TEXAS COMMISSION ON ENVIRONMENTAL QUALITY

Protecting Texas by Reducing and Preventing Pollution

June 28, 2012

Mr. Thomas Bloxham
Comal Independent School District
1404 IH 35 North
New Braunfels, Texas 78130

Re: Edwards Aquifer, Comal County

Name of Project: Comal ISD FM 306 Elementary School; Located approximately 0.72 mile north of the intersection of FM 306 and Cannan Road, 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 San Antonio File No. 3046.00; Investigation No. 1002126; Regulated Entity No. RN106385370

Dear Mr. Bloxham:

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 Gil Engineering Associates, Inc. on behalf of Comal Independent School District on April 13, 2012. Final review of the CZP was completed after additional material was received on June 19, 2012 and June 26, 2012. As presented to the TCEQ, the Temporary and Permanent Best Management Practices (BMPs) and construction plans were prepared by a Texas Licensed Professional Engineer to be in general compliance with the requirements of 30 TAC Chapter 213. These planning materials were sealed, signed and dated by a Texas Licensed Professional Engineer. Therefore, based on the engineer's concurrence of compliance, the planning materials for construction of the proposed project and pollution abatement measures are hereby approved subject to applicable state rules and the conditions in this letter. The applicant or a person affected may file with the chief clerk a motion for reconsideration of the executive director's final action on this Edwards Aquifer Protection Plan. A motion for reconsideration must be filed no later than 23 days after the date of this approval letter. *This approval expires two (2) years from the date of this letter unless, prior to the expiration date, more than 10 percent of the construction has commenced on the project or an extension of time has been requested.*

Project Description

The proposed elementary school project will have an area of approximately 19.76 acres. It will include construction of school building, sidewalks, driveways, and parking areas. The

impervious cover will be 4.52 acres (23 percent). According to a letter dated, February 15, 2012, signed by Mr. Robert Boyd, P.E., with Comal County, the site in the development is acceptable for the use of on-site sewage facilities.

Permanent Pollution Abatement Measures

To prevent the pollution of stormwater runoff originating on-site or upgradient of the site and potentially flowing across and off the site after construction, a sedimentation/filtration basin, designed using the TCEQ technical guidance document, Complying with the Edwards Aquifer Rules: Technical Guidance on Best Management Practices (2005), will be constructed to treat stormwater runoff. The required total suspended solids (TSS) treatment for this project is 4,057 pounds of TSS generated from the 4.52 acres of impervious cover (4.45 acres of on-site impervious cover and 0.06 acres of on-site uncaptured areas). The approved measures meet the required 80 percent removal of the increased load in TSS caused by the project.

The individual treatment measures will consist of geomembrane lined, sand filter basin sized to capture the first 1.6 inches of stormwater run-off from 4.52 acres of impervious cover within a 6.31 acre catchment area, providing a total capture volume of 23,270.1 cubic feet (22,976 cubic feet required) to remove 4,057 pounds of TSS. The filtration system for the basin will consist of 2,164 square feet of sand (1,915 square feet required) with an ASTM rating of C-33, which is 18 inches thick and an underdrain piping system covered with a minimum two inch gravel layer.

Special Conditions

1. 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.
2. All permanent pollution abatement measures shall be operational prior to occupancy of the facility.
3. All sediment and/or media removed from the water quality basin during maintenance activities shall be properly disposed of according to 30 TAC 330 or 30 TAC 335, as applicable.

Standard Conditions

1. Pursuant to Chapter 7 Subchapter C of the Texas Water Code, any violations of the requirements in 30 TAC Chapter 213 may result in administrative penalties.
2. The holder of the approved Edwards Aquifer protection plan must comply with all provisions of 30 TAC Chapter 213 and all best management practices and measures contained in the approved plan. Additional and separate approvals, permits, registrations

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

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

Prior to Commencement of Construction:

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 percent of the total construction has not been completed within ten years from the initial approval of a plan. A new Contributing Zone Plan must be submitted to the 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.

This action is taken under authority delegated by the Executive Director of the Texas Commission on Environmental Quality. If you have any questions or require additional information, please contact Yuliya Dunaway of the Edwards Aquifer Protection Program of the San Antonio Regional Office at 210-403-4077.

Sincerely,

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

LMB/YD/eg

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

cc: Mr. Victor Gil, P.E., Gil Engineering Associates, Inc.
Mr. Tom Hornseth, P.E., Comal County
Mr. Roland Ruiz, Edwards Aquifer Authority
TCEQ Central Records, Building F, MC212

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Gil Engineering Associates. Inc.

CONSULTING ENGINEERS ◻ SURVEYORS

PLANNERS ◻ BUILDING DESIGNERS

506 EAST BRAKER LANE AUSTIN, TEXAS 78753-2751 phone (512) 835-4203

fax (512) 835-4407

Friday, June 15, 2012

Yuliya Dunaway
Texas Commission on Environmental Quality
14250 Judson Rd.
San Antonio, TX 78233-4480

Re: Comal ISD FM306 Elementary School
Request for the Approval of a Contributing Zone Plan (CZP); 30 TAC Chapter 213
San Antonio File Number Not known

Dear Ms. Dunaway:

Please accept this as our response to your letter dated June 6, 2012.

Contributing Zone Plan Application (TCEQ-10257

1. The site map shows that the south east corner of the property is located within the 100 year flood plain.

The site plan shows the southeast corner in the 500 year flood plain. The label on the site plan sheet CS101 has been corrected to read 500 year zone x shaded. Any area in zone X is considered by FEMA to be outside the 100 year flood plain. There are no changes to be made to the Application or Attachment C.

2. Please verify if a playground or any sports facilities are proposed.

Playground areas have been labeled on the site plan Sheet CS101. They are inside 60'x60' areas. These areas were shown on the original submittal and are accounted for in the TSS calculations. No other sport facilities are proposed.

3. The site plan shows stairway with a ramp and a building located within Drainage area U2.

All impervious cover was accounted for in the TSS calculations. There is no impervious cover on site that has not been accounted for in the TSS Calculations or the impervious cover table.

4 If the total amount of the impervious cover will change, please provide new TSS removal Calculations.

The original amount of impervious cover in the submittal accounts for all impervious cover on site. There is no impervious cover that has NOT been accounted for. There are no changes to the total amount of impervious cover.

5. The TSS removal Calculations have to be sign , dated and sealed by the Texas Professional Engineer.

I have signed and sealed the TSS removal Calculations.

6. Drainage area U5 appears to have a portion of the road within its boundaries.

Drainage area U5 was drawn in error. Sheet CG104 drainage area map has been corrected to show the revised drainage area U5, A12, and A3. All impervious cover was accounted for in the TSS calculations and flows to the basins.

7. Please update your site map to clearly show each drainage area associated with the basin.

The drainage area map submitted was organized in the following way. All "A" labeled are impervious areas flowing to the basin. All "R" labeled drainage areas are from the roof and drain into the basin. All U areas are uncaptured areas that do NOT go to the basin. Any impervious cover in the U areas (small building and ramp) has been accounted for in the impervious cover table. The impervious areas in the U areas have extra TSS removal in the basin to account for the impervious cover. Also totals have been added to the drainage calculation per your request. Uncaptured totals also are shown.

8. Please include a record keeping requirement to the Inspection, Maintenance, Repair and Retrofit Plan.

A record keeping requirement has been added.

9. Energy Dissipation is required at the sediment basin inlet so that flows entering the basin...

Energy Dissipation is in the form of 30' long by 9' wide rock gabion mattresses shown on Detail 1 Sheet CG502. See previously submitted sheet CG502. Also see detail 2 CG501 for Gabion mat detail. See also Rip rap length requirement calculations on CG102 to dissipate velocities under the erosion threshold.

10. Please provide details for the inlet overflow structure. Please update the construction details plan as necessary.

The inlet details are shown on sheet. Overflow structure is shown on sheet. These sheets have been included with the update.

11. Sedimentation / filtration Pond plan references detail located on CG503 please provide.

The callout referencing detail 2 CG503 has been change. The detail callout was in error. The correct callout is to Detail 1 CG501.

12. The filtration pond design proposes the use of plug in cleanouts please revise to indicate that screw on cap will be used on each cleanout access location.

A note has been added to Detail 3 CG 102 of the plans. Revised sheet CG102 has been provided with this update.

13. Please provide a maintenance ramp for the proposed basin.

Maintenance Ramp has been added to the proposed basin. The ramp is 4:1 and 12' wide. See sheet CG101 and CG102 for the ramp.

14. Please design and indicate on the site plan and basin detail sheet the basin maintenance staging area.

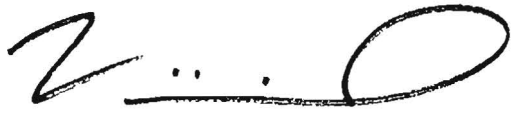
A basin maintenance staging area has been added onto the plans see Sheet CG101 and Sheet CG102 for the basin maintenance staging area.

15. Please include a copy of the notice of intent (NOI) per CZP application checklist.

A copy of the NOI has been included in this update.

Also the cover sheet of the CZP states that it is a modification of a previously approved CZP which it is not. The coversheet has been attached to this update showing that it is a new CZP.

Sincerely,



Victor M. Gil, P.E., R.P.L.S.
Gil Engineering Associates, Inc.
Texas Engineering Firm Number F-1186

Inspection, Maintenance, Repair and Retrofit Plan

Sedimentation Basins

Monthly: The vegetative growth in the basin shall be checked. The growth shall not exceed 18 inches in height.

Quarterly: The level of accumulated silt shall be checked. If depth of silt exceeds 6 inches, it shall be removed and disposed of "properly" and in an "approved" location.

The basin shall be checked for accumulation of debris and trash. The debris and trash shall be removed if excessive. All debris and trash shall be removed at least every six months.

Annually: The basin shall be inspected for structural integrity and repaired if necessary.

After Rainfall: The basin shall be checked after each rainfall occurrence to insure that it drains within 48 hours after the storm is over. If it does not drain within this time, corrective maintenance will be accomplished.

Filtration Basins

Monthly: The vegetative growth in the basin shall be checked. The growth shall not exceed 18 inches in height.

Quarterly:

The accumulation of pollutants/oils shall be checked. If the pollutants have significantly reduced the designed capacity of the sand filter, the pollutants shall be removed.

The level of accumulated silt shall be checked. If depth of silt/pollutants exceeds 1/2 inch, it shall be removed and disposed of "properly" and in an "approved" location.

The basin shall be checked for accumulation of debris and trash. The debris and trash shall be removed if excessive. All debris and trash shall be removed at least every six months.

Annually: The basin shall be inspected for structural integrity and repaired if necessary. Filter underdrain piping network shall be cleaned to remove sediment buildup.

After Rainfall: The basin shall be checked after each rainfall occurrence to insure that it drains within 48 hours. If it does not drain within this time, corrective maintenance will be accomplished.

Following any required maintenance, the surface of the filtration basin shall be raked and leveled to restore the system to it designed condition.

"Proper" disposal of accumulated silt shall be accomplished following Texas Commission on Environmental Quality and City of New Braunfels / Comal County guidelines and specifications.

Recordkeeping:

A qualified inspector will inspect the basins Monthly, Quarterly and Annualy and after each rain event. Montly, Quarterly and Annualy reports of compliance or non-compliance will be kept. The reports shall be kept on file with the owner for a period of 3 years.

An amended copy of this document will be provided to the Texas Commission on Environmental Quality within thirty (30) days of any changes in the following information

Responsible Party:	Thomas Bloxham
Entity	Comal Independent School District
Mailing Address	1404 IH 35 North
City, State, Zip Code	New Braunfels, Texas 78130
Telephone:	(830) 221-2039

Signature of Responsible Party

2-7-12
Date

ATTACHMENT N
Inspection, Maintenance, Repair and Retrofit Plan

Texas Commission on Environmental Quality

TSS Removal Calculations 04-20-2009

Project Name: Comal Isd FM306 Elementary School
Date Prepared: 1/12/2012

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

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

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

where:

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

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

County =	Comal	
Total project area included in plan * =	19.76	acres
Predevelopment impervious area within the limits of the plan * =	0.00	acres
Total post-development impervious area within the limits of the plan* =	4.52	acres
Total post-development impervious cover fraction * =	0.23	
P =	33	inches
$L_{M\ TOTAL\ PROJECT}$ =	4057	lbs

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

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

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

Drainage Basin/Outfall Area No. = 1

Total drainage basin/outfall area =	6.31	acres
Predevelopment impervious area within drainage basin/outfall area =	0.00	acres
Post-development impervious area within drainage basin/outfall area =	4.52	acres
Post-development impervious fraction within drainage basin/outfall area =	0.72	
$L_{M\ THIS\ BASIN}$ =	4057	lbs

3. Indicate the proposed BMP Code for this basin.

Proposed BMP = Sand Filter
Removal efficiency = 89 percent

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

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

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

where:

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

A_C =	6.31	acres
A_I =	4.52	acres
A_P =	1.79	acres

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94994
LICENSED
PROFESSIONAL ENGINEER

6.15.2012

TEXAS ENGINEERING FIRM
F-1186

L_R = 4622 lbs

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

Desired $L_{T\ THIS\ BASIN}$ = 4100 lbs.

F = 0.89

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

Rainfall Depth =	1.60	inches
Post Development Runoff Coefficient =	0.52	
On-site Water Quality Volume =	19146	cubic feet

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

Off-site area draining to BMP =	0.00	acres
Off-site Impervious cover draining to BMP =	0.00	acres
Impervious fraction of off-site area =	0	
Off-site Runoff Coefficient =	0.00	
Off-site Water Quality Volume =	0	cubic feet
Storage for Sediment =	3829	
Total Capture Volume (required water quality volume(s) x 1.20) =	22976	cubic feet

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

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

Required Water Quality Volume for retention basin = NA cubic feet

Irrigation Area Calculations:

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

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

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

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

9A. Full Sedimentation and Filtration System

Water Quality Volume for sedimentation basin =	22976	cubic feet	
Minimum filter basin area =	1064	square feet	
Maximum sedimentation basin area =	9573	square feet	**For minimum water depth of 2 feet**
Minimum sedimentation basin area =	2393	square feet	**For maximum water depth of 8 feet**

9B. Partial Sedimentation and Filtration System

Water Quality Volume for combined basins =	22976	cubic feet	
Minimum filter basin area =	1915	square feet	
Maximum sedimentation basin area =	7659	square feet	**For minimum water depth of 2 feet**
Minimum sedimentation basin area =	479	square feet	**For maximum water depth of 8 feet**

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

Required Water Quality Volume for Bioretention Basin = NA cubic feet

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

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

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

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

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

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

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

14. Stormwater Management StormFilter® by CONTECH

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

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

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

Design parameters for the swale:

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

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

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

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

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

$Q = CiA$ = 4.71 cfs

To calculate the flow velocity in the swale:

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

To calculate the resulting swale length:

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

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

15B. Alternative Method using Excel Solver

Design Q = CiA =	4.71	cfs	
Manning's Equation Q =	0.76	cfs	Error 1 = 3.95
Swale Width=	6.00	ft	

Instructions are provided to the right (green comments).

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

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

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

Flow Velocity	0.36	ft/s
Minimum Length =	107 24	ft

Instructions are provided to the right (blue comments).

Design Width =	6	ft	
Design Discharge =	0.76	cfs	Error 2 = 3.95
Design Depth =	0.33	ft	
Flow Velocity =	0.32	cfs	
Minimum Length =	97 48	ft	

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

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

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

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

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

Required Load Removal Based upon Equation 3 3 =	NA	lbs

First calculate the load removal at 1.1 in/hour

RG-348 Page 3-30 Equation 3.4 $Q = CiA$

C = runoff coefficient for the drainage area =	0 55		C = Runoff Coefficient = 0.546 $(IC)^2$ + 0.328 (IC) + 0.03
i = design rainfall intensity =	1 1	in/hour	
A = drainage area in acres =	1	acres	
Q = flow rate in cubic feet per second =	0.60	cubic feet/sec	

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

Q = Runoff rate calculated above =	0.60	cubic feet/sec
A = Water surface area in the wet vault =	150	square feet
V_{OR} = Overflow Rate =	0.00	feet/sec
Percent TSS Removal from Figure 3-1 (RG-348 Page 3-31) =	53	percent
Load removed by Wet Vault =	#VALUE!	lbs

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

Actual Rainfall intensity at which Wet Vault bypass Occurs =	0 5	in/hour
Fraction of rainfall treated from Figure 3-2 RG-348 Page 3-32 =	0.75	percent
Efficiency Reduction for Actual Rainfall Intensity =	0 83	percent
Resultant TSS Load removed by Wet Vault =	#VALUE!	lbs

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

PERMEABLE CONCRETE MAY ONLY BE USED ON THE CONTRIBUTING ZONE

19. BMPs Installed in a Series Designed as Required in RG-348 Pages 3-32

Michael E. Barrett, Ph.D., P.E. recommended that the coefficient for E_2 be changed from 0.5 to 0.65 on May 3, 2006

$E_{TOT} = [1 - ((1 - E_1) X (1 - 0.65E_2) x (1 - 0.25E_3))] X 100 =$	86.38	percent	NET EFFICIENCY OF THE BMPs IN THE SERIES
EFFICIENCY OF FIRST BMP IN THE SERIES = E_1 =	75.00	percent	
EFFICIENCY OF THE SECOND BMP IN THE SERIES = E_2 =	70 00	percent	
EFFICIENCY OF THE THIRD BMP IN THE SERIES = E_3 =	0 00	percent	

THEREFORE, THE NET LOAD REMOVAL WOULD BE:

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

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

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

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

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

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

(A and A_p VALUES ARE FROM SECTION 3 ABOVE)

$L_q = E_{TOT} \times P \times (A_i \times 34.6 \times A_p \times 0.54)$ = 4485.31 lbs

20. Stormceptor

Required TSS Removal in BMP Drainage Area=	NA	lbs
Impervious Cover Overtreatment=	0.0000	ac
TSS Removal for Uncaptured Area =	0.00	lbs
BMP Sizing		
Effective Area =	NA	EA
Calculated Model Size(s) =	#N/A	
Actual Model Size (if multiple values provided in Calculated Model Size or if you are choosing a larger model size) =	0	Model Size
Surface Area =	#N/A	ft^2
Overflow Rate =	#VALUE!	V_o
Rounded Overflow Rate =	#VALUE!	V_o
BMP Efficiency % =	#VALUE!	%
L_R Value =	#VALUE!	lbs
TSS Load Credit =	#VALUE!	lbs
Is Sufficient Treatment Available? (TSS Credit > TSS Uncapt.)	#VALUE!	
TSS Treatment by BMP (LM + TSS Uncapt.) =	#VALUE!	

21. Vortech

Required TSS Removal in BMP Drainage Area=	NA	lbs
Impervious Cover Overtreatment=	0.0000	ac
TSS Removal for Uncaptured Area =	0.00	lbs
BMP Sizing		
Effective Area =	NA	EA
Calculated Model Size(s) =	#N/A	
Actual Model Size (if choosing larger model size) =	Vx1000	Pick Model Size
Surface Area =	7.10	ft^2
Overflow Rate =	#VALUE!	V_o
Rounded Overflow Rate =	#VALUE!	V_o
BMP Efficiency % =	#VALUE!	%
L_R Value =	#VALUE!	lbs
TSS Load Credit =	#VALUE!	lbs
Is Sufficient Treatment Available? (TSS Credit > TSS Uncapt.)	#VALUE!	
TSS Treatment by BMP (LM + TSS Uncapt.) =	#VALUE!	

Edwards Aquifer Protection Program

Contributing Zone Plan

To:
Texas Commission on Environmental Quality
San Antonio Regional Office
14250 Judson Rd.
San Antonio, TX 78233-4480

For:

Comal Independent School District
FM 306 Elementary School
310 Cannan Road
Canyon Lake, Texas 78133

Prepared by:

Gil Engineering Associates. Inc.

CONSULTING ENGINEERS ◻ SURVEYORS

PLANNERS ◻ BUILDING DESIGNERS

506 EAST BRAKER LANE AUSTIN, TEXAS 78753-2751 phone (512) 835-4203

fax (512) 835-4407

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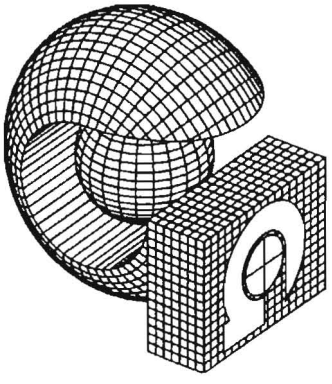

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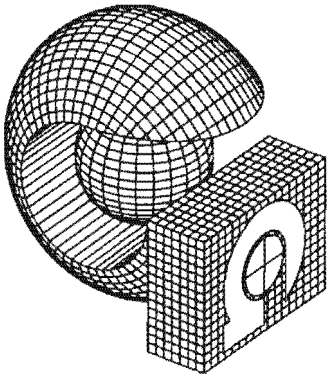

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COUNTY ENGINEER

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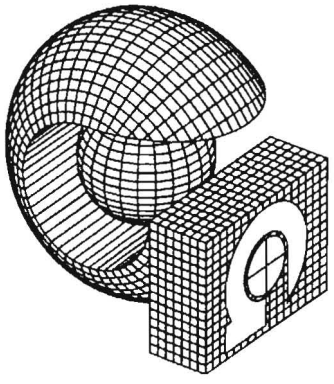

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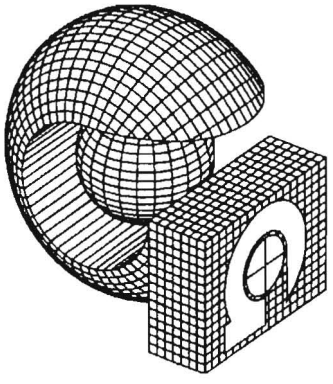

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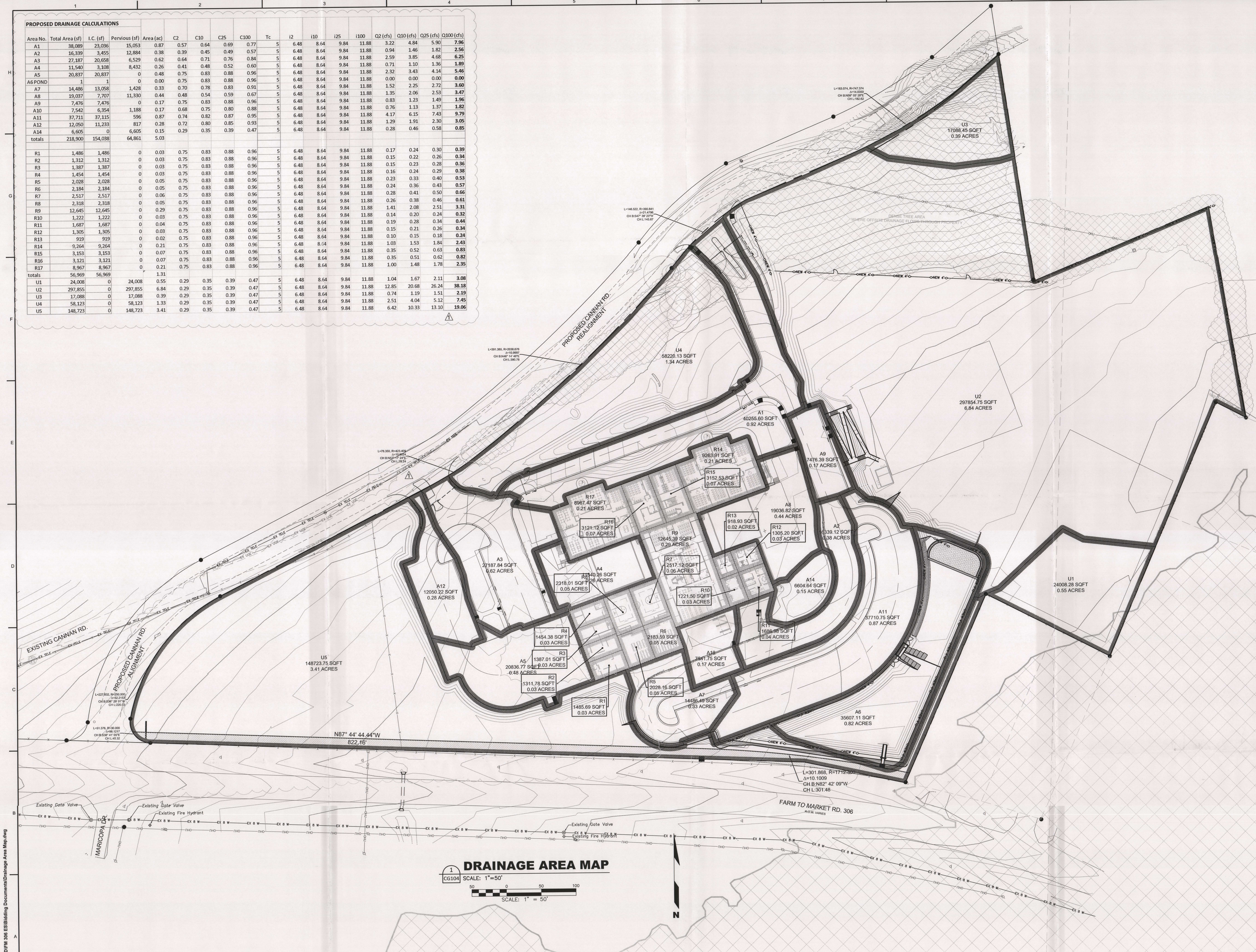
PROPOSED DRAINAGE CALCULATIONS

Area No.	Total Area (sf)	I.C. (sf)	Pervious (sf)	Area (ac)	C2	C10	C25	C100	Tc	i2	i10	i25	i100	Q2 (cfs)	Q10 (cfs)	Q25 (cfs)	Q100 (cfs)
A1	38,089	23,036	15,053	0.87	0.57	0.64	0.69	0.77	5	6.48	8.64	9.84	11.88	3.22	4.84	5.90	**7.96**
A2	16,339	3,455	12,884	0.38	0.39	0.45	0.49	0.57	5	6.48	8.64	9.84	11.88	0.94	1.46	1.82	**2.56**
A3	27,187	20,658	6,529	0.62	0.64	0.71	0.76	0.84	5	6.48	8.64	9.84	11.88	2.59	3.85	4.68	**6.25**
A4	11,540	3,108	8,432	0.26	0.41	0.48	0.52	0.60	5	6.48	8.64	9.84	11.88	0.71	1.10	1.36	**1.89**
A5	20,837	20,837	0	0.48	0.75	0.83	0.88	0.96	5	6.48	8.64	9.84	11.88	2.32	3.43	4.14	**5.46**
A6 POND	1	1	0	0.00	0.75	0.83	0.88	0.96	5	6.48	8.64	9.84	11.88	0.00	0.00	0.00	**0.00**
A7	14,486	13,058	1,428	0.33	0.70	0.78	0.83	0.91	5	6.48	8.64	9.84	11.88	1.52	2.25	2.72	**3.60**
A8	19,037	7,707	11,330	0.44	0.48	0.54	0.59	0.67	5	6.48	8.64	9.84	11.88	1.35	2.06	2.53	**3.47**
A9	7,476	7,476	0	0.17	0.75	0.83	0.88	0.96	5	6.48	8.64	9.84	11.88	0.83	1.23	1.49	**1.96**
A10	7,542	6,354	1,188	0.17	0.68	0.75	0.80	0.88	5	6.48	8.64	9.84	11.88	0.76	1.13	1.37	**1.82**
A11	37,711	37,115	596	0.87	0.74	0.82	0.87	0.95	5	6.48	8.64	9.84	11.88	4.17	6.15	7.43	**9.79**
A12	12,050	11,233	817	0.28	0.72	0.80	0.85	0.93	5	6.48	8.64	9.84	11.88	1.29	1.91	2.30	**3.05**
A14	6,605	0	6,605	0.15	0.29	0.35	0.39	0.47	5	6.48	8.64	9.84	11.88	0.28	0.46	0.58	**0.85**
totals	218,900	154,038	64,861	5.03													
R1	1,486	1,486	0	0.03	0.75	0.83	0.88	0.96	5	6.48	8.64	9.84	11.88	0.17	0.24	0.30	**0.39**
R2	1,312	1,312	0	0.03	0.75	0.83	0.88	0.96	5	6.48	8.64	9.84	11.88	0.15	0.22	0.26	**0.34**
R3	1,387	1,387	0	0.03	0.75	0.83	0.88	0.96	5	6.48	8.64	9.84	11.88	0.15	0.23	0.28	**0.36**
R4	1,454	1,454	0	0.03	0.75	0.83	0.88	0.96	5	6.48	8.64	9.84	11.88	0.16	0.24	0.29	**0.38**
R5	2,028	2,028	0	0.05	0.75	0.83	0.88	0.96	5	6.48	8.64	9.84	11.88	0.23	0.33	0.40	**0.53**
R6	2,184	2,184	0	0.05	0.75	0.83	0.88	0.96	5	6.48	8.64	9.84	11.88	0.24	0.36	0.43	**0.57**
R7	2,517	2,517	0	0.06	0.75	0.83	0.88	0.96	5	6.48	8.64	9.84	11.88	0.28	0.41	0.50	**0.66**
R8	2,318	2,318	0	0.05	0.75	0.83	0.88	0.96	5	6.48	8.64	9.84	11.88	0.26	0.38	0.46	**0.61**
R9	12,645	12,645	0	0.29	0.75	0.83	0.88	0.96	5	6.48	8.64	9.84	11.88	1.41	2.08	2.51	**3.31**
R10	1,222	1,222	0	0.03	0.75	0.83	0.88	0.96	5	6.48	8.64	9.84	11.88	0.14	0.20	0.24	**0.32**
R11	1,687	1,687	0	0.04	0.75	0.83	0.88	0.96	5	6.48	8.64	9.84	11.88	0.19	0.28	0.34	**0.44**
R12	1,305	1,305	0	0.03	0.75	0.83	0.88	0.96	5	6.48	8.64	9.84	11.88	0.15	0.21	0.26	**0.34**
R13	919	919	0	0.02	0.75	0.83	0.88	0.96	5	6.48	8.64	9.84	11.88	0.10	0.15	0.18	**0.24**
R14	9,264	9,264	0	0.21	0.75	0.83	0.88	0.96	5	6.48	8.64	9.84	11.88	1.03	1.53	1.84	**2.43**
R15	3,153	3,153	0	0.07	0.75	0.83	0.88	0.96	5	6.48	8.64	9.84	11.88	0.35	0.52	0.63	**0.83**
R16	3,121	3,121	0	0.07	0.75	0.83	0.88	0.96	5	6.48	8.64	9.84	11.88	0.35	0.51	0.62	**0.82**
R17	8,967	8,967	0	0.21	0.75	0.83	0.88	0.96	5	6.48	8.64	9.84	11.88	1.00	1.48	1.78	**2.35**
totals	56,969	56,969		1.31													
U1	24,008	0	24,008	0.55	0.29	0.35	0.39	0.47	5	6.48	8.64	9.84	11.88	1.04	1.67	2.11	**3.08**
U2	297,855	0	297,855	6.84	0.29	0.35	0.39	0.47	5	6.48	8.64	9.84	11.88	12.85	20.68	26.24	**38.18**
U3	17,088	0	17,088	0.39	0.29	0.35	0.39	0.47	5	6.48	8.64	9.84	11.88	0.74	1.19	1.51	**2.19**
U4	58,123	0	58,123	1.33	0.29	0.35	0.39	0.47	5	6.48	8.64	9.84	11.88	2.51	4.04	5.12	**7.45**
U5	148,723	0	148,723	3.41	0.29	0.35	0.39	0.47	5	6.48	8.64	9.84	11.88	6.42	10.33	13.10	**19.06**



DRAINAGE AREA MAP

1 / CG104 SCALE: 1"=50'

SCALE: 1" = 50'

S:\Projects\Comal ISD\FM 306 ES\Bidding Documents\Drainage Area Map.dwg

SHWGROUP
ARCHITECTS | ENGINEERS | PLANNERS

Consultants:
CIVIL:
Gil Engineering Associates, Inc.
CONSULTING ENGINEERS – SURVEYORS
PLANNERS – DESIGNERS

TEXAS REGISTRATION FIRM # 1186

Final Plans for Bidding and Construction

STATE OF TEXAS
VICTOR M. GIL
94994
LICENSED
PROFESSIONAL ENGINEER
4.6.2012

COMAL INDEPENDENT SCHOOL DISTRICT

COMAL ISD

FM 306 ELEMENTARY
CANYON LAKE . TX

CHECKED: Checker
SCALE:

ISSUE: April 6, 2012

⚠1 REQUEST FOR THE APPROVAL OF A CONTRIBUTING ZONE PLAN (CZP) PLAN;30 TEXAS ADMINISTRATIVE CODE (TAC) CHAPTER 213 EDWARDS AQUIFER

SECOND FLOOR

A	B

A	B
D	C

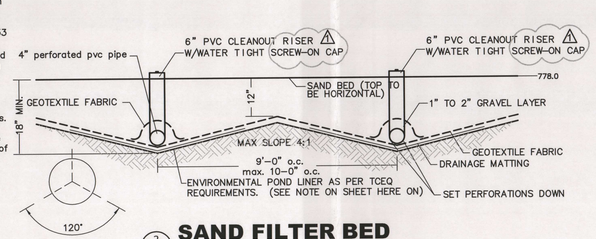
KEY PLAN (NTS)

SHEET TITLE:
DRAINAGE AREA MAP

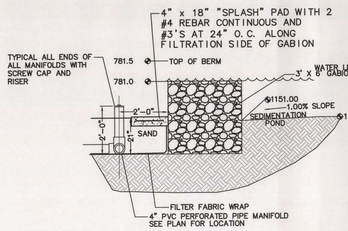
CG104

SHW Project: 4311.006.00

SAND AND GRAVEL SPECIFICATION
The top layer is to be a minimum of eighteen (18) inches of 0.02–0.04 inch diameter sand which corresponds with ASTM C–33 concrete sand (smaller sand size is not acceptable). Under the sand shall be a layer of one–half (0.5) to one and one–half (1.5) inch diameter washed, rounded, river gravel which provides a minimum of four inches of cover over the top of the underdrain lateral pipes. The sand and gravel must be separated by a layer of geotextile fabric meeting the specifications of the TCEQ.

