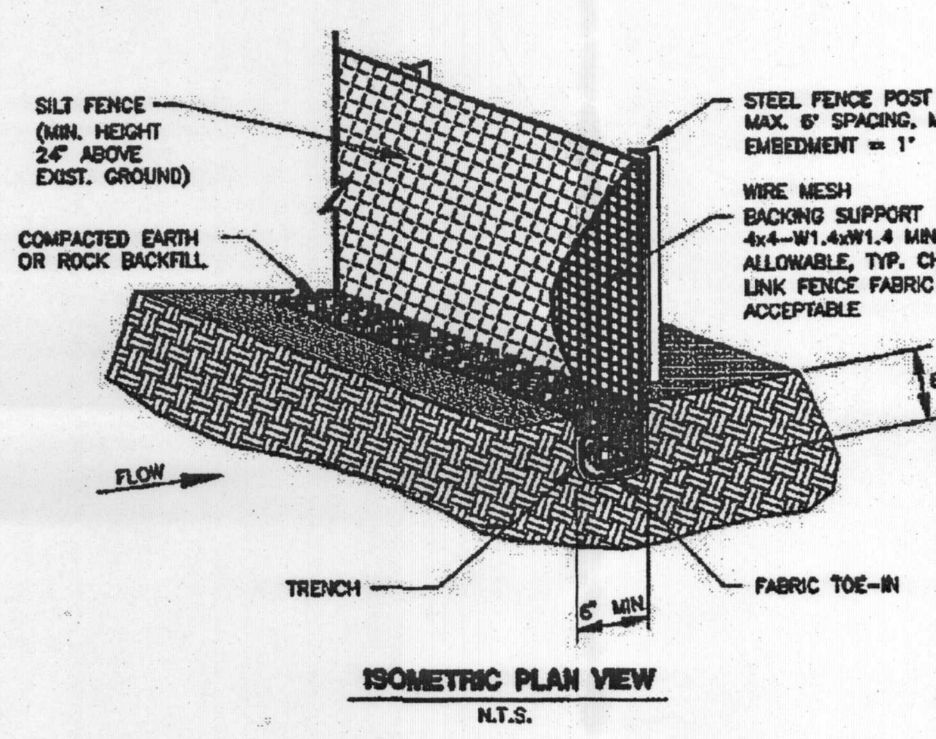

Figure 1-26 Schematic of a Silt Fence Installation (NCTCOG, 1993b)

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.