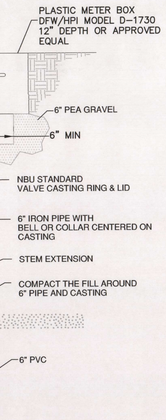


SAND FILTER BED
2 CG102 NOT TO SCALE

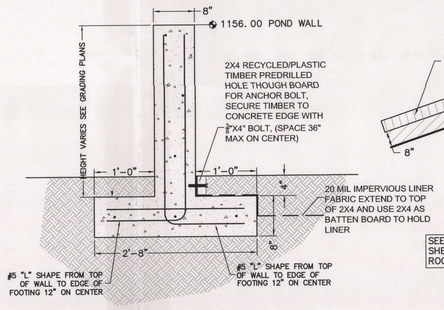


3'X6' POND GABION DIVIDER
3 CG102 NOT TO SCALE

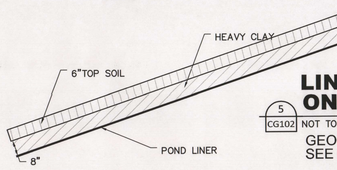
Material Specifications
A. Gabion mats shall be made from heavily zinc coated (galvanized) steel wire woven into a double twist pattern with an opening of 3" by 4" and shall be manufactured by Terra Aqua as Supplied by Southern Erosion Control (512) 385–6900. Gabions for compartment divider shall be 3' wide by 3' high with a nominal length of 6', 9' or 12' to make up the necessary length. Gabion rock shall consist of crushed stone with a minimum specific gravity of 2.25 and a percent of wear not greater than 30 when tested by ASTM C131. Rock shall be 5" to 8" dia. hand placed at surfaces of the gabion mat.



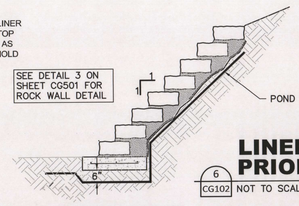
6" SHUT OFF VALVE
10 CG102 NOT TO SCALE



DETENTION/ WATER QUALITY WALL
4 CG102 NOT TO SCALE



LINER INSTALLATION ON EARTHEN SLOPE
5 CG102 NOT TO SCALE
GEOTEXTILE FABRIC SPECIFICATIONS SEE NOTE BELOW



LINER INSTALLATION PRIOR TO CONCRETE POUR
6 CG102 NOT TO SCALE

POND LINER TO BE PLACED UNDER ENTIRE POND AND TO EXTEND FROM WALL TO WALL

IMPERMEABLE LINER NOTES:

1. AN IMPERMEABLE LINER IS REQUIRED FOR THE ENTIRE ENVIRONMENTAL (SEDIMENTATION/FILTRATION) POND. THE GEOMEMBRANE IMPERMEABLE LINER SHALL BE THICKNESS OF 30 MILS AND BE ULTRAVIOLET RESISTANT. SUITABLE GEOTEXTILE FABRIC SHOULD BE PLACED ON THE TOP AND BOTTOM OF THE MEMBRANE FOR PUNCTURE PROTECTION AND THE LINERS COVERED WITH A MINIMUM OF 6 INCHES OF COMPACTED TOPSOIL THE GEOTEXTILE FABRIC (FOR PROTECTION OF GEOMEMBRANE) SHOULD BE NONWOVEN GEOTEXTILE FABRIC AND MEET THE FOLLOWING SPECIFICATIONS.

PROPERTY	TEST METHOD	UNIT	SPEC. (MIN)
Unit Weight	ASTM D–5261	oz/yd^2	8
Filtration Rate	ASTMD–4491	cm/sec	0.20
Puncture Strength	ASTM D–4833	lb	125
Mullen Burst Strength	ASTM D–3786	psi	400
Tensile Strength	ASTM D–4632	lb	200
Equiv. Opening Size	US Standard Sieve	No.	80

2. ALL THE TOPSOIL SHOULD BE STABILIZED WITH APPROPRIATE VEGETATION.

3. NO ROCKS OR PROTRUSIONS OF ANY KIND WILL BE ALLOWED ON THE ENTIRE CONTACT AREA OF POND WITH GEOMEMBRANE LINER. THE GEOMEMBRANE LINER WITH ITS GEOTEXTILE FABRIC ON TOP AND BOTTOM SHALL BE PLACED A MINIMUM OF 6" BELOW THE FINISH GRADES SHOWN AND EXTEND UP TO THE INSIDE VERTICAL FACE OF THE WALL. A MINIMUM OF 6" COMPACTED TOPSOIL IS REQUIRED OVER THE ENTIRE GEOMEMBRANE LINER TO THE FINISHED GRADES SHOWN HERE. THE INSTALLED LINER SHALL HAVE NO LEAKS WHEN TESTED AFTER PLACEMENT IN A MANNER APPROVED BY LINER MANUFACTURER. ANY LEAKS FOUND SHALL BE REPAIRED IN A MANNER ACCEPTABLE TO THE POND LINER MANUFACTURER AND THE TCEQ AND RETESTED FOR NO LEAKS.

Sedimentation Pond STAGE STORAGE TABLE				
ELEV	AREA (sq. ft.)	DEPTH (ft)	AVG END INC. VOL. (cu. ft.)	AVG END TOTAL VOL. (cu. ft.)
778	0	N/A	N/A	0.00
779	4909	1.000	2455	2455
780	7308	1.000	6109	8563
781	7945	1.000	7627	16190

Filtration Pond STAGE STORAGE TABLE				
ELEV	AREA (sq. ft.)	DEPTH (ft)	AVG END INC. VOL. (cu. ft.)	AVG END TOTAL VOL. (cu. ft.)
778	2164	N/A	N/A	0.00
779	2293	1.000	2228	2228
780	2425	1.000	2359	4587
781	2562	1.000	2493	7081

Detention Pond STAGE STORAGE TABLE				
ELEV	AREA (sq. ft.)	DEPTH (ft)	AVG END INC. VOL. (cu. ft.)	AVG END TOTAL VOL. (cu. ft.)
775.92	0	N/A	N/A	0.00
776	44	1.000	2	2
777	2202	1.000	1123	1125
778	7367	1.000	4785	5909
779	10934	1.000	9150	15060
780	13565	1.000	12250	27309
781	15375	1.000	14470	41779

Total Volume Sedimentation / Filtration	
Sedimentation Pond Total Volume (cf)	16190
Filtration Pond Total Volume (cf)	7,081
Total Water Quality Volume in Sed /Fil Pond (cf)	23,270.1
Total Capture Volume WQV *1.20 from TCEQ Calc Sheet	22,976.0
Additional Storage (cf)	294

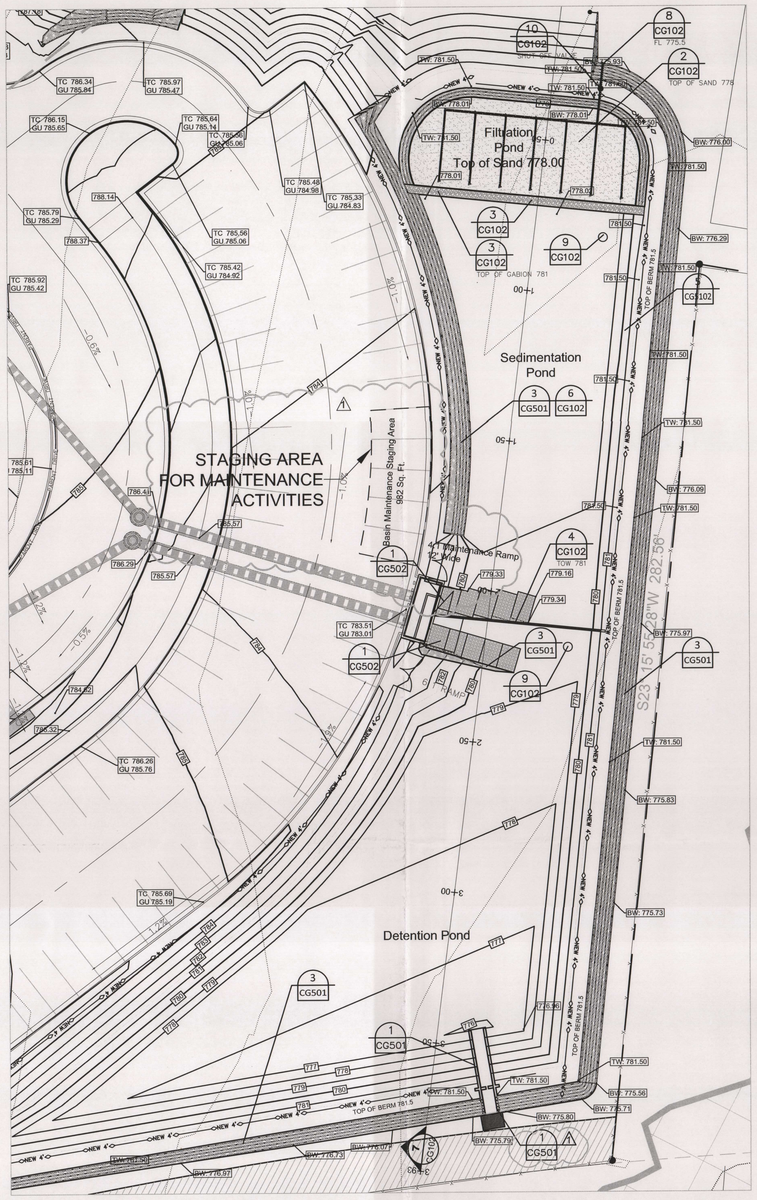
Filtration Pond Area Requirement	
Partiail Filtration Pond Minimum Filter Basin Area from TCEQ Calc Sheet	1,915
Filtration Pond Area (sf)	2164
Additional Filter Area (sf)	249

Required Splitter Box Weir Length

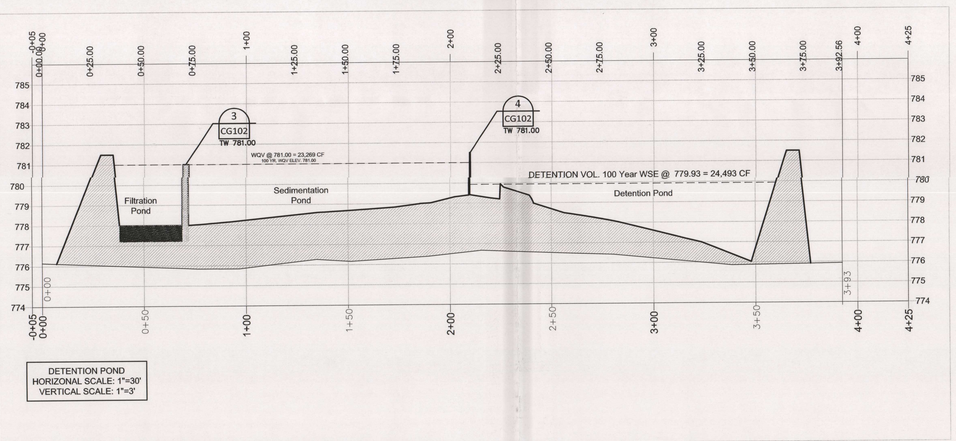
Formula	$Q = 3.8 \times L \times H^{3/2}$	
Length of Weir Reqd. (ft)	19.02	
Allowable Flows (cfs)		Design Height (ft)
Q_{100}	45.53	0.50

Rip Rap Length

Formula	L=1.7d*Q/D^2.5+8
d	2.50
D	2.50
Flows (cfs)	Riprap Length
15.53	14.68

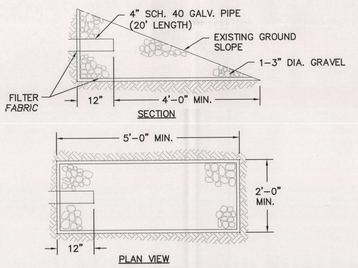


SEDIMENTATION / FILTRATION / DETENTION POND PLAN
1 CG102 1" = 20'

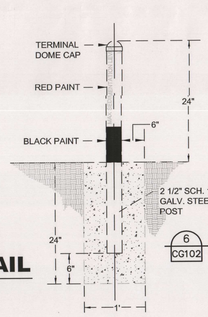


DETENTION POND
HORIZONAL SCALE: 1"=30'
VERTICAL SCALE: 1"=3'

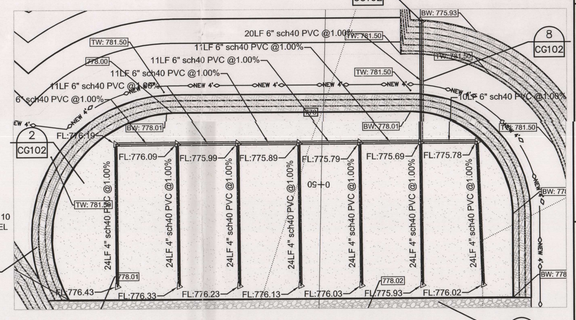
PARTIAL FILTRATION DEDIMENTATION POND AND DENTION POND
7 CG102 SCALE: 1"=30'



FILTRATION POND OUTLET DETAIL
8 CG102 NOT TO SCALE



SEDIMENT DEPTH MARKER
9 CG102 NOT TO SCALE



FILTRATION POND DETAIL
11 CG102 1" = 10'

SHW GROUP
ARCHITECTS | ENGINEERS | PLANNERS

Consultants:
CIVIL:
GII Engineering Associates, Inc.
CONSULTING ENGINEERS – SURVEYORS
PLANNERS – DESIGNERS
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TEXAS REGISTRATION FIRM # 1196

Final Plans for Bidding and Construction

STATE OF TEXAS
VICTOR M. GIL
94994
LICENSED PROFESSIONAL ENGINEER

COMAL INDEPENDENT SCHOOL DISTRICT

COMAL ISD

FM 306 ELEMENTARY
CANYON LAKE . TX

CHECKED: Checker
SCALE:

ISSUE: April 6, 2012

⚠ REQUEST FOR THE APPROVAL OF A CONTRIBUTING ZONE PLAN (CZP) PLAN:30 TEXAS ADMINISTRATIVE CODE (TAC) CHAPTER 213 EDWARDS AQUIFER

SECOND FLOOR
A B
A B
D C

KEY PLAN (NTS)

SHEET TITLE:
SEDIMENTATION, FILTRATION AND DETENTION POND PLAN

RECEIVED
JUN 2 8 2012
COUNTY ENGINEER

CG102
SHW Project: 4311.006.00

2012 JUN 19 PM 2:32
RECEIVED TCEQ
SAN ANTONIO REGION

8/19/2011 3:36 PM
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PERMANENT EROSION CONTROL NOTES

All disturbed areas shall be restored as noted below.

(a) A minimum of four inches of topsoil shall be placed in all drainage channels (except rock) and between the curb and right-of-way line.

(b) The seeding for permanent erosion control shall be applied over areas disturbed by construction as follows:

i. From September 15 to March 1, seeding shall be with a combination of 1.0 pounds per 1000 square feet of unhulled Bermuda and 5.0 pounds per 1000 square feet of Winter rye with a purity of 95% with 90% germination.

ii. From March 2 to September 14, seeding shall be with hulled Bermuda at a rate of 1.0 pounds per 600 square feet with a purity of 95% with 85% germination.

(c) Fertilizer shall have an analysis of 15-15-15 and shall be applied at the rate of 600 pounds per acre.

(d) The planted area shall be irrigated or sprinkled in a manner that will not erode the topsoil, but will sufficiently soak the soil to a depth of six inches. The irrigation shall occur at ten-day intervals during the first two months. Rainfall occurrences of 1/2 inch or more shall postpone the watering schedule for one week.

(e) Mulch type used shall be cellulose, applied at a rate of 2000 pounds per acre.

(f) Restoration shall be acceptable when the grass has grown at least 1-1/2 inches high with 95% coverage, provided no bare spots larger than 16 square feet exist.

(g) When required, native grass seeding shall comply with requirements of the City.

Developer Information:

Owner: COMAL ISD
1004 IH 35 NORTH
New Braunfels, TX 78130
(830)221-2000,
Owner's representative responsible for plan alterations:
SHW GROUP (512)867-6000
Person or firm responsible for erosion/sedimentation control maintenance:
BAIRD WILLIAMS CONSTRUCTION (254) 773-3499
Person or firm responsible for tree/natural area protection maintenance:
BAIRD WILLIAMS CONSTRUCTION (254) 773-3499

TEMPORARY EROSION CONTROL NOTES

1. The contractor shall install erosion / sedimentation controls and tree/natural area protective fencing prior to any site preparation work (clearing, grubbing or excavation.)

2. The placement of erosion / sedimentation controls shall be in accordance with the approved Erosion and Sedimentation Control Plan.

3. The placement of tree / natural area protective fencing shall be in accordance with the approved Grading / Tree and Natural Area Plan.

4. A pre-construction conference shall be held on-site with the contractor, design engineer/permit applicant and Environmental Inspector after installation of the erosion / sedimentation controls and tree/natural area protection measures and prior to beginning any site preparation work The contractor shall notify the City, at least three days prior to the meeting date.

5. Any significant variation in materials or locations of controls or fences from those shown on the approved plan a must be approved by the reviewing Engineer, Environmental Specialist or City Arborist as appropriate.

6. The contractor is required to inspect the controls and fences at weekly intervals and after significant rainfall events to insure that they are functioning properly. The person(s) responsible for maintenance of controls and fences shall immediately make any necessary repairs to damaged areas. Silt accumulation at controls must be removed when the depth reaches six (6) inches.

7. Prior to final acceptance by the City, haul roads and waterway crossings constructed for temporary contractor access must be removed, accumulated sediment removed from the waterway and the area restored to the original grade and revegetated All land clearing debris shall be disposed of in approved spoil disposal sites.

8. Field revisions to the Erosion and Sedimentation Control Plan may be required by the Environmental Inspector during the course of construction to correct control inadequacies. Major revisions must be approved by the City.

IRRIGATION NOTES

ALL MAINLINE AND LATERAL LINE PIPING AND CONTROL WIRES UNDER PAVING SHALL BE INSTALLED IN SLEEVES. MAIN AND LATERAL LINE SLEEVES SHALL BE A MINIMUM OF TWICE (2X) THE DIAMETER OF THE PIPE TO BE SLEEVED. CONTROL WIRE SLEEVES SHALL BE OF SUFFICIENT SIZE FOR THE REQUIRED NUMBER OF WIRES UNDER PAVING.

- INSTALL ALL BACKFLOW PREVENTION DEVICES AND ALL PIPING BETWEEN THE POINT OF CONNECTION AND THE BACKFLOW PREVENTER PER LOCAL CODES AND ALL GOVERNING AUTHORITIES.
- FINAL LOCATION OF THE BACKFLOW PREVENTER AND AUTOMATIC CONTROLLER SHALL BE APPROVED BY THE OWNER'S REPRESENTATIVE.
- 120 VAC ELECTRICAL POWER SOURCE AT CONTROLLER LOCATION SHALL BE PROVIDED BY OTHERS. THE IRRIGATION CONTRACTOR SHALL MAKE THE FINAL CONNECTION FROM THE ELECTRICAL SOURCE TO THE CONTROLLER.
- ALL SPRINKLER HEADS SHALL BE SET PERPENDICULAR TO FINISH GRADE UNLESS OTHERWISE SPECIFIED.
- THE IRRIGATION CONTRACTOR SHALL FLUSH AND ADJUST ALL SPRINKLER HEADS AND VALVES FOR OPTIMUM COVERAGE WITH MINIMAL OVERSPRAY ONTO WALKS, STREETS, WALLS, ETC.
- IT IS THE RESPONSIBILITY OF THE IRRIGATION CONTRACTOR TO FAMILIARIZE HIMSELF WITH ALL GRADE DIFFERENCES, LOCATION OF WALLS, RETAINING WALLS, STRUCTURES AND UTILITIES. THE IRRIGATION CONTRACTOR SHALL REPAIR OR REPLACE ALL ITEMS DAMAGED BY HIS WORK. HE SHALL COORDINATE HIS WORK WITH OTHER CONTRACTORS FOR THE LOCATION AND INSTALLATION OF PIPE SLEEVES THROUGH WALLS, UNDER ROADWAYS AND PAVING, ETC.
- ALL SPRINKLER EQUIPMENT NOT OTHERWISE DETAILED OR SPECIFIED SHALL BE INSTALLED PER MANUFACTURER'S RECOMMENDATIONS AND SPECIFICATIONS.
- THE DESIGNERS SHALL BE A REGISTERED LICENSED IRRIGATOR IN THE STATE OF TEXAS.
- ALL REMOTE CONTROL VALVES, GATE VALVES, QUICK COUPLERS, AND CONTROL WIRE SHALL BE INSTALLED IN APPROVED VALVES BOXES WITH LOCKING COVERS.
- ALL CONTROL WIRES TO BE 14 AWG SOLID COPPER INSULATED DIRECT BURIAL WIRE UF UL LISTED. WATERPROOF CONNECTORS TO BE USED ON ALL WIRE CONNECTIONS.
- IRRIGATION CONTRACTOR SHALL OBTAIN ALL PERMITS AND LICENSES, AND PAY ALL CHARGES AND FEES AND GIVE ALL NECESSARY NOTICES FOR THE COMPLETION OF WORK.
- IRRIGATION INSTALLATION IN TEXAS IS REGULATED BY THE TEXAS COMMISSION OF ENVIRONMENTAL QUALITY.
- IRRIGATION CONTRACTOR SHALL PROVIDE THE OWNER WITH "AS BUILT" DRAWINGS SHOWING THE LOCATION OF ALL MAINLINES, LATERAL LINES, VALVES AND VALVE WIRING.

GENERAL NOTES

CONTRACTOR TO SAVE TREES IN PARKING LOT ISLANDS AND OPEN SPACE AREAS AROUND BUILDING. CONTACT OWNER/ENGINEER FOR FINAL TREE REMOVAL IN THESE LOCATIONS ONLY

SEQUENCE OF CONSTRUCTION

A. AFTER THE ACQUISITION OF ALL REQUIRED PERMITS, NOTIFY THE ENGINEER AND OWNER DEPARTMENT FOR A PRE-CONSTRUCTION CONFERENCE 3 DAYS IN ADVANCE.

B. INSTALL THE TEMPORARY EROSION/SEDIMENTATION CONTROLS.

C. ROUGH GRADE THE DETENTION POND FOR A SEDIMENTATION TRAP

D. DEMOLITION AND ROUGH GRADING.

E. CONSTRUCTION OF STORM WATER SYSTEM.

F. FINISH GRADING. INSTALL INLET SILT PROTECTION FOR THE STORM SEWER SYSTEM AFTER THE INLET IS CONSTRUCTED.

G. PLACEMENT OF PARKING SURFACE MATCHING NEW GRADE.

H. INSTALL PERMANENT EROSION CONTROLS.

I. OBTAIN CONCURRENCE LETTER FROM ENGINEER, AND THE FINAL INSPECTION WILL BE SCHEDULED UPON RECEIPT OF THE LETTER

J. REMOVE TEMPORARY EROSION CONTROLS AFTER ACCEPTANCE OF THE PERMANENT CONTROLS.

FIRE ACCESS ROAD NOTES

FIRE ACCESS ROADS SHALL BE INSTALLED TO MEET THE FOLLOWING MINIMUM GUIDELINES:

1. LANES SHALL BE A MINIMUM OF 20 FEET IN WIDTH.

2. OVERHEAD CLEARANCE SHALL BE A MINIMUM OF 15 FEET, 6 INCHES FROM THE FINISHED DRIVING SURFACE.

3. THE TOP AND FACE OF ROAD CURBS SHALL BE PAINTED RED IN COLOR; IF NO CURBS ARE PRESENT, A 5 1/2 TO 6 1/2 INCH WIDE, RED STRIPE SHALL BE PAINTED ON THE DRIVING SURFACE.

4. THE LANE SHALL HAVE ALTERNATING WORDS OF "FIRE LANE" AND "NO PARKING" SPACE AT A MAXIMUM OF 12 FEET BETWEEN PHRASES, AND LETTERING SHALL BE PAINTED WHITE WITH 4" X 2" LETTERS, PLUS OR MINUS 1/2 INCH.

5. WHEN REQUIRED, SIGNAGE INDICATING "FIRE LANE NO PARKING" SHALL BE SPACED AT A MAXIMUM OF 75 FEET APART, ALONG THE LENGTH OF THE FIRE LANE (SEE EXAMPLE OF APPROVED SIGNS)

6. FACILITIES WITHOUT CURB SIDE PARKING AROUND THE BUILDING SHALL FOLLOW OPTION B.

7. FACILITIES WITH HEAD-IN PARKING AROUND THE BUILDING SHALL FOLLOW OPTION B. NOTHING IN THESE GUIDELINES SHALL BE CONSTRUED TO AFFECT THE VALIDITY OR ENFORCEMENT OF PREVIOUSLY INSTALLED AND APPROVED ACCESS ROAD AND FIRE LANE MARKINGS.

PERMANENT EROSION STABILIZATION LEGEND

LOC — LIMITS OF CONSTRUCTION LINE SHOWS AREAS OF SOIL DISTURBANCE; NO SOIL DISTURBANCE WILL OCCUR OUTSIDE THE LIMITS OF CONSTRUCTION. AREA=777,840 (17.85 AC) ALL AREAS ABRADED INSIDE THE LOC AND NOT HATCHED SHALL BE STABILIZED BY HYDROMULCH OR EQUIVALENT GRASS PRODUCING MEANS SEE PERMENANT EROSION CONTROL NOTES FOR DETAILS

BERMUDA GRASS SOD TO PROVIDED IN HATCHED AREAS WITH PERMANENT UNDERGROUND IRRIGATION SYSTEM ALL 4:1 OR GREATER SLOPES SHALL BE STABLIZED BY BERMUDA GRASS SOD

BERMUDA GRASS SOD TO PROVIDED IN HATCHED AREAS TEMPORARILY IRRIGATED UNTIL ESTABLISHED

ROCK WALL

DETENTION POND MAINTENANCE SCHEDULE

Upon completion of the project the school district will be responsible for all inspection, maintenance, and repair of all onsite detention ponds, channels and grass swales.

INSPECTION

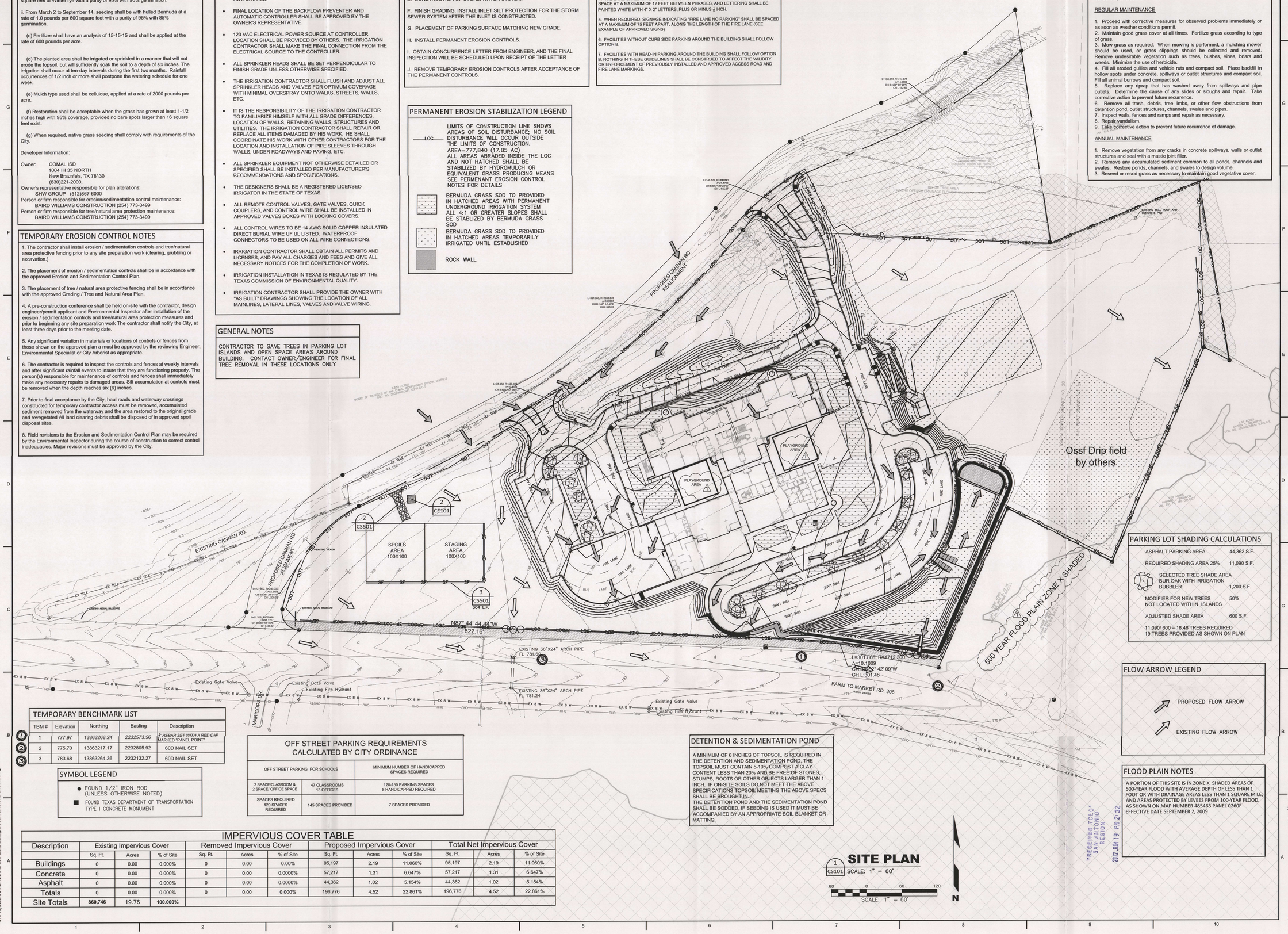
Inspect detention pond, channels and swales for erosion and any changes after every major storm even but at least monthly. Inspect embankments for any visible signs of erosion, seepage, sloughing, sliding, or other instability. Inspect outlet structures and walls for any flow obstructions, cracks, vandalism, or erosion.

REGULAR MAINTENANCE

1. Proceed with corrective measures for observed problems immediately or as soon as weather conditions permit.
2. Maintain good grass cover at all times. Fertilize grass according to type of grass.
3. Mow grass as required. When mowing is performed, a mulching mower should be used, or grass clippings should be collected and removed. Remove undesirable vegetation such as trees, bushes, vines, briars and weeds. Minimize the use of herbicide.
4. Fill all eroded gullies and vehicle ruts and compact soil. Place backfill in hollow spots under concrete, spillways or outlet structures and compact soil. Fill all animal burrows and compact soil.
5. Replace any riprap that has washed away from spillways and pipe outlets. Determine the cause of any slides or sloughs and repair. Take corrective action to prevent future recurrence.
6. Remove all trash, debris, tree limbs, or other flow obstructions from detention pond, outlet structures, channels, swales and pipes.
7. Inspect walls, fences and ramps and repair as necessary.
8. Repair vandalism.
9. Take corrective action to prevent future recurrence of damage.

ANNUAL MAINTENANCE

1. Remove vegetation from any cracks in concrete spillways, walls or outlet structures and seal with a mastic joint filler.
2. Remove any accumulated sediment common to all ponds, channels and swales. Restore ponds, channels, and swales to design volume.
3. Reseed or resod grass as necessary to maintain good vegetative cover.