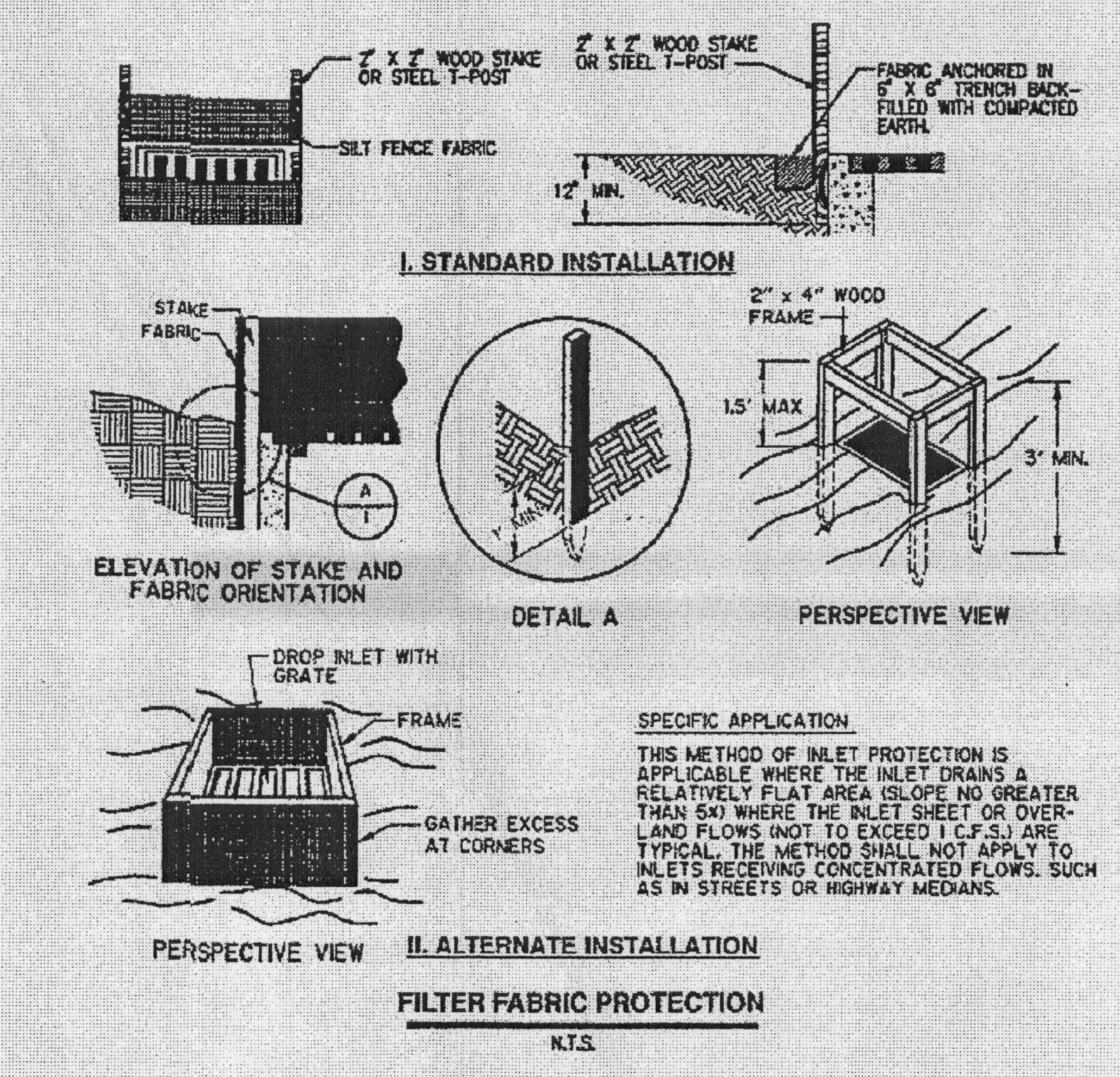

Figure 1-33 Filter Fabric Inlet Protection (NCTCOG, 1993)

(5) Place the bottom 12 inches of the fabric in a trench and backfill the trench with 12 inches of compacted soil.

(6) Fasten fabric securely by staples or wire to the stakes and frame. Joints must be overlapped to the next stake.

(7) It may be necessary to build a temporary dike on the down slope side of the structure to prevent bypass flow.

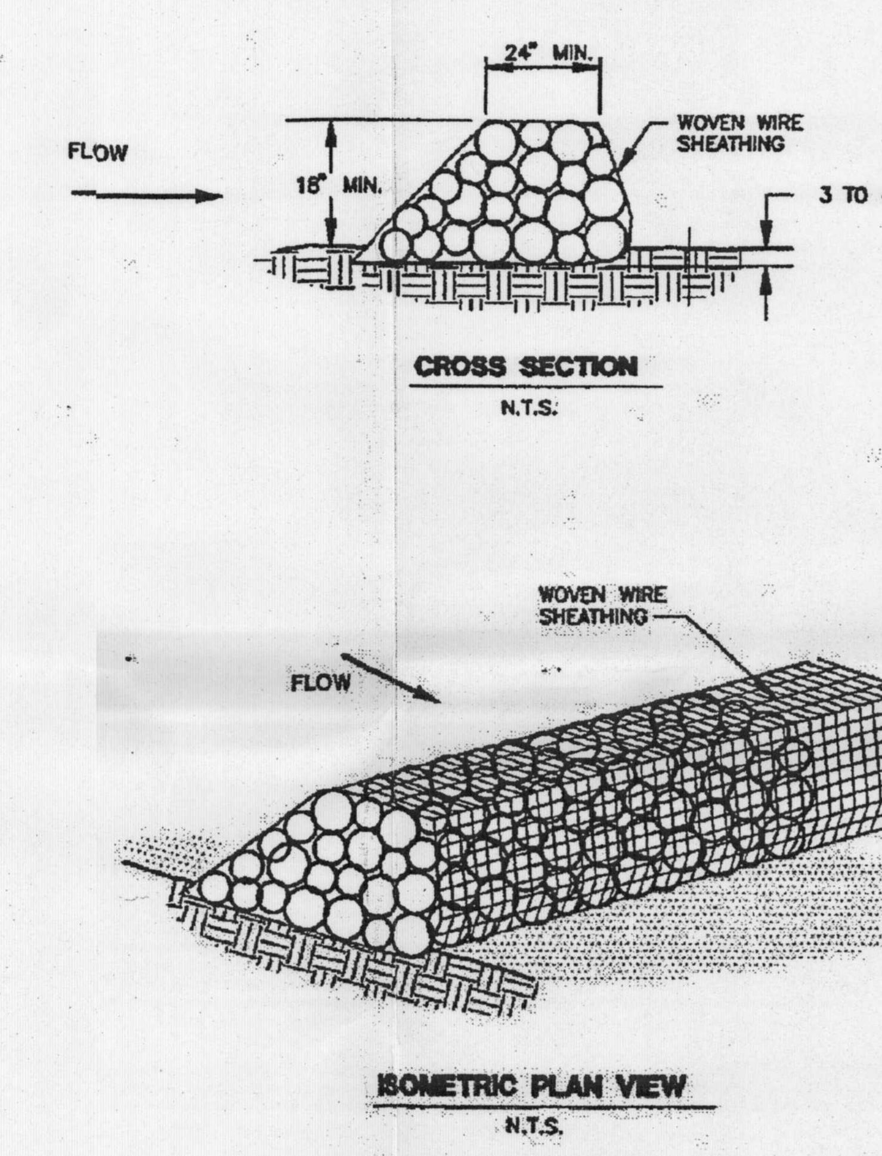

Figure 1-28 Schematic Diagram of a Rock Berm (NCTCOG, 1993)

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STATE OF TEXAS — HENRY SANFORD HARWOOD — 93504 — LICENSED PROFESSIONAL ENGINEER
2/11/09

CZP CONSTRUCTION NOTES & DETAILS

GUADALUPE RIVER CLUB
CZP UNIT 3
FM 306, COMAL COUNTY, TEXAS

DEVELOPER: STONEHILL
DRAWN/DESIGNED BY:
EIT/PROJECT MANAGER:
SR. PROJECT MANAGER:
JCB PROJECT #: 050807.001

SHEET
EX

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Xrefs:

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User: floresfp
Last Modified: Feb. 09, 09 - 13:28
Plot Date/Time: Feb. 09, 09 - 13:29:43

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User: floresfp
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Plot Date/Time: Feb. 11, 09 - 12:42:40

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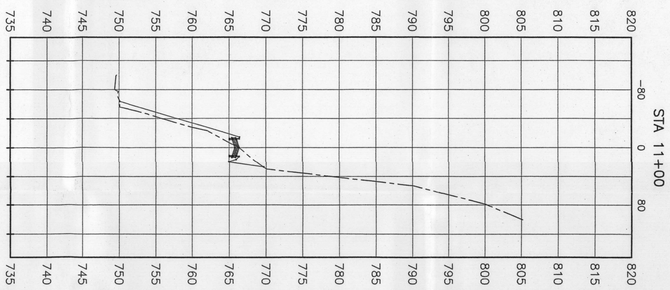
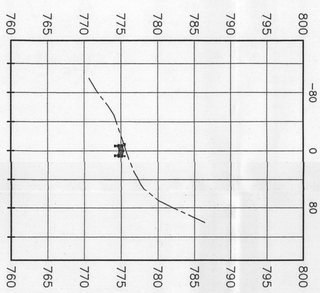
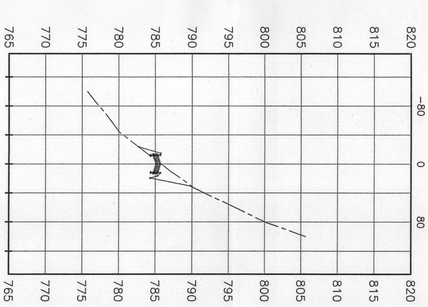
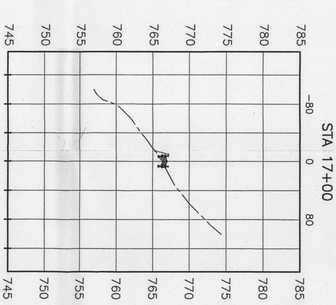
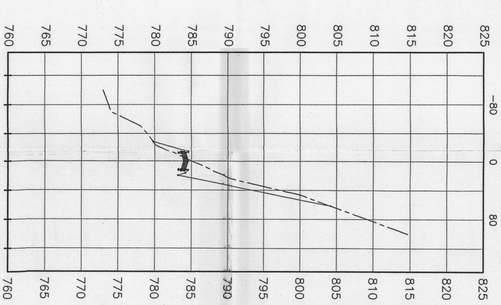










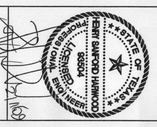
DEVELOPER:	STONEHILL P.R.M.
DRAWN/DESIGNED BY:	
EIT/PROJECT MANAGER:	
SR. PROJECT MANAGER:	
JCB PROJECT #:	050807.002

SHEET CP-104

GUADALUPE RIVER CLUB
RIVER CLUB DRIVE

COMAL COUNTY, TEXAS

RIVER CLUB DRIVE
CROSS SECTIONS



JACOBS™
2705 Bee Cave Road, Suite 300
Austin, Texas 78746
(512) 314-3100 Fax (512) 314-3156

TEXAS COMMISSION ON ENVIRONMENTAL QUALITY

Protecting Texas by Reducing and Preventing Pollution

April 30, 2008

RECEIVED
MAY 02 2008
COUNTY ENGINEER

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: Guadalupe River Club, located 1600 feet east of the fm 306 and fm 2673 intersection on the north side of FM 306 near Sattler, Comal County, Texas
PLAN TYPE: Application for Approval of a Contributing Zone Water Pollution Abatement Plan (CZP) request, 30 Texas Administration Code (TAC) Chapter 213; Edwards Aquifer Protection Program
EAPP ID.: 2799.00

Dear Mr. Hornseth:

The enclosed Contributing Zone Water Pollution Abatement Plan, received on April 30, 2008 application 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 May 29, 2007.

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

2799.00

CONTRIBUTING ZONE PLAN

FOR

GUADALUPE RIVER CLUB
RANCH ROAD FM 306
COMAL COUNTY, TEXAS

PREPARED FOR:

HEISER HOLLOW PARTNERS, LLC
12790 MERIT DRIVE, SUITE 100
DALLAS, TEXAS 75251

PREPARED BY:

JACOBS Carter Burgess

2705 BEE CAVE ROAD, SUITE 300
AUSTIN, TEXAS 78746

APRIL 2008

C&B PROJECT NO. 050807

Contributing Zone Plan Application
for Regulated Activities
on the Contributing Zone to the Edwards Aquifer
and Relating to 30 TAC §213.24(1), Effective June 1, 1999

Regulated Entity Name: **Guadalupe River Club**

County: **Comal** Stream Basin: **Guadalupe River**

1. _X_ Regulated activities on this site will disturb at least 5 acres.
   ____ Regulated activities on this site will disturb less than 5 acres and are part of a larger common plan of development or sale with the potential to disturb cumulatively five or more acres.