TEMPORARY BENCHMARK LIST

	TBM #	Elevation	Northing	Easting	Description
①	1	*777.97*	*13863268.24*	*2232573.56*	*½" REBAR SET WITH A RED CAP MARKED "PANEL POINT"*
②	2	775.70	13863217.17	2232805.92	60D NAIL SET
③	3	783.68	13863264.36	2232132.27	60D NAIL SET

SYMBOL LEGEND

- FOUND 1/2" IRON ROD (UNLESS OTHERWISE NOTED)
- FOUND TEXAS DEPARTMENT OF TRANSPORTATION TYPE I CONCRETE MONUMENT

OFF STREET PARKING REQUIREMENTS CALCULATED BY CITY ORDINANCE

OFF STREET PARKING FOR SCHOOLS		MINIMUM NUMBER OF HANDICAPPED SPACES REQUIRED
2 SPACE/CLASROOM & 2 SPACE/ OFFICE SPACE	47 CLASSROOMS 13 OFFICES	120-150 PARKING SPACES 5 HANDICAPPED REQUIRED
SPACES REQUIRED 120 SPACES REQUIRED	145 SPACES PROVIDED	7 SPACES PROVIDED

DETENTION & SEDIMENTATION POND

A MINIMUM OF 6 INCHES OF TOPSOIL IS REQUIRED IN THE DETENTION AND SEDIMENTATION POND. THE TOPSOIL MUST CONTAIN 5-10% COMPOST A CLAY CONTENT LESS THAN 20% AND BE FREE OF STONES, STUMPS, ROOTS OR OTHER OBJECTS LARGER THAN 1 INCH. IF ON-SITE SOILS DO NOT MEET THE ABOVE SPECIFICATIONS TOPSOIL MEETING THE ABOVE SPECS SHALL BE BROUGHT IN.
THE DETENTION POND AND THE SEDIMENTATION POND SHALL BE SODDED. IF SEEDING IS USED IT MUST BE ACCOMPANIED BY AN APPROPRIATE SOIL BLANKET OR MATTING.

IMPERVIOUS COVER TABLE

Description	Existing Impervious Cover			Removed Impervious Cover			Proposed Impervious Cover			Total Net Impervious Cover		
	Sq. Ft.	Acres	% of Site	Sq. Ft.	Acres	% of Site	Sq. Ft.	Acres	% of Site	Sq. Ft.	Acres	% of Site
Buildings	0	0.00	0.000%	0	0.00	0.00%	95,197	2.19	11.060%	95,197	2.19	11.060%
Concrete	0	0.00	0.000%	0	0.00	0.0000%	57,217	1.31	6.647%	57,217	1.31	6.647%
Asphalt	0	0.00	0.000%	0	0.00	0.0000%	44,362	1.02	5.154%	44,362	1.02	5.154%
Totals	0	0.00	0.000%	0	0.00	0.000%	196,776	4.52	22.861%	196,776	4.52	22.861%
Site Totals	**860,746**	19.76	**100.000%**									

PARKING LOT SHADING CALCULATIONS

ASPHALT PARKING AREA	44,362 S.F.
REQUIRED SHADING AREA 25%	11,090 S.F.
SELECTED TREE SHADE AREA BUR OAK WITH IRRIGATION BUBBLER	1,200 S.F.
MODIFIER FOR NEW TREES NOT LOCATED WITHIN ISLANDS	50%
ADJUSTED SHADE AREA	600 S.F.

11,090/ 600 = 18.48 TREES REQUIRED
19 TREES PROVIDED AS SHOWN ON PLAN

FLOW ARROW LEGEND

PROPOSED FLOW ARROW

EXISTING FLOW ARROW

FLOOD PLAIN NOTES

A PORTION OF THIS SITE IS IN ZONE X SHADED AREAS OF 500-YEAR FLOOD WITH AVERAGE DEPTH OF LESS THAN 1 FOOT OR WITH DRAINAGE AREAS LESS THAN 1 SQUARE MILE; AND AREAS PROTECTED BY LEVEES FROM 100-YEAR FLOOD. AS SHOWN ON MAP NUMBER 485463 PANEL 0260F EFFECTIVE DATE SEPTEMBER 2, 2009

1 CS101 **SITE PLAN**
SCALE: 1" = 60'

60 0 60 120
SCALE: 1" = 60'

N

"RECEIVED TCEQ" SAN ANTONIO REGION 2012 JUN 19 PM 2:32

RECEIVED JUN 29 2012 COMAL COUNTY ENGINEER

SHWGROUP
ARCHITECTS | ENGINEERS | PLANNERS

Consultants:
CIVIL:
GII Engineering Associates, Inc.
CONSULTING ENGINEERS – SURVEYORS
PLANNERS – DESIGNERS

Final Plans for Bidding and Construction

STATE OF TEXAS VICTOR M GIL 94994 LICENSED PROFESSIONAL ENGINEER 4-6-12

COMAL INDEPENDENT SCHOOL DISTRICT

COMAL ISD

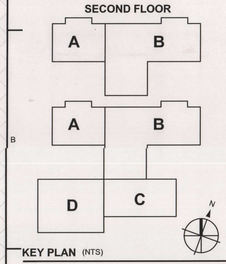
FM 306 ELEMENTARY
CANYON LAKE . TX

CHECKED: Checker
SCALE:

ISSUE: April 6, 2012

⚠1 REQUEST FOR THE APPROVAL OF A CONTRIBUTING ZONE PLAN (CZP) PLAN:30 TEXAS ADMINISTRATIVE CODE (TAC) CHAPTER 213 EDWARDS AQUIFER

SECOND FLOOR



KEY PLAN (NTS)

SHEET TITLE:
SITE PLAN

CS101

SHW Project: 4311.006.00

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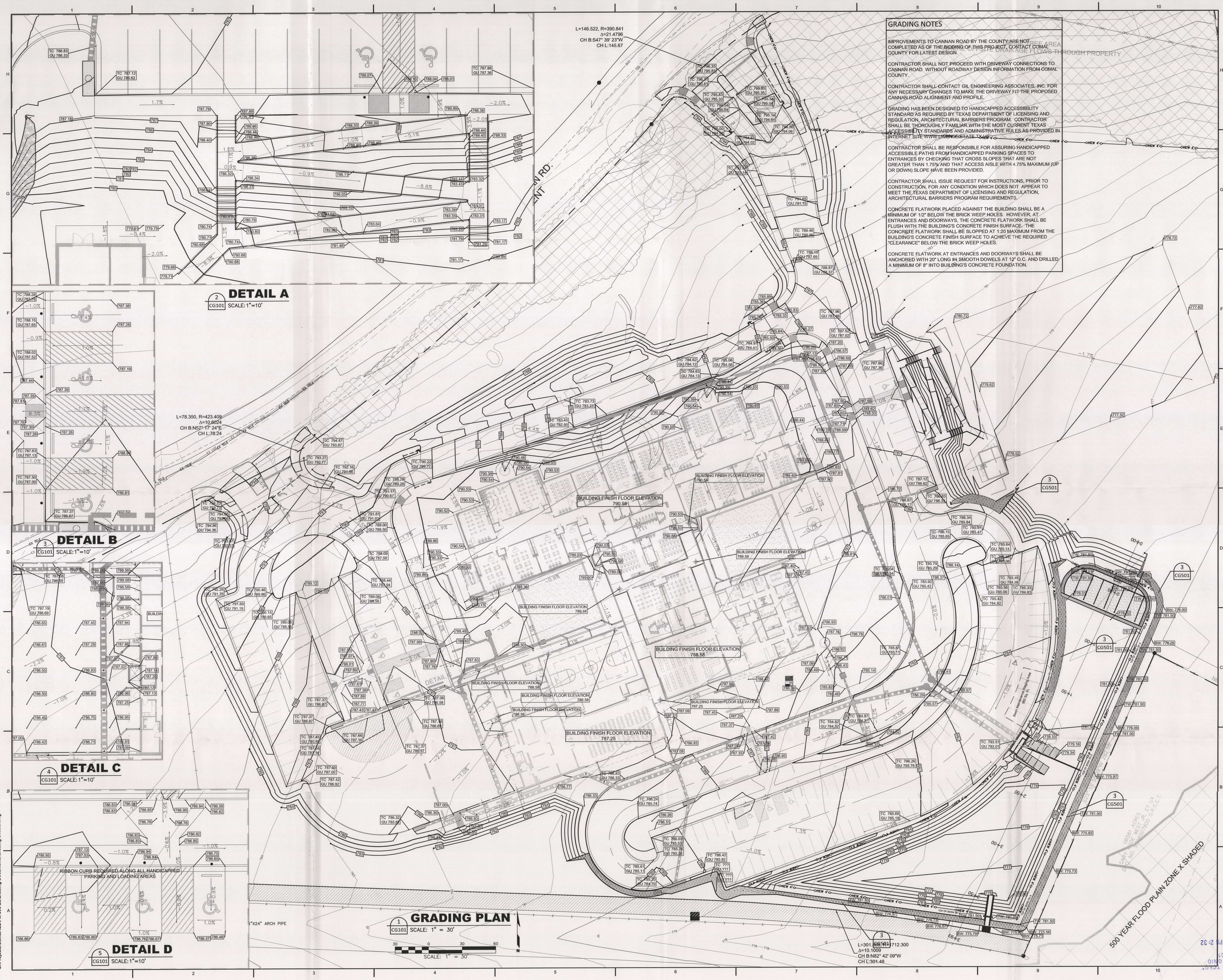


GRADING NOTES

IMPROVEMENTS TO CANNAN ROAD BY THE COUNTY ARE NOT COMPLETED AS OF THE BIDDING OF THIS PROJECT, CONTACT COMAL COUNTY FOR LATEST DESIGN.

CONTRACTOR SHALL NOT PROCEED WITH DRIVEWAY CONNECTIONS TO CANNAN ROAD WITHOUT ROADWAY DESIGN INFORMATION FROM COMAL COUNTY.

CONTRACTOR SHALL CONTACT GIL ENGINEERING ASSOCIATES, INC. FOR ANY NECESSARY CHANGES TO MAKE THE DRIVEWAY FIT THE PROPOSED CANNAN ROAD ALIGNMENT AND PROFILE.

GRADING HAS BEEN DESIGNED TO HANDICAPPED ACCESSIBILITY STANDARD AS REQUIRED BY TEXAS DEPARTMENT OF LICENSING AND REGULATION, ARCHITECTURAL BARRIERS PROGRAM. CONTRACTOR SHALL BE THOROUGHLY FAMILIAR WITH THE MOST CURRENT TEXAS ACCESSIBILITY STANDARDS AND ADMINISTRATIVE RULES AS PROVIDED IN INTERNET SITE WWW.LICENSE.STATE.TX.US.

CONTRACTOR SHALL BE RESPONSIBLE FOR ASSURING HANDICAPPED ACCESSIBLE PATHS FROM HANDICAPPED PARKING SPACES TO ENTRANCES BY CHECKING THAT CROSS SLOPES THAT ARE NOT GREATER THAN 1.75% AND THAT ACCESS AISLE WITH 4.75% MAXIMUM (UP OR DOWN) SLOPE HAVE BEEN PROVIDED.

CONTRACTOR SHALL ISSUE REQUEST FOR INSTRUCTIONS, PRIOR TO CONSTRUCTION, FOR ANY CONDITION WHICH DOES NOT APPEAR TO MEET THE TEXAS DEPARTMENT OF LICENSING AND REGULATION, ARCHITECTURAL BARRIERS PROGRAM REQUIREMENTS.

CONCRETE FLATWORK PLACED AGAINST THE BUILDING SHALL BE A MINIMUM OF 1/2" BELOW THE BRICK WEEP HOLES. HOWEVER, AT ENTRANCES AND DOORWAYS, THE CONCRETE FLATWORK SHALL BE FLUSH WITH THE BUILDING'S CONCRETE FINISH SURFACE. THE CONCRETE FLATWORK SHALL BE SLOPPED AT 1:20 MAXIMUM FROM THE BUILDING'S CONCRETE FINISH SURFACE TO ACHIEVE THE REQUIRED "CLEARANCE" BELOW THE BRICK WEEP HOLES.

CONCRETE FLATWORK AT ENTRANCES AND DOORWAYS SHALL BE ANCHORED WITH 20" LONG #4 SMOOTH DOWELS AT 12" O.C. AND DRILLED A MINIMUM OF 8" INTO BUILDING'S CONCRETE FOUNDATION.

SHWGROUP
ARCHITECTS | ENGINEERS | PLANNERS

Consultants:
CIVIL:

Gil Engineering Associates, Inc.
CONSULTING ENGINEERS – SURVEYORS
PLANNERS – DESIGNERS

Final Plans for Bidding and Construction

STATE OF TEXAS
VICTOR M. GIL
94994
LICENSED
PROFESSIONAL ENGINEER
4.6.2012

COMAL INDEPENDENT SCHOOL DISTRICT

COMAL ISD

FM 306 ELEMENTARY
CANYON LAKE . TX

CHECKED: Checker
SCALE:

ISSUE: April 6, 2012

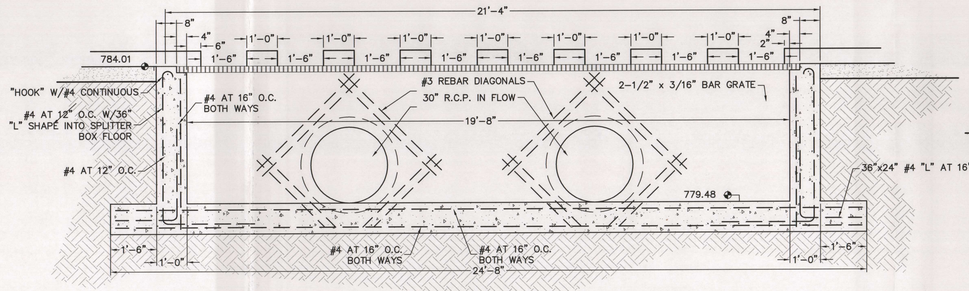
1 REQUEST FOR THE APPROVAL OF A CONTRIBUTING ZONE PLAN (CZP) PLAN;30 TEXAS ADMINISTRATIVE CODE (TAC) CHAPTER 213 EDWARDS AQUIFER

SECOND FLOOR

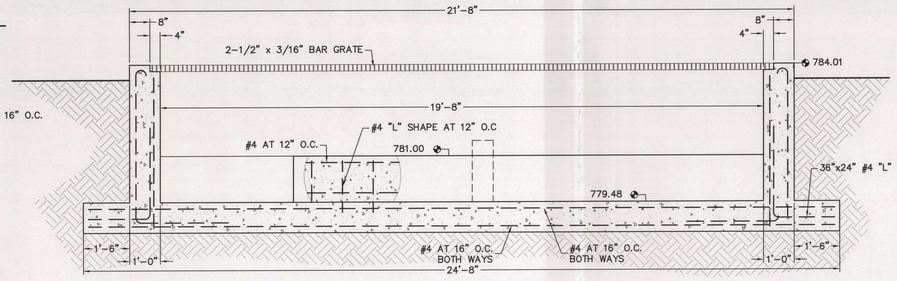
KEY PLAN (NTS)

SHEET TITLE:
GRADING PLAN

SHW Project:
CG101
4311.006.00



SECTION C-C



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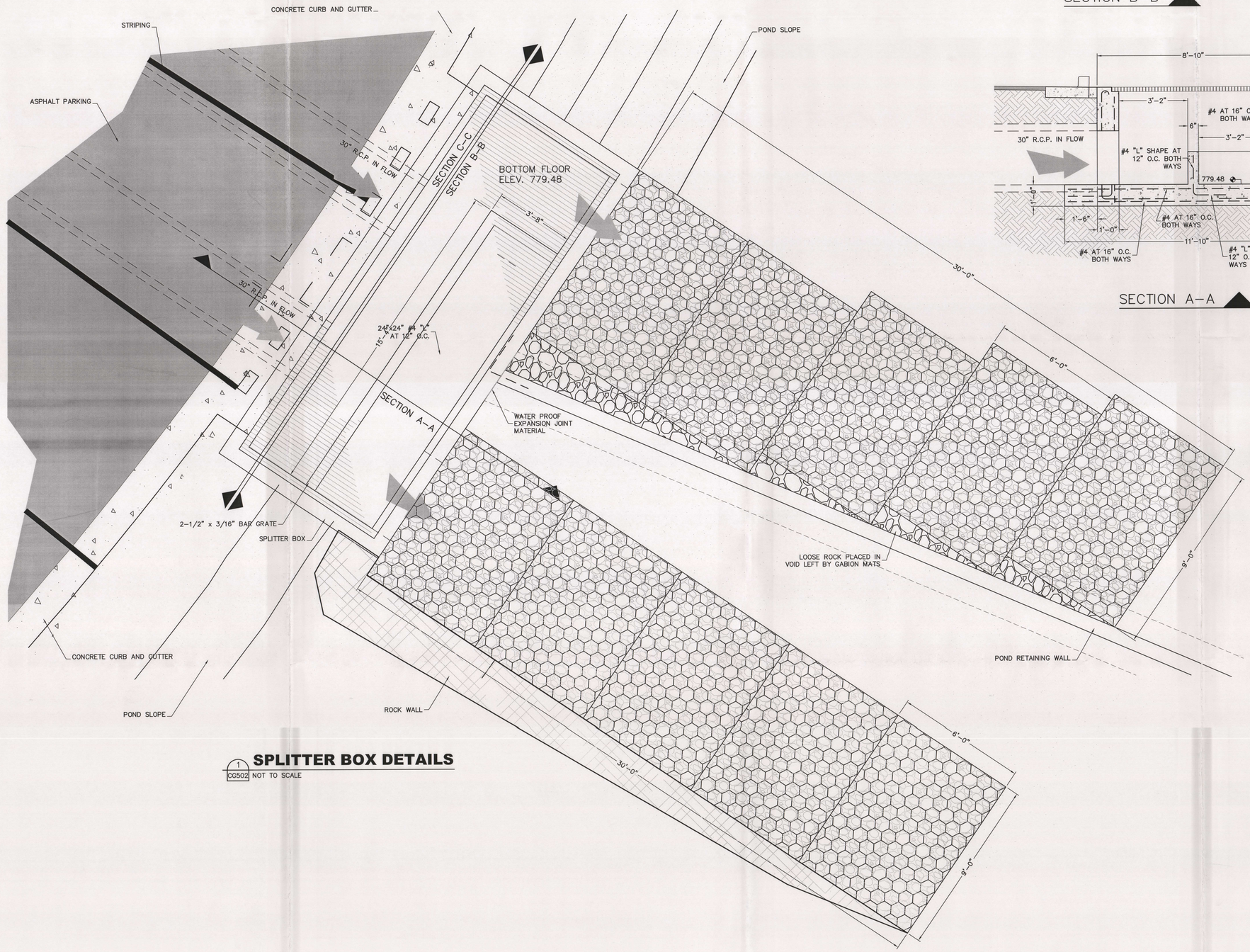
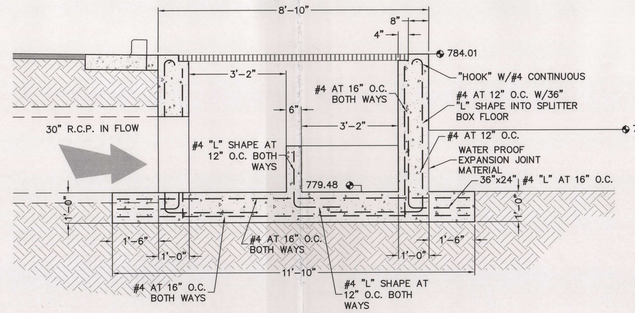


SPLITTER BOX DETAILS

1 / CG502 NOT TO SCALE



SECTION A-A

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Consultants:
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CONSULTING ENGINEERS – SURVEYORS
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Final Plans for Bidding and Construction

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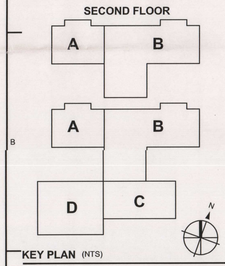

KEY PLAN (NTS)

SHEET TITLE:
GRADING DETAILS

RECEIVED
JUN 29 2012
COUNTY ENGINEER

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2012 JUN 21 AM 10:12
"RECEIVED FOR RECORD"
SAN ANTONIO
REGION

CG502

SHW Project: 4311.006.00

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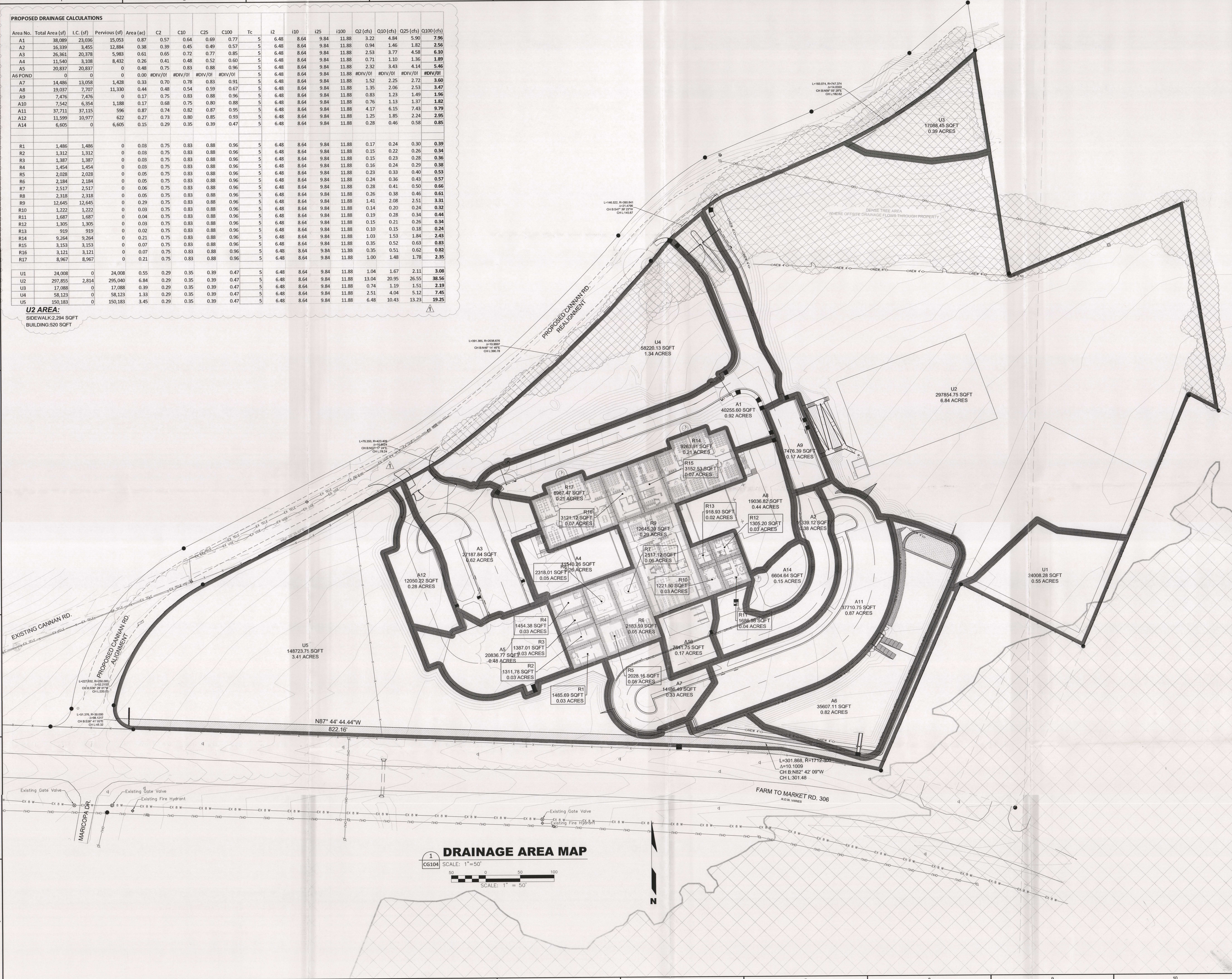
PROPOSED DRAINAGE CALCULATIONS

Area No.	Total Area (sf)	I.C. (sf)	Pervious (sf)	Area (ac)	C2	C10	C25	C100	Tc	i2	i10	i25	i100	Q2 (cfs)	Q10 (cfs)	Q25 (cfs)	Q100 (cfs)
A1	38,089	23,036	15,053	0.87	0.57	0.64	0.69	0.77	5	6.48	8.64	9.84	11.88	3.22	4.84	5.90	**7.96**
A2	16,339	3,455	12,884	0.38	0.39	0.45	0.49	0.57	5	6.48	8.64	9.84	11.88	0.94	1.46	1.82	**2.56**
A3	26,361	20,378	5,983	0.61	0.65	0.72	0.77	0.85	5	6.48	8.64	9.84	11.88	2.53	3.77	4.58	**6.10**
A4	11,540	3,108	8,432	0.26	0.41	0.48	0.52	0.60	5	6.48	8.64	9.84	11.88	0.71	1.10	1.36	**1.89**
A5	20,837	20,837	0	0.48	0.75	0.83	0.88	0.96	5	6.48	8.64	9.84	11.88	2.32	3.43	4.14	**5.46**
A6 POND	0	0	0	0.00	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	5	6.48	8.64	9.84	11.88	#DIV/0!	#DIV/0!	#DIV/0!	**#DIV/0!**
A7	14,486	13,058	1,428	0.33	0.70	0.78	0.83	0.91	5	6.48	8.64	9.84	11.88	1.52	2.25	2.72	**3.60**
A8	19,037	7,707	11,330	0.44	0.48	0.54	0.59	0.67	5	6.48	8.64	9.84	11.88	1.35	2.06	2.53	**3.47**
A9	7,476	7,476	0	0.17	0.75	0.83	0.88	0.96	5	6.48	8.64	9.84	11.88	0.83	1.23	1.49	**1.96**
A10	7,542	6,354	1,188	0.17	0.68	0.75	0.80	0.88	5	6.48	8.64	9.84	11.88	0.76	1.13	1.37	**1.82**
A11	37,711	37,115	596	0.87	0.74	0.82	0.87	0.95	5	6.48	8.64	9.84	11.88	4.17	6.15	7.43	**9.79**
A12	11,599	10,977	622	0.27	0.73	0.80	0.85	0.93	5	6.48	8.64	9.84	11.88	1.25	1.85	2.24	**2.95**
A14	6,605	0	6,605	0.15	0.29	0.35	0.39	0.47	5	6.48	8.64	9.84	11.88	0.28	0.46	0.58	**0.85**
R1	1,486	1,486	0	0.03	0.75	0.83	0.88	0.96	5	6.48	8.64	9.84	11.88	0.17	0.24	0.30	**0.39**
R2	1,312	1,312	0	0.03	0.75	0.83	0.88	0.96	5	6.48	8.64	9.84	11.88	0.15	0.22	0.26	**0.34**
R3	1,387	1,387	0	0.03	0.75	0.83	0.88	0.96	5	6.48	8.64	9.84	11.88	0.15	0.23	0.28	**0.36**
R4	1,454	1,454	0	0.03	0.75	0.83	0.88	0.96	5	6.48	8.64	9.84	11.88	0.16	0.24	0.29	**0.38**
R5	2,028	2,028	0	0.05	0.75	0.83	0.88	0.96	5	6.48	8.64	9.84	11.88	0.23	0.33	0.40	**0.53**
R6	2,184	2,184	0	0.05	0.75	0.83	0.88	0.96	5	6.48	8.64	9.84	11.88	0.24	0.36	0.43	**0.57**
R7	2,517	2,517	0	0.06	0.75	0.83	0.88	0.96	5	6.48	8.64	9.84	11.88	0.28	0.41	0.50	**0.66**
R8	2,318	2,318	0	0.05	0.75	0.83	0.88	0.96	5	6.48	8.64	9.84	11.88	0.26	0.38	0.46	**0.61**
R9	12,645	12,645	0	0.29	0.75	0.83	0.88	0.96	5	6.48	8.64	9.84	11.88	1.41	2.08	2.51	**3.31**
R10	1,222	1,222	0	0.03	0.75	0.83	0.88	0.96	5	6.48	8.64	9.84	11.88	0.14	0.20	0.24	**0.32**
R11	1,687	1,687	0	0.04	0.75	0.83	0.88	0.96	5	6.48	8.64	9.84	11.88	0.19	0.28	0.34	**0.44**
R12	1,305	1,305	0	0.03	0.75	0.83	0.88	0.96	5	6.48	8.64	9.84	11.88	0.15	0.21	0.26	**0.34**
R13	919	919	0	0.02	0.75	0.83	0.88	0.96	5	6.48	8.64	9.84	11.88	0.10	0.15	0.18	**0.24**
R14	9,264	9,264	0	0.21	0.75	0.83	0.88	0.96	5	6.48	8.64	9.84	11.88	1.03	1.53	1.84	**2.43**
R15	3,153	3,153	0	0.07	0.75	0.83	0.88	0.96	5	6.48	8.64	9.84	11.88	0.35	0.52	0.63	**0.83**
R16	3,121	3,121	0	0.07	0.75	0.83	0.88	0.96	5	6.48	8.64	9.84	11.88	0.35	0.51	0.62	**0.82**
R17	8,967	8,967	0	0.21	0.75	0.83	0.88	0.96	5	6.48	8.64	9.84	11.88	1.00	1.48	1.78	**2.35**
U1	24,008	0	24,008	0.55	0.29	0.35	0.39	0.47	5	6.48	8.64	9.84	11.88	1.04	1.67	2.11	**3.08**
U2	297,855	2,814	295,040	6.84	0.29	0.35	0.39	0.47	5	6.48	8.64	9.84	11.88	13.04	20.95	26.55	**38.56**
U3	17,088	0	17,088	0.39	0.29	0.35	0.39	0.47	5	6.48	8.64	9.84	11.88	0.74	1.19	1.51	**2.19**
U4	58,123	0	58,123	1.33	0.29	0.35	0.39	0.47	5	6.48	8.64	9.84	11.88	2.51	4.04	5.12	**7.45**
U5	150,183	0	150,183	3.45	0.29	0.35	0.39	0.47	5	6.48	8.64	9.84	11.88	6.48	10.43	13.23	**19.25**

U2 AREA:

SIDEWALK:2,294 SQFT

BUILDING:520 SQFT



DRAINAGE AREA MAP

1 CG104 SCALE: 1"=50'

SCALE: 1" = 50'

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Consultants:
CIVIL:
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TEXAS REGISTRATION FIRM # 1186

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SECOND FLOOR

KEY PLAN (NTS)