2. Customer (Applicant):

Contact Person:	**John H. Davenport**
Entity:	**Heiser Hollow Partners, LLC**
Mailing Address:	**12790 Merit Drive, Suite 100**
City, State:	**Dallas, TX 75251**
Telephone:	**469– 916- 5840 FAX: 469– 916- 5859**

Agent/Representative (If any):

Contact Person:	**Sandy Harwood, P.E.**
Title:	**Senior Project Manager**
Entity:	**Jacob Carter & Burgess**
Mailing Address:	**2705 Bee Cave Road, Ste. 300**
City, State:	**Austin, TX 78746**
Telephone:	**512- 314- 3100 FAX: 512- 314- 3135**

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

4. The location of the project site is described below. Sufficient detail and clarity has been provided so that the TCEQ's Regional staff can easily locate the project and site boundaries for a field investigation.

The site is located in Northeast Comal County, approximately 1600' east of FM 2673 and FM 306 intersection, north side of FM 306 near Sattler, TX.

5. _X_ **ATTACHMENT A - Road Map.** A road map showing directions to and the location of the project site is found as at the end of this form.

6. _X_ **ATTACHMENT B - USGS Quadrangle Map.** A copy of the a USGS Quadrangle Map (Scale: 1" = 2000') is found at the end of this form. The map(s) clearly shows:
   _X_ Project site boundaries.
   _X_ USGS Quadrangle Name(s).

7. X **ATTACHMENT C - Project Narrative.** A detailed narrative description of the proposed project is found at the end of this form.

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)
   - ___ Other:

PROJECT INFORMATION

9. The type of project is:
   - ___ Residential: # of Lots:
   - ___ Residential: # of Living Unit Equivalents:
   - ___ Commercial
   - ___ Industrial
   - X Other: **Residential entry way, serving approx 450 homes**

10. Total project area (size of site): **11.79** Acres
    Total disturbed area: **5.50** Acres

11. Projected population: **1100**

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

Impervious Cover of Proposed Project	Sq. Ft.	Sq. Ft./Acre	Acres
Structures/Rooftops (rock walls)	**1965**	÷ 43,560 =	**0.045**
Parking		÷ 43,560 =	
Other paved surfaces	36454.3	÷ 43,560 =	0.837
Total Impervious Cover	**36454.3**	÷ 43,560 =	**0.882**
		Total Impervious Cover ÷ Total Acreage x 100 =	**7.5 %**

13. X **ATTACHMENT D - Factors Affecting Surface Water Quality.** A description of factors that could affect surface water quality is found as at the end of this form. If applicable, this should included the location and description of any discharge associated with industrial activity other than construction.

14. X Only inert materials as defined by 30 TAC 330.2 will be used as fill material.

FOR ROAD PROJECTS ONLY
Complete questions 15-20 if this application is exclusively for a road project.

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

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

- X Concrete
- ___ Asphaltic concrete pavement
- ___ Other:

17. Length of Right of Way (R.O.W.): **800** feet.
Width of R.O.W.: **varies** feet.
L x W = **177153** Ft² ÷ 43,560 Ft²/Acre = **2.45** acres.

18. Length of pavement area: **1754** feet.
Width of pavement area: **varies (12-22')** feet.
L x W = **23948** Ft² ÷ 43,560 Ft²/Acre = **0.55** acres.
Pavement area **0.55** acres ÷ R.O.W. area **2.45** acres x 100 = **22.4**% impervious cover.

19.
- ___ A rest stop will be included in this project.
- X A rest stop will **not** be included in this project.

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

STORMWATER TO BE GENERATED BY THE PROPOSED PROJECT

21. X **ATTACHMENT E - 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 found at the end of this form. The estimates of stormwater runoff quality and quantity are based on area and type of impervious cover. The runoff coefficient of the site for both pre-construction and post-construction conditions is included.

WASTEWATER TO BE GENERATED BY THE PROPOSED PROJECT

22. Wastewater will be disposed of by:

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

ATTACHMENT F - Suitability Letter from Authorized Agent. An on-site sewage facility will be used to treat and dispose of the wastewater from this site. The appropriate licensing authority's written approval is provided at the end of this form. It states that the land is suitable for the use of private sewage facilities and will meet or exceed the requirements for on-site sewage facilities as specified under 30 TAC Chapter 285 relating to On-site Sewage Facilities, or it identifies those areas that are not suitable for the use of private sewage facilities. The system will be designed by a licensed professional engineer or a registered sanitarian and installed by a licensed installer in compliance with 30 TAC §285.

__ Sewage Collection System (Sewer Lines):

Wastewater is to be disposed of by conveyance to the _____ (name) treatment plant for treatment and disposal. The treatment facility is :

__ existing.
__ proposed.

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

FOR PERMANENT ABOVEGROUND STORAGE TANKS (ASTs) > 500 GALLONS
Complete questions 23-29 if this project includes the installation of AST(s) with volume(s) greater than 500 gallons. N/A

23. Tanks and substance stored:
N/A

AST Number	Size (Gallons)	Substance to be Stored	Tank Material
1			
2			
3			
4			
5			
Total		x 1.5 =	gallons

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

__ **ATTACHMENT G - Alternative Secondary Containment Methods.** Alternative methods for providing secondary containment are proposed. Specifications showing equivalent protection for the Edwards Aquifer are found at the end of this form.