SHEET TITLE:
DRAINAGE AREA MAP

CG104

SHW Project: 4311.006.00

PROPOSED DRAINAGE CALCULATIONS

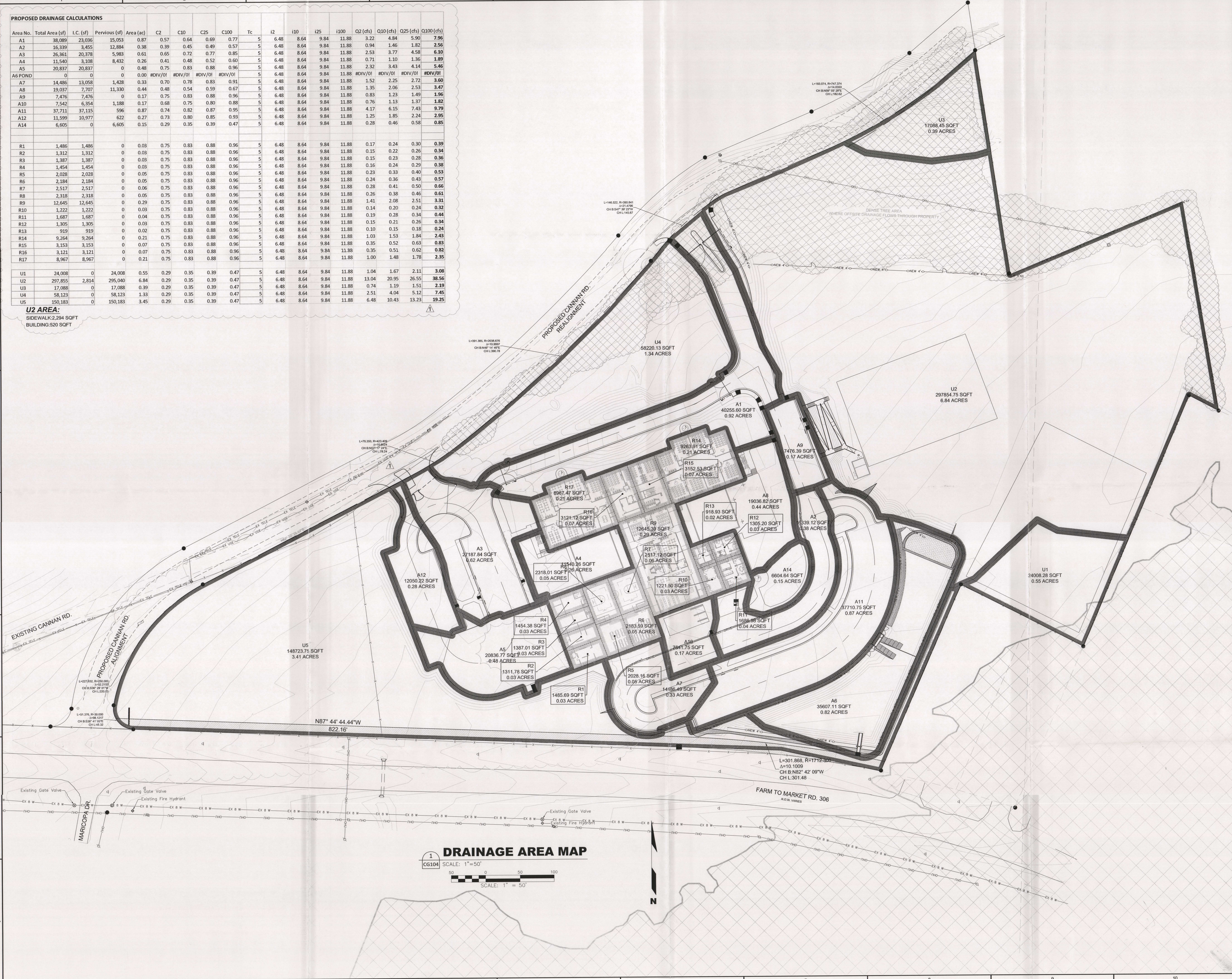
Area No.	Total Area (sf)	I.C. (sf)	Pervious (sf)	Area (ac)	C2	C10	C25	C100	Tc	i2	i10	i25	i100	Q2 (cfs)	Q10 (cfs)	Q25 (cfs)	Q100 (cfs)
A1	38,089	23,036	15,053	0.87	0.57	0.64	0.69	0.77	5	6.48	8.64	9.84	11.88	3.22	4.84	5.90	**7.96**
A2	16,339	3,455	12,884	0.38	0.39	0.45	0.49	0.57	5	6.48	8.64	9.84	11.88	0.94	1.46	1.82	**2.56**
A3	26,361	20,378	5,983	0.61	0.65	0.72	0.77	0.85	5	6.48	8.64	9.84	11.88	2.53	3.77	4.58	**6.10**
A4	11,540	3,108	8,432	0.26	0.41	0.48	0.52	0.60	5	6.48	8.64	9.84	11.88	0.71	1.10	1.36	**1.89**
A5	20,837	20,837	0	0.48	0.75	0.83	0.88	0.96	5	6.48	8.64	9.84	11.88	2.32	3.43	4.14	**5.46**
A6 POND	0	0	0	0.00	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	5	6.48	8.64	9.84	11.88	#DIV/0!	#DIV/0!	#DIV/0!	**#DIV/0!**
A7	14,486	13,058	1,428	0.33	0.70	0.78	0.83	0.91	5	6.48	8.64	9.84	11.88	1.52	2.25	2.72	**3.60**
A8	19,037	7,707	11,330	0.44	0.48	0.54	0.59	0.67	5	6.48	8.64	9.84	11.88	1.35	2.06	2.53	**3.47**
A9	7,476	7,476	0	0.17	0.75	0.83	0.88	0.96	5	6.48	8.64	9.84	11.88	0.83	1.23	1.49	**1.96**
A10	7,542	6,354	1,188	0.17	0.68	0.75	0.80	0.88	5	6.48	8.64	9.84	11.88	0.76	1.13	1.37	**1.82**
A11	37,711	37,115	596	0.87	0.74	0.82	0.87	0.95	5	6.48	8.64	9.84	11.88	4.17	6.15	7.43	**9.79**
A12	11,599	10,977	622	0.27	0.73	0.80	0.85	0.93	5	6.48	8.64	9.84	11.88	1.25	1.85	2.24	**2.95**
A14	6,605	0	6,605	0.15	0.29	0.35	0.39	0.47	5	6.48	8.64	9.84	11.88	0.28	0.46	0.58	**0.85**
R1	1,486	1,486	0	0.03	0.75	0.83	0.88	0.96	5	6.48	8.64	9.84	11.88	0.17	0.24	0.30	**0.39**
R2	1,312	1,312	0	0.03	0.75	0.83	0.88	0.96	5	6.48	8.64	9.84	11.88	0.15	0.22	0.26	**0.34**
R3	1,387	1,387	0	0.03	0.75	0.83	0.88	0.96	5	6.48	8.64	9.84	11.88	0.15	0.23	0.28	**0.36**
R4	1,454	1,454	0	0.03	0.75	0.83	0.88	0.96	5	6.48	8.64	9.84	11.88	0.16	0.24	0.29	**0.38**
R5	2,028	2,028	0	0.05	0.75	0.83	0.88	0.96	5	6.48	8.64	9.84	11.88	0.23	0.33	0.40	**0.53**
R6	2,184	2,184	0	0.05	0.75	0.83	0.88	0.96	5	6.48	8.64	9.84	11.88	0.24	0.36	0.43	**0.57**
R7	2,517	2,517	0	0.06	0.75	0.83	0.88	0.96	5	6.48	8.64	9.84	11.88	0.28	0.41	0.50	**0.66**
R8	2,318	2,318	0	0.05	0.75	0.83	0.88	0.96	5	6.48	8.64	9.84	11.88	0.26	0.38	0.46	**0.61**
R9	12,645	12,645	0	0.29	0.75	0.83	0.88	0.96	5	6.48	8.64	9.84	11.88	1.41	2.08	2.51	**3.31**
R10	1,222	1,222	0	0.03	0.75	0.83	0.88	0.96	5	6.48	8.64	9.84	11.88	0.14	0.20	0.24	**0.32**
R11	1,687	1,687	0	0.04	0.75	0.83	0.88	0.96	5	6.48	8.64	9.84	11.88	0.19	0.28	0.34	**0.44**
R12	1,305	1,305	0	0.03	0.75	0.83	0.88	0.96	5	6.48	8.64	9.84	11.88	0.15	0.21	0.26	**0.34**
R13	919	919	0	0.02	0.75	0.83	0.88	0.96	5	6.48	8.64	9.84	11.88	0.10	0.15	0.18	**0.24**
R14	9,264	9,264	0	0.21	0.75	0.83	0.88	0.96	5	6.48	8.64	9.84	11.88	1.03	1.53	1.84	**2.43**
R15	3,153	3,153	0	0.07	0.75	0.83	0.88	0.96	5	6.48	8.64	9.84	11.88	0.35	0.52	0.63	**0.83**
R16	3,121	3,121	0	0.07	0.75	0.83	0.88	0.96	5	6.48	8.64	9.84	11.88	0.35	0.51	0.62	**0.82**
R17	8,967	8,967	0	0.21	0.75	0.83	0.88	0.96	5	6.48	8.64	9.84	11.88	1.00	1.48	1.78	**2.35**
U1	24,008	0	24,008	0.55	0.29	0.35	0.39	0.47	5	6.48	8.64	9.84	11.88	1.04	1.67	2.11	**3.08**
U2	297,855	2,814	295,040	6.84	0.29	0.35	0.39	0.47	5	6.48	8.64	9.84	11.88	13.04	20.95	26.55	**38.56**
U3	17,088	0	17,088	0.39	0.29	0.35	0.39	0.47	5	6.48	8.64	9.84	11.88	0.74	1.19	1.51	**2.19**
U4	58,123	0	58,123	1.33	0.29	0.35	0.39	0.47	5	6.48	8.64	9.84	11.88	2.51	4.04	5.12	**7.45**
U5	150,183	0	150,183	3.45	0.29	0.35	0.39	0.47	5	6.48	8.64	9.84	11.88	6.48	10.43	13.23	**19.25**

1

U2 AREA:

SIDEWALK:2,294 SQFT

BUILDING:520 SQFT



1 CG104 **DRAINAGE AREA MAP**

SCALE: 1"=50'

SCALE: 1" = 50'

S:\Projects\Comal ISD\FM 306 ES\Bidding Documents\Drainage Area Map.dwg

SHWGROUP

ARCHITECTS | ENGINEERS | PLANNERS

Consultants:
CIVIL:

Gil Engineering Associates, Inc.
CONSULTING ENGINEERS – SURVEYORS
PLANNERS – DESIGNERS

Final Plans for Bidding and Construction

STATE OF TEXAS
VICTOR M. GIL
94994
LICENSED PROFESSIONAL ENGINEER
4.6.2012

COMAL INDEPENDENT SCHOOL DISTRICT

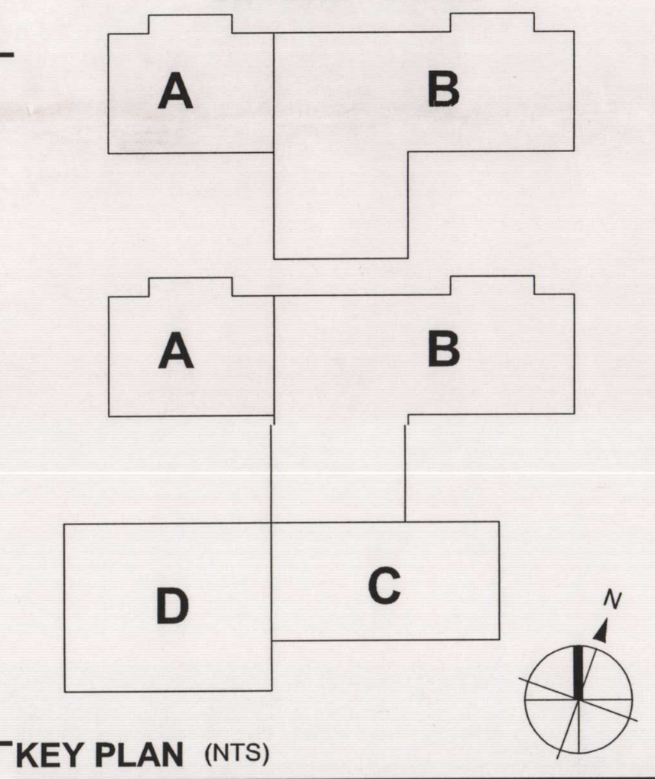
COMAL ISD

FM 306 ELEMENTARY
CANYON LAKE . TX

CHECKED: **Checker**
SCALE:

ISSUE: **April 6, 2012**

1 **REQUEST FOR THE APPROVAL OF A CONTRIBUTING ZONE PLAN (CZP) PLAN;30 TEXAS ADMINISTRATIVE CODE (TAC) CHAPTER 213 EDWARDS AQUIFER**



KEY PLAN (NTS)

SHEET TITLE:

DRAINAGE AREA MAP

"RECEIVED TCEQ" SAN ANTONIO REGION
2012 JUN 21 AM 10:12
RECEIVED
JUN 29 2012
COUNTY ENGINEER

CG104

SHW Project: **4311.006.00**

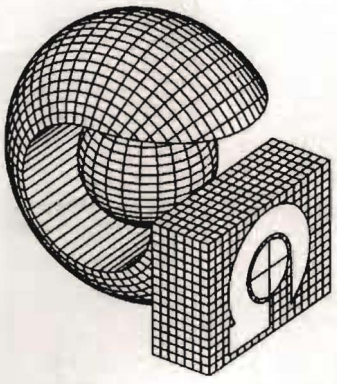
Edwards Aquifer Protection Program Modification of a Previously Approved Contributing Zone Plan

To:
Texas Commission on Environmental Quality
San Antonio Regional Office
14250 Judson Rd.
San Antonio, TX 78233-4480

For:

Comal Independent School District
FM 306 Elementary School
310 Cannan Road
Canyon Lake, Texas 78133

Prepared by:



Gil Engineering Associates. Inc.

CONSULTING ENGINEERS ▫ SURVEYORS

PLANNERS ▫ BUILDING DESIGNERS

506 EAST BRAKER LANE AUSTIN, TEXAS 78753-2751 phone (512) 835-4203

fax (512) 835-4407

TEXAS COMMISSION ON ENVIRONMENTAL QUALITY

Protecting Texas by Reducing and Preventing Pollution

April 16, 2012

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

Re: Edwards Aquifer, Bexar County
PROJECT NAME: CISD FM 306 Elementary School, located at the intersection of FM 306 and Caiman Road, Canyon Lake, Texas
PLAN TYPE: Application for Approval of a Water Pollution Abatement Plan (WPAP) 30 Texas Administration Code (TAC) Chapter 213; Edwards Aquifer Protection Program
EAPP File No.: 3046.00

Dear Mr. Hornseth:

The referenced 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 15, 2012.

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

Todd Jones
Water Section Work Leader
San Antonio Regional Office

TJ/eg

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: COMAL ISD FM 306 ELEMENTARY SCHOOL
County: Comal Stream Basin: Guadalupe River

1. ___ 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: Thomas Bloxham
Entity: Comal Independent school District
Mailing Address: 1404 IH 35 NORTH
City, State: New Braunfels Texas Zip: 78130
Telephone: (830) 221-2039 FAX: (830) 885-1001

Agent/Representative (If any):

Contact Person: VICTOR GIL
Entity: GIL ENGINEERING ASSOCIATES, INC
Mailing Address: 506 E BRAKER LN
City, State: AUSTIN, TX Zip: 78753
Telephone: (512) 835-4203 FAX: (512) 835-4407

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

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.
From the intersection of FM 2673 and FM 306 head west approximately .72 miles to Cannan Road to the project site on the right.

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

7. ✓ **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
   - ✓ Undeveloped (Cleared)
   - ___ Undeveloped (Undisturbed/Uncleared)
   - ___ Other: _____

PROJECT INFORMATION

9. The type of project is:
   - ___ Residential: # of Lots: _____
   - ___ Residential: # of Living Unit Equivalents: _____
   - ___ Commercial
   - ___ Industrial
   - ✓ Other: Public Elementary School

10. Total project area (size of site): 19.76 Acres
    Total disturbed area: 4.52 Acres

11. Projected population: 800

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	95,197	÷ 43,560 =	2.19
Parking	44,362	÷ 43,560 =	1.02
Other paved surfaces	57,217	÷ 43,560 =	1.31
Total Impervious Cover	196,776	÷ 43,560 =	4.52
Total Impervious Cover ÷ Total Acreage x 100 =			22.86 %

13. ✓ **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. ✓ 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.

__ Street or road providing access to private driveways.

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

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

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

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

20. __ 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. ✓ **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:

    ✓ 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 or equal to 500 gallons.

23. Tanks and substance stored:

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

24. __ 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):

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

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

27. ___ 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:

___ 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.

___ 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" = 60 '.

31. 100-year floodplain boundaries

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

The 100-year floodplain boundaries are based on the following specific (including date of material) sources(s):
FEMA FIRM MAP Number. 4892C20260F Effective Date September 2, 2009

32. ✓ 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. ✓ A drainage plan showing all paths of drainage from the site to surface streams.

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

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

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

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

38. ___ Surface waters (including wetlands).

39. ___ Locations where stormwater discharges to surface water.
✓ There will be no discharges to surface water.

40. ___ Temporary aboveground storage tank facilities.
✓ Temporary aboveground storage tank facilities will not be located on this site.

41. ___ Permanent aboveground storage tank facilities.
✓ 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. ✓ Permanent BMPs and measures must be implemented to control the discharge of pollution from regulated activities after the completion of construction.

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

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

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

_____

_____

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

and the property owner must notify the appropriate regional office of these changes.

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

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.

___ **ATTACHMENT I - 20% or Less Impervious Cover Waiver.** This site will be used for multi-family residential developments, schools, or small business sites and has 20% or less impervious cover. A request to waive the requirements for other permanent BMPs and measures is found at the end of this form.
___ This site will be used for multi-family residential developments, schools, or small business sites but has more than 20% impervious cover.
___ This site will not be used for multi-family residential developments, schools, or small business sites.

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

✓ A description of the BMPs and measures that will be used to prevent pollution of surface water, groundwater, or stormwater that originates upgradient from the site and flows across the site is 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.**

✓ 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. ✓ **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. ✓ **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. ✓ **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. ___ 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. ✓ **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 increases erosion that result in water quality degradation.

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

54. ✓ 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. ✓ 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. ✓ Submit one (1) original and one (1) copy of the application, plus additional copies as

needed for each affected incorporated city, groundwater conservation district, and county in which the project will be located. The TCEQ will distribute the additional copies to these jurisdictions. The copies must be submitted to the appropriate regional office.

57. ✓ 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. ✓ 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:

THOMAS BLOXHAM FOR COMMISSION
Print Name of Customer/Agent

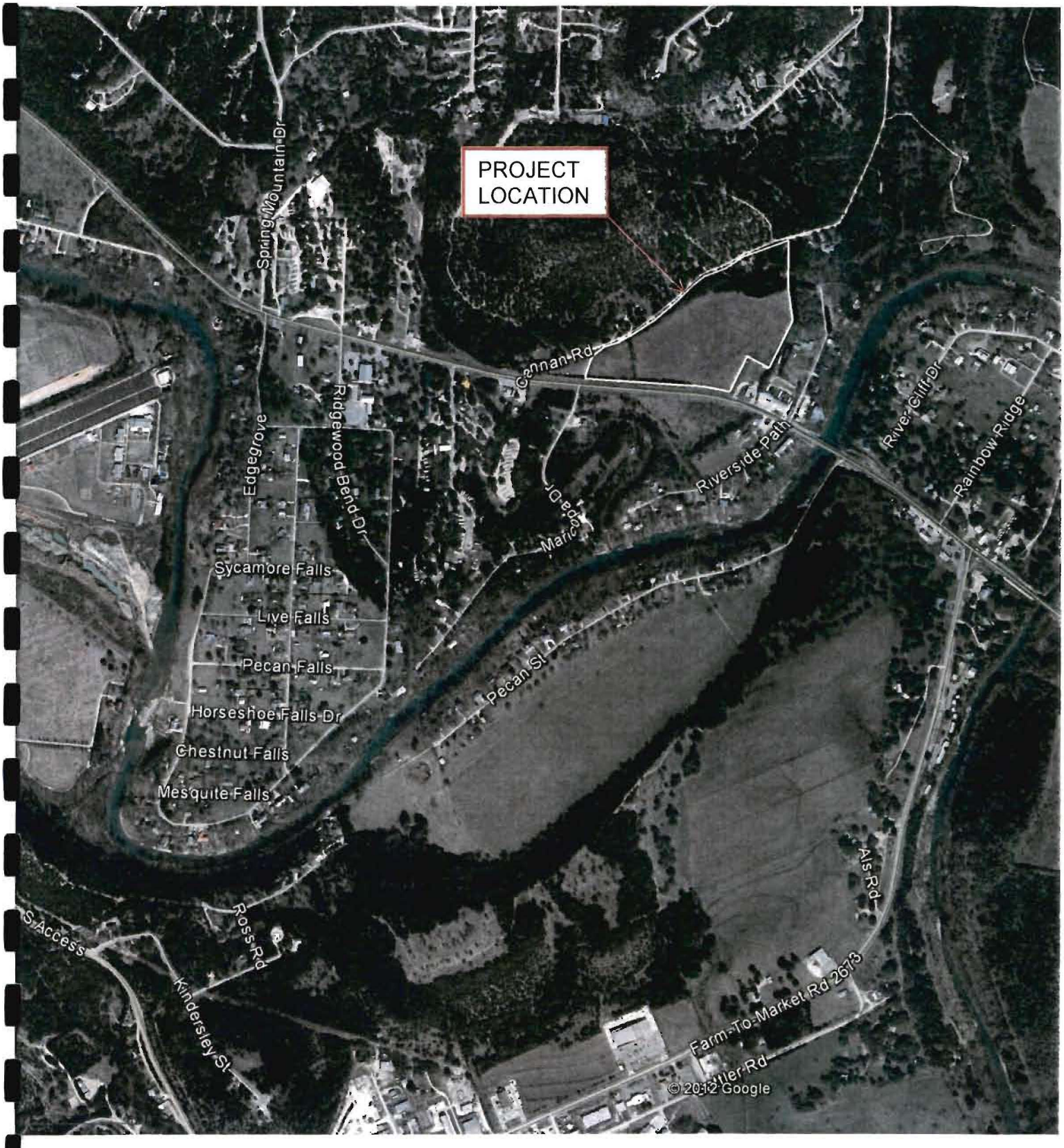
Signature of Customer/Agent

2-7-12
Date

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

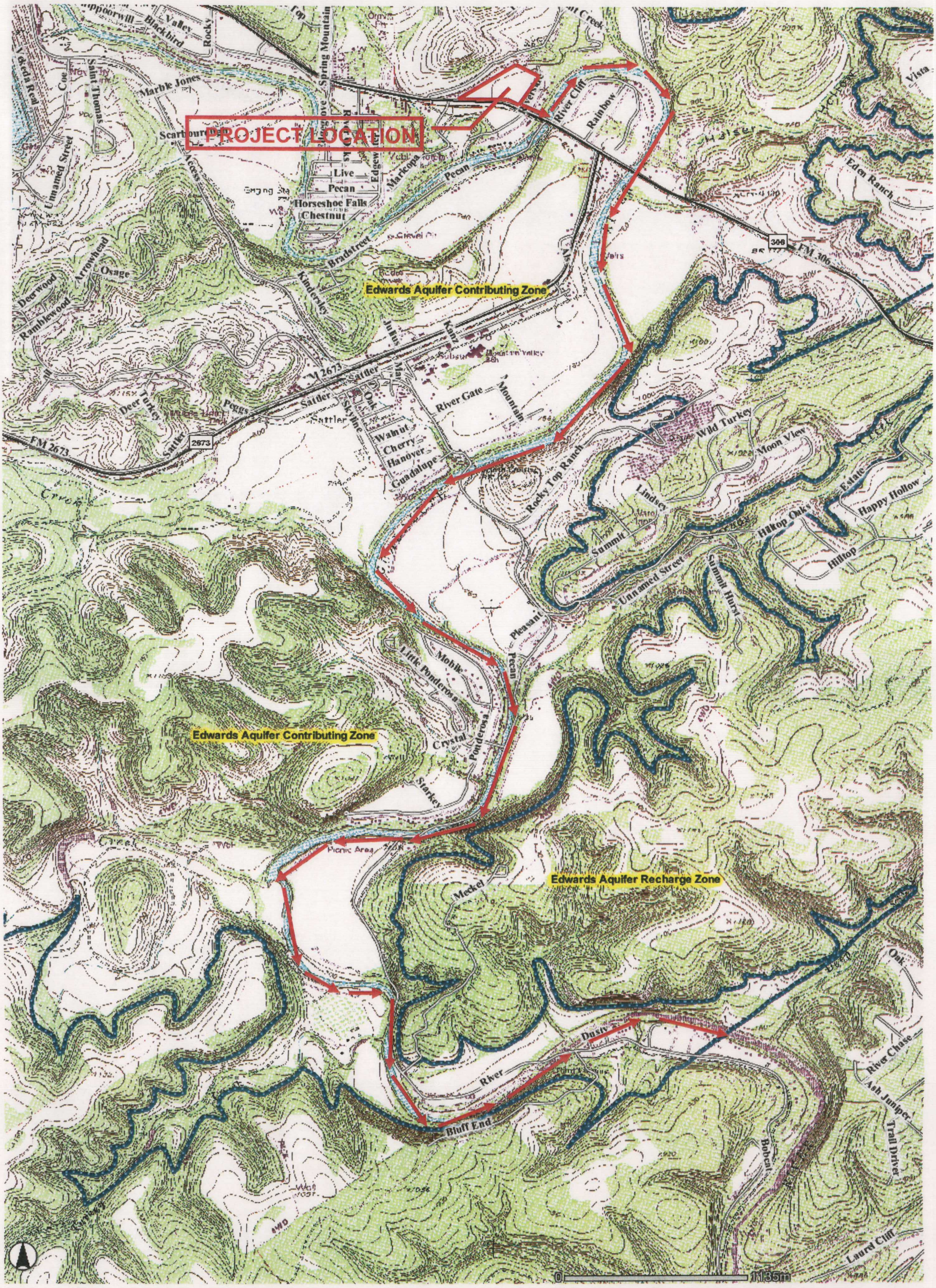
Individuals are entitled to request and review their personal information that the agency gathers on its forms. They may also have any errors in their information corrected. To review such information, contact us at 512/239-3282.

ROAD MAP



ATTACHMENT A
Road Map

SATTLER QUADRANGLE



ATTACHMENT B
USGS QUADRANGLE MAP

Scale 1" = 2000'

PROJECT NARRATIVE

Introduction

The project site consists of an approximate 19.76 acres gross site area in Comal County and is not currently zoned. The site is currently undeveloped.

The site is NOT within the limits of any 100 year flood plain and does NOT have a Critical Water Quality Zone. There are NO areas irrigated with wastewater.

The planned improvements consist of a new, approximately 95,197 square feet (2.19 ac), elementary school building and 101,579 square feet (2.33 ac) of site impervious cover including sidewalks, drives and parking areas. The site is currently undeveloped. Total post-development impervious cover comprises approximately 22.86% of the subject site. The project is to begin as soon as possible (upon project approval) and is to be completed within 12 months (after site plan approval).

The entire site is located within the Comal County jurisdiction.

On the site there is currently NO impervious cover.

Drainage Area

There is NO existing 100 year flood plain over the gross site. The site is undeveloped, so currently there are no existing drainage structures on site. Existing stormwater runoff, whether generated onsite or offsite, flows toward the south and east corners of the site. Runoff flows that travel south are currently collected in a swale located along Farm to Market 306. This swale will not be modified by these plans.

Discussion of the Existing and Proposed Drainage Patterns

Pre development, stormwater runoff is divided between two drainage basins on the site, existing onsite drainage area 1 and 2. Post development, runoff generated over new improvements will be collected through a proposed stormwater system of pipes and catch basins or allowed to overland flow via deliberate grading and topographical design. A portion of the runoff generated over new roof structures will be routed to cisterns located on the North side of the new school. Collected or routed, all of the post developed runoff will be directed and detained into a new sedimentation and sand filtration pond.

There is an existing grass lined earthen channel that is a part of the FM 306 TxDOT right of way. The channel collects water from this site and from an up gradient section along with a portion of runoff from Cannan Road. This is shown on the plan as Existing Offsite Drainage Area 1 on sheet CG102. The project area shown on existing offsite drainage area 1 will not have any impervious cover but will be used for staging and spoils. The storm water form EOAD1 currently flows into an existing TxDOT culvert as

shown on the plans. This project will create impervious cover on Onsite drainage areas 1 and 2. Onsite Drainage area 1 currently flows into the TxDOT Right of way and comingles with existing offsite drainage area 3 (FM 306 Roadway water). Onsite drainage area 2 currently flows to the eastern property line. The storm water that falls in the OSDA 1 and 2 will be collected in a Sedimentation and Sand filter basin and will be discharged toward the south property line back into the TXDOT Right of Way. The sedimentation pond and the Filtration pond along with the detention pond reduces the amount of water to below predevelopment levels at the FM306 right of way channel and the east property line.

There are no impervious areas that will not be captured by the ponds. There are 6 uncaptured pervious areas. These areas are to remain as pervious area and to be restored with vegetation if abraded after the project is completed. See sheet CG104

Sub drainage basin areas A1 through A9 are used to hydraulically size storm sewers and locate catch basins within each sub catchment drainage area. Standard hydraulic calculations are employed. See plan sheets CG501 for drainage calculations

Although not presented here or designed to be utilized as a regulated BMP, some roof runoff will be collected into two, 18,000 gallon cisterns where the rainwater can be later utilized for irrigation efforts. Current utilization is for the green roof that is on a portion of the building.

There is NO floodplain modification proposed by this Site Plan.

The existing site is NOT contained within any known 100 year flood plains.

Discussion of Proposed Variances

There are NO variances proposed by this project.

Critical Environmental Features within the Project and Know Features within 150 feet of the Project

The surrounding area has been partially developed. A cursory review by the undersigned of the entire site area did NOT reveal any critical environmental features within the limits of construction. This area is located in the Contributing Zone of the Edward's Aquifer.

Tree Preservation Plan

Some existing trees are to be removed as a part of this project. The project site is undeveloped, so trees will have to be removed, but the site has been designed around major clumps of trees so as to mitigate tree removal as much as possible.

ATTACHMENT C
Project Narrative

Known Underground Storage Tanks

There are NO known underground storage tanks located within the project area and/or the entire 19.76 acre site area.

ATTACHMENT C
Project Narrative

FACTORS AFFECTING WATER QUALITY

The planned improvements consist of a new, approximate 95,197 square foot elementary school and approximately 101,579 square feet of additional impervious cover including concrete sidewalk and asphalt parking and drives. All runoff generated on or offsite currently flows through the site via overland flow, natural channels, and swales. The site's total runoff flow is observed flowing through the Edwards Aquifer Contributing Zone (CZ) to the boundary of the Edwards Aquifer Recharge zone.

Factors that could affect surface water or groundwater quality:

- The character of the storm water would be classified as runoff associated with common commercial sites with buildings and parking lots and drives.
- Chemicals used or stored and related to chemistry, biology, agricultural, automotive and industrial technology laboratories will total less than the regulated quantity of 500 gallons. The cleanup of spills will be conducted in a manner to minimize the potential for impact to the environment.
- Activities relating to work on the sanitary sewer, spills of automotive fluids or other activities that might affect stormwater quality will be conducted in a manner to minimize the potential for impact to the environment.
- There are no other types of activities at an elementary school construction site to affect the character of the storm water.

ATTACHMENT D
Factors Affecting Water Quality

VOLUME AND CHARACTER OF STORMWATER

The planned improvements consist of a new, approximate 95,197 square foot elementary school and approximately 101,579 square feet of additional impervious cover including concrete sidewalk and asphalt parking and drives.

Existing, pre-developed flows of storm water across the 19.76 acre drainage basin are as follows:

19.76 Acre Site				
Storm Event	Existing Flow (cfs)	Proposed Flow	Released from pond Flow	Propsed Flow after Ponds
2 year	57.01	58.09	5.61	30.94 cfs
25 year	84.16	90.55	14.06	55.39 cfs
100 year	120.82	131.13	31.79	87.05 cfs

does not include cistern storage in calculations

The increase in storm water flow created by post developed improvements will be routed into collection cisterns and/or in on site storm sewer facilities and into the filtration / sedimentation ponds located on site.

The character of the storm water would be classified as runoff associated with common commercial sites with buildings and parking lots and drives. Chemicals related to chemistry, biology, agricultural, and industrial technology laboratories will total less than the regulated quantity of 500 gallons. There are no other types of activities at a elementary school to affect the character of the storm water.

Texas Commission on Environmental Quality

TSS Removal Calculations 04-20-2009

Project Name: Comal Isd FM306 Elementary School
Date Prepared: 1/12/2012

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

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

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

where

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

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

County =	Comal	
Total project area included in plan * =	19.76	acres
Predevelopment impervious area within the limits of the plan * =	0.00	acres
Total post-development impervious area within the limits of the plan* =	4.52	acres
Total post-development impervious cover fraction * =	0.23	
P =	33	inches
$L_{M\ TOTAL\ PROJECT}$ =	4057	lbs.

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

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

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

Drainage Basin/Outfall Area No. = 1

Total drainage basin/outfall area =	6.31	acres
Predevelopment impervious area within drainage basin/outfall area =	0.00	acres
Post-development impervious area within drainage basin/outfall area =	4.52	acres
Post-development impervious fraction within drainage basin/outfall area =	0.72	
$L_{M\ THIS\ BASIN}$ =	4057	lbs

3. Indicate the proposed BMP Code for this basin.

Proposed BMP = Sand Filter
Removal efficiency = 89 percent

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

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

RG-348 Page 3-33 Equation 3.7 $L_R = (\text{BMP efficiency}) \times P \times (A_I \times 34.6 + A_P \times 0.54)$

where,

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

A_C =	6.31	acres
A_I =	4.52	acres
A_P =	1.79	acres

L_M = **4622** lbs

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

Desired $L_{M\ THIS\ BASIN}$ = **4100** lbs.

F = **0.89**

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

Rainfall Depth = **1.60** inches
Post Development Runoff Coefficient = **0.52**
On-site Water Quality Volume = **19146** cubic feet

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

Off-site area draining to BMP = **0.00** acres
Off-site Impervious cover draining to BMP = **0.00** acres
Impervious fraction of off-site area = **0**
Off-site Runoff Coefficient = **0.00**
Off-site Water Quality Volume = **0** cubic feet

Storage for Sediment = **3829**
Total Capture Volume (required water quality volume(s) x 1.20) = **22976** cubic feet

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

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

Required Water Quality Volume for retention basin = **NA** cubic feet

Irrigation Area Calculations

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

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

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

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

9A. Full Sedimentation and Filtration System

Water Quality Volume for sedimentation basin = **22976** cubic feet

Minimum filter basin area = **1064** square feet

Maximum sedimentation basin area = **9573** square feet For minimum water depth of 2 feet
Minimum sedimentation basin area = **2393** square feet For maximum water depth of 8 feet

9B. Partial Sedimentation and Filtration System

Water Quality Volume for combined basins = **22976** cubic feet

Minimum filter basin area = **1915** square feet

Maximum sedimentation basin area = **7659** square feet For minimum water depth of 2 feet
Minimum sedimentation basin area = **479** square feet For maximum water depth of 8 feet

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

Required Water Quality Volume for Bioretention Basin = **NA** cubic feet

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

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

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

Required Water Quality Volume for Constructed Wetlands = NA cubic feet

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

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

Required Sedimentation chamber capacity = NA cubic feet
Filter canisters (FCs) to treat WQV = NA cartridges
Filter basin area (RIA_{FC}) = NA square feet

14. Stormwater Management StormFilter® by CONTECH

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

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

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

Design parameters for the swale:

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

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

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

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

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

Q = CiA = 4.71 cfs

To calculate the flow velocity in the swale:

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

To calculate the resulting swale length:

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

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

15B. Alternative Method using Excel Solver

Design Q = CiA = 4.71 cfs

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

Instructions are provided to the right (green comments).

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

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

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

Flow Velocity	0.36	ft/s
Minimum Length =	107.24	ft

Instructions are provided to the right (blue comments).

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

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

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

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

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

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

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

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

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

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

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

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

Required Load Removal Based upon Equation 3.3 = NA lbs

First calculate the load removal at 1.1 in/hour

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

C = runoff coefficient for the drainage area =	0.55		C = Runoff Coefficient = 0.546 (IC)^2 + 0.328 (IC) + 0.03
I = design rainfall intensity =	1.1	in/hour	
A = drainage area in acres =	1	acres	
Q = flow rate in cubic feet per second =	0.60	cubic feet/sec	

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

Q = Runoff rate calculated above =	0.60	cubic feet/sec
A = Water surface area in the wet vault =	150	square feet
V_{OR} = Overflow Rate =	0.00	feet/sec
Percent TSS Removal from Figure 3-1 (RG-348 Page 3-31) =	53	percent
Load removed by Wet Vault =	#VALUE!	lbs

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

Actual Rainfall Intensity at which Wet Vault bypass Occurs =	0.5	in/hour
Fraction of rainfall treated from Figure 3-2 RG-348 Page 3-32 =	0.75	percent
Efficiency Reduction for Actual Rainfall Intensity =	0.83	percent
Resultant TSS Load removed by Wet Vault =	#VALUE!	lbs

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

PERMEABLE CONCRETE MAY ONLY BE USED ON THE CONTRIBUTING ZONE

19. BMPs Installed in a Series Designed as Required in RG-348 Pages 3-32

Michael E. Barrett, Ph.D., P.E. recommended that the coefficient for E_3 be changed from 0.5 to 0.65 on May 3, 2006

E_{TOT} = [1 - ((1 - E_1) X (1 - 0.65E_2) x (1 - 0.25E_3))] X 100 =	86.38	percent	NET EFFICIENCY OF THE BMPs IN THE SERIES
EFFICIENCY OF FIRST BMP IN THE SERIES = E_1 =	75.00	percent	
EFFICIENCY OF THE SECOND BMP IN THE SERIES = E_2 =	70.00	percent	
EFFICIENCY OF THE THIRD BMP IN THE SERIES = E_3 =	0.00	percent	

THEREFORE, THE NET LOAD REMOVAL WOULD BE.

(A_I AND A_P VALUES ARE FROM SECTION 3 ABOVE)

$L_R = E_{TOT} \times P \times (A_I \times 34.6 \times A_P \times 0.54) =$	4485.31	lbs

20. Stormceptor

Required TSS Removal in BMP Drainage Area=	NA	lbs
Impervious Cover Overtreatment=	0.0000	ac
TSS Removal for Uncaptured Area =	0.00	lbs
BMP Sizing		
Effective Area =	NA	EA
Calculated Model Size(s) =	#N/A	
Actual Model Size (if multiple values provided in Calculated Model Size or if you are choosing a larger model size) =	0	Model Size
Surface Area =	#N/A	ft^2
Overflow Rate =	#VALUE!	V_{or}
Rounded Overflow Rate =	#VALUE!	V_{or}
BMP Efficiency % =	#VALUE!	%
L_R Value =	#VALUE!	lbs
TSS Load Credit =	#VALUE!	lbs
Is Sufficient Treatment Available? (TSS Credit > TSS Uncapt.)	#VALUE!	
TSS Treatment by BMP (LM + TSS Uncapt.) =	#VALUE!	

21. Vortech

Required TSS Removal in BMP Drainage Area=	NA	lbs
Impervious Cover Overtreatment=	0.0000	ac
TSS Removal for Uncaptured Area =	0.00	lbs
BMP Sizing		
Effective Area =	NA	EA
Calculated Model Size(s) =	#N/A	
Actual Model Size (if choosing larger model size) =	Vx1000	Pick Model Size
Surface Area =	7.10	ft^2
Overflow Rate =	#VALUE!	V_{or}
Rounded Overflow Rate =	#VALUE!	V_{or}
BMP Efficiency % =	#VALUE!	%
L_R Value =	#VALUE!	lbs
TSS Load Credit =	#VALUE!	lbs
Is Sufficient Treatment Available? (TSS Credit > TSS Uncapt.)	#VALUE!	
TSS Treatment by BMP (LM + TSS Uncapt.) =	#VALUE!	

Comal County

OFFICE OF COMAL COUNTY ENGINEER

February 15, 2012

Mr. Victor Gil, P.E., R.P.L.S.
Gil Engineering Associates, Inc.
506 East Braker Lane
Austin, TX 78753-2751

Re: CISD Elementary School at 306 Cannan Road Canyon Lake, Texas
On-Site Sewage Facility Suitability Letter, within Comal County, Texas

Dear Mr. Gil:

In accordance with TAC §213.24(8)(B), Comal County has found that the entire referenced site is suitable for the use of private sewage facilities and will meet the requirements for on-site sewage facilities as specified in TAC §285 based on the following information submitted to our office on February 13, 2012:

- The Contributing Zone Plan, prepared by Gil Engineering Associates, Inc.

If you have any questions or need additional information, please do not hesitate to contact our office.

Sincerely,

Robert Boyd, P.E.
Comal County Assistant Engineer

cc: Jan Kennady, Comal County Commissioner, Precinct No. 4

195 David Jonas Drive • New Braunfels, Texas 78130 • (830) 608-2090 FAX (830) 608-2009

BMPs FOR UPGRADIENT STORMWATER

Up gradient stormwater currently overland flows through the site from the north to the south via grass swales along Cannan Road and though the existing site in two existing channels. One is located along the fence line running north and south just west and outside the disturbed area. The other channel is in the dense tree area east of the disturbed area. This flow does NOT commingle with the proposed impervious cover generated storm water routed for filtration.

Temporary BMPs provided will be rock berm and silt fence during construction.

ATTACHMENT J
BMPs for Upgradient Stormwater

BMPs FOR ONSITE STORMWATER

To prevent pollution of stormwater runoff originating on-site or up-gradient of the site and potentially flowing across and off the site, a Sedimentation / Filtration Pond along with a detention pond will be constructed. The ponds will be rough graded as a sediment trap while construction is occurring.

On site BMP will use silt fence and Rock Berm to temporally control storm water during construction.

The project consists of 19.76 acres total project area included in plan.
The Predevelopment Impervious cover area is 0.0 acres (0.0 sf).
Total post development impervious cover area is 4.52acres
The post development impervious cover fraction is 0.23
The total load required to be removed from this project is L_M=4,057 LBS.

Pond will be sized to capture the first 1.60 inches of storm water run-off from 4.52 acres of impervious cover within a 6.31 acre catchment area. The basin will provide a total capture volume of 23,269 cubic feet (22,976 cubic feet required) to treat 4,100 pounds of total suspended solids. The sand filtration system will consist of 2167 square feet of sand (1915 square feet required)

Total Load Removed from site 4,100 LBS.

ATTACHMENT K
BMPs for Onsite Stormwater

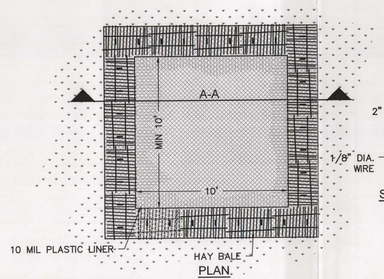
BMPs FOR SURFACE STREAMS

A proposed Sedimentation / Filtration pond, will prevent pollutants from entering the aquifer.

The proposed water quality pond, is located on site and will treat runoff from the proposed impervious cover area prior to its conveyance towards the Edwards Aquifer Recharge Zone. An outlet device will release post-developed flows to rates far less than pre-developed rates. Energy dissipation structures will proceed the detention pond outlet so that pond outflows do not damage downstream swales, channels, berms, etc.

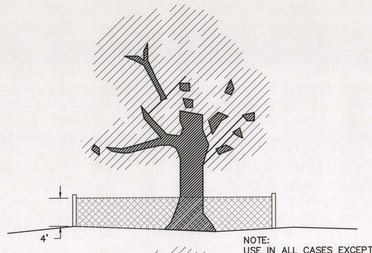
There are no sensitive or possibly sensitive features on this site.

ATTACHMENT L
BMPs for Surface Streams



2 CE101 ABOVE GRADE CONCRETE WASHOUT

NOT TO SCALE



3 CE101 TREE PROTECTION

NOT TO SCALE

TREE PROTECTION NOTES

1. A ROOT PROTECTION ZONE WILL BE ESTABLISHED AROUND EACH TREE OR ANY VEGETATION TO BE PRESERVED TO MEET THE LANDSCAPE OR TREE PRESERVATION ORDINANCES. THE ROOT PROTECTION ZONE SHALL BE AN AREA DEFINED BY THE RADIUS EXTENDING OUTWARD FROM THE TRUNK OF THE TREE A DISTANCE OF ONE (1) LINEAR FOOT FOR EACH INCH DIAMETER INCH AT BREAST HEIGHT (4.5 ') OF THE TREE. A 10–INCH DIAMETER TREE WILL HAVE A 10 FOOT RADIUS ROOT PROTECTION ZONE.

2. NO WORK SHALL BEGIN WHERE TREE PROTECTION FENCING HAS NOT BEEN COMPLETED AND APPROVED. TREE PROTECTION FENCING SHALL BE INSTALLED, MAINTAINED AND REPAIRED BY THE CONTRACTOR DURING CONSTRUCTION. THE FENCING WILL BE A MINIMUM OF 4' HEIGHT.

3. ALL ROOTS LARGER THAN ONE–INCH IN DIAMETER ARE TO BE CUT CLEANLY AND OAK WOUNDS PAINTED WITHIN 30 MINUTES.

4. EXPOSED ROOTS SHALL BE COVERED AT THE END OF THE WORK DAY USING TECHNIQUES SUCH AS COVERING WITH SOIL, MULCH OR WET BURLAP.

5. NO EQUIPMENT, VEHICLES OR MATERIALS SHALL BE OPERATED OR STORED WITHIN THE ROOT PROTECTION ZONE. NO CLEAN–OUT AREAS WILL BE CONSTRUCTED SO THAT THE MATERIAL WILL BE IN OR MIGRATE TO THE ROOT PROTECTION ZONE.

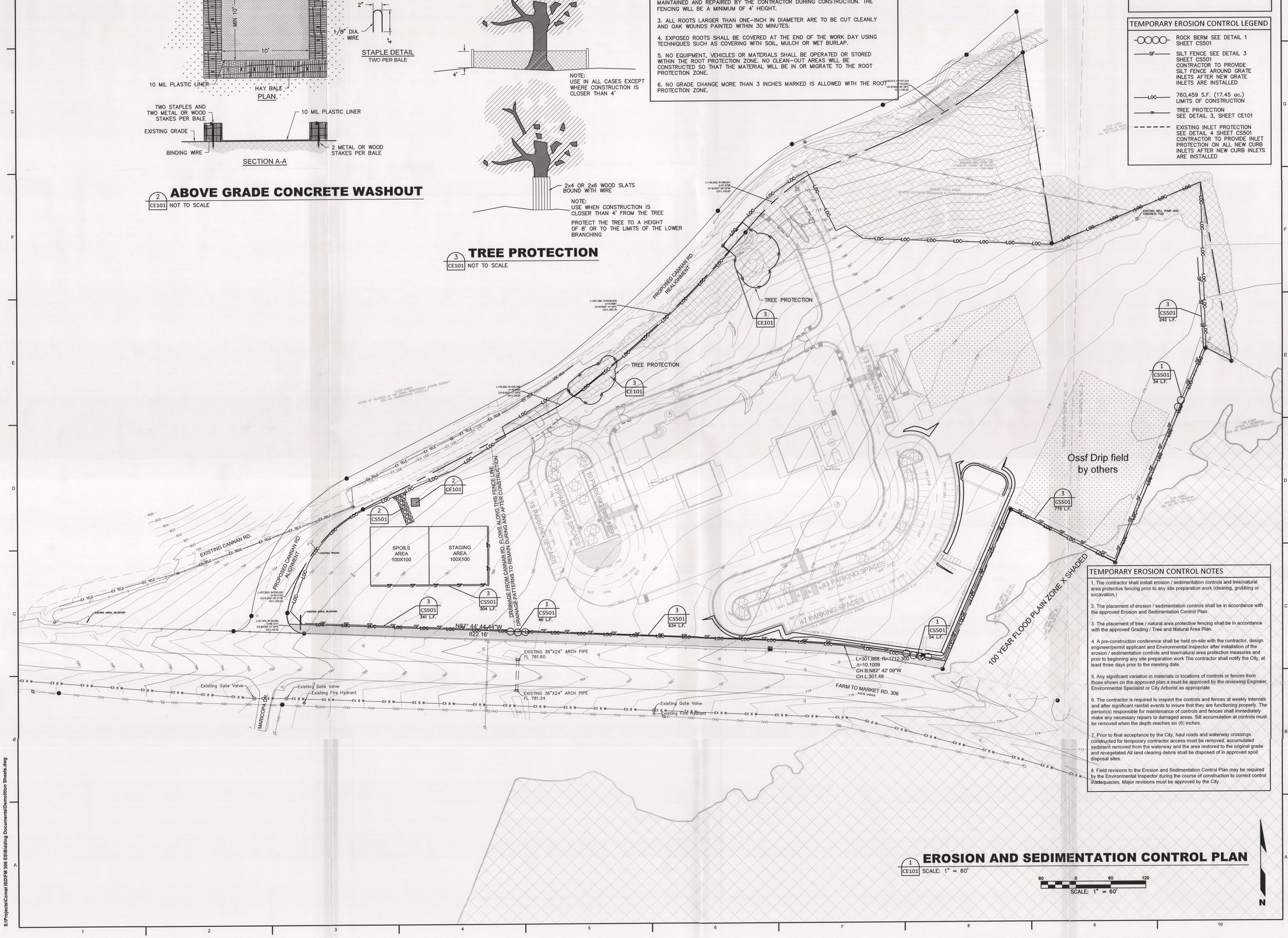
6. NO GRADE CHANGE MORE THAN 3 INCHES MARKED IS ALLOWED WITH THE ROOT PROTECTION ZONE.

GENERAL NOTES

CONTRACTOR TO SAVE TREES IN PARKING LOT ISLANDS AND OPEN SPACE AREAS AROUND BUILDING. CONTACT OWNER/ENGINEER FOR FINAL TREE REMOVAL IN THESE LOCATIONS ONLY

TEMPORARY EROSION CONTROL LEGEND

- ROCK BERM SEE DETAIL 1 SHEET CS501
- SF — SILT FENCE SEE DETAIL 3 SHEET CS501 CONTRACTOR TO PROVIDE SILT FENCE AROUND GRATE INLETS AFTER NEW GRATE INLETS ARE INSTALLED
- LOC — 760,459 S.F. (17.45 ac.) LIMITS OF CONSTRUCTION
- TP — TREE PROTECTION SEE DETAIL 3, SHEET CE101
- EXISTING INLET PROTECTION SEE DETAIL 4 SHEET CS501 CONTRACTOR TO PROVIDE INLET PROTECTION ON ALL NEW CURB INLETS AFTER NEW CURB INLETS ARE INSTALLED



1 CE101 EROSION AND SEDIMENTATION CONTROL PLAN

SCALE: 1" = 60'

SCALE: 1" = 60'

TEMPORARY EROSION CONTROL NOTES

1. The contractor shall install erosion / sedimentation controls and tree/natural area protective fencing prior to any site preparation work (clearing, grubbing or excavation.)

2. The placement of erosion / sedimentation controls shall be in accordance with the approved Erosion and Sedimentation Control Plan.

3. The placement of tree / natural area protective fencing shall be in accordance with the approved Grading / Tree and Natural Area Plan.

4. A pre-construction conference shall be held on-site with the contractor, design engineer/permit applicant and Environmental Inspector after installation of the erosion / sedimentation controls and tree/natural area protection measures and prior to beginning any site preparation work The contractor shall notify the City, at least three days prior to the meeting date.

5. Any significant variation in materials or locations of controls or fences from those shown on the approved plan a must be approved by the reviewing Engineer, Environmental Specialist or City Arborist as appropriate.

6. The contractor is required to inspect the controls and fences at weekly intervals and after significant rainfall events to insure that they are functioning properly. The person(s) responsible for maintenance of controls and fences shall immediately make any necessary repairs to damaged areas. Silt accumulation at controls must be removed when the depth reaches six (6) inches.

7. Prior to final acceptance by the City, haul roads and waterway crossings constructed for temporary contractor access must be removed, accumulated sediment removed from the waterway and the area restored to the original grade and revegetated All land clearing debris shall be disposed of in approved spoil disposal sites.

8. Field revisions to the Erosion and Sedimentation Control Plan may be required by the Environmental Inspector during the course of construction to correct control inadequacies. Major revisions must be approved by the City.

SHWGROUP
ARCHITECTS | ENGINEERS | PLANNERS

Consultants:
CIVIL:
Gil Engineering Associates, Inc.
CONSULTING ENGINEERS – SURVEYORS
PLANNERS – DESIGNERS

100% CD REVIEW SET

COMAL INDEPENDENT SCHOOL DISTRICT

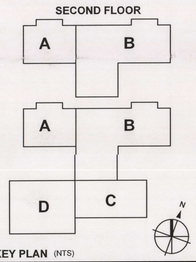
COMAL ISD

FM 306 ELEMENTARY
CANYON LAKE . TX

CHECKED: Checker
SCALE:

ISSUE: March 16, 2012

SECOND FLOOR



KEY PLAN (NTS)

SHEET TITLE:
EROSION AND SEDIMENTATION CONTROL PLAN

TCEQ Plan
APPROVED
SAN ANTONIO

CE101

SHW Project: 4310.009.00

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PERMANENT EROSION CONTROL NOTES

All disturbed areas shall be restored as noted below.

(a) A minimum of four inches of topsoil shall be placed in all drainage channels (except rock) and between the curb and right-of-way line.

(b) The seeding for permanent erosion control shall be applied over areas disturbed by construction as follows:

i. From September 15 to March 1, seeding shall be with a combination of 1.0 pounds per 1000 square feet of unhulled Bermuda and 5.0 pounds per 1000 square feet of Winter rye with a purity of 95% with 90% germination.

ii. From March 2 to September 14, seeding shall be with hulled Bermuda at a rate of 1.0 pounds per 600 square feet with a purity of 95% with 85% germination.

(c) Fertilizer shall have an analysis of 15-15-15 and shall be applied at the rate of 600 pounds per acre.

(d) The planted area shall be irrigated or sprinkled in a manner that will not erode the topsoil, but will sufficiently soak the soil to a depth of six inches. The irrigation shall occur at ten-day intervals during the first two months. Rainfall occurrences of 1/2 inch or more shall postpone the watering schedule for one week.

(e) Mulch type used shall be cellulose, applied at a rate of 2000 pounds per acre.

(f) Restoration shall be acceptable when the grass has grown at least 1-1/2 inches high with 95% coverage, provided no bare spots larger than 16 square feet exist.

(g) When required, native grass seeding shall comply with requirements of the City.

Developer Information:

Owner: COMAL ISD
1004 IH 35 NORTH
New Braunfels, TX 78130
(830)221-2000.

Owner's representative responsible for plan alterations:
SHW GROUP (512)867-6000
Person or firm responsible for erosion/sedimentation control maintenance:
BAIRD WILLIAMS CONSTRUCTION (254) 773-3499
Person or firm responsible for tree/natural area protection maintenance:
BAIRD WILLIAMS CONSTRUCTION (254) 773-3499

TEMPORARY EROSION CONTROL NOTES

1. The contractor shall install erosion / sedimentation controls and tree/natural area protective fencing prior to any site preparation work (clearing, grubbing or excavation.)

2. The placement of erosion / sedimentation controls shall be in accordance with the approved Erosion and Sedimentation Control Plan.

3. The placement of tree / natural area protective fencing shall be in accordance with the approved Grading / Tree and Natural Area Plan.

4. A pre-construction conference shall be held on-site with the contractor, design engineer/permit applicant and Environmental Inspector after installation of the erosion / sedimentation controls and tree/natural area protection measures and prior to beginning any site preparation work The contractor shall notify the City, at least three days prior to the meeting date.

5. Any significant variation in materials or locations of controls or fences from those shown on the approved plan a must be approved by the reviewing Engineer, Environmental Specialist or City Arborist as appropriate.

6. The contractor is required to inspect the controls and fences at weekly intervals and after significant rainfall events to insure that they are functioning properly. The person(s) responsible for maintenance of controls and fences shall immediately make any necessary repairs to damaged areas. Silt accumulation at controls must be removed when the depth reaches six (6) inches.

7. Prior to final acceptance by the City, haul roads and waterway crossings constructed for temporary contractor access must be removed, accumulated sediment removed from the waterway and the area restored to the original grade and revegetated All land clearing debris shall be disposed of in approved spoil disposal sites.

8. Field revisions to the Erosion and Sedimentation Control Plan may be required by the Environmental Inspector during the course of construction to correct control inadequacies. Major revisions must be approved by the City.

IRRIGATION NOTES

ALL MAINLINE AND LATERAL LINE PIPING AND CONTROL WIRES UNDER PAVING SHALL BE INSTALLED IN SLEEVES. MAIN AND LATERAL LINE SLEEVES SHALL BE A MINIMUM OF TWICE (2X) THE DIAMETER OF THE PIPE TO BE SLEEVED. CONTROL WIRE SLEEVES SHALL BE OF SUFFICIENT SIZE FOR THE REQUIRED NUMBER OF WIRES UNDER PAVING.

- INSTALL ALL BACKFLOW PREVENTION DEVICES AND ALL PIPING BETWEEN THE POINT OF CONNECTION AND THE BACKFLOW PREVENTER PER LOCAL CODES AND ALL GOVERNING AUTHORITIES.
- FINAL LOCATION OF THE BACKFLOW PREVENTER AND AUTOMATIC CONTROLLER SHALL BE APPROVED BY THE OWNER'S REPRESENTATIVE.
- 120 VAC ELECTRICAL POWER SOURCE AT CONTROLLER LOCATION SHALL BE PROVIDED BY OTHERS. THE IRRIGATION CONTRACTOR SHALL MAKE THE FINAL CONNECTION FROM THE ELECTRICAL SOURCE TO THE CONTROLLER.
- ALL SPRINKLER HEADS SHALL BE SET PERPENDICULAR TO FINISH GRADE UNLESS OTHERWISE SPECIFIED.
- THE IRRIGATION CONTRACTOR SHALL FLUSH AND ADJUST ALL SPRINKLER HEADS AND VALVES FOR OPTIMUM COVERAGE WITH MINIMAL OVERSPRAY ONTO WALKS, STREETS, WALLS, ETC.
- IT IS THE RESPONSIBILITY OF THE IRRIGATION CONTRACTOR TO FAMILIARIZE HIMSELF WITH ALL GRADE DIFFERENCES, LOCATION OF WALLS, RETAINING WALLS, STRUCTURES AND UTILITIES. THE IRRIGATION CONTRACTOR SHALL REPAIR OR REPLACE ALL ITEMS DAMAGED BY HIS WORK. HE SHALL COORDINATE HIS WORK WITH OTHER CONTRACTORS FOR THE LOCATION AND INSTALLATION OF PIPE SLEEVES THROUGH WALLS, UNDER ROADWAYS AND PAVING, ETC.
- ALL SPRINKLER EQUIPMENT NOT OTHERWISE DETAILED OR SPECIFIED SHALL BE INSTALLED PER MANUFACTURER'S RECOMMENDATIONS AND SPECIFICATIONS.
- THE DESIGNERS SHALL BE A REGISTERED LICENSED IRRIGATOR IN THE STATE OF TEXAS.
- ALL REMOTE CONTROL VALVES, GATE VALVES, QUICK COUPLERS, AND CONTROL WIRE SHALL BE INSTALLED IN APPROVED VALVES BOXES WITH LOCKING COVERS.
- ALL CONTROL WIRES TO BE 14 AWG SOLID COPPER INSULATED DIRECT BURIAL WIRE UF UL LISTED. WATERPROOF CONNECTORS TO BE USED ON ALL WIRE CONNECTIONS.
- IRRIGATION CONTRACTOR SHALL OBTAIN ALL PERMITS AND LICENSES, AND PAY ALL CHARGES AND FEES AND GIVE ALL NECESSARY NOTICES FOR THE COMPLETION OF WORK.
- IRRIGATION INSTALLATION IN TEXAS IS REGULATED BY THE TEXAS COMMISSION OF ENVIRONMENTAL QUALITY.
- IRRIGATION CONTRACTOR SHALL PROVIDE THE OWNER WITH "AS BUILT" DRAWINGS SHOWING THE LOCATION OF ALL MAINLINES, LATERAL LINES, VALVES AND VALVE WIRING.

SEQUENCE OF CONSTRUCTION

A. AFTER THE ACQUISITION OF ALL REQUIRED PERMITS, NOTIFY THE ENGINEER AND OWNER DEPARTMENT FOR A PRE-CONSTRUCTION CONFERENCE 3 DAYS IN ADVANCE.

B. INSTALL THE TEMPORARY EROSION/SEDIMENTATION CONTROLS.

C. ROUGH GRADE THE DETENTION POND FOR A SEDIMENTATION TRAP

D. DEMOLITION AND ROUGH GRADING.

E. CONSTRUCTION OF STORM WATER SYSTEM.

F. FINISH GRADING. INSTALL INLET SILT PROTECTION FOR THE STORM SEWER SYSTEM AFTER THE INLET IS CONSTRUCTED.

G. PLACEMENT OF PARKING SURFACE MATCHING NEW GRADE.

H. INSTALL PERMANENT EROSION CONTROLS.

I. OBTAIN CONCURRENCE LETTER FROM ENGINEER, AND THE FINAL INSPECTION WILL BE SCHEDULED UPON RECEIPT OF THE LETTER

J. REMOVE TEMPORARY EROSION CONTROLS AFTER ACCEPTANCE OF THE PERMANENT CONTROLS.

DETENTION POND MAINTENANCE SCHEDULE

Upon completion of the project the school district will be responsible for all inspection, maintenance, and repair of all onsite detention ponds, channels and grass swales.

INSPECTION

Inspect detention pond, channels and swales for erosion and any changes after every major storm even but at least monthly. Inspect embankments for any visible signs of erosion, seepage, sloughing, sliding, or other instability. Inspect outlet structures and walls for any flow obstructions, cracks, vandalism, or erosion.

REGULAR MAINTENANCE

1. Proceed with corrective measures for observed problems immediately or as soon as weather conditions permit.
2. Maintain good grass cover at all times. Fertilize grass according to type of grass.
3. Mow grass as required. When mowing is performed, a mulching mower should be used, or grass clippings should be collected and removed. Remove undesirable vegetation such as trees, bushes, vines, briars and weeds. Minimize the use of herbicide.
4. Fill all eroded gullies and vehicle ruts and compact soil. Place backfill in hollow spots under concrete, spillways or outlet structures and compact soil. Fill all animal burrows and compact soil.
5. Replace any riprap that has washed away from spillways and pipe outlets. Determine the cause of any slides or sloughs and repair. Take corrective action to prevent future recurrence.
6. Remove all trash, debris, tree limbs, or other flow obstructions from detention pond, outlet structures, channels, swales and pipe inlet.
7. Inspect walls, fences and ramps and repair as necessary.
8. Repair vandalism.
9. Take corrective action to prevent future recurrence of damage.

ANNUAL MAINTENANCE

1. Remove vegetation from any cracks in concrete spillways, walls or outlet structures and seal with a mastic joint filler.
2. Remove any accumulated sediment common to all ponds, channels and swales. Restore ponds, channels, and swales to design volume.
3. Reseed or resod grass as necessary to maintain good vegetative cover.

FIRE ACCESS ROAD NOTES

FIRE ACCESS ROADS SHALL BE INSTALLED TO MEET THE FOLLOWING MINIMUM GUIDELINES:

1. LANES SHALL BE A MINIMUM OF 20 FEET IN WIDTH.

2. OVERHEAD CLEARANCE SHALL BE A MINIMUM OF 15 FEET, 6 INCHES FROM THE FINISHED DRIVING SURFACE.

3. THE TOP AND FACE OF ROAD CURBS SHALL BE PAINTED RED IN COLOR; IF NO CURBS ARE PRESENT, A 5½ TO 6½ INCH WIDE, RED STRIPE SHALL BE PAINTED ON THE DRIVING SURFACE.

4. THE LANE SHALL HAVE ALTERNATING WORDS OF "FIRE LANE" AND "NO PARKING" SPACE AT A MAXIMUM OF 12 FEET BETWEEN PHRASES, AND LETTERING SHALL BE PAINTED WHITE WITH 4" X 2" LETTERS, PLUS OR MINUS ½ INCH.

5. WHEN REQUIRED, SIGNAGE INDICATING "FIRE LANE NO PARKING" SHALL BE SPACED AT A MAXIMUM OF 75 FEET APART, ALONG THE LENGTH OF THE FIRE LANE (SEE EXAMPLE OF APPROVED SIGNS)

6. FACILITIES WITHOUT CURB SIDE PARKING AROUND THE BUILDING SHALL FOLLOW OPTION B.

7. FACILITIES WITH HEAD-IN PARKING AROUND THE BUILDING SHALL FOLLOW OPTION B. NOTHING IN THESE GUIDELINES SHALL BE CONSTRUED TO AFFECT THE VALIDITY OR ENFORCEMENT OF PREVIOUSLY INSTALLED AND APPROVED ACCESS ROAD AND FIRE LANE MARKINGS.

GENERAL NOTES

CONTRACTOR TO SAVE TREES IN PARKING LOT ISLANDS AND OPEN SPACE AREAS AROUND BUILDING. CONTACT OWNER/ENGINEER FOR FINAL TREE REMOVAL IN THESE LOCATIONS ONLY

PERMANENT EROSION STABILIZATION LEGEND

- LOC — LIMITS OF CONSTRUCTION LINE SHOWS AREAS OF SOIL DISTURBANCE; NO SOIL DISTURBANCE WILL OCCUR OUTSIDE THE LIMITS OF CONSTRUCTION. AREA=777,840 (17.85 AC) ALL AREAS ABRADED INSIDE THE LOC AND NOT HATCHED SHALL BE STABILIZED BY HYDROMULCH OR EQUIVALENT GRASS PRODUCING MEANS SEE PERMENANT EROSION CONTROL NOTES FOR DETAILS
- BERMUDA GRASS SOD TO PROVIDED IN HATCHED AREAS WITH PERMANENT UNDERGROUND IRRIGATION SYSTEM ALL 4:1 OR GREATER SLOPES SHALL BE STABLIZED BY BERMUDA GRASS SOD
- BERMUDA GRASS SOD TO PROVIDED IN HATCHED AREAS TEMPORARILY IRRIGATED UNTIL ESTABLISHED
- ROCK WALL

TEMPORARY BENCHMARK LIST

	TBM #	Elevation	Northing	Easting	Description
①	1	777.97	13863268.24	2232573.56	½" REBAR SET WITH A RED CAP MARKED "PANEL POINT"
②	2	775.70	13863217.17	2232805.92	60D NAIL SET
③	3	783.68	13863264.36	2232132.27	60D NAIL SET

SYMBOL LEGEND

- ● FOUND 1/2" IRON ROD (UNLESS OTHERWISE NOTED)
- ■ FOUND TEXAS DEPARTMENT OF TRANSPORTATION TYPE I CONCRETE MONUMENT

OFF STREET PARKING REQUIREMENTS CALCULATED BY CITY ORDINANCE

OFF STREET PARKING FOR SCHOOLS		MINIMUM NUMBER OF HANDICAPPED SPACES REQUIRED
2 SPACE/CLASROOM & 2 SPACE/ OFFICE SPACE	47 CLASSROOMS 13 OFFICES	120-150 PARKING SPACES 5 HANDICAPPED REQUIRED
SPACES REQUIRED 120 SPACES REQUIRED	145 SPACES PROVIDED	7 SPACES PROVIDED

DETENTION & SEDIMENTATION POND

A MINIMUM OF 6 INCHES OF TOPSOIL IS REQUIRED IN THE DETENTION AND SEDIMENTATION POND. THE TOPSOIL MUST CONTAIN 5-10% COMPOST A CLAY CONTENT LESS THAN 20% AND BE FREE OF STONES, STUMPS, ROOTS OR OTHER OBJECTS LARGER THAN 1 INCH. IF ON-SITE SOILS DO NOT MEET THE ABOVE SPECIFICATIONS TOPSOIL MEETING THE ABOVE SPECS SHALL BE BROUGHT IN.
THE DETENTION POND AND THE SEDIMENTATION POND SHALL BE SODDED. IF SEEDING IS USED IT MUST BE ACCOMPANIED BY AN APPROPRIATE SOIL BLANKET OR MATTING.

IMPERVIOUS COVER TABLE

Description	Existing Impervious Cover			Removed Impervious Cover			Proposed Impervious Cover			Total Net Impervious Cover		
	Sq. Ft.	Acres	% of Site	Sq. Ft.	Acres	% of Site	Sq. Ft.	Acres	% of Site	Sq. Ft.	Acres	% of Site
Buildings	0	0.00	0.000%	0	0.00	0.00%	95,197	2.19	11.060%	95,197	2.19	11.060%
Concrete	0	0.00	0.000%	0	0.00	0.0000%	57,217	1.31	6.647%	57,217	1.31	6.647%
Asphalt	0	0.00	0.000%	0	0.00	0.0000%	44,362	1.02	5.154%	44,362	1.02	5.154%
Totals	0	0.00	0.000%	0	0.00	0.000%	196,776	4.52	22.861%	196,776	4.52	22.861%
Site Totals	860,746	19.76	100.000%									

PARKING LOT SHADING CALCULATIONS

ASPHALT PARKING AREA	44,362 S.F.
REQUIRED SHADING AREA 25%	11,090 S.F.
SELECTED TREE SHADE AREA BUR OAK WITH IRRIGATION BUBBLER	1,200 S.F.
MODIFIER FOR NEW TREES NOT LOCATED WITHIN ISLANDS	50%
ADJUSTED SHADE AREA	600 S.F.