25. Inside dimensions and capacity of containment structure(s): **N/A**

Length (L) (Ft.)	Width (W) (Ft.)	Height (H) (Ft.)	L x W x H = (Ft^3) Gallons
Total			

26. **N/A** All piping, hoses, and dispensers will be located inside the containment structure.
N/A Some of the piping to dispensers or equipment will extend outside the containment structure.

__ The piping will be aboveground
__ The piping will be underground

27. **N/A** The containment area must be constructed of and in a material impervious to the substance(s) being stored. The proposed containment structure will be constructed of _____.

28. **ATTACHMENT H - AST Containment Structure Drawings.** A scaled drawing of the containment structure is found at the end of this form that shows the following:
N/A

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

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

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

SITE PLAN

Items 30 through 41 must be included on the Site Plan.

30. The Site Plan must have a minimum scale of 1" = 400'.
Site Plan Scale: 1" = **50** '.

31. 100-year floodplain boundaries

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

The 100-year floodplain boundaries are based on the following specific (including date of material) sources(s): **FEMA FLOOD INSURANCE RATE MAP NO. 48091C0260 F ZONE "AE" FOR COMAL COUNTY, TX, MARCH 10, 2006.**

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

33. **X** A drainage plan showing all paths of drainage from the site to surface streams.

34. X The drainage patterns and approximate slopes anticipated after major grading activities.

35. X Areas of soil disturbance and areas which will not be disturbed.

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

37. X Locations where soil stabilization practices are expected to occur.

38. N/A Surface waters (including wetlands).

39. X Locations where storm water discharges to surface water.
__ There will be no discharges to surface water.

40. __ Temporary aboveground storage tank facilities.
X Temporary aboveground storage tank facilities will not be located on this site.

41. ___ Permanent aboveground storage tank facilities.
X Permanent aboveground storage tank facilities will not be located on this site.

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

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

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

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

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

44. X 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.

45. N/A 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.

N/A **ATTACHMENT I - 20% or Less Impervious Cover Waiver.** 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.

46. N/A 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.

__ 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.

47. **ATTACHMENT J - BMPs for Upgradient Stormwater.**

X A description of the BMPs and measures that will be used to prevent pollution of surface water, groundwater, or stormwater that originates upgradient from the site and flows across the site is provided as **ATTACHMENT J** 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 J** 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 J** at the end of this form.

48. **ATTACHMENT K - BMPs for On-site Stormwater.**

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

49. N/A **ATTACHMENT L - BMPs for Surface Streams.** A description of the BMPs and measures that prevent pollutants from entering surface streams is provided at the end of this form.

50. X **ATTACHMENT M - Construction Plans.** Construction plans and design calculations for the proposed permanent BMPs and measures have been prepared by or under the direct supervision of a Texas Licensed Professional Engineer. 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 proposed structural measures, and appropriate details must be shown on the construction plans.

51. X **ATTACHMENT N - 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.

52. X 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 O - Pilot-Scale Field Testing Plan.** A plan for pilot-scale field testing is provided at the end of this form.

53. X **ATTACHMENT P - Measures for Minimizing Surface Stream Contamination.** A description of the measures that will be used to avoid or minimize surface stream contamination and changes in the way in which water enters a stream as a result of the construction and development is 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.

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

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

ADMINISTRATIVE INFORMATION

56. X One (1) original and three (3) copies of the complete application has been provided.

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

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

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

Print Name of Customer/Agent

Signature of Customer/Agent Date APRIL 18, 2008

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.

JACOBS Carter Burgess
2705 Bee Cave Road, Suite 300
Austin, Texas 78746
(512) 314-3100 Fax (512) 314-3135

Jacobs Carter&Burgess believes all data to be accurate however, exhibits and data should be used for planning purposes only. Data received from various third party sources. Data contained here is neither sealed nor warranted by Jacobs Carter&Burgess.

Location Map

Guadalupe River Club
Comal County, Texas

DEVELOPER: STONEHILL PRM
DRAWN BY: PAUL RIVERA
DESIGNED BY: N/A
REVIEWED BY: N/A
PROJECT#: 050807

ATTACH. A

Devils Backbone

Canyon City

Wimberley

Sattler

Hunter

Subject Site

EDWARDS AQUIFER CONTRIBUTING ZONE

EDWARDS AQUIFER RECHARGE ZONE

1" = 2000'

JACOBS Carter Burgess
2705 Bee Cave Road, Suite 300
Austin, Texas 78746
(512) 314-3100 Fax (512) 314-3135

Location Map

Guadalupe River Club
Comal County, Texas

DEVELOPER: STONEHILL PRM
DRAWN BY: PAUL RIVERA
DESIGNED BY: N/A
REVIEWED BY: N/A
PROJECT#: 050807

ATTACH. B

CONTRIBUTING ZONE PLAN
ATTACHMENT C

PROJECT DESCRIPTION

Guadalupe River Club is a proposed development tract located in Comal County. The project area is located in the northeast region of Comal County, east of the Guadalupe River on FM 306 near Sattler, TX. The proposed development is an entry way plan for access to the water recreation area located on the east side of the property and the future residential phases. The combination of roadway and drainage for this site will be designed and built to serve the site without affecting any surrounding areas. The future residential area will consist of approximately 330 lots.