11,090/ 600 = 18.48 TREES REQUIRED
19 TREES PROVIDED AS SHOWN ON PLAN

FLOW ARROW LEGEND

- PROPOSED FLOW ARROW
- EXISTING FLOW ARROW

FLOOD PLAIN NOTES

A PORTION OF THIS SITE IS IN ZONE X SHADED AREAS OF 500-YEAR FLOOD WITH AVERAGE DEPTH OF LESS THAN 1 FOOT OR WITH DRAINAGE AREAS LESS THAN 1 SQUARE MILE; AND AREAS PROTECTED BY LEVEES FROM 100-YEAR FLOOD. AS SHOWN ON MAP NUMBER 48546J3 PANEL 0260F EFFECTIVE DATE SEPTEMBER 2, 2009

SITE PLAN

1 CS101 SCALE: 1" = 60'

60 0 60 120
SCALE: 1" = 60'

N

SHWGROUP
ARCHITECTS | ENGINEERS | PLANNERS

Consultants:
CIVIL:
Gil Engineering Associates, Inc.
CONSULTING ENGINEERS – SURVEYORS
PLANNERS – DESIGNERS
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TEXAS REGISTRATION FIRM # 1195

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COMAL INDEPENDENT SCHOOL DISTRICT

COMAL ISD

FM 306 ELEMENTARY
CANYON LAKE . TX

CHECKED: Checker
SCALE:

ISSUE: March 16, 2012

SECOND FLOOR

A B
A B
D C

N

KEY PLAN (NTS)

SHEET TITLE:
SITE PLAN

TCEQ P13
APR 15 2012
SAN ANTONIO

CS101

SHW Project: 4310.009.00

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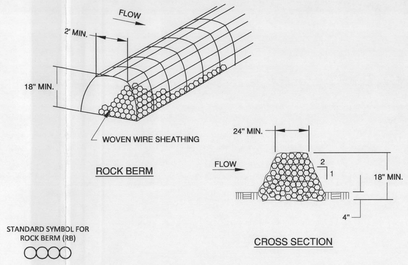


MATERIALS

1. THE BERM SHALL BE SECURED WITH A WOVEN WIRE SHEATHING HAVING MAXIMUM OPENING OF 1" AND MINIMUM WIRE DIAMETER OF 20 GAUGE GALVANIZED AND SHOULD BE SECURED WITH SHOAT RINGS.
2. CLEAN OPEN GRADED 3 TO 5 INCH DIAMETER ROCK SHOULD BE USED, EXCEPT IN AREAS WHERE HIGH VELOCITIES OR LARGE VOLUMES OF FLOW ARE EXPECTED, WHERE 5 TO 8 INCH DIAMETER ROCK MAY BE USED.

INSTALLATION

3. LAYOUT THE WOVEN WIRE SHEATHING PERPENDICULAR TO THE FLOW LINE. THE SHEATHING SHOULD BE 20 GAUGE WOVEN WIRE MESH WITH 1 INCH OPENING.
4. BERM SHOULD HAVE A TOP WIDTH OF 2 FEET MINIMUM WITH SIDE SLOPES BEING 2:1 (H:V) OR FLATTER.
5. PLACE THE ROCK ALONG THE SHEATHING AS SHOWN IN THE DIAGRAM (FIGURE 1.29 OF RG-348) TO A HEIGHT NOT LESS THAN 18"
6. WRAP THE WIRE SHEATHING AROUND THE ROCK AND SECURE WITH TIE WIRE SO THAT THE END OF SHEATHING OVERLAP AT LEAST 2 INCHES, AND THE BERM RETAINS ITS SHAPE WEN WALKED UPON.
7. BERM SHOULD BE BUILT ALONG THE CONTOUR AT ZERO PERCENT GRADE OR AS NEAR AS POSSIBLE.
8. THE END OF THE BERM SHOULD BE TIED INTO EXISTING UPSLOPE GRADE AND THE BERM SHOULD BE BURIED IN A TRENCH APPROXIMATELY 3 TO 4 INCHES DEEP TO PREVENT FAILURE OF THE CONTROL.

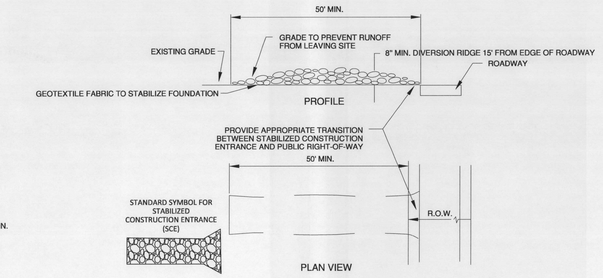
COMMON TROUBLE POINTS

9. INSUFFICIENT BERM HEIGHT OR LENGTH (RUNOFF QUICKLY ESCAPES OVER TOP OR AROUND SIDES OF BERM)
10. BERM NOT INSTALLED PERPENDICULAR TO FLOW LINE (RUNOFF ESCAPING AROUND O E SIDE)

INSPECTION AND MAINTENANCE GUIDELINES

11. INSPECTION SHOULD BE MADE WEEKLY AND AFTER EACH RAINFALL BY THE RESPONSIBLE PART. FOR INSTALLATIONS IN STREAMBED, ADDITIONAL DAILY INSPECTION SHOULD BE MADE.
12. REMOVE SEDIMENT AND OTHER DEBRIS WHEN BUILDUP REACHES 6 INCHES AND DISPOSE OF THE ACCUMULATED SILT OF IN A APPROVED MANNER.
13. REPAIR ANY LOOSE WIRE SHEATHING
14. THE BERM SHOULD BE RESHAPED AS NEEDED DURING INSPECTION
15. THE BERM SHOULD BE REPLACED WHEN THE STRUCTURE CEASES TO FUNCTION AS INTENDED DUE TO SILT ACCUMULATION AMONG THE ROCKS, WASHOUT, CONSTRUCTION TRAFFIC DAMAGE , ETC.
16. THE ROCK BERM SHOULD BE LEFT IN PLACE UNTIL ALL UPSTREAM AREAS AREA STABILIZED AND ACCUMULATED SILT REMOVED.

1 ROCK BERM
CS501 NOT TO SCALE



MATERIALS:

1. THE AGGREGATE SHOULD CONSIST OF 4 TO 8 INCH WASHED STONE OVER A STABLE FOUNDATION AS SPECIFIED IN THE PLAN.
2. THE AGGREGATE SHOULD BE PLACED WITH A MINIMUM THICKNESS OF 8 INCHES.
3. THE GEOTEXTILE FABRIC SHOULD BE DESIGNED SPECIFICALLY FOR USE AS A SOIL FILTRATION MEDIA WITH THE APPROPRIATE WEIGHT OF 6 OUNCES PER SQUARE YARD, A MULLEN BURST RATING OF 140 LB PER INCHES SQUARED AND AN EQUIVALENT OPENING SIZE GREATER THAN A NUMBER 50 SIEVE.
4. IF A WASHING FACILITY IS REQUIRED A LEVEL AREA WITH A MINIMUM OF 4 INCH WASHED STONE OR COMMERCIAL RACK SHOULD BE INCLUDED IN THE PLANS. DIVERT WASH WATER TO A SEDIMENT TRAP OR BASIN.

INSTALLATION

5. AVOID CURVES ON PUBLIC ROADS AND STEEP SLOPES. REMOVE VEGETATION AND OTHER OBJECTIONABLE MATERIAL FROM THE FOUNDATION AREA. GRADE CROWN FOUNDATION FOR POSITIVE DRAINAGE.
6. THE MINIMUM WIDTH OF THE ENTRANCE/EXIT SHOULD BE 12 FEET OR THE FULL WIDTH OF EXIT ROADWAY, WHICHEVER IS GREATER.
7. THE CONSTRUCTION ENTRANCE SHOULD BE AT LEAST 50 FEET LONG.
8. IF THE SLOPE TOWARD THE ROAD EXCEEDS 2%, CONSTRUCT A RIDGE, 6 TO 8 INCHES HIGH WITH 3:1 (H:V) SIDE SLOPES, ACROSS THE FOUNDATION APPROXIMATELY 15 FEET FROM THE ENTRANCE TO DIVERT RUNOFF AWAY FROM A PUBLIC ROAD.
9. PLACE GEOTEXTILE FABRIC AND GRADE FOUNDATION TO IMPROVE THE STABILITY, ESPECIALLY WHERE WET CONDITIONS ARE ANTICIPATED.
10. PLACE STONE TO DIMENSIONS AND GRADES SHOWN ON PLANS. LEAVE SURFACE SMOOTH AND SLOPE FOR DRAINAGE.
11. DIVERT ALL SURFACE RUNOFF AND DRAINAGE FROM THE STONE PAD TO A SEDIMENT TRAP OR BASIN.
12. INSTALL PIPE UNDER PAD AS NEEDED TO MAINTAIN PROPER PUBLIC ROAD DRAINAGE.

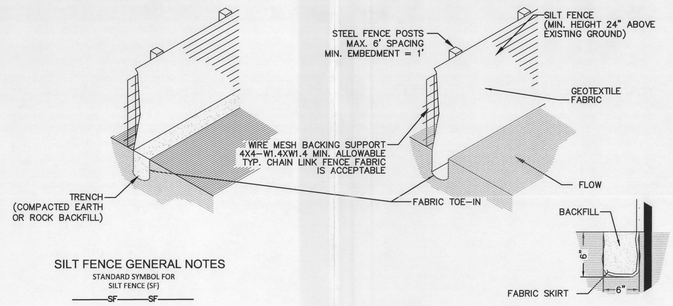
COMMON TROUBLE POINTS

13. INADEQUATE RUNOFF CONTROL – SEDIMENT WASHES ONTO PUBLIC ROAD.
14. STONE TOO SMALL OR GEOTEXTILE FABRIC ABSENT, RESULTS IN MUDDY CONDITION AS STONE IS PRESSED INTO SOIL.
15. PAD TOO SHORT FOR HEAVY CONSTRUCTION TRAFFIC – EXTEND PAD BEYOND THE MINIMUM 50 FOOT LENGTH AS NECESSARY.
16. PAD NOT FLARED SUFFICIENTLY AT ROAD SURFACE, RESULTS IN MUD BEING TRACKED ONTO ROAD AND POSSIBLE DAMAGE TO ROAD EDGE.
17. UNSTABLE FOUNDATION – USE GEOTEXTILE FABRIC UNDER PAD AND/OR IMPROVE FOUNDATION DRAINAGE.

INSPECTION AND MAINTENANCE GUIDELINES:

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

2 STABLIZED CONSTRUCTION ENTRANCE
CS501 NOT TO SCALE



MATERIALS:

1. SILT FENCE MATERIAL SHOULD BE POLYPROPYLENE, POLYETHYLENE OR POLYAMIDE WOVEN OR NONWOVEN FABRIC. THE FABRIC WIDTH SHOULD BE 36 INCHES, WITH A MINIMUM UNIT WEIGHT OF 4.5 OZ/YD, MULLEN BURST STRENGTH EXCEEDING 190 LB/IN2, ULTRAVIOLET STABILITY EXCEEDING 70%, AND MINIMUM APPARENT OPENING SIZE OF U.S. SIEVE NUMBER 30.
2. FENCE POSTS SHOULD BE MADE OF HOT ROLLED STEEL, AT LEAST 4 FEET LONG WITH TEE OR Y-BAR CROSS SECTION, SURFACE PAINTED OR GALVANIZED, MINIMUM NOMINAL WEIGHT 1.25 LB/FT2, AND BRINDELL HARDNESS EXCEEDING 140.
3. WOVEN WIRE BACKING TO SUPPORT THE FABRIC SHOULD BE GALVANIZED 2" X 4" WELDED WIRE, 12 GAUGE MINIMUM.

INSTALLATION:

4. STEEL POSTS, WHICH SUPPORT THE SILT FENCE, SHOULD BE INSTALLED ON A SLIGHT ANGLE TOWARD THE ANTICIPATED RUNOFF SOURCE. POST MUST BE EMBEDDED A MINIMUM OF 1- FOOT DEEP AND SPACED NOT MORE THAN 8 FEET ON CENTER. WHERE WATER CONCENTRATES, THE MAXIMUM SPACING SHOULD BE 6 FEET.
5. LAY OUT FENCING DOWN-SLOPE OF DISTURBED AREA, FOLLOWING THE CONTOUR AS CLOSELY AS POSSIBLE. THE FENCE SHOULD BE SITED SO THAT MAXIMUM DRAINAGE ARE IS 1/4 ACRE/100 FEET OF FENCE.
6. THE TOE OF THE SILT FENCE SHOULD BE TRENCHED IN WITH A SPADE OR MECHANICAL TRENCHER, SO THAT THE DOWN-SLOPE FACE OF THE TRENCH IS FLAT AND PERPENDICULAR TO THE LINE OF FLOW. WHERE FENCE CANNOT BE TRENCHED IN (E.G., PAVEMENT OR ROCK OUTCROP), WEIGHT FABRIC FLAP WITH 3 INCHES OF PEA GRAVEL ON UPHILL SIDE TO PREVENT FLOW FROM SEEPING UNDER FENCE.
7. THE TRENCH MUST BE A MINIMUM OF 6 INCHES DEEP AND 6 INCHES WIDE TO ALLOW FOR THE SILT FENCE FABRIC TO BE LAID IN THE GROUND AND BACKFILLED WITH COMPACTED MATERIAL
8. SILT FENCE SHOULD BE SECURELY FASTENED TO EACH STEEL SUPPORT POST OR TO WOVEN WIRE, WHICH IS IN TURN ATTACHED TO THE STEEL FENCE POST. THERE SHOULD BE A 3-FOOT OVERLAP, SECURELY FASTENED WHERE ENDS OF FABRIC MEET.
9. SILT FENCE SHOULD BE REMOVED WHEN THE SITE IS COMPLETELY STABILIZED SO AS NOT TO BLOCK OR IMPEDE STORM FLOW OR DRAINAGE.

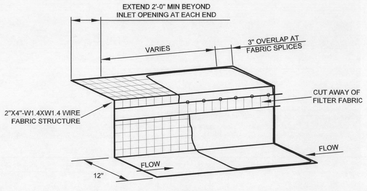
COMMON TROUBLE POINTS:

10. FENCE NOT INSTALLED ALONG THE CONTOUR CAUSING WATER TO CONCENTRATE AND FLOW OVER THE FENCE. (2) FABRIC NOT SEATED SECURELY TO GROUND (RUNOFF PASSING UNDER FENCE)
11. FENCE NOT INSTALLED PERPENDICULAR TO FLOW LINE (RUNOFF ESCAPING AROUND SIDES)
12. FENCE TREATING TOO LARGE AN AREA, OR EXCESSIVE CHANNEL FLOW (RUNOFF OVERTOPS OR COLLAPSES FENCE)

INSPECTION AND MAINTENANCE GUIDELINES:

13. INSPECT ALL FENCING WEEKLY, AND AFTER ANY RAINFALL.
14. REMOVE SEDIMENT WHEN BUILDUP REACHES 6 INCHES.
15. REPLACE ANY TORN FABRIC OR INSTALL A SECOND LINE OF FENCING PARALLEL TO THE TORN SECTION.
16. REPLACE OR REPAIR ANY SECTIONS CRUSHED OR COLLAPSED IN THE COURSE OF CONSTRUCTION ACTIVITY. IF A SECTION OF FENCE IS OBSTRUCTING VEHICULAR ACCESS, CONSIDER RELOCATING IT TO A SPOT WHERE IT WILL PROVIDE EQUAL PROTECTION, BUT WILL NOT OBSTRUCT VEHICLES. A TRIANGULAR FILTER DIKE MAY BE PREFERABLE TO A SILT FENCE AT COMMON VEHICLE ACCESS POINTS.
17. WHEN CONSTRUCTION IS COMPLETE, THE SEDIMENT SHOULD BE DISPOSED OF IN A MANNER THAT WILL NOT CAUSE ADDITIONAL SILTATION AND THE PRIOR LOCATION OF THE SILT FENCE SHOULD BE REVEGETATED. THE FENCE ITSELF SHOULD BE DISPOSED OF IN AN APPROVED LANDFILL.

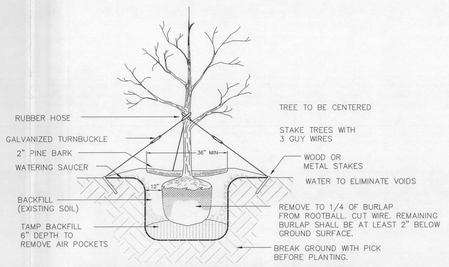
3 SILT FENCE
CS501 NOT TO SCALE



NOTES:

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

4 CURB INLET PROTECTION DETAIL
CS501 NOT TO SCALE



5 TREE PLANTING DETAIL
CS501 NOT TO SCALE

SEE SHEET CS101 FOR LOCATIONS OF TREE PLANTINGS

TxDOT NOTES:

1. "If waste areas or material source areas result from this project, the Contractor is reminded to follow the requirements of the Texas Aggregate Quarry and Pit Safety Act. In addition, it is requested that these areas not be visible from any highway on the State system."
2. "Any trees existing within State Right Of Way are the natural resources of the State and will be protected. In the event that trees must be removed, TxDOT written permission will be received in advance and will identify the specific trees by species, diameter and location to be removed. The developer will be fined for any unpermitted removal of trees."
3. "The developer will maintain at the project site, and make available upon request, copies of all approved environmental plans and permits relating to work in State Right Of Way."
4. "Any slopes in State Right Of Way which become steeper than 3:1 as a result of the work will be treated with 4" thick reinforced concrete riprap and be treated with metal beam guard fence. This may entail additional rip-rap beyond that shown in the plans."
5. "John Cox (830) 609-0707, TxDOT Maintenance Supervisor will be contacted by the contractor 48 hours prior to work occurring in State Right Of Way."
6. State Right Of Way will not be used as an area for contractor parking or for staging the receipt of materials or equipment."
7. "Traffic control and construction barricades will meet the requirements of the Texas MUTCD."
8. "At no time will the roadway travel way be blocked"
9. "Lane closures will only be permitted with 48 hour prior approval of the TxDOT Maintenance Supervisor. Lane closures will be permitted only between 9:00 a.m. and 4:00 p.m. Monday through Friday."
10. "A minimum 3:1 (H:V) temporary safety slope of stable compacted material will be required adjacent to the State highway edge of pavement at all times during non working hours."
11. "All pavement markings will be Type I thermoplastic with an underseal meeting TxDOT specifications."
12. *"All materials and construction methods used in state ROW will meet TxDOT specifications. This supersedes all other specifications in the* plans."
13. "Any damage to TxDOT facilities will be repaired at no expense to the State, to TxDOT's satisfaction."
14. "The contractor will use Best Management Practices (BMP's) to minimize erosion and sedimentation in the State Right of Way resulting from the proposed construction. Re-vegetation of disturbed areas will be completed in accordance with TxDOT Standard Specifications."
15. "Prior to seeding or re-vegetation the front slopes will be shouldered up with topsoil to eliminate any pavement edge drop-off."
16. "Mud tracked onto the roadway from the site will be immediately removed to the satisfaction of TxDOT."
17. "It will be the developer/owner's responsibility to clean out, to the state's satisfaction, any drainage structure or storm sewer system that becomes silted as a result of their operations."
18. "The adjustment of any utilities in State Right Of Way or adjacent private easement will be the responsibility of the owner/developer."
19. "The contractor is responsible for placing and maintaining existing signs on TxDOT approved temporary mounts until permanent signs are placed."
20. "The final placement of permanent signs will be coordinated prior to placement with the local TxDOT Maintenance Supervisor."

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 of 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 situation. 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 but 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 storm water shall be prevented from becoming a pollutant source for storm water discharges (e.g., screen 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. Stabilized 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.

Austin Regional Office
Office 2800 S. IH 35, Suite 100
Texas 78704-5712
Phone (512) 339-2929
Fax (512) 339-3795

San Antonio Regional
14250 Judson Road Austin,
San Antonio, Texas 78233-4480
Phone (210) 490-3096
Fax (210) 545-4329

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Consultants:
CIVIL:
Gil Engineering Associates, Inc.
CONSULTING ENGINEERS – SURVEYORS
PLANNERS – DESIGNERS

100% CD REVIEW SET

COMAL INDEPENDENT SCHOOL DISTRICT

COMAL ISD

FM 306 ELEMENTARY CANYON LAKE . TX

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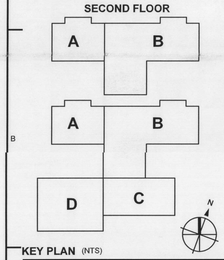
SCALE:

ISSUE: March 16, 2012

SECOND FLOOR



KEY PLAN (NTS)

SHEET TITLE:
SITE DETAILS

TCEQ-R13
APR 13 2012
SAN

SHW Project:

CS501
4310.009.00

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PROPOSED CANNAN RD. REALIGNMENT

DENSE TREE AREA
WHERE OFFSITE DRAINAGE FLOWS THROUGH PROPERTY

EXISTING CONCRE

L=146.522, R=390.841
Δ=21.4796
CH B:S47° 39' 23"W
CH L:145.67

L=391.385, R=2038.676
Δ=10.9997
CH B:N46° 14' 46"E
CH L:390.78

NEW 4'X4' AREA INLET- (1585)
RIM:786.46
INV IN:783.13 18" RCP
INV OUT:783.13 18" RCP

101LF 18" RCP @ 0.54%

4LF 18" RCP @ 2.13%

18" PIPE END TREATMENT
FL:782.50

6'X13'RIP RAP

182LF 18" RCP @ 0.65%

NEW 4"X4" AREA INLET- (1584)
RIM:787.46
INV OUT:784.13 18" RCP

3'X3' CONCRETE BOX
RIM:790.24
INV OUT:783.24 24" RCP

1-24"X24"X10" WYE
INV OUT:784.06 24" RCP

90LF 24" RCP @0.91%
STORM LINE A

27LF 24" RCP @ 0.89%
1-24"X24"X8" WYE
INV OUT:784.73 24" RCP

73LF 24" RCP @ 0.92%

NEW 20' CURB INLET-(1537)
RIM:787.98
INV IN: 784.97 8" PVC
INV IN:784.97 8" PVC
INV OUT: 784.97 24" PVC

20LF 8" PVC @ 3.00%

1-10" 45° BEND
INV OUT:784.11 10" PVC
7LF 10" PVC @ 1.00%

CONNECT TO CISTERN OVERFLOW
INV OUT:784.18 10" PVC

19LF 8" PVC @ 3.00%

1-8" 45° BEND
INV OUT:785.28 8" PVC

21LF 8" PVC @ 3.00%

FL:785.91

1-18" 45° BEND
INV OUT:785.86 10" PVC
11LF 10" PVC @ 1.00%

1-18" 45° BEND
INV OUT:785.96 10" PVC
7LF 10" PVC @ 1.01%

90LF 10" PVC @ 1.00%
STORM LINE A

1-8" 45° BEND
INV OUT:785.57 8" PVC
21LF 8" PVC @ 3.00%

FL:786.19

CONNECT TO CISTERN OVERFLOW
INV OUT:786.03 10" PVC

40LF 12" PVC @ 1.20%

NEW 4'X4' AREA INLET - (1571)
RIM:786.51
INV IN:781.89 24" RCP
INV IN:781.89 12" RCP
INV OUT:781.89 24" RCP

1-45° BEND
INV OUT:785.46 12" PVC
9LF 12" PVC @ 1.20%

1-12"X12"X12" WYE
INV OUT:784.99 12" PVC

12LF 12" PVC @ 1.20%

1-12" 45 ° BEND
INV OUT:784.85 12" PVC

7LF 12" PVC @ 1.20%

1-12"X12"X8" WYE
INV OUT:784.55 12" PVC

NEW 10' CURB INLET - (1574)
RIM:788.63
INV OUT:785.63 12" RCP

66LF 12" RCP @ 5.71%

788.66

9LF 12" PVC @ 3.06%
1-12" 45° BEND
INV OUT:781.90 12" PVC

27LF 24" RCP @ 0.91%

1-24"X24"X12" WYE
INV OUT:781.65 24" RCP

69LF 12" PVC @ 3.06%

NEW 3'X3' AREA INLET - (1554)
RIM:787.57
INV IN:784.00 12" PVC
INV OUT:784.00 12" PVC

30LF 12" PVC @ 1.00%

1-12"X12"X8" WYE
INV OUT:784.29 12" PVC

4LF 8" PVC @ 3.00%

CONNECT TO DOWNSPOUT
INV OUT:784.52 8" PVC

26LF 12" PVC @ 1.00%

5LF 8" PVC @ 3.00%

1-8" 45° BEND
INV OUT:784.68 8" PVC

CONNECT TO CISTERN OVERFLOW
INV OUT:783.45 8" PVC

CONNECT TO DOWNSPOUT
INV OUT:784.79 8" PVC
4LF 8" PVC @ 90.14%

CONNECT TO CONDENSATION SUMP PUMP

34LF 8" PVC @ 4.27%

NEW 5' STORM MH - (1542)
RIM:785.36
INV IN:780.36 24" RCP
INV OUT:780.36 30" RCP

1-4'X4' AREA INLET - (1572)
RIM:785.01
INV IN:782.01 8" PVC
INV OUT:782.01 12" RCP

27LF 12" RCP @ 6.51%

185LF 30" RCP @ 0.55%

STORM LINE B

34LF 18" RCP @ 1.00%

CG502
SPLITTER BOX

NEW 5' STORM MH - (1429)
RIM:785.25
INV IN:779.98 30" RCP
INV OUT:779.98 30" RCP

NEW 10' CURB INLET-(1511)
RIM: 783.05
INV OUT:780.65 18" RCP

6'X6' JUNCTION BOX WITH MH COVER - (1428)
RIM:784.96
INV IN:780.31 30" RCP
INV IN:780.31 18" RCP
INV IN:780.31 12" RCP
INV OUT:780.31 30" RCP

NEW 10' CURB INLET-(1502)
RIM:785.76
INV IN: 781.32 18" RCP
INV OUT: 781.32 18" RCP

NEW 20' CURB INLET-(1501)
RIM:785.62
INV OUT:781.71 18" RCP

78LF 18" RCP @ 0.50%

6'X6' JUNCTION BOX WITH MH COVER - (1426)
RIM:786.01
INV IN:781.15 30" RCP
INV IN:781.15 8" PVC
INV IN:781.15 18" RCP
INV OUT:781.15 30" RCP
INV OUT:782.95 8" PVC

148LF 24" RCP @ 0.91%
STORM LINE A

90LF 24" RCP @0.91%

22LF 8" PVC @ 3.00%
FL:783.35

14LF 8" PVC @ 3.00%

1-8" 45° BEND
INV OUT:783.35 8" PVC

FL:783.56

8LF 8" PVC @ 3.00%
FL:782.93

1-8" 45° BEND
INV OUT:782.71 8" PVC

1-8" 45° BEND
INV OUT:782.59 8" PVC

FL:782.81

8LF 8" PVC @ 3.00%

1-30" 45° BEND
INV OUT:781.59 30" RCP

18LF 30" RCP @ 0.50%

19LF 8" PVC @ 11.35%

1-30"X30"X8" WYE
INV OUT:781.50 30" RCP

15LF 30" RCP @ 0.50%

1-30" 45° BEND
INV OUT:781.30 30" RCP

55LF 30" RCP @ 0.50%

22LF 12" PVC @ 2.64%

18LF 12" PVC @ 2.64%

17LF 18" PVC @ 2.64%

1-18" 45° BEND
INV OUT:783.10 18" PVC

NEW 4'X4' AREA INLET - (1458)
RIM:787.11
INV OUT:783.02 24" RCP

151LF 12" FRENCH DRAIN @ 2.65%

11LF 12" PVC @ 2.63%
11LF 12" PVC @ 8.29%
FL:785.58

APPX. 190LF 12" FRENCH DRAIN @ 1.85%

9LF 24" RCP @ 1.00%
1-18" WYE
INV OUT:782.93 24" RCP
14LF 24" RCP @ 1.00%
1-18" 45° BEND
INV OUT:782.80 24" RCP

STORM LINE B

FL:784.73
FL:784.46
FL:784.62
FL:784.00

NEW 3'X3' AREA INLET - (1411)
RIM:788.44
INV IN:783.00 18" PVC
INV OUT:783.00 24" RCP

15LF 24" RCP @ 0.50%
FL:783.08

34LF 24" RCP @ 0.50%

APPX. 246LF 12" FRENCH DRAIN @ 2.35%

1-8" 45° BEND
INV OUT:782.90 8" PVC
10LF 8" PVC @ 3.00%
FL:783.19

1-8" 45° BEND
INV OUT:782.90 8" PVC
7LF 8" PVC @ 3.00%
FL:783.09

49LF 18" RCP @ 1.00%

NEW 10' CURB INLET
RIM: 787.19
INV IN:783.14 18" RCP
INV OUT:783.14 18" RCP

16LF 8" PVC @ 3.00%

17LF 30" RCP @ 0.50%

1-30"X30"X6" WYE
INV OUT:785.42 30" RCP

32LF 30" RCP @ 0.50%

1-12"X12"X8" WYE
INV OUT:782.74 12" PVC

16LF 12" PVC @ 3.00%

1-30"X30"X6" WYE
INV OUT:782.26 30" RCP

24LF 30" RCP @ 0.50%

19LF 8" PVC @ 3.00%

1-30"X30"X6" WYE
INV OUT:782.14 30" RCP

25LF 30" RCP @ 0.50%

19LF 8" PVC @ 3.00%

1-30"X30"X6" WYE
INV OUT:782.02 30" RCP

9LF 30" RCP @ 0.50%

58LF 18" RCP @ 1.00%

NEW 10' CURB INLET
RIM:787.29
INV OUT:783.72 18" RCP

46LF 18" RCP @ 0.50%

1-18" 45° BEND
INV OUT:782.16 18" RCP

10LF 18" RCP @ 0.50%

1-18" 45° BEND
INV OUT:782.11 18" RCP

27LF 18" RCP @ 0.50%

NEW 10' CURB INLET
RIM:786.19
INV OUT:782.38 18" RCP

6'X6' JUNCTION BOX WITH MH COVER - (1422)
RIM:786.80
INV IN:781.98 30" RCP
INV IN:781.98 18" RCP
INV OUT:781.98 30" RCP

EXISTING 36"X24" ARCH PIPE
FL 781.60

L=301.868, R=1712.300
Δ=10.1009
CH B:N82° 42' 09"W
CH L:301.48

100 YEAR FLOOD PLAIN ZONE X SHADED

N62° 45' 41.72"W 200'±

RALPH SOWTER SURVEY NO. 20

C.H. HUNT SURVEY NO. 21

4" MINIMUM DEPTH SANDY LOAM MIXTURE AS CALLED IN SPECIFICATIONS

NATURAL GROUND

FOR INTERCEPTOR DRAINS NOT UNDER BUILDING BACK FILL SHALL CONSIST OF CLEAN WAHSED ASTM C33 COURSE SAND

SELECT COMPACTED BACKFILL SEE SPECS FOR UNDER BUILDING REQUIREMENTS

CLEAN WASHED GRAVEL MEETING THE GRADATION REQUIREMENTS OF ASTM C33 GRADE 57

SEE PLAN FOR PIPE SIZE PIPE SHOULD BE PERFORATED WITH ¼" SIZED HOLES SPACE 6" APART

UNDISTURBED EARTH

WRAPPED WITH FILTER FABRIC MIRAFI 14N OR EQUIVALENT

DEPTH VARIES TO NATURAL GROUND MIN. DEPTH 6" BELOW GRADE BEAM

PIPE O.D. + 18"

PIPE O.D. + 24" MIN.
PIPE O.D. + 36" MAX.