The total site area is 11.79 acres with 0.882 acres being impervious, making this site 7.5% impervious. The only history of previous development to this site is a water recreation area for canoeing and tubing and some existing camp grounds. The existing impervious area on this site is 0.627 acres which again consists of a tubing center and tube holding bin, walking areas and some miscellaneous cover.

The project is located within the Edwards Aquifer Contributing Zone. Few portions of this project are within the FEMA recognized 100-year floodplain per Flood Insurance Rate Map (FIRM) Panel No. 48091C0260F, effective date March 10, 2006.

CONTRIBUTING ZONE PLAN
ATTACHMENT D

FACTORS AFFECTING SURFACE WATER QUALITY

Ultimately, this project will be used as an entry way for a 458 acre low-density, single family residential subdivision and a small commercial piece of property on the southwest side of the site. Therefore, certain factors that could affect the surface water quality are the suspended solids, such as oil grease, gas, transmission fluids and/or other car fluids forming from the construction activity taking place. Also, when construction is complete, motorists entering the site could also be responsible for the same suspended solids mentioned on the concrete pavement. As rain drops hit this site, the flow is east to west towards the Guadalupe River. On the down stream side of the entry way, a 15 foot vegetative filter strip will be in place to serve as our primary water quality source.

CONTRIBUTING ZONE PLAN
ATTACHMENT E

VOLUME AND CHARACTER OF STORMWATER

Storm-water runoff originating within the project boundaries will be collected throughout the site by landscape walls with drainage openings, a swale, a grated drainage inlet and pipe, and a grass parking area consisting of a permeable top soil. The storm-water will sheet flow across the site and eventually flows into the Guadalupe River, located about 800-ft to the west of the site.

The runoff for the proposed project is only slightly altered compared to the existing conditions. The increased impervious runoff created by the proposed roadways will be offset by the large grass parking area. A drainage study was performed to compare the existing drainage patterns with the proposed. Based on the analysis, the overall drainage patterns only changed slightly with a less than 1% change, with regards to the flow pattern and quantity of run-off reaching the Guadalupe River.

Below are tables of the runoff calculations, existing and proposed, for the project site. The calculations were performed using the Rational Method Formulas: Q = K*C*I*A (per City of New Braunfels Drainage Manual.)

Existing Conditions

Storm Frequency	$C_{composite}$	Existing Runoff (cfs)
10-YEAR	0.41	51.5
100-YEAR	0.41	101.1

Proposed Conditions

Storm Frequency	$C_{composite}$	Proposed Runoff (cfs)
10-YEAR	0.42	51.7
100-YEAR	0.42	101.6

CONTRIBUTING ZONE PLAN
ATTACHMENT F

SUITABILITY LETTER FROM AUTHORIZED AGENT

Please see following page

CONTRIBUTING ZONE PLAN
ATTACHMENT G

ALTERNATIVE SECONDARY CONTAINMENT METHODS

NOT APPLICABLE TO THIS SITE.

CONTRIBUTING ZONE PLAN
ATTACHMENT H

AST CONTAINMENT STRUCTURE DRAWINGS

NOT APPLICABLE TO THIS SITE.

Drawing: L:\050807 Heiser Hollow\ENGINEERING\REPORTS\Contributing Zone Plan\CZP-Site Plan.dwg
User: floresfp
Last Modified: Apr. 21, 08 - 13:33
Plot Date/Time: Apr. 21, 08 - 13:34:39

Xrefs: ..\..\..\CAD FILES\XREF\050807_CSSP01.dwg
..\..\..\CAD FILES\XREF\050807_CSSP01.dwg

GUADALUPE RIVER

PROPERTY LINE

JAMES T. MURPHY SURVEY NO. 24

APPROX. SURVEY LINE (TYPICAL)

HENRY A. REED SURVEY NO. 76

FM 306
(100 R.O.W.)

APPROXIMATE LIMIT OF "ZONE A9" 100-YR FLOOD BASED ON FIRM MAP NUMBER 485463 0090 C DATED: SEPTEMBER 29, 1986

SOIL DISTURBANCE/ STABILIZATION

15' VEGETATIVE FILTER STRIP

DISCHARGE TO PENINSULA OUTFALL TO HAVE 100 LB. RIP-RAP.

PROPERTY BOUNDARY

UPGRADIENT STORMWATER

OVERFLOW LINE

LEGEND

- BOUNDARY / RIGHT OF WAY LINE
- 726 EXISTING CONTOUR ELEVATIONS
- 726 PROPOSED CONTOUR ELEVATIONS
- SF TEMPORARY SILT FENCE
- 100 YEAR FLOODPLAIN
- SOIL STABILIZATION
- DRAINAGE FLOW
- 15' VEGETATIVE FILTER STRIP

0 25 50 100

NOTES:

1. SOIL WITHIN THE PROPERTY BOUNDARY WILL BE DISTURBED BUT WILL BE STABILIZED AS SHOWN.
2. NO TEMPORARY OR PERMANENT ASTs REQUIRED FOR THIS SITE.

PLOTTING SCALE:	1"= 40'
DRAWN BY:	FF
DESIGNED BY:	JCC
REVIEWED BY:	SANDY HARWOOD
PROJECT #:	050807.001

SHEET

GUADALUPE RIVER CLUB
ENTRANCE PLAN
FM 306
COMAL COUNTY, TEXAS

CONTRIBUTING ZONE
SITE PLAN

JACOBS Carter Burgess
2705 Bee Cave Road, Suite 300
Austin, Texas 78746
(512) 314-3100 Fax (512) 314-3135

CONTRIBUTING ZONE PLAN
ATTACHMENT I

20% OR LESS IMPERVIOUS COVER

NOT APPLICABLE TO THIS SITE

CONTRIBUTING ZONE PLAN
ATTACHMENT J

PERMANENT BMPs FOR UPGRADIENT STORMWATER

The upgradient stormwater will be treated by a proposed 15' vegetative filter strip that will be located on the upstream side of a decorative rock wall structure that will be constructed between two of our one-way roads. The rock wall is strictly a decorative feature that can either have a connecting swale or allow water to drain under (a picture is attached). In our case, there is a small swale that will be sloped off the rock wall draining water to a grate inlet. This swale and the surrounding area will be vegetated so the storm water will be treated before reaching the inlet. The site plan attached shows a better illustration.

CONTRIBUTING ZONE PLAN
ATTACHMENT K

PERMANENT BMPs FOR ON-SITE STORMWATER

Permanent BMPs will be used on this site to reduce the amount of total suspended solids (i.e. oil, grease, gasoline) associated with the site development.

The utilization of 15' engineered vegetative filter strips are proposed for this site. These strips have been designed to meet the guidelines of Section 3.4.6 of the Edwards Aquifer Technical Guidance Manual. The layout of the strips can be seen on the site plan attached. Since we meet all requirements in designing the strips, we will meet the minimum removal rate of 80%.

Texas Commission on Environmental Quality

TSS Removal Calculations 02-20-2008

Project Name: Guadalupe River Club
Date Prepared: 4/20/2008

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

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

CONTRIBUTING ZONE PLAN
ATTACHMENT L

BMPs FOR SURFACE STREAMS

REFER TO ATTACHMENT "I"

CONTRIBUTING ZONE PLAN
ATTACHMENT M

CONSTRUCTION PLANS

ALL CONSTRUCTION PLANS ARE ATTACHED TO CONTRIBUTING ZONE PLAN.

CONTRIBUTING ZONE PLAN
ATTACHMENT N

INSPECTION, MAINTENANCE, AND RETROFIT PLAN

The inspection, maintenance and retrofit plan will follow the basic guidelines provided by the Edwards Aquifer Technical Guidance Manual.

Once a vegetated area is well established, little additional maintenance is generally necessary. The key to establishing a viable 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. If the filter strip is made up of turf grass, it should be moved as needed to limit vegetation height to 18 inches, using a mulching mower (or removal of clippings). If native grasses are used, the filter may require less frequent mowing, but a minimum of twice annually. Grass clippings and brush debris should not be deposited on vegetated filter strip areas. Regular mowing should also include weed control practices, however herbicide use should be kept to a minimum (Urbonas et al., 1992). Healthy grass can be maintained without using fertilizers because runoff usually contains sufficient nutrients. Irrigation of the site can help assure a dense and healthy vegetative cover.

- Inspection. Inspect filter strips at least twice annually for erosion or damage to vegetation; however, additional inspection after periods of heavy runoff is most desirable. The strip should be checked for uniformity of grass cover, debris and litter, and areas of sediment accumulation. More frequent inspections of the grass cover during the first few years after establishment will help to determine if any problems area developing, and to plan for long-term restorative maintenance needs. Bare spots and areas of erosion identified during semi-annual inspections must be replanted and restored to meet specifications. Construction of a level spreader device may be necessary to reestablish shallow overland flow.

- Debris and Litter Removal. Trash tends to accumulate in vegetated areas, particularly along highways. Any filter strip structures (i.e. level spreaders) should be kept free of obstructions to reduce floatables being flushed downstream, and for aesthetic reasons.

The need for this practice is determined through periodic inspection, but should be performed no less than 4 times per year.

- Sediment Removal. Sediment removal is not normally required in filter strips, since the vegetation normally grows through it and binds it to the soil. However, sediment may accumulate along the upstream boundary of the strip preventing uniform overland flow. Excess sediment should be removed by hand or with flat-bottomed shovels.

- Grass Reseeding and Mulching. A healthy dense grass should be maintained on the filter strip. If areas are eroded, they should be filled, compacted, and reseeded so that the final grade is level. Grass damaged during the sediment removal process should be promptly replaced using the same seed mix used during filter strip establishment. 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, particularly as they vegetation is initially established.

CONTRIBUTING ZONE PLAN
ATTACHMENT O

PILOT SCALE FIELD TESTING PLAN

NOT APPLICABLE TO THIS SITE.

CONTRIBUTING ZONE PLAN
ATTACHMENT P

MEASURES FOR MINIMIZING SURFACE STREAM CONTAMINATION

Instead of all the site drainage flowing across one filter strip, we are breaking the flow where as two separate portions of the drainage will flow across two filter strips which should allow for the treatment process to be more effective. One portion of the flow will cross one 12' lane and then to a filter strip and the second portion will flow across two lanes before being treated. We believe this process will help minimize extra contamination in the water.