INTERCEPTOR DRAIN DETAIL

2 CN101 NOT TO SCALE

STORM SEWER NOTES:

1. 6'X6' JUNCTION BOX WITH MH COVER - (1417)
   RIM:787.71
   INV IN:782.50 18" PVC
   INV IN:782.50 18" RCP
   INV OUT:782.50 30" RCP

STORM SEWER PLAN

1 CN101 SCALE: 1"=30'

N

30 0 30 60
SCALE: 1" = 30'

SHWGROUP
ARCHITECTS | ENGINEERS | PLANNERS

Consultants:
CIVIL:
Gil Engineering Associates, Inc.
CONSULTING ENGINEERS – SURVEYORS
PLANNERS – DESIGNERS

100% CD REVIEW SET

COMAL INDEPENDENT SCHOOL DISTRICT

COMAL ISD

FM 306 ELEMENTARY
CANYON LAKE . TX

CHECKED: Checker
SCALE:

ISSUE: March 16, 2012

SECOND FLOOR

A B
A B
D C

KEY PLAN (NTS)

SHEET TITLE:
STORM SEWER PLAN

TCEQ-R13

CN101

SHW Project: 4310.009.00

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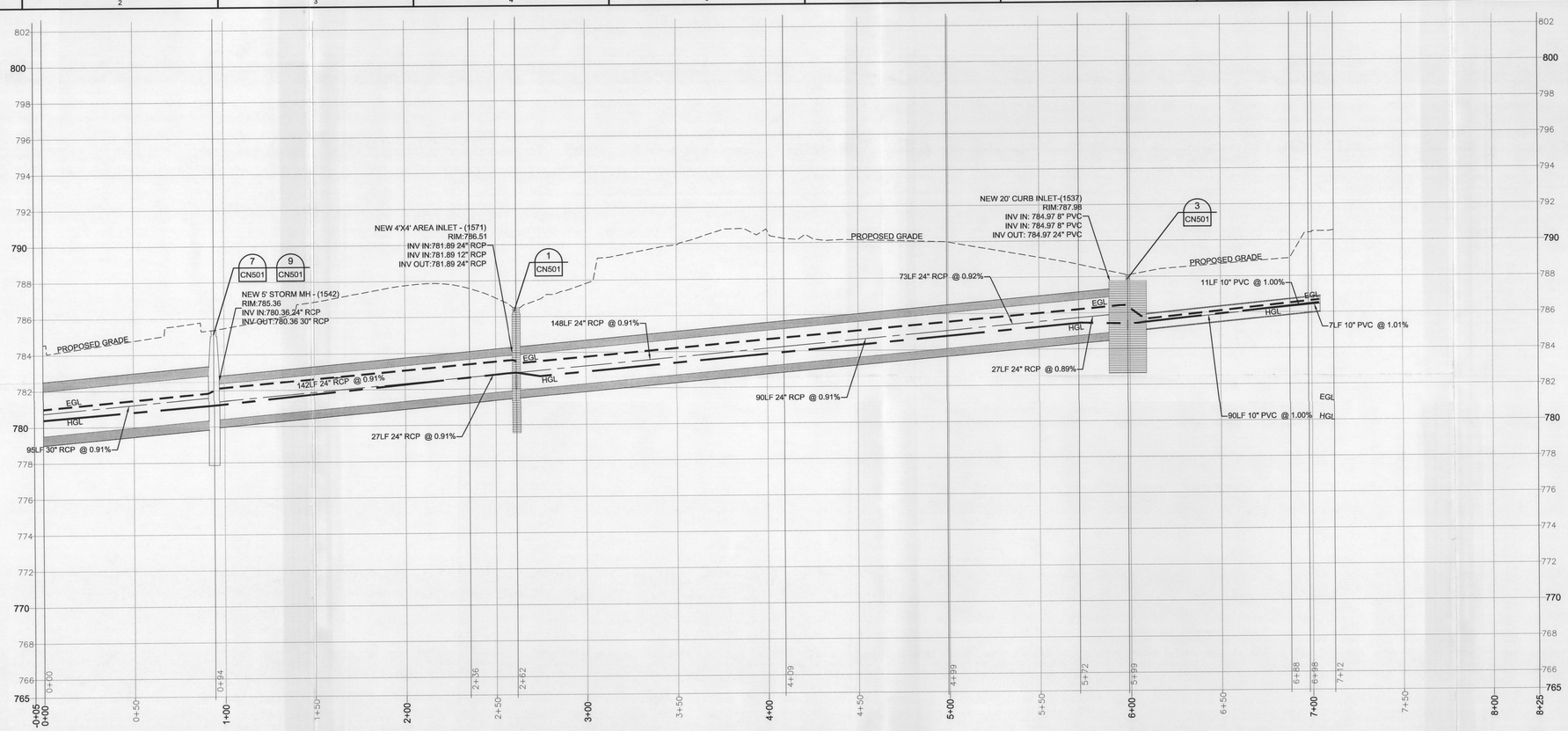
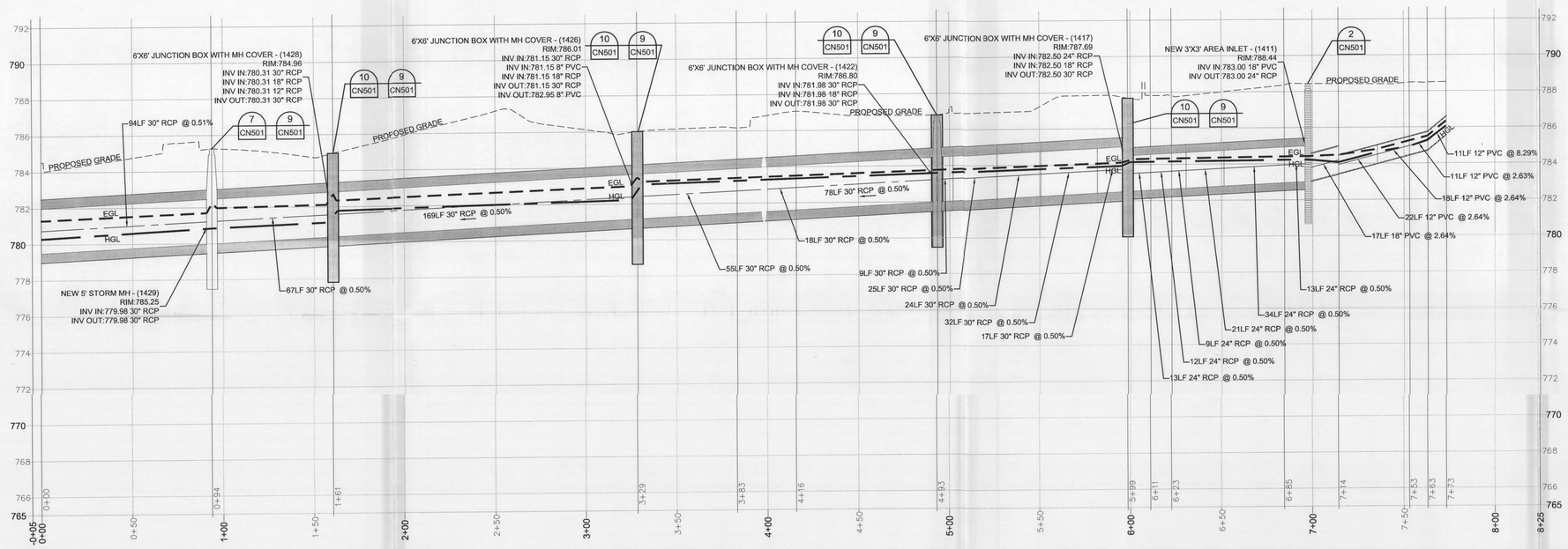


STORM LINE A

1 / CN102

STORM LINE A
HORIZONAL SCALE: 1"=30'
VERTICAL SCALE: 1"=3'



STORM LINE B
HORIZONAL SCALE: 1"=30'
VERTICAL SCALE: 1"=3'

STORM LINE B

2 / CN102

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ARCHITECTS | ENGINEERS | PLANNERS

Consultants:
CIVIL:
Gil Engineering Associates, Inc.
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FM 306 ELEMENTARY
CANYON LAKE . TX

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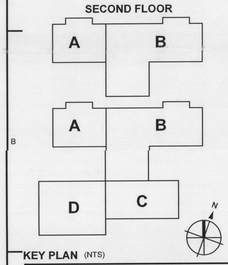
SCALE:

ISSUE: March 16, 2012

SECOND FLOOR



KEY PLAN (NTS)

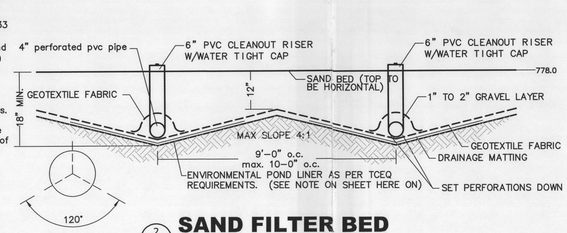
SHEET TITLE:
PIPE NETWORK PROFILES

TCEQ-R13

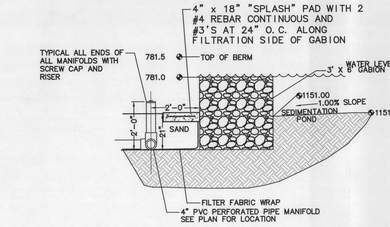
CN102

SHW Project: 4310.009.00

SAND AND GRAVEL SPECIFICATION
The top layer is to be a minimum of eighteen (18) inches of 0.02-0.04 inch diameter sand which corresponds with ASTM C-33 concrete sand (smaller sand size is not acceptable). Under the sand shall be a layer of one-half (0.5) to one and one-half (1.5) inch diameter washed, rounded, river gravel which provides a minimum of two inches of cover over the top of the underdrain lateral pipes. The sand and gravel must be separated by a layer of geotextile fabric meeting the specifications of the TCEQ.

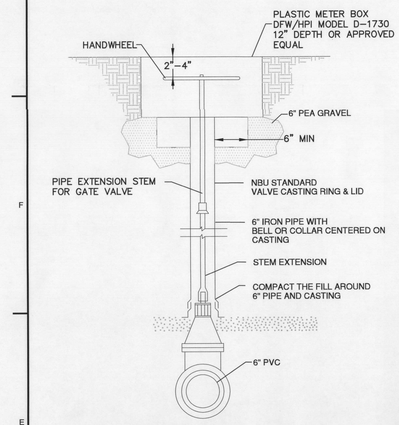


2 SAND FILTER BED
CG102 NOT TO SCALE

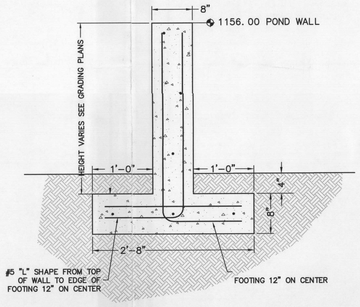


3 3'X6' POND GABION DIVIDER
CG102 NOT TO SCALE

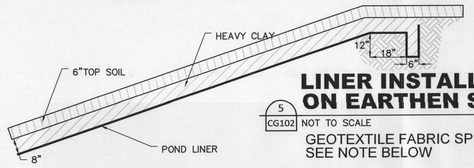
Material Specifications
A. Gabion mats shall be made from heavily zinc coated (galvanized) steel wire woven into a double twist pattern with an opening of 3" by 4" and shall be manufactured by Terra Aqua as Supplied by Southern Erosion Control (512) 385-6900. Gabions for compartment divider shall be 3' wide by 3' high with a nominal length of 6', 9' or 12' to make up the necessary length. Gabion rock shall consist of crushed stone with a minimum specific gravity of 2.25 and a percent of wear not greater than 30 when tested by ASTM C131. Rock shall be 5" to 8" dia. hand placed at surfaces of the gabion mat.



10 6" SHUT OFF VALVE
CG102 NOT TO SCALE



4 DETENTION/ WATER QUALITY WALL
CG102 NOT TO SCALE



5 LINER INSTALLATION ON EARTHEN SLOPE
CG102 NOT TO SCALE

GEOTEXTILE FABRIC SPECIFICATIONS SEE NOTE BELOW

6 LINER INSTALLATION PRIOR TO CONCRETE POUR
CG102 NOT TO SCALE

POND LINER TO BE PLACED UNDER ENTIRE POND AND TO EXTEND FROM WALL TO WALL

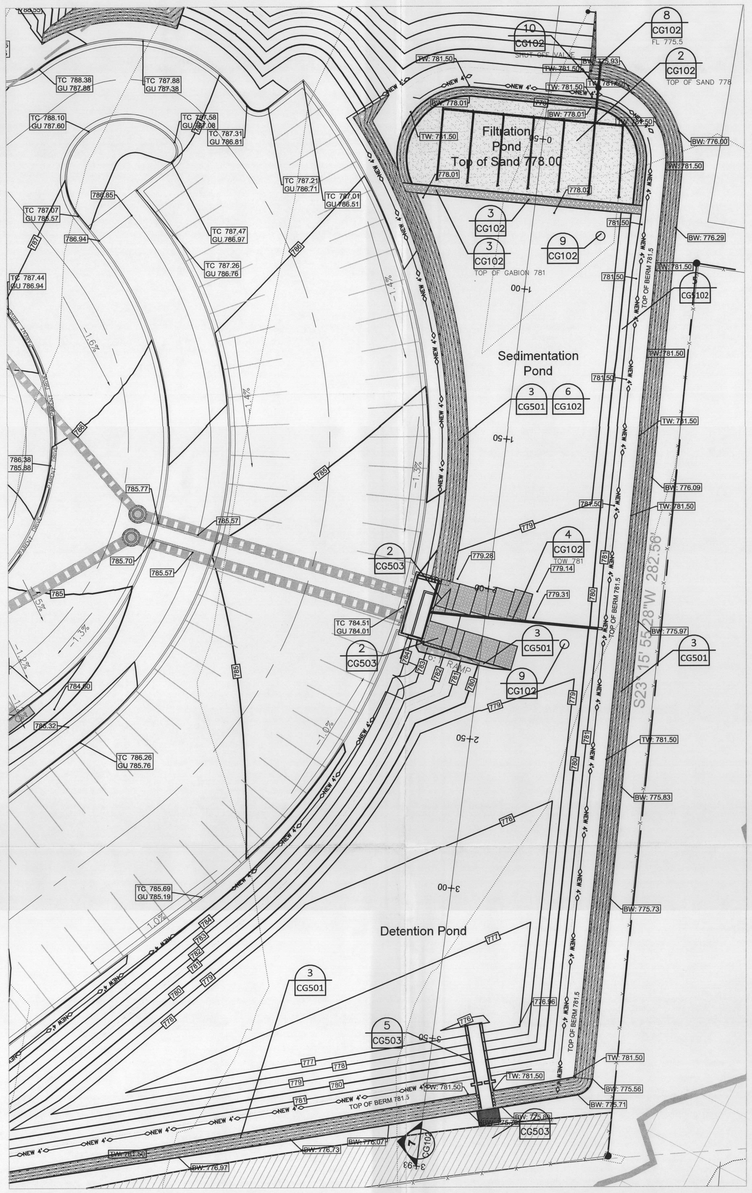
IMPERMEABLE LINER NOTES:

1. AN IMPERMEABLE LINER IS REQUIRED FOR THE ENTIRE ENVIRONMENTAL (SEDIMENTATION/FILTRATION) POND. THE GEOMEMBRANE IMPERMEABLE LINER SHALL BE THICKNESS OF 30 MILS AND BE ULTRAVIOLET RESISTANT. SUITABLE GEOTEXTILE FABRIC SHOULD BE PLACED ON THE TOP AND BOTTOM OF THE MEMBRANE FOR PUNCTURE PROTECTION AND THE LINERS COVERED WITH A MINIMUM OF 6 INCHES OF COMPACTED TOPSOIL. THE GEOTEXTILE FABRIC (FOR PROTECTION OF GEOMEMBRANE) SHOULD BE NONWOVEN GEOTEXTILE FABRIC AND MEET THE FOLLOWING SPECIFICATIONS.

PROPERTY	TEST METHOD	UNIT	SPEC. (MIN)
Unit Weight	ASTM D-5261	oz/yd^2	8
Filtration Rate	ASTMD-4491	cm/sec	0.20
Puncture Strength	ASTM D-4833	lb	125
Mullen Burst Strength	ASTM D-3786	psi	400
Tensile Strength	ASTM D-4632	lb	200
Equiv. Opening Size	US Standard Sieve	No.	80

2. ALL THE TOPSOIL SHOULD BE STABILIZED WITH APPROPRIATE VEGETATION.

3. NO ROCKS OR PROTRUSIONS OF ANY KIND WILL BE ALLOWED ON THE ENTIRE CONTACT AREA OF POND WITH GEOMEMBRANE LINER. THE GEOMEMBRANE LINER WITH ITS GEOTEXTILE FABRIC ON TOP AND BOTTOM SHALL BE PLACED A MINIMUM OF 6" BELOW THE FINISH GRADES SHOWN AND EXTEND UP TO THE INSIDE VERTICAL FACE OF THE WALL. A MINIMUM OF 6" COMPACTED TOPSOIL IS REQUIRED OVER THE ENTIRE GEOMEMBRANE LINER TO THE FINISHED GRADES SHOWN HERE. THE INSTALLED LINER SHALL HAVE NO LEAKS WHEN TESTED AFTER PLACEMENT IN A MANNER APPROVED BY LINER MANUFACTURER. ANY LEAKS FOUND SHALL BE REPAIRED IN A MANNER ACCEPTABLE TO THE POND LINER MANUFACTURER AND THE TCEQ AND RETESTED FOR NO LEAKS.



1 SEDIMENTATION / FILTRATION / DETENTION POND PLAN
CG102 1" = 20'

Sedimentation Pond STAGE STORAGE TABLE				
ELEV	AREA (sq. ft.)	DEPTH (ft)	AVG END INC. VOL. (cu. ft.)	AVG END TOTAL VOL. (cu. ft.)
778	0	N/A	N/A	0.00
779	4909	1.000	2455	2455
780	7308	1.000	6109	8563
781	7945	1.000	7627	16190

Filtration Pond STAGE STORAGE TABLE				
ELEV	AREA (sq. ft.)	DEPTH (ft)	AVG END INC. VOL. (cu. ft.)	AVG END TOTAL VOL. (cu. ft.)
778	2164	N/A	N/A	0.00
779	2293	1.000	2228	2228
780	2425	1.000	2359	4587
781	2562	1.000	2493	7081

Detention Pond STAGE STORAGE TABLE				
ELEV	AREA (sq. ft.)	DEPTH (ft)	AVG END INC. VOL. (cu. ft.)	AVG END TOTAL VOL. (cu. ft.)
775.92	0	N/A	N/A	0.00
776	44	1.000	2	2
777	2202	1.000	1123	1125
778	7367	1.000	4785	5909
779	10934	1.000	9150	15060
780	13565	1.000	12250	27309
781	15375	1.000	14470	41779

Total Volume Sedimentation / Filtration	
Sedimentation Pond Total Volume (cf)	16190
Filtration Pond Total Volume (cf)	7,081
Total Water Quality Volume in Sed /Fil Pond (cf)	23,270.1
Total Capture Volume WQV *1.20 from TCEQ Calc Sheet	22,976.0
Additional Storage (cf)	294

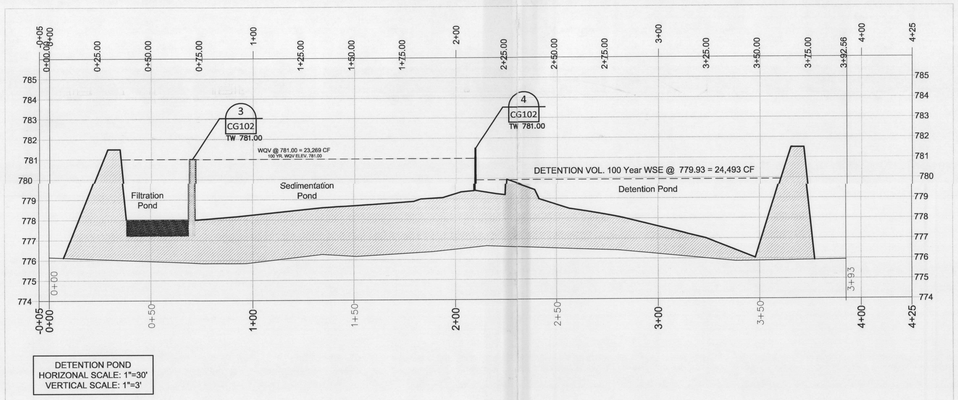
Filtration Pond Area Requirement	
Partiail Filtration Pond Minimum Filter Basin Area from TCEQ Calc Sheet	1,915
Fiiltration Pond Area (sf)	2164
Additional Filter Area (sf)	249

Required Splitter Box Weir Length

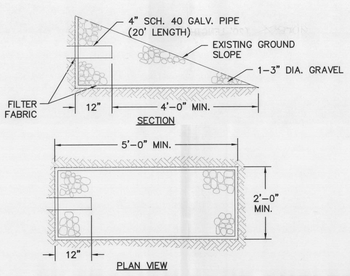
Formula	$Q = 3.8 \times L \times H^{3/2}$	
Length of Weir Reqd. (ft)	19.02	
Allowable Flows (cfs)		Design Height (ft)
Q_{100}	45.53	0.50

Rip Rap Length

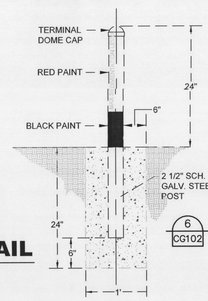
Formula	L=1.7d*Q/D^2.5+8
d	2.50
D	2.50
Flows (cfs)	Riprap Length
15.53	14.68



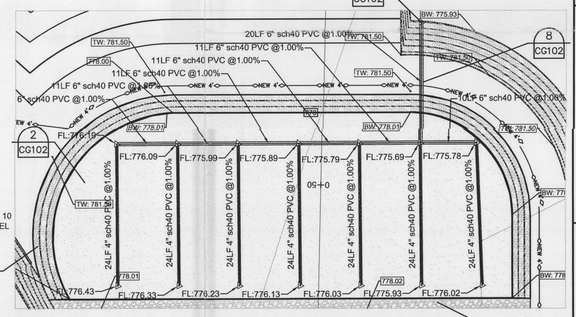
7 PARTIAL FILTRATION DEDIMENTATION POND AND DENTION POND
CG102 SCALE: 1"=30'



8 FILTRATION POND OUTLET DETAIL
CG102 NOT TO SCALE



9 SEDIMENT DEPTH MARKER
CG102 NOT TO SCALE



10 FILTRATION POND DETAIL
CG102 1" = 10'

SHW GROUP
ARCHITECTS | ENGINEERS | PLANNERS

Consultants:
CIVIL:
Gil Engineering Associates, Inc.
CONSULTING ENGINEERS – SURVEYORS
PLANNERS – DESIGNERS

100% CD REVIEW SET

COMAL INDEPENDENT SCHOOL DISTRICT

COMAL ISD

FM 306 ELEMENTARY CANYON LAKE . TX

CHECKED: Checker
SCALE:

ISSUE: March 16, 2012

SECOND FLOOR
A B
A B
D C

KEY PLAN (NTS)

SHEET TITLE:
SEDIMENTATION, FILTRATION AND DETENTION POND PLAN

TCEQ-R13
APR 13 2012
SAN ANTONIO

CG102

SHW Project: 4310.009.00

8/19/2011 3:36 PM
S:\Projects\Comal ISD\FM 306 ES\Bidding Documents\Grading Sheets.dwg

Inspection, Maintenance, Repair and Retrofit Plan

Sedimentation Basins

Monthly: The vegetative growth in the basin shall be checked. The growth shall not exceed 18 inches in height.

Quarterly: The level of accumulated silt shall be checked. If depth of silt exceeds 6 inches, it shall be removed and disposed of "properly" and in an "approved" location.

The basin shall be checked for accumulation of debris and trash. The debris and trash shall be removed if excessive. All debris and trash shall be removed at least every six months.

Annually: The basin shall be inspected for structural integrity and repaired if necessary.

After Rainfall: The basin shall be checked after each rainfall occurrence to insure that it drains within 48 hours after the storm is over. If it does not drain within this time, corrective maintenance will be accomplished.

Filtration Basins

Monthly: The vegetative growth in the basin shall be checked. The growth shall not exceed 18 inches in height.

Quarterly:

The accumulation of pollutants/oils shall be checked. If the pollutants have significantly reduced the designed capacity of the sand filter, the pollutants shall be removed.

The level of accumulated silt shall be checked. If depth of silt/pollutants exceeds 1/2 inch, it shall be removed and disposed of "properly" and in an "approved" location.

The basin shall be checked for accumulation of debris and trash. The debris and trash shall be removed if excessive. All debris and trash shall be removed at least every six months.

Annually: The basin shall be inspected for structural integrity and repaired if necessary. Filter underdrain piping network shall be cleaned to remove sediment buildup.

ATTACHMENT N
Inspection, Maintenance, Repair and Retrofit Plan

After Rainfall: The basin shall be checked after each rainfall occurrence to insure that it drains within 48 hours. If it does not drain within this time, corrective maintenance will be accomplished.

Following any required maintenance, the surface of the filtration basin shall be raked and leveled to restore the system to it designed condition.

"Proper" disposal of accumulated silt shall be accomplished following Texas Commission on Environmental Quality and City of New Braunfels / Comal County guidelines and specifications.

An amended copy of this document will be provided to the Texas Commission on Environmental Quality within thirty (30) days of any changes in the following information

Responsible Party:	Thomas Bloxham
Entity	Comal Independent School District
Mailing Address	1404 IH 35 North
City, State, Zip Code	New Braunfels, Texas 78130
Telephone:	(830) 221-2039

Signature of Responsible Party

2-7-12
Date

ATTACHMENT N
Inspection, Maintenance, Repair and Retrofit Plan

MEASURES FOR MINIMIZING SURFACE STREAM CONTAMINATION

Gabion mats will be placed at ends of pipes to minimize surface stream contamination and minimize any changes in the way water enters a stream.

All measures were designed and included in accordance with the Comal County guidelines and requirements for minimizing surface stream contamination.

ATTACHMENT P

Measures for Minimizing Surface Stream Contamination

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

REGULATED ENTITY NAME: Comal ISD FM 306 Elementary School

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

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

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

2. ✓ **ATTACHMENT A - Spill Response Actions**. A description of the measures to be taken to contain any spill of hydrocarbons or hazardous substances is provided at the end of this form.

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

4. ✓ **ATTACHMENT B - Potential Sources of Contamination.** Describe in an attachment at the end of this form any other activities or processes which may be a potential source of contamination.
__ The are no other potential sources of contamination.

SEQUENCE OF CONSTRUCTION

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

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

TEMPORARY BEST MANAGEMENT PRACTICES (TBMPs)

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

7. ✓ **ATTACHMENT D - Temporary Best Management Practices and Measures.** A description of the TBMPs and measures that will be used during and after construction are provided at the end of this form. For each activity listed in the sequence of construction, include appropriate control measures and the general timing (or sequence) during the construction process that the measures will be implemented.

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

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

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

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

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

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

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

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

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

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

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

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

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

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

11. n/a **ATTACHMENT H - Temporary Sediment Pond(s) Plans and Calculations.** Temporary sediment pond or basin construction plans and design calculations for a proposed temporary BMP or measure has been prepared by or under the direct supervision of a Texas Licensed Professional Engineer. All construction plans and design information must be signed, sealed, and dated by the Texas Licensed Professional Engineer. Construction plans for the proposed temporary BMPs and measures are provided as at the end of this form.

12. ✓ **ATTACHMENT I - Inspection and Maintenance for BMPs.** A plan for the inspection of temporary BMPs and measures and for their timely maintenance, repair, and, if necessary, retrofit is provided at the end of this form. A description of documentation procedures and recordkeeping practices is included in the plan.

13. ✓ All control measures must be properly selected, installed, and maintained in accordance with the manufacturers specifications and good engineering practices. If periodic inspections by the applicant or the executive director, or other information indicates a control has been used inappropriately, or incorrectly, the applicant must replace or modify the control for site situations.

14. ✓ If sediment escapes the construction site, off-site accumulations of sediment must be removed at a frequency sufficient to minimize offsite impacts to water quality (e.g., fugitive sediment in street being washed into surface streams or sensitive features by the next rain).

15. ✓ Sediment must be removed from sediment traps or sedimentation ponds not later than when design capacity has been reduced by 50%. A permanent stake will be provided that can indicate when the sediment occupies 50% of the basin volume.

16. ✓ Litter, construction debris, and construction chemicals exposed to stormwater shall be prevented from becoming a pollutant source for stormwater discharges (e.g., screening outfalls, picked up daily).

SOIL STABILIZATION PRACTICES

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

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

18. ✓ Records must be kept at the site of the dates when major grading activities occur, the dates when construction activities temporarily or permanently cease on a portion of the site, and the dates when stabilization measures are initiated.

19. ✓ Stabilization practices must be initiated as soon as practicable where construction activities have temporarily or permanently ceased.

ADMINISTRATIVE INFORMATION

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

21. ✓ If any geologic or manmade features, such as caves, faults, sinkholes, etc., are discovered, all regulated activities near the feature will be immediately suspended. The appropriate TCEQ Regional Office shall be immediately notified. Regulated activities must cease and not continue until the TCEQ has reviewed and approved the methods proposed to protect the aquifer from any adverse impacts.

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

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

THOMAS BLUXHAM FOR COMAL ISD
Print Name of Customer/Agent

Signature of Customer/Agent

2-7-12
Date

SPILL RESPONSE ACTIONS

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

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

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

(4) Train employees in spill prevention and cleanup.

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

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

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

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

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

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

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

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

Cleanup

(1) Clean up leaks and spills immediately.

(2) Use a rag for small spills on paved surfaces, a damp mop for general cleanup, and absorbent material for larger spills. If the spilled material is

hazardous, then the used cleanup materials are also hazardous and must be disposed of as hazardous waste.

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

Minor Spills

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

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

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

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

(5) Contain the spread of the spill.

(6) Recover spilled materials.

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

Semi-Significant Spills

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

Spills should be cleaned up immediately:
(1) Contain spread of the spill.

(2) Notify the project foreman immediately.

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

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

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

Significant/Hazardous Spills

For significant or hazardous spills that are in reportable quantities:

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

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

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

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

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

ATTACHMENT A
Spill Response Actions

POTENTIAL SOURCES OF CONTAMINATION

Potential sources of contamination at the site include:

- Placement of asphalt, emulsions, or coatings for asphaltic pavement surfaces.
- Oil and other engine fluids from vehicles and equipment during and after construction.
- Short-term storage of road flexible base material, asphaltic products, pipe bedding materials, and miscellaneous soils, gravel, etc.
- Possible littering around the construction site.
- Short term exposure of soil surfaces during construction and prior to stabilization.
- Short term storage and use of fertilizers for use in establishing vegetation.

All activities will be conducted in a manner to minimize the potential for impact to the environment.

ATTACHMENT B
Potential Sources of Contamination

SEQUENCE OF MAJOR ACTIVITIES

A. After the acquisition of all required permits, notify the environmental inspector for a pre-construction conference 3 days in advance.

B. Install the temporary erosion / sedimentation controls. Erosion / Sedimentation controls rock berm, silt fence, and construction entrance, will be installed according to the plan. (10% site disturbed)

C. Demolition and rough grading including rough grading of the pond as a sediment trap.(85% site disturbed)

D. Construction of building and appurtenances. (85% site disturbed)

E. Placement of parking surface matching new grade. (60% site disturbed)

F. Check existing permanent erosion controls. Ensure that existing permanent erosion controls are in good working order. (50% site disturbed)

G. Obtain concurrence letter from engineer, and the final inspection will be scheduled upon receipt of the letter.

H. Remove temporary erosion controls after acceptance of the existing permanent controls.

ATTACHMENT C
Sequence of Major Activities

TEMPORARY BEST MANAGEMENT PRACTICES AND MEASURES

A. BMP and measures will prevent pollution of surface water, groundwater or storm water that originates up gradient from the site and flows across the site by diverting the up gradient storm water from the construction site. Upgradient stormwater will be diverted through an existing storm sewer system and through existing concrete and grass channels to rock berms and silt fences that shall be placed to prevent pollution of surface water, groundwater or storm water.

B. BMP and measures will prevent pollution of surface water, groundwater or storm water that originates on-site or flows off site, including pollution caused by contaminated storm water runoff from the site. All other areas will have silt fences and rock berms to prevent pollution of surface water, groundwater or storm water that originates on-site or flows off site, including pollution caused by contaminated storm water runoff from the site. Areas that will not have soil disturbance shall be left with its natural ground cover. The contractor shall not abrade any areas outside the limits of construction (LOC).

C. Silt fences and rock berms shall be placed to prevent pollutants from entering surface streams, sensitive features or the aquifer. There are no sensitive features located on this site at this time by the geologic assessment.

D. Silt fences and rock berms placed on site will be maintained according to the maintenance schedule. This will maintain flow to naturally occurring sensitive features identified in either the geologic assessment, TCEQ inspections, or during excavation, blasting, or construction. There are no sensitive features located on this site at this time by the geologic assessment.

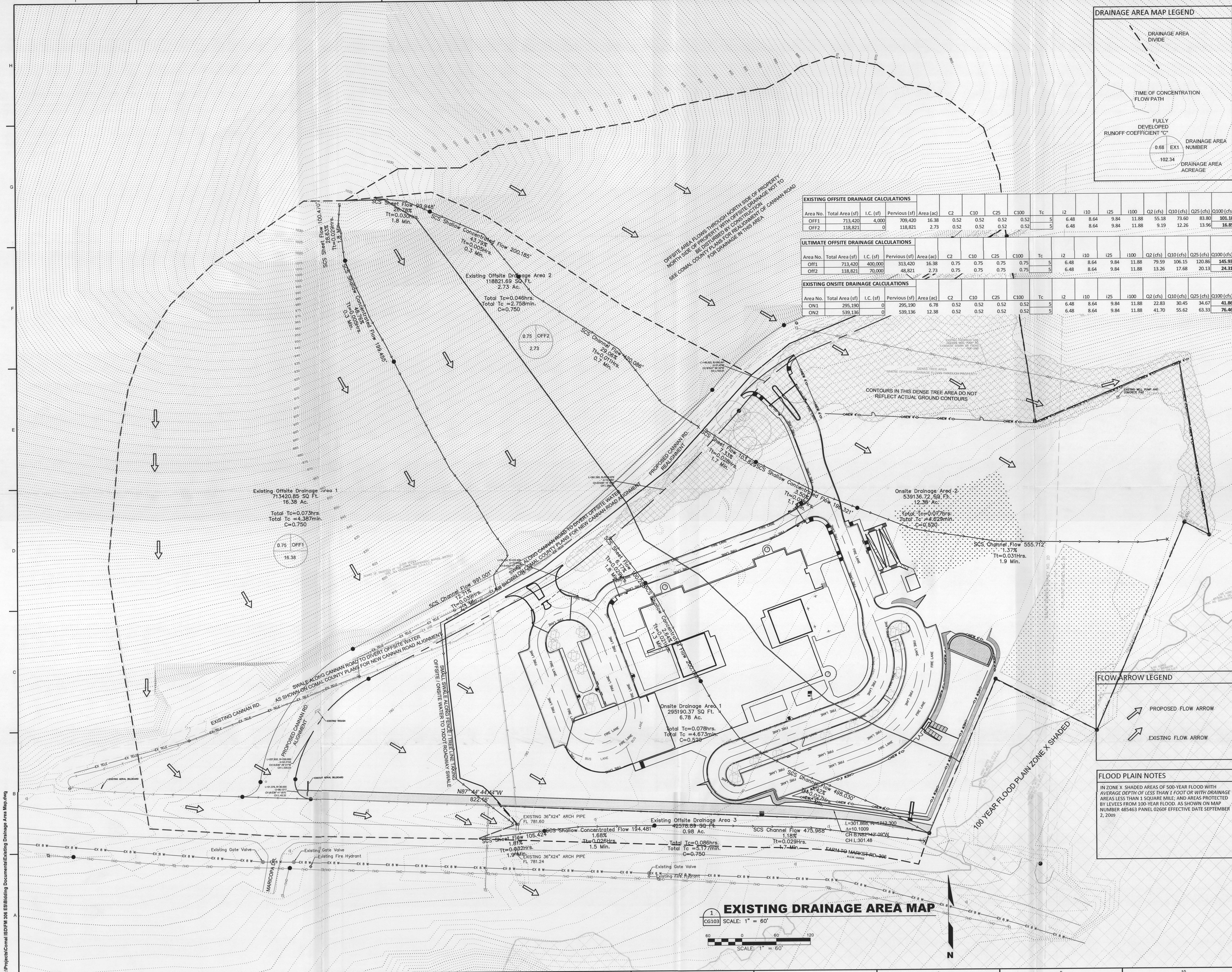
ATTACHMENT D

Temporary Best Management Practices and Measures

STRUCTURAL PRACTICES

Before construction, silt fence will be placed to store flows and to limit runoff discharge of pollutants from exposed areas of the site. Rock berm will be placed to divert flows away from exposed soils and to limit runoff discharge of pollutants. Placement of structural practices in floodplains has been avoided. There is no silt fence or rock berm placed in any flood plain.

ATTACHMENT F
Structural Practices


DRAINAGE AREA MAP LEGEND
DRAINAGE AREA DIVIDE
TIME OF CONCENTRATION FLOW PATH
FULLY DEVELOPED RUNOFF COEFFICIENT "C"
0.68
EX1
102.34
DRAINAGE AREA NUMBER
DRAINAGE AREA ACREAGE
OFFSITE AREA FLOWS THROUGH NORTH SIDE OF PROPERTY. NORTH SIDE OF PROPERTY WITH OFFSITE DRAINAGE NOT TO BE DISTURBED BY CONSTRUCTION. SEE COMAL COUNTY PLANS FOR REALIGNMENT OF CANNAN ROAD FOR DRAINAGE IN THIS AREA
Existing Offsite Drainage Area 2
118821.69 SQ Ft.
2.73 Ac.
Total Tc=0.046hrs.
Total Tc =2.758min.
C=0.750
0.75
OFF2
2.73
Existing Offsite Drainage Area 1
713420.85 SQ Ft.
16.38 Ac.
Total Tc=0.073hrs.
Total Tc =4.387min.
C=0.750
0.75
OFF1
16.38
SCS Sheet Flow 93.948'
SCS Shallow Concentrated Flow 200.185'
SCS Channel Flow 400.086'
SCS Shallow Concentrated Flow 199.455'
SCS Channel Flow 991.001'
CONTOURS IN THIS DENSE TREE AREA DO NOT REFLECT ACTUAL GROUND CONTOURS
Onsite Drainage Area 2
539136.72 SQ Ft.
12.38 Ac.
Total Tc=0.077hrs.
Total Tc =4.629min.
C=0.520
SCS Channel Flow 555.712'
1.37%
Tt=0.031Hrs.
1.9 Min.
Onsite Drainage Area 1
295190.37 SQ Ft.
6.78 Ac.
Total Tc=0.078hrs.
Total Tc =4.673min.
C=0.520
SWALE ALONG CANNAN ROAD TO DIVERT OFFSITE WATER AS SHOWN ON COMAL COUNTY PLANS FOR NEW CANNAN ROAD ALIGNMENT
EXISTING CANNAN RD.
PROPOSED CANNAN RD. ALIGNMENT
PROPOSED CANNAN RD. REALIGNMENT
SMALL SWALE ALONG FENCE / TREE LINE TAKING OFFSITE / ONSITE WATER TO TXDOT ROADWAY SWALE
N87°44'44"W
822.16'
EXISTING 36"X24" ARCH PIPE FL 781.60
EXISTING 36"X24" ARCH PIPE FL 781.24
Existing Offsite Drainage Area 3
42576.83 SQ Ft.
0.98 Ac.
Total Tc=0.086hrs.
Total Tc =5.177min.
C=0.750
SCS Sheet Flow 105.424
SCS Shallow Concentrated Flow 194.481
1.68%
Tt=0.026Hrs.
1.5 Min.
SCS Channel Flow 475.968
1.18%
Tt=0.029Hrs.
1.7 Min.
SCS Channel Flow 498.030
FARM TO MARKET RD. 306
Existing Gate Valve
Existing Fire Hydrant
MARICOPA DR.
100 YEAR FLOOD PLAIN ZONE X SHADED
FIRE LANE
BUS LANE
FLOW ARROW LEGEND
PROPOSED FLOW ARROW
EXISTING FLOW ARROW

FLOOD PLAIN NOTES

IN ZONE X SHADED AREAS OF 500-YEAR FLOOD WITH *AVERAGE DEPTH OF LESS THAN 1 FOOT OR WITH DRAINAGE* AREAS LESS THAN 1 SQUARE MILE; AND AREAS PROTECTED BY LEVEES FROM 100-YEAR FLOOD. AS SHOWN ON MAP NUMBER 485463 PANEL 0260F EFFECTIVE DATE SEPTEMBER 2, 2009

EXISTING OFFSITE DRAINAGE CALCULATIONS

Area No.	Total Area (sf)	I.C. (sf)	Pervious (sf)	Area (ac)	C2	C10	C25	C100	Tc	i2	i10	i25	i100	Q2 (cfs)	Q10 (cfs)	Q25 (cfs)	Q100 (cfs)
OFF1	713,420	4,000	709,420	16.38	0.52	0.52	0.52	0.52	5	6.48	8.64	9.84	11.88	55.18	73.60	83.80	**101.18**
OFF2	118,821	0	118,821	2.73	0.52	0.52	0.52	0.52	5	6.48	8.64	9.84	11.88	9.19	12.26	13.96	**16.85**

ULTIMATE OFFSITE DRAINAGE CALCULATIONS

Area No.	Total Area (sf)	I.C. (sf)	Pervious (sf)	Area (ac)	C2	C10	C25	C100	Tc	i2	i10	i25	i100	Q2 (cfs)	Q10 (cfs)	Q25 (cfs)	Q100 (cfs)
Off1	713,420	400,000	313,420	16.38	0.75	0.75	0.75	0.75	5	6.48	8.64	9.84	11.88	79.59	106.15	120.86	**145.93**
Off2	118,821	70,000	48,821	2.73	0.75	0.75	0.75	0.75	5	6.48	8.64	9.84	11.88	13.26	17.68	20.13	**24.31**

EXISTING ONSITE DRAINAGE CALCULATIONS

Area No.	Total Area (sf)	I.C. (sf)	Pervious (sf)	Area (ac)	C2	C10	C25	C100	Tc	i2	i10	i25	i100	Q2 (cfs)	Q10 (cfs)	Q25 (cfs)	Q100 (cfs)
ON1	295,190	0	295,190	6.78	0.52	0.52	0.52	0.52	5	6.48	8.64	9.84	11.88	22.83	30.45	34.67	**41.86**
ON2	539,136	0	539,136	12.38	0.52	0.52	0.52	0.52	5	6.48	8.64	9.84	11.88	41.70	55.62	63.33	**76.46**

1 CG103 **EXISTING DRAINAGE AREA MAP**
SCALE: 1" = 60'

SHWGROUP
ARCHITECTS | ENGINEERS | PLANNERS

Consultants:
CIVIL:
Gil Engineering Associates, Inc.
CONSULTING ENGINEERS – SURVEYORS
PLANNERS – DESIGNERS

100% CD REVIEW SET

COMAL INDEPENDENT SCHOOL DISTRICT

COMAL ISD

FM 306 ELEMENTARY
CANYON LAKE . TX

CHECKED: Checker
SCALE:

ISSUE: March 16, 2012

SECOND FLOOR
A B
A B
D C
KEY PLAN (NTS)

SHEET TITLE:
EXISTING DRAINAGE AREA MAP

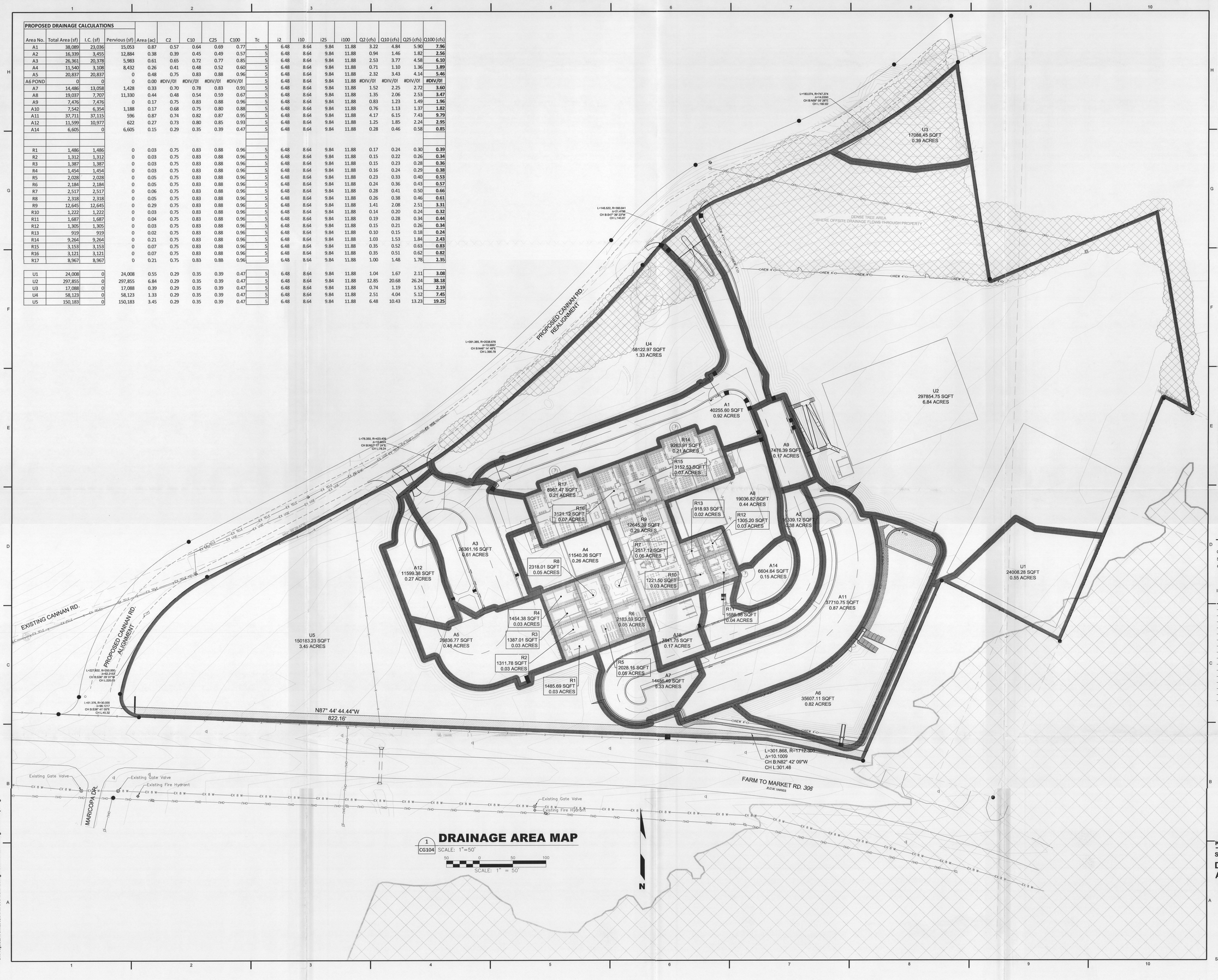
CG103

SHW Project: 4310.009.00

S:\Projects\Comal ISD\FM 306 ES\Bidding Documents\Existing Drainage Area Map.dwg

PROPOSED DRAINAGE CALCULATIONS

Area No.	Total Area (sf)	I.C. (sf)	Pervious (sf)	Area (ac)	C2	C10	C25	C100	Tc	i2	i10	i25	i100	Q2 (cfs)	Q10 (cfs)	Q25 (cfs)	Q100 (cfs)
A1	38,089	23,036	15,053	0.87	0.57	0.64	0.69	0.77	5	6.48	8.64	9.84	11.88	3.22	4.84	5.90	**7.96**
A2	16,339	3,455	12,884	0.38	0.39	0.45	0.49	0.57	5	6.48	8.64	9.84	11.88	0.94	1.46	1.82	**2.56**
A3	26,361	20,378	5,983	0.61	0.65	0.72	0.77	0.85	5	6.48	8.64	9.84	11.88	2.53	3.77	4.58	**6.10**
A4	11,540	3,108	8,432	0.26	0.41	0.48	0.52	0.60	5	6.48	8.64	9.84	11.88	0.71	1.10	1.36	**1.89**
A5	20,837	20,837	0	0.48	0.75	0.83	0.88	0.96	5	6.48	8.64	9.84	11.88	2.32	3.43	4.14	**5.46**
A6 POND	0	0	0	0.00	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	5	6.48	8.64	9.84	11.88	#DIV/0!	#DIV/0!	#DIV/0!	**#DIV/0!**
A7	14,486	13,058	1,428	0.33	0.70	0.78	0.83	0.91	5	6.48	8.64	9.84	11.88	1.52	2.25	2.72	**3.60**
A8	19,037	7,707	11,330	0.44	0.48	0.54	0.59	0.67	5	6.48	8.64	9.84	11.88	1.35	2.06	2.53	**3.47**
A9	7,476	7,476	0	0.17	0.75	0.83	0.88	0.96	5	6.48	8.64	9.84	11.88	0.83	1.23	1.49	**1.96**
A10	7,542	6,354	1,188	0.17	0.68	0.75	0.80	0.88	5	6.48	8.64	9.84	11.88	0.76	1.13	1.37	**1.82**
A11	37,711	37,115	596	0.87	0.74	0.82	0.87	0.95	5	6.48	8.64	9.84	11.88	4.17	6.15	7.43	**9.79**
A12	11,599	10,977	622	0.27	0.73	0.80	0.85	0.93	5	6.48	8.64	9.84	11.88	1.25	1.85	2.24	**2.95**
A14	6,605	0	6,605	0.15	0.29	0.35	0.39	0.47	5	6.48	8.64	9.84	11.88	0.28	0.46	0.58	**0.85**
R1	1,486	1,486	0	0.03	0.75	0.83	0.88	0.96	5	6.48	8.64	9.84	11.88	0.17	0.24	0.30	**0.39**
R2	1,312	1,312	0	0.03	0.75	0.83	0.88	0.96	5	6.48	8.64	9.84	11.88	0.15	0.22	0.26	**0.34**
R3	1,387	1,387	0	0.03	0.75	0.83	0.88	0.96	5	6.48	8.64	9.84	11.88	0.15	0.23	0.28	**0.36**
R4	1,454	1,454	0	0.03	0.75	0.83	0.88	0.96	5	6.48	8.64	9.84	11.88	0.16	0.24	0.29	**0.38**
R5	2,028	2,028	0	0.05	0.75	0.83	0.88	0.96	5	6.48	8.64	9.84	11.88	0.23	0.33	0.40	**0.53**
R6	2,184	2,184	0	0.05	0.75	0.83	0.88	0.96	5	6.48	8.64	9.84	11.88	0.24	0.36	0.43	**0.57**
R7	2,517	2,517	0	0.06	0.75	0.83	0.88	0.96	5	6.48	8.64	9.84	11.88	0.28	0.41	0.50	**0.66**
R8	2,318	2,318	0	0.05	0.75	0.83	0.88	0.96	5	6.48	8.64	9.84	11.88	0.26	0.38	0.46	**0.61**
R9	12,645	12,645	0	0.29	0.75	0.83	0.88	0.96	5	6.48	8.64	9.84	11.88	1.41	2.08	2.51	**3.31**
R10	1,222	1,222	0	0.03	0.75	0.83	0.88	0.96	5	6.48	8.64	9.84	11.88	0.14	0.20	0.24	**0.32**
R11	1,687	1,687	0	0.04	0.75	0.83	0.88	0.96	5	6.48	8.64	9.84	11.88	0.19	0.28	0.34	**0.44**
R12	1,305	1,305	0	0.03	0.75	0.83	0.88	0.96	5	6.48	8.64	9.84	11.88	0.15	0.21	0.26	**0.34**
R13	919	919	0	0.02	0.75	0.83	0.88	0.96	5	6.48	8.64	9.84	11.88	0.10	0.15	0.18	**0.24**
R14	9,264	9,264	0	0.21	0.75	0.83	0.88	0.96	5	6.48	8.64	9.84	11.88	1.03	1.53	1.84	**2.43**
R15	3,153	3,153	0	0.07	0.75	0.83	0.88	0.96	5	6.48	8.64	9.84	11.88	0.35	0.52	0.63	**0.83**
R16	3,121	3,121	0	0.07	0.75	0.83	0.88	0.96	5	6.48	8.64	9.84	11.88	0.35	0.51	0.62	**0.82**
R17	8,967	8,967	0	0.21	0.75	0.83	0.88	0.96	5	6.48	8.64	9.84	11.88	1.00	1.48	1.78	**2.35**
U1	24,008	0	24,008	0.55	0.29	0.35	0.39	0.47	5	6.48	8.64	9.84	11.88	1.04	1.67	2.11	**3.08**
U2	297,855	0	297,855	6.84	0.29	0.35	0.39	0.47	5	6.48	8.64	9.84	11.88	12.85	20.68	26.24	**38.18**
U3	17,088	0	17,088	0.39	0.29	0.35	0.39	0.47	5	6.48	8.64	9.84	11.88	0.74	1.19	1.51	**2.19**
U4	58,123	0	58,123	1.33	0.29	0.35	0.39	0.47	5	6.48	8.64	9.84	11.88	2.51	4.04	5.12	**7.45**
U5	150,183	0	150,183	3.45	0.29	0.35	0.39	0.47	5	6.48	8.64	9.84	11.88	6.48	10.43	13.23	**19.25**



1 CG104 **DRAINAGE AREA MAP**

SCALE: 1" = 50'

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SHWGROUP
ARCHITECTS | ENGINEERS | PLANNERS

Consultants:
CIVIL:
Gil Engineering Associates, Inc.
CONSULTING ENGINEERS – SURVEYORS
PLANNERS – DESIGNERS

100% CD REVIEW SET

COMAL INDEPENDENT SCHOOL DISTRICT

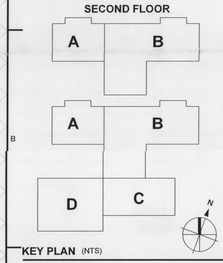
COMAL ISD

FM 306 ELEMENTARY
CANYON LAKE . TX

CHECKED: Checker
SCALE:

ISSUE: March 16, 2012

SECOND FLOOR



KEY PLAN (NTS)

SHEET TITLE:
DRAINAGE AREA MAP

TCEQ-R13
SAN ANTONIO
APR 11 2012

CG104

SHW Project: 4310.009.00

INSPECTION AND MAINTENANCE FOR BMPs

All temporary BMPs shall be inspected weekly and after each rain event or water usage or leakage.

SILT FENCE

ONCE EACH WEEK: Silt Fence shall be inspected weekly for damage by workers, machinery or any other activity that may cause damage to silt fence.

AFTER RAIN EVENT OR WATER USAGE/LEAKAGE: Silt Fence shall be inspected after every rain event and after water usage or leakage. If there is any silt accumulation 6 inches or greater the contractor will be required to clean the silt fence and dispose of silt at an approved landfill location. Contractor will be required to repair or replace any silt fence that is damaged and fails to stop erosion or sediment transport.

CONSTRUCTION ENTRANCE

ONCE EACH WEEK: Construction entrance shall be inspected weekly for damage by workers, machinery or any other activity that may cause damage to construction entrance including erosion and normal wear and tear. Construction Entrance should be maintained to the standards shown in Detail 1, Sheet C#.

AFTER RAIN EVENT OR WATER USAGE/LEAKAGE: Construction entrance shall be inspected after every rain event and after water usage or leakage. If there is any silt accumulation 6 inches or greater on or around the construction entrance, the contractor will be required to clean the construction entrance and dispose of silt at an approved landfill location. Contractor will be required to repair or replace any construction entrance that is damaged and fails to stop erosion or sediment transport.

ROCK BERMS

ONCE EACH WEEK: Silt Fence shall be inspected weekly for damage by workers, machinery or any other activity that may cause damage to rock berm. Repair any loose wire sheathing and reshape as needed. Contractor will be required to replace rock berm if the structure ceases to function.

AFTER RAIN EVENT OR WATER USAGE/LEAKAGE: Rock berm shall be inspected after every rain event and after water usage or leakage. If there is any silt accumulation 6 inches or greater the contractor will be required to clean the silt fence and dispose of silt at an approved landfill location.

ATTACHMENT I
Inspection and Maintenance for BMPs

If a discharge occurs or if the project receives a written notice or order from any regulatory agency, the contractor will immediately notify the Engineer and will file a written report to the regulatory agency within 7 days of the discharge event, notice, or order. Corrective measures will be implemented immediately following the discharge, notice or order.

The report to the regulatory agency will contain the following items:

- The date, time, location, nature of operation, and type of discharge, including the case or nature of the notice or order;
- The BMPs deployed before the discharge event, or prior to receiving notice or order;
- The date of deployment and type of BMPs deployed after the discharge event, or after receiving the notice or order, including additional BMPs installed or planned to reduce or prevent re-occurrence;
- An implementation and maintenance schedule for any affected BMPs

Recordkeeping:

A qualified inspector will inspect the site each week and after each rain event. Regular weekly reports of compliance or non-compliance will be kept. The weekly reports shall be kept on site during the construction period. After the project has ended the contractor shall keep the weekly reports for a period of 3 years after the certificate of occupancy has been delivered to the owner. A copy of the weekly report to be completed by the qualified inspector is attached.

SITE STABILIZATION

Temporary BMPs shall be left in place until site is completely stabilized and silt and debris should be removed and disposed of in the proper manner.

ATTACHMENT I
Inspection and Maintenance for BMPs

NPDES STORM WATER CONSTRUCTION COMPLIANCE INSPECTION REPORT FOR CONTRACTORS

NPDES PERMIT NO.:_____ **DATE OF INSPECTION:**_____
PROJECT NAME:_____ **COUNTY:**_____
PROJECT DESCRIPTION (check one): ___**Residential** ____**Commercial** ____ **Other:**_____

I. TYPE OF INSPECTION:

___ 1) At least once every 7 calendar days, or

___ 2) At least once every 14 calendar days and within 24 hrs of the end of a storm event of 0.5 inches or greater.

II. WEATHER CONDITIONS

1) Weather conditions during inspection:_____

2) Weather conditions since last inspection, including rainfall information: _____

_____

III. SITE AND PLAN REVIEW

Are the following required items available for regulatory review:

Y N 1) SWPPP
Y N 2) Copy of the General Permit
Y N 3) NOI
Y N 4) DHEC Coverage Letter
Y N 5) Co-permittee agreements or contractor certification statements
Y N 6) Weekly inspection forms

IV. BEST MANAGEMENT PRACTICES

Y N 1) Is the Construction entrance/exit properly installed according to plans
Y N 2) Is the perimeter silt fence and/or other controls properly installed
Y N 3) Did any BMPs fail to operate as designed or prove inadequate? *If Yes, Identify BMPs and location(s):

_____
_____
_____
_____
_____

Y* N 4) Are additional BMPs needed? *If Yes, identify BMPs needed and which location(s):

_____
_____
_____
_____
_____

Y* N 5) Do any BMPs require maintenance? * If Yes, provide location(s) and description(s):

_____
_____

Y N 6) Is construction activity following the phasing and sequencing plan?
Y N 7) Has construction activity on the site ceased for 14 days or more?

Y N* 8) If activity has ceased, have temporary stabilization measures been installed within 14 days? *If No, identify location(s) needing stabilization: _____

_____

Y N* 9) Are litter, construction debris, oils, fuels, building products & construction chemicals being properly addressed and or removed? *If No, identify location(s): _____

_____

_____

_____

V. FINAL STABILIZATION

Y* N Have all land disturbing activities at the site permanently ceased? "If Yes, complete the following questions:

Y N 1) Are there any areas of active erosion evident? If Yes, location(s): _____

_____

_____

Y N 2) Does the permitted area have 70% permanent vegetative cover (i.e. grass or other cover) **OR** have equivalent measures such as riprap, or geotextiles been installed?

VI. OFFSITE IMP ACTS FROM PROJECT

1) Are there any offsite impacts? __**No** ___ **Yes**, where? ____Public Right of Way ____ Adjoining Property Owner ____Wetlands ___ Creek/River _____ Lake/Pond _____Other (please specify):_____

2) If answering "Yes" to the previous question, indicate the location and describe the impact: _____

_____

_____

_____

VII. DEFICIENCIES/ CORRECTIVE ACTIONS

Were deficiencies noted in this inspection previously listed in a monthly report? ___Yes ___No

Corrective Action needed as a result of this inspection, including date to be completed: _____

_____

_____

_____

VIII. STORM WATER POLLUTION PREVENTION PLAN UPDATES

Y N 1) Does the SWPPP need to be modified as a result of the inspection?

Y N 2) Has the SWPPP been modified since the last inspection? If so, note the date(s): _____

IX. COMMENTS

_____

_____

_____

_____

_____

_____

_____

Inspector:_____ **Title/Qualifications:**_____

SCHEDULE OF INTERIM AND PERMANENT SOIL STABILIZATION PRACTICES

Existing on-site vegetation will be protected through limiting the construction areas as well as through the use of temporary best management practices including silt fence and tree protection. Much of the construction for the new field house is located on areas that are already impervious cover. Areas around the field house will be sodded with bermuda grass sod as soon as, but no more than 14 days after construction activities in that area have permanently ceased. Where the initiation of stabilization measures by the 14th day after construction activity temporarily or permanently cease is precluded by weather conditions, stabilization measures shall be initiated as soon as practicable. Where construction activity on a portion of the site is temporarily ceased, and earth disturbing activities will be resumed within 21 days, temporary stabilization measures do not have to be initiated on that portion of site. In areas experiencing droughts where the initiation of stabilization measures by the 14th day after construction activity has temporarily or permanently cased is precluded by seasonal arid conditions, stabilization measures shall be initiated as soon as practicable. Hydromulching will be required on all abraded areas for permanent soil stabilization as shown by hatching on our site plan. Temporary BMPs shall not be removed until grass from hydromulching is established to prevent erosion. On all 4:1 slopes, grass sod is required. There are no slopes greater than 4:1 on site.

ATTACHMENT J
Schedule of Interim and Soil Stabilization Practices

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

I Thomas Bloxham,
Print Name

Assistant Superintendent of Facility Management,
Title - Owner/President/Other

of Comal Independent School District,
Corporation/Partnership/Entity Name

have authorized Victor M. Gil
Print Name of Agent/Engineer

of Gil Engineering Associates Inc.
Print Name of Firm

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

I also understand that:

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

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

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

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

5. No person shall commence any regulated activity on the Edwards Aquifer Recharge Zone, Contributing Zone or Transition Zone until the appropriate application for the activity has been filed with and approved by the Executive Director.

SIGNATURE PAGE:

Applicant's Signature

4-10-12
Date

THE STATE OF TEXAS §

County of COMAL §

BEFORE ME, the undersigned authority, on this day personally appeared THOMAS BLOXHAM 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 10TH day of APRIL, 2012.

NOTARY PUBLIC

M. SILVA
My Commission Expires
September 29, 2014

M. SILVA
Typed or Printed Name of Notary

MY COMMISSION EXPIRES: 9/29/14

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

NAME OF PROPOSED REGULATED ENTITY: Comal ISD FM 306 Elementary School
REGULATED ENTITY LOCATION: 310 Cannan Road
NAME OF CUSTOMER: Comal Independent School District
CONTACT PERSON: Thomas Bloxham PHONE: 830-221-2039
(Please Print)

Customer Reference Number (if issued): CN 600249825 (nine digits)

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

Austin Regional Office (3373) ☐ Hays ☐ Travis ☐ Williamson

San Antonio Regional Office (3362) ☐ Bexar ☑ Comal ☐ Medina ☐ Kinney ☐ Uvalde

Application fees must be paid by check, certified check, or money order, payable to the **Texas Commission on Environmental Quality**. Your canceled check will serve as your receipt. **This form must be submitted with your fee payment.** This payment is being submitted to (Check One):

☐ **Austin Regional Office**

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

☑ **San Antonio Regional Office**

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

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

Type of Plan	Size	Fee Due
Water Pollution Abatement Plan, Contributing Zone Plan: One Single Family Residential Dwelling	Acres	$
Water Pollution Abatement Plan, Contributing Zone Plan: Multiple Single Family Residential and Parks	Acres	$
Water Pollution Abatement Plan, Contributing Zone Plan: Non-residential	19.76 Acres	$ 6,500
Sewage Collection System	L.F.	$
Lift Stations without sewer lines	Acres	$
Underground or Aboveground Storage Tank Facility	Tanks	$
Piping System(s)(only)	Each	$
Exception	Each	$
Extension of Time	Each	$

Signature

4-10-2012
Date

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

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

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

Water Pollution Abatement Plans and Modifications
Contributing Zone Plans and Modifications

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

Organized Sewage Collection Systems and Modifications

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

Underground and Aboveground Storage Tank System Facility Plans and Modifications

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

Exception Requests

PROJECT	FEE
Exception Request	$500

Extension of Time Requests

PROJECT	FEE
Extension of Time Request	$150

TCEQ Use Only

TCEQ Core Data Form

For detailed instructions 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 — TCEQ Forms 10257, 0602, 0599, 0574

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 600249825		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: SCHOOL DISTRICT

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

10. Mailing Address:

City	State	ZIP	ZIP + 4

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

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

13. Telephone Number ( ) -

14. Extension or Code

15. Fax Number *(if applicable)* ( ) -

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

20. Number of Employees

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

21. Independently Owned and Operated?

☐ Yes ☐ No

SECTION III: Regulated Entity Information

22. General Regulated Entity Information *(If 'New Regulated Entity" is selected below this form should be accompanied by a permit application)*

☒ New Regulated Entity ☐ Update to Regulated Entity Name ☐ Update to Regulated Entity Information ☐ No Change** *(See below)*

If "NO CHANGE" is checked and Section I is complete, skip to Section IV, Preparer Information.

23. Regulated Entity Name *(name of the site where the regulated action is taking place)*

Comal ISD FM306 Elementary School

24. Street Address of the Regulated Entity: *(No P.O. Boxes)*	306 Cannan Road							
	City	Canyon Lake	State	TX	ZIP	78133	ZIP + 4	
25. Mailing Address:	306 Cannan Road							
	City	Canyon Lake	State	TX	ZIP	78133	ZIP + 4	

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

30. Primary SIC Code (4 digits)	31. Secondary SIC Code (4 digits)	32. Primary NAICS Code (5 or 6 digits)	33. Secondary NAICS Code (5 or 6 digits)
8211		611110	

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

Elementary School

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

35. Description to Physical Location:	at the intersection of FM306 and Cannan Road in Comal County, Texas

36. Nearest City	County	State	Nearest ZIP Code
Canyon Lake	Comal	TX	78133

37. Latitude (N) In Decimal:	29.866433		38. Longitude (W) In Decimal:	-98.1667056	
Degrees	Minutes	Seconds	Degrees	Minutes	Seconds
29	51	59.16	98	10	0.14

39. TCEQ Programs and ID Numbers Check all Programs and write in the permits/registration numbers that will be affected by the updates submitted on this form or the updates may not be made. If your Program is not listed, check other and write it in. See the Core Data Form instructions for additional guidance.

☐ Dam Safety	☐ Districts	☒ Edwards Aquifer	☐ Industrial Hazardous Waste	☐ Municipal Solid Waste
☐ 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:	Victor M. Gil	41. Title:	Principal

42. Telephone Number	43. Ext./Code	44. Fax Number	45. E-Mail Address
(512) 835-4203		(512) 835-4407	vgil@gilengineering.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:	Gil Engineering Associates, Inc.	Job Title:	Principal
Name *(In Print)*:	Victor M. Gil	Phone:	(512) 835-4203
Signature:		Date:	3.20.2012