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

I JOHN DAVENPORT,
Print Name

PRINCIPAL
Title - Owner/President/Other

of HEISER HOLLOW PARTNERS, LLC
Corporation/Partnership/Entity Name

have authorized SANDY HARWOOD, PE
Print Name of Agent/Engineer

of JACOBS CARTER BURGESS
Print Name of Firm

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

I also understand that:

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

2. For applicants who are not the property owner, but who have the right to control and possess the property, additional authorization is required from the owner.

3. Application fees are due and payable at the time the application is submitted. The application fee must be sent to the TCEQ cashier or to the appropriate regional office. The application will not be considered until the correct fee is received by the commission.

4. A notarized copy of the Agent Authorization Form must be provided for the person preparing the application, and this form must accompany the completed application.

Applicant's Signature — Date: 3-28-08

THE STATE OF TX §

County of Kendall §

BEFORE ME, the undersigned authority, on this day personally appeared John Davenport 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 24 day of March, 2008.

NOTARY PUBLIC

Adam Koransky

Typed or Printed Name of Notary

ADAM NEAL KORANSKY
Notary Public, State of Texas
My Commission Expires
February 27, 2011

MY COMMISSION EXPIRES: February 27, 2011

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

NAME OF PROPOSED REGULATED ENTITY: GUADALUPE RIVER CLUB
REGULATED ENTITY LOCATION: NE COMAL COUNTY, APPROX 1600' E of FM306/2673 INT. NAME OF CUSTOMER: HEISER HOLLOW PARTNERS, LLC
CONTACT PERSON: JOHN DAVENPORT PHONE: 469-916-5840
(Please Print)

Customer Reference Number (if issued): CN 603189463 (nine digits)
Regulated Entity Reference Number (if issued): RN _____ (nine digits)

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

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

APPLICATION FEES MUST BE PAID BY CHECK, CERTIFIED CHECK, OR MONEY ORDER, PAYABLE TO THE Texas Commission on Environmental Quality. YOUR CANCELED CHECK WILL SERVE AS YOUR RECEIPT. **THIS FORM MUST BE SUBMITTED WITH YOUR FEE PAYMENT. THIS PAYMENT IS BEING SUBMITTED TO (CHECK ONE):**

☑ **SAN ANTONIO REGIONAL OFFICE**

☐ **AUSTIN REGIONAL OFFICE**

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

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

Check one:

☑ **Contributing Zone Plan - Fee Due $250**

☐ **Modification of a Previously Approved Contributing Zone Plan - Fee Due $250**

☐ **Extension of Time Request - Fee Due $100**

[signature]
Signature

4/8/08
Date

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

Individuals are entitled to request and review their personal information that the agency gathers on its forms. They may also have any errors

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

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 603189663		RN

SECTION II: Customer Information

5. Effective Date for Customer Information Updates (mm/dd/yyyy)

6. Customer Role (Proposed or Actual) *– as it relates to the Regulated Entity listed on this form. Please check only one of the following:*

☐ 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: LLC

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

Heiser Hollow Partners, LLC

10. Mailing Address: 12790 Merit Drive, Suite 100

City	State	ZIP	ZIP + 4
Dallas	TX	75251	1247

11. Country Mailing Information *(if outside USA)*

12. E-Mail Address *(if applicable)*

jdavenport@stonehill-prm.com

13. Telephone Number	14. Extension or Code	15. Fax Number *(if applicable)*
(469) 916-5840		(469) 916-5859

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)*
20-891223	32030847845		0800806156

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)*

Guadalupe River Club

24. Street Address of the Regulated Entity: *(No P.O. Boxes)*	Not assigned						
	City		**State**		**ZIP**		**ZIP + 4**	
25. Mailing Address:	12790 Merit Drive, Suite 100						
	City	Dallas	**State**	TX	**ZIP**	75251	**ZIP + 4**	1247
26. E-Mail Address:	jdavenport@stonehill-prm.com						
27. Telephone Number	**28. Extension or Code**		**29. Fax Number** *(if applicable)*				
(469) 916-5840			(469) 916-5859				
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)		
7999	1542		713900				
34. What is the Primary Business of this entity? *(Please do not repeat the SIC or NAICS description.)*							
Commercial and Residential Entry way							

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

35. Description to Physical Location:	NE Comal County, approx 1600' E of FM 306 & FM 2673 intersection, N side of FM 306				
36. Nearest City	**County**		**State**	**Nearest ZIP Code**	
Sattler	Comal County		TX	78132	
37. Latitude (N) In Decimal:	29.847		**38. Longitude (W) In Decimal:**	-98.175	
Degrees	Minutes	Seconds	Degrees	Minutes	Seconds
29	50	53	98	10	32

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
☐ 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:	Sandy Harwood c/o Jacobs Carter Burgess	**41. Title:**	Senior Project Manager

42. Telephone Number	**43. Ext./Code**	**44. Fax Number**	**45. E-Mail Address**
(512) 314-3100		(512) 314-3135	sandy.harwood@jacobs.com

SECTION V: Authorized Signature

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

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

Company:	Jacobs Carter Burgess	**Job Title:**	Senior Project Manager
Name *(In Print)*:	Sandy Harwood	**Phone:**	(512) 314-3100
Signature:		**Date:**	4/8/08